

NATIONAL DEBATE TOPIC FOR HIGH
SCHOOLS, 2014-2015

**Resolved: The United States Federal
Government Should Substantially Increase
Its Non-Military Exploration and/or
Development of the Earth's Oceans**

NATIONAL DEBATE TOPIC FOR HIGH SCHOOLS, 2014-2015
Pursuant to 44 United States Code, Section 1333

Compiled by the Congressional Research Service
Library of Congress



U.S. Government Printing Office
Washington, DC 2014

44 U.S.C., SECTION 1333

CHAPTER 13--PARTICULAR REPORTS AND DOCUMENTS

Sec. 1333. National high school and college debate topics

(a) The Librarian of Congress shall prepare compilations of pertinent excerpts, bibliographical references, and other appropriate materials relating to:

- (1) the subject selected annually by the National University Extension Association as the national high school debate topic and
- (2) the subject selected annually by the American Speech Association as the national college debate topic.

In preparing the compilations the Librarian shall include materials which in his judgment are representative of, and give equal emphasis to, the opposing points of view on the respective topics.

(b) The compilations on the high school debate topics shall be printed as Senate documents and the compilations on the college debate topics shall be printed as House of Representative documents, the cost of which shall be charged to the congressional allotment for printing and binding. Additional copies may be printed in the quantities and distributed in the manner the Joint Committee on Printing directs.

(P.L. 90-620, Oct. 22, 1968, 82 Stat. 1270)

Historical and Revision Notes

Based on 44 U.S. Code, 1964 ed., Supp. III, Sec. 170 [Sec. 276a] (Dec. 30, 1963, Pub. L. 88-246, Secs. 1, 2, 77 Stat. 802)

CONTENTS

	Page
FOREWORD	V
INTRODUCTION	3
SUMMARY	3
BACKGROUND AND EXISTING OCEAN POLICY	4
EXPLORATION AND DEVELOPMENT	5
ORGANIZATIONS AND THINK TANKS	5
ARTICLES, BOOKS, REPORTS, AND CONFERENCES	11
ECONOMIC ISSUES	11
ENVIRONMENTAL ISSUES	11
POLITICAL ISSUES	18
SCIENCE AND TECHNOLOGY ISSUES	19
SOCIAL ISSUES	24
U.S. GOVERNMENT PUBLICATIONS	24
ECONOMIC ISSUES	24
ENVIRONMENTAL ISSUES	25
POLITICAL ISSUES	25
SCIENCE AND TECHNOLOGY ISSUES	26
SOCIAL ISSUES	28
CONGRESSIONAL HEARINGS	28
FEDERALLY-FUNDED RESEARCH AND DEVELOPMENT	33
PRIVATELY-FUNDED RESEARCH AND DEVELOPMENT	34
SUBJECT BIBLIOGRAPHY	35

Foreword

The 2014-2015 high school debate topic is: “Resolved: The United States Federal Government Should Substantially Increase Its Non-Military Exploration and/or Development of the Earth’s Oceans.”

In compliance with 44 U.S.C., Section 1333, the Congressional Research Service (CRS) of the Library of Congress prepared this bibliography to assist high school debaters in researching the topic. This bibliography is intended to assist debaters in the identification of further references and resources on the topic. In selecting items for inclusion in this bibliography, CRS has sampled a wide spectrum of opinions reflected in the current literature on this issue. No preference for any policy is indicated by the selection or positioning of articles, books, or websites cited, nor is CRS disapproval of any policy or article to be inferred from its omission.

The bibliography was prepared by Michelle Cadoree Bradley, Audrey Crane-Hirsch, Denise Dempsey, Maria Kreiser, Sundeep Mahendra, and Elizabeth Schiller, Reference Librarians and Science Reference Specialists in the Knowledge Services Group of CRS and in the Science, Technology and Business Division of the Library of Congress.

The project team leader was Jerry W. Mansfield, Information Research Specialist, Knowledge Services Group.

We wish the best to each debater as they research, prepare, and present arguments on this year’s topic.

Mary B. Mazanec, Director
Congressional Research Service

NATIONAL DEBATE TOPIC FOR HIGH SCHOOLS, 2014-2015

**RESOLVED: THE UNITED STATES FEDERAL GOVERNMENT SHOULD
SUBSTANTIALLY INCREASE ITS NON-MILITARY EXPLORATION AND/OR
DEVELOPMENT OF THE EARTH'S OCEANS**

AN ANNOTATED BIBLIOGRAPHY ON THE 2014-2015
HIGH SCHOOL DEBATE TOPIC

Compiled by

Audrey Crane-Hirsch, Maria Kreiser, Sundeep Mahendra, and
Elizabeth Schiller, Reference Librarians in the Knowledge Service
Group of CRS and Michelle Cadoree Bradley and Denise
Dempsey, Reference Librarians and Science Reference Specialists in the
Science, Technology and Business Division of the Library of Congress
under the direction of project team leader Jerry W. Mansfield,
Information Research Specialist, Knowledge Services Group

September 2014

Introduction

The 2014-2015 high school debate topic is: “Resolved: The United States Federal Government Should Substantially Increase Its Non-Military Exploration and/or Development of the Earth’s Oceans.”

This selective bibliography with brief annotations is intended to assist debaters in identifying resources and references on the national debate topic. It lists citations to books, congressional publications, journal articles, organizations, and websites on the Internet. The bibliography is divided into two broad sections, “Background and Existing Ocean Policy,” and “Exploration and Development.” Included in the bibliography are organizations and think tanks, articles, books, reports, conference proceedings, government publications, and congressional hearings. Where applicable, articles, books, reports, conference proceedings, and government publications are further divided into the sub-sections “economic issues,” “environmental issues,” “political issues,” “social issues,” and “science and technology issues,” with links to websites and documents. The bibliography concludes with selected federal and privately-funded research and development sources.

Summary

The purpose of the bibliography is to provide students with a brief overview of information related to the 2014-2015 high school debate topic.

This compilation is not intended to provide complete coverage of the topic. Further research on the topic may be accomplished at high school, research, depository, and public libraries.

In addition to those included in this bibliography, there are many more international organizations, U.S. Government agencies, private think tanks, and non-governmental organizations (NGOs) that provide information on the debate topic and sub-topics on their websites. Debaters are encouraged to consult the Internet as well as library resources for their research.

Background and Existing Ocean Policy

Etzioni, Amitai. "Final Frontier vs. Fruitful Frontier: The Case for Increasing Ocean Exploration." *Issues in Science and Technology* (2014): 65-74.

Available online at: [<http://issues.org/30-4/final-frontier-vs-fruitful-frontier-the-case-for-increasing-ocean-exploration/>].

Editorial comparing the importance of ocean exploration in contrast to space exploration.

"Possible solutions to the world's energy, food, environmental, and other problems are far more likely to be found in nearby oceans than in distant space."

Executive Office of the President. Executive Order 13547, "Stewardship of the Ocean, Our Coasts, and the Great Lakes," *75 Federal Register* 43023, July 19, 2010.

Available online at: [<http://www.gpo.gov/fdsys/pkg/DCPD-201000608/pdf/DCPD-201000608.pdf>].

This Executive Order established a National Ocean Policy, based on recommendations of the Interagency Ocean Policy Task Force.

Available online at: [http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf].

Executive Office of the President. National Ocean Council. *National Ocean Policy Implementation Plan*. Washington, DC: 2013.

Available online at:

http://www.whitehouse.gov/sites/default/files/national_ocean_policy_implementation_plan.pdf].

The National Ocean Policy, created by Executive Order 13547, established the National Ocean Council which consists of departments and offices from 27 federal agencies. The Council developed the Plan over a two-year period with extensive public input from stakeholders. The National Ocean Policy and Plan with help to spur economic growth, empower states and communities, and save taxpayer dollars through better coordination that avoids conflicts.

Fluharty, David. "Recent Developments at the Federal Level in Ocean Policymaking in the United States." *Coastal Management* 40 (2): 209-221. 2012.

Article focusing on efforts to develop a comprehensive national ocean policy, and related policy initiatives and issues.

McNutt, Marcia. "USGS Support for a National Ocean Policy: From the Coasts to Deep Ocean." *Sea Technology* 51, no. 1 (January 2010): 16-17.

Article on the work of the U.S. Geological Survey (USGS), part of an Interagency Task Force, on research to provide science and information about coastal and ocean systems, and the influence of the USGS on decision and policy making in various U.S. federal agencies.

National Oceanic and Atmospheric Administration. Ocean Exploration Review Panel. *Review Panel Final Report: Ocean Exploration's Second Decade*. National Oceanic and Atmospheric Administration (NOAA). 2012.

Available online at: [<http://oceanexplorer.noaa.gov/about/program-review/2012-12-12-final-oe-review-report.pdf>].

This final report is a review of the implementation and evolution of the NOAA Ocean Exploration Program [<http://oceanexplorer.noaa.gov/about/what-we-do/program-review/welcome.html>], a national program focused on exploring the world's unknown ocean.

U.S. Congress. House of Representatives. *Omnibus Public Lands Management Act of 2009*, Public Law 111-11.

Available online at: [<http://www.gpo.gov/fdsys/pkg/PLAW-111publ11/pdf/PLAW-111publ11.pdf>].

Title XII of this act includes the creation of programs for undersea research, undersea and coastal mapping, and ocean conservation.

United States Commission on Ocean Policy. *An Ocean Blueprint for the 21st Century Final Report*. Washington, DC: U.S. Commission on Ocean Policy. 2014.

Available online at: [<http://purl.access.gpo.gov/GPO/LPS59977>].

A presentation of the Commission's final recommendations for a myriad of issues addressed by its proposed new, coordinated, comprehensive national ocean policy. In conjunction with the Pew Ocean Commission, under the Joint Ocean Commission Initiative [<http://www.jointoceancommission.org/>].

Exploration and Development

Organizations and Think Tanks

American Wind Energy Association (AWEA).

Available online at: [<http://www.awea.org/Issues/Content.aspx?ItemNumber=822>].

The American Wind Energy Association “is the national trade association for the U.S. wind industry.” Its “mission is to promote wind power growth through advocacy, communication and education.”

The Arctic Institute.

Available online at: [<http://www.thearcticinstitute.org/>].

Think tank for Arctic policy issues. Research areas include climate science, geopolitics, law, oil and gas.

Bigelow Laboratory for Ocean Sciences.

Available online at: [<https://www.bigelow.org/>].

The Bigelow Laboratory for Ocean Sciences was founded in 1974 in Maine to undertake fundamental research into the ecosystems of the world's ocean and promote education of ocean science. Research is organized around three core themes of Blue Biotechnology, Ocean Biogeochemistry and Climate Change, and Ocean Health.

Conservation International.

Available online at: [<http://www.conservation.org/what/pages/oceans.aspx>].

Global environmental organization dedicated to protection of nature, including fresh water and oceans.

Consortium for Ocean Leadership.

Available online at: [<http://oceanleadership.org/>].

