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# Ocean Studies Board Annual Report 1988 And Future Plans

Ocean Studies Board  
Commission on Physical Sciences, Mathematics, and Resources  
National Research Council

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The Ocean Studies Board (OSB) was established in July 1985. It is a unit of the Commission on Physical Sciences, Mathematics, and Resources (CPSMR) of the National Research Council (NRC). The NRC serves as an independent advisor to the federal government on scientific and technical matters of national importance. Jointly administered by the National Academy of Sciences (NAS), National Academy of Engineering (NAE), and the Institute of Medicine (IOM), the NRC brings the resources of the entire scientific community to bear on national problems through its volunteer advisory committees.

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## OVERVIEW

The Ocean Studies Board (OSB) was established in July 1985. It is a unit of the Commission on Physical Sciences, Mathematics, and Resources (CPSMR) of the National Research Council (NRC). The NRC serves as an independent advisor to the federal government on scientific and technical matters of national importance. Jointly administered by the National Academy of Sciences (NAS), National Academy of Engineering (NAE), and the Institute of Medicine (IOM), the NRC brings the resources of the entire scientific community to bear on national problems through its volunteer advisory committees.

Dr. John Sclater became chairman of the OSB on July 1, 1988. The current membership of the board is listed in Appendix I.

The terms of reference for the OSB are:

1. to contribute to the advancement of the scientific understanding of the ocean by maintaining continuous oversight of the health of ocean sciences and stimulating their progress;
2. to foster the application of scientific knowledge to the wise use of the ocean and its resources;
3. to provide leadership for the formulation of national and international marine policy and to clarify scientific issues that affect ocean policy; and
4. to address scientific issues involved in cooperative international oceanographic research and to improve technical assistance.

The Ocean Studies Board, on behalf of the NRC, monitors the status and needs of ocean sciences and assists U.S. government agencies in the development and maintenance of strong programs of ocean research responsive to scientific opportunities and national interest. The structure of the board in 1988 is shown in Figure 1.

The National Academy of Sciences represents the United States in the International Council of Scientific Unions (ICSU). In addition to its unions and commissions, ICSU has scientific committees, one of which is the Scientific Committee on Oceanic Research (SCOR). As the U.S. National Committee to SCOR, the OSB ensures participation of the U.S. oceanographic community in meetings and planning activities of this organization and encourages international cooperation in research projects recommended by SCOR.

The OSB meets approximately three times annually to review its program, to provide a forum for presentation and discussion of information about federal oceanographic R&D programs, and to assist in the development of U.S. positions on matters to come before SCOR. Interaction at board meetings often reveals questions or needs that become the focus for new studies.

The board is a multidisciplinary body with members representing the fields of physical oceanography, marine geology and geophysics, marine biology, marine chemistry, marine acoustics, molecular ecology, and social sciences. Board members are appointed for staggered 3-year terms. The board conducts much of its work through committees, working groups, and panels. These groups are formed to conduct specific studies and are

