New Developments in Marine Science and Technology: Economic, Legal and Political Aspects of Change

Proceedings of the 22nd Annual Conference of the Law of the Sea Institute

co-sponsored by the

Center for Ocean Management Studies The University of Rhode Island

June 12–16, 1988 Narrangansett, Rhode Island

Edited by
Lewis M. Alexander
Scott Allen
Lynne Carter Hanson

Published by
The Law of the Sea Institute
William S. Richardson School of Law
University of Hawaii • Honolulu

The Law of the Sea Institute is housed and sponsored by the William S. Richardson School of Law, University of Hawaii, and is a project (PP/R2) sponsored by the University of Hawaii Sea Grant College Program under Institutional Grant No. NA85AA-D-SG082 from NOAA, Office of Sea Grant, Department of Commerce. The United States government is authorized to produce and distribute reprints for governmental purposes notwithstanding any copyright notations that may appear herein. This is Sea Grant publication UNIHI-SEAGRANT-CR-89-01.

Copyright © 1989 by the Law of the Sea Institute, University of Hawaii. All rights reserved. Manufactured in the United States of America.

International Standard Book Number: 0-911189-20-3

Library of Congress Cataloging-in-Publication Data

Law of the Sea Institute. Conference (22nd : 1988 : Narragansett, R.I.)

New developments in marine science and technology.

"Proceedings of the 22nd Annual Conference of the Law of the Sea Institute, co-sponsored by the Center for Ocean Management Studies, the University of Rhode Island, June 12-16, 1988, Narragansett, Rhode Island." Includes index.

1. Marine resources conservation—Law and legislation—Congresses. 2. Maritime law—Congresses.
3. Oceanography—Research—Law and legislation—Congresses. 3. Oceanography—Research—Law and legislation—Congresses. 4. Marine sciences—Congresses. 5. Marine engineering—Congresses.

I. Alexander, Lewis M., 1921- . II. University of Rhode Island. Center for Ocean Management Studies. III. Title.

K3484.6 1988 333.91'6416 89-12446
ISBN 0-911189-20-3

This book may be ordered from: The Law of the Sea Institute William S. Richardson School of Law University of Hawaii at Manoa 2515 Dole Street, Room 208 Honolulu, Hawaii 96822 Phone (808) 948-6750 or 941-8500 Telex 7431895 (ITT) SEALAW FAX (808) 948-6402

THE LAW OF THE SEA INSTITUTE

1988 STAFF

John P. Craven, Director
Scott Allen, Associate Director
Maivan Lam, Assistant Director
Carol Stimson, Administrator/Editor
Elizabeth Ng, Publications
Philomene Verlaan, Los Lieder and Membership

1988 EXECUTIVE BOARD

Lewis M. Alexander Department of Geography University of Rhode Island

Lee G. Anderson College of Marine Studies University of Delaware

Richard B. Bilder School of Law University of Wisconsin

Thomas A. Clingan, Jr. School of Law University of Miami

Edgar Gold IITOPS Halifax, Nova Scotia

Lee A. Kimball Council on Ocean Law Washington, D.C.

Tommy T.B. Koh Ambassador of the Republic of Singapore to the United States

Dale C. Krause UNESCO Paris

Tadao Kuribayashi Keio University Tokyo Edward L. Miles Institute for Marine Studies University of Washington

Max K. Morris Arthur Vining Davis Foundation Jacksonville, Florida

Satya Nandan Undersecretary General for the Law of the Sea United Nations

Myron Nordquist Attorney Washington, D.C.

Francisco Orrego Vicuna Institute of International Studies Santiago

Willy Ostreng Fridtjof Nansen Institute Oslo

Tullio Treves Permanent Mission of Italy to the United Nations

Jon Van Dyke Wm. S. Richardson School of Law University of Hawaii

Conrad G. Welling Ocean Minerals Company Mountain View, California

TABLE OF CONTENTS

OPENING CEREMONIES

Lewis M. Alexander	3 6
PART I: NEW DIRECTIONS IN MARINE SCIENCE AND TECHNOLOGY AND THE NATURE OF THEIR POTENTIAL IMPACTS	
Introduction	15
A New Dimension of International and	17
Discussion	25
Marine Science in the 1990s: Global Change and	27
Discussion	34
Technology and the Law of the Sea (A Twenty Year Reprise) John P. Craven	36
Discussion	50
PART II: IMPACTS OF NEW DEVELOPMENTS ON THE EXPLOITATION AND MANAGEMENT OF NONLIVING MARINE RESOURCES	
Introduction	55
Trends in the Exploitation of Deep Seabed Minerals	57
Political and Technological Changes Affecting Oil and Gas Development in the Canadian Arctic R.A.W. Hoos	61
Political and Technological Aspects of Change in the Arctic - The Oil and Gas Industry Roger Herrera	71
Discussion	77