Collaborative organization of 100+ public and private ocean research and education institutions. The organization manages ocean research and education programs in areas of scientific ocean drilling, ocean observing, ocean exploration, and ocean partnerships.

Coral Reef Alliance.

Available online at: [<http://coral.org/>].

An alliance for protecting coral reefs.

Deep Sea Conservation Coalition.

Available online at: [<http://www.savethehighseas.org/>].

International alliance of 70+ organizations, founded to protect deep-sea ecosystems and safeguard their long-term health and resilience.

Earthwatch Institute. Earth Institute.

Available online at: [<http://earthwatch.org/scientific-research/our-research-areas/ocean-health>].

The Earthwatch Institute's mission is: "To engage people worldwide in scientific field research and education to promote the understanding and action necessary for a sustainable environment."

Food and Agricultural Organization of the United Nations (FAO). Fisheries & Aquaculture Department. Available online at: [<http://www.fao.org/fishery/en>].

The mission of the FAO's Fisheries & Aquaculture department is "To strengthen global governance and the managerial and technical capacities of members and to lead consensus-building towards improved conservation and utilization of aquatic resources."

Florida Atlantic University. Harbor Branch Oceanic Institute.

Available online at: [<http://www.fau.edu/hboi/>].

The institute "drives innovation in ocean engineering, at-sea operations, drug discovery and biotechnology from the oceans, coastal ecology and conservation, marine mammal research and conservation, aquaculture, ocean observing systems and marine education."

Greenpeace International. Greenpeace USA.

Available online at: [<http://www.greenpeace.org/usa/en/>].

International organization that campaigns on worldwide environmental issues. The Ocean protection campaign focuses on protecting oceans via marine reserves that protect wildlife: <http://www.greenpeace.org/usa/en/campaigns/oceans/>.

Intergovernmental Panel on Climate Change (IPCC).

Available online at: [<http://www.ipcc.ch/index.htm>].

"The IPCC is a scientific body under the auspices of the United Nations (UN). It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change."

International Union for Conservation of Nature and Natural Resources (IUCN).

Available online at: [<http://www.iucn.org/about/work/programmes/marine/>].

IUCN's "mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable."

Joint Ocean Commission Initiative.

Available online at [<http://www.jointoceancommission.org/>].

"The Joint Initiative is committed to providing constructive assistance to all entities—federal, state, and local governments, as well as nongovernmental, academic, and private sector interests— and is dedicated to moving our nation toward a better coordinated national ocean policy, with an improved governance framework and enhanced management tools to carry out that policy."

Marine Conservation Institute.

Available online at: [<http://www.marine-conservation.org/>].

Headquartered in Seattle, WA, Marine Conservation Institute has several program areas centered on three broad conservation themes: identify vulnerable marine ecosystems, advocate for healthy oceans, and protect wild places.

Marine Science & Technology Foundation.

Available online at: [<http://mstfoundation.org/>].

MSTF is a private nonprofit foundation for advancing technology in oceanographic research. Microbial life beneath the sea floor exploration tool and project funded by MSTF can be found here: <http://mstfoundation.org/story/DEBI-SELECT>

Marine Technology Society.

Available online at: [<https://www.mtsociety.org/>].

International organization composed of members of academia, government and industry to promote awareness, understanding, advancement and application of marine technology. *MTS Journal* is the flagship publication.

Monterey Bay Aquarium Research Institute.

Available online at: [<http://www.mbari.org/>].

MBARI is a nonprofit oceanographic research center located in Moss Landing, California that addresses issues of global and social relevance through the themes of: ocean visualization, ecosystem dynamics, ocean biogeochemistry, and exploration.

National Council for Science and the Environment (NCSE).

Available online at: [<http://www.ncseonline.org/>].

The National Council for Science and the Environment (NCSE) is a not-for-profit organization dedicated to improving the scientific basis for environmental decision making.

National Geographic Society.

Available online at: [<http://www.nationalgeographic.com/>].

Nonprofit scientific and educational institutions with interests in geography, archaeology and natural science, and environmental conservation.

National Ocean Policy Coalition (NOPC).

Available online at: [<http://oceanpolicy.com/>].

“The National Ocean Policy Coalition is a national organization focused on developing a national ocean policy that considers the following interests: energy, mining, agriculture, chemicals, construction, manufacturing, shipping, transportation, ports, commercial and recreational fishing, and boating.”

National Oceanographic and Atmospheric Administration. Hawaii Undersea Research Laboratory.

Available online at: [<http://www.soest.hawaii.edu/HURL/>].

Research topics include deep-water marine processes, ecosystems, fisheries, and environmental impact measurements associated with innovative ocean energy technologies (e.g., ocean thermal energy conversion, cold water cooling, and undersea energy transmission between the islands originating from renewable sources such as wind farms).

National Research Council (NRC).

Available online at: [<http://dels.nas.edu/osb>].

“The National Research Council’s mission is to improve government decision making and public policy, increase public understanding, and promote the acquisition and dissemination of knowledge in matters involving science, engineering, technology, and health.”

National Science Foundation (NSF).

Available online at: [<http://www.nsf.gov/div/index.jsp?div=oce>].

The National Science Foundation’s Division of Ocean Sciences “supports research, infrastructure, and education to advance understanding of all aspects of the global oceans and ocean basins, including their interactions with people and the integrated Earth system.”

Natural Resources Defense Council (NRDC).

Available online at: [<http://www.nrdc.org/oceans/default.asp>].

“NRDC works to safeguard the earth — its people, its plants and animals, and the natural systems on which all life depends.”

The Nature Conservancy.

Available online at:

[<http://www.nature.org/ourinitiatives/habitats/oceanscoasts/index.htm?intc=nature.tnav.how.list>].

The Nature Conservancy’s mission is to “conserve the lands and waters on which all life depends.” The Conservancy’s scientists and policy experts “focus on the need for improved overall governance, policies and management of our oceans at all scales, from individual sites, to regional, national and multinational levels balancing development and conservation needs.”

Ocean Acidification International Coordination Centre (IAEA-OA-ICC).

Available online at: [<http://www.iaea.org/ocean-acidification/page.php?page=2181>].

“The project works to communicate, promote and facilitate a series of over-arching activities in

science, capacity building and communication intended to serve the scientific community, policy makers, the general public, media and other stakeholders.”

Ocean Futures Society.

Available online at: [<http://www.oceanfutures.org/>].

Global organization emphasizes the exploration of the ocean, using videos and books to illustrate the critical connection between humanity and nature, and the importance of the ocean for the survival of all life on the planet.

Ocean Renewable Energy Coalition (OREC).

Available online at: [<http://www.oceanrenewable.com/>].

OREC is a “national trade association exclusively dedicated to promoting marine and hydrokinetic energy technologies from clean, renewable ocean resources.”

Oceana.

Available online at: [<http://oceana.org/en>].

World’s largest ocean conservation and advocacy organization. Specific campaign goals are created to achieve measurable results through targeted campaigns to produce clear policy changes within 3-5 year timeframes. Efforts focus on preventing collapse of fish populations and other sea life caused by industrial fishing and pollution.

Resources for the Future.

Available online at: [<http://www.rff.org/Pages/default.aspx>].

“Resources for the Future improves environmental and natural resource policymaking worldwide through objective social science research of the highest caliber.”

The Safina Center.

Available online at: [<http://safinacenter.org/>].

“The Safina Center studies how the ocean is changing and what these changes mean for wildlife and people.” The center “works to create a more knowledgeable constituency for conservation.”

Schmidt Ocean Institute.

Available online at: [<http://www.schmidtocean.org/>].

Research facility that supports applications of modern technology to understand the oceans.

Scientific Committee on Oceanic Research (SCOR).

Available online at: [<http://www.scor-int.org/>].

“SCOR activities focus on promoting international cooperation in planning and conducting oceanographic research, and solving methodological and conceptual problems that hinder research. Scientists from thirty-two nations have formed national SCOR committees to interact with international SCOR.”

Seaflow.

Available online at: [<http://baynature.org/organization/seaflow/>].

A nonprofit project “to build an international movement dedicated to protecting humans, whales, dolphins and all marine life from active sonars and other ocean lethal ocean noise pollution.”

Seasteading Institute.

Available online at: [<http://www.seasteading.org/>].

Think tank that advances the movement for ocean-based structures and cities.

United Nations Environment Programme (UNEP).

Available online at: [<http://www.unep.org/>].

The United Nations Environment Programme “is the voice for the environment within the United Nations system. UNEP acts as a catalyst, advocate, educator and facilitator to promote the wise use and sustainable development of the global environment.”

University of Calgary. Arctic Institute of North America.

Available online at: [<http://arctic.ucalgary.ca/>].

Their mission is “to advance the study of the North American and circumpolar Arctic through the natural and social sciences, the arts and humanities and to acquire, preserve and disseminate information on physical, environmental and social conditions in the North.”

University of California, San Diego. Scripps Institution of Oceanography.

Available online at: [<https://scripps.ucsd.edu/>].

According to the website, Scripps is one of the “oldest, largest, and most important centers for ocean, earth and atmospheric science research, education, and public service in the world.”

Wild Oceans.

Available online at: [<http://wildoceans.org/>].

Nonprofit organization with a mission of “keeping the oceans wild to preserve fishing opportunities for the future.”

World Ocean Council (WOC).

Available online at: [<http://www.oceancouncil.org/site/>].

“The World Ocean Council brings together the multi-sectoral ocean business community to catalyze global leadership and collaboration in ocean sustainability and ‘Corporate Ocean Responsibility’.”

WWF (World Wildlife Federation).

Available online at: [http://wwf.panda.org/about_our_earth/blue_planet/].

WWF is an independent conservation organization dedicated to conserving earth’s biodiversity, promoting sustainable renewable energy, and reducing pollution and wasteful consumption.

Articles, Books, Reports, and Conferences

Economic Issues

“Treasure on the Ocean Floor.” *The Economist*, vol. 381, no. 8506 (Dec 2, 2006): 10.
Underwater mining for mineral wealth in the ocean presents new opportunities as well as environmental concerns.

“The Unplumbed Riches of the Deep; Seabed Mining.” *The Economist*, vol. 391, no. 8631 (May 16, 2009): 30-31.

This article discusses commercial interest in seafloor minerals, which the author believes will increase as scientists discover new mineral deposits in the ocean.

Winner, Cherie. “The Socioeconomic Costs of Ocean Acidification.” *Oceanus*, vol. 50, no. 2 (Fall 2013): 72-75.

Winner discusses how the oceans dropping pH may dramatically impact food supplies, livelihoods, and societies as a whole.

Environmental Issues

Arias, Andrés Hugo and María Clara Menedez (eds.). *Marine Ecology in a Changing World*. Boca Raton, FL: CRC Press, 2013).

In this book, oceanographers examine ecological issues relating to marine ecosystems, with a focus on climate change. The book addresses the topics of ecosystem stability, water quality, and biodiversity.

Barbier, Edward B. et al. “Protect the Deep Sea.” *Nature*, vol. 505, no. 7484 (January 23, 2014): 475-477.