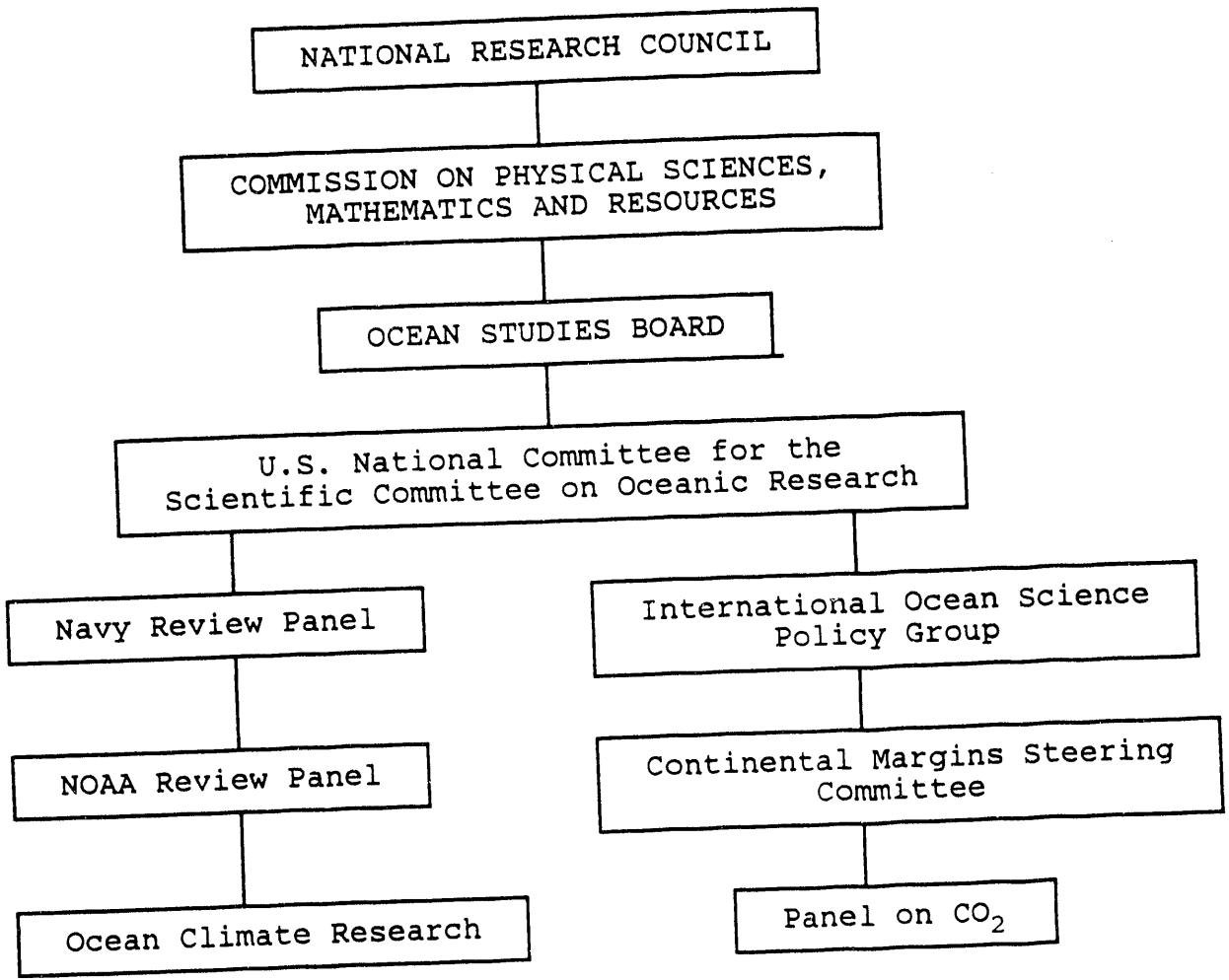


Figure 1 Structure of the Ocean Studies Board in 1988.



discharged on completion of their work and publication of their reports.

Members of the board and its committees and panels are selected from university, industry, and national laboratories, based on their high level of expertise and professional qualifications. Approximately 75 distinguished individuals serve on the board and/or its subgroups, without remuneration.

The work of the OSB is supported by the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation (NSF), the Office of Naval Research (ONR), the National Aeronautics and Space Administration (NASA), the Department of Energy (DOE), the Environmental Protection Agency (EPA), the Department of State (DOS), and the U.S. Geological Survey (USGS).

Core funding from the NSF also supports the board as it serves as the U.S. National Committee for SCOR.

#### MAJOR ACTIVITIES - 1988

During 1988, the board continued its review of the oceanographic programs of ONR, NOAA, NSF, NASA, USGS, DOE, EPA, and DOS. It also considered the entire spectrum of issues confronting the ocean community. A brief discussion of panel activities is presented below.

### Navy Review Panel

This panel was established in 1985 at the request of the Chief of Naval Research to serve as an advisory panel on Navy ocean science developments. Specifically, the panel was charged with the following:

1. advising on the development of a long-range plan for Navy ocean science and development;
2. annually identifying (and updating if necessary) the leading priority areas on which Navy research is based: (a) current scientific opportunities and (b) Navy needs (these two areas are expected to change only gradually over a 5-year period);
3. reviewing specific documents describing current and projected Navy programs; and
4. responding to other ad hoc requests for review and guidance as required.