Historical and Archeological Treasures	80
Commentary	84
Discussion	89
PART III: IMPACTS OF NEW DEVELOPMENTS ON THE EXPLOITATION AND MANAGEMENT OF LIVING MARINE RESOURCES	
Introduction	95
Large Marine Ecosystems: A Case Study	97
Marine Ecosystem Model: The Law of the Sea's Mandate for Comprehensive Management Martin H. Belsky	115
Commentary	135
The Convention on the Construction of Antarctic	138
Discussion	148
Law Enforcement Capabilities in EEZs: Australia andthe South Pacific Island States Peter Varghese	150
New Technology in Surveillance and Enforcement and Appropriate Development in the Pacific Islands Don Aldous	153
Fisheries Law Enforcement Programs, Practices	171
Commentary	191
Discussion	194

PART IV: IMPACTS ON NEW DEVELOPMENTS ON NON-RESOURCE USES OF THE OCEAN

Introduction	199
International and the New Law of the Sea: New Directions For a Traditional Use? Edgar Gold	200
Commentary	214
New Legal Issues Resulting from the U.S. Global Military Commitment: A Naval Perspective of the Persian Gulf Tanker War Richard J. Grunawalt	229
Discussion	234
An Overview of New Developments	237
Commentary	242
Subseabed Disposal of High-Level Radioactive Wastes; Transition from a Hare-Brained Idea to a Feasible Technology Kenneth Hinga	245
Legal Perspectives	271
DINNER SPEECH	
A Practicum in Marine Technology	285
PART V: SCIENTIFIC ISSUES: LOSC AND ACCESS; TECHNOLOGY AND DATA MANAGEMENT	
Introduction	291
Freedom of Scientific Research	293
Marine Scientific Research: U.S. Perspective on Jurisdiction and International Cooperation David Ross Judith Fenwick	308
Discussion	319

Opportunities in Oceanographic Science Offered by New Advances in Data Management Gregory W. Withee Douglas R. Hamilton	322
Maximizing the Benefits from the New Technologies of Oceanographic Data Gathering and Management The ICSU Perspective S.I. Rasool	333
Developing Technologies within the Oceanographic Component of the World Climate Research Program Raymond H. Godin	337
Management of Oceanographic Data and International Cooperation in China Dai Ruguang	342
Technology and Data Management: U.S. Science	345
Discussion	352
PANEL VI A: OCEAN MANAGEMENT CONCERNS OF SPECIAL INTEREST	
Introduction	359
The State of the Environment	361
New Challenges for Coastal Area Management and Ocean Management in the 1990s Stella Maris A. Vallejo	368
Coastal and Ocean Planning	388
Integrated Coastal Resources Management Program for Developing Countries Stephen Olsen	390
Discussion	395
CONTRIBUTED PAPER	
Some Questions of Implication of UNCLOS for	405
	New Advances in Data Management Gregory W. Withee Douglas R. Hamilton Maximizing the Benefits from the New Technologies of Oceanographic Data Gathering and Management The ICSU Perspective S.I. Rasool Developing Technologies within the Oceanographic . Component of the World Climate Research Program Raymond H. Godin Management of Oceanographic Data and International . Cooperation in China Dai Ruguang Technology and Data Management: U.S. Science . Community Views Ferris Webster Discussion PANEL VI A: OCEAN MANAGEMENT CONCERNS OF SPECIAL INTEREST Introduction Lee Kimball The State of the Environment Alasdair McIntyre New Challenges for Coastal Area Management and . Ocean Management in the 1990s Stella Maris A. Vallejo Coastal and Ocean Planning Eric Carlson Integrated Coastal Resources Management Program for Developing Countries Stephen Olsen Discussion CONTRIBUTED PAPER Some Questions of Implication of UNCLOS for . Special Agreements on Prevention of Marine Pollution Valery I. Andrianov

SPECIAL SESSION ON TRENDS IN THE LAW OF MARITIME BOUNDARY DELIMITATIONS	
Introduction	411
The Sources of Law of Maritime Delimitation	412
The Content of the Law of Maritime Delimitation Jean-Pierre Queneudec	418
Commentary	423
Discussion	430
PANEL VII: IS THE LOS CONVENTION ADDRESSING TODAY'S CHANGING MARINE SCIENTIFIC, TECHNOLOGICAL, ECONOMIC, LEGAL, AND POLITICAL ISSUES?	
Introduction	441
The Military Perspective	442
The Shipping Perspective	448
The Fishing Perspective	460
Deep Seabed Mining: Environmental Monitoring Site Proposals Implementation of the Stable Reference Area Concept Step One Richard Greenwald	466
The Administration Perspective	481
Discussion	485
BANQUET SPEECH	
Preparing for UNCLOS IV?	491
LIST OF PARTICIPANTS	505
INDEX	513