Calls for the creation of networks to maintain biodiversity and protect the ecosystems in the world's oceans. Outlines the benefits of restoration of the deep sea and suggests strategies for funding and governance.

Billé, Raphaël et al. “Taking Action Against Ocean Acidification: A Review of Management and Policy Options.” *Environmental Management*, vol. 52, no. 4 (October, 2013): 761-779.

This paper argues that research efforts into ocean acidification have failed to focus on management and policy issues. The authors present a review of policy options.

Corbin, John S. “Sustainable U.S. Marine Aquaculture Expansion, a Necessity.” *Marine Technology Society Journal*, vol. 44, no. 3 (May/June, 2010): 7-21.

Supports the position that the United States' Exclusive Economic Zone (EEZ) should be developed as a resource for expanded domestic marine aquaculture. Cites statistics on current and future demand for seafood in the U.S. and outlines some resources for expanding marine seafood production.

Danson, Ted and Michael D'Orso. *Oceana: Our Endangered Oceans and What We Can Do to Save Them*. NY: Rodale, 2011.

Ted Danson tells the story of his involvement with oceanic environmental activism. Danson explains the history of ocean exploitation as well as protection efforts, from a personal perspective.

Deep-Ocean Stewardship Initiative (DOSI). *Deep Ocean Stewardship Initiative (DOSI) Experts Planning Workshop, April 15-17, 2013, Mexico City, Mexico*. Southampton, UK: International Network for Scientific Investigation of Deep-Sea Ecosystems, 2013.

Available online at: [http://www.indeep-project.org/sites/indeep-project.org/f/document/DOSI_report_may2013.pdf].

This workshop was a meeting to establish and launch the Deep Ocean Stewardship Initiative (DOSI); DOSI's "intent is to foster an international forum for the development of common goals, exchange of research information and use of consistent methods and terminology among scientists, industry, regulators, civil society and other stakeholders."

Doney, Scott C. et al. "Climate Change Impacts on Marine Ecosystems." *Annual Review of Marine Science*, vol. 4, (2012): 11-37.

A review of the effects of rising atmospheric carbon dioxide and climate change on the ocean's ecosystems, including biological effects, physiological changes, and changes in population.

Earle, Sylvia. "Mission Blue: Protect and Restore the Oceans, Earth's Blue Heart." *Global Dialogue*, vol. 14, no. 1 (Winter 2012): 28-34.

The article argues that humanity is at a critical point in history, as it relates to how we understand and interact with the environment. According to the author, this knowledge comes with the responsibility to protect the natural world we rely on.

Earle, Sylvia. *The World Is Blue: How Our Fate and the Ocean's Are One*. Washington, DC: National Geographic Society, 2010.

Earle compiles personal stories in this book accompaniment to National Geographic's ocean initiative on overfishing.

Eisler, Ronald. *Oceanic Acidification: A Comprehensive Overview*. Boca Raton, FL: CRC Press, 2012.

"This book critically examines the available literature on oceanic acidification, including a historical review of pH and atmospheric CO₂ levels over the millennia; natural and anthropogenic sources of CO₂ to the atmosphere and sea surface; chemical, physical, and biological mode of action; biological effects of acidification to marine plants and animals under laboratory conditions; field observations on seawater chemistry and effects of declining pH; and various technical and political mitigation strategies."

Farr, Sam. "Implementing National Ocean Policy, Cleaning Up and Monitoring the Ocean." *Sea Technology*, vol. 55, no. 1 (January, 2014): 27-28.

Highlights some of the improvements expected by the implementation of the National Ocean Policy including clearing marine debris and dealing with ocean acidification.

Foley, Melissa M. et al. "Improving Ocean Management Through the Use of Ecological Principles and Integrated Ecosystem Assessments."

Bioscience, vol. 63, no. 8 (August, 2013): 619-631.

Explores how approaches based on ecological assessments can be incorporated into NOAA's Integrated Ecosystem Assessment (IEA) program.

Food and Agriculture Organization of the United Nations. Fisheries and Aquaculture Department. *The State of World Fisheries and Aquaculture (SOFIA)*. Rome: Food and Agriculture Organization of the United Nations, 2014.

Available online at: [<http://www.fao.org/fishery/sofia/en>].

The State of World Fisheries and Aquaculture (SOFIA) is a publication of the FAO Fisheries and Aquaculture Department. This advocacy document is published every two years to provide policy-makers, civil society and others with interest in the sector a comprehensive, objective and global view of capture fisheries and aquaculture, including associated policy issues.

Food and Agriculture Organization of the United Nations. Technical Workshop on Expanding Mariculture Farther Offshore. *Expanding Mariculture Farther Offshore: Technical, Environmental, Spatial and Governance Challenges, FAO Technical Workshop, 22-25 March 2010, Orbetello, Italy*. Edited by Alessandro Lovatelli et al. Rome: Food and Agriculture Organization of the United Nations, 2013. (FAO fisheries and aquaculture proceedings, vol. 24) Available online at: [ftp://ftp.fao.org/fi/CDrom/P24/full_version.pdf].

“The objective of this workshop was to discuss the growing need to transfer land-based and coastal aquaculture production systems farther off the coast and provide recommendations for action to FAO, governments and the private sector.”

Fox, Helen E. et al. “Reexamining the Science of Marine Protected Areas: Linking Knowledge to Action.” *Conservation Letters*, vol. 5, no. 1 (January, 2012): 1-10.

A discussion of the need for advanced marine protected areas science and research to make effective marine protected areas policy. Reviews some areas of research in policy-relevant marine protected areas science.

Galland, Grantly, Ellycia Harrould-Kolieb, and Dorothee Herr. “The Ocean and Climate Change Policy.” *Climate Policy (Earthscan)*, vol. 12, no. 6 (2012): 764-771.

Argues that the ocean plays a major role in regulating Earth's climate although it receives little attention in policymaking decisions on climate change. Makes recommendations to enhance the consideration of the ocean in climate change adaptation policies.

Gattuso, Jean-Pierre and Lina Hansson, eds. *Ocean Acidification*. NY: Oxford University Press, 2011.

Includes chapters on Background and History of Ocean Acidification, and Chapters on Marine Ecosystems, the Effect of Ocean Acidification on Marine Organisms, Biodiversity, Human Society, and Climate Change.

Griffis, Roger B. and Jennifer Howard. *Oceans and Marine Resources in a Changing Climate: A Technical Input to the 2013 National Climate Assessment*. Washington: Island Press, 2013.

(National climate assessment regional technical input report series)

“This book provides an assessment of scientific knowledge of the current and projected impacts

of climate change and ocean acidification on the physical, chemical, and biological components and human uses of marine ecosystems under U.S. jurisdiction.”

Herr, D., K et al. *Ocean Acidification: International Policy and Governance Options*. Gland, Switzerland: International Union for Conservation of Nature and Natural Resources, 2014. Available online at: [<https://portals.iucn.org/library/sites/library/files/documents/IUCN-2014-016.pdf>].

This report presents an overview of the science of ocean acidification, reviews existing policy on the issue, and makes some observations and recommendations for future progress.

Hinrichsen, Don. *The Atlas of Coasts & Oceans: Ecosystems, Threatened Resources, Marine Conservation*. Chicago: The University of Chicago Press, 2011.

A reference work that focuses on mapping the environmental impact of humans on the oceans. Includes graphs and maps illustrating such issues such as overfishing, pollution, and energy production.

Hoegh-Guldberg, Ove and John F. Bruno. “The Impact of Climate Change on the World’s Marine Ecosystems.” *Science*, vol. 328, no. 5985 (June 18, 2010): 1523-1528.

Reviews how climate change resulting from rising greenhouse gas levels affects the marine ecosystems of the world’s oceans and urges policies that will minimize the risk of exposure.

Holland, Geoff and David Pugh. *Troubled Waters: Ocean Science and Governance*. NY: Cambridge University Press, 2010.

This book commemorates the 50th anniversary of the Intergovernmental Oceanographic Commission of UNESCO; 30 international experts address topics including marine pollution, exploitation, and hazards.

Hollowed, Anne B. et al. “Projected Impacts of Climate Change on Marine Fish and Fisheries.” *ICES Journal of Marine Science / Journal Du Conseil*, vol. 70, no. 5 (September, 2013): 1023-1037.

Available online at:

[<http://icesjms.oxfordjournals.org/content/early/2013/07/05/icesjms.fst081.full.pdf+html>].

A review of the current literature forecasting the effects of climate change on marine fish, fish and fisheries. Issues discussed include impacts on ecosystems, habitats, quantity and quality, changes in production, and food security.

Hull, Eric V. “Ocean Acidification: Legal and Policy Responses to Address Climate Change’s Evil Twin.” *New York University Environmental Law Journal*, vol. 20, no. 3 (April, 2014): 507-544.

The author argues that previous United States policy has not adequately addressed actions necessary to prevent the intensification of ocean acidification and recommends legal and policy remedies.

International Geosphere-Biosphere Programme (IGBP), Intergovernmental Oceanographic Commission (IOC), and Scientific Community on Ocean Research (SCOR). *Ocean Acidification Summary for Policymakers: Third Symposium on the Ocean in a High-CO₂ World*. Edited by

Wendy Broadgate et al. Stockholm, Sweden: International Geosphere-Biosphere Programme, 2013.

Available online at:

[http://www.igbp.net/download/18.30566fc6142425d6c91140a/1385975160621/OA_spm2-FULL-lorez.pdf].

This report is a summary of state-of-the-art knowledge of ocean acidification presented at the Third Symposium on the Ocean in a High-CO₂ World, held in Monterey, California in 2012.

Leonard, Mike. "A Long Row for Proper Fisheries Management." *Environmental Forum*, vol. 29, no. 3 (May/June, 2012): 49.

Argues that appropriate fisheries management policy can only be implemented with a foundation of sound, quality, and current scientific data.

Mendler de Suarez, Janot et al. "Ensuring Survival: Oceans, Climate and Security." *Ocean & Coastal Management*, vol. 90, (March, 2014): 27-37.

Argues that the ocean plays an important role in the regulation of the earth's climate and temperature and in the lives of billions of people. Encourages ecosystem-based approaches to ocean management to ensure ocean security and resilience.

Mengerink, Kathryn J. et al. "A Call for Deep-Ocean Stewardship." *Science*, vol. 344, no. 6185 (May 16, 2014): 696-698.

As advancements in technology enable greater access to deep sea resources, experts urge caution, highlighting the potentially irreversible damage that extracting such materials can cause, and warning against lasting damage to the deep ocean, caused by fishing, oil and gas development, industrial-scale mining, waste disposal and land-based pollution.

Migliaccio, Emily. "The National Ocean Policy: Can it Reduce Marine Pollution and Streamline our Ocean Bureaucracy?" *Vermont Journal of Environmental Law*, vol. 15, no. 3 (Spring 2014): 629-656.

Focuses on the problem of marine pollution and debris, outlines the reasons why the protection of the ocean is important, and discusses how the National Ocean Policy can help to reduce the problem.

