

From the Stratton Plan to GEOSS: A Brief History of U.S. Ocean Policy

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Abstract

The history of U.S. ocean policy over about the last 40 years is reviewed and summarized. The history is told in largely chronological order beginning with the Stratton Report in 1969. Various ocean policy commission reports are the cornerstones of the story. In addition, several other reports are highlighted. Several themes run through the story including the interplay of policy with science and technology, ocean governance in the U.S., and fisheries management.

Introduction

In 2008 the Oceanic Engineering Society (OES) of the Institute of Electrical and Electronics Engineers (IEEE) celebrated the fortieth anniversary of its founding. As part of the celebration, a history of OES during this period was written.¹ In addition, each OES technology committee was asked to write a history covering the committee topic area. While the OES Policy Committee was not created until 2004, it still makes sense to write a history of U.S. ocean policy, since, of course, the Society's technology interests are significantly influenced by U.S. ocean policy. In addition, the Marine Technology Society (MTS), co-sponsor of the annual North American OCEANS conferences and partner in promoting ocean and marine interests, has had a policy committee for decades and has played a more prominent role in ocean policy during this period than OES. This history is focused on the U.S. policy making institutions and their influence on the ocean community rather than on either society's roles in influencing that policy.

1969: Stratton Report: *“Our Nation and the Sea: a Plan for National Action”*

The Marine Resources and Engineering Development Act of 1966 (P.L. 89-454) established the presidential Commission on Marine Science, Engineering, and Resources, which came to be known as the “Stratton” Commission, after Dr. Julius Stratton, then recently retired president of MIT. The effort had started nearly ten years earlier with a publication of the National Academy of Science Committee on Oceanography.² The launch of the Soviet satellite Sputnik in 1957 was a wake-up call for American science, including oceanography. Part of the U.S. response was the passage of the National Sea Grant College and Program Act (P.L. 89-688) in 1966, long promoted by Athelstan Spilhaus and others. It was originally placed under the management of the National Science Foundation.

The fifteen members of the commission took two years to gather information, deliberate, prepare the report and issued it in 1969. It contained over 120 specific recommendations and was instrumental in defining the structure of a comprehensive federal ocean policy, which significantly influenced future commissions. The Stratton Commission recommendations led directly to several actions implemented over the following ten years. The National Oceanic and Atmospheric Administration (NOAA)

was created in 1970 within the Department of Commerce, though not as an independent agency, as recommended by the Stratton Commission; nor was it given an “organic” charter, but rather created under a Presidential Reorganization Plan and describing specific ocean and atmospheric tasks, including managing the Sea Grant College Program. While not all the Commission’s recommendations were adopted, their impact was significant, being the impetus for 10 ocean related laws passed between 1966 and 1976.³ In addition during the 1970s many executive branch organizations accepted the challenge to implement the recommendations, notably Department of Commerce, by issuing the *U.S. Ocean Policy in the 1970’s: Status and Issues* in 1978.

U.N. Convention on the Law of the Sea (UNCLOS)

During the 1980’s two notable events provided impetus to ocean policy formulation. In 1983, President Reagan proclaimed the 200 mile Exclusive Economic Zone (EEZ) and in 1988 he extended the U.S. territorial limit from three to twelve nautical miles. He also made the decision not to sign the original version of the U.N. Convention on the Law of the Sea.

UNCLOS resulted from nearly ten years of work by the U.N. Conference on the Law of the Sea and UNCLOS was open for signature between December 1982 and December 1984.⁴

The U.S. and other industrialized nations, while agreeing with most of the Convention, announced that it needed modification in several important areas associated with deep seabed resources beyond national boundaries before it was acceptable. In 1993 revisions were made and codified in an Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea. The Clinton Administration signed the agreement and submitted it and the Convention to the Senate for approval. However, the Senate took no action, and Convention and Agreement entered into force on July 28, 1996, without U.S. participation. Although President Bush announced support of the Convention, the U.S. Senate took no action. As of December 31, 2008, 157 entities were part of the Convention, including the European Union, and the latest nation to join is Liberia.⁵

As a result of the inaction of the Senate, the U.S. lost its seats on the International Seabed Authority. “Failure of the U.S. to accede to the convention leaves U.S. interest, such as, the oil and gas industry, the scientific research community, and other, in irons while another 157 nations enjoy a fresh wind and the power to control the international course.”⁶ The Watkins Commission, The Joint Ocean Commission Initiative, and the President’s Ocean Action Plan all currently recommended that the U.S. accede to UNCLOS.

