

# MARINE SCIENTIFIC RESEARCH



Publications on Ocean Development

Volume 49

*A Series of Studies on  
the International, Legal, Institutional and Policy Aspects  
of Ocean Development*

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# Marine Scientific Research

The Operation and Status of Research Vessels  
and Other Platforms in International Law

FLORIAN H.Th. WEGELEIN

MARTINUS NIJHOFF PUBLISHERS  
LEIDEN / BOSTON

A C.I.P. Catalogue record for this book is available from the Library of Congress.

Printed on acid-free paper.

ISBN 90 04 14521 4

© 2005 by Koninklijke Brill NV, Leiden, The Netherlands  
Koninklijke Brill NV incorporates the imprints Brill Academic Publishers, Martinus Nijhoff Publishers and VSP.

<<http://www.brill.nl>>

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Printed and bound in The Netherlands.

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## Preface and Acknowledgements

The roots for this book can probably be traced back to my (hanseatic) ancestry, not least because of my modest and foresightful parents and grandparents who not only supplied me with the relevant funds but, more importantly, also bestowed upon me the prerequisite perseverance and a curious interest for the (maritime) world. With respect to the subject matter, my studies of the law of the sea at the University of Wales at Cardiff in 1994/1995 and at the University of Washington at Seattle in 1997/1998 have been key steps towards a comprehensive understanding of the issue. Returning to Hamburg in 1998 with my head full of knowledge about the law and marine affairs, I was fortunate enough to find in Professor *Lagoni* an understanding supervisor for sorting and bringing together the divers patches of information: on his suggestion I dived into the world of marine science and explored its legal frontiers. The findings, compiled and reviewed in the course of some six years at various places in the world, have been reduced to the present book. The work has been challenging and demanding, never tiring, boring, or even frustrating; and I hope that the rewarding part of it for me will find a balance, a favour in return so to speak, in a stimulation of a discussion on a subject, which, in my humble view, warrants a more thoughtful attention by lawyers and decision-makers across the world.

Many people have helped me in the course of the work on this analysis in one way or another, and naturally I cannot list everyone here. Thus, certain of omitting the names of several and hoping that these feel tacitly included, I want to express my gratitude to the following for help and assistance in accessing and discussing documents and information: *Craig H. Allen*, University of Washington, School of Law and School of Marine Affairs, *Patricio*

*Bernal*, Executive Secretary Intergovernmental Oceanographic Commission and Assistant Director General of UNESCO, *William T. Burke*, University of Washington, School of Law and School of Marine Affairs, *Mary M. Manous*, U.S. Environmental Protection Agency, *Edward Miles*, University of Washington, School of Marine Affairs, *Alan Simcock*, Executive Secretary of the OSPAR Commission and Chair at UNICPOLOS 2001, *Alfred H. A. Soons*, Utrecht University, Director of the Institute of Public International Law and the Netherlands Institute for the Law of the Sea, *Hjalmar Thiel*, University of Hamburg, and *Warren W. Wooster*, University of Washington, School of Marine Affairs. Also, I want to thank the University of Washington at Seattle for twice accepting me as visiting scholar in the course of my research, the ‘Völkerrechtsseminar’ of the Georg-August-Universität Göttingen which afforded me all possible privileges as an extern, and the librarians at various institutions for their help and patience in familiarising me with their respective library systems. I am indebted to *H.-H. Reimers* and *D. Haude* for helping me coming to grips with Linux and L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>, as well as to *J. A. Lacy* for reviewing my usage of the English language.

Special thanks go to my first supervisor *Rainer Lagoni*, University of Hamburg, Director of the Maritime and Law of the Sea Institute, for his valuable advice and guiding commentaries as well as the expedient delivery of his vote; and also, for the second vote, to *Peter Ehlers*, Director of the German Federal Maritime and Hydrographic Agency.

Finally, I am grateful to *Annebeth Rosenboom* and *Joeri Coppejans* for publishing this work in the *Publications on Ocean Development* series and guiding me through the editing process.

This analysis was originally accepted by the faculty of law at the University of Hamburg in May 2004 as partial fulfilment of the requirements for a doctorate degree; the text has been updated for publication in March 2005.

Göttingen, March 2005



# Abbreviations

Note: The distinction between Acronyms and Abbreviations is based on the author's interpretation; within quotations or document signatures, however, the respective original is used.

A.F.L.Rev.:	Air Force Law Review
Am.J.Int'l L.:	American Journal of International Law
A.U.V.:	Autonomous Underwater Vehicles
A.V.R.:	Archiv des Völkerrechts
Baltic Sea Env't Proc.:	Baltic Sea Environment Proceedings
B.C.Int'l & Comp.L.Rev.:	Boston College International and Comparative Law Review
B.G.Bl.:	Bundesgesetzblatt (Official Journal of Germany)
B.M.P.:	Baltic Monitoring Programmes
Brit.Y.Int'l L./B.Y.I.L.:	British Yearbook of International Law
B.S.H.:	Bundesamt für Seeschifffahrt und Hydrographie (Federal Maritime and Hydrographic Agency)
<i>BVerfG-E</i> :	Entscheidungssammlung des Bundesverfassungsgerichts
Cal.W.Int'l L.J.:	California Western International Law Journal
C.B.D.:	Convention on Biological Diversity
CITES:	Convention on International Trade in Endangered Species
cons.ed.:	consolidated edition
C.T.D./S.T.D.:	(Sensors for) conductivity, temperature, depth/salinity, temperature, depth
DGM-Mitteilungen:	Mitteilungen der Deutschen Gesellschaft für Meeresforschung (Reports of the German Association for Marine Research)
D.O.D.P.:	Deep Ocean Drilling Program
DÖV:	Die öffentliche Verwaltung
E.C.:	European Communities
EC:	Treaty establishing the European Community (Amsterdam Version)

E.C.O.J.:	Official Journal of the European Communities
ECT:	Treaty establishing the European Community (Maas-tricht version)
E.E.Z.:	Exclusive Economic Zone
Eur.J.Int'l L.:	European Journal of International Law
ENSO:	<i>El Niño</i> -Southern Oscillation
E.U.:	European Union
F.A.O.:	Food and Agriculture Organization of the United Na-tions
FlaggRG:	Gesetz über das Flaggenrecht der Seeschiffe und die Flaggenführung der Binnenschiffe (Flaggenrechtsge-setz) i.d.Bek.v. 26.10.1994 (B.G.Bl. 1994 I 3140) (Ger-man flags law)
G.A.O.R.:	Official Records of the United Nations General As-sembly
G.Bl. der D.D.R.:	Gesetzblatt der Deutschen Demokratischen Republik (Official Journal of the G.D.R.)
G.B.R.M.P.:	Great Barrier Reef Marine Park
G.C.O.S.:	Global Climate Observing System
G.D.R.:	German Democratic Republic (D.D.R.)
GEO:	Group on Earth Observation
GEOHAB:	Global Ecology and Oceanography of Harmful Algal Blooms
Geo.Int'l & Env'l L.Rev.:	Georgetown International & Environmental Law Re-view
G.I.S.:	Geographic Information System
GLOSS:	Global Sea Level Observing System
GODAE:	Global Data Assimilation Experiment
G.O.E.D.:	Global Ocean Ecosystem Dynamic
GOFS:	Global Ocean Flux Studies
GOOS:	Global Ocean Observing System
G.P.S.:	Global Positioning System
G.T.S.:	Global Telecommunications System
How.Scroll:	Howard Scroll: The Social Justice Review
ICAO:	International Civil Aviation Organization
ICES:	International Council for the Exploration of the Sea
I.C.J.:	International Court of Justice
I.C.J.Rep.:	Reports of Judgements, Advisory Opinions and Or-ders of the International Court of Justice
I.C.S.U.:	International Council of Scientific Unions
i.d.Bek.v.:	in der Bekanntmachung vom (as published on)
I.G.B.P.:	International Geosphere-Biosphere Program
IGOOS:	International GOOS
IGOSS:	Integrated Global Ocean Services System
I.G.Y.:	International Geophysical Year
I.H.B.:	International Hydrographic Bureau
I.L.C.:	International Law Commission
I.L.M.:	International Legal Materials
ILO:	International Labour Organization
ILSA J.Int'l & Comp.L.:	ILSA Journal of International and Comparative Law
Indian J.Int'l L. :	Indian Journal of International Law
Int'l & Comp.L.Q.:	International and Comparative Law Quarterly
Int'l J.Mar. & C.L.:	International Journal for Marine & Coastal Law
Int'l J.Remote Sensing :	International Journal on Remote Sensing
IOC/ABE-LOS:	I.O.C./Advisory Body of Experts on the Law of the

	Sea
I.O.C.:	Intergovernmental Oceanographic Commission
ISA:	International Sea-bed Authority
I.S.N.T.:	Informal Single Negotiation Text
I.S.S.:	International Space Station
I.T.L.O.S.:	International Tribunal for the Law of the Sea
J.Air L. & Com.:	Journal of Air Law & Commerce
J.C.O.M.M.:	Joint IOC-WMO Technical Commission for Oceanography and Marine Meteorology
J.I.R.:	Jahrbuch für internationales Recht (since 1976 German Yearbook of International Law)
J.Mar.L. & Com.:	Journal of Maritime Law & Commerce
L.N.T.S.:	League of Nations Treaty Series
LOS:	Law of the Sea
Mar.T.Soc.J.:	Marine Technology Society Journal
MAST:	Marine Science and Technology (programme of the Commission of the European Communities)
MSC:	Maritime Safety Committee of I.M.O.
MSR:	Marine Scientific Research
MT:	'Moon Treaty', Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
M/V:	Motor Vessel
Nat.Res. & Env't:	Natural Resources and Environment
nm:	Nautical mile
NOAA:	National Oceanic and Atmospheric Administration
N.Y.Int'l L.Rev.:	New York International Law Review
O.D. & Int'l L.:	Ocean Development & International Law
Off.Rec.:	Official Records of the Third United Nations Conference on the Law of the Sea
OOSA:	Office for Outer Space Affairs
OST:	Outer Space Treaty, Treaty on principles governing the activities of States in the exploration and use of outer space, including the moon and other celestial bodies.
Pace Int'l L.Rev.:	Pace International Law Review
P.C.I.J.:	Permanent Court of International Justice
PICES:	Pacific International Council for the Exploration of the Sea
Pol.Y.Int'l L.:	Polish Yearbook of International Law
P.R. China:	People's Republic of China
P.S.S.A.:	Particularly Sensitive Sea Area
P.T.T.:	Platform Transmitter Terminals
RIDGE:	Ridge Interdisciplinary Global Experiment
R.Int'l Arb.Awards:	Reports of International Arbitral Awards
ROV:	Remotely operated vehicle
R.S.N.T.:	Revised Single Negotiating Text
R/V:	Research Vessel
SAR:	Synthetic Aperture Radars
SBC Off.Rec.:	Official Records of the Sea-Bed Committee
SBC Rep.:	Reports of the Sea-Bed Committee
SchRegO:	Schiffsregisterordnung i.d.Bek.v. 26.05.1994 (B.G.Bl. 1994 I 1133) (ships registry regulation)
SCOR:	Scientific Committee for Ocean Research
SeeAufG:	Gesetz über die Aufgaben des Bundes auf dem Gebiet der Seeschifffahrt (Seeaufgabengesetz) i.d.Bek.v. 26

	Juli 2002 (B.G.Bl. 2002 I 2876) (Federal Shipping Law)
Sing.J.Int'l & Comp.L.:	Singapore Journal of International and Comparative Law
SOLAS:	Safety Of Life At Sea
SO-LAS:	Surface Ocean – Lower Atmosphere Study
SOOP:	Ships of Opportunity Programme
SOPAC:	South Pacific Applied Geoscience Commission
S/S:	Steam Ship
S.S.T.:	Sea Surface Temperature
StGB:	Strafgesetzbuch i.d.Bek.v. 13.11.1998 (B.G.Bl. 1998 I 3322) (German Penal Code)
TESAC:	Temperature, Salinity and Conductivity
TOGA:	Tropical Ocean and Global Atmosphere Programme
TRACKOB:	Report of marine surface observation along a ship's track
Transp.L.J.:	Transport Law Journal
TRIPS:	Trade Related Aspects of Intellectual Property
Ukrainian S.S.R.:	Ukrainian Socialist Soviet Republic
U.L.V.:	Ultra Light Vehicles
U.Miami Inter-Am.L.Rev.:	University of Miami Inter-American Law Review
U.N.:	United Nations
UNEP:	United Nations Environment Programme
UNESCO:	United Nations Educational, Scientific and Cultural Organization
U.N.L.S.:	United Nations Legislative Series
U.N.O.L.S.:	University-National Oceanographic Laboratory System
U.N.T.S.:	United Nations Treaty Series
U.Pa.L.Rev.:	University of Pennsylvania Law Review
U.S./U.S.A.:	United States of America
U.S.C.A.:	United States Code Annotated
U.S.N.S.:	United States Navy Ship
U.S.S.R.:	Union of Socialist Soviet Republics
Va.J.Int'l L.:	Virginia Journal of International Law
Vand.J.Transnat'l L.:	Vanderbilt Journal of Transnational Law
Wash.L.Rev.:	Washington Law Review
W.C.R.P.:	World Climate Research Programme
W.H.O.I.:	Woods Hole Oceanographic Institution
WIG:	Wing-in-Ground craft
W.M.O.:	World Meteorological Organisation
WOCE:	World Ocean Circulation Experiment
W.W.W.:	World Weather Watch
X.B.T.:	Expendable bathythermographs
Yale J.Int'l L.:	Yale Journal of International Law
Y.I.L.C.:	Yearbook of the International Law Commission
Z.a.ö.R.V. :	Zeitschrift für ausländisches öffentliches Recht und Völkerrecht
Z.L.W.:	Zeitschrift für Luft- und Weltraumrecht

## Introduction

Almost 25 years have passed since the Third United Nations Convention on the Law of the Sea<sup>1</sup> was signed at Montego Bay. On 16 November 1994 the Convention entered into force and has since then become binding for some 145 countries. The 1982 LOS Convention deals comprehensively with public international law aspects of the oceans. Its Part XIII on marine scientific research is at the heart of the present analysis as it stipulates a coherent legal regime for research activities in all parts of the sea.

Marine scientific research today finds itself between a rock and a hard place: on the one hand, there is increasing demand for scientific knowledge, which is widely perceived as a prerequisite for sound management decisions;<sup>2</sup> on the other hand, many restrictions on the conduct of research activities prevent scientists from freely pursuing their investigations in the natural environment. Part XIII of the 1982 LOS Convention, in establishing a coherent system of rights and obligations for coastal and researching States, attempts to combine, at the same time, coastal States' security and integrity interests and researchers' need to have access to all parts of the sea. The 1982 LOS Convention is assumed to provide the valid rules in a game whose objectives are on the one hand research for the furtherance of humans' knowledge and on the other hand the protection of security, integrity and jurisdiction, as well

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<sup>1</sup>*Third United Nations Convention on the Law of the Sea (UNCLOS III)*, adopted 10 December 1982, entry into force 16 November 1994, 1833 U.N.T.S. 397 [hereinafter: 1982 LOS Convention], the text and additional information is available at *Oceans and Law of the Sea*, Division for Ocean Affairs and the Law of the Sea (DOALOS), (<http://www.un.org/Depts/los/index.htm>) – visited on 31 January 2005.

<sup>2</sup>See *U.N. Secretary-General, Oceans and the law of the sea*, UN Doc. A/56/58, New York, 9 March 2001, para. 9.

as national resources and economic interests. The actors are one or more researching State(s), including international organisations, represented by the research platform; and one or more coastal State(s). The regime, within which activities in relation to their objectives are conducted, determines the operations and status of every participant. This may happen in a spatial sense, for example, by restricting the freedom of scientific research in certain areas of the ocean differently; it may be in a functional sense, as happens under the 1982 LOS Convention where a distinction is made between marine scientific research and exploration (Part XIII and Part XI).

The core proviso of the marine scientific research regime stipulates that a coastal State must give consent to activities within its jurisdiction. This “consent relationship” is primarily determined by an—ideally—formalised procedure. Yet, diplomatic issues may deliberately be linked: political decisions of the foreign State may cause the domestic clearance agency to refuse any co-operation with the former. The relationship may be influenced through the participation in an international organisation. Other rules may be imported by virtue of the status of the subject: A vessel has a different status under the 1982 LOS Convention than a mere installation. And a regular vessel is exposed to the control of the coastal State to a different extent than a vessel which is entitled to sovereign immunity: the two concepts—coastal state jurisdiction with respect to marine scientific research and States’ sovereign immunity—collide when the research platform claims sovereign immunity. Outside the regime of marine scientific research, for example in the context of navigational freedoms, the status may be affected by again other aspects, like whether or not the vessel is in distress when calling at a port. The mere fact that this vessel is equipped for a certain scientific purpose may be of no significance anymore. The function or dedication of the platform may or may not influence the status of the platform *vis-à-vis* other actors.

The analysis follows a twofold approach: First, it examines the text of the law in the light of the literature published especially with respect to marine scientific research in international law. Any interpretation of the provisions of the 1982 LOS Convention is posed with a problem to the extent that the *travaux préparatoire* are not available in an official compilation.<sup>3</sup> Several documents submitted by various delegations exist; yet, they are not contained in the Official Records of the Third U.N. Conference on the Law of the Sea and can thus not be considered as endorsed by the parties—at least not without serious restraints. Also, the unique circumstances and the rules of procedure of the negotiations make it problematic to have recourse to these documents in order to determine the intention of the parties.

Second, for certain instances and where practical, the analysis explores the

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<sup>3</sup>It is submitted that, while *travaux préparatoire* according to Article 32 of the Vienna Convention on the Law of Treaties are in general only of limited relevance, they are nevertheless useful for clarification in cases of ambiguity.

1982 LOS Convention in the general context of international law at large. The Convention and its concepts have been around for some thirty years; adoption of the final text took place in December 1982, entry into force followed in November 1994. It is submitted that the rights conferred under the Convention and their interpretation change over time in the light of the general development in international law.<sup>4</sup> For the validity of every treaty in international law subsequent state practice by treaty parties is of high significance. Due to the doctrine of *consuetudo*, as reflected in the validity requirements for an international treaty laid down in Article 31(3)(b) of the Vienna Convention<sup>5</sup>, a given treaty, even if fully accepted and implemented by its parties, can be considered valid and may contribute to the body of international law in the spirit of the text only if the contracting parties abide by it. Where, however, the parties deviate collectively from the text, interpretation must take account of such changes. The actual development of the 'real' world may change over time the interpretation of the text or necessitate an amendment where state practice is not covered any longer by the wording in the original agreement.

Over the past 30 years a number of developments have taken place which cannot be neglected when looking at the law of marine scientific research now. Thus, for example, the Rio Declaration on Environment and Development<sup>6</sup> and associated instruments have had a significant impact on the development of international law; also development policy has witnessed changes that might influence the understanding of today's lawyers and politicians when looking at the text of the 1982 LOS Convention. Similarly, the importance of research vessels, contemplated by the Convention as the main platform for research activities, has decreased and their operation has been supplemented or even replaced by other research tools. It is noteworthy, however, that the trend is not towards a complete replacement but rather a mixture of a variety of research platforms specifically honed to the relevant purposes; vessels are thus only one in a range of available research platforms. Equally important, scientific programmes have become bigger in scope and

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<sup>4</sup>The I.C.J. in its *Advisory Opinion of 21 June 1971 on Legal Consequences for States of the Continued Presence of South Africa in Namibia (South-West Africa) Notwithstanding Security Council Resolution 276 (1970)*, 1971 I.C.J.Rep., p. 16, para. 53, supports this submission when holding that "the Court must take into consideration the changes which have occurred in the supervening half-century, and its interpretation cannot remain unaffected by the subsequent development of law. [...] In this domain, as elsewhere, the *corpus iuris gentium* has been considerably enriched, and this the Court, if it is faithfully to discharge its functions, may not ignore."

<sup>5</sup>*Vienna Convention on the Law of Treaties*, adopted 23 May 1969, entry into force 27 Jan 1980, 1155 U.N.T.S. 331 [hereinafter: Vienna Convention], the text is available at [www.un.org/law/ilc/texts/treaties.htm](http://www.un.org/law/ilc/texts/treaties.htm) – visited on 31 January 2005.

<sup>6</sup>*Declaration of the United Nations Conference on Environment and Development, UN Doc. A/CONF.151/26 I [1992]*, adopted 14 June 1992 [hereinafter: Rio Declaration], the text can be accessed at <http://www.un.org/documents/ga/conf151/acnf15126-1annex1.htm> – visited on 31 January 2005.

scale and involve scientists from a number of different countries. The market for off-shore resources has not developed as envisaged in the 1970s and 1980s; it is still an open question whether sea-bed mining will start on an economically feasible level in the foreseeable future. And lastly, scientists from developing countries have increasingly participated in the global village of science owing to developments in transportation and communication—one beneficial result of which could be their ability to advise their governments on *bona fide* marine scientific research proposals.<sup>7</sup>

In the context of the present analysis any platform used for scientific investigation is viewed as an expression of research: it constitutes the manifestation of an abstract and perceived threat to the integrity<sup>8</sup> of coastal States, and, at the same time, represents the interests of the researching State or international organisation to conduct scientific research. Unless indicated otherwise the term ‘researching State’ denotes both, the State and the international organisation conducting scientific investigations; the term ‘platform’ denotes not only research vessels and scientific installations, but also all other carriers of scientific equipment if used in the actual research; it is used as an umbrella term to include all chattels carrying scientific investigative instrumentation.

The analysis focusses on the relationship between coastal and researching States as exemplified by the relationship of a coastal State and the operator of a research platform. The operator of the platform can only act within the limits drawn by the concerned States: on the one hand, the coastal State by virtue of the regime of marine scientific research, on the other hand, the researching State which on an international level is responsible for the compliance by the research platform with public international law. The operational freedom of the platform is a function of the relationship between the coastal State and the researching State, i. e., its legal status, determined to a large extent by international law (and diplomacy<sup>9</sup>). The platform is the core of this analysis also for the very practical reason that a research project requires a platform on, or from which it can be conducted. The platform as such, however, has no significance for the regime of marine scientific research

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<sup>7</sup>See Pugh, David, *Criteria and Guidelines for Ascertaining the Nature and Implications of Marine Scientific Research*, IOC Doc. ABE-LOSI/7, Paris, 2001, p. 2.

<sup>8</sup>Integrity is understood here as a set of interests among which security interests—while ranking high—are only part of the whole picture; others may be economic and environmental interests.

<sup>9</sup>It must be noted that international law provides but a frame within which and beyond which research operations may take place. Diplomacy is presently understood as a means to transgress the legal frame by political agreement. “Not legal” research, i. e., research that is by virtue of special arrangement not subject to the restrictions of the international legal system, differs from illegal research, i. e., research that is conducted in contravention of the legal framework, by the fact that the involved states have a political understanding that the research may take place. This is different from state practice—as a prerequisite for customary law—as it does not necessarily reflect *opinio juris*.



if it does not serve for scientific investigation. And only if the platform is deployed outside the waters of the researching State the international regime of marine scientific research examined in this analysis becomes relevant.

The legal status of the platform is determined by the relationship to other actors within the game: platforms operated for the purposes of marine scientific research conduct their activities on the basis of the legal regime of marine scientific research. For a research platform the legal status can thus only be determined by the regime; “outside” the regime its status may be altogether different. At the same time research platforms may be subject to acts that are based on premises completely alien to the marine scientific research regime. Thus, in the context of the Paracel and Spratly Islands dispute, it appears that research activities may have to be abandoned for reasons other than those provided for by Part XIII of the 1982 LOS Convention, namely, the disputed status of jurisdiction.<sup>10</sup> Such instances or exceptions to the rule are not at the focus of this analysis and may only appear for illustration purposes.<sup>11</sup>

The term ‘operation’ in this analysis denotes the research activities con-

<sup>10</sup>In this instance it was reported by the *Far Eastern Economic Review*, 13 October 1994, that a Chinese vessel on a research mission had been ordered to leave Vietnamese waters by the Vietnamese Navy and that the Chinese unit had complied. The question, alien to marine scientific research in this case, was whether the research was intended to assert a Chinese claim to Vietnamese waters.

<sup>11</sup>It should be noted that this analysis does not cover the legal aspects of access to marine scientific research by land-locked and geographically disadvantaged States; the reader is referred instead to *Hafner, Gerhard, Die seerechtliche Verteilung von Nutzungsrechten, Rechte der Binnenstaaten in der ausschließlichen Wirtschaftszone*, Wien, 1987. Neither does it touch upon the issue of security risks, such as piracy and terrorist attacks (piracy has been discussed as an issue amongst vessel operators, see *Rietveld, Marieke J., Seventeenth International Research Ship Operators Meeting, 21–22 October 2003, Valparaiso, Chile*, (<http://www.nioz.nl/isom/>) – visited on 31 January 2005, p. 14; in response to the terror attacks on the World Trade Center in 2001 the U.S.-based *Research Vessel Operators’ Committee (R.V.O.C.)* formed a security sub-committee to assess potential security threats for research vessels noting that acts of piracy, known to research cruises from the past, may not have mere robbery as their sole motive any longer; I.M.O. has reported a few piracy attacks on research vessels). The transfer of know-how and technology, which is to some extent linked to the regime of marine scientific research, is covered only in passing (*Brown, Edward D./Gaskell, Nicholas J.J., The Operation of Autonomous Underwater Vehicles*, Volume 2: Report on the Law, Society for Underwater Technology, London, 2000, pp. 24f. touches these issues). Similarly, areas, like air and space law and state responsibility could only be covered on the surface. The analysis does not deal with (the international) aspects of national law as may occur in the context of scientific research, such as labour law, administrative law, budgetary law, corporate law, copyright and intellectual property laws etc. (with respect to Germany the reader is referred to *Meusel, Ernst-Joachim, Außeruniversitäre Forschung im Wissenschaftsrecht*, 2nd edition. Köln, 1999, and *Trute, Hans-Heinrich, Die Forschung zwischen grundrechtlicher Freiheit und staatlicher Institutionalisierung: das Wissenschaftsrecht als Recht kooperativer Verwaltungsvorgänge*, Tübingen, 1994, Jus publicum 10). Finally, this analysis does not explore the legal issues concerning individuals in international law, namely, detention and liability.

ducted on or from the platform. The operation has legal significance by itself because it establishes a legal relationship, namely, that the platform falls under the regime for marine scientific research to begin with. The 1982 LOS Convention distinguishes between different kinds of investigative conduct;<sup>12</sup> and the relevance of this differentiation shall be examined in the course of the second part.

The practical implication of this analysis may be a clarification of the relationship between the subjects, and the identification of persisting problems or loopholes in the 1982 LOS Convention; it may help to formalise the Article-246-consent procedure internationally; it may outline the legal limitations of activities as shaped by state practice subsequent to the entry into force of the 1982 LOS Convention; it may give guidance in questions of the legal aspects of deployment of scientific platforms (legal status of scientific installations); and may finally contribute to the interpretation of a coherent body of law on marine scientific research by comparing the different concepts of law in three relevant areas, namely, law of the sea, air law and space law.

The present text is outlined in the following structure: Part I deals with marine science and its various disciplines as it is conducted today. On the basis of actual research projects and descriptions of the scientific orientation of its disciplines a complex picture of marine scientific research will evolve. Apart from the areas of research, scientific methods and means and their use will be presented. Part II explores the legal context of marine scientific research. The focus lies on Part XIII of the 1982 LOS Convention, its background and predominant concepts. Subsequently, the scientific methods and means will be examined for their legal significance; central to this part is the attempt of a legal definition for the various platforms. Part III explores in more detail the relevant provisions of Part XIII. Emphasis is put on the rights of the coastal States. In addition to the 1982 LOS Convention, air and space law are to be looked at in passing as they may become relevant for research operations. Part IV deals with the “residual” rights and safeguards of the researching States. The dispute settlement is viewed as one of these safeguards. The more general clauses in Part XIII calling on States to co-operate and to promote and facilitate marine scientific research are examined for their potential to save the stakes of the researching States. Finally, state responsibility in the context of marine scientific research is looked at. Part V contains the conclusions drawn on the basis of the previous parts.

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<sup>12</sup>Article 21(1)(g) ‘hydrographic surveys’, Article 40 “any research or survey activities”, and Part XIII ‘marine scientific research’.

**Part I.**

**Marine Scientific Research,  
the Science Side**



## Chapter 1.

# Marine Scientific Research as a Distinct System

The task of marine scientific research is to observe, to explain, and eventually to understand sufficiently well how to predict and explain changes in the natural (marine) world.<sup>1</sup> The importance of this task, especially with regard to the marine environment, comes increasingly to the international attention. The principal international organisation concerned with marine scientific research, the *Intergovernmental Oceanographic Commission (I.O.C.)*, sub-entity of UNESCO<sup>2</sup>, declared in its Status Report on Existing Ocean Elements and Related Systems<sup>3</sup>, that “[a] significant proportion of world economic activity and a wide range of services, amenities and social benefits depend on wise use of the sea.” It noted that for many countries, marine resources and services provide 3–5% of their Gross National Products. The majority of goods in international trade, i. e., 3,5 billion tonnes of cargo, is transported by ships. I.O.C. estimates that by the year 2020, 75% of the world’s population will live within 60 km of sea coasts and estuaries. World production of offshore oil and gas, worth U.S. \$ 135 billion in 1990, amounting to 20% of world hydrocarbon production, is likely to

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<sup>1</sup>The natural system, of which the marine world only forms a part, is understood here as a continuum of changes in the sense that only changes of a status or condition can be measured. The natural system can thus be only explained by differences in conditions; a status can only be described if compared to another.

<sup>2</sup>U.N. Educational, Scientific and Cultural Organization, see (<http://www.unesco.org/>) – visited on 31 January 2005.

<sup>3</sup>*Status Report on Existing Ocean Elements and Related Systems*, GOOS Report No. 59, IOC/INF-1113, Paris, 1998, p. 3, accessible through the UNESCO document service (<http://unesdoc.unesco.org/ulis/index.html>) – visited on 31 January 2005.

increase since on-shore fields become less and less profitable. The world fish catch is 80–90 million tonnes/year, amounting to some 20% of the total human consumption of animal protein, and worth approximately U.S. \$ 70 billion. Wetland and other shoreline areas are extremely important areas for reproduction for many species; over 50% of these areas have already undergone severe environmental degradation. I.O.C. concludes that “[e]xpected growth in population with the attendant pressure on natural resources, suggests that the economic significance of the oceans is more likely to increase than to decline, as will the need for its sustainable use.” It should derive from these citations that the oceans present and harbour a great significance for humankind. If not directly mentioned the importance attributed implicitly to marine scientific research stems from the fact that knowledge of humans about the marine environment is still fairly limited. This was asserted by I.O.C., à propos the initiation of the *Global Ocean Observing System (GOOS)*:

The ability to determine the present state of systems and predict their future conditions is the cornerstone for adequately protecting and managing ocean and coastal areas and for rational use and development of their living and non-living resources. Effective management of oceans and coastal areas is often limited by the high degree of uncertainties in the present information.<sup>4</sup>

Direct potential beneficiaries of a better understanding of the marine environment are therefore the managers of coastal defences, of ports and harbours, of fishing and fish farming, of shipping, off-shore industry, and recreation. The benefits are not limited to these, though, as indirectly also the on-shore suppliers of food, energy, water and medical supplies may profit. This is especially apparent in cases, where natural events like *El Niño* can be predicted in a reasonably reliable manner, and arrangements can be made in advance to mitigate the catastrophe. Governments benefit from research results when assessing, whether they are meeting their obligations under various international conventions and action plans, such as the 1982 LOS Convention; the Framework Convention on Climate Change;<sup>5</sup> the Biodiversity Convention;<sup>6</sup> Agenda 21;<sup>7</sup> the Global Programme of Action for the Protec-

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<sup>4</sup>Towards Operational Oceanography: The Global Ocean Observing System (GOOS), 26 April 1996, IOC/INF 1028, p. 7.

<sup>5</sup>*United Nations Framework Convention on Climate Change*, adopted 9 May 1992, entry into force 21 March 1994, 31 I.L.M. 849 [hereinafter: Climate Change Convention], text and additional information is available at [http://unfccc.int/files/essential\\_background/background\\_publications\\_htmlpdf/application/pdf/conveng.pdf](http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf) – visited on 31 January 2005.

<sup>6</sup>*United Nations Convention on Biological Diversity*, adopted 5 June 1992, entry into force 29 December 1993, 31 I.L.M. 818 [hereinafter: Biodiversity Convention], text and additional information is available at <http://www.biodiv.org/> – visited on 31 January 2005.

<sup>7</sup>*Environment and Development Agenda*, adopted at the United Nations Conference on Environment and Development (UNCED) 14 June 1992, UN Doc. A/CONF.151/26

tion of the Marine Environment from Land-Based Activities;<sup>8</sup> the London Dumping Convention;<sup>9</sup> the Agreement on Highly Migratory and Straddling Stocks,<sup>10</sup> and others.

## DEFINITION OF MARINE SCIENTIFIC RESEARCH

The 1982 LOS Convention, in Part XIII, contains a number of provisions which deal specifically with marine scientific research. The text does not provide a definition of this term, though. This is mainly due to the fact that the discussions at the conference were extremely complicated<sup>11</sup> and did not lead to a satisfactory result. In the end, the participants apparently agreed that a definition was not necessary because the intended meaning would become clear from the content of the provisions.<sup>12</sup> Yet, a definition is obviously required to determine what may or may not be affected by the regime on marine scientific research and is necessary to determine the exact scope of rights and obligations.<sup>13</sup> The definition of the subject area is therefore placed here as a prefix. In lieu of an authoritative legal definition this task is approached by reference to definitions in the scientific community.

Research comprises of creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society.<sup>14</sup> Marine scientific research is, generally speaking, any

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[hereinafter: Agenda 21], text and additional information is available at <http://www.unep.org/Documents/Default.asp?DocumentID=52> – visited on 31 January 2005.

<sup>8</sup> *Global Programme of Action for the Protection of the Marine Environment from Land-based Activities*, adopted by an UNEP Intergovernmental Conference 3 November 1995., text and additional information is available at <http://www.gpa.unep.org/> – visited on 31 January 2005.

<sup>9</sup> *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters*, adopted 29 December 1972, entry into force 30 August 1975, 11 I.L.M. 1291 [hereinafter: London Dumping Convention], text and additional information is available at <http://www.londonconvention.org/> – visited on 31 January 2005.

<sup>10</sup> *Agreement for the Implementation of the Provisions of the Convention relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks*, adopted 8 September 1995, entry into force 11 December 2001, 34 I.L.M. 1542 [hereinafter: 1995 Implementation Agreement].

<sup>11</sup> See Soons, Alfred H. A., *Marine Scientific Research and the Law of the Sea*, Deventer, 1982, p. 119.

<sup>12</sup> See *Ibid.*, p. 124.

<sup>13</sup> See Soons, Alfred H. A., *The Developing Regime of Marine Scientific Research: Recent European Experience and State Practice*, in Alexander, Lewis M./Allen, Scott/Hanson, Lynne C., editors, *New developments in marine science and technology: economic, legal, and political aspects of change*, Honolulu, Hawaii, 1989, p. 302: “Careless use of terms may lead to confusion about the applicable rules.”

<sup>14</sup> *Organisation for Economic Co-operation & Development, Frascati Manual: 1993*, The measurement of scientific and technological activities; proposed standard practice for surveys of research and experimental development, Paris, 1994, p. 13; see also Alber-Malchow, Christine/Steigleder, Thomas, *Definition der Begriffe Wissenschaft und Forschung – Eigengesetzlichkeit von Wissenschaft und Forschung*, in Wagner, Hellmut, editor, *Rechtliche Rahmenbedingungen für Wissenschaft und Forschung*,

study and experimental work designed to increase humans' knowledge of the marine environment.<sup>15</sup> As a discipline it consists itself of a number of disciplines, which are concerned with the physical, chemical, biological, geological and other features of the oceans.<sup>16</sup> For the present analysis only those studies of the mentioned features and characteristics are relevant that require *in situ* experiments or analyses. Where scientific research can be conducted and provide the desired results without any input from the real environment, the scientist will rarely interfere with international legal rules; only oceanographic activities that in some way or other affect or interfere with foreign interests are of interest for the present analysis. Such interferences can involve tangible and intangible items, such as purity of the environment or integrity of the coastal State's security which is an inherently abstract notion. The relevance of the activity stems solely from the fact that some internationally pronounced and recognised interest is concerned. Thus, it is not debated—so far, one may add—that marine scientific research, concerned with the marine environment on the high seas, i. e., outside spheres of national jurisdiction, is not affected by the question whether or not coastal States' legislation is within the ramifications of the 1982 LOS Convention, because there is no basis for such legislation in the first place. However, on the high seas questions may occur that relate to conflicts with other uses or, for example, the competence of the *International Seabed Authority (ISA)*<sup>17</sup>.

### *Disciplines of Marine Scientific Research*

#### *Biology*

Marine biology is concerned with the living organisms of the sea, such as marine microbes, plankton, benthic organisms, adhesion organisms, eggs and juvenile fish, nektones, algae, marine reptiles and marine mammals. According to their provenance they can be divided into three major groups: *benthic*, *necton*, and *planktonic* organisms.

Benthic organisms, or *benthos*, usually live on the bottom of the sea, or attached to various substrates. They may crawl on the bottom of the sea, or live buried in holes up to several meters deep. Accordingly, in order to

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Forschungsfreiheit und staatliche Regulierung, Volume 1: Freiheit von Wissenschaft und Forschung, Baden-Baden, 2000, p.28 with further references, and *Meusel, Ernst-Joachim, Außeruniversitäre Forschung im Wissenschaftsrecht*, 2nd edition. Köln, 1999, pp.1 and 136; the German Supreme Court held: “[Wissenschaft ist] alles, was nach Inhalt und Form als ernsthafter, planmäßiger Versuch zur Ermittlung der Wahrheit anzusehen ist”, *BVerfGE* 35,79(113).

<sup>15</sup>This definition reflects the text of the *Informal Single Negotiation Text (I.S.N.T.)*, Part III, Article 1 of the Marine Scientific Research part.

<sup>16</sup>See for an overview and introduction of the principles of marine sciences: *Duxbury, Alyn C., Fundamentals of oceanography*, 3rd edition. Boston, 1999; *Segar, Douglas A., Introduction to Ocean Sciences*, Belmont, 1997; *Prager, Ellen J., The Oceans*, New York, 2000.

<sup>17</sup>Hereinafter: Authority.



investigate benthic life, scientists have to extract samples from the bottom of the sea. For this purpose they use bottom samplers, which—depending on the aim and the wide variation in local conditions, sediment type, water depth, and size or lifting gear of the research vessel—range from simple hand operated corers to complicated bottom dredges, sledges, trawls, grabs, and deeply penetrating geological corers.

*Necton* are free and actively swimming organisms, like most of the (pelagic) fishes; *plankton* are suspended or floating organisms, and are not able to withstand water currents. The equipment used for the study of these is a wide assortment of nets, sampling bottles, and traps. Difficulties, which need to be accommodated by the equipment and the scientists, are the wide and three dimensional dispersion,<sup>18</sup> the range of size, structure, and substance,<sup>19</sup> and other properties of the object of interest and its natural surroundings.<sup>20</sup>

### Chemistry

Marine chemistry deals with the chemical properties of the sea water. Dissolved Oxygen and pH, salinity and trace elements like lead (Pb), copper (Cu), iron (Fe), zinc (Zn), cadmium (Cd), mercury (Hg), and cobalt (Co) are important parameters of the marine environment that effect the characteristics of the water column. Also, the concentration of nutrients of the sea water, consisting of phosphate-phosphorus, nitrate-nitrogen, and silicate-silicon as well as ammonia, play a role in ocean chemistry. One of the most important devices used by ocean chemists are sampling bottles of varying sophistication in order to obtain “non-contaminated” water samples from a distinct location in the water column as deep as several thousand meters<sup>21</sup> in order to analyse the chemical substrate. Instrument probes with electrical sensors mounted on a wire, so called C.T.D. (conductivity, temperature, and depth) or S.T.D. (salinity, temperature, and depth), are increasingly used

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<sup>18</sup>The mere size of the oceans and therefore the possible dispersion of species is a difficulty in itself as obviously not the whole ocean can be sampled for a certain species at once.

<sup>19</sup>The objects of interest range from small fish to gigantic whales which obviously cannot be tracked down with the same equipment. Also, organisms which have adapted to the high pressure of the ocean bottom may not be suited to the relatively low pressure at sea level and therefore collapse as they are brought to the surface, before any useful information about their existence can be obtained. Fragile organisms can only be collected in jars or bottles, an activity, which can easily be done by divers in the upper layers of the ocean, but is an exceedingly difficult task at greater depth.

<sup>20</sup>This includes not only the adversities and hardships of the environment as such but also, for example, the fact that the water column precludes visibility beyond a few meters, species may avoid and escape sampling devices, *et cetera*.

<sup>21</sup>A difficult problem is posed by the microlayer, i. e., the top 0,1 mm or so, of the water column, which contains a higher concentration of chemicals than the water below. The content of open sampling bottles when lowered by the vessel's side is thus easily contaminated, and samples therefore not representative of the investigated water depth. The exact depth for sampling is usually determined by temperature and salinity, i. e., determinants of water density.

since the 1970s to read salinity and temperature (and also dissolved oxygen and the pH) continuously as a function of depth.<sup>22</sup>

### *Physics*

Marine physics or physical oceanography is concerned with the physical characteristics of sea water, like optics, acoustics, and density, and all forms of motion in the ocean, like currents, circulation, and waves, and relates its observations to physical laws, such as Newton's Law on acceleration. Some of these occurrences, like current speed and direction, can be computed from salinity and temperature distributions. Like wind systems in the atmosphere are linked to atmospheric pressure patterns, ocean currents are linked to pressure patterns in the ocean. Pressure at any depth in the ocean is determined by the weight of the water above, which is determined by the density of the water, which in turn depends on the water's temperature and salinity. Accordingly, ocean currents can be determined by temperature and salinity measurements in different locations. Therefore the basic properties of sea water are equally relevant for the oceanic circulation and the physical laws that govern it. Another obvious method for tracing currents is the use of chemical or radioactive tracers. Other methods include drifters, drogues, and floats<sup>23</sup> whose buoyancy can be adjusted to a certain water density so that they remain within a predefined water layer. The devices can be traced by radar, or by triangulation of two or more listening stations that follow signals emitted by the float. Also fixed (moored) current meters which operate much like weather vanes can measure the rate and direction of water flowing past them.

### *Geology, geophysics*

Marine geology is concerned with the tectonic situation of the sea floor, with submarine topography, terrestrial magnetism and paleomagnetism, gravity, quake and elastic wave, and sedimentation. Understanding plate tectonics is prerequisite for a reliable prediction of *Tsunamis*<sup>24</sup> and earthquakes. Marine geology provides explanations for sea mounts and ocean ridges, the forming and collapse of islands. Marine geology derives its information from seismic and drilling studies of the lithosphere, from geomorphologic studies of and dredge and grab samples from the sea floor, and studies of magnetic anomalies.

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<sup>22</sup>See *Segar* (as in n. 16 on page 12), pp. 43f.

<sup>23</sup>An inexpensive method to gain information about currents are drift cards which are thrown overboard at a certain location, drift on the surface until they are picked up and returned with details of where and when it was found to the 'sender'.

<sup>24</sup>Gigantic waves as a result of (mid) ocean earthquakes or land slides with catastrophic effects on the shores as occurred on 26 December 2004 in the Indian Ocean.

*Meteorology and Climatology*

Marine meteorology is concerned with the interactions and mutual influence between the oceans and the atmosphere. Much of the weather is affected by the characteristics of the sea surface and, *vice versa*, both on a global and a regional scale as exemplified by atmospheric weather patterns<sup>25</sup>, land and sea breezes<sup>26</sup>, coastal fog<sup>27</sup>, and mountain effects<sup>28</sup>. Important parameters are the *Sea Surface Temperature (S.S.T.)*, air temperature, barometric pressure, wind speed, wind direction, precipitation, insulation, cloud, visibility, and humidity which can be obtained by direct measurements. In respect of Global Climate Change marine scientific research includes a number of other constituents that play a role in the interaction of the various factors. In addition to greenhouse gases, for example, chemical and physical properties and the geographical distribution of natural and anthropogenic aerosols and their precursors, the effects of these aerosols on clouds and radiation, and the resultant influences on regional and global climate have been at the focus of studies.<sup>29</sup>

*Hydrography*

Hydrography<sup>30</sup> is concerned with the aspects of navigation of the sea. Mapping of the sea floor, depth soundings, wreck search and tide schedules are the most prominent services for navigators. Information usually needs to

<sup>25</sup>The atmospheric convergence cells determine predominant wind direction and persistence, the average extent of cloud cover, and average rainfall, see for details *Ibid.*. *El Niño* and the *Southern Oscillation* (ENSO) are a prominent example of global weather systems and their interrelation with the oceans.

<sup>26</sup>Due to the higher heat capacity of water the air above the water remains cooler than on land during the day. Cold air has a higher density than warm air. The result is a pressure gradient between the air masses above the water and the land. Come night the wind switches as the land cools off much quicker than the water and the pressure gradient switches accordingly.

<sup>27</sup>Due to coastal up welling surface water near the coast is often warmer than several kilometres offshore. Where sea breezes occur warm moist air from offshore is drawn into the sea breeze system. As the warm air passes over colder coastal water the water vapour condenses and small water droplets form 'fog'.

<sup>28</sup>Air masses, moving over the Earth's oceans, absorb water up to the point of saturation, the level of which depends on pressure and temperature. Once the air masses encounter a coast line with mountains, they are forced to rise. And as they rise they cool off and the vapour saturation pressure decreases resulting in condensation and precipitation which explains why seaward slopes receive more precipitation than the leeward side of mountains. A similar effect occurs at the inter-tropical convergence where moist air masses are forced upward due to atmospheric up welling.

<sup>29</sup>See *Rosenfeld, Daniel*, *Suppression of Rain and Snow by Urban and Industrial Air Pollution*, in *Science* 287 [2000], p.1793; *Toon, Owen B.*, *How Pollution Suppresses Rain*, in *Science* 287 [2000], p.1763; *Ackerman, A. S.* et al., *Reduction of Tropical Cloudiness by Soot*, in *Science* 288 [2000], p.1024.

<sup>30</sup>See Expertise of *M.B. Schaefer* at the First U.N. Conference on the Law of the Sea, 4th Committee, 1 Official Records, Vol. VI, p. 89.

be updated on a regular basis which requires continuous monitoring and surveying. This is almost always undertaken by governments/government agencies, because it is a critical element for maritime traffic and thus in interdependent world trade which is vital to all nations.<sup>31</sup>

### *Oceanography*

Oceanography is often used as a synonym for marine scientific research. Yet, at least in the scientific community, the term oceanography has come to denote the holistic study of the marine environment, namely, the system of oceans and atmosphere from all possible views of the marine sciences: “the scientific studies of ocean, its boundaries and bottom topography, its physics and chemistry and of its marine organisms, including the interrelations and interactions.”<sup>32</sup> Thus there is a slight, albeit important, difference: oceanography, as perceived here, is a discipline in its own right aiming at cognisance under the guideline ‘the total is more than the sum of its parts’. Many of the parameters used in marine science have across the board significance. Thus, meteorologists increasingly need to consider biology (plankton) and its control of gases (chemistry); *vice versa* oceanographers are increasingly interested in meteorological data.<sup>33</sup> Similarly, measurements on suspended particulate matter and ocean colour may provide estimates of algal phytoplankton abundance, primary production, suspended solids, and circulation, information required not only by biologists but also physicists. It derives also that the investigation of the climate change and its effects on the environment are closely associated with the term oceanography.<sup>34</sup> Marine

<sup>31</sup>See *International Hydrographic Bureau, National Maritime Policies and Hydrographic Services*, Monaco, 2003, p.1, available at [http://www.iho.shom.fr/PUBLICATIONS/Publications\\_E.htm](http://www.iho.shom.fr/PUBLICATIONS/Publications_E.htm) – visited on 31 January 2005. The U.S. Navy issued a document on 30 January 2004, titled “Oceanographic, Hydrographic, and Bathymetric Survey Requirements” (OPNAVINST 3140.55A) with the following definition of hydrography: “Depiction of shallow water bottom features, coastline, beach, tides, and surf characterization”, available at *OPNAV Instruction 3140.55A*, Department of the Navy, [http://neds.daps.dla.mil/Directives/3140\\_55a.pdf](http://neds.daps.dla.mil/Directives/3140_55a.pdf) – visited on 31 January 2005. It is submitted that this definition has been adopted officially.

<sup>32</sup>*Baretta-Bekker, Hanneke G./Duursma, Egbert K./Kuipers, Bouwe R., Encyclopedia of Marine Sciences*, Berlin, 1992, p.185; *Malone, Thomas F., A New Dimension of International and Interdisciplinary Cooperation*, in *Alexander, Lewis M./Allen, Scott/Hanson, Lynne C.*, editors, *New developments in marine science and technology: economic, legal, and political aspects of change*, Honolulu, Hawaii, 1989, p.22.

<sup>33</sup>At I.O.C. and W.M.O. this led to the constitution of the *Joint IOC-WMO Technical Commission for Oceanography and Marine Meteorology (J.C.O.M.M.)* in 1997; its terms of reference are (i) further develop the observing networks; (ii) implement data management systems; (iii) deliver products and services; (iv) provide capacity-building to Member States; and (v) assist in the documentation and management of the data in international systems, see IOC-WMO-UNEP Committee for the Global Ocean Observing System (I-GOOS-IV) Fourth Session 23–25 June 1999, Paris; IOC-WMO-UNEP/I-GOOS-IV/3, February 2000, Paris, p.24.

<sup>34</sup>See on this particular aspect *Corell, Robert, Marine Science in the 1990s: Global Change and Its Implications*, in *Alexander, Lewis M./Allen, Scott/Hanson, Lynne C.*,

scientific research on the other hand is rather an all-inclusive term of art. An important element of oceanography in the holistic sense is the size of its programmes and tasks. Oceanography is inherently international and requires a combination of various instruments over wide spatial extension and long periods of time.

### *Locations of Marine Scientific Research*

From the above it derives that for the determination of legal relevance it makes no sense to distinguish between the various disciplines of marine scientific research: there are a number of overlaps in methods and required input. Also, on a general level, it cannot be determined which parts of the oceans are required to be accessible for marine sciences' needs. The decision, where to conduct a certain experiment from a scientist's point of view, would be most likely based on scientific expedience, that is to say, what features the scientific experiment is aimed at, and in which location these natural features are best represented. It is difficult to find unequivocal oceanographic criteria to justify the delineation of certain zones in the oceans. And also, scientific subjects and areas of interest may vary and develop over time. It is difficult to anticipate scientific development as the object of research is usually to explain satisfactorily what has not been described yet. "The waters continually move and interchange, and the animals add to this a motion of their own. The intimate relation of organisms and environment is evident, but the whole system is fluid and mobile, and the only clear boundary is the land itself."<sup>35</sup> Accordingly, a delineation of the oceans from a marine scientific research point of view makes not much sense. Various areas of the oceans need to be accessed as a function of the objectives pursued with a certain research project. What this implies may be best illustrated by the following examples: The surface temperature of the world's oceans plays a fundamental role in the exchange of energy, momentum, and moisture between the ocean and the atmosphere. It is a central determinant of air-sea interactions and climate variability. The recurring *El Niño-La Niña* cycle, which has a profound effect on the world's weather and climate, is a dramatic manifes-

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editors, *New developments in marine science and technology: economic, legal, and political aspects of change*, Honolulu, Hawaii, 1989, p. 29.

<sup>35</sup> *Wooster, Warren S., Scientific Aspects of Maritime Sovereign Claims*, in O.D. & Int'l L. 1 [1973], p. 19; similarly, *Franssen, Herman T., Developing Country Views of Marine Science & Law*, in *Wooster, Warren S., editor, Freedom of Oceanic Research: A Study Conducted by the Center for Marine Affairs of the Scripps Institution of Oceanography University of California, San Diego*, New York, 1973, p. 153; and *Malone* (as in n. 32 on the preceding page), p. 17, describing the development from the early recognition of the inextricable links between life and its surrounding energetic and material structure to the recognition of a deepened understanding of anthropogenically induced global change.

tation of the coupling of S.S.T. to atmospheric circulation.<sup>36</sup> The surface temperature field also influences the development and evolution of tropical storms and hurricanes<sup>37</sup>, and is correlated with nutrient concentration and primary productivity<sup>38</sup>. The surface temperature all the way across the ocean from the shallow bights at the shore to the deep oceans is relevant in this context.

Another more recent focus of oceanographic research is the separation of oceanic plates at mid-ocean ridge spreading centres, where partial melting of the up-welling mantle creates enough magma to form a layer of basaltic crust 6 to 7km thick. Seismic reflection and refraction studies have shown that this crust forms within 1 to 2km of the ridge axis. The two major questions have been how melt is transported from the distributed region of melt production in the mantle to such a narrow zone at the axis, and how deep the melting extends.<sup>39</sup>

Yet another example to demonstrate the far reaching implications of oceanographic research projects concerns changes in oceanic primary production. In the ocean, photosynthetic carbon fixation by marine phytoplankton leads to the formation of ca. 45 gigatons of organic carbon per annum, 16 gigatons of which are exported to the ocean interior. Because of the linkages in the network of global biogeochemical cycles, changes in the magnitude of total and export production can strongly influence atmospheric CO<sub>2</sub> levels (and hence climate), as well as set upper boundaries for sustainable fish catches. The two fluxes, in and out of the oceans, are critically dependent on geophysical processes, which are responsible for mixed-layer depth, nutrient fluxes to and within the ocean, and food-web structure.<sup>40</sup> From the above it should clearly derive that scientific research has no clear cut borders. Field observations in marine biology do not necessarily coincide geographically

<sup>36</sup>See *McPhaden, Michael J., Genesis and Evolution of the 1997–98 El Niño*, in *Science* 283 [1999], p. 950.

<sup>37</sup>See *Demaria, M./Kaplan, J., Sea-Surface Temperature and the Maximum Intensity of Atlantic Tropical Cyclones*, in *Journal of Climate* 7 [1994], p. 1324; *Emanuel, Kerry A., Thermodynamic Control of Hurricane Intensity*, in *Nature* 401 [1999], p. 665.

<sup>38</sup>See *Kamykowski, D., A Preliminary Biophysical Model of the Relationship Between Temperature and Plant Nutrients in the Upper Ocean*, in *Deep-Sea Research, Part A-Oceanographic Research Papers* 34 [1987], p. 1067.

<sup>39</sup>See *MELT Seismic Team, Imaging the Deep Seismic Structure Beneath a Mid-Ocean Ridge: The MELT Experiment*, in *Science* 280 [1998]. For the experiment, passive arrays of *ocean-bottom seismometers (OBS)*, electrometers, and magnetometers were deployed on the sea floor across the East Pacific Rise to record seismic waves from regional and teleseismic earthquakes and coupled variations in the electric and magnetic fields. The seismological observations demonstrated that basaltic melt is present beneath the East Pacific Rise spreading centre in a broad region several hundred kilometres across and extending to depths greater than 100 kilometres, not just in a narrow region of high melt concentration beneath the spreading centre, as predicted by some models.

<sup>40</sup>See *Falkowski, Paul G./Barber, Richard T./Smetacek, Victor, Biogeochemical Controls and Feedbacks on Ocean Primary Production*, in *Science* 281 [1998], p. 200.

with any other marine science (although they may very well do). The delineation of research areas may therefore vary from research cruise to research cruise and from experiment to experiment. For oceanography the legal or political concept of, for example, an exclusive economic zone has no significance. Biological delimitation happens along isobaths, isotherms, and other aspects of the physical environment, if at all. It must be noted that the arbitrary 200 nm line was introduced independent from any scientific considerations. For the present analysis it is accepted that marine scientific research cannot be delineated geographically. While it may be possible to carry out experiments and measurements completely outside of national jurisdiction, this would make little sense due to the fact that for practical purposes the oceans (and the land) are one system, which cannot be split up without losing information. It is submitted that the focus of marine science on specific areas is a function of necessity rather than choice. Even though large-scale studies are increasingly carried out, the feasibility of such undertakings is determined by a number of factors, including those alien to legal considerations in the regime of marine scientific research, namely, costs and capacity.

Some observations with respect to various parts of the oceans can be made nevertheless:

1. Research vessels, as much as other vessels, need to access ports on a more or less regular basis to replenish their bunkers. The major importance of internal waters stems from the fact that all ports are situated entirely in internal waters.<sup>41</sup> To the extent that research vessels need land or shore access for bunkering, taking aboard new crew or scientists, as well as repairs, the internal waters are an important aspect of research cruises.
2. Marine scientific research by tradition has been predominantly focussed on coastal waters. These have been considered as the most important parts of the oceans as they are the most prolific areas in the world. It is close to the shores of the continents that up-welling water transports nutrients in the upper layer where photosynthesis generates enough primary energy so the nutrients can be utilised by biological organisms and plants. Also, the study of the movement of material from the land to the oceans and the distribution of this material within the ocean is among the primary concerns of oceanographic research. Thus, the coastal waters remain an important issue in marine science.
3. Vast areas of the ocean are still *terra incognita*.<sup>42</sup> To improve scientific knowledge of the whole system, the processes of the open ocean and the sea-floor must also be open for scientific studies.

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<sup>41</sup>Roadsteads are not considered ports in this sense.

<sup>42</sup>A mere 6% of the sea bed has been explored.

*Two Forms of Marine Scientific Research: Research and Operational Oceanography*

Much of what was described above is oceanography, which is focussed on a certain feature of the natural environment. It is based upon a certain premise or hypothesis, which is either verified or falsified through *in situ* experiments or through findings based on *in situ* measurements. Both, experiments and measurements, are carried out specifically and intentionally with a view to falsification or verification. Usually, data obtained in the context of such individual oceanographic investigations are being used in the scientific process of verification before it is released or published. Withholding the raw data from the general public, until such a time that the initial hypothesis is confirmed or vitiated, is a central characteristic of this kind of oceanography. Because obtaining data is coupled with a certain research project, this kind of oceanography is in the present analysis called ‘research oceanography’.

In contrast, what has been named *operational* oceanography is concerned with continuous and long term observation to provide data about the present state of the ocean and atmosphere, to assemble climatic data sets for the description of past states, and to produce time series showing trends and changes. It can be viewed as a supplemental means to enhance the capacity to understand and forecast seas and oceans.<sup>43</sup> Observations in programmes of operational oceanography provide data about the present state of the sea and about its future states for as far ahead as possible. These data are made available to a wide range of users and customers all over the world, either by the observer directly or through programmes of international organisations, predominantly I.O.C.<sup>44</sup> In order to fulfil the expectations by users and customers, operational observations are required to be systematic, accurate and precise, routine, cost-effective, high quality, sustained for the long term, available in a timely manner, and relevant and responsive to users’ needs.<sup>45</sup> Operational oceanography is by no means a recent occurrence, it rather has developed over years to meet the needs of the community, and observing systems are still growing, both in terms of data from remote sensing platforms and from *in situ* measurements.

<sup>43</sup>See *Summerhayes, Colin/Rayner, Ralph, Operational Observing Systems*, in IOC Annual Reports Series No. 6, Paris, 2000, p. 27; the *Academy of Finland, European Strategy on Marine Research Infrastructure*, Report compiled for the European Strategy Forum on Research Infrastructure by the Ad Hoc Working Group on Marine Research Infrastructure, April 2003, Helsinki, 2003, Publications of the Academy of Finland 6/03, p. 17, defines operational oceanography “as the activity of systematic and long-term routine measurements of the seas and oceans and atmosphere, and their rapid interpretation and dissemination.”

<sup>44</sup>At the global level the demand for operational oceanographic information is coordinated through the agency of the GOOS; locally, information centres retrieve, store, manage, and process data to provide custom tailored information, see *Summerhayes/Rayner* (as in n. 43), p. 27.

<sup>45</sup>IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Third Session, Accra, Ghana, 13–15 April 1999, IOC-WMO-UNEP-ICSU/C-GOOS-III/3, p. 4.



*Conduct of Marine Scientific Research*

Wooster has described the characteristics of marine science as to include:

1. Space and time scale extending over an enormous range, from near-molecular to the breadth of the earth and from less than seconds to the lifetime of the planet;
2. The impracticability of controlled experiments, their place being taken by natural experiments that necessitate careful field observations and ingenious interpretations;
3. The inherent multidisciplinary, or even interdisciplinary, nature of most marine problems;
4. The common need for the cooperative efforts of many field observers because of the wide range of scales involved; and
5. The requirement for comparable quality in data compiled from a variety of sources and used to describe processes and phenomena of larger scale.<sup>46</sup>

Research in experimental oceanography is fairly expensive, both in terms of equipment and execution. Therefore oceanographers need to employ equipment and personnel so as to make the most effective use of it, both in terms of time and space. In terms of space, oceanographers will meet with coastal State reservations wherever research is likely to affect exclusive interests of that State.<sup>47</sup> Access restrictions increase costs, especially when they are encountered while the research is already in progress: the project must be abandoned, carried out all over again with permission, or in a less suitable location, all of which might compromise the relevance and significance of the project's results. The operational cost of an oceanographic research vessel typically exceeds U.S. \$ 15,000 per day, so any coastal State requirement that increases ship time is a serious financial matter. In some cases, the unattractive alternative to additional ship time is to delete other planned projects or oceanographic stations. Yet, the projects of a well-planned oceanographic expedition are usually interrelated so as to make the overall study as nearly comprehensive and economical of ship time as possible which makes it difficult or even impossible to abandon single projects without impairing the rest. In terms of time, any delay adds further costs to the undertaking. Also, scientific experiments may for physical or biological reasons have seasonal constraints, which, if not met, might render the whole project useless. And finally, rapid experimental investigation of new ideas has been described as the essence of scientific enterprise: if too much time elapses, between the inception of the idea and its verification, the scientist and his financial supporters are likely to go to work on something else.<sup>48</sup>

<sup>46</sup>Wooster, Warren S., *On the Evolution of International Marine Science Institutions*, in *Ocean Yearbook* 10 [1993], p. 172.

<sup>47</sup>For these interests see section 2.

<sup>48</sup>See *Revelle, Roger, Scientific Research on the Sea-bed, International Cooperation in Scientific Research and Exploration of the Sea-bed*, in *Sztucki, Jerzy*, editor, *Sympo-*

## HISTORY OF MARINE SCIENTIFIC RESEARCH

*History before WW II*

As a scientific discipline in its own right marine scientific research has developed over the past 150 years or so. The first significant step in this development was the cruise of the *M/S Challenger*. A British operated vessel set out to explore specifically the properties of the oceans from 21 December 1872 to 24 May 1876.<sup>49</sup> Scientific investigation of the oceans in the

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sium on the International Regime of the Sea-bed, Rome 1969, Rome, 1970, Accademia nazionale dei Lincei, Istituto affari internazionali, p.660.

<sup>49</sup>However, before this 'oceanographic' undertaking, humans had been interested in the oceans leading to reported observations and investigations from traders and explorers as early as 1500 B.C. The Phoenicians excellent sailors and navigators are believed to have circumnavigated the African continent about 600 BC, the Arabs and Polynesians made use of their observations of birds, waves, cloud formations and astronomical bodies when sailing off-shore. The Greeks observed and asked themselves questions about the seas. *Aristotle* (384–322 B.C.) knew that the sun evaporated water from the sea surface, which would condense and return as rain. *Pliny the Elder* (A.D. 23–79) related the tides to the phases of the moon and reported on the currents in the Strait of Gibraltar. *Ptolemy* (A.D. 127–51) produced the first world atlas with great detail. While during the medieval ages intellectual activity in relation to the oceans ceased in northern Europe, shipbuilding improved and made longer voyages far offshore increasingly possible due to greater seaworthiness and better manoeuvrability. Equally the knowledge of navigation increased: harbour-finding charts with a mileage scale and noted hazards, magnetic compasses, early tide tables were among the achievements of this time. Successful trading routes were established with some partial ocean crossings, merchant leagues like the German *Hansa* flourished and bolstered the development of navigation. Discovery became a thriving force of development in the early fifteenth century when the Chinese organised seven voyages to explore the Pacific and Indian Oceans. In Europe the desire for the products from new lands led individuals to underwrite the costs of long voyages through all oceans of the world. The search for new and faster routes to the precious products of the East led into the age of European discovery. It began with *Bartholomeu Dias* (1450?–1500), who sailed around Cape of Good Hope in 1487. *Christopher Columbus* sailed across the Atlantic ocean four times; *Vasco da Gama* established a sea route to India around the Cape of Good Hope; and *Amerigo Vespucci* journeyed several times to the New World exploring 6,000 miles of South American coast, he accepted South America as a new continent not a part of Asia. Although these men sailed for fame and riches for their countries they greatly contributed to the knowledge of the earth in general and stimulated others to follow. *Ferdinand Magellan* left Spain in 1519, rounded South America through the Strait of Magellan, and made his way across the Pacific Ocean to the Philippines enormously furthering the early charting of the oceans. Only one of his five ships reached Spain again completing the first circumnavigation of the earth. New ideas and knowledge had stimulated the explorations and discoveries during the fifteenth and sixteenth centuries, but most of the thinking about the oceans was still rooted in ideas of *Aristotle* and *Pliny*. In the seventeenth century practical needs of commerce, economic and political expansionism still guided the events at the sea, but increasingly scientists on land became interested in experimental science and the study of specific substances. The emergence of modern science characterised by the axiom of experimental evidence as postulated by *Isaac Newton* (1642–1727) bolstered the curiosity about the earth in general, which should later expand to the oceans. Development of better navigational techniques and charts was intensified with expansion of trade, travel and exploration.

seventeenth and eighteenth centuries was still guided by the need for better navigation, tide prediction, safety, as well as geographic discovery.<sup>50</sup> The early nineteenth century witnessing new technological developments that required the laying of transatlantic telegraph cables made an understanding of certain properties of the oceans necessary,<sup>51</sup> namely, some knowledge about conditions of the sea floor, including bottom topography, currents, and organisms that might adversely affect the cables. The British began a series of deep-sea studies following the retrieval of a damaged sea cable covered with organisms from a depth believed to be ‘azoic’. Based on findings from two of these expeditions, *Wyville Thomson* (1830–1882) wrote what can be seen as the first book on oceanography: the *Depths of the Sea*, published in 1873.<sup>52</sup> With public interest running high, the Circumnavigation Committee of the British Royal Society was able to persuade the British Admiralty to organise the “most comprehensive single oceanographic expedition ever undertaken”<sup>53</sup>. During their three-and-a-half year voyage scientists aboard the *M/S Challenger* sounded depths, collected deep-sea water, sea-bottom as well as biological samples, investigated deep-water motion, and measured temperatures at all depths. The actual cruise was followed by twenty years of organising and compiling the information, published in the 55 volumes of the *Challenger Reports*. Oceanography as a modern science is generally

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Important steps were the acceptance of the relationship between time and longitude, accurate chronometers for measuring the time at sea. With these improvements in the back naturalists and biologists became more and more interested in the oceans. *Alexander von Humboldt* (1769–1859) took out on a five year voyage (1799–1804) to South America noting the vast numbers of animals inhabiting the Humboldt current flowing northward along the west coast of South America. *Charles Darwin* joined the survey vessel *Beagle* as the ship’s naturalist from 1831 to 1836 collecting and describing land and sea organisms. *Christian Ehrenberg* (1795–1876) observed that the sea was filled with microscopic life and that life organisms added to the skeletons he found in the sea floor sediments. The investigation of these drifting plants and animals was continued by *Johannes Müller* (1801–1858) and later by *Victor Hensen* (1835–1924) who not only improved the quantitative study of these organisms but also gave them the name plankton in 1887.

<sup>50</sup>See *Jones, Joyce E./Jones, Ian S.F., Physical Oceanography in the Oceans around Australia before 1850*, in *Lenz, Walter/Deacon, Margaret*, editors, *Ocean Sciences: Their History and Relation to Man*, Volume 22, Hamburg, 1990, p.280.

<sup>51</sup>See *Ibid.*, pp.280–284, pointing out that the evolution of oceanographic features like surface currents, temperature variations with depths and associated theories started around the 1820s; see also *Boguslawski, Georg v., Handbuch der Ozeanographie*, Volume I: räumliche, physikalische und chemische Beschaffenheit der Ozeane, Stuttgart, 1884, pp.6 and 186f. with respect to *Mathieu Fontaine Maury’s* observations concerning the Atlantic sea routes in the first half of the 19s century.

<sup>52</sup>In 1884 and 1887, what can be seen as the first comprehensive German publication on oceanography, was published: *Ibid.* and *Boguslawski, Georg v./Krümmel, Otto, Handbuch der Ozeanographie*, Volume II: die Bewegungsformen des Meeres, Stuttgart, 1887; see also *Krause, Gunter, Sensoren in der Meeresforschung: Von den Anfängen bis heute*, in DGM-Mitteilungen [1999], Nr. 3, pp.30f.; *Kortum, Gerhard, Über A.v. Humboldts Atlantiküberquerung vor 200 Jahren*, in DGM-Mitteilungen [1999], Nr. 1, pp. 3f., for accounts of contributions by German oceanographers.

<sup>53</sup>See *Duxbury* (as in n. 16 on page 12), p.12.

associated with the cruise of the *M/S Challenger*. Other nations were to follow, and before the second world war Norwegian, French, German, Austrian, U.S. American, Italian, and Russian ships set out to satisfy increased intellectual interest in the oceans. Cruises like these had the aim of gathering data to test hypotheses rather than to further navigational or safety purposes, although economic reasons, like national fishing programmes, stimulated oceanographic research and international co-operation.

As early as 1870, scientists began to realise their need for knowledge of the physical and chemical properties of the oceans to understand ocean biology. Recognising that the ocean is a system across borders, Germany, Russia, Great Britain, Holland, and the Scandinavian countries formed in 1902 the *International Council for the Exploration of the Sea (ICES)*<sup>54, 55</sup> to sponsor and co-ordinate research of the sea and fisheries. Also as early as 1911 the relevance of scientific input for management decisions was recognised by international agreements. In the *Bering Fur Seal Convention*<sup>56</sup> the parties based on the experiences made in the course of the Bering Fur Seal Arbitration<sup>57</sup> agreed to impose restrictions and regulations for conservation management decisions, which would inevitably require scientific information in terms of official counts.<sup>58</sup> And in 1926 scientific research on marine pollution contributed to the first draft of a convention controlling pollution from ships, which in 1954 eventually became the IMO OILPOL Convention<sup>59</sup>.

Prior to the 1950s, marine scientific research could be conducted freely anywhere in the world's oceans except perhaps for the territorial sea, whose

<sup>54</sup> *Convention for the International Council for the Exploration of the Sea*, adopted 12 September 1964, entry into force 22 July 1968, 652 U.N.T.S. 237 [hereinafter: ICES Convention], the text is available at (<http://www.ices.dk/aboutus/convention.asp>) – visited on 31 January 2005.

<sup>55</sup> For an overview see *Anderson, Emory D., The International Council for the Exploration of the Sea*, in *Platzöder, Renate/Verlaan, Philomène*, editors, *The Baltic Sea: new developments in national policies and international cooperation*, The Hague, 1996, European workshops on the law of the sea, pp.271f.; *Post, Alfred, ICES 2000*, in *DGM-Mitteilungen* [1999], Nr. 1, pp.20f., pointing out (pp. 24f.) that ICES today supplies various “clients”, including OSPAR, HELCOM, the European Union and Regional Fisheries Organisations, with scientific information.

<sup>56</sup> *Convention Respecting Measures for the Preservation and Protection of Fur Seals in the North Pacific*, signed 7 July 1911, see 104 (1911) *British State Papers* 175–181, parties were the U.K., U.S.A., Japan and Russia.

<sup>57</sup> See *Moore, John Bassett, International Arbitrations to Which the United States has been a Party*, Volume I, Washington, 1898, pp. 834–904, and 907; *Birmie, Patricia W., Law of the Sea and Ocean Resources: Implications for Marine Scientific Research*, in *Int'l J.Mar. & C.L.* 10 [1995], p. 404.

<sup>58</sup> Article X, especially referring to the rights of the U.S. under the convention provides the right: “from time to time to suspend altogether the taking of seaskins... and to impose such restrictions and regulations upon the total number of skins to be taken in any season, and the manner and times and places of taking them, as may seem necessary to protect and preserve the seal herd or to increase its number.” Article XII grants the same right to Russia.

<sup>59</sup> *International Convention for the Prevention of Pollution of the Sea by Oil*, London 1954, 327 U.N.T.S. 3; see *Ibid.*

breadth was widely if not uniformly accepted with three nautical miles.<sup>60</sup> As scientific research was mostly conducted in nearby waters of friendly nations even access to the internal waters was readily permitted. Scientists took samples of water, biota and even the sea bottom while passing through the territorial sea, only informally notifying the coastal state. Plus, notification was often made only through the scientific colleagues in that nation. Even research operations and port calls of larger and far ranging expeditions were scheduled without considerable formalities as they were rare and usually generally welcomed.<sup>61</sup>

### *Marine Scientific Research in and after WW II*

The researcher claims a kind of privilege because of his duty, his social part he wants a *scientific immunity*, which gives him the right of travelling without restraint through frontiers, of meeting, of publishing his discoveries, of working as he wants, where he wants, with the persons and in the domains he has chosen, without rendering an account to the governmental authorities.<sup>62</sup>

After WW II the work of the oceanographer became increasingly a concern of States' interest. Three factors may be identified as contributing to the growing competition for the use of the sea, and to the conflict between the regulation of such use and the tradition of freedom in terms of scientific research.<sup>63</sup>

The first, and probably the most important, factor was a boost in terms of technology and knowledge enhancement due to military needs: problems required a timely solution and funds were made available through the war machinery. The Allies in WW II needed to move men and materials by sea to remote locations, to predict ocean and shore conditions for amphibious landings and naval warfare,<sup>64</sup> to know how explosives behaved in sea water, to chart beaches and harbours from aerial reconnaissance, and to find and destroy submarines.<sup>65</sup> Indirectly, the need for continuing production

<sup>60</sup>See *Mangone, Gerard J., The Effect of Extended Coastal State Jurisdiction over the Seas and Seabed upon Marine Scientific Research*, in *Park, Choon-Ho*, editor, *Law of the Sea in the 1980s*, Honolulu, Hawaii, 1983, pp.294f.

<sup>61</sup>See *Schaefer, Milner B., Freedom of Scientific Research and Exploration in the Sea*, in *Stanford J.Int'l Studies* 4 [1969], pp.60f.

<sup>62</sup>See *Ringard, Gisele, Scientific Research: From Freedom to Deontology*, in *O.D. & Int'l L.* 1 [1973], p.126.

<sup>63</sup>See *Schaefer*, *Freedom and Exploration* (as in n. 61), pp.50-59.

<sup>64</sup>The prediction of thermoclines, or areas of rapid water temperature change, under which a submarines could hide to escape enemy detection by surface sonar was of imminent importance.

<sup>65</sup>In terms of scientific achievement, *Ibid.*, p.49, notes: "Perhaps the most important aspect of wartime and postwar technological development was the emergence of operations research and systems analysis, and their application to the solution of technological problems."

of goods and services with reduced manpower mobilised scientific and technological effort. After the war oceanographers had, as a result of WW II investments, an array of new, sophisticated instruments, like *radar (RAdio Detecting And Ranging)*, *sonar (SOund Navigation Ranging)*, automated wave detectors, and temperature depth recorders. Also, large-scale government funds were still available in the U.S.A., and other developed countries followed the American example. The beginning of the Cold War made the continuance of high spending policy easy to justify.

The second factor was the need to satisfy the world's growing requirements for extractive resources, transportation, and military strategy. Due to a rapidly expanding world population the pressure for food and other resources, especially in less privileged countries, brought the riches of the sea into focus. Fish, water and fossil fuels became increasingly a supplement and replacement of the on- and in-shore commodities. International trade with heavy or bulk materials remained dependent on water based transport. The developments in naval warfare, especially in respect of submarines, continued to play an important role in the Cold War military strategies. And finally, the sea was also considered for waste disposal.

The third factor was the increase in scientific capacities and requirements itself. The availability of new techniques and technologies as well as financial and technical support of scientists from major maritime nations enabled more comprehensive studies in physical and biological oceanography. The possibilities stimulated demand and the oceanographic community grew in size and numbers. The post war boost of science culminated in the *International Geophysical Year (I.G.Y.)* from 1957–58, in which 67 nations co-operated to explore the sea floor and made discoveries that completely revolutionised geology and geophysics.<sup>66</sup> After the International Geophysical Year by the International Union of Geodesy and Geophysics the *International Council of Scientific Unions (I.C.S.U.)* formed a *Scientific Committee on Ocean Research (SCOR)* to further organise international co-operation in oceanography. SCOR organised the International Indian Ocean Expedition, involving 23 countries and more than 40 ships operating at various times from

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<sup>66</sup>One of the more notable discoveries is the tectonic plates movement, the drifting of the continents: "the theory of plate tectonics, the concept that the surface of the earth is comprised of a mosaic of eight large and several small rigid, dynamic lithospheric plates which move on a partially molten, plastic asthenosphere, has revolutionised the field of marine geology since the late 1960s. According to this theory... individual lithospheric plates behave as rigid bodies, but at their boundaries the plates interact in three ways: (1) by spreading or diverging, as at mid-ocean ridges; (2) by converging, as at deep-sea trenches; and (3) by sliding past each other, as at transform faults or fracture zones. Forces operating at the plate boundaries include tension (at areas of divergence), compression (at zones of convergence), and shearing (at transform faults). The relative motions of the plates account for tectonic activity at their margins, concentrating most earth-quakes and volcanoes on the surface of the earth at these perimeters." *Kennish, Michael J., Practical Handbook of Marine Science*, 2nd edition. Boca Baton, 1994, p. 173.

1959 to 1965. I.O.C., as an umbrella organisation, was incepted by UNESCO in order to provide a more formal means of intergovernmental co-ordination in 1960. It took over the co-ordinating function from SCOR for the Indian Ocean Expedition and has since sponsored other multinational programs.<sup>67</sup> *Treves* suggests that the I.O.C. itself “as the competent international organization for marine scientific research. . . under the Convention. . . acquired the right to conduct marine scientific research”<sup>68</sup>.

Another result of the efforts of the I.G.Y. is the *Antarctic Treaty System (A.T.S.)*, under which the parties agree to forestall or ‘freeze’ their territorial claims to the Antarctic continent in order to provide a suitable political climate for future scientific research and, most importantly, to ban all (economic) mining activities for years to come. The A.T.S. can be considered the first comprehensive international legal framework for the conduct of scientific research operations. International endeavours followed, like the *Indian Ocean Expedition* in 1963–64 and the *International Decade of Ocean Exploration* in the 1970s.

Important steps for marine sciences in these years were special research vessels and submarines, internally recording current meters, neutrally buoyant floats, and profiling devices, the introduction of electronics, like computers allowing for sorting, analysing, and interpreting of data on site and at large quantities, and new technology, like satellites permitting oceanographers to ascertain the sea in its global entirety and to great depths.<sup>69</sup>

Deep-sea hot vents, as well as their associated animal life and mineral deposits, renewed the interest in the marine science disciplines. Increasingly, the oceans came into focus as a food source with mounting pressure on the living resources. Growing demand for fish and increasing ability to harvest due to improved technology, led to dwindling fish stocks and made it eventually inevitable to face problems of resource ownership and management. Both posed new questions to the marine science, as managers needed reliable data and predictions to make their allocation decisions, and, at the same time, pushed for extended ownership of the resources with the consequence of access restrictions for others.

Ironically, as the scientific capacities and knowledge have grown, control over marine scientific research activities has been increasingly assigned to

<sup>67</sup>See *Childers, James J.; Brewer, Peter G.*, editor, *Oceanic biology: lost in space?* New York, 1983, p.133; *Ehlers, Peter*, *The Intergovernmental Oceanographic Commission: An International Organisation for the Promotion of Marine Research*, in *Int'l J.Mar. & C.L.* 15 [2000], pp.534f.; such as the international investigations of the tropical Atlantic, international investigations of the Kuroshio in the western Pacific, and investigations in the Caribbean and Mediterranean seas, see *Schaefer*, *Freedom and Exploration* (as in n. 61 on page 25), p. 58.

<sup>68</sup>*Treves, Tullio*, *The Role of Universal International Organizations in Implementing the 1982 UN Law of the Sea Convention*, in *Soons, Alfred H. A.*, editor, *Implementation of The Law of the Sea Convention Through International Institutions*, Honolulu, Hawaii, 1990, p. 27.

<sup>69</sup>See *Kennish* (as in n. 66 on the facing page), p. 7.

coastal States' jurisdiction.<sup>70</sup> The development of awareness for the potential consequences of man-made impacts on the atmosphere and the recognition of large-scale ocean research findings as a key element for sound management decisions has been paralleled by a trend of advancing restrictions in terms of free access. The trend towards access restriction was initiated and welcomed mainly by and among the new and developing countries. Following their newly gained independence, they developed quickly their own sense for needs and interests. Parallel to the increase in scientific research activities (developing) coastal States grew wearier and more suspicious of scientific operations. The possible reasons are manifold. The most prominent is the perceived enhancement of political power as a function of control.<sup>71</sup> The technological development put scientists in a position to explore the seas in greater detail and thoroughness. The discovery of offshore carbon resources and the increasing importance of the oceans as a valuable food source brought an economic aspect to the exploration of the sea. Developing countries with less sophisticated scientific knowledge and technology, became particularly apprehensive of research conducted in close proximity to their territory without their participation. They feared that the living and non-living resources of the sea and the sea-bed would be exploited mainly by developed States owing to their better knowledge of the marine environment.<sup>72</sup> The extension of exclusive jurisdiction was a logical step to prevent developed countries from exploiting what the developing countries intended to preserve for the industrial future. And it must not be forgotten that unilateral advancements of developed countries encouraged developing countries in their pursuit of ownership over resources off their coasts.<sup>73</sup> Also, the refusal of one of the former "master's" wishes can in itself constitute a triumph despite the potential repercussions in the long term. Frustration in view of the own weaknesses with respect to the furtherance of their interests in global politics, might have brought developing countries to the point, where they played whatever trump they had still available. Following the acknowl-

<sup>70</sup>See *Horness, Beth H., Research on the Role of the Ocean in Global Climate Change: The Effect of Extended Jurisdiction*, in O.D. & Int'l L. 22 [1991], p. 75.

<sup>71</sup>See *Knauss, John A., Development of the Freedom of Scientific Research Issue of the Third Law of the Sea Conference*, in O.D. & Int'l L. 1 [1973], p. 94; *Friedheim, Robert L., Negotiating the new ocean regime*, Columbia, SC, 1993, p. 201.

<sup>72</sup>See *Rembe, Nasila S., Africa and the International Law of the Sea: A Study of the Contribution of the African States to the Third United Nations Conference on the Law of the Sea*, Alphen aan den Rijn, 1980, p. 134.

<sup>73</sup>See *Hollick, Ann L., The Origins of the 200 mile Offshore Zones*, in Am.J.Int'l L. 71 [1977], p. 500, who holds that, while the United States' unilateral claim (*Truman Proclamation*) in 1945 (*Truman, Harry S., Presidential Proclamation No. 2667*, "Policy of the United States with Respect to the Natural Resources of the Subsoil and Sea Bed of the Continental Shelf", 28 September 1945, the text is available at <http://www.oceanlaw.net/texts/truman1.htm>) – visited on 31 January 2005) to off-shore resources was not a direct stimulus, it no doubt encouraged the Chilean and Peruvian Governments to believe that their off-shore claims were not inconsistent with developing international practice.



edgement of the formula ‘freedom favours the powerful and tends to crush the weak’, developing countries were no longer interested in an abstract notion of freedom, which was perceived as contributing to, if not increasing, their weakness. They were demanding control over foreign scientific research activities in order to moderate the perceived negative effects of free competition.<sup>74</sup> Also, solutions to developmental problems were increasingly sought in the field of science and the application of scientific knowledge.<sup>75</sup> In terms of the development of an independent and indigenous scientific community, free access to coastal waters for research purposes had to be restricted in order to foster own efforts of gaining scientific knowledge. The developing States were therefore interested in new scientific findings and their implications yet not necessarily in other nations’ acquiring that knowledge without their control. The necessity of genuine independence, both in terms of political freedom and material independence, must not be underestimated.<sup>76</sup> The resentment against activities of foreign scientists is therefore conceivable as a matter of nationalism on science in reaction to actual or perceived patronisation by scientists from the developed countries. Finally, the Cold War era put national security on most political agendas. Scientific research and intelligence activities were not necessarily, let alone readily, distinguishable, and the former could easily serve as the camouflage for the latter, like the case of the R/V *Glomar Explorer*<sup>77</sup> proved in the course of the negotiations of the 1982 LOS Convention;<sup>78</sup> an incident that did probably more harm than good to the cause of the scientists at the Conference.<sup>79</sup> Prior to the 1982

<sup>74</sup>See *Ringgaard* (as in n. 62 on page 25), pp. 127f.

<sup>75</sup>See *Rembe* (as in n. 72 on the facing page), p. 134.

<sup>76</sup>See *Franssen, Herman T., Understanding the Ocean Science Debate*, in O.D. & Int’l L. 2 [1974], p. 191. See also *Gorina-Ysern, Montserrat, An International Regime for Marine Scientific Research*, Ardsley, 2003, pp. 14f., noting that Mr. *Tadao Sighra* on behalf of the members of the Pacific Island Forum at the United Nations Informal Consultative Process on Oceans and the Law of the Sea emphasised the need of concrete policies and result-oriented initiatives and called for “science for development” and capacity-building.

<sup>77</sup>The purpose of the vessel was to discover—under the camouflage of a scientific research cruise—a sunken Soviet submarine in 1968.

<sup>78</sup>*Wooster, Warren S./Redfield, Michael, Consequences of Regulating Oceanic Research*, University of California, San Diego, in *Wooster, Warren S., editor, Freedom of Oceanic Research: A Study Conducted by the Center for Marine Affairs of the Scripps Institution of Oceanography*, New York, 1973, p. 222 seeing difficulties to visualise “realistic ways in which the military security of a developing coastal State can be threatened by the acquisition of oceanographic information in the intermediate zone [i. e., outside 12 nm]”, which sheds some light at the (irrational) nature of the coastal State apprehensions; see also *Oxman, Bernard H., The Third United Nations Conference on the Law of the Sea: The 1977 New York Session*, in Am.J.Int’l L. 72 [1978], pp. 75f., reporting concerns with respect to *bona fide* research and related drafting difficulties.

<sup>79</sup>See *Miles, Edward L., Global Ocean Politics: the Decision Process at the Third United Nations Conference on the Law of the Sea, 1973–1982*, The Hague, 1998, p. 161, who, while asserting that there was no immediate reaction or influence on the negotiations, points at the amusement showed by some delegations about the U.S.A. proposal advanced at the same time in Committee III which would have had the coastal State

LOS Convention, the rules of international law on marine scientific research were vague and imprecise if present at all. Rules on *Ocean Data Acquisition Systems (ODAS)*, for example, were virtually non-existent.<sup>80</sup> As a result, the national laws, regulations and procedures were frequently uncertain, imprecise and primitive. Practical advice on the conduct of research activities in foreign waters had to be informed by a knowledge of the pertinent rules of international and municipal law as well as by experience of the coastal States' practice of procedures and attitudes and of the negotiating tactics, which had been successfully employed in securing consent in the past.<sup>81</sup> The advances in terms of seagoing facilities, equipment, and capabilities to investigate large-scale problems in oceanography were accompanied by an increase of the capabilities and aspirations of nations, both to utilise the oceans' resources more fully and to collect revenues from the users. As a consequence of the latter coastal States expanded their jurisdictional claims in an attempt to gain control over resources and activities thus hampering the freedom of scientific research. Paradoxically, scientific progress necessary for a fuller utilisation of ocean resources was thus retarded by new regimes, which were established because of such enhanced utilisation.<sup>82</sup> In addition, there was a fear for stricter regulation of all sources of marine pollution as a result of the better understanding of the marine environment and the increased concern of its status with inhibitory consequences for the industrialisation of developing countries.<sup>83</sup>

The first U.N. Conference on the Law of the Sea was convened under the impression of the unsettling trend toward extended jurisdictional claims and the increased interest in marine resources. This trend is reflected with respect to marine scientific research in Article 5(1) of the Continental Shelf Convention.<sup>84</sup> The role of (fundamental) research had increasingly been

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accept the certification from the researching State that the activity in question was pure scientific research (ibid., n. 1 on p. 161).

<sup>80</sup>See further *Brown, Edward D., Freedom of Scientific Research and the Legal Regime of Hydrospace*, in *Indian J.Int'l L.* 9 [1969], pp. 363, 370–376.

<sup>81</sup>See *Brown, Edward D., The International Law of the Sea*, Volume I Introductory Manual, Dartmouth, 1994, p. 421.

<sup>82</sup>See *Schaefer*, Freedom and Exploration (as in n. 61 on page 25), p. 94; similarly *Knauss*, Freedom of Scientific Research (as in n. 71 on page 28), p. 94.

<sup>83</sup>See *Birnie* (as in n. 57 on page 24), p. 406; *Njenga, Frank X., Historical Background of the Evolution of the Exclusive Economic Zone and the Contribution of Africa*, in *Pontecorvo, Giulio*, editor, *The new order of the oceans: the advent of a managed environment*, New York, 1986, pp. 136–141; *Mawdsley, Andrés Aguilar, Law of the Sea: The Latin American View*, in *Pontecorvo, Giulio*, editor, *The new order of the oceans: the advent of a managed environment*, New York, 1986, pp. 175–84, 189, 193.

<sup>84</sup>*Geneva Convention on the Continental Shelf*, adopted on 29 April 1958, entry into force 10 June 1964, 499 U.N.T.S. 311 [hereinafter: Continental Shelf Convention], Article 5(1) provides:

The exploration of the continental shelf and the exploitation of its natural resources must not result in any unjustifiable interference with navigation, fishing or the conservation of the living resources of the sea, nor result in

called into question, especially in relation to the preparatory work for the First U.N. Conference on the Law of the Sea in 1958. Initial consideration by the *International Law Commission (I.L.C.)* caused concern within the scientific community for it seemed to endanger the freedom to conduct research activities in the soil of the continental shelf and in the waters above it. Even after clarification by the I.L.C. to the effect that “the freedom to conduct research in [the waters above a continental shelf] is in no way affected”<sup>85</sup> scientists remained dissatisfied as scientific research appeared to be exposed to potentially considerable restraints. Through I.O.C. the scientists relayed to the conference that it was impossible to draw a valid distinction between the seabed and the superjacent waters as far as the environment of the geophysical study of the ocean bottom was concerned. Fundamental oceanic research by any nation, whether in the superjacent waters or on the actual seabed, whether aimed at a better scientific understanding of the ocean waters or the sea bottom, was viewed as being in the interest of all and should be properly safeguarded in any legal instrument. The intention of open publication was identified as an important characteristic of such research.<sup>86</sup>

The Continental Shelf Convention, introduced the first specific restriction for the conduct of marine scientific research in an international context, providing in its Article 5(8):

The consent of the coastal State shall be obtained in respect of any research concerning the continental shelf and undertaken there. [T]he coastal State shall not normally withhold its consent if the request is submitted. . . with a view to purely scientific research into the physical or biological characteristics of the continental shelf, subject to the proviso that the coastal State shall have the right. . . to participate or to be represented in the research, and that in any event the results shall be published.

After the Geneva conferences, scientific organisations like I.O.C. and ICES undertook to review the effects of Article 5 on oceanography.<sup>87</sup> Working

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any interference with fundamental oceanographic or other scientific research carried out with the intention of open publication.

<sup>85</sup>ILC Rep., 11 G.A.O.R., Suppl. 9, p. 43, UN Doc. A/3159 [1956]; see also *Brown*, Freedom (as in n. 80 on the facing page), p. 347.

<sup>86</sup>See *Schaefer*, Freedom and Exploration (as in n. 61 on page 25), p. 62, referring to a Communication from the I.C.S.U. concerning Part II, Section III of the Articles concerning the Law of the Sea (continental shelf), transmitted by UNESCO, UN Doc. A/Conf.13/28 at pp. 6–7 [1958].

<sup>87</sup>See *Kildow, Judith A. Tegger, Nature of the Present Restrictions on Oceanic Research*, University of California, San Diego, in *Wooster, Warren S.*, editor, *Freedom of Oceanic Research: A Study Conducted by the Center for Marine Affairs of the Scripps Institution of Oceanography*, New York, 1973, pp. 5f. See also *Gorina-Ysern*, International Regime (as in n. 76 on page 29), pp. 262f., for an overview of the discussion on the interpretation of the Geneva Continental Shelf Convention.

groups were established, and in 1968 I.O.C. listed as problems ensuing from the new legal regime:

1. The absence of a uniform and commonly recognised limit for the territorial sea and the continental shelf creating problems for planning and executing research programmes;
2. Lengthy and complicated procedures for regular and emergency port calls and access to territorial waters;
3. The interpretation of prerequisites for consent under Article 5(8), especially where the requirement of precise details of the research programme renders any subsequent change difficult or impossible; and
4. Overlapping of different jurisdiction for the same area, i. e., the water superjacent to the continental shelf and the shelf as such.<sup>88</sup>

The impediments to access for purposes of research varied in degree from absolute prohibition to total freedom depending on location and discipline.<sup>89</sup> The impact on the scientific community of this provision<sup>90</sup> was such that in the preparation of the third U.N. Conference on the Law of the Sea scientists around the world tried to muster support and gain access to their government.<sup>91</sup> The possibility of a relaxation of coastal state jurisdiction with respect to scientific research was considered extremely improbable. The question, therefore, was rather which were to prevail: regulations “that tend to encourage research” or those with “the effect, intentional or otherwise, of discouraging or preventing research”.<sup>92</sup>

At the outset of the third U.N. LOS Conference the customary and conventional legal regime of marine scientific research was characterised by uncertainty with respect to the exact scope of coastal state jurisdiction over marine scientific research.<sup>93</sup> In addition, States exercised their jurisdiction with considerable divergences. While the degree of obstruction to marine science in the beginning of the 70s is difficult to establish, the following factors suggest the dimensions of the problems encountered:

<sup>88</sup>Cited from *Kildow* (as in n. 87 on the page before), pp. 7f., referring to UNESCO Doc. AVS/9/89(9), Paris, 27 September 1968.

<sup>89</sup>See *Ibid.*, pp. 14–20.

<sup>90</sup>*Ibid.*, p. 23, notes: “Foreign access restrictions do not seem to have had a major deleterious effect upon oceanic research thus far.” Yet, it must be borne in mind that previously no such restrictions had existed officially. Only with the advent of the legal recognition records of access restrictions seriously started, see *ibid.*, p. 10.

<sup>91</sup>See *Wooster, Warren S., International Institutions and Cooperation in Ocean Research: Three Marine Science Organizations and the Law of the Sea*, in *Lenz, Walter/Deacon, Margaret*, editors, *Ocean Sciences: Their History and Relation to Man*, Volume 22, Hamburg, 1990, p. 318, pointing at the role of the National Committees of SCOR.

<sup>92</sup>*Wooster/Redfield* (as in n. 78 on page 29), p. 219.

<sup>93</sup>See *Soons*, *Marine Scientific Research* (as in n. 11 on page 11), p. 96; also due to the lack of clarity in the outer limits of territorial waters since the traditional three miles limit had been extended since WW II by numerous States unilaterally with varying breadths, see for an overview *Brown*, *Law of the sea* (as in n. 81 on page 30), pp. 43–50.

1. Diversion of time, resources, and money;
2. Deterrence of requests for clearances;
3. Influence upon nature, scope, and methods of marine research;
4. Denials of clearance requests;
5. Indications of private and public international concern;
6. Creation of a regime for the deep sea bed.<sup>94</sup>

For scientists the handicap for the conduct of effective research was stated as to result from four factors:

- (1) Lack of certainty as to the geographical extent of jurisdiction of the coastal state with respect to the continental shelf and with respect to exclusive fisheries zones;
- (2) Lack of certainty as to what kinds of research are subject to control by the coastal state;
- (3) Length and uncertainty of time required to obtain permission from the coastal state to carry on research in the portions of the ocean under its jurisdiction; and
- (4) Inaccessibility of portions of the ocean in the event the coastal state denies permission.<sup>95</sup>

It can be assumed that especially Article 5(8) of the Geneva Continental Shelf Convention has contributed to the increasing difficulties posed for science throughout the world's oceans ever since. Indeed, one may say that this convention was the first international instrument to call "attention to the possible commercial significance of scientific exploration and investigation at sea."<sup>96</sup> *Revelle* points out that the ambiguities in the qualification contained in Article 5(8), namely, the proviso that "the coastal State shall not normally withhold its consent if the request is submitted by a qualified institution with a view to purely scientific research", and the further proviso that "the coastal State shall have the right. . . to participate or to be represented in the research, and that in any event the results shall be published", have

<sup>94</sup>See *Burke, William T., Marine Science Research and International Law*, Law of the Sea Institute Occasional Paper No. 8, Kingston, 1970, pp. 2f.

<sup>95</sup>*Schaefer, Milner B., The Changing Law of the Sea—Effects on Freedom of Scientific Investigation*, in *Alexander, Lewis M.*, editor, *The Law of the Sea: the Future of the Sea's Resources*, Kingston, RI, 1968, Proceedings of the Second Annual conference of the Law of the Sea Institute, p. 114; similarly, *Brown*, *Freedom* (as in n. 80 on page 30), p. 364; see also above page 32.

<sup>96</sup>*Burke, William T., The International Law and Politics of Marine Scientific Research*, in *Reisman, William Michael*, editor, *Toward world order and human dignity: essays in honor of Myres S. McDougal*, New York, 1976, p. 485; similarly, *Birnie* (as in n. 57 on page 24), p. 406; and *Revelle* (as in n. 48 on page 21), pp. 658f.: "The Convention on the Continental Shelf. . . is the chief international legal instrument that inhibits marine scientific research, compared to the previous situation in international law."

been implicitly taken advantage of, “to justify the imposition of stringent and complicated procedures which must be followed in attempting to obtain [the coastal States] consent.”<sup>97</sup> While some States under Article 5(8) claimed discretion as to grant or withhold consent to research activities, others saw themselves bound to grant permission if certain requirements were fulfilled. Lead-times ranged from one to at least six months, which posed severe difficulties for the planning of research cruises;<sup>98</sup> and many States claimed the right to participate or to be represented in the research.<sup>99</sup> Generally, it has been submitted, the freedom to conduct marine scientific research was restricted to a considerable extent by the coastal States in order to safeguard their national interests.<sup>100</sup> Be that as it may, it can be asserted that the introduction of marine scientific research on the international legal platform as such has contributed to the legal significance of marine scientific research: By recognising this (new) category of ocean use authoritatively it drew more attention from the involved parties. With its recognition marine scientific research loses the freedom of the “nobody” and becomes accountable. The rise to prominence brings perhaps more drawbacks than advantages but it is a fact that the parties concerned had to acknowledge henceforth.

### *Private and Public Research*

Research can be carried out by public and private institutions. The distinction is principally based upon the legal personality of the institution under whose auspices the research project is carried out. Whether or not an institution is public, must be determined under municipal law. International law itself does not make such a distinction, yet, in some instances it presupposes the existence of a private or public entity.<sup>101</sup>

Traditionally, marine research projects have been financed publicly as the costs for the projects are usually high and difficult to ponder in terms of competition and commercial viability. Private research operations depend on the economic feasibility of a project. Aspects like market responsiveness, elasticity of demand, economic development and competition need to be factored into the research activities. Conversely, free market principles in operating, servicing, allocating the use of, and adding research capabilities are not easy to incorporate into state (marine) research programmes.<sup>102</sup>

<sup>97</sup> *Revelle* (as in n. 48 on page 21), pp. 659f.

<sup>98</sup> See *Friedheim* (as in n. 71 on page 28), p. 202.

<sup>99</sup> See *Soons*, *Marine Scientific Research* (as in n. 11 on page 11), p. 96.

<sup>100</sup> See *Wooster, Warren S., Oceanic Research Dilemma*, in *New Scientist* [1974], p. 552; *Knauss, John A., Marine Science and the 1974 Law of the Sea Conference*, in *Science* 184 [1974], p. 1338.

<sup>101</sup> See section 3.

<sup>102</sup> See *Kosuge, Toshio, US Commertical Space Act of 1998 and Its Implications for the International Space Station*, in *Proceedings of the 42<sup>nd</sup> Colloquium on the Law of Outer Space*, International Institute of Space Law of the International Astronautical Federation, October 4–8, 1999, Reston, 2000, pp. 33f., on the American attempt to open access to the International Space Station (I.S.S.) to commercial users.

The marine environment has been of interest to the private sector where resources are involved, which promise commercial exploitability. The off-shore industry is mainly interested in the exploitation of fossil fuels as the revenue justifies relatively high costs of development and investment. A new sector of off-shore industry might develop around the sea mounts and hydrothermal vents and the corresponding life forms. *Extremophiles*, i. e., forms of life that can sustain extreme environs, may prove to be a valuable 'resource' for the (pharmaceutical) industry. Under such premises privately funded research may become viable and exploratory research, as a first step of industry research and development<sup>103</sup>, justifiable under economic considerations. For the present analysis, however, the distinction between private and public research operations is not considered a significant factor in the field of marine scientific research.

### *Current and Future Role of Marine Scientific Research*

In recent years the global climate change and the possible abatement capacity of the oceans has strengthened the position of oceanography as an important interdisciplinary science: only with a comprehensive understanding of the ecological systems, it became apparent, the problems of the earth could be addressed appropriately. Other tasks, like the basic questions, as to the how and why and interconnectedness of ocean phenomena, the management of living and non-living resources,<sup>104</sup> and cost effective transportation by sea, remain in the oceanographer's catalogue. Targets for scientific investigation include also the interaction of sea water with the earth's crust, the dynamics of the continental margins and sea-bed, the energy resources of the sea, the exchange of gases between the atmosphere and the oceans, the transport of sediments in the oceans, and increasing food availability. Valuable input has come from an unlikely source: previously classified data from military observations and systematic surveys are made available to the general public and yield new information on ocean depth, sediment composition, marine gravity, seabed magnetism, water temperature, salinity, sea-surface height, ice depth, ice shape, light transmissibility, and bioluminescence. Moreover, data collected by various methods (e. g., towed sensors, submarines, fixed and floating buoys, remote sensing and satellites) can be combined to produce yet newer data with potential benefits in fields, like environmental studies, geology, climatology, marine engineering, commercial fisheries management, and deep sea oil and mineral exploration.<sup>105</sup>

<sup>103</sup>See *Ibid.*, pp. 29f.

<sup>104</sup>In a newspaper article (Dow Jones Int'l News, 4 November 1998, Australia Fisheries: Action Must Be Taken To Save Ecosystems) the role of marine scientific research was emphasised in establishing the cause for the deterioration of the fisheries in Australia. At the same time the article stresses the importance of further research "to overcome gaps in existing knowledge and to ensure ongoing ecologically sustainable management of fisheries ecosystems".

<sup>105</sup>See *U.N. Secretary-General, Law of the Sea*, UN Doc. A/51/645, New York, 1 November 1996, p. 73, assuming that about 10 to 20 per cent of United States Navy data

Yet, as knowledge progresses another factor comes into play increasingly: scientific research becomes ever more specific and single projects bigger in size, both of which makes it equally more important that a research operation can be carried out as projected; access restrictions have thus nothing lost of their significance but rather gained importance. In the future, the recognition of the earth as a complex of interconnected systems and sub-systems rendering interdisciplinary boundaries meaningless, will inevitably lead to new large scale investigative methods; global problems, like climate change, and their associated costs will increasingly necessitate regional or even global co-ordination and co-operation in the field of marine scientific activities.<sup>106</sup> In order to finance costly research activities and to meet the challenges of large scale investigations scientists must increasingly combine forces. This goes so far as to call for a new paradigm, which deals with the ocean as a whole and forces scientists to take an integrated systems approach, in which they integrate not only across the science disciplines, but also between them and the social sciences where value is determined by analyses of benefits and costs.<sup>107</sup> Several programs under the auspices of the United Nations, or one of its sub-organisations, point in such a direction: the *International Geosphere-Biosphere Program (I.G.B.P.)* and *World Climate Research Program (W.C.R.P.)*; the *Organisation for Economic Co-operation and Development (O.E.C.D.)* proposed the *Global Ocean Observing System (GOOS)* with the aim of predicting ocean phenomena for socio-economic benefits<sup>108</sup>; others are the *World Ocean Circulation Experiment (WOCE)* with the goal to yield ocean models that will adequately predict decadal climate change<sup>109</sup>; *Tropical Oceans and Global Atmosphere (TOGA)* and *Global Ocean Flux Studies (GOFS)*; the *Global Ocean Ecosystem Dynamic (G.O.E.D.)* investigating the responses of marine plant and animal populations to changes in ocean circulation and chemistry; the *Deep Ocean Drilling Program (D.O.D.P.)* and the *Ridge Interdisciplinary Global Experiment (RIDGE)* exploring the earth's ocean floors. Hot topics of environmental concern on an international level include the decline in commercial fisheries, the demise of coral reefs, the ocean's role in climate change, invasive species, the ocean carbon cycle, iron fertilisation of the oceans, harmful algal blooms, destruction of benthic habitat, coastal pollution and erosion to name but a few.<sup>110</sup>

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had been declassified of which eventually about 95 per cent of the data would be made public (citing *The New York Times*, 28 November 1995, p. C1).

<sup>106</sup>See *U.N. Secretary-General, Law of the Sea*, UN Doc. A/46/724, New York, 5 December 1991, p. 39.

<sup>107</sup>IOC Status (as in n. 3 on page 9), p. 1.

<sup>108</sup>The most notable example for such effects is the *El Niño-Southern Oscillation* event with devastating consequences for Latin American economies whose fish industries dwindle when fish stocks move north out of their fishing zones, and whose food resources are reduced by droughts ruining the harvests on land.

<sup>109</sup>See *Kennish* (as in n. 66 on page 26), p. 7.

<sup>110</sup>See *McNutt, Marcia K., Song for an Ocean Planet*, Science Book Review of 'Great Waters, An Atlantic Passage', by *Deborah Cramer*, Norton, New York, 2001, in Science



CURRENT MEANS OF RESEARCH AND THEIR IMPLICATIONS FOR  
COASTAL STATES' INTERESTS

From a coastal state perspective, two aspects of marine scientific research are of eminent importance. One is the objective of the research operation and its potential implications for the national interests of the State. The other is the method or technology employed and its potential to provide information that is prejudicial to coastal state interests without a possibility for the State to exercise effective control. A few general remarks are necessary to introduce the various methods employed by modern oceanography: *Data*, as used in this context, denotes representations that can be operated upon by a computer, they regularly have a numeric value or a digital format; *Information*, in contrast, is *data* that has been interpreted by humans for a certain purpose.<sup>111</sup> In oceanography, as much as in science generally, data sets must be interpreted before they can be used for scientific assumptions, analyses or discussions. The raw material is of no use unless processed through certain models. Also, only then data can provide useful and sensible input for management purposes or decision-making processes. Principally, two methods can be distinguished for gathering the data needed in marine scientific research: ground based and remote sensing methods. The ground based methods are generally speaking *in situ* measurements, surveys or observations, i. e., a sensor is immediately at the location of, or in contact with the object in question; the remote sensing methods operate on the basis of image data acquired by a sensor like aerial cameras, scanners or radar from some distance.<sup>112, 113</sup> Image data, as well as data obtained from a ground based method, represent the real world in an abstract form: the data need to be processed, analysed, and interpreted to provide readily understandable information; data sets from different sensors may need to be combined in order to get sufficient information for a particular purpose. Since the sensors deliver only a limited reflection of the real world, the data obtained need to be calibrated, interpolated, and supplemented as need be for the 'whole picture'. Usually, a number of sensors with different objectives, with respect to the sensed object or spatial distribution, and characteristics, in terms of sensitivity and sensing method, are operated for one particular purpose. Calibration purposes may require the combination of various methods. Thus, in order to verify the measurements obtained from a remote sensing device, it may be necessary to collect data from ground based sensors at the same time and location or at some point of reference.

The wide variety of data that is needed for oceanographic experiments

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294 [2001], p. 791.

<sup>111</sup>See Janssen, Lucas L.F., editor, *Principles of Remote Sensing, International Institute for Aerospace Survey and Earth Sciences (ITC)*, Enschede, 2000, p. 17.

<sup>112</sup>See *Ibid.*, p. 18.

<sup>113</sup>For the present analysis 'some distance' refers to air- or space borne sensors, see page 52.

and models requires an appropriate array of platforms to satisfy the demand in terms of quantity and quality. The diversity of the fields of operation of the platforms—from shallow waters to the deep trenches of the oceans—has led to a number of instruments from which to choose.<sup>114</sup> The device actually collecting the scientifically relevant data is usually some form of sensor with a specific capacity, depending on the objective of the research operation, or a sampling construction to collect samples for further investigation in the laboratory. Thus, oceanographic chemistry requires measurement of salinity, dissolved gases, nutrients, minor and trace elements, and the concentration of constituents (sodium, magnesium, chloride, and sulfate); while marine biology requires data on bacteria (planktonic, neustonic, epibiotic, benthic, and endobiotic types) essential to the marine food webs and cycling of elements (e. g., nitrogen and sulfur cycles).

### *Ground Based Sensing Platforms*

#### *Generally*

Ground based sensing platforms are those, which are continuously attached to the ground, i. e., water or land surface.<sup>115</sup> A number of ground based platforms can be distinguished:

1. Vessels, ranging from mere power boats for operations in the coastal waters, for example, surveying for charting purposes, to large ocean going vessels capable of carrying hundreds of crew and tons of equipment for an array of experiments on extended research cruises, and submersibles;
2. Buoys, drifters, floats, gauges;
3. Autonomous Underwater Vehicles (A.U.V.);
4. Remotely Operated Vehicles (ROV).

These can be subdivided into manned and unmanned platforms and into fixed and free platforms. Manned platforms are those that require the presence of at least one human being for proper operation as a matter of principle. Thus, vessels and submarines need to be operated by technical and/or scientific personnel for proper navigation and adequate use. Only under meaningful control the vessel or submarine can be effectively employed in the research activities. Fixed platforms are those, which are mounted or moored in a given position and measure the change of parameters against a defined point in space. Free platforms may be used to collect measurements

<sup>114</sup>See *Kennish* (as in n. 66 on page 26), pp. 7f.

<sup>115</sup>For an overview of platforms used in (physical) oceanography, see *Tomczak, Matthias, An introduction to physical oceanography*, Adelaide, 2000 (<http://www.es.flinders.edu.au/%7Emattom/IntroOc/newstart.html>) – visited on 31 January 2005.

of certain parameters or properties of the immediate surroundings, such as salinity, temperature and wind speed, and they can serve as an indicator themselves, for example, for currents. Due to their comparatively low costs they can be deployed in great numbers so as to collect vast data sets. Ground based sensing platforms are the traditional means of the oceanographer to collect the required data. They are located on the surface and usually close by the object of interest. From the point of view of science there is no qualitative difference between vessels and buoys; both, sufficiently large or small, can serve as a means for data collecting and processing. In contrast, the question whether or not a platform is manned, is an important one. For one thing, data collected can be assessed and verified right away and *in situ* with the possibility to repeat the sampling sequence. Secondly, data may be processed depending on the circumstances and the means available, and follow-up experiments may be conducted on the basis of the information obtained from the data. Thus, while automated and autonomous observing platforms are inevitable for continuous and long-term programmes,<sup>116</sup> manned platforms will most likely remain an indispensable part of marine scientific research, at least as concerns specific oceanography.<sup>117</sup>

### Vessels

A research vessel is first of all an ocean going ship, accordingly it has to be seaworthy and capable of riding out adverse weather conditions. Size and type of vessel as well as equipment depend on the area and object of investigation: Research exclusively in coastal waters will require a different sort of vessel and equipment than research operations in Arctic waters with the potential of iceberg encounters. Similarly, handling of heavy equipment at sea or the need for a large scientific party during an interdisciplinary study, can increase the minimum size. Typical ocean going research vessels are 50–80 m long, have a total displacement of 1.000–2.000 tonnes and provide accommodation for 10–20 scientists.<sup>118</sup>

<sup>116</sup>At the Seventh Session of the *Joint IOC-WMO Committee for the Integrated Global Ocean Services System (IGOSS)*, Paris, 20–29 November 1995, it was noted:

Automated observing and reporting systems have greater accuracy and fewer garbles than manual systems and, because they are automatic, can provide many more observations than manual systems. Increased use of automated observing and reporting systems will be required to make the large numbers of accurate reports needed by GOOS and other future programmes.

See Doc. IOC-WMO/IGOSS-VII/2, p. 4.

<sup>117</sup>Recent developments in telemetry seem to put scientists in a position to communicate with remote platforms to download data and possibly change sampling strategy. Range is in the order of 100 kilometres, thus this technology is well suited to shelf applications, see IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Third Session, Accra, Ghana, 13–15 April 1999, IOC-WMO-UNEP-ICSU/C-GOOS-III/3, Annex VI, p. 17.

<sup>118</sup>The German Commission for Oceanography of the German Research Council (“Senatskommission für Ozeanographie der Deutschen Forschungsgemeinschaft”) noted as

A number of other requirements determine the construction of a research vessel. A reasonably large working deck with powerful winches is required because a lot of the work involves large and heavy instrumentation that is lowered and retrieved over the side or the stern.<sup>119</sup> The minimum laboratory requirements consist of a wet laboratory for dealing with water samples, a computer laboratory for data processing, an electronics laboratory for the preparation of instruments, and a chemical laboratory for sample analysis. For multidisciplinary research operations biological, geophysical and geological laboratories are added. Also, vessel and crew need to be at sea for extensive periods of time, remain stationary while equipment is handled over the side and move at very slow speed when equipment is towed behind the vessel.<sup>120</sup>

For many decades research vessels were the only available platform for data collection on the high seas, and even with the advent of deep-sea moorings, satellites, and drifters they remain—despite their high operation costs (U.S. \$15,000–25,000 per day at sea)—an essential tool in oceanographic research.<sup>121</sup> Today, they are principally used for large scale near-synoptic surveys of oceanic property fields and for targeted process studies.<sup>122</sup> Manned

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requirements for ocean research: medium-term planning periods, capacity to remain *in situ* for 30 days and to navigate arctic waters, lifts and cranes, modern laboratories and space for 20–25 scientists, see *Senatskommission für Ozeanographie, Der Bedarf an Forschungsschiffen für die marine Grundlagenforschung in Deutschland*, in DGM-Mitteilungen [1996], Nr. 2, p. 45.

<sup>119</sup> Lowering and retrieving equipment over the side of a vessel requires more than zero thrust because otherwise the vessel will drift with the wind and across the instrument wire. To keep the wire vertical and free from the vessel's hull the vessel has to counteract the effects of wind and current. This is usually achieved through additional thrusters at the bow and at the stern, which by way of sideway thrust can keep the vessel in the same position.

<sup>120</sup> Most research vessels can remain at sea for 20–25 days before running out of fuel, which gives them a range of 6,000–8,000 nm, sufficient to operate at the high seas within a few days of reach of land; only a few oceanographic institutions operate research vessels with global research capabilities.

<sup>121</sup> *Ryder, Peter, Marine Scientific Research and Operational Oceanography in the Context of the UN Convention on the Law of the Sea*, Sixth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System (GOOS), Scientific and Technical Requirements of GOOS in Relation to UNCLOS, Paris, 10–14 March 2003, IOC-WMO-UNEP/I-GOOS-VI/10, p. 6, available at (<http://unesdoc.unesco.org/images/0012/001295/129558E.pdf>) – visited on 31 January 2005.