The panel, chaired by Dr. Michael Gregg, met several times in 1988 to review the Navy's seven oceanographic programs (Marine Geology/Geophysics, Coastal Sciences, Biological Oceanography, Physical Oceanography, Arctic Sciences, Chemical Oceanography, and Marine Engineering) of the Office of Naval Research (ONR), the Naval Research Laboratory (NRL), and the Naval Ocean Research and Development Activity (NORDA) in order to identify new research opportunities. This review was published in 1988 as a report entitled Oceanography and the Navy--Future Directions.

The director of the Office of Naval Research has now charged the Ocean Studies Board with the following seven tasks to be undertaken during the next 3 years:

1. identify promising research opportunities that are at the forefront of oceanic and related science and have high navy relevance;
2. identify implications of marine data classification;
3. assist in formulation of long-range ocean sciences ship use, especially the use of AGOR-23 and the navy submersibles;
4. address manpower issues, including attracting quality students and quality scientists into navy oceanography, and the future of the Secretary of the Navy Chairs;
5. identify approaches to improve utilization of existing oceanographic data;
6. assess whether infrastructure needs of the oceanographic community are being addressed adequately and how the Navy can contribute to these needs; and
7. recommend what the Navy can do to revitalize physical acoustics in the university community.

Members of the Navy Review Panel met with members of the Naval Studies Board (NSB) of the NRC + assist in resolving the national security issue between NOAA and both ONR and the Department of Defense (DOD) resulting from NOAA's proposed high-resolution acoustic survey of the U.S. exclusive economic zone (EEZ). A meeting was held in November 1988 to learn in

detail the position held by NOAA and ONR. The Navy Review Panel will continue to be involved in the deliberations of this study.

Dr. John Orcutt, of the Scripps Institution of Oceanography, will serve as the new chairman of the Navy Review Panel.

#### National Oceanic and Atmospheric Administration Review Panel

This panel was established in November 1985 at the request of Dr. Anthony Calio, administrator of NOAA. The charge to the panel was to:

1. annually identify the leading priorities for NOAA programs in oceanography, emphasizing areas in which NOAA's role is critical to long-term scientific advancement;
2. provide short-term advice on issues of importance to NOAA's oceanic programs;
3. cooperate with a panel of the Board on Atmospheric Sciences and Climate (of the NRC) in reviewing the ocean-related aspects of NOAA's atmospheric and climatic research activities; and
4. identify issues of concern regarding NOAA for board consideration and further action.

Dr. William Evans, Under Secretary of Commerce for Oceans and Atmosphere, and Dr. Melvin Peterson, Chief Scientist for NOAA, participated in discussions on the future of this panel. As a result, Dr. Peterson has requested that the panel examine the various scientific issues and new initiatives within NOAA. As a preliminary exercise, a

roundtable discussion was held in November 1988. Dr. David Ross of the Woods Hole Oceanographic Institution (WHOI) serves as the new chairman of the NOAA panel.

### CO<sub>2</sub> Panel

The CO<sub>2</sub> panel was established in 1987 to provide oversight and guidance of scientific progress and plans for the investigation of the role of oceanic carbon, and related biogenic elements, in maintaining and modifying planetary biogeochemical and climatic stability. At its first meeting, the panel decided to address the following matters over a 3-year period:

1. data assimilation and modeling, including satellite issues;
2. ocean carbonate dissolution and climate feedback; and
3. observing technologies for ocean CO<sub>2</sub>, radiocarbon, and organic carbon.

The panel had two meetings in 1988 under the chairmanship of Dr. Peter Brewer of the Woods Hole Oceanographic Institution. At its first meeting, in April 1988, the panel was asked by the International WOCE Steering Committee to consider and prepare an implementation plan for a World Ocean Climate Experiment (WOCE) carbon measurement program. A draft plan was formulated and made available in November 1988. At its second meeting, in September 1988, the panel considered the issue of CO<sub>2</sub> standards; a resolution was passed by the committee regarding the accuracy, precision,

and intercomparability of these standards. The next meeting of the panel will consider the health and vitality of oceanic and atmospheric carbon dioxide research in the United States, and a letter report will be prepared.

#### International Ocean Science Policy Group

The International Ocean Science Policy Group (IOSPG) was established in response to requests by several agencies to serve as an advisory body in international matters ranging from modes of bilateral cooperation with other countries to U.S. participation in organizations such as the International Council for the Exploration of the Sea (ICES).

Issues that this group will consider over the next 3 years include the following.