Also in the 1980’s and 1990’s, legislation was repeatedly introduced in the Congress to create a national ocean council and to establish another ocean commission. Finally, Congress passed The Oceans Act of 2000 (P.L. 106-256), which established a U.S. Commission on Ocean Policy.⁷ That law was partially motivated by a National Ocean Conference convened by the White House in June 1998 in connection with U.N. designation of 1998 as the International Year of the Ocean. In 1999, the Conference released report entitled *Turning to the Sea: America’s Ocean Future*.”

2003: Pew Commission Report: “America’s Living Oceans: Charting a Course for Sea Change”

Partly because of the repeated failures to pass The Oceans Act in the 1990’s, an independent group of ocean experts was funded in early 2000 by the Pew Charitable Trust. The Pew Commission, as it became to be known was led by Leon Panetta. The commission released its report, *America’s Living Oceans: Charting a Course for Sea Change*, on June 4, 2003.⁸ In addition nine science reports were also issued.⁹ The report listed 26 recommendations packaged into six categories:

- Governance for Sustainable Seas
- Restoring America’s fisheries
- Preserving Our Coasts
- Cleaning Coastal Waters
- Guiding Sustainable Marine Aquaculture
- Science, Education, and Funding

2004: Commission on Ocean Policy Report: “An Ocean Blueprint for the 21st Century”

President Bush, on July 3, 2001, appointed 16 members to the U.S. Commission on Ocean Policy (USCOP), established by The Oceans Act of 2000. The Commission was lead by Admiral James D. Watkins, U.S. Navy (retired). Four working groups were established: 1. governance, 2. research, 3. stewardship, and, 4. investment and implementation. The commission entered into nearly a year of information gathering during which 15 public meeting were held across the country. The entire process is described at the Commission website, <http://oceancommission.gov/>. The Commission released a *Preliminary Report* in April 2004 and, after incorporating comments on it, issued a final report on September 20, 2004 entitled *An Ocean Blueprint for the 21st Century*.

The report contained 212 recommendations, highlighted by 13 critical areas:

- Establish a National Ocean Council in the Executive Office of the President, chaired by an Assistant to the President.
- Create a President’s Council of Advisors on Ocean Policy.
- Strengthen NOAA and improve the federal agency structure.
- Develop a flexible and voluntary process for creating regional ocean councils, facilitated and supported by the National Ocean Council.
- Double the nation’s investment in ocean research.
- Implement the national Integrated Ocean Observing System (IOOS).
- Increase attention to ocean education through coordinated and effective formal and informal programs.
- Strengthen the link between coastal and watershed management.
- Create a coordinated management regime for federal waters.
- Create measurable water pollution reduction goals, particularly for nonpoint sources, and strengthen incentives, technical assistance, and other management tools to reach these goals.

- Reform fisheries management by separating assessment and allocation, improving the Regional Fishery Management Council system, and exploring the use of dedicated access privileges.
- Establish an Ocean Policy Trust Fund based on revenue from offshore oil and gas development and other new and emerging offshore uses to pay for implementing the recommendations.