<sup>122</sup> For many purposes they are not likely to be replaced any time soon. For example, the only way to obtain precise depths in the open ocean is with traditional bathymetry, in which the distance to the ocean floor is measured from a platform, usually a vessel, by bouncing sound waves off the bottom. A satellite, by contrast, cannot sense the bottom of the ocean. Only by inference from the reflection of the sea surface, i. e., from the resulting pattern of lumps and bulges, one can conjecture what is underneath. A sea mount, for example, exerts a small but measurable gravitational pull on the water around it, creating a bump 2 or 3 meters high that is easily detectable by a satellite. Additionally, satellite data cannot reveal features smaller than about 12 kilometres in diameter, also shallow water and local variations in density of the ocean floor can produce unreliable results, see *Mackenzie, Dana, Ocean Floor is Laid Bare by New*

submersibles are mainly used in oceanography for the exploration of the sea floor (marine geology) and for the study of sea floor ecosystems (marine biology).<sup>123</sup> Unmanned submersibles, ROV and A.U.V.<sup>124</sup>, can be used to take measurements and collect samples at great depth and other regions of the ocean with reduced accessibility and high risks. Vessels and submersibles are different from land-based platforms as they are not fixed to a certain location, they are different from buoys (and other non fixed installations) as they are propelled and manned and therefore can be purposefully navigated. And they can serve as a platform to deploy and operate other scientific platforms. They are usually employed for a certain period of time and a number of pre-arranged experiments and investigations. Depending on the type of research cruise scientists from different oceanographic disciplines, laboratories and countries may come together on a single vessel. Cruises are usually organised by one leading institute, which offers time and space windows to other institutions and scientists. These may reserve space aboard for one or a number of experiments depending on availability of allocated space and time.

In *operational* oceanography vessels play a distinctly different role. They are usually regular (merchant) vessels, not specifically designed for research purposes, which have been equipped with sensors for scientific observations. The *Ships of Opportunity Programme (SOOP)*, for example, is an existing operational component of GOOS and directed primarily towards the implementation of the common GOOS/G.C.O.S. ocean climate module. Under the programme vessels send so-called *BATHY messages (temperature versus depth profiles)*<sup>125</sup> using expendable *bathythermographs (X.B.T.)* and *temperature, salinity and conductivity measurements (TESAC)* taken with *Conductivity-Temperature-Depth (C.T.D.)* instruments. The data are transferred, in a standardised form, to receiving stations (via satellite) on shore. Vessels with additional equipment, like satellite navigation receivers, which automatically compute surface currents by drift calculations, can report additional information into the system. The data are collected and archived in data centres, responsibility for which falls internationally under the purview of I.O.C.'s *International Data and Information Exchange (IODE)*<sup>126, 127</sup>.

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*Satellite Data*, in Science 277 [1997], p. 1921.

<sup>123</sup>See Tomczak (as in n. 115 on page 38).

<sup>124</sup>See for an example of an A.U.V. the website of a German developer (<http://www.deepc-auv.de>) – visited on 31 January 2005.

<sup>125</sup>In 1997, an estimated total of 47.542 of these *BATHY* messages and 3.879 track line data, known as *TRACKOB* messages were exchanged. Since 1976, almost 850.000 *BATHY* and over 116.000 *TESAC* messages have been exchanged through *IGOSS*.

<sup>126</sup>IODE was established in 1961 by the I.O.C. as an intergovernmental mechanism to improve the management and exchange of marine data in delayed mode. In 1998, IODE consisted of over 65 member countries with more than 40 National Oceanographic Data Centres and Designated National Agencies providing data management services to their countries and assisting the global exchange of data.

<sup>127</sup>A similar programme is the *Voluntary Observing Ship (V.O.S.)* under the auspices of

*Installations*

The term ‘installation’ in this context is used to include all types of data acquisition platforms, both on land and at sea—except for manned vessels and submersibles—, fixed or free, i. e., buoys, floats, weather stations *et cetera*. The most important difference in terms of scientific observations is the fact that on a manned platform *ad hoc* changes of the observation object can be assessed and analysed immediately and on the location with the option to change observation patterns and directions accordingly. In contrast, automated and remote controlled data acquisition platforms need to send the data about changes first to a receiving station where they can be analysed and observing patterns be adjusted accordingly. Also, the former usually allows to have recourse to additional information on the location while the latter is mostly restrained to the set of data that themselves indicate the change; certainty and cross checking are therefore only available to a limited extent. Reports from installations are very useful as they usually provide continuous and consistent reports, one day to the next.<sup>128</sup> Such sampling is required for temporal monitoring of conditions such as the equatorial currents and for input to numerical models. For spatial mapping of ocean features, buoys provide redundant information, one report to the next, in comparison with ship observations. Such redundant information is necessary, for example, to obtain accurate fields of winds stress and air pressure for storm surge modelling.

Installations can be subdivided into two categories, fixed and free floating. Both are generally used to gather a set of various data, like temperature, salinity, *et cetera*, over a long period of time. Advantages of fixed observing systems include:

1. Better predictions of extreme weather;
2. Improved now-casts and forecasts of wind and air pressure fields data of which can be used for hydrodynamic models;

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W.M.O. to collect real-time meteorological observations, see *Ryder* (as in n. 121 on page 40), p. 6.

<sup>128</sup>For example, the *SeaWatch* programme, which operates moored buoys in northern Europe to monitor the sea state, toxic plankton blooms and other conditions, see Seventh Session of the Joint IOC-WMO Committee for the Integrated Global Ocean Services System (IGOSS), Paris, 20–29 November 1995, IOC-WMO/IGOSS-VII/2, p. 4; as to the importance of ODAS in the future, the U.N. Secretary-General stated in his *U.N. Secretary-General, 1991 Report* (as in n. 106 on page 36):

Marine scientific research generally... will rely increasingly on the use of autonomous measuring equipment: moored units for localised velocity, subsurface floaters for currents, surface drifters for velocity and for relating surface parameters to satellite measurements. [...] The objective is to monitor ocean circulation simultaneously and continuously over great spatial and temporal scales.

See also *Papadakis, Nikos, The International Legal Regime of Artificial Islands*, Leyden, 1977, pp. 31f., for a list of possible uses envisaged already in the 1970s.

3. Calibration and validation of remote sensors (e. g., winds, surface temperature, currents, sea level, ocean productivity);
4. Expanded database of ocean variability.

Such *moorings* are usually made up of three basic elements: an anchor, a mooring line, and one or more buoyancy elements, which hold the mooring upright and as close to vertical as possible. They are the appropriate platform for scientific sensors wherever measurements are required at one particular location for an extended period of time. They can be used as subsurface moorings where information about the surface is not essential. Thus, the mooring is not exposed to surface wave action and the dangers of shipping, also there is little risk of vandalism or theft. Just above the anchor of a deep sea mooring a remotely controllable release may be placed, which, when triggered through a coded acoustic signal from the ship, releases the rope and buoyant part for surface recovery of the mooring. Triggering the release brings the mooring to the surface.

Surface moorings are used for measurements of the surface layer and meteorological data. The buoyant part for such a mooring looks much like a substantial buoy that floats at the surface and has enough displacement to carry meteorological instrumentation.

Standard moored buoy sensors measure surface winds, air temperature, relative humidity, sea surface temperature and ten subsurface temperatures in the upper 500 meters. Additional sensors for rainfall, radiation, and surface salinity can be added as required. Significant developments in instrumentation for measuring water properties from offshore platforms allow now for measurements of vertical profiles of current, temperature, salinity, fluorescence, transmittance, position using *Global Positioning System (G.P.S.)*, radiance and irradiance at wavelengths sensed by satellites with spectroradiometers. With new sensors nitrate and CO<sub>2</sub> analyses can be provided.

*Tide gauges*<sup>129</sup> monitor the sea level in a given location. Two types of gauges can be distinguished. The first is the stilling-well gauge, which consists of a cylinder with an connection to the sea at the bottom so that the backward and forward motion of the water associated with wind waves and other waves of short period cannot pass through; only the slow change of water level associated with the tide is recorded. These gauges allow the direct reading of the water level at any time. In offshore and remote locations, for practical reasons, pressure gauges are used, which are placed on the sea floor and measure the pressure of the water column above them. Recordings must be transmitted to the surface or stored internally until the instrument is retrieved.

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<sup>129</sup>A network of approximately 300 tide gauge stations distributed along continental coastlines and throughout each of the world's island groups was established as a result of the first *Global Sea Level Observing System (GLOSS)*, Implementation Plan by I.O.C. from 1990.

Information about the sea level can be used by oceanographers to infer changes in ocean circulation, a major component of the Earth's climate system, which, in turn, is known to affect the level of the sea and the associated risks of coastal flooding.<sup>130</sup> For measuring sea level change as a function of climate variability in the order of millimetres per year the gauges have to be highly accurate. This accuracy is achieved by a new generation of tide gauges, which basically replaces the float and wire arrangement of the traditional stilling-well gauge by a laser distance measurement coupled with stable benchmark values. For monitoring purposes the data are transmitted via satellite to a receiving centre, which continuously monitors the performance of every gauge.

*Rigs* used for hydrocarbon exploitation are used in oceanography also.<sup>131</sup> They either carry weather stations for their own purposes whose data can be relayed to oceanographic receiving stations, anyway, or they may simply serve as a platform—much like any other fixed structure—for scientific instrumentation. Remotely controlled submersibles, though predominantly used in the off-shore oil and gas industry and for retrieving items like flight recorders from crashed aeroplanes, find similar uses like manned submersibles. They are limited in their range of operation and can therefore only be used in very specific experiments or research operations.

*Towed vehicles* are used from research vessels to study oceanic processes, which require high spatial resolution, such as mixing in fronts and processes in the highly variable upper ocean. Most systems consist of an underwater body, an electro-mechanical (often multi-conductor) towing cable and a winch for retrieving. The underwater body is fitted with fins remotely controlled via the cable to keep the desired level or diving path in the water column. In addition to the sensor package (usually a C.T.D., sometimes additional sensors for chemical measurements) it carries sensors for pressure, pitch and roll to monitor its own movements and relative location. The data are sent to the aboard the vessel via the cable. An alternative to the undulating towed system is a towed cable with built-in sensors at fixed intervals. It has the disadvantage that it does not offer the same vertical data resolution like the former one.

*Floats* and *drifters* move freely with the ocean current. Accordingly, their position at any given time can only be controlled to a limited extent. These platforms are used in remote regions such as the Southern Ocean and in the central parts of the large ocean basins that are rarely reached by research vessels and where it is difficult and expensive to deploy a mooring. They can also be used to study ocean currents specifically. Strictly speaking, *float* is a

<sup>130</sup>See *Global Sea Level Observing System (GLOSS) Implementation Plan-1997*, IOC Technical Series No. 50, UNESCO 1997, p. 1.

<sup>131</sup>*SeaNet*, for example, is a European organisation concerned with monitoring networks on fixed structures in the North Sea region. Its objective is to realise a North Sea monitoring system based as a contribution to an integrated European marine monitoring and forecasting system.



generic term for anything that does not sink to the ocean floor. A *drifter*, on the other hand, is especially designed to move with the currents. For that reason it contains a flotation device or buoyant part that keeps it at a certain height in the water column. Two basic types can be distinguished. *Surface* drifters float at the surface and can therefore transmit data via satellite. If they are designed to collect information about the ocean surface they carry meteorological instruments on top of the float and a temperature and occasionally a salinity sensor underneath the float. To prevent strong winds from blowing them out of the area of observation they can be equipped with a “sea anchor” at some depth. To collect information on the water column sensors can be placed between the buoyant part and the sea anchor. *Subsurface* drifters are designed to be neutrally buoyant in water of a certain density, which usually corresponds to a certain depth. Such drifters are used to monitor ocean currents at various depths, from a few hundred metres to below 1.000 m depth. The data can be transmitted acoustically through the ocean to coastal receiving stations especially at the depth of the sound velocity minimum (the SOFAR channel) at about 1.000 m depth. In modern subsurface drifters the buoyant element can be programmed to change at a given moment which enables them to remain at depth for several weeks, come to the surface briefly to transmit their data to a satellite and return again to their allocated depth. In contrast to subsurface drifters, the diving path of *autonomous submersibles* can be predetermined due to their own propulsion. They are capable to carry instrumentation, such as a C.T.D., and survey an ocean area by regularly diving and surfacing along a track from one side of an ocean region to the other.<sup>132</sup> When at the surface they transmit, much like drifters, the collected data via satellite to receiving stations ashore. Autonomous submersibles have the potential to reduce the need for research vessels for ocean monitoring. Free floating buoys or drifters are indispensable as platforms for investigation of some of the more recent oceanographic discoveries such as the migration and evolution of a deep ocean hydrothermal event plume<sup>133</sup>. So called *RAFOS*<sup>134</sup> were deployed for a period of 60 days to measure the plume’s vorticity, concentrations of suspended particles, particulate iron, and dissolved manganese from within the plume.<sup>135</sup>

<sup>132</sup>See *Ryder* (as in n. 121 on page 40), p. 7.

<sup>133</sup>A plume can be described as a hot water bubble, which can be caused by a cataclysmic release of hot water and maintains its consistency rather than to dissolve in surrounding water. The first of these event plumes was observed over the southern Juan de Fuca Ridge in 1986. It was an oblate spheroid, 20 kilometres in diameter and 600 m thick, centred 800 m above the sea floor, and with temperatures up to 0, 25 °C above that of the surrounding waters, see *Baker, E. T./Massoth, G. J./Feely, R. A., Cataclysmic Hydrothermal Venting on the Juan-De-Fuca Ridge*, in *Nature* 329 [1987], p. 149.

<sup>134</sup>Backwards for *SOFAR (Sound Fixing and Ranging)*, these floats emit sounds that are detected by fixed hydrophones. The opposite method is used by the *RAFOS* floats: The *RAFOS* drifter uses a microprocessor in combination with an internal clock to record the arrival times of sound signals.

<sup>135</sup>See *Lupton, John E. et al., Tracking the Evolution of a Hydrothermal Event Plume with*

Under the *Argos project* a global array of about 3.000 profiling floats will eventually be deployed in open ocean waters and provide data from all over the world.<sup>136, 137</sup> Each of the floats measures temperature and salinity profiles in the upper 2.000 metres of the water column. The floats are designed to drift at depths as great as 2.000 metres; after a programmed period they adjust their buoyancy, drift to the surface, compute a profile of temperature and salinity, transmit the data to a satellite, and then return to their allocated depth.<sup>138</sup>

A relatively recent development is the so called *Seaglider*. This device is similar to a free floating drifter. Owing to a unique kind of propulsion (taking advantage of fins and changes in buoyancy) it is able to cover great distances with a minimum of power supply and, unlike drifters, can be programmed to “sail” to a given destination. It has the advantage of relatively low costs (compared to an autonomous vehicle) coupled with the possibility to predetermine to a certain extent the course of the platform.<sup>139</sup> It can carry the same sensors as a drifter with the same reporting configurations.

Another category of platforms used in oceanography are *expedible marine instruments*. The most important difference to the instruments mentioned above is that these are deployed only once and never retrieved; some may be designed to sink to the bottom where they remain as a permanent fixture of the seabed or subsoil, others remain afloat during their life span. Once in the water they are designed to relay back oceanographic data, such as air temperature, wind, humidity, barometric pressure, magnetic bearing,

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a *RAFOS Neutrally Buoyant Drifter*, in Science 280 [1998], p. 1052.

<sup>136</sup>Argos is a programme for the acquisition and transmission of oceanographic data from fixed or floating platforms equipped with *Platform Transmitter Terminals (P.T.T.)*, see generally Roemmich, Dean/Owens, W. Brechner, *The Argo Project: Global ocean observations for understanding and prediction of climate variability*, in Oceanography 13 [2000], Nr. 2, pp. 45f. In February 1997, the Argos service was handling reports from 1.044 drifting buoys, 284 moored buoys, 4 balloons, 598 fixed stations and 420 miscellaneous platforms. See IOC Status (as in n. 3 on page 9), pp. 11f.

<sup>137</sup>In March 1998, data from a total of 1.242 drifting buoys were collected and processed at the Argos global Processing Centres of Toulouse, France and Landover, Maryland, U.S.A. for distribution in real-time or deferred-time to respective *Principal Investigators (P.I.)*. These buoys are operated by 21 countries (Australia, Brazil, Canada, China, Finland, France, Germany, Iceland, India, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, South African, Spain, Sweden, Taiwan, United Kingdom, and U.S.A.). Of the 1.242 drifting buoys, about 52% transmit the data in real time via the *Global Telecommunication System (G.T.S.)*. Approximately 6% of all drifting buoys have no sensors and are used as *Lagrangian tracers* only, 25% do not report on G.T.S. because of poor quality (e.g., end of life-time, tests), 7% are not inserted on G.T.S. because permission was not granted (buoys principally from research programmes, for which data are being released only after formal publication of related studies) and 10% for unknown reasons.

<sup>138</sup>Data and *data products* derived from those floats will be freely available in real-time and delayed mode through I.O.C. and W.M.O. data exchange systems, as well as other appropriate international mechanisms, and will support operational oceanography and marine meteorology.

<sup>139</sup>See Seattle Times, 1 August 2000, Health & Science section.

water column temperature, conductivity, current flows, sea surface temperatures, wave height, wave period, wave direction, power spectrum, energy dissipation, sound velocity, and irradiance (optical clarity) in the seas.<sup>140</sup> The data are transmitted to the mother ship via a thin copper wire connected to the ship or a floated antenna unit whose signals can be received aboard a nearby patrolling aircraft. There are numerous varieties of expendable marine instruments that perform various observational tasks, both in oceanography and naval research.<sup>141</sup>

### *Airborne or Remote Sensing Platforms*

The term airborne (or space borne) remote sensing generally refers to methods using sensors that are not in direct contact with the object of scientific investigation, in the sense that the data are collected from a sizeable distance above ground or sea level. The use of such sensors is usually associated with airborne or space borne platforms. Some remote sensing techniques, such as *radar* and *acoustic tomography*, however, may also be used on ground based platforms.<sup>142</sup>

In science three definitions of remote sensing exist:

1. Remote sensing is the science of acquiring, processing and interpreting images that record the interaction between electromagnetic energy and matter.
2. Remote sensing is the science and art of obtaining information about an object, area, or phenomenon through the analysis of data acquired by a device that is not in contact with the object, area, or phenomenon under investigation.
3. Remote sensing is the instrumentation, techniques and methods to observe the Earth's surface at a distance and to interpret the images or numerical values obtained in order to acquire meaningful information of particular objects on Earth.<sup>143</sup>

Important aspects of these definitions are that the data can be obtained from a distance and that interpretation of thus acquired data is an inherent part

<sup>140</sup>See *Kraska, James, Oceanographic and Naval Deployments of Expendable Marine Instruments under U.S. and International Law*, in O.D. & Int'l L. 26 [1995], p. 315.

<sup>141</sup>See *Ibid.*, pp. 313f., pointing out that these instruments are an integral feature of antisubmarine warfare operations. According to him pursuant to navy training military operations and federally funded oceanography, the U.S. government annually deploys tens of thousands of expendable marine instruments into the oceans since the 1960s as they are indispensable for scientific progress in a host of oceanographic and atmospheric fields and for the maintenance of national security.

<sup>142</sup>See *Normile, Dennis/Hui, Li, Science Overrides Politics for East Asian Monsoon Study*, in *Science* 280 [1998], p. 373.

<sup>143</sup>See *Janssen* (as in n. 111 on page 37), pp. 18f.

of remote sensing.<sup>144</sup> The data obtained, for example, by an imaging radar consists of a multitude of digital numbers, which correspond to the strength of the reflected or backscattered energy that is received by the sensor. The strength of the reflected signal depends on the one hand on the strength of the illuminating signal, i. e., the energy of the radar beam, its angle, and a number of other factors, and on the other hand on the illuminating object, i. e., surface configuration, shape, orientation, consistency, physical properties, *et cetera*. The numbers need to be processed—usually by high capacity computers that can cope with the amount of data input—to provide readily interpretable images. The type of image is thus determined both by the data received from the sensor and by the computer model or software used for processing.

Surveillance by aircraft (airborne sensors) and satellite (space borne sensors) are an important supplement to water based research in oceanography, indispensable when it comes to large-scale studies covering an extensive part of the world's surface in terms of information about morphology, consistency and utilisation. Remote sensing has the advantage over local probing that information of surface qualities of wide areas, owing to the reflection and emission characteristics of the Earth's surface, can be gathered without the necessity of interpolation.<sup>145</sup> It allows for a continuous flow of new images from the Earth surface, which can be used for updating the *Geographic Information System (G.I.S.)* and, in general, oceanographic data.<sup>146</sup> Last but not least, remote sensing can deliver information for areas where it is impossible or difficult to operate and maintain a network of ground-based measuring platforms. The huge amounts of data that can be gathered by remote sensing are useful to increase the knowledge about currents, waves, plant life, sea ice, storms, and even the sea floor.

Airborne and space borne sensing is relevant in oceanography to capture the spatial and temporal dimensions of change in surface property (e. g., dynamic height, winds, waves, currents, temperature, sea ice, ocean colour and coral reef assessment). data can be obtained on surface and internal waves, fronts, variations in bottom topography and bathymetry, meso- and microscale eddies and currents,<sup>147</sup> surface wind speed and other processes

<sup>144</sup> Additionally, models and measurements must be calibrated for inaccuracies like systematic and random instrumental errors, effects of different tides, sea-level static response to atmospheric pressure (so-called inverse barometer), shifts in orbit altitudes, and wave heights which can be done by comparison to data obtained from ground based methods.

<sup>145</sup> See Mauser, W., *Nutzbarmachung von Fernerkundungsdaten für Modelle der Hydrologie*, München, 2001, p. 1, the study was conducted on terrestrial hydrology, yet the technology used can also be employed for off-shore data. Noteworthy are the improvements in microwave and optical technology that allow for a better radiometric and geometric resolution.

<sup>146</sup> See McPhaden (as in n. 36 on page 18).

<sup>147</sup> See Villares, P. et al., *The Use of Topex-Poseidon, ERS-1 and ERS-2 altimeters to Detect MEDDIES*, in Casanova, José Luis, editor, *Remote Sensing in the 21<sup>st</sup> Century*:

that give rise to subtle variations in surface appearance. It can give hints about phytoplankton biomass and productivity, and coupled with data on pressure systems and wind directions can be used to predict toxic algae blooms in the sea.<sup>148</sup> Remotely sensed data also provides a precise reference frame for absolute measurements, for example, of the sea level in the order of centimetres per year and spatial extensions in the order of ocean systems.<sup>149</sup>

Scientific investigations of the marine environment with radar equipment began early on. Sub-marine sand waves were discovered on radar imagery as early as 1969,<sup>150</sup> measurements of *Sea Surface Temperature (S.S.T.)* began in the 1970s, using infrared radiometers on geo-stationary and polar orbiting platforms.<sup>151</sup> Today scientists are able to gain reasonable images of the sea floor topography from radar measurements<sup>152</sup> and S.S.T. is measured routinely. With infrared radiometers supplemented by correctly calibrated, low frequency microwave radiometry, scientists can even overcome the two major limitations of satellite imagery and look through clouds and aerosols.<sup>153</sup> The growth in ocean remote-sensing from satellites, together with the steadily increasing power of computers to process the acquired data and the continued improvement of coupled ocean-climate and ecological-physical models have been identified by GOOS as particularly important factors for a global view of data collection and numerical forecasting.<sup>154</sup> Future developments of remote sensing technology may put scientists, in a position to analyse rocks from afar<sup>155</sup> to assess biodiversity<sup>156</sup> and locate fish stocks based on

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Economic and Environmental Applications, Rotterdam, 2000, pp. 452f.

<sup>148</sup>See, for example, *Conde, P. Pardo et al., Red Tides GIS monitoring the Galician Coast*, in *Casanova, José Luis*, editor, *Remote Sensing in the 21<sup>st</sup> Century: Economic and Environmental Applications*, Rotterdam, 2000, pp. 431f.

<sup>149</sup>See *Catalán-Pu, M. et al., A Mean Sea Level Variation in the Mediterranean Using Topex-Poseidon, ERS-1 and ERS-2 Altimeter Observations*, in *Casanova, José Luis*, editor, *Remote Sensing in the 21<sup>st</sup> Century: Economic and Environmental Applications*, Rotterdam, 2000, p. 422.

<sup>150</sup>See *Hennings, I., An Historical Overview of Radar Imagery of Sea Bottom Topography*, in *Int'l J. Remote Sensing* 19 [1998], pp. 1447f.

<sup>151</sup>See *McClain, E. P./Pichel, W. G./Walton, C. C., Comparative Performance of AVHRR-Based Multichannel Sea-Surface Temperatures*, in *Journal of Geophysical Research-Oceans* 90 [1985], p. 1587.

<sup>152</sup>See *Hennings, I./Metzner, M./Calkoen, C.J., Island Connected Sea Bed Signatures Observed by Multi-Frequency Synthetic Aperture Radar*, in *Int'l J. Remote Sensing* 19 [1998], pp. 1933f., with further references.

<sup>153</sup>See *Wentz, Frank J. et al., Satellite Measurements of Sea Surface Temperature Through Clouds*, in *Science* 288 [2000], p. 847.

<sup>154</sup>See IOC Status (as in n. 3 on page 9), p. 1, and IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Third Session, Accra, Ghana, 13–15 April 1999, IOC-WMO-UNEP-ICSU/C-GOOS-III/3, p. 11.

<sup>155</sup>See *Longhi, I. M. Sgavetti/Chiari, R./Mazzoli, C., Spectral Analysis and Classification of Metamorphic Rocks from Laboratory Reflectance Spectra in the 0.4–2.5  $\mu\text{m}$  Interval: A Tool For Hyperspectral Data Interpretation*, in *Int'l J. Remote Sensing* 22 [2001], pp. 3763f.

<sup>156</sup>See *Nagendra, H., Using Remote Sensing to Assess Biodiversity*, in *Int'l J. Remote Sensing* 22 [2001], pp. 2393f., and *Zarco-Tejada, P. J. et al., Optical Indices as Bioindi-*

a synergetic analysis of chlorophyll concentrations<sup>157</sup> or of S.S.T. and atmospheric conditions.<sup>158</sup> And finally, remote sensing may serve sociological and epidemiological observations for disease prevention.<sup>159</sup> The economic and security implications of these prospects are obvious and induce, not surprisingly, reservations on the side of those States that do not participate in satellite programmes. Yet, decision-makers are inevitably faced with this increasing capabilities of scientific investigations; and inasmuch as problems are posed, recourse is had to the legal ramifications for possible answers—or necessary adjustments.

### *Principle of Operation*

Remote sensing makes use of the fact that every object warmer than 0 K<sup>160</sup> due to molecular movements emits, reflects or diffracts electromagnetic waves (or radiation) depending on the size and structure of its surface and to some extent of its consistency.

Waves generally are characterised by their speed, frequency, and wavelength. Frequency and wavelength of electromagnetic waves determine each other: the shorter the wavelength, the higher the frequency and *vice versa*.<sup>161</sup> For quantifying the amount of energy measured by a (multi spectral) sensor

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*cators of Forest Condition from Hyperspectral CASI Data*, in Casanova, José Luis, editor, Remote Sensing in the 21<sup>st</sup> Century: Economic and Environmental Applications, Rotterdam, 2000, p. 521. Although the authors refer mainly to land territories and on-land resources it appears to be a safe assumption that future technological developments will enable scientists to analyse the marine environment also.

<sup>157</sup>See Solanki, H. U./Dwivedi, R. M./Nayak, S. R., *Synergetic Analysis of SeaWiFS Chlorophyll Concentration And NOAA-AVHRR SST Features For Exploring Marine Living Resources*, in Int'l J.Remote Sensing 22 [2001], p. 3881; Sarangi, R. K. et al., *Phytoplankton Distribution in the Arabian Sea Using IRS - P4 OCM Satellite Data*, in Int'l J.Remote Sensing 22 [2001], pp. 2863f.

<sup>158</sup>See Romo, A./Casanova, J. L./Calle, A., *Location of Tuna-Fish Banks in the Mediterranean Sea Using NOAA Images*, in Casanova, José Luis, editor, Remote Sensing in the 21<sup>st</sup> Century: Economic and Environmental Applications, Rotterdam, 2000, p. 438; see also Ryder (as in n. 121 on page 40), pp. 4f.

<sup>159</sup>It appears that it is now possible to utilise remote sensing and computer processing to integrate oceanographic, ecological, micro-biological, marine biological, epidemiological, medical, and satellite imagery data for the purpose of developing predictive models of cholera outbreaks: Colwell, Rita R., *Global Climate and Infectious Disease: The Cholera Paradigm*, in Science 274 [1996], p. 2025; also Chen, K., *An Approach to Linking Remotely Sensed Data and Areal Census Data*, in Int'l J.Remote Sensing 23 [2002], pp. 37f.

<sup>160</sup>0 K equals -273 °C.

<sup>161</sup>Electromagnetic waves travel at the speed of light, a fact, which results in an interrelation of the wave characteristics, expressed as

$$c = \lambda \times \nu$$

where  $c$  is the speed of light,  $\lambda$  is the wavelength, i.e., the distance between two consecutive troughs, and  $\nu$  the frequency, i.e., the number of troughs passing a fixed point over a specific period of time.

the particle theory—as distinct from the above described wave theory—provides a convenient model, according to which electromagnetic energy is composed of discrete units called ‘photons’.<sup>162</sup> The practical implication for remote sensing is that radiation with longer wavelength, such as radio waves (around 1 metre), are more difficult to measure than the more energetic short wave *Gamma* rays (around  $10^{-9}$  m). The energy represented by waves or radiation relates to a specific part of the electromagnetic spectrum: usually visible light, but it may also be infrared light or radio waves. The simplest method of remote sensing is accordingly photography, making use of the visible spectrum.

Another important phenomenon relevant in this context is the rate of absorption and re-emission. Matter that is capable of absorbing and re-emitting *all* energy is known in physics as a blackbody. For a blackbody emissivity and absorptance are equal to 1. In reality a blackbody hardly ever exists; in general, natural objects have emissivities less than one, i. e., some of the absorbed energy is retained. The rate of absorption of energy is a physical property. For each material a specific *reflectance curve* can be established, which shows the reflected fraction of the incident radiation. Based on the above mentioned equation and knowledge about the physical properties of surface matter it is thus possible to deduce from the re-emitted energy contained in waves (and radiation) the consistency of the Earth’s surface. Some of the main factors, that influence the reflectance curve of, for example, bare soil, are the soil moisture content and the presence of carbonates and iron oxides. Also, vegetation has a higher rate of reflection (up to 50%) than soil (up to 30–40%), and water reflects the least of incoming radiation (up to 10%).<sup>163</sup>

The electromagnetic spectrum used for remote sensing extends from the *optical part* where laws of optics, such as reflectance and refraction, can be applied to the longer wavelengths in the thermal infrared (around  $10\ \mu\text{m}$ ) and microwave (1 mm–1 m) region. The shortest wavelengths of practical use in remote sensing is the ultraviolet (UV) portion of the spectrum (around  $0,1\ \mu\text{m}$  thus beyond the visible part of the spectrum, commonly referred to as light), which is emitted by some of the Earth’s surface material when illuminated with UV radiation.

Within this range remote sensing is further restricted by atmospheric absorption through ozone, water vapour and carbon dioxide which effectively limits the measurable wavelength regions to so-called *atmospheric transmission windows* outside the main absorption bands of the atmospheric gases.<sup>164</sup>

<sup>162</sup>The amount of energy held by a photon of a specific wavelength is given by

$$Q = h \times \nu = h \times c/\lambda$$

where  $Q$  is the energy of the photon,  $h$  is Planck’s constant, and  $\nu$  is the frequency. It follows that the longer the wave length, the lower its energy content.

<sup>163</sup>See *Janssen* (as in n. 111 on page 37), pp. 34f.

<sup>164</sup>These are between  $0,4\text{--}2\ \mu\text{m}$ , at around 3 and  $5\ \mu\text{m}$ , and from approximately 8 to

Another phenomenon affecting the accuracy of remote sensing is atmospheric scattering: Particles or molecules in the atmosphere redirect electromagnetic waves from their original path. Scattering causes a distortion of the spectral characteristics of the reflected light and affects thus the interpretation of the data.<sup>165</sup>

*Gamma* ray spectrometers make use of a different physical phenomenon: spontaneous decay of naturally occurring isotopes generates *Gamma* radiation. The rays albeit not capable of penetrating solid rock or more than a few centimetres of soil have sufficient energy to travel a few hundred metres through the atmosphere and may therefore be detected from low-flying aircraft. Thus obtained imagery can reveal interesting features of soil composition and origin and to a limited extent of geology. Another phenomenon that can be used for remote sensing is the distortion of gravity and magnetic anomalies. Rocks with abnormal density or magnetic properties in the upper few kilometres of the Earth's crust can change the Earth's gravity and magnetic fields by small but perceptible amounts. Careful and detailed mapping reveals complex patterns that are related to the geological structure and composition. Over the world's oceans radar altimetry of the sea-level from satellite has achieved a precision of less than 10 cm. Undulations of a few metres on the sea-surface can be attributed to gravity anomalies. These again arise from density variations in the subsurface. Thus altimetry can be used even for mapping the topography of the ocean floor.<sup>166</sup> The mapping of magnetic anomalies based on the same principles has been used for geological surveys in commercial exploration for more than 50 years.<sup>167</sup>

### *Sensors*

The sensors used in remote sensing are devices<sup>168</sup> that measure and record electromagnetic energy. Two groups of sensors can be distinguished:<sup>169</sup>

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14  $\mu\text{m}$ ; the band beyond 1 mm is more or less transparent, see *Janssen* (as in n. 111 on page 37), p. 30.

<sup>165</sup>See for more details *Ibid.*, pp. 31f.

<sup>166</sup>See *Ibid.*, pp. 92f.

<sup>167</sup>See *Ibid.*, p. 93; yet another possibility to obtain a map of the subsurface is electrical imaging by measuring conductivity, i.e., the electrical resistance of the subsurface material. It is determined by the presence of water (also in pores, cracks and fissures of large rock) and the distinct electrical properties of certain minerals. While this is traditionally a ground based method it may be supplemented by electromagnetic methods where current is induced by the passage of an alternating current through a transmitter coil. This method has been developed largely for mineral exploration, yet, at present, is of little use on the oceans.

<sup>168</sup>These devices may itself consist of a number of components, like radar systems including a transmitter, a receiver, an antenna and a recorder, where the transmitter is used to generate the microwave signal and transmit the energy to the antenna and the receiver accepts the signal of the reflected wave as received by the antenna, filters and amplifies it as required for recording.

<sup>169</sup>See for a brief overview *Ryder* (as in n. 121 on page 40), pp. 4f.



1. Passive sensors, depending on an external source of energy (usually the sun), such as
  - (a) *Gamma-ray spectrometers*, which measure the amount of gamma rays emitted by the surface; the energy measured in specific wavelength bands can provide information on the abundance of minerals (or rather related radio-isotopes);
  - (b) *Aerial (photographic) cameras*,<sup>170</sup> which provide precise images of the surface topography mainly for mapping purposes (the most common type of remote sensing technique<sup>171</sup>);
  - (c) *Video cameras*, which are used to provide low cost data for qualitative purposes such as additional visual information on an area captured by a different sensor;
  - (d) *Multi-spectral scanner/imaging spectrometer*, which measure the energy of (several/narrower) wavelength bands or spectral curves, each of which represents a specific characteristic of the surface, for example, reflection characteristics of the blue light give information about the mineral composition (after aerial photography the most common sensors<sup>172</sup>);
  - (e) *Thermal scanners*, which measure wavelengths that are directly related to the object's temperature;
  - (f) *Radiometers*, which measure very long wavelengths emitted from soil and rocks on or just below the surface, the data can be used for mineral exploration and soil mapping.
  
2. Active sensors with their own source of energy, such as
  - (a) *Laser scanners*, which use a laser beam to measure the distance from the platform (usually an aircraft) to the surface and provide high resolution data for topographic mapping;

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<sup>170</sup>The (aerial) survey camera used for this purpose works on the same principles like a regular amateur camera. The main difference is the quality and size of lens and film material. The accuracy of the image projected on the film, i. e., the degree of distortion, depends on the lens quality. *Spectral* and *general sensitivity* of the film emulsion determine the range of wavelengths recorded and how much light in general, i. e., brightness and exposure time, is required to bring about a change in film density. *Spatial resolution* refers to the ability to distinguish two adjacent objects: The smaller the objects the higher the resolution. A number of factors influence spatial resolution: the image scale (determined by the *flying height* and the *focal length*), the quality of the optical system, the grain structure of the film, the contrast of the original objects, atmospheric scattering and movement of the object. *Photogrammetry* is the science and technique of making measurements from photos and image data. See *Janssen* (as in n. 111 on page 37), pp. 54–58.

<sup>171</sup>See *Ibid.*, p. 53.

<sup>172</sup>See *Ibid.*, p. 69.

- (b) *Radar altimeters* which measure the topographic profile (rather than images) parallel to the satellite orbit;
- (c) *Imaging radar*, which measures different wavelength bands (in the microwave (1–100 cm) domain) that are related to specific characteristics of the Earth's surface similar to the *multi-spectral scanner*, two radar images of the same area can provide information about terrain height or changes.<sup>173</sup>

### Platforms

#### Aircraft

For airborne observations sensors may be mounted on aeroplanes, Ultra Light Vehicles (U.L.V.), balloons, zeppelins or kites. Airborne sensing is usually done between 100 m and 40.000 m.<sup>174</sup>

#### Spacecraft

For Earth observations from space, sensors are usually mounted on satellites. As platforms, satellites fall into three groups distinguished by their orbits.<sup>175</sup> The relevant orbit characteristics are (1) the distance to the earth surface (usually at 600–800 km—polar orbit—or at 36.000 km—geo-stationary orbit) as the *altitude* determines which areas may be viewed in which detail; (2) the angle between the orbit and the equator (*inclination angle*), which determines the latitudes that can be observed; (3) the time required to complete a full orbit (*period*), which determines the type of images that may be obtained; and (4) the time between two identical orbits in succession (*repeat cycle*). Most satellites follow orbits, which are inclined against the equator. Typically, inclinations are close to 60° which effectively means that the satellite covers latitudes between 60°N and 60°S. Some satellites have orbits of an inclination of nearly or exactly 90°, which run across or close by the poles and are therefore called polar orbits. The third group are geostationary satellites orbiting around the Earth at the same speed as the Earth rotates which keeps them stationary with respect to the Earth surface. This is only possible if the satellite is over the equator and orbits at a height of 35.800 km, therefore geostationary satellites cannot cover the poles.

The monitoring capabilities of the sensors mounted on satellites are determined by the parameters of the satellite's orbit and by their own technological sophistication.<sup>176</sup> The data acquired by the sensor is sent by satellite communication technology to a receiving station on the Earth's surface (*downlink*) where it is eventually analysed and processed. The quality of

<sup>173</sup>See *Janssen* (as in n. 111 on page 37), p. 39.

<sup>174</sup>See *Ibid.*, p. 45.

<sup>175</sup>See *Tomczak* (as in n. 115 on page 38).

<sup>176</sup>See *Janssen* (as in n. 111 on page 37), p. 47.

the resulting images is primarily depending on sensor-platform characteristics such as (1) *spectral* and *radiometric resolution* being a function of the electromagnetic spectrum and the electromagnetic energy measured respectively; (2) *spatial resolution* referring to the minimum size of objects of observation; and (3) *revisit time* determined by the period of time elapsing between two successive images of the same location on Earth (thus depending on the *repeat cycle* and the *pointing capability* of the sensor, i. e., the capability to 'look' sideways, or the *Field of View (FOV)*).<sup>177</sup>

In terms of oceanographic research it does not matter whether the sensor is mounted on a satellite or any other transport unit. What matters is the distance between the sensor and the object of observation and the relative speed to it. Thus a distinction must be made between those platforms that maintain a fixed position relevant to the Earth's surface and those that circle around the Earth at a certain speed.

The satellite sensors currently in use are:

- (1) Altimeters to measure surface height, ocean circulation, and climate variability;
- (2) Scatterometers for vector winds and air-sea interaction;
- (3) Ocean colour sensors to obtain data on ocean productivity and coastal pollution;
- (4) *Synthetic Aperture Radar (SAR)* to measure sea ice and wind-wave-current interaction;
- (5) Passive Microwave Sensors to measure sea ice, scalar winds, atmospheric moisture;
- (6) Visible/infrared (500–1.000 km) to measure surface temperature, sea ice;
- (7) Visible/infrared (5–80 km and 1–10 km) for coastal and coral reef assessments.<sup>178</sup>

### *Conclusion*

A recent report prepared under the auspices of I.O.C., W.M.O. and UNEP as a basis for future deliberations within the framework of IGOOS notes a continuing need for research into the air/sea-interface, the ocean/atmosphere interactions, biological diversity and ocean ecosystem<sup>179</sup> in order to assess

<sup>177</sup>See *Ibid.*, pp. 48f. and 69f.

<sup>178</sup>See *Thompson, Keith (Chair)/Julie Hall, Eduardo Marone, George Needler, Jozef Pacyna, Steven Walker and Adriana Zingone*, Draft Design for the Initial Observing System of Coastal GOOS, IOC-WMO-UNEP-ICSU/C-GOOS-III/3, Annex VI, p. 14.

<sup>179</sup>*Ryder* (as in n. 121 on page 40), pp. 3f.

and predict the marine environment in response to political, economic and social requirements.<sup>180</sup> It emphasises the significance of new achievements in research technology for collecting data in a focused fashion.<sup>181</sup>

Increasingly new technologies, like satellites and powerful supercomputers necessary to run advanced numerical forecast models, supported by appropriate *in situ* measurements from within the body of the ocean, and at its interfaces with land, air, and ice, are used to provide comprehensive information in a timely fashion.<sup>182</sup> The success of ocean forecasts made by numerical models relies on the integration of remotely-sensed data from satellites with observations of the ocean's surface and subsurface that cannot be made from space.<sup>183</sup> In most large scale oceanographic studies a combination of any of the above mentioned research platforms is used. Every single method provides a distinct set of data and one research technology cannot easily replace another.

Also, the respective methods are used for calibration in order to procure accurate information. Thus, the location of tide gauges is verified through satellite based G.P.S., and, *vice versa*, satellite data is calibrated through *in situ* measurements by ground based platforms, such as floats and gauges. Measurements of sea level changes at the coast by means of conventional gauges complement the large scale coverage of changes in the deep ocean of airborne altimetry. Consequently, despite technological advancements in the past twenty years, comparatively primitive scientific methods from the early days of oceanographic observation, like temperature and depth measurements, still bear important significance. This also means that prerequisites for scientific research projects in terms of access and sampling, remain the same for ground based platforms, like vessels or buoys.

For the present analysis it is important to note that there are three distinct levels at which marine scientific research may be carried on: (1) the sea level; (2) the airspace; and (3) outer space. Each level requires a corresponding platform technology: (a) vessels and buoys; (b) aeroplanes, balloons, kites *et cetera*; and (3) satellites (and to a limited extent other spacecraft).

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<sup>180</sup> *Ryder* (as in n. 121 on page 40), pp. 10f.

<sup>181</sup> *Ibid.*, p. 7.

<sup>182</sup> See IOC Status (as in n. 3 on page 9), p. 1, linking the effort under GOOS to the framework system under *World Weather Watch (W.W.W.)*. See also *Ryder* (as in n. 121 on page 40), p. 7, emphasising the role of programmable autonomous platforms, such as A.U.V. and drones.

<sup>183</sup> See IOC Status (as in n. 3 on page 9), p. 8.

Part II.

The 1982 LOS Convention,  
the Legal Context



## Chapter 2.

# Part XIII: History, Principles and Legal Concepts

### OVERVIEW

Part XIII of the 1982 LOS Convention contains 27 articles in six separate sections, which establish the regime of marine scientific research under the 1982 LOS Convention. The provisions determine general principles and obligations, which are to be observed by all States, as well as the operational restrictions of research activities as a function of the location where the research is intended to be carried out. The more general provisions have a corollary in the *Resolution on Development of National Marine Science, Technology and Ocean Service Infrastructure*<sup>1</sup>, annexed to the Final Act of the Conference, which puts them in a frame spanning the whole 1982 LOS Convention.

Part XIII must be read together with previous parts of the 1982 LOS Convention on the appropriation of ocean space, namely, Parts II through V. In the work of the Sub-Committees prior to the Third U.N. Conference on the Law of the Sea, it had become apparent that questions on scientific research surfaced in different contexts. Rather than referring back and forth, the drafters of the 1982 LOS Convention decided to have one general section on marine scientific research with the major principles, and include in each

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<sup>1</sup>Reprinted in *Nordquist, Myron H. et al., editors, United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 1 to 85, Annexes I and II, Final Act, Annex II, Volume II, Dordrecht, 1993, pp. 436f.

separate area a specific provision qualifying the general regime for the particular purpose. Thus, Article 56(1)(b)(ii) confers jurisdiction on the coastal State with respect to marine scientific research in the exclusive economic zone, and Part XIII lays down the principles for the exercise and scope of such jurisdiction.<sup>2</sup>

To the extent that the interests of the coastal States in the living and non-living resources were recognised by the 1982 LOS Convention, it was necessary—failing a workable distinction between fundamental and applied research<sup>3</sup>—to align the regime on research activities with the zonal appropriation of the ocean space.

The result is a graded system of control as a function of the appropriation of resources reflected in the provisions on sovereignty and jurisdiction.<sup>4</sup> Part XIII as a coherent body of rules reflects what is widely accepted as a compromise between the involved interests, in respect of which *Soons* pronounced: “[w]e should now consider it a fact and take it as it is, whether we like it or not”.<sup>5</sup>

## HISTORY

For the marine scientist, it is undoubtedly a truism that freedom of marine scientific research is fundamental to man’s understanding of ocean processes, to the protection of the marine environment and to the optimum exploitation of marine resources. [...] Ideally, the marine scientist would like to have absolute freedom to pursue his researches in any part of the oceans.<sup>6</sup>

This statement principally alludes to the dilemma of scientists in the legal world of appropriation and exclusive interests. It must be understood that not all science is motivated by the pure pursuit of knowledge and altruistic ends. In many instances the search for the riches of the sea as a potential source of economic profit is the thriving factor behind costly research activities. In these instances the coastal State has a legitimate interest to control activities, which may have a bearing on living or non-living resources situated within its jurisdiction, or which may even affect its security.<sup>7</sup> To end this conflict of interests, which has not always been facilitated by either

<sup>2</sup>See *Gündling, Lothar, Die 200 Seemeilen-Wirtschaftszone: Entstehung eines neuen Regimes des Meeresvölkerrechts*, Berlin, 1983, p.232; *Lucchini, Laurent/Voelckel, Michel, Droit de la mer*, La mer et son droit, les espaces maritime, Volume I, Paris, 1990, § 243f.

<sup>3</sup>See section 2.

<sup>4</sup>See section 2.

<sup>5</sup>*Soons, Alfred H. A., Marine Scientific Research Provisions in the Convention on the Law of the Sea: Issues of Interpretation*, in *The UN Convention on the Law of the Sea: Impact and Implementation*, Honolulu, Hawaii, 1989, p.365.

<sup>6</sup>See *Brown, Edward D., The International Law of the Sea*, Volume I Introductory Manual, Dartmouth, 1994, p.417.

<sup>7</sup>See *Friedheim, Robert L., Negotiating the new ocean regime*, Columbia, SC, 1993,



side,<sup>8</sup> legislative action was taken within the general framework of “codification”<sup>9</sup> which eventually led to the signing of the 1982 LOS Convention on 12 December 1982 at Montego Bay.

*The Geneva Conventions and Marine Scientific Research*

Under the impression of nuclear tests, the discussions preceding the 1958 Geneva Conference within the *International Law Commission (I.L.C.)* were very controversial.<sup>10</sup> Despite some attempts to list scientific research as one of the freedoms, the final text of the 1958 Geneva High Seas Convention—irrespective of the ILC Declaration that there are other freedoms apart from the four listed<sup>11</sup>—did not contain such a reference. Nevertheless, the right to conduct research activities was widely viewed as a freedom of the high seas.<sup>12</sup>

The roots for the extension of coastal state jurisdiction with respect to marine scientific research can be traced back to the Geneva Continental Shelf Convention. The silence of the 1958 Geneva High Seas Convention in respect of marine scientific research, and the express regulation, in contrast, in the Continental Shelf Convention,<sup>13</sup> provided the coastal States later with a claim for jurisdiction over marine scientific research in the exclusive economic zone—the water column above the continental shelf—to begin with<sup>14</sup>: Article 5(1) obligates the coastal State to refrain from any activities, which could result in an interference with fundamental oceanographic or other scientific research carried out with the intention of open publication<sup>15</sup>, even

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p. 201, pointing at the suspicion that ocean science would enhance the political power by providing knowledge about resources, which would eventually give corporations or agencies an advantage in possible negotiations; and also at the role of ocean science in helping the developed States “grab” the minerals of the deep sea bed, an anxiety that, according to him, ultimately led to the introduction of the concept of “common heritage of mankind”.

<sup>8</sup>See *Brown*, Law of the sea (as in n. 6 on the preceding page), p. 417.

<sup>9</sup>Note, that the 1982 LOS Convention was not intended to codify the customary law of the sea, the term is used here in its more general meaning.

<sup>10</sup>See *Hafner, Gerhard, Die seerechtliche Verteilung von Nutzungsrechten, Rechte der Binnenstaaten in der ausschließlichen Wirtschaftszone*, Wien, 1987, p. 358 and *Brown, Edward D., Freedom of Scientific Research and the Legal Regime of Hydro-space*, in *Indian J.Int'l L.* 9 [1969], p. 347, referring to the 1956 Y.I.L.C., vol. I, pp. 11–14.

<sup>11</sup>See United Nations Report of the International Law Commission of its Eighth Session, 23 April–4 July 1956 (ILC Off.Rec., Suppl. 9 (A/3159)), reprinted in *Am.J.Int'l L.* 51 [1957], p. 154(206).

<sup>12</sup>See *Churchill, Robin R./Lowe, Alan V., The law of the sea*, 3rd edition. Yonkers, NY, 1999, Melland Schill studies in international law, p. 401.

<sup>13</sup>Article 5(8) of the Continental Shelf Convention.

<sup>14</sup>See *Hafner* (as in n. 10), p. 358.

<sup>15</sup>See *Rembe, Nasila S., Africa and the International Law of the Sea: A Study of the Contribution of the African States to the Third United Nations Conference on the Law of the Sea*, Alphen aan den Rijn, 1980, pp. 135f.

to the extent that it accorded an absolute right to researchers.<sup>16</sup> However, Article 5(8) clearly established a jurisdictional basis for coastal States. And even though the Continental Shelf Convention requires consent of the coastal State only “in respect of any research concerning the continental shelf and undertaken there” and not in respect of the superjacent waters of the shelf, the expansion of jurisdiction at the cost of high sea areas can be considered a logical consequence.

### *The Ad Hoc Sea-Bed Committee*

In the years following the Geneva Conventions marine scientific research’s significance and its recognition within the legal realm grew considerably. Intergovernmental discussion of the issue of marine scientific research started in 1967 when the Maltese delegate to the 22<sup>nd</sup> Session of the U.N. General Assembly presented the concept of “common heritage of mankind”.<sup>17</sup> In response, the U.N. General Assembly established the *Ad Hoc* Committee to Study the Peaceful Uses of the Seabed and the Ocean Floor Beyond the Limits of National Jurisdiction<sup>18</sup>.

In the work of the *Ad Hoc* Sea-Bed Committee, mainly concerned with questions of the legal status of the deep seabed, the reservation for peaceful purposes, and the use of the resources in this area, the increasing role of marine scientific research itself was acknowledged.<sup>19</sup> At the end of its third session this Committee issued a report, which led the U.N. General Assembly to establish a standing *Committee on the Peaceful Uses of the Seabed and the Ocean Floor Beyond the Limits of National Jurisdiction*.<sup>20</sup>

<sup>16</sup>See *Brown*, Freedom (as in n. 10 on the page before), p. 353.

<sup>17</sup>According to this proposal the ocean floor beyond the limits of national jurisdiction should be excluded from national appropriation, and all activities be supervised and controlled by an international agency, see UN Doc. A/6695 [1967].

<sup>18</sup>UN GA Res. 2340 (XXII), adopted 18 December 1967, see also *Oda, Shigeru, The law of the sea in our time*, Volume I, Leyden, 1977, pp. 3–8.

<sup>19</sup>See SBC Rep. 1968, pp. 4–7; issues reflected on were the freedom of scientific research, the need for international co-operation, distinction between fundamental or pure and resource-oriented or applied scientific research.

<sup>20</sup>Hereinafter: Sea-Bed Committee or SBC; UN GA Res. 2467 A (XXII), 21 December 1968, “Establishing the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor beyond the Limits of National Jurisdiction”, the Committee was instructed:

1. To study the elaboration of the legal principles and norms which would promote international cooperation in the exploration and use of the seabed and the ocean floor, and the subsoil thereof, beyond the limits of national jurisdiction and to ensure the exploitation of their resources for the benefit of mankind, and the economic and other requirements which such a regime should satisfy in order to meet the interests of humanity as a whole;
2. To study the ways and means of promoting the exploitation and use of the resources of this area, and of international cooperation to that end, taking into account the foreseeable development of technology and the economic implications of such exploitation and bearing in mind the

Its Sub-committee on legal issues dedicated some deliberation on questions of scientific research.<sup>21</sup> Based on the work of this Committee the U.N. General Assembly adopted the “Declaration of Principles Governing the Seabed and the Ocean Floor, and the Subsoil Thereof, Beyond the Limits of National Jurisdiction”<sup>22</sup>, it included an article on scientific research, which urged States to promote international co-operation through international programmes; publication and dissemination of information; as well as strengthening the capabilities of developing countries. The U.N. General Assembly also decided to convene the Third U.N. Conference on the Law of the Sea in 1973 and instructed the Sea-Bed Committee to prepare draft treaty articles on all issues of the law of the sea.<sup>23, 24</sup> In its 1972 report with respect to the preparations for the Third UN Conference on the Law of the Sea, the Sea-Bed Committee lists as one subject for consideration scientific research.<sup>25</sup> Also in 1972, the first two official proposals specifically on a regime of marine scientific research were submitted to the third Sub-Committee of

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fact that such exploitation should benefit mankind as a whole;

3. To review the studies carried out in the field of exploration and research in this area and aimed at intensifying international co-operation and stimulating the exchange and the widest possible dissemination of scientific knowledge on the subject; and
4. To examine proposed measures of cooperation to be adopted by the international community in order to prevent the marine pollution which may result from the exploration and exploitation of the resources of this area.

Its Sub-Committee II considered, amongst others, problems relating to the conduct of marine scientific research in maritime zones of national jurisdiction; detailed discussion of these, however, was undertaken in Sub-Committee III.

<sup>21</sup> See report in *Ibid.*, pp. 51–80.

<sup>22</sup> UN GA Res. 2749 (XXV), 17 December 1970, adopted by 108 to 0 with 14 abstentions; see also *Ibid.*, pp. 132–151.

<sup>23</sup> UN GA Res. 2750 C (XXV), 17 December 1970: “the problems of ocean space are closely interrelated and need to be considered as a whole.” (Preamble, para. 4.)

<sup>24</sup> The Sea-Bed Committee, meeting twice a year, worked in three Sub-Committees, which were entrusted with the following subjects:

Sub-Committee I, international regime for the area and the resources of the seabed beyond national jurisdiction;

Sub-Committee II, list of subjects and issues relating to the law of the sea, the regimes of the Territorial Sea, the Contiguous Zone, the Continental Shelf, the High Seas, and the living resources;

Sub-Committee III, preservation of the marine environment and scientific research,

SBC Off.Rec. 26<sup>th</sup> session 1971, pp. 5f.

<sup>25</sup> Item 13.

1. Nature, characteristics and objectives of research of the oceans
2. Access to scientific information
3. International cooperation

SBC Off.Rec. 27<sup>th</sup> session 1972, p. 8.

the Sea-Bed Committee. Both of them, the Canadian submission<sup>26</sup> and the one by Bulgaria, the Ukrainian S.S.R. and the U.S.S.R.<sup>27</sup> already suggested the principal concepts of the 1982 LOS Convention, Part XIII; however, only the Canadian proposal contained a coastal state consent regime which should prove to become a major point of debate.<sup>28</sup>

### *The Third U.N. Conference on the Law of the Sea*

During the early years of the Third U.N. Conference on the Law of the Sea the Third Committee, which was formally entrusted with marine scientific research, made not much progress. The other two Sub-Committees despite the initial assignment of certain topics considered marine scientific research across the areas of the initial distribution to the extent that their deliberation was important in the respective contexts.<sup>29</sup> This became necessary as questions relating to marine scientific research naturally occurred in the contexts of other relevant subject areas.<sup>30</sup>

There were, in principle, two different approaches to a regime on marine scientific research: one, the consent regime, which made it a prerequisite for any scientific research project to acquire permission prior to the initiation of the research—this approach can also be called zonal, as it is based on graded influence of coastal States on research as a function of different zones; and the freedom regime, which favoured the free access to all waters beyond the territorial sea of the coastal States and as a concession to the coastal States' concerns attempted a distinction between various types of research.<sup>31</sup>

Freedom of access for marine scientific research was mainly considered as a trade-off against interests in resources or security; it appears that only the

<sup>26</sup>UN Doc. A/AC.138/SC.III/L.18 [1972].

<sup>27</sup>UN Doc. A/AC.138/SC.III/L.23 [1972].

<sup>28</sup>In 1973, seven formal proposals for a marine scientific research regime were submitted to Sub-Committee III: UN Doc. A/AC.138/SC.III/L.31 (Bulgaria, Poland, Ukrainian S.S.R. and U.S.S.R.) [1973]; UN Doc. A/AC.138/SC.III/L.34 (Malta) [1973]; UN Doc. A/AC.138/SC.III/L.42 (China) [1973]; UN Doc. A/AC.138/SC.III/L.44 (U.S.A.) [1973]; UN Doc. A/AC.138/SC.III/L.45 (Brazil, Ecuador, El Salvador, Peru, and Uruguay) [1973]; UN Doc. A/AC.138/SC.III/L.50 (Italy) [1973]; UN Doc. A/AC.138/SC.III/L.55 (Algeria, Brazil, China, Ethiopia, Egypt, Iran, Kenya, Pakistan, Peru, Philippines, Roumania, Somalia, Trinidad and Tobago, Tunisia, and Yugoslavia) [1973]; and others to Sub-Committee I (UN Doc. A/AC.138/SC.I/L.26 (Italy) [1973] and II (UN Doc. A/AC.138/SC.II/L.10 (Kenya) (reproduced in SBC Rep. 1972, p. 180)) respectively.

<sup>29</sup>See Miles, Edward L., *Global Ocean Politics: the Decision Process at the Third United Nations Conference on the Law of the Sea, 1973–1982*, The Hague, 1998, p. 38.

<sup>30</sup>See Henchoz, Alain-Denis, *Réglementations Nationales et Internationales de l'exploration et de l'exploitation des Grands Fond Marins*, Zürich, 1992, Schweizer Studien zum Internationalen Recht 76, p. 323; Marffy, Annick de, *La Recherche Scientifique Marine*, in Dupuy, René-Jean/Vignes, Daniel, editors, *Traité du nouveau droit de la mer*, Paris, 1985, p. 961.

<sup>31</sup>See *Ibid.*, pp. 960f.

U.S.A. and the F.R.G. campaigned openly for unrestricted access<sup>32</sup> which, in the context of the exclusive economic zone, was a foregone struggle.<sup>33</sup> The lobbying efforts of three major intergovernmental scientific organisations<sup>34</sup> did not save the stakes of the scientific community. In 1979 the issues were resolved and the Committee was eventually shut down in 1980.<sup>35</sup> To continue the work of the Committee was considered not only unnecessary but dangerous because of the potential of inviting challenges to the delicate balance of hard-fought compromises.<sup>36</sup> The result at the end of the negotiations on the 1982 LOS Convention was deeply disappointing for the scientists as global politics and rivalling interests had shattered their cause.<sup>37</sup>

<sup>32</sup>See *Miles* (as in n. 29 on the facing page), pp. 77 and 80, pointing out that the U.S. delegation under its chairman Richardson pursued a trade-off strategy that anticipated concessions in respect of marine scientific research and dispute settlement against inevitable compromises on the deep sea-bed issues in Committee I; see also *Nordquist, Myron H./Park, Choon-Ho*, editors, *Reports of the United States Delegation to the Third United Nations Conference on the Law of the Sea*, *Law of the Sea Institute*, Honolulu, Hawaii, 1983, Occasional Paper No. 33, pp. 220f.

<sup>33</sup>See *Friedheim* (as in n. 7 on page 60), p. 202, pointing out that in respect of the international area, the ocean science issue was a relatively minor aspect of a larger issue and could be treated as a trade-off to help foster agreement on the larger issue; on the conduct of ocean science in the exclusive economic zone, a comparable trade-off was not available, because the introduction of the 200 nm exclusive economic zone was a foregone conclusion conceded by the “superpowers” at the beginning of the formal negotiations; similarly, *Mangone, Gerard J.*, *The Effect of Extended Coastal State Jurisdiction over the Seas and Seabed upon Marine Scientific Research*, in *Park, Choon-Ho*, editor, *Law of the Sea in the 1980s*, Honolulu, Hawaii, 1983, p. 301, pointing out that the 1945 *Truman Proclamation* (*Truman, Harry S.*, *Presidential Proclamation No. 2667*, “Policy of the United States with Respect to the Natural Resources of the Subsoil and Sea Bed of the Continental Shelf”, 28 September 1945) led the way in unilaterally asserting jurisdiction over the resources of the continental shelf.

<sup>34</sup>ICES, the SCOR within the I.C.S.U., and the I.O.C. under the auspices of UNESCO, see *Wooster, Warren S.*, *International Institutions and Cooperation in Ocean Research: Three Marine Science Organizations and the Law of the Sea*, in *Lenz, Walter/Deacon, Margaret*, editors, *Ocean Sciences: Their History and Relation to Man*, Volume 22, Hamburg, 1990, pp. 316 and 318 noting little influence of the National Committees of SCOR on the respective national delegations and the fact that I.O.C. due to its membership structure—a majority of the States Parties were former colonies “who saw offshore research by the industrialized nations as threatening their control of these waters and resources”—was not a proper platform.

<sup>35</sup>See *Miles* (as in n. 29 on the facing page), pp. 45–59, 60; *Nordquist/Park* (as in n. 32), p. 443.

<sup>36</sup>See *Miles* (as in n. 29 on the facing page), pp. 388–393; *Oxman, Bernard H.*, *The Third United Nations Conference on the Law of the Sea: The Ninth Session (1980)*, in *Am.J.Int'l L.* 75 [1981], p. 237.

<sup>37</sup>See *Friedheim* (as in n. 7 on page 60), p. 202, referring to a number of comments from marine scientists and legal scholars, see *ibid.*, n. 60; similarly, *Miles* (as in n. 29 on the facing page), p. 90.

## VIEWS OF COASTAL STATES

The incorporation in the 1982 LOS Convention of a legal regime on marine scientific research is a consequence of the increased significance of marine science for the balance of interests between coastal and flag States.<sup>38</sup> The dichotomy is reflected in the two approaches toward a legal regime for marine scientific research: On one side the coastal States that favoured an exclusionary solution requiring the researching State to seek the prior consent by the coastal State. And on the other side the researching States that preferred to have marine scientific research perceived as one of the freedoms of the high seas which would only be restricted within the territorial sea. Accordingly, consent on marine scientific research within the internal waters and the territorial sea was easier established than for the exclusive economic zone, which, while a regime of its own, can be described essentially as a combination of the classical freedoms of the high seas and patches of coastal state jurisdiction.<sup>39</sup> Thus, ships may freely navigate in the exclusive economic zone of a foreign State exercising the high seas freedom of navigation but they are not allowed to engage in activities that are likely to compromise the coastal State's economic or security interests including marine scientific research.

*Increase of Knowledge as a "Threat"*

The refusal of (mainly) developing countries to allow for greater freedom of scientific research was predominantly based on the perception of military and security issues as well as resource related or economic questions. A number of reservations on the side of the coastal States can be distinguished; all, or a combination of which, are at the root of the current regime of marine scientific research.

1. The collection and evaluation of data was seen as a "national resource".<sup>40</sup> Inasmuch as natural resources were considered the property of the coastal State, any activities related to it should be under the control of the owner. In this instance the marine environment was either considered as to consist of only resources or that any information about the marine environment would inevitably allude to the presence and quality of resources.

<sup>38</sup>See *Miles* (as in n. 29 on page 64), pp. 8f.

<sup>39</sup>*Molenaar, Erik Jaap, Coastal state jurisdiction over vessel-source pollution*, The Hague, 1998, International environmental law and policy series 51, p. 362, noting, with reference to *Orman, Bernard H., The Third United Nations Conference on the Law of the Sea: The 1977 New York Session*, in *Am.J.Int'l L.* 72 [1978], pp. 70f., that the debate about the legal status—residual high seas character or zone *sui generis*—is mere academic.

<sup>40</sup>See *Franssen, Herman T., Understanding the Ocean Science Debate*, in *O.D. & Int'l L.* 2 [1974], pp. 194f.

Apprehensions of coastal States in this respect and their desire to keep information about the natural resources secret have different reasons. Natural resources are a valuable asset in the distribution of goods and a comparative advantage in the world; and especially developing countries—amongst which there are many coastal States—with the growth of their debts become increasingly dependent on their resources. Comparing the revenue of raw material and final products it makes sense from a developing country's point of view to wait with the exploitation of natural resources until such a time when better use of them can be made. Where resources are known, the pressure on exploiting them is an inevitable consequence. Also, once a resource is discovered and explored there is the risk that commercial developers exploit the natural resources from outside the jurisdictional limits—in the case where such resources border the 200 nm limit of the coastal State's exclusive economic zone or the exclusive economic zone of a neighbouring State willing to authorise access from its exclusive economic zone.<sup>41</sup> From a coastal State's perspective the waters adjacent to its coast have a high significance predominantly due to the economic value of the natural resources. Rational management of such resources requires, *inter alia*, knowledge of and about those resources, which may be acquired through fundamental, applied *or* exploratory research. The essential role of marine scientific research in the development of the riches of these waters was recognised by developing countries<sup>42</sup>, yet their conclusion was different from that drawn by the developed countries. In their proposals and statements the developing countries advocated coastal state regulation over scientific research conducted within their exclusive economic zones.

2. Research activities were seen as a symbol of economic espionage or advantage for the maritime nations.<sup>43</sup> This view was rooted both in Cold War antagonism and post-colonial contentions. State security was considered fundamental in the heightened state of alert and espionage since a seriously compromising threat thought to be ubiquitous.

<sup>41</sup>See *Lagoni, Rainer, Oil and Gas Deposits Across National Frontiers*, in Am.J.Int'l L. 73 [1979], pp. 217, 219–221.

<sup>42</sup>See *Rembe* (as in n. 15 on page 61), pp. 135f.; similarly, *Mlimuka, Aggrey K.L.J., The Eastern African States and the Exclusive Economic Zone*, Hamburg, 1998, pp. 31f.

<sup>43</sup>See *Cheek, Conrad H./Brown, Louis B./Sullivan, William L., U.S. Committee on International Ocean Affairs, Subject: Scientific Research*, survey conducted by an *ad hoc* sub-committee, 23 March 1973, p. 1; according to a Memorandum, dated 24 February 1972, subject "US Position on Scientific Research for the 1973 Law of the Sea Conference", it was clear, at least for the U.S. Ocean Science Community, that "[n]umerous coastal states are suspicious of the research intentions of the maritime nations. They associate ocean research with economic exploitation, not simply with the desire for knowledge, and they want control over scientific research in broad zones adjacent to their coasts."

3. The idea of freedom is susceptible to abuse unless exercised with regard to the interests of other States. For the maritime powers, the “freedom of the seas” was a permissive doctrine, which enabled them to use the seas to further their interests to the limits of their will and capability. “For the weak, however, it was a doctrine which allowed unpleasant things to be done to them: it was a means of oppression, not an expression of freedom.”<sup>44</sup>
4. Scientific research offered a possibility to assert newly won independence. Since this item did not feature very high on the agenda of the maritime powers, it provided the basis for former colonies to stand their ground against the former oppressors and generally call in question what the colonial powers considered custom.<sup>45</sup> The least developed countries advanced the argument in favour of coastal state jurisdiction over every scientific research on the basis that the general benefit of scientific knowledge was not to be left to the “white man” alone. They feared his superior knowledge would then be bestowed onto the “black man” as a favour rather than a right. They were also concerned about the subsistence of the population in the area where scientific research was to be conducted as western influence could seriously disrupt local community structures.<sup>46</sup>
5. Even when noting the significance and desirability of increased scientific knowledge and co-operation for their own developmental problems,<sup>47</sup> scientific research was not free from political considerations for developing countries. In their view it was likely to be geared to destructive ends. Thus, the developing countries with less sophisticated scientific knowledge and technology, were particularly apprehensive of research conducted in close proximity to their territory beyond their control and without their participation. Therefore they advocated the regulation of scientific research and greater participation and sought a combination of their participation with the transfer of technology and the realization of the objectives of the Second U.N. Development Decade and the New International Economic Order.<sup>48</sup>

While all of the above mentioned arguments ignore the reasoning of the attempt to establish a rational distinction between research<sup>49</sup> that may be

<sup>44</sup> *Booth, Ken, Law, Force and Diplomacy at Sea*, London, 1985, p. 13.

<sup>45</sup> See *Hafner* (as in n. 10 on page 61), pp. 357f.

<sup>46</sup> See *Ibid.*, p. 359.

<sup>47</sup> See *Cheek/Brown/Sullivan* (as in n. 43 on the preceding page), p. 1.

<sup>48</sup> See *Rembe* (as in n. 15 on page 61), pp. 134f.

<sup>49</sup> *Knauss, John A., Marine Science and the 1974 Law of the Sea Conference*, in *Science* 184 [1974], p. 1338, speaks somewhat frustrated of “the large emotional issue of nationalism of the newly emerging nations. [I]t cannot be assumed that logical arguments will automatically prevail.”



conducted to everyone's benefit and that, which is profit oriented; they point out that the problem of access might go much deeper than would be expected by an oblivious observer.<sup>50</sup>

### *A Change of Perception*

*Friedheim*<sup>51</sup> singles out three reasons for the result of the negotiations and the perception that the furtherance of knowledge was a threat rather than a social good to society. First, scientists set themselves an impossible task when they sought to "roll back the clock" to the status prior to the Continental Shelf Convention without any coastal state consent thereby essentially terminating an existing national sovereign right. Secondly, observers did not recognise early enough that developing countries were acting rationally in their (short-term) self-interest: given that knowledge is an adjunct to political and economic power—if you cannot gain it, use it, or use it well, and your rival might, you are better off not allowing either one of you to know. And thirdly, developing countries were aware of the relative political weakness of ocean science in the developed world and managed to exclude ocean science from those issues, on which the major developed countries demanded a satisfactory outcome as the price for supporting the extension of coastal States' power; "[t]he issue simply was not as salient to major developed states as agreement on a modest increase in the territorial sea or on a right of transit through straits used for international navigation."<sup>52</sup> He also notes a steady movement toward a consent regime in all geographic groups at the Conference, and concludes that scientists were made "to pay for the state of relationships between North and South, and for the validation of a new concept in international ocean law—an exclusive economic zone."<sup>53</sup>

### *Differentiation as a Possible 'Way out'*

In this context it is important to note that early on it was attempted to distinguish between 'fundamental' (or basic) and 'applied' science in order to appease developing countries' concerns and to safeguard maximum freedom for the science that is only intended for the common good.<sup>54</sup> This distinction

<sup>50</sup>See *Franssen, Maureen N., Oceanic Research and the Developing Nation Perspective*, in *Wooster, Warren S., editor, Freedom of Oceanic Research: A Study Conducted by the Center for Marine Affairs of the Scripps Institution of Oceanography University of California, San Diego, New York, 1973, p.182*; see also *Biermann, Frank, Science as Power in International Environmental Negotiations: Global Environmental Assessments Between North and South*, Harvard University, 2000, Discussion Paper 2000-17, Environment and Natural Resources Program, pp. 1f. and 20f.

<sup>51</sup>See *Friedheim* (as in n. 7 on page 60), pp. 210f.; see also *Hafner* (as in n. 10 on page 61), pp. 358f., for a similar assessment.

<sup>52</sup>*Friedheim* (as in n. 7 on page 60), p. 211; see also n. 32 on page 65.

<sup>53</sup>*Ibid.*, p. 218.

<sup>54</sup>See *Marffy* (as in n. 30 on page 64), p. 961.

generated much controversy because an exact demarcation seemed to be difficult to establish.<sup>55</sup>

In the context of the 1982 LOS Convention the defining elements of the former have been identified as the benefit for humankind, complete and expeditious availability of results and raw material in the public domain, and the participation of foreign experts;<sup>56</sup> and in contrast, applied science being predominantly associated with the exploitation of resources or specific objectives “for the economic benefit of a limited group, as evidenced by restrictions on publication and on availability of data and samples.”<sup>57</sup> According to the *Frascati Manual*:

Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. Applied research is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.<sup>58</sup>

*Prima facie* it would seem that one can draw a line between a study whose sole cause is the furtherance of knowledge with respect to the studied object, and a study, according to which the object is investigated for the purpose of informed management decisions. The distinguishing factor is the objective of the research project. While fundamental research starts out to answer

<sup>55</sup> *Marffy* (as in n. 30 on page 64), p. 960, quotes the Spanish delegate at the Conference as saying “[l]a distinction entre les deux types de recherche est assez floue et les données océaniques obtenues grâce à des recherches fondamentales peuvent être utilisées à des fins commerciales ou militaires.”

<sup>56</sup> See *Burger, W., Treaty Provisions Concerning Marine Science Research*, in O.D. & Int'l L. 1 [1973], p. 170; similarly, *Knauss, John A., Development of the Freedom of Scientific Research Issue of the Third Law of the Sea Conference*, in O.D. & Int'l L. 1 [1973], p. 106; *Caflisch, Lucius/Piccard, Jacques, The Legal Régime of Marine Scientific Research and the Third United Nations Conference on the Law of the Sea*, in Z.a.ö.R.V. 38 [1978], p. 850; see also *Ocean Affairs Board of the National Academy of Science*, reprinted in O.D. & Int'l L. 1 [1973], p. 115, defining “open research” as “intended for the benefit of all mankind and... characterized by prompt availability and full publication of results” which equals the definition of “fundamental” science.

<sup>57</sup> *Ocean Affairs Board of the National Academy of Science*, *ibid.* (as in n. 56 on page 70); similarly *Alber-Malchow, Christine/Steigleder, Thomas, Definition der Begriffe Wissenschaft und Forschung – Eigengesetzlichkeit von Wissenschaft und Forschung*, in *Wagner, Hellmut*, editor, *Rechtliche Rahmenbedingungen für Wissenschaft und Forschung, Forschungsfreiheit und staatliche Regulierung*, Volume 1: *Freiheit von Wissenschaft und Forschung*, Baden-Baden, 2000, p. 29; *Meusel, Ernst-Joachim, Außeruniversitäre Forschung im Wissenschaftsrecht*, 2nd edition. Köln, 1999, p. 3; see also *Brown, Freedom* (as in n. 10 on page 61), p. 360, with respect to the discussions around Article 5 of the Continental Shelf Convention.

<sup>58</sup> *Organisation for Economic Co-operation & Development, Frascati Manual: 1993*, The measurement of scientific and technological activities; proposed standard practice for surveys of research and experimental development, Paris, 1994, p. 13; see also *Alber-Malchow/Steigleder* (as in n. 57), p. 29, with further references; and *Meusel* (as in n. 57), p. 2.

the question: what do I not know about the object of my study yet; applied research starts out to answer the question: how can I best or appropriately utilise the object of my study (and what do I need to know to achieve that end). In other words: one is guided by the curiosity about the object of the study as such, the other by the curiosity about the object and its *utility* for a certain purpose. While findings on the object in question are interchangeable, the answers cannot replace each other.

The problem of differentiation between science for the benefit of all and science for the benefit of the few is a general one; and in practice it is mainly the unrestricted publication as well as the intent of the research, which distinguishes fundamental from applied science.<sup>59</sup> Under practical considerations the subjective aspects of an act are of little use as it is generally difficult to establish real intention on the basis of facts in foresight. The import of subjective elements may even, on the contrary, bear the potential of arbitrary accusations. Therefore, it might be seen as a benefit that the Convention avoids any language, which would point in the direction of permitting or requiring intention as evidence.<sup>60</sup>

In the context of the negotiations of the 1982 LOS Convention the relevance of the distinction between the two kinds of research lies predominantly in the proposition that it would have been difficult to defend the pursuit of national interests against the benefit for all, especially among the developing countries. It can thus be seen as an attempted stratagem in a lost battle. The attempt failed because of the difficulties in clearly classifying fundamental and resource related scientific research. Often the implications of scientific research for economic or security interests are obvious; there are, however, many instances, in which the consequences are not immediately conceivable. Scientific findings in general are seldom so specific that they do not affect areas beyond the immediate research focus. Practical and commercial applications are usually a result of a transfer process but cannot be predicted at the outset. Scientific data on ocean currents, gathered with the goal to better understand weather systems and meteorological occurrences, may be useful for the exploitation of living resources because fish migration patterns depend on the physical characteristics of the marine environment.<sup>61</sup> The knowledge about potential carbon fuel resources as de-

<sup>59</sup>See *Hafner* (as in n. 10 on page 61), pp. 32f.

<sup>60</sup>See *Allen, Craig H., Protecting the Oceanic Gardens of Eden: International Law Issues in Deep-sea Vent Resource Conservation and Management*, in *Geo.Int'l & Env'l L.Rev.* 13 [2001], p. 648.

<sup>61</sup>See *U.N. Secretary-General, Law of the Sea*, UN Doc. A/51/645, New York, 1 November 1996, para. 296:

The oceans were not considered to be as well mapped as Venus, until the release this year of the first global map of the ocean floor by the *United States National Oceanic and Atmospheric Administration (NOAA)*. It was based on recently declassified satellite data acquired by the United States Navy, combined with recent readings from a European satellite. Besides being of great scientific importance for studies of active geological processes

duced from typical geological formations can obviously put the sole bearer of such knowledge in an advantageous position in negotiations about access rights. It is perhaps less obvious that knowledge about the physical characteristics of currents or waves can be crucial for coastal management.<sup>62</sup> And the potential commercial exploitation of scientific discoveries, findings and observations downstream can hardly ever be foreseen at the time when the research is taking place. And—as a consequence—the potential implications of every research project for resource exploitation or national security, every scientific activity had to be subjugated to coastal States' jurisdiction.<sup>63</sup> Had the attempt been successful the outcome of the negotiations might have been different.

### *A New Concern*

A comparatively recent issue is the possible adverse effect of research activities on the marine environment. Increased awareness of the state of the environment has brought marine scientific research into perspective as a possible contributor to environmental degradation. Thus, the U.N. Secretary-General has identified research activities as a key threat to the deep sea ecosystems.<sup>64</sup> The discussion revolves around the question whether the taking of samples or the conduct of research operations disrupts the marine environment in a harmful manner.<sup>65</sup>

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in deep ocean basins, including plate tectonics, as well as climate studies, the map has proved of commercial value: already, fishermen use it to locate sea mounts that produce up welling of deep, nutrient-rich water that in turn supports abundant living resources; industries use it to find the kinds of rocks that overlay oilfields and the kinds of volcanic eruptions that form undersea deposits of copper, iron, silver and gold.

<sup>62</sup>See, for example, *Farmer, David/Armi, Laurence, The Generation and Trapping of Solitary Waves over Topography*, in *Science* 283 [1999], p.188, for an account of the little investigated phenomenon of “internal solitary waves”, which influence mixing, acoustic propagation, radar observations, and offshore engineering design.

<sup>63</sup>See *Hafner* (as in n. 10 on page 61), p.359.

<sup>64</sup>*U.N. Secretary-General, Oceans and the law of the sea*, UN Doc. A/59/62, New York, 4 March 2004, p.62; see also *U.N. Secretary-General, Oceans and the law of the sea*, UN Doc. A/58/65, New York, 3 March 2003, p.59; *Korn, Horst/Firedrich, Susanne/Feit, Ute*, editors, *Deep Sea Genetic Resources in the Context of the Convention on Biological Diversity and the United Nations Convention on the Law of the Sea*, Bonn, 2003, BfN Skripten 79, pp.19f.; *Thiel, Hjalmar/Koslow, J. Anthony*, editors, *Managing Risks to Biodiversity and the Environment on the High Sea, Including Tools Such as Marine Protected Areas*, Scientific Requirements and Legal Aspects, Bonn, 2001, BfN Skripten 43, p.22; and *Glowka, Lyle, Testing the Waters: Establishing the Legal Basis to Conserve and Sustainably Use Hydrothermal Vents and Their Biological Communities*, in *Thiel, Hjalmar/Koslow, J. Anthony*, editors, *Managing Risks to Biodiversity and the Environment on the High Sea, Including Tools Such as Marine Protected Areas*, Bonn, 2001, BfN Skripten 43, pp.197f., suggesting (for the protection of hydrothermal vents) to make the granting of permission conditional upon management plans and environmental impact assessments for research operations.

<sup>65</sup>See e.g., *Mullineaux, Lauren/Juniper, S. Kim/Desbruyères, Daniel, Deep-Sea Sanctuaries at Hydrothermal Vents: A Position Paper*, in *InterRidge News* 7 [1998],

Scientists have been confronted with a sceptical view of their activities before, most notably in the context of the Antarctic Treaty. There, with growing (scientific) knowledge, the delicate balance of the Antarctic environment has come increasingly to the contracting parties' attention.<sup>66</sup> The freedom of scientific research in Antarctica was already limited to some extent by the Antarctic Treaty itself: research can be carried out only subject to the Treaty's provisions. Additional restrictions have been imposed by other instruments of the Antarctic Treaty System and bear evidence of the growing awareness mentioned. The *Agreed Measures for the Conservation of Antarctic Fauna and Flora* introduced a permit system administered by the Contracting Parties for the killing, wounding, capturing or molesting of any native mammal or native bird and, so called, specially protected areas for unique natural ecological systems.<sup>67</sup> Access to the latter is only granted on a permit basis for a "compelling scientific purpose which cannot be served elsewhere" and on the condition that the action permitted "will not jeopardise the natural ecological system existing in that Area."<sup>68</sup> The designation of protected areas restricts the free exercise of scientific research and is likely to constrain research activities in the future.<sup>69</sup> The adoption of the Environmental Protocol<sup>70</sup> has added new<sup>71</sup> and supplemented old measures for the protection of the Antarctic environment.<sup>72</sup> Most notably, it provides for an

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p. 15, pointing at the incompatibility of certain investigations at hydrothermal vents and proposing a deep sea research reserve system to alleviate the pressure on deep sea ecosystems as a voluntary measure; see also *Glowka*, Testing the Waters (as in n. 64 on the facing page), pp. 200f.

<sup>66</sup>See also *Rothwell*, *Donald R.*, *Polar Environmental Protection and International Law: The 1991 Antarctic Protocol*, in *Eur.J.Int'l L.* 11 [2000], p. 592.

<sup>67</sup>*Agreed Measures for the Conservation of Antarctic Fauna and Flora*, adopted 2 June 1964, entry into force 1 November 1982, Article VI, reproduced in *Bush*, *W. M.*, editor, *Antarctica and international law: a collection of inter-state and national documents*, Volume 1, London, 1982, p. 146.

<sup>68</sup>1964 Measures (as in n. 67), Article VIII.

<sup>69</sup>At the XV<sup>th</sup> meeting of the Consultative Parties Recommendation XV-10 was adopted providing for the establishment of *Specially Reserved Areas* to protect areas of outstanding geologic, aesthetic, and other value in Antarctica. The meeting also adopted Recommendation XV-11 providing for the establishment of *Multiple-use Planning Areas* to assist in planning and co-ordinating activities to avoid mutual interference and minimise cumulative environmental impacts in high-use areas.

<sup>70</sup>*Protocol on Environmental Protection to the Antarctic Treaty*, adopted 4 October 1991, entry into force 14 January 1998, 30 I.L.M. 1461 [hereinafter: Environmental Protocol].

<sup>71</sup>It provides in Annex V that "any area, including any marine area, may be designated as an Antarctic Specially Protected Area or an Antarctic Specially Managed Area. Activities in those Areas shall be prohibited, restricted or managed in accordance with Management Plans".

<sup>72</sup>See *Cesari*, *Patrizia de*, *Scientific Research in Antarctica: New Developments*, in *International law for Antarctica*, 2nd edition. The Hague, 1996, p. 425; *Rothwell* (as in n. 66), p. 595. Article 4(2) of the Environmental Protocol expressly provides that no rights and obligations under the other international instruments in force within the Antarctic Treaty system shall be derogated.

environmental impact assessment for any activity in the area, including scientific research.<sup>73</sup> As a result, contracting parties must assess every research proposal in accordance with the uniform procedures and standards of evaluation established under Annex I of the Environmental Protocol. Since the Environmental Protocol applies also in areas, which would otherwise enjoy the status of the high seas, scientists from contracting parties are under a severe restriction compared to the 1982 LOS Convention. Considering that many, if not all, of the initiatives for environmental protection are based on knowledge generated by scientific research, it comes as no surprise that the Environmental Protocol has been perceived by scientists as the biggest of ironies.

The designation of marine protected areas<sup>74</sup> can take on similar restrictive implications for research operations.<sup>75</sup> Generally speaking, the designation of a marine protected area serves management purposes in terms of marine biodiversity conservation. The restrictions that are applied to protect marine ecosystems against human-induced changes vary with size, type and purpose. In some areas activities may be regulated in order to facilitate scientific research,<sup>76</sup> but the general trend seems to indicate that research activities may become subject to strict regulations in order to conserve an important ecosystem. Thus, regulations for the *Great Barrier Reef Marine Park (G.B.R.M.P.)*<sup>77</sup> subject scientific research in certain parts of the park to a strict permit system by the authorities; and researchers must be careful

<sup>73</sup>See *Rothwell* (as in n. 66 on the page before), pp.599f., for an analysis of the relevant procedural requirements and problems.

<sup>74</sup>See generally on marine protected areas *Baker, J. L., Guide to Marine Protected Areas*, Adelaide, 2000, pp.7f.

<sup>75</sup>In the IUCN guidelines for protection areas Category Ia, Strict Nature Reserve: protected area managed mainly for science, provides the strictest management scheme. Generally, research as a primary management objective is permitted but may be subject to restrictions, see *IUCN World Conservation Union*, editor, *Guidelines for protected area management categories*, Cambridge, 1994.

<sup>76</sup>These may be termed “monitoring and science areas” with the purpose to allow for long-term research activities; the concept was first suggested in 1978 and further discussed in the 80s in the context of deep sea-bed mining, see *Thiel, Hjalmar, Unique Science and Reference Areas on the High Sea*, in *Thiel, Hjalmar/Koslow, J. Anthony*, editors, *Managing Risks to Biodiversity and the Environment on the High Sea, Including Tools Such as Marine Protected Areas*, Bonn, 2001, BfN Skripten 43, p.97. Reference areas today play an important role for comparative purposes in long-term studies on deep sea ecological processes, see *ibid.*, p.100; *Gage, John, Comment from another Scientific Stakeholder on Hjalmar Thiel’s Concept of Unique Science Priority Areas in “Science as a Stakeholder”*, in *Deep-sea Newsletter* 32 [2003], p.15; and *Gjerde, Kristina M./Breide, Charlotte*, editors, *Towards a Strategy for High Seas Marine Protected Areas*, Proceedings of the IUCN, WCPA and WWF Experts Workshop on High Seas Marine Protected Areas, 15–17 January 2003, Malaga, Spain, Gland, 2003, p.40.

<sup>77</sup>The G.B.R.M.P. is, with 344.800 km<sup>2</sup>, the largest protected area predominantly marine in character on the World Heritage List; see *Thorsell, Jim/Levy, Renée Ferster/Sigaty, Todd, A Global Overview of Wetland and Marine Protected Areas on the World Heritage List*, Gland, September 1997.

not to misinterpret the lengthy definition of permissible activities.<sup>78, 79</sup> Similar regulations are imposed in other management areas.<sup>80</sup> The more recent discussions on marine protected areas on the high seas also address scientific research activities as a potential threat in need of being regulated.<sup>81</sup> Regulation in this sense may prove to become a serious concern for researchers in the future, currently it surfaces as an item for discussion in different fora.

In this context the argument has been made that “research activities have to follow marine environment protection and preserving provisions laid down in Part XII [of the 1982 LOS Convention].”<sup>82</sup> While this is true on the surface, it is on the brink of presumptuousness when stated without a careful analysis of the relation of the two parts *vis-à-vis* each other. A number of provisions in Part XII call in question such an hierarchical order. Article

<sup>78</sup>The G.B.R.M.P. Act 1975 foresees research activities generally as permissible (sec. 7(1)(b): research is a function of the Park Authority; sec. 32(7) cautions that in preparation of zoning plans “regard shall be had to... (e) the preservation of some areas of the Great Barrier Reef in its natural state undisturbed by man except for the purposes of scientific research”; research is excepted from the prohibition of minerals extraction by sec. 38). The Zoning Plan 2003, based on sec. 32(11) of the G.B.R.M.P. Act 1975, establishes a system of (eight) zones with varying degrees of restrictions. The General Use, Habitat Protection, Conservation Park Zones may be entered without permission for *limited impact research* (the G.B.R.M.P. Regulations 1983 define in reg. 19(2) and (3) *limited impact research (extractive)* as limited in sampling (some species are completely excluded), as limited to projects or programmes and to approval by the Authority), for other research written permission by the Authority is mandatory, see secc. 2.2.3(e), 2.2.4(g), 2.3.3.(e), 2.3.4(g), 2.4.3(e), 2.4.4(f). In the Buffer and Marine National Park Zones only *non-extractive* limited research may be carried on without permission, sec. 2.5.3(e); permission may be given, according to sec. 2.5.4(c) for other research that

- (i) is relevant to, and a priority for, the management of the Marine Park;
- or
- (ii) cannot reasonably be conducted elsewhere.

The main objective of the Scientific Research Zone is to provide “protection of the natural integrity and values of areas of the Marine Park, generally undisturbed by human activities”; only subject to this objective, research is facilitated around scientific research stations. Limited impact research is permissible, sec. 2.6.3(d), other research requires permission, sec. 2.6.4(a). In the Preservation Zone, whose objective is to provide “preservation of the natural integrity and values of areas of the Marine Park”, research may be carried out only with permission, sec. 2.8.4(a).

<sup>79</sup>The G.B.R.M.P. has been designated a *Particularly Sensitive Sea Area (P.S.S.A.)* in 1990 according to I.M.O. standards under resolution A.927(22) *Guidelines for the Designation of Special Areas under MARPOL 73/78 and Guidelines for the Identification and Designation of Particularly Sensitive Areas*, adopted 29 November 2001. The Guidelines list “high scientific interest” as one criteria for the designation of P.S.S.A.

<sup>80</sup>See *Gjerde/Breide* (as in n. 76 on the facing page), pp. 39f. See also the Classification system of the U.S. MPA Center, available at <http://www.mpa.gov/> – visited on 31 January 2005. The South African government requires permits for research operations within protected areas, see, for example, Government Notice 26432 of 4 June 2004 with respect to the Bird Island Group Marine Protected Area.

<sup>81</sup>See *Gjerde/Breide* (as in n. 76 on the preceding page), pp. 12f. and 22; *Thiel/Koslow* (as in n. 64 on page 72), p. 24.

<sup>82</sup>*Korn/Firedrich/Feit* (as in n. 64 on page 72), p. 28.

193 links the duty to protect and preserve the marine environment to the sovereign right to exploit the natural resources. This already indicates that environmental protection is not an all surmounting obligation, but rather a qualification of the exercise of sovereignty—like so many others. Inasmuch as the jurisdiction over marine scientific research is rooted in the sovereign rights over the living and non-living resources within the exclusive economic zone, it also is a function of that sovereignty. While this does not preclude a prioritisation, it opens the view for a more practical approach. Article 194(1) requires States to “reduce and control pollution. . . using. . . the best practicable means. . . and in accordance with their capabilities”. The terms “best practicable means” and ‘capabilities’ assume developmental progress and introduce an element of relativity, which is linked to the technological and scientific development in the respective State. This, inherently, presupposes on-going scientific research in terms of a knowledge increase about both, the state of the environment and the impact of human activity on the environment. Article 194(2) makes it an obligation for States to “ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment”. This warrants a few observations: First, it is questionable whether scientific research operations can qualify as pollution in the sense of the 1982 LOS Convention. Second, protection of the environment is not geared towards an idealised state of the environment in the form of certain targets; this leaves it essentially to the State concerned whether it defines a given situation as pollution of its environment or not. Finally, Article 194(4) clearly subjects the exercise of environmental protection and preservation of Part XII to the rights of other States pursuant to the 1982 LOS Convention; and a right to conduct marine scientific research is enshrined in Article 238 for all States.

It is common place that the increase in scientific knowledge about the impact of human activity on the environment has been the key prerequisite for an environmental policy and ensuing legislation. Thus, a distinction should be made between such research, which is necessary to provide a solid knowledge basis for informed management decisions, also with respect to marine protected areas, and such research, that is not directly related to environmental protection. Only in the latter case the above mentioned argument may be advanced: environmental protection without any knowledge about status, risks, and threats amounts to a *petitio principii* that makes no sense at the current stage of human intervention with the natural environment.<sup>83</sup> This view is corroborated by Article 204, which requires States “to observe, measure, evaluate and analyse, by recognized scientific methods, the risks or

<sup>83</sup>The relevant international instruments acknowledge the necessity for scientific research as a prerequisite for or corollary of environmental protection, compare the overview by Warner, Robin M. F., *The Application of the Oceans Law Framework on Marine Environmental Protection to Maritime Areas beyond National Jurisdiction – Steps towards Integrated Protection*, APEC Integrated Ocean Management Forum III (2004/IOM F3/031), 2004, pp. 33f., and see section 3.



effects of pollution of the marine environment.” Whereas the term ‘effects’ as such would strengthen the view that only monitoring, as distinct from scientific research, is warranted by Part XII; the term ‘risks’ suggests a much broader concept which would also encompass marine scientific operations, since it imports an element of uncertainty which requires a more profound approach than the mere observation and description of the situation. In conclusion one should note, that Article 204 would subject scientific research to (meta) scientific research operations if it were considered pollution.

#### USE OF THE TERM “MARINE SCIENTIFIC RESEARCH” IN THE 1982 LOS CONVENTION

The Sea-Bed Committee, in its work prior to the Third U.N. Conference on the Law of the Sea, defined marine scientific research as including fundamental and applied studies. In 1973, one submission on draft articles contained the following delimitation: marine scientific research is any study, “which does not aim directly at industrial exploitation”<sup>84</sup>. Freedom of scientific research was thus restricted to studies with no direct significance to resource exploration or exploitation and to areas outside national jurisdiction.<sup>85</sup> Even though the phrase ‘direct significance’ bears some ambiguity<sup>86</sup> and may already point in the direction of the differentiation later advanced, the definition seems to be more favourable to the holistic approach of oceanography.<sup>87</sup> The last definition proposed to the Sea-Bed Committee for marine scientific research was: “[A]ny study and related experimental work, excluding industrial exploration and other activities aimed at the direct exploitation of marine resources, designed to increase mankind’s scientific knowledge of the marine environment and conducted for peaceful purposes.”<sup>88</sup> The mentioning of the word ‘exploration’ prompted the concept of fundamental and applied research as counter proposal: Even though ‘exploration’ was further qualified by the word ‘industrial’ and the combination with ‘direct exploitation’, the difficulties in interpretation and the potential impact on all scientific research became already conceivable. Proponents of the distinction between ‘fundamental’ and ‘applied’ research claimed that the former would not affect the coastal States’ interest and should therefore be considered a freedom of the high seas to be maintained within the coastal States’ exclusive

<sup>84</sup>UN Doc. A/AC.138/SC.III/L.31 (Bulgaria, Poland, Ukrainian S.S.R. and U.S.S.R.) [1973].

<sup>85</sup>See *Nordquist, Myron H./Rosenne, Shabtai/Yankov, Alexander*, editors, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 192 to 278, Final Act, Annex VI, Volume IV, Dordrecht, 1991, p. 442.

<sup>86</sup>The problem persists in the language of Article 246(5)(a), see section 8.

<sup>87</sup>See section 1.

<sup>88</sup>UN Doc. A/AC.138/SC.III/L.53 (WG 3, Paper No. 4), reproduced in SBC Rep. 1973, p. 102; this ‘definition’ was also contained in the I.S.N.T., Part III, Art. 1 [1975] and R.S.N.T., Part II, Art. 48 [1976].

economic zone. Opponents held that it would be extremely difficult to distinguish between the two.<sup>89</sup> *Soons* points out that the Convention contains no definition of the term “marine scientific research” because—apparently—there was a consensus at the Conference that the substantive provisions of the 1982 LOS Convention clearly establish the meaning intended.<sup>90</sup>

### *Marine Scientific Research and Scientific Research*

The 1982 LOS Convention uses the term ‘marine scientific research’ in Part XIII and ‘scientific research’ in the context of other subject matters within the Convention. It may be concluded that the regime on ‘marine scientific research’ does not include ‘scientific research’.<sup>91</sup> This makes sense as the more specific term hardly includes the more general. Yet, this is not only a distinction between the general and the more specific term, it is also a distinction of substance: ‘marine scientific research’, though not clearly defined in the Convention, denotes such scientific undertaking that is directly concerned with the marine environment (so broadly that may be interpreted).

The significance of the difference between ‘marine scientific research’ and ‘scientific research’ in this sense might best be illustrated by the following example: A scientist wants to send a sailing vessel remote controlled via satellite around the world. The vessel is not manned because one of the goals of the experiment is to examine the feasibility of remote controlled navigation for international shipping. In the process of its journey, the vessel inevitably passes through waters under the jurisdiction of several foreign States. It cannot exactly be determined in advance which States may be concerned, as the course of the vessel is exclusively determined by the prevailing sailing conditions.

The classification as marine scientific research or other scientific research may determine whether or not the scientist has to request prior permission by the respective States. The crucial point is here to what extent the project—remote controlled shipping—constitutes marine scientific research.<sup>92</sup>

Marine scientific research is different from scientific research in that it relates to the marine environment. Clearly, within this description fall activities like measuring of the physical and chemical characteristics of the oceans, e. g., temperature, salinity, density, oxygen contents. The examination of

<sup>89</sup>See page 70.

<sup>90</sup>See *Soons, Alfred H. A., Marine Scientific Research and the Law of the Sea*, Deventer, 1982, p. 124; in contrast, *Nordquist/Rosenne/Yankov* (as in n. 85 on the preceding page), pp. 448f, suggest that “the development of the relevant texts demonstrates [at least] that the general right to conduct marine scientific research, recognized in article 238, may have a different substantive content in relation to different maritime zones.”

<sup>91</sup>*Soons*, *Marine Scientific Research* (as in n. 90), p. 125.

<sup>92</sup>For an account of the legal implications of remote controlled or autonomous navigation the reader is referred to *Brown, Edward D./Gaskell, Nicholas J.J., The Operation of Autonomous Underwater Vehicles*, Volume 2: Report on the Law, Society for Underwater Technology, London, 2000, pp. 107–136.

the behaviour of vessels in the marine environment might constitute marine scientific research where this research focuses on a particular physical problem of the oceans. But in the example mentioned above the sole purpose is to prove the possibility of steering a vessel around the world via satellite. This project is therefore concerned with technical aspects of satellite communication and vessel manoeuvring; the properties of the ocean comes second to the physics and mechanics of technical equipment at best.

Another possible way of looking at it is to examine whether the national economic and security interests of coastal States in the above described sense<sup>93</sup> are in any way affected. In the above mentioned example this does not seem to be the case. Marine scientific research is concerned with differences in the value of local features. Like generally in science, a given value is only of interest if it can be compared to a status at a different location in time or space. In marine science these values are related to the oceans and indirectly to the coastal State's jurisdiction (which poses the problem to begin with). The project outlined above is not affected by differences in the local water columns, neither is data to be gathered about the coast line or the sea-bed formations. Indeed, the success of the project rather depends on the reliability of available data in terms of charts. The scientifically relevant difference for this project lies in the verification or falsification of the hypothesis that remote controlled steering is a feasible alternative to traditional navigation. The compared values are thus technical practicalities. If then the project does not qualify as marine scientific research, it does not fall under Part XIII of the 1982 LOS Convention; and as the project constitutes mere scientific research it would not require consent by the coastal State under the regime.<sup>94</sup>

The problem becomes a bit more sophisticated if part of the study is the examination of the influences of ocean properties on the behaviour of such a vessel. Assuming that currents or temperature gradients affect the vessel in its sailing behaviour, the scientist might want to install equipment to monitor such influences. This equipment would then generate information that is essentially related to the marine environment albeit incidental to some general scientific research project. Based on the observation above, namely, that in accordance with the 1982 LOS Convention only facts need to be taken into account when determining whether or not a research project falls under Part XIII, it is necessary to identify the predominant aspects and qualify the whole project accordingly.

Inasmuch regular merchantmen take certain weather observations, depth soundings, *et cetera*, as a matter of routine,<sup>95</sup> it would appear that such

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<sup>93</sup>See section 2.

<sup>94</sup>A *caveat* should be brought out as consent might be required under other considerations.

Thus, in the territorial sea the coastal State may preclude activities that do not qualify as innocent passage.

<sup>95</sup>*Data*, which is also collected as part of *operational* oceanography, see section 1.

recordings would not change the quality of any project so as to make it “marine”.<sup>96</sup> These “scientific” activities are only conducted incidental to the journey.

To avoid the question as to the intent of the journey, namely, whether the observations of the marine environment are the sole or predominant purpose of the undertaking, one has to weigh the objective facts of the experiments. The crucial element seems to be the relevance of aspects relating to the marine environment for the findings of the experiment. Where the objective of the experiment is not seriously at risk if observations relative to the marine environment were not taken, one can safely assume that the experiment as such is not marine scientific research. Where, on the other hand, the result is skewed if given marine data were not introduced into the evaluation, the balance tends to lean towards marine scientific research. It will not always be possible to establish a clear dividing line; in doubtful cases the advice it to play safe as uncertainties of interpretation will most likely be employed to the disadvantage of the researching State as a consequence of the general outline of Part XIII.

### *Hydrography Distinguished*

Similarly, as becomes apparent by Article 21(1)(g) of the 1982 LOS Convention, a distinction must be made between ‘marine scientific research’ and ‘hydrographic survey’. The demarcation between the two may be difficult, yet worthwhile since the provisions of Part XIII of the LOS Convention do not apply to hydrographic surveying. This effectively means that vessels conducting such survey do not need to request consent by the coastal State for activities outside the territorial waters. The U.S. Department of State has cautioned against imprecise use of the term ‘hydrography’ in the sense of physical oceanography and proffered, in an effort of clarification, the following definition:

- a. Hydrography—The branch of applied science which deals with the measurement and description of the physical features of the navigable portion of the earth’s surface and adjoining coastal areas, with special reference to their use for the purpose of navigation.
- b. Survey, Hydrographic—A survey having for its principal purpose the determination of data relating to bodies of water. A hydrographic survey may consist of the determination of one or several of the following classes of data: depth of water, configuration and

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<sup>96</sup>This is not to say that in the realm of international law this would be an advisable approach. For all practical purposes, language is ambiguous and states have broad discretion as to what they accept or prohibit within their jurisdiction. Whenever there is some marine scientific aspect to it, the ordinary course of action should be to provide the coastal State with an outline of the scientific agenda, i. e., to play safe rather than taking the risk of being cornered on the seas.

nature of the bottom; directions and force of currents; heights and times of tides and water stages; and location of fixed objects for survey and navigation purposes.<sup>97</sup>

While this definition gives a fairly clear picture of the activity in question, it should be noted that coastal States may employ a different reading or may even claim jurisdiction over hydrographic surveys. Since the 1982 LOS Convention does neither contain an authoritative definition of marine scientific research nor of hydrographic survey, States are relatively free in finding their own interpretation as long as they adopt the principal differentiation between an activity called marine scientific research and one called hydrographic survey.<sup>98</sup> Accordingly researchers are advised to consult with the relevant authorities even if an official request may not be necessary *prima facie*.

### *Differentiation of Research at Sea*

Not every oceanographic research needs to be carried out in the marine environment. Conversely, not every research conducted at or within the sea may necessarily be a marine research. And the mere gathering of samples at sea must be distinguished from the sampling of data for scientific purposes.

First of all, marine scientific research is a sub-category of scientific research, in that it is an investigation of a question, problem or phenomenon of the natural world conducted according to the principles and rules of science. Marine scientific research is that part of science that applies scientific methods to explain and understand the marine environment. What exactly constitutes the marine environment is determined by the discipline: it is difficult to draw an exact line between land and sea, and land and air. At a sufficiently small scale there is no clear distinction between solid and fluid, between fluid and gaseous states but only equilibrium. For all practical pur-

<sup>97</sup>See Notice to Research Vessel Operators No. 70, *Precise Use of Term “Hydrography”*, released by the Department of State, Bureau of Oceans and International Environmental and Scientific Affairs, 15 May 1986. See also *OPNAV Instruction 3140.55A*, Department of the Navy, ([http://ned.s.daps.dla.mil/Directives/3140\\_55a.pdf](http://ned.s.daps.dla.mil/Directives/3140_55a.pdf)) – visited on 31 January 2005.

<sup>98</sup>States legislation is not conclusive on the issue: most States do not provide explicitly for a differentiation of the two. The *International Hydrographic Bureau* established by the *International Hydrographic Organization* defines hydrography in terms of a service, which “through systematic data collection carried out on the coast and at sea produces and disseminates information in support of maritime navigation safety and marine environment preservation, defence and exploitation”, *International Hydrographic Bureau, National Maritime Policies and Hydrographic Services*, Monaco, 2003, p. 1. The latter part of this definition would appear to come dangerously close to aspects that, according to the view expressed here, do not fall under the exemption for hydrography stipulated in the 1982 LOS Convention. Yet, correctly understood, hydrography only provides the data and information that can form the basis for such uses; hydrography thus becomes entangled in the issue of dual application, see page 97.

poses, however, it suffices—at this point—to define marine scientific research as that scientific research, which is concerned with the marine environment.<sup>99</sup>

Where research is conducted in the marine environment without being concerned with the phenomena of the marine environment as such, the research in question is not marine scientific research. Thus, where an experiment requires sufficiently moist and pure air that can only be found on the oceans but is otherwise not related to the sea, it would not fall under the definition of marine scientific research. Laboratories at sea, therefore, do not necessarily fall within the scope of the present analysis. Similarly, to fall under the regime of marine scientific research, sampling of any kind must be carried out with a view to scientific analysis, i. e., it must relate to some question, problem or phenomenon of the marine world, which is investigated by scientific methods. Mere private sampling for collecting purposes is not a scientific discipline and therefore does not fall in the scope of the present analysis either.

#### MARINE SCIENTIFIC RESEARCH AND “EXPLORATION RESEARCH”

While the distinction between ‘fundamental’ and ‘applied’ research has no basis in the 1982 LOS Convention, the principal considerations advanced in the context of this debate continue to apply in a different field: In Article 246(5)(a) the 1982 LOS Convention makes the distinction between marine scientific research on the one hand and research directly for exploration purposes on the other. *Soons* points out that Part XIII of the 1982 LOS Convention contains no provision describing the relation between each other within the regime on marine scientific research.<sup>100</sup>

#### *Differentiation on the Basis of Intent*

*Caflisch/Piccard* suggest a distinction on the basis of *intention*.<sup>101</sup> Indeed it seems that such a subjective element is the only possible avenue to distinguish one from the other.<sup>102</sup> They suggest that the

intentions of an institution or of individuals claiming to conduct marine scientific research can be ascertained by examining whether the

<sup>99</sup>This includes all the disciplines outlined in section 1.

<sup>100</sup>See *Soons*, Marine Scientific Research (as in n. 90 on page 78), p. 125.

<sup>101</sup>See *Caflisch/Piccard* (as in n. 56 on page 70), p. 850.

<sup>102</sup>See also *Gündling* (as in n. 2 on page 60), p. 246; *Glowka, Lyle, The Deepest of Ironies: Genetic Resources, Marine Scientific Research, and the Area*, in *Ocean Yearbook 12* [1996], p. 172, pointing out that “[a]ctivities *intended* to locate and exploit economically valuable natural resources, such as minerals, fisheries, and now useful genetic resources, might be an example” for other “investigative activities that are undertaken purely to uncover commercially useful information and natural resources [emphasis added].” He concludes: “[T]he distinction between marine scientific research and commercial ‘investigative’ activities... varies with the nature and intent of the activity at issue.”

open publication of the results of the project is intended or not... Neither exploration or exploitation activities nor resource-related or military research will meet the condition of open publication, for the results of such activities or research will necessarily remain secret; there is no reason, on the other hand, to refuse to publish the results of fundamental research.<sup>103</sup>

However, the differentiation between the two on the basis of the research's intent meets with the same reservations as its usefulness and viability in the context of international law.<sup>104</sup> It is difficult if not impossible to establish the true intent in advance with a reasonable degree of reliability. A subjective requirement is always open to ambiguity and abuse by both, the researching and the coastal State. It also results in the suggestion to give the term 'marine scientific research' the broadest possible meaning, as it would comprise of both aspects, i. e., fundamental as well as applied science.<sup>105</sup> Accordingly, the U.N. Implementation Guide<sup>106</sup> notes with respect to Article 246(5) of the 1982 LOS Convention:

It should be emphasized that the discretion of the coastal State referred to in that paragraph concerns only the decision to grant consent. The coastal State cannot exercise its discretion to determine if a particular research project comes within the scope of paragraph 5(a)-(d); this determination must be based on objective facts.<sup>107</sup>

### *The Term 'Exploration'...*

If taken together with the provisions on Part V and Part XI, it appears that not every activity conducted with the methods and technology of marine scientific research might fall under Part XIII. Article 246(5)(a) provides that coastal States may withhold their consent if the research relates to the "exploration and exploitation of natural resources, whether living or non-living". This provision has its principal foundation in Part V, Article 56(1)(a). With respect to the rights of the coastal State in the exclusive economic zone,

<sup>103</sup> *Castlich/Piccard* (as in n. 56 on page 70), p. 850; the point was similarly argued earlier in Working Group I at the Symposium on the International Regime of the Sea-bed, Rome 1969, in *Sztucki, Jerzy*, editor, *Symposium on the International Regime of the Sea-bed, Rome 1969*, Rome, 1970, Accademia nazionale dei Lincei, Istituto affari internazionali, p. 668. The U.N. Secretary-General employs the same *rationale* for the distinction between marine scientific research and "bioprospecting", *U.N. Secretary-General, 2004 Report* (as in n. 64 on page 72), p. 66: "Marine scientific research activities are characterized by transparency and openness, the obligation to disseminate information and data obtained therefrom, as well as the subsequent publication of results of the research."

<sup>104</sup> See *Allen* (as in n. 60 on page 71), p. 648; and page 69, and section 8.

<sup>105</sup> See *Gündling* (as in n. 2 on page 60), p. 235.

<sup>106</sup> *U.N. Division for Ocean Affairs & Law of the Sea, Marine Scientific Research, A Guide to the Implementation of the Relevant Provisions of the United Nations Convention on the Law of the Sea*, New York, 1991.

<sup>107</sup> *Ibid.*, p. 12.

this Article expressly prescribes that “exploring and exploiting . . . the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil” falls under the sovereign rights of the coastal State. The question is then whether there is a difference between ‘exploration’ and ‘marine scientific research’ and, if so, whether there is a possibility to conduct ‘marine scientific research’ into resources.

*Soons* defines ‘exploration’ as “data collecting activities concerning natural resources”<sup>108</sup>, and in these general terms it can clearly be confused with scientific research since more often than not natural resources are the focus of scientific research (depending on the definition of resource). The Implementation Guide concedes that the formulation of Article 246(5)(a) may give rise to different interpretations.<sup>109</sup> Unfortunately, it is of little avail in directing such interpretations. It merely acknowledges that research projects of direct significance for the exploration or exploitation of natural resources may be those, which can “reasonably be expected to produce results enabling resources to be located, assessed and monitored with respect to their status and availability for commercial exploitation.”<sup>110</sup> Not much can be gained where ‘exploration’ is defined as meaning:

(1)(a) to search through or into, (b) to examine carefully and in detail especially for diagnostic purposes, (c) to penetrate into or range over for the purposes of discovery (2) to make or conduct a systematic search<sup>111</sup>,

as ‘in detail’, ‘carefully’, and ‘systematic’ are attributes that are likely to be claimed by scientists for their method of work even if expressly not engaged in resource related activities. The same is valid for the purposes of discovery and diagnosis with the consequence that, indeed, in general terms, there is no distinction between ‘exploration’ and ‘scientific research’. Yet, the general legal definition of ‘exploration’ is given as:

The examination and investigation of land supposed to contain valuable minerals, by drilling, boring, sinking shafts, driving tunnels, and other means for the purpose of discovering the presence of ore and its extent.<sup>112</sup>

This definition is much narrower and already points in a direction that might be helpful in the present context: It alludes to an economic aspect of exploration (“valuable minerals”) and, what may be called, a pure scientific aspect (“for the purpose of discovering”). With reference to the definition

<sup>108</sup> *Soons*, Marine Scientific Research (as in n. 90 on page 78), p. 125.

<sup>109</sup> *UN DOALOS*, Implementation Guide (as in n. 106 on the preceding page), p. 12.

<sup>110</sup> *Ibid.*

<sup>111</sup> *Leventhal, Philip* et al., editors, *Webster’s New Encyclopedic Dictionary*, New York, 1995.

<sup>112</sup> See ‘exploration’ *Black, Henry Campbell/ Garner, Bryan A.*, editors, *Black’s law dictionary*, 7th edition. St. Paul, Minn., 1999.



above, ‘exploration’ can thus be defined as the “collecting of data concerning natural resources with a view of using them economically”.

The 1982 LOS Convention confirms this interpretation in Article 56(1)(a) when it uses the term ‘exploration’ in combination with the term ‘exploitation’, the latter of which is clearly linked to the utilisation of the natural resource beyond its mere discovery. Thus, the definition of ‘exploration’ also leads back to the above distinction between ‘fundamental’ and ‘applied’ science where applied science was that form of research, which was conducted to increase the general knowledge and to provide a basis for decision-makers. The parallel is that ‘exploration’ is usually conducted to provide a basis for the decision whether or not to exploit a natural resource.

Annex III of the 1982 LOS Convention on Basic Conditions of Prospecting, Exploration and Exploitation, though in principle related to Part XI of the 1982 LOS Convention, contains in Article 17(2)(b) another hint as to the meaning of ‘exploration’ in this context:

- (ii) Exploration should be of sufficient duration to permit a thorough survey of the specific area, the design and construction of mining equipment for the area and the design and construction of small and medium-size processing plants for the purpose of testing mining and processing systems.

The economic aspect of exploration clearly shines through in this definition. The activity described here is very different from research as conducted to understand the basic processes of the marine environment. It should be carried out with a clear view to subsequent exploitation (irrespective of whether or not this will take place) as evidenced by the words ‘mining’ and ‘processing plant’.

According to the Sea-bed Regulations<sup>113</sup> ‘exploration’ must not be confused with *scientific* exploration: Regulation 1(1)(n) defines ‘exploration’ as, among other aspects, “searching for deposits of polymetallic nodules in the Area with exclusive rights.” Scientific research, on the other hand, is conducted without exclusive rights<sup>114</sup>, its sole purpose is deemed to be the furtherance of human knowledge of the oceans. The term ‘prospecting’ as defined by Regulation 1(1)(r) comes closest to scientific research as it denotes

the search for deposits of polymetallic nodules in the Area, including estimation of the composition, sizes and distributions of polymetallic nodule deposits and their economic values, *without* any exclusive rights [emphasis added].

However, the allusion to economic values again distinguishes prospecting from marine scientific research as such: the drafters had that research in

<sup>113</sup> *Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, ISBA/6/A/18*, adopted by the Council of the International Seabed Authority on 13 July 2000, ISA Kingston, 2000.

<sup>114</sup> See the express non-recognition of legal title in Article 241 of the 1982 LOS Convention.

mind that is clearly conducted with a view to exploitation of resources.<sup>115</sup> It is in this sense the outflow of the discussion and its various facets, led during the negotiations about fundamental and applied research, and raises similar questions of reliable differentiation.

At the I.O.C. a careful interpretation by coastal States of the word ‘exploration’ in Article 246(5)(a) was recommended as its meaning would be different from the ordinary interpretation of the word and had to be distinguished from marine scientific research.<sup>116</sup> As pointed out above, the intention behind the research, so to speak the subjective element, would have to be taken into consideration to *clearly* distinguish ‘fundamental’ from ‘applied’ research. And it seems that for the purpose of differentiating between ‘exploration’ and ‘marine scientific research’ it is also the intention that constitutes the decisive factor.