National Research Council (U.S.). Committee on the Development of an Integrated Science Strategy for Ocean Acidification Monitoring, Research, and Impacts Assessment. *Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean / Committee on the Development of an Integrated Science Strategy for Ocean Acidification Monitoring, Research, and Impacts Assessment, Ocean Studies Board, Division on Earth and Life Studies, National Research Council of the National Academies*. Washington, DC: National Academies Press, 2010.

Available online at: [http://www.nap.edu/catalog.php?record_id=12904].

Reviews ocean acidification's effects on the chemistry of the ocean, biological effects on marine organisms, and its effects on marine ecosystems and discusses the implementation of a National Ocean Acidification Program.

National Research Council (U.S.). Committee on the Review of the National Ocean Acidification Research and Monitoring Plan. *Review of the Federal Ocean Acidification Research and Monitoring Plan / Committee on the Review of the National Ocean Acidification Research and Monitoring Plan, Ocean Studies Board, Division on Earth and Life Studies, National Research Council of the National Academies*. Washington, DC: National Academies Press, 2013.

Available online at: [http://www.nap.edu/catalog.php?record_id=17018].

Recommendations to improve the Strategic Plan for Federal Research and Monitoring of Ocean Acidification draft. Analyzes seven themes of the Strategic Plan.

Ocean Acidification Reference User Group. *Ocean Acidification: Questions Answered*. D. d'A Laffoley, J. M. Baxter, eds. Nairobi, Kenya: European Project on Ocean Acidification (EPOCA), 2010.

Available online at: [<http://medsea-project.eu/wp-content/uploads/2011/04/qa-english.pdf>].

“In this guide we do four new things. We answer some key questions many people are now asking about ocean acidification. We say how sure the international scientific community is about what is already happening to the ocean, we discuss what the future may hold for the ocean in a high carbon dioxide (CO₂) world, and we explore the consequences for all of us of what is now happening.”

Radulovich, Ricardo. “Massive Freshwater Gains from Producing Food at Sea.” *Water Policy*, vol. 13, no. 4 (07, 2011): 547-554.

Argues that an increase in marine food production could save large amounts of freshwater by decreasing the reliance of agriculture on rainwater and irrigation; states that any policy discussions on food production and water should include the increase to freshwater by the deliberate production of food at sea.

Ramirez-Llodra et al. “Man and the Last Great Wilderness: Human Impact on the Deep Sea.” *Plos One*, vol. 6, no. 7 (July, 2011): 1-25.

Available online at:

[<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0022588>].

“This paper provides scientific expert judgment and a semi-quantitative analysis of past, present and future impacts of human-related activities on global deep-sea habitats within three categories: disposal, exploitation and climate change.”

Rau, Greg H., Elizabeth L. McLeod, and Ove Hoegh-Guldberg. “The Need for New Ocean Conservation Strategies in a High-Carbon Dioxide World.” *Nature Climate Change*, vol. 2, (October, 2012): 720-724.

This article argues that the current approach to mitigation of increasing atmospheric carbon dioxide in policy statements is inadequate and that more robust conservation strategies and policies must be considered.

Roberts, Callum. *The Ocean of Life: the Fate of Man and the Sea*. NY: Penguin, 2013.

Roberts, a conservation biologist, presents the history of the sea, from the earliest known traces of water on earth to the present day. He discusses the impact of overfishing, deep-sea mining, and climate change.

Scherer, Lauri S., ed. *Oceans*. Farmington Hills, MI: Greenhaven Press, 2011.

Presents contrasting viewpoints and perspectives to answer the questions: How are oceans changing?; What are the most significant threats to oceans?; and How should oceans be protected?

“A Shrinking Problem; Ocean Acidification.” *The Economist*, vol. 410, no. 8870 (Jan 18, 2014): 79.

This article explains how scientists study Olympia oysters off the coast of California as an example of how ocean life reacts to changes in the environment.

Tropova, Caitlyn et al., eds. *Global Ocean Protection: Present Status and Future Possibilities*. Brest, France: Agence des aires marines protégées; Gland, Switzerland, Washington, and NY, USA: IUCN WCPA; Cambridge, UK: UNEP-WCMC; Arlington, USA: TNC; Tokyo, Japan: UNU; NY, USA: WCS, 2010.

Available online at: [<https://portals.iucn.org/library/efiles/documents/2010-053.pdf>].

This report “provides an overview of the different types of marine protected areas and other area-based management measures and the benefits they provide.”

Turley, Carol and Kelvin Boot. *UNEP Emerging Issues: Environmental Consequences of Ocean Acidification: A Threat to Food Security*. Nairobi, Kenya: United Nations Environment Programme (UNEP), 2010.

Available online at: [www.unep.org/dewa/Portals/67/pdf/Ocean_Acidification.pdf].

Explores the effect that increased carbon dioxide has on the chemistry of the ocean and how the resulting ocean acidification will disrupt the marine food chain and damage human activities connected to the ocean.

“Uncovering an Ocean; the Science.” *The Economist*, vol. 403, no. 8789 (Jun 16, 2012): S.6-S.8.

This article discusses how researchers track sea ice, especially in Ny-Alesund, where scientists track the melting Artic.”

Vallis, Geoffrey, K. *Climate and the Oceans*. Princeton, NJ: Princeton University Press, 2011.

This introduction to how the oceans influence Earth’s climate system discusses how oceans serve as a pacemaker of climate variability and change.

Van Dover, Cindy Lee. “Tighten Regulations on Deep-Sea Mining.” *Nature*, vol. 470, no. 7332 (Feb 03, 2011): 31-33.

The author argues that deep-sea mineral mining should be postponed until ocean ecologists have had sufficient time to research the impacts of mining and conservation policies have been enacted to protect the ocean ecosystems.

Wallace, Doug W. R. et al. *Ocean Fertilization: A Scientific Summary for Policymakers*. Paris: Intergovernmental Oceanographic Commission; United Nations Educational, Scientific and Cultural Organization, 2010.

Available online at:

[<http://www.igbp.net/download/18.1b8ae20512db692f2a680007762/1376383138638/SPM->

[ocean+fertilization.pdf](#)].

This report is an overview of the benefits, practicalities, and ramifications of large-scale fertilization of the ocean by using iron or other nutrients in an effort to remove carbon dioxide from the atmosphere and to increase microscopic marine plant growth.

“A Welcome Pause; the Oceans and Climate Change.” *The Economist*, vol. 410, no. 8875 (Feb 22, 2014): 53.

This article discusses a study which attributes the slowdown in the rise of Earth’s surface temperature to strengthened east-west trade winds at equatorial latitudes.

Wilhelmsson, D. et al. *Greening Blue Energy: Identifying and Managing the Biodiversity Risks and Opportunities of Offshore Renewable Energy*. Gland, Switzerland: IUCN, 2010.

Available online at: [http://cmsdata.iucn.org/downloads/2010_014.pdf].

This report is a review of the current literature on the impacts of offshore renewable energy production on the marine environment. An overview of offshore wind energy, and the impact of wind farms on fish, birds, marine mammals, other marine animals, and the seabed is included.

Political Issues

Cruickshank, Michael. “Marine Mining: An Area of Critical National Need.” *Mining Engineering*, vol. 63, no. 5 (May 2011): 89-93.

The author discusses how the mineral resources in the ocean are largely undeveloped, and how roughly half of these resources are in locations governed by the United Nations International Seabed Authority.

Joint Ocean Commission Initiative. *Charting the Course: Securing the Future of America’s Oceans*. Washington: Meridian Institute, 2013.

Available online at:

[http://www.jointoceancommission.org/documents/JOI_Charting%20the%20Course_FINAL%20June%202013.pdf].

This report was developed by the Joint Ocean Commission Initiative and recommends the actions that the Obama Administration and the Congress should undertake to effectively manage the America’s ocean resources.

“Leaders: An Awkward Absence; the Sea.” *The Economist*, vol. 391, no. 8631 (May 16, 2009): 14.

The United States, which has never ratified the 27-year-old UN Convention on the Law of the Sea, declines to participate in submitting or evaluating new claims to the seabed. The author argues that the United States should take a more active role, given the research and resource potential of the ocean.

Science and Technology Issues

Aarup, T. et al., eds. *Sea-Level Rise and Variability: A Summary for Policy Makers*. Paris: United Nations Educational, Scientific and Cultural Organization; Intergovernmental Oceanographic Commission, 2010.

Available online at: [<http://unesdoc.unesco.org/images/0018/001893/189369e.pdf>].

This summary report is based on Chapter 13 of the book *Understanding Sea Level Rise and Variability*, Edited by John A. Church and Others, Chichester, West Sussex; Hoboken, NJ: Wiley-Blackwell, 2010. The report reviews the changes in sea-level and the rate of sea-level rise, the causes and science behind rising levels, projections for future sea-level rise, and makes some recommendations for mitigation of the rising sea levels.

Appiott, Joseph, Amardeep Dhanju, and Biliana Cicin-Sain. "Encouraging Renewable Energy in the Offshore Environment." *Ocean & Coastal Management*, vol. 90, (March, 2014): 58-64. Discusses the various forms of offshore renewable energy, and some of the policy, environmental, and technical issues obstructing the development of renewable energy in the offshore environment.

Baker, Beth. "New Ocean Policy Depends on Biology Research." *Bioscience*, vol. 62, no. 5 (May, 2012): 524.

Discusses the importance of biology research in achieving the objectives of the National Ocean Policy.

Barnett, Judith B. "Ocean Exploration: A Guide to Information Resources." *Science & Technology Libraries*, vol. 31, no. 3 (2012): 305-314.

An overview and reference guide to the literature of ocean exploration. Includes historical works, encyclopedias, bibliographies, electronic resources, and institutions.

Barron, Eric J., Rana A. Fine, and Oscar Schofield. "Critical Ocean Infrastructure Needs for the US in the Year 2030." *Sea Technology*, vol. 52, no. 8 (August, 2011): 17-21.

Discusses the report Infrastructure Strategy for U.S. Ocean Research in 2030 and gives an overview of recommendations, major themes, and technological trends that are critical for ocean policy success.

Bondareff, Joan M. "The Impact of Coastal and Marine Spatial Planning on Deepwater Drilling." *Natural Resources & Environment*, vol. 26, no. 2 (Fall 2011): 3-6.

Gives a brief review of the history of coastal and marine spatial planning, touches on legal aspects of coastal and marine spatial planning and concludes that the development of CMSPs may have a positive effect on deepwater drilling for oil and gas and on the development of renewable energy.

Conover, David and Roxanne Nikolaus. "Innovation and Unity in Advancing Ocean Sciences." *Sea Technology*, vol. 54, no. 1 (January, 2013): 19-20.

Reviews some of the latest NSF-supported advances in ocean access and discovery and NSF's Science, Engineering and Education for Sustainability (SEES) portfolio.

Gardner, Lauren. "Oceans Plan Meets Wave of GOP Resistance." *CQ Weekly*, vol. 70, no. 22 (June 4, 2012): 1137-1138.