Though more brief than the specific recommendations of the USCOP are the following set of principles to guide national ocean policy:¹⁰

- Sustainability
- Stewardship
- Ocean-Land-Atmosphere Connection
- Ecosystem-based Management
- Multiple Use Management
- Preservation of Marine Biodiversity
- Best Available Science and Information
- Adaptive Management
- Understandable Laws and Clear Decisions
- Participatory Governance
- Timeliness
- Accountability
- International Responsibility

2004 President's Commission on Ocean Policy Report, *U.S. Ocean Action Plan*

The Ocean Act of 2000 required the President to submit, within 120 days of the U.S. Commission on Ocean Policy final report, a response to the findings of the Commission. In December, 2004, President Bush submitted Congress a report entitled *U.S. Ocean Action Plan*.¹¹ A concomitant Executive Order (13366) established as part of the Council on Environmental Quality (CEQ), a Committee of Ocean Policy. In January 2007, that Committee issued the *U.S. Ocean Action Plan Implementation Update*.¹² In subsequent action the Committee established an ocean governance structure to be discussed later in this paper.

The *Ocean Action Plan Implementation Update* includes the following focus areas:

1. Enhancing ocean leadership and coordination. This includes the passage of the NOAA organic act, establishing a cabinet level Committee on Ocean policy, supporting regional ocean collaborations and partnerships
2. Advancing our understanding of the oceans, coasts, and Great Lakes. This includes developing an ocean research priorities plan, promoting the Integrated Ocean Observing System (IOOS) and its integration with the Global Earth Observing System of Systems (GEOSS), developing new ocean platforms, promoting lifelong ocean education, and expanding the Sea Grant Program internationally.
3. Enhancing the use and conservation of ocean, coastal, and Great Lakes resources. This includes supporting effective fisheries management, fostering sustainable fish harvests, promoting coral reef conservation and management,

enhancing conservation of marine mammals, advancing aquaculture, and managing offshore energy development.

4. Managing coasts and their watersheds. This includes reauthorization of the Coastal Zone Management Act, establishing a forecasting system for harmful algal blooms, advancing watershed conservation, conserving coastal habitat, preventing the spread of invasive species, and reducing coastal water and air pollution.
5. Supporting marine transportation. This includes reducing vessel pollution, improving navigation, and developing a nation marine transportation strategy.
6. Advancing international ocean science and policy. This includes supporting the signing of UNCLOS, expanding international cooperation on pollution, ocean-based trade, advancing international ocean science, and leadership of the integrated ocean drilling program.

2006: From Sea to Shining Sea: Priorities for Ocean Policy Reform – A Report to the United States Senate

The U.S. Commission on Ocean Policy was formally closed on 20 December 2004. The Joint Ocean Commission Initiative was formed as a collaborative effort of the U.S. Commission of Ocean Policy and the Pew Commission to accelerate the pace of change in ocean policy. The co-chairs are Adm. Watkins and Leon Panetta and are supported by many of the commissioners of the prior Commissions. The Initiative has issued several reports, including *From Sea to Shining Sea: Priorities for Ocean Policy Reform*,¹³ in response to a request from a bipartisan group of U.S. Senators to identify the most important priorities for Congressional action. They are:

- Adopt a statement of national ocean policy
- Pass an organic act to establish NOAA in law and work with the Administration to identify and act upon opportunities to improve federal agency coordination on ocean and coastal issue
- Foster ecosystem-based regional governance
- Reauthorize an improved Magnuson-Stevens Fishery Conservation and Management Act
- Enact legislation to support innovation and competition in ocean-related research and education consistent with key initiatives in the Administration's Ocean Research Priorities Plan an Implementation Strategy
- Enact legislation to authorize and fund the Integrated Ocean Observing System (IOOS)
- Accede to the U. N. Convention on the Law of the Sea (UNCLOS)
- Establish an Ocean Trust Fund in the U.S. Treasury as a dedicated source of funds for improved management and understanding of ocean and coastal resources by federal and state governments
- Enact ocean and coastal legislation that progressed significantly in the 109th Congress

The Joint Ocean Commission Initiative uses an annual U.S. Ocean Policy Report Card to evaluate progress on implementing its objectives. The results for 2007 are found

at http://www.jointoceancommission.org/resource-center/2-Report-Cards/2008-02-27_2007_Ocean_Policy_Report_Card.pdf and summarized in Table 1.