Then—if there is no way around intent—the question arises how such a test can be employed without ambiguity. Criteria and guidelines submitted to I.O.C. on this matter<sup>117</sup> suggest that the relationship between scientists of the coastal and the researching State be used to develop confidence and mutual trust. It calls upon coastal States to cautiously exercise their rights under Article 246 since a better understanding of the oceans owing to marine scientific research is essentially to the benefit of all humankind. Finally, it imports the interesting suggestion that in some cases a differentiation on the basis of the institution conducting the research may be advisable. Thus, the relevance for resource exploration and exploitation of research proposals from laboratories of government agencies or universities, particularly in the context of international programmes, is less immediate than that of private institutions or companies. While these suggestions, *prima facie*, relate to the general climate, in which research proposals are submitted and carried out, they eventually pertain to the element of intention. Mutual trust is a prerequisite for the acceptance of an assurance that a research proposal does not fall under Article 246(5)(a). Such an assurance is only a statement about the intent, though. And only a climate of mutual trust may lead to a more favourable interpretation of the facts on the assumption that the intention is to conduct “genuine” marine scientific research.

The last suggestion, referred to above, stipulates an assumption in favour of public research institutions. While there is probably some merit to the

<sup>115</sup>See *U.N. Secretary-General*, 2004 Report (as in n. 64 on page 72), p. 66, with respect to “bioprospecting” which raises similar issues. But see *Korn/Firedrich/Feit* (as in n. 64 on page 72), pp. 51f., who, noting an increasing commercialisation due to costs and risks of deep sea scientific research, conclude: “vent research activities can also be classified as prospecting for resources under Part XI, or exploring and exploiting living or non-living resources. It always varies with the intent and the nature of the activity.”

<sup>116</sup>See *Pugh, David, Criteria and Guidelines for Ascertaining the Nature and Implications of Marine Scientific Research*, IOC Doc. ABE-LOSI/7, Paris, 2001, p. 6.

<sup>117</sup>See *Ibid.*

submission that research by such institutions is not targeted at the exploitation of natural resources, it may be questioned that their research is of no direct significance for the exploration and exploitation: Research results published by these institutions are usually made available in the public domain which makes them accessible for everyone. On the premise that research has ‘direct significance’ in terms of Article 246(5)(a) if someone can use the data for purposes of exploitation, research conducted with the intent of publication could qualify. However, this interpretation would subject every research to the contingency of potential usefulness. The word ‘direct’ must therefore be interpreted as to limit the significance for exploration and exploitation, both in substance *and* in time. ‘Substance’ would in this case mean the relevance of the data for exploitation—substituting possible exploratory research—and ‘time’ the temporal proximity: the data must be sufficient to allow for exploitation in the foreseeable future with the technology available.

*... and the Term ‘Resources’*

The other problematic term in Article 246(5) of the 1982 LOS Convention is ‘resource’. The term ‘natural resource’ is defined in Article 77(4) of the 1982 LOS Convention as to mean:

[T]he mineral and other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species, that is to say, organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil.

The adjective ‘natural’ qualifies the term resource as to mean only those resources, which are deposited or to be found in the marine environment as a matter of natural processes rather than as a consequence of human intervention. Yet, the definition of resources in Article 77(4) relates exclusively to the ‘natural resources’ relevant in the context of the continental shelf and is only of limited avail for the term ‘resource’ in the exclusive economic zone.

In the ordinary sense of the word ‘resource’ means:

(1) a new or a reserve source of supply or support (2) a usable stock or supply as of money, products, power, or energy.<sup>118</sup>

This includes the notion of a resource’s utility and implicitly, therefore, its economic value. Similarly, in the context of the 1982 LOS Convention the term ‘resource’ conceptualises the utilisation of natural tangibles by humans,<sup>119</sup> which becomes apparent by the use of the word ‘resource’ in the

<sup>118</sup> *Leventhal et al.* (as in n. 111 on page 84).

<sup>119</sup> As to the use of ‘living resources’ in the Convention, see *Owen, Daniel, The Application of the Wild Birds Directive Beyond the Territorial Sea of European Community Mem-*

context of ‘exploration and exploitation’. Exploitation has the notion of making use or taking advantage of something to generate benefit of some kind. This raises the question whether Article 246(5)(a) may also relate to ‘resources’, which become ‘resources’ only in hindsight. The estimation or economic value of any natural object found in the ocean may change over time and previously worthless creatures may become a valuable asset.<sup>120</sup> If the word ‘resource’ was to be understood to include every natural object that has the potential of exploration and exploitation, Article 246(5) would effectively be rendered void. Inasmuch as the consumption of resources continues to increase on a global level, the pressure to explore additional sources of supply and thus of previously unused objects would inevitably lead to a comprehensive exclusion of scientific activity. Article 246(5) must be interpreted as to mean only those ‘resources’ that are, at the time when the research request is submitted, not exploited.

#### *Consequences with respect to Areas of Marine Scientific Research*

Obviously, natural resources, living or non-living, are more often than not the object of interest in scientific studies of the marine environment. In the field of oceanography it is biological and geological oceanography that are most likely to get caught in the conflict between ‘exploration’ and ‘marine scientific research’. Biological oceanography is concerned with the study of marine life, of which fish constitute a relevant part. Accordingly, studies of fish would, generally speaking, qualify as marine scientific research. Conversely, fish that is targeted as an economically valuable asset, constitutes a resource and therefore any research in relation to it falls under the discretion of the coastal State.

Geological research encounters a similarly problematic predicament. Seismic studies used to investigate and examine, for example, plate tectonics, allow at least by inference conjectures about the presence of valuable resources. This would mean that any geological research can only be carried out as ‘marine scientific research’ within the exclusive economic zone if it is related to an area, which has been explored for resources already or has even been exploited.

For the study of ocean fluxes of water, heat, salt and other properties, one of the main tools in physical oceanography is the *ocean section*. It

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*ber States*, in J.Env'l L. 13 [2001], p. 51; Glowka, Genetic Resources (as in n. 102 on page 82), p. 155, pointing out that “genetic resources may be the Area’s most immediately exploitable and lucrative resource, yet are not referred to in the [1982 LOS Convention]”.

<sup>120</sup>The attempts to use krill in the food industry may, if successful, change the attitude towards these minuscule creatures and effectively generate competition for the exploitation of that resource. Similarly, the genetic resources of the sea-bed, now considered a valuable resource of immediate interest, were not known to the negotiators of the 1982 LOS Convention, see *Ibid.*, p. 177.

computes fluxes across a line or section between two land masses. Owing to the rotation of the earth the pole-ward currents are concentrated on the western boundary of the main oceans, with a more general return circulation towards the equator, to the east. Without detailed measurements close to the coasts, i. e., within the 200 nm zones off the coasts, understanding of the horizontal and vertical circulation in the ocean would be meagre.<sup>121</sup> Such a study has apparently no direct implication for exploration and exploitation.

The stability of continental margins and slopes around ocean islands is important for understanding the structure of deep-sea sediments and turbidity currents. The frequency and magnitude of collapses of continental margins appears to be related to global sea level, or its rates of change. Most continental margins fall within designated exclusive economic zones but their study is of general interest: such collapses can generate large *tsunamis* with catastrophic implications for coastal areas. While the study of these occurrences is generally designed to understand general ocean processes, they involve the study of tectonics that may reveal information about resources in the shelf and could thus be interpreted as *relating* to natural resources and their exploration.

While physical and chemical oceanography are much less likely to get into conflict with the interest of the coastal State in its exclusive utilisation of any resource, research in these faculties might be excluded on the grounds that the properties examined are *related* to natural resources. The word 'related' again offers much leeway for creative interpretation. The physical and chemical properties of the water are important for living resources as they define the characteristics of a certain habitat. An exact knowledge of properties like temperature, salinity, and nutrient distribution combined with information about the preferences of certain species may allow conclusions on species abundance. Similarly, the presence of certain chemicals may provide hints as to extremophiles or mineral resources.

#### MINIMUM REQUIREMENTS FOR *Scientific* RESEARCH

Another question is whether there is a threshold, below which an activity would not qualify as marine scientific research and therefore not fall under Part XIII of the 1982 LOS Convention. The answer is relevant because, for example, under the *International Whaling Convention (IWC)*<sup>122</sup> whaling for scientific purposes is exempted from restrictions otherwise applicable

<sup>121</sup>See *Pugh* (as in n. 116 on page 86), p. 5.

<sup>122</sup>Based on the 1946 International Convention for the Regulation of Whaling, adopted 2 December 1946, entered into force 10 November 1948, with the principal objectives to ensure that all harvesting and research activities are conducted in accordance with the Convention; to formulate, adopt and revise conservation measures; to compile, analyse and disseminate information on the status of resources; and to facilitate research activities.

under a moratorium.<sup>123</sup> The argument could be advanced that, as long as the activity may be pursued legally under the I.W.C., there would be an obligation of the coastal State to grant consent on the basis of Article 247 of the 1982 LOS Convention. Where whaling activities do not satisfy the minimum requirements for scientific research projects they would come under the general provisions and would have to be ceased. Also, where floats or drifters are used for marine scientific research, vessels are usually employed for their retrieval. If that activity was to be considered marine scientific research, such a vessel would have to request coastal State consent prior to its mission in accordance with Part XIII. The same question arises where a vessel simply deploys scientific instruments: must the researching State request clearance for any vehicle or structure that is used in a project or just for those that actually serve as platforms for scientific research activities.

There are two aspects that determine marine scientific research: one is the general definition of science, the other is the relation to the marine environment. Generally, science denotes the purposeful and systematic study of the phenomena and behaviour of the physical and natural world, including living beings, to the end of explaining and understanding the processes generating the same in accordance with specific methods such as inducting or deducting. In terms of living beings this means essentially the study of the species in all aspects of their presence, including the life cycle, taxonomy, anatomy, and physiology.

The intent of scientists is a function of their curiosity. Whether or not a research proposal is truly scientific can be established on the basis of facts, i. e., whether there is a natural phenomena, a hypothesis or attempt of explanation, an experiment or observation, and finally a conclusion. Yet, hypotheses can be confirmed or repudiated and have no intrinsic value which could be used to identify whether or not a certain project is carried out in pursuance of truly scientific ends or, in fact, other less prestigious ends in the disguise of science. As for “scientific whaling”, the definition of scientific research seems to be matched if the formal requirements are fulfilled. Science as such does not require a decision about necessity, i. e., whether or not a research object must be killed is a question of the hypothesis and the study outline but not of ‘right or wrong’. While the repeated slaying of animals may be considered scandalous in terms of ethical or philosophical considerations, in science it may serve to substantiate a hypothesis. It follows that once relevant data for the study is acquired and the end of the scientific activity met, scientists will inevitably loose their interest in the object of curiosity. Whatever happens to the object afterwards does not affect the qualification

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<sup>123</sup>In 1982, the *International Whaling Commission* took a decision, which came into force for the 1986 and 1985/86 seasons, that catch limits for all commercial whaling would be set to zero; this measure has effectively remained in place ever since, see *Schiffman, Howard S., Scientific Research Whaling in International Law: Objectives and Objections*, in *ILSA J.Int'l & Comp.L.* 8 [2002], p. 474.

of the prior conduct as scientific. Thus, whales hunted for scientific research purposes may be discarded or disposed of in other—including economic—ways without rendering the killing less scientific than otherwise. The moral connotations of scientific activity are not a constituent of the definition of science. Whether or not whaling is morally permissible is a question which must be answered in an ethical or political discourse within the society. Consequentially, science as such cannot answer the question, whether whaling for economic purposes conducted only under the pretext of science may be considered legal; and the legal system, which would answer to the question in the negative, is dependent on the submission of clear evidence for the true purpose which again is a factual question.<sup>124</sup> The Convention is silent as regards the question, whether retrieval or deployment as such constitute marine scientific research. The answer to this question is essentially open to state practice. It would seem that activities ancillary to the conduct of marine scientific research fall under the same rules and regulations as the main activity; which, of course, raises the question how this ancillary activity must be defined. Obviously, not every activity carried on *en passant* a scientific research programme can be considered ancillary to the project. Thus, the mere navigation of a research vessel would not constitute research even though the research may not be possible without the vessel; equally, a research vessel would be entitled to innocent passage as long as no research is conducted. The 1982 LOS Convention refers to marine scientific research in general terms, as opposed to enumerating constituting aspects

<sup>124</sup>See for a summary of the controversy around “scientific whaling” and the limited role of IWC’s Scientific Committee *Ibid.*, pp.475f., with the somewhat daring suggestion that a unilateral and consumptive take of hundreds of cetaceans would constitute a violation of Article 241 and other provisions of the 1982 LOS Convention. Further with respect to this issue *Van Dyke, Jon M., More Bad News for the Whales*, in *Nat.Res. & Env’t* 19 [2004]; *Setear, John K., Can Legalization Last?: Whaling and the Durability of National (Executive) Discretion*, in *Va.J.Int’l L.* 44 [2004], p.724; *Gillespie, Alexander, Iceland’s Reservation at the International Whaling Commission*, in *Eur.J.Int’l L.* 14 [2003], p.978; *Ackerman, Reuben B., Japanese Whaling in the Pacific Ocean: Defiance of International Whaling norms in the Name of “Scientific Research”, Culture, and Tradition*, in *B.C.Int’l & Comp.L.Rev.* 25 [2002], pp.326f.; *Greenberg, Eldaon V.C./Joff, Paul S./Goulding, Michael I., Japan’s Whale Research Program and International Law*, in *Cal.W.Int’l L.J.* 32 [2002], pp.159f.; *Gillespie, Alexander, The Ethical Question in the Whaling Debate*, in *Geo.Int’l & Env’t L.Rev.* 9 [1997], pp.355f.; *Berger-Eforo, Judith, Sanctuary for the Whales: Will this be the Demise of the International Whaling Commission or a Viable Strategy for the Twenty-first Century*, in *Pace Int’l L.Rev.* 8 [1996], pp.463f.; *D’Amato, Anthony/Chopra, Sudhir K., Whales: Their Emerging Right to Life*, in *Am.J.Int’l L.* 85 [1991], pp.23f.; *Brownell, Robert L./Tillman, Michael F., Further Scrutiny of Scientific Whaling*, in *Science* 290 [2000], p.1696; *Aron, William, Scientific Whaling*, in *Science* 291 [2001], p.253; note also *Whale species is new to science*, A previously unidentified species of whale has been recorded by researchers, BBC News world edition pointing out that the finding may complicate the debate over “scientific whaling”, available at <http://news.bbc.co.uk/2/hi/science/nature/3284843.stm> – visited on 31 January 2005.

of research, such as observation and analysis; it does not specify the platform from which research may be conducted; and finally, Part XIII covers the conduct of marine scientific research as a comprehensive activity. Research is the actual activity of observation and *data* collection *in situ*. In the context of Part XIII it refers to sampling and measuring—even if information is stored for later use or analysis—and real time observation in the marine environment. The conduct of research does not include preparations ashore. Between these two points of reference there are stages where the use of the term ‘conducting research’ may be questionable. For example, preparing drifters for deployment while already within a foreign State’s waters would appear not to constitute conduct of research. Yet, lowering the drifters over board brings the researcher so close to the anticipated results that it can be viewed as a constituent of the collection of *data*. The separating line is drawn by the proximity between the research related act and the actual start of observation and analysis. Where no further significant step lies between the act in question and the input of *data*, the activity may be viewed as conduct of research. Between the preparation for deployment and the lowering over the side there are important steps like functional check, mounting on the cargo lifter or other appropriate device *et cetera*. Accordingly, a ship approaching its researching grounds with scientific equipment on deck in expectation of its deployment may not be viewed as conducting research operations. Conversely, a ship set out to retrieve floats or drifters can be viewed as conducting research in the sense that it retrieves the *data* stored in these devices although by itself it may not conduct measurements or other research activities as such. Then again, the mere *removal* of such floats or drifters would not constitute a research related activity if the purpose is not connected to the *data*, for example, after the expiration of their life expectancy. It is noteworthy in this context that Article 42(1) of the 1982 LOS Convention relating to laws and regulations on transit passage, while explicitly mentioning the stowage of fishing gear (Article 42(1)(c)), does not contain any hint as to scientific equipment. Article 19 of the 1982 LOS Convention on the meaning of innocent passage declares both, fishing and research or survey activities, as prejudicial to the peace, good order, or security, thus rendering passage accompanied by these activities non-innocent. From this Article one could deduce that fishing gear and research equipment are treated equally inasmuch as they are prerequisite for the respective activities. The coastal State may prescribe similar rules for both. Article 42, in contrast, suggests a differentiated treatment: the coastal State may require fishing gear to be stowed in passage while it does not have such a right with respect to scientific equipment. It must be understood that the straits regime applies to water ways, which had previously been high sea corridors used for international navigation. With the extended breadth of the territorial sea these corridors fell nominally under complete jurisdiction of the coastal State. As this would have subjected international navigation to the



more stringent innocent passage regime of the territorial sea, the introduction of the transit passage regime must be viewed as a stronger restriction of the rights of coastal States than the former. In the light of the express mention of the fishing equipment it follows that the silence of Article 42(1) with respect to research equipment must be interpreted as a limitation of the rights of coastal States in this respect.

#### MILITARY AND CIVILIAN RESEARCH

In various provisions of the 1982 LOS Convention the right to conduct marine scientific research is qualified by the phrase “(exclusively) for peaceful purposes”<sup>125</sup>. While the peaceful use of the oceans is a principal concern of all States—as already follows in general terms from the Charter of the United Nations,<sup>126</sup> Article 1(1), and other provisions of the 1982 LOS Convention<sup>127</sup>—, mention of peaceful conduct in the connection with marine scientific research refers predominantly to the purpose of marine scientific research itself. Yet, the meaning of the phrase ‘research exclusively for peaceful purposes’ is rather murky and raises similar questions as arise in the context of the discussion on the distinction between ‘fundamental’ and ‘applied’ research.

There seems to be a wide consensus that the phrase does not necessarily exclude research for military purposes.<sup>128</sup> This, however, can only be a starting point as it raises the question how military research is different from marine scientific research and whether every kind of military research is covered by such provisions.

#### *The Military Issue at the Conference*

During the negotiations the discussion about peaceful conduct in ocean space was raised (again).<sup>129</sup> The opposing views were essentially that the ocean

<sup>125</sup>See Articles 143(1), 240(a), 242(1), 246(3) of the 1982 LOS Convention.

<sup>126</sup>See *Francioni, Francesco, Peacetime Use of Force, Military Activities, and the New Law of the Sea*, in *Cornell Int'l L.J.* 18 [1985], pp.221f., for a discussion of whether this phrase represents an application of Article 2(4) of the U.N. Charter or an autonomous concept, concluding at p. 224 that it “does not impair the exercise of sea power in its conventional military forms.”

<sup>127</sup>Such as Articles 88, 141, and 301.

<sup>128</sup>See *Gündling* (as in n. 2 on page 60), pp.237f., 240; *Lukaszuk, Leonard, Settlement of international disputes concerning marine scientific research*, in *Pol.Y.Int'l L.* 16 [1987], p. 42: “International Law, as it stands today, does not forbid marine scientific research being conducted by military staff with use of military equipment.” However, *Gorina-Ysern, Montserrat, An International Regime for Marine Scientific Research*, Ardsley, 2003, p.295, cautions: “States are divided with respect to the lawfulness of MSR activities of a non-aggressive military nature in areas under national jurisdiction”.

<sup>129</sup>See *Treves, Tullio, Military Installations, Structures, and Devices on the Seabed*, in *Am.J.Int'l L.* 74 [1980], pp.815f and 834, with further references; also *Pirtle, Charles E., Military Uses of Ocean Space and the Law of the Sea in the New Millen-*

space should be demilitarised, on the one hand, and that military activities for defensive purposes or those in accordance with the Charter of the United Nations would have to be possible, on the other hand. The latter view entails a differentiation between the defence against the threat or use of force against the territorial integrity or political independence of any State and acts of aggression or other breaches of the peace. It must be noted that the dichotomy of offensive versus defensive (weaponry) cannot sensibly be employed in the interpretation of the phrase in question here, since the distinction between offensive and defensive (weapons) is rather one of political strategy than of precise legal categorisation.<sup>130</sup> This dichotomy is therefore ignored here. The question remains what the phrase ‘peaceful purpose’ refers to and what bearing it has for military research and marine scientific research.

The final text of the 1982 LOS Convention does not explicitly provide for the military use of the sea.<sup>131</sup> This, however, does not preclude military activities in peacetime; *Churchill/Lowe* suggest as such routine law enforcement, manoeuvres and weapons testing, the projection of naval power and influence, and logistic support for land-based actions.<sup>132</sup> Other possible military uses of the sea are monitoring or reconnaissance activities and research for purposes of naval activities, including weapons testing, improvement of instruments for detection or hydrodynamics of vessels. The range of activities as well as their legality is still open to debate.<sup>133</sup>

### “Peaceful Purposes” and Military Research

Part XIII of the 1982 LOS Convention deals with marine scientific research only in terms of an activity. Specific reference to research platforms is only had in Part XIII, Section 4.<sup>134</sup> On this premise one can safely assume that marine scientific research by the means of warships or from military

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*nium*, in O.D. & Int'l L. 31 [2000], p. 9; *Francioni* (as in n. 126 on the page before), p. 203.

<sup>130</sup>See *Gündling* (as in n. 2 on page 60), pp. 237f., 241.

<sup>131</sup>*Churchill/Lowe* (as in n. 12 on page 61), p. 421.

<sup>132</sup>*Ibid.*, p. 426, noting that especially manoeuvres and weapons testing in the exclusive economic zone of foreign States is still a matter of debate; similarly *Francioni* (as in n. 126 on the preceding page), p. 214.

<sup>133</sup>*Churchill/Lowe* conclude “[t]he only thing that can be said with confidence is that it is most unlikely that the major naval powers will cease from the use of the seas for military exercises and the deployment of such systems, no matter what the Convention might say”, *Churchill/Lowe* (as in n. 12 on page 61), p. 428. See also *Boczek, Boleslaw A., Peaceful Purposes Provisions of the United Nations Convention on the Law of the Sea*, in O.D. & Int'l L. 20 [1989]; *Francioni* (as in n. 126 on the preceding page), p. 205, observes for the territorial sea: “no military operations other than simple navigation are permissible”.

<sup>134</sup>Article 248(d) requires only information about the research vessel’s expected entry and departure, deployment of the equipment and its removal, but does not specifically refer to the same in terms of limitations.

installations is not precluded. Conversely, the phrase ‘peaceful purposes’ would appear to exclude research, which could serve aggressive purposes or threaten the security of other users of marine areas.<sup>135</sup> Thus, if a marine scientific research project was intended to mean the testing of weaponry, the requirement of peaceful conduct would seem to prohibit such research; similarly, research intended to compromise security interests of a coastal State would border on the brink of legality where only peaceful research is permissible.<sup>136</sup>

The question is then to what extent the general term marine scientific research includes military research. Article 246(3) of the 1982 LOS Convention would appear to denote all research aimed at the furtherance of knowledge in general. This does neither include nor exclude research for military purposes. Yet, looking at the issues that surfaced during the negotiations as part of the coastal States’ security concerns a differentiation between civil and military marine scientific research seems to be warranted. Against this background one may argue that only research for non-military purposes may be conducted wherever a ‘peaceful purposes’ reservation is entered into.

This argument, however, meets with the general observation that explicit discussion of military issues at the negotiations of the 1982 LOS Convention was avoided<sup>137</sup> so that the omission is more telling than any express mention: The omission of a clear exception for military research, it is held, must be interpreted as a permission.<sup>138</sup> This would, in effect, mean that military research would be free of any restrictions<sup>139</sup>—except where coastal state

<sup>135</sup>See *Lukaszuk* (as in n. 128 on page 93), p. 42; *Brown, Edward D., The Significance of a Possible EC EEZ for the Law related to Artificial Islands, Installations and Structures, and to Cables and Pipelines in the Exclusive Economic Zone*, in O.D. & Int'l L. 23 [1992], p. 124, notes “that the coastal state has exclusive jurisdiction over military installations and structures only if they ‘may interfere with the exercise of the rights of the coastal State in the zone,’ as stated in Article 60(1)(c).” *Paolilo, Felipe H., The Exclusive Economic Zone in Latin American Practice and Legislation*, in O.D. & Int'l L. 26 [1995], pp. 112f., notes with respect to Latin America—after observing the 1982 LOS Convention’s inconclusiveness—that “the question will remain open”; even though Latin American States were the main proponents of a demilitarised exclusive economic zone, their legislation, according to *Paolilo*, is silent on military uses, only Brazil and Uruguay seem to retain the right of consent.

<sup>136</sup>See also *Francioni* (as in n. 126 on page 93), pp. 207f., with reference to the *Pueblo* and *Sirte* incidents.

<sup>137</sup>See *Booth, Ken, The Military Implications of the Changing Law of the Sea*, in *Gamble, John King*, editor, *Law of the Sea, Neglected issues: October 23–26, 1978*, Honolulu, Hawaii, 1979, p. 340; similarly, *Treves, Military Installations* (as in n. 129 on page 93), p. 811, pointing out that the rules concerning military activities and objects must be inferred from the most general principles of the law of the sea.

<sup>138</sup>*Song, Yann-Huei, The PRC’s Peacetime Military Activities in Taiwan’s EEZ – A Question of Legality*, in Int'l J.Mar. & C.L. 16 [2001], pp. 335f., concludes, after describing the views expressed during the negotiations of the 1982 LOS Convention: “[I]f the coastal state’s rights and interests...in its EEZ...are not affected by the military activities conducted by another state, these kinds of military activities are permissible under the LOSC.” Similarly, *Brown, Artificial Islands* (as in n. 135), p. 126.

<sup>139</sup>*Galdorisi/Kaufmann* cite, with reference to the U.S. view that military survey activities

rights and interests are affected—, while civilian scientific research remained subject to Part XIII.

### *The Main Points against a Differentiation*

The distinction between military and other research in the context of peaceful purpose clauses is mainly contested on two grounds:

First, such construction would be unacceptable to maritime powers, which in any case find classified military research essential for defense purposes. Second, it is common knowledge that in view of the dual application of today's scientific knowledge, it is not possible to draw a clear dividing line between "peaceful" and "military" or "defensive" and "offensive" research.<sup>140</sup>

The two stated reasons meet at least with one objection. The fact, that some interpretation is not acceptable to the maritime powers, does by itself not invalidate the suggested interpretation. Politics and the rather precarious assumption that defence starts in a foreign exclusive economic zone aside, international law is not formed by power but by States' consent. Even though the persistent objector rule affords the minority a possibility to prevent a change of the status quo,<sup>141</sup> it is of no use if a certain interpretation needs to be advanced as the only valid interpretation. The objection of major maritime powers to the above mentioned interpretation is not a persuasive legal argument against the rejected interpretation. In this instance and at this stage, where there is no settled interpretation, the objector must not only object but also consistently assert its perceived right. *In concreto*, the major maritime powers would have to actively pursue their interest by conducting research for military purposes even in spite of coastal States' express objection.<sup>142</sup> It is rather doubtful that the maritime powers would openly engage in such an endeavour: secrecy is an essential element of classified military research. This secrecy, it would appear, prevents at the same time the assertion of a perceived right which challenges the position of the persistent objector. Secret conduct cannot claim the gleam of lawful behaviour.

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are not marine scientific research and therefore not subject to coastal state regulation, from the U.S. Navy's *The Commander's Handbook on the Law of Military Operation*: "Although coastal nation consent must be obtained in order to conduct marine scientific research in its exclusive economic zone, the coastal nation cannot regulate hydrographic surveys or military surveys conducted beyond its territorial sea, nor can it require notification of such activities", *Galdorisi, George V./Kaufmann, Alan G., Military Activities in the Exclusive Economic Zone: Preventing Uncertainty and Defusing Conflict*, in *Cal.W.Int'l J.* 32 [2002], p. 295.

<sup>140</sup> *Boczek* (as in n. 133 on page 94), p. 376.

<sup>141</sup> See *Colson, David A., How Persistent Must The Persistent Objector Be?* in *Wash.L.Rev.* 61 [1986], pp. 964f., 967f., based on *Ted Stein, The Approach of the Different Drummer: The Principle of the Persistent Objector in International Law*, 26 [1985] *Harv.Int'l L.J.* 457, pp. 458–463.

<sup>142</sup> Similarly, *Pirtle* (as in n. 129 on page 93), pp. 10f.

The potential of dual application is indeed the sore point for many States in favour of a more restrictive interpretation. The results of civilian marine scientific research have become a focus of military interests and development, and in many cases the data obtained from surveys or observations can be used equally well for military and civilian scientific purposes—and it goes without saying that military data might be of use for civilian research after being declassified.<sup>143, 144</sup>

### *A Possible Solution?*

The consequence of the problem to find a viable distinction is not necessarily to leave all scientific research fly, as it might be proposed in favour of the position of the maritime powers or researching States. Rather it would be desirable to establish a dividing line, arbitrary as it may be. The problem is, indeed, to draw a clear line since the security of a State is essentially a

<sup>143</sup>See *Kraska, James, Oceanographic and Naval Deployments of Expendable Marine Instruments under U.S. and International Law*, in O.D. & Int'l L. 26 [1995], p.316; *Treves, Tullio, Marine Research*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume 11, Amsterdam, 1989, p.207; for an account of China's view on the security issues of marine scientific research, see *Song, Yann-Huei, Marine Scientific Research and Marine Pollution in China*, in O.D. & Int'l L. 20 [1989], p.606. *McLaughlin* argues for a change of the U.S. policy not to exercise jurisdiction over foreign research within the U.S. exclusive economic zone based on the fact that multi-beam bathymetry can generate maps of the ocean floor which the Navy considers a national security concern. He points at the paradox situation that maps generated by the *National Oceanic and Atmospheric Administration (NOAA)* through multi-beam bathymetry are classified as 'confidential' on the basis of national security, while foreign research vessels enjoy the freedom to conduct their own bathymetric surveys with potentially the same accuracy and completeness. See *McLaughlin, Richard J., Confidential Classification of Multi-Beam Bathymetric Mapping of the U.S. EEA: Is a New U.S. Marine Scientific Research Policy in Order?* in O.D. & Int'l L. 19 [1988], pp. 4f.

<sup>144</sup>U.S. Navy research vessels, for example, are employed by both, civilian and Navy activities. They are equipped with instrumentation that supports missions such as acoustic deep-water and littoral research, near-bottom and ocean surveys as well as weapons launches and sensor trials (which are obviously military related), see with respect to the U.S. Navy research vessels: (<http://www.chinfo.navy.mil/navpalib/factfile/ships/ship-tagss.html>) – visited on 31 January 2005, and (<http://www.50.dt.navy.mil/facilities/athena/>) – visited on 31 January 2005, and, more generally, (<http://www.nrl.navy.mil/>) – visited on 31 January 2005, for publicly available information on the U.S. National Research Laboratory which “coordinates, executes, and promotes the science and technology programs of the United States Navy and Marine Corps through schools, universities, government laboratories, and nonprofit and for-profit organizations.” The description of the capacity in the W.H.O.I. press release on the occasion of the launch of the *USNS “Mary Sears”*, 17 October 2000, reads like that for any civilian research mission: “[The class is] designed and constructed to provide multiple capabilities, including physical, chemical and biological oceanography; multi-discipline environmental investigations; ocean engineering and marine acoustics; marine geology and geophysics; and bathymetric, gravimetric and magnetometric surveying.”

term of art whose definition changes with the perception of danger.<sup>145</sup>

It has been suggested to apply a similar rationale as in the distinction between fundamental and applied research on the basis that projects with non-peaceful purposes are not intended for publication.<sup>146</sup> This distinction, however, also imports the ambiguities of its parameters, such as intent. Absent a clear and objective distinction, the problem of dual application is likely to haunt scientists in terms of increased coastal state apprehensions, as the problem of differentiation is more likely to lead to a closer observation and stricter control of research activities than the opposite. Since the protection of national security and integrity is a generally accepted line of defence, coastal States may conceivably advance that sort of argument and preclude research activities in an indiscriminate fashion. This can happen especially where researching States are known or perceived as circumventing coastal state regulations or as falsely stating the true nature of their research projects or visits to foreign exclusive economic zones or continental shelves.<sup>147</sup> Seemingly, the arbitrariness of the discussion would only be shifted, yet the national defence clause is of a much more general nature and thus more comprehensive than the distinction between civilian and military research. The solution to this predicament would appear to be the development of a climate of confidence and mutual trust as suggested by I.O.C., a contribution to which could be open publication and availability to coastal States of research results.<sup>148</sup>

<sup>145</sup>In some States the mere presence of warships may cause anxiety while for others not even the exact mapping of the sea-floor, necessary for precise navigation of submarines, is conceived as a potential threat; see *McLaughlin* (as in n. 143 on the page before), pp. 4f., with respect to the U.S. policy not to regulate foreign mapping of the sea floor within the U.S. exclusive economic zone.

<sup>146</sup>See Working Group I at the Symposium on the International Regime of the Sea-bed, Rome 1969, in *Sztucki* (as in n. 103 on page 83), p. 669.

<sup>147</sup>I.O.C. takes implicitly note of such repercussions when it urges States to develop an atmosphere of confidence and trust amongst each other, compare *Pugh* (as in n. 116 on page 86), p. 6; Article 246(5)(d) of the 1982 LOS Convention would appear to envisage such a situation and provide the coastal State with a limited countermeasure, namely, discretionary denial.

<sup>148</sup>The U.S. Navy in a 2004 release (see n. 31 on page 16) provided a definition of military research and marine scientific research:

Military Survey refers to activities undertaken in the ocean and coastal (littoral) waters involving marine data collection (whether or not classified) for military purposes. Military surveys can include oceanographic, hydrographic, bathymetric, marine geological, geophysical, chemical, biological, acoustic, non-acoustic, and related data.

Marine Scientific Research refers to activities undertaken in accordance with Part XIII of the United Nations Convention on the Law of the Sea in the ocean and coastal waters whose purpose is to expand general scientific knowledge of the marine environment. The results of marine scientific research are generally made publicly available.

With these definitions the U.S. reiterates its position *vis-à-vis* the research regime in the 1982 LOS Convention. Noteworthy is especially the broad definition of military survey: public availability of the results remains as the only difference between military research and marine scientific research.

## SOVEREIGNTY AND JURISDICTION

Part V Article 56(1)(a) of the 1982 LOS Convention, with respect to the rights of the coastal State in the exclusive economic zone, expressly prescribes that “exploring and exploiting... the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil” fall under the “sovereign rights” of the coastal State. In contrast, marine scientific research in the same area falls under the “jurisdiction” of the coastal State. Article 245 stipulates that coastal States may regulate, authorise and conduct marine scientific research in the territorial sea “in the exercise of their sovereignty”, while, according to Article 246 of the 1982 LOS Convention, in the exclusive economic zone they may do so (only) “in the exercise of their jurisdiction”. A differentiation between ‘sovereign rights’, ‘sovereignty’, and ‘jurisdiction’ occurs in different contexts throughout the Convention.<sup>149</sup> As legal concepts they require clarification in order to determine the exact scope of coastal States’ competencies, namely, in terms of jurisdiction, with respect to marine scientific research.<sup>150</sup>

*Sovereignty as a Concept of International Law*

Sovereignty is essentially a concept of international law. *Brownlie* describes it as a “legal shorthand for legal personality of a certain kind, that of statehood.”<sup>151</sup> It has, from the perspective of a State, an internal (or national) and an external (or international) aspect. On the level of state it describes “supremacy, the right to demand obedience [with the prominent idea] of some sort of title to exercise control.”<sup>152</sup> On an international level sovereignty describes a status, which denotes the absence of hierarchy: it identifies a State as an independent subject and assigns it a distinct characteristic that distinguishes it from other subjects of international law;<sup>153</sup> it requires mu-

<sup>149</sup>See *Churchill/Lowe* (as in n. 12 on page 61), pp. 71–75, for an overview of the traditional views on coastal State rights within the territorial sea.

<sup>150</sup>NB: The 1982 LOS Convention does not contain a clear cut distinction between the concepts of sovereignty and jurisdiction. For example, in the exclusive economic zone the coastal State has “sovereign rights” in respect of the living resources which would suggest that it has the exclusive power to regulate the distribution of fish. However, the exercise of its sovereign rights is to some extent constrained by Articles 62 through 70. Article 62, for example, puts the coastal State under the obligation to give other States access to surplus fish. Clearly, Article 62(2) of the 1982 LOS Convention leaves no doubt as to the right of the coastal State to fish within its exclusive economic zone. Yet, where “the coastal State does not have the capacity to harvest the entire allowable catch, it shall...give other States access to the surplus of the allowable catch”. In contrast, Article 77(2) is much stricter as it declares the sovereign rights on non-living resources peremptory. By comparison, the ‘sovereign rights’ as conferred by Article 56(1)(a) look strikingly similar to exclusive jurisdiction.

<sup>151</sup>*Brownlie, Ian, Principles of public international law*, 5th edition. Oxford, 2001, p. 106.

<sup>152</sup>See ‘Sovereignty’ in *Black/Garner* (as in n. 112 on page 84).

<sup>153</sup>See *Kranz, Jerzy, Notion de Souveraineté et le Droit International*, in A.V.R. 30 [1992], p. 412; *Brownlie* (as in n. 151), p. 106; *Steinberger, Helmut, Sovereignty*, in

tual recognition, which is validated by virtue of reciprocity<sup>154</sup> and presumes equality: *par in parem non habet imperium*.<sup>155</sup> The link between the internal and the external aspect is provided by the definition of ‘State’ whose basic constituents are: “une organisation politique qui exerce un pouvoir suprême sur une population donnée et sur un territoire donnée.”<sup>156, 157</sup> Where, according to modern theory, the population, within the political structure or organisation, provides the legitimacy for the internal exercise of power by the State and the representation of national interests on an international level.

The concept ‘sovereignty’ denotes thus different legal relations. They are—in a system of *a priori* independent and equal subjects—determined by substantive, spatial, and temporal limitations<sup>158</sup> which are a function of the relevant legal regime. Substantive limitations are the restrictions of freedoms and rights, i. e., externally, the content of state practice or substantive provisions of treaties respectively, limiting or conceding freedoms or rights vis-à-vis others,<sup>159</sup> internally, the exercise of functions of state

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Bernhardt, Rudolf, editor, *Encyclopedia of Public International Law*, Volume IV, Amsterdam, 2000, p. 512.

<sup>154</sup>See Fowler, Michael Ross/Bunck, Julie Marie, *Law, power, and the sovereign state: the evolution and application of the concept of sovereignty*, University Park, PA, 1995, p. 67.

<sup>155</sup>See Schrijver, Nico, *The Changing Nature of State Sovereignty*, in *Brit.Y.Int'l L. 70* [2000], p. 71; also Steinberger, *Sovereignty* (as in n. 153 on the page before), p. 515. This aspect of sovereignty was expressed by Judge Max Huber in his arbitral award in the *Island of Palmas Case*, Permanent Court of Arbitration, 4 April 1928, 2 R.I.A.A. 829(838): “Sovereignty in the relations between States signifies independence.” According to him this independence means predominantly the right to exercise in a certain portion of the globe the functions of a State exclusively, i. e., to the exclusion of other States. He views the principle of the exclusive competence of the State with respect to its own territory as “the point of departure in settling most questions that concern international relations.”

<sup>156</sup>See Kranz (as in n. 153 on the preceding page), p. 412; Brownlie (as in n. 151 on the page before), p. 105; also Crawford, James, *The creation of states in international law*, Oxford, 1979, pp. 36f.; Fowler/Bunck (as in n. 154), p. 33, who point at the wide variations within these constituents in fact and their meaninglessness for the question of what constitutes a sovereign State. Nevertheless this appears to be widely accepted as a starting point or principal definition, see *ibid.*, p. 53.

<sup>157</sup>Conflicts arise between international and national law doctrine when the State is represented in the international community by a power, which is not recognised as legitimate by the majority of its subjects; and also, if the exercise of sovereignty according to domestic legislation is viewed to be in violation of internationally recognised limits.

<sup>158</sup>See Keohane, Robert O., *Sovereignty, interdependence and international institutions*, Cambridge, 1991, p. 1.

<sup>159</sup>This, for example, was under discussion with respect to India’s sovereignty when Portugal claimed a right of passage over India’s territory as a peremptory right. See *Right of Passage Over Indian Territory (Portugal v India)*, 1960 I.C.J.Rep., pp. 6(36f. and 45f.), a summary of the decision can be found at <http://www.icj-cij.org/icjwww/idecisions.htm> – visited on 31 January 2005; Fowler/Bunck (as in n. 154), pp. 86f., point, among others, at the lease of territory (88f.), international servitudes (99f.), foreign military occupation and dictated treaty terms (102f.) and, most importantly,



and exclusive legal competence legitimised by the population. Spatial limitations are set by reference to geographical parameters, in the sense that the sphere of sovereign influence is delineated by exact co-ordinates on the Earth's surface.<sup>160</sup> Finally, temporal limitations occur where the sovereign status of an entity changes on a time line.<sup>161</sup> In the field of international law, i. e., externally, these limitations originate in agreements and practice of sovereigns requiring consent and reciprocity.<sup>162, 163</sup> Internally, the exercise of legal competence is first of all a reflection of the internal legal order and the political system, secondly it mirrors the international ramifications. Sovereignty is thus understood as the competence to exercise all functions of state internally within the external limitations set by international law.<sup>164</sup>

In the context of the present analysis mainly the spatial and the substantive limitations to sovereignty are relevant. The spatial component to the extent that the territorial scope of sovereignty has been extended by the 1982 LOS Convention; the substantive component to the extent that the 1982 LOS Convention confers certain substantive rights (to other States). While spatial delimitation in terms of geographic co-ordinates can be done fairly straightforward by reference to the relevant provisions in the 1982 LOS Convention, the substantive limitations in terms of legal authority are not a clear cut issue. Traditionally, the law of the sea defined spheres of influence by the principle of exclusive competence: ocean space was either subject to sovereignty or *res communis*. The principle was fairly strict and literal when the capability of a State to impose its power in its territory was considered a key element of sovereignty.<sup>165</sup> Today, though, the capacity to enforce ef-

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to State-to-State political relationships (112f.).

<sup>160</sup>This geographical aspect of sovereignty is embodied in international boundaries as recognised by the international community and by the zonal segmentation under the 1982 LOS Convention.

<sup>161</sup>This aspect is a basic parameter of a continuum: as relations exist for a period of time, their status must be referenced against time. In Antarctica, for example, sovereign claims have been suspended by treaty (although it may be highly debatable that the Antarctic Treaty represents a time limitation as to the so-called claimant States' sovereignty).

<sup>162</sup>An agreement or treaty gains validity only where participants approve of its content. This consent can be only acquired when the participants also agree to respect their mutual obligations or, in other words, trust that every participant adheres to the stipulations be they advantageous or not (reciprocity). This is true even for a dictated treaty: the yielding interest is granted its existence and will fulfil its obligations only as long as that admittedly basic prerequisite is warranted.

<sup>163</sup>On reciprocity see *Brownlie* (as in n. 151 on page 99), pp. 289–299; *Verdross, Alfred / Simma, Bruno, Universelles Völkerrecht: Theorie und Praxis*, 3rd edition. Berlin, 1984, § 64f.

<sup>164</sup>Inasmuch as the exercise of functions of state requires independence and the recognition of integrity by other sovereigns. Recognition of integrity in turn presupposes the use of rights within recognised limits; *Kranz* (as in n. 153 on page 99), pp. 415f.: “[Le principe de l'égalité souveraine] en résulte que chaque Etat est notamment obligé de respecter l'intégrité territoriale des autres Etats et leur liberté dans l'exercice des compétences et pouvoirs”.

<sup>165</sup>With respect to the extension of the territory into the sea this idea was embodied in the

fectively domestic laws throughout the boundaries of the territory is neither required by the 1982 LOS Convention nor is it viewed a prerequisite under customary law.<sup>166</sup> Actual enforcement is rather a question of domestic and international credibility than one of the validity of a legal assertion or claim; and it is not a prerequisite for the lawful exercise of sovereign jurisdiction.

The concept of sovereignty, or rather its exact content, despite its persisting and recognised significance in international law,<sup>167</sup> is not a settled matter of the international legal discourse.<sup>168</sup> To the contrary, sovereignty as a concept seems to be in the process of deconstruction or rather of fundamental review. Looking at Antarctica, Outer Space, and the Sea-bed, *Galloway* arrives at the conclusion: "Sovereignty has been eroding for a long time. Independence, autonomy and complete control are legal fiction in the world today."<sup>169</sup> For the exercise of sovereignty it is therefore necessary to refer in every single instance to its origin and content. In this respect *O'Connell* observes—with respect to changes in the law of the sea since 1945—a fundamental change in vindication of unilateral claims to the sea: "[I]t is easier... to vindicate the exercise of power on the supposition that it is not prohibited by international law, than on proof that it is positively permitted by international law."<sup>170</sup>

While this describes seemingly only a change of perspectives, it denotes a crucial change in practice. Where, for example, new uses of the sea are advanced, it is rather unlikely to find a provision that expressly prohibits it. Conversely, it is rather difficult to establish that the drafters of a concessive provision also had this new use in mind when they permitted certain activities on the sea. Also, where a coastal State assumes proprietary rights with

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cannon shot rule whose ballistic footing was the basic reason for the establishment of the 3 nm wide territorial sea for centuries, see *O'Connell, Daniel P./Ivan A. Shearer, editor, The international law of the sea*, Volume I, Oxford, 1982, pp. 60f.

<sup>166</sup>The Geneva Territorial Sea Convention contains no reference to the effective exercise of exclusive competence, let alone to the cannon shot rule.

<sup>167</sup>See *Fowler/Bunck* (as in n. 154 on page 100), pp. 3, 32, 61f.

<sup>168</sup>See *Kranz* (as in n. 153 on page 99), p. 439, who asserts that sovereignty is nothing but "un concept descriptif et fonctionnel qui n'énonce aucune règle juridique. Elle n'a pas un contenu matériel précis et invariable; il n'existe pas un minimum formel de la souveraineté dans le sens d'un catalogue de matières ou compétence fixé d'avance."

<sup>169</sup>*Galloway, Jonathan F., Limits to Sovereignty: Antarctica, Outer Space and the Seabed*, in Proceedings of the 41<sup>st</sup> Colloquium on the Law of Outer Space, Reston, 1999, p. 84; similarly, *Schrijver* (as in n. 155 on page 100), pp. 75f.; see also *Fowler/Bunck* (as in n. 154 on page 100), pp. 36f, 74f.; *Wolfrum, Rüdiger, The Convention on Biological Diversity: Using State Jurisdiction as a Means of Ensuring Compliance*, in *Wolfrum, Rüdiger, editor, Enforcing Environmental Standards: Economic Mechanisms as Viable Means?* Berlin, 1996, Beiträge zum ausländischen öffentlichen Recht 125, p. 379, who speaks of a "limitation of State sovereignty" as a consequence of the growing corpus of international environmental law.

<sup>170</sup>*O'Connell, Law of the sea I* (as in n. 165), p. 31, pointing to the *S/S "Lotus" Case* and *North Sea Continental Shelf Case*, where the I.C.J. referred to the *Truman Proclamation* as initiating the doctrine of the continental shelf, and inferred that, for that reason it embodied the basic elements and features of the new regime.

respect to previously not appropriated portions of the globe it is much easier to justify such action on the basis that it is—as of yet—not forbidden. One of the traditional principles of international law, despite the general perception of it as having no teeth,<sup>171</sup> is the justification of acts of state on the basis of legality or legitimacy. The maxim, “what is not prohibited is permitted”, is a rather troubling approach in light of the pretty sketchy body of international rules. Against this background the Third U.N. Conference on the Law of the Sea was, at least by some States, seen as a means to curb and channel some of the developments taking place in the law of the sea since 1945.<sup>172</sup> Thus, one may argue that the Convention should be the principal and only source for legal claims or for the justification of acts of state with respect to the sea; and, indeed, not few have called the Convention a constitution of the oceans effectively embodying the law of the sea conclusively.

### *Sovereignty and Jurisdiction in the Law of the Sea*

#### *Sovereignty: Expression of Statehood*

Based on the foregoing observations the meaning of the term ‘sovereignty’ is to be determined in the context of the relevant provisions of the 1982 LOS Convention. Article 2 of the 1982 LOS Convention is fairly straightforward with respect to the spatial limitation of sovereignty:

1. The sovereignty of a coastal State extends, beyond its land territory and internal waters... to an adjacent belt of sea, described as the territorial sea.

And continues, more on the substance:

3. The sovereignty over the territorial sea is exercised subject to this Convention and to other rules of international law.

Article 2 does not define the term ‘sovereignty’, it can only be inferred that it denotes a certain depth and sphere of state influence. Sovereignty is supposed to be exercised over the land territory and internal waters of the coastal State anyway. And sovereignty in the territorial sea is effectively the same as on land with one important difference: in the territorial sea sovereignty is subject to “this Convention and to other rules of international law” which, in effect, subjects sovereignty to the regime of innocent passage. Naturally, the other rules of international law are only significant where they relate to the territorial sea and ocean use as such. Otherwise they would define the concept of sovereignty as it is assumed to exist by Article 2. The reference to sovereignty in Article 2 is thus dynamic: If a rule of international law validly qualifies sovereignty on land, it affects the sovereignty over the territorial

<sup>171</sup>See *Gosciny, René/Uderzo, Albert, Astérix chez les Helvètes*, Volume 16, Paris, 1970, p. 35, with an ironic reference to the League of Nations or United Nations respectively.

<sup>172</sup>See *O’Connell, Law of the sea I* (as in n. 165 on the preceding page), pp. 24f.

sea, as set forth by the 1982 LOS Convention, automatically. This is only seemingly a contradiction to the previous observation that the meaning of sovereignty needs to be established on a case-by-case basis in the context of its application. Sovereignty may take on different values depending on the situation in which it is to be applied. Yet, certain aspects of sovereignty apply with essentially the same consequences regardless of the specific situation. Thus, territorial sovereignty usually denotes control over every legal subject within the territorial boundaries, i. e., passage of nationals of foreign States may be restricted. In the territorial sea—by virtue of Article 2(1) subject to territorial sovereignty—this control is limited with respect to innocent passage but may be fully exercised over non-innocent passage. Except for this qualification, however, the term ‘sovereignty’ in the 1982 LOS Convention refers to general international law and is thus expression of statehood.

Prior to the 1958 Geneva Territorial Sea Convention the juridical nature of the waters adjacent to the coast was subject of prolonged and considerable debate. Two strands of arguments may be distinguished: on the one hand, the theories, which basically view the waters adjacent to the coast as part of the high seas with certain preemptory rights of the coastal State; and, on the other hand, those, which view the waters adjacent to the coast as appurtenant to the land with certain conciliatory rights for other States.<sup>173, 174</sup> With the advent of the 1958 Geneva Conventions<sup>175</sup> the debate about the juridical nature of the territorial waters lost its momentum and the concept

<sup>173</sup>See for an overview *O’Connell*, Law of the sea I (as in n. 165 on page 102), pp. 59–71; *Steinert, Karl-Friederich, Die internationalrechtliche Stellung des Schiffes im fremden Küstenmeer im Frieden*, Frankfurt am Main, 1970, pp. 86–94.

<sup>174</sup>The first theory with respect to the rights of the coastal State in the adjacent waters was the Property Theory, a philosophical explanation rooted in the seventeenth century. According to this theory the extent of jurisdiction was embodied in the notion that the territorial sea is property of the coastal State. The most effective and prevalent exhibition of such jurisdiction was the exercise of power exemplified by the maximum distance of a cannon-shot (this cannon-shot rule remained the underlying principle for the delimitation of the territorial sea at 3nm). *Galiani* wrote “in accordance with the principles of commonly accepted law, we can call territory all the space up to where the magistrate and public officers can, with the coercion derived from the force entrusted to them, impose the orders of their sovereign.” (*Galiani, Ferdinando, Dei Doveri dei Principi Neutrali verso I Principi Guerreggianti*, 1782 (2nd ed. 1942), cited according to *O’Connell*, Law of the sea I (as in n. 165 on page 102), p. 60; see also *Shearer, Ivan A., Problems of Jurisdiction and Law Enforcement Against Delinquent Vessels*, in *Int’l & Comp.L.Q.* 35 [1986], pp. 320f.) And the United States Supreme Court held that “[territorial] waters are considered as a part of the territory of the sovereign” and any seizure of a vessel therein “an invasion of that territory.” (*Church v Hubbard* 2 [1804] Cranch 187(234, J. Marshall).) Under this concept of sovereignty it was crucial to have the capability to exercise immediate power.

<sup>175</sup>*Geneva Convention on the Territorial Sea and Contiguous Zone*, adopted on 29 April 1958, entry into force 10 September 1984, 516 U.N.T.S. 205; *Geneva Convention on the High Seas*, adopted on 29 April 1958, entry into force 30 September 1962, 450 U.N.T.S. 82 [hereinafter: High Seas Convention]; *Continental Shelf Convention* (as in n. 84 on page 31).

of the territorial sea as part of the sovereign territory became firmly established. It comprises of the notion of territorial possession as assigned by the 1982 LOS Convention or customary international law and the capability to predicate and assert it *vis-à-vis* third parties. The legitimacy of exercising such authority is a matter of international relations and state practice as evidenced by the recognition of a state government as legitimate.<sup>176</sup> The 1982 LOS Convention applies the same concept in Part II and Article 245 of the 1982 LOS Convention reiterates it with respect to marine scientific research in the territorial sea.

Sovereignty, as noted earlier, denotes internally, i. e., within the territorial boundaries and *vis-à-vis* the legal subjects therein, the full exercise of state functions. What the functions of state are, derives from the concept of sovereignty in general and States' independence in particular. Independence presupposes the recognition of each other's right to determine their own internal affairs<sup>177</sup> and utilise the freedoms conferred by international law. Figuratively speaking, the functions of state fill the space which is provided by the ramifications of international law: as long as the independence and equality of other States is respected, a State may proceed with its internal affairs as it wishes; the role of international law is concessive, not peremptory.<sup>178</sup> The internal boundaries to the functions of state are set by the population and the political structure of the State. With respect to the territorial sea, coastal States can thus determine exclusively what and how they may regulate and authorise, i. e., subordinate to the functions of state, the conduct of any legal subject.

### *Jurisdiction: Exercise of State Power*

Jurisdiction is generally perceived as the power or competence to legislate and regulate within a certain (geographic or substantive) area and exercise authority over all persons and things within it.<sup>179</sup> It is always attributed to a state authority either directly, e. g., the entity is part of the State, or indirectly, e. g., the acting entity derives its competence from a state agency. The exercise of jurisdiction is always limited either in terms of its geographical (*rationae loci*) and temporal application (*rationae temporis*), or its applicability to (assets and legal) persons (*rationae personae*) or subject matters (*rationae materiae*).

<sup>176</sup>See *Fowler/Bunck* (as in n. 154 on page 100), pp. 38f.

<sup>177</sup>Which is not to say that self-determination is itself subject to certain limitations, see *Ibid.*, pp. 43f.

<sup>178</sup>*O'Connell*, *Law of the sea I* (as in n. 165 on page 102), p. 59, pointing out that the function "is not to invest States with legal regimes but to secure recognition of regimes contrived by action of individual members of the community of nations."; see also I.C.J. *Anglo-Norwegian Fisheries Case*, 1951 I.C.J.Rep., p. 116(132).

<sup>179</sup>See 'jurisdiction' in *Black/Garner* (as in n. 112 on page 84); see also *Meyers, Herman, The nationality of ships*, Den Haag, 1967, pp. 33-40.

For the present analysis jurisdiction is further subdivided into horizontal and vertical aspects; where the horizontal dimension denotes the areas in which jurisdiction may be exercised,<sup>180</sup> for example, marine scientific research or environmental protection; and where the vertical dimension describes the various measures by which jurisdiction may be effected,<sup>181</sup> for example, the order of cessation of activities or the institution of proceedings.<sup>182</sup> The basis for horizontal jurisdiction with respect to marine scientific research is contained in Part V, the vertical dimension of such jurisdiction is defined in Part XIII. Jurisdiction is thus understood as a minus in comparison to sovereignty in the sense that sovereignty comprises full jurisdiction, whereas jurisdiction entails only the exercise of certain aspects of sovereignty.

### *Origin of Jurisdiction*

Jurisdiction on state level is always derived from some other source, be that, on the one hand, sovereignty as such or, on the other hand, a treaty or established custom to the extent that States can agree to expand or restrict the exercise of jurisdiction on a mutual and reciprocal basis. The Harvard Research on International Law described this aspect as follows: “The international competence of the State may be regarded. . . as something with which international law invests States, or from another point of view, as the result of an absence of legal restrictions upon State activity.”<sup>183</sup>

The origin becomes important where jurisdiction is contested since then the source of competence decides about the burden of proof: If all States enjoy freedom *a priori*, a restriction must be based on a treaty or custom whose existence must be proven by the party that intends to restrict the freedom. If, in contrast, States can only exercise freedom as it is conferred by treaty or custom, the party pursuing the alleged freedom must show its rooting in law. In the *S/S “Lotus” Case* the Permanent Court of International Justice appears to have taken the former view: “[A]ll that can be required of a State is that it should not overstep the limits which international law places upon its jurisdiction; within these limits, its title to exercise jurisdiction rests in its sovereignty.”<sup>184</sup> In other words, where jurisdiction is exercised by virtue of sovereignty, the State is at liberty to make full use of its legal capacity. Where, in contrast, jurisdiction is conferred by treaty it can only be exercised within the scope and ramifications of that treaty—notwithstanding further limitations by other sources of international law.<sup>185</sup>

<sup>180</sup>See chapter 4 and chapter 6.

<sup>181</sup>See chapter 5 and section 3.

<sup>182</sup>See generally section 4 and, more specifically, section 5 with respect to the words ‘regulate’ and ‘authorise’ in the context of Part XIII.

<sup>183</sup>See *Harvard Research on International Law, Jurisdiction with Respect to Crime*, an effort by the Harvard Law School faculty in the 1920s and 30s to codify the international rules of jurisdiction, in *Am.J.Int’l L.*, Suppl. 1 29 [1935], pp. 467f., citing the *S/S “Lotus” Case (France v Turkey)*, 1927 P.C.I.J. Rep., Series A, No. 9, p. 18.

<sup>184</sup>*S/S “Lotus” Case (France v Turkey)* (as in n. 183 on page 106), p. 19.

<sup>185</sup>See section 4 with respect to the “residual” rights in the exclusive economic zone.

*Principles of Jurisdiction*

Five principles, with respect to the exercise of jurisdiction, are usually identified based on which the relevant State may generally exercise immediate control over individuals or their assets. In its survey the Harvard Research on International Law defined these principles as follows:<sup>186</sup>

First, the territorial principle, determining jurisdiction by reference to the place where the offence is committed; second, the nationality principle, determining jurisdiction by reference to the nationality or national character of the person committing the offence; third, the protective principle, determining jurisdiction by reference to the national interest injured by the offence; fourth, the universality principle, determining jurisdiction by reference to the custody of the person committing the offence; and fifth, the passive personality principle, determining jurisdiction by reference to the nationality or national character of the person injured by the offence.<sup>187</sup>

Of these five principles, the first is universally accepted and regarded as of primary importance and of fundamental character.<sup>188</sup> It, in fact, is a consequence of sovereignty to the extent that sovereignty applies to a certain territory. The second is also universally accepted although Harvard Research noted some striking differences in its application; it also is a direct derivative of sovereignty to the extent that sovereignty presupposes a population. With respect to the other principles the report notes:

The third is claimed by most States, regarded with misgivings in a few, and generally ranked as the basis of an auxiliary competence. The fourth is widely though by no means universally accepted as the basis of an auxiliary competence, except for the offence of piracy, with respect to which it is the generally recognized principle of jurisdiction. The fifth, asserted in some form by a considerable number of States and contested by others, is admittedly auxiliary in character and is probably not essential for any State if the ends served are adequately provided for on other principles.

Presently, it suffices to note that jurisdiction may be based on a territorial link, i. e., a geographic proximity between the authority and the location where the activity in question takes place, or a national link, i. e., an individual relation, usually documented by a formal registration, between the authority and the entity, which conducts the activity in question.

<sup>186</sup>While the principles have been developed with respect to criminal offences, their reasoning applies, *mutatis mutandis*, in other sectors where the State intends to exercise authoritative control over a certain activity.

<sup>187</sup>See *Ibid.*, p. 445; the principles and accompanying considerations persevere in today's (Third) Restatement of the Foreign Relations Law of the United States, Part IV. Jurisdiction and Judgments, Chapter 1. Jurisdiction to Prescribe, Sub-chapter A. Principles of Jurisdiction to Prescribe. Note, that these principles provide the basis for Article 109(3) of the 1982 LOS Convention. See also *Molenaar* (as in n. 39 on page 66), pp. 78–86 with respect to environmental protection.

<sup>188</sup>See *Harvard Research* (as in n. 183 on the facing page), p. 445.

*Legislation and Enforcement*

In general, jurisdiction entails the authority for legislative (*jurisdiction*) and executive (*jurisdiction*) acts of state; it also includes the competence for judicial review (*adjudication*). These competencies are principally vested in a State by virtue of its status as a sovereign entity of international law.<sup>189</sup> By the exercise of its legislative jurisdiction the State asserts the rights conferred to it by international law<sup>190</sup> and implements international treaty or customary law in the domestic legal system. In the context of marine scientific research this requires the implementation of the substantive provisions in Parts V and XIII of the 1982 LOS Convention (or corresponding customary law). Implementation, i. e., bringing internal law into conformity with obligations under international law, has been described as a general duty of States, and the failure to do so on a specific occasion as a breach of international law.<sup>191</sup> Claiming an exclusive economic zone by itself does consequently not fulfil this obligation as this is only the notice to other States of the intention to exercise the respective rights. The jurisdiction conferred upon the coastal State<sup>192</sup> by the 1982 LOS Convention must be laid down specifically.<sup>193, 194</sup>

<sup>189</sup>See page 105.

<sup>190</sup>Similarly, *Caminos, Hugo, Harmonization of Pre-existing 200-Mile Claims in the Latin American Region with the United Nations Convention on the Law of the Sea and its Exclusive Economic Zone*, in U.Miami Inter-Am.L.Rev. [1998], pp.17f., describing harmonisation and implementation as a prerequisite of compliance with the 1982 LOS Convention in respect of the exclusive economic zone.

<sup>191</sup>*Brownlie* (as in n. 151 on page 99), p. 35 with further references; similarly, *Caminos* (as in n. 190), p. 17; see also *Advisory Opinion on the Exchange of Greek and Turkish Populations*, 1925 P.C.I.J., Series B, No. 10, p. 20.

<sup>192</sup>NB: the 1982 LOS Convention distinguishes with respect to jurisdiction between port, coastal and flag States; this distinction plays predominantly a role for jurisdiction with respect to environmental protection, see *Molenaar* (as in n. 39 on page 66), pp.91f and 130; for the present analysis, however, it suffices to distinguish between coastal States and flag/researching States.

<sup>193</sup>In general, the act of claiming the exclusive economic zone coincides with the entry into force of national implementation measures. Only where Part XIII is not fully implemented, the exercise of jurisdiction is restricted accordingly.

<sup>194</sup>It has been suggested that the crucial provisions in Part XIII, namely, Articles 246, 248 and 249, are “self-executing”, see *Plesmann, Wolf/Röben, Volker, Marine Scientific Research: State Practice versus Law of the Sea?* in *Wolfrum, Rüdiger*, editor, *Law of the Sea at the Crossroads: The Continuing Search for a Universally Accepted Regime*, Berlin, 1990, Veröffentlichungen des Instituts für Internationales Recht an der Universität Kiel 113, p. 389. Yet, the concept of self-executing treaties—see *Bleckmann, Albert, Self-Executing Treaty Clauses*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume IV, Amsterdam, 2000, p. 374—refers predominantly to rights of individuals; Part XIII, however, establishes rights and duties of States. It is very doubtful that a scientist, whose research request—lacking proper implementation of the 1982 LOS Convention—has been denied, could base a claim on Article 246 against the coastal State in its domestic courts on the premise that the coastal State has an obligation to grant such a request under normal circumstances. Also, it is difficult to imagine that a scientist would “volunteer” to have its research



*Implementation: Consent Procedure and Other Measures*

Article 246(3) makes it an obligation of the coastal State to “establish rules and procedures ensuring that such consent will not be delayed or denied unreasonably” and provides thus for a comparatively strong guidance with respect to the implementation of the regime of marine scientific research in the exclusive economic zone. First, unlike in the territorial sea, coastal State legislation must foresee consent; second, more specifically, such consent must normally be granted; and third, the coastal State must ensure by legislation that the applications for consent will be dealt with in an expedient manner.

In order to implement Article 246(3) coastal States have to arrange for a procedure by which researching States can obtain consent.<sup>195</sup> The coastal State needs to set up the conditions of consent and the relevant authority charged with processing the research requests. The conditions generally relate to details on the research project, the research platforms which will be used and the personnel participating in the project.<sup>196</sup> The consent authority is in most cases either the foreign or another ministry, sometimes a specialised agency, which functions as principal authority in a process of internal co-ordination of involved interests represented by other ministries or state institutions.<sup>197</sup>

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project sacrificed in order to establish the case for a self-executing Article 246.

<sup>195</sup>Where the coastal State has not implemented its jurisdiction on marine scientific research, a consent procedure is obviously not necessary.

<sup>196</sup>See U.N. Draft Standard Form A “Application for Consent to Conduct Marine Scientific Research”, issued by the U.N., which foresees General Information (institution, coastal state participation), Description of the Project (nature and objective), Methods and Means to be Used (including aircraft and harmful substances), Installations and Equipment (information on laying, servicing, recovery and location), Geographical Areas, Dates (of entry and departure), Port Calls (with information on special requirements and shipping agent), Participation (of coastal State), Access to data, samples and research results, the form is available at <http://www.state.gov/documents/organization/11121.doc> – visited on 31 January 2005; the “Notification of Proposed Research Cruise” from ICES provides for similar information, see *Helsinki Commission*, Baltic Sea Env’t Proc. 27A [1988], p. 35f.

<sup>197</sup>See, for example, the South Korean Enforcement Decrees for Marine Scientific Research Act 8.8, Presidential Decree No. 15135 (Ministry of Marine Affairs and Fisheries and its subdivisions) from 8 August 1996, stipulating:

[T]he minister of the Ministry of Marine Affairs and Fisheries, once received the Permission application, should distribute the Permission application and the research proposal to the Ministers of the [the Ministry of Foreign Affairs and Trade, the Government Legislation Agency, the Ministry of National Defence, the Ministry of Education, the Ministry of Commerce, Industry and Energy, the Ministry of Information and Communications, the Ministry of Environment, and the Ministry of Construction and Transportation].

The Federal Law on the Exclusive Economic Zone of the Russian Federation from November 1998, released by the Department of State, Bureau of Oceans and International Environmental and Scientific Affairs, March 1999 (the text is available at *Maritime Space: Maritime Zones and Maritime Delimitation*, <http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/index.htm>) – visited on 31 January 2005) provides in Section IV Resource and Maritime Scientific Research, Article 20(5):

The entity thus charged with processing foreign research requests would constitute the “official channel” for the purposes of Article 250 regardless of the actual nature of the relevant authority, as the coastal State retains the competence to determine which authorities are to deal with research requests. Where no procedure has been established the researching State must take special care of the obligation in Article 250 and identify the relevant authority itself,<sup>198</sup> usually this would be the ministry of foreign affairs.

It would appear that the request of the researching State must be from an official authority as the submitting end of the “official channel”. Normally this would be the researching State’s foreign service/embassy in the coastal State. Yet, this is not necessarily so; coastal States may also accept consent

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Permits to conduct maritime scientific research shall be issued by the specially authorized federal executive agency for science and technology by agreement with the specially authorized federal executive agency for fisheries, the federal executive agency for security, the federal executive agency for the border service, the federal executive agency for environmental protection, the federal executive agency for matters pertaining to the geology and use of the subsoil, the federal executive agency for hydrometeorology and monitoring of the environment, and...with other interested federal executive agencies.

The Regulations of the People’s Republic of China on the Management of Foreign-Related Marine Scientific Research, promulgated by Decree No. 199 of the State Council of the P.R. China on 18 June 1996 and effective as of 1 October 1996, provide in Article 3:

The competent state administrative authority of the People’s Republic of China for marine affairs...shall be responsible for the management of foreign-related marine scientific research activities...Other departments concerned under the State Council shall, as required by their responsibilities...participate in the management of foreign-related marine scientific research activities...in cooperation with the competent authority for marine affairs.

In contrast, Japan, in addition to the regular application to be submitted to the Ministry of Foreign Affairs, requires researching States to obtain a separate approval from the Ministry of Agriculture, Forestry and Fisheries of Japan under the Law on the Exercise of Sovereign Rights Concerning Fisheries in the exclusive economic zone when the research project involves catching, taking or exploration of marine animals and/or plants in the exclusive economic zone. Similarly, New Zealand advises foreign scientists that a consent to carry out marine scientific research does not authorise the entry of the research vessel into a marine reserve. Permission to access such reserves must be obtained from the Director General of Conservation. Applications should be made at the same time as an application for marine scientific research. Also, Australia requires researching States to obtain permits from the relevant authorities for the intended activity, such as the Fisheries Management Authority for fisheries research, the Department of Primary Industries and Energy for geoscientific research of a type that is relevant to petroleum and mineral exploration, and research is illegal in a marine park, marine national nature reserve or other park, reserve or protected area without a permit from the Director of National Parks and Wildlife.

The texts are available through the U.S. government, Department of State: *Notices to Research Vessel Operators*, (<http://www.state.gov/www/global/oes/oceans/notices.html>) – visited on 31 January 2005.

<sup>198</sup>See *Soons*, Marine Scientific Research (as in n. 90 on page 78), p. 193.

requests directly from research institutions.<sup>199</sup>

*Soons* points out that the requirement to use official channels is especially relevant for the prevention of uncertainties with respect to questions, like whether the competent coastal state authorities did receive the research request and on what date in order to establish the assumption of implied consent and to determine the date, on which the operations may start; for ensuring the researching State's responsibility as a function of involvement in the case of private research operations; and finally, for adding some weight to the request.<sup>200</sup> However, only where state responsibility is based on the fact that the researching State has processed the research request by official channels, the researching State would be well advised to establish a procedure by which it could actually keep track and control of the research programmes of its nationals.<sup>201</sup> The other points in question do not necessitate a lengthy procedure and it would suffice to dispatch the request officially to have the documentary proof. Yet, since marine scientific research has become a matter of international law entailing rights and obligations, such a requirement by municipal law is a likely occurrence at least with respect to public institutions.<sup>202</sup>

A comprehensive consent procedure by the coastal State would play an important role where a single research project (with various platforms) affects a number of different coastal state interests and the competence of different authorities. In such an instance, the question may arise if the coastal State—generally under the obligation of Articles 239 to facilitate scientific research—must in the course of the national consent procedure concentrate all relevant permissions that may be required for the research activities. For example, where the researching State wants to use remote controlled aircraft, it would have to obtain prior permission principally from the national aviation authority. The permission to use such aircraft could be combined with the general permit to conduct the research activity. But the coastal State

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<sup>199</sup>For example, Norway accepts, according to § 8 of its Regulations relating to foreign marine scientific research in Norway's internal waters, territorial sea and exclusive economic zone and on the continental shelf, laid down by Crown Prince Regent's Decree on 30 March 2001, applications "by the researcher, research institution or international organization that is to conduct the research." The text is available at (<http://www.fiskeridir.no/fiskeridir/content/download/2989/20001/file/regulations.pdf>) – visited on 31 January 2005 and DOALOS: State practice (as in n. 197 on page 109).

<sup>200</sup>See *Soons*, Marine Scientific Research (as in n. 90 on page 78), p. 194.

<sup>201</sup>See page 350.

<sup>202</sup>See *Kildow, Judith A. Tegger, Nature of the Present Restrictions on Oceanic Research*, University of California, San Diego, in *Wooster, Warren S.*, editor, *Freedom of Oceanic Research: A Study Conducted by the Center for Marine Affairs of the Scripps Institution of Oceanography*, New York, 1973, p. 11, illustrating the U.S. policy in the 1960/70s; according to *Stevens, Lee R., Handbook for international operations of U.S. scientific research vessels*, January 1986 ([http://www.gso.uri.edu/unols/for\\_cln/for\\_cln.html](http://www.gso.uri.edu/unols/for_cln/for_cln.html)) – visited on 31 January 2005, the situation had apparently not changed for U.S. practice in the 80s.

may also require the researching State to submit a request to the aviation authorities itself, prior, parallel or subsequent to the request for approval of the research project in accordance with Article 246(3) of the 1982 LOS Convention. Article 246(5) suggests that the coastal State's approval is all-inclusive with respect to a research project as it envisages the denial in case of implications on a number of different sectors, like, for example, the exploitation of living and non-living resources, mining and the construction of artificial islands. In fact, state practice does not consistently indicate that States circulate research requests internally to the various departments that could be concerned.<sup>203</sup>

The consent procedure is the principal authoritative step the coastal State may take as a reflection of its jurisdiction to legislate. It may naturally be subject to extraneous political considerations. The general relations between the flag State or researching State and the coastal State may prove to be of more relevance than the actual implications of the scientific research project.<sup>204</sup> State practice will have to show in the long term to what extent the consent procedure will serve as an instrument to facilitate or to obstruct marine scientific research. As a corollary of the obligation to grant consent under normal circumstances the reasons for a denial may attain a great significance. Unfortunately, the 1982 LOS Convention does not explicitly call for a justification in this sense.<sup>205</sup>

Other measures covered by coastal States' jurisdiction to regulate could encompass any type of national legislation that does not render the consent to a research request void. The coastal State would thus appear to be able to restrict research in terms of design and construction standards, limit the use of equipment or research technology as long as research can principally be effected.

### *Enforcement Measures*

In addition to the jurisdiction to prescribe, the coastal State may also enforce its legislation. This is expressed by the word 'authorise' which denotes authoritative permission and—as its flip side—denial. Where a research request is denied the coastal State must be able to enforce this decision, i. e., secure that no research activity takes place. Enforcement actions in the con-

<sup>203</sup>See n. 197 on page 109.

<sup>204</sup>See *Burke, William T., Marine Science Research and International Law*, Law of the Sea Institute Occasional Paper No. 8, Kingston, 1970, p. 2: "Sometimes relations between the port state, the flag state, and a third state have such political implications, perhaps only momentarily, that a port call seems undesirable to coastal officials. Occasionally such tense feelings prevail between rival political factions within the host state that visits by foreign vessels are temporarily forbidden." Similarly, *Mangone* (as in n. 33 on page 65), p. 310 contending that "diplomatic issues, often quite unrelated to marine science research, have been a prevailing factor [in denials of access]."

<sup>205</sup>See page 306.

text of activities on the sea can occur in various forms.<sup>206</sup> The following sequence of activities can be distinguished in this respect:

1. *Surveillance* or *Monitoring*, which denotes oversight, superintendence, supervision. It is a (police investigative) technique involving visual or electronic observation or listening directed at a person or place. The objective is to gather evidence of an illegal activity or merely to accumulate information and eventually intelligence about such an activity.<sup>207</sup>
2. *Approaching*, denoting that the authorities advance the platform for purposes of establishing identity and nationality and a detailed visual scrutiny without impeding safety and passage; as a matter of practice radio communications are established to obtain additional information such as last port of call, next port of call, cargo, and other information pertinent to the voyage.<sup>208</sup>
3. *Stopping and boarding* is the physical interference with the platform as such not necessarily the activities conducted by or from the platform or the personnel aboard. A platform may be simply stopped to prevent it from entering a certain area; it may also be stopped to execute further investigations.<sup>209</sup>
4. *Search or inspection* is usually associated with intrusive conduct, a quest with some sort of force, either actual or constructive. While surveillance can be done without interfering with the platform itself, search or inspection necessitates physical interception. A search constitutes an examination of the chattel or person aboard, with a view

<sup>206</sup> *Franckx, Erik*, editor, *Vessel-source pollution and coastal state jurisdiction: the work of the ILA Committee on Coastal State Jurisdiction Relating to Marine Pollution (1991–2000)*, Boston, 2001, pp. 147–391, provides case studies for 15 countries with respect to implementation and enforcement of environmental legislation, which indicate imprisonment as an exception and detention or expulsion as a drastic albeit possible enforcement measure.

<sup>207</sup> See ‘surveillance’ in *Black/Garner* (as in n. 112 on page 84); *Wolfrum, Rüdiger*, *Means of ensuring compliance with and enforcement of international environmental law*, in *Recueil des cours* 272 [1998], p. 36; *Anderson, Andrew W.*, *In the Wake of the Dauntless: The Background and Development of Maritime Interdiction Operations*, in *Clingan, Thomas A.*, editor, *What lies ahead?* Honolulu, Hawaii, 1988, p. 24 with respect to intelligence as an important prerequisite in the battle against smugglers of cocaine in the U.S.

<sup>208</sup> See *Ibid.*, p. 32, after conceding that it is questionable under the customary right of approach to require a vessel to do more than show her flag, he contends that “the failure to communicate and provide information would be such a departure from the norm as to be a proper factor for inclusion in a determination as to whether reasonable suspicion exists that a vessel is engaged in illicit activity”.

<sup>209</sup> Stopping may entail the use of force, see *Ibid.*, p. 28, describing U.S. experience in stopping of vessels on the high seas by use of firing warning shots across the bow, dousing the vessel with high pressure water hoses and similar tactics.

to the discovery of contraband or illicit property, or some evidence of guilt to be used in the prosecution of an alleged violation of domestic laws and regulations. 'Search' implies prying into hidden places for that which is concealed and that the object searched for had been hidden or intentionally put out of the way; merely looking at that which is open to view is not a search. Inspection, in the context of international law, usually denotes examining, checking over, or viewing for the purpose of ascertaining the quality, authenticity or conditions of ship standards, papers, history and maintenance records and documentation, *et cetera*;<sup>210</sup> in the context of marine science this would include documentary proof of the coastal State's consent and compliance with relevant conditions.

5. *Reporting* denotes the relaying of any infractions or violations with a view to inducing compliance as a function of comity and reputation; black-listing of incessant violators may result in severe restraints on the operational range by the refusal of port access, for example, or the denial of access for subsequent research requests.
6. *Arresting or seizing* of persons and/or chattels. Arrest means to deprive a person or a chattel of its liberty by legal authority, i. e., taking, under real or assumed authority, into custody for the purpose of holding or detaining them or it to answer a criminal or administrative charge (or civil claim). A seizure is the act of taking possession of property, for example, for a violation of law or by virtue of an execution of a judgement. The term implies a taking or removal of something from the possession, actual or constructive, of another person or persons.
7. *Detention* in contrast to arrest or seizure denotes the act of keeping back, restraining or withholding, either accidentally or by design, a person or thing. Detention thus presupposes an arrest or seizure and is the perpetuation of either.
8. *Application of law* by judicial or other process including imposition of sanctions is the last step of enforcement actions, the execution of a judgement being part of it.<sup>211</sup>

State practice with respect to the enforcement of national legislation relating to marine scientific research is scarce. The limited evidence available produces an inconclusive picture. The Article 25 of the Ukrainian Law on the

<sup>210</sup>Similarly, König, Doris, *Durchsetzung internationaler Bestands- und Umweltschutzvorschriften auf hoher See im Interesse der Staatengemeinschaft*, Berlin, 1990, Veröffentlichungen des Instituts für Internationales Recht an der Universität Kiel 108, pp. 37f.; Wolfrum, Enforcement (as in n. 207 on the page before), pp. 43f., with respect to the enforcement of international environmental law.

<sup>211</sup>See Burke, William T./Legatski, Richard/Woodhead, William W., *National and International Law Enforcement in the Ocean*, Seattle, 1975, p. 1.

exclusive (marine) economic zone of 16 May 1995 makes unlawful conduct of marine scientific research as a minimum “punishable by a fine of between 100 and 500 times the minimum monthly wage.” The Border Forces, which are authorised to impose such fines, may, according to Article 27, detain the offender. Such enforcement measures are not foreseen by the 1982 LOS Convention.<sup>212</sup> Tanzania, in its legislation relating to the exclusive economic zone, seems to take the view that failure to enter into an agreement with the government on carrying out any search or conducting any research constitutes a criminal offence, which may be punishable by fine or even imprisonment.<sup>213</sup> Tanzanian officials charged with enforcing Tanzania’s legislation have far reaching powers to board,—in case there are “reasonable grounds to suspect that an offence has been committed under this Act” without warrant or process—seize and detain a vessel regardless of whether or not it is operated by the government of a foreign State.<sup>214</sup>

#### *Free Floating Installations*

The I.O.C. in its Resolution XX-6 noted “the absence of a specific international legal instrument regulating profiling floats, drifting buoys, and other similar objects deployed in the oceans;” and recognised that “just as with existing surface drifting buoys, some of these new instruments may drift into waters under national jurisdiction.”<sup>215</sup> In lieu of a satisfactory legal framework, the I.O.C. instructed the Executive Secretary

- (i) to inform all Member States. . . and appropriate UN agencies, including I.M.O. and F.A.O., of the acceptance of the Argo project by I.O.C. and W.M.O.;
- (ii) to inform all Member States of how to determine float locations and access float data;
- (iii) to consider how all Member States might participate in and benefit from the Argo project, as well as propose options to that end; and

<sup>212</sup>Note, that Article 32 of the Ukrainian law refers directly to the 1982 LOS Convention and other international treaties in cases of doubt as to the lawfulness of Ukraine’s norms, the text of Ukraine’s Law is available at DOALOS: State practice (as in n. 197 on page 109).

<sup>213</sup>See *Mlimuka, Aggrey K. L. J., The Influence of the 1982 United Nations Convention on the Law of the Sea on State Practice: The Case of the Tanzanian Legislation Establishing the Exclusive Economic Zone*, in O.D. & Int’l L. 26 [1995], pp. 66f, referring to sec. 10 of Tanzania’s Territorial Sea and Exclusive Economic Zone Act, noting that Tanzanian legislation is in clear breach of the 1982 LOS Convention, which expressly prohibits imprisonment in Article 73. Similarly, Article 20 Civil and criminal jurisdiction of the Act on the Marine Areas of the Islamic Republic of Iran in the Persian Gulf and the Oman Sea, 1993 provides for investigation and detention where laws and regulations in the exclusive economic zone have been violated, the text is available at DOALOS: State practice (as in n. 197 on page 109).

<sup>214</sup>See *Mlimuka* (as in n. 213), pp. 67f.

<sup>215</sup>See IOC Resolution XX-6 ‘The Argo Project’, adopted by the Assembly at the 20<sup>th</sup> session, 29 June–9 July 1999, Paris.

- (vi) to appeal for international cooperation in making the Argo project a success;

and “to consult with the ABE-LOS and JCOMM on the legal... implications ... of the deployment of profiling floats, drifting buoys, and other similar objects in the ocean, including the feasibility of drafting a legal instrument.”<sup>216</sup>

While the drifting buoys and profiling floats would qualify as equipment under Part XIII, Section 4 of the 1982 LOS Convention, no provision is made for the specific implication of such objects. As it stands, Article 258 of the 1982 LOS Convention would require the researching State to monitor the device and submit an access request around six months before the device drifts into the waters of a foreign State. It is obvious that such a procedure is impracticable: drifters and floats are designed to follow the ocean currents, and normally their course can only be predicted in terms of probabilities. The scientific value of their measurements would be significantly impaired if drifters had to be retrieved before they enter foreign waters and not be re-released before permission is obtained; conversely, the exact date of entry can usually not be predicted (as the revelation of the determinants is the purpose of the experiment to begin with), neither which foreign waters it may stray into.

The advisable course of action would appear to be to enter into a general agreement with the potentially affected coastal States to secure widespread consent and a sufficient level of flexibility. For the Argo-project, conducted as part of the *Global Climate Observing System/Global Ocean Observing System (G.C.O.S./GOOS)*, the *Climate Variability and Predictability Experiment (CLIVAR)*, and the *Global Ocean Data Assimilation Experiment (GODAE)*, I.O.C. concludes in Resolution XX-6 that every concerned coastal State “must be *informed* in advance, through appropriate channels, of all deployments of profiling floats which might drift into waters under their jurisdiction, indicating the exact locations of such deployments [emphasis added].” The Assembly thus recognised that the normal consent procedure under Article 246 of the 1982 LOS Convention would not be practicable for this project, yet that the coastal States’ jurisdiction over marine scientific research would require some form of participation.

### *Clearance*

The coastal State by requiring submission to a consent procedure implements its right under international law to regulate scientific research activities. The 1982 LOS Convention, namely, by Article 246 introducing the consent requirement, envisages the consent procedure principally as a unilateral measure by the coastal State. Where the research requests are submitted by an official authority from the researching State, this State often also subjects

<sup>216</sup>See Draft Resolution in IOC-WMO-UNEP/I-GOOS-IV/3, Annex VI, p. 3.



the proposal to a *clearance procedure*. In the context of the present analysis consent procedure is understood as the process of obtaining coastal state consent for the conduct of a marine scientific research project. In contrast, clearance procedure denotes the process of approval of a proposed research project through a domestic (state) agency. In general, such a clearance procedure will serve as a mechanism to prevent unnecessary delays and surprises since requests can be supplemented or amended on the basis of past experience of the combined government services. The national research institution or individual must submit a formal request which is processed through a certain agency, usually located in the foreign service or ministry.<sup>217</sup> This agency, on the basis of the State's foreign policy and international relations, may assess the research project with respect to coastal state legislation, political circumstances, security implications and other considerations. It may—based on previous experience with certain States—suggest amendments to the proposal in order to facilitate the consent procedure; it may also make processing conditional upon the compliance with certain requirements. To what extent the researching State causes mere inconveniences or obstacles, to what extent national clearance authorities facilitate or hinder scientific research is entirely a domestic issue. The request is then forwarded to the foreign recipient authority or agency as determined by the national law of the foreign State.

It should be emphasised that the consent procedure prescribed by Article 246(3) of the 1982 LOS Convention does not require clearance through the researching State as such. However, Article 250 of the 1982 LOS Convention may be construed in such a way that researching States must in effect establish a clearance procedure. Article 250 of the 1982 LOS Convention establishes the obligation to make all communications relating to marine scientific research “through appropriate official channels”. The relevant communications under Part XIII are the application for consent pursuant to Article 246 or 247 and the request by the coastal State for additional information (Article 252); additionally, all other relevant communications that

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<sup>217</sup>See Fenwick, *Judith, International profiles on marine scientific research: national maritime claims, MSR jurisdiction, and U.S. research clearance histories for the world's coastal states*, Woods Hole, MA, 1992, p.ix: in the U.S.A., for example, marine scientists should submit research clearance requests to the U.S. State Department; while government R/V are required to go through official channels, other scientists are only “encouraged”; failure to do so may have repercussions, though: “If applications are filed directly with the Nigerian Navy our ability to follow-up and to deal with questions or problems that may arise are limited. The Embassy is often in a position to facilitate clearances through its direct contacts with the Nigerian Navy and others. The Embassy is not authorized to accept applications directly from American researchers.” See Notice to Research Vessel Operators No. 72, *Subject: Nigerian Research Clearance Requirements*, Released by the Department of State, Bureau of Oceans and International Environmental and Scientific Affairs, 6 January 1988, available at <http://www.state.gov/www/global/oes/oceans/ntrvo72.html> – visited on 31 January 2005. In Germany research requests are processed by the foreign ministry.

concern the rights and obligations of the involved Parties, such as the notice of consent or the order of suspension.<sup>218</sup> The coastal State is free to determine the channels by which it wishes to receive the applications for consent. Thus, States may accept submissions from research institutions or scientists directly. On the side of the researching State, considerations of liability may nevertheless lead to the institution of a clearance procedure.<sup>219</sup>

#### ARTICLE 241, THE EXCLUSION OF LEGAL TITLE

Article 241 derogates the possibility of acquiescence of legal title in the context of marine scientific research. The provision has two aspects: one relates to territorial claims in terms of a geographic area, the other relates to an object, exemplified by the word 'resource'. Traditionally, in order to acquire a legal title to a certain territory, the claimant had to come in possession by either of five modes—occupation, accretion, cession, conquest (or subjugation), and prescription.<sup>220</sup>

Part XIII of the 1982 LOS Convention imports the concept employed in Antarctica where States' territorial claims were suspended in order to foster scientific exploration of the continent.<sup>221</sup> For discoveries under the marine scientific research legal regime the same reasoning applies: no claim to legal title may be based upon a discovery in the pursuit of such research. *Soons* contends that the inclusion of Article 241 was not necessary since other

<sup>218</sup> *Gorina-Ysern*, International Regime (as in n. 128 on page 93), pp. 483f., examines Article 250 in the light of a *pacta de contrahendo/de negotiando* concept arguing that the consent regime "contains terms that postpone certain mutual obligations relating to the conduct of MSR [which] cannot simply be communicated or notified. They must be negotiated [...] The obligation to negotiate the terms of such access (through official channels pursuant to Article 250) arises from Article 245".

<sup>219</sup> See page 350.

<sup>220</sup> See *Brownlie* (as in n. 151 on page 99), pp. 129–137; effective occupation, as the public international law corollary to legal possession in private law, normally denotes the extension of sovereignty to *terra nullius*. Acquisitive prescription, in contrast, signifies that previously unchallenged sovereignty of one State to a territory is challenged by a competitor. The intensity of state activity necessary to establish proof of possession and sovereignty will be less in the case of *terra nullius* than where different States compete for the same territory.

<sup>221</sup> Generally, title to Antarctic territory would be acquired according to the same principles as apply to any other land territory, i. e., effective occupation consisting of an objective element, which can be generally described as state activity, and a subjective element, which can be described as the intention to act as sovereign or *animus occupandi/possidendi*. The process of land appropriation in Antarctica has been forestalled by a legal framework that "freezes" property claims for the time being. Pure presence and redundant assertions do not secure a territorial claim: the claimant States agreed against the background of the I.G.Y. to explore Antarctica in an international effort rather than in pursuit of national self interests, see *Holmes, William James, A Comparison of the United States and Russian Federation Regimes for Protection of the Antarctic by the Use of Environmental Impact Assessments*, in *Geo.Int'l & Env'l L.Rev.* 6 [1993], p. 76; *Kimball, Lee, Environmental Law and Policy in Antarctica*, in *Sands, Philippe*, editor, *Greening International Law*, New York, 1994, p. 122.

provisions of the 1982 LOS Convention must be interpreted as to give the same effect.<sup>222</sup>

Yet, the implications of Article 241 may go beyond what has been enshrined in the 1982 LOS Convention in terms of sovereignty over sea space and natural resources. For example, in the context of the discussion about intellectual property rights, Article 241 may present an argument against ownership.<sup>223</sup> It is therefore necessary to determine the scope of this provision: While the acquired data of any scientific research do not necessarily qualify as intellectual property as they only represent facts, the conclusions drawn from them are, generally speaking, copyrighted material. They represent a genuine intellectual achievement that enjoys protection by law. Article 241 could not have been intended to exclude this process, as scientific research would become meaningless from the standpoint of scientific initiative. The individual achievement of the scientist must be distinguished from the raw data.<sup>224</sup> The latter is a prerequisite of the former but as such insufficient for any conclusions, which are characterised by the mental effort of the scientist. It is quite difficult to envisage scientists who would not want their findings associated with their names, as generating results and thereby reputation is an important aspect in the professional world of science.

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<sup>222</sup>See *Soons*, *Marine Scientific Research* (as in n. 90 on page 78), p. 138; see also *Gorina-Ysern, Montserrat, Marine scientific research activities as the legal basis for intellectual property claims?* in *Marine Policy* 22 [1998], pp. 343f.

<sup>223</sup>See *Ibid.*, pp. 344f. See also *Gorina-Ysern, Montserrat, Legal Issues Raised by Profitable Biotechnology Development through Marine Scientific Research*, ASIL Insights, September 2003 (available at <http://www.asil.org/insights/insigh116.htm>) – visited on 31 January 2005); and *Gorina-Ysern, International Regime* (as in n. 128 on page 93), pp. 353f., for an analysis of this aspect for marine scientific research—also in the light of CITES, C.B.D., and TRIPS—, concluding at p. 458 that “[c]oastal States resort to Articles 241 and 249.2, 1982 UNCLOS, to protect their proprietary interests over foreign MSR activities that might yield data, samples and results bearing on the commercial exploitation of coastal State natural resources. [...] [L]egal and political complexities will require a piece-meal approach to MSR clearances involving collection of marine flora and fauna specimens that may eventually lead to commercial products or processes.” The U.N. Secretary-General touches on this aspect in the context of “bioprospecting”, *U.N. Secretary-General, 2004 Report* (as in n. 64 on page 72), p. 66.

<sup>224</sup>Similarly, *Gorina-Ysern, I.P. Claims* (as in n. 222), p. 346, pointing out at p. 350 that the “CBD recognizes the existence of this link by granting the country of origin of biological and genetic resources the control over access by foreign researchers under domestic law and subject to agreements mutually beneficial.”



## Chapter 3.

# Platforms from a Legal Perspective: Definition and Status

### DEFINITIONS

The word platform in the present analysis is used as an umbrella term to include all possible carriers of sensors used in marine scientific research. These include simple buoys or floats as well as highly sophisticated air- or spacecraft. The term ‘platform’ thus encompasses *Ocean Data Acquisition Systems (ODAS)* in the terminology used by the I.O.C. which includes light-houses and light vessels, observing towers and platforms, oil rigs, land-based automatic stations (if allocated international ocean data buoy identifier numbers), ice drift buoys, buoys mounted on a ship, only requiring a suitable instrumentation for marine meteorological and oceanographic observation and transmission of data.<sup>1</sup> It goes even further because the term ‘ODAS’ normally refers only to those platforms that remain on or below the water surface. A platform in the current context can be any solid structure that is capable of carrying a sensor as a technical instrument or an individual person for scientific observations. Depending on the scientific purpose, the platform may be below, on or above the water surface.

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<sup>1</sup>See IOC-WMO Regular Information Service Bulletin On Non-Drifting Ocean Data Acquisition Systems (ODAS), Issue 20 [1997], p. i.

*'Vessel' and 'Ship'**Vessels in General*

The 1982 LOS Convention uses the terms 'vessel'<sup>2</sup> and 'ship'<sup>3</sup> but does not define either. Article 29 merely defines the term warship presuming the meaning of ship. The two terms occur in the Convention without an apparent difference in meaning. Since customary international law provides no definition either,<sup>4</sup> the ordinary meaning of the word must be used as a starting point.

A ship or vessel may be generally defined as a craft of a certain size used or capable of being used as a means of transportation on water.<sup>5</sup> This definition includes any type of hollow structure that, owing to its buoyancy, can be used for transportation. Thus, lighting vessels, dredging barges, floating cranes, amphibious crafts, hydrofoils as well as submersibles<sup>6</sup> may qualify as vessels. In contrast, boats propelled by oars or paddles, rafts, floating docks, floating islands and seaplanes are normally not considered ships.<sup>7</sup> A

<sup>2</sup>Articles 211, 217, 248 of the 1982 LOS Convention.

<sup>3</sup>Articles 17, 38, 90 of the 1982 LOS Convention.

<sup>4</sup>See *Lagoni, Rainer, Der Hamburger Hafen, die internationale Handelsschifffahrt und das Völkerrecht*, in A.V.R. 26 [1988], p.282; *Hasselmann, Cord-Georg, Die Freiheit der Handelsschifffahrt: eine Analyse der UN-Seerechtskonvention*, Kehl am Rhein, 1987, Veröffentlichungen des Instituts für Seerecht und Seehandelsrecht der Universität Hamburg 1, p.55, referring to a number of shipping treaties; see also *Beckert, Erwin/Breuer, Gerhard, Öffentliches Seerecht*, Berlin, 1991, p.153. Similarly the definition in Article 1 of the *Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs)*, adopted 20 October 1972, entry into force 15 July 1977, I.M.O. London 2002 (cons.ed.) [hereinafter: Collision Regulations]: "vessel" includes every description of water craft, including non-displacement craft and seaplanes, used or capable of being used as a means of transportation on water.

<sup>5</sup>See *Lagoni, Rainer, Merchant Ships*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume III, Amsterdam, 1997, p.346; see also *Engert-Schüler, Heidi, Völkerrechtliche Fragen des Eigentums an Wracks auf dem hohen Meer*, Frankfurt am Main, 1979, *Das geltende Seevölkerrecht in Einzeldarstellungen* 11, p.57. The U.S. Congress has defined a vessel as including "every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water." 1 U.S.C.A. § 3. The U.S. Supreme Court has defined vessels as "all navigable structures intended for transportation." *Cope v Vallette Dry-Dock Co.*, 119 US 625 (1887); *Hasselmann* (as in n. 4), pp.55f., differentiates between 'ship', as any vessel of considerable size navigating deep water and not propelled by oars, paddles, or the like, and 'vessel', as a craft for travelling on water, a ship or boat, especially one larger than a row boat, and concludes that the two terms can be used synonymously. This interpretation is supported by the French and Spanish version of the 1982 LOS Convention which use the same word in all instances.

<sup>6</sup>See *Brown, Edward D./Gaskell, Nicholas J.J., The Operation of Autonomous Underwater Vehicles*, Volume 2: Report on the Law, Society for Underwater Technology, London, 2000, pp.82-96 for an analysis of the term 'ship' with respect to its application to A.U.V. See also *Showalter, Stephanie, The Legal Status of Autonomous Underwater Vehicles*, in *Mar.T.Soc.J.* 38 [2004], pp.80f., available at <http://www.olemiss.edu/orgs/SGLC/Commentary.pdf> – visited on 31 January 2005.

<sup>7</sup>Note, that Rule 3(a) of the Collision Regulations (as in n. 4 on page 122) includes

ship under construction is a ship as soon as it is able to float; conversely, a ship ceases to be a ship once it cannot be repaired anymore.<sup>8</sup> In such a case it turns into a wreck and its status is determined by different rules.<sup>9</sup>

Public international law in general leaves the definition of a ship to state law unless an international treaty provides otherwise.<sup>10</sup> This means essentially that a State not only determines under what conditions a ship may be registered in the national registry, i. e., formal requirements as to ownership, manning, design construction etc., but also that the State determines what qualifies as a ship in the first place;<sup>11</sup> for the principal prerequisite under this Article is the quality which makes a chattel a ship. The ordinary meaning of the word vessel or ship gives accordingly only a broad frame, within which the State may define the characteristics of a ship registered under its national registry. International treaties may define further restrictions for the term ship in certain contexts through rules and standards;<sup>12</sup> international law at large, however, suggests principally an all inclusive meaning of ship. The 1982 LOS Convention generally imports this concept of 'ship'; yet, inasmuch as it mentions ships in various contexts the meaning must be determined within the respective context.<sup>13</sup>

Article 21 of the 1982 LOS Convention gives some hints as to the concept of 'ship' under the Convention by implication. Whenever a ship navigates in the territorial sea of a foreign State it is subject to the conditions which that foreign State may enforce in accordance with international law. Article 21, inasmuch as it gives the coastal State the authority for enforcement,<sup>14</sup> can

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seaplanes and WIG craft in the definition of 'vessel' to extend the scope of application for the purpose of collision prevention *on* the water.

<sup>8</sup>See *Lagoni*, Merchant Ships (as in n. 5 on the facing page), p. 346.

<sup>9</sup>See generally *Engert-Schüler* (as in n. 5 on the preceding page), pp. 69f., defining wreck as an object afloat, beached, or lying on the sea floor not of insignificant size, once used in, but presently or temporarily not capable of navigation, or any part thereof and all appurtenances, which, at the time of loss of navigability, belonged to the object.

<sup>10</sup>See *Lagoni*, Merchant Ships (as in n. 5 on the facing page), p. 346; see *O'Connell*, *Daniel P./Ivan A. Shearer*, editor, *The international law of the sea*, Volume II, Oxford, 1984, pp. 749f., for a comparison of definitions used in international instruments; see for an overview of some national definitions of ships *Engert-Schüler* (as in n. 5 on the preceding page), pp. 31–57. States' authority has been made explicit in Article 91(1) of the 1982 LOS Convention: "Each State shall fix the conditions... for the registration of ships in its territory." Note, that Article 5(1) of the Geneva Convention on the High Seas has a parallel wording.

<sup>11</sup>This can lead to the situation that a flag State escapes its duties under Article 94 of the 1982 LOS Convention on the premise that the chattel in question is under national law not regarded a ship, see *Hasselmann* (as in n. 4 on the facing page), p. 60.

<sup>12</sup>Similarly, *O'Connell*, *Law of the sea II* (as in n. 10), p. 750; *Engert-Schüler* (as in n. 5 on the facing page), pp. 60f.

<sup>13</sup>Similarly, *Hasselmann* (as in n. 4 on the preceding page), p. 60.

<sup>14</sup>See *Sharma, Surya P.*, *Territorial Sea*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume IV, Amsterdam, 2000, p. 821, pointing out that the plenary authority of the coastal State in the territorial sea is subject to the condition that it may not enforce its laws unless they give effect to generally accepted international rules and standards.

be considered as giving effect to the rules and standards for ships referred to under the 1982 LOS Convention.<sup>15</sup> In effect, Article 21(2) incorporates the internationally accepted rules and standards relating to the design, construction, manning or equipment of ships.<sup>16</sup> Conversely, this means that ships in international law must have a certain design and construction, and must be manned and equipped in a certain way, imprecise or general as such standards or rules may be.<sup>17</sup> The SOLAS Convention sets certain standards with respect to manning a ship,<sup>18</sup> yet they do not provide a conclusive definition of the term ‘ship’. What derives from the preceding paragraphs, however, is the fact that ‘ship’ is a term used in a general and broad sense.<sup>19</sup>

<sup>15</sup>Where a ship never traverses or navigates the territorial sea of a foreign State, enforcement of these conditions is left to the flag State. Yet, it is submitted that coastal States, where at the same time flag States, apply the same standards to their own ships and those of any foreign flag for reasons of equality and non-discrimination.

<sup>16</sup>It should be noted that the 1982 LOS Convention contains in Part XII clear obligations to give effect to certain standards and rules (see Articles 207(1), 208(1), 210(1), 211(2) and 212(1) referring to the adoption of appropriate legislation and Articles 213, 214, 217(1), 220(4) and 222 referring to the enforcement of such legislation), see *Lagoni, Rainer, Die Abwehr von Gefahren für die marine Umwelt*, in *Umweltschutz im Völkerrecht und Kollisionsrecht*, Volume 32, Heidelberg, 1992, p. 131. As to the fact, that Part II contains no such clear obligations one must bear in mind that in the territorial sea the laws of the coastal State apply anyway; Article 21(2), in contrast to the above mentioned Articles, which are concessive in the sense that they confer jurisdiction (to regulate and to enforce), is peremptory, i. e., it restricts coastal state authority.

<sup>17</sup>See *Ibid.*, pp. 132f., pointing out in the context of Part XII that these standards or rules constitute a minimum standard (“Mindeststandard”) but are not legally mandatory—unless the relevant State is party to the standard or rule setting instrument or the standard or rule has become part of customary law—and must therefore only be taken into account, yet not be underachieved; compare *Molenaar, Erik Jaap, Coastal state jurisdiction over vessel-source pollution*, The Hague, 1998, International environmental law and policy series 51, pp. 183f., who assumes a binding force of those rules and standards that are incorporated by reference in 1982 LOS Convention.

<sup>18</sup>*International Convention for the Safety of Life at Sea (SOLAS)*, adopted 1 November 1974, entry into force 25 May 1980, I.M.O. London 2001 (cons.ed.) [hereinafter: SOLAS Convention], Chapter V, Regulation 13 makes it an obligation for the contracting parties “to adopt measures for the purpose of ensuring that, from the point of view of safety of life at sea, all ships shall be sufficiently and efficiently manned.” What this essentially entails in terms of number and qualification is not spelled out in the SOLAS Convention. The minimum crew size is regulated exclusively by national legislation of the flag States, which generally tend to engage in a downward competition in order to promote the competitiveness of their own flag, see *Beckert/Breuer* (as in n. 4 on page 122), pp. 201f.

<sup>19</sup>See *Walker, George K./Noyes, John E., Definitions for the 1982 Law of the Sea Convention*, in *Cal.W.Int'l L.J.* 32 [2002], p. 366.



*Research Vessels*

To define a research vessel in terms of the legal system<sup>20</sup> one must identify the relevant characteristics that distinguish ships from ships first. Such characteristics relate predominantly to design and construction<sup>21</sup> on the technical, and dedication and purpose on the functional side. Evidently, the latter may influence the former, and the former will to some extent determine possible purposes, in which the ship may engage.

Design and construction are important as regulations may require to heed certain technical benchmarks in terms of safety and stability.<sup>22</sup> Also, the applicability of legislation may depend on characteristics in the construction or design. Thus, a hydrofoil must comply with different safety standards than a barge, even though both are considered ships in general and may as such serve as platforms for marine scientific research.

Research vessels may be designed for different purposes, such as fisheries research, ocean drilling research, polar research, near-shore research or deep-sea research, and therefore vary in size, number of crew, sea-going capacity and on-board facilities.<sup>23</sup> Yet, a differentiation from other vessels on the basis of construction does not offer any merit. The variety of purposes, for which a research vessel may be employed, requires, in general terms, laboratories with the relevant equipment for analysis and experiments, cranes, workshops and launching devices for scientific installations and equipment. These are features, which do not require a specific construction in terms of vessel type; at a certain level of generalisation these features may be found on vessels with a broad variety of dedications. Nevertheless, one must note that the objective of a research project may influence the design of the vessel. The function 'research', however, does not indicate a certain type of vessel,

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<sup>20</sup>Not much legislation is available; Article 5(22) of the Croatian Maritime Code from 1994 provides "[a] 'scientific research ship' is a ship or other waterborne craft equipped for scientific research (work) or other exploration or exploitation of the seabed or its subsoil" seems to be an exception. Similarly, Article 2(8) of the Act concerning the Coastal Sea and the Continental Shelf of 23 July 1987 of the Federal Republic of Yugoslavia defines "'scientific research vessel' means a vessel or other floating object equipped for the scientific or other exploration or exploitation of the sea, the seabed and its subsoil." The texts are available at *Maritime Space: Maritime Zones and Maritime Delimitation*, (<http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/index.htm>) – visited on 31 January 2005.

<sup>21</sup>The Australian guidelines for foreign research vessels, for example, request information on means of propulsion, configuration and dimensions of the vessel in the application for access to Australian waters.

<sup>22</sup>See SOLAS Convention (as in n. 18 on page 124) and Annexes and the *International Convention on Load Lines, 1966 as modified by the 1988 Protocol relating thereto*, adopted 5 April 1966, entry into force 21 July 1968, I.M.O. London 2002 (cons.ed.) [hereinafter: Loadlines Convention].

<sup>23</sup>See *Academy of Finland, European Strategy on Marine Research Infrastructure*, Report compiled for the European Strategy Forum on Research Infrastructure by the Ad Hoc Working Group on Marine Research Infrastructure, April 2003, Helsinki, 2003, Publications of the Academy of Finland 6/03, p. 14.

which could be distinguished from other vessels by design or construction.

The decisive criterion, whether a vessel is a research vessel or not, is accordingly the vessel's function and use as a research platform.<sup>24</sup> The function 'research' is not legally defined. Contrasting 'research' to 'cargo', 'tanker' or 'passenger' is of no avail as these functions do not exclude research: it is quite conceivable—economic considerations aside—that any one of the latter may serve for scientific measurements or deployment and retrieval of equipment simply by the fact that they provide for a floating basis. The term 'research vessel' must accordingly be understood to mean a vessel that is predominantly dedicated to research.<sup>25</sup> 'Research' as the determining function would consist of every investigation aimed at the discovery and interpretation of facts and natural phenomena. By itself it is not confined to any particular field even though the use of a vessel may suggest that the research is conducted on the marine environment. Based on the definition of marine scientific research all ships that are dedicated to serve the purposes of this activity can be considered research vessels. The characteristics of research vessels used in marine scientific research are dictated by their function to serve as a research platform for the collection of scientific data and their interpretation. What specific type of equipment or furnishings, what concrete deck layout the vessel must have, depends on the research project; it has no significance for questions of international law.

It should be noted that in international law only the actual function of the vessel as research platform is relevant: if a "research vessel" is engaged in navigation only, it cannot be considered as conducting the function 'research'; it must be regarded like any other ship. Conversely, if a vessel is conducting research it remains a vessel and must comply with the laws on vessels.<sup>26</sup> Dedication as 'research vessel' has no significance as long as the 'research vessel' is not engaged in research.

The size of the research vessel is of no relevance in international law. Whether a research vessel has global or only regional operability does not change the vessel's status. Yet, for research vessels like for other vessels a distinction can be made between sea- or ocean-going ships and ships for inland navigation.<sup>27</sup> In the context of this analysis only those ships are rel-

<sup>24</sup>Note, that the *Code of Safety for Special Purpose Ships, Res. A.534(13)*, I.M.O. London 1984 [hereinafter: Code of Safety], refers in sec. 1.3.4 specifically to the function of the ships in question, which include "ships engaged in research, expeditions and survey".

<sup>25</sup>Under sec. 1.3.3. of the Code of Safety, Special Purpose Ships may not carry more than 12 passengers, i. e., persons that belong neither to the special personnel nor to the crew of the ship.

<sup>26</sup>The Code of Safety provides for an exemption from the SOLAS Convention but only for the special purpose; a regular ships that "undertakes an exceptional single voyage as a special purpose ship" may, according to sec. 1.4.2, be exempted by the administration from the Code of Safety.

<sup>27</sup>See *Beckert/Breuer* (as in n. 4 on page 122), p. 155; *Hasselmann* (as in n. 4 on page 122), p. 60.

evant that are able to navigate the marine environment in such a way as to leave the internal waters of a State and navigate in the marine environment at large. Since only the situation of research vessel in international law is considered, there is the additional prerequisite that the vessel is capable of leaving the flag State's waters to conduct marine scientific research in waters under foreign jurisdiction or on the high seas. The two kinds of ships are distinguished by reference to their purpose:<sup>28</sup> Where a vessel is predominantly engaged in inland navigation it is considered a vessel used for inland navigation. Conversely, a sea-going vessel is normally—considering its function, purpose and capabilities—expected both to carry passengers or cargo and to engage in substantial operations beyond the boundary line dividing inland waters from other parts of the seas. The 1982 LOS Convention, however, does not import the differentiation between sea-going and inland navigation: vessels either engage in scientific research operations outside the flag state waters or they do not. Since the 1982 LOS Convention does not employ the difference made in national law, any vessel, normally commissioned for inland navigation exclusively, falls under the regime of Part XIII if it conducted operations within the ambit of the same.

In contrast to other platforms, such as buoys, floats or installations, research vessels can be used in purposeful navigation. They are operated by a crew to allow absolute standstill and planned relocations in time and space. The most prominent consequence is that the research vessel must comply with all rules and standards pertaining to navigation and manning. These are principally the I.M.O. Conventions, either directly<sup>29</sup> or indirectly through the 1982 LOS Convention which refers in various Articles to “gen-

<sup>28</sup>See Núñez-Müller, Marco, *Die Staatszugehörigkeit von Handelsschiffen im Völkerrecht: Voraussetzungen und Rechtsfolgen der Flaggenverleihung unter besonderer Berücksichtigung der sog. Billigflaggen*, Berlin, 1994, Schriften zum Völkerrecht 113, p. 69.

<sup>29</sup>The SOLAS Convention (as in n. 18 on page 124 is applicable to all ships “entitled to fly a flag of States the Governments of which are Contracting Governments” (Article II) and “engaged in international voyages” (Annex, Regulation 1(a)); ‘International voyage’ is defined by Regulation 2(d) as “a voyage from a country to which the present Convention applies to a port outside such country, or conversely.” The SOLAS Convention distinguishes between *passenger ships* which, according to Regulation 2(f), are ships carrying more than twelve passengers, and *cargo ships* which, according to Regulation 2(g), are ships that are not passenger ships. Regulation 2(i) defines *fishing vessel* as a “vessel used for catching fish, whales, seals, walrus or other living resources of the sea.” Research vessels, inasmuch as they are different from passenger vessels, freighters and tankers, are exempt from certain specifications under the Code of Safety (as in n. 24 on the preceding page) recommending design criteria, construction standards and other safety measures for special purpose ships so as to exempt them from security codes for passenger vessels in view of the scientific personnel aboard a research vessel; in accordance with the Code of Safety a special certificate should be issued in addition to the certificates required by the SOLAS Convention. Generally, research vessels are in many instances exempt from such international conventions on the basis of their status as government ships operated for non-commercial purposes, see *Brown/Gaskell* (as in n. 6 on page 122), p. 109, with respect to other international conventions.

erally accepted rules and standards”<sup>30</sup>.

To the extent that the I.M.O. rules and standards for design, construction, manning and equipment are generally accepted, vessels engaged in research operations within the jurisdiction of a foreign State may face enforcement of such rules and standards under the 1982 LOS Convention. Inasmuch as the SOLAS Convention<sup>31</sup>, the Loadlines Convention<sup>32</sup> and the STCW Convention<sup>33</sup> apply to ships, they are principally applicable to research vessels also.

Research vessels are not foreseen as a separate category under the SOLAS Convention; the SOLAS Convention only distinguishes between passenger ships and cargo ships<sup>34</sup>. They would principally qualify as passenger ships where more than twelve scientists are on board: the SOLAS Convention only distinguishes between crew members and passengers rendering every individual not belonging to the crew automatically a passenger. The Code

<sup>30</sup>See n. 16 on page 124. The ILO Convention No. 147 of 1976 supplements in Article 2(e) the obligation under the SOLAS Convention with a minimum standard for merchant ships, namely, that each contracting State must “ensure that seafarers employed on ships registered in its territory are properly qualified or trained for the duties for which they are engaged.” See generally *Lindemann, Dierk, Das Übereinkommen Nr. 147 der Internationalen Arbeitsorganisation vom 29. Oktober 1976 über Mindestnormen auf Handelsschiffen*, Baden-Baden, 1983, pp.54–68; note, however, that the ILO Convention No. 147 is generally not applicable to research vessels as these do not serve commercial purposes.

<sup>31</sup>See n. 29 on page 127.

<sup>32</sup>As in n. 22 on page 125; it supplements the SOLAS Convention, as it sets forth limitations on the draught to which a ship may be loaded as a safety measure. These limits are given in the form of free-boards, which constitute external weather- and watertight integrity to ensure adequate stability and avoid excessive stress on the ship’s hull as a result of overloading. It applies by virtue of Article 4(1) to

- (a) ships registered in countries Governments of which are Contracting Governments;
- (c) unregistered ships flying the flag of a State, the Government of which is a Contracting Government

and which—Article 4(2)—engage in international voyages; exempted are according to Article 5 ships of war, ships of less than 24 metres or less than 150 gross tons and fishing vessels.

<sup>33</sup>The *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers*, adopted 7 July 1978, entry into force 28 April 1984 (1995 amendments which completely revised the Convention entered into force on 1 February 1997, additional amendments were made in 1997 and 1998 and entered into force 1 January 1999 and 1 January 2003 respectively), I.M.O. London 2001 [hereinafter: STCW Convention], provides certain requirements for the form of manning, namely, the standards of qualification of the crew and the master and the certificates documenting the appropriate training. It applies by virtue of Article III to “seafarers serving on board seagoing ships entitled to fly the flag of a Party”; exempted are those serving on board of “warships, naval auxiliaries or other ships owned or operated by a State and engaged only on governmental non-commercial service” and fishing vessels.

<sup>34</sup>See n. 29 on page 127; sub-categories, such as ‘tanker’, have been introduced for cargo ships where specific safety measures were warranted, yet these are of no significance for the present analysis.

of Safety exempts vessels for special purposes from the SOLAS Convention on the premise that not all “passengers” require the safety measures provided thereunder<sup>35</sup> and provides an international standard of safety itself. Application of the Code is based upon the presence of special personnel, which is defined as “persons who are specially needed for the particular operational duties of the ship and are in addition to those persons required for the normal navigation, engineering and maintenance of the ship”. On a research cruise these persons would be the scientists and any personnel specifically entrusted with tasks directly related to the research projects. In contrast, crew are those persons who are “carried on board the ship to provide navigation and maintenance of the ship, its machinery, systems, and arrangements essential for propulsion and safe navigation or to provide services for other persons on board.” It must be noted that the Code of Safety only applies where the ship carries more than 12 special personnel (including passengers as defined under the SOLAS Convention). The Code of Safety does not apply where the crew also undertakes the research related tasks. In such an instance the ship would qualify either as cargo or passenger ship under the SOLAS Convention.

Ships operated by the military are regularly exempt from the scope of application of these instruments; usually the same applies to government ships operated for non-commercial purposes<sup>36</sup> in which cases, however, States are called upon to apply similar standards.