A review of some of the issues contributing to the opposition of the Obama Administration's National Ocean Policy.

Gillis, Christopher T. *Offshore Windpower*. Atglen, PA: Schiffer Pub., 2011.

A history and overview of the development of offshore wind power; includes a chapter on efforts and projects in North America.

Glackin, Mary, et al. "Exploring New Technology Horizons." *Solutions Journal*, vol. 2, no. 1 (January/February, 2011): 51-52.

Highlights the use of autonomous underwater vehicles (AUVs) and animal-borne sensors (ABS) in capturing data on temperature, salinity, and other oceanographic data throughout the world's oceans.

Haerens, Margaret, ed. *Offshore Drilling*. Detroit: Greenhaven Press, 2010.

Presents different ideas and opposing views to the questions: Is offshore drilling beneficial for the United States?; What are the consequences of offshore drilling?; What offshore drilling policies should the U.S. government consider?; and What other energy policies should the U.S. government consider?

Hall, Ralph M. "Insufficient Science Behind Obama's Plans to Restrict and Regulate Waters." *Sea Technology*, vol. 53, no. 1 (January, 2012): 37-38.

Argues that the Obama Administration's ocean policy strategy needs more scientific research and that the proposed zoning of the ocean will negatively impact offshore oil and gas, recreational fishing, and coastal communities.

Holdren, John P. "Technology and Science in Service of US Oceans, Coasts and Great Lakes." *Sea Technology*, vol. 53, no. 1 (January, 2012): 10-12.

Outlines some of the advancements in science and technology systems that will support the implementation of the National Ocean Policy.

Holland, Geoff and David Pugh, eds. *Troubled Waters: Ocean Science and Governance*. NY: Cambridge University Press, 2010.

This book focuses on the cooperation needed between ocean scientists and policy makers to ensure good ocean governance and stewardship. Chapters include overviews of Ocean Science, Histories of Marine Organizations, Intergovernmental Partnerships, Regional Partnerships, and the Future of Ocean Science.

Kapetsky, James McDaid, José Aguilar-Manjarrez, and Jeff Jenness. *A Global Assessment of Offshore Mariculture Potential from a Spatial Perspective*. Rome: Food and Agriculture Organization of the United Nations, 2013. (FAO fisheries and aquaculture technical paper, vol. 549)

Available online at: [<http://www.fao.org/docrep/017/i3100e/i3100e00.htm>].

"This publication provides, for the first time, measures of the status and potential for offshore

mariculture development from a spatial perspective that are comprehensive of all maritime nations and comparable among them.”

Kempener, Ruud and Frank Neumann. *Ocean Thermal Energy Conversion: Technology Brief*. Abu Dhabi, United Arab Emirates: IRENA (International Renewable Energy Agency), 2014.

(IRENA Ocean Energy Technology Brief, vol. 1)

Available online at: [http://www.irena.org/DocumentDownloads/Publications/Ocean_Thermal_Energy_V4_web.pdf].

An overview of Ocean Thermal Energy Conversion (OTEC) technologies including the process, costs, and barriers to development.

Kempener, Ruud and Frank Neumann. *Tidal Energy: Technology Brief*. Abu Dhabi, United Arab Emirates: IRENA (International Renewable Energy Agency), 2014. (IRENA Ocean Technology Brief, vol. 3)

Available online at:

[http://www.irena.org/DocumentDownloads/Publications/Tidal_Energy_V4_WEB.pdf].

An overview of tidal renewable energy resources including the process, costs, and barriers to development.

Kempener, Ruud and Frank Neumann. *Wave Energy: Technology Brief*. Abu Dhabi, United Arab Emirates: IRENA (International Renewable Energy Agency), 2014. (IRENA Ocean Technology Brief, vol. 4)

Available online at: [http://www.irena.org/DocumentDownloads/Publications/Wave-Energy_V4_web.pdf].

An overview of wave energy technology including the process, costs, and barriers to development.

Kirkland, Kyle. *Marine Sciences: Notable Research and Discoveries*. NY: Facts on File, 2010.

A history of the exploration of the world’s oceans and an overview of current research and future applications.

Lewis, Anthony et al. “Ocean Energy.” Chap. 6, IN *IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation*, Edenhofer, O., R. et al eds. Cambridge; NY: Cambridge University Press, 2011, pp 497-533.

Available online at: [http://www.ipcc.ch/pdf/special-reports/srren/SRREN_Full_Report.pdf].

This chapter contains an overview of the potential forms of ocean renewable energy and details the technology, applications, industry development, environmental and societal impacts, and costs of each type.

Mofor, Linus, Jarett Goldsmith, and Fliss Jones. *Ocean Energy: Technology Readiness, Patents, Deployment Status and Outlook*. Abu Dhabi, United Arab Emirates: IRENA (International Renewable Energy Agency), 2014.

Available online at: [http://www.irena.org/DocumentDownloads/Publications/IRENA_Ocean_Energy_report_2014.pdf].

Reviews the different types of renewable ocean energy, discusses renewable energy technologies

and barriers to deployment, and makes recommendations for policy priorities. Also includes a list of some recent patents related to renewable ocean energy.

Ocean Energy: Review of Supporting Policies. Lisbon, Portugal: Ocean Energy Systems, 2014. Available online at: [http://www.ocean-energy-systems.org/news/new_report_on_policies_published_by_the_oes/].

This report focuses on the diverse ocean energy policies of 21 countries. Policy issues discussed include funding for research and development, testing facilities, market incentives, national policies, and regulatory issues.

Ocean Literacy: The Essential Principles and Fundamental Concepts of Ocean Sciences for Learners of all Ages. Version 2: March 2013 ed. Virginia: College of Exploration, Ocean Literacy Network, 2013.

Available online at: [www.coexploration.org/oceanliteracy/documents/OceanLitChart.pdf].

Presents seven essential principles of ocean sciences to educate members of the public on the ocean's influence on humans and humans' influence on the ocean.

Offshore Renewable Energy: Accelerating the Deployment of Offshore Wind, Tidal, and Wave Technologies / IEA-RETD. Abingdon, Oxon; NY: Earthscan, 2012.

This book reviews the sources of marine renewable energy, and covers the technologies, policies, economics, and costs of offshore renewable energy, as well as the technical and environmental barriers and challenges that are faced by renewable energy projects. It also includes guidelines and recommendations for the development of offshore energy projects and renewable energy industry profiles for 18 countries.

Portman, Michelle E. "Marine Renewable Energy Policy: Some US and International Perspectives Compared." *Oceanography*, vol. 23, no. 2 (June, 2010): 98-105.

Available online at: [http://www.tos.org/oceanography/archive/23-2_portman.pdf].

An overview of the policy framework for the development of marine renewable energy projects in the United States. Compares the US to the policy frameworks in Germany, Portugal, and the United Kingdom.

Sandifer, Paul A., Juli M. Trtanj, and Tracy K. Collier. "A Perspective on the History and Evolution of an Oceans and Human Health 'Metadiscipline' in the USA." *Microbial Ecology*, vol. 65, no. 4 (May, 2013): 880-888.

Overview of the history of the Oceans and Human Health programs and activities in the Federal government, including research and support from the National Science Foundation, National Institute of Environmental Health Sciences, National Oceanic and Atmospheric Administration, and Congress.

Schrope, Mark. "Journey to the Bottom of the Sea." *Scientific American*, vol. 310, no. 4 (April, 2014): 60-69.

Examines the use of submersible vehicles to explore the deep ocean and discusses some of the possible questions that deep sea exploration could answer.

“Science and Technology: The Life in an Ocean Wave; Microbiology.” *The Economist*, vol. 366, no. 8307 (Jan 18, 2003): 78-80.

This article discusses recent discoveries in the role that bacteria play in ocean life, as well as how microbes regulate the interaction of air and oceans.

“Science and Technology: The Other Carbon-Dioxide Problem; Ocean Acidification.” *The Economist*, vol. 396, no. 8689 (Jul 3, 2010): 76-77.

This article explores the concerns, research, and possible consequences of ocean acidification.

“Scientific Mission Will Explore One of the Deepest Ocean Trenches.” *Ocean News & Technology*, vol. 20, no. 5 (May 2014): 27.

Discusses plans by an international team of researchers to take the Nereus, the world’s only full-ocean depth, hybrid remotely operated vehicle, to the Kermadec Trench. This project aims to be the first systematic study of life in ocean trenches.

Snelgrove, Paul V. R. *Discoveries of the Census of Marine Life: Making Ocean Life Count*. Cambridge; NY: Cambridge University Press, 2010.

Highlights some of the most important discoveries of the Census of Marine Life and takes a look at what the future of the ocean might be.

United Nations. Division for Ocean Affairs and the Law of the Sea. *Marine Scientific Research: A Revised Guide to the Implementation of the Relevant Provisions of the United Nations Convention on the Law of the Sea*. Rev ed. NY: United Nations, 2010.

Available online at: [http://www.un.org/Depts/los/doalos_publications/publicationtexts/msr_guide%202010_final.pdf].

A guide to the provisions of the United Nations Convention on the Law of the Sea that pertain to scientific marine research. Includes a legislative history, defines marine scientific research under the Convention, and covers topics such as scientific research installations, settlement of disputes, and protection of the marine environment.

Vallis, Geoffrey K. *Climate and the Oceans*. Princeton: Princeton University Press, 2012.

This book is an introduction to the oceans’ influence on Earth’s climate system. Chapters include a basic overview on Earth’s climate, a description of the ocean, the ocean’s role in climate, and global warming and the ocean.

“Water Energy.” Chap. 7, IN *Alternative Energy*, edited by Lerner, K. Lee, Brenda Wilmoth Lerner and Kathleen J. Edgar. 2nd ed. Vol. 3. Detroit: UXL/Gale, Cengage Learning, 2012, pp 303-352.

An introduction to water energy as a renewable source of energy. The chapter contains a historical overview, information on current and future technology, and a discussion of the benefits, drawbacks, and impacts of water energy.

Social Issues

“The Age of Aquarius; Deep-Sea Exploration.” *The Economist*, vol. 402, no. 8778 (Mar 31, 2012): 90.

Two ocean exploration trips of recent interest: James Cameron became the third person to voyage to the Challenger Deep in the Mariana Trench. Another mission, by the French oceanography institute, Ifremer, brought live specimen samples to the surface in a special chamber called PERISCOP.

“Cities on the Ocean.” *The Economist*, vol. 401, no. 8762 (Dec 3, 2011): S.14-S.16.

Seasteading, or building inhabitable colonies on the ocean, provides an opportunity for those who want to build a new society. Seasteading allows participants to found colonies apart from existing governments, but poses legal, financial, and technical challenges.

Nestor, James. *Deep: Freediving, Renegade Science, and What the Ocean Tells Us about Ourselves*. NY: Houghton Mifflin Harcourt Publishing, 2014.

The author explores the practice of Freediving, in which athletes dive without special equipment to depths of 300 feet (or more) below the ocean’s surface. Freediving is both an extreme sport and a research practice, contributing to our knowledge of the ocean and the human body.