Table 1 Joint Ocean Commission Initiative 2007 U.S. Ocean Policy Report Card

Subject	Grade	Comments
National Ocean Governance	D	Lack of policy and framework hampers progress. Consideration given to but no enactment of legislation.
Regional and State Ocean Governance Reform	A-	Promising strides in regions and states on a variety of issues.
International Leadership	C+	Significant support for Law of the Sea Convention but need Senate approval.
Research, Science, and Education	C-	Increasing recognition of needs, but limited progress in implementation.
Fisheries Management Reform	C+	Slow progress in implementation.
New Funding for Ocean Policy and Programs	D+	Efforts to address funding needs but still inadequate.
Links Between Oceans and Climate Change	C	New subject added to report card. Initial recognition of role of oceans in climate change.

Published in September 2008, the Commission website also contains a list of ocean policy priorities for the new administration, http://www.jointoceancommission.org/news-room/news-releases/Changing_Oceans,_Changing_World.pdf.

U.S. Ocean Governance

U.S. ocean policy has developed in a piecemeal fashion over the last half century, largely in response to specific events, temporal needs, and crises. Over 140 public laws were passed by Congress that created, moved, or reassigned federal organizations to deal with the problem at hand. The result is that there are a large number of federal agencies involved in ocean management. The USCOP report summarizes these organizations and their summary is repeated here to illustrate the complexity:

Table 2 Federal Organizations Involved in U.S. Ocean Governance

Major Organization	Sub-Organizations					
Department of Agriculture	Natural Resource Conservation Service	Agricultural Research Service	Animal and Plant Health Inspection Service	U.S. Forest Service	Cooperative State Research, Education and Extension	

					Service	
Department of Commerce: National Oceanic and Atmospheric Administration	National Ocean Service	National Marine Fisheries Service	National Weather Service	Office of Oceanic and Atmospheric Research	National Environmental Satellite, Data, and Information Service	Office of Program Planning and Integration
Department of Defense	Department of the Navy	U.S. Army Corps of Engineers	National Geospatial Intelligence Agency			
Department of Energy	Office of Science	Office of Fossil Energy				
Department of Health and Human Services	National Institutes of Health	U.S. Food and Drug Administration				
Department of Homeland Security	Federal Emergency Management Agency	U.S. Coast Guard	Transportation Security Administration	Bureau of Customs and Border Protection		
Department of Interior	U.S. Geological Survey	National Park Service	U.S. Fish and Wildlife Service	Minerals Management Service	Bureau of Reclamation	Bureau of Indian Affairs
Department of Justice	Environment and National Resources Division					
Department of Labor	Occupational Safety and Health Administration					
Department of State	Bureau of Oceans and International Environmental and Scientific Affairs	Bureau of International Organization Affairs				
Department of Transportation	U.S. Maritime Administration	St. Lawrence Seaway Development Corp.	Research and Special Programs Administration			
Environmental Protection	Office of Water	Office of Research and	Office of Air and Radiation	Office of Enforcement and	Office of Prevention, Pesticides and	Office of Solid Waste and

Agency		Development		Compliance Assurance	Toxic Substances	Emergency Response
National Aeronautics and Space Administration	Office of Earth Science					
National Science Foundation	Office of Polar Programs	Directorate for Geosciences	Directorate for Biological Science			
U.S. Agency for International Development						

In addition, there are numerous state agencies and tribal organizations involved in ocean governance. To make matters even more complicated are the 50 Congressional Committees and Subcommittees that have appropriation and authorization responsibilities for the above federal organizations [<http://www.oceanleadership.org/policy/federal>].