### *Ship Categories in the 1982 LOS Convention*

The 1982 LOS Convention further defines the term ‘ship’ by a number of characterisations: thus it speaks of “fishing vessels” in Articles 42(1)(c), 62(4)(a), and distinguishes in Part II, Section 3 between “all ships”, “merchant ships and government ships operated for commercial purposes” and “warships and other government ships operated for non-commercial purposes”<sup>37</sup>. Finally in Article 248(d), the 1982 LOS Convention mentions “research vessels” as another type of vessel.

### *Warships*

The term ‘warship’ is defined in Article 29 of the 1982 LOS Convention as

a ship belonging to the armed forces of a State bearing the external marks distinguishing such ships of its nationality, under the command

<sup>35</sup>The Preamble of the Code of Safety provides:

Because special personnel are expected to be able bodied with a fair knowledge of the layout of the ship and have received some training in safety procedures and the handling of the ship’s safety equipment, the special purpose ships on which they are carried need not be considered or treated as passenger ships.

<sup>36</sup>See *Brown/Gaskell* (as in n. 6 on page 122), p. 109.

<sup>37</sup>These occur also in Articles 42(5), 95, 96, 236, 298(1)(b) of the 1982 LOS Convention.

of an officer duly commissioned by the government of the State and whose name appears in the appropriate service list or its equivalent, and manned by a crew which is under regular armed forces discipline.

It is important to note that the term warship is not defined by the design of the ship but rather by its commission. Thus, research vessels belonging to the armed forces could be regarded equally as warships like, for example, a frigate or aircraft carrier. Part XIII of the 1982 LOS Convention takes note of this fact in that it only exempts research for non-peaceful purposes. Marine scientific research may accordingly be—and has in the past to a large extent been—conducted by military ships. The navy forces usually maintain their own research programmes for specific military related areas of marine scientific research. In addition, the U.S. Navy, for example, entrusts civilian institutions with research of a more general nature.

#### *Fishing Vessels*

It would appear that ‘fishing vessel’ includes any kind of vessel used in fishing. Yet, the question of what constitutes a fishing vessel cannot easily be disposed of: fisheries research may be conducted from fishing vessels, it may also be conducted by vessels specifically dedicated to fisheries research or generally to marine scientific research. Then the question occurs if such vessels would qualify as fishing vessel or research vessel. Equally, the question may arise whether regular fishing vessels would qualify as research vessels if in the process of fishing activities measurements or observations for scientific purposes are taken.

A similar question occurred in the *M/V “Saiga” Case*. There, a bunkering vessel was detained by the coastal State because it had allegedly violated coastal state laws. In the course of the proceedings the question was raised whether, as a supporting ship of fishing operations, the *M/V Saiga* could legally be detained for bunkering a fishing vessel on the premise that this activity constituted an aspect of fishing and was in violation of the coastal State’s regulations.<sup>38</sup> The crucial point is the distinction between the design

<sup>38</sup>See *M/V “Saiga” Case (Saint Vincent and the Grenadines v Guinea)*, I.T.L.O.S., judgement of 4 December 1997, in para. 56 the Tribunal observed:

[If bunkering of fishing vessels were] to be considered as an activity the regulation of which falls within the scope of the exercise by the coastal State of its ‘sovereign rights to explore, exploit, conserve and manage the living resources in the exclusive economic zone’,... violation of a coastal State’s rules concerning such bunkering would amount to a violation of the laws and regulations adopted for the regulation of fisheries and other activities concerning living resources in the exclusive economic zone.

The point was not further addressed as the Tribunal deemed it sufficient to note that a violation of Article 73 was alleged, para. 59. In the *M/V “Saiga” (No. 2) Case (Saint Vincent and the Grenadines v Guinea)*, I.T.L.O.S., judgement of 1 July 1999, the point was not raised in the judgement as it was of no relevance, para. 138; merely Guinea in its Counter-Memorial took the question up, para. 104; yet, in para. 106 it observed: “Although the bunkering activities are ancillary measures of a considerable importance

of the vessel and the activity conducted by it. It is submitted that if the type of vessel was defined by features of its construction, clearly indicating the type of activity it was intended for, the question could easily be answered in the negative. Usually, bunkering would appear not to qualify as a fishing activity. And it is rather doubtful that the mere fact that the M/V *Saiga* supplied fishing vessels with gas oil suffices to render it a fishing vessel for the purpose of the dispute. A supply vessel in a fishing fleet may, as a consequence of its status as part of the fleet, fall under the obligation to comply with the coastal state regulations applying to the *fishing* vessels of the fleet in the exercise of their fishing activity. But the fact that the supply vessel is part of the fleet does not render it a fishing vessel. Bunkering is not an activity that is related to the catching of fish. Even though it may be necessary for a fishing vessel to renew its bunkers from time to time to be able to conduct its activities in the first place, the bunkering as such is not a corollary of the fishing activities but only of the navigation of the vessel. Since navigation is common to all ships it cannot be a distinguishing factor between fishing and non-fishing vessels. Conversely, bunkering cannot serve as a basis to associate a bunkering vessel to fishing activities. In addition, the construction of a bunkering and a fishing vessel are completely different as the latter requires the technical arrangements for the fishing gear. In this example it is therefore fairly easy to draw a line between a fishing vessel and non-fishing vessels.

The line between a mere fishing vessel and a fisheries research vessel, in contrast, is much more difficult to draw: the design of the two different vessels would be essentially the same, at least where the same species is “targeted”. Even the activity as such would be the same where fish must be caught for research purposes. The difference occurs in the objective of the activity: A fishing vessel catches fish for economic reasons, namely, to sell the catch to earn a living; the fisheries research vessel catches fish in order to increase (scientific) knowledge. The fish as such has no economic value for the latter; the conclusions, which may be drawn from a combination of various factors, constitute the reason for the activity. The differentiation between fishing and fisheries research is essentially the same as between marine scientific research and exploration (and exploitation). This difference plays a role when it comes to the distinction between regular marine scientific research and marine scientific research *directly* significant for the exploitation of living resources in the exclusive economic zone.<sup>39</sup>

Another question is the differentiation between fisheries research and (biological) marine scientific research. The two pursue in principle the same

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for the fishing vessels concerned, they constitute neither fishing nor conservation or management activities with respect to the living resources themselves.” Judgement and dissenting opinions for decisions of the Tribunal are available at [http://www.itlos.org/start2\\_en.html](http://www.itlos.org/start2_en.html) – visited on 31 January 2005.

<sup>39</sup>See section 8.

activities. They may be distinguished on the basis that the former is conducted with a view to management decisions while the latter has no immediate application beyond the mere scientific objective. Furthermore fisheries research is more concerned with the technicalities of fishing, i. e., it deals, for example, with the improvement of fishing gear and techniques. It should be borne in mind that marine scientific research into the biological aspects of the oceans will more often than not generate useful information for fisheries management also, and even information on climate change from large scale oceanographic research projects might factor in such decisions.<sup>40</sup> Conversely, input for scientific research may be based on observations of fishermen themselves.<sup>41</sup>

### *Merchant Ships*

Part II, Section 3(b) of the 1982 LOS Convention distinguishes merchant vessels and government ships operated for commercial purposes from other ships. Merchant ships are generally those, which are employed for commercial purposes, i. e., in trade and transport of cargo and passengers against remuneration; they include ships that are not necessarily engaged in transport on the sea but provide services in shipping, such as salvaging, repairing, or towing.<sup>42</sup> Where ships operated by the government engage in such activities<sup>43</sup> they are treated like regular merchant vessels under the 1982 LOS Convention.

Marine scientific research does usually not have a commercial connotation as such; indeed, the differentiation between exploration and scientific research in the 1982 LOS Convention would appear to exclude research for commercial purposes from the application of Part XIII. However, research can be conducted from commercially owned ships without being itself necessarily geared to economic ends. It is even conceivable that the ship may be operated by a private entity that essentially pursues the goal of economic revenue, for example, by chartering out research capacity to scientists or scientific institutions. Thus, Russian research vessels, after having been decommissioned and consequently, or for other reasons, lacking official funding, offer open slots to foreign scientists in order to generate the means for service and maintenance. Also, the term ‘merchant ship’ as used in the 1982 LOS Convention must not be interpreted to exclude private vessels operated for non-commercial purposes. The category ‘merchant ships’ must be understood as a juxtaposition to government vessels, operated both for commercial *and* non-commercial purposes. Research vessels not operated by the government would thus fall under the ‘merchant ship’ category. It must be borne in mind, though, that Section 3 refers to a specific situation, namely,

<sup>40</sup> *Nellen, Walter, Klima und Fischerei*, in DGM-Mitteilungen [1995], Nr. 4, p. 12.

<sup>41</sup> *Ibid.*, p. 14.

<sup>42</sup> See *Beckert/Breuer* (as in n. 4 on page 122), pp. 157f., pointing at a number of international instruments that further define sub-categories of merchant ships.

<sup>43</sup> See section 3.



ships in innocent passage, where a further differentiation is not necessarily warranted.

### *Government Vessels*

Read together with the heading of Section 3(c) there are three types of government vessels: those used for commercial purposes, warships, and other government ships. The 1982 LOS Convention contains no definition of government ships, except for warships. The term 'government' can generally be defined as to include all public functions of state. It is not limited to the actual (internationally recognised) government of a State but includes all forms of state administration, namely, the total of all levels of government, like central and local government or state governments in federal countries, responsible for any sphere of public administration. The term 'government' can therefore be equated to the term (public) 'administration', and be viewed synonymous to 'public' as opposed to 'private'.<sup>44</sup>

Government ships are normally those used or operated—but not necessarily owned—by the State in the exercise of administrative functions, such as police, customs, surveillance, fisheries control and supply operations.<sup>45</sup> In these cases, the ships gain government status by virtue of their function, namely, to exercise immediate state power or control; they predominantly serve to assert the sovereignty or jurisdiction of the State. This is clear for police and customs operations; fisheries control is akin to police functions and asserts the sovereign rights of the coastal State with respect to the living resources in its waters; supply operations fall within the sphere of public administration where they serve a special purpose of national interest, for example, the supply of resources and services to an island whose inhabitants are not sufficiently self sustained. Government status may be lent to ships on a case by case basis where the service or operation in question serves specific state interests.

Closely linked to the status of government ship is the concept of state immunity: to the extent that a ship is operated by the government for government functions it represents state functions and is therefore equated to the State as a subject of international law. Conversely, where a government ship is engaged in commercial activities—which are not state functions—the ship is treated as regular merchant ship under the 1982 LOS Convention (and customary international law<sup>46</sup>). Whether or not a ship operated by the government enjoys state immunity, depends essentially on its designation under national law. The status of the owner of the vessel gives no hint as to the ship's government or private status. In principle, ships in government service can be operated by a government or a private entity. Where such a

<sup>44</sup>A government ship and a public vessel are accordingly the same.

<sup>45</sup>See *Lagoni*, Merchant Ships (as in n. 5 on page 122), p.346; *Beckert/Breuer* (as in n. 4 on page 122), pp.158f., differentiate between war, police, or customs ships and ships for other (administrative) purposes.

<sup>46</sup>See section 3.

private agency is bestowed with government functions and the vessel so designated the ship must be viewed as a government ship, since the State itself determines whether the status of a ship is public or not.<sup>47</sup> The history of the distinction between commercial and non-commercial government ships, however, suggests that there is a limit to the purposes the State can dedicate government ships for.<sup>48</sup>

### *Research Vessels*

From the preceding paragraphs it derives that research vessels do not constitute a separate category of ships within the 1982 LOS Convention. This effectively means that they are either public ships falling under the category 'other government ships operated for non-commercial purposes' or private ships falling under the category 'merchant ships'. In the latter case the research vessel is subject to the same rules like merchant ships except where international agreements stipulate more specific rules.<sup>49</sup> Where the application of general rules and requirements is too restrictive, international agreements may stipulate exceptions.<sup>50</sup> Where the research vessel has the status of a public ship it is exempt by virtue of its status to most of the international agreements. These regularly exempt public ships from their scope of application, in which case the parties to the relevant instrument are called upon to secure equivalent standards for public vessels under their national legislation. Since international competition is not a factor in securing safety standards for public vessels, it can be assumed that flag States generally extend the application of the international rules and standards to their public vessels as is practicable.

'Research vessel' constitutes a distinct category only in the context of Part XIII of the 1982 LOS Convention where the term is expressly mentioned in Article 248(d) with respect to information on the expected date of first appearance and final departure; Article 249(1)(a) with respect to the right of participation in the research project aboard the vessel; and Article 255 with respect to access to ports and assistance. Article 248(d) is expression of the special regime within which the research vessel operates. The link between a research vessel and its flag State is by virtue of its dedication much closer than between a regular (merchant) vessel and its flag State: the research vessel's privileges are conditioned on the compliance of the flag State with the provisions of Part XIII. This is expressly stated in Arti-

<sup>47</sup>See *Lagoni*, Merchant Ships (as in n. 5 on page 122), p. 346.

<sup>48</sup>See *Brownlie, Ian*, *Principles of public international law*, 5th edition. Oxford, 2001, pp. 330–339; similarly, *Beckert/Breuer* (as in n. 4 on page 122), p. 159; *Thommen, Thamarapallil Kochu*, *Legal status of government merchant ships in international law*, The Hague, 1962, pp. 20–23.

<sup>49</sup>See *Lagoni*, Merchant Ships (as in n. 5 on page 122), p. 347; *Beckert/Breuer* (as in n. 4 on page 122), p. 160; see also section 9.

<sup>50</sup>Code of Safety (as in n. 24 on page 126); IMO Res. A.749(18) Code on Intact Stability for All Types of Ships Covered by IMO Instruments (amended by Res. MSC75(69)), entry into force 4 November 1993 (14 May 1998 for amendment).

cle 246(5)(d) subjugating coastal State's consent to the researching State's previous behaviour. Similarly, Article 249(1)(a) is evidence of a restriction upon the vessels freedom by virtue of its dedication: regular vessels may have to accept the boarding by coastal state officials in exceptional circumstances, research vessels must accept representatives of the coastal State as a condition of their presence in the waters under the national jurisdiction of the coastal State. While Articles 248 and 249 of the 1982 LOS Convention thus restrict the freedom of the research vessel in comparison to other ships, Article 255 seems to alleviate that strain by affording special treatment.<sup>51</sup>

Applied to the experiment mentioned earlier<sup>52</sup> one can conclude: The 1982 LOS Convention assigns certain rights and restrictions to vessels. If the vessel in the mentioned experiment would not qualify as such, the regime of (transit/innocent) passage, for example, would not apply. As a mere structure it may be detained by the authorities or removed as debris interfering with ship traffic.

### *Installations*

Generally speaking, installations for purposes of marine scientific research are by inference all those platforms that remain on or below the surface and do not qualify as ships.

#### *Installations in the 1982 LOS Convention*

The 1982 LOS Convention lists in Article 60(1) artificial islands, structures and installations and confers "exclusive jurisdiction" over them to the coastal State. Article 147 refers to "installations" only, Article 194(3)(c) and (d) refer to "installations and devices", Article 209(2) refers to "installations, structures and devices", and, finally, Articles 258–262 refer to "installations and equipment". Inasmuch as all of these are solid structures they could all serve as platforms for scientific research. The difference between the terms used in the 1982 LOS Convention is not clear as the Convention provides no definition. Only by inference one can assume that all of these terms are different from natural islands and therefore have, for example, no maritime zones around them. *Nordquist et al.* note that the term 'installation' was understood by the Drafting Committee of the Third U.N. Conference on the Law of the Sea as to include artificial islands and structures.<sup>53</sup> Artificial are those structures, which were made by humans. The dichotomy of artificial

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<sup>51</sup>See section 9.

<sup>52</sup>See page 78.

<sup>53</sup>*Nordquist, Myron H. et al., editors, United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 1 to 85, Annexes I and II, Final Act, Annex II, Volume II, Dordrecht, 1993, p.584.

and natural seems to define the line sufficiently well.<sup>54</sup> Whether the platform is built on shore or at sea is of no relevance in the context of the 1982 LOS Convention and has no bearing for the regime of marine scientific research. The 1982 LOS Convention uses the word artificial only in the context of islands; the other objects, installations and structures, are artificial in the sense that they are man-made.

It derives, *inclusio unius est exclusio alterius*, from the 1982 LOS Convention that artificial islands, installations and structures are neither “normally used for the loading, unloading and anchoring of ships”; nor “a naturally formed area of land which is surrounded by and above water at low tide but submerged at high tide”; nor “a *naturally* formed area of land, surrounded by water, which is above water at high tide [emphasis added]”; nor “rocks which cannot sustain human habitation or economic life of their own”.<sup>55</sup> The Convention mirrors thus principally the end result of a discussion that started in 1893 in the Behring Sea Arbitration and had revolved around the question whether man made structures could be regarded as extension of the land territory.<sup>56</sup> The question that remains unanswered today, whether an artificially expanded or altered island can be considered an island under Article 121 of the 1982 LOS Convention, seems not to be relevant in the context of marine scientific research.<sup>57</sup> Generally, it suffices to say in the tradition of *Gidel*<sup>58</sup>, that the legal categorisation should be based on the categorisation of the foundation; and conversely, that a superstructure cannot change the legal category of its basis. Accordingly, low-tide elevations remain low-tide elevations even if they constitute the natural basis of a superstructure that is above the water line at high water.

The definition of structures and installations would seem to be of greater significance for marine science since their potential scope of application is

<sup>54</sup>Artificial islands and installations have two characteristics which distinguish them from natural islands: they are usually man-made, i.e., artificial in origin, and they are permanently or transitionally fixed to the sea floor which determines their geographic location. See *Lagoni, Rainer, Künstliche Inseln und Anlagen im Meer*, in *Jahrbuch für Internationales Recht* 18 [1975], pp.243f.

<sup>55</sup>See the respective Articles in the 1982 LOS Convention: 12 (roadsteads), 13(1) (low-tide elevation), 121(1) and (3) (regime of islands).

<sup>56</sup>See *Fitzpatrick, Cordula, Künstliche Inseln und Anlagen auf See: der völkerrechtliche Rahmen für die Errichtung und den Betrieb künstlicher Inseln und Anlagen*, Frankfurt am Main, 1998, *Schriften zum internationalen und öffentlichen Recht* 21, pp.36f., for an overview of the discussion leading up to Article 10 of the 1958 Geneva Territorial Sea Convention and Article 5(4) of the Continental Shelf Convention and eventually to the cited articles in the 1982 LOS Convention.

<sup>57</sup>See *Ibid.*, p.39, suggesting an answer to the question in connection with “ocean cities” on the basis of the ratio of natural to artificial proportions; in marine scientific research the relocation of laboratories to the sea has not been ventilated to the same extent. Quite obviously an “ocean city” can be used in various ways, among which scientific research may be one of many; yet, as an exclusively scientific institution, such a structure has so far not been envisaged.

<sup>58</sup>See *Gidel, Gilbert, Le Droit International Public de la Mer: le Temps de Paix*, La Mer Territoriale et la Zone Contigue, Volume III, Paris, 1934, p.677.

wider. Article 246(5)(c) of the 1982 LOS Convention refers directly to Article 60(1) subjecting all artificial islands, installations and structures specifically to the consent of the coastal State. Curiously, this is the only provision, which mentions artificial islands and structures. Other provisions in Part XIII refer only to (research) installations and equipment<sup>59</sup> which raises the question how structures, installations and equipment are different from each other.

*Nordquist et al.* note that Article 258 does not merely repeat Articles 60 and 147 but is wider in scope as it embraces all provisions on marine scientific research contained in the 1982 LOS Convention. However, they conclude that Article 258 provides a broad linkage between all those Articles.<sup>60</sup> According to the history of this Article the phrase 'any type' must be read as to include mobile and fixed installations; the phrase 'any area' denotes all conceivable locations on and below the water surface.<sup>61</sup>

Also, from Article 258 of the 1982 LOS Convention it derives that the exact purpose of the installation or equipment does not matter as Article 258 refers to scientific research in general.<sup>62</sup> Thus, Part XIII, Section 4 of the 1982 LOS Convention applies not only to installations and equipment used in *marine* scientific research operations but those used in *any* scientific research conducted on the oceans. This is relevant in the context of the above mentioned experiment<sup>63</sup> as it imports a number of important conditions that must be observed when sending the sailing vessel on its voyage: since 'manning' is a constitutive element of a vessel, the ship in the experiment does not qualify as such. This leaves, in the context of marine scientific research, installation or equipment as possible options. Based on the definition above<sup>64</sup> one must conclude that an unmanned vessel is an installation in the sense of Article 258. Accordingly, Part XIII, Section 4 applies and makes it an obligation, to obtain coastal state consent for the deployment of the platform.<sup>65</sup>

#### *Equipment, Installation or Structure*

In Section 4 of Part XIII the term installation is used in juxtaposition to equipment. As neither is defined, one must resort to the ordinary meaning. The word equipment usually denotes items needed for a particular purpose;

<sup>59</sup>Articles 249(a), 249(g), 258–262 of the 1982 LOS Convention.

<sup>60</sup>*Nordquist, Myron H./Rosenne, Shabtai/Yankov, Alexander*, editors, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 192 to 278, Final Act, Annex VI, Volume IV, Dordrecht, 1991, p.614.

<sup>61</sup>See the submissions during the negotiations reprinted in *Ibid.*, pp.615f.

<sup>62</sup>See *Soons, Alfred H. A.*, *Marine Scientific Research and the Law of the Sea*, Deventer, 1982, pp.230f.

<sup>63</sup>See page 78.

<sup>64</sup>See section 3.

<sup>65</sup>In addition, the installation must bear identification markings and must not interfere with shipping in accordance with Article 262 and Article 261 respectively.

installation, in contrast, would denote a facility or a grouping of facilities, located in the same vicinity, for a particular function or purpose. The difference between installations and equipment would therefore appear to consist of a time and size element: while installations are intended to remain in place for an extended period of time or even permanent, equipment has the connotation of being quickly deployed and removed in the course of a single experiment; an installation may consist of a number of various parts with a variety of functions, while equipment is only intended for one specific objective. In addition, the term 'platform' as used in the present analysis would not include equipment since 'platform' denotes the carrying structure, whereas 'equipment' would denote a thing or things which are to be carried by the structure. The differentiation is not of great significance, as both terms occur together and objects qualifying as either will infer the same legal consequences. 'Structures', in contrast, denotes an arrangement of and relations between the parts of something complex. The term may thus be considered synonymous to installation; again, the difference would appear to be of little significance.

Whether or not 'installation' includes artificial islands envisaged in Article 246(5)(c) of the 1982 LOS Convention can be answered in the affirmative. The difference in language, bearing in mind the observation of the Draft Committee<sup>66</sup>, has no significance in the context of marine scientific research. This conclusion is, *prima facie*, supported by Article 259, which expressly exempts installations and equipment from the status of islands.

#### *Free Floating and Fixed*

From a legal point of view a distinction should be made between fixed and free floating installations or equipment. While this differentiation had been introduced by some countries during the negotiations,<sup>67</sup> it was not included in the final text. Yet, by the word 'any' Article 258 of the 1982 LOS Convention still includes all kinds of installations. A differentiation appears to be necessary nevertheless as the two types raise profoundly different questions of law, especially as regards the consent of the coastal State.

For the coastal State fixed installations pose rather straightforward questions of permission in terms of shipping or other uses at the relevant location. Free floating installations, in contrast, have no precisely defined location as they drift with the surrounding water—the patterns of global or regional currents can, to the extent that they are sufficiently predictable, provide a basis for the estimation of a likely position. In order to locate an exact position usually auxiliary means, such as radar, sonar, or other devices for remote detection and triangulation (e. g., General Positioning Systems), must be employed. In terms of coastal state consent such installations are

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<sup>66</sup>See page 135.

<sup>67</sup>See *Nordquist/Rosenme/Yankov* (as in n. 60 on the preceding page), p. 616.

much more critical: interferences with other uses can only be predicted on the basis of probability; and removal is subject to remote detection.

Finally, it must be noted that installations, where pushed or towed by a vessel, may be assimilated to the ship, as tows and ships are treated as equal under public international law.<sup>68</sup> This legal assumption holds true where the ship actually tows the installation through the water. In contrast, where, for example, a drifter or buoy is tethered to the mother-ship and the purpose of the tether is to exchange data between the ship and the installation, the combination of ship and installation cannot be considered a tow. It constitutes a particular configuration for research purposes lacking the crucial element of a tow, namely, to move the installation from one place to another. While this as such may be the case with a buoy or drifter, too, the principal cause for the connection to the ship is the exchange of (scientific) data; relocation in space comes as a corollary to the scientific purpose of the measurements but not as a principal concern. In such a case one should treat the (small) platform a part of the mother-ship on the basis that the tether constitutes a connection that is sufficiently close as to regard the ship and the buoy as one single entity.

*'Installations' in other Instruments*

Article 1(l) of the 1992 OSPAR Convention<sup>69</sup> provides the following definition:

“Offshore installation” means any man-made structure, plant or vessel or parts thereof, whether floating or fixed to the sea-bed, placed within the maritime area for the purpose of offshore activities.

At first sight it strikes odd that the definition contains the word vessel. However, vessel, as becomes apparent when looked at Article 1(n)<sup>70</sup> denotes any hollow structure. The relevant characteristic is the fact that it is man-made, yet not a regular vessel or aircraft. Scientific installations as defined above would accordingly qualify under the definition of ‘offshore installation’ in

<sup>68</sup>See *Lagoni*, Merchant Ships (as in n. 5 on page 122), p. 346; *Hasselmann* (as in n. 4 on page 122), p. 64, pointing out that according to most conventions propulsion and transport are not determining factors.

<sup>69</sup>*Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)*, adopted 22 September 1992, entry into force 25 March 1998, Official Journal of the EC 1998 L 104/2 [hereinafter: OSPAR Convention], the text can be accessed at (<http://www.ospar.org>) – visited on 31 January 2005.

<sup>70</sup>Article 1(n):

“Vessels or aircraft” means waterborne or airborne craft of any type whatsoever, their parts and other fittings. This expression includes air-cushion craft, floating craft whether self-propelled or not, and other man-made structures in the maritime area and their equipment, but excludes offshore installations and offshore pipelines.

the OSPAR Convention. Consequently, within the geographical scope of the OSPAR Convention environmental stipulations, namely, with respect to removal,<sup>71</sup> would have to be observed. Article 2(3) of the Helsinki Convention includes installations in the definition of ships by the criterion ‘vessel’.<sup>72</sup> Again, the word ‘vessel’ would denote hollow structure. And for the purposes of the Helsinki Convention, namely, the ecological restoration of the Baltic Sea, a differentiation between installations and ships seems not to be necessary. The pollution from any platform, used in a broad sense, is targeted.

The definitions are to be narrowly applied in accordance with the objectives of the respective instrument and of little avail in the present context. Yet, it is noteworthy that the two conventions apply by virtue of their broad definitions to every platform defined as such in the present analysis.

### *Distinction between Ships and Installations*

In conclusion, it is submitted that the distinction between a ship and an installation can be best ascertained by the ship’s capacity of active propulsion or navigation.<sup>73</sup> The question may arise whether a permanently moored ship ceases to be a ship and becomes an installation. The answer would depend on the ships capacity to navigate despite the mooring, i. e., if the mooring can be removed without imminent loss of the vessel, the ship will remain a ship even without actually navigating.

The manning must be seen as a second prerequisite for a ship under the 1982 LOS Convention. While a ship may generally serve the purpose of transportation without manning like, for example, a light vessel, barge or a remote controlled submersible,<sup>74</sup> master and crew are principally required or presupposed by international law, i. e., the STCW Convention<sup>75</sup>, the Col-

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<sup>71</sup>See section 5.

<sup>72</sup>Article 2(3):

“Ship” means a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft and fixed or floating platforms.

<sup>73</sup>Similarly, *Papadakis, Nikos, The International Legal Regime of Artificial Islands*, Leyden, 1977, p. 100. While seaglidiers, see page 46, have in principle the capacity to follow a certain course, their method of propulsion is passive, i. e., forward movement as a function of a change in relation to the environment. Also, they are to a greater extent subject to and sometimes wholly dependent on influences from the environment, such as currents. Ocean going ships, in contrast, derive their forward thrust from the consumption of energy which enables them to follow a course independent from currents.

<sup>74</sup>See *Brown/Gaskell* (as in n. 6 on page 122), pp. 84–92, identifying means of propulsion, the area of work and the object of work as the principal criteria for establishing whether or not a chattel is a ship.

<sup>75</sup>STCW Convention (as in n. 33 on page 128).



lision Regulations<sup>76</sup> and the Loadlines Convention<sup>77</sup>, to secure the safety of navigation.<sup>78</sup> Thus, it seems that beyond a certain size, there has never really arisen the question whether a ship may be sailed by remote control.

The 1982 LOS Convention does not mention manning in the context of installations and structures, neither does it mention anything about the “manning” of artificial islands. Only by inference one could assume that artificial islands, like natural islands, must sustain human inhabitation which would require the presence of humans or some form of economic life on such islands. Installations, on the other hand, may—at least temporarily—or may not carry humans for direct observations or control.<sup>79</sup> Manning therefore has no bearing for the distinction in the 1982 Convention between research vessels, on the one hand, and installations and equipment, on the other.

### *Aircraft as Research Platform*

Generally speaking the definition of aircraft and what vehicles may qualify as such is left to domestic law,<sup>80</sup> which does not provide a clear picture.<sup>81</sup> As the first generally accepted legal definition of the term ‘aircraft’ one may consider the one contained in Annex 7 of the Chicago Convention: “any machine that can derive support in the atmosphere from the reactions of the air.”<sup>82</sup> Later the words “other than the reactions of the air against the earth’s surface” were added to exclude hovercrafts from the definition of aircraft.<sup>83</sup>

<sup>76</sup>As in n. 4 on page 122; Rules 5, 6 and 7 require or presuppose the presence of human beings.

<sup>77</sup>As in n. 22 on page 125.

<sup>78</sup>See *Brown/Gaskell* (as in n. 6 on page 122), pp. 106–136, for an analysis of the requirements of international conventions in terms of manning and their applicability to A.U.V. See also *Showalter* (as in n. 6 on page 122), p. 81.

<sup>79</sup>Note, that the definition of ODAS also includes manned platforms, see *UNESCO and IMCO, Safety Provisions of Ocean Data Acquisition Systems, Aids and Devices (ODAS)*, IMCO London 1972, p. 10.

<sup>80</sup>See *Schwenk, Walter, Handbuch des Luftverkehrsrechts*, 2nd edition. Köln, 1996, p. 234.

<sup>81</sup>See *Dauses, Manfred, Die Begriffbestimmung von Luftfahrzeug und Raumfahrzeug im Völkerrecht und innerstaatlichem Recht*, in *Z.L.W.* 21 [1972], pp. 75–78.

<sup>82</sup>*Convention on International Civil Aviation*, adopted 7 December 1944, entry into force 4 April 1947, 15 U.N.T.S. 295 [hereinafter: Chicago Convention]. The Chicago Convention is the successor to the Convention Portant Réglementation de la Navigation Aérienne (Convention relating to the Regulation of Aerial Navigation), Paris, 13 October 1919, 11 L.N.T.S. 173, which used the same definition of aircraft.

<sup>83</sup>See *Diederiks-Verschoor, Isabella H. Philepina, An introduction to air law*, 5th edition. Deventer, 1993, p. 5. Aircraft can be further subdivided in *aerostatic* and *aerodynamic* craft, see *Dauses* (as in n. 81), p. 84. The first are characterised by the fact that their specific weight is lighter than the surrounding air. Balloons, for example, take advantage of warmer air ascending in colder air or less dense gases rising in denser gases. Again, this means utilising a reaction of the air for support as the rise and fall of a balloon depends on the temperature of the surrounding air. The latter type of aircraft require propulsion for a vertical lift. They operate also on the principle of air density, namely, the difference in air density below and above the wing.

The manning plays no role for the definition of aircraft as such.<sup>84</sup> On the basis of this definition aeroplanes, helicopters, airships, gliders, kites and balloons are considered aircraft although some of these may be exempted from regulation in national legislation<sup>85</sup> based on the fact that they are insignificant to the safety of aviation. The platforms generally used for airborne remote sensing in marine scientific research qualify accordingly as aircraft under the Chicago Convention.<sup>86</sup>

### *Spacecraft*

There is no generally accepted definition of the term spacecraft in international law<sup>87</sup>; and unfortunately, national legislation does not provide a more precise definition of the term either.<sup>88</sup> Article VII OST uses the term outer space object, yet no definition is provided. In Article XII OST reference is made to “stations, installations, equipment and space vehicles” which, by inference, must be regarded as space objects in accordance with Article VII given that they were somehow transported from the Earth’s surface into space. The 1974 Registration Convention in Article I(b) provides: “The term ‘space object’ includes component parts of a space object as well as its launch vehicle and parts thereof” which, due to its circular definition, is of little avail either.

Definitions on the basis of the nature of the craft or its intended purpose are not very helpful as they import the discussion about the delimitation of

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<sup>84</sup>Special consideration is warranted for unmanned aircraft as these constitute a potential hazard to general aviation. Article 8 of the Chicago Convention contains a specific provision for pilot-less aircraft whereby the use of these are generally subject to prior permission. When employing pilot-less aircraft due regard must be had to this requirement wherever the entry into a State’s airspace seems likely. This must be taken into account if drones, i. e., a craft designed to be remotely controlled during operations in the air, should be employed in research activities wherever the entry into a State’s airspace seems likely. Outside the areas under national jurisdiction the proper air traffic authorities would have to be contacted in advance to ensure the safety of civil aviation.

<sup>85</sup>See *Schwenk* (as in n. 80 on the preceding page), pp. 234f.

<sup>86</sup>Missiles or rockets do not derive support from the air but follow ballistic principles, the thrust and the initial pitch angle largely determine the flight path; they are not covered by this analysis as they are, to the author’s knowledge, not used in marine scientific research.

<sup>87</sup>See *Hintz, Manfred, Weltraumgegenstände*, in *Böckstiegel, Karl-Heinz*, editor, *Handbuch des Weltraumrechts*, Köln, 1991, pp. 158f.; *Dausen* (as in n. 81 on the page before), p. 80.

<sup>88</sup>Section IV on Space Objects and Space Infrastructure of the Russian Federation Space Act refers to space objects as objects capable of flying or staying in space or on celestial bodies; and U.S. American law provides in 42 U.S.C.A. § 2452 (2) “aeronautical and space vehicles” means aircraft, missiles, satellites, and other space vehicles, manned and unmanned, together with related equipment, devices, components, and parts, yet, this definition gives only two examples and leaves it than to the reader to surmise what other space vehicles might be.

the air space and outer space.<sup>89</sup> In contrast to aircraft, spacecraft must be able to move in space independent from reactions of the air. Accordingly, early proposals for a definition of spacecraft alluded to that quality.<sup>90</sup> Yet, this would include objects, like missiles and rockets that are not designed for use in space and may, in fact, never travel beyond the air space. Other attempts include the definition of space craft on the basis of the orbit, within which a device revolves around the Earth; and on the basis of its intended destination: every object launched into outer space to fulfil certain tasks; and all of these have their particular drawbacks.<sup>91</sup> Quite readily, one may accept rockets and shuttles, satellites and space stations as space objects. In relation to remote sensing activities Principle I<sup>92</sup> speaks rather vague of “remote sensing space systems”. The term ‘system’, as different from ‘object’, suggests a structure consisting of several parts, every single one of which may or may not qualify as a space object under the Outer Space Treaty. On the other hand, the term “remote sensing space system” may only refer to the fact that remote sensing not only requires a carrier but also a sensor, a storage as well as a processing facility. In this instance, the Principles would not necessarily deviate from general space law but would only expand its application. Looking at the objective of the Principles, namely, to prescribe a ‘code of conduct’ for the use of information acquired from remote sensing activities, as becomes clear in Principle IV<sup>93</sup>, the latter interpretation appears to be more appropriate.

For purposes of liability, *Wins* defines a space object as any object, which is launched by humans in the direction of outer space, regardless of whether it is active or inactive, whether in its original configuration or fallen to pieces.<sup>94</sup> Similarly wide, the Registration Convention<sup>95</sup> in Article I defines

<sup>89</sup>See *Hintz* (as in n. 87 on the facing page), p. 161.

<sup>90</sup>See *Dausen* (as in n. 81 on page 141), p. 82.

<sup>91</sup>See *Hintz* (as in n. 87 on the facing page), pp. 161f.

<sup>92</sup>See section 6 and n. 92 on page 266.

<sup>93</sup>Principle IV:

[T]he exploration and use of outer space shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development. . . These activities shall be conducted on the basis of respect for the principle of full and permanent sovereignty of all States and peoples over their own wealth and natural resources, with due regard to the rights and interests, in accordance with international law, of other States and entities under their jurisdiction. Such activities shall not be conducted in a manner detrimental to the legitimate rights and interests of the sensed State.

<sup>94</sup>See *Wins, Elmar, Weltraumhaftung im Völkerrecht*, Berlin, 2000, Tübinger Schriften zum internationalen und europäischen Recht 51, p. 97.

<sup>95</sup>*Convention on Registration of Objects Launched Into Outer Space, UN GA Res. 3235 (XXIX)*, adopted by the General Assembly of the United Nations, at New York, on 12 November 1974, entry into force 15 September 1976, 1023 U.N.T.S. 16, 14 [1975] I.L.M. 43 [hereinafter: 1974 Registration Convention].

'space object' as to include "component parts of a space object as well as its launch vehicle and parts thereof."

In the present context it is sufficient to distinguish remotely sensing platforms used in space from those, which are used in the air.<sup>96</sup> The distinguishing factor—as in *Wins*' definition and in the Outer Space Treaty—is the fact that a space object is launched with the intention to send the object into space. An appropriate definition may thus be: a spacecraft is any object launched into outer space or intended for the purpose of use or exploration of outer space.<sup>97</sup> The distinction is necessary since different legal implications may derive from one or the other.<sup>98</sup>

### STATUS AND NATIONALITY

While conferring nationality is in principle an act of domestic jurisdiction,<sup>99</sup> it plays a significant role in international law.<sup>100</sup> The attribution of rights and obligations—and violations thereof—to States follows principally the nationality of the individual having asserted or violated a right or obligation. Similarly, application and enforcement of the law in general is based upon the concept of nationality.<sup>101</sup>

Recognition of nationality by foreign States is an inevitable prerequisite to determine status, i. e., the relationship to a certain (legal) system, in international law. The domestic rules about acquisition and loss of nationality must therefore conform with international law so as to induce general recognition of the State's subjects as its nationals.<sup>102</sup> A distinction must be made between the attribution of nationality to individuals and corporations or assets. Natural persons usually acquire the nationality by birth or by descent or by naturalisation,<sup>103</sup> The nationality of property or assets follows different rules, and these may be national and international by form.<sup>104</sup> Generally,

<sup>96</sup>While presently most of the oceanographically relevant data from space are obtained from satellites it is quite conceivable that other platforms, like the *International Space Station (ISS)*, may contribute to the data inflow from space in the future. Thus the term spacecraft is used rather than satellite as such.

<sup>97</sup>See *Hintz* (as in n. 87 on page 142), p. 163, and subsequent pages for an application of this definition.

<sup>98</sup>Where the space object traverses the airspace, the question arises whether the regime of the airspace applies at least for parts of the flight. Discussion of this question is beyond the scope of this analysis, see generally, *Dauses* (as in n. 81 on page 141), p. 89

<sup>99</sup>See *Brownlie* (as in n. 48 on page 134), p. 385.

<sup>100</sup>The importance of nationality becomes apparent when, for example, the principle of diplomatic protection is invoked before a national court or government, i. e., the protection of a national subject receiving or having received injury or loss at the hands of another State, see *Ibid.*, pp. 406f., 482–496.

<sup>101</sup>See *Ibid.*, p. 386; see also *Meyers, Herman, The nationality of ships*, Den Haag, 1967, pp. 27–30.

<sup>102</sup>See *Brownlie* (as in n. 48 on page 134), p. 387.

<sup>103</sup>See *Ibid.*, pp. 390–397, which, in the present context, is of little significance.

<sup>104</sup>See *Ibid.*, p. 432.

the attribution of nationality has the same significance for natural persons and assets alike: application and enforcement of international rights and obligations as well as national laws as a result of status.

### *Ships*

In the 1982 LOS Convention the status of ships is determined in accordance with Article 92. It stipulates that the status follows the ship's nationality, evidence of which is provided by the flag.<sup>105</sup> The 1982 LOS Convention spells out the following different possibilities of status: the flag of a State (Article 92), the flag of an organisation (Article 93) or no flag. The last case follows from Article 92(2) of the 1982 LOS Convention which stipulates that a ship, using more than one nationality according to convenience<sup>106</sup>, is rendered a ship without nationality.

The constituting act for the designation of nationality is the act conferring the right to fly the State's flag. This does not necessarily require the registration of the ship in a national registry as provided for by Article 91 of the 1982 LOS Convention.<sup>107</sup> As evidenced by Article 94(2)(a), registration presupposes nationality and the right to fly the flag State's flag demonstrated by appropriate documents issued by the flag State.<sup>108</sup> Registration is thus only the act of publication.<sup>109</sup> Regulation of the conditions for this connecting act is left to the State that offers its flag.<sup>110</sup> This means also that

<sup>105</sup>The significance of a ship's nationality is great: by virtue of its nationality the flag State can exercise jurisdiction over the vessel on the high seas; and nationality is the link between the norms of international law and the individual vessel, see *Núñez-Müller* (as in n. 28 on page 127), pp. 74f.

<sup>106</sup>NB: 'Flag of Convenience' is a term of art that denotes a flag whose State's register is open to everyone and less rigid than others with respect to rules and standards relating to design, construction, manning and equipment; they are sought by ship owners mainly for financial reasons, like lower maintenance and service cost and taxation, see *Ignarski, Jonathan S., Flags of Convenience*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume II, Amsterdam, 1995, p. 404; see also *Li, K. X./Wonham, L., Registration of Vessels*, in *Int'l J.Mar. & C.L.* 14 [1999], pp. 140f.

<sup>107</sup>In Germany the flag law ("Flaggenrechtsgesetz") generally requires ownership of the vessel by a German citizen (§ 1 FlaggRG: "Die Bundesflagge haben alle Kauffahrtseischeiffe und sonstigen zur Seefahrt bestimmten Schiffe (Seeschiffe) zu führen, deren Eigentümer Deutsche sind und ihren Wohnsitz im Geltungsbereich des Grundgesetzes haben.") All regular ships entitled to fly the German flag are registered in the national ships registry, §3(2) SchRegO, located at the magistrates courts; ships owned by the German State, however, need to be entered into these registries, they fly the German public service flag ("Bundesdienstflagge"/"Landesdienstflagge") based on a flag document ("Flaggenbescheinigung"). Generally the ship's certificate issued under § 60 SchRegO is documentary proof of the entitlement to fly the German flag, § 3(1) FlaggRG.

<sup>108</sup>Article 91(2) of the 1982 LOS Convention; see *Beckert/Breuer* (as in n. 4 on page 122), pp. 167f., purporting that the flag merely indicates the nationality of the ship.

<sup>109</sup>See *Núñez-Müller* (as in n. 28 on page 127), pp. 76f., pointing out that for merchant ships the flying of a flag is only, *prima facie*, evidence of the ship's nationality.

<sup>110</sup>See *O'Connell, Law of the sea II* (as in n. 10 on page 123), p. 752; see on nationality *Advisory Opinion with regard to the Nationality Decrees issued in Tunis and Morocco*,

the regularity and validity of a registration can be questioned only by the registering State;<sup>111</sup> and that no State may question the conditions governing the attribution of the flag by another State or to refuse to recognise this flag, except in the circumstances provided for in Article 92(2).<sup>112</sup> As a consequence of this registration the ship is entitled (and under a duty<sup>113</sup>) to fly the flag of the State where it is registered and whose law applies to the ship as the law of the flag. Ships that sail under more than one flag as a matter of convenience are not entitled to claim the jurisdiction of either State in question *vis-à-vis* any other State. They are considered ships without nationality. What this entails, however, is unclear since the vessel is not “lawless”.<sup>114</sup> In public international law, it would appear, the vessel is subject to the exclusive control of the State in whose jurisdiction the vessel is located at any time;<sup>115</sup> on the high seas the vessel would be subject to the jurisdiction of any State claiming it,<sup>116</sup> an obviously undesirable situation.

A controversial requirement proffered in international law<sup>117</sup> and provided for by Article 91(1) of the 1982 LOS Convention is the “genuine link” between the ship and the flag State. In addition to the maintenance of a

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P.C.I.J.Rep., Series B, No. 4, p. 24; *Nottebohm Case (Liechtenstein v Guatemala)*, Judgement of 6 April 1955, 1955 I.C.J.Rep. 4(23).

<sup>111</sup>See *Colombos, C. John*, *International law of the sea*, 6th edition. London, 1967, p. 289, quoting the decision of the U.S. Supreme Court in *Lauritzen v Larsen* [1953] 345 U.S. 571.

<sup>112</sup>See *Dupuy, René-Jean/Vignes, Daniel*, editors, *A Handbook on the new law of the sea*, Dordrecht, 1991, p. 405; see also Separate Opinion of *J. Anderson* in the *M/V “Saiga” (No. 2) Case* (as in n. 38 on page 131), p. 2, referring to States that wish to challenge the regularity and validity of a particular registration to Part XV of the 1982 LOS Convention.

<sup>113</sup>The consequences of a lack of formal nationality may be severe; however, in general the vessel retains the nationality of its owner, see *Núñez-Müller* (as in n. 28 on page 127), p. 78, with further references; *O’Connell*, *Law of the sea II* (as in n. 10 on page 123), p. 756.

<sup>114</sup>*Ibid.*, submits—referring to *The Chiquita*, 19 F 2nd 417 [1927]—that the status of a ship without nationality is determined by the law of that State, of which the owner of the ship is a citizen; States have provided municipally for requisition or condemnation of a vessel on the basis of ownership, see *Caron, David D.*, *Ships, Nationality and Status*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume IV, Amsterdam, 2000, p. 403; *Anderson, Andrew W.*, *In the Wake of the Dauntless: The Background and Development of Maritime Interdiction Operations*, in *Clingan, Thomas A.*, editor, *What lies ahead?* Honolulu, Hawaii, 1988, p. 18, pointing at uncertainties resulting from the stateless status with respect to judicial proceedings, which outweighed theoretical disadvantage in the prosecution of smugglers.

<sup>115</sup>The showing of the flag in waters under foreign jurisdiction indicates to the authorities that the ship is (also) subject to a concurring jurisdiction; display of the ship’s name and port of registry appear to serve the same purpose.

<sup>116</sup>See *Papadakis* (as in n. 73 on page 140), p. 126, citing *The Asya*, (1948) AC 351(369f.), where a ship was forfeited on the grounds that it had no nationality: “No question of comity nor of any breach of international law can arise if there is no State under whose flag the vessel sails.”

<sup>117</sup>See *Brownlie* (as in n. 48 on page 134), p. 428, with further references.

registry and the issuance of documentation to registered vessels required by Article 91(2), the 1982 LOS Convention in Article 94 lists duties of the flag State to ensure that the flag reflects a connection between the State and the owner in reality.<sup>118</sup> Even though these requirements may constitute an improvement in international law, views on the realisation of a genuine link are sceptical.<sup>119</sup> The significance of the “genuine link” concept is further challenged by the proposition that a State may not refuse to recognise the nationality of a vessel because of a dubious link between the ship and the flag State.<sup>120</sup> And finally, the International Tribunal for the Law of the Sea, in the *M/V “Saiga” (No. 2) Case*, has refused the concept of “genuine link” as not to be a “criteri[on] by reference to which the validity of the registration of ships in a flag State may be challenged by other States.”<sup>121, 122</sup> As it is beyond the scope of this analysis to explore the intricacies of the “genuine link” problem, suffice it to say that this problem in the context of marine scientific research plays a marginal role, if at all, as research operations as such do not constitute a big business.<sup>123</sup>

<sup>118</sup>These duties include the exercise of jurisdiction and control with respect to administrative, technical and social measures and ensure safety at sea in matters relating to manning, seaworthiness, collision prevention, construction and crew qualification in conformity with generally accepted international standards and practices. Additionally, measures must be taken to ensure regular surveys and appropriate equipment and instruments for safe navigation, as well as appropriate qualification of master, officers and crew. Greater compliance with international standards is further pursued by Article 94(7) of the 1982 LOS Convention with the obligation

to cause an inquiry to be held by or before a suitably qualified person or persons into every marine casualty or incident of navigation on the high seas involving a ship flying its flag and causing loss of life or serious injury to nationals of another State or serious damage to ships or installations of another State or to the marine environment.

<sup>119</sup>See *Kasoulides, George C., Port state control and jurisdiction: evolution of the port state regime*, Dordrecht, 1993, pp. 65f.

<sup>120</sup>See *Caron* (as in n. 114 on the preceding page), p. 402.

<sup>121</sup>See *M/V “Saiga” (No. 2) Case* (as in n. 38 on page 131), para. 83.

<sup>122</sup>The U.N. 1986 Registration Convention (*UN Convention on Conditions for Registration*, adopted 7 February 1986 by a diplomatic conference convened under the auspices of UNCTAD, not yet in force, 26 I.L.M. 1229 [hereinafter: 1986 Registration Convention]) lists a number of modalities for the effective exercise of jurisdiction and control as the concept of “genuine link” would require. While some of these only flesh out the obligations already contained in Article 94 of the 1982 LOS Convention, Article 6 of the 1986 Registration Convention, for example, requires measures for increased accountability of the person registered as the owner; Article 8 and 9 call for appropriate provisions for the participation of the State’s nationals either in the ownership or the manning of the ship; and Article 10 demands that ship-owning companies be duly represented or incorporated in the State of registry and that the financial situation of the companies be in order.

<sup>123</sup>In Germany, however, the question arose whether the German R/V *Sonne* may be registered in the international registry of Germany with the consequence that the crew, unlike in the German national registry, does not have to be of German nationality. While this is principally possible it indicates, more generally, that in a tender for

The two most important aspects of nationality in the present context are the application of the flag State's law to the ship and the diplomatic protection of the ship by the flag State against illegal acts by a foreign sovereign<sup>124</sup>. The violation of any rights conferred upon the researching State by the 1982 LOS Convention must be invoked by the State concerned. Only the State, of which the individual is a citizen, can defend the rights under the 1982 LOS Convention—where these are a function of the activity by individuals—as a matter of diplomatic protection.<sup>125</sup> Thus, the refusal of consent to research activities in normal circumstances would provide a basis for proceedings on the basis of a violation of a coastal state obligation. And while the scientist is affected as an individual person, proceedings before an international court or tribunal could only be instituted by the researching State.<sup>126</sup>

### *Installations*

Article 262 by inference seems to suggest that installations, similar to vessels, would have to be registered with a State or an international organisation.<sup>127</sup> This derives from the requirement that installations must bear identification markings, by which they can clearly be associated with a particular State or organisation having emplaced them in the ocean. The markings could thus be considered the 'flags' of the installation; and inasmuch as the flag signifies the registration of the vessel in a particular State, the markings would appear to allow the same assumption. Even if the State whose markings the installation bears has not properly registered the same, the markings would effectively allow a refutable presumption that the relevant State exercises control over the installation.

One notable difference between installations and ships with respect to coastal state jurisdiction may actually explain the different requirements for signs of attribution. Attribution generally entails jurisdiction. For ships this general rule is reiterated, for example, in Article 97 of the 1982 LOS Convention where the exclusive jurisdiction of the flag State with respect to collisions is reserved. For clarification purposes the ship must be regis-

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research vessel operators the question of registration with an open registry may become a salient issue in the future.

<sup>124</sup>See with respect to these two aspects: *Beckert/Breuer* (as in n. 4 on page 122), p. 155; *Münch, Ingo v., Internationales Seerecht: seerechtliche Abhandlungen 1958–1982 mit einer Einführung in das Internationale Seerecht*, Heidelberg, 1985, R.v. Decker's rechts- und sozialwissenschaftliche Abhandlungen 20, pp. 72f. and 76f.

<sup>125</sup>See *Brownlie* (as in n. 48 on page 134), p. 53.

<sup>126</sup>Apart from such an international dispute, a private individual may seek damages in the national courts of the coastal State but this would require a legal basis for such a claim under the domestic law as it is rather doubtful that the relevant provisions of Part XIII can be considered self-executing, see n. 194 on page 108.

<sup>127</sup>Presently, only Norway requires such registration in its legislation, see § 19 of its Regulations relating to foreign marine scientific research, see n. 199 on page 111.



tered so that jurisdiction over criminal acts is effectively exercised—in the interest of the community of States. Installations, in contrast, fall under a different regime: in the exclusive economic zone, Article 60 of the 1982 LOS Convention establishes the exclusive jurisdiction of the coastal State for “the establishment and use” of installations and structures. Article 246(5)(c) of the 1982 LOS Convention takes note of that fact when subjugating the construction, operation and use of artificial islands, installations and structures to the coastal State’s discretion for the approval of the research project.<sup>128</sup> The markings are accordingly only necessary to facilitate the identification of the owner; a conclusion which is supported by the language used in Article 262: “to which they belong” instead of “which exercise control”.

In the context of Article 60 the question also arises to what extent installations fall under coastal state jurisdiction. The answer is relevant where a free moving installation is registered in the researching State and is thus by virtue of nationality subject to the jurisdiction of that State. Article 60 does not distinguish between fixed and free installations, and the various drafts submitted during the negotiations of the 1982 LOS Convention suggest that Article 60 applies to *all* types of installations.<sup>129</sup> Jurisdiction of the “flag State” seems to be precluded for both types: A proposal to retain rights of the flag State authorised by the coastal State to construct installations<sup>130</sup> is not reflected in the final text. This, *prima facie*, suggests that the jurisdiction of the coastal State would apply regardless of the type of installation used. With respect of free floating installations an argument in favour of jurisdiction by the “flag State” may be based on an analogy to ships: nationality entails flag state jurisdiction. However, a distinction must be made between installations and ships when it comes to jurisdiction.

The doctrine of flag state jurisdiction and the freedom of navigation are closely intertwined: the latter is a prerequisite of the former, as the freedom from other States’ interference is necessary for the flag State to exercise its jurisdiction, and *vice versa*: non recognition of flag state jurisdiction constitutes essentially a violation of the doctrine of freedom of navigation.<sup>131</sup>

Installations fall under a different doctrine than ships: Article 87 of the 1982 LOS Convention distinguishes the freedom to construct artificial islands and other installations from the freedom of navigation. This by itself does not suggest that installations must be treated differently from ships when it comes to nationality and jurisdiction: free floating installations can be registered like ships and thus be subject to the jurisdiction of the registering State on the high seas. With respect to the exclusive economic zone, however, Article 58 mentions expressly only the freedom of navigation; the

<sup>128</sup>Article 258 does not add any noteworthy aspect as it refers to Article 246(5) anyway.

<sup>129</sup>See *Nordquist et al.* (as in n. 53 on page 135), pp. 573f.

<sup>130</sup>See *Ibid.*, p. 582.

<sup>131</sup>The principle of flag state jurisdiction is constrained by coastal state jurisdiction to a certain extent; yet, it prevails generally for internal matters of the ship, see page 147.

possibility to construct artificial islands and installations is regulated by Article 56(1)(b). It is submitted that this differentiation results in a different application of the doctrine of flag state jurisdiction. Article 60 underlines this difference by subjecting the construction, operation and use of artificial islands and installations to the *exclusive* right of the coastal State to authorise and regulate these activities. Exclusiveness means that the emplacing State may not regulate even if the coastal State has not taken any regulatory measures. Therefore one must conclude that the doctrine of flag state jurisdiction does not apply to installations within the exclusive economic zone regardless of whether or not such installations are free moving.<sup>132</sup> Jurisdiction of the flag State may apply where the coastal State so allows, where the coastal State is not exercising its exclusive rights<sup>133</sup> and where the coastal State has no jurisdiction<sup>134</sup>.

In conclusion one can say that neither States nor organisations *have* to register installations or equipment for purposes of status. The attribution of installations or equipment to a particular State does not necessarily entail the same status in terms of nationality as for ships. Where the 1982 LOS Convention confers *exclusive* jurisdiction to the coastal State the owner may not claim that activities in relation to the platform fall under the jurisdiction of the researching State. The owner is rather dependent on the protection of foreign ownership under the relevant coastal state jurisdiction. In contrast, on the high seas the ownership of the installation or equipment would appear to suffice to give the “flag State” of the object jurisdiction, very similar, in fact, to stateless vessels.<sup>135</sup>

Nevertheless it should be noted that Article 262 of the 1982 LOS Convention retains its significance within Part XIII. This, however, has nothing to do with status in the sense described earlier. The relevance of Article 262 lies in its context: installations used in marine scientific research operations must be attributable to a certain research project or State in order to determine whether or not they have been lawfully emplaced and do not constitute debris; also markings are necessary for the return to the rightful owner in case of loss; and finally, liability may be imposed on the basis of Article-262-markings.<sup>136</sup>

<sup>132</sup>Note that the 1982 LOS Convention does not distinguish between fixed and free floating installations or structures.

<sup>133</sup>Unlike in the case of the continental shelf and Article 77(2) of the 1982 LOS Convention, the exclusive economic zone and the corresponding rights must be claimed by the coastal State in order to take effect.

<sup>134</sup>Either in terms of exemptions *ratione materiae*, i. e., military installations, or in terms of geographic scope. Note, that the IOC Draft Convention on ODAS provided for coastal state jurisdiction also, see *Papadakis* (as in n. 73 on page 140), p. 229.

<sup>135</sup>See page 146.

<sup>136</sup>The I.O.C., in the 1970s, discussed the problem of ODAS and proposed a Draft Convention on ODAS—it never entered into force; and after the adoption of the 1982 LOS Convention, members of I.O.C. were of the impression that the regime of ODAS as contained in Part XIII constituted a workable reflection of the IOC Draft Convention.

*Air- and Spacecraft*

Similar to the law of the sea, air law requires registration of aircraft; the nationality of aircraft is determined by the State of registry.<sup>137</sup> And international responsibility for the compliance with the relevant rules and regulations of international law<sup>138</sup> follows nationality.<sup>139</sup> For the purpose of the present analysis the concept of nationality of aircraft can be considered to be the same as that of ships in the law of the sea described earlier.

Spacecraft must be registered in accordance with Article II of the 1974 Registration Convention<sup>140</sup> which makes it an obligation for the launching State to register the spacecraft. 'Launching State' is defined as that State, which launches or procures the launching of a space object; and the State from whose territory or facility a space object is launched. This requirement is narrower than in air law, where the aircraft may—subject to agreement—even connect destinations outside the territory of the State of registry.<sup>141</sup> In space law this option is not envisaged.

Ownership has no relevance; the decisive factor is the association of the launch site with a State. Thus, even if launching sites were to be situated on the high seas, there would be a State, to which this facility could be attributed for the purposes of the 1974 Registration Convention.<sup>142</sup> One single spacecraft can thus only be registered in one single State, although the State of registry can change when the spacecraft is subsequently launched

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The IOC Draft Convention assimilated the status of ODAS to vessels; it established a duty by the coastal State, in case ODAS entered into its jurisdiction, to inform the State of registration, the owner or operator had to reimburse the coastal State for costs of retrieval; provision was made for the immediate repatriation of ODAS personnel and for assistance in distress (in analogy to the principles for crews of ships and space vehicles); finally it stipulated that data obtained by ODAS in areas under national jurisdiction could be retained by the coastal State and the operation of ODAS in a zone under national jurisdiction was subject to national legislation of that State. See *Ibid.*, pp. 227–229.

<sup>137</sup> Articles 17f. of the Chicago Convention; the provisions are principally the same: aircraft have the nationality of the State of registry, an aircraft can have only one nationality, rules of registration as such are subject to national legislation, aircraft must carry nationality and registration marks; see *Schwenk* (as in n. 80 on page 141), p. 265.

<sup>138</sup> For example, Article 3bis of the Chicago Convention which stipulates that national aircraft may not deliberately be used contrary to the aims of the Chicago Convention.

<sup>139</sup> See *Zylicz, Marek, International air transport law*, Dordrecht, 1992, Utrecht studies in air and space law 12, p. 75.

<sup>140</sup> 1974 Registration Convention (as in n. 95 on page 143).

<sup>141</sup> Article 83bis of the Chicago Convention confirms the possibility of short term "alienation", as it provides for "flagging out" where the aircraft is in foreign service for a longer period of time.

<sup>142</sup> Except perhaps, in the unlikely event that no State claims jurisdiction over the island. Even if the operation of such a facility was solely in private hands, there would naturally be a State, which, by national jurisdiction over its citizens, would have control over these activities. By virtue of the 1974 Registration Convention and international law it is an obligation of States to ensure the compliance—also of their citizens—with the registration requirements.

from a site in another State.

Notably, the 1974 Registration Convention does not make it a mandatory requirement to report or register any modifications or changes in operation to an original registration after launch; neither does it make provision for space objects that are not launched into space but are constructed in space from single parts not falling under the 1974 Registration Convention.<sup>143</sup> While this would appear to be a major source of uncertainty with respect to nationality, it seems to be of little relevance in practice. As a space object may consist of a sum of its component parts<sup>144</sup>, the possibility to register such a composite space object in one registry may become a relevant question, especially for co-operating States. The *International Space Station (I.S.S.)*, for example, is assembled in space from a number of different modules launched into space from different States and possibly owned by yet other States.<sup>145</sup> The solution in terms of registration and control has been to consider as space object every single element and module of the I.S.S.<sup>146</sup> The test, whether an individual object is a component part or a separate space object, is based on the capacity and function of the object in question: if it is able to operate in space independently, it must be registered as a space object; if it is dependent on support by other objects it is a component part.<sup>147</sup> Another possibility for the determination of nationality of composite spacecraft would be to enter into contractual agreements with each other to secure the rights of every single participating State under a single registration. This possibility apart, nationality of spacecraft follows registration like in the law of the sea; differences exist with respect to the rules of registration, namely, the requirement of the launching State to register the spacecraft.

## RESEARCH AND STATES' IMMUNITY

### *Concept of State Immunity*

State practice is sufficiently established and generally consistent to allow the conclusion that, whatever the doctrinal basis may be, customary international law admits a general rule... that foreign states cannot be sued.<sup>148</sup>

<sup>143</sup>See Cheng, Bin, *Space Objects and their Various Connecting Factors*, in Lafferanderie, Gabriel/Crowthier, Daphné, editors, *Outlook on Space Law over the Next 30 Years, Essays Published for the 30<sup>th</sup> Anniversary of the Outer Space Treaty*, The Hague, 1997, p. 205.

<sup>144</sup>See Bittlinger, Horst, *Das europäische Weltraumprojekt COLUMBUS—Rechtsfragen der Registrierung*, in Z.L.W. 35 [1986], p. 21.

<sup>145</sup>See *Intergovernmental Agreement (IGA)*, Article 5, the text is available at [ftp://ftp.hq.nasa.gov/pub/pao/reports/1998/IGA.html](http://ftp.hq.nasa.gov/pub/pao/reports/1998/IGA.html) – visited on 31 January 2005.

<sup>146</sup>See Zanghi, Claudia, *Aerospace Object*, Essays Published for the 30<sup>th</sup> Anniversary of the Outer Space Treaty, in Lafferanderie, Gabriel/Crowthier, Daphné, editors, *Outlook on Space Law over the Next 30 Years*, The Hague, 1997, p. 116.

<sup>147</sup>See Hintz (as in n. 87 on page 142), p. 166.

<sup>148</sup>Jennings, Robert/Watts, Arthur, *Oppenheim's International Law*, Volume I, 9th edition. Harlow, 1992, p. 343.

State immunity becomes relevant in the context of marine scientific research to the extent that research is conducted from vessels claiming immunity on the basis of their status as government vessels.<sup>149</sup> Immunity, according to the general legal notion depicted above, denotes an exemption from a duty, liability, or service of process. In the context of international law it denotes more specifically "the legal principles and rules under which a foreign State may claim exemption from, suspension of, or non-amenability to the jurisdiction of another State."<sup>150</sup> It extends to all acts of government or state under its legislative, judicial and administrative powers and is thus the flip side to the jurisdiction of the forum State. The relevance of immunity for research activities was highlighted when it was proposed that the U.S.S.R. resolve the problem of restricted access by making its research vessels navy ships and thus escape coastal state control.<sup>151</sup>

### *History of State Immunity*

The concept of state immunity is thought to have originated in the 17<sup>th</sup> century in the Westphalia Peace<sup>152</sup> and as having emerged with the concept of territoriality of States and their related powers.<sup>153</sup> It derives from the principle of the equality of States and the rule *par in parem non habet imperium* which in effect means that no State can claim jurisdiction over another;<sup>154</sup> and/or the principles of independence and of dignity of States.<sup>155</sup> Since its inception the concept of immunity has been extended to cover state property<sup>156</sup> and to include individuals since an action against those representing

<sup>149</sup>See section 3.

<sup>150</sup>*Steinberger, Helmut, State Immunity*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume IV, Amsterdam, 2000, p. 615.

<sup>151</sup>See *Miles, Edward L., Global Ocean Politics: the Decision Process at the Third United Nations Conference on the Law of the Sea, 1973-1982*, The Hague, 1998, p. 80.

<sup>152</sup>For a detailed discussion of the historical roots of the doctrine of state immunity, see *Hill, Thomas H., A Policy Analysis of the American Law of Foreign State Immunity*, in *Fordham L.Rev.* 50 [1981], pp. 155, 158-162, with further references.

<sup>153</sup>See *Steinberger*, Immunity (as in n. 150), p. 616; *Volker Epping* in: *Ipsen, Knut*, editor, *Völkerrecht: ein Studienbuch*, 4th edition. München, 1999, § 2, paras. 66f.

<sup>154</sup>See Report by *Matsuda* and *Diena* for the League of Nations Codification Committee on the Competence of the Courts in Regard to Foreign States, C 204 M (1927) V, and *Am.J.Int'l L.* 22 [1928], Special Suppl., pp. 118-132, and comment by *Kuhn*, *Am.J.Int'l L.* 21 [1927], pp. 742-747.

<sup>155</sup>See *Jennings/Watts* (as in n. 148 on the facing page), p. 342, pointing at the doubtfulness of these as a basis for the doctrine, and purporting that there is no obvious impairment of these principles if a State is subjected to ordinary judicial processes within the territory of a foreign State.

<sup>156</sup>See *International Law Commission, Draft Articles on Jurisdictional Immunities of States and Their Property, A/46/10*, in *Y.I.L.C.* II [1991], Article 5 provides:

A State enjoys immunity, in respect of itself and its property, from the jurisdiction of the courts of another State subject to the provisions of the present articles.

a State can be regarded as impleading the State;<sup>157</sup> it entails an assumption that individuals who serve the interest of a sovereign State should not be held responsible for acts committed in that interest. This interpretation of immunity led to the distinction between acts committed in an official or sovereign capacity (*acta jure imperii*) as distinct from those with a private or commercial character (*acta jure gestionis*).<sup>158</sup> The differentiation between these two types of acts of state culminated in the conclusion of the European Convention on State Immunity in 1972.<sup>159</sup> The trend has been further approved by the ILC Draft on Immunity which subjects the general state immunity to numerous exceptions.<sup>160</sup>

### *The Contemporary Concept*

The contemporary situation of state immunity may be described as to require “the forum State to grant immunity from jurisdiction (and execution) when and in so far as the claim of action against the foreign State is based on its conduct *jure imperii*, or execution is brought against its property serving public purposes of the foreign State.”<sup>161</sup>

If the State is entitled to immunity, immunity is given effect by refraining from exercising jurisdiction in any proceedings before a foreign State’s court.

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By sec. 6(4) of the U.K. State Immunity Act 1978 a court in the U.K. may not entertain proceedings against a person other than a State if they relate to property, which is “in the possession or control of a State” or in which a State “claims an interest”, provided that the State would have been immune had the proceedings been brought against it. In the U.S. the Foreign Sovereign Immunities Act 1976 appears only to affect the law in this matter in relation to certain suits in admiralty 28 U.S.C.A. § 1605(b). See *Jennings/Watts* (as in n. 148 on page 152), p. 348.

<sup>157</sup> See *Ibid.*, p. 346.

<sup>158</sup> See *Fitzmaurice, Gerald G., State Immunity from Proceedings in Foreign Courts*, in *Brit.Y.Int'l L.* 14 [1933], p. 101, differentiating the latter position in two separate attitudes: States, which strictly construe voluntary submission to foreign jurisdiction of a sovereign, i.e., nothing short of a submission directed towards the court itself is sufficient, and States, which, in practice, allow for the foreign government to be sued in cases where it has entered into commercial or other transactions of a private nature by interpreting the notion of voluntary submission in a very wide sense, i.e., the foreign sovereign is deemed to have submitted itself simply by its conduct; see also *Christian Gloria* in: *Ipsen* (as in n. 153 on the preceding page), § 26, para. 17.

<sup>159</sup> *European Convention on State Immunity*, adopted 16 May 1972, entry into force 11 June 1976, 1495 U.N.T.S. 182; *Jennings/Watts* (as in n. 148 on page 152), p. 343, consider the Convention as “reflecting with sufficient general accuracy the prevailing rules of international law and the current practice of states in the field of state immunity.” See *Hill* (as in n. 152 on the preceding page), pp. 162–166, for a detailed discussion of the foundation of state immunity with further references.

<sup>160</sup> Namely, commercial contracts (Articles 2.1(c), 3(2), 10), contracts of employment (Article 11), personal injuries and damage to property (Article 12), ownership, possession and use of property (Article 13), intellectual and industrial property (Article 14), participation in companies or other collective bodies (Article 15), state-owned or state-operated ships engaged in commercial service (Article 16), and arbitration agreements entered into by the State (Article 17).

<sup>161</sup> See *Steinberger*, Immunity (as in n. 150 on the page before), p. 619.

It is the obligation of every State to ensure that its courts determine on their own initiative that the immunity of that other State is respected.

Article 7(2) and (3) of the ILC Draft on Immunity provide that proceedings are to be considered as having been brought against a State—whether or not it is named as a party—if the proceedings in effect seek to compel the State either to submit to the jurisdiction of the court or to bear the consequences of a determination by the court, which may affect the State's property, rights, interest, or activities, or if the proceedings are designed to deprive the State of its property or of the use of property in its possession or control and assets abroad, as well as state ships.

Part III of the ILC Draft on Immunity sets forth the instances in which immunity cannot be invoked. These include situations where the State engages in commercial transactions with a foreign natural or juridical person or enters in a contract of employment between the State and an individual for work in the foreign State; other cases include questions of ownership, possession and use of property, the participation in companies or other collective bodies and, most importantly, ships owned or operated by a State.<sup>162</sup>

### *Immunity of Ships*

Immunity with respect to ships means the exemption of individuals—as “representatives” of the State—in the service of or aboard a government's ship from jurisdiction by a State other than the flag State.<sup>163</sup> It also means the exemption of the vessel itself from any proceedings. The question of immunity thus arises in proceedings against the State owning or operating the vessel or its representatives, and in proceedings *in rem* against the vessel which are regarded as indirectly impleading the State.<sup>164</sup>

The principle of immunity of government ships came to be recognised in the beginning of the 19<sup>th</sup> century.<sup>165</sup> It was first established in a legal case in 1812 by *J. Marshall* of the U.S. Supreme Court.<sup>166</sup> While this case involved a warship, American and British courts applied the decision later to all categories of government ships, irrespective of their actual employment.<sup>167</sup>

<sup>162</sup>See n. 160 on page 154.

<sup>163</sup>See *Thommen* (as in n. 48 on page 134), p. 1.

<sup>164</sup>See *Jennings/Watts* (as in n. 148 on page 152), p. 1171.

<sup>165</sup>See *Thommen* (as in n. 48 on page 134), p. 9.

<sup>166</sup>See *The Schooner Exchange v McFaddon and others*, 7 Cranch 116, where the commission of the ship was considered to be sufficient to evidence her character as a state vessel.

<sup>167</sup>See *Ibid.*, p. 10, referring to *Berizzi Bros. v S/S Pesaro*, 271 US 562; *The Pampa*, 245 F 137; *The Roseric*, 254 F 154; *The Parlement Belge*, 5 PD 197; *The Porto Alexander*, (1920) P 30.

In the judicial practice of the United States, courts following the so-called principle of absolute immunity did not exercise jurisdiction over a foreign government ship whose immunity had been recognised by the State Department; and if the State Department had no guidance on a particular vessel, courts granted immunity if the vessel was in the possession and service of the foreign State (see *ibid.*, p. 11, citing *Republic of Mex-*

When in the course of the general development of trade in the 19<sup>th</sup> and 20<sup>th</sup> century, States increasingly engaged in international trade and economic relations, immunity of state ships, which were employed in much the same manner as were private ships, was more and more called into ques-

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*ico v Hoffman*, 324 US 30). A distinction was made between ships owned and ships operated by a foreign State. This distinction is important, as the fate of the vessel can be different from that of the crew where immunity from jurisdiction does not depend on ownership: thus, the crew of ships owned but not operated by a State could be subject to court proceedings. Vessels in the ownership of a State were not exempt from *in rem* proceedings unless it was proved that the vessel was in the actual possession and service of the State (see *Thommen* (as in n. 48 on page 134), pp. 12, 39–41, citing *The Navemar*, 303 US 68; *Ervin v Quitanilla*, 99 F(2d) 935, 1938 AMC 1459; *The Beaton Park*, A-D 1946 No. 35; and quoting *Chief Justice Waite*: “property does not necessarily become a part of the sovereignty because it is owned by the sovereign. To make it so it must be devoted to the public use and must be employed in carrying on the operations of the Government.” *The Fidelity*, 324 US 37).

The United States adopted the so-called restrictive approach to state immunity officially in 1952 (see *Jennings/Watts* (as in n. 148 on page 152), p. 357, referring to the ‘Tate letter’ from the Department of State (J.I.R. 7 [195] p. 403), which formed the basis of the Department’s policy when asked to provide a ‘suggestion’ of immunity for judicial proceedings) and eventually enacted the Foreign Sovereign Immunities Act in 1976 consolidating U.S. policy (28 USC § 1602, reprinted 15 [1976] I.L.M. 1388; the text is available at <http://uscode.house.gov/>) – visited on 31 January 2005).

Historically, U.K. courts would not try a foreign sovereign, unless the sovereign voluntarily submitted to English jurisdiction by waiving its immunity. This policy extended to all legal proceedings, whether they would “involve process against his person or seek to recover from him specific property or damages” (*Duff Development Co. v The Government of Kelantan* 1924 AC 797, quoted from *Fitzmaurice* (as in n. 158 on page 154), p. 105) and also covered ships. For a ship to assume immunity from seizure, arrest or proceedings a declaration by a foreign State that the ship was its property was conclusive and could not be questioned by an English court (see, with reference to *The Parlement Belge*, [1880] 5 PD 197, *Thommen* (as in n. 48 on page 134), p. 13). Foreign state-owned ships, or ships not the property of a foreign State but in its possession or control, were accorded immunity even though engaged in commercial activities or otherwise not devoted solely to the public service of the State (see *ibid.*, p. 42; and *Jennings/Watts* (as in n. 148 on page 152), p. 358, both with further references to case law). The law was changed by the State Immunity Act 1978. Section 3 of the Act provides that a foreign State is not immune as respects proceedings relating to commercial transactions or contractual obligations of the State to be performed in the United Kingdom; section 10 precludes immunity from Admiralty proceedings, or proceedings on any claim which could be made the subject of Admiralty proceedings, in respect of a ship in use or intended for use for commercial purposes: “An Act to make new provision with respect to proceedings in the United Kingdom by or against other States; to provide for the effect of judgements given against the United Kingdom in the courts of States parties to the European Convention on State Immunity; to make new provision with respect to the immunities and privileges of heads of State; and for connected purposes”, 20 July 1978, reprinted in 17 [1978] I.L.M. 1123.

As regards other States *ibid.*, pp. 1173–1174, observe, with reference to relevant cases, that the earlier decisions of various national courts granting immunity to state ships engaged in commercial ventures have in some cases been superseded by legislation, and even in the absence of subsequent legislation might now no longer be followed since the trend towards limiting the immunity of States to the exercise of their public and sovereign capacities has become more firmly established in recent years, both in relation to shipping and generally.



tion.<sup>168</sup> After World War I the trend to restrictive immunity in the sense that state ships were granted the status of immunity only for conduct *jure imperii* continued. The Brussels Convention for the Unification of certain Rules concerning the Immunity of State-owned Vessels, 1926, abolished jurisdictional immunity for state-owned ships engaged in commerce. Article 3 of this convention excludes from its ambit warships, hospital and supply ships, and the like, as well as ships employed exclusively "on Government and non-commercial service"; a Protocol from 1934 provides that Article 3 includes also ships on time or voyage charter to a State while exclusively employed on governmental and non-commercial activities. Article 9 of the 1958 Geneva Convention on the Territorial Sea and Contiguous Zone affirmed the principle that ships owned or operated by a State and used exclusively for governmental, non-commercial purposes enjoy immunity from the jurisdiction of other States than the flag State. Eventually, the 1982 LOS Convention in Part II confirmed the wording of the Geneva Convention and thus the predominance of the restrictive theory which can safely be viewed as the sole remaining concept of state immunity for all practical purposes in the context of the law of the sea.

The most important conclusion from the history of the development of restricted immunity is its initiation by the increasing engagement of States in trade and economic activities. The principal concern of opponents to absolute immunity would thus appear to be the comparative advantage of States by virtue of their immunity to (foreign) jurisdiction in the competition with private individuals or entities in matters, essentially, of private law.

### *State Ships*

The question as to what constitutes a state ship is not all too clear. A distinction on the basis of ownership is of no avail since ships can be owned and operated by two different legal entities. Government ships are usually publicly owned, but not every publicly owned vessel is necessarily operated for the government or for government purposes. Conversely, a ship must not be owned by the government as to be entitled to state immunity: immunity follows the vessel's function in government service not its legal title. The function of the vessel is determined by the actual operator. The decisive factor for state immunity is therefore whether, irrespective of actual ownership, the State acts as the operator of the vessel. Whether or not a State or a state agency operates a given vessel, is a question of fact. In contrast, whether or not the activity, in which the vessel is engaged in, i. e., marine scientific research in the present context, qualifies as *acta jure imperii*, entitling the vessel to immunity, is a question of law.

<sup>168</sup>See *Steinberger*, Immunity (as in n. 150 on page 153), p. 617, referring to a number of judgements between 1879 and 1926, noting that *The Parlement Belge*, was not upheld in the higher courts.

*Research Vessels as State Ships*

Under the 1982 LOS Convention and customary international law, warships and other government ships operated for non-commercial purposes generally enjoy immunity.<sup>169</sup> This rule is based on the premise that such type vessels represent by virtue of their function the State, whose immunity extends to objects of its statehood. With respect to research vessels the question then arises if research activities constitute a government function as to include research vessels in that rationale.

Government functions have been described as public administration at all state levels<sup>170</sup>; as seen above, for purposes of immunity, conduct *jure imperii* and *jure gestionis* must be distinguished. The core of what actually constitutes conduct *jure imperii* can be described as the “functions of States which are constitutive for their independence and sovereignty and are essential to their exercise.”<sup>171</sup> These are normally core state functions, such as police, customs, or fiscal related activities, namely, those which serve the general public security and order. Marine scientific research does not constitute such a function as it neither expresses nor serves the independence of States nor their sovereignty<sup>172</sup> nor public security and order in a strict sense. However, as was noted earlier, the differentiation between *acta jure imperii* and *acta jure gestionis* was primarily introduced to exempt vessels engaged in commercial activities from state immunity. Based on this premise, research not constituting a commercial activity,<sup>173</sup> might nevertheless come within government functions as envisaged by the 1982 LOS Convention.

*Research as a State Function**Research as a Function of Obligations*

Where States as a function of their sovereignty establish obligations *vis-à-vis* each other they are responsible for acting accordingly. It is the duty of a State to ensure compliance with the relevant obligation itself, i. e., the government has to instruct its administration to act in compliance with the

<sup>169</sup>Article 32 of the 1982 LOS Convention. Article 22(2) of the Geneva Territorial Sea Convention exempts government ships operated for non-commercial purposes from criminal jurisdiction of the coastal State.

<sup>170</sup>See section 3.

<sup>171</sup>*Steinberger*, Immunity (as in n. 150 on page 153), p. 625.

<sup>172</sup>Note, that Article 241 expressly excludes the recognition of legal titles based on marine scientific research.

<sup>173</sup>This is one of the essential elements of the distinction between marine scientific research and exploration! *Brown/Gaskell* (as in n. 6 on page 122), pp. 45f., point to the difficulties in differentiating between publicly funded fundamental or pure research and applied, commercial research in the context of immunity; and advise as a consequence not to claim immunity because it is difficult to sustain such a claim in light of the problematic differentiation and on the premise that “foreign States may be less sympathetic to requests for consent to undertake MSR in their waters if the request is made by an agency for which sovereign immunity is claimed.”

international obligation. Where the fulfilment of an obligation requires the involvement of the State or execution by the State one may consider the activity in question a function of state.

Policy and management decisions in the fisheries sector require knowledge about the fish stocks. Deficiencies in coming to grips with the fish depletion in many respects is due to the limited knowledge about the targeted species and their interrelatedness with other species and the marine environment at large.<sup>174</sup> The 1982 LOS Convention and other international instruments seem to take note of this fact when they compel States to further their knowledge with respect to fisheries.<sup>175</sup> Article 61(1) of the 1982 LOS Convention establishes the obligation of the coastal State to determine the allowable catch of the living resources in its exclusive economic zone. Prerequisite to fulfil this obligation is a sufficient knowledge about the living resources, both in terms of numbers and size. In terms of time, these two factors require an assessment of the presence and the future. While the assessment of the contemporary situation can be based on real time observation, a reasoned prognosis for the future can only be based on sufficiently profound knowledge of the living resources and their interrelations with the natural environment; these are essentially questions of marine scientific research, accordingly Article 61(2) stipulates that the coastal State must take into account "the best scientific advice available to it". Conservation and management measures for the maintenance of the living resources in the exclusive economic zone and their exploitation are thus linked to scientific knowledge and—in consequence—its furtherance.<sup>176</sup> Judged by the fact that generally regional fisheries organisations and state research agencies are entrusted with the task foreseen by Article 61<sup>177</sup> one can conclude that in

<sup>174</sup>See *Campbell, Harry/Herrick (jr.), Samuel F./Squires, Dale, The Role of Research in Fisheries Management: The Conservation of Dolphins in the Eastern Tropical Pacific and the Exploitation of Southern Bluefin Tuna in the Southern Ocean*, in O.D. & Int'l L. 31 [2000], pp. 357f.

<sup>175</sup>See *Birnie, Patricia W., Law of the Sea and Ocean Resources: Implications for Marine Scientific Research*, in Int'l J.Mar. & C.L. 10 [1995], pp. 436f., citing Article 61 of the 1982 LOS Convention and a number of fisheries agreements/organisations that require scientific input. See with respect to the European Community: Evaluation of Fishing Agreements Concluded by the European Community, Final Report, ref.APC02, Luxembourg 2000, p. 7; the report notes at p. 114 with respect to the EU/Morocco Protocol: "With regard to scientific co-operation, the documents signed by the two delegations do show a real will to co-operate but there were also real problems of exchange as soon as a scientific question became too closely linked to a new management decision."

<sup>176</sup>Compare *Ibid.*, pp. 416, 436f.

<sup>177</sup>In regional fisheries organisations research is conducted either by research secretariats or multinational arrangements, i.e., the national research efforts of every member State, see *Ward, Peter/Kearney, Bob/Tsirbas, Nektarios, Science arrangements for the regional management of tuna fisheries*, in *Marine Policy* 24 [2000], pp. 94f, 100; see also *Campbell/Herrick (jr.)/Squires* (as in n. 174), pp. 353f. In Germany fisheries research is conducted by a specialised federal agency ("Bundesanstalt für Fischerei"). In the United States fisheries research is conducted by the *National Marine Fisheries*

the particular field of fisheries research, States take the view that such research is a function of state. It must be borne in mind, though, that fisheries research relates very specifically to the living resources and corresponding management obligations as expression of the coastal State's sovereign rights. Since this specific connection between sovereign rights and research does not exist for marine scientific research at large one cannot deduce that the latter has the same status for States.

The 1982 LOS Convention refers in various Articles to charts of the coastal State for verification purposes. Thus, Articles 5 and 6 speak of charts "officially recognized by the coastal State" with respect to baselines and reefs respectively; Article 16(2) requires coastal States to submit "charts or lists of geographical coordinates" with respect to their baselines to the Secretary-General of the United Nations.<sup>178</sup> Regular hydrographic surveying is a prerequisite for precise nautical charts and must therefore be regarded as a function of government.<sup>179</sup> Yet, hydrographic surveying cannot be considered marine scientific research. While it is akin to scientific research, it is principally different, as it only attempts to accurately display the natural environment, but does not endeavour to explain any natural phenomena or processes. The 1982 LOS Convention also distinguishes hydrographic surveys from marine scientific research—although without any hint as to the exact scope or demarcation of the two activities.

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*Service.*

<sup>178</sup>Further references to charts (and due publicity) are contained in Articles 22(4), 41(6), 47(8) and (9), 53(10), 75, 76(9), 84 and 134(3); while all of the preceding relate to the coastal state obligation of giving due publicity to its delimitation parameters, 94(4)(a) contains the obligation of the flag State to ensure that its ships have "on board such charts, nautical publications and navigational equipment and instruments as are appropriate for the safe navigation of the ship".

<sup>179</sup>The I.H.B. views hydrographic services as a prerequisite for an adequate national maritime policy "designed to obtain the economic benefits necessary for the development of a nation"; it observes that "in most maritime countries governments have set up a national Hydrographic Service" and points to Chapter V, Regulation 9 of SOLAS which makes it an obligation for contracting parties to publicise, disseminate and keep "up to date all nautical information necessary for safe navigation", (Reg. 9(1)), see *International Hydrographic Bureau, National Maritime Policies and Hydrographic Services*, Monaco, 2003, pp. 1 and 10. Under the Helsinki Convention member states agreed—for the first time in an international binding instrument—a joint hydrographic re-survey plan, see *Ehlers, Peter, Strategien der Helsinki-Kommission*, in *Ehlers, Peter/Erbguth, Wilfried*, editors, *Aktuelle Entwicklungen im Seerecht II*, Baden-Baden, 2003, Rostocker Schriften zum Seerecht und Umweltrecht 25, pp. 91f., with an account of the *Helcom Copenhagen Declaration* as the basis for the plan; see also press release from 16 January 2003, available at (<http://www.helcom.fi/helcom/news/166.html>) – visited on 31 January 2005. § 1(9) and (10) and § 5(1)(5) of the German Law on the Authorities of the Federal Level with respect to Shipping ("Gesetz über die Aufgaben des Bundes auf dem Gebiet der Seeschifffahrt" (Seeaufgabengesetz, SeeAufG) i.d.Bek.v. 26 Juli 2002 (B.G.Bl. 2002 I 2876)) assigns this task to a federal agency as part of the public administration.

*Research as a Function of Common Interest*

The State as the stake-holder of a community's interest must perform certain tasks as a function of its mandate from the community: certain tasks in a community must be delegated to the administration for reasons of efficiency, others for reasons of capacity, or both. The argument could be made that scientific research belongs to the functions of state on the premise that the furtherance of knowledge—the principal purpose of scientific research in general—is a common interest which cannot be warranted by individual members of the community and is thus to be secured by the State. Also, (marine) scientific research is more often than not coupled with education—evidenced by the number of research institutions that are associated with universities—which may also be considered a function of state. Finally, disciplines of marine scientific research such as meteorology or climatology are pertinent to the provision of reliable weather forecast and climate predictions, the latter of which deliver essential information for policy and management decisions in terms of political providence.<sup>180</sup> This is further emphasised by the fact that numerous international treaties recognise the necessity of an increased knowledge of the natural environment,<sup>181</sup> the obligation in the 1982 LOS Convention to promote and facilitate scientific research is only one of the first examples. This would by implication suggest that States Parties to such treaties incur the responsibility for the furtherance of research also. And while they can principally escape a concrete obligation to promote a

<sup>180</sup>The importance of hydrography has been outlined in section 2.

<sup>181</sup>See Articles II, III, IX of the *Antarctic Treaty*, adopted 1 December 1959, entry into force 23 June 1961, 402 U.N.T.S. 71, available at ([http://www.scar.org/Treaty/Treaty\\_Text.htm](http://www.scar.org/Treaty/Treaty_Text.htm)) – visited on 31 January 2005; Article 6(1) of the Environmental Protocol (as in n. 70 on page 73); Article I and XI of the *Treaty on Principles Governing the Activities of States in the Exploration and use of Outer Space, Including The Moon and other Celestial Bodies*, UN GA Res. 2222 (XXI), signed at Washington, London, Moscow, 27 January 1967, entry into force 10 October 1967, 610 U.N.T.S. 205 [hereinafter: Outer Space Treaty or OST]; Annex sec. 5(1)(c) of the *Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982*, adopted 20 July 1994, entry into force 28 July 1996, 33 I.L.M. 1309 [hereinafter: 1994 Implementation Agreement], available at ([http://www.un.org/Depts/los/convention\\_agreements/convention\\_overview\\_part\\_xi.htm](http://www.un.org/Depts/los/convention_agreements/convention_overview_part_xi.htm)) – visited on 31 January 2005; Articles 12(b) and (c), 15(6) and 18 of the Biodiversity Convention; Articles 4(g),(h), 5(b) and 9 of the Climate Change Convention; Agenda 21, Chapter 17. See also *U.N. Secretary-General, Oceans and the law of the sea*, UN Doc. A/57/57, New York, 7 March 2002, p.54, with respect to a duty to promote and undertake scientific research under the 1982 LOS Convention and Agenda 21. See furthermore *Czybulka, Detlef/Kersandt, Peter, Rechtsvorschriften, rechtliche Instrumentarien und zuständige Körperschaften mit Relevanz für marine Schutzgebiete ("Marine Protected Areas"/MPAs) in der Ausschließlichen Wirtschaftszone (AWZ) und auf Hoher See des OSPAR-Konventionsgebietes*, Bonn, 2000, BfN Skripten 27, pp. 89f., available at (<http://www.bfn.de/09/awz.pdf>) – visited on 31 January 2005, with a list of clauses in environmental treaties with relevance for marine scientific research.

single research project,<sup>182</sup> their general attitude may not run counter the general aim of promoting and facilitating scientific research. Where such an obligation on the level of States exist, one may reasonably infer that States principally consider scientific research as their task with the consequence that, at least where sufficient information cannot be obtained from other sources, scientific research must be conducted under the auspices of the State. However, compared with the obligation in Article 61 of the 1982 LOS Convention and its specific context, the more general language of treaty clauses establishing a duty to promote and facilitate scientific research does not allow the conclusion that States view scientific research a function of state.

### *State Practice*

State practice, with respect to the question whether or not scientific research is a state function, is difficult to establish: specific legislation is scarce and the relatively small number of research vessels does not warrant much attention. The following paragraph is based on available legislation and information gathered directly from relevant authorities.<sup>183</sup> Some States seem to consider marine scientific research as a state function and express this view in their legislation; others merely indicate the possibility that research may be a state function by affording research vessels public status. Canada, for example, provides in sec. 42 of its 1996 Ocean Act not only for the conduct of hydrographic but also oceanographic surveys as a function of the minister with respect to marine science.<sup>184</sup> Such oceanographic surveys would ap-

<sup>182</sup>See, for the discussion in Germany, *Meusel, Ernst-Joachim, Außeruniversitäre Forschung im Wissenschaftsrecht*, 2nd edition. Köln, 1999, pp.13 and 143f., noting, with reference to *BVerfGE* 35, 79(115) and 43, 291(314f.), a general obligation by virtue of public law: "Forschungsförderung [ist] eine öffentliche Aufgabe... , an deren Erfüllung Staat und Gesellschaft ein gesteigertes Interesse haben."

<sup>183</sup>Most often information could not be obtained because (a) no legislation was available, (b) an authoritative statement could not be obtained.

<sup>184</sup>The text of sec. 42 reads:

In exercising the powers and performing the duties and functions [which are determined by the Department of Fisheries and Oceans Act]... the Minister may

- (b) conduct hydrographic and oceanographic surveys of Canadian and other waters;
- (c) conduct marine scientific surveys relating to fisheries resources and their supporting habitat and ecosystems;
- (d) conduct basic and applied research related to hydrography, oceanography and other marine sciences, including the study of fish and their supporting habitat and ecosystems;
- (e) carry out investigations for the purpose of understanding oceans and their living resources and ecosystems;
- (j) conduct studies to obtain traditional ecological knowledge for the purpose of understanding oceans and their living resources and ecosystems.

pear to be the same as marine scientific research in that they encompass all relevant scientific disciplines related to the ocean environment. Sec. 42(c), inasmuch as it concerns the living resources and thus Canada's obligations under Article 61 of the 1982 LOS Convention, can be considered as describing an area of scientific research, which falls within the scope of state function to the extent that the 1982 LOS Convention confers upon parties obligations with respect to fisheries management, which require scientific input.<sup>185</sup> Sec. 43(b) on powers stipulates that the Minister in order to carry out his duties and function under the Department of Fisheries and Oceans Act may "conduct. . . applied and basic research programs. . . for the purpose of understanding oceans and their living resources and ecosystems, and. . . for that purpose maintain and operate ships, research institutes, laboratories and other facilities for research". More specifically, in terms of functions of state, sec. 43(c) foresees "marine scientific advice, services and support to the Government of Canada and, on behalf of the Government, to the governments of the provinces, to other states, to international organizations and to other persons."

The German Law on the Authorities of the Federal Level with respect to Shipping<sup>186</sup> contains similar provisions. It stipulates in § 1(9) and (10) SeeAufG that the Federal Level is responsible for nautical and hydrographic services, including surveys, tide tables and weather forecasts, which would relate to the duties established under the 1982 LOS Convention with respect to shipping.<sup>187</sup> § 1(11) SeeAufG specifically provides that the Federal Level conducts oceanographic research<sup>188</sup> which suggests that Germany considers marine scientific research a possible state function.<sup>189</sup>

<sup>185</sup>See page 159.

<sup>186</sup>See n. 179 on page 160.

<sup>187</sup>See n. 178 on page 160. § 1 reads:

Dem Bund obliegen auf dem Gebiet der Seeschifffahrt

9. die nautischen und hydrographischen Dienste, insbesondere
  - a) der Seevermessungsdienst,
  - b) der Gezeiten-, Wasserstands- und Sturmflutwarndienst,
  - c) der Eisenachrichtendienst,
  - d) der erdmagnetische Dienst;

10. die Herstellung und Herausgabe amtlicher Seekarten und amtlicher nautischer Veröffentlichungen sowie die Verbreitung nautischer Warnnachrichten und sonstiger Sicherheitsinformationen.

<sup>188</sup>§ 1 SeeAufG reads: "Dem Bund obliegen auf dem Gebiet der Seeschifffahrt [...] 11. meereskundliche Untersuchungen einschließlich der Überwachung der Veränderungen der Meeresumwelt".

<sup>189</sup>In Germany a differentiation is made between coercive/administrative acts of state ("hoheitliches/obrigkeitliches Verwaltungshandeln", "Eingriffsverwaltung"), simple acts of state ("schlicht-hoheitliches Handeln") and factual acts of state ("schlichtes Verwaltungshandeln", "Tathandlungen"), see *Wolff, Hans J./Bachof, Otto/Stober, Rolf, Ver-*

§ 5(1)(5) SeeAufG provides that the facilitation of shipping by scientific and nautical information—except for marine biology which falls under the purview of the national fishing authorities (*Bundesforschungsanstalt für Fischerei*)—is the task of the German Federal Maritime and Hydrographic Agency (*Bundesamt für Seeschifffahrt und Hydrographie, B.S.H.*).<sup>190</sup> While this makes first of all clear that the B.S.H. is the authority to provide all mariners with the necessary information for safe navigation, § 5(1)(5) goes beyond this function of state where it also assigns the task of providing scientific information. The phrase could be read as to include marine scientific research in general. However, §5(1)(5) refers explicitly to the facilitation of shipping. This implies that only such research falls within the tasks of the B.S.H., which is conducted with a view to the needs of shipping affairs. Marine scientific research can generally not be considered to be carried out on such a premise even though shipping might benefit from scientific findings. In practice, the B.S.H. operates not only its three survey vessels for bathymetry and wreck detection (plus two additional smaller vessels), clearly fulfilling state functions, under the national flag for the public service but also a research vessel for purposes of marine scientific research. The position of the Ministry for Traffic, Building and Housing, supervising the B.S.H., appears to be that marine scientific research is a state function.<sup>191</sup> For other

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*waltungsrecht: ein Studienbuch*, Volume 1, 11th edition. München, 1999, § 23 VI.2. The characterisation of scientific research operations as acts of state meets with difficulties: § 1(11) SeeAufG can be interpreted as a legal basis for marine scientific research operations by the state administration, yet it does not provide a basis for coercive administration (“Eingriffsverwaltung”). The word “obliegen” suggests a responsibility of the Federal Level to ensure that the relevant activity must be conducted. The question is whether or not such operations, without being coercive administration, can be characterised as “schlicht-hoheitlich”. *Wolff/Bachof/Stober, Wolff/Bachof/Stober* (as in n. 189 on the preceding page), § 23 VI.2., name as an example for “schlicht-hoheitliches Verwaltungshandeln” the establishment and maintenance of agencies and institutions. This could also include research institutions and the operation of vessels. The carrying out of marine scientific research as such, however, only serves to collect information and would in the German terminology only constitute “schlichtes Verwaltungshandeln”. Note: the differentiation in German law is of little relevance for public international law as the distinction there is only that between *acta jure imperii* and *acta jure gestionis*.

<sup>190</sup> § 5(1) SeeAufG reads:

Das Bundesamt für Seeschifffahrt und Hydrographie ist eine Bundesoberbehörde im Geschäftsbereich des Bundesministeriums für Verkehr, Bau- und Wohnungswesen. Es hat die Aufgaben

5. der Förderung der Seeschifffahrt und Seefischerei durch naturwissenschaftliche und nautisch-technische Forschungen mit Ausnahme meeresbiologischer Forschungen.

<sup>191</sup>“Meeresforschung ist eine hoheitliche Aufgabe.” Interview by telephone with the Ministerium für Verkehr, Bau- und Wohnungswesen, 4 September 2003. The information provided can be viewed as reflecting widespread opinion, as it is corroborated on the basis of the following observation: Article 255 requires the facilitation of port



German sea-going research vessels—all operated by public institutes or institutions<sup>192</sup>—the same applies: they all fly the flag for the public service and are considered state ships.<sup>193</sup>

Australia recognises the public status of a research vessel if the Department of Foreign Affairs and Trade so determines.<sup>194</sup> According to its Public Vessel Status Guidelines the status may be extended to vessels “owned, chartered, temporarily employed, contracted or commissioned by any foreign State, or agency or instrumentality of that State, when such ships are not engaged in any commercial activity.”<sup>195</sup> The status is normally granted to foreign research vessels on the assumption that they fulfil these criteria. Diplomatic missions are advised to include information with any request showing that the vessel is government owned or chartered and is not engaged in commercial activities. By recognising the possibility that research vessels may enjoy public status Australia indicates that research may be considered a non-commercial government activity.

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access for research vessels. Generally, port access is only restricted for state ships; non-governmental ships may usually enter ports without prior notification. On the assumption that Article 255 was intended to alleviate the situation of research vessels one may conclude that research vessels were widely considered state ships when Article 255 was drafted. This conclusion is admittedly not peremptory as obstacles for the entry to ports of research vessels could also be based on the premise that these ships are engaged in an activity which is considered with scepticism by the coastal State, to say the least. Yet, Denmark distinguishes in its legislation between public research vessels and private research vessels (see Ordinance Governing the Admission of Foreign Warships and Military Aircraft to Danish Territory in Time of Peace from 16 April 1999)—research vessels not owned or operated by a foreign State would apparently not fall under the Ordinance; only the former needs to give prior notification when entering Danish internal waters.

<sup>192</sup>The relevant research institutes are affiliated with state universities or, as in the case of the Alfred-Wegener-Institute. *Meusel* (as in n. 182 on page 162), pp. 13f., arrives, at least for Germany, at the conclusion that the state is deeply intertwined with (private) research institutions. He identifies in Germany: non-university state institutions (completely integrated in the state structure), non-university private institutions (which nevertheless may be funded at least partially by the state) and non-university quasi-state institutions (predominantly financed by the state, yet privately organised). The German Alfred-Wegener-Institute, for example, is a public foundation (“Stiftung öffentlichen Rechts”), which is funded by the Federal Ministry for Education and Research (90%) and the states of Bremen (8%), Schleswig-Holstein and Brandenburg.

<sup>193</sup>Telephone interview with the “Leitstelle ‘Meteor’” on 2 September 2003. Note: according to § 1 and 2 FlaggRG, registration with the German ships registry is usually prerequisite to the right to fly the German flag. According to § 3(c) FlaggRG for ships in public service no such registration is necessary; these ships may prove entitlement to fly the German flag by simple documentation (“Flaggenschein”). Research vessels not operated in public service may be flagged out to other registries.

<sup>194</sup>Note, that this is the general practice with state ships anyway: enforcement authorities usually rely on information from the foreign ministry whether a vessel in question is recognised as state ship.

<sup>195</sup>See Australian Notification N ALA 96/386 by the Department of Foreign Affairs and Trade from 6 September 1996. The “Guidelines” form part of Australia’s implementation of the 1982 LOS Convention, the text is available at <http://www.state.gov/www/global/oes/oceans/ntrvo117.html> – visited on 31 January 2005.

*Conclusion*

Neither the considerations of law nor the evidence of state practice available must be interpreted as to indicate that States consider marine scientific research as an *exclusive* state function; rather it suggests that States view research operations a possible task of the government.<sup>196</sup> Unlike police and customs operations scientific research is not the exclusive domain of the government. Nevertheless research vessels, where operated by the State or a state agency, seem as a rule to sail under public vessel status. It is submitted that the 1982 LOS Convention warrants the designation of research vessels as public on the premise that the research is conducted for non-commercial purposes. The language of Articles 32, 96 and 236 of the 1982 LOS Convention is sufficiently broad to cover research operations. Indeed, the negative exclusion expressed by the term ‘non-commercial’ allows for broader concept of state function than the dichotomy of *acta jure imperii* and *acta jure gestionis*. Conversely, even if States consider marine scientific research a state function, research vessels operated by private institutions would not gain public status through the type of activity they are engaged in. Public international law does not provide a conclusive answer on the status of research vessels: they may, but they do not *need* to be public.<sup>197</sup> In conclusion one should note, that the State determines which ships have public status and may therefore enjoy state immunity. A diplomatic certificate to that effect would provide conclusive evidence.<sup>198</sup>

*Aircraft*

The legal status of state aircraft is at present very unsatisfactory, with a corresponding degree of uncertainty.<sup>199</sup> Yet, it would appear that similar

<sup>196</sup>In the U.S. only those research vessels that are operated by state universities or government agencies have public status, other research vessels sail as regular ships. The R/V *Thomas Thompson*, a research vessel operated by the University of Washington, displays documentation of its immunity status on the bridge. Similarly, research vessels operated by NOAA bear documentation of their public status. Within the *University-National Oceanographic Laboratory System (U.N.O.L.S.)* most of the larger research vessels are owned by the Navy or the National Science Foundation; they are operated by public (Scripps Institution of Oceanography at the University of California, University of Washington, National Oceanographic and Atmospheric Agency) and private (Woods Hole Oceanographic Institution, University of Columbia) institutions, see <http://www.unols.org> – visited on 31 January 2005, with further information.

<sup>197</sup>*Lagoni*, Merchant Ships (as in n. 5 on page 122), p. 347, contends that it is eventually the flag State that defines which ships are public ships. In Germany, in connection with the R/V *Sonne*, the question arose whether research ships may be “flagged out”—by hiring a crew from Eastern Europe a bidder was able to remain 48% below the offers of competitors—with the consequence of losing the status as state ship; as public international law does not stipulate a specific rule with respect to research vessels the latter may also be registered in an open registry.

<sup>198</sup>See *Brown/Gaskell* (as in n. 6 on page 122), p. 45.

<sup>199</sup>See *Diederiks-Verschoor* (as in n. 83 on page 141), p. 31.

rules apply to state aircraft with respect to immunity like to vessels in the law of the sea.

There are clear examples of state aircraft which comprise those in customs, police, and military service. If, however, the guiding criterion is the craft's intended use for public service, it may include a vast number of other aircraft as well. As additional categories of state aircraft have been proposed: mail-carrying aircraft;<sup>200</sup> aircraft carrying Heads of State; aircraft carrying high government officials; and aircraft on special missions.<sup>201</sup> Especially the last category seems to forsake the quality of a traditionally sovereign purpose. "Special missions", unless interpreted in a strict manner, can include virtually every flight conducted under the auspices of a state.

The Chicago Convention by virtue of its Article 3 distinguishes between civil and state aircraft as it applies only to civil aircraft. However, state aircraft, it appears, according to Article 3(b), includes only aircraft used in military, customs and police services.<sup>202</sup> If research aircraft were considered state aircraft under the Chicago Convention, Article 3(c) would require prior "authorization by special agreement" of any flight over foreign state territory. Article 3, instead of a definition of the term state aircraft, provides a list of functions which are traditionally associated with state power: military, customs and police. While it is not debated that aircraft pursuing military, customs or police purposes are state aircraft, the questions arises whether an aircraft operated by a government for scientific purposes would qualify as state aircraft.

For want of a better definition state aircraft are those that are employed for a state purpose, the quality of which is determined by the national government.<sup>203</sup> With respect to the status of aircraft used in scientific research operations the situation is thus the same as in the law of the sea: the State may determine the public status and thereby whether or not the aircraft falls under state immunity; public international law does not stipulate a specific rule.

The issue of sovereign immunity was raised in an incident on 1 April 2001 where a U.S. Navy patrol plane and its crew after an emergency landing on a Chinese island were detained and released only after several days.<sup>204</sup> An U.S.

<sup>200</sup>Which are not any longer in use; and aircraft carrying mail only as part of their cargo do not enjoy the same status, *Ibid.*, p. 34.

<sup>201</sup>See *Ibid.*, p. 32.

<sup>202</sup>See generally on the distinction in the Chicago Convention cite[897f.]bourbonnieremil; *Schwenk* (as in n. 80 on page 141), p. 243.

<sup>203</sup>Similarly, *Diederiks-Verschoor* (as in n. 83 on page 141), p. 34: "state aircraft may include aircraft which, in the light of the mission, display appropriate state markings (for instance aircraft intended for rescue operations, scientific missions, *et cetera*)."

<sup>204</sup>See Associated Press of 1 April 2001. As reported by the Navy News on 4 April 2001 the US plane was a long-range reconnaissance aircraft that contains sensitive high-gain antennas and receivers, and can listen to a wide range of electronic emissions from deep within a targeted territory. The plane was on a routine operation over the South China Sea, reportedly between 50 to 80 nm off the Chinese Island of Hainan in international

officer was reported by *Reuters* on 2 April 2001 to have stated: “According to our lawyers, the aircraft enjoys sovereign immune status, [which] precludes foreign officials from searching, inspecting or detaining the aircraft without U.S. consent.”

The important issue relates to the question whether States have indeed sovereignty over their aircraft in foreign territory. By an analogy to the traditional rules of international law of the sea, the aircraft would have enjoyed immunity from coastal State jurisdiction, both as a ‘warship’ (or government vessel operated for non-commercial purposes) and as a vessel in distress. From the development of the events one can hardly deduce that much respect was paid by the Chinese authorities to the fact that the aircraft was a state craft.<sup>205</sup> While this example does not necessarily call into question the concept of state immunity in general, it shows that immunity is itself not a holy grail either. Evidence for the recognition of state immunity of state aircraft may depend severely on the circumstances of the particular case. For marine scientific research operations one might conceive of cases where the claim to state immunity is similarly blatantly disregarded, for example, when it is alleged that the research projects is not in compliance with the conditions set by the coastal State or infringing on coastal state interests and rights.

With respect to state immunity in the context of marine scientific research operations, the relevant instrument on aircraft is the Convention for the Unification of Certain Rules Relating to the Precautionary Attachment of

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airspace (see generally on legislation and delimitation of China *Song, Yann-Huei/Keyuan, Zou, Maritime Legislation of Mainland China and Taiwan: Developments, Comparison, Implications, and Potential Challenges for the United States*, in O.D. & Int’l L. 31 [2000], pp.306f.). At 09:15 local time, Chinese fighters intercepted the aircraft, and after some daring manoeuvres by a Chinese pilot, apparently in pursuit of the protection of Chinese airspace, it came to a mid-air collision. The U.S. aircraft declared an in-flight emergency and sent out distress signals, reception of which was neither confirmed nor denied by the Chinese authorities. The commander of the U.S. plane managed to land safely on a nearby Chinese island. After the landing the crew was detained and interrogated. The status of the crew and the aircraft remained uncertain for some time. The crew was released on 11 April and returned to the U.S., the aircraft was recovered by a team from Lockheed-Martin, which took the plane apart and brought the salvageable parts back to the U.S. on the 5 July 2001. See also *Lewis, Margaret K., An Analysis of State Responsibility for the Chinese-American Airplane Collision Incident*, in N.Y.U. L. Rev. 1404 77 [2002], pp.1404f.

<sup>205</sup>According to reports in the newspapers, the U.S. itself has been inconsistent in its policy toward foreign reconnaissance aircraft grounded on U.S. territory: *Lee Siew*, Is U.S. being hypocritical?, *The Straits Times*, 5 April 2001, referring to a report by the New York Times of a Soviet MiG-25 fighter, which was taken apart and inspected for nine weeks, despite Soviet protests, by American intelligence officials, before it was sent back to Moscow in packing crates. See *André Karg* in: *Heinegg, Wolff Heintschel von*, editor, *Casebook Völkerrecht*, München, 2005, pp.470f., and *Lewis* (as in n. 204), pp.1414f.

Aircraft.<sup>206, 207</sup> It relates, according to its Article 2(1), to the arrest (a) in pursuit of a private interest or (b) by a judicial or administrative authority. Article 3(1) provides that "aircraft exclusively appropriated to a state service, including postal service, but excluding commercial service" are exempt from application of the convention, i. e., from precautionary arrest. This provision effectively reiterates the immunity status of state chattel in international law. The word 'exclusively' is further defined by the two clauses. The most important qualification is contained in the second clause: "commercial service". Services that are carried out for financially profitable purposes fall thus under the scope of the convention. Since marine scientific research is generally not conducted for commercial reasons this would principally imply that state aircraft engaged in such operations are exempt from attachment procedures as covered by this convention.<sup>208</sup>

The 1982 LOS Convention accords sovereign status to aircraft explicitly only in Article 236 with respect to the provisions on the protection and preservation of the marine environment. By an analogy to warships and government vessels in non-commercial service one can extend the relevant provisions from Part II and VII of the 1982 LOS Convention which would afford state immunity in much the same way as the air law instruments referred to above. Yet as seen in the Chinese-U.S. incident the principles established under international law are not necessarily heeded.

### *Spacecraft*

Special rules about the treatment of spacecraft in proceedings before a court of a foreign State do not exist and have as of yet not arisen. Thus, the general principles relating to the arrest of state property in foreign jurisdictions would appear to apply. State immunity of spacecraft would appear to follow the same rules like the one of vessels and aircraft: where the spacecraft is operated by the government for non-commercial purposes and state immunity is claimed the craft must be considered to be immune in accordance with public international law.

<sup>206</sup>Adopted on 29 May 1933, reprinted in parts in *Matte, Nicolas Matesco, Treatise on air-aeronautical law*, Montreal, 1981, pp. 498f.

<sup>207</sup>See *Diederiks-Verschoor* (as in n. 83 on page 141), p. 165.

<sup>208</sup>It is noteworthy that the Convention on International Interests in Mobile Equipment (adopted by a Diplomatic Conference, 29 October–16 November 2001)—superseding in accordance with its Protocol, Article XXIV, the 1933 Convention—in Article 39(1)(b) 'Rights having priority without registration' gives a contracting State the option to declare "at any time, generally or specifically... (b) that nothing in this Convention shall affect the right of a State or State entity, intergovernmental organisation or other private provider of public services to arrest or detain an object under the laws of that State for payment of amounts owed to such entity, organisation or provider directly relating to those services in respect of that object or another object." This preferential treatment of interests deriving from public services, however, does not apply to objects in state service itself. In lieu of specific rules on the immunity from proceedings, general rules of international law apply, which protect the property of a state from attachments in a foreign state.

*Treatment of Foreign Property*

In the context of the 1982 LOS Convention installations must be distinguished from ships and aircraft: for the latter the 1982 LOS Convention sets forth rules on state immunity, for the former it does not.<sup>209</sup>

*J. Max Huber* observed with respect to state property that the exclusive right to display the activities of a State as a matter of territorial sovereignty has as a corollary the obligation to protect the rights of other States, in particular their right to integrity and inviolability.<sup>210</sup>

The question is whether considerations of state equality require that a State must grant any special exception from action by its executive authorities affecting the property of foreign States under its jurisdiction. Usually state property in another State belongs to the diplomatic or consular staff, or visiting armed forces, or state agencies covered by special agreements. Such property is either subject to special and generally accepted rules, for example, those of diplomatic or consular relations, or to the provisions of specific agreements. While the host State must respect such property in its territory as belonging to a foreign State, there does not seem to be any general rule of international law that all such property, just because it is state owned, be assigned any special inviolability or other exemption from the exercise of jurisdiction by the host State.<sup>211</sup> Thus, the property would seem to be liable to temporary seizure or to expropriation, it may be the subject of orders restricting the foreign State's freedom to deal with the property or requiring it to deal with the property in a certain way, and may be subject to taxation.

A distinction, however, must be drawn between the absence of any inviolability or exemption of the property from such actions, and the enforcement against it. Where such enforcement requires the institution of proceedings or may be resisted by having judicial recourse, questions of general state immunity as accorded by the forum State would arise. With respect to installations the 1982 LOS Convention seems to take account of that fact when it stipulates in Article 60(1) that the coastal State has the exclusive right to construct and to authorise and regulate the construction, operation and use of artificial islands, installations and structures. The exclusive right to

<sup>209</sup>Spacecraft must be considered a separate category altogether as the term is defined relatively broad: a distinction between spacecraft and mere installations on the basis of purposeful navigation would appear to make sense in space law, too, it has no legal significance, though, since the relevant instruments provide no difference in application.

<sup>210</sup>See his arbitral award in the *Island of Palmas Case*, Permanent Court of Arbitration, 4 April 1928, 2 R.Int'l Arb.Awards 829(838).

<sup>211</sup>See *Jennings/Watts* (as in n. 148 on page 152), p.364; *Brownlie* (as in n. 48 on page 134), pp.346f. The I.C.J. observed in the *Barcelona Traction, Light and Power Co. Case (Belgium v Spain)*, 1970 I.C.J.Rep., p. 3, para. 33: "When a State admits into its territory foreign investments. . . it is bound to extend to them the protection of the law and assumes obligations concerning the treatment afforded them. These obligations, however, are neither absolute nor unqualified."

regulate the use, by inference, comprises the right to prohibit or suspend the use; but it does not necessarily include the detention in the course of judicial proceedings. Installations owned (and/or operated) by a State would have to be dealt with in accordance with the forum law on foreign state property.<sup>212</sup> The coastal State in authorising the emplacement of the installation may require the emplacing State to forsake state immunity with respect to its installation.<sup>213</sup>

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<sup>212</sup>Note that Article 9(1) of the revised Draft Convention on the Legal Status of Ocean Data Acquisition Systems, Aids and Devices (ODAS), IOC-XVII/Inf. 1, 21 January 1993, requires a coastal State to return the ODAS to the owner or operator on request or permit them to recover it, and Article 24 explicitly protects the State owner from seizure, arrest or detention of its ODAS, see *Brown/Gaskell* (as in n. 6 on page 122), pp. 37 and 41.

<sup>213</sup>See *Christian Gloria* in: *Ipsen* (as in n. 153 on page 153), § 26, para. 25, with respect to the waiver of immunity in general.





## Part III.

### Regulation of Research by Part XIII



## Chapter 4.

### Marine Scientific Research in the Different Zones from Sea Level

The sea surface is the natural location for the conduct of marine scientific research. The 1982 LOS Convention, according to its preamble, is intended to settle all issues relating to the law of the sea by establishing a legal order for the seas and oceans. Yet, the 1982 LOS Convention does not contain a definition of the sea or ocean space to which it applies.