Schrope, Mark. “End of an Age for Aquarius.” *Nature*, vol. 487, no. 7408 (Jul 26, 2012): 416-417.

This article discusses the history of Aquarius, an underwater habitat and research laboratory of the United States National Oceanic and Atmospheric Administration. Due to budget constraints, Aquarius has undergone changes in operatorship and uncertainty about continuity of research functions.

“20,000 Colleagues Under the Sea; Exploring the Oceans.” *The Economist*, vol. 403, no. 8788 (Jun 9, 2012): 84-85.

Discusses the how sea gliders, small unmanned submarines, open up new opportunities for sea exploration. Since sea gliders require a very small amount of power, they can stay out in the ocean for prolonged periods of time.

U.S. Government Publications

Economic Issues

National Oceanic and Atmospheric Administration (NOAA). *The NOAA Report on the Ocean and Great Lakes Economy of the United States*. 2009. Prepared by Booz Allen Hamilton. Available online at: [<http://www.csc.noaa.gov/digitalcoast/publications/econreport>].

“The *NOAA Report on the Ocean and Great Lakes Economy of the United States* examines the critically important economic contributions of the oceans and Great Lakes.” Included are a variety of infographics, or visual representations of the data, at the national, regional, and state levels.

U.S. Senate. Committee on Commerce, Science and Transportation. Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard. *The Blue Economy: The Role of the Oceans in Our Nation's Economic Future*. 111th Congress, 1st Session. (S. hrg.111-46) Washington, DC: For sale by the Superintendent of Documents, U.S. Government Printing Office, 2009. Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-111shrg50769/html/CHRG-111shrg50769.htm>].

The hearing highlights “The Blue Economy, the jobs and economic opportunities that emerge from our oceans, Great Lakes, and coastal resources, as one of the main tools to rebuilding the U.S. economy. The ocean and coastal economies of the U.S. provide over 50 million jobs for Americans and contribute nearly 60 percent of our GDP.”

Environmental Issues

Strategic Advice on Designing and Implementing Coastal and Marine Spatial Plans: Report to the NOAA Science Advisory Board from the Ecosystem Science and Management Working Group. Silver Spring, MD: U.S. Department of Commerce. National Oceanic and Atmospheric Administration, 2011.

Available online at:

[http://www.sab.noaa.gov/Meetings/2011/may/ESMWG_CMSP_Report_Text_2May11.pdf].

A study of coastal and marine spatial plans and recommendations for NOAA’s implementation of an ecosystem-based management approach to coastal and marine spatial planning.

United States. Environmental Protection Agency. "Oceans." IN *Climate Change Indicators in the United States, 2014*. 3rd ed. Washington, DC: U.S. Environmental Protection Agency, 2014, pp 44-55.

Available online at [<http://www.epa.gov/climatechange/pdfs/climateindicators-full-2014.pdf>]

EPA's Climate Change Indicators is a report published to help readers “understand observed long-term trends related to the causes and effects of climate change, the significance of these changes, and their possible consequences for people, the environment, and society.” Some of the indicators discussed in the section on oceans include sea surface temperature, ocean heat, sea level, and ocean acidity.

Political Issues

Alaska. Office of the Lieutenant Governor. *Arctic Frontiers Conference: Geopolitics and Marine Production in a Changing Arctic*. Anchorage, AK: 2013.

Available at: [<http://ltgov.alaska.gov/treadwell/press-room/full-press-release.html?pr=169>].

A paper presented by Lt. Governor Mead Treadwell at the conference held in Tromsø, Norway.

National Ocean Council. *Federal Oceanographic Fleet Status Report*. Washington, DC: National Ocean Council, 2013.

Available at:

[http://www.whitehouse.gov/sites/default/files/federal_oceanographic_fleet_status_report.pdf].

This report updates the 2007 inventory of the Nation's fleet of oceanographic-survey and research vessels.

National Science and Technology Council (U.S.). Subcommittee on Ocean Science and Technology. *Science for an Ocean Nation: Update of the Ocean Research Priorities Plan*. Washington: Executive Office of the President of the United States, Office of Science and Technology Policy, 2013.

Available online at:

[http://www.whitehouse.gov/sites/default/files/microsites/ostp/ocean_research_plan_2013.pdf].

“Structured around six societal themes, this report recommends research priorities designed to advance our understanding of critical ocean processes and phenomena that are relevant to human health, economic well-being, environmental sustainability, adaptation to climate and other environmental change, and national and homeland security. The report also provides updates on research progress in a number of these areas.”

State Ocean Management Plans and Policies. Synthesis Report. Columbia, SC: Dept. of Health and Environmental Control, Office of Ocean and Coastal Resource Management, 2006.

Available online at:

[https://www.scdhec.gov/HomeAndEnvironment/Docs/Ocean_Mgt_Plans_Policies.pdf].

This report includes summaries of ocean management initiatives in CA, FL, OR, MA, NC, and WA including regional planning efforts in the Gulf of Maine and the Gulf of Mexico. Lessons learned are presented along with potential obstacles and challenges in ocean management planning.

Science and Technology Issues

Beaudry-Losique et al. *A National Offshore Wind Strategy: Creating an Offshore Wind Energy Industry in the United States*. Washington: U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, Wind & Water, Power Program; U.S. Department of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, 2011.

Available online at:

[http://www1.eere.energy.gov/wind/pdfs/national_offshore_wind_strategy.pdf].

This report presents a rationale for the development of a U.S. national offshore wind energy program, barriers and challenges to offshore wind energy development, and some of the strategies that the DOE will use to overcome some of these challenges.

IOOS Integrated Ocean Observing System: U.S. IOOS Summit Report: A New Decade for the Integrated Ocean Observing System: November 13-16 2012, Herndon, Virginia. Washington: Interagency Ocean Observation Committee, 2013.

Available online at:

[http://www.ioos.noaa.gov/about/governance/summit2012/usioos_summit_report.pdf].

The IOOS summit was held to assess the progress of the Integrated Ocean Observing System and to develop plans for the improvement of the IOOS and to make recommendations for the future.

Lang, Michael A. et al., eds. 2013. *Research and Discoveries: The Revolution of Science through Scuba*. Smithsonian Contributions to the Marine Sciences Washington, DC: Smithsonian

Institution Scholarly Press.

Papers of the “Research and Discoveries: The Revolution of Science through Scuba” symposium held in May 2010 in Washington, DC. The symposium, convened by the Smithsonian Institution, the National Science Foundation, and the Ocean Studies Board of the National Research Council, presented findings on the advances and scientific contributions of research using self-contained underwater breathing apparatus (scuba).

Ling, Hao, et al. *Assessment of Offshore Wind Farm Effects on Sea Surface, Subsurface and Airborne Electronic Systems*. Washington: U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, Office of Wind and Hydropower Technologies; University of Texas, Austin, TX; Science Applications International Corporation, Billerica, MA, 2013.

Available online at:

[\[http://energy.gov/sites/prod/files/2013/12/f5/assessment_offshore_wind_effects_on_electronic_systems.pdf\]](http://energy.gov/sites/prod/files/2013/12/f5/assessment_offshore_wind_effects_on_electronic_systems.pdf).

This report is an assessment of the potential for offshore wind farms to interfere with electronic and acoustical equipment in the marine environment, including surveillance equipment, navigational systems, and communications.

Musial, Walter and Bonnie Ram. *Large-Scale Offshore Wind Power in the United States: Assessment of Opportunities and Barriers*. Golden, CO: National Renewable Energy Laboratory, 2012.

Available online at: [\[http://www.nrel.gov/docs/fy10osti/40745.pdf\]](http://www.nrel.gov/docs/fy10osti/40745.pdf).

“This report provides a broad understanding of today’s wind industry and the offshore resource, as well as the associated technology challenges, economics, permitting procedures, and potential risks and benefits. An appreciation for all sides of these issues will help to build an informed national dialog and shape effective national policies.”

NOAA Ocean Acidification Steering Committee. *NOAA Ocean and Great Lakes Acidification Research Plan / Richard A. Feely, et al.* Edited by Adrienne J. Sutton. Silver Spring, MD: U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, 2010. (Contribution No. 3500 from NOAA/Pacific Marine Environmental Laboratory)

Available online at: [\[www.pmel.noaa.gov/co2/files/feel3500_without_budget_rfs.pdf\]](http://www.pmel.noaa.gov/co2/files/feel3500_without_budget_rfs.pdf).

NOAA's research plan is organized by six regions of the United States and each region's research strategy is divided into an overview of that region's ocean acidification and six themes:

Monitoring Ocean Acidification, Organism Response to Ocean Acidification, Biogeochemical and Ecological Models, Human Dimensions, Synthesis of Data and Information Products, and Engagement Strategy.

National Research Council. Ocean Studies Board. *Oceanography in 2025: Proceedings of a Workshop*. Washington, DC: The National Academies Press, 2009.

Available online at: [\[http://www.nap.edu/catalog.php?record_id=12627\]](http://www.nap.edu/catalog.php?record_id=12627).

“The goal of the workshop was to bring together scientists, engineers, and technologists to explore future directions in oceanography, with an emphasis on physical processes. The focus centered on research and technology needs, trends, and barriers that may impact the field of oceanography over the next 16 years.”

U.S. Integrated Ocean Observing System (U.S. IOOS) 2013 Report to Congress. Silver Spring, MD: U.S. IOOS, 2013.

Available online at:

[http://www.ioos.noaa.gov/about/governance/ioos_report_congress2013.pdf].

This biennial report to Congress “provides information on the impact of U.S. IOOS activities and the current capabilities of ocean and coastal observations, including specific platforms; updates the status of the Data Management and Communications subsystem implementation; and describes the successful implementation of ICOOS-Act-mandated governance activities, such as the formation of the U.S. IOOS System Advisory Committee and the development of an Independent Cost Estimate.”

Social Issues

Aquarium of the Pacific and U.S. National Oceanic and Atmospheric Administration. *The Report of Ocean Exploration 2020: A National Forum: July 19-21, 2013*. Long Beach, CA: Aquarium of the Pacific, Aquatic Forum, 2013.

Available online at: [<http://www.aquariumofpacific.org/downloads/oe2020report.pdf>].

“The report details priorities for a national exploration program; expedition partnerships linking public agencies, private sector organizations, and academic institutions; exploration platforms, including ships, submersibles, and other assets; technology development; citizen science efforts; data sharing; and public engagement. The forum’s sponsoring partners included NOAA, the Aquarium of the Pacific, the Global Foundation for Ocean Exploration, the Schmidt Ocean Institute, the Richard Lounsbery Foundation, Google, Inc., and Felix Williams and Susan Slavik Williams.”

National Research Council (U.S.). Committee on an Ocean Infrastructure Strategy for U.S. Ocean Research in 2030. *Critical Infrastructure for Ocean Research and Societal Needs in 2030 / Committee on an Ocean Infrastructure Strategy for U.S. Ocean Research in 2030, Ocean Studies Board, Division on Earth and Life Studies, National Research Council of the National Academies*. Washington, DC: National Academies Press, 2011.