The task of integrating these federal organizations under the Bush administration fell to the Committee on Ocean Policy [<http://ocean.ceq.gov/welcome.html>] within the Council on Environmental Quality, which bears consistency with the recommendations of the Commissions. The Committee's structure consists of the Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI) and two subcommittees: the Joint Subcommittee on Ocean Science and Technology (JSOST) and the Subcommittee on Integrated Management of Ocean Resources (SIMOR). JSOST developed the *Ocean Research Priorities Plan and Implementation Strategy* which is the first national description of ocean science priorities.¹⁴ The ICOSRMI is advised by the Ocean Research Resources Advisory Panel (ORRAP) which has developed a priorities plan.¹⁵ SIMOR has published a progress report for 2008.¹⁶

National Oceanographic Partnership Program (NOPP)

In 1997, Public Law 104-201 called for the establishment of the National Oceanographic Partnership Program¹⁷ in addition to National Ocean Research Leadership Council (NORLC), which is composed of fifteen federal agencies involved in ocean research. The NORLC has an Interagency Working Group, an Ocean Research Advisory Panel and an interagency coordination office for managing IOOS. NOPP is now organized under the Joint Subcommittee on Ocean Science and Technology, and provides inter-agency funding for ocean related research and education projects. NOPP has four strategic goals:

- Achieve and sustain an Integrated Ocean Observing System
- Promote lifelong ocean education
- Modernize infrastructure and enhance technology development
- Foster interagency partnerships to increase and apply scientific knowledge

IOOS and GEOSS

An *Ocean Action Plan* priority is Integrated Ocean Observing System (IOOS).¹⁸ It is an end-to-end system designed to coordinate oceanic and atmospheric data acquisition and dissemination in all U.S. stakeholders and NOAA has been designated as the lead federal agency. It is a collaboration of federal agencies to provide leadership and coordination of national oceanographic research and education initiatives.

IOOS is the U.S. contribution to the Global Earth Observing System of Systems (GEOSS). It is an international effort to implement an integrated system of sensors to improve data collection for nine societal benefits:

- Disasters: Reducing loss of life and property from natural and human-induced disasters
- Health: Understanding environmental factors affecting human health and well-being
- Energy: Improving management of energy resources
- Climate: Understanding, assessing, predicting, mitigating, and adapting to climate variability and change
- Water: Improving water resource management through better understanding of the water cycle
- Weather: Improving weather information, forecasting and warning
- Ecosystems: Improving the management and protection of terrestrial, coastal and marine resources
- Agriculture: Supporting sustainable agriculture and combating desertification
- Biodiversity: Understanding, monitoring and conserving biodiversity

The international efforts of GEOSS are guided by the Group on Earth Observations.¹⁹ GEO consists currently of 76 countries and the European Union. The IEEE supports the effort through its IEEE Committee on Earth Observations (ICEO) [<http://www.ieee-earth.org/>]. In addition MTS supports the effort through its Ocean Observing Systems Professional Committee. Both societies embody a broad range of skills from standards, system engineering best practices, data and communication management and to ocean technology innovation.

Fisheries and Aquaculture

U.S. fisheries issues have migrated significantly in the past half century. After the Second World War, sonar technology and other technological advances from the world's military efforts brought greater efficiency to the fishing industry. The combination of factory trawling and fleet trawling accelerated the interests of coastal nations in assigning extensions of jurisdiction, be it as Exclusive Economic Zones or Fishery Conservation Zones, in order to extend control over harvestable resources. In the United States, a 200 mile conservation zone pushed foreign fishing vessels away from U.S. shores, and led

further to increased, and later over-capitalization effort and the reduction in many fish stocks. Increasingly, public concern about overfishing and the restoration of depleted stocks has generated significant concern and did appear in both USCOP and the Pew Commission. Both commissions and the Government Accountability Office have discussed the need for a revised regulatory framework.²⁰ The legislative history is very complex and while recent amendments to the nation's fisheries management act calls for an end in over-fishing, a number of issues remain unresolved.²¹

Technology and Ocean Policy

Technology has changed significantly over the last 40 years. Measurement that were taken by hearty (or possibly seasick) scientists and sailors who would deploy for weeks or months at sea are now recorded by computers receiving satellite transmissions from autonomous vehicles, and the responsible scientist may casually review the data upon receipt in the comfort of their own home, or their laboratory if they prefer. This change will surely continue toward greater automation and autonomy, and toward greater density and quality of data. This will increase what our society knows, and the more our society knows, the better the quality of the decisions we are able to make against the growing number of environmental challenges facing our society, and borne by our inhabitation of this Earth. It will be by sound and consistent policy that we will address the challenges of climate change, sea level rise, depleted natural resources, and the face of Earth as we know it today.