The title of the 1982 LOS Convention suggests that the 1982 LOS Convention is applicable to the areas of the Earth's surface covered by the sea. Various provisions, however, suggest that the 1982 LOS Convention has *ratione materiae* a much broader area of coverage, namely, the pollution from land-based sources, ice-covered areas, and resources in the sea bed and subsoil.

It can be assumed that the Preamble provides purpose and object of the 1982 LOS Convention.<sup>1</sup> The President of the Third U.N. Conference on the Law of the Sea referred to it as “‘siting’ the instrument in its political, historical, and, if necessary ideological context” and emphasised that special care in drafting was taken with a view to Article 31 of the Vienna Convention<sup>2</sup>

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<sup>1</sup>See *Hasselmann, Cord-Georg, Die Freiheit der Handelsschifffahrt: eine Analyse der UN-Seerechtskonvention*, Kehl am Rhein, 1987, Veröffentlichungen des Instituts für Seerecht und Seehandelsrecht der Universität Hamburg 1, p. 39.

<sup>2</sup>See President's formal report to the Conference on the work of the Informal Plenary on the preamble, reprinted in *Nordquist, Myron H.*, editor, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Volume I, Dordrecht, 1985, pp. 458, 466f.

which expressly refers to the preamble and annexes of a given instrument for purposes of interpretation. The preamble contains, indeed, some references to the oceans. Thus, recital 4 refers to the study, protection and preservation of the marine environment. But the term marine environment which probably comes closest to describing the meaning of sea/ocean space is not defined. Recital 8 seems to allude to the 1982 LOS Convention's drafters perception that certain matters remained "to be governed by the rules and principles of general international law" which suggests that they fall outside the scope of the 1982 LOS Convention but may be related in some respect to the oceans. It follows that the preamble of the 1982 LOS Convention only refers to the object of the 1982 LOS Convention in general terms and seems to presuppose a definition of its scope of application when it invokes the desire to settle *all issues* relating to the law of the sea. This would suggest that the scope of the 1982 LOS Convention derives from the issues it deals with.

Article 1 on the use of terms and scope provides no hint on the spatial application of the 1982 LOS Convention. The word 'scope' in the context of Article 1 does not refer to the extent of the 1982 LOS Convention *ratione materiae* but only "to its scope in the sense of participation in it *ratione personae*."<sup>3</sup> Article 1(4) of the 1982 LOS Convention speaks of 'marine environment, including estuaries', and Articles 145(a) and 211(1) of the 1982 LOS Convention of 'marine environment, including the coastline'. By inference one could assume that the 1982 LOS Convention applies to the oceans seawards of the coastline, as Article 8 establishes a right of innocent passage where the drawing of baselines in accordance with the 1982 LOS Convention "has the effect of enclosing as internal waters areas which had not previously been considered as such". But it also refers in Article 194(3)(a) to land-based sources of pollution and thus extends its spatial scope landwards to the watersheds draining into the oceans—or even beyond, where aeolian transport, i. e., by wind, is taken into account—even if restricted to pollution of the environment. By virtue of Article 1(1), Part VI and XI, its scope extends to the sea floor and the subsoil thereof throughout the oceans. Again, the depth up to which the 1982 LOS Convention applies to the subsoil is not determined but would appear to extend to the centre of the Earth, and at least to the depth, at which natural resources can be extracted. Conversely—as is of special interest in the context of marine scientific research—, there is no provision on how far the scope of the 1982 LOS Convention extends into the atmosphere. Some provisions extend its applicability to aircraft and overflight. Yet, the extension would appear to be valid only for the legal concepts for which such application was envisaged and must be determined on a case by case basis. Determining the spatial scope of the 1982 LOS Convention

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<sup>3</sup> Nordquist, Myron H. et al., editors, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 1 to 85, Annexes I and II, Final Act, Annex II, Volume II, Dordrecht, 1993, p.30.

must therefore follow either of two approaches: on the one hand, looking at the subject matter that the title of the 1982 LOS Convention refers to, on the other hand, looking at the various provisions and their meaning.

The scope of application must be delineated horizontally and vertically. Vertically, because water and air follow different regimes, horizontally, because States' exercise of power is spatially limited as a function of their sovereignty and jurisdiction over the ocean under the terms of the 1982 LOS Convention. The 1982 LOS Convention is fairly elaborate on its scope in terms of horizontal application, i. e., it defines internal waters (as different from fresh water or land), the territorial sea, the exclusive economic zone, and the high seas; but it is less explicit in terms of its vertical application. There are provisions on the continental shelf and the sea-bed (extensions of land, one may say, which are governed by the Law of the Sea), but, except for some references to over-flight, none on the space above the water.<sup>4</sup> The Preamble of the 1982 LOS Convention casts no light on the applicability of the 1982 LOS Convention to the air space above the water. In paragraph 3 it is acknowledged that "the problems of ocean space are closely inter-related and need to be considered as a whole". From this, however, one cannot infer that 'oceans' was meant to include the air, even though, from a scientific point of view, there is no strict border between the oceans and the atmosphere. Similarly, the reference to "a legal order for the seas and oceans which will facilitate international communication, and will promote the peaceful uses of the seas and oceans, the equitable and efficient utilisation of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment," in recital 4 provides no clarity. In conclusion, one must say that the drafters of the 1982 LOS Convention did apparently not consider the implications of the substantive provisions on the airspace regime a salient issue.

The 1982 LOS Convention provides for a number of different zones adjacent to the territory of coastal States which, to a varying degree, are subject to their jurisdiction. For the purpose of the present analysis the extent of every single zone, as well as the respective delineations set forth by the 1982 LOS Convention, are assumed to be settled law.<sup>5</sup> It is noteworthy that,

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<sup>4</sup>But see Walker, George K./Noyes, John E., *Definitions for the 1982 Law of the Sea Convention – Part II*, in Cal.W.Int'l L.J. 33 [2003], p.208, who, with respect to the definition of "ocean space" and "sea" in the 1982 LOS Convention, conclude in rather general terms "'ocean space' or 'sea'... [includes] the water surface and water column as those water areas are regulated by Convention provisions." He continues: "'Ocean space' or 'sea' may include the air column superjacent to a given water surface of an ocean space...; the law of the air column over these ocean space or sea areas is governed in part by the Convention (e. g., high seas overflight...) and in part by other law, e. g., air law."

<sup>5</sup>A discussion of the implications of claims that deviate from the course given by the 1982 LOS Convention would be beyond the format of this analysis, the reader is therefore referred to treatises that focus on these questions, for example, Brown, Edward D., *The International Law of the Sea*, Volume I Introductory Manual, Dartmouth, 1994,

except for the territorial sea and the continental shelf,<sup>6</sup> States must claim jurisdiction with respect to these zones in order to invoke rights provided for by the 1982 LOS Convention; mere ratification or accession by a State does not confer any rights in respect of these zones. The constituting act by the State may be a formal declaration or legislation to that effect. Like any constitutive legal act, it requires an objective element, which gives notice to the legal community, and a subjective element, which carries and encompasses the former.

### INTERNAL WATERS

Immediately adjoining the coast are the internal waters, they extend from the shores to the baseline. Generally, the baseline is the low water line along the coast. Included are rivers, lakes, harbours and bays to a certain extent.<sup>7</sup> Part XIII of the 1982 LOS Convention does not mention the internal waters at all.<sup>8</sup> Any research project to be conducted in the internal waters—

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pp. 43–52.

<sup>6</sup>See *Brown*, Law of the sea (as in n. 5 on the page before), p.218; nevertheless the coastal State must establish the breadth of the territorial sea and the continental shelf, at least where an outer continental shelf is to be claimed; Germany published its proclamation of the continental shelf without determining the limits (“Proklamation der Bundesregierung über die Erforschung und Ausbeutung des deutschen Festlandsockels vom 22.01.1964”, B.G.Bl. 1964 II 104) which were later agreed with Denmark, the Netherlands and the United Kingdom (Agreements with the respective countries and Germany: B.G.Bl. 1972 II 881, 889, 897; see also *North Sea Continental Shelf Cases*, (*F.R.G. v Den.*; *F.R.G. v Neth.*), Judgement of 20 February 1969, 1969 I.C.J.Rep. 3.) and extended its territorial sea as of 1 January 1995 (“Bekanntmachung der Proklamation der Bundesregierung über die Ausweitung des deutschen Küstenmeeres vom 11.11.1994”, B.G.Bl. 1994 I, 3428).

<sup>7</sup>See Article 10 of the 1982 LOS Convention on bays, which excludes indentations of the coast whose area is smaller than “that of the semi-circle whose diameter is a line drawn across the mouth of that indentation” and allows to draw a straight baseline of 24 nm if the distance between the low-water marks of the natural entrance points of a bay exceeds 24 nm and finally states that the internal waters are principally considered a part of the coastal states territory, only seaward of the baseline the delimitation of the sea in an internationally significant way begins. With respect to the breadth of the internal waters the OSPAR Convention (as n. 69 on page 139) defines in its Article 1:

- b. “Internal waters” means the waters on the landward side of the baselines from which the breadth of the territorial sea is measured, extending in the case of watercourses up to the freshwater limit.
- c. “Freshwater limit” means the place in a watercourse where, at low tide and in a period of low freshwater flow, there is an appreciable increase in salinity due to the presence of seawater.

As both, the internal waters and the watercourses, fall under the unfettered territorial jurisdiction of the coastal State the differentiation is of no relevance here.

<sup>8</sup>Part XIII, Section 3 on the conduct and promotion of marine scientific research starts with a provision on the territorial sea and continues with provisions applicable in the exclusive economic zone and beyond.

which can comprise important parts of the oceans<sup>9</sup>—must therefore follow the procedures laid down by the relevant State.

### TERRITORIAL SEA

The territorial sea extends 12 nm seaward from the baseline/internal waters. This is the principle established by the 1982 LOS Convention and can be accepted as the generally recognised limit. Some States still claim territorial seas in excess of the 12 nm,<sup>10</sup> but those claims are clearly contrary to the stipulations of the 1982 LOS Convention, widely contested and therefore not even acceptable as customary international law outside the 1982 LOS Convention.<sup>11</sup>

The internal waters and the territorial sea of the coastal State fall under its sovereignty, which extends to the sea bed, waters, and air space above.<sup>12, 13</sup> The exact content of such power is left to be determined by the coastal State's interpretation of sovereignty through its municipal law. The 1982 LOS Convention "allows for the maximum implications that may be drawn from the concept of sovereignty."<sup>14</sup> The exercise of jurisdiction by the coastal State in the territorial sea, however, is subject to the right of innocent passage enjoyed by the flag States under the ramifications of that regime.<sup>15</sup>

<sup>9</sup>The Wadden Sea in the North Sea constitutes to a large extent internal waters and is at the same time of high interest to oceanography as a thriving habitat for a wide variety of living beings; similarly, studying issues, such as shoreline erosion and shallow water environment, is witnessing increased significance in the context of coastal zone management. See also Kraska, James, *Oceanographic and Naval Deployments of Ependable Marine Instruments under U.S. and International Law*, in O.D. & Int'l L. 26 [1995], p. 327.

<sup>10</sup>See Fenwick, Judith, *International profiles on marine scientific research: national maritime claims, MSR jurisdiction, and U.S. research clearance histories for the world's coastal states*, Woods Hole, MA, 1992, pp. 184 and 186–193, lists Angola, Benin, Cameroon, Congo, Ecuador, El Salvador, Liberia, Nicaragua, Nigeria, Panama, Peru, Sierra Leone, Somalia, Syria, Togo, and Uruguay.

<sup>11</sup>Some States, like, for example, Greece claim less than 12 nm. But this is, generally speaking, owing to a specific geographical or political situation whose implications cannot be generalised: in the case of Greece it is the unsettled jurisdictional conflict with Turkey in the Aegean Sea. Similarly, Italy and France claim only a 6 nm territorial sea in the Mediterranean Sea in consideration of regional agreements.

<sup>12</sup>Article 2 of the 1982 LOS Convention; see Churchill, Robin R./Lowe, Alan V., *The law of the sea*, 3rd edition. Yonkers, NY, 1999, Melland Schill studies in international law, pp. 75f., for a historic overview.

<sup>13</sup>In the past the juridical nature of the territorial sea was much debated inasmuch it affected the precise scope of the rights of the coastal State; this discussion was put to rest with the advent of the Law of the Sea conventions. Article 1 of the 1958 Geneva Convention clearly concedes to the coastal State plenary power to regulate events in the territorial sea, see O'Connell, Daniel P./Ivan A. Shearer, editor, *The international law of the sea*, Volume I, Oxford, 1982, p. 80.

<sup>14</sup>See *Ibid.*; it is beyond the scope of this analysis to examine the municipal law of coastal States as to their interpretation of the term sovereignty.

<sup>15</sup>Part II, Section 3 of the 1982 LOS Convention, and section 5 of the present analysis.

Article 245 of the 1982 LOS Convention confers on the coastal State the “exclusive right to regulate, authorize and conduct marine scientific research” within the territorial sea, and explicitly states that “marine scientific research therein shall be conducted only with the express consent of . . . the coastal state.” Article 245 only clarifies what is already embodied in Part II, i. e., the coastal State’s complete jurisdiction over all activities within the territorial sea including marine scientific research, subject only to the regime of innocent passage. A merit of including this restatement in Part XIII can be seen in its providing a complete picture of the regime of marine scientific research.<sup>16</sup> It must be noted that the exercise of coastal state sovereignty is in no way compromised. Even the general exhortations in terms of international co-operation in and the facilitation and promotion of marine scientific research set forth by Articles 239, 242 and 243 of the 1982 LOS Convention can hardly be interpreted as to condense to a concrete obligation of the coastal States to make arrangements for marine scientific research.<sup>17</sup>

A differentiation must be made between the regulation, the authorisation and the conduct of marine scientific research. Regulatory competence denotes the right to prescribe laws and regulations pursuant to which activities may be conducted. Thus, the coastal State may prescribe certain research methods and may restrict the use of others. Authorisation is different from regulation, as it denotes a case-by-case decision. Thus, an authorisation may lay down stricter rules than the general regulations, and, conversely, it may grant an exception from certain restrictions laid down in the framework. Finally, the word ‘conduct’ refers to the actual activity, which naturally may be carried out by the coastal State itself.

Interpretative uncertainties<sup>18</sup> can be avoided in the context of Part II of the 1982 LOS Convention: the exclusive right in respect of marine scientific research is not more exclusive than the jurisdiction of the coastal State in general; thus, matters generally exempt from coastal state jurisdiction remain exempt under Article 245, too. Accordingly, the coastal State has as little an exclusive right to regulate the internal affairs of the research vessel as it has in respect of any other vessel. General concepts, like sovereign immunity as well as the limitations set forth by Article 2(3) of the 1982 LOS Convention, namely, “other rules of international law”, apply in the context of marine scientific research as well.

Article 245 of the 1982 LOS Convention describes—like all provisions of the 1982 LOS Convention—the lowest denominator possible in terms of free

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<sup>16</sup>See *Soons, Alfred H. A., Marine Scientific Research and the Law of the Sea*, Deventer, 1982, p. 145; during the negotiations it had already been expressed that the inclusion was desirable for clarification purposes, see Report by the Chairman on the work of the Committee’s work, VI Off.Rec., p. 91, para. 6.

<sup>17</sup>See section 9.

<sup>18</sup>See *Ibid.*, pointing out that the word ‘exclusive’ seems not to be correct as the researching or flag State retains the right to regulate matters aboard the vessel and in respect of the research.



access for purposes of research. Consequently, coastal States may refrain from regulating scientific research at all, they may not even require prior notification for any research project in the territorial sea.<sup>19</sup> This is supported by Article 21(1)(g) of the 1982 LOS Convention, which makes provision for coastal state regulations on marine scientific research during innocent passage. Thus, a coastal State could, for example, exempt any marine scientific research from Article 19(2)(j) of the 1982 LOS Convention by a regulation effectively rendering research an innocent activity. It would have to do so explicitly as Article 19(2) establishes a presumption to the contrary.

Article 245 of the 1982 LOS Convention only sets the basis on which researching States may make their dispositions; it describes the standard by which States are presumed to act. As a consequence of the presumption of non-innocence, all research projects within the territorial sea have to be cleared, i. e., even if the coastal State does not have any legislation on scientific research within the territorial sea, some communication should be exchanged to confirm free access. It cannot be assumed that the rights conferred on the coastal State by Article 245 are waived. Also, if there is no confirmation, research carried out nevertheless would be in contravention of the 1982 LOS Convention. The requirement of coastal State's consent means conversely the denial of access for purposes of marine scientific research: if no communication from the coastal State is received, no research can be carried out.<sup>20</sup> The word 'exclusive' as defined in Article 77(2) underlines this interpretation.<sup>21</sup>

But a coastal State cannot go below Article 245, i. e., it cannot exclude what has been accepted as not to fall under the term 'marine scientific research' as used in the 1982 LOS Convention, namely, operational oceanography. While it is nowhere expressly stated that operational oceanography does not form a part of marine scientific research, this has been the understanding of the negotiators at the conference. Thus, a ship taking measurements of water temperature, wind direction and currents, soundings, and other information, as a matter of routine and ancillary to navigation must not cease to pursue these activities upon entry into foreign territorial waters for the purpose of innocent passage.<sup>22</sup>

## CONTIGUOUS ZONE

In an area up to 24nm the coastal State may enforce its laws and regulations relating to custom, fiscal, immigration, and sanitary purposes.<sup>23</sup> In

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<sup>19</sup>See also *Ibid.*.

<sup>20</sup>See also *Ibid.*, recalling that the rules of 'implied consent' do not apply in the territorial sea.

<sup>21</sup>See page 185.

<sup>22</sup>See section 5.

<sup>23</sup>Article 33, contiguous zone

respect of marine scientific research, the legal regime of the contiguous zone is governed by the provisions on the exclusive economic zone. Where both zones are claimed, the coastal State has the jurisdictional competence of Article 33 of the 1982 LOS Convention in addition to those rights afforded in Part V. If, however, no exclusive economic zone is claimed the coastal State, has no jurisdiction with respect to marine scientific research between 12 and 24 nm. Yet, since the exclusive economic zone is a concession at the cost of the high sea freedoms,<sup>24</sup> it would appear that the coastal State, *maiore ad minus*, may decide to claim jurisdiction not for all matters and not to the spatial extent envisaged by Part V. Such a “custom tailored” exclusive economic zone would have to be claimed with explicit specifications and would be registered as such rather than as a mere contiguous zone.

#### EXCLUSIVE ECONOMIC ZONE AND CONTINENTAL SHELF

The legal regime of the exclusive economic zone was developed during the negotiations of the Third U.N. LOS Conference,<sup>25</sup> The zone extends coastal state jurisdiction to another 37 per cent of the world oceans.<sup>26</sup> Its special status is reflected by the fact that it is considered a zone *sui generis*, expressed in Article 55 of the 1982 LOS Convention<sup>27</sup> and alluded to in Article 59 of the 1982 LOS Convention where the basis for the resolution of conflicts is explicitly constrained.<sup>28</sup> The continental shelf, in contrast, has a longer

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1. In a zone contiguous to its territorial sea...the coastal State may exercise the control necessary to:

- (a) prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea;
- (b) punish infringement of the above laws and regulations committed within its territory or territorial sea.

<sup>24</sup>See page 183.

<sup>25</sup>See *Nordquist et al.* (as in n. 3 on page 176), pp. 496f.; precursors of this concept, however, had been introduced somewhat earlier, see *ibid.*, pp. 493f.; see also *Lupinacci, Julio César, The Legal Status of the Exclusive Economic Zone in the 1982 Convention on the Law of the Sea*, in *Vicuña, Francisco Orrego*, editor, *The Exclusive Economic Zone: a Latin American Perspective*, Boulder, CO, 1984, pp. 75–91.

<sup>26</sup>See *Knauss, John A., Marine Science and the 1974 Law of the Sea Conference*, in *Science* 184 [1974], p. 1337.

<sup>27</sup>Article 55, Specific legal regime of the exclusive economic zone

The exclusive economic zone is...subject to the *specific legal regime* established in this Part, under which the rights and jurisdiction of the coastal State and the rights and freedoms of other States are governed by the relevant provisions of this Convention [emphasis added].

<sup>28</sup>Article 59, Basis for the resolution of conflicts regarding the attribution of rights and jurisdiction in the exclusive economic zone

[W]here this Convention does not attribute...jurisdiction to the coastal State...within the exclusive economic zone, and a conflict arises..., the

history and dates back to the *Truman Proclamation*<sup>29</sup> from 1945. Many of the provisions in Part XIII apply to both zones as they, in general, overlap in their geographical borders: the exclusive economic zone comprises of the water column above the continental shelf.

### *The EEZ Concept in Article 56 and Marine Scientific Research*

#### *Marine Scientific Research as Residual Freedom*

Article 56 of the 1982 LOS Convention reflects the conflict between the (access) interests of the major maritime powers and the (economic) interests of coastal States.<sup>30</sup> Sovereign rights over living and non-living resources, as well as exclusive jurisdiction in respect of economic activities, rest with the coastal State, while other activities may be pursued under the legal ramifications as applicable on the high seas.<sup>31</sup> By virtue of Article 56(1)(b)(ii) of the 1982 LOS Convention the coastal State has jurisdiction with respect to marine scientific research. It may be viewed as a corollary to the sovereign right to explore and exploit resources set forth in Article 56(1)(a): The coastal States' concern about "their" resources was at the root of the regime on the exclusive economic zone.<sup>32</sup> Jurisdiction over research activities had to come within coastal state ambit because an uncontrolled increase of scientific knowledge had the potential of being used to the disadvantage of the coastal State with respect of its resources. And since attempts during the negotiations failed to introduce a clear distinction between scientific research and exploration, all research was subjected to restrictions.<sup>33</sup>

The term 'exclusive economic zone' suggests that the coastal State enjoys exclusive jurisdiction with respect to the economic activities carried out

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conflict should be resolved on the basis of equity and in the light of all the relevant circumstances, taking into account the respective importance of the interests involved to the parties as well as to the international community as a whole.

<sup>29</sup> *Truman, Harry S., Presidential Proclamation No. 2667*, "Policy of the United States with Respect to the Natural Resources of the Subsoil and Sea Bed of the Continental Shelf", 28 September 1945.

<sup>30</sup> See *Miles, Edward L., Global Ocean Politics: the Decision Process at the Third United Nations Conference on the Law of the Sea, 1973–1982*, The Hague, 1998, p. 90.

<sup>31</sup> Or, as *Lupinacci* (as in n. 25 on the preceding page), p. 98, has put it: the underlying issue is "the problem of residual rights, which... becomes a matter of deciding between residual application of the principle of sovereignty of the coastal state and residual application of the principle of freedom of all states"; see also *Lucchini, Laurent/Voelckel, Michel, Droit de la mer*, La mer et son droit, les espaces maritime, Volume I, Paris, 1990, § 243f. This problem is at the core of Article 59 of the 1982 LOS Convention.

<sup>32</sup> See section 2; see also *Knauss, Marine Science 1974* (as in n. 26 on the facing page), p. 1338.

<sup>33</sup> See *Burke, William T., Marine Science Research and International Law*, Law of the Sea Institute Occasional Paper No. 8, Kingston, 1970, p. 25: "[T]he only way of freeing scientific research is to abolish the coastal state's exclusive right of exploration."

within the zone.<sup>34</sup> However, in Article 56(1)(b) the word ‘exclusive’ is missing.<sup>35</sup> *Gündling* suggests that the omission of the word ‘exclusive’ in Article 56(1)(b) constitutes a diminution of the coastal State’s rights compared to Article 245 (research in the territorial sea) and other areas encompassed by Article 56 of the 1982 LOS Convention.<sup>36</sup> In Part V only Article 60 with respect to artificial islands, installations and structures uses the phrase *exclusive* jurisdiction; neither the protection and preservation of the marine environment nor marine scientific research are further qualified in this respect. Both are dealt with separately in Parts XII and XIII. The complexity of the two issues warrants this separation. And a closer look at the relevant provisions reveals that the conceptualisation of the two regimes in the exclusive economic zone is one of graded jurisdiction, which seeks to strike a balance between extended control by the coastal State and traditional freedoms of the high seas precluding the use of the term ‘exclusive’ as defined in Article 77(2) of the 1982 LOS Convention.

#### “Vertical” Jurisdiction with Respect to Marine Scientific Research

##### *Regulation and Authorisation*

Article 245 would appear to deduce the “*exclusive* right to regulate, authorize and conduct [emphasis added]” from the coastal State’s sovereignty.<sup>37</sup> Article 246 confers the respective rights and speaks of “exercise of jurisdiction” not further qualifying jurisdiction. The “*exclusiveness*” of coastal state jurisdiction is somewhat illustrated by Article 56(2): in exercising its jurisdiction “the coastal State shall have *due regard* to the rights and duties of other States [emphasis added]”. In the exercise of sovereign rights (in the territorial sea) coastal States are only restrained by the regime on innocent passage. Where they avail themselves of their *jurisdiction* under Articles 56(1)(b) and 246(1) other restrictions apply. With respect to marine scientific research these would mainly be contained in Article 246(3), which

<sup>34</sup>See *Lucchini/Voelckel* (as in n. 31 on the page before), § 243f.

<sup>35</sup>There are some States that nevertheless claim “exclusive jurisdiction” with respect to marine scientific research: see Article 13(2) of the Cape Verde Law No. 60/IV/92 of 21 December 1992; Article 13 of the Act No. 15/1984 of 12 November 1984 on the Territorial Sea and Exclusive Economic Zone of the Republic of Equatorial Guinea; Article 8 of the Gabon Act No. 9/84 establishing an exclusive economic zone of 200 nautical miles; see also Article 13(d) of the Djibouti Law No. 52/AN/78 concerning the territorial sea, the contiguous zone, the exclusive economic zone, the maritime frontiers and fishing of 9 January 1979; text of the preceding laws and regulations is available at <http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/> – visited on 31 January 2005; see also *U.N. Division for Ocean Affairs & Law of the Sea, United Nations, Practice of States at the time of entry into force of the United Nations Convention on the Law of the Sea*, New York, 1994.

<sup>36</sup>See *Gündling, Lothar, Die 200 Seemeilen-Wirtschaftszone: Entstehung eines neuen Regimes des Meeresvölkerrechts*, Berlin, 1983, p. 234.

<sup>37</sup>See section 2.

provides by default for a grant of consent. For exercising their jurisdiction in compliance with Article 246(1) coastal States must therefore introduce measures that “under normal circumstances” lead to a consent to research requests.<sup>38</sup> Indeed, one could advance the argument that a State claiming an exclusive economic zone would either have to regulate marine scientific research, i. e., first of all establish the relevant rules and procedures in accordance with Article 246(3), or to allow the conduct of all marine scientific research within its exclusive economic zone. A comparison with Article 77(2) supports this reading as it can be taken to define the word ‘exclusive’, namely, that it precludes concurrent jurisdiction or exercise of activities. ‘Exclusive’ in the sense of Article 77(2) means that non-regulation is regulation, namely, no activity at all. Part XIII contains no such default rule, rather to the contrary jurisdiction over marine scientific research must be viewed as a concession to the previous freedom of marine scientific research in the waters now under coastal state jurisdiction. Accordingly, Article 56(1)(b)(ii) gives the coastal State only a prerogative or pre-emptive right; where the coastal State does not avail itself of the possibilities offered by the 1982 LOS Convention, other States may operate on the assumption of the high sea freedoms.<sup>39</sup> Where a State, having failed to implement Article 246(3), refuses a research vessel access to its exclusive economic zone it would be in

<sup>38</sup>See section 2 with respect to this obligation; section 8 with respect to the phrase ‘normal circumstances’.

<sup>39</sup>Germany, for example, has not passed legislation concerning research in the water column (an exclusive economic zone has been established by proclamation from 25 November 1994 (B.G.Bl. 1994 II 3769) as of 1 January 1995)—research activities with respect to the sea bed are regulated under legislation on the continental shelf, § 132 *Bundesberggesetz* from 13 August 1980 (B.G.Bl. 1980 I 1310)—consequently, such research has been considered free by the German Federal Maritime & Hydrographic Agency (applications submitted nevertheless have been regarded as mere notifications); a permission is required where research extends into the sea-bed, for example, sampling of sediment, on the basis of the public order at sea, § 132(1):

Wer in Bezug auf den Festlandsockel an Ort und Stelle Forschungshandlungen vornehmen will, die ihrer Art nach zur Entdeckung... von Bodenschätzen offensichtlich ungeeignet sind, bedarf hinsichtlich der Ordnung der Nutzung und Benutzung der Gewässer... und des Luftraumes... der Genehmigung.

A federal law on marine scientific research (“Gesetz über die Durchführung wissenschaftlicher Meeresforschung” from 6 June 1995, B.G.Bl. 1995 I 778) foresees the legal basis for legislation to introduce a consent procedure in accordance with Article 246 of the 1982 LOS Convention.

In contrast, the German Democratic Republic, issued on 23 March 1989 a Regulation for marine scientific research (Verordnung über ausländische wissenschaftliche Meeresforschung in den Territorialgewässern, auf dem Festlandsockel und in der Fischereizone der DDR, ‘Meeresforschungsverordnung’, G.Bl. der D.D.R. 1989 I 121). The regulation implements Part XIII literally with respect to the consent regime. Interestingly, § 8 foresaw an administrative charge of 500 *Reichsmark* for infringements of the consent requirement and any conditions set in accordance with § 6 (implementing Article 249), and a charge of 1,000 *Reichsmark* if such conduct had seriously violated the public order and security, societal interests or could have caused major damage.

breach of international law.<sup>40</sup>

Conversely, since the 1982 LOS Convention does not explicitly restrict the extent to which a coastal State may regulate the conduct of marine scientific research, Article 300 of the 1982 LOS Convention, the obligation to good faith and the prohibition of abuse of rights, is the only apparent limit to regulation. Yet, Article 300 would only prevent such legislation, which effectively precludes any marine scientific research thereby denying even the recognition of a residual right of the researching State.<sup>41</sup>

### *Enforcement Measures*

Article 56(1)(b) of the 1982 LOS Convention refers to Part XIII with respect to the substantive content of coastal state jurisdiction on marine scientific research. However, Part V contains in Article 73 a number of enforcement measures in respect of laws and regulations by the coastal State. The list of enforcement measures, i. e., boarding, inspection, arrest, and judicial proceedings, is only indicative as is obvious from the word ‘including’. Yet, the coastal State may enforce laws and regulations only in the exercise of sovereign rights as they relate to exploration, exploitation, conservation and management of the *living* resources.

On the basis of the exclusive economic zone concept, namely, that it constitutes a zone *sui generis* within which uncertainties in law need to be settled in the light of the whole balance struck between coastal state rights and the freedoms of the high seas, one could take the view that Article 73 of the 1982 LOS Convention is also applicable in respect of research activities conducted in contravention of the 1982 LOS Convention. Where, for example, research activities pertain to the living resources of the exclusive economic zone, a distinction between marine scientific research and exploration is difficult to make anyway.<sup>42</sup> In such an instance the coastal State could take the view that the incriminated activities infringe upon its sovereign rights which would then trigger the enforcement measures of Article 73(1). However, the language used in Article 73(1) is parallel to that used in Article 56(1)(a), whereas marine scientific research is listed in the same Article in subparagraph (1)(b)(ii). This indicates that a clear distinc-

<sup>40</sup>See section 2. Note, the legal situation may be completely different from the factual: a scientist would not want to risk arrest or detention even though these would constitute illegal acts, see *Plesmann, Wolf/Röben, Volker, Marine Scientific Research: State Practice versus Law of the Sea?* in *Wolfrum, Rüdiger*, editor, *Law of the Sea at the Crossroads: The Continuing Search for a Universally Accepted Regime*, Berlin, 1990, Veröffentlichungen des Instituts für Internationales Recht an der Universität Kiel 113, p. 379, for an account of “legal uncertainty” for a research cruise; in contrast, *Nellen, W. et al., MINDIK, Meteor-Berichte*, Hamburg, 1996, pp. 49f., describe a more boldly approach when faced with an unclear delimitation of exclusive economic zones in the Red Sea.

<sup>41</sup>Apart from such a clear breach of Article 300, it is difficult to employ this provision in a substantive manner owing to its inherent ambiguity.

<sup>42</sup>See section 2.

tion must be drawn between the two activities. Marine scientific research is not mentioned in Article 73, and in as much as Article 73 refers to sovereign rights, enforcement measures with respect to matters, over which the coastal State has “only” jurisdiction, would fall squarely outside the scope. Additionally, Article 73(3), excluding imprisonment and corporal punishment from enforcement measures, re-emphasises the focus on living resources in that it refers to fisheries laws and regulations. Only where those are violated by an activity otherwise falling into the realm of marine scientific research, the question would arise whether measures could be taken in accordance with Article 73(3). Only then the question would have to be answered whether the activity in question infringes sovereign rights, as envisaged by Article 73, or must be regarded as falling under an exception for marine scientific research (on living resources).<sup>43</sup>

Part XIII contains in Article 253 the competence of the coastal State to enforce its legislation and distinguishes the right to require suspension or cessation of the research activity. Suspension denotes a preliminary status: the research project is only interrupted but may be continued if certain requirements are fulfilled and/or conditions met. It presupposes that the research project is already being effected. Accordingly, in exercising this right the coastal State is limited to reasons as provided by Articles 248 and 249. There is no exact time frame for lifting the order of suspension, neither is there a clear time limit within which compliance must be effected. Interpretation of these provisions must therefore be guided by the good faith principle of Article 300 of the 1982 LOS Convention, i. e., a suspension must not result in a *de facto* cessation, in other words suspension should be short enough as not to endanger the relevance of the research project and in particular the usefulness of already collected data. A definite time frame would depend on the type of infringement and the kind of research in question: where a research project requires continuous measuring or sample taking, e. g., ocean flux observations, suspension would have to be shorter than in projects where continuity is less important, e. g., tectonic operations.

Cessation, on the other hand, denotes the abandonment of the research project altogether. Accordingly, Article 253(2) presupposes—on the basis of the conditions set forth under Article 248—a serious infringement, “which amounts to a major change in the research project or the research activities”, or the failure to rectify non-compliance within a reasonable period of time.<sup>44</sup> Power to do so in cases of non-compliance is limited, though, to the

<sup>43</sup>The answer to this question had to be based predominantly on the purpose or the intention of the activity, see section 2.

<sup>44</sup>§ 22 of Norway’s Regulations relating to foreign marine scientific research (see n. 199 on page 111) stipulates:

The Directorate of Fisheries may require the cessation of marine scientific research if any matters that have given grounds for suspension... have not been rectified within a reasonable period of time...

information requirements under Article 248 as they have been relevant to the coastal State's decision; and, in case of Article 249, to the rights of the coastal State with respect to the research project. The latter would appear to include the coastal State's participation in, its access to data and samples of, and information about the research project. The right of the coastal State to have all scientific equipment removed after completion would not appear to matter much in the context of Article 253. Failure to comply with this obligation, though, will most likely result in denial of subsequent access requests in accordance with Article 246(5)(d).

### *Conditions for Research Activities*

Article 249(1) of the 1982 LOS Convention lays out what can be seen as an interpretation of Article 246(1) of the 1982 LOS Convention. The duty to comply with the measures prescribed by the coastal State for any activity within its jurisdiction is the corollary of the coastal State's authority to grant or withhold permission for marine scientific research in the exclusive economic zone. The coastal State is not only deciding upon the 'yes' or 'no' of the research activities, competence for which is enshrined in the right to regulate and authorise, it also has, by virtue of Article 249(1), the power to decide about the 'how'. This second aspect is part of the authorisation process also. It goes beyond the competence provided for by Article 246(1), namely, the general right to regulate the conduct of research activities, in that it confers on the coastal State the possibility to impose restrictions on a case-by-case basis. Conversely, the coastal State, when regulating marine scientific research activities in general, may not go beyond the requirements listed in Article 249(1). Article 249(2) supports this reading by stating two exceptions, namely, the discretion to grant or withhold consent in the instances enumerated in Article 246(5) and the request for international availability of research results. Judging from legislation and reported state practice, participation and publication are the most salient issues for research requests.

### *Participation*

The participation of foreign scientists in research operations has been a wide spread practice already before it was included in the 1982 LOS Convention. In a survey conducted by the U.S. Committee on International Ocean Affairs in 1973 it was discovered:

For the 357 [consents] granted<sup>45</sup> the participation of 275 coastal state scientists was arranged in advance of clearance requests. Thus the

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<sup>45</sup>22 were abandoned (due to delay by the coastal State, discouraging statements by other scientists, the applicant's institution, a US agency, or the foreign State), 28 clearances were rejected (see below), and 60 were still pending when the survey was put together, pp. 70 and 73 of the report. The report (pp. 73f.) states:



average number of invited guest scientists per cruise was 0.77. [...] There were 80 foreign scientists whose participation was not invited, but was required by the states granting [consent]. [...] Only 33 observers, excluding invited and uninvited participating scientists, were required by coastal states granting [consent]. [...] This group brings the total onboard count of coastal state guests to 388 for 357 cruises, for an overall average of 1.09 per cruise.

The survey concludes:

[T]he great majority of [consents] granted in the past involved very little accommodation other than having coastal state guests aboard. Considerable difficulty was encountered only in the East Asia region, where substantial changes in cruise plans were often required.<sup>46</sup>

Currently, the policy of the U.S. State Department seems to be even stricter as it discourages clearance requests “if there is no intention of allowing foreign scientific participation in the research project.” The reason given for this policy—expressly based on Article 249 of the 1982 LOS Convention—is that “U.S. scientists have in the past caused strained relations when they cancelled their request” on the basis that the coastal State planned to request participation.<sup>47</sup>

It seems that the financial aspect of accommodating the coastal State’s representative is seldom, if at all, an issue, changes in cruise plans to take that representative aboard, in contrast, were seen as an abuse of an otherwise legitimate request. Indeed, the obligation to ensure the participation

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There are several interesting observations concerning the reported rejections. (1) There were no reported rejections by Mexico and only one by a coastal state in the CBC region, although these are the regions of greatest research activity. (2) Three of the four reported rejections for the region of South America were by a U.S. agency. (3) Three of the four rejections of port call requests for South Asia were by Burma, which has a general policy of non-involvement in ocean affairs and customarily disallows all requests. (4) The Soviet Union often rejects requests for territorial sea and continental shelf research, and is responsible for the majority of such rejections in East Asia. (5) The most prevalent reason given for clearance rejections is none at all. The State Department, which usually is the U.S. agency rejecting clearance, often is unfairly blamed by disappointed applicants. The State Department has no alternative to denial of clearance when the political climate does not permit diplomatic relations with the foreign state, or when the foreign state insists on a requirement which is juridically unacceptable to the U.S. Indeed, a foreign state may utilise the latter case to shift the responsibility for rejection of a request it does not wish to honor.

<sup>46</sup>Ibid., pp. 63f.

<sup>47</sup>See Notice to Research Vessel Operators No. 85 (Rev. 1), *Foreign Participation aboard U.S. Research Vessels*, released by the Department of State, Bureau of Oceans and International Environmental and Scientific Affairs, 20 June 1995, the text can be accessed at (<http://www.state.gov/www/global/oes/oceans/ntrvo85.html>) – visited on 31 January 2005.

or representation of a coastal State's representative gives ample leeway for unfriendly interpretations. Article 249(1)(a) of the 1982 LOS Convention provides for the placement of coastal State participants or observers and stipulates that such placement should be effected "without payment of any remuneration to the scientists of the coastal State and without obligation to contribute towards the costs of the project." This clarifies that *scientists* may neither have to provide nor to receive compensation for their participation. Inspectors, as an example of 'representative' are neither expressly included nor exempted from Article 249(1), and it seems that some coastal States take this ambiguity as an encouragement to fathom their possibilities with respect to this condition.<sup>48</sup> The limit again would seem to be Article 300 of the 1982 LOS Convention: where the request for participation or representation is accompanied by additional conditions these must remain within reasonable limits and not endanger the whole research project, both in terms of time schedules and economic viability.

The U.S. Department of State has issued guidelines on participation to minimise problems, which had been encountered with coastal State participation. These problems include:

- (a) late notification of planned participation by the coastal state,
- (b) slow response on the part of researchers,
- (c) unusual conditions of participation (at-sea rendezvous),
- (d) insufficient space for participants resulting from lack of planning by the researcher, and
- (e) researchers cancelling requests when it is learned that foreign participation is requested.

Article 249(1)(a) leaves it to the coastal State's discretion what person to place on board. The words 'participate' and 'be represented' include persons that actively contribute to the project and those merely observing whether prescribed conditions are complied with. Meaningful control, however, would also call for insightful officers which, in the face of the sophistication of today's science, can hardly be achieved anywhere on a broad scale.<sup>49</sup> Indeed,

<sup>48</sup>Thus, Colombia requires that "the expenses of travel and subsistence of [scientific personnel and inspectors], as well as the cost of stays in foreign ports and airline travel when necessary" be paid by the applicant, see Article 16(c) of the Colombian Decree No. 644 from 23 March 1990; by a *note verbale* from 8 August 1997, the Dirección Marítima y Portuaria [Bureau of Maritime Affairs and Ports] advised the U.S. Foreign Ministry that the inspector appointed pursuant to Article 16 of the Decree No. 644 "shall be paid a daily fee of [Colombian-] \$ 100,000.00, and this expense shall also be borne by the entity sponsoring the research", the text of the Colombian note is available at <http://www.state.gov/www/global/oes/oceans/ntrvol19.html> – visited on 31 January 2005.

<sup>49</sup>In 1973 already *Langeraar* observed:

it is difficult to see how control without any understanding of the project makes sense to begin with. The implications of the prescribed conditions on the project might not be readily comprehensible, in other words, someone without the necessary knowledge would not know what to look for or, conversely, make the wrong inferences from in fact harmless equipment or occurrences. The system puts the burden on the scientist to inform the coastal State authorities in a manner that enables them to choose a suitable individual and perhaps even to instruct the relevant persons beforehand about possible implications effectively.

Also, there seems to be a conflict between Articles 248(f) and 249(1)(a): while the former subjects participation and representation of the coastal State to the extent that the coastal State should be able, the latter makes it an obligation to “ensure the *right* [emphasis added]” of the coastal State to participate and be represented. A right, it would appear, cannot be compromised. Article 248(f) suggests that the question of ability is to be assessed by the researching State. This would, in effect, mean that the researching State “offers” an opportunity and is not acting upon an obligation as the reflection of the coastal State’s right. Yet, the exercise of a right presupposes the capacity to realise it. Accordingly, where the coastal State does not have the capacity to exercise its right, there is no further obligation of the researching State. Therefore, Article 249(1) must be read “ensure that the coastal State *may* exercise its right to participate”.

The two provisions raise another aspect, namely, the prerogative of the researching State to *determine* “the extent to which it is considered that the coastal State should be able to participate or to be represented”. One limiting

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To find a scientist or scientists able to judge accurately what a modern research vessel is actually doing, will already pose a problem. Most of the instrumentarium on board will measure automatically and record its observations on line with the shipborne computer. All measurements will be stored on magtape of which reading the printout already requires some skill. [...] On board a modern oceanographic research vessel the thermometer in a bucket of seawater is a thing of the past.

At the end of the cruise the scientists will go back with the raw or computer evaluated data on magtape or punched tape and possibly printouts thereof as well. More often than not the scientist of a developing country will have the greatest difficulties handling such information, because of lack of training, lack of electronic aids, lack of time or lack of trained staff. Consequently, scientific results published abroad some time later and based on this raw material cannot always be related by the scientists of the developing country to the raw data they have in hand. Moreover, they may not have the means to make certain that the raw data do not contain other information than that published. Uncertainty is the result of this state of affairs, uncertainty that may easily develop into mistrust.

*Langeraar, Wijnand, Oceanographic Research*, in *The future of the law of the sea: proceedings of the Symposium on the Future of the Sea, Den Helder 26 and 27 June 1972*, The Hague, 1973, Royal Netherlands Naval College and International Law Institute of Utrecht State University, p. 102.

factor as to the participation and representation is the coastal State's own capacity;<sup>50</sup> the other is the probably limited capacity of the researching State to host additional individuals on the research platform. Article 249(1)(a) allows for a reservation of practicability. Yet this is only a temporal not a conditional reservation: "when practicable". The condition "if it so desires" clarifies that the right of participation must be explicitly invoked and is subject to the coastal States capacities (s.a.); there is no assumption of participation or representation in the 1982 LOS Convention. State practice, however, shows that most coastal States grant consent only subject to the participation of their own scientists or observers.<sup>51</sup>

#### *Availability of Data*

In the above mentioned survey<sup>52</sup> it was further noted that the interviewed scientists were strongly opposed to any requirements involving jurisdiction over raw data and/or samples and the right of publication. While open publication of the results of a research cruise as such is not an issue, scientists would reject a proposal that publication of results be made a compulsory obligation.<sup>53</sup> It is mainly such instances, in which the outcome of a scientific investigation does not warrant the effort and expense of publication, that cause problems. Often the fruits of the labour are so insignificant that their exposure would do more harm than good, including harm to the scientist's reputation. This is especially a concern where the coastal State requires the submission of raw data with the potential of releasing data, which are shown invalid after public disclosure. Other reasons for contentions in this respect include: the appropriation and publication of results ahead of the rightful author; unrealistic time frames for publication because a scientist cannot guarantee in advance that results will be publishable within a certain time; and the ethics of enhancing the stature of a coastal state scientist by agreeing to undeserved co-authorship. The least-acceptable sample requirement for scientists, according to the survey, is to permit custody and control of non-

<sup>50</sup>See *Knauss*, *Marine Science* 1974 (as in n. 26 on page 182), p.1338, pointing out that "most nations have insufficient local scientific talent to participate in [scientific programmes], evaluate their content, and provide assurance to the government that such programs are not harmful and indeed, in the long run, are beneficial."

<sup>51</sup>See *Stevens, Lee R., Handbook for international operations of U.S. scientific research vessels*, January 1986 ([http://www.gso.uri.edu/unols/for\\_cln/for\\_cln.html](http://www.gso.uri.edu/unols/for_cln/for_cln.html)) – visited on 31 January 2005; *Knauss, John A./Katsouros, Mary H., Recent Experience of the United States in Conducting Marine Scientific Research in Coastal State Exclusive Economic Zones*, in *Clingan, Thomas A.*, editor, *What lies ahead?* Honolulu, Hawaii, 1988, p.308; see *Notices to Research Vessel Operators*, (<http://www.state.gov/www/global/oes/oceans/notices.html>) – visited on 31 January 2005.

<sup>52</sup>See page 188.

<sup>53</sup>See above mentioned survey (as in n. 52), p. 86; similarly *Burke, William T., The International Law and Politics of Marine Scientific Research*, in *Reisman, William Michael*, editor, *Toward world order and human dignity: essays in honor of Myres S. McDougal*, New York, 1976, p.520.

duplicable data or samples by the coastal State. These apprehensions on the side of scientists have principally remained the same.<sup>54</sup>

From a coastal State's perspective the explanation given for non-publication would appear not to matter much if there is no appreciation for the particularities of scientific publication. It seems to be in the best interest of both sides to read Article 249 of the 1982 LOS Convention in a broad way. Where the results of the research do not warrant publication as a contribution to the world of scientific expertise, the scientist as a matter of comity may provide the coastal State with the results including a scientific interpretation under the condition of non-publication. Thus, publication may not be understood as a term of art but rather a responsibility incurred by the scientist in the course of the consent procedure as a matter of comity in view of the coastal State's integrity interests.

*Knauss/Katsouros* contend that the primary purpose of Article 249(2) was to provide an opportunity for the coastal State to control the availability of information on the resources in its exclusive economic zone, and that this condition was accordingly limited to types of research that actually relate to the resources in the exclusive economic zone.<sup>55</sup> One may consider Article 249(2) as a logical consequence of Article 246(5)(a): where the granting of consent is in the discretion of the coastal State it may also impose certain conditions on the research when it is actually carried out.<sup>56</sup> The interesting point, however, is whether Article 249(2) must be considered an exception or example. If it were intended to indicate that the coastal State may impose such a condition only where the research has direct significance for the exploration and exploitation of natural resources, Article 249(2) would constitute a limitation of the discretion conferred by Article 246(5). Then the coastal State could not advance the requirement of prior agreement if the research did not involve drilling into the sea-bed or the use of installations or structures. If, on the other hand, Article 249(2) was intended to exemplify what the coastal State may require in the context of Article 246(5) in general, Article 249(2) would not be in conflict with Article 246(5). Article 246(5) does not qualify the exercise of the discretion but merely lists the instances in which the coastal State may exercise its discretion to withhold consent.<sup>57</sup> It would seem that exercise of discretion entails the imposition of whatever conditions the coastal State deems fit.<sup>58</sup> And the granting of consent under the condition that coastal State agreement must be obtained prior to any publication is less of a restriction on the freedom of scienti-

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<sup>54</sup>Thus, the requirement to permit custody and control of non-duplicable data, effectively requiring that research must be completed in the foreign State with additional cost and inconveniences, has deterred scientists from further pursuing their research projects, see, for example, *Nellen et al.* (as in n. 40 on page 186).

<sup>55</sup>See *Knauss/Katsouros* (as in n. 51 on the facing page), p. 305.

<sup>56</sup>See *Soons*, Marine Scientific Research (as in n. 16 on page 180), pp. 191f.

<sup>57</sup>See page 83.

<sup>58</sup>See *Ibid.*, p. 192.

fic research than the outright denial of access. On the other hand, Article 249(2) is fairly straightforward and explicit in limiting the requirement of prior agreement to that kind of research, which is of direct significance to the natural resources. Since the economic interests of the coastal State are the main concern of the relevant provisions, namely, in Part V and Part XIII, and since control of the information about the natural resources is an essential prerequisite for controlling the exploration and exploitation of the resources and thus a decisive factor in the economic use of the exclusive economic zone, the restrictive reading of Article 249(2) prevails. The express restriction to the instances envisaged by Article 264(5)(a) must be interpreted as a restriction on the exercise of the discretionary power of the coastal State. It is obviously up to the requesting State to accept a condition of prior agreement to publication in other cases than envisaged by Article 249(2), and it might be the only way to obtain coastal state consent, but strictly speaking setting such a condition would push the boundaries of international law.<sup>59</sup>

#### *Non-interference with the Coastal State*

An additional compliance requirement is listed in Article 246(8): Marine scientific research activities shall not unjustifiably interfere with activities undertaken by coastal States in the exercise of their sovereign rights and jurisdiction provided for in the 1982 LOS Convention. This is not just another facet of the constraints on scientific research but more generally a recognition of the coastal State's prerogative in the exclusive economic zone. It is important for the researching State to inquire beforehand if there might be any conflicts in this respect. And it would seem that the coastal State is by virtue of Article 242 and 243 obliged to facilitate such information so that the researching state can make appropriate arrangements in a timely manner. If the researching State encounters a conflict in the process of the research, Article 246(8) assumes a presumption in the coastal State's favour. Only if the consent by the coastal State refers to such a conflict and provides for appropriate arrangements the researching State can prevent the effects of Article 246(8). Even though the word 'unjustifiable' gives room for some discretion in the actual conflict of use, it is in the best interest of the researching State to take appropriate measure to prevent such surprises.

#### *Control of Compliance During Operation*

With a view to the negotiation process it is evident that the restrictions imposed on science are rather a result of distrust than one of scientific competition. This is confirmed by Article 249(1), providing for the submission of

<sup>59</sup> *Voluntati non fit iniuria* would apply where the coastal State is willing to fulfil such a condition; as to the question whether recourse to dispute settlement may be an option, see section 8.

preliminary reports, access of the coastal State to samples, and data including assessments and interpretation thereof, and Article 249(2) of the 1982 LOS Convention, expressly reserving the right to require “prior agreement for making internationally available the research results of a project of direct significance for the exploration and exploitation of natural resources” under Article 246(5) instead of making it a case-by-case condition in accordance with Article 249(1). The common denominator of these provisions is the open flow of information. While this is not in every instance in the interest of the scientist, it aligns well, as described above, with the suggested distinction between fundamental and applied research on the basis of open publication.<sup>60</sup> Compliance with the conditions imposed by coastal state regulation and authorisation relates therefore mostly to the flow of information or transparency of operations.

Article 249 makes it a duty for the researching State to comply with certain conditions; Article 253 gives the coastal State the right to require suspension or cessation of a research project if conditions or requirements, as may be imposed while the research is already under way, are not satisfied.<sup>61</sup> On the surface, the obligation to comply with the coastal State’s directions for the conduct of marine scientific research is merely reflecting the right of the coastal State to regulate research activities within its exclusive economic zone. However, the obligation reaches further if, on the basis of this provision, the coastal State gains investigative rights. Clearly, the order to follow certain directions is meaningless if the coastal State has no authority to control and ensure compliance. This includes necessarily the right to inspect the vessel’s and scientists’ activities. Such a right might already be embodied in Article 249(1)(a), which makes it an obligation to ensure participation or representation of the coastal State in the research project.<sup>62</sup> Participation, it would appear, serves only the immediate purpose of the furtherance of knowledge. It presupposes a certain level of involvement and would appear to require at least a level of scientific knowledge, which enables the participant to make meaningful contributions or be employed in some way in the conduct of the actual research. Representation, in contrast, denotes a passive presence; no special knowledge seems to be required, and the only purpose would appear to be securing that coastal state interests are observed and laws, regulations and conditions are complied with. Article 249, therefore, not only establishes the obligation of the researching State to comply with coastal State’s conditions, but also imports a restriction on the freedom of marine scientific research in terms of enforcement by conferring implicitly the right of inspection on the coastal State.

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<sup>60</sup>See section 2.

<sup>61</sup>See page 187.

<sup>62</sup>Duty to comply with certain conditions, namely, to “ensure the right of the coastal State...to participate or be represented in the marine scientific research project, especially on board research vessels and other craft or scientific research installations.”

*Investigation of Compliance*

Notwithstanding Article 249(1)(a) of the 1982 LOS Convention, the question remains whether the coastal State has the competence to board the vessel at any time for the purpose of control. This would go beyond the right of the coastal State to place an observer aboard a vessel afforded by Article 249(1)(a), because it would give the coastal State the possibility to control the conduct of the research project at all times independent from prior arrangements. Such a right would run counter to the freedom of navigation as purported by Article 87 and incorporated in the regime of the exclusive economic zone by Article 58(1). However, with respect to research platforms, the regime of Part XIII establishes a special relationship, which gives the coastal State a number of competences as a function of its jurisdiction over marine scientific research.

As outlined above,<sup>63</sup> the exercise of jurisdiction on the ocean entails a number of actions which the coastal State may employ to ensure or control compliance. Article 253 setting forth enforcement measures in Part XIII must be read in this context as establishing the ceiling of such enforcement.<sup>64</sup> Cessation and suspension may be ordered if the research is found to be in violation of coastal State laws, regulations, or conditions. This would, *prima facie*, exclude arrest and detention, as these measures constitute a manifest physical interference with the platform which is the most severe restriction of the freedom of navigation. Suspension and cessation do not entail such a physical interference; the platform is only to cease all, or the relevant, scientific activities but is otherwise free to navigate at its pleasure.<sup>65</sup> Articles 73(1) and 220(2), (6), in contrast, expressly provide for the arrest of a vessel where fisheries laws or environmental legislation, respectively, have allegedly been violated. A detention of a vessel, any other platform, or the crew in the field of marine scientific research would accordingly constitute a violation of the 1982 LOS Convention.

The other enforcement measures, however, remain in the coastal State's arsenal, namely, surveillance, boarding, and inspection. Even though boarding, including stopping, denotes a physical interference with the platform it is the inevitable prerequisite to verify the compliance or violation of the coastal State's laws, regulations or conditions. If the coastal State were precluded from boarding the vessel in the course of enforcement, this would first compromise its rights under Part XIII, especially Article 249 of the 1982 LOS Convention, second expose the coastal State to the risk of violating international law when ordering the cessation of the research without a sufficient basis in fact. On the premise that the order of a cessation or

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<sup>63</sup>See page 112.

<sup>64</sup>See section 4.

<sup>65</sup>See Article 253(4): "Following notification by the coastal State of its decision to order suspension or cessation, States... shall terminate the research activities that are the subject of such a notification."



suspension may ensue dispute settlement procedures, the coastal State must have the possibility to collect evidence supporting its position. This would also call for the right to stop, board and inspect the vessel as an ancillary to the right to order the cessation or suspension.

### *Conditions for Control*

The question then arises which conditions must be fulfilled to stop, board, and inspect the vessel. The 1982 LOS Convention requires in Article 220(3) “clear grounds for believing” and in Article 220(6) “clear objective evidence” as prerequisites for enforcement measures. In contrast, in Article 218(1) a mere suspicion, if at all,<sup>66</sup> seems to suffice. And Article 73(1), leaving it to the coastal State to decide whether enforcement measures are *necessary*, lets the coastal State decide about the requirements. Now, taking into account the different circumstances which these provisions address, one must note that the degree of interference varies with the coastal State’s rights of control. Thus, where the vessel is (voluntary) in the port, the prerequisites for investigations are less stringent than for those instances, in which the coastal State interferes with a vessel at sea and its freedom of navigation. Article 73 relates to *living resources*, which fall under coastal State sovereignty and warrant a different control than Part XII (or XIII).<sup>67</sup> A further distinction must be made between Part XII and XIII, as Part XII embodies a regime, within which the coastal State may be described as the “steward” for the interests of humankind in terms of environmental protection.<sup>68</sup> Part XIII, in contrast, relates to an activity, which, at the time of the negotiations, was not perceived as generally beneficial for the common good.<sup>69</sup> Yet, the residual freedoms of the high seas worked in favour of the researching States

<sup>66</sup>Note, that the phrase “where the evidence so warrants” applies only to the institution of proceedings; this clearly implies a prior collecting of evidence under less stringent conditions.

<sup>67</sup>See page 186.

<sup>68</sup>See König, Doris, *The Enforcement of the International Law of the Sea by Coastal Port States*, in Z.a.ö.R.V. 62 [2002], pp. 14f.; Wolfrum, Rüdiger, *Means of ensuring compliance with and enforcement of international environmental law*, in Recueil des cours 272 [1998], pp. 46 and 153f.; König, Doris, *Durchsetzung internationaler Bestands- und Umweltschutzvorschriften auf hoher See im Interesse der Staatengemeinschaft*, Berlin, 1990, Veröffentlichungen des Instituts für Internationales Recht an der Universität Kiel 108, pp. 164f., pointing out that the coastal State in the exercise of its jurisdiction is constrained to generally accepted standards which must be fulfilled by the flag State anyway.

<sup>69</sup>Note, that at the time when the negotiations took place, the *Stockholm Declaration (Declaration of the United Nations Conference on the Human Environment)*, adopted 16 June 1972, 11 I.L.M. 1416, the text is available at (<http://www.unep.org/Documents/Default.asp?DocumentID=97&ArticleID=1503>) – visited on 31 January 2005) had already been adopted and that the severe oil spill from the super-tanker *Torrey Canyon* had raised States’ awareness to the necessity of environmental protection, see Stansfield, Robert H., *Torrey Canyon, The*, in Bernhardt, Rudolf, editor, *Encyclopedia of Public International Law*, Volume IV, Amsterdam, 2000, p. 868.

in this instance: jurisdiction with respect to marine scientific research gives the coastal State less options of enforcement. Part XIII provides no express basis for any physical interference.

Yet, Article 249(1)(b) makes it an obligation to provide the coastal State with “preliminary reports”. ‘Preliminary’ must be interpreted as meaning ‘prompt’, i. e., as soon as possible after the research has been concluded. This is also indicated by the phrase “as soon as practicable” which would appear to incorporate a reference to scientific needs. ‘Practicable’ refers to the conditions of an activity, in this case of the scientific process of assessing and evaluating collected data and samples. How long it takes to draw conclusions and consolidate these in a report cannot be determined *in abstracto*,<sup>70</sup> the limit is abuse. The time elapse is therefore essentially in the researching State’s discretion. And scientific practicability cannot be considered a basis for a decision in the context of an actual investigation.

Article 249(1)(c) requires “access for the coastal State, at its request, to all data and samples derived from the marine scientific research project”. The terms ‘data’ and ‘samples’ must be interpreted as referring to raw data, which have been collected “on the spot”. Together with the phrase “at its request”—which can be voiced at any time during the research as is indicated by the word ‘when’ in Article 249(1)—these terms provide an implicit basis for the investigation of the vessel. As the word ‘request’ is not further qualified, the coastal State may—in the light of the general skew of Part XIII in favour of the coastal State—approach the vessel on the basis of a mere research-related concern to realise the researching State’s obligations. The word ‘access’ would appear to give the coastal State also the right of boarding the vessel, since ‘access’ denotes the possibility to examine the data and samples at the place where they are generated or kept.<sup>71</sup> Inspection is limited by the word ‘derived’ to those data and samples that are directly connected to the research project thereby limiting the coastal State’s possibilities to interfere with the vessel’s internal affairs in general. Evidence for an infraction of Part XIII would only fall under Article 249 where data and samples itself indicate such an infraction, i. e., where they have been collected in contravention to specifications by the authorisation.

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<sup>70</sup>Application forms for coastal state consent foresee the provision of *expected* dates of submission for reports, see, for example, Denmark’s request form, available at *Forms Required for Requesting Authorization to Conduct Marine Scientific Research in Denmark and Greenland Waters*, (<http://www.state.gov/www/global/oes/oceans/ntrvo103.html>) – visited on 31 January 2005; Colombia, in contrast, specifies a maximum period of one year after leaving Colombian waters for the submission, text available at (<http://www.state.gov/www/global/oes/oceans/ntrvo94.html>) – visited on 31 January 2005.

<sup>71</sup>In the case of samples, it appears to be obvious that they must remain in the researching State’s custody until the research is completed.

*Control of Non-authorised Research*

Where the researching State is secretly undertaking research, which is not related to the authorised research project, Article 249 would appear not to apply as the word 'derived' refers to the authorised project. In such a case, the question would arise whether the coastal State may inspect the vessel on the basis of "clear objective evidence", "clear grounds for believing", or according to another standard. Taking into account the balance of interests of coastal and flag/researching States in Parts V, XII and XIII, the standard for inspections must be strict. Yet, the freedom of navigation as a residual high sea's right in the exclusive economic zone must not render the coastal State's jurisdiction ineffective. It is therefore submitted that the coastal State may, where there is "clear objective evidence", board and inspect the vessel on the basis of its jurisdiction with respect to marine scientific research. Clear objective evidence would appear to be, for example, a behaviour or action deviating from the research proposal in a significant manner, not warranted by external circumstances, like sea or weather conditions, and not co-ordinated with the relevant coastal State authority. Under these conditions a change of the cruise plan or itinerary or the use of equipment not itemised in the research request could provide the basis for coastal State interference on the basis of a presumed infraction of the research permit namely, that the researching State transgresses the limits of the authorised activity. In contrast, a mere delay in the transmission of data or "preliminary reports" as a condition of the research permit would as such not constitute such evidence, as it does not indicate a transgression.

*Conclusion*

Based on the right to regulate and authorise marine scientific research under certain conditions the coastal State may interfere with the research project with a view to verifying compliance. Control of compliance is, however, limited to intelligence. Since arrest or detention are not envisaged in the context of Article 253 of the 1982 LOS Convention and Article 249 gives only a right of access (limited to data and samples), the coastal State is not entitled to seize any property aboard a platform. The collection of evidence must therefore be limited to documentary proof in the form of certified pictures or copies and testimonies. The researching State would appear to be under an obligation to co-operate.

Jurisdiction with respect to marine scientific research in the exclusive economic zone is thus not exclusive like in the territorial sea. One may describe it as exclusive in character on the grounds of the coastal State's power to establish rules of management, of control, and of enforcement of laws and regulations within the framework of the 1982 LOS Convention.<sup>72</sup> But a com-

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<sup>72</sup>See *Lupinacci* (as in n. 25 on page 182), p. 106.

parison with Article 77(2) shows that jurisdiction must be realised explicitly: a research project cannot be conducted if the coastal State has (a) claimed an exclusive economic zone, and (b) established laws and regulations that implement Article-56-jurisdiction as set forth by Part XIII. In particular a consent procedure as described in Article 246(3) is prerequisite for the lawful exercise of jurisdiction by the coastal State.

#### *Article 246(1): Continental Shelf*

Article 246(1) of the 1982 LOS Convention extends jurisdiction with respect to marine scientific research in the exclusive economic zone to the continental shelf as well. Although Part VI of the 1982 LOS Convention contains no parallel provision to Article 56(1)(b), competence for such jurisdiction with respect to the continental shelf derives, *a fortiori*, from the notion of the “natural prolongation of [the coastal State’s] land territory.” Even though the concept of jurisdiction over the continental shelf is comparatively old,<sup>73</sup> the extent to which coastal States may interfere with other States’ activities on or in relation to their continental shelf is not altogether clear.

#### *Jurisdiction under the Geneva Convention*

Under the Continental Shelf Convention<sup>74</sup> the interpretation of its relevant Article 5(8), namely, the clause “any research concerning the continental shelf and undertaken there”, caused a substantive problem. The phrase can be advanced as all-embracing, requiring prior consent for all research into shelf characteristics, features, and resources no matter how such research is conducted. Alternatively, the phrase “and undertaken there” can be interpreted as to connote some kind of physical relationship between the investigative actions and the sea floor constituting the shelf which would exclude at least the sort of research not necessarily involving actual operational contact with the sea floor.<sup>75</sup>

Assuming the protection of the coastal State’s interests as the fundamental basis for the requirement of its consent, *Bouchez* points out that this interest could hardly “be limited to scientific research carried out on the continental shelf concerning the shelf and exclude scientific research undertaken on the

<sup>73</sup>It was first reclaimed by the *Truman Proclamation* in 1945 (*Truman* (as in n. 29 on page 183)) and has since been adopted by virtually all States; over time the delimitation and the content, especially with respect to marine scientific research have been changed and further elaborated: compare Continental Shelf Convention and Part VI of the 1982 LOS Convention.

<sup>74</sup>See n. 84 on page 31.

<sup>75</sup>See on this point *Menzel, Eberhard, Scientific Research on the Sea-bed and its Regime*, in *Sztucki, Jerzy*, editor, *Symposium on the International Regime of the Sea-bed*, Rome 1969, Rome, 1970, Accademia nazionale dei Lincei, Istituto affari internazionali, p. 623: assuming as the decisive criterion “the touching of the ground”; see also *Burke, Politics* (as in n. 53 on page 192), p. 487.

continental shelf for other purposes.”<sup>76</sup> Yet, this would presuppose that the protected interest of the coastal State is absolute and not limited to resources.

As *Soons* points out there is no clear indication of a solution either way from the history of the Geneva Continental Shelf Convention or subsequent state practice.<sup>77</sup> Based on the purpose of Article 5(8) of the Continental Shelf Convention one can assume that the phrase is best interpreted as to require “the consent of the coastal State for all scientific research, whatever the method used, concerning the continental shelf.”<sup>78</sup>

### *Jurisdiction under the 1982 LOS Convention*

A similar problem persists in the 1982 LOS Convention. The use of the word *on* in the phrase “marine scientific research. . . on the continental shelf” may cause some doubt as to its exact meaning:

if the preposition *on* is used to indicate the geographical location where the research is conducted, the phrase must be interpreted as referring to marine scientific research involving physical contact with the sea floor;

if the preposition *on* is used instead to indicate only the object of interest in the sense of *about*, the phrase can be interpreted as to refer to marine scientific research relating to the continental shelf.<sup>79</sup>

*Soons* points out that arguments can be advanced supporting either of the two interpretations: Thus, the clear reference to the location of marine scientific research by the use of the word ‘in’ in other provisions would suggest that ‘on’ with respect to the continental shelf was merely used for grammatical reasons. Yet, the use of the word ‘on’ can be also interpreted as to indicate a deviation from the other provisions on marine scientific research, namely, not to indicate a location but rather an object of study. *Soons* refers to the Spanish version—“en la plataforma continental”—, as expressly indicating a location, and the French version—“sur le plateau continental”—, which is equally ambiguous like the English text.<sup>80</sup> Similarly, the Russian version—“na kontinentalnom shelve”—bears some ambiguity as ‘na’ can mean

<sup>76</sup>*Bouchez, Leo J., The Legal Regime of Scientific Research on the Sea-bed*, in *Sztucki, Jerzy*, editor, *Symposium on the International Regime of the Sea-bed*, Rome 1969, Rome, 1970, Accademia nazionale dei Lincei, Istituto affari internazionali, p. 600.

<sup>77</sup>See *Soons*, *Marine Scientific Research* (as in n. 16 on page 180), pp. 68f., examining the legislation of 11 out of 50 States Parties.

<sup>78</sup>See *Ibid.*, p. 71; similarly *Bouchez* (as in n. 76), p. 600: “it is then preferable to replace in the first sentence of Article 5, Paragraph 8 the phrase ‘concerning the continental shelf and undertaken there’, with the phrase: ‘concerning the continental shelf or physically undertaken there’.”

<sup>79</sup>See *Soons*, *Marine Scientific Research* (as in n. 16 on page 180), p. 215.

<sup>80</sup>See *Ibid.*

both ‘about’ and ‘on’ (in a strictly spatial sense). In the Arabic version, in contrast, the phrase has a predominantly spatial connotation.<sup>81</sup> In light of the history, especially Article 5(8) of the Continental Shelf Convention, and the negotiations, especially of coastal States’ zeal for an expansion of their control, one must conclude that the word ‘on’ denotes the broadest meaning of the word, i. e., also the notion of ‘about’, which would include operations relating to the continental shelf without physical contact, too.

Another observation supports this: Article 77(1) of the 1982 LOS Convention confers on the coastal State “sovereign rights for the purpose of exploring [the continental shelf, *including* the outer continental shelf] and exploiting its natural resources.” These rights are “exclusive in the sense that if the coastal State does not explore the continental shelf or exploit its natural resources, no one may undertake these activities without the express consent of the coastal State.”<sup>82</sup>

Article 246(7) of the 1982 LOS Convention ensures that “[t]he provisions of paragraph 6 [referring to the continental shelf extending beyond the 200 nm limit, “outer” continental shelf] are without prejudice to the rights of coastal States over the continental shelf as established in article 77.” Yet, these are only the rights of exploitation and exploration. As noted above<sup>83</sup> a distinction must be made between, on the one hand, exploration and exploitation and, on the other hand, marine scientific research. Again, sovereign rights with respect to exploration and exploitation reflect the interests of the coastal State in the resources of its continental shelf; and where these are affected by research activities it is likely that Article 77(2) will be invoked to preclude such activities. In the context of marine scientific research one would then encounter a conflict between Article 77(2) and Article 246(5)(a), especially with regard to Article 246(6): Article 246(5) gives a basis for withholding consent as a matter of discretion;<sup>84</sup> Article 77(2) precludes the activity sweepingly. If Article 77(2) prevailed over Article 246(5) the rules on implied consent<sup>85</sup> would not apply and access to the continental shelf could not be effected—not even with respect to areas, for which, according to Article 246(6), the coastal State may not withhold its consent.<sup>86</sup> Accordingly, in order to avoid this conflict, one must interpret ‘on’ to mean ‘about’ also.

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<sup>81</sup>The Arabic word ‘ala’ denotes ‘on’, while the word ‘an’ would be the equivalent for ‘about’.

<sup>82</sup>Article 77(2) of the 1982 LOS Convention, see page 185.

<sup>83</sup>See page 69 and section 2.

<sup>84</sup>See section 4.

<sup>85</sup>See section 8.

<sup>86</sup>Namely, those beyond the 200 nm limit and outside those areas “which coastal States may at any time publicly designate as areas in which exploitation or detailed exploratory operations focused on those areas are occurring or will occur within a reasonable period of time.”

Where a coastal State does not claim an exclusive economic zone,<sup>87</sup> the provisions on marine scientific research would still apply to every research project conducted on the continental shelf. Based on the interpretation of the word 'on', the researching State may conduct projects with respect to the water column and its living and non-living resources even in physical contact with the continental shelf and without the consent of the coastal State. There is, however, the condition that the project has no significance for the living and non-living resources of the sea bed and does not interfere with the uses of the coastal State of its continental shelf. Two conditions which make it advisable to plan the research project in close contact with the coastal State.

#### *Horizontal Scope of Articles 56 and 246*

A similar question relates to the exact horizontal scope of Articles 56(1)(b) and 246(1). Both confer jurisdiction over marine scientific research *in* the exclusive economic zone (and *on* the continental shelf). In view of the text, *Gündling* suggests that the word 'in' includes research into/of and from the exclusive economic zone.<sup>88</sup> Yet, this needs some clarification, especially if the research focusses on subjects outside the waters of the exclusive economic zone, within which the researching State conducts its activities lawfully.

To the extent that the airspace above the exclusive economic zone is subject to the regime of Part XIII<sup>89</sup>, any research above the water would have to be included in the consent of the coastal State.<sup>90</sup> If the object of study extends into a neighbouring exclusive economic zone, consent by the respective coastal State would have to be requested.

Similarly, if the platform is outside any exclusive economic zone, yet research is conducted on a phenomena *inside* an exclusive economic zone, it becomes decisive whether the coastal State's jurisdiction extends beyond the sea, i. e., into the airspace above it,<sup>91</sup> and beyond its immediate jurisdiction as conferred by the 1982 LOS Convention, i. e., into the area of the high seas. Even though the research platform as such may not enter into the neighbouring exclusive economic zone and thus may conduct its research project *from* an area where it lawfully engages in research activities, the research may affect the neighbouring State's integrity interests at the core of Article 246 of the 1982 LOS Convention.<sup>92</sup> Interpreting the word 'in' as to mean every research that is concerned with phenomena *in* the exclusive economic zone

<sup>87</sup>Or an exclusive economic zone that extends not as far seaward as the regular continental shelf.

<sup>88</sup>See *Gündling* (as in n. 36 on page 184), p. 236.

<sup>89</sup>See section 6.

<sup>90</sup>As the consent is granted on the basis of the research proposal it comprises research objects and methods as set forth in the application.

<sup>91</sup>See section 6.

<sup>92</sup>See section 2.

would eventually extend coastal state jurisdiction beyond the 200 nm limit. Since such an interpretation would be in stark contrast to the freedom of the high seas concept in the 1982 LOS Convention, one must conclude that ‘in’ denotes exclusively the location where the research activities are actually carried out.

*Art 246(6): Marine Scientific Research on the Outer Continental Shelf*

Article 246(6) of the 1982 LOS Convention addresses the case that a coastal State has established an “outer” continental shelf in accordance with Article 76 of the 1982 LOS Convention. Marine scientific research on such an outer continental shelf is subject to coastal state jurisdiction on the premise that:

Coastal States may not exercise their discretion to withhold consent under [Article 246(5)(a)]. . . in respect of marine scientific research projects to be undertaken in accordance with the provisions of this Part. . . outside those specific areas which coastal States may. . . publicly designate as areas in which exploitation or detailed exploratory operations. . . are occurring or will occur within a reasonable period of time.

With the reference to Article 76 of the 1982 LOS Convention—which in itself bears uncertainty to the extent that an outer continental shelf might not have been publicly delimited yet—Article 246(6) offers a gateway for a coastal State’s reluctance with respect to research activities outside the 200nm limit. The history of this particular paragraph shows that coastal States sought to expand their control over marine scientific research at the expense of the freedom of the high seas even beyond the 200nm limit.<sup>93</sup> The legitimacy for this claim is founded on an interpretation of geological features in combination with the concept of natural prolongation of the land territory.<sup>94</sup>

The provision as such gives the coastal State the right to exclude certain areas of the outer continental shelf from the freedom of scientific research under the condition that exploration and exploitation are carried out or will commence “within a reasonable period of time.” While the question, whether actual exploitation is carried out, can be answered on a mere factual analysis, the phrase “detailed exploratory operations” may include a number of operations and is thus open to interpretative ambiguities. The qualification ‘detailed’ would not appear to limit the possibilities as its exact meaning would be determined by circumstances, such as available technology and

<sup>93</sup>See *Nordquist, Myron H./Rosenne, Shabtai/Yankov, Alexander*, editors, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 192 to 278, Final Act, Annex VI, Volume IV, Dordrecht, 1991, pp.515f.; *Soons*, *Marine Scientific Research* (as in n. 16 on page 180), p.157.

<sup>94</sup>See for details on the conceptualisation of Article 76 *Nordquist et al.* (as in n. 3 on page 176), pp.844–883.



know-how. Yet, 'detailed' would as a minimum call for an advanced stage in the exploration of natural resources. Accordingly, the prospecting phase, in which only the presence of natural resources as such but not their quality and quantity is of interest, would seem to be exempt from Article 246(6).<sup>95</sup> However, where projects with a view to the exploration and exploitation of the resources are still in the prospecting phase, the second qualification would come into play, namely, that such detailed exploration can be assumed to commence "within a reasonable period of time." The time frame described by this phrase depends essentially on the project in question, namely, the accessibility of the area and the resources, as well as the available technology and know-how, all of which are factors that determine the progress and the transition from prospecting to exploring. "Within a reasonable period of time" would mean in the not too distant future. Yet, exact time references cannot be provided and must be assessed on a case-by-case basis. And the standard of reasonableness depends essentially on good faith. To give this term some content, state practice or authoritative interpretation, e.g., through third party dispute settlement, would be necessary. In an early stage of the prospecting phase the coastal State could not, it would appear, preclude other States from pursuing research, i.e., withhold its consent. Yet, marine scientific research can only be conducted with the consent of the coastal State; this would leave for access only those unlikely cases where a consent procedure has not been implemented yet.

<sup>95</sup>Regulation 1(3)(e) of the *Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, ISBA/6/A/18*, adopted by the Council of the International Seabed Authority on 13 July 2000, ISA Kingston, 2000 defines prospecting as

the search for deposits. . . , including estimation of the composition, sizes and distributions of. . . deposits and their economic values, without any exclusive rights;

exploration, in contrast, is defined in Regulation 1(3)(b) as

searching for deposits. . . with exclusive rights, the analysis of such deposits, the testing of collecting systems and equipment, processing facilities and transportation systems, and the carrying out of studies of the environmental, technical, economic, commercial and other appropriate factors that must be taken into account in exploitation.

The most important differences between the two are the depth of analysis and rights to the deposits. This suggests that analysis of the deposits in the first phase must only go so far as to assess the value of the deposits for the decision whether or not it warrants the acquisition of rights. The "Continental Shelf Law" of the Russian Federation provides in Chapter V, Article 25(3) in accordance with Article 246(6) of the 1982 LOS Convention for an exemption of "regions in which, by a declaration of the Russian Federation Government, there is or will be regional geological study of the Continental Shelf, searching, prospecting, or development for mineral resources or the harvesting of biological resources" from scientific research activities. Information on these regions shall be published in the 'izveshcheniya moreplavatelyam' [Notices to Mariners]. The language leaves room for interpretation and especially the word 'will' in connection with 'prospecting' and 'development' seem to stretch the language of Article 246(6) of the 1982 LOS Convention beyond its apparent meaning, as both activities indicate a preliminary state already.

## HIGH SEAS

First of all, Article 87(1)(f) of the 1982 LOS Convention settles the question whether marine scientific research belongs to the freedoms of the high seas in the affirmative. Yet, this freedom is qualified by the phrase “subject to Parts VI and XIII” and the inherent limitations of all freedoms in general, namely, that the exercise of a freedom finds its boundaries in the exercise of the same or other freedom by others.<sup>96</sup> The right to conduct such research is furthermore limited by the provisions on the protection and preservation of the environment, and other instruments pursuant to the 1982 LOS Convention, i. e., generally accepted rules and standards for shipping and navigation. Article 257 of the 1982 LOS Convention contains an additional qualification when it stipulates that research must be conducted “in conformity with this Convention”. *Soons* lists as important limitations in this respect the rights of coastal States with respect to their continental shelf, the general principles for the conduct of marine scientific research (Article 240) and the provisions on scientific installations and equipment (Articles 258 through 262).<sup>97</sup>

The reference to Part VI in Article 87(1)(f) of the 1982 LOS Convention has direct significance for the conduct of marine scientific research only where a coastal State, in accordance with Article 76 of the 1982 LOS Convention, has successfully<sup>98</sup> claimed an outer continental shelf. Only in this area may an overlap occur between the rights of the coastal State with respect to the sea floor and the rights of the researching State under the high seas regime. Another possible instance occurs where the coastal State has a continental shelf, which is not congruent with the exclusive economic zone. The most important restrictive provisions of Part XIII of the 1982 LOS Convention are only applicable in the exclusive economic zone, consequently, the high

<sup>96</sup>See *Burke*, Politics (as in n. 53 on page 192), p. 519, referring to the discussions in the Legal Committee where delegations observed that “no freedom was absolute” and that to impose preconditions on research was merely to assure that the exercise was not “abused” and was “exercised with reasonable regard to the interests of other states.”

<sup>97</sup>See *Soons*, Marine Scientific Research (as in n. 16 on page 180), p. 224.

<sup>98</sup>Establishing an outer continental shelf necessitates a comprehensive procedure: applicants have to submit their claims to the Commission on the Limits of the Continental Shelf (C.L.C.S.), see Annex II of the 1982 LOS Convention. Just to comply with the application requirements, i. e., mainly to provide the scientific material (Scientific and Technical Guidelines of the C.L.C.S., 13 May 1999), is a task in itself that not so many countries have the resources to undertake; according to the Commissions ‘website’, as of 19 June 2003, only the Russian Federation has submitted a request. Against the background of the ten year limit of Article 4, Annex II developing States have voiced their concerns at the tenth Meeting of the States Parties. A decision on the matter is pending, see *Issues with respect to article 4 of Annex II to the Convention (ten-year time limit for submissions)*, Commission on the Limits of the Continental Shelf (CLCS), ([http://www.un.org/Depts/los/clcs\\_new/issues\\_ten\\_years.htm](http://www.un.org/Depts/los/clcs_new/issues_ten_years.htm)) – visited on 31 January 2005 with the relevant documents.

seas regime applies where the coastal State has not extended its jurisdiction up to the 200 nm limit by formally declaring an exclusive economic zone or otherwise declaring its jurisdiction.<sup>99</sup>

Part XIII of the 1982 LOS Convention is applicable to the extent that its provisions generally apply to research activities, irrespective of the location in which they take place. This means that the general principles set forth in sections 1 and 2, especially co-operation in and promotion of marine scientific research, and sections 4 and 5, which relate to the use of research installations and responsibility respectively, must be taken into account by the researching State if research were to be conducted by its nationals in the water column outside national jurisdiction. As regards the general principles of sections 1 and 2, it would appear, though, that they have little tangible effect on the high seas as they generally establish a rather weak obligation.

Article 257, especially on marine scientific research in the waters outside national jurisdiction contains a noteworthy reservation, namely, the reference to Article 246(6) and (7):<sup>100</sup> Researching States must observe the outer limits of the continental shelf, because Article 246(6) gives the coastal State a right to prior consent in such areas which it has designated for exploration and exploitation.<sup>101</sup>

Most notably, neither Part VII nor Part XIII, Section 4 of the 1982 LOS Convention contain a prohibition of the deployment of installations or equipment. Researching States may thus employ such objects in their research operations when on the high seas.<sup>102</sup> Part XIII, Section 4 sets forth a number of restrictions which would apply, yet they do not amount to a serious threat to the freedom of marine scientific research with installations or equipment. The most severe one, it would appear, is again enshrined in the inherent limitation of the high sea freedoms, namely, the obligation not to interfere with shipping routes.

On the high seas coastal States, like all States, have jurisdiction in the limited instances enumerated in Article 110, none of which would by itself include or exclude marine scientific research. The competence for enforcement in accordance with Article 110 derives from the quality of those instances, which constitute germane cases of jurisdiction. In all other cases, jurisdiction over the conduct of marine scientific research rests entirely with the researching/flag State. It must provide for appropriate measures to ensure the compliance of its subjects with the relevant provisions in Part XIII.<sup>103</sup>

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<sup>99</sup> *Maiore ad minus*, the coastal State must be able to claim less than the 1982 LOS Convention provides for.

<sup>100</sup> See *Soons*, *Marine Scientific Research* (as in n. 16 on page 180), p. 224.

<sup>101</sup> See page 204.

<sup>102</sup> See *Papadakis, Nikos, The International Legal Regime of Artificial Islands*, Leyden, 1977, pp. 212f.

<sup>103</sup> See page 147.

## THE AREA

The sea floor beyond the continental shelf under national jurisdiction is defined by Article 1(1)(1) of the 1982 LOS Convention as the 'Area'. It is subject to a special regime laid down in Part XI of the 1982 LOS Convention and the Implementation Agreement.<sup>104</sup> According to Article 133(a) of the 1982 LOS Convention Part XI is concerned with "all solid, liquid or gaseous mineral resources *in situ* in the Area at or beneath the seabed, including polymetallic nodules", which Article 136 declares the "common heritage of mankind".

*Marine Scientific Research as an Activity in the Area*

Article 134(2) of the 1982 LOS Convention generally extends the applicability of Part XI to activities in the area, which according to Article 1(1)(3) of the 1982 LOS Convention means "all activities of exploration for, and exploitation of, the resources". While Article 136 speaks of the 'Area' and 'resources' as of two separate items subject to the common heritage of mankind, Article 150 of the 1982 LOS Convention makes it evident that the principles governing the Area relate predominantly to its resources, and more specifically to its *non-living* resources.<sup>105</sup>

The only other activity expressly mentioned in Part XI of the 1982 LOS Convention, and not necessarily resource related, is that of marine scientific research in Article 143. The question remains whether Article 143 in the light of Part XI applies to all marine scientific research conducted in the Area, i. e., with respect to the sea-bed and the subsoil, or only to those activities that are directly relevant to the resources. The problem is similar to that mentioned in respect of the continental shelf,<sup>106</sup> yet it appears that the answer may be different: Article 257 of the 1982 LOS Convention provides all States with the right "to conduct marine scientific research in the water column beyond the limits of the exclusive economic zone." However, the exercise of this right is subject to the provisions of the 1982 LOS Convention and here, Part XI might qualify that right. Also, Article 257 speaks only of a *right* to conduct

<sup>104</sup>As in n. 181 on page 161.

<sup>105</sup>Article 150 provides: activities in the Area should be carried out "to foster healthy development of the world economy and balanced growth of international trade... and with a view to ensuring: (a) the development of the resources...; (b) orderly, safe and rational management of the resources...; (c) the expansion of opportunities for participation in such activities...; (d) participation in revenues by the Authority...; (e) increased availability of the minerals derived from the Area...; (f) the promotion of just and stable prices...; (g) the enhancement of opportunities... to participate in the development of the resources...; (h) the protection of developing countries from adverse effects... resulting from a reduction in the price of an affected mineral... to the extent that such reduction is caused by activities in the Area...; (i) the development of the common heritage...; and (j) conditions of access to markets for the imports of minerals".

<sup>106</sup>See section 4.

but not of a *freedom*, as does Article 87 of the 1982 LOS Convention, which is applicable at least to the water column above the Area. The right to conduct would not necessarily exclude the imposition of conditions on that conduct, i. e., the requirement of prior consent, for example, or restrictions so as to accommodate different conflicting activities, as long as the right is preserved in principle. A freedom, in contrast, it is submitted, denotes the exercise of the activity without any restriction except for the inherent limitation by other freedoms.

Outside the exclusive economic zone Article 143(3) of the 1982 LOS Convention makes it necessary to distinguish between scientific research that is concerned with “the seabed and ocean floor and subsoil thereof”<sup>107</sup> including sedentary species, and research relating to the superjacent water. Only with respect to the latter the doctrine of the freedom of the high seas applies. With respect to the former, Article 143 provides States Parties with the possibility to carry out marine scientific research on the condition of obligations such as the promotion of international co-operation through the participation in international programmes, the support of developing countries in their endeavours, and the dissemination of the research results. The content of these obligations would again not appear to differ substantially from those established in Part XIII.

Article 143 of the 1982 LOS Convention grants the right to conduct oceanographic research in the Area for “peaceful purposes and for the benefit of mankind as a whole”. By reference it incorporates Part XIII of the 1982 LOS Convention and more specifically Article 256 on research activities in the Area. States Parties, as well as international organisations—of which the Authority is one—, may carry out research projects with respect to the Area and its resources. The difference between Article 256 and Article 143 with respect to international organisations would appear to be of no consequence.<sup>108</sup>

Article 143(2) establishes the obligation to promote and encourage the conduct of research and co-ordinate and disseminate the results and analyses thereof for the Authority; for other international organisations this obligation would derive from Articles 239 and 244(1) which would appear to be more detailed. Yet, to the extent that the Authority constitutes a competent organisation for marine scientific research the provisions of Part XIII are

<sup>107</sup>Article 1(1) of the 1982 LOS Convention, definition of the Area.

<sup>108</sup>See *Soons*, Marine Scientific Research (as in n. 16 on page 180), p. 227, pointing out that the difference does not purport to affect the scope of the subjects, and that the Authority is established by Article 143 as a competent international organisation. Similarly, *Henchoz* points at the oddity that Article 256 accords the right to all *States* while Article 143 mentions only *States Parties*, see *Henchoz, Alain-Denis, Réglementations Nationales et Internationales de l'exploration et de l'exploitation des Grands Fond Marins*, Zürich, 1992, Schweizer Studien zum Internationalen Recht 76, p. 385. In fact, this difference in the language has little significance. Article 143 rather emphasises the obligations of States, which are engaged in research activities, and is not intended to derogate the principles of Part XIII, see *ibid.*.

equally applicable; Article 143(2) is thus superseded where the Authority actually engages in scientific research.<sup>109</sup>

*“Freedoms” and “Activities”*

The relationship between the regulation of the Area and the freedoms of the high seas is not conclusively settled in the 1982 LOS Convention. Where, for example, marine scientific research is conducted in the water column only, but may interfere with exploration and exploitation activities in the Area, a conflict arises which must be settled in accordance either with the regime for the Area or the high seas.

Article 157(3) would suggest that the Authority may restrict scientific research if it affects activities that have (validly) been permitted by the Authority. The high seas regime, in contrast, could be interpreted as giving the exercise of the freedom the priority over the regulated activity in the Area. Article 138 of the 1982 LOS Convention refers to the general conduct of States in the Area, tying every activity to the provisions of Part XI of the 1982 LOS Convention, the Charter of the United Nations, and international law in general, emphasising the interest of maintaining peace and security and the promotion of international co-operation. While this is a general guideline for the conduct of States involved in conflicting uses, it does not prescribe any clear standard by which States can solve an actual conflict. In addition, Article 138 of the 1982 LOS Convention—like the subsequent provisions—refers to activities *in* the Area. This seems not to cover the possibility that research within the superjacent water column—expressly exempted from Part XI by Article 135 of the 1982 LOS Convention and thus belonging to the regime of the high seas—conflicts with activities in the Area itself. Yet, the effects of activities in the Area are not limited to the Area. In fact, no activity in the Area can be conducted, it seems, from the Area and remain completely limited to it: any equipment used will necessarily protrude into the superjacent water column and most activities will be directed or controlled from outside the Area, i. e., from the superjacent water column.

The 1982 LOS Convention envisages a potential conflict between Area-related activities, on the one hand, and navigation and fishing, on the other hand: Article 147(2)(b) of the 1982 LOS Convention prohibits the establishing of installations used for carrying out activities in the Area where these may interfere with sea lanes or areas of intensive fishing. The latter relate to high seas freedoms, which are further qualified by reference to the actual

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<sup>109</sup>The Secretary-General of the Authority, noting the value of scientific information for the management of future impacts of mining operations, has proposed to earmark funds for the promotion of targeted research, *International Seabed Authority, Report of the Secretary-General*, ISBA/10/A/3, Kingston, 2004, p.3; see also *U.N. Secretary-General, Oceans and the law of the sea*, UN Doc. A/59/62, New York, 4 March 2004, p.20.

practice of such freedoms. Thus, a conflict with navigation as such would not fall under Article 147(2)(b); only where navigation has been consolidated to the status of a recognised sea lane it is protected against conflicting use of the Area by installations. Similarly, 'intense fishing' would appear to require a sufficient consolidation in terms of time and numbers; also the fishing activities must have reached this status before the installation is to be erected in the Area. Even though Article 147(2)(b) does not make explicit provision for a conflict between activities in the Area with marine scientific research projects, it nevertheless suggests that the freedoms of the high seas take priority at least where such freedoms can be considered consolidated practice.

### *Conflicts between Marine Scientific Research and other Activities*

A potential conflict beyond the mere exercise of antagonistic freedoms in the same area may arise, if research activities are to be conducted where exploration and exploitation of the deep sea-bed take place in accordance with Part XI of the 1982 LOS Convention and the Implementation Agreement. Exploration and exploitation of non-living resources are not mentioned as freedoms in Article 87 of the 1982 LOS Convention since these activities exclusively relate to the sea floor which, by virtue of the Part XI-regime, employs the concept of "common heritage of mankind". While in such an instance no single State has the competence to restrict the research activities, the Authority, established under Part XI, may intervene on the basis of its capacity for the sea floor. Where, for example, scientific research activities would constitute a threat to the natural environment, the Authority, according to Article 145 of the 1982 LOS Convention, has to "adopt appropriate rules, regulations and procedures" to ensure the effective protection of the marine environment from any harmful effects of such activities in the Area. As harmful effects could conceivably arise from marine scientific research, it may become subject to regulation even though it is principally permitted in the Area either for the Authority itself or for States.<sup>110</sup> The 1982 LOS Convention does not contain a provision which would suggest that the approval of the Authority is required to conduct research activities.<sup>111</sup> But the competence of the Authority under Article 145 would appear to allow for such a regulation at least where the activities involve "drilling, dredging, excavation, disposal of waste, construction and operation or maintenance of installations, pipelines and other devices".

<sup>110</sup>See *Birnie, Patricia W., Law of the Sea and Ocean Resources: Implications for Marine Scientific Research*, in Int'l J.Mar. & C.L. 10 [1995], pp.414f.

<sup>111</sup>See also *O'Connell, Daniel P./Ivan A. Shearer, editor, The international law of the sea*, Volume II, Oxford, 1984, pp.1-27.

*Regulation of Marine Scientific Research by the Authority*

Apart from such express competence, the question is whether the competence of the Authority can extend beyond the activities involving the sea floor, with implications for activities in the water column. In the course of the discussions on Part XI, texts on the competence of the Authority were submitted that allowed for an interpretation to the effect that scientific research would have effectively been subject to the Authority's jurisdiction.<sup>112</sup> Based on the premises of Article 150 of the 1982 LOS Convention, reiterated by the Authority in its Sea-bed Regulations,<sup>113</sup> Part XI itself would only be relevant to marine scientific research if some provision therein explicitly said so, or if the research involved the investigation of the mentioned resources.

Article 143(2) of the 1982 LOS Convention provides that the Authority itself may carry out research and may enter into contracts to that effect.<sup>114</sup> The Implementation Agreement stipulates in its Annex a mandate for the authority to promote and encourage the conduct of marine scientific research.<sup>115</sup> This mandate, however, is clearly limited to the activities envisaged by Part XI, i. e., such scientific research must have a bearing on

<sup>112</sup>See *Marffy, Annick de, La Recherche Scientifique Marine*, in *Dupuy, René-Jean/Vignes, Daniel*, editors, *Traité du nouveau droit de la mer*, Paris, 1985, pp.970f., quoting from the work of the First Committee: "l'expression *activités menées la Zone* s'étend de toutes les activités d'exploration de la Zone et d'exploitation de ses ressources ainsi que des autres activités connexes menées dans la Zone, y compris les activités de recherche scientifique [emphasis in original]", a stipulation whose latter part was later on not repeated: "Il n'est plus mentionné ici la référence 'aux autres activités connexes, y compris la recherche scientifique'." See also *Friedheim, Robert L., Negotiating the new ocean regime*, Columbia, SC, 1993, pp.201f., pointing out that concerns were raised during the negotiations that the Authority (and the Enterprise) might be put at a disadvantage in future negotiations if scientists from developed states provided their governments with data about the International Area that were not available to the Authority or Enterprise. To prevent this, proposals were introduced to ensure that science conducted over, in, and on the deep-ocean sea-bed was to be controlled by the Authority. This would prevent abuses, and also might be converted into an indirect tax on the developed. In return for permission to conduct research, researchers would be required to provide all of their data to the Authority at no cost.

<sup>113</sup>The Preamble reads: "[t]he seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction, and its resources, are the common heritage of mankind." ISBA/6/A/18.

<sup>114</sup>The Authority has engaged in collaborative research projects, see *U.N. Secretary-General*, 2004 Report (as in n. 109 on page 210), p. 67.

<sup>115</sup>Annex, section 1.5:

Between the entry into force of the Convention and the approval of the first plan of work for exploitation, the Authority shall concentrate on:

- (h) Promotion and encouragement of the conduct of marine scientific research with respect to activities in the Area and the collection and dissemination of the results of such research and analysis, when available, with particular emphasis on research related to the environmental impact of activities in the Area.



the resources of the Area. One must conclude that activities in the Area—similar as in the exclusive economic zone—have to be differentiated according to their prospects and aims: any activity with a view to exploration and/or exploitation of the Area falls within the jurisdiction and competence of the Authority, any other investigative conduct falls under the freedoms of the high sea. Only with respect to the former—notwithstanding the difficulties of identifying the one from the other—the Authority would be in the position to impose restrictions.<sup>116</sup>

Even though activities in the Area fall under the jurisdiction of the Authority, there is, no evident competence for the reconciliation of conflicts. An implicit competence may derive from the capacity of the Authority as the competent instance for matters of exploration and exploitation: if these are affected by a conflicting activity, the Authority might have the power to restrict conflicting uses. Such an implied power would have to derive from the Authority's task to organise and control activities in the Area. In order to properly fulfil this task the Authority may assume competences associated with and related to the activities in the Area. Such interpretation is principally supported by Article 157(1) and more specifically by Article 157(3):

The Authority shall have such incidental powers, consistent with this Convention, as are implicit in and necessary for the exercise of those powers and functions with respect to activities in the Area.

However, certain considerations run counter to such an interpretation. First, the debates about the requirement of prior notification are not reflected in the final text;<sup>117</sup> second, regulation 1(4) of the Sea-bed Regulations—which serve to implement the regime of the Area and the competencies of

<sup>116</sup>It is noteworthy that conservation and management of the biological resources of the deep seabed, according to the U.N. Secretary-General, is inevitably related to the regulation of deep seabed mining; regulation of “bioprospecting” falls therefore under the purview of the Authority, see *Ibid.*.

<sup>117</sup>See *Friedheim* (as in n. 112 on the facing page), pp. 205–208. Quite to the contrary, regulation 4(d) on the notification of prospecting prescribes that the prospector must submit:

- a satisfactory written undertaking that the proposed prospector will:
  - (i) comply with the Convention and the relevant rules, regulations and procedures of the Authority concerning:
    - a. cooperation in the training programmes in connection with marine scientific research and transfer of technology referred to in articles 143 and 144 of the 1982 LOS Convention; and
    - b. protection and preservation of the marine environment; and
  - (ii) accept verification by the Authority of compliance therewith.

Explicit mention of prospecting and silence on marine scientific research underlines the Authority's take that marine scientific research does principally not fall under its purview.

the Authority within it—contains an explicit exemption which stipulates that the regulations “shall not in any way affect the freedom of scientific research, pursuant to article 87 of the 1982 LOS Convention, or the right to conduct marine scientific research in the Area pursuant to articles 143 and 256 of the 1982 LOS Convention.” It follows that the Authority does not consider itself to be in a position to restrict the freedom of scientific research. In the event of a conflict of uses reference must be had to the general due-regard rule implicit to the freedoms of the high sea, i. e., where an activity has been duly authorised by the Authority (with a view to conflicting uses of the high sea<sup>118</sup>) interference with such an activity by the exercise of a high sea freedom would be restricted to the extent that due regard suggests a possible alternative.

The consequence of the above quoted provisions seems to be that the Authority must have a right to verify that a research project is not in reality a prospecting operation. The regime of the sea-bed affords comprehensive competence to the Authority, which, accordingly, has the last word on research activities relating to or affecting the Authority’s jurisdiction. To what extent this might limit scientific investigation of the sea-bed is open to future development. The Authority is establishing a set of rules that will govern all scientific or commercial conduct within the Area.<sup>119</sup> The effect on scientific activities cannot be predicted yet.

### MARINE ARCHAEOLOGY

A section on marine archaeology<sup>120</sup> is included here because it is a discipline whose activities in some respect resemble those of oceanographers.<sup>121, 122</sup>

<sup>118</sup>One may argue that the Authority by authorising a certain activity exercises due regard with the consequence that the exercise of the high sea freedoms is restricted. This argument, however, neglects the status of the Authority: it is not designed as an impartial umpire in multiple use conflicts, its purpose is to manage the activities *in* the Area.

<sup>119</sup>See *Statement by the Secretary-General of the International Sea-bed Authority to the fourth Meeting of the Informal Consultative Process*, delivered at the United Nations, New York, 2–6 June 2003, pp. 1f., the text is available at ([www.isa.org.jm/en/whatsnew/UNICPOLOSStatement.pdf](http://www.isa.org.jm/en/whatsnew/UNICPOLOSStatement.pdf)) – visited on 31 January 2005.

<sup>120</sup>Legal problems arising in the context of so called treasure hunters are not considered; their aim is usually to claim property in order to generate a profit.

<sup>121</sup>The close resemblance becomes apparent in incidents like that of the R/V *Glomar Explorer*, (see n. 77 on page 29); see generally *Mather, Roderick, Technology and the Search For Shipwrecks*, in *J.Mar.L. & Com.* 30 [1999], pp. 175f.

<sup>122</sup>See *Strati, Anastasia, The protection of underwater cultural heritage: an emerging objective of the contemporary law of the sea*, Kluwer, 1995, pp. 253–257, on the discussion arising out of Article 5(8) of the Geneva Continental Shelf Convention whether archaeological research qualifies as fundamental oceanographic or other scientific research, some of the interpretational problems of that Article could be avoided by the new language in Article 246 of the 1982 LOS Convention; in Working Group I at the Symposium on the International Regime of the Sea-bed, Rome 1969, views were expressed that explicitly included archaeological research in scientific research, see *Sztucki, Jerzy*,

And in some instances the scientific aspects of underwater archaeology have been even under the scrutiny of courts in salvage award proceedings.<sup>123</sup> Underwater archaeology has been a niche discipline, if one in its own right at all. A few years ago interest in underwater exploration of artefacts surged when an underwater expedition to the “RMS Titanic” was successful. Today, historic salvage or ‘treasure hunting’, which is dedicated to the recovery and preservation of artefacts and valuable goods sunken on shipwrecks, is a multi-billion dollar activity for maritime interests.<sup>124</sup>

### *Marine Archaeology in the 1982 LOS Convention*

#### *Applicability*

For marine archaeological expeditions technology is used similar to that employed for marine scientific research and sometimes the respective results feed into the investigations of the other discipline.<sup>125</sup> This, however, is clearly not a basis for the application of Part XIII of the 1982 LOS Convention, neither would, in lieu of its applicability, the pursuit of these activities generally fall under the freedom of the high seas. At least in a zone up to 200 nm the provisions on the exclusive economic zone apply, of which Part XIII only aligns and appends the basic principles with respect to marine scientific research. Most notably, Article 56 of the 1982 LOS Convention confers upon the coastal State the sovereign rights in respect of the exploration and exploitation of the natural living and non-living resources. In respect of archaeological objects one might argue that they constitute a non-living resource which falls under the sovereign rights of the coastal State. As a consequence, the coastal State would be legally entitled to regulate archaeological research on the basis of either Article 56(1)(a)—rather than Article 56(1)(b) of the 1982 LOS Convention—or Article 77(1)—to the extent that

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editor, *Symposium on the International Regime of the Sea-bed, Rome 1969*, Rome, 1970, Accademia nazionale dei Lincei, Istituto affari internazionali, p. 669.

<sup>123</sup>See *Nafziger, James A.R., The Titanic Revisited*, in *J.Mar.L. & Com.* 30 [1999], pp. 316, 324, referring to *R.M.S. Titanic, Inc. v Wrecked and Abandoned Vessel*, 9 F.Supp. 2d 624, 638f. and 640f. (E.D. Va. 1998); *Klein v Unidentified Wrecked and Abandoned Sailing Vessel*, 758 F. 2d 1511, 1515, 1985 AMC 2970 (11<sup>th</sup> Cir. 1985) (quoting the district court to the effect that unscientific removal of artefacts did more to create a marine peril than to prevent it); *MDM Salvage, Inc. v Unidentified, Wrecked and Abandoned Sailing Vessel*, 631 F.Supp. 308, 1987 AMC 537 (S.D.Fla. 1986) (salvors denied relief from interlopers because they failed to protect wreck’s archaeological integrity); *Chance v Certain Artifacts Found and Salvaged from The Nashville, 606 F.Supp. 801, 1985 AMC 609 (S.D.Ga. 1984)*, *aff’d*, 775 F. 2d 302, 1986 AMC 1216 (11<sup>th</sup> Cir. 1985) (*salvors denied award because of their failure to exercise sufficient care in rescuing an historic vessel*).

<sup>124</sup>See *Bederman, David J., Historic Salvage and the Law of the Sea*, in *U.Miami Inter-Am.L.Rev.* 30 [1998], p. 102.

<sup>125</sup>See *Boesten, Eke, Archaeological and/or historic valuable shipwrecks in international waters: Public International Law and What it Offers*, The Hague, 2002, p. 70.

shipwrecks belong to the continental shelf natural resources<sup>126</sup>—in connection with Part XIII.

The 1982 LOS Convention prescribes yet another way as it deals with marine archaeology or underwater objects in separate provisions, namely—*inclusio unius est exclusio alterius*—in Article 149 and 303. The former of which provides that “[a]ll objects of an archaeological and historical nature found in the Area shall be preserved or disposed of for the benefit of mankind as a whole” and, nevertheless, assigns those States preferential rights, which have a particular link to the object in question. This effectively means that marine archaeology can only enjoy the freedom of the high seas where its objects are not to be found on the sea floor; otherwise marine archaeologists are obliged to carry out their activities within the ramifications of the heritage of humankind concept.

Article 303 relates to archaeological and historical objects found at sea generally. It puts all states under a duty to protect and co-operate with respect to such objects when found at sea.<sup>127</sup> *Dupuy/Vignes* contend that the Authority has no managerial power over archaeological objects as these are not contained in the definition of ‘resources’; consequently, their removal would not be subject “to any form of international regulation or authorization and is governed by the general principle of the freedom of the high seas.”<sup>128</sup>

#### *Jurisdiction over Marine Archaeology*

In terms of jurisdiction, Article 303 of the 1982 LOS Convention only refers to Article 33 of the 1982 LOS Convention (Contiguous Zone) and stipulates that a removal in that zone “without its approval would result in an infringement within its territory or territorial sea of the laws and regulations referred to in that article.” Article 149 of the 1982 LOS Convention applies in the Area, i. e., on the sea-bed outside national jurisdiction. This leaves

<sup>126</sup>See *Hoyle, Brian J., Historical and Archaeological Treasures*, in *Alexander, Lewis M./Allen, Scott/Hanson, Lynne C.*, editors, *New developments in marine science and technology: economic, legal, and political aspects of change*, Honolulu, Hawaii, 1989, pp. 86f.

<sup>127</sup>Article 303(3) of the 1982 LOS Convention exempts “the rights of identifiable owners, the law of salvage or other rules of admiralty, or laws and practices with respect to cultural exchanges” and stipulates thus a notable exception of the general duty: if a maritime wreck is not an object of an archaeological and historical nature, other legal regimes of general maritime law may apply, such as the law of finds or the law of salvage. The (common) law of finds treats abandoned property as returned to the state of nature and thus equivalent to property, such as fish or ocean plants, with no prior owner. The first person to reduce such property to ‘possession’, either real or constructive, becomes its owner (see *Hener*, 525 F.Supp. 354). The law of salvage, certain conditions met, entitles the salvor to an award which may be claimed in an *in rem* action against the vessel.

<sup>128</sup>*Dupuy, René-Jean/Vignes, Daniel*, editors, *A Handbook on the new law of the sea*, Dordrecht, 1991, p. 567, contemplating, however, a control of compliance with Article 149 of the 1982 LOS Convention by the Authority or UNESCO. See also *Boesten* (as in n. 125 on the page before), pp. 51f.

an unwieldy uncertainty with respect to items in the margin between the contiguous zone and the sea-bed, regularly between 24 and 200 nm.<sup>129</sup> The *Convention on the Protection of the Underwater Cultural Heritage*<sup>130</sup> complements these two provisions with respect to coastal state jurisdiction as a basis for the enforcement of protection measures.<sup>131</sup> Article 10(2) provides that the coastal State “has the right to prohibit or authorize any activity directed at [cultural heritage]” in the exclusive economic zone or on the continental shelf. As the States Parties, according to the Preamble, took account of the legal ramifications set forth by the 1982 LOS Convention when adopting the Heritage Convention, they effectively predicate that a State, on a territorial basis, may exercise its jurisdiction with respect to cultural heritage to the limits of the continental shelf and the exclusive economic zone on the basis of the 1982 LOS Convention.<sup>132</sup> On a nationality basis, parties are required by virtue of Article 7(2) to enforce the “Rules”<sup>133</sup> against their own nationals and against anyone, where the material from a protected site is brought within the territorial limits of the party. Thus, a party would normally seize any object whose excavation, even outside that State’s territory and offshore jurisdiction, was deemed to violate the Rules’ criteria.<sup>134</sup>

<sup>129</sup>See *Nafziger* (as in n. 123 on page 215), p. 320.

<sup>130</sup>See *Convention on the Protection of the Underwater Cultural Heritage*, adopted on 2 November 2001 by the General Conference of UNESCO at its 31<sup>st</sup> Session [hereinafter: Heritage Convention], the text is available at [http://www.unesco.org/culture/laws/underwater/html\\_eng/convention.shtml](http://www.unesco.org/culture/laws/underwater/html_eng/convention.shtml) – visited on 31 January 2005. Summaries of preparatory work within UNESCO include the *Preliminary Study on the Advisability of Preparing an International Instrument for the Protection of the Underwater Cultural Heritage*, UNESCO Doc. 28C/39 (Oct. 4, 1995), and the *Feasibility Study for the Drafting of a New Instrument for the Protection of the Underwater Cultural Heritage*, UNESCO Doc. 146 EX/27 (23 March 1995). The Heritage Convention largely builds upon the *Buenos Aires Draft Convention on the Protection of the Underwater Cultural Heritage*, reprinted in 1994 Int’l L. Ass’n 432, (Report of the Sixty-Sixth Conference). A summary of the Working Session on the Draft Convention at the ILA Conference appears *ibid.*, pp. 448f. For the Report, Draft Convention, Selected Bibliography, and article-by-article commentaries, see *O’Keefe, Patrick/Nafziger, James A.R., The Draft Convention on the Protection of the Underwater Cultural Heritage*, in O.D. & Int’l L. 25 [1994], p. 391 and *O’Keefe, Patrick/Nafziger, James A.R., The Draft Convention on the Protection of the Underwater Cultural Heritage*, in O.D. & Int’l L. 26 [1995], p. 193; *Brown, Edward D., Protection of the Underwater Cultural Heritage: Draft Principles and guidelines for Implementation of Article 303 of the United Nations Convention on the Law of The Sea, 1982*, in *Marine Policy* 20 [1996].

<sup>131</sup>See *Carducci, Guido, New Developments in the Law of the Sea: the UNESCO Convention on the Protection of Underwater Cultural Heritage*, in *Am.J.Int’l L.* 96 [2002], pp. 420f., speaking of a *lex specialis* in relation to the 1982 LOS Convention.

<sup>132</sup>One must assume that the Parties to the Heritage Convention did not intentionally set themselves in contradiction to the 1982 LOS Convention but rather view the relevant provisions of the Heritage Convention as a restatement of the former.

<sup>133</sup>These Rules are set forth in an Annex to the Heritage Convention, see n. 130 on page 217. They go back to the *International Charter on the Protection and Management of Underwater Cultural Heritage*, prepared by the *International Council on Monuments and Sites (ICOMOS)*, 5–9 October 1996.

<sup>134</sup>See *Nafziger* (as in n. 123 on page 215), p. 321.

*Marine Archaeology and Marine Scientific Research Distinguished*

To fall under the scope of the relevant provisions in the 1982 LOS Convention an underwater object has to be of “an archaeological and historical nature”. Albeit it has been suggested that the conjunction ‘and’ makes it necessary that the object has both characteristics,<sup>135</sup> this is not a settled matter since the other official versions do not correspond to the English conjunctive terminology.<sup>136</sup> The term ‘historical nature’ includes a time and a more ambiguous aspect of evaluation or appreciation.<sup>137</sup> The time aspect excludes the objects of the presence; the value aspect those which are of no significance. But there are no specific limits for the temporal aspect, i. e., when does the presence start and end; and there are neither any clear indications for the value aspect, as this will depend on the value system under whose pretext the object is discovered.<sup>138</sup> In terms of time, the Heritage Convention only attempts to draw a line by defining a cultural heritage object in Article 1(a) as “all traces of human existence... which have been partially or totally under water, periodically or continuously, for at least 100 years.” It appears that the 100-years rule is used as a benchmark by most of the legislative acts in this area of law and may even be regarded as a customary norm.<sup>139</sup> Where thus the historical nature might be identified on the basis of state practice, the adjective ‘archaeological’ poses problems still. It had been defined in Article 1 of the 1969 *European Convention on the Protection of Archaeological Heritage* as describing “all remains and objects, or any other traces of human existence, which bear witness to epochs and civilizations for which excavations or discoveries are the main source or one of the main sources of scientific information”<sup>140</sup> But this definition only rephrases the crucial ambiguity: it is already difficult to distinguish single epochs with a reasonable degree of exactness, it is even harder to identify something that bears witness of the same. The revised version of 1992 brought some improvements in terms of precision with respect to the protected objects,<sup>141</sup> but remained equally broad with respect to the time

<sup>135</sup>See *Allain, Jean, Maritime Wrecks: Where the Lex Ferenda of Underwater Cultural Heritage Collides with the Lex Lata of the Law of the Sea Convention*, in *Va.J.Int'l L.* 38 [1998], p. 753.

<sup>136</sup>See *Nordquist, Myron H./Rosenne, Shabtai/Sohn, Louis B.*, editors, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 279 to 320, Annexes V, VI, VII, VIII and IX, Final Act, Annex I, Resolutions I, III and IV, Volume V, Dordrecht, 1989, p. 160.

<sup>137</sup>See *Ibid.*

<sup>138</sup>Similarly, *Carducci* (as in n. 131 on the preceding page), p. 422; *Giorgi, Maria Cristina, Underwater Archaeological and Historical Objects*, in *Dupuy, René-Jean/Vignes, Daniel*, editors, *A Handbook on the New Law of the Sea*, Dordrecht, 1991, p. 565.

<sup>139</sup>See *Strati* (as in n. 122 on page 214), pp. 179f.

<sup>140</sup>*European Convention on the Protection of the Archaeological Heritage*, adopted 6 May 1969, entry into force 20 November 1970, 8 I.L.M. 736.

<sup>141</sup>*European Convention on the Protection of the Archaeological Heritage (Revised)*, adopted 16 January 1992, entry into force 25 May 1995., Article 1

frame. The definition, with the addition of the time frame, is essentially repeated in Article 1 of the Heritage Convention: “the potential reach of the definition is subject only to a time limit”.<sup>142</sup> In the end it will be left to the persuasiveness of the scientist and the persuasion (as a result of the former) of the relevant authorities, which are concerned with the legal interpretation, to establish the quality of an archaeological and historic item.

The crucial difference between marine archaeology and marine scientific research can now be identified as the following: Marine archaeology is concerned with underwater objects or maritime wrecks, which should be understood as man-made items lost to the marine environment<sup>143</sup> or, more generally, traces of humans’ existence.<sup>144</sup> Archaeologists work to preserve and record information concerning these in accordance with scientific methods and principles. In marine archaeology, the researcher is interested in man-made items whose only relation to the marine environment is the fact that they happen to be found there or even only there. The oceanographer, in contrast, is not so much interested in man-made items as such but rather in the properties of the environment and, possibly, humans’ relations to and influences on the marine environment as exemplified by a change in the conditions of the environment. As far as findings like fossils are concerned it would appear that they do not fall under the common definition of marine archaeology in that they do not represent a man-made item.<sup>145</sup>

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- (2) To this end shall be considered to be elements of the archaeological heritage all remains and objects and any other traces of mankind from past epochs:
- i the preservation and study of which help to retrace the history of mankind and its relation with the natural environment;
  - ii for which excavations or discoveries and other methods of research into mankind and the related environment are the main sources of information; and
  - iii which are located in any area within the jurisdiction of the Parties.
- (3) The archaeological heritage shall include structures, constructions, groups of buildings, developed sites, moveable objects, monuments of other kinds as well as their context, whether situated on land or under water.