Available online at: [http://www.nap.edu/catalog.php?record_id=13081].

Report that addresses infrastructure planning issues for the United States’ future ocean research and makes recommendations to ensure that the United States will have the capacity to benefit from knowledge and innovations in oceanographic research in 2030.

Congressional Hearings

U.S. Congress. House Committee on Energy and Commerce. Subcommittee on Energy and Environment. *Drilling Down on America’s Energy Future: Safety, Security, and Clean Energy: Hearing before the Subcommittee on Energy and Environment of the Committee on Energy and Commerce, House of Representatives*. 111th Congress, 2nd Session, June 15, 2010, Serial No. 111-134. Washington, DC: GPO, 2013.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg77911/pdf/CHRG-111hhrg77911.pdf>].

House of Representatives hearing in the aftermath of the BP Deepwater Horizon Oil Spill with testimony from executives of several oil companies on the testing, safe operation, and risk assessment of deepwater oil well drilling.

U.S. Congress. House Committee on Natural Resources. *The President's New National Ocean Policy: A Plan for Further Restrictions on Ocean, Coastal, and Inland Activities: Oversight Hearing before the Committee on Natural Resources, U.S. House of Representatives*. 112th Congress, 1st Session, Tuesday, October 4, 2011, Serial No. 112-68. Washington, DC: GPO, 2012.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-112hhrg70597/html/CHRG-112hhrg70597.htm>].

One of two House of Representatives oversight hearings held in October 2011 on the Obama Administration's new National Ocean Policy.

U.S. Congress. House Committee on Natural Resources. *NOAA's Steller Sea Lion Science and Fishery Management Restrictions: Does the Science Support the Decisions?: Oversight Field Hearing before the Committee on Natural Resources, U.S. House of Representatives*, 112th Congress, 1st Session, Monday, October 17, 2011, in Seattle, Washington. Serial No.112-72. Washington, DC: GPO, 2012.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-112hhrg70764/pdf/CHRG-112hhrg70764.pdf>].

Witnesses testified on the restrictions placed by NOAA on commercial fishing activities in the Bering Sea and the Gulf of Alaska in an effort to protect the Steller sea lion.

U.S. Congress. House Committee on Natural Resources. *The President's New National Ocean Policy: A Plan for further Restrictions on Ocean, Coastal, and Inland Activities: Oversight Hearing before the Committee on Natural Resources, U.S. House of Representatives*. 112th Congress, 1st Session, Wednesday, October 26, 2011, Serial No. 112-76. Washington, DC: GPO, 2012.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-112hhrg70954/html/CHRG-112hhrg70954.htm>].

The second of two House of Representatives oversight hearings held in October 2011 on the Obama Administration's new National Ocean Policy.

U.S. Congress. House Committee on Science. Subcommittee on Environment, Technology, and Standards. *Undersea Research and Ocean Exploration: H.R. 3835, the National Ocean Exploration Program Act of 2005 and the Undersea Research Program Act of 2005: Hearing Before the Subcommittee on Environment, Technology, and Standards of the Committee on Science, House of Representatives*. 109th Congress, 2nd Session, July 27, 2006. Serial No.109-58. Washington, DC: GPO, 2011.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-109hhrg28758/pdf/CHRG-109hhrg28758.pdf>].

A House hearing "to examine the National Oceanic and Atmospheric Administration's (NOAA) National Undersea Research Program (NURP) and Ocean Exploration (OE) Program and to receive comments on H.R. 3835, the National Ocean Exploration Program Act of 2005 and the

Undersea Research Program Act.” Stated topics include the goals and missions of the NURP and OE programs, and whether it would be appropriate for them to be merged.

U.S. Congress. House Committee on Science and Technology. *Ocean Exploration and Undersea Research. Committee on Science and Technology, Report to Accompany H.R. 1834*. 110th Congress, 1st Session. (H. Rept. 110-311, part 2.) Washington, DC: GPO, 2007. Available online at: [<http://www.gpo.gov/fdsys/pkg/CRPT-110hrpt311/pdf/CRPT-110hrpt311-pt2.pdf>].

This House report states that the purpose of the referenced House bill “is to authorize the national ocean exploration program and the national undersea research program within the National Oceanic and Atmospheric Administration (NOAA)... [T]his bill authorizes a coordinated national ocean exploration and undersea research program that promotes collaboration with existing programs of the Administration.” Pages 5-7 discuss “background and need for legislation.”

U.S. Congress. House Committee on Science and Technology. Subcommittee on Energy and Environment. *Deepwater Drilling Technology, Research, and Development: Hearing before the Subcommittee on Energy and Environment, Committee on Science and Technology, House of Representatives* (2007). 111th Congress, 2nd Session, June 23, 2010, Serial No. 111-101. Washington, DC: GPO, 2010.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg57179/pdf/CHRG-111hhrg57179.pdf>].

“The purpose of this hearing is to explore the technologies, standards, and practices for prevention and mitigation of oil spillage during deepwater oil and natural gas drilling operations; the role of government-sponsored technology development programs in advancing these technologies; and, in the wake of the Deepwater Horizon tragedy, how firms will assess risk as it relates to incident prevention and mitigation.”

U.S. Congress. House Committee on Science, Space, and Technology. Subcommittee on Energy and Environment. *Offshore Drilling Safety and Response Technologies: Hearing before the Subcommittee on Energy and Environment, Committee on Science, Space, and Technology, House of Representatives*. 112th Congress, 1st Session, Wednesday, April 6, 2011, Serial No. 112-12. Washington, DC: GPO, 2011.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-112hhrg65490/pdf/CHRG-112hhrg65490.pdf>].

A House of Representatives “hearing to examine industry and Federal efforts to identify and address safety and response technology challenges since last year’s *Deepwater Horizon* oil spill, and how Federal programs in these areas can best be structured and prioritized.”

U.S. Congress. House Committee on Transportation and Infrastructure. Subcommittee on Coast Guard and Maritime Transportation. *Assuring the Safety of Domestic Energy Production: Lessons Learned from the Deepwater Horizon Oil Spill: Hearing before the Subcommittee on Coast Guard and Maritime Transportation of the Committee on Transportation and Infrastructure, House of Representatives*. 112th Congress, 1st Session, November 2, 2011, Serial No. 112-58. Washington, DC: GPO, 2012.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-112hhrg71098/pdf/CHRG-112hhrg71098.pdf>].

This hearing was held “to examine the lessons learned in the wake of the BP Deepwater Horizon oil spill, review the latest investigations into the causes of the spill and the Coast Guard response to it, hear the recommendations of those involved in these investigations, and find out what actions the Service has taken or will take in response to those recommendations.”

U.S. Congress. Senate Committee on Commerce, Science, and Transportation. Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard. *The Environmental and Economic Impacts of Ocean Acidification: Hearing before the Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard of the Committee on Commerce, Science, and Transportation, United States Senate*, 111th Congress, 2nd Session, April 22, 2010. (S. hrg. 111-962) Washington, DC:GPO, 2011. Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-111shrg66170/pdf/CHRG-111shrg66170.pdf>].

A Senate hearing addressing the impact of increased carbon dioxide on the chemistry of the oceans.

U.S. Congress. Senate Committee on Commerce, Science, and Transportation. Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard. *Developments and Opportunities in U.S. Fisheries Management: Hearing before the Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard of the Committee on Commerce, Science, and Transportation, United States Senate*, 113th Congress, 1st Session, March 19, 2013. (S. hrg. 113-99) Washington, DC: GPO, 2013.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-113shrg85319/html/CHRG-113shrg85319.htm>].

This Senate “hearing will provide an overview of interjurisdictional marine fisheries management examining the extent to which states and the Federal Government are effectively coordinating the conservation and management of shared fishery resources.”

U.S. Congress. Senate Committee on Commerce, Science, and Transportation, Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard. *Looking to the Future: Lessons in Prevention, Response, and Restoration from the Gulf Oil Spill: Hearing before the Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard of the Committee on Commerce, Science, and Transportation, United States Senate*. 112th Congress, 1st Session, July 20, 2011. (S. hrg. 112-249) Washington, DC: GPO, 2012.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-112shrg72820/html/CHRG-112shrg72820.htm>].

In the wake of the BP Deepwater Horizon Oil Spill, this hearing focuses on the changes necessary to prevent future ocean oil spills, the nation's response to oils spills, and the restoration of the marine ecosystem.

U.S. Congress. Senate Committee on Commerce, Science, and Transportation, Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard. *Deep Sea Challenge: Innovative Partnerships in Ocean Observation: Hearing before the Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard of the Committee on Commerce, Science, and Transportation, United States Senate*. 113th Congress, 1st Session, June 11, 2013. (S. hrg. 113-268) Washington, DC: GPO, 2014.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-113shrg87852/html/CHRG-113shrg87852.htm>].

This Senate hearing was on the topic of collaborating and fostering partnerships between the Federal government, academic institutions, and private organizations in an effort to increase and support ocean research and development.

U.S. Congress. Senate Committee on Energy and Natural Resources. *Hydropower: Hearing before the Committee on Energy and Natural Resources, United States Senate, 112th, 1st Session, to Receive Testimony on S. 629, to Improve Hydropower, and for Other Purposes; S. 630, to Promote Marine and Hydrokinetic Renewable Energy Research and Development, and for Other Purposes; and Title I, Subtitle D of the American Clean Energy Leadership Act of 2009 (S. 1462 from the 111th Congress), March 31, 2011.* 112th Congress, 1st Session. (S. hrg. 112-26) Washington, DC: GPO, 2011.

Available online at [<http://www.gpo.gov/fdsys/pkg/CHRG-112shrg66811/html/CHRG-112shrg66811.htm>].

A Senate hearing to hear testimony “from administration and other witnesses about the potential we have to produce more hydropower in this country through improved efficiency at existing hydropower facilities and adding hydropower capabilities to existing structures.”

U.S. Congress. Senate Committee on Energy and Natural Resources. *Oil and Gas Development: Hearing before the Committee on Energy and Natural Resources, United States Senate.* 112th Congress, 1st Session, on S. 516, S. 843, S. 916, S. 917, May 17, 2011. (S. hrg. 112-51) Washington, DC: GPO, 2011.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-112shrg67632/pdf/CHRG-112shrg67632.pdf>].

A Senate hearing to discuss several acts concerning domestic oil and gas production: the Oil and Gas Facilitation Act, the Outer Continental Shelf Reform Act, the Lease Act, and the Outer Continental Shelf Permit Processing Coordination Act.

U.S. Congress. Senate Committee on Energy and Natural Resources. *Sea Level Rise: Hearing before the Committee on Energy and Natural Resources to Receive Testimony on the Impacts of Sea Level Rise on Domestic Energy and Water Infrastructure, Apr. 19, 2012.* United States Senate, 112th Congress, 2nd Session. (S. hrg. 112-622.) Washington, DC, GPO, 2012.