1. Access to foreign waters for scientific research--research vessel clearances will be monitored and the oceanographic community will be provided with an assessment of the problems of access.
2. Research Vessels Clearance Handbook--a follow-up questionnaire will be sent to major institutions asking whether the handbook has been useful, how the flow of information can be improved, and what individual scientists want to know. Evaluation of the questionnaire returns will give guidance for updating the handbook.
3. Past report recommendations--these recommendations from previous OSB and NRC ocean policy groups will be extracted and their implementation will be analyzed.

4. The role of international organizations vis-a-vis the changing marine science capabilities of developing countries.

#### Ocean Climate Research Committee

The Ocean Climate Research Committee (OCRC) has been reviewing the major international oceanographic programs such as the World Ocean Circulation Experiment (WOCE), the Global Ocean Flux Study (GOFS), the Greenland Sea Project, and the Ridge Interdisciplinary Global Experiments (RIDGE) to identify gaps and possible areas of cooperation and interaction.

This committee has now been replaced by the Committee on the Ocean's Role in Global Change. The terms of reference for this new committee are:

1. identify the major physical, chemical, biological, and geological processes that are important in understanding the role of the ocean in global change;
2. develop and prioritize the programs needed to significantly understand these processes;
3. study the desirability and feasibility of additional global ocean observation experiments to take place during the late 1990s to measure, over an appropriate time period, the climatic state and motion of the world's oceans, and to estimate global change; and
4. serve as the liaison between the U.S. ocean research community and the ICSU Committee on Climatic Changes and the Ocean (CCCC), consulting with and advising the CCCC on U.S. programs and plans for ocean climate research as it relates to global change.

## The Continental Margins Workshop Committee

This committee was established in 1988 to organize a workshop in cooperation with the earth and ocean science communities to examine the structure, tectonics, and dynamics of the continental margins. The continental margins are of interest because they constitute the only available record of the long-term dynamic interaction of oceanic and continental lithosphere. Margin geometry and the physical and chemical processes that occur in the continental margins play an important role in ocean circulation and chemistry.

The Ocean Studies Board in conjunction with the Board on Earth Sciences and Resources, seeing the potential for a rapid and dramatic advance in understanding of the continental margins, convened a workshop on continental margins. The purpose of the workshop was to (1) define the state of knowledge of continental margins, (2) identify the areas in which research is poised to make dramatic progress, and (3) devise a plan to effect these advances during the next decade.

The workshop was held in November 1988 at the National Academy of Sciences Beckman Center in Irvine, California. It was chaired by Dr. C. Barry Raleigh, director of the Lamont-Doherty Geological Observatory. Seventy-two individuals from five countries and representing a wide range of interests in physical and chemical oceanography, geology, and geophysics attended the workshop. They included representatives of national and international academia, industry, and government.

The major scientific objectives were identified during the workshop and there was a consensus that a multidisciplinary, coordinated research



program was the most efficient way to accomplish the stated scientific objectives. A committee has been formed that will write and publish a report of the workshop results and recommendations and define a structure to institute the recommendations and oversee progress in margins research. This will be accomplished during 1989.

#### The Exclusive Economic Zone (EEZ)

In 1988, the Ocean Studies Board became involved in the EEZ. There were discussions between several NRC boards and the Joint Office of Mapping and Research (JOMAR) of the USGS.

These discussions occurred because of the need to consider the issue of classification of NOAA bathymetric data within the EEZ, the implications of the extension of the U.S. territorial sea to 12 nautical miles, and other related NRC activities currently in progress. The proposed plan is that the NRC Marine Board's Committee on Future Uses of the Seabed will present its report to the national EEZ symposium in November 1989. A nonfederal user committee will be established within the Marine Board to provide advice to JOMAR and review draft plans beyond the charge to the current committee. Also, the Naval Studies Board will present its deliberations of the classification of bathymetric data within the EEZ.

Finally, the Ocean Studies Board will begin a dialogue with representatives of the USGS and the U.S. Department of Commerce to develop mechanisms for the coordination of geological and geophysical research carried out by the academic, industrial, and environmental communities and

the EEZ mapping and survey activities of these two agencies. Of particular importance will be the long-term needs of those who conduct research within the EEZ. It is hoped that such coordination will eliminate duplication of effort and assure the establishment of linkages between the federal agencies and the academic and industrial geological research communities.