The text is available through the *Council of Europe Treaty Office* at <http://conventions.coe.int/> – visited on 31 January 2005.

<sup>142</sup> *Carducci* (as in n. 131 on page 217), p. 422.

<sup>143</sup> See *Allain* (as in n. 135 on the preceding page), p. 748.

<sup>144</sup> Definition used in Article 1 of the *Buenos Aires Draft Convention on the Protection of the Underwater Cultural Heritage*, see ILA, Report of the Sixty-Sixth Conference (1994), pp. 432f. But see *Boesten* (as in n. 125 on page 215), p. 70, contending that “the focus on objects and their man-made nature may have been overtaken by developments, which would support a less strict interpretation of the ‘natural resource only scope’ of MSR.”

<sup>145</sup> But see *Ibid.*, qualifying the difference by emphasising an approximation of ‘natural resources’ and ‘objects’.





## Chapter 5.

# Coastal State Jurisdiction with respect to Marine Scientific Research

The legal status of a platform for the present analysis is understood as the legal relationship between the platform and the coastal State in international law.<sup>1</sup> This relationship is a function of the coastal State's jurisdiction over the platform, i. e., the legal capacity of the coastal State to interfere with the platform's internal affairs. It is expressed in rights and obligations of the researching and the coastal State with respect to marine scientific research. The competence of the coastal State to regulate, authorise and conduct marine scientific research varies in accordance with the maritime zones.<sup>2</sup> Flag State jurisdiction may be exercised by the researching State as a reflex of this graded jurisdiction.

### JURISDICTION WITH RESPECT TO SHIPS

With respect to jurisdiction by States the 1982 LOS Convention distinguishes between flag States, coastal States, and port States. Flag States have jurisdiction over a vessel by virtue of the vessel's nationality. Port States have jurisdiction as a result of a vessel's presence in a port of the State, where

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<sup>1</sup>The legal status is not affected by the legal regime aboard the platform and the legal relationships between the individuals on it, be they scientific or technical personnel.

For the present analysis, the composition of the crew or the scientific personnel is of no significance; national legislation, however, such as labour laws or administrative regulations, may require a differentiation of each individual's legal relation to the platform or its operator to determine the legal consequences of individual behaviour.

<sup>2</sup>See chapter 4.

jurisdiction is normally conditioned on the vessel's voluntary presence as opposed to that for reasons of distress or coercion. Finally, coastal States have jurisdiction on the basis of the vessel's geographic location as a function of their territorial sovereignty or jurisdiction as conferred by the 1982 LOS Convention.

Article 92 stipulates that the State whose flag the ship flies has the exclusive jurisdiction over the vessel on the high seas. By virtue of Article 94(1) the flag State must ensure that ships flying its flag comply with international obligations, namely, in administrative, technical and social matters; Article 94(2) specifically relates these to the master, officers and crew of the ship. Article 94(3) and (4) refer to the safety of the ship and stipulate an obligation to take appropriate measures. The obligation thus established incorporates by reference the relevant instruments of I.M.O. as regards international standards for the safety at sea and other matters.<sup>3</sup> The flag State has to take appropriate steps within its jurisdiction to comply with Article 94, i. e., it has to implement the relevant rules and standards and enforce them vis-à-vis ships of its nationality.

By virtue of nationality the competence of the flag State extends beyond the administrative, technical, and social matters listed in Article 94. It includes the civil and criminal jurisdiction and generally all manifestations of sovereignty.<sup>4</sup> The general concept of flag state jurisdiction applies not only on the high seas, but wherever the ship sails, except where other States have a prerogative to exercise their jurisdiction<sup>5</sup> again within the ramifications of international law,<sup>6</sup> i. e., as reflection of coastal State jurisdiction in the various zones.

<sup>3</sup>See *Lagoni, Rainer, Die Abwehr von Gefahren für die marine Umwelt*, in *Umweltschutz im Völkerrecht und Kollisionsrecht*, Volume 32, Heidelberg, 1992, pp. 141f.

<sup>4</sup>In maritime law this concept is the foundation for the custom that a ship-owner who sends a vessel into a foreign port gives notice by the flag to all potential contracting parties of the owner's intent for that law to regulate all contracts made involving the ship or its cargo, see 'law of the flag' *Black, Henry Campbell/Garner, Bryan A.*, editors, *Black's law dictionary*, 7th edition. St. Paul, Minn., 1999.

<sup>5</sup>According to 18 U.S.C.A. § 7, for example, the special maritime and territorial jurisdiction of the United States extends:

1. With respect to its geographical scope to the high seas and any other waters within the admiralty and maritime jurisdiction of the United States and out of the jurisdiction of any particular State;
2. With respect to vessels, jurisdiction includes any vessel belonging in whole or in part to the United States or to any citizen or juridical person created by or under the laws of the United States if not within the jurisdiction of any particular state;
3. The United States also claims jurisdiction, if so permitted by international law, over foreign vessels with a scheduled departure from or arrival in the United States with respect to an offence committed by or against a national of the United States.

<sup>6</sup>See *König, Doris, Durchsetzung internationaler Bestands- und Umweltschutzvorschriften auf hoher See im Interesse der Staatengemeinschaft*, Berlin, 1990, Veröffentlichungen des Instituts für Internationales Recht an der Universität Kiel 108, pp. 226f.

*Territorial Sea*

The coastal State may exercise its jurisdiction as a derivative of its territorial sovereignty also within the adjacent sea up to the 12nm-limit. The territorial sea belongs to the coastal State by virtue of geographical circumstances, a fact which entails certain consequences in terms of obligations.<sup>7</sup> These obligations in turn make the possession of the territorial waters not optional but compulsory.<sup>8</sup> The obligations derive from treaty and customary law, may be different from State to State and also change over time. As regards marine scientific research the 1982 LOS Convention does not prescribe any specific obligation of the coastal State *vis-à-vis* foreign States, such as, for example, special legislative arrangements for the permission of research activities.

Different from the internal waters—as qualified by Article 8(2) of the 1982 LOS Convention—though, the coastal State has to observe certain rights afforded by the 1982 LOS Convention and customary law to other States: The entitlement of foreign flag vessels to innocent passage or transit passage, whichever applies. Both concepts, however, are in themselves restricted in respect of research activities.

*Innocent Passage**Passage and Marine Scientific Research*

Ships may navigate the territorial sea in general only for the purpose of passage either to get port access or to get to another part of the ocean. Though not explicitly stated in the Convention, this follows from the existence of the regime of innocent passage itself: Only if the State has the right of exclusion in the territorial sea, it makes sense to secure the right of other States to traverse this zone. In this sense the right of innocent passage became important under the 1982 LOS Convention as a counterweight to the expansion of the coastal States' jurisdiction: as many formerly open areas of the ocean fell forthwith under national jurisdiction within the territorial sea, innocent passage ensured navigational freedom for crucial areas of communication.

<sup>7</sup>As espoused by *J. McNair* in the *Anglo-Norwegian Fisheries Case*:

To every State whose land territory is at any place washed by the sea, international law attaches a corresponding portion of maritime territory consisting of what the law calls territorial waters (and in some cases national waters in addition). International law does not say to a State: "You are entitled to claim territorial waters if you want them."

1951 I.C.J.Rep., p. 116(160); similarly *Fitzmaurice, Sir Gerald, The Law and Procedure of the International Court of Justice, 1951-54: Points of Substantive Law*, in *Brit.Y.Int'l L.* 31 [1954], p. 372.

<sup>8</sup>See 1951 I.C.J.Rep., p. 116(160); or as *J. Alvarez* exemplified: "States have certain rights over their territorial sea, particularly rights to the fisheries; but they also have certain duties, particularly those of exercising supervision off their coasts, of facilitating navigation by the construction of lighthouses, by the dredging of certain areas, *et cetera*", *ibid.*, p. 150.

Article 17 of the 1982 LOS Convention affords the right of innocent passage to all States; the heading of Part II, Section 3, Subsection A makes it explicit that the right is accorded to *all* ships. The right of innocent passage is generally accepted to be a right under customary law. However, there is no universal agreement as to what this right encompasses. The general reference to ships is subject to some discussion, as some nations do not accord this right unlimitedly to all ships but require, for example, warships to obtain prior permission or authorisation. Though this practice is contested by most maritime nations, the fact remains that even after the entry into force of the 1982 LOS Convention in 1994 the exact scope of innocent passage seems to remain in dispute.<sup>9</sup>

In order for a vessel to enjoy the right of innocent passage, as set forth in the 1982 LOS Convention, it has to comply with certain requirements. One of these is, according to Article 19(2)(j) of the 1982 LOS Convention, to discontinue—while in the territorial sea—“the carrying out of research or survey activities”. This provision goes further than any provision in Part XIII as its language is much more general. The equivalent provision in Part XIII, Article 245 of the 1982 LOS Convention, confers on coastal States the “exclusive right to regulate, authorize and conduct marine scientific research in their territorial sea”, and refers thus to marine scientific research only. Reading Article 245 of the 1982 LOS Convention in isolation, it seems that other research can be conducted within the boundaries of the territorial sea unimpeded by the coastal State.

The mere requirement of prior notification for any marine scientific research as purported by Article 245 of the 1982 LOS Convention could potentially modify the meaning of innocent passage for research vessels. While for ships in general the requirement of prior authorisation or notification is widely regarded as contravening the right of innocent passage,<sup>10</sup> for research vessels there could be an exception on the premise that the coastal State would have to be able to control compliance. Article 245 of the 1982 LOS Convention, however, applies only where marine scientific research is actually conducted or intended to be conducted in the territorial sea. Article 19(2) and Article 245 regulate different situations. A research vessel not

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<sup>9</sup>See *Ngantcha, Francis, The right of innocent passage and the evolution of the international law of the sea: the current regime of “free” navigation in coastal waters of third states*, London, 1990, Graduate Institute of International Studies, Geneva, p. 197; *Shearer, Ivan A., Problems of Jurisdiction and Law Enforcement Against Delinquent Vessels*, in *Int'l & Comp.L.Q.* 35 [1986], pp. 324f.; also *McDougal, Myres S./Burke, William T., The Public Order of the Oceans*, New Haven, 1987, pp. 180f., with respect to control of access to the territorial sea.

<sup>10</sup>The requirement of prior notification/authorisation is mainly discussed in the context of warship passage, see *Brown, Edward D., The International Law of the Sea*, Volume I Introductory Manual, Dartmouth, 1994, pp. 64–72; *O'Connell, Daniel P./Ivan A. Shearer, editor, The international law of the sea*, Volume I, Oxford, 1982, pp. 274–297; yet, Sweden, for example, according to information from the B.S.H. from March 1991 (on file with the author), required prior notification from every state ship.

engaged in any type of investigative activity is a mere vessel to which the general provisions of the 1982 LOS Convention apply. As clear as this may appear on a theoretical level, the practice may look a lot different. For enforcement authorities it might not be obvious that a research vessel is only traversing the territorial sea without infringing the coastal state regulations or laws. To verify that the vessel pursues an activity, which is prejudicial to coastal state interests according to Article 19(2), the coastal State would have to survey or even inspect the vessel. Such enforcement activities would appear to be at variance with the right of innocent passage.<sup>11</sup>

Generally, if a vessel conducts research activities while traversing the territorial sea it cannot claim the right of innocent passage since the presumption in Article 19(2)(j) of the 1982 LOS Convention precludes the application of Article 17.<sup>12</sup> This is even the case where the vessel conforms with all other conditions of Article 19(2).<sup>13</sup> The situation is different if a vessel's activities fall outside Article 19(2)(j) of the 1982 LOS Convention. This is not necessarily a contradiction to Article 21(1)(g) of the 1982 LOS Convention in the sense that carrying out research activities during passage even with the authorisation by the coastal State would make that passage non-innocent. Article 21 of the 1982 LOS Convention only reiterates the competence of the coastal State to regulate certain activities in the territorial sea. Thus, Article 21(1)(g) of the 1982 LOS Convention constitutes an exemption of the exemption: a vessel conducting research while in passage cannot claim the right of innocent passage except if the coastal State has generally exempted that particular kind of research by way of regulations. But this is different from the case when a vessel is authorised by the coastal state authorities to conduct research. The former is the general exemption of non-innocent activities, the latter is the case-by-case authorisation in accordance with Part XIII of the 1982 LOS Convention. By consulting the laws and regulations of the coastal State a researcher might find that certain research activities do not require prior authorisation because they are generally exempted and do not render the passage non-innocent.<sup>14</sup> Passage in these cases would not

<sup>11</sup>*Shearer* (as in n. 9 on the preceding page), pp. 325f., identifies three categories of power that the coastal State may exercise: take necessary steps to prevent non-innocent passage in accordance with Article 25(1), exercise criminal jurisdiction (if the incident is not as serious as to render the passage non-innocent), and expel the vessel from the territorial sea.

<sup>12</sup>See *Franckx, Erik*, editor, *Vessel-source pollution and coastal state jurisdiction: the work of the ILA Committee on Coastal State Jurisdiction Relating to Marine Pollution (1991–2000)*, Boston, 2001, pp. 126f., noting that Article 19(2) only refers to activities and suggesting that nothing but activities—which would exclude a mere threat except where the condition of the ship is “so utterly deplorable that it is extremely likely to cause a serious incident”—can render passage non-innocent.

<sup>13</sup>See *Soons, Alfred H. A.*, *Marine Scientific Research and the Law of the Sea*, Deventer, 1982, p. 148.

<sup>14</sup>This is admittedly a fictitious case, yet, as the 1982 LOS Convention permits this option it seems worthwhile to mention it; also in a regional context such a measure could be possible: see page 290 with respect to an initiative in the European Union.

be innocent as defined by Article 19(1), yet it would be permitted by law. Research activities, which are not mentioned in laws or regulations passed pursuant to Article 21(1)(g) of the 1982 LOS Convention, render passage non-innocent and require principally prior authorisation.

*Passage and Operational Oceanography*

Operational oceanography is conducted by numerous vessels—so-called ships of opportunity or voluntary ships<sup>15</sup>—around the world at all times and in all zones of jurisdiction and even in innocent passage.<sup>16</sup> *Soons* suggests that data samples from such operational activity may constitute research in the sense of Article 19 of the 1982 LOS Convention when “used for studies of... ocean currents”<sup>17</sup>, thus rendering that passage innocent. Already during the negotiations, the possibility, operational oceanography could fall under the regime of marine scientific research, caused some concern by the *World Meteorological Organization (W.M.O.)*; its Eighth World Meteorological Congress submitted therefore to the Third Committee the view:

[A]dequate marine meteorological data coverage, including that from areas within the exclusive economic zone, was indispensable for timely and accurate storm warnings for the safety of navigation and for the protection of lives and property in coastal and offshore areas.<sup>18</sup>

In this statement the W.M.O. referred to its *Voluntary Observing Ship's Scheme* as part of the *World Weather Watch (W.W.W.)* as well as to activities carried out under the projects and programmes of organisations, such as the *Marine Meteorological Services*, the *Tropical Cyclone Project* and the *Integrated Global Ocean Station System*. In his response the chairman, *Alexander Yankov*, of the Third Committee explained that in his opinion “such activities had already been recognised as routine observations and data collecting which were not covered by Part XIII.”<sup>19</sup> If this kind of data sampling were encompassed by the references to research activities, the above mentioned programmes as well as today's global monitoring schemes would have faltered. No merchant ship participating in the Voluntary Observing Ship's Scheme would seriously consider submitting to a burdensome authorisation process or risk the violation of international law to do a mere favour. For practical reasons, operational oceanography may be considered as scientific research in a technical sense: measurements taken as a matter of routine are difficult, if not impossible, to track down by coastal state authorities, let alone to follow up their subsequent use.

<sup>15</sup>See n. 127 on page 42.

<sup>16</sup>Other platforms for operational oceanography are the global network of tide gauges, satellites, and surface drifters, see section 1.

<sup>17</sup>See *Soons*, Marine Scientific Research (as in n. 13 on the preceding page), p. 149.

<sup>18</sup>Recited in the *Report of the Chairman on the work of the Committee*, in Third United Nations Conference on the Law of the Sea: Official Records, Volume XIV, New York, 1982, p. 102, para. 5; UN Doc. A/CONF.62/L.61, para. 8.

<sup>19</sup>*Ibid.*

Yet another question is whether or not the coastal State may exclude such routine activities by way of regulations in accordance with Article 21(1)(g). This would seem possible if one considered routine activities, despite the interpretation by *Yankov*, as marine scientific research at least in those cases where sampled data are intended for scientific research programmes. If, however, routine activities as such were not perceived as marine scientific in the first place, regulation of such activities was neither enshrined in Article 21(1)(g) nor in Article 245.

The former view finds its basis in a strictly formal interpretation of the 1982 LOS Convention: any activity intended to increase knowledge about the marine environment must be regarded conduct of marine scientific research. The latter better reflects the practice: data from operational oceanography consists mainly of measurements that are made as a matter of ship routine, including depths soundings, current and wind speed, water temperature, atmospheric pressure, and other data having a bearing on navigational concerns. The issue may, however, become a concern of a coastal State if these data are collected and analysed by a third institution, which may thus be put into a position to draw conclusions that go beyond the mere aspects of navigation. In the end, it must be reiterated that operational oceanography was not considered by the negotiators as constituting marine scientific research in the sense of Part XIII. Since the Conference was informed by the W.M.O. of the importance as well as of the implications of operational oceanography, it must be assumed that, in responding, *Yankov* was also aware of the possibility that such data become publicly available.

It is noteworthy that the exemption of routine activities applies to all zones inasmuch they are not considered research. *Yankov*, in his response, explicitly referred to “operational and *research* activities [emphasis added]”. Thus, even if the sampled data were intended for a research programme, the fact that the ship conducts the sampling as a matter of routine prevents it from infringing the pertinent provisions of the 1982 LOS Convention. Since this is an *a priori* exemption, operational oceanography is neither included in the words ‘research’ or ‘survey’ as used in Article 19(2), nor in any other Article using these words—unless the 1982 LOS Convention were to redefine its terms in every single Part: marine scientific research only begins where operational oceanography ends.

20 years after the entry into force of the 1982 LOS Convention coastal state laws do not allude to their opinion that such activities constituted a contravention of innocent passage. Rather operational oceanography has become an ever-important data resource for the global climate programmes of I.O.C.<sup>20</sup> The fact, that I.O.C. is the main sponsor of programmes of operational oceanography, suggests that States’ views in this matter conform with *Yankov*’s statement to W.M.O.

<sup>20</sup>See *Summerhayes, Colin/Rayner, Ralph, Operational Observing Systems*, in IOC Annual Reports Series No. 6, Paris, 2000.

*Right of Innocent Passage in Internal Waters*

Any research platform entering internal waters falls under the strict regulation by the coastal State, irrespective of whether or not research is actually being conducted. Under customary law internal waters are considered part of the land.<sup>21</sup> The exact legal status depends on domestic legislation. And inasmuch as a State may exclude foreigners from entering its territory the coastal State may exclude ships from accessing its internal waters.

There is, however, one exception in Article 8(2) of the 1982 LOS Convention with respect to areas, which had, prior to the introduction of the concept of straight baselines as by Article 7 of the 1982 LOS Convention, not been considered internal waters. In these areas a right of innocent passage exists in accordance with Part II, Section 3. Since the right of innocent passage entails the abstention from any survey or research activities,<sup>22</sup> this exception is of no consequence for marine scientific research.

Otherwise, access to internal waters is not a matter of right, but of discretion by the coastal State.<sup>23</sup> One may say that research in the internal waters does not even fall under marine scientific research as envisaged by the Convention.

*Expendable Instruments*

A special problem is the use of expendable marine instruments in marine scientific research. These instruments are intended to remain in the ocean even after their use. Within a coastal State's territorial sea the deployment of such instruments is prohibited unless coastal state permission is secured for such activities. The 1982 LOS Convention stipulates that "carrying out of research or survey activities" without the permission of the coastal State violates the tenets of innocent passage through the territorial sea. Since a vessel can be within a foreign territorial sea only by permission or in exercise of the right of innocent passage, the prohibition follows implicitly from Article 19(2)(j) of the 1982 LOS Convention. Additionally, coastal States may adopt laws that address the use of 'marine scientific research' or 'hydrographic survey' within the territorial sea. Accordingly, expendable (or recoverable) marine electronic instrumentation for naval or peaceful purposes may not be deployed within the territorial sea of a coastal state without the explicit permission of that coastal state.<sup>24</sup>

It has been argued that the 1982 LOS Convention, taken as a whole, concentrates on monitoring larger, recoverable manned and unmanned stations

<sup>21</sup>See *Lagoni, Rainer, Internal Waters, Seagoing Vessels in*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume II, Amsterdam, 1995, p. 1036.

<sup>22</sup>See section 5.

<sup>23</sup>See *Burke, William T., The International Law and Politics of Marine Scientific Research*, in *Reisman, William Michael*, editor, *Toward world order and human dignity: essays in honor of Myres S. McDougal*, New York, 1976, p. 480; *McDougal/Burke* (as in n. 9 on page 224), pp. 128f.

<sup>24</sup>See *Kraska, James, Oceanographic and Naval Deployments of Expendable Marine Instruments under U.S. and International Law*, in *O.D. & Int'l L.* 26 [1995], p. 327.



and buoys and does not apply to expendable instruments.<sup>25</sup> Yet, this seems by far not self-evident. The term ‘equipment’ would appear to extend to all tools or objects used in marine scientific research. An exception could only be based on the premise that expendable instruments are, in fact, equipment used for operational oceanography. Such an interpretation would be warranted at least where these instruments only record the same measurements like those collected by ships of opportunity. On the other hand, expendable instruments pose different questions in terms of security and national interest: they remain in the sea and constitute—at least after their life span has expired—debris. Finally, if expendable instruments were not covered by Part XIII, Section 4, researching States could easily escape the condition to remove the equipment after its use as set forth in Article 249(1)(g) of the 1982 LOS Convention.

#### *Transit Passage/Archipelagic Sea Lanes Passage*

The two regimes on transit passage and archipelagic sea lanes passage are considered together because they employ parallel provisions. Though generally similar to the regime of innocent passage, there are some noteworthy differences in terms of international navigation. First of all they have a specific geographic scope of application: while the regime of innocent passage is applicable anywhere in the territorial sea, transit passage and archipelagic sea lanes passage apply only

to straits which are used for international navigation between one part of the high seas or an exclusive economic zone and another part of the high seas or an exclusive economic zone<sup>26, 27</sup>

and to

sea lanes and air routes thereabove [which include all normal passage routes used as routes for international navigation or overflight through or over archipelagic waters]<sup>28</sup>,  
suitable for the continuous and expeditious passage of foreign ships

<sup>25</sup>See *Ibid.*, p. 325, n. 95, referring to the I.O.C. and the U.S. Department of State, which have treated the convention as not applying to expendable instruments.

<sup>26</sup>Article 37 of the 1982 LOS Convention.

<sup>27</sup>Evidence of the use for international navigation is the regular passage of ships. Regular passage of foreign warships or other ships with special characteristics, such as “nuclear-powered vessels, carriers of nuclear substances or other noxious and dangerous materials, oil tankers, and *ships engaged in ocean research and survey*”, has been suggested as weightier evidence than those by merchantmen, *Jia, Bing Bing, The regime of straits in international law*, Oxford, 1998, Oxford monographs in international law, pp. 46f. The justification for this suggestion would seem to be based on coastal States’ anxiety with respect to the implications of such ships. A basis in fact with respect to research vessels is not identifiable.

<sup>28</sup>Article 53(4) of the 1982 LOS Convention.

and aircraft through or over... archipelagic waters and the adjacent territorial sea,<sup>29</sup>

respectively. There is a notable difference between archipelagic waters and straits where the transit passage regime applies: in archipelagic waters ships only enjoy the “rights of navigation” while in straits they enjoy the “freedom of navigation”. The difference in terms has been suggested to mean that in the straits “you may have the right but not necessarily total freedom; there are some rules and regulations that you have to follow.”<sup>30</sup> The difference has no significance for marine scientific research vessels as the term ‘navigation’ would not include the exercise of research activities, anyway. Navigation in the context of the 1982 LOS Convention is generally the directing of a course as well as following a route with a vessel or aircraft.

Article 39 (1)(c) of the 1982 LOS Convention provides that ships (and aircraft), while exercising the right of transit passage, shall “refrain from any activities other than those incident to their normal modes of continuous and expeditious transit unless rendered necessary by *force majeure* or by distress.” The phrase “normal mode” is intended, as has been suggested on the basis of the context and the negotiating history,<sup>31</sup> to mean that mode which is normal or usual for navigation by the particular type of ship or aircraft. Thus, it must pertain to the directing of a course or pursuing of a route and must be a characteristic of the construction. Inasmuch as the construction determines direction and course, the phrase is, *prima facie*, significant only for submarines whose normal mode of operation is assumed as navigating submerged. One might advance the argument that the normal mode of operation of research vessels is—as a function of its purpose—to conduct marine scientific research. Yet, research vessels are regular ships with certain privileges or obligations on the basis of the *activities* they are engaged in. The *mode* of operation is not affected by these activities (whereas the *speed* of operation very well may). Submarines are especially constructed to travel below the surface; regular research vessels, even if fitted for a special deployment, like icebreakers, retain the vessel type’s mode of operation: a research submarine may therefore travel below the surface.

Article 40 of the 1982 LOS Convention refers to research and survey activities carried out during passage. The explicit reference to “foreign ships, *including* marine scientific research and hydrographic survey ships [emphasis added]” might render the qualification made in respect of operational oceanography in innocent passage void. No differentiation between general

<sup>29</sup> Article 53(1) of the 1982 LOS Convention.

<sup>30</sup> *Djalal, Hasjim, Commentary*, in *Soons, Alfred H. A.*, editor, *Implementation of The Law of the Sea Convention Through International Institutions*, Honolulu, Hawaii, 1990, p. 266.

<sup>31</sup> See *Nordquist, Myron H.* et al., editors, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 1 to 85, Annexes I and II, Final Act, Annex II, Volume II, Dordrecht, 1993, p. 342.

ships, on the one hand, and research and survey vessels, on the other hand, is made in the context of innocent passage. As for other (foreign) ships engaged in research or survey activities, those participating in voluntary observing schemes come to mind. It has been suggested that “article 40 is a general prohibition of *any* kind of research or survey activities during transit passage without the prior authorization of the State or States bordering the strait [emphasis added].”<sup>32</sup> Yet, in respect of these activities the same considerations apply as for innocent passage, namely, that routine data sampling does not constitute research in the sense employed in the 1982 LOS Convention to begin with.

Moreover, in the context of transit passage, routine activities may be exempted from Article 40 of the 1982 LOS Convention as being incidental to the normal mode of continuous and expeditious transit under Article 39(1)(c). The term ‘incidental activities’ has been interpreted to denote the employment of regular navigational instruments like radar, sonar and depth sounding devices; the variation of course and speed to take account of currents, weather and navigational hazards; and activities depending on the characteristics of the ship or the strait, namely, draught and depths.<sup>33</sup> This interpretation would also include the measurements associated with operational oceanography by ships of opportunity.

### *Jurisdiction*

The 1982 LOS Convention mentions explicitly only civil and criminal jurisdiction, namely, in the context of the territorial sea; in Part VII on the high seas it mentions penal jurisdiction specifically in the context of collisions. Administrative jurisdiction, in the sense of legislation and enforcement for the maintenance of public order,<sup>34</sup> is not expressly mentioned in the 1982 LOS Convention. Yet, regulation of marine scientific research activities would appear to be administrative in character. Only where collected data is classified as relevant to security concerns, coastal States might be inclined to levy criminal charges.<sup>35</sup> While traditionally the investigation and prosecution of violations of coastal state laws and regulations is described as criminal law<sup>36</sup>, administrative law may take on a very similar form in terms

<sup>32</sup>Ibid., p. 352.

<sup>33</sup>Ibid., pp. 342f.

<sup>34</sup>See *Vogel, Klaus, Administrative Law, International Aspects*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume I, Amsterdam, 1992, p. 22.

<sup>35</sup>The case is not so fictitious since research and reconnaissance activities, as the case of the *R/V Glomar Explorer* (see n. 77 on page 29) suggests, can often not readily be distinguished: normally coastal States will restrict research in sensitive areas; some States, however, for example the Russian Federation (see n. 197 on page 109), retain the right to deny consent on the basis of security interests; the “*Meeresforschungsverordnung*” (see n. 39 on page 185) of the former G.D.R. contained a reference to societal interests, a phrase offering a sufficiently broad basis for criminal indictments.

<sup>36</sup>See *König, Durchsetzung* (as in n. 6 on page 222), p. 209.

of enforcement: in seeking to punish the offender and restore the rule of law the difference between a criminal and an administrative charge is one of degree rather than of substance. From an international point of view it does not matter if an infraction results in an administrative or criminal charge. However, the penalty imposed may be subject to restrictions: monetary and non-monetary penalties should be distinguished.<sup>37</sup> The 1982 LOS Convention in Article 73(3), for example, explicitly excludes imprisonment which by inference means that all other potential sanctions short of these may be levied against the offender. The basis for administrative jurisdiction is jurisdiction as such. This can be deduced, *e contrario*, from the principle that “a State may exercise sovereign acts in all territories where no other nation has previously established exclusive jurisdiction.”<sup>38</sup> Article 21 of the 1982 LOS Convention stipulates a number of items, such as safety of navigation and the regulation of maritime traffic, the protection of navigational aids and facilities and other facilities or installations and so forth, which are essentially administrative matters relating to the maintenance of public order and thus administrative jurisdiction. It is noteworthy that Part II, Section 3 contains no provisions limiting enforcement like Article 73(1), 220(2) and (6) of the 1982 LOS Convention. Article 19 on the meaning of innocent passage suggests that the violation of certain assumptions renders the passage non-innocent, thus submitting the vessel to the plenary jurisdiction of the coastal State subject only to necessity and proportionality.<sup>39</sup> Article 30 exempts foreign warships from enforcement measures in respect of the violation of laws set forth in Article 21. By inference, one must conclude that all other ships are subject to all enforcement measures available to the coastal State. This would include, first of all, the expulsion of the vessel but also enforcement action laid down in Part II, Section 3; in addition, enforcement measures foreseen by Article 253 as *lex specialis* may be taken.<sup>40</sup> At the same time, however, the attribution of the vessel to its flag State does

<sup>37</sup>See *Franckx*, Vessel-source pollution (as in n. 12 on page 225), pp.64f., noting in the context of Article 230 of the 1982 LOS Convention that “[t]he possibility of imposing non-monetary penalties could then be regarded as fulfilling an unforeseen need.”

<sup>38</sup>*Grabitz, Eberhard, Administrative, Judicial and Legislative Activities on Foreign Territory*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume I, Amsterdam, 1992, p.20; *Vogel* (as in n. 34 on the preceding page), pp.25f.

<sup>39</sup>See *Franckx*, Vessel-source pollution (as in n. 12 on page 225), p.88, raising the question “if a right to deny a ship entry into the territorial sea or to expel it therefrom exists only in cases of non-innocent passage”; and arriving, based on state practice, at the conclusion that “at least some states take the view that expulsion/denial of entry is not exclusively reserved for cases in which passage has become non-innocent.” See also *Shearer* (as in n. 9 on page 224), pp.341f., for a discussion of the general international law rule for the exercise of enforcement powers generally and especially the use of force with reference to *The I’m Alone* (1935 R.I.A.A. 1609) and *The Red Crusader* (35 I.L.R. 485).

<sup>40</sup>See *Franckx*, Vessel-source pollution (as in n. 12 on page 225), p.87, referring with respect to enforcement measures for environmental protection to Article 220(2) which is the analogous enforcement provision of Part XII.

not cease which inevitably results in a concurrence of jurisdiction of at least two States.<sup>41</sup> The conflict is resolved by the assumption of precedence of territorial jurisdiction over jurisdiction under another basis,<sup>42</sup> i. e., wherever the coastal State has adopted legislation it prevails, flag state legislation is only applicable where no conflicting legislation exists. Inasmuch as coastal state legislation, as a consequence of territorial sovereignty in the internal waters and the territorial sea, may prejudice the flag State's prerogative to prescribe legislation with respect to the vessel,<sup>43</sup> the conflict would usually relate to measures on the design, construction, manning and equipment of a vessel as set forth in the IMO Conventions.<sup>44</sup> In the territorial sea this particular conflict has been resolved by reference to generally accepted rules and standards; however, *other* national rules and standards could be made applicable.<sup>45</sup> For research—as for any other—activities conducted in the territorial sea in contravention of the 1982 LOS Convention and the applicable coastal state criminal law,<sup>46</sup> arrest and detention of the vessel would therefore be possible on the basis of sovereignty.<sup>47</sup>

The coastal State has by virtue of Article 245 the exclusive competence to authorise and regulate marine scientific research, and it is submitted that this competence is not affected by the flag State's competence to prescribe laws and regulations for its research vessels.<sup>48</sup> Also, as *Lindemann* observes,

<sup>41</sup>See *Lindemann, Jan Henning, Untersuchung, Festhalten und sofortige Freigabe ausländischer Seehandelschiffe*, Hamburg, 1997, pp.248f., who asserts that the flag State's competence prevails customarily in such conflicts with respect of civil and criminal jurisdiction—albeit qualified by Article 218(1) of the 1982 LOS Convention—but coastal and port state control may be exercised in terms of ship security and labour regulations.

<sup>42</sup>See *Molenaar, Erik Jaap, Coastal state jurisdiction over vessel-source pollution*, The Hague, 1998, International environmental law and policy series 51, p.87.

<sup>43</sup>See *Bodansky, Daniel, Protecting the Marine Environment from Vessel-Source Pollution: UNCLOS III and Beyond*, in *Ecology Law Quarterly* 18 [1991], p.735; *Lagoni, Rainer, Der Hamburger Hafen, die internationale Handelsschiffahrt und das Völkerrecht*, in *A.V.R.* 26 [1988], pp.335f.; *Steinert, Karl-Friedrich, Die internationalrechtliche Stellung des Schiffes im fremden Küstenmeer im Frieden*, Frankfurt am Main, 1970, p.99.

<sup>44</sup>See *Lindemann* (as in n. 41), p.251, for a brief discussion of this kind of collision; see *Franckx, Vessel-source pollution* (as in n. 12 on page 225), pp.66f., noting, with respect to such measures in the context of marine pollution, that “[i]nternational rules and standards have to be ‘applicable’ in the mutual relationship between these States as a condition for enforcement.”

<sup>45</sup>See *Molenaar* (as in n. 42), pp.87f., also noting that in the exclusive economic zone only generally accepted standards may be applied.

<sup>46</sup>*Franckx, Vessel-source pollution* (as in n. 12 on page 225), p.125, concluding that “non-compliance with ‘passive’ requirements, such as [construction, design, equipment and manning] standards, the type of cargo carried or a mere threat to pollution..., does not render passage non-innocent.”

<sup>47</sup>*Ibid.*, p.129, concluding that “coastal states are in principle allowed to use the full range of enforcement powers [on ships in non-innocent passage], including expulsion from the territorial sea.”

<sup>48</sup>The competence of a State to exercise its enforcement jurisdiction outside its own ter-

the general practice of States seems to show a notable reluctance to invoke territorial jurisdiction over ships, even though this practice is not a result of *opinio juris* but rather a function of international comity.<sup>49</sup>

There is an exception with respect to innocent passage, though: flag state jurisdiction applies to acts on board the ship as long as these do not render the passage non-innocent.<sup>50</sup> Where the coastal State does not exercise its jurisdiction, by default, the jurisdiction of the flag State applies. In state practice, coastal States do generally not exercise jurisdiction over activities which have no bearing on the affairs of the coastal State.<sup>51</sup> The situations, in which coastal state interests may be involved, are illustrated by the list in Article 27(1) of the 1982 LOS Convention for criminal matters: thus, the act committed must either effectuate consequences in the coastal State, i. e., extend beyond the limits of the ship; or be liable of disturbing the peace of the country or the good order of the territorial sea; furthermore, the coastal State may intervene on behalf of the flag State if specifically requested to do so, or if measures are necessary for the suppression of illicit traffic in narcotic drugs or psychotropic substances. *Prima facie*, the list is exhaustive and may, subject to Article 27(2), only be expanded if the vessel in question passes through the territorial sea *after* leaving internal waters.<sup>52</sup> Yet, the use of the words “should not”, rather than “may not”, as in Article 27(5) of the 1982 LOS Convention, suggests that the coastal State has some leeway in interpreting its obligation.<sup>53</sup> The phrase was—when it first occurred—intended to reflect the fact that the rule enunciated represents standard international practice rather than strict international law.<sup>54</sup> The implication is, however, yet another: the list is exhaustive but if one of the situations envisaged in Article 27(1) occurs, the coastal State has complete discretion whether or not to enforce its jurisdiction.<sup>55</sup>

An interesting question arises in the context of Article 27(5) of the 1982 LOS Convention which stipulates that no steps should be taken on board

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ritory is restricted by international law, see *Okressek, Wolf, Hoheitsakte auf fremdem Staatsgebiet: Eine Betrachtung anhand praktischer Fälle*, in *Österr.Z.öf.R. & Völkererr.* 35 [1985], p.327, citing an advisory opinion “Gutachten der Hochschulprofessoren DDR. Verdross und DDR. Walter” for the Verfassungsausschuss des Nationalrates; *Grabitz* (as in n. 38 on page 232), p.20.

<sup>49</sup>See *Lindemann* (as in n. 41 on the page before), pp.247f., pointing out that the only treaty in this respect relates to minor criminal charges, which do not affect the public order of the port; *Grabitz* (as in n. 38 on page 232), p.20, identifying a customary law to that effect; *McDougal/Burke* (as in n. 9 on page 224), pp.128f.

<sup>50</sup>See *Meyers, Herman, The nationality of ships*, Den Haag, 1967, pp.78 and 81.

<sup>51</sup>See *Lindemann* (as in n. 41 on the preceding page), p.11, with further references.

<sup>52</sup>See *Nordquist et al.* (as in n. 31 on page 230), p.242.

<sup>53</sup>See *Lindemann* (as in n. 41 on the preceding page), p.286.

<sup>54</sup>See *Fitzmaurice, Sir Gerald, Some Results of the Geneva Conference on the Law of the Sea: Part I—The Territorial Sea and Contiguous Zone and Related Topics*, in *Int'l & Comp.L.Q.* 8 [1959], p.104.

<sup>55</sup>See *O'Connell, Daniel P./Ivan A. Shearer, editor, The international law of the sea*, Volume II, Oxford, 1984, p.961.

a foreign ship to arrest someone or conduct an investigation in connection with a crime “committed before the ship entered the territorial sea.” While Part XII of the 1982 LOS Convention is expressly mentioned, Part XIII is not. Provisions on marine scientific research could be included by reference since Part V of the 1982 LOS Convention confers jurisdiction with respect to marine scientific research onto the coastal State. Yet, the express mention of Part XII—jurisdiction in respect of which equally derives from Part V—prohibits such an assumption. This in turn means that acts, committed in the exclusive economic zone in contravention of Part XIII of the 1982 LOS Convention, are excluded from coastal state enforcement by way of arrest or detention. The only lawful sanction of such violation is afforded by Part XIII itself, namely, to order a cessation of the research and to withhold consent for subsequent access applications in consideration of such violations.<sup>56</sup> This is important inasmuch as a violation of legislation relating to marine scientific research, where framed as criminal law, could neither be prosecuted by boarding nor be sanctioned by arrest. Notably, Article 27(5) applies only to those acts committed prior to entry into the territorial sea.

### *Contiguous Zone*

In the Contiguous Zone the coastal State may exercise control over activities that may have legal implications for the territorial sovereignty. These are either activities, which have been committed within the coastal State’s territory, or those, which may infringe “customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea.” There must be a direct link to the territorial integrity of the coastal State, for example, the mere traversing of the contiguous zone with stowaways<sup>57</sup> does not provide a sufficient basis for the exercise of the rights accorded by Article 33(1) of the 1982 LOS Convention. If there are, however, clear grounds for the assumption that the stowaways will attempt to reach the shore and thus immigrate illegally, the coastal State may take such measures as are necessary to prevent the infraction of its laws or regulations. The measures must be in conformity with international law, though, and in this instance particularly with the freedoms of the high seas as they apply in the exclusive economic zone (as well as on the high seas if the coastal State has not claimed an exclusive economic zone).

The declaration of a contiguous zone has no legal significance with respect to research platforms. The provisions on the exclusive economic zone super-

<sup>56</sup>See *Franck*, Vessel-source pollution (as in n. 12 on page 225), pp. 87f., with respect to enforcement relating to marine pollution.

<sup>57</sup>Research vessels have repeatedly been used as vehicle to get into another country, see I.M.O., Reports on Stowaway Incidents, 30 September 2001, IMO Doc. FAL.2/Circ.57, 27 July 1999. The reports are issued quarterly and usually contain several hundred reported incidents. In 3 out of 504 cases over the whole reporting period (ca. 4y) research vessels were involved.

sede or rather supplement those of the contiguous zone. There is, however, one aspect that may be important to research vessels. Part V on the exclusive economic zone does not contain provision for those administrative functions contained in Article 33. While the provisions on marine scientific research specify the coastal State's competence for regulations on marine scientific research, the competence for the exercise of control of laws and regulations imports an independent basis for enforcement activities by the coastal state authorities. Wherever access to the coastal state waters is permitted in accordance with Part XIII of the 1982 LOS Convention, additional interference with the research project may very well occur if the vessel is within the contiguous zone and the coastal State authorities find themselves in the position to inspect whether or not the vessel complies with its customs, fiscal, immigration or sanitary laws and regulations.

### *Exclusive Economic Zone*

Offences committed by or from the ship within the exclusive economic zone can be punishable under the laws of the coastal State where international law accords the relevant jurisdiction. The 1982 LOS Convention confers on the coastal State jurisdiction for the protection and preservation of the marine environment. Article 210(1) of the 1982 LOS Convention generally calls upon States to adopt laws and regulations to prevent, reduce and control pollution.<sup>58</sup> It is not specified whether these may have the nature of criminal laws buttressed with penalties or sanctions including imprisonment. By comparison, such an assumption seems to be precluded: Article 73 of the 1982 LOS Convention, prescribing the competence of the coastal State for the enforcement of the protection of its sovereign rights, excludes imprisonment or corporal punishment. Inasmuch as sovereign rights take priority in the Convention over other matters falling under the jurisdiction of the coastal State, Article 73 rules out, *maiore ad minus*, the possibility of imprisonment with regard to the violation of provisions for the protection of the environment.<sup>59</sup> *König* observes, with respect to the provisions on the enforcement of laws and regulations for the protection of the environment, that flag States have generally managed to secure their interest in freedom of navigation: coastal States can inspect vessels but may not hamper their journey; regularly, they are left with a mere request for information, while investigation and institution of proceedings is reserved to the flag State. Yet, she asserts that the coastal State may have some discretion in interpreting the relevant provisions—subject to dispute settlement under Article 297(1)

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<sup>58</sup>Note, that some States, for example Portugal, Poland and the Russian Federation, make consent conditional upon environmental considerations, see section 7.

<sup>59</sup>See also *Franck*, Vessel-source pollution (as in n. 12 on page 225), p.94, referring to Article 220 as *lex specialis* in pollution matters.



of the 1982 LOS Convention.<sup>60</sup> But where a certain threshold has been reached—the 1982 LOS Convention speaks of “clear grounds for believing” that a violation has taken place—the coastal State may indeed hamper the journey of a vessel and even detain it for the purpose of (judicial) proceedings.<sup>61</sup>

In this context the question arises whether the coastal State has jurisdiction in criminal matters in the exclusive economic zone. On the high seas, the exclusive jurisdiction of the flag State is guaranteed by Article 92 of the 1982 LOS Convention. Only “international crimes” may be prosecuted in a forum different from the flag State. Since the freedoms of the high seas apply principally in the exclusive economic zone also, the argument could be made that flag state jurisdiction prevails there, too. However, Parts V, XII, and XIII of the 1982 LOS Convention qualify the meaning of the freedoms of the high seas in favour of coastal state jurisdiction. Judging from Article 27 of the 1982 LOS Convention, the answer is equally negative: the coastal State may conduct an investigation in connection with crimes committed on board a ship during its passage only, and even then exclusively:

- (a) if the consequences of the crime extend to the coastal State;
- (b) if the crime is of a kind to disturb the peace of the country or the good order of the territorial sea;
- (c) if the assistance of the local authorities has been requested by the master of the ship or by a diplomatic agent or consular officer of the flag State; or
- (d) if such measures are necessary for the suppression of illicit traffic in narcotic drugs or psychotropic substances.

Since the legal regime of the exclusive economic zone is more restrictive in terms of the coastal State’s rights to prescribe generally applicable rules, and Article 27(5) of the 1982 LOS Convention expressly limits the possibility of the coastal State to take steps on board a foreign ship to arrest a person or to conduct an investigation with respect to acts committed while the ship is passing the territorial sea, Article 27—as regards the territorial sea—must already be considered a limitation. Unrestricted criminal jurisdiction, according to Article 27(2), applies only within internal waters and the territorial sea, if the ship passes the territorial sea after leaving the internal waters or is not in passage to begin with. An exception, in general, is not open to application by analogy. The criminal jurisdiction conferred by Article 27 is consequently strictly limited in its spatial scope.

<sup>60</sup>See *König*, Durchsetzung (as in n. 6 on page 222), pp. 163f.; similarly, *Franck*, Vessel-source pollution (as in n. 12 on page 225), p. 95; *Shearer* (as in n. 9 on page 224), pp. 334f.

<sup>61</sup>See Article 220(2) of the 1982 LOS Convention.

There are three exceptions to this general rule, though. First, those acts that constitute a violation of the laws and regulations adopted in accordance with Part V; in these instances Article 73 provides for a number of enforcement measures. Second, acts that are described in Part XII, Section 5, as in these instances Part XII, Section 6—notably Articles 216(1)(a), 218(1), 219, 220(1), (3), (5) and (6) of the 1982 LOS Convention—provides for enforcement measures which might also include the arrest of the ship.<sup>62</sup> And third, acts which infringe laws on customs, fiscal, immigration or sanitary issues.

While the coastal State has thus jurisdiction to legislate, it may not necessarily be entitled to enforce its laws and regulations. Part XII prescribes a number of enforcement measures which give the coastal State a legal basis to take actions against an offender in the exclusive economic zone, namely, the request of information, inspection of the vessel and, in exceptional circumstances, the institution of proceedings, including the detention of the vessel. Part XIII contains no such provisions. The only remedy available to the coastal State is to order the suspension or cessation of the research project, and to take such violation into account when another application by the same flag State is submitted. If the coastal State inspected the research vessel nevertheless, it could possibly become subject to claims for damages under international law.

Yet, the coastal State could reserve the right of inspection as a prerequisite for its consent. The placement of observers on board a research vessel is envisaged by Article 249(1) of the 1982 LOS Convention as a legitimate condition which the research State must comply with.<sup>63</sup> *Maiore ad minus*,

<sup>62</sup>To the extent that § 324(1) StGB (German penal code which has principally become applicable in the exclusive economic zone with the proclamation of the same) makes the pollution of water punishable (“Wer unbefugt ein Gewässer verunreinigt oder sonst dessen Eigenschaften nachteilig verändert, wird mit Freiheitsstrafe bis zu fünf Jahren oder mit Geldstrafe bestraft.”) and thus serves the protection and preservation of the marine environment it is applicable in the exclusive economic zone, see *König*, Durchsetzung (as in n. 6 on page 222), p.233, noting that the coastal State has jurisdiction to enforce laws and regulations pertaining to research activities and exploitation on the continental shelf.

<sup>63</sup>Colombia, for example, has provided for inspectors *and* scientific personnel to be placed on board a ship; in addition it requires harbour masters to thoroughly inspect the ship in port to verify the background information submitted with the application. See Articles 16 ‘General Obligations’ and 19 ‘Inspection of the Vessel’ of the Colombian Decree No. 644 from 23 March 1990, the text is available at <http://www.state.gov/www/global/oes/oceans/ntrvo94.html> – visited on 31 January 2005; under sec. 32(b)(12) of The Archipelagic Waters and exclusive economic zone Act 1986, Trinidad and Tobago reserves the right to board and inspect the vessel “at anytime during the research period while such vessel(s)/equipment is/are in the archipelagic waters, territorial sea, the exclusive economic zone or on the continental shelf”; Venezuela expressly reserves a right to inspect the vessel on a routine basis in Venezuelan waters, see III ‘Provisions’, C ‘General Provisions’, (i), in the Directive from the Defence Office, “Provisions for issuing permits for scientific or exploratory research in Venezuelan jurisdictional waters” in force since 1 February 1980; the Directive refers expressly to Article 5(8) of the Continental Shelf Con-

the inspection of a vessel from time to time would appear to be equally legitimate.<sup>64</sup> One important difference may be the fact that an observer on board the vessel has a better impression and insight of the research project and is in the position to inspect continuously without interfering substantially with the progress of the project. Inspections at random, in contrast, may cause a serious disruption in the course of experimentation and observation and thus endanger the schedule of the cruise. But where such inspections have been announced beforehand the research State can make appropriate arrangements to ensure that the schedule provides enough room for such delays.

### *High Seas*

The exercise of jurisdiction on the high seas over vessels of other States is principally illegitimate.<sup>65</sup> Research vessels are subject only to the laws and regulations of their flag State. This is a consequence of the freedom of navigation and the nationality of ships. The exceptions to exclusive flag state jurisdiction stipulated in Part VII do not have a specific bearing on marine scientific research activities.

## JURISDICTION WITH RESPECT TO INSTALLATIONS

The legal status of an installation not only comprises the rights that maybe established by the installation itself, as, for example, the question of its territorial qualities, but also which regime is to be applied on the installation. *Soons* puts it into the question as to which State may exercise jurisdiction over which installations and to what extent.<sup>66</sup>

Installations have at some stage been assimilated to islands or regarded as ships<sup>67</sup> which would suggest to apply the relevant rules with respect to jurisdiction. The potential implications of the former—every island has its own territorial sea, exclusive economic zone, and continental shelf—let States

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vention, yet extends also to the exclusive economic zone, the text is available at <http://www.state.gov/www/global/oes/oceans/ntrvo81.html> – visited on 31 January 2005.

<sup>64</sup>The Australian guidelines (see n. 195 on page 165) provide in Part 3(k):

Persons aboard all research vessels may be requested to record sightings of cetaceans and marine turtles in Australian waters, and to provide the information to the Biodiversity Group of Environment Australia at the completion of the voyage.

It is at least questionable if such a request would still be within the ramifications of Article 246: it would appear to constitute an encroachment on flag state jurisdiction if personnel aboard a vessel is required to make observations for the host State.

<sup>65</sup>See *König*, *Durchsetzung* (as in n. 6 on page 222), p. 225.

<sup>66</sup>See *Soons*, *Marine Scientific Research* (as in n. 13 on page 225), p. 234.

<sup>67</sup>See *Papadakis, Nikos*, *The International Legal Regime of Artificial Islands*, Leyden, 1977, pp. 89–91, with further references.

abandon this concept. Similarly, the assimilation to ships proved unsatisfactory because of different characteristics in terms of construction and safety of navigation.

During the negotiations of the 1982 LOS Convention some countries tabled a proposal as to the jurisdiction on the installations: concurrent jurisdiction of coastal States and of States either emplacing scientific installations or having registered them.<sup>68</sup> This proposal would have likened installations to ships, and the fact that it is not reflected in the 1982 LOS Convention must be noted.

### *Territorial Sea and Internal Waters*

Territorial sovereignty of the coastal State extends also to installations. Different from ships, no right of innocent passage applies. Thus, the coastal State has unfettered jurisdiction. The researching State may, accordingly, retain rights *to* the structure in terms of ownership but it has no right *over* the structure in terms of jurisdiction. With respect to civil, criminal and administrative jurisdiction legislation of the coastal State prevails. This includes not only the deployment, operation and use but also every activity conducted on such a structure.

In archipelagic waters the sovereignty of the archipelagic State over installations is only restricted by “existing agreements, traditional fishing rights and existing submarine cables.” Unless an existing agreement affords the right to install artificial structures, the coastal State is free to decide whether to grant permission for such a use or not.

### *Exclusive Economic Zone*

#### *Article 60 of the 1982 LOS Convention, Removal*

In the exclusive economic zone the jurisdiction of the coastal State is provided by Article 56(1) of the 1982 LOS Convention conferring jurisdiction<sup>69</sup> with regard to “the establishment and use of artificial islands, installations and structures” upon the coastal State. The exercise of this jurisdiction was explicitly made subject to other relevant provisions of the 1982 LOS Convention. Article 60(1)(b) provides for the *exclusive* “right to construct and to authorize and regulate the construction, operation and use of installations and structures” but limits the exercise of this right to the scope of Article

<sup>68</sup>These were France, the Netherlands, Trinidad and Tobago, Turkey and Tunisia, and Germany, C.3/3<sup>rd</sup> session/CRP/Sc.Res./1 (1975, reprinted in *Platzöder, Renate*, editor, *Third United Nations Conference on the Law of the Sea: Documents*, Volume 10, New York, 1986, pp.341–343); *Nordquist, Myron H./Rosenne, Shabtai/Yankov, Alexander*, editors, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 192 to 278, Final Act, Annex VI, Volume IV, Dordrecht, 1991, p.616.

<sup>69</sup>See section 4 for a discussion on the use of the word ‘exclusive’ in this context.

56 of the 1982 LOS Convention; and Article 60, (1)(c) refers to the exercise of the coastal State's rights in the exclusive economic zone. In respect of artificial islands the coastal State has the sole control to authorise and regulate construction, operation and use; no foreign State can deploy artificial islands in the exclusive economic zone without permission; and denial is at the coastal State's discretion. The coastal State itself would seem to be restricted only by Article 300: once the construction and use of an installation is authorised it may not be suspended on arbitrary grounds; similarly, interference with the functioning of such installations would be precluded on the basis of estoppel.

In contrast, powers of the coastal State in regard of installations and structures seem to be less comprehensive. Article 60(1) of the 1982 LOS Convention makes clear that the coastal State's exclusive right to construct and to authorise and regulate the construction, operation, and use of installations is confined to (1) those installations and structures that are provided for the purposes given in Article 56 of the 1982 LOS Convention, namely, marine scientific research, and other economic purposes; and (2) those that may interfere with the exercise of the rights of the coastal State in the zone.

Part XIII mentions the removal of installations and equipment only in Article 248(d). The researching State must provide the coastal State with information about removal in its application for consent. How such removal is effected and if depends first of all on the installation. Floats and drifters pose the only problem of locating them prior to retrieval; installations of a bigger size pose the question whether or not they may be disposed of at sea or be landed ashore for further decommissioning.<sup>70</sup> I.M.O. has adopted *Guidelines and Standards* for the removal of installations<sup>71</sup> The guidelines are primarily concerned with safety aspects of disused installations. Accordingly, they advise the complete removal or a thorough assessment of the implications for surface and subsurface navigation in the case of non- or partial removal. The Removal Guidelines would principally apply also to scientific research installations that are no longer in use. It should be noted, though, that marine scientific research installations are normally retrieved for data analysis; also, they are usually much smaller in size and number than, for example, oil rigs and pose therefore less of a risk to the safety of navigation.<sup>72</sup>

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<sup>70</sup>See for a brief account of the *Brent Spar* decommissioning and follow ups *Fayette, Louise de la, New Developments in the Disposal of Offshore Installations*, in Int'l J.Mar. & C.L. 14 [1999], p. 525.

<sup>71</sup>*Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone*, IMO MSC/Circ. 490 [1988], Annex to IMO Res. 672(16) [1989], reprinted in *Brown, Edward D., The International Law of the Sea*, Volume II Documents, Cases and Tables, Dartmouth, 1994, pp. 118f. [hereinafter: Removal Guidelines]; see *Brown*, Law of the sea (as in n. 10 on page 224), pp. 268f., for an analysis.

<sup>72</sup>Loss through collisions, however, is one of the prevailing problems of ODAS. Therefore,

The 1982 LOS Convention leaves it essentially to the coastal State to decide whether or not research installations must be removed; Article 60(3) of the 1982 LOS Convention suggests that the coastal State take into account generally accepted international standards. The Removal Guidelines do not restrict that discretion but only provide criteria for the decision whether to have the installation removed or not and what measures are to be taken in terms of safety of navigation in either case.

Other conventions provide for a stricter regime of abandonment. The approach of the OSPAR Convention and the revised London Dumping Convention is to require a permit for disposal which may be granted on the basis of an environmental impact assessment.<sup>73</sup> Only if disposal at sea proves to be the best environmental option will dumping be permitted. Preference is given to reuse, recycling and disposal on land.<sup>74</sup> The Helsinki Convention requires according to Annex VI, Regulation 8 that “Contracting Parties ensure that abandoned, disused offshore units... are entirely removed and brought ashore”. However, all three conventions provide for an exception, which would apply to research installations: ‘dumping’ does not include the “placement of matter for a purpose other than the mere disposal thereof”.<sup>75</sup> Research installations, since their primary purpose is data collection, would thus not fall under ‘dumping’. Even expendable instruments<sup>76</sup> serve first of all scientific needs of measuring before their lifespan expires and they become mere debris.

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the W.M.O. Executive Committee at its Twenty-eighth Session (Res. 6 (EC-XXVIII)) and the I.O.C. Executive Council at its Seventh Session (Res. EC-VII.10), requested their respective secretariats to initiate a regular service for obtaining information from Member States on their ocean data buoys. This information was intended both to ensure the safety of navigation and the protection of buoys against collision, but also to inform the maritime community of the great scientific value of, and the immediate benefits to be derived from, ocean data buoys in order to prevent wilful disablement, see IOC-WMO Regular Information Service Bulletin on Non-Drifting Ocean Data Acquisition Systems (ODAS), Issue 20, 1997, p. i; see also *Rietveld, Marieke J., Seventeenth International Research Ship Operators Meeting, 21–22 October 2003, Valparaiso, Chile*, (<http://www.nioz.nl/isom/>) – visited on 31 January 2005.

<sup>73</sup>See Article 5(1), Annex III of the OSPAR Convention and Article 4 of 1996 Protocol to the London Dumping Convention (not yet in force; as of May 2003 there are 9 ratifications missing).

<sup>74</sup>*Fayette*, Int'l J.Mar. & C.L. 1999 (as in n. 70 on the preceding page), p. 526.

<sup>75</sup>Article III(1)(b)(ii) of the London Dumping Convention (as in n. 9 on page 11), see also Article 1(4)(2)(2) of the 1996 Protocol; the Oslo Dumping Convention from 1972 (now Article 1(g)(ii) of the OSPAR Convention (as in n. 69 on page 139)) and Article 2(4)(b)(ii) of the *Convention on the Protection of the Marine Environment of the Baltic Sea Area*, adopted 9 April 1992, entry into force 17 January 2000, Official Journal 1994 L 73/20 [hereinafter: Helsinki Convention]. This definition of ‘dumping’ is employed also by Article 1(1)(5)(b)(ii) of the 1982 LOS Convention.

<sup>76</sup>See section 5.

*Military or Scientific Installations*

The interpretation of the text leads to the (astonishing) consequence that military installations and structures can be erected by a foreign State without authorisation from the coastal State, whereas a similar construction for purposes of marine scientific research would require the coastal State's consent.<sup>77</sup> Adherents of this textual view point to the vigorous opposition to any amendments of Article 60 during the negotiations. Reportedly, the U.S. exerted heavy pressure when a group of developing countries proposed in 1974 that "no state shall be entitled to construct, maintain, deploy or operate on or over the continental shelf of another state any military installations or devices or any other installations for whatever purposes without the consent of the coastal state."<sup>78</sup>

Military installations, according to *Treves*, fall into two categories: weapons and detection or communication devices; and they may be placed in the ocean directly or be mounted on other platforms, including platforms for scientific research.<sup>79</sup> The definition is crucial since installations for (peaceful) military research could either be considered military installations or installations for marine scientific research. It is submitted, though, that the express reference to Article 56 would preclude military installations from conducting marine scientific research. The possibility for a circumvention of the consent requirement would be obvious if the commission of the platform would prevail over the activity conducted from it. This leads to the surprising consequence that military installations for reconnaissance purposes may be deployed or emplaced in a foreign exclusive economic zone, whereas installations for purposes of marine scientific research may not.

Even if one took the view that military installations were generally permitted, it would seem that the deployment is nevertheless subject to the rights of the coastal State embodied in Article 56 of the 1982 LOS Convention. Where the exercise of these rights could be compromised by a foreign military installation, the special regime of the exclusive economic zone would suggest that the interest of the foreign State must subside. In the exclusive economic zone, according to Article 58(3), the freedoms of the high seas can only be exercised under the limitations of the rights expressly conferred upon

<sup>77</sup>See the declaration by Italy made upon signature (7 December 1984) and confirmed upon ratification (13 January 1995) stating that Article 60 would apply only to the installations explicitly listed, *U.N. Division for Ocean Affairs & Law of the Sea, United Nations, The Law of the Sea: Declarations and Statements with Respect to the United Nations Convention on the Law of the Sea and to the Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982*, New York, 1997, p. 12.

<sup>78</sup>UN Doc. A/CONF.62/C/2/L.42/Rev. 1 [1974], III Off.Rec., p. 252; *Woodliffe, John, The Peacetime Use of Foreign Military Installations under Modern International Law*, Dordrecht, 1992, p. 96.

<sup>79</sup>See *Treves, Tullio, Military Installations, Structures, and Devices on the Seabed*, in *Am.J.Int'l L.* 74 [1980], p. 809.

the coastal State. While Article 87 of the 1982 LOS Convention recognises that there is a freedom to construct artificial islands and “other installations permitted under international law” in the high seas, that freedom is not incorporated among the freedoms that other States enjoy in the exclusive economic zone under Article 58; neither can the construction and use of military installations and structures be considered to be “other internationally lawful uses of the sea related to these freedoms” under Article 58(1).<sup>80</sup>

Furthermore, from Article 81 of the 1982 LOS Convention, regarding the continental shelf, it follows that the coastal State may oppose the deployment of installations and structures for all purposes (which would include military ones) if such deployment entails drilling in the sea bed and subsoil. Finally, from what is provided in Article 246(5)(b) of the 1982 LOS Convention “it is proper to infer that the coastal state would also be empowered to object to the deployment of installations, structures, or devices involving the utilization of explosives or the introduction into the marine environment of noxious substances.”<sup>81</sup>

### *Legislative Jurisdiction*

The regulation of the operation and use of installations and structures would appear to go beyond the competences endowed to coastal States in respect of vessels. Jurisdiction over marine scientific research entails the regulation of that activity; jurisdiction to regulate the use and operation goes further as it may relate to other activities than only marine scientific research. The exact scope of coastal state jurisdiction depends on the interpretation of the reference to Article 56. If Article 60 were to be interpreted in the sense that the reference embodies the authority conferred upon the coastal State under Part XIII, the coastal State would be restrained to the regulation of marine scientific research as such. Yet, the language of Article 60(1) suggests that the coastal State’s competence goes beyond such a restrictive interpretation. The fact, that the coastal State has the *exclusive* right to construct, to authorise, and to regulate, would suggest that there is no space for a flag State to legislate on behalf of its device. Also, Article 60(2) lists a number of fields, which go beyond the mere regulation of a specific activity, and is clearly wider in its scope than Article 33 on the contiguous zone.

It is submitted that the word ‘regulate’ confers upon the coastal State competences that are similar to those in respect of ships in innocent passage, namely, to enact and enforce such laws and regulations that safeguard the

<sup>80</sup>See Brown, Edward D., *The Significance of a Possible EC EEZ for the Law related to Artificial Islands, Installations and Structures, and to Cables and Pipelines in the Exclusive Economic Zone*, in O.D. & Int’l L. 23 [1992], pp. 124f.

<sup>81</sup>Schreiber, Alfonso Arias, *The Exclusive Economic Zone: Its Legal Nature and the Problem of Military Uses*, in Vicuña, Francisco Orrego, editor, *The exclusive economic zone: a Latin American perspective*, Boulder, CO, 1984, pp. 141f.



interests of the coastal State.<sup>82</sup> Naturally, the implications for the coastal State from any acts committed outside the 12 nm limit of the territorial sea decrease with mounting distance from the shore. One could argue that the coastal State's prerogative to interfere with the operation and use of the installation and structure had to be reduced accordingly. This argument could be based on the character of the exclusive economic zone: coastal state rights need to be fairly balanced with the rights of other users. Since the coastal state jurisdiction in the exclusive economic zone serves predominantly its economic interests, one could conclude that jurisdiction in other respects would have to be exercised with due restraint. The prescription of environmental standards for such installations or of sanctions for any violations of relevant coastal State's laws in relation to the design, construction, and size, for example, would appear to be possible; Article 60 mentions expressly regulations for the removal of disused installations and safety zones. Article 258 of the 1982 LOS Convention would not contradict such an interpretation as it subjects the "deployment and use" to the requirements of Part XIII, namely, the consent procedure and its special conditions. The limit to coastal State's competence with respect to the jurisdiction to legislate and enforce would in this instance be provided by the reference to foreign state residual rights in the exclusive economic zone. Thus, the coastal State may not interfere with the rights of communication as embodied in Article 58(1) of the 1982 LOS Convention.

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<sup>82</sup>See *Francioni, Francesco, Peacetime Use of Force, Military Activities, and the New Law of the Sea*, in *Cornell Int'l L.J.* 18 [1985], pp.216f., with respect to the coastal State's use of force as an exercise of police power, concluding, on the basis of *The I'm Alone*, that "shooting for the purpose of warning and arresting... is permissible."



## Chapter 6.

### Marine Scientific Research from above Sea Level

An interesting aspect of remote sensing is the possibility of collecting data from the air space or even outer space.<sup>1</sup> While the value of the combination of land-based research platforms and remote sensing platforms has been recognised early on,<sup>2</sup> Part XIII of the 1982 LOS Convention is silent on scientific research conducted from above the water.

It should be noted that remote sensing only describes the activity of collecting information from a distance. The word ‘reconnaissance’, as used in the present context, denotes an activity usually conducted by the military for intelligence purposes. Reconnaissance may use the same data sets as are used for marine scientific research, yet the purpose is different: reconnaissance is conducted to obtain information that factors in military strategies.

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<sup>1</sup>See below. Outer space is defined as the space beyond the airspace (which falls under the sovereignty of the State on the surface below). Where exactly one can draw a line between the air space and outer space has been subject of an extensive debate. For the present analysis it is sufficient to delineate it at between 80 to 100 km above the sea level. See *Hobe, Stephan, Die rechtlichen Rahmenbedingungen der wirtschaftlichen Nutzung des Weltraums*, Berlin, 1992, p. 22; *Maleev, Jurij Nikolaevic, Internationales Luftrecht: Fragen der Theorie und Praxis*, German translation by Elmar Rauch, Berlin, 1990, p. 53; also *Classen, Claus Dieter, Fernerkundung und Völkerrecht: völkerrechtliche Probleme der Fernerkundung der Erde aus dem Weltraum*, Berlin, 1987, Tübingen Schriften zum internationalen und europäischen Recht 16, p. 26.

<sup>2</sup>See *Benkő, Marietta/Graaff, Willem de/Reijnen, Gijsbertha C.M., Space law in the United Nations*, Dordrecht, 1985, pp. 8f., pointing at meteorological satellites in the 1960s.

This, however, does not mean that the information can be made directly operative in warfare.<sup>3</sup>

With respect to remote sensing from space one can identify a similar conflict of interest as existed in respect of marine scientific research in the context of the law of the sea negotiations: sovereign States refused the possibility of third parties gaining access to information without their control.<sup>4</sup> In the eyes of predominantly developing countries, their sovereignty—in the traditional sense, i. e., non-intervention with the State's internal affairs and supremacy over the State's territory<sup>5</sup>—was questioned if third parties could gain possession of information independent from any state authority.<sup>6</sup> In the end, these concerns yielded to the thriving force of the developed powers.<sup>7</sup> It must be noted that the very character of *remote* sensing activities limits the practicability of any restrictive regime, as enforcement is almost impossible. *Classen* suggests that the only way to prevent remote sensing activities effectively is the closure of certain orbits, i. e., the prohibition of over-flight, as it is next to impossible to verify whether or not the sensors are switched off while travelling across a certain geographical area.<sup>8</sup>

#### LEGAL REGIME OF THE AIR SPACE ACCORDING TO THE 1982 LOS CONVENTION

The air above the water (and the land) is legally speaking not one coherent body. Horizontally, a distinction must be made between the air space above the territory of States and above other areas of the Earth surface, and between the air space of neighbouring States. Vertically, also a distinction must be made between the air space and the rest of the atmosphere and beyond.<sup>9</sup> The delimitation becomes important with respect to questions of jurisdiction.

<sup>3</sup>Which is important when it comes to peaceful-conduct clauses on the use of the sea, see section 2.

<sup>4</sup>See *Classen* (as in n. 1 on the page before), p. 32; *Benkö/Graaff/Reijnen* (as in n. 2 on the preceding page), pp. 19f.

<sup>5</sup>See *Steinberger, Helmut, Sovereignty*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume IV, Amsterdam, 2000, pp. 514, 516.

<sup>6</sup>See *Classen* (as in n. 1 on the page before), pp. 31 and 33; *Benkö/Graaff/Reijnen* (as in n. 2 on the preceding page), pp. 19f.

<sup>7</sup>See *Classen* (as in n. 1 on the page before), p. 75: "Da den Entwicklungsländern wohl ziemlich klar gewesen ist, daß sie die Fernerkundungsaktivitäten der Weltraummächte kaum verhindern können, bot sich als einzige politisch sinnvolle Lösung an, 'mitspielen', also der Fernerkundung ohne prior consent zuzustimmen, aber gleichzeitig sicherzustellen, daß sie durch die Übermittlung der gewonnenen Informationen an deren Vorteilen partizipieren können."

<sup>8</sup>See *Ibid.*, p. 96; the significance of this consideration became apparent in the "Bogotá Declaration" from 3 December 1976, reprinted in *Jasentuliyana, Nadasiri/Lee, Roy S., Manual on Space Law*, Volume IV, New York, 1981, pp. 383f., by which a few States essentially attempted to close the airspace above their territory.

<sup>9</sup>See section 6.

*Airspace above Areas under Sovereignty*

There is no debate that a State has sovereignty over the airspace above its territory—*cuius est solum eius est usque ad coelum et ad inferos*—on the basis that the owner of the land should also be given the right to control the superjacent airspace. This principle is enshrined in Article 1 of the Chicago Convention.<sup>10, 11</sup> That control is thus a corollary of the sovereignty over the territory on the surface. Accordingly, between neighbouring States the territorial borders delineate in a vertical direction the sphere of sovereignty over the airspace.<sup>12</sup> Additionally, the coastal State has by virtue of Article 2 of the Geneva Territorial Sea Convention,<sup>13</sup> Article 2(2) of the 1982 LOS Convention as well as customary law sovereignty over the airspace above its territorial sea. There is one notable difference, however, between air- and water-space. In contrast to the regime applicable on the water, there is no innocent passage in the airspace above the territorial sea.<sup>14</sup> The 1982 LOS Convention, in Part II, Section 3 on innocent passage, contains no provision corresponding to Article 38(1) of the 1982 LOS Convention on transit passage, which, for the regime of transit passage, retains the right of over-flight as a remainder of the previous high sea status. Inasmuch as innocent passage constitutes an exception to the coastal State's sovereignty,

<sup>10</sup>As in n. 82 on page 141: "The contracting parties recognize that every State has complete and exclusive sovereignty over the airspace above its territory." See generally on the Chicago System (<http://www.icao.int/icao/en/leb/treaty.htm>) – visited on 31 January 2005; the text is available at (<http://www.iasl.mcgill.ca/airlaw/public.htm>) – visited on 31 January 2005.

<sup>11</sup>*Brownlie, Ian, Principles of public international law*, 5th edition. Oxford, 2001, p. 119, as a consequence of the *principle of appurtenance*; see also *Diederiks-Verschoor, Isabella H. Philepina, An introduction to air law*, 5th edition. Deventer, 1993, pp. 4f and 30; *Pépin, Ernest, The Law of the Air and the Draft Articles Concerning the Law of the Sea Adopted by the International Law Commission at its Eighth Session*, UN Doc. A/Conf.13/4 [1957], New York, 1957, para. 30; *Harvard Research on International Law, Jurisdiction with Respect to Crime*, an effort by the Harvard Law School faculty in the 1920s and 30s to codify the international rules of jurisdiction, in *Am.J.Int'l L.*, Suppl. 1 29 [1935], p. 471.

<sup>12</sup>See *Maleev* (as in n. 1 on page 247), pp. 54f., pointing out at 58 that the airspace above the territory, due to the shape of the planet, is tapered towards the centre of the earth.

<sup>13</sup>As in n. 175 on page 104; the Geneva Conventions are generally viewed as reflecting the customary law of the date, in other words, where the 1982 LOS Convention goes beyond what was enshrined in the Geneva Conventions one can safely assume that States not party to the 1982 LOS Convention have to abide by the rules laid down in the Geneva Conventions.

<sup>14</sup>See *Müller, Reinhard, Der Luftraum und die völkerrechtliche Regelung seiner Nutzung*, Halle, 1981, p. 71, n. 232; Article 5 of the Chicago Convention gives the right of non-scheduled flights across or into the territory of a contracting party subject to certain conditions; but for one, this right is afforded by treaty and has thus not the character of a universal principle, and for another, the conditions under which such flights may be carried out can be more restrictive than the conditions possible under the Convention in respect of Innocent passage; see also *Diederiks-Verschoor* (as in n. 11), p. 12; *Pépin* (as in n. 11), paras. 18–24.

it cannot, by analogy, be conferred on aircraft in the airspace above the territorial sea.<sup>15</sup>

By virtue of Article 49(1) of the 1982 LOS Convention, archipelagic waters are under the full sovereignty of the archipelagic State; the only exception is the right of sea lanes passage.<sup>16</sup> Sea lanes are determined by an axis line and a 25 nm corridor to either side; they may thus traverse adjacent territorial sea areas; but passage may not extend through the whole waterway of the strait in the geographical sense.<sup>17</sup> By virtue of Article 49(2), sovereignty over archipelagic waters extends also to the airspace.<sup>18</sup> Since the content of sovereignty in respect of the airspace follows the concept of sovereignty on the surface, the State may exercise absolute control over all activities, individuals, and goods within the limits of its sovereignty delineated geographically and substantially by treaty and customary law.<sup>19</sup> Accordingly, the coastal State may exercise its jurisdiction over activities and individuals in the airspace above the territorial sea or, as the case may be, the archipelagic waters. Research activities from the airspace above the territorial sea and the archipelagic waters fall therefore under Article 245 of the 1982 LOS Convention and thus under the exclusive right to regulate, authorise, and conduct marine scientific research.<sup>20</sup>

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<sup>15</sup>See *Bentzien, Joachim, Die Zuständigkeit des Internationalen Seegerichtshofes für Streitigkeiten der internationalen Luftfahrt*, in Z.L.W. 45 [1996], p. 148; *Horst Fischer* in: *Ipsen, Knut*, editor, *Völkerrecht: ein Studienbuch*, 4th edition. München, 1999, § 55, paras. 10–12.

<sup>16</sup>The concept of sea lanes passage is akin to the right of transit passage (see section 5) as it requires “the exercise in accordance with this Convention of the rights of navigation and overflight in the normal mode solely for the purpose of continuous, expeditious and unobstructed transit”.

<sup>17</sup>See *Djalal, Hasjim, Commentary*, in *Soons, Alfred H. A.*, editor, *Implementation of The Law of the Sea Convention Through International Institutions*, Honolulu, Hawaii, 1990, p. 267.

<sup>18</sup>See *Bentzien* (as in n. 15), p. 152.

<sup>19</sup>See *Müller* (as in n. 14 on the preceding page), pp. 148f., pointing at the Chicago Convention and the *Convention for the Unification of Certain Rules Relating to International Carriage by Air*, adopted 12 October 1929, amended and supplemented by the *Hague Protocol*, Protocol to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air from 28 September 1955, entry into force on 1 August 1963; *Guadalajara Convention* from 18 September 1961 for the Unification of Certain Rules Relating to International Carriage by Air Performed by a Person Other than the Contracting Carrier, entry into force 1 May 1964; *Guatemala Protocol*, Protocol to Amend the Warsaw Convention from 8 March 1971 and four amending Protocols concluded at Montreal on 25 September 1975, and *Montreal Agreement*, Agreement Relating to Liability Limitations of the Warsaw Convention and the Hague Protocol, 4 May 1966, 137 L.N.T.S. 11 [hereinafter: Warsaw Convention].

<sup>20</sup>See page 179.

*Airspace above Areas not under Sovereignty**High Seas*

For areas outside national jurisdiction, namely, above the high seas, it is established that there is no sovereignty over the airspace; rather the concept of *ius communis* applies and every state enjoys the freedoms associated with the high seas regime.<sup>21</sup> The freedom of over-flight is expressly mentioned in Article 87(1)(b) of the 1982 LOS Convention—actually the only freedom directly referring to the airspace.<sup>22</sup>

Since no State has jurisdiction over foreign aircraft above the high sea, marine scientific research activities conducted from the airspace above the high sea would appear to enjoy the same freedom as those conducted from the surface. It has been suggested that Article 87(1)(b) gives only one example of the lawful uses of the airspace and that customary international law allows for “all activities of aircraft unless prohibited as harmful”, including reconnaissance and all activities of civil and state aircraft.<sup>23</sup> This would also apply to scientific research activities in the airspace above the water. Yet, this view presupposes that the location is the determining factor for the question whether a specific activity is lawful.

Indeed, Articles 56(1)(b)(ii) and 246(1) of the 1982 LOS Convention seem to refer to only those activities that are conducted within the geographical scope of the coastal State’s jurisdiction. The two relevant provisions combined read:

*In* the exclusive economic zone, the coastal State has [...] jurisdiction to regulate, authorize and conduct marine scientific research *in* [the] exclusive economic zone [emphasis added].

The twofold reference “*in* the exclusive economic zone” reinforces the geographical reference in the 1982 LOS Convention. Article 246(3) does not read “*of* their exclusive economic zone” which would have made sense also, especially when compared to the phrase “*on* the continental shelf [emphasis added]”.<sup>24</sup>

However, a different result evolves if one focuses on the location of the effects or implications of the same platform: while the sensor as such may

<sup>21</sup>See *Hailbronner, Kay, Airspace over Maritime Areas*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume I, Amsterdam, 1992, p. 91; *Schwartz, Irmela, Durchflug von Weltraumgegenständen durch nationale Lufträume*, Köln, 1989, pp. 27f.; *Pépin* (as in n. 11 on page 249), para. 38.

<sup>22</sup>See *Maleev* (as in n. 1 on page 247), p. 69. Other provisions in Part VII contain more references to the airspace: thus in accordance with Articles 101–107 states may seize pirate aircraft and Article 111(5) gives the right to effect hot pursuit by aircraft (but not of aircraft), see *Hailbronner* (as in n. 21), p. 93. None of these provisions, however, confers additional freedoms but only sets forth the possibility of states to pursue their jurisdiction in respect of crimes like piracy by means other than sea going ships.

<sup>23</sup>See *Ibid.*

<sup>24</sup>See page 201.

be located in the airspace above the high seas so that its operation falls under the freedoms of the high sea, the information is obtained from a location, which may be subject to State jurisdiction.

Now, the question, whether the location of the platform or the object of the study is decisive for establishing jurisdiction, may be answered either way. Practicality speaks for the former view: it is much easier to locate the platform and establish the lawfulness of its activities based on its position with respect to the Earth surface than to extrapolate, on the basis of the information collected or the kind of equipment used, whether the area of investigation falls under national jurisdiction. The latter view would depend on the accurateness of the project description and information provided by the operator; require actual interference with the platform in the air in the course of the research project;<sup>25</sup> or appear virtually senseless when information were to be exacted in hindsight. As noted above,<sup>26</sup> the possibility to regulate remote sensing is limited by the nature of the activity. A restrictive reading in terms of object based jurisdiction is impractical as there is no viable verification procedure.<sup>27</sup>

### *Contiguous Zone*

In the contiguous zone adjacent to the territorial sea the coastal State may, by virtue of Article 24 of the Geneva Territorial Sea Convention and Article 33 of the 1982 LOS Convention, only exercise control necessary to prevent and punish infringements of its customs, fiscal, immigration or sanitary laws and regulations within its territory or its territorial sea. These rights shall also extend to the airspace above the contiguous zone, where (and if claimed), in respect of the freedom to use the airspace, as has been suggested, the exclusive economic zone regime would apply.<sup>28</sup> The exercise of this control, however, is not a spatial extension of sovereignty but only a corollary of the exercise of sovereignty within the territorial sea or the land territory itself.<sup>29</sup> In any event, the status of the contiguous zone has no significance for research activities in the airspace.

<sup>25</sup>Which would be either recklessly daring or extremely costly or both in comparison to inspections of a platform on the surface; in any event, a rather unlikely course of action.

<sup>26</sup>See page 248.

<sup>27</sup>As a consequence, the whole regime of Part XIII may eventually become superfluous as technology progresses and may eventually enable scientists to explore all parts and aspects of the sea, namely, *into* the exclusive economic zone, from areas outside coastal State jurisdiction; but that is the future and beyond the present analysis.

<sup>28</sup>See *Hailbronner* (as in n. 21 on the preceding page), p.91; *Cheng, Bin, Air law*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume I, Amsterdam, 1992, p.68, holds that the legal status of the airspace above the exclusive economic zone is generally viewed as identical to that over the high seas.

<sup>29</sup>This is exemplified by the right of hot pursuit, Article 111 of the 1982 LOS Convention as it applies to the exercise of certain sovereign rights.



*Exclusive Economic Zone*

In the exclusive economic zone, where the coastal State has no sovereignty but still jurisdiction, it is not so clear which legal regime applies.<sup>30</sup> Point of reference for Part XIII of the 1982 LOS Convention, namely, Articles 245 through 247, is the activity of conducting marine scientific research<sup>31</sup>, rather than the research platform as such. This suggests that any platform which serves as a basis for the conduct of such activities may be subject to the rights and obligations prescribed by Part XIII. This would hold true also for aircraft above the exclusive economic zone.

The question in respect of the airspace above the exclusive economic zone is then whether or not it is subject to the legal concept as promulgated in Article 56 of the 1982 LOS Convention. Part V of the 1982 LOS Convention itself contains no explicit provision on the space above the water. The only provision indirectly linked to the airspace is Article 58(1), which incorporates by reference the freedoms of Article 87 of the 1982 LOS Convention and thus, more specifically, the freedom of over-flight and internationally lawful uses of the sea associated with the operation, amongst others, of aircraft. Yet, according to Article 87(2), the exercise of freedoms and lawful uses must be compatible with other provisions of the 1982 LOS Convention which in the present context are predominantly those of Part V and to some extent Part XIII. The implication of the reference to the high sea freedoms is thus to some extent modified: the quality of the freedom exercisable in the exclusive economic zone is not necessarily the same on the high seas.<sup>32</sup> The question is then whether, and if, how the provisions contained in Part V and those in Part XIII are capable of limiting the freedoms reserved by Article 58(1) of the 1982 LOS Convention.

It has been suggested that “the establishment of an exclusive economic zone does not justify any restrictions of the traditional freedom of over-flight of the area” and that “[a] third state. . . is not precluded from civil or peaceful military uses of the airspace”.<sup>33</sup> To the extent that marine scientific oper-

<sup>30</sup> *Vicuña, Francisco Orrego, Trends and Issues in the Law of the Sea as Applied in Latin America*, in O.D. & Int'l L. 26 [1995], p. 95, notes that a few Latin American States that claimed initially 200 nm territorial seas also restricted over-flight in that area; as these claims were made before 1982, he concludes that expanded sovereignty is “largely a problem of the past.”

<sup>31</sup> Part XIII refers only to marine scientific research. Research only into the atmosphere (see page 15, page 16 and page 78), either from the water or in the air, is not covered.

<sup>32</sup> See *O'Connell, Daniel P./Ivan A. Shearer, editor, The international law of the sea*, Volume I, Oxford, 1982, p. 578.

<sup>33</sup> See *Hailbronner* (as in n. 21 on page 251), p. 92; similarly, *Müller* (as in n. 14 on page 249), p. 74, and *Mestral, Amand de, International Civil Aviation: Law of the Sea Issues*, in *Soons, Alfred H. A., editor, Implementation of The Law of the Sea Convention Through International Institutions*, Honolulu, Hawaii, 1990, p. 256; see also *Lewis, Margaret K., An Analysis of State Responsibility for the Chinese-American Airplane Collision Incident*, in N.Y.U. L. Rev. 1404 77 [2002], pp. 1421f., and *André Karg* in: *Heinegg, Wolff Heintschel von, editor, Casebook Völkerrecht*, München,

ations are civil or peaceful military conduct, the jurisdiction of the coastal State would then end where the airspace begins, i. e., right above the water surface.

Lacking a provision like Article 2(2) of the 1982 LOS Convention, which extends the scope of application explicitly into the airspace, it is difficult to assume that the coastal State has the same jurisdiction in respect of the airspace above the exclusive economic zone like on the surface. Article 38(1) of the 1982 LOS Convention extends its applicability to aircraft in transit passage. Although this reference to aircraft is similar to that in Article 58(1), it differs to the extent that Article 38(1) envisages a specific situation and not the general concept of control. Moreover, with respect to research activities, Article 38(2) expressly provides that the right of over-flight is assigned to aircraft on the condition of continuous and expeditious transit which would appear to exclude research activities.<sup>34</sup> This would suggest that the freedom of over-flight must fully apply above the exclusive economic zone, which is less of an encroachment on the freedoms of the high seas than is the transit passage regime. Yet, this inference is not necessarily conclusive because the regime of the exclusive economic zone provides for certain restrictions, namely, coastal state jurisdiction, which may have implications for the freedom of over-flight above the exclusive economic zone also. Article 58(1) of the 1982 LOS Convention refers to these restrictions and thus suggests that the freedom of over-flight above the exclusive economic zone is not the same as provided for by Article 87 of the 1982 LOS Convention.

It has been suggested that, as a matter of principle, the legal regime of the airspace follows the legal regime of the surface below.<sup>35</sup> As a consequence, marine scientific research activities conducted in the airspace would be subject to the same regime as marine scientific research on the water. This concept is certainly valid for the areas of sovereignty, like the land territory and the territorial sea; it is also valid on the high seas where there is no conflict with coastal state interests. Difficulties, however, arise in the context of the exclusive economic zone because this zone does not follow the traditional approach of a clear distinction between sovereignty and *res communis*. Based on the exceptional character of the exclusive economic zone, one could argue that the concept is only applicable where expressly so provided. On the other hand, one could take the view that the balance of interests is the same for the sea level as for the airspace.<sup>36</sup> Indeed, Part XIII of the 1982 LOS Convention would be rendered void in many instances where the researching State could escape its obligations by simply raising

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2005, pp.470f., with respect to jurisdiction in the context of the Chinese airplane collision (see p. 167).

<sup>34</sup>Research is excluded either on the basis of Article 39(1)(c) of the 1982 LOS Convention as not incidental to the normal mode of transit or—by inference—on the basis of Article 40 of the 1982 LOS Convention, which precludes research activities from ships.

<sup>35</sup>See Müller (as in n. 14 on page 249), p. 72.

<sup>36</sup>Not clear as to his reasons: Hailbronner (as in n. 21 on page 251), p. 93.

the research platform above the surface of the water. And as sophistication of scientific equipment progresses, more and more details and information of what has caused coastal States' concern in the first place will be available by remote sensing.<sup>37</sup> Nevertheless, it must be noted that the 1982 LOS Convention does not provide a clear answer to its vertical scope of application. State practice is not conclusive (or rather non-existent) on the issue.<sup>38</sup> The question, whether marine scientific research from the air above the exclusive economic zone, is subject to the provisions of Part XIII must accordingly be left open. The airspace above the sea, except for the extension of the territorial sea, has essentially remained unregulated by the 1982 LOS Convention.

### *Chicago Convention*

To the extent that the 1982 LOS Convention assigns new rights to coastal States and delineates the oceans in a way previously not customary, it is the foundation for other treaties that by reference incorporate concepts like the extensions of sovereignty. These instruments may have implications on the research platform to the extent that they establish additional rules governing the activity in the air.

The Chicago Convention<sup>39</sup> is important in this context as it lays down the rights and privileges of civil aircraft above foreign territory, as well as general obligations and requirements that must be fulfilled by such aircraft. The scope of the Chicago Convention is universal; it differentiates between the areas of state sovereignty and the high seas. It defines in Article 1 the scope of a State's sovereignty by reference to the State's territory.<sup>40</sup> Yet, Article 2 of the Chicago Convention provides for a definition of the term 'territory' that goes beyond the standard in public international law:

For the purpose of this Convention the territory of a State shall be deemed to be the land areas and territorial waters adjacent thereto under the sovereignty, suzerainty, protection or mandate of such state.

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<sup>37</sup>This might eventually render the whole regime of Part XIII void, see n. 27 on page 252.

<sup>38</sup>But see *Lewis* (as in n. 33 on page 253), pp.1421f., pointing at Article 58, draws—somewhat daringly—the conclusion that the 1982 LOS Convention allows for reconnaissance over-flight on the basis of the general view on peaceful military manoeuvres (see section 2); it is, however, questionable, first, to categorise reconnaissance as military manoeuvre when it is aimed, not at exercising or practising a certain military operation, but at gathering new information; and, second, to sweepingly assume state practice in the light of a sizeable number of coastal States contesting a certain practice (see, for example, with respect to innocent passage *Wolff Heintschel von Heinegg* in: *Heintschel von Heinegg* (as in n. 33 on page 253), pp.433f.; see also *Gorina-Ysern, Montserrat, An International Regime for Marine Scientific Research*, Ardsley, 2003, p.295).

<sup>39</sup>As in n. 82 on page 141.

<sup>40</sup>See *Milde, Michael, KE 007—“Final” Truth and Consequences*, in Z.L.W. 42 [1993], p.362.

Subject to the interpretation of the terms “sovereignty, suzerainty, protection or mandate”, they could include the area under the exclusive jurisdiction of the coastal State, i. e., the exclusive economic zone, also. The term ‘sovereignty’ is used in the 1982 LOS Convention and cannot have a broader meaning under the Chicago Convention than is promulgated in the Law of the Sea. ‘Suzerainty’ is a term of limited application<sup>41</sup> whose connotation is of no avail with respect to the present question. ‘Protection’, in the context of the Chicago Convention, can be best described as safeguarding, preserving or even defending territorial interests by one legal entity for another. ‘Mandate’, in international law, denotes an authority given by the League of Nations and, later, the United Nations to take over the administration and development of certain territories.<sup>42</sup> Neither of these latter terms is thus of relevance in the present context. However, in as much as concepts of international law change over time, it may be necessary to look at the terms in a broader sense. Sovereignty, as the narrowest concept, is here accompanied by three different types of dominion varying in degrees of legal interference. The concept of jurisdiction in the 1982 LOS Convention takes on the characteristics of some of these types: thus, the obligation to protect and preserve the environment is akin to the administration of a territory in the sense that it requires mainly legislative and executive acts. The list of various types of dominions suggests that the Chicago Convention was intended to apply to such areas where the relevant State exercises governmental control—limited as that may be—which would give an argument to apply the same test to the exclusive economic zone. Yet, this does not necessarily mean that state control, as envisaged in the 1982 LOS Convention in terms of jurisdiction, would extend to civil aviation at large, since the 1982 LOS Convention expressly reserves the freedom of over-flight for the airspace above the exclusive economic zone.<sup>43</sup> But where the activities in the airspace become significant for the jurisdiction of the coastal State on the surface, i. e., marine scientific research by remote sensing, the argument could be made that in this area coastal state jurisdiction assumes a quality that is strikingly similar to the concepts of control envisaged in Article 2 of the Chicago Convention: where the coastal State enjoys exclusive control over a certain activity, its

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<sup>41</sup>See ‘suzerainty’ in *Black, Henry Campbell/Garner, Bryan A.*, editors, *Black’s law dictionary*, 7th edition. St. Paul, Minn., 1999: The dominion of a nation that controls the foreign relations of another nation but allows it autonomy in its domestic affairs. “At the present time there appears to be no instance of a relation between states which is described as a suzerainty. The term was applied to the relation between Great Britain and the South African Republic, and also to that between Turkey and Bulgaria from 1878 to 1909, but it seems likely to disappear from diplomatic terminology”, see *Brierly, James L.*, *The law of nations: an introduction to the international law of peace*, 5th edition. Oxford, 1955, p. 128.

<sup>42</sup>See ‘mandate’ in *Black/Garner* (as in n. 41).

<sup>43</sup>See *Bentzen* (as in n. 15 on page 250), p. 154, asserting that the coastal State has no jurisdiction (‘Hoheitsrechte’) in the airspace above the exclusive economic zone.

competence qualifies for Article 2 of the Chicago Convention.<sup>44</sup>

Control over an activity is an important distinction between the jurisdiction in respect of marine research and jurisdiction for the purposes of the protection of the environment. The latter aims at the regulation of a potential occurrence incidental to any activity, and not at an activity as such. This distinction would also apply for artificial structures and islands in the exclusive economic zone: "the coastal State has... jurisdiction with regard to the establishment and use of artificial islands, installations and structures", Article 56(1)(b)(i) of the 1982 LOS Convention. 'Establishment' and 'use' are activities that would warrant the extent of control suggested with respect to marine scientific research. Jurisdiction for the purpose of the protection and preservation of the marine environment, in contrast, warrants the prescription of measures for all relevant activities, yet it does not justify the comprehensive regulation of an activity that pollutes the marine environment. The differentiation between jurisdiction over an activity and over certain aspects of all activities would provide a logical basis for jurisdiction in terms of national traffic regulations granted to the coastal State in respect of takeoffs and landings on artificial islands and structures within its exclusive economic zone without extending jurisdiction in general.<sup>45</sup> The coastal State may prescribe such rules because they define essentially the use of the artificial island; over-flight as an activity may, however, not be regulated. For marine scientific research this would mean that the coastal State may prescribe rules how research operations by aircraft are to be conducted, but it may not regulate traffic in general.

In the systematic of the Chicago Convention there is either sovereignty over the airspace or the freedom of the high seas.<sup>46</sup> Control over the airspace follows closely this dichotomy. Only in limited instances may the control of a coastal State extend to the high seas for aviation security under the mandate of the *International Civil Aviation Organisation (ICAO)*. These extensions are not to be understood as an expansion of sovereignty.<sup>47</sup> With respect to marine scientific research activities it must be noted that the Chicago Convention applies outside the limits of national sovereignty only in accordance with its Article 12, namely, on the basis of nationality and with respect to the rules of the air.<sup>48</sup>

<sup>44</sup>Similarly, *Ibid.*, p. 155.

<sup>45</sup>See *Hailbronner* (as in n. 21 on page 251), p. 92, arguing, however, that reasonableness was the basis for such measures.

<sup>46</sup>See *Schwenk, Walter, Handbuch des Luftverkehrsrechts*, 2nd edition. Köln, 1996, p. 195.

<sup>47</sup>See *Ibid.*

<sup>48</sup>Article 12 – Rules of the air

Each contracting State undertakes... to insure that every aircraft... carrying its nationality mark, wherever such aircraft may be, shall comply with the rules and regulations relating to the flight and maneuver of aircraft there in force. Each contracting State undertakes to keep its own regulations... uniform... with those established... under this Convention. Over the high seas, the rules in force shall be those established under this Convention.

In exercising their rights under the Chicago Convention, States are called upon to regulate air traffic in compliance with the “Chicago System”.<sup>49</sup> Traffic regulation in the airspace under the sovereignty of all States is sought to be uniformed by the Rules of the air, prescribed for the airspace above the high seas in Annex 2 of the Chicago Convention. They are of a general nature, mandatory only in the airspace above the high seas and predominantly designed to prevent collisions. In the airspace above the territory of a State, national laws and regulations apply, which must be in accordance with the Chicago System. Some specific rules concern operations by aircraft on the surface above the water. Annexes 6 (Operation of Aircraft—International Commercial Air Transport), 11 (Air Traffic Services) and 12 (Search and Rescue) also contain provisions relating to the airspace above the high seas. Additionally, the ICAO has put into place some traffic control measures. All these rules are designed to ensure the safety of aircraft over the high seas.<sup>50</sup> They do not give any hint as to the possibility of marine scientific research from airspace nor do they qualify as a restriction on the freedom of marine scientific research in the high seas area. The Chicago Convention while applicable to civil aircraft in general has no specific bearing on marine scientific research from airspace.<sup>51</sup>

#### LEGAL REGIME OF OUTER SPACE WITH RESPECT TO MARINE SCIENTIFIC RESEARCH

The word ‘space’ denotes the area above the air space and a distinct legal regime. The *air* space can be delimited from *outer* space by its density: where the air is not dense enough to allow regular aviation to take place—in

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[...]

The practical consequence is meagre, as the national air legislation follows to a large extent the rules of the air in the international airspace, anyway, see *Schwenk* (as in n. 46 on the preceding page), p. 199.

<sup>49</sup>Which includes the convention, annexes, and subsequent updates.

<sup>50</sup>See *Pépin* (as in n. 11 on page 249), para. 30.

<sup>51</sup>The only provision remotely concerned with research by aircraft is Article 36 of the Chicago Convention which provides:

Each contracting State may prohibit or regulate the use of photographic apparatus in aircraft over its territory.

While photography is one of the principle means of remote sensing, today’s equipment goes beyond the mere photographic reproduction. Reconnaissance from air was known to the parties, yet not mentioned in the Chicago Convention, as it only applies, *expressis verbis*, to civil aircraft. Photographic pictures, on the other hand, could be taken from civil aircraft and then be fed in a cycle of use and analysis which the reproduced State had no control over. A broad reading of Article 36 of the Chicago Convention is not warranted in the present context, as all investigative methods employed for the purpose of marine scientific research require, by virtue of Articles 245 and 246 of the 1982 LOS Convention, prior permission by the coastal State. Article 36 of the Chicago Convention is thus of no significance in the context of marine scientific research from the air.

general at around 80–100 km above sea level—outer space begins requiring spacecraft for transport.<sup>52, 53</sup> The body of law termed ‘space law’ comprises “all international and national legal rules and principles governing the exploration of outer space by states, international organisations, private persons, companies or other relevant actors”<sup>54</sup> and is still in the process of development.<sup>55</sup>

### *Remote Sensing and the Legal Pretext*

The principal objection of certain States to the observation and investigation of their territory by remote sensing is rooted in sovereignty. The concern about potential use of increased knowledge on natural resources is a parallel to the debates in the law of the sea.<sup>56</sup> Remote sensing from space was thus one of the first issues on the agenda when the developing countries caught up in the 1970s with the general development in space law. In U.N. Resolution 41/65<sup>57</sup> remote sensing was defined as:

[T]he sensing of the Earth's surface from space by making use of the properties of electromagnetic waves emitted, reflected or diffracted by the sensed objects, for the purpose of improving natural resources management, land use and protection of the environment;

And remote sensing activities as:

[T]he operation of remote sensing space systems, primary data collection and storage stations, and activities in processing, interpreting and disseminating the processed data.

<sup>52</sup>See *Classen* (as in n. 1 on page 247), p.38; *Benkō/Graaff/Reijnen* (as in n. 2 on page 247), pp. 122f.

<sup>53</sup>Delimitation follows thus aerodynamic principles: aircraft make use of a combination of high and low pressure below and above the wings generated by a forward movement, the resulting upward movement opposes the pull of gravity and keeps the craft in the air, balloons derive their support equally from differences in density between the balloon and surrounding air.

<sup>54</sup>*Malanczuk, Peter, Actors: States, International Organisations, Private Entities*, Essays Published for the 30<sup>th</sup> Anniversary of the Outer Space Treaty, in *Outlook on Space Law over the Next 30 Years*, The Hague, 1997, p. 29.

<sup>55</sup>Over the past years a number of areas of law have evolved, which increasingly concern matters relating to outer space, such as intellectual property law—for example, intellectual property rights in scientific data or discoveries of economic value, see *Beier, Friedrich-Karl/Stauder, Dieter, Weltraumstationen und das Recht des geistigen Eigentums*, in *Böckenstiegel, Karl-Heinz*, editor, *Space Stations: Legal Aspects of Scientific and Commercial Use in a Framework of Transatlantic Cooperation*, Köln, 1985, pp.156f.; and *Luxenberg, Barbara, Aspects of Law and Practice in the United States*, in *Böckenstiegel, Karl-Heinz*, editor, *Space Stations: Legal Aspects of Scientific and Commercial Use in a Framework of Transatlantic Cooperation*, Köln, 1985, p. 176—and insurance law.

<sup>56</sup>See *Mostesbar, Sa'ad, Development of the Regime for the Low Earth Orbit and the Geostationary Orbit*, in *Outlook on Space Law over the Next 30 Years*, Essays Published for the 30<sup>th</sup> Anniversary of the Outer Space Treaty, The Hague, 1997, p.97, who identifies this point as a challenge to any new space system.

<sup>57</sup>Unanimously adopted on 3 December 1986.

Remote sensing for scientific purposes was not explicitly included in the definition, and those purposes mentioned, i. e., natural resources management, land use, and the protection of the environment, do not necessarily include purely scientific purposes. However, on the premise that climatological, meteorological, or oceanographic research are a *conditio sine qua non* for the protection of the environment (or for any other of the mentioned purposes) the principles also apply to scientific research operations. In any event, the technical part of the definition is generally applicable and can be used in the context of scientific research also. Key elements of the definition are the emission, reflection, and diffraction of particles (or photons) and electromagnetic waves. All apparatuses making use of these phenomena would fall under remote sensing.

While the air space above the land territory and the territorial sea is subject to state sovereignty, outer space—similar to the air space above the high seas—is *res communis*.<sup>58</sup> No State has jurisdiction to legislate rules that apply to all States; States may, however, on the basis of the nationality principle, prescribe rules and obligations.<sup>59</sup> Yet, this does not mean that there is no general legal regime in outer space.<sup>60</sup> In contrast to air law—which follows the law of the subjacent surface—it is autonomous in the sense that it consists of innate rules set forth namely, in the Outer Space Treaty<sup>61</sup>, the 1974 Registration Convention<sup>62</sup>, and the 1974 Liability Convention<sup>63</sup>. It

<sup>58</sup>See *Maleev* (as in n. 1 on page 247), p. 54; *Zanghi, Claudia, Aerospace Object*, Essays Published for the 30<sup>th</sup> Anniversary of the Outer Space Treaty, in *Lafferanderie, Gabriel/Crowther, Daphné*, editors, *Outlook on Space Law over the Next 30 Years*, The Hague, 1997, p. 120; *Brownlie* (as in n. 11 on page 249), p. 263, likening it to Antarctica.

<sup>59</sup>See *Klinner, Tilo, Satellitenfernerkundung im Völkerrecht: inwieweit existiert ein völkerrechtlicher Datenschutz?* Frankfurt am Main, 1989, *Schriften zum Staats- und Völkerrecht* 38, pp. 84f.

<sup>60</sup>Before the first space crafts were launched legal scholars saw the potential for legal conflicts in outer space and proposals for a legal regime were made as early as 1910, see *Marcoff, Marco G., Traité de droit international public de l'espace*, Fribourg, 1973, p. 45; *Classen* (as in n. 1 on page 247), p. 17, with further references. In the early 60s the U.N. General Assembly adopted three resolutions on outer space—Res. 1721(XVI) *International Cooperation in the Peaceful Uses of Outer Space*, 16 G.A.O.R., Suppl. 17, p. 6 [1961]; Res. 1884(XVIII) *Regarding Weapons of Mass Destruction in Outer Space*, and Res. 1962(XVIII) *Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space*, both 18 G.A.O.R., Suppl. 15, pp. 13 and 15 [1963]—whose substantive provisions were embodied in the Outer Space Treaty, see *Harris, David J., Cases and Materials on International Law*, 4th edition. London, 1991, p. 226.

<sup>61</sup>As in n. 181 on page 161.

<sup>62</sup>*Convention on Registration of Objects Launched Into Outer Space, UN GA Res. 3235 (XXIX)*, adopted by the General Assembly of the United Nations, at New York, on 12 November 1974, entry into force 15 September 1976, 1023 U.N.T.S. 16, 14 [1975] I.L.M. 43 [hereinafter: 1974 Registration Convention].

<sup>63</sup>*Convention on the International Liability for Damage Caused by Space Objects*, Opened for signature at London, Moscow, and Washington 29 March 1972, entry into force 1 September 1979, 961 U.N.T.S. 187 [hereinafter: 1974 Liability Convention].



may have notable impacts on the future development of the law of the sea with respect to principles on common space.<sup>64</sup> And more so than perhaps in other areas of law, space law remains as of today predominantly a province of state activity.<sup>65</sup>

### *Outer Space Treaty*

Apart from the U.N. General Assembly resolutions which may be considered declarations of customary law,<sup>66</sup> the first international instrument on space activities relevant in the context of this analysis was the Outer Space Treaty of 1967.<sup>67</sup> Its Article I sets forth the general framework for space activities and contains also the principal stipulation for scientific research.<sup>68</sup>

<sup>64</sup>See *Lucchini, Laurent/Voelckel, Michel, Droit de la mer, La mer et son droit, les espaces maritime*, Volume I, Paris, 1990, p. 7. *Tannenwald, Nina, Law versus Power on the High Frontier: the Case of a Rule-based Regime for Outer Space*, in *Yale J. Int'l law* 29 [2004], pp. 388f., in contrast, notes that "the historical analogy between the high seas and space is flawed; the nature of space, its uses, and its relation to earth are significantly different from the nature and uses of the high seas and their relation to the land." According to her the 'freedom of the seas' concept cannot be used as a guiding management principle for space; she points out that the law/freedom of action dichotomy at the root of the high seas freedom "has been gradually disappearing... in international practice"; based on *Gilbert Gidel* she argues that the freedom of the high seas "is not suitable for the sea as a source of wealth, because the resources were not inexhaustible."

<sup>65</sup>See *Malanczuk, Actors* (as in n. 54 on page 259), p. 30, pointing at the increasing relevance of other actors in space law, first of all international organisations; see also *Waldrop, Elizabeth Seebode, Integration of Military and Vicilian Space Assets: Legal and National Security Implications*, in *A.F.L.Rev.* 55 [2004], pp. 168f.; investigation of this aspect is beyond the scope of the present analysis.

<sup>66</sup>The resolutions were adopted unanimously thus having sufficient weight as interpretations or statements of law.

<sup>67</sup>See n. 181 on page 161; it embodies in Article IV essentially UN GA Res. 1884(XVIII) and in Articles I-III and V-IX Res. 1721(XVI) and Res. 1962(XVIII); the "Moon Treaty", *Agreement Governing the Activities of States on the Moon and other Celestial Bodies, UN GA Res. 34/68*, opened for signature at New York on 18 December 1979, entry into force 11 July 1984, 1363 U.N.T.S. 22 [hereinafter: Moon Treaty or MT], is of little significance for the present analysis except where, for reasons of defining the concepts therein, it can serve as a basis for comparisons.

<sup>68</sup>It provides:

1. The exploration and use of outer space... shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.
2. Outer space... shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas...
3. There shall be freedom of scientific investigation in outer space... and States shall facilitate and encourage international co-operation in such investigation.

*Research Activities under the Outer Space Treaty*

It must be noted that Article I(1) OST refers both to exploration and use of outer space. Scientific research activities would appear to fit under both categories. The term 'exploration' as used in the Outer Space Treaty must not be confused with the notion of the same term in the 1982 LOS Convention. Article I(1) OST refers to exploration in a more general sense rather than in connection with natural resources and their exploitation. This suggests a broader concept denoting discovery and investigation of any aspect of space rather than a specific focus like in the 1982 LOS Convention. Yet, the differentiation in Article I(3) can be interpreted as to reserve for scientific research a different regime than for other space activities. This may either be more strict or more generous. Article I(3) is basically left to be fleshed out by the space powers, which arrange for the regulation of their activities by so-called *Memoranda of Understanding* between each other, with the notable consequence that no particular recommendations emanating from the scientific community have been formulated.<sup>69</sup>

From a law of the sea perspective it strikes odd that there is no distinction between resources oriented and pure scientific investigation. Three reasons come to mind in this respect: first, when the Outer Space Treaty was negotiated, space and its use was thought to be open to all countries and would benefit humankind as a whole<sup>70</sup>; appropriation of any part thereof was not contemplated.<sup>71</sup> Second, the resource situation in space was basically unknown at that time; in contrast, resources from the sea and the sea-bed were already used and had become increasingly valuable when the 1982 LOS Convention was negotiated. Third, Article I, *prima facie*, only refers to the exploration of outer space itself. It is silent on the possibility of exploration of the Earth from space. Accordingly, the contentions with respect to readily exploitable resources on the Earth's surface were, on the face, not affected.<sup>72</sup>

*Application to Marine Scientific Research*

Based on the assumption that, in the absence of any norm to the contrary, States can remotely investigate whatever they want<sup>73</sup>, the scope of application of the Outer Space Treaty would have to exclude marine scientific research. From the text it is not certain whether scientific research *from*

<sup>69</sup>See *Lafferanderie, Gabriel, Space Science and Space Law*, Essays Published for the 30<sup>th</sup> Anniversary of the Outer Space Treaty, in *Outlook on Space Law over the Next 30 Years*, The Hague, 1997, p. 111.

<sup>70</sup>See *Marcoff* (as in n. 60 on page 260), pp. 357f.

<sup>71</sup>The omission has probably led to the rather curious (property) claims by private individuals to the moon and other celestial bodies; the space regime remains open in this point.

<sup>72</sup>Only some ten years later the issue of remote sensing activities generated States' concern about their interests, see page 266.

<sup>73</sup>See *Classen* (as in n. 1 on page 247), p. 33.

space is covered by Article I OST to begin with. In respect of research activities as a “use” of outer space, a similar problem arises. Taken the purpose of the activity, one may arrive at the conclusion that scientific investigations of the Earth’s surface are not even covered by Article I(3). In contrast, one may interpret the phrase “use of outer space” as to include also those activities that are not necessarily directed at the subject matter ‘outer space’ itself but may be only carried out within the same.<sup>74</sup> Similarly, activities *in* outer space would not necessarily mean that research is being done *on* outer space. Thus, only if the focus of the activity is of no significance, the Outer Space Treaty would cover marine scientific research activities. Indeed, a parallel to the law of the sea would suggest that the location of the researcher is the determining factor rather than the location of the object of interest. In space law, however, it is widely accepted that the Outer Space Treaty applies to activities of both kinds, *on* and *from* space.<sup>75</sup> Support for this interpretation comes from the historic context—the observation of the Earth’s surface was already known when the Outer Space Treaty was adopted—, the lack of official objections<sup>76</sup> and, finally, the impracticality of a consent regime: remote sensing by satellites is done in orbits with little or no possibility to change course over ground; also, the sensors cover an area that may stray several borders on the Earth’s surface. For these reasons, one can conclude that the activity of remote sensing for purposes of marine scientific research is principally covered by the Outer Space Treaty.

### *Conduct of Remote Sensing*

One can safely assume that remote sensing from outer space is free from any restriction where the object is either on the high seas or in Antarctica<sup>77</sup>, the same would appear to hold true for the territory of the State which is conducting the investigation.<sup>78</sup> It has been suggested that, by analogy to the law of the sea, observation of the State from outside its jurisdiction was permissible.<sup>79</sup> Traditional customary space law recognises the right to launch satellites or space objects, which orbit over the subjacent territory of other sovereign countries without prior permission or authorisation.<sup>80</sup> Yet, this

<sup>74</sup>See *Ibid.*, p. 85.

<sup>75</sup>See *Malanczuk, Peter, Erdfernerkundung*, in *Böckstiegel, Karl-Heinz*, editor, *Handbuch des Weltraumrechts*, Köln, 1991, p. 447, with further references.

<sup>76</sup>See *Ibid.*, p. 448, noting that States are only rarely aware of their territory being observed from space.

<sup>77</sup>See *Lagoni, Rainer, Antarctica Mineral Resources in International Law*, in *Z.a.ö.R.V.* 39 [1979], p. 16, on jurisdiction and title over Antarctica’s resources.

<sup>78</sup>See *Classen* (as in n. 1 on page 247), p. 94; *Malanczuk, Erdfernerkundung* (as in n. 75), p. 439.

<sup>79</sup>See *Klünner* (as in n. 59 on page 260), p. 83, with further references as to the permissibility of remote sensing of States from the high seas.

<sup>80</sup>See *Marcoff* (as in n. 60 on page 260), p. 156; *Bosco, Joseph A., International Law Regarding Outer Space—An Overview*, in *J. Air L. & Com.* 55 [1989], p. 620.

custom must be regarded with some caution as it is principally established by those few States that actually conduct space activities, whereas the vast majority remains steadfast on the ground and might tend to differ. *Marcoff* submits that the legality of reconnaissance from space depends on the nature of the activity: in the light of Article I(1) a distinction would have to be made between peaceful and military, i. e., strategic, observation. He contends:

[Le critère “dans l’intérêt de tous les pays”] rend illicite, non seulement toute activité spatiale de nature stratégique, entreprise sans autorisation des autres Etats intéressés, mais aussi toute utilisation de l’espace, de quelque nature que ce soit, qui n’est pas effectuée en harmonie avec les intérêts légitimes des Etats tiers.<sup>81</sup>

This would render illegal remote sensing activities where a subjacent State lodges an objection to its territory being investigated from space. While this position arguably finds its foundation in the text of the Outer Space Treaty, state practice differs considerably. The attempt of eight States in 1976 to essentially establish this position in international space law and extend their control to activities in outer space failed.<sup>82</sup> Based on the premise that the 1982 LOS Convention confers on the coastal State jurisdiction in respect of marine scientific research in its exclusive economic zone, it has been suggested that the exclusive economic zone should be treated as the State’s territory with respect to remote sensing.<sup>83</sup> Similarly, it has been submitted that on the basis of the passive personality principle<sup>84</sup> and protective or security principle<sup>85</sup> States may, where severe security interests are concerned, exercise jurisdiction.<sup>86</sup> This would mean that the coastal State’s consent had to be obtained for activities that qualify as marine scientific research, including in particular remote sensing. However, the possibility of remote sensing of foreign territory seems not to have been contested principally in the U.N. Committee on Peaceful Uses of Outer Space since the middle of the 80s.<sup>87</sup> And indeed, the differentiation between peaceful and military use of

<sup>81</sup> *Marcoff* (as in n. 60 on page 260), p. 384.

<sup>82</sup> The “Bogota Declaration” of 3 December 1976, adopted by eight developing countries, never received enough support, especially not by the two major countries engaged in space activities.

<sup>83</sup> See *Classen* (as in n. 1 on page 247), p. 91, with reference to the Argentinian (UN Doc. A/AC.105/C.2/L.73, [1970], reprinted in *Jasentuliyana/Lee* (as in n. 8 on page 248), pp. 367f., Brazilian (UN Doc. A/AC.105/122), Argentinian/Brazilian (UN Doc. A/AC.1/1047, [1974], reprinted in *ibid.*, pp. 373f., and Mexican (UN Doc. A/AC.105/288, Annex 1) proposals, which—as may be recalled—promoted during the third U.N. LOS Conference the concept of a 200 nm territorial sea.

<sup>84</sup> See generally *Brownlie* (as in n. 11 on page 249), pp. 306f.; *Harvard Research* (as in n. 11 on page 249), p. 445.

<sup>85</sup> See generally *Brownlie* (as in n. 11 on page 249), p. 307; *Harvard Research* (as in n. 11 on page 249), p. 445.

<sup>86</sup> See *Klinner* (as in n. 59 on page 260), p. 87, citing German norms prohibiting aerial photography and also remote sensing regardless of the location of the observer as long as the object concerned is located within the territory of Germany.