Available online at: [<http://www.gpo.gov/fdsys/pkg/CHRG-112shrg76897/pdf/CHRG-112shrg76897.pdf>].

Hearing on the impacts of sea level rise on domestic energy and water infrastructure. Chairman’s opening statement begins: “Over the past century a tremendous amount of high value infrastructure has been built along the coastlines of the United States. This infrastructure serves the needs of coastal communities and is the foundation for developing much of our abundant coastal energy resource. Much of that infrastructure has been built in low lying areas that were already prone to flooding from extreme weather that’s become even more at risk as sea levels have risen.”

Federally-Funded Research and Development

Consortium for Ocean Leadership. “Science Funding.” 2014.

Available online at: [<http://oceanleadership.org/ocean-policy-legislation/science-funding/>].

Collection of appropriations requests, testimonies, and letters to Congress from the Consortium for Ocean Leadership, a Washington, DC-based nonprofit organization representing public and private ocean research and education institutions and industry members.

Dokoupil, Tony. “Is Manned Exploration of the Ocean Over?” *Newsweek Global*, vol. 161, no. 2 (January 11, 2013): 1.

Discusses using remotely controlled submarines and rovers to explore the ocean versus human piloted exploration and the funding and government support for each approach.

National Oceanic and Atmospheric Administration (NOAA). Office of Ocean Exploration and Research. “Funding Opportunities.” Silver Spring, MD: U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, 2014.

Available online at: [<http://oceanexplorer.noaa.gov/about/what-we-do/funding-opportunities.html>].

Funding opportunities for research and exploration provided by the NOAA Office of Ocean Exploration and Research (OER), the “only federal organization dedicated to exploring the unknown reaches of our ocean.” Includes descriptions of funding opportunities, and a link to past and present OER-funded activities.

National Research Council (U.S.). Committee on the Review of the Scientific Accomplishments and Assessment of the Potential for Future Transformative Discoveries with U.S.-Supported Scientific Ocean Drilling. *Scientific Ocean Drilling: Accomplishments and Challenges*. Ocean Studies Board, Division on Earth and Life Studies, National Research Council of the National Academies. Washington, DC: National Academies Press, 2011.

Available online at: [http://www.nap.edu/catalog.php?record_id=13232].

The report reviews the science plan for a proposed 2013-2023 scientific ocean drilling program. “Through direct exploration of the seafloor, U.S.-supported scientific ocean drilling programs have significantly contributed to a broad range of scientific accomplishments in Earth science disciplines, shaping understanding of Earth systems and enabling new fields of inquiry. Scientific accomplishments of U.S.-supported scientific ocean drilling over the past four decades are reviewed. The book evaluates how the programs (Deep Sea Drilling Project [DSDP], 1968-1983, Ocean Drilling Program [ODP], 1984-2003, and Integrated Ocean Drilling Program [IODP], 2003-2013) have shaped understanding of Earth systems and Earth history and assessed the role of scientific ocean drilling in enabling new fields of inquiry. This book also assesses the potential for transformative discoveries for the next proposed phase of scientific ocean drilling.”

National Science Foundation (NSF). “Division of Ocean Sciences (OCE).” 2014.

Available online at: [<http://www.nsf.gov/div/index.jsp?div=OCE>].

Collection of Ocean Sciences programs and funding opportunities through the Directorate for Geosciences (GEO) of the National Science Foundation. Listed program links, such as (OCE-PRF) and (OCE-RIG), include a list of projects of awards recently granted by the program, with abstracts.

Privately-Funded Research and Development

The Marine Science and Technology Foundation. “The Marine Science and Technology Foundation.” 2013.

Available online at: [<http://mstfoundation.org/>].

Self-described “non-profit, private operating foundation dedicated to advancing technology in oceanographic research.”

The Ocean Exploration Trust. “The Ocean Exploration Trust.” 2013.

Available online at: [<http://www.oceanexplorationtrust.org/>].

Non-profit organization founded in 2008 “to engage in pure ocean exploration.” Partners with and is sponsored by academic, public, and private institutions.

Schmidt Ocean Institute. “Schmidt Ocean Institute.” 2013.

Available online at: [<http://www.schmidtocean.org/story/show/38>].

Non-profit foundation established in March 2009 “to advance oceanographic research, discovery, and knowledge, and catalyze sharing of information about the oceans.”

Wendy Schmidt Ocean Health XPRIZE. “ABOUT XPRIZE.” 2014.

Available online at: [<http://oceanhealth.xprize.org/about>].

Incentivized prize competition “to build the innovative technology necessary to develop accurate, affordable, and robust ocean pH sensors that will advance our understanding of ocean acidification.”

Woods Hole Oceanographic Institution. “Funding Opportunities.” 2014.

Available online at: [<http://www.whoi.edu/main/oi/funding-opportunities>].

Self-described as “the world's largest private, non-profit oceanographic research institution.”

Provides funding to conduct “high-risk, high-reward science” with supplemental funding from federal agencies and private foundations.

SUBJECT BIBLIOGRAPHY

**This section of the bibliography was compiled by the U.S. Government Printing Office
Library Services and Content Management**

**These resources are available for purchase at the GPO bookstore at
<http://bookstore.gpo.gov/>**

“Resolved: The United States Federal Government Should Substantially Increase Its
Non-Military Exploration and/or Development of the Earth’s Oceans”

**Alaska's Sovereignty in Peril: The National Ocean Policy's Goal to Federalize Alaska,
Oversight Field Hearing, April 3, 2012**

Publisher: Subcommittee on Fisheries, Wildlife, Oceans and Insular Affairs of the Committee on
Natural Resources of the House of Representatives

Year/Pages: 2013: 56 p.

Price: \$7.00

**Assessing U.S. Preparedness and Response in the Arctic: The Opportunities and
Challenges of Increased Marine Activity, Field Hearing, March 17, 2013**

Publisher: Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard of the Committee
on Commerce, Science, and Transportation of the Senate

Year/Pages: 2013: 77 p.

Price: \$8.00

**Data Collection Issues in Relation to the Reauthorization of the Magnuson-Stevens Fishery
Conservation and Management Act, Oversight Hearing, May 21, 2013**

Publisher: Subcommittee on Fisheries, Wildlife, Oceans and Insular Affairs of the Committee on
Natural Resources of the House of Representatives

Year/Pages: 2013: 106 p.

Price: \$11.00

Deep Sea Challenge: Innovative Partnerships in Ocean Observation, Hearing, June 11, 2013

Publisher: Committee on Commerce, Science, and Transportation of the Senate

Year/Pages: 2014: 67 p.

Price: \$7.00

Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling, Report to the President, January 2011

Publisher: National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

Year/Pages: 2011: 392 p.

Price: \$39.00

Deepwater Drilling Technology, Research, and Development, Hearing, June 23, 2010

Publisher: Subcommittee on Energy and Environment of the Committee on Science, Space, and Technology of the House of Representatives

Year/Pages: 2010: 64 p.

Price: \$7.00

Developments and Opportunities in U.S. Fisheries Management, Hearing, March 19, 2013

Publisher: Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard of the Committee on Commerce, Science, and Transportation of the Senate

Year/Pages: 2013: 102 p.

Price: \$10.00

Empty Hooks: The National Ocean Policy Is the Latest Threat to Access for Recreational and Commercial Fishermen, Oversight Hearing, March 22, 2012

Publisher: Subcommittee on Fisheries, Wildlife, Oceans and Insular Affairs of the Committee on Natural Resources of the House

Year/Pages: 2013: 58 p.

Price: \$7.00

Exxon Valdez to Deepwater Horizon: Protecting Victims of Major Oil Spills, Hearing, July 27, 2010

Publisher: Committee on the Judiciary of the House of Representatives

Year/Pages: 2011: 55 p.

Price: \$6.50

Final Report of the President's National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, Oversight Hearing, January 26, 2011

Publisher: Committee on Natural Resources of the House

Year/Pages: 2011: 90 p.

Price: \$10.00

Fisheries Economics of the United States: 2012

Publisher: Commerce Department, National Marine Fisheries Service

Year/Pages: 2014: 181 p.

Price: \$43.00

Fisheries of the United States 2012

Publisher: Commerce Department, National Marine Fisheries Service

Year/Pages: 2013: 138 p.

Price: \$23.00

Fishery Bulletin

Publisher: Commerce Department, National Marine Fisheries Service

Year/Pages Varies.

Price: \$19.00 per issue. Quarterly, \$32.00 a year.

Fishing = Jobs: How Strengthening America's Fisheries Strengthens Our Economy, Oversight Field Hearing, August 25, 2012

Publisher: Committee on Natural Resources of the House of Representatives

Year/Pages: 2013: 70 p.

Price: \$7.00

Fishing Safety: The Policy Implications of Cooperatives and Vessel Improvements, Hearing, July 9, 2008

Publisher: Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard of the Committee on Commerce, Science, and Transportation of the Senate

Year/Pages: 2013: 91 p.

Price: \$10.00

Future of the Marine Mammal Protection Act (MMPA), Hearing, July 16, 2003

Publisher: Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard of the Committee, on Commerce, Science, and Transportation of the Senate

Year/Pages: 2013: 54 p.

Price: \$15.00

Global Overfishing and International Fisheries Management, Hearing, June 12, 2003

Publisher: Committee on Commerce, Science, and Transportation of the Senate

Year/Pages: 2013: 91 p.

Price: \$10.00

Macondo: The Gulf Oil Disaster, Chief Counsel's Report 2011

Publisher: National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

Year/Pages: 2011: 387 p.

Price: \$35.00

Nomination of Dr. Mark E. Schaeffer to be Assistant Secretary for Oceans and Atmosphere for the U.S. Department of Commerce, Hearing, July 24, 2013

Publisher: Committee on Commerce, Science, and Transportation of the Senate

Year/Pages: 2014: 36 p.

Price: \$4.75

Pacific Marine Environmental Laboratory (PMEL) Strategic Plan 2013-2017

Publisher: Commerce Department, National Oceanic and Atmospheric Administration, Office of Oceanic and Atmospheric Research

Year/Pages: 2013: 54 p.

Price: \$11.50

Rising Tides, Rising Temperatures: Global Warming's Impacts on the Oceans, Hearing, April 29, 2008

Publisher: Select Committee on Energy Independence and Global Warming of the House of Representatives

Year/Pages: 2010: 104 p.

Price: \$10.00

Through a Fish's Eye: The Status of Fish Habitats in the United States 2010

Publisher: Commerce Department, National Marine Fisheries Service

Year/Pages: 2011: 68 p.

Price: \$13.00

Understanding Marine Debris: Games & Activities for Kids of All Ages, Marine Debris 101

Publisher: Commerce Department, National Marine Fisheries Service

Year/Pages: 2009: 21 p.

Price: \$5.00

U.S. Coast Guard Budget and Oversight, Hearing, April 18, 2007

Publisher: Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard of the Committee on Commerce, Science, and Transportation of the Senate

Year/Pages: 2013: 108 p.

Price: \$12.00