It is well known that public policy affects science and technology (S&T). The poster child for this is NASA. When the U.S. made a commitment to reach the moon and put money to the task, aerospace S&T was fundamentally transformed, and its spin-off profoundly affected the U.S. economy in numerous ways, e.g., electronic miniaturization and lightweight materials. Advances in S&T often have profound impacts on public policy. Often, the result of the interaction between S&T and policy is difficult to predict. It is certainly true in the ocean area. Change often means opportunity.²²

The U.S. policy of supporting IOOS is a powerful stimulus to creating new technology and to fostering technology transfer from other domains to the task of IOOS. The NOAA commitment to support a dedicated exploration ship, the Okeanos Explorer will likely transform the way the U.S. conducts civilian ocean research. On the other hand, new autonomous vehicle (AUV) technology will impact policy and law. The maritime salvage laws are likely to need revision to prevent unintended interruption of AUV missions by inadvertent discovery of an "abandoned" AUV. More profoundly, the availability of IOOS and GEOSS data to the world community will likely shape laws and policies of many countries.

Role of the OCEANS Conferences in Disseminating Ocean Policy

The annual North American OCEANS'YY MTS/IEEE conferences are cosponsored by the Marine Technology Society and the Oceanic Engineering Society of IEEE. These meetings, as well as the international OCEANS conferences, provide important forums for the ocean community to be exposed to new technology, new technical ideas, new acquaintances, and policy updates. The conferences routinely host important plenary and banquet presentations by policy makers. In addition, many policy prime movers are Honorary Chairs of the OCEANS conferences. Unfortunately, their

presentations are not recorded in the conference proceedings because the proceedings go to press nearly a month prior to the conference (and often probably before the speeches are actually composed). Thus, the written record of policy presentations at OCEANS conferences is sparse. However, some notable examples include the appearance of Dr. John Knauss and Dr. Ferris Webster at the OCEANS'83 conference in San Francisco. The conference theme was "Effective Use of the Sea - An Update," which updated three significant documents of the prior decade: The President's Scientific Advisory Committee report, *The Effective Use of the Sea*, the Stratton Commission report, *Our Nation and the Sea, A Plan for Action*, and the National Academy of Engineering Marine Board Report, *Toward Fulfillment of a National Commitment*. In addition, Dr. James Curlin and Dr. Athelstan Spilhaus spoke at banquets.

A more recent example of OCEANS as policy forum is OCEANS'05 MTS/IEEE in Washington, which featured Dr. David Sampson, Deputy Secretary of Commerce as a plenary speaker; James Connaughton, Chair of CEQ as banquet speaker, Adm. James Watkins and VADM Admiral Conrad Lautenbacher, Administrator of NOAA, co-hosting a town hall meeting to assess policy implementation progress, a policy workshop to see how U.S. ocean issues are handled in Congress, and a JSOST meeting. Keynote speakers of recent conferences included Dr. Richard Spinrad, Assistant Administrator of NOAA, and several commanders of the U.S. Naval Meteorology and Oceanography Command. OCEANS conferences outside the U.S. frequently invite policy makers of the host and neighboring conferences. There is always a policy/education/outreach track in the technical program. Attending the OCEANS conference is a way to stay informed.

Does Ocean Policy Matter?

We believe a well constituted ocean policy does matter. For one thing it would help decision makers to prioritize funding, especially important in the current financial crisis in the U.S. Secondly, it would help the federal, state, tribal, and local ocean-concerned organizations, so thoroughly identified in the Watkins Commission report, to coordinate their efforts and provide the nation with direction. Lastly, it would provide guidelines to commercial and academic organizations who invest corporate and individual resources in ocean enterprises.