#### PROSPECTIVE ACTIVITIES

The Ocean Studies Board will continue to be the focal point for the NRC in considering national and international ocean science issues and the spokesman for and to the academic community. The board will also continue to serve as the U.S. National Committee for SCOR, will ensure participation of the U.S. oceanographic community in the meetings and planning activities of this organization and will encourage international cooperation in research endeavors recommended by SCOR.

Ongoing and future activities of concern to the board include:

1. classification of oceanographic data;
2. sea-going measurements and the role of satellites and computers,
3. manpower needs;
4. coastal oceans;
5. marine geochemistry needs; and
6. contemporary issues in fisheries.

The Ocean Studies Board will continue to maintain close liaison with other NRC groups concerned with ocean issues through formal and informal discussions, exchange of pertinent documents and reports, and briefings. In particular, liaison will be maintained with the Board on Atmospheric Sciences and Climate, the Committee on Global Change, the Marine Board, the Naval Studies Board, the Board on Science and Technology for International Development, the Polar Research Board, the Board on Earth Sciences and Resources, and the Board on Environmental Studies and Toxicology.

The board will also maintain close liaison with sponsoring agencies, foundations, and the public through the preparation of semi-annual reports and through formal and informal discussions, briefings, and notifications of meetings.

Reports resulting from these efforts will be prepared in sufficient quantity to ensure their distribution to the sponsor, board members, and other relevant parties in accordance with Academy policy. Reports may be made available to the public without restriction.

APPENDIX I  
OCEAN STUDIES BOARD  
MEMBERSHIPS

Navy Review Panel

Michael C. Gregg, University of Washington, physical oceanography,  
Chairman

Alan Berman, University of Miami, physical oceanography

David W. Hyde, Science Applications International Corporation,  
industrial

Peter Jumars, University of Washington, biological oceanography

Walter H. Munk, NAS, Scripps Institution of Oceanography, physical  
oceanography

John G. Sclater, University of Texas, oceanography

Liaison Members:

Craig E. Dorman, Office of Naval Warfare, Department of the Navy

Edward Y. Harper, Strategic Submarine Division, Department of the Navy

National Oceanic and Atmospheric Administration Review Panel

John Imbrie, NAS, Brown University, oceanography, Chairman

Klaus Wyrtki, University of Hawaii, physical oceanography

Arnold Gordon, Lamont-Doherty Geological Observatory, sea level

Warren Prell, Brown University, geological oceanography

Roy Jenne, National Center for Atmospheric Research, satellite data

Liaison Members:

Garry D. Brewer, Yale University, political science

James J. McCarthy, Harvard University, biological oceanography

John H. Steele, Woods Hole Oceanographic Institution, biological  
oceanography

Ad Hoc CO<sub>2</sub> Panel

Peter G. Brewer, Woods Hole Oceanographic Institution, chemical  
oceanography, Chairman

Wayne E. Esaias, National Aeronautics and Space Administration, biological  
oceanography

Richard H. Gammon, National Oceanic and Atmospheric Administration,  
physical chemistry

James Hansen, National Aeronautics and Space Administration, cell biology

Charles D. Keeling, Scripps Institution of Oceanography, physical  
chemistry

James J. McCarthy, Harvard University, biological oceanography

Berrien Moore, III, University of California, San Diego, mathematics

Roger R. Revelle, NAS, University of California, San Diego, oceanography

Eric Sundquist, U.S. Geological Survey, geochemistry

Taro Takahashi, Lamont-Doherty Geological Observatory, geochemistry

David Walt, Tufts University, bioorganic chemistry

Ray Weiss, Scripps Institution of Oceanography, geochemistry

### International Ocean Science Policy Group

David A. Ross, Woods Hole Oceanographic Institution, geological oceanography, Chairman  
Thomas Clingan, University of Miami, law  
Robert Friedheim, University of Southern California, international relations  
Richard H. Gammon, National Oceanic and Atmospheric Administration, physical chemistry  
Michael Glantz, National Center for Atmospheric Research, meteorology/climatology  
G. Ross Heath, Oregon State University, oceanography/marine geology  
George Keller, Oregon State University, marine geology  
Roger R. Revelle, NAS, University of California, San Diego, oceanography