<sup>87</sup> See *Malanczuk*, *Erdfernerkundung* (as in n. 75 on the preceding page), p. 450.

data seems to be useless in light of the factual use of civilian remote sensing data by both, the public and the military.<sup>88</sup>

This rule deviates strikingly from the generally recognised approach in air law with respect to sovereignty in the airspace above state territory. The difference can have curious practical results: while spying and other military operations in the airspace superjacent to a foreign State's territory are, according to international air law, absolutely forbidden, the same activities—with practically the same effect in terms of information—may be conducted legally from outer space by satellites orbiting over the territory of that State.<sup>89</sup> The same is true for civilian remote sensing activities for purposes of marine scientific research. In air law the right to restrict remote sensing of state territory has its clear foundation in the sovereignty over the airspace. In space law no such foundation is recognised. Article IX OST merely calls on States Parties to conduct all their activities in outer space “with due regard to the corresponding interests of all other States Parties to the Treaty.” It continues: “States Parties... shall pursue studies of outer space... and conduct exploration... so as to avoid... harmful contamination and also adverse changes in the environment of the Earth”. The question in the context of these two Articles is then whether the ‘due regard’ obligation prevents States from conducting research operations by remote sensing the Earth's surface under state sovereignty or jurisdiction. The second part of Article IX suggests that this obligation is directed to the physical integrity of a state's territory but not intended to prevent mere imaging or sensing activities. The 1982 LOS Convention would appear not to apply where space law applies: even though the 1982 LOS Convention was negotiated and adopted after the Outer Space Treaty, no provision is made for the relationship of the two to each other; it must thus be concluded that the signatories to the Convention saw no conflict or overlap between the two instruments. Therefore, one may say that the Outer Space Treaty allows for remote sensing of the Earth's surface regardless of whether or not the territory falls under state sovereignty.<sup>90</sup>

<sup>88</sup>See *Kries, Wulf v.*, *The UN Remote Sensing Principles of 1986 in Light of Subsequent Developments*, in Z.L.W. 45 [1996], p. 175. See also *Waldrop* (as in n. 65 on page 261), p. 172, on the practice of non-Western states to converge military and civilian remote sensing.

<sup>89</sup>See *Bosco* (as in n. 80 on page 263), p. 638, pointing out the possibility of a so called aerospace vehicle to fly across a subjacent State's territory without the necessity to request prior permission.

<sup>90</sup>It should be noted, though, that at I.O.C. Resolution XXII-12 established a new open-ended IOC/ABE-LOS sub-group “to provide advice on the legal framework within the context of UNCLOS which is applicable to the collection of oceanographic data”, *IOC Resolution XXII-12*, IOC Circular Letter No. 2094, 11 February 2004 ([http://ioc.unesco.org/unclos/ABE-LOS-IV/CL%202094\\_e.pdf](http://ioc.unesco.org/unclos/ABE-LOS-IV/CL%202094_e.pdf)) – visited on 31 January 2005. A preliminary outline of the group's tasks comprise of technology, i. e., the available platforms for the collection of oceanographic data (including aircraft and satellites); locations of research (including operations from land, air and space); object relevance; potential adverse effects (introduction of harmful substances, sound transmissions); and legal aspects (sharing of responsibility in multinational operations, jurisdictional

*Principles on Remote Sensing*

The activities in space relating to the earth's surface received attention, especially by developing States, in the 1970s. The Working Group III on Remote Sensing of the Earth by Satellites of the U.N. Committee on Peaceful Uses of Outer Space considered in 1975 the question whether the consent of a State should be required for remote sensing from outer space of the territory of that State.<sup>91</sup> This question, however, was not further discussed in the follow-up sessions of the Working Group III and is not reflected in the final text of the *Principles Relating to Remote Sensing of the Earth from Space*.<sup>92</sup> *Jasentuliyana* notes that the political climate, at the time when the Sensing Principles were adopted in 1986, was completely different from that of the 1982 LOS Convention. After lengthy debates on the subject since the 1970s, experience with satellite operations had shown that the initial fear of aggressive exploitation of developing countries' resources based on information from space, had been exaggerated.<sup>93</sup> Indeed, the information about resources on the ground obtained from satellite data proved to be of little use, as countries remained in control of ground access to the

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issues of new technology and liability), see *Hakapää, Kari, List of Points of Interest*, Fourth Meeting of the Advisory Body of Experts on the Law of the Sea, Lefkada Island, Greece, 4–7 May 2004, UNESCO Doc. IOC/ABE-LOS-IV/8, 2004.

<sup>91</sup>See Report of the Chairman of Working Group III, UN Doc. A/AC.105/147, para. 8, reprinted in *Jasentuliyana/Lee* (as in n. 8 on page 248), p. 467.

<sup>92</sup>UN Doc. A/RES/41/65, [1987], reprinted in *Welck, Stephan Frhr. v./Platzöder, Renate*, editors, *Weltraumrecht: Textsammlung—Law of outer space*, Baden-Baden, 1987, p. 643, [hereinafter: Sensing Principles]; see generally, *Christol, Carl Q., Space law: past, present, and future*, Deventer, 1991, pp. 76–83, pointing out that “those issues characterized as central to the negotiations relating to remote sensing were either expressly set forth in the final Principles or excluded via the consensus process” (pp. 88f.); similar, yet more sceptical, *Andem, Maurice N., International legal problems in the peaceful exploration and use of outer space*, Rovaniemi, 1992, University of Lapland publications in law 20, pp. 65–70; and *Klünner* (as in n. 59 on page 260), pp. 97–104. Since the Sensing Principles were adopted as a U.N. General Assembly resolution and not formally endorsed in a treaty, they constitute “soft law”, which, while not a formal source of international law—which are (1) treaties; (2) international custom; (3) general principles of law; and (4) subsidiary sources, such as decisions of court and tribunals and the writing of jurists, see Statute of the International Court of Justice, 1989 I.C.J. Acts & Docs. 59, Art. 38(1)—, suggests the likely future direction of legal developments and informally establishes acceptable norms of behaviour for nations, see *Christol* (as in n. 92), pp. 92f.; *Andem* (as in n. 92), p. 402; Handl argues that “soft law” can be a valuable instrument for enhancing or supplementing international law proper and serves to “capture emerging notions of international public order”, *Handl, Günther, A Hard Look at Soft Law*, in *Am.Soc’y Int’l L.Proc.* 82 [1988], pp. 373f.; see also *Matz, Nele, Comment: The Common Interest in International Law: Some Reflections on its Normative Content*, in *Z.a.ö.R.V.* 62 [2002], pp. 18f. It can be assumed that the Sensing Principles, though not binding, will determine the international customary law development in the future, see *Malanczuk, Erdfernerkundung* (as in n. 75 on page 263), p. 443; similarly, *Hobe* (as in n. 1 on page 247), pp. 209f.

<sup>93</sup>See *Jasentuliyana, Nandasiri, International Space Law and the United Nations*, The Hague, 1999, p. 315.

resources. Also, following a period of general North-South confrontation, *Jasenuliyana* submits, the widespread hostility to multinational companies had ceased, and a growing recognition of positive effects of the co-operation with multinational industries ensued among developing countries resulting, in the middle of the 1980s, in a period of renewed interest in economic and political co-operation.<sup>94</sup>

The fundamental problem in arriving at a consensus with respect to unconditional freedom of remote sensing is the question whether a State has a right to privacy by virtue of its sovereignty. It has been suggested that “only the actual interference, not intellectual, mental or cultural intervention, may count as ‘interference in domestic affairs’: neither a State nor its people as a collectivity can and should have ‘privacy’.”<sup>95</sup> In support of this argument *Wassenbergh* puts forward that the “free international exchange of information and ideas is the best guarantee of the maintenance of international peace and security and the development of friendly relations and cooperation between nations.”<sup>96</sup> In conclusion then, the requirement of prior consent would be counter-productive to international co-operation and the maintenance of peace. The argument is qualified to some extent by the assertion that there remain some instances in which the sensed State has a right to ‘privacy’, namely, when remotely sensed information “actually adversely affects its international relations”. A State putting forward such a line of argument would then, according to *Wassenbergh*, “have to be able to convincingly demonstrate that its peaceful relations or its trade relations are so affected” that international restrictions are justified.<sup>97</sup>

With respect to the substantive content of the Sensing Principles in terms of marine scientific research, Principle IV acknowledges with reference to Article I OST, first of all, that “the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries” and establishes thus the Outer Space Treaty as the starting point for the interpretation of the Sensing Principles. It further recognises “the principle of full and permanent sovereignty of all States and peoples over their own wealth and natural resources”, and embodies a due-regard rule with respect to the rights and interests of the sensed State for the conduct of remote sensing activities. This clause may be interpreted as a protection of the sensed State, especially with respect to the dissemination of data from remote sensing to third parties.<sup>98</sup> It has no bearing for the question whether the researching State must obtain

<sup>94</sup>See *Ibid.*

<sup>95</sup>*Wassenbergh, Henri A., Principles of outer space law in hindsight*, Dordrecht, 1991, p. 89.

<sup>96</sup>*Ibid.*

<sup>97</sup>See *Ibid.*, pp. 89f.

<sup>98</sup>See *Malanczuk, Erdfernerkundung* (as in n. 75 on page 263), pp. 452f.; *Benkö, Marietta/Gruber, Gerhard, The UN Committee on the Peaceful Uses of Outer Space: Adoption of Principles on Remote Sensing of the Earth from Outer Space and other recent Developments*, in Z.L.W. 36 [1987], p. 22.

consent prior to the remote sensing of the coastal State. Principle IV rests on the principal assumption that all States may freely pursue remote sensing in outer space.

Principle V makes it an obligation for States carrying out remote sensing activities to promote international co-operation through opportunities for participation on equitable and mutually acceptable terms. Similarly, Principles VI through VIII request States to take appropriate steps, like establishment and operation of data collecting and storage stations and processing and interpretation facilities, and the arrangement of technical assistance to other States, to increase the benefits from remote sensing.<sup>99</sup> Principle IX requires “a State carrying out a programme of remote sensing [to] inform the Secretary-General of the United Nations” in accordance with Article IV of the 1974 Registration Convention and Article XI OST, and also, “at its request”, it shall “make available any other relevant information to the greatest extent feasible and practicable to any other State. . . that is affected by the programme”. These obligations are again similar to those set forth in Part XIII, sections 1 and 2 of the 1982 LOS Convention and may also be viewed as a function of community interests, as opposed to the sensed State’s interest in exclusive access to the data, for example.

With reference to the decade of debate in the Working Group, the Sensing Principles are noteworthy for what they do not prohibit or regulate.<sup>100</sup> They define remote sensing as “the sensing of the Earth’s surface from space by making use of the properties of electromagnetic waves emitted, reflected or diffracted by the sensed objects.” By virtue of this definition, they, first of all, do not apply to remote sensing from the airspace.<sup>101</sup> This is important as it leaves untouched the established principle of a State’s sovereignty over its airspace in air law. The Sensing Principles only concern remote sensing “for the purpose of improving natural resources management, land use and the protection of the environment”, Principle I(a); thus, they do not cover the controversial uses of remote sensing, like security data or information with respect to natural resources.<sup>102</sup> Principle XII grants the sensed State a right of access to primary and processed data “concerning the territory under its jurisdiction”; moreover, the State shall have access to “the available analysed information. . . in the possession of any State participating in remote sensing activities on the same basis and terms”. While the sensed State thus has a far reaching right of access, the mere existence of this right suggests that acquisition of the data mentioned in Principle XII is legal. The compromise reached with the Sensing Principles does not contain a prior consent regime for remote sensing; merely ancillary obligations of the sensing State were

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<sup>99</sup>This can be viewed as one of the primary problems to arrive at a consensus on remote sensing between developed and developing states, see *Malanczuk*, *Erdfernerkundung* (as in n. 75 on page 263), pp. 439f.

<sup>100</sup>See *Christol* (as in n. 92 on page 266), p. 91.

<sup>101</sup>See *Malanczuk*, *Erdfernerkundung* (as in n. 75 on page 263), pp. 443f.

<sup>102</sup>See *Wassenbergh* (as in n. 95 on the page before), p. 88.



incorporated, namely, to (a) consult with the sensed State upon its request and (b) make available opportunities for participation. Accordingly, the actual sensing of the Earth from space must be considered free, while the distribution of the data, unenhanced, processed, or analysed, remains subject of conflicting interests and therefore subject to different opinions. The use to be made of the data must conform with the first paragraph of Article I OST (for the benefit and in the interest of all countries) since the activity is generally covered. And it must be in accordance with general norms of international law.<sup>103</sup>

### *Legal Consequences for Marine Scientific Research*

In conclusion, one can say that coastal States opposed to their territory and their exclusive economic zone being remotely investigated for scientific purposes may invoke the Outer Space Treaty and the Sensing Principles (as “soft law”) with respect to the due-regard rule. But there is no substantial rule that would prevent third States to conduct scientific investigations of the Earth’s surface, including foreign States’ territory, from space. Space law on remote sensing is not definite and is unlikely to become more conclusive: the law is evolving rather nationally than internationally and States’ compliance is difficult to assess lacking clear obligations which again fosters an incoherent development of the law.<sup>104</sup> In terms of the 1982 LOS Convention, one may advance the argument that observations from space are akin to operational oceanography and thus are not covered by the provisions of the 1982 LOS Convention to begin with;<sup>105</sup> the statement of *Yankov* during the negotiations<sup>106</sup> would indeed warrant such a conclusion.

## CO-OPERATION INITIATIVES

Especially with respect to remote sensing activities, co-operation between sensed and sensing States becomes more and more essential for a research conducive climate. A recent initiative in the field of co-operation is the *Group on Earth Observations (GEO)*. It was started on 31 July 2003 by

<sup>103</sup>See *Ibid.*, p. 90; *Classen* (as in n. 1 on page 247), p. 194; see *Heintze, Hans-Joachim, Rechtsfragen der Nutzung von Fernerkundungssatelliten bei humanitären Hilfsaktionen*, in *Z.L.W.* 42 [1993], pp. 278, 284f.

<sup>104</sup>See *Kries* (as in n. 88 on page 265), p. 178.

<sup>105</sup>See *Ryder, Peter, Marine Scientific Research and Operational Oceanography in the Context of the UN Convention on the Law of the Sea*, Sixth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System (GOOS), Scientific and Technical Requirements of GOOS in Relation to UNCLOS, Paris, 10–14 March 2003, IOC-WMO-UNEP/I-GOOS-VI/10, p. 23; the report is cautious, though, to recommend the authoritative manifestation of such an interpretation in a proper forum or a protocol.

<sup>106</sup>See section 5.

thirty-three countries and the European Commission. Its purpose is to establish a comprehensive, co-ordinated, and sustained Earth observation system. Currently, it has 52 members, including the European Community; additionally, some 30 participating international organisations are accredited, including U.N. sub-entities (F.A.O., I.O.C., UNESCO, UNEP) and other intergovernmental and scientific organisations (I.C.S.U., I.G.B.P., W.C.R.P., W.M.O.).<sup>107</sup> At its last summit, on 25 April 2004, the group adopted a framework document for a 10-year-implementation plan. While this document is not legally binding it provides an agenda for elaborating the implementation plan; signatories express their “willingness to cooperate on, and participate in, the implementation of the [Global Earth Observation System of Systems] plan”; the work of the GEO is described as a “‘best efforts’ activity with voluntary input from states and advice and support from international organizations.”<sup>108</sup> The document identifies land, water, ice, climate, and ocean observation as areas in need of more co-operation;<sup>109</sup> its main objective is to co-ordinate existing observation efforts for increased socio-economic benefits on the basis of user requirements; in addition, it aims for filling gaps in observation methodology, areas, and accessibility. A “robust regulatory framework for Earth observation” is envisaged but according to the framework document it will be confined to questions of observation as such.<sup>110</sup> Yet, as a “system of systems” it has the potential to become a “platform” for co-operative research operations beyond its initial objective.

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<sup>107</sup>Information is available at *Group on Earth Observations (GEO)*, (<http://earthobservations.org/>) – visited on 31 January 2005.

<sup>108</sup>*From Observation to Action – Achieving Comprehensive, Coordinated, and Sustained Earth Observation for the Benefit of Humankind*, Framework for a 10-Year Implementation Plan, adopted by Earth Observation Summit on 25 April 2004, (<http://earthobservations.org/docs/Framework%20Doc%20Final.pdf>) – visited on 31 January 2005, p. 7.

<sup>109</sup>*Ibid.*, p. 3.

<sup>110</sup>The document gives “protection of Radio frequency bands” as an example.

## Chapter 7.

# Customary Law with respect to Marine Scientific Research

To what extent the provisions of the 1982 LOS Convention constitute international customary law has been and will remain an interesting question so long as some coastal States remain outside the conventional regime.<sup>1</sup> For

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<sup>1</sup>The relevance of the question, whether or not the marine scientific research regime reflects customary international law, becomes apparent from an example made by *Ross, David A./Landry, Thérèse A., Marine Scientific Research Boundaries and the Law of the Sea*, WHOI Massachusetts, 1987, p.23: As a non-party to the Convention, the policy of the United States was one of recognising jurisdiction over marine scientific research only within a three nautical miles territorial sea and on the continental shelf as purported by the Geneva Conventions. This meant that a researcher often had to include a research station within three nautical miles or on the continental shelf (rarely delimited) of a coastal State in order to pursue clearance through official State Department channels, regardless of whether the research programme originally required such a station. Otherwise the decision of the State Department could have been interpreted by third states as an acceptance of the other contested provisions of the 1982 LOS Convention.

When on 10 March 1983 the U.S. proclaimed an exclusive economic zone and recognised the right of other states to exercise control over marine scientific research activities within their exclusive economic zones, U.S. researchers and the State Department's Office of Marine Science and Technology Affairs came into the position to request and process clearance for any research activity within 200 nm. Where, however, the U.S. does not recognise claims made in accordance with the provisions of the 1982 LOS Convention, like, for example, the extension of the continental shelf up to 350 nm as provided for by Article 76(5), requests for clearance of research activities within such an area may not be processed by the State Department; see also *Knauss, John A./Katsouros, Mary H., Recent Experience of the United States in Conducting*

these, the rights and duties established by the Convention are only binding if they are in fact restatements of or have been transposed into customary law.

It cannot be denied that new rules of customary international law may be formed when a conventional or contractual norm passes into the general corpus of international law and becomes accepted as such by the *opinio juris* of States. The International Court of Justice views this as a possible process and a recognised method by which a conventional rule can “become binding even for countries which have never, and do not, become parties to the Convention.”<sup>2</sup> A number of requirements, however, must be met for such a process to generate valid rules of customary law. First, the provision concerned should be of a fundamentally norm creating character such as could be regarded to form the basis of a general rule of law. Evidence of such norm creating character is a straightforward obligation and the absence of ambiguous language.<sup>3</sup> Second, there must be a certain elapse of time which—short though it may be—can be supplemented or substituted by a very widespread and representative participation, including States whose interests are specially affected. In this respect, the Court noted:

That non-ratification may sometimes be due to factors other than active disapproval of the convention concerned can hardly constitute a basis on which positive acceptance of its principles can be implied: the reasons are speculative, but the facts remain.<sup>4</sup>

Third, as an indispensable requirement, there must be state practice, both extensive and virtually uniform in the sense of the provision invoked; and should moreover have occurred in such a way, as to show a general recognition that a rule of law or legal obligation is involved.<sup>5</sup> The need for such a belief, i. e., the existence of a subjective element, is implicit in the very notion of the *opinio juris vel sive necessitatis*.<sup>6</sup> But this suggests little more than the necessity of a case-by-case analysis as long as there are conflicts between parties and non-parties.<sup>7</sup>

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*Marine Scientific Research in Coastal State Exclusive Economic Zones*, in *Clingan, Thomas A.*, editor, *What lies ahead?* Honolulu, Hawaii, 1988, pp. 301f.

*Brown, Edward D./Gaskell, Nicholas J.J.*, *The Operation of Autonomous Underwater Vehicles*, Volume 2: Report on the Law, Society for Underwater Technology, London, 2000, p. 16, describe a similar problem with respect to excessive claims of jurisdiction where the official request for consent could be interpreted as a recognition of the claim. In such a case they advise States, given good will on both sides, to *notify* the coastal State of their intention to conduct research at a specific distance without referring to the territorial sea; the coastal State may then *consent* preferably without reference to the territorial sea claim on the assumption that it would have to consent also on the premise of the exclusive economic zone regime.

<sup>2</sup>*North Sea Continental Shelf Cases*, (*F.R.G. v Den.*; *F.R.G. v Neth.*), Judgement of 20 February 1969, 1969 I.C.J.Rep. 3, p. 41, para. 71.

<sup>3</sup>See *Ibid.*, pp. 41f., para. 72.

<sup>4</sup>See *Ibid.*, p. 42, para. 73.

<sup>5</sup>See *Ibid.*, p. 43, para. 74.

<sup>6</sup>See *Ibid.*, p. 44, para. 77.

<sup>7</sup>Or conflicts between non-parties alone.

## THE 1982 LOS CONVENTION

In the case of the predecessor of the 1982 LOS Convention, the parties viewed the text as representing customary international law and made that explicit.<sup>8</sup> A similar statement is missing in the Convention and thus the question is open to much debate. Proponents and opponents are abound, and a clear cut answer is probably impossible.

The regime on marine scientific research in the 1982 LOS Convention consists of a well-woven set of provisions giving rise to the argument that single provisions cannot be considered outside the broader context.<sup>9</sup> Inasmuch as the 1982 LOS Convention is a package-deal in this sense,<sup>10</sup> provisions may have to be interpreted in the light of the various trade-offs relating to each other.<sup>11</sup> The 1982 LOS Convention has reached a level of participation which makes it indeed universal in application. Yet, important players in the marine environs, namely, the United States, remain outside and thus compromise the claim to the Convention's validity in terms of generally accepted rules. To make the case even more complex, non-parties, like the United States, claim that a number of provisions represent custom. However, the approach of these non-parties is particularly delicate, as it offers the possibility of a choose-and-pick attitude with respect to the rights and duties under the 1982 LOS Convention which would be contrary to the package-deal concept. For that reason the applicability of the 1982 LOS Convention to non-parties has been widely contested.

Ambassador *Koh*, second President of the Third U.N. Conference on the Law of the Sea, in his closing statement of the Conference after the Convention had been adopted, said:

[T]his Convention is not a codification Convention. The argument

<sup>8</sup>See Preamble of the Geneva High Seas Convention: "adopted the following provisions as generally declaratory of established principles of international law".

<sup>9</sup>See *Miles, Edward L., Global Ocean Politics: the Decision Process at the Third United Nations Conference on the Law of the Sea, 1973-1982*, The Hague, 1998, p. 81, referring to the position of signatories, among them the Soviet Union, that argued a pick and choose approach was not possible, and the cost the U.S. had to incur to maintain or rather gain the protection of navigational rights.

<sup>10</sup>Closing Statement by the President of the Conference on the Law of the Sea, Press Release SEA/MB/14, reprinted in *Nordquist, Myron H./Park, Choon-Ho*, editors, *Reports of the United States Delegation to the Third United Nations Conference on the Law of the Sea, Law of the Sea Institute*, Honolulu, Hawaii, 1983, Occasional Paper No. 33, pp. 686f.; for a subsequent analysis see *Miles* (as in n. 9), pp. 4f.; see also the rules of procedure, UN Doc. A/CONF.62/30/Rev. 3, reprinted in *Churchill, Robin R./Nordquist, Myron H./Lay, S. Houston, New Directions in the Law of the Sea*, Documents (including index to volumes I-VI), Volume VI, The British Institute of International and Comparative Law, London, 1977, pp. 565-581, especially Rules 37f. and Appendix (*Gentlemen's Agreement*).

<sup>11</sup>See *Nordquist, Myron H.*, editor, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Volume I, Dordrecht, 1985, pp. 462f., warning against a sweeping declaration of custom.

that... the Convention codifies customary law or reflects existing international practice is factually incorrect and legally insupportable.<sup>12</sup>

In contrast, Ambassador *Clingan*, Head of the U.S. Delegation to the U.N. Conference, after asserting that the U.S.A. would not ratify the Convention, said on occasion of his address at the Final Session:

[T]hose parts of the 1982 LOS Convention dealing with navigation and overflight and most other provisions of the 1982 LOS Convention serve the interest of the international community. These texts reflect prevailing international practice. They also demonstrate that the Conference believed that it was articulating rules in most areas that reflect the existing state of affairs—a state we wished to preserve by enshrining these beneficial and desirable principles in treaty language.<sup>13</sup>

The Chamber of the International Court of Justice, constituted in the *Case Concerning the Delimitation of the Maritime Boundary in the Gulf of Maine Area (Canada v United States of America)*, noted that certain provisions concerning the continental shelf and the exclusive economic zone were, in the 1982 LOS Convention, adopted without any objections and may be regarded as consonant at present with general international law on the question.<sup>14</sup> Now, more than twenty years after the adoption and about ten after its entry into force, even the majority of the earlier opponents has ratified the Convention<sup>15</sup> and with the number of Parties increasing<sup>16</sup> the question, whether the Convention may reflect customary law at large, becomes less and less important.<sup>17</sup>

### *Part XIII in State Practice*

*E.D. Brown* pointed out in 1994 that “signatory and non-signatory States alike are gradually accepting the rules of Part XIII and are basing their law

<sup>12</sup> *Koh, Thomas T., A Constitution for the Oceans*, in *United Nations*, editor, *The Law of the Sea: Official Text of the United Nations Convention on the Law of the Sea with Annexes and Index*, New York, 1983, p. xxxv.

<sup>13</sup> Quoted from *Nordquist/Park* (as in n. 10 on the page before), p. 665.

<sup>14</sup> See 1984 I.C.J.Rep., p. 246(294); in the *Case Concerning the Continental Shelf (Libyan Arab Jamahiriya v Malta)*, 1985 I.C.J.Rep., p. 13(33), went even further.

<sup>15</sup> It seems that even in the U.S.A. as the fiercest of all opponents a new dynamism might lead to ratification before long, as the Bush administration has appointed an independent national Ocean Commission to recommend ways for a co-ordinated, effective, and sustainable ocean policy, see U.S. Ocean Act 2000 (Public Law 106–256, 106<sup>th</sup> Congress), 7 August 2000.

<sup>16</sup> As of 15 July 2003 there are 143 Contracting Parties to the 1982 LOS Convention, see *Oceans and Law of the Sea*, Division for Ocean Affairs and the Law of the Sea (DOALOS), (<http://www.un.org/Depts/los/index.htm>) – visited on 31 January 2005.

<sup>17</sup> It should be noted, that the Preamble in the seventh paragraph puts the reader on notice that the Convention as a whole was not, on its adoption, sharply categorised as being either one of codification or a restatement of customary law, see *Nordquist* (as in n. 11 on the preceding page), p. 463.

and practice upon these rules.” He also found that even States remaining outside the 1982 LOS Convention could hardly afford to ignore Part XIII as a matter of practicality: “A refusal to respect the rights of other States under the Convention would simply mean that consent would be withheld from British applicants wishing to conduct marine scientific research in the foreign waters in question.”<sup>18</sup> In contrast, with respect to the provisions on marine scientific research, *Knauss* observed that individual state practice sometimes differs substantially from strict and uniform compliance with the 1982 LOS Convention’s provisions; although some of these divergences seemed to stem from coastal States’ willingness to waive certain rights granted under the treaty, rather than to require more,<sup>19</sup> it would nevertheless be difficult to view Part XIII under this premise as declaratory of established custom. According to *McLaughlin*, some States deviate from the 1982 LOS Convention to the extent that research is effectively precluded, and the policy of a few coastal States may even be termed capricious.<sup>20</sup> Divergences reach from less stringent requirements, such as less than six months advance notice, over ‘unacceptable’ conditions,<sup>21</sup> such as the requirement of additional port calls, to outright contraventions. For example, Algeria claims that dissemination of collected “information constitutes an obligation” and requires assistance in interpreting results; moreover, “equipment used may, at the conclusion of the mission, be handed over to Algerian researchers” as Algeria considers the transfer of technology an essential element of Algerian practice.<sup>22</sup> In his latest annual report the U.N. Secretary-General observes, after noting a general trend towards harmonisation of legislation with provisions of the 1982

<sup>18</sup>See *Brown, Edward D., The International Law of the Sea*, Volume I Introductory Manual, Dartmouth, 1994, p. 422; note, however, that he contends at p. 438 “that there is still a long way to go in transforming the UN Convention regime of MSR into municipal law and practice.” *Treves, Tullio, Marine Research*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume 11, Amsterdam, 1989, p. 208, holds that the consent principle seems generally accepted with respect to the territorial sea and the continental shelf but not to the same extent for the exclusive economic zone; however, apart from a mere influence on national legislation, “the detailed provisions spelled out in the [Convention] certainly are not [becoming customary law] and, because of their precision, are unlikely to become so.”

<sup>19</sup>See *Knauss/Katsouros* (as in n. 1 on page 271), pp. 304f.

<sup>20</sup>See *McLaughlin, Richard J., Confidential Classification of Multi-Beam Bathymetric Mapping of the U.S. EEA: Is a New U.S. Marine Scientific Research Policy in Order?* in *O.D. & Int'l L.* 19 [1988], p. 15; *Knauss/Katsouros* (as in n. 1 on page 271), pp. 304–307; *Fenwick, Judith, International profiles on marine scientific research: national maritime claims, MSR jurisdiction, and U.S. research clearance histories for the world's coastal states*, Woods Hole, MA, 1992, p. viii, finding that “some states, regardless of their LOS status, have drafted regulations which are inconsistent with the treaty”, and others have proclaimed more stringent or specific requirements.

<sup>21</sup>See *Knauss/Katsouros* (as in n. 1 on page 271), pp. 305f., referring first to a case where express consent for publication was required, and secondly a case where parts of the research project were cancelled because the required port calls would have entailed detours of the scheduled itinerary which deemed unacceptable.

<sup>22</sup>Cited from *Fenwick* (as in n. 20), p. 2.

LOS Convention, “[s]ome deviations relate also to the rights of the coastal States. . . in relation to marine scientific research.”<sup>23</sup>

### *State Practice Worldwide*

With respect to the overall picture of compliance with the legal regime of Part XIII, *E.D. Brown*—on the basis of 33 instruments with detailed regulations or procedures for marine scientific research produced by 31 States in the period from 1971 to 1989—observed that no clear pattern emerged. He noted “considerable variety among Asian States”, little or broad reference to Part XIII in African and Latin American States, with clear departures among the latter, and only for the group of Western European States and Others “a substantial degree of conformity with the UN Convention regime”. With respect to legislation passed since 1989, the picture is not a whole lot different. Many States have transposed the text of the 1982 LOS Convention literally into domestic legislation—at least in part.<sup>24</sup> Others devi-

<sup>23</sup> *U.N. Secretary-General, Oceans and the law of the sea*, UN Doc. A/59/62, New York, 4 March 2004, p. 10.

<sup>24</sup> See, for example, the Preamble (c)(iii) of Australia’s Seas and Submerged Lands Act 1973, as amended by the Maritime Legislation Amendment Act 1994; Angola’s Law No. 21/92 of 28 August 1992, Article 8(b)(2); Article 14 of the Federal Law No. 19 of 1993 in respect of the delimitation of the maritime zones of the United Arab Emirates; sec. 10(b)(ii) of the Maritime Areas Act, 1982, Act No. 18 of 17 August 1982 of Antigua and Barbuda; sec. 9(b)(ii) of Belize’s Maritime Areas Act, 1992; Article 11 of China’s Law on the Territorial Sea and the Contiguous Zone of 25 February 1992; Sec. 4(c) of Jamaica’s Act 33 of 1991 entitled “The Exclusive Economic Zone Act, 1991”; Article 3(2)(c) of Korea’s Exclusive Economic Zone Act No. 5151, promulgated on 8 August 1996; the Maldives require authorisation by sec. 3 of the Maritime Zones of Maldives Act No. 6/96; Article 9(2)(b) of Sierra Leone’s Maritime Zones (Establishment) Decree, 1996; Article 6(e) of Sao Tome and Principe’s Law No. 1/98 on delimitation of the territorial sea and the exclusive economic zone; sec. 9(1)(b) of Sierra Leone’s Maritime Zones (Establishment) Decree, 1996; sec. 9 of Tanzania’s Territorial Sea and Exclusive Economic Zone Act of 1989 (but note, that Tanzania provides in sec. 10 for imprisonment and forfeiture of any vessel as a possible enforcement measure where research is conducted outside an agreement with the government; see also *Mlimuka, Aggrey K. L. J., The Influence of the 1982 United Nations Convention on the Law of the Sea on State Practice: The Case of the Tanzanian Legislation Establishing the Exclusive Economic Zone*, in *O.D. & Int’l L.* 26 [1995]); sec. 2(b) of Thailand’s Royal Proclamation establishing the Exclusive Economic Zone of the Kingdom of Thailand of 23 February 1981; Article 10(3)(b) of Law No. 7/2002 Maritime Borders of the Territory of the Democratic Republic of Timor-L’Este; sec. 19(b) of Trinidad and Tobago’s Archipelagic Waters and Exclusive Economic Zone Act, No. 24 of 11 November 1986; sec. 12 of Tuvalu’s Marine Zones (Declaration) Act of 1983 provides for regulation of marine scientific research by reference to international law; Articles 6(B) and 13 of Uruguay’s Act 17.033 of 20 November 1998 establishing the boundaries of the territorial sea, the adjacent zone, the exclusive economic zone, and the continental shelf; Article 13 establishes a consent procedure by reference to the 1982 LOS Convention; Article 3(1)(b) and 9 of Venezuela’s Act establishing an Exclusive Economic Zone of 26 July 1978 (except for a rather vague stipulation with respect to denial of consent on the basis of “unjustifiable interference”); the texts are available at *Maritime Space: Maritime Zones and Maritime Delimita-*



ate in terminology<sup>25</sup> which indicates uncertainty as to the interpretation of the coastal State's rights under the 1982 LOS Convention, or in substance, ranging from provisions deviating in substance<sup>26</sup> to absent legislation with respect to marine scientific research.<sup>27</sup> Even though the time limit for the consent procedure establishes an upper ceiling, deviation from which, in the form of shorter lead-times, would not constitute a violation of the 1982 LOS Convention, the fact remains that some States have effectively precluded research activities or presented unacceptable demands. Such an attitude would not fulfil the above mentioned requirements established by the International Court of Justice.

The possibility of repercussions where research cruises are conducted in

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tion, (<http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/index.htm>) – visited on 31 January 2005.

<sup>25</sup> Thus, a number of States claim *exclusive* jurisdiction over marine scientific research (see Article 8 of Brazil's Law No. 8.617 of 4 January 1993 on the territorial sea, the contiguous zone, the exclusive economic zone and the continental shelf; Republic of Cape Verde's Article 13(b) of the Law No. 60/IV/92 of 21 December 1992. Article 2(2) of Turkey's Decree No. 86/11264 of 17 December 1986; sec. 6(2)(c) of Pakistan's Territorial Waters and Maritime Zones Act from 22 December 1976; sec. 2(B) of the Philippine's Presidential Decree No. 1599 of 11 June 1978 establishing an Exclusive Economic Zone and for other purposes; sec. 10(e) of the Seychelles' Maritime Zones Act, 1999 (Act No. 2 of 1999); sec. 10(c) of Vanuatu's Maritime Zones Act No. 23 of 1981; Statement by the Republic of Vietnam on the Territorial Sea, the Contiguous Zone, the Exclusive Economic Zone and the Continental Shelf of 12 May 1977; Article 14(c) of Yemen's Act No. 45 of 1977), others claim (exclusive) jurisdiction over scientific research or marine research (see, for example, Article 5 of Cambodia's Decree of the Council of State of 13 July 1982; sec. 28(1) of Niue's Territorial Sea and Exclusive Economic Zone Act 1996 which in the context of fisheries provides for a permit for scientific research; Article 6(e) of Sao Tome and Principe's Law No. 1/98 on delimitation of the territorial sea and the exclusive economic zone; sec. 26(a) of Tonga's Territorial Sea and Exclusive Economic Zone Act as amended by Act No. 19 of 1989). The texts are available at *Ibid.*.

<sup>26</sup> See, for example, the Territorial Waters and Maritime Zones Act 1974, Act No. XXVI of 1974 of Bangladesh, containing a number of provisions whose scope of application *ratione materiae* is not entirely clear: it establishes an economic zone (which also comprises of the sea-bed) and a continental shelf, research is mentioned but only in relation to the continental shelf, it is thus not clear if and how Bangladesh may exercise jurisdiction under Part XIII; Western Samoa's Exclusive Economic Zone Act No. 3 (amended 1980) foresees in sec. 15(1) "regulating the conduct of scientific research within the exclusive economic zone" without any further specifications; according to sec. 20 of its Maritime Areas Act of 19 May 1983 (Act No. 15 of 19 May 1983) St. Vincent and the Grenadines intends to regulate the exploration of living resources on the same level as marine scientific research. A few States require "licenses" for research activities which would raise the question if such licenses had to be paid for, see, for example, sec. 11(c) of Vanuatu's Maritime Zones Act No. 23 of 1981. The texts are available at *Ibid.*

<sup>27</sup> See, for example, Argentine's Act No. 23.968 of 14 August 1991: Article 5 on the exclusive economic zone contains provision for the exercise of sovereign rights with respect to living and non-living resources and other activities for the economic exploitation and exploration of the zone, no mention is made of scientific research; yet, in Article 9 Argentine retains exclusive jurisdiction over "all kinds of installations and structures" which would also include those for marine scientific research.

spite of the rules established by Part XIII of the 1982 LOS Convention, is likely to deter scientists from even considering that option. Conversely, non-compliance with the provisions of Part XIII by coastal States is unlikely to be remedied, for example, by third party dispute settlement since scientists, given the high costs of research cruises, are more likely to either abandon the research project or subdue to the conditions presented with. While this does not necessarily lead to the establishment of customary law, because of the missing subjective element—*opinio juris vel sive necessitatis*—, it has the same practical consequence and can eventually not be distinguished from state practice.<sup>28</sup>

### *State Practice in Europe*

Europe has a long standing history of co-operation in the area of marine science;<sup>29</sup> it presents more researching States than any other region in the world; several regional agreements touch on the issue of marine scientific research; and research is to a large extent conducted within the waters of neighbouring European States.

With respect to the European Union, a study on the attitude and practice of its member States reveals that at least these 15 industrialised countries take a rather relaxed view at the matter of scientific research. Belgian law requires consent for research in the territorial sea, prior notification for fisheries research in its fishery zone, and a license for research concerning the natural resources; all requests must be processed through the Ministry of Foreign Affairs and be submitted three months prior to intended start of

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<sup>28</sup> *Gorina-Ysern, Montserrat, An International Regime for Marine Scientific Research*, Ardsley, 2003, pp. 31–181, gives an overview of regional implementation of the Marine Scientific Research Regime according to 12 categories, including boundaries, jurisdiction, implementation problems and implied consent. She concludes “that there are many regions where the regime remains nominal for lack of practical implementation [and...] that the lack of definition of MSR in the convention has resulted in a significant terminological chaos.” I.O.C. has conducted a survey based on a questionnaire which had been reformulated to take specific account of provisions on marine scientific research in the 1982 LOS Convention and the debate at I.O.C. The questionnaire was finalised on 20 November 2002; until 9 April 2003 31 completed questionnaires were returned to the Secretariat (which amounts to a sample size of a mere 24%), *Intergovernmental Oceanographic Commission, Introductory Paper of the Secretariat on the Results of the IOC Questionnaire 3 on the Practices of the IOC Member States regarding Marine Scientific Research and Transfer of Marine Technology (Extract of a report by Roland Roger)*, Fourth Meeting of the Advisory Body of Experts on the Law of the Sea, Lefkada Island, Greece, 4–7 May 2004, IOC/ABE-LOS IV/9 rev., 23 April 2004, p.2. A detailed report by Mr. *Roland Rogers* may be obtained through the I.O.C. at Paris.

<sup>29</sup> The ICES Convention (as in n. 54 on page 24) can be considered the first international agreement on marine scientific research.

the project.<sup>30</sup> Denmark retains its rights under international law<sup>31</sup> and requires three months lead time.<sup>32</sup> Finland requires prior permission for research on the continental shelf.<sup>33</sup> France purports to exercise its jurisdiction within the international ramifications and requires prior authorisation for all marine scientific research activities conducted in the territorial sea, the exclusive economic zone and on the continental shelf; the relevant law makes no difference between national and foreign researchers in the authorisation process; for that reason “le décret, auquel renvoie la loi pour la définition des conditions et modalités de délivrance des autorisations, n’est toujours pas intervenu.”<sup>34</sup> Germany does not require permission for research activities relating to the water column as such; however, authorisation by the B.S.H. may be required where marine scientific research interferes with other uses of the sea. A license must be obtained for research activities relating to the continental shelf.<sup>35</sup> Greece requires permission for research in its territorial sea and on its continental shelf, request of which must be submitted two months before the scheduled time of the research.<sup>36</sup> Ireland has no domestic legislation on marine scientific research, nevertheless, it has established a procedure in accordance with its attitude of approval toward Part XIII.<sup>37</sup> Italy has implemented the text of the 1982 LOS Convention in the domestic law by a formal statute so that the provisions of Part XIII apply directly.<sup>38</sup>

<sup>30</sup>See *Franck, Erik, Belgium and the Law of the Sea*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, p. 88.

<sup>31</sup>See Article 3 of the Act No. 411 of 22 May 1996 on Exclusive Economic Zones, the text is available at DOALOS: State practice (as in n. 24 on page 276).

<sup>32</sup>See *Forms Required for Requesting Authorization to Conduct Marine Scientific Research in Denmark and Greenland Waters*, (<http://www.state.gov/www/global/oes/oceans/ntrvo103.html>) – visited on 31 January 2005; according to information from the B.S.H. lead time (for German vessels) is two months.

<sup>33</sup>See Article 2 of the Law No. 149 of 5 March 1965 concerning the Continental Shelf, the text is available at DOALOS: State practice (as in n. 24 on page 276); according to information from the B.S.H. lead time for research cruises is 14 days.

<sup>34</sup>*Quéneudec, Jean-Pierre, La France et le droit de la mer*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, p. 195; according to information from the B.S.H. France requires four months lead time.

<sup>35</sup>See § 132(1) BBergG, see n. 39 on page 185. Even though Germany has claimed an exclusive economic zone in 1994 (“Bekanntmachung der Proklamation der Bundesrepublik Deutschland über die Errichtung einer ausschließlichen Wirtschaftszone der Bundesrepublik Deutschland in der Nordsee und in der Ostsee vom 29.11.1994”, B.G.Bl. 1994 II 3769), it has as of 15 July 2003 not passed any legislation to implement Part XIII.

<sup>36</sup>See *Roucounas, Emmanuel, Greece and the Law of the Sea*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, pp. 248f.; according to information from the B.S.H. German vessels need to give notice 24hrs prior to a port access and be represented by a local agent.

<sup>37</sup>See *Symmons, Clive R., Ireland and the Law of the Sea*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, pp. 315f.; see (<http://www.marine.ie/scientific+services/surveys/foreign+vessels+surveys/index.htm>) – visited on 31 January 2005, it would appear that the procedure follows closely Part XIII: according to information from the B.S.H. lead time is six months.

<sup>38</sup>See *Treves, Tullio, Italy and the Law of the Sea*, in *Treves, Tullio*, editor, *The Law of*

The Netherlands require three months advance notification of research activities within its jurisdiction (although there are no rules dealing specifically with marine scientific research), it seems to follow a notification rather than an authorisation concept, exceptions apply where the research “may lead to the proving of the presence of exploitable quantities of mineral resources”, as in such an instance prior permission must be obtained from the Ministers of Economic Affairs and of Education and Sciences.<sup>39</sup> Portuguese law on marine scientific research tends to be a strict implementation of Part XIII—in fact, stricter on nationals than on foreign researchers; once the project is authorised, the additional conditions by Portuguese law tend to be less restrictive than those envisaged in Article 249 of the 1982 LOS Convention; yet the general justifications for refusal of an application—“à des fins de défense nationale” or “à des fins de protection du milieu aquatique”—are not to be found in Part XIII but may be justified on the grounds of the powers granted to coastal States by Part XII.<sup>40</sup> Spain requires prior authorisation of research projects. Permission must be expressly obtained for the territorial sea; for the exclusive economic zone and the continental shelf consent may be assumed after four months.<sup>41</sup> Sweden requires prior permission which can be obtained with a 4–6 weeks lead time.<sup>42</sup> The United Kingdom has no special statutory regime, permission is required nevertheless for research in the territorial sea and in a 200 nm zone if it concerns the resources of the

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the Sea: the European Union and its Member States, The Hague, 1997, pp.359–363; according to information from the B.S.H. a cruise report must be submitted promptly after the end of the cruise.

<sup>39</sup>See *Dotinga, Harm M./Soons, Alfred H. A., The Netherlands and the Law of the Sea*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, p. 426.

<sup>40</sup>See *Gonçalves, Maria Eduarda, Le Portugal et le droit de la mer*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, pp.445f.; according to information from the B.S.H. lead time is six months; participation of a Portuguese scientist is compulsory in the territorial sea. But note, that Article 7 of Portugal’s Act No. 33/77 of 28 May 1977, regarding the juridical status of the Portuguese Territorial Sea and the Exclusive Economic Zone, refers to scientific research in general.

<sup>41</sup>See *Bou, Valentín/Bermejo, Romaldo, L’Espagne et le droit de la mer*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, p.491. Note, however, the experience of *Plesmann/Röben, Plesmann, Wolf/Röben, Volker, Marine Scientific Research: State Practice versus Law of the Sea?* in *Wolfrum, Rüdiger*, editor, *Law of the Sea at the Crossroads: The Continuing Search for a Universally Accepted Regime*, Berlin, 1990, Veröffentlichungen des Instituts für Internationales Recht an der Universität Kiel 113, p.382; according to information from the B.S.H. lead time is six months.

<sup>42</sup>See *Jacobsson, Marie, Sweden and the Law of the Sea*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, pp.504f. Article 9 of the Act on Sweden’s economic zone, promulgated on 3 December 1992, does not stipulate a time frame (according to information from the B.S.H.—on file with the author—Sweden has required permission even for innocent passage of state research vessels); yet, the relevant authority may waive the requirement of prior permission, the text is available at DOALOS: State practice (as in n. 24 on page 276).

continental shelf or fisheries; applications must be submitted three months before the proposed research; normal conditions for consent are that results of the research must be provided within 12 months after the cruise and a British observer be invited.<sup>43</sup>

Other European countries provide a similar picture. Bulgaria deviates from the 1982 LOS Convention by claiming an *exclusive* right and jurisdiction with regard to the conduct of marine scientific research.<sup>44</sup> Croatia provides for a consent procedure in accordance with Part XIII.<sup>45</sup> Estonia requires prior notification for access to internal waters by 14 days and for innocent passage 48hrs through diplomatic channels; Latvia requires notification three months prior to the research cruise, permission must be obtained for port access; Lithuania requires prior notification by 30 days, permission must be obtained for port access.<sup>46</sup> Monaco requires prior permission which may be denied when research methods pose a threat to the environment.<sup>47</sup> Consent must be obtained for research in waters under Norwegian jurisdiction from the Directorate of Fisheries; applicants are advised to comply with separate legislation before entering Norwegian jurisdiction; lead time for application is six months; Norwegian legislation follows closely the provisions of Part XIII.<sup>48</sup> Poland requires six months lead time for notification; consent may be denied if the research project threatens the environment; otherwise Polish legislation complies with Part XIII.<sup>49</sup> Roumania requires consent for research in internal waters and the territorial sea.<sup>50</sup> The Russian Federation requires application for consent six months prior to the research cruise; consent may be refused on the grounds of national security and threats to the environment.<sup>51</sup> Ukraine's legislation requires six months lead time for

<sup>43</sup>See *Lowe, Vaughan, The United Kingdom and the Law of the Sea*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, p. 552.

<sup>44</sup>Article 47(2)(b) of the Maritime Space, Inland Waterways and Ports Act of the Republic of Bulgaria 28 January 2000, no difference is made between research in the territorial sea and in the exclusive economic zone; Article 52(2), however, makes direct reference to the 1982 LOS Convention with respect to the permission.

<sup>45</sup>See Articles 13, 32, 41 of the Maritime Code from January 1994; further regulations shall be laid down on the basis of Article 1043(43) by the competent minister.

<sup>46</sup>Information from the B.S.H. on file with the author.

<sup>47</sup>Article L.241-2 of the Act No. 1.198 of 27 March 1998 containing the Code of the Sea; further regulations are foreseen by way of a sovereign order.

<sup>48</sup>See Norway's Regulations relating to foreign marine scientific research as in n. 199 on page 111.

<sup>49</sup>Articles 17(2)(b), 28-32 of the Act concerning the maritime areas of the Polish Republic and the marine administration from 21 March 1991; note, that, according to Article 31 of the Polish Act, research may be conducted by Polish natural and juridical persons without a licence; they are merely required to inform the relevant authorities 14 days ahead of the research cruise.

<sup>50</sup>Article 29 of the Act concerning the Legal Regime of the Internal Waters, the Territorial Sea and the Contiguous Zone of Roumania, 7 August 1990.

<sup>51</sup>See Article 21 'Grounds for refusal of permission to carry out marine scientific research' of the Federal Act (as in n. 197 on page 109) these reasons are not listed in Article

applications, conditions for consent are in accordance with Part XIII.<sup>52</sup>

In effect, one may argue that at least some of these States—while belonging to the most important researching States—do not apply the concept of prior consent in the strict spirit of the letter and provide for that reason no conclusive evidence of state practice. However, where these European States have established a consent procedure, they tend to interpret Part XIII of the 1982 LOS Convention as a ceiling; none of the States has implemented measures that would constitute a breach of their international obligations. From the researching state perspective it makes sense to provide for more lenient requirements on the basis of reciprocity: it could instigate a change of attitude by other States. In addition, one must note that the waters of European coastal States are predominantly visited by research vessels from other European States<sup>53</sup> which would suggest a more co-operative approach on the basis of reciprocity as well as regional agreements.<sup>54</sup>

#### OTHER INTERNATIONAL INSTRUMENTS

The development of international law at large may have consequences for the regime of marine scientific research, as established under the 1982 LOS Convention. The Convention, comprehensive though it is, does not cover every aspect of ocean uses and is careful to affirm in the eighth recital of the Preamble that matters not regulated by it continue to be governed by the rules and principles of “general international” law.<sup>55</sup> This phrase is not a term of art but aims to establish a link between the 1982 LOS Convention and existing law, and to ensure the most effective application by avoiding any lacunae.<sup>56</sup> Also, it is an established principle of treaty law that subsequent state practice may assist in interpreting the treaty provisions in question.<sup>57</sup>

Apart from the 1982 LOS Convention, a number of other international treaties refer in some way or other to marine scientific research.<sup>58</sup> They

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249.

<sup>52</sup>Articles 4, 13, 14 and 15 of the Law of Ukraine on the exclusive (marine) economic zone of 16 May 1995.

<sup>53</sup>Conclusion drawn from a survey in the context of a Draft Council Directive (copy on file with the author).

<sup>54</sup>Under the Helsinki Convention co-operation in the field of monitoring of the Baltic Sea has led some States to grant open permissions for a whole year in order to allow for research operations on short notice, compare HELCOM Recommendation 12/1 from 21 February 1992.

<sup>55</sup>See *Birnie, Patricia W., Law of the Sea and Ocean Resources: Implications for Marine Scientific Research*, in Int'l J.Mar. & C.L. 10 [1995], p. 403.

<sup>56</sup>See *Nordquist* (as in n. 11 on page 273), p. 465.

<sup>57</sup>See I.C.J. in its *Advisory Opinion of 21 June 1971* (as in n. 4 on page 3).

<sup>58</sup>See *Ryder, Peter, Marine Scientific Research and Operational Oceanography in the Context of the UN Convention on the Law of the Sea*, Sixth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System (GOOS), Scientific and Technical Requirements of GOOS in Relation to UNCLOS, Paris, 10–14 March 2003, IOC-WMO-UNEP/I-GOOS-VI/10, pp. 35f., referring to SOLAS Convention (as

can generally be divided into bilateral and multilateral agreements<sup>59</sup>; and furthermore, those which have marine scientific research as their specific subject and those which affect research only implicitly and deal substantially with the protection or management of living resources, the environmental protection, or scientific and technical co-operation.<sup>60</sup>

Clauses in these treaties with relevance to marine scientific research may be categorised as follows:<sup>61</sup> clauses on or containing:

1. Definitions;
2. The promotion or facilitation of scientific research which are usually of a more general character and refer to the intention of the parties and the significance of scientific research for the purpose of the treaty; these can be subdivided into clauses that provide:
  - a) General declarations of intent;<sup>62</sup>
  - b) Exceptions or waivers to minimise restrictions on research;<sup>63</sup>
  - c) Obligations with respect to the promotion of institutions or scientists in terms of funding or education and know-how transfer;<sup>64</sup>

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in n. 18 on page 124), Climate Change Convention (as in n. 5 on page 10), Biodiversity Convention (as in n. 6 on page 10), Agenda 21 (as in n. 7 on page 10), 1995 Implementation Agreement (as in n. 10 on page 11), London Dumping Convention (as in n. 9 on page 11), Global Programme of Action (as in n. 8 on page 11), Helsinki Convention (as in n. 75 on page 242), and OSPAR Convention (as in n. 69 on page 139) as conferring the obligation upon states under the various instruments to promote and foster scientific research or contribute to research operations.

<sup>59</sup>See *Ostseeinstitut für Seerecht und Umweltrecht, Synopse und Analyse meeresbezogener Forschungsklauseln in völkerrechtlichen Verträgen*, Rostock, 2001, p. 6, referring for Germany to 63 bilateral and 34 multilateral treaties (including the 1982 LOS Convention) with some relevance to marine scientific research; *Döhler, Elmar/Nemitz, Carsten, Wissenschaft und Wissenschaftsfreiheit in internationalen Vereinbarungen*, in *Wagner, Hellmut*, editor, *Rechtliche Rahmenbedingungen für die Wissenschaft und Forschung, Forschungsfreiheit und staatliche Regulierung*, Volume 1: *Freiheit von Wissenschaft und Forschung*, Baden-Baden, 2000, p. 161.

<sup>60</sup>See *Ostseeinstitut* (as in n. 59), pp. 7f.

<sup>61</sup>See on the following: *Döhler/Nemitz* (as in n. 59), pp. 166f.; see also *Czybulka, Detlef/Kersandt, Peter, Rechtsvorschriften, rechtliche Instrumentarien und zuständige Körperschaften mit Relevanz für marine Schutzgebiete ("Marine Protected Areas"/MPAs) in der Ausschließlichen Wirtschaftszone (AWZ) und auf Hoher See des OSPAR-Konventionsgebietes*, Bonn, 2000, BfN Skripten 27, pp. 89f.

<sup>62</sup>See preamble of the Biodiversity Convention (as in n. 6 on page 10); preamble and Article IX(1) of the Antarctic Treaty (as in n. 181 on page 161).

<sup>63</sup>See, for example, Article VIII(1) of the *International Convention for the Regulation of Whaling*, adopted 2 December 1946, entry into force 11 October 1949, 161 U.N.T.S. 74, the text is available at (<http://www.iwcoffice.org/commission/convention.htm>) – visited on 31 January 2005.

<sup>64</sup>See, for example, Article 3 of the *Vienna Convention for the Protection of the Ozone Layer*, adopted 22 March 1985, entry into force 22 September 1988, 1513 U.N.T.S. 324.

3. International co-operation, which usually contain a mere declaration of intent, but may also stipulate the exchange of scientists and data;
4. Information exchange,<sup>65</sup> need of which is often the background for an international agreement;
5. Partaking in research projects, resources, and results which could include free access to research institutions and results; inasmuch as they stipulate an obligation they provide a basis for active participation and go beyond the mere free access clauses;
6. Institution of international organisations for the furtherance of scientific research.<sup>66</sup>

Equally, treaties may contain restrictions in terms of research bans or limitations, certain requirements with respect to qualification (restricting research to a certain number of qualified personnel), and provisions on liability,<sup>67</sup> which require (costly) additional measures of precaution.<sup>68</sup>

### *Global Instruments*

Global instruments, like the Biodiversity Convention and Climate Change Convention, refer in general terms to (scientific) research and make it an obligation for their respective parties to “promote and encourage”<sup>69</sup>, or “support international and intergovernmental efforts”<sup>70</sup>. However, these obligations are hardly more than a restatement of what is already contained in the 1982 LOS Convention. As such they gain not much momentum in changing the general pretext under which marine scientific research is conducted.

### *Regional Instruments*

More effect in terms of promotion and facilitation can be expected from instruments with a regional scope. Generally, the text of the relevant provisions signals a higher commitment of the parties.

<sup>65</sup>See, for example, Article III(a) of the Antarctic Treaty (as in n. 181 on page 161); Article VIII(3) of the Whaling Convention (as in n. 63 on the page before).

<sup>66</sup>See, for example, Article 9 of the Climate Change Convention (as in n. 5 on page 10); Article VII and XV of the *Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR)*, adopted 20 May 1980, entry into force 07 April 1982, 1329 U.N.T.S. 481.

<sup>67</sup>*Döhler/Nemitz* (as in n. 59 on the preceding page), pp. 169f.

<sup>68</sup>*Gorina-Ysern*, *International Regime* (as in n. 28 on page 278), pp. 492f., examines a number of agreements complementing the M.S.R. clearance process with emphasis on the intellectual property rights issues arising out of or in relation to M.S.R. activities.

<sup>69</sup>Article 12(c) of the Biodiversity Convention (as in n. 6 on page 10).

<sup>70</sup>Article 5(b) of the Climate Change Convention (as in n. 5 on page 10).



*ICES*

The *International Council for the Exploration of the Sea (ICES)* had taken steps to simplify consent procedures after the experience of difficulties in the 1960s and 1970s; most of these attempts failed, however, and “the only success has been the drafting of a Standard Form”.<sup>71, 72</sup> Nevertheless, ICES continues to serve as a valuable platform for the co-ordination of research efforts; its mandates as advisory body for national governments and the European Union may lead to a key role in European research efforts in the future.

*Helsinki Convention*

According to Article 3(5) of the Helsinki Convention, the parties are required to conduct “measurements and calculation... in a scientifically appropriate manner in order to assess the state of the marine environment of the Baltic Sea Area and ascertain the implementation of [the Helsinki Convention].”<sup>73</sup> Article 24(1) of the Helsinki Convention, requiring scientific co-operation,<sup>74</sup> uses the word ‘undertake’ instead of ‘shall’ which suggests a much more stringent obligation in comparison to the general wording of Articles 242 and 243 of the 1982 LOS Convention. Furthermore, it stipulates a change of policies as a concrete action of facilitation which also goes beyond the language of the two Articles and of the more pertinent Article 255. And even though the Helsinki Commission, charged according to Article 20 with the observation of the implementation of the Helsinki Convention, has no power to take binding decisions, its recommendations, covering the whole ambit of the Helsinki Convention, constitute a significant political incentive.<sup>75</sup> Article 16 establishes further obligations of States Parties with respect to reporting and exchange of information.

<sup>71</sup> Soons, Alfred H. A., *Regulation of Marine Scientific Research by the European Community and its Member States*, in O.D. & Int'l L. 23 [1992], p. 273.

<sup>72</sup> The so-called ICES-form (“Notification of Proposed Research Cruise”) provides principally for the same information as the U.N. Standard Form A (see n. 196 on page 109); it is predominantly used and required by ICES member States.

<sup>73</sup> See also Ehlers, Peter, *Das revidierte Helsinki-Übereinkommen*, in Koch, Hans-Joachim/Lagoni, Rainer, editors, *Meeresumweltschutz für Nord- und Ostsee: Zum Zusammenspiel von Völkerrecht und nationalem Umweltrecht*, Baden-Baden, 1996, Forum Umweltrecht 19, p. 109.

<sup>74</sup> See n. 75 on page 242, Article 24(1):

The Contracting Parties undertake directly... to co-operate in the fields of science, technology and other research, and to exchange data and other scientific information for the purposes of this Convention. In order to facilitate research... the Contracting Parties undertake to harmonize their policies with respect to permission procedures for conducting such activities.

See *Ibid.*, pp. 122f.

<sup>75</sup> See *Ibid.*, p. 121.

The Baltic Monitoring Programmes (B.M.P.) undertaken under the Helsinki Convention from 1979 until 1993 were an example for a regional research co-operation. The “Guidelines” adopted for each programme<sup>76</sup> provide a basis for scientific research into the marine environment.<sup>77</sup> The aim of the third programme was “to follow the long-term... change... of selected determinands in the Baltic ecosystem.”<sup>78</sup> Monitoring was undertaken in order to assess “the state of the marine environment” and forecast “possible man-induced changes”. Yet, it explicitly excluded “scientific investigations, which... may be of importance in the planning of future monitoring activities.”<sup>79</sup> The difference between monitoring and marine scientific research is not easy to establish. In many instances methods will be the same. The crucial point would appear to be that monitoring has the character of reporting and observing the current state of the environment on the basis of established knowledge, whereas marine scientific research attempts to explain the unknown. Also, monitoring in the context of the Helsinki Convention takes on the character of a policy measure to ensure compliance with the obligations undertaken under the instrument, whereas such considerations are generally alien to marine scientific research. It should be noted that monitoring and marine scientific research may not be delineated like fundamental and applied science. Even though monitoring feeds directly into the management it is not carried out with a view to commercial interests; monitoring data are essentially a public good.

Interestingly, the B.M.P. guidelines did not provide for simplified procedures for carrying out scientific research in the exclusive economic zones of States Parties; the standard notification format was to be used.<sup>80</sup> Only in 1991 the Helsinki Commission urged parties “to grant one year permits for planned research activities in the exclusive economic zones... in the frame-

<sup>76</sup>See for the third stage (1988–1993), *Helsinki Commission, Guidelines for the Baltic Monitoring Programme for the Third Stage*, adopted 17 February 1988 by HELCOM Recommendation 9/7, Baltic Sea Env’t Proc. No. 27 A, 1988; as of 1992 steps were taken to join B.M.P. with other monitoring activities under one organisational umbrella, see *Helsinki Commission, Intergovernmental Activities in the Framework of the Helsinki Convention 1974–1994*, Baltic Sea Env’t Proc. No. 56, 1994, p. 40: *Co-operative Monitoring in the Baltic Marine Environment (COMBINE)* under which coastal waters were to be included in the monitoring schemes of the organisation.

<sup>77</sup>The guidelines provided essentially for a code system for the monitoring stations, the (obligatory and tentative) determinants that should be monitored and a standardised reporting format in order to achieve comparability, see *Helsinki Commission, Guidelines* (as in n. 76), pp. 3f.

<sup>78</sup>*Ibid.*, p. 1.

<sup>79</sup>*Ibid.*; Wooldridge, Christopher F./McNullen, Christopher/Howe, Vicki, *Environmental management of ports and harbours – implementation of policy through scientific monitoring*, in Marine Policy 23 [1999], p. 417, note: “Fundamental to managing the environment is monitoring it. [...] [I]f managers have no idea of the initial nature of the... environment, then how are they going to assess change and consequently, if they cannot see the changes then it is very difficult to establish links between causes and effects.”

<sup>80</sup>See n. 196 on page 109.

work of the BMP, during which period the coastal state is only to be notified in advance for each individual cruise"; and "to facilitate and without unnecessary delay grant the permits in connection with the BMP and for research vessels for all Baltic Sea States to carry out joint scientific studies of common interest".<sup>81</sup> This urge did not meet with much response, rather research vessels in most cases had to follow the general procedures established in the respective States.<sup>82</sup>

### *OSPAR Convention*

The OSPAR Convention<sup>83</sup> contains no direct reference to marine scientific research. Its predominant goal is the protection of the marine environment.<sup>84</sup> In order to achieve this goal, the OSPAR Convention calls in Article 8(1) upon its parties to "establish complementary or joint programmes of scientific or technical research"; as a corollary, parties shall transmit the research results and details of all relevant programmes to the Commission of the OSPAR Convention.<sup>85</sup> This obligation of the parties must be read in connection with Article 22 of the OSPAR Convention providing for a reporting system according to which the parties shall report on measures of implementation, their effectiveness and encountered problems.<sup>86</sup> The reports are,

<sup>81</sup>HELCOM Recommendation 12/1, Procedures for Granting Permits for Monitoring and Research Activities in the Territorial Waters and Exclusive Economic Zones, Fishing Zones or Continental Shelves, adopted 21 February 1991, Baltic Sea Env't Proc. No. 37.

<sup>82</sup>According to information from the B.S.H.—on file with the author—one year permits could be obtained from Estonia, Finland, Germany, Latvia and Lithuania.

<sup>83</sup>See n. 69 on page 139.

<sup>84</sup>See for an overview *Fayette, Louise de la, The OSPAR Convention Comes into Force: Continuity and Progress*, in Int'l J.Mar. & C.L. 14 [1999], pp. 247f.; *Lagoni, Rainer, Das OSPAR-Übereinkommen von 1992 und der Schutz der Nordsee: Einwirkungen auf das deutsche Umweltrecht*, in Koch, Hans-Joachim/Lagoni, Rainer, editors, Meeresumweltschutz für Nord- und Ostsee: Zum Zusammenspiel von Völkerrecht und nationalem Umweltrecht, Baden-Baden, 1996, Forum Umweltrecht 19, pp. 87f.

<sup>85</sup>The OSPAR Commission is established by Article 10; it is made up by representatives of the parties and meets at regular intervals. Its duties are according to Article 10(2):

- a. to supervise the implementation of the Convention;
- b. generally to review the condition of the maritime area...;
- c. to draw up...programmes and measures for the prevention and elimination of pollution...;

To fulfil its duties the Commission may adopt binding decisions in accordance with Article 13, see *Lagoni, Rainer, Monitoring Compliance and Enforcement of Compliance Through the OSPAR Commission*, in Ehlers, Peter/Mann-Borgese, Elisabeth/Wolfrum, Rüdiger, editors, Marine issues from a scientific, political and legal perspective, The Hague, 2002, p. 155.

<sup>86</sup>Article 22 Reporting to the Commission:

The Contracting Parties shall report to the Commission at regular intervals on:

- a. the legal, regulatory, or other measures taken...for the implementation...of the Convention and of decisions and recommendations

according to Article 23, the basis for assessments by the OSPAR Commission of parties' compliance with the OSPAR Convention; the OSPAR Commission may take steps to promote the implementation "including measures to assist a Contracting Party to carry out its obligations."<sup>87</sup> *Lagoni* identifies administrative measures and technical or scientific help as possible means of assistance.<sup>88</sup>

In addition, the parties have the obligation in accordance with Article 6 to "undertake and publish at regular intervals joint assessments of the quality status of the marine environment"; these assessments should also include an evaluation of the effectiveness of the "measures taken and planned for the protection of the marine environment". These quality status reports are published by the OSPAR Commission at regular intervals.<sup>89</sup> Article 6 provides thus a close link between scientific research and the reporting requirements with respect to the goal of the OSPAR Convention.

Annex IV on the assessment of the quality of the marine environment specifies the obligation under Article 6 of the OSPAR Convention; it defines monitoring in Article 1 as "the repeated measurement of the quality of the marine environment and each of its compartments". Even though the main purpose of monitoring must be considered the assessment of compliance, Article 1(2) expressly refers to monitoring for research purposes.<sup>90</sup> According to Article 2 the parties shall—beyond monitoring—"carry out, individually or preferably jointly, research which is considered necessary... to increase knowledge and scientific understanding of the marine environment". Specific reference is had to international research programmes, Article 2(e); and Article 3(d) calls upon the OSPAR Commission "to cooperate with... competent

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adopted thereunder...;

- b. the effectiveness of the measures...;
- c. problems encountered in the implementation...

<sup>87</sup>See *Heinegg, Wolf Heintschel v., The Development of Environmental Standards for the North-East Atlantic, Including the North Sea*, in *Ehlers, Peter/Mann-Borgese, Elisabeth/Wolfrum, Rüdiger*, editors, *Marine issues from a scientific, political and legal perspective*, The Hague, 2002, pp. 139f.; see *Lagoni*, Compliance (as in n. 85 on the page before), pp. 158f., with respect to the role of supervision and control.

<sup>88</sup>*Ibid.*, p. 161.

<sup>89</sup>*Ibid.*, p. 155.

<sup>90</sup>Annex I, Article 1:

1. ... "monitoring" means the repeated measurement of:
  - a. the quality of the marine environment and each of its compartments, that is, water, sediments and biota;
  - b. activities or natural and anthropogenic inputs which may affect the quality of the marine environment;
    - the effects of such activities and inputs.
2. Monitoring may be undertaken either for the purposes of ensuring compliance... or for research purposes.

international organisations in carrying out quality status assessments.”

In comparison to the Helsinki Convention, the OSPAR Convention does not make a distinction between marine scientific research and monitoring. In general, the OSPAR Convention can be interpreted as more favourable to marine scientific research because it not only establishes obligations of the parties but also entrusts the OSPAR Commission with a mandate to facilitate international co-operation. In this respect, the OSPAR Convention is the most far reaching regional instrument.

### SOPAC

The *South Pacific Applied Geoscience Commission (SOPAC)* has as its purpose by virtue of Article 2 of its Constitution,<sup>91</sup> amongst others, “to promote, facilitate, undertake, co-ordinate, advise on, and cooperate in, the prospecting of and research into, the non-living resources in the offshore, coastal and onshore areas”; a Secretariat is charged, by virtue of Article 7, with the implementation of SOPAC’s policies, as part of these it may establish working arrangements with relevant regional and international organisations.

One of its recent reports notes for the region that there is still a need to promote and encourage further international research “both in areas already researched. . . as well as extending research surveys into new areas.”<sup>92</sup> It identifies a two-fold data-related problem in the region: either data from marine scientific research operations are not transferred at all or in an unsuitable format. The report suggests, in a follow-up to a workshop held in February 1999, a receptive policy of member countries towards research requests and to develop and strengthen the internal procedures “to ensure that measures are taken to avoid the abuse of such access.”<sup>93</sup> While a specific policy recommendation with a view to easier access has not been given,<sup>94</sup> SOPAC functions as a forum for co-operation and is open for participation by other

<sup>91</sup>SOPAC was originally established in 1972 as a project called *Committee for Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas*; it was re-established in 1984 by the *Agreement Establishing the South Pacific Applied Geoscience Commission*, available at <http://www.sopac.int/Secretariat/Constitution.html> – visited on 31 January 2005; it is an intergovernmental, regional organisation comprising 20 members from the South Pacific.

<sup>92</sup>*SOPAC Secretariat, Ocean Issues and Challenges within SOPAC Responsibilities*, Prepared for the Pacific Islands Regional Ocean Forum, Sava, Fiji, 2003, p. 2; similarly, *Ram-Bidesi, Vina, Sustainable Use of Marine Resources: Lessons from the Pacific Islands*, Oceans: Interaction between Man and Maritime Environment, UNU Global Seminar – 5<sup>th</sup> Shimane Session, Japan, 2–5 August 2004, p. 15.

<sup>93</sup>*SOPAC Secretariat* (as in n. 92), p. 3.

<sup>94</sup>A SOPAC regional workshop held in 2001 made recommendations with respect to marine scientific research and called upon the secretariat to facilitate the development of a legal framework and proactive research climate, see SOPAC contribution *Ocean issues in the Pacific region in 2001: initiatives and priorities*, Annex II, p. 132, in *U.N. Secretary-General, Oceans and the law of the sea*, UN Doc. A/57/57, New York, 7 March 2002.

organisations. If not to the extent of OSPAR or the Helsinki Convention, it supports research operations through general policy recommendations for a better research climate.<sup>95</sup>

### *European Union*

The European Union took up the task of uniform access requirements within the territorial seas and exclusive economic zones of the member States in 1995.<sup>96</sup> The aim of the initiative—whose proposal for a Council directive did not enter the official legislative procedure—was to remove the burden of cumbersome procedures and limitations imposed by EU member States. The financial strain on public funds, especially with respect to EU projects, should have been alleviated. Simplified authorisation procedures were intended to ensure lead times of two to three months, implicit consent within 1 month and a mere notification for international research projects and “emergency research” (such as on harmful algal blooms). The Draft Directive<sup>97</sup> was to apply between applicants from member States and provided for a much more lenient “notification procedure” than is foreseen by Article 246.<sup>98</sup> Conditions, like participation (at the scientists own expense), submission of data and samples, and interim and final reports, set forth similarly in Article 249 of the 1982 LOS Convention, were nevertheless to apply. The coastal State could have established so-called designated areas for purposes of public security, military or defence in which marine scientific research could have been carried out only with express consent. The applicant was to be notified within 10 days of submission. Restrictions also applied to so-called controlled activities corresponding to research projects enumerated in Article 246(5)(a)–(c) of the 1982 LOS Convention; for such activities coastal state consent would have had to be obtained by application 40 days prior to commencement. The coastal State would have been under an obligation to furnish the researching State with reasons for withholding consent. While

<sup>95</sup>See *sop*, *CROP Marine Sector Working Group Fifth Meeting*, Outcomes of the Workshop on Marine Scientific Research: Issues and Challenges, PIFS(01)MSWG.2, 28 March 2001.

<sup>96</sup>A possible legislative basis was identified in then Articles 6, 60, 130f and h, Title XV ECT (now Articles 12, 50, 163 and 165, Title XIII EC). This basis is comparatively weak, and the lack of a convincing EU competence was probably the reason that this effort did not materialise in an EU directive; see also on previous steps in this regard *Soons*, *European Community* (as in n. 71 on page 285), pp. 265f and 274f., emphasising the Commission’s right “to take...any useful initiative to promote coordination of national policies and Community policy” and referring to the work of the MAST programme.

<sup>97</sup>Dating from 4 January 1996; the document is on file with the author.

<sup>98</sup>The Draft speaks of 30 working days prior to the commencement of the research activity under normal circumstances and 5 working days in cases of unforeseen phenomena; the information to be provided to the coastal state authorities, however, seems to have been essentially the same (see n. 196 on page 109) which has caused critical comments from scientists.

the Draft Directive has had no legislative effect, it indicates nevertheless a possible approach to improve the situation of marine scientific research within a regional organisation. Simplified application procedures, i. e., mere notification with a short lead time, limited restrictions on the conduct of research operations and the requirement to provide the applicant with a reasoned decision can be considered key elements for an improvement of the regime on marine scientific research in Part XIII.

A new initiative for a legislative measure, especially with respect to the Art. 246(3) procedure, has not been undertaken since. Nevertheless, the European Commission has increased its efforts to foster (marine) scientific research within the framework of the European Union.<sup>99</sup> Under the sixth Framework Programme marine research has been one of the priorities.<sup>100</sup> For the new Framework Programme covering the period from 2007–2015 the Commission has proposed an increase for the research funding to an average of € 10 billion<sup>101</sup> of which research projects in the marine sector would also benefit.<sup>102</sup>

<sup>99</sup>See *Edwards, Alan, The Contribution of the EC Research Framework Programmes to the Informal Consultative Process on Oceans and the Law of the Sea: Protecting Vulnerable Marine Ecosystems and the Safety of Navigation*, 20 December 2002, for an overview of activities available at [http://www.un.org/Depts/los/general\\_assembly/contributions58.htm](http://www.un.org/Depts/los/general_assembly/contributions58.htm) – visited on 31 January 2005.

<sup>100</sup>See *Scientific and Technological Objectives, Broad Lines of the Activities and Priorities*, Annex I of Decision No. 1513/2002/EC of the European Parliament and of the Council, Official Journal 2002 L 232/4–33, p. 15, available at [http://europa.eu.int/eur-lex/en/oj/dat/2002/l\\_232/l\\_23220020829en00010033.pdf](http://europa.eu.int/eur-lex/en/oj/dat/2002/l_232/l_23220020829en00010033.pdf) – visited on 31 January 2005.

<sup>101</sup>See Press Release from 16 June 2004; see for comments *Kennedy, Donald, Europe, Science, and Unity*, in *Science* 301 [2003], p. 1157; and *Nowotny, Helga, European Research Momentum*, in *Science* 305 [2004], p. 753. The Commission has conducted a general consultation for views on its proposal and to identify thematic domains for future European support with the greatest impact; the proposal for the 7<sup>th</sup> Framework Programme is expected for 2005, information is available at *Future European Union Research Policy*, [http://europa.eu.int/comm/research/future/index\\_en.html](http://europa.eu.int/comm/research/future/index_en.html) – visited on 31 January 2005.

<sup>102</sup>One could surmise that more emphasis might be put on marine scientific research in the light of the latest (sixth) Environment Action Plan of the European Commission, in which the protection and conservation of the marine environment figures as a key thematic strategy; at the global level the Commission plans to take action in pursuing “on-going dialogue and international scientific and technological research cooperation with partner countries and regions” (Action 22) and “promote research in order to enhance the understanding of the link between the pressures on the marine environment and impacts of these” (Action 23), see *Towards a strategy to protect and conserve the marine environment*, Communication from the Commission to the Council and the European Parliament, [http://europa.eu.int/eur-lex/en/com/pdf/2002/com2002\\_0539en01.pdf](http://europa.eu.int/eur-lex/en/com/pdf/2002/com2002_0539en01.pdf) – visited on 31 January 2005, p. 26; see also *ibid.*, pp. 55f; *Europe and Basic Research*, Communication from the Commission, [http://europa.eu.int/comm/research/press/2004/pdf/acte\\_en\\_version\\_final\\_15janv\\_04.pdf](http://europa.eu.int/comm/research/press/2004/pdf/acte_en_version_final_15janv_04.pdf) – visited on 31 January 2005, p. 5.

## MARINE SCIENTIFIC RESEARCH AS A FUNCTION OF THE LEGAL STATUS

*Knauss/Katsouros* note that difficulties with obtaining permission for research projects may result in fewer requests to conduct research in such areas: "If a scientist or a research agency has a choice of research areas in which to work, that area where permission to work is either assured or not required will likely be chosen over that where permission to work is questionable."<sup>103</sup> While they have been unable to quantitatively estimate lost opportunities due to 'self-selection', anecdotal evidence shows that scientists make a conscious decision to eliminate the risk of possible political difficulties. In conclusion they find that only five percent of 505 requests processed by the U.S. State Department between March 1983 and December 1985 did not go through; the vast majority of events were processed routinely; and some required intense communication before the research project could be conducted.<sup>104</sup>

*Plesmann/Röben* identify legal uncertainty as one major obstacle in making full use of the regime on marine scientific research.<sup>105</sup> They report a number of instances in which a coastal State had not adopted any legislation implementing Part XIII of the 1982 LOS Convention.<sup>106</sup> As a consequence, research requests could not be processed or consent was denied. Additional difficulties arose where the zones of coastal State jurisdiction were not clearly delimited with the consequence that the scope of the consent could not be established. A possible solution for the future was outlined by *Nagel*.<sup>107</sup> He took the view that unnecessary bureaucracy had to be avoided and procedures to be simplified, shortened and accelerated, especially by shorter lead times for the submission of requests. As a starting point for such a development he suggested agreements on a regional basis.<sup>108</sup>

Today, the picture has not changed much. The observation of *Knauss/Katsouros* and *Plesmann/Röben* holds true. States that are not forthcoming with their consent procedures are avoided in research cruises. The consequences for marine scientific research are gaps in data and samples which one might not be able to bridge by remote sensing technique. This is an undesirable situation, in the least; considering the obligations contained in Part XIII one may even speak of coastal state disdain for the common interest of humankind.

<sup>103</sup> *Knauss/Katsouros* (as in n. 1 on page 271), p. 303; see also comment by *Karl-Friedrich Nagel* in *Wolfrum, Rüdiger, editor, Law of the Sea at the Crossroads: The Continuing Search for a Universally Accepted Régime*, Berlin, 1990, Veröffentlichungen des Instituts für Internationales Recht an der Universität Kiel 113, p. 406.

<sup>104</sup> See *Knauss/Katsouros* (as in n. 1 on page 271), pp. 307f.; similarly *Plesmann/Röben* (as in n. 41 on page 280), pp. 377f.

<sup>105</sup> *Ibid.*, pp. 379 and 389f.

<sup>106</sup> This experience is corroborated by *Nellen, W. et al., MINDIK, Meteor-Berichte*, Hamburg, 1996, pp. 49f.

<sup>107</sup> See discussion in *Wolfrum, Rüdiger, editor* (as in n. 103), p. 406.

<sup>108</sup> Regional agreements with a potential for marine scientific research already exist, see section 7.



## Part IV.

### Limits to Regulation



## Chapter 8.

# Safeguards for Marine Scientific Research in Part XIII

### IMPLIED CONSENT

Implied consent means that after the elapse of a certain period of time the requesting state may proceed on the assumption that its request has been granted. The coastal State is then deemed to have accepted the application of the researching State as is. This principle is the core<sup>1</sup> of what is left of the previous freedom to conduct marine scientific research. It is a default rule leaving the coastal State with the initiative—delay or obstruction will backfire—, and is enshrined in Articles 246(2), 248, and 252 of the 1982 LOS Convention.<sup>2</sup>

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<sup>1</sup>See *Nordquist, Myron H./Rosenne, Shabtai/Yankov, Alexander*, editors, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 192 to 278, Final Act, Annex VI, Volume IV, Dordrecht, 1991, p. 511, referring to the statement of the Chairman of the Third Committee that it was necessary “to work out a framework of rules of conduct which might form the legal basis for greater mutual trust between coastal States and States conducting research and between developing and developed States” and identifying Articles 246, 249, 252, 253, and 264 of the 1982 LOS Convention as the core of that framework.

<sup>2</sup>It must be noted that the risk of suspension or interruption—even though illegal—of a research cruise carried out on the basis of *implied* consent is a deterrent in the light of the expenses incurred in such a case. *Plesmann/Röben*, without stating a reason, note that “*R/V ‘Meteor’* did not rely on the concept of tacit coastal State consent, although there were two cases where the coastal State did not respond at all to its request”, see *Plesmann, Wolf/Röben, Volker, Marine Scientific Research: State Practice versus Law of the Sea?* in *Wolfrum, Rüdiger*, editor, *Law of the Sea at the*

*Prerequisites*

There are essentially two sides to the principle of implied consent: on the one hand, it establishes that any marine scientific research requires prior consent; on the other hand, it provides for a formalised procedure with a default option. Principally, the right to conduct research is acknowledged subject to the coastal State's approval. While the consent procedure contains no detailed conditions protecting research, and could therefore be interpreted as only specifying coastal state jurisdiction in the exclusive economic zone, consent by default could rectify that picture to some extent in favour of the researching State.

According to Articles 246(2), 248, and 252 of the 1982 LOS Convention, a State wishing to conduct marine scientific research in the coastal State's exclusive economic zone must request consent prior to the actual conduct and furnish no later than six months before the expected starting date a full description of various cruise related facts.<sup>3</sup> If after six months the coastal State has not replied, consent of the coastal State with the research project may be assumed and the research can be carried out. Consent cannot be assumed if the coastal State within four months of receipt of the information declares that it intends to withhold consent on the basis of its sovereign interests (Article 246(5)); that the information provided is not sufficient or needs to be supplemented; or that there are outstanding obligations from previous undertakings. The practical use of this provision must be regarded with caution, though: scientists, faced with coastal state silence have, to the author's cognisance, never availed themselves of the resulting entitlement; the odds for coastal state enforcement measures in spite of Article 252 are

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Crossroads: The Continuing Search for a Universally Accepted Regime, Berlin, 1990, Veröffentlichungen des Instituts für Internationales Recht an der Universität Kiel 113, p. 386. Contrary to these basic considerations scientists may be prepared to sweepingly disregard the risk of coastal State repercussion if expedience calls for bold measures: in *Nellen, W. et al., MINDIK, Meteor-Berichte, Hamburg, 1996, pp. 49f.*, an incidence is reported where the outer limit of an exclusive economic zone was rather boldly "delimited" to convenience at sea. Note, leaving uncertain the exact delimitation of the zones, constitutes a breach of an obligation, see n. 178 on page 160.

<sup>3</sup>These are:

- (a) the nature and objectives of the project;
- (b) the method and means to be used, including name, tonnage, type and class of vessels and a description of scientific equipment;
- (c) the precise geographical areas in which the project is to be conducted;
- (d) the expected date of first appearance and final departure of the research vessels, or deployment of the equipment and its removal, as appropriate;
- (e) the name of the sponsoring institution, its director, and the person in charge of the project; and
- (f) the extent to which it is considered that the coastal State should be able to participate or to be represented in the project.

See also U.N. Draft Form A (as in n. 196 on page 109).

too high to take the risk. Nevertheless it remains as one of the provisions to secure the stakes of marine scientific research.

### *Qualifications*

The implied consent principle of Part XIII is qualified in favour of the researching State by Article 246(3) which establishes the assumption that the coastal State should normally grant permission for marine scientific research projects, and Article 246(5) which limits coastal State's discretion for the denial of a research request to certain cases.<sup>4</sup> Some of these are wide open to coastal States' extensive interpretation. At the same time, Article 246(5) of the 1982 LOS Convention assumes that coastal States cannot withhold their consent as a matter of routine since the occasions which are subject to the coastal State's discretion are thought as exception to the general rule stated in Article 246(3).

#### *"Direct Significance"*

Notwithstanding the ambiguities surrounding the words 'exploration' and 'resource' as such, it is rather doubtful what constitutes a "direct significance". In fact, all research may in some way ultimately be relevant and a basis for exploitation. The word 'direct' denotes a certain immediateness of the activity. It would thus subject to coastal state discretion such research that is akin to prospecting.<sup>5</sup> The word 'significance' denotes a certain relevance of the activity. In other words, where research is conducted without a view to the economic value of the object, it would be not of *direct* significance. Findings may very well be used for exploration or exploitation purposes at a later stage, but these purposes have not been factored into the research project at hand. The fact, that drilling and the use of explosives—the principal means for exploration—are mentioned in a separate subparagraph suggests that "direct significance" is intended as a "catch all" clause. Inasmuch as seismic profiling can be done by acoustic signals short of the

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<sup>4</sup>These cases include:

- (a) [projects with *direct* significance for] the exploration and exploitation of natural resources, whether living or non-living [emphasis added];
- (b) ...drilling into the continental shelf, the use of explosives or the introduction of harmful substances into the marine environment;
- (c) ...the construction, operation or use of artificial islands, installations and structures...;
- (d) ...inaccurate [information in respect of the requirements of Article 248] or...outstanding obligations to the coastal State from a prior research project.

<sup>5</sup>See page 85; see also *Ozman, Bernard H., The Third United Nations Conference on the Law of the Sea: The Eighth Session (1979)*, in *Am.J.Int'l L.* 74 [1980], p.27.

use of explosives and scientific investigative techniques become more and more sophisticated, the provision has obvious merit. According to *Ozman* the phrase also reflects coastal state concerns about premature distribution of information about their natural resources.<sup>6</sup> Since the requirement not to publish the results of a research project runs counter to the principle of open publication of fundamental scientific research, incriminated projects thus subjected to coastal state discretion could, as a minus, be permitted on the condition of non-publication.

### *Drilling, Explosives and Harmful Substances*

Drilling and the use of explosives could be considered as epitomising “direct significance” in the sense that both activities provide data that can be used directly for exploratory purposes. A different aspect are the potential implications for other uses of the exclusive economic zone. Drilling may be conducted either from ships or from platforms; in any event, they must remain moored in the exact same position in order to operate the drilling gear safely. Consequently, they pose an obstacle to all communication activities in the area. For the use of explosives it goes without saying that it poses a potential danger to other activities as well as to the environment. By inclusion of “harmful substances” Article 246(5) takes note of the environmental concerns reflected in Part XII and the safety interests of the coastal State.<sup>7</sup>

### *Outstanding Obligations*

The clause has been identified as an attempt “to deal in an objective manner with the question of bona fides”.<sup>8</sup> The United States proposed with respect to the outstanding obligations a clarification to the effect that this phrase only referred “to the absence of timely efforts to commence and complete performance of the obligation in good faith.”<sup>9</sup> This would effectively mean that an outstanding obligation could not be construed from the fact that the final results of a recently completed research project have not been supplied yet, as long as the researcher fully intends to submit them as soon as compilation and evaluation is finished.<sup>10</sup> Since this suggestion is not reflected in the final text one is left, as regards the time frame, with the hints in Article

<sup>6</sup> *Ozman*, 1979 Session (as in n. 5 on the preceding page), pp. 27f.

<sup>7</sup> See *Ozman*, Bernard H., *The Third United Nations Conference on the Law of the Sea: The 1977 New York Session*, in Am.J.Int'l L. 72 [1978], p. 76.

<sup>8</sup> *Ibid.*

<sup>9</sup> See Informal Proposal by the United States of America (marine scientific research/2/Rev. 1, 1979), article 247, paragraphs 1 and 6, and Notes, reprinted in *Platzöder, Renate*, editor, *Third United Nations Conference on the Law of the Sea: Documents*, Volume 10, New York, 1986, p. 387; *Ozman*, 1979 Session (as in n. 5 on the page before), p. 25, n. 83.

<sup>10</sup> See *Nordquist/Rosenme/Yankov* (as in n. 1 on page 295), pp. 514f.

249 of the 1982 LOS Convention. “Outstanding obligation” would predominantly refer to paragraphs (b) through (e), namely, to make available to the coastal State data, samples, results, and reports.<sup>11</sup>

### *General Qualifications*

For all cases Article 246(3) prescribes that consent has to be granted under “normal circumstances”. It is not entirely clear what constitutes normal circumstances. While the non-existence of diplomatic relations is according to Article 246(4) no indication of non-normal circumstances,<sup>12</sup> the imminent danger of armed conflict most likely is.<sup>13</sup> Yet, many circumstances short of armed conflict or danger thereof may make a coastal State want to deny access.<sup>14</sup> A clear definition of the term “normal circumstances” is therefore desirable, to prevent as far as possible any arbitrariness on the side of the coastal State.

Article 246(5) by describing the situations in which the coastal State may use its discretion essentially exemplifies non-normal situations. The wording and the history<sup>15</sup> of this paragraph suggest an exhaustive character. As an indicator for potential exceptions to Article 246(3), however, it is of not much help in establishing what kind of situation may constitute *non*-normal circumstances. It only provides a list of cases in which the research as such, or the methods by which it is conducted are in conflict with coastal State’s interests as perceived by the 1982 LOS Convention. While these situations can be categorised as normal or non-normal in terms of scientific research usage, they are clearly limited to aspects of the research project as such. The term “normal circumstances” as used in Article 246(3), however, has a different connotation, namely, a reference to the general political climate between the coastal State and the researching State/organisation.<sup>16</sup> The term ‘normal’ implies a situation which in a time continuum represents the average quality. ‘Normal’ can describe both, intensive and virtually non-existent ex-

<sup>11</sup>See page 198 with respect to the time frame.

<sup>12</sup>The United States pointed out that for many countries the absence of diplomatic relations was rather a reflection of financial constraints than of bad faith and further submitted that “the absence of diplomatic relations alone should not be the determining factor—all relevant factors should be considered”, see Informal Proposal by the United States (marine scientific research/2, 1978), article 247, paragraphs 1 and 6, and Notes, reprinted in *Platzöder* (as in n. 9 on the preceding page), p. 363.

<sup>13</sup>See *Soons, Alfred H. A., Marine Scientific Research and the Law of the Sea*, Deventer, 1982, p. 168.

<sup>14</sup>See *Soons, Alfred H. A., The Developing Regime of Marine Scientific Research: Recent European Experience and State Practice*, in *Alexander, Lewis M./Allen, Scott/Hanson, Lynne C.*, editors, *New developments in marine science and technology: economic, legal, and political aspects of change*, Honolulu, Hawaii, 1989, pp. 305f., pointing at overlapping claims to marine areas as in the Aegean sea between Greece and Turkey.

<sup>15</sup>See *Nordquist/Rosenne/Yankov* (as in n. 1 on page 295), pp. 496f. and 518.

<sup>16</sup>Similarly, *Oxman*, 1979 Session (as in n. 5 on page 297), p. 26.

change, as long as it represents what can be conceived as the general quality of the relation. Yet, two standards must be distinguished, one is the general standard as it is applied across the board to all relations between States, the other is the individual standard as applied to the relation between two (or more) States. A further distinction on the basis of subject matters, namely, with respect to trade relations or the transfer of technology, seems to be irrelevant, as every single relation is usually affected and determined by foreign policy. Thus, where a coastal State is generally unsatisfied with, for example, a researching State's trade policy, it is more likely to be obstinate when it comes to research requests than where the political climate is in general friendly. Naturally, various implications of the research project as such may equally raise concerns on the side of the coastal State. *E.D. Brown* identifies as likely questions to be considered by the coastal State upon its response "the degree of sophistication of the navigation and collision avoidance systems of the vehicle, the environmental sensors, the degree to which it will operate along pre-determined tracks, arrangements for deployment, recovery and emergencies, and for marking and warning of presence."<sup>17</sup> All these questions would appear to relate to safety as well as security concerns of the coastal State. The degree to which such concerns may influence the decision in an arbitrary manner will mostly depend on the general attitude towards marine scientific research. It follows that absent any authoritative interpretation of the term "normal circumstances" this Article provides an escape hatch for the coastal State, which is not content with the limitations of denial set by Article 246(5).

In addition, the assumption of Article 246(3) is further qualified by constraining it to marine scientific research carried out "for peaceful purposes and in order to increase scientific knowledge of the marine environment for the benefit of all mankind." This qualification refers, on the one hand, to the distinction between civilian and military research, on the other hand, implicitly to the distinction between fundamental and applied research. Research carried out for the benefit of all mankind would appear to require the general availability of scientific data and open publication of the results; this would principally exclude applied and military research.

Obviously, the coastal State has a number of options to foul the authorisation process. The only avenue for the researching State to prevent the effects of such a behaviour seems to be a recourse to dispute settlement. For the scientific community the consent procedure is less than desirable because it contains no specific protections for research and because the obligations are regarded as costly and seriously time-consuming.<sup>18</sup>

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<sup>17</sup> *Brown, Edward D., The International Law of the Sea, Volume I Introductory Manual, Dartmouth, 1994, p. 421.*

<sup>18</sup> *See Miles, Edward L., Global Ocean Politics: the Decision Process at the Third United Nations Conference on the Law of the Sea, 1973–1982, The Hague, 1998, p. 389.*



## DISPUTE SETTLEMENT

Part XV of the 1982 LOS Convention provides for a complex dispute settlement system with various procedures whose results range from mere reports, Annex V, Article 7(2), to binding decisions, Article 296(1). Part XV is important to the extent that it exemplifies and safeguards the balance of interests in the substantive parts of the 1982 LOS Convention.<sup>19, 20</sup> Disputes arising in the context of Part XIII are by virtue of Article 264 subject to dispute settlement procedures of Part XV. As a rule, disputes are submitted by virtue of Article 286 to section-2-procedures entailing binding decisions. Yet, Article 297 establishes a number of exceptions in which the dispute is referred to a Conciliation Commission especially. Even though the report of this Conciliation Commission does not carry the same weight as a judgement by an international tribunal, it bears some relevance in the international legal discourse as it constitutes an authoritative statement. The benefit of this less weightier solution may prove to be that States might be more readily prepared to submit a conflict to third party dispute settlement. Also, it should be noted that compulsory conciliation is not necessarily inferior to compulsory dispute settlement: Even though the decision of the conciliation commission is not binding for the parties, it carries “nevertheless the weight of an impartial judgement and cannot as such be lightly discarded by [a] party to the dispute.”<sup>21</sup> Additionally, the decision of the conciliation commission gains ‘persuasive power’ by the mere fact that it is to be deposited with the U.N. Secretary-General and the parties must give notice

<sup>19</sup>See *Rosenne, Shabtai, The Settlement of Disputes in the New Law of the Sea*, in *Rev.Iranienne Rel.Int'l* 11/12, p. 425; *Riphagen, Willem, Dispute Settlement in the 1982 United Nations Convention on the Law of the Sea*, in *Rozakis, Christos L./Stephanou, Constantine A.*, editors, *The New Law of the Sea*, Amsterdam, 1983, pp. 289f.

<sup>20</sup>It must be borne in mind that the rights which can be invoked in the course of the dispute settlement in accordance with Part XV of the 1982 LOS Convention must be those of the researching or coastal State under international law. Where a platform enters into private law relationships, e.g., by a contract for the replenishment of bunkers, even with a state, private international law (or law of conflicts) applies with the consequence of a different form of adjudication, namely, by ‘private’ law courts. The research platform, or its operator for that matter, are not subjects of international law, accordingly, they have no *locus standi* in an (assertive) action before an international court—the question of domestic jurisdictional avail has to be considered separately. In case of a dispute about rights arising out of Part XIII—or, in fact, any other international custom or law—the research State must invoke the rights in a proceeding against the coastal State; even where the right in question can only be exercised by a private individual, the relevant State “representing” the research platform or operator in the exercise of diplomatic protection must institute and conduct the proceedings—it is not an altogether different situation if the vessel is detained and sought to be released under Article 292 of the 1982 LOS Convention, i.e., the procedure for the prompt release of vessels.

<sup>21</sup>See *Jaenicke, Günther, Dispute Settlement under the Convention on the Law of the Sea*, in *Z.a.ö.R.V.* 43 [1983], p. 826.

whether or not they intend to abide by it. This kind of publicity itself may persuade a reluctant State to think twice before rejecting a conciliation decision: “No state wishes to see its manifest or arbitrary failure to meet its treaty obligations exposed.”<sup>22</sup>

### *Application of Article 297*

Article 297(1) of the 1982 LOS Convention reiterates the general rule with respect to “the exercise by a coastal State of its sovereign rights or jurisdiction provided for in [the] Convention”, yet, in its sub-paragraphs limits its application to two different types of dispute. These include cases where allegedly

- (a) a coastal State has acted in contravention of the provisions of [the] Convention in regard to the freedoms and rights of navigation, overflight... or in regard to other internationally lawful uses of the sea specified in article 58;
- (b) a State in exercising... freedoms, rights or uses has acted in contravention of [the] Convention or of laws or regulations adopted by the coastal State in conformity with [the] Convention and other rules of international law not incompatible with [the] Convention.

Article 297(1) thus refers, on the one hand, to the substantive provisions of Part V, on the other hand, more generally to the balance of interests between coastal States and other States.

Article 297(2) refers explicitly to Part XIII and equally establishes the general applicability of Section 2. However, it provides for a few noteworthy exceptions relating to compromises on substantive issues which reflect the more intricate conflicts of interest during the negotiations:<sup>23</sup>

- (a) (i) the exercise... of a right or discretion in accordance with article 246; or
- (ii) a decision... to order suspension or cessation of a research project in accordance with article 253.

<sup>22</sup>See *Treves, Tullio, “Compulsory” Conciliation in the UN Law of the Sea Convention*, in *Volkmar, Götz/Selmer, Peter/Wolfrum, Rüdiger*, editors, *Liber amicorum Günther Jaenicke—zum 85. Geburtstag*, Berlin, 1998, Beiträge zum ausländischen öffentlichen Recht und Völkerrecht 135, p. 622.

<sup>23</sup>See *Rosenne* (as in n. 19 on the preceding page), p. 425; *Riphagen* (as in n. 19 on the page before), pp. 283 and 287f. The reflection of the conflicting interests in Part XIII may be described as follows: those of the community are set forth especially in Section 1 and 2, as well as in Article 249(1)(e) and Article 246(3) (to the extent that it requires the research project to be carried out “for peaceful purposes and in order to increase scientific knowledge of the marine environment for the benefit of all mankind”); those of the coastal State are epitomised in Articles 246(5) and 249(1) of the 1982 LOS Convention, see *Wolfrum, Rüdiger, Commentary*, in *Park, Choon-Ho*, editor, *Law of the Sea in the 1980s*, Honolulu, Hawaii, 1983, pp. 322f.

- (b) A dispute arising from an allegation... that... the coastal State is not exercising its rights under articles 246 and 253 in a manner compatible with this Convention.

A dispute in accordance with Article 297(2)(b) may be submitted by either party to conciliation under Annex V, Section 2.<sup>24</sup> Article 297(2)(b) of the 1982 LOS Convention makes two further exceptions to this rule: first, the exercise by the coastal State of its discretion to designate specific areas as referred to in Article 246(6), and second, its discretion to withhold consent in accordance with Article 246(5).<sup>25</sup> In these instances the conciliation commission “shall not call in question” the decision of the coastal State. In effect, the researching State has no possibility to have the standards of discretion clarified or their application by the coastal State reviewed, let alone to obtain a binding decision.<sup>26</sup>

### *Adjudication with respect to Article 246*

#### *Article 246(3) of the 1982 LOS Convention*

It is fairly clear what the word ‘discretion’ in subparagraph (i) refers to. Yet, the reference to “a right” of the coastal State warrants some discussion. It appears that the use of this word would exempt from jurisdiction those disputes that relate to research activities in respect of which the coastal State has no discretion or must give its consent. One could assume that Article 246(3) is but a mere exception to the general rule laid down in Article 246(1), i. e., “the right to regulate, authorize and conduct marine scientific research... in accordance with the relevant provisions of this Convention.” In that case, the obligation of coastal States to “grant their consent for marine scientific research projects by other States or competent international organizations in their exclusive economic zone or on their continental shelf”

<sup>24</sup>According to Annex V, Article 6 of the 1982 LOS Convention the function of the Conciliation Commission is to

hear the parties, examine their claims and objections, and make proposals to the parties with a view to reaching an amicable settlement.

There is no binding decision at the end of such a settlement procedure.

<sup>25</sup>Article 297(2)(b)

A dispute arising from an allegation by the researching State that with respect to a specific project the coastal State is not exercising its rights under articles 246 and 253... shall be submitted... to conciliation under Annex V, Section 2, provided that the conciliation commission shall not call in question the exercise by the coastal State of its discretion... to withhold consent in accordance with article 246, paragraph 5.

<sup>26</sup>According to *Treves*, Conciliation (as in n. 22 on the facing page), p. 618, the conciliation procedure was not introduced to complement the needs of the dispute settlement system as such, but rather to meet the needs of the compromise reached at the negotiations.

would fall outside Article 297(2)(a)(i) of the 1982 LOS Convention and be subject to section-2-procedures.<sup>27</sup>

While Article 297(2) of the 1982 LOS Convention excludes the exercise of rights and discretion by the coastal State from section-2-procedures, a review of the coastal State obligations, i. e., compliance with Article 246, by third party dispute settlement entailing binding decision would appear to be possible. Two duties of the coastal State under the present regime have been described as important with respect to the implementation of Part XIII: (1) The duty of the coastal State to grant consent for marine scientific research projects in the exclusive economic zone or on the continental shelf in normal circumstances; and (2) the duty to establish rules and procedures ensuring that such consent will not be delayed or denied unreasonably.<sup>28</sup>

The question is then whether the duty to grant consent is peremptory or concessive. In support of the former one could advance the argument that Part XIII is not intended to subject marine scientific research to the coastal State's prerogative completely. The phrase "in normal circumstances" would suggest that by default the coastal State must consent; the duty to consent could then be interpreted as a reflex of the freedom of navigation. In this case, full adjudication of "consent in normal circumstances" would be possible.

Equally, one could argue that the rights of Article 246(1) prevail and that the duty to consent is only a specification of the right to regulate. In that case, "consent in normal circumstances" would constitute an exercise of a right and would not be justiciable in a section-2-procedure. Support for this argument comes from the last sentence of Article 246(3) requiring the coastal State to establish appropriate procedures: subparagraph 3 refines subparagraph 1 in terms of regulating marine scientific research.

Eventually, one must look, in accordance with Article 58, at Parts V and XIII together and weigh the arguments in the light of the special regime of the exclusive economic zone. This would appear to support the former position for the following reason: Article 58 refers to the freedoms of the high seas (of which marine scientific research is one); they constitute residual principles which are only in limited instances confined by coastal state jurisdiction inasmuch as the *sui generis* concept presupposes the provisions of Part XIII. Accordingly, the freedoms referred to in Article 58 are at the root of the conflict, not a weight on the scale for the appreciation of the

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<sup>27</sup>See Treves, Tullio, *Principe du Consentement et Nouveau Régime Juridique de la Recherche Scientifique Marine*, in Bardonnet, Daniel/Virally, Michel, editors, *Le nouveau droit international de la mer*, Paris, 1983, Publications de la revue générale de droit international public 39, p. 281; Caftisch, Lucius/Piccard, Jacques, *The Legal Régime of Marine Scientific Research and the Third United Nations Conference on the Law of the Sea*, in Z.a.ö.R.V. 38 [1978], p. 878.

<sup>28</sup>See Roach, J. Ashley, *Marine Scientific Research and the New Law of the Sea*, in O.D. & Int'l L. 27 [1996], p. 68.

circumstances in accordance with Article 59 of the 1982 LOS Convention.<sup>29</sup> Exercise of coastal state jurisdiction in the exclusive economic zone must therefore be considered a concessive right. For this reason the right in Article 246(1) must be interpreted as concessive also and, consequently, the duty to consent be viewed as a reflex of the freedom of navigation with the consequence of justiciability.

#### *Article 246(5) of the 1982 LOS Convention*

Another highly relevant issue relates to Article 246(5): where the coastal State justifies the denial of access on one of the grounds mentioned in Article 246(5) of the 1982 LOS Convention, the researching State may want to challenge that decision in a section-2-procedure.<sup>30</sup> The answer in this case hinges on the words 'exercise' and 'rights'. If the exercise of discretion encompasses the establishment of the facts based on which the discretionary decision is made, the question would be excluded from adjudication by section-2-procedure. If, however, only the decision to grant or withhold consent as such is referred to in Article 297(2)(a)(i) of the 1982 LOS Convention,<sup>31</sup> the question, whether the coastal State has based its discretion on a reasonable analysis of facts, for example, would then be open to compulsory dispute settlement under Part XV, Section 2.

#### *Exercise of Rights and Due Process*

Article 246(1) of the 1982 LOS Convention expressly gives only the right to regulate, authorise and conduct marine scientific research in the exclusive economic zone, and to withhold consent under the specifications of Article 246(5). It does not give the right to determine whether or not submitted facts may be taken into account. This issue is not related to marine scientific research; it rather constitutes due process. An infraction would thus not relate to the rights and the discretion of the coastal State but rather to

<sup>29</sup> Churchill, Robin R./Lowe, Alan V., *The law of the sea*, 3rd edition. Yonkers, NY, 1999, Melland Schill studies in international law, pp.165f., take a different view, yet would appear to disregard the significance of Article 58 in Part V which is reinforced by Article 86 when it explicitly emphasises the freedoms of all States in the exclusive economic zone.

<sup>30</sup> Mangone, Gerard J., *The Effect of Extended Coastal State Jurisdiction over the Seas and Seabed upon Marine Scientific Research*, in Park, Choon-Ho, editor, *Law of the Sea in the 1980s*, Honolulu, Hawaii, 1983, p.301, points at the rather bleak prospect of a conciliation procedure: "A conciliation commission would *not* have the right to question the exercise of the discretion of the coastal State in withholding its consent, that is, in judging whether the research is of direct significance for the exploration and exploitation of the resources, involves drilling, explosives, artificial islands, or harmful substances, or contains information about the nature or objectives that is inaccurate, or whether the applicant has outstanding obligations to the coastal State."

<sup>31</sup> This seems to be the position of DOALOS, see *U.N. Division for Ocean Affairs & Law of the Sea, Marine Scientific Research, A Guide to the Implementation of the Relevant Provisions of the United Nations Convention on the Law of the Sea*, New York, 1991, p. 12, also above, page 83.

“general principles of law recognized by civilized nations”<sup>32</sup>, namely, a right of access to the relevant reasons for a decision.<sup>33</sup> This would mean that the researching State could challenge the denial of a research request in a section-2-procedure where, for example, the coastal State has not at all or wrongly determined the relevant facts.

Yet, inasmuch Article 297(2)(a)(i) of the 1982 LOS Convention reflects and safeguards the balance of Part XIII, the intention of Article 297(2)(a)(i) beyond the mere language should also be taken into account. Article 297(2), by exempting the exercise of the coastal State’s rights from judicial review, goes already beyond preserving the balance: Article 297(2) augments the bias by facilitating coastal state arbitrariness.<sup>34</sup> It is therefore submitted that exceptions to Section 2 must be interpreted restrictively. Inasmuch as the above mentioned issues are those of due process, they do not affect the balance either way. A decision would not replace or substitute the coastal State’s discretion and thus not affect the substantive provisions of Part XIII. At the same time, the researching State could nevertheless have an interest in a third party dispute settlement in the matter as it safeguards its right to a fair consideration of its research request.

<sup>32</sup>Article 38(1)(c) of the Statute of the I.C.J.; see generally *Weiss, Wolfgang, Allgemeine Rechtsgrundsätze des Völkerrechts*, in A.V.R. 39 [2001], pp.396–414.

<sup>33</sup>It is yet another question if such a right could be established as a “[rule] of international law not incompatible with this Convention”, (Article 293(1) Applicable law). Discussion of this question is beyond the scope of the present analysis, but it is submitted that such a rule exists: In municipal law this right is generally part of due process in the sense that the addressee of a decision must be enabled to comprehend the reasoning so that it may change the relevant aspects justifying the decision in the first place. In international environmental law the right is established, both by custom and treaty, see *Stiegel, Ute, Das Übereinkommen über die Umweltverträglichkeitsprüfung im grenzüberschreitenden Rahmen (Espoo-Übereinkommen): Inhalt, Bedeutung und Durchführung*, Frankfurt am Main, 2001, Europäische Hochschulschriften Reihe 2, Rechtswissenschaft 3142, pp.69–81, with respect to the duty of information and consultation in the event of environmental impact assessments: At least in environmental matters notification, information, participation and documentation can be claimed as a matter of law on the basis of *Convention on Environmental Impact Assessment in a Transboundary Context*, adopted 25 February 1991, entry into force 10 September 1997, 30 I.L.M. 800 [hereinafter: Espoo Convention], the text is available at <http://www.unece.org/env/eia/> – visited on 31 January 2005. Article 6(2) of this convention explicitly provides:

The Party of origin shall provide to the affected Party the final decision on the proposed activity along with the reasons and considerations on which it was based.

<sup>34</sup>*Lukaszuk* goes too far when he contends that “the coastal State may eschew the submission of *any* dispute involving marine scientific research to the procedures provided for in Section 2 if this research has been, or is about to be, conducted in its exclusive economic zone or on its continental shelf [emphasis added].” *Lukaszuk, Leonard, Settlement of international disputes concerning marine scientific research*, in Pol.Y.Int’l L. 16 [1987], p. 49.

*“Direct Significance”*

The question, whether a certain research project has *direct* significance for the exploration and exploitation of natural resources, in contrast, depends on the interpretation of the word ‘direct’. This is effectively a discretionary decision and can thus only be submitted to a Conciliation Commission.

*Denial under Article 300 of the 1982 LOS Convention*

If the coastal State refuses to give any justification for its decision envisaged in either Article 246(3) or (5) of the 1982 LOS Convention, there is good reason for the argument that by this attitude the coastal State would violate Article 300 of the 1982 LOS Convention which is fully capable of judicial review. Such a refusal would obviously not constitute a right or the exercise of a right under Article 246. However, in order to be justiciable the researching State would have to have the right to request such a justification.<sup>35</sup> An obligation of the coastal State to furnish a reasoned opinion to the researching State if it withholds consent can be construed on the basis of Article 246(3); where the consent shall normally not be withheld, the coastal State must prove that the circumstances of the case in question are not normal.<sup>36</sup> The interests of the coastal State would not be affected by such a requirement since the coastal State would only have to defend its position on the basis of the submission without any additional information.

*Suspension and Cessation*

Where on the grounds of Article 253 the coastal State has ordered the suspension of the research, a dispute with respect to the question, whether compliance with the requirements set forth in Articles 248 and 249 has subsequently been effected, would seem to fall outside Article 297(2) and thus be admissible to compulsory jurisdiction. Lifting of the suspension is an obligation of the coastal State assertion of which would not affect the interests of the coastal State safeguarded in Articles 246(5) and 249. On the other hand, the order of suspension or cessation as such is essentially an enforcement measure ancillary to the exercise of the coastal State’s rights. An exception would apply where such an order is based on wrong evidence which would bring the order at least close to a violation of Article 300 of the 1982 LOS Convention.

*Conclusion*

In conclusion, one may say that, albeit Part XIII is skewed in favour of the coastal State, Part XV provides a number of options to secure the rights of the researching States. Clarification of the respective rights could prove to be one of the most merital tasks of any third party dispute settlement body, regardless whether the decision is binding or not. It is left to be seen to what extent researching States will avail themselves of judicial review but from the preceding assessment it would appear to be a promising option.

<sup>35</sup>See n. 33 on page 306.

<sup>36</sup>See *Soons*, Marine Scientific Research (as in n. 13 on page 299), p. 167.

## THE POTENTIAL OF INTERNATIONAL CO-OPERATION

*Promotion of International Co-operation*

Ocean processes know no national boundaries and the ubiquitous nature of many of the problems to be solved means that it is often prudent to implement even local and regional operational or research programmes co-operatively and in a co-ordinated way.<sup>37</sup>

Closely linked to the promotion of science in general, the 1982 LOS Convention calls upon States and international organisations to promote international co-operation. Marine science is inherently international and there are positive benefits scientists can receive from co-operation and from organisations that facilitate this co-operation. Such benefits include information and data exchange; standards and inter-calibration; assistance in carrying out 'simultaneous' observations on long (geological) or short (synoptic) time scales.<sup>38</sup> Also, in many instances bi- or multilateral co-operation is the only possibility to secure the funding for large-scale, long-term or global projects as investments are too large to be borne by one country alone.<sup>39</sup> Additionally,—as for much of the monitoring and generating of advice relating to environmental change—the benefits of this kind of research are essentially public goods, i. e., they cannot be appropriated in any reasonable manner to a single proprietor. Inasmuch as scientific knowledge enters the public domain, researching States have an interest to share the cost of providing such information by as many participants as possible or feasible. Moreover, the need to co-operate on an international level is not only a political or economic concern, it becomes increasingly essential from a technical point of view. Proficient data management is the foundation based upon which global monitoring programmes, such as GOOS and GCOS, can be carried out only.<sup>40</sup>

<sup>37</sup> *Status Report on Existing Ocean Elements and Related Systems*, GOOS Report No. 59, IOC/INF-1113, Paris, 1998, p. 2.

<sup>38</sup> See *Wooster, Warren S., International Organization for Science*, in *Alexander, Lewis M.*, editor, *Proceedings of the Third Annual Conference of the Law of the Sea Institute*, June 27, 1968, Kingston, RI, 1969, p. 420.

<sup>39</sup> Already in the 1960s the term 'global technologies' referred in this sense to aspects of outer space, nuclear energy, large-scale weather modification, air pollution, and elements of exploitation and the use of the marine environment. See *Schaefer, Milner B., Freedom of Scientific Research and Exploration in the Sea*, in *Stanford J.Int'l Studies* 4 [1969], p. 47.

<sup>40</sup> If global data sets, in particular those from satellites, are denied broad access to the global models used for weather or climate studies and predictions, then the acquisition of data will have limited benefits. As noted by the Seventh Session of the Joint IOC-WMO Committee for the Integrated Global Ocean Services System (IGOSS), Paris, 20–29 November 1995 (IOC-WMO/IGOSS-VII/2, p. 5):

The provision of this access involves two parallel efforts: the first is to develop the present data distribution networks into efficient, high volume data systems and networks capable of providing global distribution; the second



*International Organisations in the Context of Part XIII*

The term international organisation is important in the context of marine scientific research as such organisations are assigned a significant role, both in the conduct of research projects as such, as well as in the promotion and facilitation in general. Throughout the 1982 LOS Convention reference is made to international organisations; the Convention seems to presuppose an international organisational framework,<sup>41</sup> both in the context of administering ocean related policy decisions and implementing the Convention itself. The 1982 LOS Convention generally distinguishes between ‘appropriate’ and ‘competent’ international organisations without an apparent significance for the law.<sup>42</sup> *Treves* suggests that Article 243 shows a higher degree of reliance on international organisations for the implementation of its legislative objective than other provisions in that it envisages “an activity of the competent international organizations as such in relation to States and not of States with one another through the competent international organizations.”<sup>43</sup> Indeed, Article 238 affords competent international organisations the same treatment as individual States, i.e., they may conduct research activities under the same rules as States.<sup>44</sup> Two principal activities of a competent organisations in the context of Part XIII must be distinguished: one is the conduct of marine scientific research by own means in accordance with Article 238, the other is the promotion and facilitation of marine scientific research as foreseen by Article 239 and reiterated in Article 242, 243 and 244. While to date not many international organisations carry out their own

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is a data policy that provides data and data information to the entire user community according to their requirements and capabilities, and that does not disadvantage any member or potential member of the user community.

<sup>41</sup>See *Treves, Tullio, The Role of Universal International Organizations in Implementing the 1982 UN Law of the Sea Convention*, in *Soons, Alfred H. A.*, editor, *Implementation of The Law of the Sea Convention Through International Institutions*, Honolulu, Hawaii, 1990, p. 14.