Need for Personal Perspectives on Ocean Policy History

Perhaps it a shortcoming of the authors that this rendering of U.S. ocean policy history relies heavily on the official documents of the commissions and other bodies involved with forming and implementing the policy. With the notable exception of Knauss's papers, liberally referenced here, we were unable to find personal accounts of the formation of these important documents and the lengthy discussions and disagreements that must surely have accompanied the deliberations. In addition, some lessons must have been learned from previous efforts, which appear to be tacitly contained in current documents. Our sense from reading histories of science and technology by professional historians is that leaving out: 1. the ambiguity and uncertainty of decision making, 2. the personal dynamics and interactions of the participants, 3. the numerous false starts and ill-conceived ideas, and 4. the political and international contexts within which the policy is being made tend to do a disservice to the serious student of policy. We invite those who participated in the efforts discussed here and

others that we do not know of to write their version of the history. Perhaps with enough interest a book could be assembled from the perspectives. The first author (who can be reached at jczika@cox.net) will gladly receive any such stories and offers to be a focal point for any future assembly of articles.

Footnotes

1. *The Oceanic Engineering Society at Forty: The Challenges of an Evolving Society*, by Stanley Chamberlain, Joseph Czika, Norman Miller, and Glen Williams, IEEE J. Ocean. Eng., Vol.33, No.1 February 2008, p 1.
2. For a description of actions prior to the Stratton commission see *The Stratton Commission: Its Origin, How it Operated, It's Legacy* by J.A. Knauss, Mar. Technol. Soc. J., 38(4), 2005.
3. *The Stratton Commission: The Model for a Sea Change in National Marine Policy*, by William J. Merrill, Mary Hope Katsouros, and Jacqueline Bienski, J.Oceanography, Vol. 14, No. 2, p.11, 2001.
4. See *Law of the Sea Convention and U.S. Policy*, by Marjorie Ann Brown, CRS 1B95010, Updated February 10, 2005 and *Marine Science and the 1974 Law of the Sea Conference*, by John Knauss, Science, Vol 184, No 4144, 28 June 1974, p.1335.
5. Current status can be found at <http://www.un.org/depts/los/index.htm>.
6. *Marine Technology and Policy in 2005: Emerging Opportunities and Challenges*, by Craig McLean, Stephanie Showalter, and Emily Larkin, Mar. Technol. Soc. J, 39(3), 2005, p 76.
7. For a history of the ocean commissions, see *Oceans Commissions: Ocean Policy Review and Outlook*, by Harold F. Upton and Eugene H. Buck, Updated August 15, 2008, CRS RL33603.
8. http://www.pewtrusts.org/pdf/env_pew_oceans_final_report.pdf.
9. http://www.pewtrusts.org/our_work_detail.aspx?id=130.
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11. <http://ocean.ceq.gov/actionplan.pdf>.
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15. <http://www.nopp.org/iDuneDownload.dll?GetFile?AppId=141&FileID=329934&Anchor=&ext=.pdf>] and NSC Policy Coordinating Committee – Global Environment.
16. http://ocean.ceq.gov/about/docs/SIMOR_08_Report_on_Progress.pdf.
17. <http://www.nopp.org/>.
18. See <http://www.ocean.us>, and <http://ioos.noaa.gov/>.
19. <http://earthobservations.org/>.
20. See for example, *Offshore Marine Aquaculture: Multiple Administrative and Environmental Issues, Need to be Addressed in Establishing a Regulatory Framework* GAO-08-594, May 2008 and *National Marine Fisheries Service: Improved Economic Analysis and Evaluation Strategies Needed for Proposed Changes to Atlantic Large Whale Protection Plan*, GAO-07-881, July 2007.
21. *Fishery, Aquaculture, and Marine Mammal Legislation in the 110th Congress*, by Eugene H. Buck, updated October 30, 2008.
22. *Marine Technology and Policy in 2005: Emerging Opportunities and Challenges*, by Craig McLean, Stephanie Showalter, and Emily Larkin, *Mar. Technol. Soc. J.*, 39(3), 2005, p 76.