### Ocean Climate Research Committee

D. James Baker, Jr., Joint Oceanographic Institutions, Inc., physical oceanography, Chairman  
Richard H. Gammon, National Oceanic and Atmospheric Administration, physical chemistry  
John Imbrie, Brown University, oceanography  
Roy Jenne, National Center for Atmospheric Research, satellite data  
Seelye Martin, University of Washington, oceanography  
James J. O'Brien, Florida State University, meteorology  
Roger R. Revelle, NAS, University of California, San Diego, oceanography  
Friedrich Schott, University of Miami, oceanography  
John H. Steele, Woods Hole Oceanographic Institution, biological oceanography

### Continental Margins Steering Group

C. Barry Raleigh, Columbia University, geophysics, Chairman  
James Austin, University of Texas at Austin, seismic stratigraphy, marine geology  
Mark Brandon, Yale University, geology, geophysics  
Darrel Cowan, University of Washington, geology  
Daniel Davis, State University of New York, Stony Brook, geophysics  
Suzanne Kay, Cornell University, petrology, marine geology  
Gregory Moore, University of Tulsa, geology, geophysics  
John Mutter, Lamont-Doherty Geological Observatory, marine seismology, geophysics  
John Sclater, University of Texas at Austin, oceanography, geophysics  
Brian Wernicke, Harvard University, structural technology, geology

APPENDIX II  
OCEAN STUDIES BOARD  
MEETINGS, 1988

January 14	PIPICO Washington, DC
January 25	Continental Margins Washington, DC
January 27	Soviet Scholars Washington, DC
February 2-4	Greenland Sea Project Bremerhaven, FRG
February 10	PIPICO Washington, DC
February 23	Peter Brewer, Chairman, CO <sub>2</sub> Panel Washington, DC
February 24-26	Arctic Ocean Sciences Board Bremerhaven, FRG
April 13-14	CO <sub>2</sub> Panel Washington, DC
April 21	Navy Review Panel Washington, DC
April 22	John Sclater, Chairman, Ocean Studies Board Washington, DC
April 25	Ocean Studies Board/Agency Dinner Washington, DC
May 18	Navy Review Panel La Jolla, CA
May 19-20	Ocean Studies Board La Jolla, CA
June 14	U.S. Geological Survey Reston, VA
June 15	Continental Margins Washington, DC
July 12	Ocean Studies Board Projects La Jolla, CA
July 13	Navy Review Panel Projects La Jolla, CA

August 9-10	Ocean Studies Board Woods Hole, MA
August 11	Coastal Oceans Washington, DC
August 25 - September 2	Joint Oceanographic Assembly and SCOR Acapulco, Mexico
August 25	Ocean Studies Board Boston, MA
September 7	Navy Review Panel Projects Washington, DC
September 20	Continental Margins Washington, DC
September 21-22	CO <sub>2</sub> Panel Washington, DC
September 30 - October 1	Ad Hoc Panel Meeting on Nuclides La Jolla, CA
October 26	U.S. Geological Survey Reston, VA
October 31 - November 2	Oceans 1988 Baltimore, MD
November 1, 1988	NOAA Roundtable Discussion Washington, DC
November 6-10	Ocean Studies Board Projects Washington, DC
November 10	Navy Review Panel/EEZ Washington, DC
November 20-23	Continental Margins Workshop Irvine, CA
December 9	Ocean Studies Board Projects Dallas, TX
December 12	Ocean Studies Board/Chairman Washington, DC
December 13-14	Ocean Studies Board Washington, DC

APPENDIX III  
LIST OF OCEAN STUDIES BOARD PUBLICATIONS

Greenland Sea Project (1987)

The Mid-Oceanic Ridge: A Dynamic Global System--Proceedings of a Workshop (1987)

Physical Oceanography for the Year 2000 (1987)

Recruitment Processes and Ecosystem Structure of the Sea (1987)

Oceanography and the Navy--Future Directions (1988)

Ocean Studies Board Annual Report 1987 and Future Plans (1988)

Background Papers for the Workshop on Continental Margins: Evolution of Passive Continental Margins and Active Marginal Processes (1988)

Symposium Commemorating the 25th Anniversary of the Demonstration of the Feasibility of Deep Ocean Drilling (1989)

In Preparation for Future Publication

The Margins Initiative: Interdisciplinary Studies of Processes Attending Lithospheric Extension and Convergence--Proceedings of a Workshop (in review)



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