<sup>42</sup>*Ibid.*, p. 17, suggests that ‘appropriate’ requires a judgement in terms of opportunity, while ‘competent’ requires a judgement in terms of law, yet he also assumes that the difference is not important.

<sup>43</sup>*Ibid.*, p. 20.

<sup>44</sup>It must be noted that these organisations, not being a party to the 1982 LOS Convention, can assume the rights under the Convention only by acceptance; as regards obligations, such acceptance must be explicit and in writing. The *Vienna Convention on the Law of Treaties between States and International Organizations or between International Organizations*, adopted 21 March 1986 (UN-Doc. A/CONF.129/15), 25 I.L.M. 543 provides in Article 35 ‘Treaties providing for obligations for third States or third organizations’:

An obligation arises for... a third organization from a provision of a treaty if the parties to the treaty intend the provision to be the means of establishing the obligation and... the third organization expressly accepts that obligation in writing. Acceptance by the third organization of such an obligation shall be governed by the rules of that organization.

research projects,<sup>45</sup> promotion and facilitation of marine scientific research is undertaken by a number of organisations such as I.O.C., ICES, PICES, the OSPAR and Helsinki Conventions.

On an international level, i. e., within the framework of existing international organisations, the necessity to co-operate seems to be an established basis of business today.<sup>46</sup> Also private relationships between scientists of different provenance are often helpful either to circumvent time consuming consent procedures or to accelerate the processing of research requests.<sup>47, 48</sup>

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<sup>45</sup>The European Union pursues its own research programmes in addition to funding programmes on a national and regional level; within its general research programmes the *Marine Science and Technology Programme (MAST)* focusses on ocean related research, information is available at <http://europa.eu.int/comm/research/marine1.html> – visited on 31 January 2005 (Note, that the term ‘international organization’ as used in Article 305 differs from the term used in Part XIII: ‘competent international organizations’ must not fulfil the requirements of Annex IX, Article 1 of the 1982 LOS Convention.). Also, the F.A.O. conducts research programmes albeit exclusively on fisheries, see the *Lake Tanganyika Project*, information is available at <http://www.fao.org/fi/ltr/index.htm> – visited on 31 January 2005.

<sup>46</sup>See as an example for co-operation within I.O.C.: The Memorandum of Understanding (MoU) for the Mediterranean GOOS (MedGOOS) (IOC Doc.-XX/Inf. 2, Paris, 6 April 1999, the document is available through a searchable database at UNESCO: <http://unesdoc.unesco.org/ulis/index.html>) – visited on 31 January 2005), it represents the informal association fostering co-operation on GOOS in the Mediterranean, as signed during the Second International Conference on EuroGOOS (Rome, 10–13 March 1999) by the representatives of Cyprus, France, Greece, Israel, Italy, Malta, Morocco, Slovenia and Spain.

<sup>47</sup>Thus, in the 1990s it has been possible for U.S. scientists from the University of Washington to conduct research from Russian research vessels without proper clearance neither through U.S. nor Russian authorities on a strictly private basis; generally, however, the U.S. cautions against such private contacts: “problems have often been encountered with well-meaning colleagues in the coastal state who offer to obtain clearance on behalf of their U.S. counterparts. It is frequently and unfortunately the case that such direct approaches are not successful.” see *Stevens, Lee R., Handbook for international operations of U.S. scientific research vessels*, January 1986 ([http://www.gso.uri.edu/unols/for\\_cln/for\\_cln.html](http://www.gso.uri.edu/unols/for_cln/for_cln.html)) – visited on 31 January 2005, chapter 4.

<sup>48</sup>*Gorina-Ysern, Montserrat, An International Regime for Marine Scientific Research*, Ardsley, 2003, pp. 537f. and 562f., provides an overview of global and regional activities in the area of marine science (including marine scientific research) and concludes “the majority of States are engaged in extensive and far-reaching regional and international efforts to incorporate ocean science into management policies, in coordination with regional agencies and with the agencies of the U.N. system. [...] They will also require more effective monitoring, surveillance and enforcement of international legal instruments and codes of conduct.” At the practical level she views a potential of the “oceanographic communities of research fleet rich and powerful States” to make a contribution towards capacity-building for developing coastal States through interaction aboard research vessels and through oceanographic research activities in maritime zones of coastal States.

*Consent by Co-operation, Article 247 of the 1982 LOS Convention*

Article 247 provides for a consent procedure by default in the context of international research co-operations. It provides a special consent mechanism for research conducted under the auspices of international organisations and may be interpreted as a waiver of the rights under Article 246 in the specified circumstances. If an international organisation, within the ramifications provided for by Article 247, decides to carry out a marine scientific research project, the activity of the respective research platform would be embraced by the decision. Access in such cases would not fall under the condition of the consent by the coastal State on a case-by-case basis; neither would the coastal State's approval by virtue of Article 246 be a prerequisite.<sup>49</sup>

*Prerequisites for Consent*

Article 247 specifies the level of coastal State involvement, being a prerequisite for such a consent, as membership of, or bilateral agreement with the organisation. Consent is assumed in either of two situations.

*Approval or...*

The State in question must have approved of the project when the decision was made by the organisation. It is not clear why Article 247 contains the qualification "detailed project" as it would appear that the requirement of approval is sufficient. Approval presupposes an explicit expression of the State's attitude towards the decision, otherwise the State would have to abstain or object. If then the coastal State concerned has approved a decision on the basis of the presented project outline, its lack of detail cannot serve as a justification for a subsequent denial of access. In such an instance the doctrine of estoppel would hinder the coastal State to deviate from its earlier position. If, however, the details of the project are substantially altered or supplemented, the coastal State may find itself in an altogether different situation with the consequence that the previous approval cannot be held against it. Accordingly, the consequences of approval also suggest minimum

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<sup>49</sup>Article 22 'Particular aspects of obtaining permission for marine scientific research conducted by competent international organizations' of the Federal Act (as in n. 197 on page 109) provides:

If the Russian Federation, as a member of a competent international organization or under a bilateral treaty with such an organization, approves a draft plan for the conduct of marine scientific research or expresses the wish to participate in such research, and if the specifically authorized federal agency for science and technological policy does not state any objections within four months from the date of its receipt of the organization's application, the competent international organization, on the expiry of the time limit indicated in the application, may begin to conduct the marine scientific research in accordance with this Federal Law and the international treaties of the Russian Federation.

requirements for the proposal: only where the project outline decided upon reflects to a sufficient extent the project as it is to be carried out, the State's voting conduct can be binding on the basis of estoppel. How approval may be expressed is a question of (voting) procedure within the organisation. It may be necessary to make an explicit statement, it may suffice to remain silent and approve thus implicitly. In any event, approval as set forth by the rules of procedure of the relevant organisation would suffice for the purposes of Article 247.

*... Willingness to Participate...*

The relevant State must be willing to participate in the project. The willingness, too, needs to be explicitly expressed. Yet, in these cases, participation from preliminary stages would suggest that the coastal State will have a vested interest in facilitating access to study sites in its waters.<sup>50</sup> The difference to the first situation is the coastal State's involvement. While in the former the coastal State may just have availed itself of its proper rights within or vis-à-vis the organisation, in the second situation it may incur financial and political liabilities as a consequence of its participation.

*... Persisting Four Months*

In any case, approval and willingness must persist for at least four months after notification of the project, a period during which a coastal State can voice any objections in respect of the project and, accordingly, withdraw its previous approval.<sup>51</sup> It is not entirely clear what the date of notification refers to. On the basis of the text, one could assume that this is the date at which the "detailed project" has been made available to the State concerned. For practical purposes the date of the voting gives more clarity because no changes may be made after this date without compromising the States' approval. Since Article 247 is a provision independent from any organisational framework, this safeguard would also apply if the state had initially, i. e., during the decision making process within the organisation, consented to the research plans. Article 247 thus provides a "second thoughts" escape and an exception to the principle of estoppel. This may cause serious repercussions for the activities and processes of organisations, as there will be no certainty about the voting until four months after notification. However, a state taking such an attitude may find itself accused of violating Article 300 as well as its reputation within the organisation compromised.

<sup>50</sup>See *Horness, Beth H., Research on the Role of the Ocean in Global Climate Change: The Effect of Extended Jurisdiction*, in O.D. & Int'l L. 22 [1991], p. 76.

<sup>51</sup>Which is a regrettable change to the earlier version, see *Oxman, Bernard H., The Third United Nations Conference on the Law of the Sea: The Ninth Session (1980)*, in Am.J.Int'l L. 75 [1981], p. 236.

*"International Organisation" according to Article 247*

No requirements are provided as to what constitutes an international organisation for the purposes of Article 247. It is not even clear if only those international organisations are qualified which enjoy legal status under general international law or any organisation comprised of an international membership. Since the organisation assumes certain rights under the 1982 LOS Convention it would follow that it must also have legal personality in accordance with general public international law; even more so, as public international law itself has no legal and administrative process comparable to municipal law which makes the term international organisation rather flexible. *Brownlie* summarises the criteria for international organisations as:

1. A permanent association of states, with lawful objects, equipped with organs;
2. A distinction, in terms of legal powers and purposes, between the organisation and its member states;
3. The existence of legal powers exercisable on the international plane and not solely within the national systems of one or more states.<sup>52</sup>

Yet, these criteria would seem to exclude even organisations that have a clear competence in the area of marine scientific research and must be recognised under the 1982 LOS Convention as competent, such as I.O.C., and strictly restrained in taking independent action.<sup>53</sup> In the light of Part XIII, the term 'international organisation' is, therefore, to be understood as to refer to international associations, in which the coastal State in question is represented in such a way, as to make the decisions of the organisation binding, as a matter of international law, for the relevant State. Otherwise the same considerations apply like with respect to competent international organisations.<sup>54</sup>

Article 247 does not require that the international organisation has to be competent in the area of marine scientific research. Thus, other organisations generally not concerned with marine scientific research could institute procedures under Article 247 as long as the relevant requirements are fulfilled.<sup>55</sup> It is important to note that the "detailed project" and "agreed specifications" warrant a certain level of scientific cognisance anyway; also participation in and acceptance of competence of such an organisation by the coastal State would be effected on a voluntary basis.

<sup>52</sup> *Brownlie, Ian, Principles of public international law*, 5th edition. Oxford, 2001, pp. 679f.

<sup>53</sup> *Brownlie* exempts the subsidiary organs of the U.N. from the status of international organisations, see *Ibid.*, p. 680.

<sup>54</sup> See page 309.

<sup>55</sup> The F.A.O. is one such organisation inasmuch as it conducts own research in fisheries, for example the *Lake Tanganyika Project* (as in n. 45 on page 310); see section 8.

*Form of Coastal State Involvement*

Two categories of international organisations may then be distinguished: one is the intergovernmental, the other the non-governmental type. Both can conceivably contribute to international co-operation and research projects.<sup>56</sup> In this sense, both would qualify as international organisation for the purposes of Article 247 of the 1982 LOS Convention. An intergovernmental organisation consists, as the name suggests, of multiple (as a minimum two) governments. Where Article 247 speaks of membership it would principally refer to such an organisation. As these organisations directly involve the represented governments, the decisions taken by the bodies are—in accordance with the organisation’s framework and Article 247—attributable to and binding for the represented State as a subject of international law by virtue of the state’s membership.

Non-governmental organisations do not have states as members. Yet, they could enter into bilateral agreements with a coastal State in accordance with the second option of Article 247. Although this is theoretically conceivable it seems rather impractical or at least of little relevance. The rights ascribed in the 1982 LOS Convention apply principally between states. They can consequently only be asserted and pursued by states. If a non-governmental organisation entered into a bilateral agreement with a coastal state for the purpose of conducting research, that organisation, in case of breach of contract, would have to pursue its rights under the contract in accordance with general contract law; Article 247 would not apply. Deemed consent presumes that there has been some form of state conduct that makes a certain result accountable to a state. To the extent that non-governmental organisations consist of private individuals they cannot bind governments under public international law. The international role of non-governmental organisations may be significant for the furtherance of science; however, they do not qualify for Article 247.

A bilateral agreement may also exist between a non-member state and an intergovernmental organisation either on a case-by-case basis or permanently. Accountability for the voting behaviour of that State is then based on the bilateral agreement in which the State agrees to be legally bound under international law principles to comply with the contents of the agreement. In addition, it would appear that this State must be present or participate at least at the adoption of the “detailed project” which would probably include a deliberation phase also, depending on the rules of voting in the relevant organisation.

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<sup>56</sup>See *Nordquist/Rosenne/Yankov* (as in n. 1 on page 295), p. 449, the term “does not refer to any specific organization, but to whichever organization is competent under the circumstances. [...] Nongovernmental organizations with particular concern for marine science, and capable of participation in research programs, could also come within the scope of article 238.”

*Research Project Potential under Article 247*

There are principally two conceivable possibilities for the conduct of research projects under Article 247 in terms of accountability. Either the organisation is itself responsible for the research project or it sponsors scientists within another framework either financially or with technology and know-how. While the first qualifies as direct international co-operation between the coastal State and the organisation, the second not necessarily does. An international organisation with the principal purpose of scientific research may provide a general framework within which the scientists of the participating States enjoy a greater freedom on the basis of reciprocity, i. e., where the framework of the organisation proffers the basis for mutual trust in order to overcome integrity concerns. From a researching state perspective this potential must not necessarily look like one.<sup>57</sup>

Yet, it seems that rather negative views on the potential of co-operation have not materialised. The international co-operation cannot be said to have been decreasing after the entry into force of the 1982 LOS Convention. Rather to the contrary, international efforts have become more in numbers and in size, though mainly due to scientific necessities—and probably rather in spite of the 1982 LOS Convention than as a result of it.

*Platform for Mutual Trust*

In the future, the co-operation in organisations—while presently non-existent, at least in the sense of Article 247—could be beneficial for both, the coastal and the researching State. The organisational structure may provide an atmosphere of mutual trust that is essential for exchange of data and

<sup>57</sup>See *Ozman*, 1977 Session (as in n. 7 on page 298), p. 77, noting:

[This Article reflects] a perception among developing countries that negative control over scientific research is insufficient... [It] seems to say that in exchange for cooperation by major research states and institutions in the conduct of scientific research by regional or global organizations (a collective effort under heavy developing country influence) predictability will be enhanced and bureaucratic problems simplified with respect to the coastal states that have approved or are participating in the project.

A similar view is expressed in the report of the U.S. delegation to the Third U.N. Conference on the Law of the Sea when it notes

a potential roadblock to the conduct of marine scientific research by regional organizations in which the coastal State concerned participates. This well may remove a major incentive for countries with advanced marine scientific research capability to cooperate in regional scientific research projects organized by developing coastal States.

See *Nordquist, Myron H./Park, Choon-Ho*, editors, *Reports of the United States Delegation to the Third United Nations Conference on the Law of the Sea*, *Law of the Sea Institute*, Honolulu, Hawaii, 1983, Occasional Paper No. 33, p. 357; in contrast, *Gomez, Edgardo D.*, *Marine Scientific Research in the South China Sea and Environmental Security*, in *O.D. & Int'l L.* 32 [2001], p. 209, notes a potential of scientific research for overcoming regional political and diplomatic deadlock in the South China Sea.

know-how but sometimes difficult to attain. It can increase predictability and certainty that goes beyond bilateral agreements, because the complexity of relationships in an organisation tends to inhibit change. Especially for developing countries, the organisational framework may serve as an option to negotiate the terms of access with the researching States on an equal footing which could effect a beneficial *tit-for-tat* with respect to the transfer of technology within a long term co-operation. Finally, a broader basis to shoulder the cost of large-scale projects and the effects of economies of scales would from a financial perspective speak for co-operation in organisations, too.

#### *Flexibility in spite of Part XIII*

An important implication of such co-operation is its potential for flexibility in spite of the rather rigid framework of the 1982 LOS Convention. States co-operating in an Article-247-organisation may go as far as to delegate decisions to their respective scientific entities completely. On a basis of mutual trust a (regional) organisation may liberate its scientists from the strings attached to the regular consent procedure. Within the setting of an international organisation States may take on different views on the balance of gains and losses. The benefits of co-operation within a set long-term framework may be more apparent than in a bilateral agreement. And to the extent that organisations become somewhat independent from their initiators—and thus independent from the single States constituting the organisation—they may be able to serve as impartial guardian of scientific interests without impairing the coastal States' integrity. Such a development would naturally depend on the ability of the organisation to convey the image of impartiality and transparency. Yet, an organisation put up to carry out common research projects would in its own interest seek and exhibit a kind of behaviour that best secures future support from its constituents. Ideally the organisation would provide a link between the scientific world of curiosity and the coastal State's world of exclusive use and politics. Experience with co-operation in a scientific context, i. e., multinational research teams, might very well have influence beyond the initial scope of applicability. Inasmuch as the fisheries regime of the 1982 LOS Convention generated implementation through regional fishing organisations, Article 247's most notable effect might be the furtherance of the implementation of Part XIII through international framework organisations.

#### *Implementation by International Organisations*

The *Pacific International Council for the Exploration of the Sea (PICES)*, in a Council recommendation adopted in 1996, affirmed the application of Article 247 of the 1982 LOS Convention for co-operative projects. According to that decision, a Working Group submits the research proposal, which entails elements where questions of access arise, to the Science Board which



on approval forwards the proposal to the Governing Council for formal endorsement by the organisation.

Also, the I.O.C. in its session in June 2001 considered the implications of Article 247 of the 1982 LOS Convention and, more specifically, the organisational prerequisites necessary to apply Article 247 to its maximum use. In principle, the procedure envisaged by Article 247 was considered to be of potential benefit in cases where a large number of areas under coastal States' jurisdiction would need to be accessed in the course of a particular project.<sup>58</sup> It was also noted that such a procedure might contribute to the promotion of marine scientific research in general.

As regards the specific requirements of Article 247 of the 1982 LOS Convention, a number of issues were identified that would have to be addressed in the implementation of Article 247. These include the kind of projects qualifying for the procedure, the competent organs that would be in the position to make a decision, and finally the kind of information that must be available for the decision.<sup>59</sup> In May 2004, the IOC/ABE-LOS sub-group "on the internal appropriate procedure related to an effective use of Article 247 of UNCLOS on marine scientific research projects undertaken by or under the auspices of international organizations" presented its progress report at the ABE-LOS meeting.<sup>60</sup> The chairman noted "significant differences of opinion" among the members with respect to a possible procedure and use of Article 247. In terms of advancement of scientific freedom, the discussions in the sub-group seem to revolve around strikingly similar issues as had surfaced during the negotiations of the 1982 LOS Convention. These points include the participation of the coastal State, the information to be submitted with the proposal, and procedural conditions.<sup>61</sup> The chairman concluded cautiously "[o]nly thereafter could a decision be taken if it is *possible or advisable* to further pursue this project."<sup>62</sup>

<sup>58</sup>See section 1.

<sup>59</sup>See on the following *Soons, Alfred H. A., Procedures to be Followed within International Organisations to Conduct marine scientific research Including the ARGO Project in the Context of UNCLOS*, paper presented at the first meeting of the Advisory Body of Experts on the Law Of the Sea, Paris, 11–13 June 2001, UNESCO Doc. IOC/ABE-LOS I/9, 2001, pp. 4f.

<sup>60</sup>*Soons, Alfred H. A., Progress Report of the Chairman of the IOC/ABE-LOS Sub-Group on the Possible Establishment of an IOC Internal Appropriate Procedure Related to an Effective Use of Article 247 of UNCLOS Under the Auspices of International Organizations*, Fourth Meeting of the Advisory Body of Experts on the Law of the Sea, Lefkada Island, Greece, 4–7 May 2004, UNESCO Doc. IOC/ABE-LOS-IV/7, 2004.

<sup>61</sup>See, e.g., Argentina's submission, reprinted in *Soons, Alfred H. A., Summary of Comments regarding the IOC Internal Procedure Related to an Effective and Appropriate Use of Article 247 of the UN Convention on the Law of the Sea*, Fourth Meeting of the Advisory Body of Experts on the Law of the Sea, Lefkada Island, Greece, 4–7 May 2004, UNESCO Doc. IOC/ABE-LOS-IV/7 Add., 2004, p. 2.

<sup>62</sup>*Soons*, Progress Report 2004 (as in n. 60).

*Competent Organs*

With respect to the competent organs, it should be ensured that all coastal States that are affected by the research project in question ought to be involved in the decision making process.<sup>63</sup> The level of involvement contemplated at I.O.C. is direct participation in the relevant meeting; thus, it was suggested that—for global or inter-regional programmes—the Assembly of I.O.C. would be the appropriate organ; as regards regional subsidiary bodies of I.O.C., the competent organ would have to be established accordingly. As regards available information, reference must be had to the requirements of Article 247 which refers to the approval “of the detailed project”. It was submitted as unlikely that Article 247 envisages the same level of detail for a research proposal to the organisation as is required for a single clearance request by a coastal State. Indeed, it would seem that within the context of an international organisation a number of issues could be delegated or deferred; only if that was the case, a level of simplification would be reached, making it worthwhile to engage an international organisation in the process in the first place.

It was further submitted that the decision to approve the project should contain explicit provision for matters like participation or representation of coastal States in the research and on board of research vessels, provision of reports and access to data and samples, as well as assistance in evaluating research results. It would seem that such provisions can be considered a matter of necessity in the context of an international organisation where the direct co-operation between developing and developed States in the decision making process on an equal footing may take the form of a *tit-for-tat*. Where, however, such provisions are not contained in the final decision, approval by the involved States could not be conditioned in hindsight: the significance of Article 247 lies in the fact that approval by the organisation establishes a clear operational basis for the conduct of the research project (within the ramifications of the decision). Even if such provisions would appear to be included in a detailed project proposal, as a matter of organisational policy or routine rather than legal obligation, it seems desirable to have some form of safeguard in the procedural rules that prevent single States from “opting out” at a later stage or taking advantage of the four months escape hatch

<sup>63</sup>Article 2 of the Draft Internal Procedure takes note of that:

All member States in whose EEZ or on whose continental shelf the marine scientific research project is to be carried out, or otherwise to be involved in the execution of the project, shall be provided an opportunity to participate in the discussion of the proposed project.

See Annex Soons, Alfred H. A., *Progress Report of the Chairman of the IOC/ABE-LOS Sub-Group on the Possible Establishment of an IOC Internal Appropriate Procedure Related to an Effective Use of Article 247 of UNCLOS on Marine Scientific Research Projects Undertaken by or Under the Auspices of International Organizations*, presented at the first meeting of the Advisory Body of Experts on the Law Of the Sea, Lisbon, 12–15 May 2003, UNESCO Doc. IOC/ABE-LOS-III/8, 2003.

provided for in Article 247. Clearly, for a research proposal to be accepted by an Article-247-procedure it would have to appease every actual and potential point of conflict or apprehension so as to make the effort worthwhile.

### *Procedure*

This last observation is also valid for the question what procedure should be followed. At I.O.C. it was underlined that all coastal States potentially involved should be informed and, if possible, involved from the start of the discussion. Transparency from the beginning, accommodation of concerns, and appeasement of apprehensions seem to be crucial elements within heterogeneous decision making bodies. Comments by Argentina and Thailand on the draft indicate that this is a delicate issue.<sup>64</sup>

Another point relates to the level at which discussions about a research project should be conducted. It is very likely that projects are accepted by one or a small number of researchers and will spread from there. The next logical level, the first level for discussion on a broader international level within the framework of an organisation, would be the scientific and technical bodies of the organisation whose task would be to assess the feasibility of the project from a scientific and technical point of view.<sup>65</sup> To leave this initial decision to a scientific body alone has proved to be a rather contentious issue in the discussions at I.O.C.<sup>66</sup>

The assessment would then have to be further evaluated for its political and legal implications in the light of Part XIII or, in fact, the organisational framework. It is unlikely that the contentions, evidence of which is given by the regime of Part XIII, disappear in the context of an international organisation. Therefore, it is advisable, from a policy point of view, to address the potential concerns of coastal States in advance. The scientific assessment, thus politically and legally refined, would then be presented in form of a *detailed* project proposal to the competent, ultimately decisive organ of the organisation.<sup>67</sup>

The preferred form for any decision taken by the organisation to approve a project is a resolution from that organ. It should explicitly mention that

<sup>64</sup>Both propose the omission of the phrase “[shall] be invited to [participate]”, making participation a prerequisite for an orderly decision, *Soons*, Summary of Comments (as in n. 61 on page 317), pp.2f.

<sup>65</sup>This has been incorporated in Article 2 of the Draft Internal Procedure:

An initiative by one or more member States to submit a proposal that the Commission undertake a marine scientific research project...shall be referred to the appropriate scientific body or an ad hoc body established by the Assembly.

See n. 63 on page 318.

<sup>66</sup>See the comments by Argentina and Thailand, *Ibid.*.

<sup>67</sup>The U.S. in its comments points out, on the basis of its experience, that it is impossible to supply certain information, namely, in terms of Article 248(b) and (d), at that stage of a project already, see *Ibid.*, p. 7.

it is adopted for the purpose of Article 247 of the 1982 LOS Convention to avoid any misunderstandings, especially the revocation of approval by a coastal State. The internal procedure can, due to the organisation's rules of communication and decision, harbour a number of traps for further delay of the project.<sup>68</sup>

### *Notification*

After the decision, the secretariat of the organisation or executive committee should notify immediately all coastal States concerned. This would be extremely important where the procedural rules contain no amendment of the "second-thoughts-clause" in Article 247 of the 1982 LOS Convention, as from the date of notification the four months would be counted.

It must be noted that objections, lodged within four months of receipt of notification, may only be based on Article 246(5) of the 1982 LOS Convention or, if the coastal State would otherwise have been entitled to invoke the existence of "non-normal" circumstances, on Article 246(3) and (4).<sup>69</sup> An objection, for example, on the basis that the project proposal had originally been insufficient, would have to be subject to serious limitations. Generally, objections relating to the requirements set forth by Article 247 should be only possible at the time when the facts for such an objection have become known to the objecting State. While vicarious knowledge of the executive board or committee as a standard would be desirable, it is probably not a viable option since it would deprive coastal States of a valuable escape route.

### *Termination*

At I.O.C. it was further suggested to look into the modalities of procedures for terminating, by a decision of the competent organ, a research project which has already been approved and is in the process of being carried out. An adequate solution would be to append provision for such a situation to the organisation's decision or, alternatively, devise a generally applicable procedure, competence for which remains with the organisation's competent organ. Similarly, it may be advisable to centralise the supervision of the research to the extent that conditions for the research conduct, in accordance with Article 249 of the 1982 LOS Convention, are to be contained in the decision of approval by the organisation rather than issued subsequently by every single coastal State.

<sup>68</sup>Argentina, in its comments on the IOC Internal Procedure, proposes a six, instead of a two months period minimum for communicating a draft resolution to the relevant States before the adoption, see *Soons*, Summary of Comments (as in n. 61 on page 317), p.2; the U.S., in its comments, points out that a lengthy procedure may render any effort futile, see *ibid.*, pp. 8f.

<sup>69</sup>See *UN DOALOS*, Implementation Guide (as in n. 31 on page 305), p. 14.

*Compliance with Part XIII*

During and after the conduct of the research, all States involved should comply with the other relevant provisions of Part XIII. This involves the duty to inform coastal States about changes in the programme, the right to order suspension or cessation, and removal of installations and equipment. All of these duties and rights may find a corollary in the organisation's decision. This would be desirable, as only if such duties and rights are waived, a coherent execution of a research project would appear to be possible. Communication with the coastal State should naturally be effected through the organisation since the organisation replaces under the purview of Article 247 the single researching State. As stated above, the right to order cessation or suspension of a research project may be deferred to the executing organs of the organisation to ensure coherence and transparency in the execution of the programme. Finally, the organisation would have to make arrangements for its responsibility *vis-à-vis* its members, not only for the removal of installations and equipment but also for other acts and omissions attributable to the organisation in the course of the research project.

*Ad hoc Participation*

Wherever a procedure is set up in accordance with Article 247 of the 1982 LOS Convention, arrangements should be made to allow third coastal States to participate on an *ad hoc* basis. This will usually take the form of a co-operation agreement between the organisation and the particular state. Where such a State is not a party to the 1982 LOS Convention special precaution must be had that the rights and duties set forth in the 1982 LOS Convention are also incurred by that State.

*Military and Foreign Policy Interests*

In addition, it should be noted that on a governmental level military and foreign policy interests often conflict with research interests. And if such conflicts are not transparent, military and foreign policy concerns are very likely to hinder scientific co-operation as envisaged in Article 247 of the 1982 LOS Convention. Article-247-procedures must take into account the various implications of a scientific research project and from early on address such apprehensions as may arise among the various stake holders. It is submitted that the greatest possible transparency from the beginning will reduce the rate of objections in the four months after notification of the decision and similarly the number of cessation or suspension orders in the course of the project.

*Non-scientific Organisations*

As an alternative to a specialised scientific organisation, it may be contemplated to incorporate Article-247-mechanisms in other, not principally science related organisations. For example, the *North Atlantic Fisheries Organization (NAFO)* under its management scheme<sup>70</sup> already grants research vessels certain privileges, namely, the unrestricted possibility to take fish; in fact, the regulatory measures devised by the NAFO Commission pertaining to the taking of fish would not apply to such a vessel.<sup>71</sup> It must be noted, though, that this privilege only applies in the “Regulatory Area” which is according to Article 1(2) of the NAFO Convention “that part of the Convention Area which lies beyond the areas in which Coastal States exercise fisheries jurisdiction.” Since this area coincides essentially with the high seas, the NAFO regulations provide (presently) no benefits for marine scientific research. Yet, under Article 247 of the 1982 LOS Convention it would be conceivable that a contracting party to NAFO delegates the right accorded under Article 246(5) of the 1982 LOS Convention to the NAFO Executive Secretary with respect to research on fish taking account of the fact that a number of species in the area straddle the jurisdictions of the NAFO parties. Such a measure could principally also extent to areas under national

<sup>70</sup>See NAFO FC Document 02/9, Conservation and Enforcement Measures, accessible at <http://www.nafo.ca/> – visited on 31 January 2005; the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries, establishing NAFO, was signed on 24 October 1978, it entered into force on 1 January 1979 and has currently 18 Contracting Parties: Bulgaria, Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), Estonia, European Union (EU), France (Saint Pierre et Miquelon), Iceland, Japan, Republic of Korea, Latvia, Lithuania, Norway, Poland, Roumania, Russian Federation, Ukraine, United States of America; the text of the NAFO Convention has been published in the E.C.O.J., L 378, 30 December 1978, pp. 2–29, and can be accessed at the above website.

<sup>71</sup>Naturally, the privileges are only extended to those vessels engaged in such research that requires the taking of fish. Additional conditions apply as to the type of vessel, namely, that the vessel must be either a permanent research vessel or a vessel normally engaged in commercial fishing or fisheries support activity. Also, the privilege is only extended to vessels of contracting parties to NAFO, and the desire to conduct such research must be communicated to the Executive Secretary before the commencement of a research period with information on the

- (a) name of vessel owner and address;
- (b) type and name of vessel;
- (c) length, beam and draft of vessel;
- (d) port of registration, registration number, and radio call sign;
- (e) a note whether the vessel is a permanent research vessel or the period for which the vessel will be employed as a research vessel; and
- (f) for vessels which are temporarily employed in research only, purpose and area of research and plan of research program.

jurisdiction.<sup>72</sup>

The question may arise if such a waiver of the rights under Article 246(5) extends to all living resources or only to those which are normally managed under NAFO. A distinction to this effect would appear to be highly impracticable for at least two reasons: first, living organisms in the sea are rather a part of a system than single individuals which could be easily separated from each other. Research on fish will usually take account of this fact and will thus be based on a systems approach. Even if a species approach is taken, in practice, it will only rarely be possible to focus the research activity in such a way as not to affect other living organisms as well. Second, as a consequence of the foregoing, it would constitute an unnecessary bureaucratic obstacle to obtain two 'clearances', one from NAFO, the other from the coastal State, as the fisheries management is pursued in co-operation anyway.

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<sup>72</sup>In the context of the EU Draft Directive (see page 290) the point was raised that national authorities may delegate their competence to an international organisation in order to simplify consent/notification procedures.





## Chapter 9.

### Potential of other Provisions for Research

#### FREEDOM OF MARINE SCIENTIFIC RESEARCH

Article 238 of the 1982 LOS Convention establishes the general right for all States to conduct marine scientific research. Read together with Article 87 of the 1982 LOS Convention, it clarifies what had been vague to some extent in the aftermath of the Geneva Conventions: marine scientific research is one of the freedoms of the high seas. Yet, this freedom becomes a receding right when looking at other provisions of the 1982 LOS Convention. Most areas where research is being carried out fall within the zones of national jurisdiction. Also, the sea-bed beyond the limits of national jurisdiction is subject to a special regime, which grants the freedom of scientific research with qualifications. This leaves only the water column outside national jurisdiction for unfettered research activities. By itself Article 238 has no potential of realising scientific needs or desires; however, as a general policy statement it may weigh in dispute settlement procedures by introducing a common interest aspect as counterweight to coastal state interests. How much weight the common interest is given, however, depends on the circumstances of the case at hand and development of international law at large.

OBLIGATION TO PROMOTE AND FACILITATE MARINE SCIENTIFIC  
RESEARCH

*The General Obligations of Section 1 and 2*

The content of the obligation “to promote and facilitate the development and conduct of marine scientific research” is not further specified in Part XIII. And it is rather doubtful that it confers a claim that could counterbalance the coastal State’s prerogatives with respect to research.<sup>1</sup> Article 238 only states the general principle that marine scientific research is an activity that may be pursued by anybody. The freedom to conduct scientific research is limited inherently and explicitly. Inherently by the freedoms of other States for activities in the oceans as bequeathed by the 1982 LOS Convention. Explicitly by other provisions that restrain the freedom of scientific research in the light of other States’ jurisdiction.

Article 239 does neither spell out a specific goal, nor measures<sup>2</sup>, nor a time frame. Even though it employs the mandatory ‘shall’, the obligation remains fruitless without identifying steps against which a possible forthcoming can be measured. Article 239 must be understood as to merely reflect a generally felt need to increase the knowledge of the marine environment, grown from the perception that the oceans may provide ample possibilities for the solution of a number of problems of humanity. Similar to Article 238 the general obligation in Article 239 cannot by itself generate much momentum in favour of marine scientific research.

Article 242 supplements the policy guideline of Article 239 with a call for international co-operation. Although Article 242 uses the mandatory ‘shall’, it makes quite clear that it merely contains a policy statement on which no legal claim may be based: paragraph 1 points to sovereignty and jurisdiction limiting implicitly the scope of the initial phrase. The rights vested in the coastal State within its exclusive economic zone reduce the meaning of Article 242 to a general declaration of intent. Article 243 calls on States to conclude bilateral and multilateral agreements for the promotion of scientific research. While the agreements that may be fathered by this obligation can contain additional rights and privileges of researching States,<sup>3</sup> the obligation as such does not provide a legal basis for any claim. The broad and general language of this provision favours single State’s jurisdiction over the common interest in marine scientific research.

<sup>1</sup>See with respect to a general right to scientific research under public international law *Döhler, Elmar/Nemitz, Carsten, Wissenschaft und Wissenschaftsfreiheit in internationalen Vereinbarungen*, in *Wagner, Hellmut*, editor, *Rechtliche Rahmenbedingungen für die Wissenschaft und Forschung, Forschungsfreiheit und staatliche Regulierung*, Volume 1: *Freiheit von Wissenschaft und Forschung*, Baden-Baden, 2000, pp. 182f.

<sup>2</sup>But see section 9 with respect to measures of the coastal State.

<sup>3</sup>See, for example, German-New Zealand Scientific Co-operation Agreement (“Deutsch-Neuseeländische Vereinbarung über die wissenschaftliche Zusammenarbeit in der Antarktis”), concluded 26 June 1981 in Wellington, B.G.B.I. 1981 II 1062.

*Obligations under Article 255*

Article 255 exemplifies that promotion of scientific research may take place by adopting adequate legislation and procedures for research being conducted *outside* the territorial sea. This phrase would appear to repeat, with respect of coastal States, the obligation under Article 246(3)<sup>4</sup> and, in a more general way, to call upon all States to introduce measures for the furtherance of marine scientific research, be that lenient procedures for the permission of or generous financing for national research projects or the participation in international organisations, such as I.O.C. or ICES. Coastal States are furthermore called upon to grant research vessels port access and assistance.

*Port Access*

In general, access to internal waters and ports is subject to the coastal State's sovereignty.<sup>5</sup> Port access is discussed here as a possible conflict with coastal States' sovereignty to the extent that the general rule of coastal state control of access to internal waters might be superseded by international law.<sup>6</sup> It denotes the entry to the internal waters<sup>7</sup> for the purpose of docking or going at berth in order to replenish bunkers, disembark or take on board crew and other persons or material. Calls at various ports during a research cruise as well as the traversing of coastal waters depend on the schedule of the cruise. The exchange of scientists, taking on board observers in accordance with the conditions of a research authorisation, or, less routinely, cases of emergency, be it sickness or distress may to a larger or lesser extent occur during any research cruise. Foreign ships do not have access to every port everywhere. Access to ports as a shipping routine can be restricted for different reasons, namely, as a measure of national security, economic or safety interests<sup>8</sup> with respect to one single ship or all vessels of the same flag.

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<sup>4</sup>See section 2.

<sup>5</sup>The I.C.J. noted in the *Nicaragua Case* with express reference to the 1982 LOS Convention that it is "by virtue of its sovereignty that the coastal State may regulate access to its ports", *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v U.S.A.)*, 1986 I.C.J.Rep., p. 14(111).

<sup>6</sup>Access to deep water ports is not discussed here, see for an overview *O'Connell, Daniel P./Ivan A. Shearer, editor, The international law of the sea*, Volume II, Oxford, 1984, pp. 842–847.

<sup>7</sup>See *Lagoni, Rainer, Der Hamburger Hafen, die internationale Handelsschifffahrt und das Völkerrecht*, in A.V.R. 26 [1988], p. 264.

<sup>8</sup>See *Ibid.*, pp. 268f., distinguishing between restrictions based on germane national interests (self-isolation, protection of domestic trade); those based on the international relation between port and flag State as a function of foreign policy (embargoes, reprisal); and those based essentially on safety and health considerations (hazardous waste).

*Access as a matter of Law*

Port access has been discussed as a principle of international law entitling every ship to access ports (at least under certain circumstances).<sup>9</sup> For parties of the Geneva Convention and Statute on the International Régime of Maritime Ports<sup>10</sup> and under bilateral treaties of commerce and navigation such a law exists.<sup>11</sup> In general, it can be said that the scope of the right accorded in these treaties or bilateral agreements merely amounts to the obligation to treat parties equally in relation to each other and to most-favoured (third) nations.<sup>12</sup> On the basis of non-discrimination clauses in international treaties, a right to port access may also derive from agreements that concern predominantly other areas of law.<sup>13</sup> Since research vessels often have to call at ports for a variety of reasons the question arises if they can access ports along the route as a matter of right.

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<sup>9</sup>See *Kasoulides, George C., Port state control and jurisdiction: evolution of the port state regime*, Dordrecht, 1993, pp. 1–20, for a discussion of the various views.

<sup>10</sup>*Convention and Statute on the International Régime of Maritime Ports*, adopted 9 December 1923, entry into force 26 July 1926, 58 L.N.T.S. 285 [hereinafter: 1923 Convention and Statute], the text is available at (<http://www.imli.org/docs/6.DOC>) – visited on 31 January 2005. Its Article 2 provides:

Subject to the principle of reciprocity... every contracting State undertakes to grant the vessels of every other Contracting State equality of treatment with its own vessels, or those of any other state whatsoever, in the maritime ports situated under its sovereignty or authority, as regards freedom of access to the port, the use of the port, and the full enjoyment of the benefits as regards navigation and commercial operations... The equality of treatment... shall cover facilities of all kinds... as well as dues and charges of all kinds.

<sup>11</sup>See *Lagoni, Rainer, Internal Waters, Seagoing Vessels in*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume II, Amsterdam, 1995, p. 1038, on the basis of a combination of the 1923 Geneva Convention and Statute and bi- and multilateral agreements, including the British Commonwealth Merchant Shipping Agreement (10 December 1931, 129 L.N.T.S. 177(184)); *Lagoni*, *Hamburger Hafen* (as in n. 7 on the preceding page), pp. 267f. and 291f., noting on p. 327f. that research vessels fall under most bilateral agreements if these are not restricted in their application to trading merchant vessels; *Kasoulides* (as in n. 9), pp. 13f., 21f., takes a critical view on the relevance of the 1923 Convention and Statute for customary international law and finds the bilateral and multilateral agreements too vague and divers to establish a custom.

<sup>12</sup>See *Brown, Edward D., The International Law of the Sea*, Volume I Introductory Manual, Dartmouth, 1994, p. 39; also *Kasoulides* (as in n. 9), pp. 21f.

<sup>13</sup>In the W.T.O. dispute *European Union v Chile – Measures Affecting the Transit and Importation of Swordfish*, WT/DS/193/1–3 the case of the European Union for access to Chilean ports was based on W.T.O. trade law, see *Orellana, Marcos Cruz, The Swordfish in Peril: the EU Challenges Chilean Port Access Restrictions at the WTO*, in BRIDGES 4 [2000], p. 11; also generally with respect to the GATT *Fayette, Louise de la, Access to Ports in International Law*, in Int'l J.Mar. & C.L. 11 [1996], pp. 18f.

*Research Vessels under the 1923 Convention and Statute*

The 1923 Convention and Statute applies to “[a]ll ports which are normally frequented by sea-going vessels and used for foreign trade”<sup>14</sup>. It applies by virtue of Article 13 to all ships, except

warships or vessels performing police or administrative functions, or, in general exercising any kind of public authority, or any other vessels which for the time being are exclusively employed for the purposes of the Naval, Military or Air Forces of a State.

These exceptions<sup>15</sup> relate to activities that are normally associated with the functions of state. The question is therefore whether marine scientific research constitutes such a function. It clearly is not the exercise of police functions as it does neither serve the prevention and detection of crime nor the maintenance of public order; even if research, in an institutional sense, was carried on by civil (as opposed to the military) institutions of a government it would, in a functional sense, not exercise police powers.

The question is then whether marine scientific research can be an administrative function. Administration is the maintenance and organisation of a (societal) structure.<sup>16</sup> This would include such research as is necessary to fulfil specific needs of the state executive in the exercise of its functions.<sup>17</sup> Applying this definition to marine affairs one could first of all think of transport and shipping and general services conducted at sea as part of a state infrastructure. Wherever a craft navigates, basic safety considerations demand appropriate knowledge of the marine area. Navigation charts are therefore an indispensable part of safe shipping, and charting, for that reason, can be considered an administrative function of the state to the extent that it is necessary for the maintenance of the public order at sea.<sup>18</sup> Yet, this activity is covered more precisely by hydrography and is different from marine scientific research as such.<sup>19</sup>

This leaves the question if marine scientific research can be “any kind of public authority”. The term ‘public authority’ is not further defined in this context. Yet, read together with the preceding terms, ‘authority’ would appear to denote the official exercise of power as a state function, namely prescription or enforcement of regulations and laws. Since marine scientific research does not entail the exercise of any authoritative power, but merely the collection of data and samples, perhaps the conduct of experiments,

<sup>14</sup>Article 1 of the 1923 Convention and Statute.

<sup>15</sup>A further exemption, in Article 14, relates to fishing vessels and their catches, since research vessels are not fishing vessels Article 14 is not contemplated as relevant.

<sup>16</sup>See also page 133.

<sup>17</sup>See *Trute, Hans-Heinrich, Die Forschung zwischen grundrechtlicher Freiheit und staatlicher Institutionalisierung: das Wissenschaftsrecht als Recht kooperativer Verwaltungsvorgänge*, Tübingen, 1994, *Jus publicum* 10, p. 99.

<sup>18</sup>According to *J. Alvarez*, 1951 I.C.J.Rep., p. 116(150), one may even call it an international obligation *vis-à-vis* third states.

<sup>19</sup>See already section 2.

it would not qualify for the third alternative either. Therefore it must be concluded that regular research vessels generally do not exercise a government function or a public authority in the sense of the 1923 Convention and Statute<sup>20</sup> and would therefore enjoy the right to port access as a function of equal treatment.

The question may arise if a vessel conducting *military* research would fall under the exception of Article 13 inasmuch it is employed by the military. In such an instance it would be decisive if the vessel was actually a military research vessel or if the military research project was conducted by a non-military institution on a contractual basis. In the latter case, the 1923 Convention and Statute would appear to apply as the vessel as such would fall outside the scope of Article 13, provided the military is not the operator of the vessel. This is important as Article 13 applies to vessels that, by virtue of their designation, represent a foreign public authority or government and therefore fulfil a certain function. Research vessels, even if employed for a certain period of time to conduct research relevant for the military, do not represent such a function. The activity as such does not factor in this consideration as research is generally not conducted in port. The case is different, though, where a duly commissioned warship conducts research activities. In such a case, the fact of the vessel's commission prevails over its purpose. Thus, Article 13 lists warships and vessels of which only the latter is further qualified by the clause "performing police or administrative functions". Accordingly, *military* research as such is not a basis to deny port access on the basis of Article 13, while the fact that a ship is duly commissioned for the navy may very well be.

Article 2 of the 1923 Convention and Statute confers on Contracting States a duty of non-discrimination with respect to "freedom of access to the port, the use of the port, and the full enjoyment of the benefits as regards navigation and commercial operations which it affords to vessels, their cargoes and passengers."<sup>21</sup> It does thus not provide port access as an individual claim.<sup>22</sup>

Principally the 1923 Convention and Statute is geared towards the needs of international shipping and trade.<sup>23</sup> It applies to research vessels on the premise that it covers all shipping services afforded to vessels in general including repair and bunkering and other services relating to navigation. Still, port access for research vessels may be restricted on the grounds of their function: the 1923 Convention and Statute affords only equal treatment. This prohibits discrimination on the basis of the vessel's flag but leaves the possibility to restrict access on the basis of other characteristics, like type of vessel or propulsion.<sup>24</sup>

<sup>20</sup>See *Lagoni*, Hamburger Hafen (as in n. 7 on page 327), pp.283f. and 327.

<sup>21</sup>Article 2 of the 1923 Convention and Statute.

<sup>22</sup>See *Ibid.*, pp. 284f.

<sup>23</sup>*Ibid.*, p. 285.

<sup>24</sup>*Ibid.*, p. 286; note, restriction as a reprisal on the basis of non-compliance envisaged by Article 8 is not contemplated here. Also, the port State may preclude port access of single vessels on the basis of Articles 3 and 17 which have no specific bearing on

*Access under General Customary Law*

Where no agreement or treaty exists between the flag State and the port State, the general view now is that no right of access exists.<sup>25</sup> Port States may or may not decide to open their ports to foreign vessels<sup>26</sup> with the possible limitation of non-discrimination between foreign vessels.<sup>27</sup> Where coastal state legislation allows other States explicitly to navigate in internal waters it usually stipulates also that navigation is subject to regulations on maritime and internal navigation.<sup>28</sup> Sometimes navigation of research vessels is expressly exempted.<sup>29</sup>

A general exception is made for vessels in distress.<sup>30</sup> Every vessel if com-  
 research vessels.

<sup>25</sup>See *Lindemann, Jan Henning, Untersuchung, Festhalten und sofortige Freigabe ausländischer Seehandelschiffe*, Hamburg, 1997, pp. 356f., with further references, pointing out that there is a presumption based on custom that ports engaged in international trading are open to ships of all nations and may be closed only in exceptional circumstances; *Fayette, Access* (as in n. 13 on page 328), p. 1; *Lagoni, Hamburger Hafen* (as in n. 7 on page 327), pp. 303f.

<sup>26</sup>See *Lindemann* (as in n. 25), p. 356. *Bou, Valentín/Bermejo, Romaldo, L'Espagne et le droit de la mer*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, p. 453, state with respect to Spain:

En principe, l'entrée dans les ports espagnols des navires de commerce n'est pas soumise à autorisation, même si, pour des raisons de réglementation du trafic maritime ou de sécurité de la navigation, elle peut être soumise à des conditions par le Commandement de la Marine présente dans chaque port.

And *Lowe, Vaughan, The United Kingdom and the Law of the Sea*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, p. 524 finds with respect to the U.K.: "In the absence of distress, there is no right to enter internal waters." Access to Danish internal waters (harbours) is, according to *Bangert, Kaare, Denmark and the law of the sea*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, p. 103, "conditional to prior notification and is subject to certain restrictions in militarily sensitive areas", special rules apply to fishing vessels; similarly, Finland requires six days prior authorisation for entry into the internal waters by governmental research vessels, to civil (*viz.*) research vessels such restrictions do not apply, see *Koskenniemi, Martti/Lehto, Marja, Finland and the Law of the Sea*, in *Treves, Tullio*, editor, *The Law of the Sea: the European Union and its Member States*, The Hague, 1997, p. 147; see with respect to France and the U.S. *Fayette, Access* (as in n. 13 on page 328), pp. 6f., which also take the view that ports may be closed absent specific agreements.

<sup>27</sup>See *O'Connell, Law of the sea II* (as in n. 6 on page 327), p. 848, suggesting that such a custom exists on the basis of the 1923 Convention and Statute; similarly, *Lagoni, Vessels* (as in n. 11 on page 328), p. 1038 and *Lagoni, Hamburger Hafen* (as in n. 7 on page 327), p. 308.

<sup>28</sup>See, for example, Article 4 of the Act concerning the Coastal Sea and the Continental Shelf of 23 July 1987 of the Federal Republic of Yugoslavia, the text is available at *Maritime Space: Maritime Zones and Maritime Delimitation*, (<http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/index.htm>) – visited on 31 January 2005.

<sup>29</sup>See Article 6 of the Yugoslavian Act (preceding note), requiring prior approval by the Federal Secretariat of National Defence and the federal administrative authority; Article 15 provides for the possibility of access in distress.

<sup>30</sup>See *Lowe* (as in n. 26), p. 524; *Lagoni, Vessels* (as in n. 11 on page 328), p. 1040; *Lagoni, Hamburger Hafen* (as in n. 7 on page 327), pp. 310f.; see also *Lindemann* (as in n. 25), p. 358, with further references; *Molenaar, Erik Jaap, Coastal state jurisdiction*

pelled to take refuge either by stress of weather or other *force majeure* constituting a grave necessity<sup>31</sup> may access the internal waters and ports of the coastal State on the basis of customary law.<sup>32</sup> Inasmuch as this right is based on ‘necessity’ and not on the characteristics of the ship or its functions, it would have to be afforded to research vessels also.<sup>33</sup> Conversely, research activities by themselves would not constitute a basis to claim a case of distress.

### *Port Access as a Facilitation of Marine Scientific Research*

Article 255 of the 1982 LOS Convention provides for an obligation that could become a potential counterbalance to the coastal State’s jurisdiction over marine scientific research. It contains a general obligation to promote and facilitate marine scientific research and requires more specifically the facilitation of “access to . . . harbours” and promotion of “assistance for marine scientific research vessels”. With respect to the general obligation one must conclude that by itself it could hardly instruct States Parties to take a specific favourable measure with respect to marine scientific research.<sup>34</sup> Yet, its second part provides for a very specific measure of promotion and facilitation, namely, the facilitation of port access and assistance for marine research vessels.

Early versions of this provision suggested an obligation of coastal States to simplify the procedure of entry for research vessels in general. These met with objections as they were considered unnecessary or redundant and also,

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*over vessel-source pollution*, The Hague, 1998, International environmental law and policy series 51, p. 101, suggests an exception where port/coastal State’s interests may override those of the ship in distress.

<sup>31</sup>See *Lagoni*, Vessels (as in n. 11 on page 328), p. 1036; *O’Connell*, Law of the sea II (as in n. 6 on page 327), pp. 855f., provides an overview of the concept of ‘necessity’ which “must be urgent and proceed from such a state of things as may be supposed to produce in the mind of a skilful mariner a well-grounded apprehension of the loss of the vessel and cargo, or of the lives of the crew.” (*The New York*, 3 Wheat. 59 [1818]).

<sup>32</sup>*Kate A. Hoff (The Rebecca) Case 4* [1929] R.Int’l Arb.Awards 444(447); *Ibid.*, p. 857.

<sup>33</sup>Some States, however, seem to take exception to this rule: *Plesmann, Wolf/Röben, Volker, Marine Scientific Research: State Practice versus Law of the Sea?* in *Wolfrum, Rüdiger*, editor, *Law of the Sea at the Crossroads: The Continuing Search for a Universally Accepted Regime*, Berlin, 1990, Veröffentlichungen des Instituts für Internationales Recht an der Universität Kiel 113, p. 379 report an incident where Saudi Arabian authorities denied a German research vessel with a sick person on board in need of medical treatment entry to port. *Röben* assumes a misconception on the side of the coastal State, see Discussion in *Wolfrum, Rüdiger*, editor, *Law of the Sea at the Crossroads: The Continuing Search for a Universally Accepted Régime*, Berlin, 1990, Veröffentlichungen des Instituts für Internationales Recht an der Universität Kiel 113, p. 410.

<sup>34</sup>See page 109; similarly *Lagoni*, *Hamburger Hafen* (as in n. 7 on page 327), p. 328, calling it a soft obligation (“recht weiche Verpflichtung”); see more generally *Döhler/Nemitz* (as in n. 1 on page 326), p. 185, concluding that a right to freedom of scientific research cannot be derived from international treaties.



more importantly, as infringing upon coastal State sovereignty.<sup>35</sup> The final text differs from these earlier versions in four important respects. First, it establishes a general obligation for all States, second it refers to research “beyond [the coastal States’] territorial sea”, third it subjects facilitation and promotion to the State’s laws and regulations and, finally, to the compliance with Part XIII. All of these changes reduce the operability of Article 255: a clear obligation of coastal States for simplified port access is missing, the sovereignty of the coastal State is not affected in the least by the obligation to promote and facilitate research activities, and, finally, the qualification by reference to coastal state laws and regulations renders Article 255 in terms of port access almost void as it would be fairly easy to draft laws and regulations in such a way as to provide rather an obstacle than a facilitation.

Nevertheless, the word ‘facilitation’ denotes an improvement, if not by itself then by reference, and must thus induce change. It would appear to mean either an improvement with respect to a previous situation or with respect to other (non-research) vessels. If one followed the latter interpretation, Article 255 would, in effect, oblige States to treat research vessels like any other vessel. And because in the past research vessels have normally been treated as government vessels (operated for non-commercial purposes),<sup>36</sup> the standard of comparison would have to be the treatment of merchant vessels; equal treatment with warships would not constitute a facilitation. While this would be desirable from a scientific perspective in terms of simplified port access, it is not readily conceivable that Article 255 was meant that way. Interpretation in the former sense, however, would require an improvement of the situation in the direction of the latter: where treatment of government/state vessels is less favourable than that of merchant vessels, facilitation of port access would require an assimilation to the treatment of the latter.

A look at coastal state legislation does not reveal a clear picture how Article 255 of the 1982 LOS Convention is perceived. Some States require prior

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<sup>35</sup>See the various submissions to the first four sessions which required (domestic) legislation by the coastal State, reprinted in *Nordquist, Myron H./Rosenne, Shabtai/Yankov, Alexander*, editors, *United Nations Convention on the Law of the Sea, 1982: A Commentary*, Articles 192 to 278, Final Act, Annex VI, Volume IV, Dordrecht, 1991, pp. 598f.

<sup>36</sup>See, for example, Denmark’s Ordinance (as in n. 191 on page 165); Estonia requires prior notification from research vessels like from warships and other vessels exercising government functions; the Norwegian Foreign Ministry in a *note verbale* from October 1996 declared that research vessels like warships and in contrast to merchant and fishing vessels, were not exempted from the requirement of prior notification before entering internal waters; according to information from April 1998, Portugal requires application for port access by research vessels even if no research in Portuguese waters is projected which suggests that they are treated like warships; the Ministry of Foreign Affairs and Trade of New Zealand advised in September 1997 that formal consent had to be obtained for port visits by research vessels whether or not they undertake research in New Zealand’s territorial sea (Information from the B.S.H., on file with the author).

notice for port calls by research vessels.<sup>37</sup> In many instances such information must be filed with the research request.<sup>38</sup> Others, with a fairly elaborated implementation of Part XIII, make no reference to Article 255 at all.<sup>39</sup> Some States seem to make a difference between research vessels operated by a State and private research vessels exempting the latter from legislation requiring prior notification.<sup>40</sup> It remains that Article 255, if—lacking a clear point of reference—not providing for a positive change, prevents at least the introduction of less favourable treatment on the basis of the characteristic ‘research’.

#### *Access by virtue of Bilateral Agreements*

Since a general right to preferential treatment under Article 255 of the 1982 LOS Convention does not exist, it can be interesting for States to enter into specific agreements providing for special treatment. New Zealand and Germany, for example, have concluded a bilateral agreement relating to co-operation in Antarctica,<sup>41</sup> in which New Zealand agrees to grant port access by vessels and aircraft participating in German research projects in Antarctica to specified ports, airports and other facilities in New Zealand and the use of such facilities, in accordance with the laws of New Zealand.<sup>42</sup> Agreements with such a specific facilitation measure appear to remain the exception rather than the rule. In general bilateral agreements provide only

<sup>37</sup>See, for example, Australia's guidelines (as in n. 195 on page 165) for research vessels Part 1(a); see Article 10 of Croatia's Maritime Code 1994, text available at DOALOS: State practice (as in n. 28 on page 331); also preceding n. 36. *Plesmann/Röben* note that Spain expected research vessels to submit to “a special consent procedure when calling at Spanish ports independently of whether the ship has carried out any research in Spanish waters”, *Plesmann/Röben* (as in n. 33 on page 332), p. 382.

<sup>38</sup>See the U.N. Standard Form A (as in n. 196 on page 109).

<sup>39</sup>See, for example, chapter VI of the Belgian Act concerning the exclusive economic zone of Belgium in the North Sea, 22 April 1999: provision is made for the consent procedure (with a fairly lenient 3 months lead-time); yet, nothing alludes to the facilitation of marine scientific research, let alone port access; the text is available at DOALOS: State practice (as in n. 28 on page 331).

<sup>40</sup>Denmark's Ordinance (as in n. 191 on page 165) points in that direction when it stipulates in sec. 1(2): “Other vessels which are owned or used by a foreign State and which are not employed exclusively for commercial purposes shall be equated with foreign warships.”

<sup>41</sup>See n. 3 on page 326.

<sup>42</sup>See 3(b) of the agreement (n. 3 on page 326): “[Neuseeland gewährt] den Zugang zu den vereinbarten Häfen, Flughäfen und anderen erforderlichen Einrichtungen in Neuseeland und ihre Benutzung durch Schiffe und Luftfahrzeuge, die an dem deutschen Antarktis-Forschungsprogramm beteiligt sind, im Einklang mit dem neuseeländischen Recht und vorbehaltlich der Zahlung der üblichen Gebühren und Abgaben”. Interestingly, the 1923 Convention and Statute would have provided for the same privileges between New Zealand and Germany if research vessels were to be considered exempt from the exception of Article 13 (New Zealand ratified the 1923 Convention and Statute 1 April 1925, Germany 1 May 1928). A possible conclusion is that New Zealand had generally not treated research vessels as conceded in the bilateral agreement.

a framework for co-operation in a specific field without specifying the details of such co-operation. Thus, such agreements provide for the exchange of scientists, mutual participation in research cruises and symposia or conferences.<sup>43</sup> A state practice on the basis of bilateral agreements with respect to Article 255 of 1982 LOS Convention cannot be identified.

### *European Union*

The member States of the European Union recognise to a greater or lesser extent the freedom of scientific research in their legislation and respect it throughout as a value warranting protection.<sup>44</sup> On the premise that the freedom of scientific research includes the conduct of marine scientific research and that it furthermore entails the right to access all facilities necessary for its exercise, precluding the authorities from imposing regulations which pertain to the use of those in scientific research, one could advance the argument that port access must be granted as an ancillary right to the freedom of scientific research.

Yet, even in common law countries, where scientific research is not restricted unless explicitly so provided by statute,<sup>45</sup> port access is generally restricted. Thus, in the U.K., port access deduced from a freedom of scientific research would be in conflict with the principle that there is generally no right to enter internal waters<sup>46</sup>. Moreover, such a right would usually be afforded only to the State's citizens who would appear to enjoy a right of port access by virtue of their nationality anyway.

<sup>43</sup>See, for example, Article 3 of the co-operation agreement between China and Germany on marine scientific research from 27 June 1986 ("Vereinbarung zwischen dem Bundesminister für Forschung und Technologie der Bundesrepublik Deutschland und dem Staatlichen Ozeanographischen Zentralamt der Volksrepublik China über die Zusammenarbeit in der Meeresforschung und in der Entwicklung der Meerestechnik", B.G.Bl. 1986 II 844f.); Article 2 of the co-operation agreement between the U.S. and Germany from 7 March 1994 ("Vereinbarung zwischen dem Bundesministerium für Forschung und Technologie der Bundesrepublik Deutschland und der National Science Foundation der Vereinigten Staaten von Amerika über die Zusammenarbeit in der geowissenschaftlichen Forschung", B.G.Bl. 1994 II 418f.). In contrast, the fisheries co-operation agreement between Argentina and Germany from 24 April 1978 ("Abkommen zwischen der Regierung der Bundesrepublik Deutschland und der Regierung der Argentinischen Republik über die Zusammenarbeit auf dem Gebiet der Fischerei", B.G.Bl. 1979 II 441f.) provides that in addition to two German research vessels two German fisheries vessels may sail under the Argentinian flag to conduct research on gear and processing improvement.

<sup>44</sup>See *Dreyer-Mülzer, Susanne, Das Grundrecht der Wissenschaftsfreiheit in den einzelnen Mitgliedsstaaten*, in *Wagner, Hellmut*, editor, *Rechtliche Rahmenbedingungen für Wissenschaft und Forschung, Forschungsfreiheit und staatliche Regulierung*, Volume 1: *Freiheit von Wissenschaft und Forschung*, Baden-Baden, 2000, p.212; and *Wagner, Hellmut, Das Grundrecht der Wissenschaftsfreiheit im Europäischen Gemeinschaftsrecht*, in *Wagner, Hellmut*, editor, *Rechtliche Rahmenbedingungen für Wissenschaft und Forschung, Forschungsfreiheit und staatliche Regulierung*, Volume 1: *Freiheit von Wissenschaft und Forschung*, Baden-Baden, 2000, p. 215.

<sup>45</sup>See *Ibid.*, p. 216.

<sup>46</sup>See *Lowe* (as in n. 26 on page 331), p.524.

An EU Draft Directive from 1996<sup>47</sup> contained a fairly far reaching provision for the facilitation of port access between member States.<sup>48</sup> Failing its realisation, the member States did not take any action to achieve the goals of the Commission's initiative independently. This would suggest that even in a region with a comparatively high activity with respect to marine scientific research port access as a facilitating measure was not considered a pressing issue. The MAST group is currently not pursuing any follow-up to the 1996 initiative publicly.

### *Promotion of Scientific Research in Germany*

In countries, like Germany, where the freedom of scientific research is protected by the constitution,<sup>49</sup> one may raise the question to what extent this freedom is not only to be protected against state interventions,<sup>50</sup> but also guaranteed in terms of its existence<sup>51</sup> and with the mandate for the State not only to protect but *also* to promote science.<sup>52</sup>

The mandate to promote science is to be administered in a neutral fashion albeit with a utilitarian component<sup>53</sup>, i. e., while the scientific goals shall not be prescribed by the State, promotion may be based on considerations of societal benefits. One could advance the argument that this mandate creates an obligation of the State to provide scientific research with all necessary means available—access to ports would in this context probably constitute one of the least controversial issues. Yet, while, for example in Germany, the promotion of science is generally accepted as a duty of the state, the content of such duty *vis-à-vis* individual citizens is not clearly defined. Generally, where the constitution is interpreted as to provide for a beneficial

<sup>47</sup>See page 290.

<sup>48</sup>The proposed Article 6 'Conditions' contained a subparagraph whose wording was:

[A] research vessel may enter at any time any port of the coastal state, subject to compliance with conditions applicable to any ship, and disembark any person on board involved in carrying out the marine scientific research, subject to the person complying with normal entry requirements of the Member State concerned.

<sup>49</sup>See *Wagner, Hellmut, Gibt es ein Grundrecht der Wissenschaftsfreiheit im europäischen Gemeinschaftsrecht?* in DÖV [1999], p.132, listing in the European context Greece, Italy, Austria, Portugal and Spain with similar constitutional provisions.

<sup>50</sup>See *Oppermann, Thomas, Freiheit von Forschung und Lehre*, in *Isensee, Josef/Kirchhof, Paul*, editors, *Handbuch des Staatsrechts der Bundesrepublik Deutschland*, Volume 6 Freiheitsrechte, Heidelberg, 1989, § 145, para. 17.

<sup>51</sup>See *Ibid.*, § 145, paras. 18f.

<sup>52</sup>See *Wagner*, *Grundrecht* (as in n. 49), pp.130–132; *Oppermann* (as in n. 50), § 145, paras. 20f.; in the German discussion the term 'facilitation' ("Erleichterung") is not used but would seem to be encompassed by the word 'promotion' ("Förderung").

<sup>53</sup>See *Ibid.*, § 145, para. 20; *Isensee, Josef, Grundrechtsvoraussetzungen und Verfassungserwartungen*, in *Isensee, Josef/Kirchhof, Paul*, editors, *Handbuch des Staatsrechts der Bundesrepublik Deutschland*, Volume 5 Allgemeine Grundrechtslehren, Heidelberg, 1992, § 115, para. 191.

interference (“Leistungsrecht”<sup>54</sup>), it is understood in a very restrictive way to guarantee only the institution ‘freedom of science’ as such. The mandate would oblige the State to provide and secure the basic functions of science,<sup>55</sup> i. e., it has to ensure the *possibility* of conducting science, namely, the availability of the requisite infrastructure.<sup>56</sup> But the constitutional right is not viewed as providing a basis for a claim to promotion of an individual project or scientist. It follows for the question of port access for research vessels that the State would have to provide the possibility of conducting marine scientific research at large, but that it does not need to grant port access under all circumstances. As long as port access is principally possible the constitutional obligation is heeded. An individual right of port access cannot be deduced from the general obligation to promote science.

In addition one should note that such a right would entitle national individuals of the relevant State (or all member States subject to European law) to conduct their own research free of any interferences by state authorities within the limits of the relevant laws and regulations, such right would not provide nationals from outside the European Union with a claim to access a specific port—or conduct research within the exclusive economic zone or territorial sea for that matter.

#### *Port Access in terms of Comity*

In times of peace foreign merchant ships and state vessels operated for commercial purposes have almost everywhere access to internal waters<sup>57</sup> which would normally coincide with port access. Public vessels must usually request permission for a port call prior to their access to the internal waters of a foreign State. Private vessels, on the other hand, are granted entry into ports as a matter of routine. Arrangements are regularly made by the vessel’s or operator’s agent in advance of the call.<sup>58</sup>

Research vessels are generally well advised to request permission or notify access in advance: if the research vessel is operated by a State available state practice suggests that it is considered a public vessel and subject to regulations for government vessels operated for non-commercial purposes. But

<sup>54</sup>See Stern, Klaus, *Idee und Elemente eines Systems der Grundrechte*, in Isensee, Josef / Kirchhof, Paul, editors, *Handbuch des Staatsrechts der Bundesrepublik Deutschland*, Volume 5 Allgemeine Grundrechtslehren, Heidelberg, 1992, § 109, paras. 43f.

<sup>55</sup>See Oppermann (as in n. 50 on the preceding page), § 145, para. 21.

<sup>56</sup>See Trute (as in n. 17 on page 329), p. 424; Oppermann (as in n. 50 on the preceding page), § 145, para. 29.

<sup>57</sup>See Lagoni, Vessels (as in n. 11 on page 328), p. 1036; Colombos, C. John, *International law of the sea*, 6th edition. London, 1967, p. 176, holds the view that the port State cannot prohibit the use of its ports and harbours to foreign nationals: “This would imply a neglect of its [duty] for the promotion of international intercourse, navigation and trade which customary international law imposes upon it.”

<sup>58</sup>See Burke, William T., *Marine Science Research and International Law*, Law of the Sea Institute Occasional Paper No. 8, Kingston, 1970, p. 1.

even if the research vessel is privately operated authorisation or notification may be required: the regime on marine scientific research creates a unique relationship between the research vessel and the coastal State apparent in the consent requirement of Article 246 of the 1982 LOS Convention.<sup>59</sup> Generally, crossing the border of a State without proper authorisation by the State constitutes an infringement on the State's territorial sovereignty as the crossing must be seen as an act of defiance with respect to the State's competence. Where the permission of entry is a prerequisite, the coastal State may as a prerogative grant or deny such entry, and it may prescribe access requirements breach of which would make the vessel liable to coastal State prosecution. Short of denial the coastal State may also delay consent until so late that approval can no longer be awaited or expected. In such a case the vessel would have to follow contingency plans. The disadvantage or indeed harmful effects of such a situation are obvious: the vessel has either to abandon plans associated with and conditional on the port call or it has to divert its course to another port. Shift to another port, whether or not pursuant to contingency plans, can diminish the scientific effectiveness of the cruise as alternative routes are likely to be of less scientific convenience, relevance or quality.<sup>60</sup> In any event the operator and/or researching institution and individual incur additional costs in terms of money and time.

#### TRANSFER OF TECHNOLOGY

Part XIV of the 1982 LOS Convention contains provisions on the development and transfer of marine technology. While these provisions are, *prima facie*, not connected with the regime on marine scientific research,<sup>61</sup> they may play a significant role for research operations in the light of Articles 242–244 and the general coastal state attitude.<sup>62</sup> The provisions of Part

<sup>59</sup>Where States treat research vessels like warships it is not necessarily clear if they do so on the premise that research vessels are normally state vessels or because research vessels conduct marine scientific research: Portugal's and Spain's legislation would speak for the latter, Denmark's for the former, see n. 36 on page 333.

<sup>60</sup>See *Burke*, Research (as in n. 58 on the page before), p. 2; *Schaefer, Milner B., Freedom of Scientific Research and Exploration in the Sea*, in *Stanford J.Int'l Studies* 4 [1969], p. 59.

<sup>61</sup>But see *Soons, Alfred H. A., Marine Scientific Research and the Law of the Sea*, Deventer, 1982, pp. 38f., referring to the view of developing States that "the primary objectives of the . . . regime of marine scientific research should be to meet [their] research needs and to bridge the scientific and technological gap between the developed and the developing world." Historically, the emergence of Part XIV is closely linked to Part XIII, as the point was first raised under the general rubric of preservation of the environment and marine scientific research, see *Nordquist/Rosenne/Yankov* (as in n. 35 on page 333), p. 665.

<sup>62</sup>*Patricio Bernal*, I.O.C. executive-general, links benefits from earth observation to capacity-building, see *Normile, Dennis, Summit Pledges Global Data Sharing*, in *Science* 304 [2004], p. 661; *King, David A., Climate Change Science: Adapt, Mitigate, or Ignore?* in *Science* 303 [2004], p. 177, raises the issue in the context of global re-

XIV were drafted with a view to conformity with General Assembly resolutions and are thus largely declaratory of policy goals,<sup>63</sup> namely, to bridge the gap between developing and developed states. Taken together, Articles 266(1) and 267 “recognize that the legitimate interests of the States providing marine science and technology are also to be acknowledged and protected.”<sup>64</sup> Despite indications for specific measures in Article 269, emphasis rests on international co-operation rather than on formal obligation.<sup>65</sup> Possible implications are discussed here merely in the light of technology transfer as part of research programmes,<sup>66</sup> since recent developments indicate that technology transfer may serve as a vehicle to facilitate access to waters under coastal state jurisdiction.

At the United Nations the importance of transfer of technology has been repeatedly noted and specifically linked to marine scientific research.<sup>67</sup> The

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sponsibility and equity. See also *Annan, Kofi, Science for All Nations*, in *Science* 303 [2004], p.925, calling—with reference to *InterAcademy Council, Inventing a Better Future, A Strategy for Building Worldwide Capacities in Science and Technology*, Amsterdam, January 2004, available at (<http://www.interacademycouncil.net/report.asp?id=6258>) – visited on 31 January 2005—for a partnership in general terms. See *Sohn, Louis B., Managing the Law of the Sea: Ambassador Pardo's Forgotten Second Idea*, in *Col.J.Transnat'l L.* 36 [1997], pp.289f. and 297f., recounting Ambassador Pardo's concept of ocean management and the framework of co-operation in the 1982 LOS Convention of which capacity-building forms one part.

<sup>63</sup> *Nordquist/Rosenne/Yankov* (as in n. 35 on page 333), p.668. The first relevant resolution is the *Programme of Action on the Establishment of a New International Economic Order* (GA 3202 S-VI), adopted 1 May 1974 (section IV on transfer of technology is reprinted in *ibid.*, p.667). *Weiss, Friedl/Cabanellas, Guillermo, Technology Transfer*, in *Bernhardt, Rudolf*, editor, *Encyclopedia of Public International Law*, Volume IV, Amsterdam, 2000, p.788, doubt that “principles and rules [on technology transfer] have as yet attained the quality of rules of customary international law.”

<sup>64</sup> *Nordquist/Rosenne/Yankov* (as in n. 35 on page 333), p. 679.

<sup>65</sup> *Ibid.*, p.694.

<sup>66</sup> Other international agreements also contain provisions on technology-transfer and capacity-building: Biodiversity Convention (as in n. 6 on page 10), Climate Change Convention (as in n. 5 on page 10) and Agenda 21 (as in n. 7 on page 10; see *Fontaubert, Charlotte de/Downes, David R./Agardy, Tundi S., Biodiversity in the Seas: Implementing the Convention on Biological Diversity in Marine and Coastal Habitats*, in *Geo.Int'l Env'tl.L.Rev.* 10 [1998], p.831, for an analysis of the C.B.D., and *Seiler, Achim/Dutfield, Graham, Regulating Access and Benefit Sharing*, Basic issues, legal instruments, policy proposals, Bonn, 2001, BfN Skripten 46, on the subject in the context of “bioprospecting”). The issue of technology transfer arises in a broader context of international co-operation; the reader is referred to specific literature on the subject: *Weiss/Cabanellas* (as in n. 63), pp.776f.; *Davis, Kevin E., Regulation of Technology Transfer to Developing Countries: The Relevance of Institutional Capacity*, in *Law & Policy* 27 [2005], pp.10f.; *Gorina-Ysern, Montserrat, An International Regime for Marine Scientific Research*, Ardsley, 2003. For the present analysis the view is taken that Part XIII and XIV of the 1982 LOS Convention constitute a framework that allows for examination irrespective of the general developments (e.g., within GATT).

<sup>67</sup> E.g., RES/55/7 para. 32, RES/58/240, paras. 20–21 and RES/58/14, paras. 51–53, and the *UN Informative Consultative Process on Oceans and the Law of the Sea*. See also *Cicin-Sain, Biliiana et al., A Guide to Oceans, Coasts and Islands at the World Summit*, Integrated Management from Hilltops to Oceans, Newark: Center for the

U.N. Secretary-General notes that capacity-building,<sup>68</sup> as a cross-sectoral concern, has become a key issue at the level of the U.N. in the context of the law of the sea.<sup>69</sup> It is understood, on the basis of Agenda 21, Chapter 37, as a holistic concept of (financial and in-kind) assistance and co-operation enabling beneficiaries to perform and sustain the targeted functions.<sup>70</sup> In practical terms, the Secretary-General identifies measures involving, *inter alia*, “executing technical cooperation projects. . . ; undertaking educational, training, research and public awareness programmes and strengthening institutions capable of carrying out such programmes; exchange of data, information and experiences; creating and strengthening physical as well as institutional infrastructure; and provision and mobilization of raw materials, equipment, facilities and vessels.”<sup>71</sup> Such measures are provided by all international global and regional organisations with an ocean-related portfolio as well as by individual national agencies.<sup>72</sup>

Regional organisations with a scientific focus have recognised transfer of know-how and technology as a key element in the design of major studies and research operations, and some international programmes include provisions to the same effect.<sup>73</sup> An IOC-report recommends to make technology and know-how transfer an integral part of any international operation so that this aspect is not dependent on adequate funding and contributes to confidence building among coastal States.<sup>74</sup> Inasmuch as research operations require the

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Study of Marine Policy, August 2002, p.5 and *U.N. Secretary-General, Oceans and the law of the sea*, UN Doc. A/59/62, New York, 4 March 2004, pp.26f.

<sup>68</sup>Note, that the phrase “transfer of technology” has been replaced by the term ‘capacity-building’ understood as the end point in the evolution of development-cooperation and technical-assistance activities; also the C.B.D. work programme on marine and coastal biodiversity refers to capacity-building (Dec. VII/5, Annex I, sec. IV).

<sup>69</sup>*Ibid.*, p.27; as a consequence of RES/56/12, a specific chapter on capacity-building is included in the reports of the Secretary-General.

<sup>70</sup>*Ibid.*, with reference to UNCTAD/U.N.D.P. See also Korn, Horst/Schliep, Rainer/Eppele, Cordula, editors, *Report on the international workshop “Capacity-Building for Biodiversity in Central and Eastern Europe”*, Bonn, 2004, BfN Skripten 121, p.3.

<sup>71</sup>*U.N. Secretary-General, Oceans and the law of the sea*, UN Doc. A/57/57, New York, 7 March 2002, p.89.

<sup>72</sup>See *Ibid.*, pp.90f.; the relevant organisation in the context of marine scientific research is I.O.C. (with its regional bodies)

<sup>73</sup>E.g., Gentien, P. et al., editors, *Global Ecology and Oceanography of Harmful Algal Blooms (GEOHAB) – Implementation Plan*, 2003, p.34 and Hall, Julie/Monfray, Patrick, *Integrated Marine Biogeochemistry and Ecosystem Research (IMBER)*, Draft Science Plan and Implementation Strategy, 15 January 2004, p.12.

<sup>74</sup>Ryder, Peter, *Marine Scientific Research and Operational Oceanography in the Context of the UN Convention on the Law of the Sea*, Sixth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System (GOOS), Scientific and Technical Requirements of GOOS in Relation to UNCLOS, Paris, 10–14 March 2003, IOC-WMO-UNEP/I-GOOS-VI/10, p.22, with reference to GOOS initiatives. Noting that the drafters of the Convention appealed to international organisations for continued guidance on research methods and technology and on practical compromises between scientific needs and national interests, the report suggests coastal state involvement, data access and publication as a fruitful option, *ibid.*, pp.16f.



co-operation of States at different levels of development, the issue of capacity-building may become central for the success of the overall objective. Work on standards and codes of conduct has already started;<sup>75</sup> the future must show to what extent marine scientific research operations will benefit from this development. It must not be underestimated, though, that technology transfer remains to a large extent a private sector issue and thus “a matter of domestic and regional competition, property and contract law.”<sup>76</sup>

A related issue is the accessibility of programme generated data and information since this is in many instances also a question of available technology. International programmes emphasise the importance of common management in order to increase the use and application of research operations. Large scale international research initiatives—such as the *Global Ecology and Oceanography of Harmful Algal Blooms (GEOHAB)* by S.C.O.R. and I.O.C., and the *Surface Ocean – Lower Atmosphere Study (SO-LAS)* by S.C.O.R., W.C.R.P., I.G.B.P., and others—take note of the necessity to include proper data and information management from the beginning for the ultimate success of the programme; this includes provisions for open access within co-operative non-governmental and intergovernmental management systems.<sup>77</sup> Within such programmes researchers may achieve a relative freedom for the conduct of their studies; the added value may not only be the amount of available data but also the streamlining effect of routine operations within a larger framework.

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<sup>75</sup>See *Seiler/Dutfield* (as in n. 66 on page 339), pp. 61f., with respect to the area of genetic resources.

<sup>76</sup>*Weiss/Cabanellas* (as in n. 63 on page 339), p. 788.

<sup>77</sup>E.g., *Gentien et al.* (as in n. 73 on the facing page), p. 33, *Broadgate, Wendy*, editor, *Surface Oceans – Lower Atmosphere Study*, Science Plan and Implementation Strategy, Stockholm, 2004, IGBP 50, p. 73, and *Hall/Monfray* (as in n. 73 on the preceding page), p. 67, Appendix II.



## Chapter 10.

### Responsibility and Liability

La responsabilité est le corollaire nécessaire du droit. Tous droits d'ordre international ont pour conséquence une responsabilité internationale. La responsabilité entraîne comme conséquence l'obligation d'accorder une réparation au cas où l'obligation n'aurait pas été remplie.<sup>1</sup>

Inasmuch as the regime of marine scientific research confers rights and obligations upon States, it determines the attribution of responsibility in case of damages. By distinguishing between the rights and obligations of researching and coastal States, Part XIII lays down the rules according to which responsibility is established in the context of the conduct of marine scientific research. The operator of a research platform entails primary responsibility and liability for wrongs and damage inflicted upon third parties by the platform.<sup>2</sup> Apart from such claims arising under private law, the

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<sup>1</sup>*Affaire des biens britanniques au Maroc espagnol (Spain v United Kingdom)* report by *J. Max Huber*, 2 R.Int'l Arb.Awards 615(641); similarly *Chorzów Factory Case (Indemnity)(Merits)*, 1928 P.C.I.J.Rep., Series A, No. 17, p. 29.

<sup>2</sup>For aircraft, liability under international private law is provided by the *Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface*, adopted 7 October 1952, entry into force 4 February 1958, 310 U.N.T.S. 182 [hereinafter: 1952 Liability Convention]; note, that the Protocol amending the 1952 Liability Convention provides in its Article II:

In Article 2 of the Convention the following shall be added as new paragraph 4: "4. If the aircraft is registered as the property of a State, the liability devolves upon the person to whom, in accordance with the law of the State concerned, the aircraft has been entrusted for operation."

question may arise if the State of registry may be held liable for acts committed by the platform either directly or subsidiary.

## GENERAL INTERNATIONAL LAW

Responsibility in international law means that a certain act or omission can be imputed to a State which must answer for consequences of such behaviour. Liability of a State is a function of its responsibility for (wrongful) acts or omissions which can be imputed to it; however, the conceptual difference between the two terms is slim.<sup>3</sup> The legal basis for liability and the kind of remedy that ensues from a breach of duty or violation of law is to be found in the so called primary norms which consist of all legal relationships that may be violated in international law; secondary norms prescribe the regime of liability as such.

### *Breach of Obligation*

The question of state responsibility usually arises out of a breach of an international obligation by a State.<sup>4</sup> The legal justification for this responsibility lies in the assumption of free will: the State concerned is deemed to have the possibility to preclude activities which give rise to responsibility.<sup>5</sup> In principle any act or omission constituting on its face a breach of a legal obligation ensues responsibility, irrespective of the legal source of the obligation.<sup>6</sup> It creates a new legal relationship between the violator and the victim state, the content of which is usually the reparation of the damage.<sup>7</sup>

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For spacecraft, liability is governed by the *Convention on the International Liability for Damage Caused by Space Objects*, Opened for signature at London, Moscow, and Washington 29 March 1972, entry into force 1 September 1979, 961 U.N.T.S. 187 [hereinafter: 1974 Liability Convention].

<sup>3</sup>See Wolf, Joachim, *Die Haftung der Staaten für Privatpersonen nach Völkerrecht*, Berlin, 1997, Schriften zum Völkerrecht 129, p. 44.

<sup>4</sup>The most basic obligation of every State is to exercise its sovereignty and jurisdiction in a manner compatible with the rights of other states under international law, thus there are specific requirements with respect to the judiciary and the public order as far as foreign states are concerned, see *Ibid.*, p. 40, referring to the *S/S "Lotus" Case (France v Turkey)* (as in n. 183 on page 106), pp. 1f.; *Island of Palmas Case (Netherlands v United States)*, 2 R.Int'l Arb.Awards 829f.; *Affaire des biens britanniques au Maroc espagnol (Spain v United Kingdom)*, 2 R.Int'l Arb.Awards 640.

<sup>5</sup>See *Ibid.*, p. 38.

<sup>6</sup>See Brownlie, Ian, *Principles of public international law*, 5th edition. Oxford, 2001, p. 439; in international law, every breach of an obligation or violation of a law is considered a damage—specific rules may apply where so provided, see Wolf, Haftung (as in n. 3), pp. 42f. This principle is restated in Article 2 of the *International Law Commission, Draft Articles for State Responsibility for Internationally Wrongful Acts*, adopted by the ILC in its 53<sup>rd</sup> session, New York: 56 G.A.O.R., Suppl. No. 10 (A/56/10), chp.IV.E.2, 2001, p. 43; see also accompanying commentary *ibid.*, pp. 69f., with further references.

<sup>7</sup>See *Ibid.*, p. 63; see also Wolf, Haftung (as in n. 3), p. 41.

*Imputability to a State*

State, in this context, includes all private persons acting for/on behalf of that State including individuals who, as a matter of fact, have the possibility to effect the functions of a state.<sup>8</sup> Where the individual does not act in its capacity as an entity of the State, the activity is private and of no relevance in the context of responsibility under international law. Whether or not a private individual is acting for or on behalf of a State is a decisive question in the context of marine scientific research. The answer depends on the nature of the activity<sup>9</sup> and leads back to the question whether or not marine scientific research constitutes a function of state.<sup>10</sup> Essential elements of state responsibility are therefore a breach of an obligation arising from treaty, custom or some other basis<sup>11</sup> and its imputation to the State, evidence of which could be the control by the State over the activity inflicting damage.

*Negligence or Fault*

The third element for state liability is principally negligence or fault for the act or omission leading to the breach; the actual standard is provided by the primary rules of international law establishing obligations.<sup>12</sup> The predominant measure for fault or negligence in international law is the exercise of due diligence. By that concept the State is responsible—as a function of the general duty under international law not to inflict harm on other States—for any act or omission which could only happen because the State was not diligently exercising control over its subjects. The standard of diligence is not exactly determined in international law, though.<sup>13</sup> On the basis of due diligence a State may be liable even where private parties have incurred liability

<sup>8</sup>This may include even illegal acts committed by covert or open order of the State, see *Ibid.*, p. 52. As one example of such an act the abduction of Adolf Eichmann by Israeli agents from Argentinian territory in 1960 may be referred to; see also *Jennings, Robert/Watts, Arthur, Oppenheim's International Law*, Volume I, 9th edition. Harlow, 1992, pp. 539–548, with numerous references. The obvious limit to such an attribution are murder and acts of terrorists and organised crime.

<sup>9</sup>See *H. G. Venable (U.S.A.) v United Mexican States*, 4 R.Int'l Arb.Awards 219(245): "It is the character of functions which persons perform and the manner in which those functions are discharged that determine the question of responsibility."

<sup>10</sup>See section 3.

<sup>11</sup>See *Brownlie* (as in n. 6 on the facing page), p. 439.

<sup>12</sup>Note, that in some areas of international law strict liability, i. e., responsibility in the absence of fault or negligence, may apply, see *I.L.C.*, Draft on Responsibility (as in n. 6 on the preceding page), p. 70; on p. 73 the *I.L.C.* observes with respect to the question whether fault constitutes a necessary element of the internationally wrongful act of a State: "This is certainly not the case if by 'fault' one understands the existence, for example, of an intention to harm. In the absence of any specific requirement of a mental element in terms of the primary obligation, it is only the act of a State that matters, independently of any intention."

<sup>13</sup>See *Wolf, Haftung* (as in n. 3 on the facing page), pp. 69f.

under (international) private law already.<sup>14</sup> Thus, even if the researching institution pays compensation to any foreign victims for damages incurred in the course of research operations, for example the destruction of fishing gear or pipelines through sample dredging, the researching State might be held liable for a breach, for example, of its duty to provide relevant information in pursuance of Article 248 of the 1982 LOS Convention. Another standard debated in the context of international law is that of “objective responsibility”<sup>15</sup> which essentially denotes that any act or omission by a State with a causal connection to the violation of international law constitutes a breach of duty by the result alone.<sup>16</sup> While there has been some discussion as to strict liability of States in international environmental law,<sup>17</sup> in traditional public international law the rules of due diligence continue to apply.<sup>18</sup>

### “Damage”

The term ‘damage’ in international law denotes a concrete loss causing a position in law *or* in reality which is less favourable than the one prior to the relevant act or omission.<sup>19</sup> A causal link, the quality in terms of directness or proximity of which varies with the type of breach, must tie the damage to the wrongful act.<sup>20</sup> Whether the damage has quantitatively occurred as a consequence of the act giving rise to responsibility can be determined by a comparison between the two positions. Reparation or compensation, as a function of liability, “must, as far as possible, wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been committed.”<sup>21</sup>

<sup>14</sup>See *Handl, Günther, State Liability for Accidental Transnational Environmental Damage by Private Persons*, in *Am.J.Int'l L.* 74 [1980], p. 530.

<sup>15</sup>See on the discussion *Brownlie* (as in n. 6 on page 344), pp. 439–444; *Volker Epping in: Ipsen, Knut*, editor, *Völkerrecht: ein Studienbuch*, 4th edition. München, 1999, § 39, para. 34–42; *Jennings/Watts* (as in n. 8 on the preceding page), pp. 508–511.

<sup>16</sup>See *Brownlie* (as in n. 6 on page 344), p. 439.

<sup>17</sup>See *Handl*, *State Liability* (as in n. 14), p. 536, with further references.

<sup>18</sup>See *Ibid.*, pp. 538f., with further references.

<sup>19</sup>See *Wolf, Joachim, Gibt es im Völkerrecht einen einheitlichen Schadensbegriff?* in *Z.a.ö.R.V.* 49 [1989], pp. 406f. Note, that this concept of ‘damage’ does not correspond to the concept in domestic legal systems: in international law damage can consist of a mere violation of an obligation, see *I.L.C.*, *Draft on Responsibility* (as in n. 6 on page 344), p. 73; the violation provides the basis for “reparation”, see *ibid.*, p. 127, and justification for countermeasures (Article 23 of the ILC Draft on Responsibility), see *ibid.*, pp. 180f.

<sup>20</sup>See Article 31(1) of the ILC Draft on Responsibility: “The responsible State is under an obligation to make full reparation for the [damage] *caused* by the internationally wrongful act [emphasis added]” and *Ibid.*, pp. 227f.

<sup>21</sup>*Chorzów Factory Case (Indemnity) (Merits)*, 1928 P.C.I.J.Rep., Series A, No. 17, p. 47; see further on *restitutio in integrum*, especially in respect of environmental damage: *Wolf*, *Haftung* (as in n. 3 on page 344), pp. 492f.

## LIABILITY UNDER THE 1982 LOS CONVENTION

*Liability for Research Operations*

Generally in the present context, two situations giving rise to liability must be distinguished. On the one hand, there are incidents that may occur aboard the platform or in connection with it, namely, wrongful acts which give rise to a claim for damages against the operator or ship owner, either under contract or tort, i. e., essentially private law; such incidents may include, for example, claims for damages by scientific personnel injured in the course of their duties.<sup>22</sup> Such claims are principally settled under the national law of the flag.<sup>23</sup> On the other hand, there is the possibility that a wrongful act by the research platform affects the territory or property of another State, or, conversely, that a wrongful act of a foreign State implicates the research platform.<sup>24</sup> In the context of marine scientific research such a situation may occur, for example, if in the course of the research activities the marine environment is polluted. Conversely, the coastal State may have to answer for acts contrary to international law against the research platform occurring in waters under its jurisdiction.<sup>25</sup> The questions arising in respect of inter-

<sup>22</sup>See *Presley v M/V Caribbean Seal*, 537 F.Supp. 956 (S.D. Tex. 1982), affirmed in part, revised in part, 709 F.2d 406 (5<sup>th</sup> Cir. 1983), cert. denied, 104 S.Ct. 699 (1984): The plaintiff was part of the seismic crew aboard the oceanographic research vessel *M/V "Caribbean Sea"* conducting seismic measurements. He was repairing an air compressor, used exclusively to supply air at high pressure to the air guns which are fired to produce seismic data, when he became entangled in the machinery and injured his arm. He received medical treatment and workmen's compensation in accordance with the terms of his employment contract from the date of the injury until suit was filed; see case note by *Jarrett, Russell Keith, Admiralty—Remedies Available to Oceanographic Research Vessel Personnel in the Wake of Presley v M/V Caribbean Seal*, in *Tulane L.Rev.* 58 [1984], pp. 1499f.

<sup>23</sup>The legal remedies may be sought either on the basis of general maritime law, namely, for unseaworthiness, maintenance, and cure, labour law, including specific maritime statutes and contracts, or ordinary law of torts; which kind of legal remedies is available depends on national legislation and the forum in which remedy is sought, see for the U.S. American context *Ibid.*, pp. 1502 and 1516f.; obviously, these claims may have an international aspect which effects conflicts of law to be settled under international private law.

<sup>24</sup>See generally *Ipsen* (as in n. 15 on the preceding page), § 40, paras. 29–31.

<sup>25</sup>See *Corfu Channel Case (United Kingdom v Albania)*, 1949 I.C.J.Rep., p. 4(23), where the Court reached the conclusion "that Albania is responsible under international law for the explosions which occurred on October 22nd, 1946, in Albanian waters, and for the damage and loss of human life which resulted from them, and that there is a duty upon Albania to pay compensation to the United Kingdom." Responsibility of Albania was found on the basis of its physical control over its territorial sea; see also *Island of Palmas Case (Netherlands v United States)*, 2 R.Int'l Arb.Awards 829(839); *Advisory Opinion of 21 June 1971 on Legal Consequences for States of the Continued Presence of South Africa in Namibia (South-West Africa) Notwithstanding Security Council Resolution 276 (1970)*, 1971 I.C.J.Rep., p. 16, para. 118, emphasising "physical control of a territory, and not sovereignty or legitimacy of title, is the basis of State liability for acts affecting other States".

national responsibility in the context of marine scientific research relate to state obligations<sup>26</sup> and imputability.

While the principle of state liability originally was limited to the areas of the State's (physical) control, namely, within the territory under sovereignty, Principle 21 of the 1972 Stockholm Declaration,<sup>27</sup> extended the doctrine—with respect to the environment—as to include responsibility for activities conducted anywhere outside the jurisdiction of that State.<sup>28</sup>

Research operations in the oceans fall under state control to the extent that research requests are normally “cleared” through the foreign ministry of the researching State which submits them to the competent authority of the coastal State.<sup>29</sup> Inasmuch as the researching State has control over the question whether or not to appraise and submit the research request, it also has control over the researching individuals. According to Article 8 of the ILC Draft on Responsibility<sup>30</sup> control over the conduct of a person is a sufficient basis for imputation irrespective of the person's national legal status. Imputation on the basis of the clearance procedure would, however, be limited to those wrongful acts that are instigated by the application for consent, namely, wrong information. The coastal State assumes responsibility on the basis of the *Corfu Channel Case* for the accuracy of its officials. Where damage arises as a consequence of a lack of control on the side of the coastal State, that is, if the cause for the damage could have been discovered in advance and been prevented in accordance with the principles of due diligence, coastal State's claims for damage may be inhibited.

### *Imputability for Ships*

In the 1982 LOS Convention the attribution of an activity by a vessel to a particular State is established under Article 94(1) of the 1982 LOS Convention which generally stipulates that “[e]very State shall effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag.” As noted earlier, the flag is, *prima facie*, evidence of the registration of the vessel in the State of registry. Attribution is based on nationality which itself is based on registration. Article 94(1) of the 1982 LOS Convention would principally provide a sufficient basis to hold the flag State liable for any breaches of international law a vessel flying its flag may get involved in.

<sup>26</sup>These have been examined in the preceding parts.

<sup>27</sup>*Declaration of the United Nations Conference on the Human Environment*, adopted 16 June 1972, 11 I.L.M. 1416.

<sup>28</sup>See *Handl*, State Liability (as in n. 14 on page 346), p. 528, asserting that the Stockholm Declaration can be viewed as declaratory of existing principles of international law and signifies state practice. Principle 21 was literally repeated by Principle 2 of the Rio Declaration (as in n. 6 on page 3).

<sup>29</sup>See section 2 and section 2.

<sup>30</sup>*I.L.C.*, Draft on Responsibility (as in n. 6 on page 344), p. 45.



However, as *Handl* points out, the control of the flag State can by no means be taken for granted.<sup>31</sup> In fact, where the vessel is far from its home port the coastal State authorities have little factual influence on the behaviour of the vessel in question. State providing a flag of convenience may indeed never see the vessel flying its flag. The mere fact of the vessel's nationality does not establish a presumption for the flag State's control over the vessel. Where the flag State cannot exercise effective control over the vessel, liability may arise on the basis of an omission. Yet, the casual link between an omission and a breach of international law is difficult to establish.

Where the flag State cannot exercise effective control, the coastal State may incur liability as a matter of proximity or direct control. Under the regime of marine scientific research the consent procedure in which the flag State submits its proposal for approval by the coastal State may constitute a casual link for subsequent breaches. Where the question arises which of two or more states has effectively control over the activity in question, the decisive factor is the closeness of the causal relationship between the actor and every state.

It is noteworthy in this context, that the flag State retains responsibility for its warships and other government ships operated for non-commercial purposes in the territorial sea of the coastal State. These ships are exempted from coastal State enforcement jurisdiction and therefore remain presumably under the effective control of the flag State which consequently must ensure observance of applicable rules and regulations. The responsibility for state ships becomes thus the flip side of state immunity.

In contrast, private ships fall under the complete jurisdiction of the coastal State with the effect that the coastal State must ensure their safety, both by providing the necessary services and enforcing the relevant laws and regulations. Conversely, for damage caused by other ships responsibility may rest with the coastal State whose right to enforce its laws and regulations also entails the duty to exercise sufficient control so as to prevent the infliction of harm to third parties.<sup>32</sup>

### *Imputability under Part XIII*

For research activities Article 263(1) of the 1982 LOS Convention provides for a separate basis for international responsibility. Article 263(1) of the 1982 LOS Convention presumes the control by the researching State when it refers to activities undertaken by it or on its behalf. It establishes the duty of the researching State to ensure compliance by its subjects with the provisions of the 1982 LOS Convention. Paragraph 2 establishes the responsibility of all

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<sup>31</sup>See *Handl*, State Liability (as in n. 14 on page 346), pp.532f., submitting that the potential control of the coastal State over the activities in waters under its jurisdiction has been largely increased by the Convention.

<sup>32</sup>This is, in effect, the reasoning of the *Corfu Channel Case*, see n. 25 on page 347.

States for any acts or omissions in contravention of the provisions on marine scientific research *vis-à-vis* other States, their subjects and international organisations. Paragraph 3 explicitly imports responsibility and liability for environmental damage pursuant to Article 235 of the 1982 LOS Convention. This essentially means that compensation must be paid in accordance with general international law.<sup>33</sup>

A notable difference between paragraph 1 and paragraphs 2 and 3 of Article 263 of the 1982 LOS Convention is the use of the words ‘responsibility’ and ‘liability’. As has been observed earlier, in general international law the use of these two words does not denote a significant difference: the responsible State is usually also liable. In the context of Article 263 the difference may be explained by the fact that a failure to ensure compliance of marine scientific research activities with the 1982 LOS Convention does not entail the prevention of damage as such. Paragraph 2 clarifies that States generally are responsible and liable for any damage caused as a result of a contravention of the 1982 LOS Convention. Yet, the greater significance of Article 263(1) of the 1982 LOS Convention lies in the fact that it explicitly imputes all wrongful acts arising in direct relation to the conduct of marine scientific research to the researching State. This essentially means that the general rule under international law, namely, the principle of effective control, is superseded by the obligation to ensure compliance. Only where the researching State is able to show that it has itself observed the obligation under Article 263(1), the coastal State may be held liable subsidiarily on the basis of effective control. This stipulation on state responsibility may actually make it advisable for the researching State to implement a thorough clearance procedure serving as a control of compliance with the relevant provisions of the 1982 LOS Convention.<sup>34</sup>

Article 263(2) of the 1982 LOS Convention is broader than Article 94 of the 1982 LOS Convention as it confers responsibility for all wrongful acts performed in the course of marine scientific research activities; this includes not only damages caused by vessels—which would be covered by Article 94, too—but also for damage caused as a consequence, for example, of the deployment of drifters and by disregard for coastal state rights.

<sup>33</sup>See Article 235(1) of the 1982 LOS Convention.

<sup>34</sup>Note, that the U.S. Department of State seems to take precautions in this respect: “The Embassy explained that the U.S. Government would be prepared to request [consent] for private institutions, but the Government of Morocco should understand that neither the vessel nor the crew is official and that the U.S. Government is not responsible for any indiscretion that may occur. Our request would only represent our belief that the research was legitimate, worthwhile, and sufficiently of interest to the U.S. Government to warrant a request. In the event of an indiscretion, we would be interested to the extent that American nationals and/or property were involved.” Notice to Research Vessel Operators No. 56, *Subject: Morocco – Official Channels Required*, released by the Department of State, Bureau of Oceans and International Environmental and Scientific Affairs, 2 November 1979, the text is available at <http://www.state.gov/www/global/oes/oceans/ntrvo56.html> – visited on 31 January 2005.

Conversely, the coastal State by virtue of Article 263(2) of the 1982 LOS Convention is responsible for affording other States, including their natural or juridical persons, or competent organisations the rights assigned to them under Part XIII of the 1982 LOS Convention. This responsibility may become relevant if the coastal State does not warn foreign researchers about hazards in the proposed area of research. Also, the denial of consent contrary to Article 246(3) of the 1982 LOS Convention<sup>35</sup> could constitute a case in which the coastal State incurs liability. Finally, the coastal State may incur liability if it orders the suspension or cessation of a research project without reason or denies access to the research area contrary to earlier consent.

Based on the foregoing observations two types of situations giving rise to questions of liability must be distinguished: first, damage inflicted by the research activity as such, and second, damage inflicted incidentally to such activities. The former encompasses situations in which, for example, a remotely operated vehicle (ROV) hits and damages an object; the latter denotes instances where the damage is completely unrelated to any research activity, for example, errors in navigation. Thus a collision may occur as a consequence of a navigational error, but also as a consequence of research activities, for example, with floats that are not under navigational control. The difference is important as Article 263 of the 1982 LOS Convention gives a specific basis for state responsibility where the wrongful act or omission is related to marine scientific research. Compensation for damage as a result of an activity only incidental but not related to the conduct of research activities must therefore be obtained under the general rules for state responsibility. The decisive criterion, to determine whether a wrongful act has been effected in the course of research activities, is the causal link between the wrongful act and the research activity. Causality would depend on the question whether the wrongful act would have occurred independently from the function of the activity.

### *Standard of Liability*

As to requirement of fault or negligence, the 1982 LOS Convention provides no germane standard and follows accordingly the traditional international law approach of due diligence. During the negotiations, proposals for strict liability—with respect to environmental damage, for example, by private vessels in transit passage—were tabled but did not find sufficient support;<sup>36</sup>

<sup>35</sup>See *Knauss, John A./Katsouros, Mary H., Recent Experience of the United States in Conducting Marine Scientific Research in Coastal State Exclusive Economic Zones*, in *Clingan, Thomas A.*, editor, *What lies ahead?* Honolulu, Hawaii, 1988, pp.306f., referring to a number of cases, in which the coastal State withheld its consent although none of the situations envisaged by Article 246(5) was cited.

<sup>36</sup>See *Handl, State Liability* (as in n. 14 on page 346), p.543; also Fourth and Fifth meeting of the Third Committee, II Off.Rec., pp. 316, 319, 321 and 324, 327.

in the end the Convention maintains the general liability standard of international law at least with respect to marine scientific research.<sup>37</sup>

#### LIABILITY IN AIR LAW

The relevant international conventions relating to liability for damage caused by aircraft are predominantly geared towards the compensation by a private operator.<sup>38</sup> State responsibility as a matter of public international law may arise on the basis of the general principles of state responsibility. Thus, where an aircraft is in government service or where the “flag State” exercises sufficient control over the service in question, the “flag State” may principally be liable to third parties for damages caused in the pursuit of such service.

If the aircraft is engaged in research activities under the regime of marine scientific research, Article 263 on the basis of speciality: to the extent that liability under Part XIII is tied to an activity rather than a platform or location, liability would also extend to aircraft operated in such an activity. This would be the case at least where aircraft are explicitly included in research operations, namely, by an access request to coastal state waters. Where such a link cannot be established general international law applies.

#### LIABILITY IN SPACE LAW

Article VI OST provides for the responsibility of States Parties for the conduct in conformity with the Outer Space Treaty, irrespective of whether activities are carried out by governmental agencies or by non-governmental entities. It is upon the “appropriate State Party” to ensure that every activity by non-governmental entities is duly authorised and supervised by the State. In the event of an international organisation carrying out space activities, the organisation as well as the participating States Parties bear the responsibility for compliance with the Outer Space Treaty. Article II of the Liability Convention places absolute liability on the launching State for damages caused by a space object on the surface of the earth.<sup>39</sup> The standard of absolute liability in the Liability Convention goes beyond that of Article

<sup>37</sup>See Sixth meeting of the Third Committee on the discussions of liability for environmental damage, II Off.Rec., pp. 330, 332.

<sup>38</sup>The liability system within Air law established by the Warsaw Convention in 1929 and its amendments and successors respectively (as in n. 19 on page 250) hinges upon the carrier’s liability for damage caused to passengers, baggage and goods, and damage caused by delay. In research missions Article 34 of the Warsaw Convention would appear to apply, by virtue of which carriage performed in extraordinary circumstances is not covered by the Warsaw Convention, see *Diederiks-Verschoor, Isabella H. Philepina, An introduction to air law*, 5th edition. Deventer, 1993, p. 57.

<sup>39</sup>1974 Liability Convention (as in n. 2 on page 344), Article II provides: “A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight.”

263 of the 1982 LOS Convention as it has no further condition placed upon liability than damage and causation. On the other hand, Article I defines damage as “loss of life, personal injury or other impairment of health; or loss of or damage to property” which would exclude moral damage<sup>40</sup>. Yet, the only conceivable “moral” damage that could be inflicted from space in the context of marine scientific research would be the disregard of coastal States’ rights under Part XIII and these do not apply to space activities, anyway. For (marine scientific) research activities from space Part XIII has therefore no significance.

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<sup>40</sup>See the definition of ‘injury’ in Article 31(2) of the ILC Draft on Responsibility.



## Conclusions

Marine scientific research has not lost any of its significance for the world of today; for the future it might become even more important as the interaction between the oceans and the atmosphere is perhaps the single most important factor for the development of the global climate. Knowledge in this area will be crucial for management decisions in most areas of human life. This necessity has been recognised widely as evidenced by numerous references to scientific research in international environmental treaties. Yet, even though in international treaty law States' obligation to promote scientific research is repeatedly emphasised it does not take on the character of a specific or concrete duty with respect to marine scientific research operations.

Against this background marine scientific research has developed considerably. Research projects have increased in numbers and size and only the budgetary constraints of the 1990s have slowed down the scientific and technological developments. Still, the oceans are far from being fully investigated, let alone understood,<sup>41</sup> and technological developments for scientific research continue. It has not been the intention of the present analysis to

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<sup>41</sup>See *Ryder, Peter, Marine Scientific Research and Operational Oceanography in the Context of the UN Convention on the Law of the Sea*, Sixth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System (GOOS), Scientific and Technical Requirements of GOOS in Relation to UNCLOS, Paris, 10–14 March 2003, IOC-WMO-UNEP/I-GOOS-VI/10, pp. 3f.; also *Kunzig, Robert, Deep-Sea Biology: Living with the Endless Frontier*, in *Science* 302 [2003], p. 991, for an account of life on the sea floor; *Körtzinger, Arne et al., The Ocean Takes a Deep Breath*, in *Science* 306 [2004], p. 1337, with respect to autonomous floats used to monitor episodic “breathing” of the ocean; *Hansen, Bogi et al., Enhanced: Already the Day After Tomorrow?* in *Science* 305 [2004], p. 953, with respect to the complex picture of climate change predictions.

follow-up on all advancements in the science sector; instead, it aimed at laying out the most significant developments in research technology that warrants a review of the legal framework. Today, a number of different research platforms catered for the specific needs of marine science are available posing different questions of law. Apart from research vessels which remain a central platform for a wide range of research activities, installations, air- and spacecraft have become increasingly important for large-scale projects.

In the context of the 1982 LOS Convention it is foremost of all the function of the platform that determines whether Part XIII on marine scientific research applies. Only where a *scientific research* activity is pursued the platform has to conform with its rules. Research platforms do not form distinct categories in terms of construction or design. Sensors employed for measurements and equipment used for sampling may be mounted on virtually everything that floats or flies. From a legal point of view platforms can be distinguished from each other on the basis of propulsion. Thus, a research vessel can be used for purposeful navigation, whereas an installation has no active propulsion and may therefore either remain in one location or drift aimlessly owing its course to wind and currents. Aircraft derive support from reaction with the air and may either be able to produce upward movement themselves or depend on passive propulsion. Spacecraft, finally, are defined broadly as those platforms launched into space.

Installations, in contrast to vessels, are subject to a more far reaching control by the coastal State. Whereas vessels principally remain subject to flag state jurisdiction even if within the geographical scope of coastal state jurisdiction, installations in the exclusive economic zone fall under coastal state control in terms of authorisation and regulation. While the former is principally a function of the consent procedure, the latter is more far reaching and indicates a tighter control by the coastal State as a function of *exclusive* jurisdiction. Aircraft used in the context of marine scientific research are subject to the regime of Part XIII above the territory of the coastal State; beyond the area of sovereignty, the applicability of the 1982 LOS Convention is doubtful. With respect to research from space the 1982 LOS Convention does clearly not apply; space law governs the conduct of activities in space exclusively, even if these relate to the surface of the Earth.

Where a platform falls by virtue of its function under Part XIII, it assumes a number of obligations *vis-à-vis* the coastal State and other States. With respect to the coastal State, the relationship is mainly determined by the consent procedure stipulated by Article 246 of the 1982 LOS Convention. It reduces the freedom to conduct marine scientific research to a mere reflex of coastal State's security and integrity interests. The complex structure of this relationship is protected by the dispute settlement system in Part XV of the 1982 LOS Convention. Other States' interests are warranted by the consent procedure, inasmuch conflicting uses factor in the coastal State's decision, and by the stipulations on state responsibility which establish a



germane standard of imputation.

On the premise of function, Part XIII would also apply to platforms above the sea level. This corresponds to established law in air law as regards the territory under sovereignty; it is at odds with the principle of free over-flight outside the territorial sea. Neither the 1982 LOS Convention nor air law provide a conclusive answer to this problem. And even though sensor technology has developed to a level where the distance does not matter much, the legal regime on marine scientific research essentially remains close to the surface: Part XIII is of no relevance to research activities from space. *De lege ferenda* it may be worthwhile to contemplate a more comprehensive approach: the course of technological developments suggests regulation on the basis of function irrespective of the location of the platform. *De lege ferenda* one may also pose the question whether the regulation of marine scientific research activities makes sense to begin with given the severe obstacles for an effective control of remote sensing. Transparency and open publication may provide a basis for a more effective control by the public. This would necessitate a strengthening of international co-operation which is at present far from being satisfactory: it develops parallel rather than in accordance with the 1982 LOS Convention. Article 247, while presenting an option to improve the situation of marine scientific research, remains principally rooted in the consent procedure. The more promising avenue is therefore the co-operation within regional organisations, some of which stipulate much clearer obligations with respect to the promotion and facilitation of scientific research than the 1982 LOS Convention.

The legal regime established for the conduct of marine scientific research dates back to the 70s, a time when the factor 'environment' was only dawning in international law. Restrictions on the operation of research platforms were first of all intended to save coastal States' security and integrity interests. The economic potential of the living and non-living resources was the prevailing factor for the establishment of the exclusive economic zone. The interests of marine scientific research had to subside principally as a consequence of the failure to distinguish them clearly from commercial or profit oriented undertakings. Today, environmental concerns may very well prove to become an additional obstacle for research operations.

The 1982 LOS Convention indisputably restricts the freedom of marine scientific research and subjects it to the rights of the coastal State with respect to resources and economic activities. At the same time it provides a framework within which the researching State can reasonably safely operate. On the assumption that not even the freedom of scientific research as envisaged for the high seas is granted without restriction, the balance struck for the exclusive economic zone accommodates the concerns of coastal States at a bearable cost on the side of the researching States. Arbitrary denial is impossible under the 1982 LOS Convention. Even the denial of access in accordance with Article 246(5) must abide by the limitations set forth therein.

Also, the coastal State is not at liberty to impose restrictions, requirements, and formalities on researching States and international organisations; it must comply with Part XIII, notably Article 253, and Article 300 of the 1982 LOS Convention when requiring the suspension or cessation of the research by the researching State or international organisation.

Unfortunately, Part XIII of the 1982 LOS Convention does not sufficiently account for the importance of research activities for the furtherance of common knowledge as a public good. General policy statements call for co-operation as well as promotion and facilitation of marine scientific research. Yet, they are outweighed by provisions on coastal States' rights. In the juxtaposition of knowledge as a public good and predominantly resource related ownership interests this result comes as no surprise. The most promising provision in Part XIII from a researching perspective is accordingly Article 247: where international co-operation can be institutionalised, the public good may become more of a common concern than is presently the case.

A only way to prevent the coastal State from frustrating the effective operation of the consent regime seems to be a climate of trust which can be established by ensuring that principal scientists and civil servants comply fully and in good faith with the conditions set forth by the coastal State *in compliance* with the 1982 LOS Convention. In this sense, the consent regime with conditions for coastal State consent—such as including its own scientists on the expedition, training its scientists, sharing data and specimens, restricting the area in which research can be conducted, or not allowing research at a time of the year in which an interesting phenomenon is occurring—may be viewed as a vehicle and motivation for a new deal with developing countries in international co-operation.<sup>42</sup> For the individual scientist this could include, for example, the collaboration with foreign scientists; full information about the research project, including assistance in understanding and interpreting its scientific implications; the encouragement of participation by foreign scientists; timely submission of cruise reports and scientific results; and, generally, full compliance with the obligations imposed in accordance with the 1982 LOS Convention. Researching States may foster a climate of mutual trust by providing training and education to coastal States' personnel; they may enter into bi- and multilateral agreements in order to promote and facilitate marine scientific research in a more tangible way than under Part XIII of the 1982 LOS Convention; they may “encourage” reluctant States by diplomatic means, including reciprocity when it comes to denials of consent. The potential co-operation and transfer of technology and know-how should not be underestimated. Regional agreements incorporating these aspects will probably provide the best option for overcoming the shortcomings of the 1982 LOS Convention.

A number of initiatives for the promotion of marine scientific research on

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<sup>42</sup>See Panel on the Law of Ocean Uses, *U.S. Interests and the United Nations Convention on the Law of the Sea*, in O.D. & Int'l L. 21 [1990], p. 409.

a regional and global level will hopefully build a climate of mutual trust. Still the most promising and advanced in terms of freedom of scientific research at a global level is probably the one undertaken at I.O.C.: while other initiatives merely call upon members to promote research activities, parties at I.O.C. engage in a process of establishing a regulatory framework to implement Article 247 of the 1982 LOS Convention. However, the process has not reached its goal yet and, in fact, proves to be more cumbersome than anticipated. And even though the initiative may be interpreted as evidence of a changing perception of scientific research among states, the issues raised in the deliberations are strikingly akin to those made during the original negotiations and are evidence of the reluctance to adopt pragmatic solutions in the interest of a furtherance of general scientific knowledge. I.O.C. remains the appropriate forum for future development in direction of global institutionalised co-operation, even though the process suggests, at the same time, a shift of focus to bi-lateral or regional co-operation agreements.

On a regional level the initiatives taken by the European Union are most advanced. And even though new legislative measures are not in the pipeline, it is in the European Union that a new quality of cross-border co-operation can most likely be achieved due to the unique constitution of the European Community as a regional organisation and the interaction of the European Commission, central promoter of research programmes, and the member states.

The developments within SOPAC are interesting as they indicate a possible shift in perception among developing countries. The recognition of the importance of scientific knowledge for management and sustainable development will hopefully lead to a more productive and pragmatic attitude towards scientific research operations. The emphasis on know-how and technology transfer indicates that these countries are increasingly making use of a collaborative and co-operative approach as a mutually beneficial way forward.

Although there are a number of other initiatives for international co-operation in research efforts and capacity-building worldwide, the current status of these does not allow for any predictions in terms of better access conditions for research operations. The framework documents spell out measures only in broad language and mostly limit their scope to co-ordination and planning; the word 'facilitation' refers only to the development and exchange of observations but not to observing operations as such. Still it can be stated that, as a continuing trend, ocean related science operations employ "benefit of scales" considerations: regional and global initiatives are spreading and with them—hopefully—a political impetus for closer regional and international co-operation.



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