

Chapter 13: OCEANS

BACKGROUND

- Oceans are as critical to the species on land as they are to the life within them. [Ocean flora and fauna feed 3.5 billion people.](#)
- **[Ocean plants produce half of the world's oxygen – more than all of Earth's forests combined.](#)** Ocean waters are vast storehouses of heat and carbon from the atmosphere.
- Oceans are already under stress from human impacts such as overfishing, pollution and coastal development. **Climate change will exacerbate existing threats** and add complex new stresses.
- **Sea levels are rising**, threatening human communities. One of every 10 people on Earth lives on a river delta, an island or in a low-lying coastal area that faces probable inundation. Rising sea levels are expected to create millions of climate refugees as coastal areas are lost, ecologically important coastal wetlands drown and drinking-water supplies are compromised.
- **Ocean temperatures are increasing**, which is threatening the world's coral reefs and the ocean food chain which includes the plant life that helps store carbon from the atmosphere and produce oxygen.
- **Changing precipitation patterns are likely to produce intense hurricanes** as a result of warmer water temperatures and **heavier rainfall** as a result of increased evaporation, which in turn, through flooding and storm surge, will add to the debris and toxic flow of land-based pollutants into coastal waters.
- **Oceans are becoming less saline and more acidic.** This change in chemistry also threatens life in the ocean. Salinity is decreasing due to the infusion of fresh water from melting glaciers and ice sheets. As greenhouse gas emissions increase and are absorbed by the ocean, carbon (in the form of carbonic acid) is making seawater more acidic. This inhibits the development of calcium compounds that help form coral reefs and the shells of the crustaceans and shellfish that are the basis of the food chain in all ocean habitats.



Photo: NASA Jet Propulsion Laboratory

Precipitation and evaporation patterns over the oceans have changed, as evidenced by increased ocean salinity near the equator and decreased salinity at higher latitudes.

Source: IPCC Fourth Assessment Report, Technical Summary, p. 48

FRAMEWORK FOR FEDERAL POLICY

- The interrelationship between oceans and climate change must be recognized, understood and incorporated into climate change policies. The next president will need to ensure that oceans are an important part of the national climate change policy debate and that solutions for addressing climate change take the role of oceans into account.
- **A major overhaul is needed in how we govern the human activities that affect ocean health.** Two independent commissions on U.S. ocean policy – [the Pew Oceans Commission](#) in 2003 and the [U.S. Commission on Ocean Policy in 2004](#) – have reached the same conclusion and have joined forces as the [Joint Ocean Commission Initiative](#) to continue to sound the alarm about the urgent need for change.

EXECUTIVE ACTIONS

- 1. Re-design ocean governance.** a) By executive order, create a President's Council of Advisors on Ocean Policy to review and rank the recommendations of the Pew and U.S. commissions in the context of emerging climate science and the observed effects of climate change. The council should identify opportunities to improve ocean and coastal governance through recommendations such as [those from the Joint Oceans Commissions Initiative](#).¹ b) Establish a permanent interagency coordinating structure in the White House, supported by an Ocean Policy and chaired by an assistant to the president to oversee implementing national ocean policy, including coordinated and comprehensive management of offshore activities and a framework to help states initiate and coordinate efforts at the regional level.
- 2. Anticipate threats to coastal communities; develop the capacity to plan and adapt.** a) Direct the [Climate Change Science Program](#) to help coastal populations and ecosystems adapt to the effects of climate change by assessing the likely impacts of global warming on coastal communities and ecosystems. Provide this assessment to help the Federal Emergency Management Agency (FEMA) and state and local governments improve planning, adaptation and disaster-prevention programs. b) Direct FEMA to evaluate the potential to relocate vulnerable coastal communities, including the capacity to move threatened coastal infrastructure, prevent the interruption of human services and drinking-water supplies and provide emergency services.
- 3. Strengthen research; create and maintain an ocean warning and monitoring system.** a) Direct the lead ocean agency to improve monitoring and warning systems using satellite systems that measure ocean temperature, waves, winds and sea levels. The department should collaborate with the National Science Foundation to identify gaps in continuing research to quantify the effects of climate change on ocean habitat and ecology. b) Direct the lead ocean agency to assess existing and emerging threats to oceans, as well as their potential ecosystem services in light of emerging science about climate change. The agency should study the economic and food security consequences of acidification, ways to reduce the pH of oceans while not harming them and the potential for ecologically safe harvesting of ocean energy, including offshore wind generation and tidal power. c) Improve mechanisms for early warning of catastrophic weather events. (See related recommendations in the Fresh Water chapter.)
- 4. Develop a national ocean conservation and adaptation strategy.**² Direct the lead ocean agency and other relevant federal agencies to develop a national oceans strategy to reduce ocean pollution, overfishing, coastal development in sensitive areas and damage to marine habitat, so that oceans and coastal areas are better able to adapt to climate change.

5. Significantly enhance our capacity to prevent, monitor, and mitigate oil and other hazardous substance spills.

- a) Direct the Coast Guard to more proactively address, through regulation, the root causes of oil spills, such as organizational and management failures regarding crew training, equipment maintenance, fuel transfers, crew size, crew fatigue and language requirements.
- b) Work to remove preemption of state regulations geared toward oil spill prevention.
- c) Engage with international treaty organizations to aggressively pursue changes to the worldwide vessel fleet needed to better protect our nation's waters.
- d) Embrace state and maritime punitive damages awards against companies that recklessly cause oil spills, either directly or through their employees.
- e) Call for thorough examination and reform to the federal oil spill response process to ensure adequate coordination among federal, state and local agencies; adequate capacity and preparation by the Coast Guard and other entities; clarity of laws and regulations governing oil spill response; and adequate resources to ensure appropriate implementation.

6. Reduce air pollution (including CO₂ emissions) and potential fuel and cargo spills from shipping.

- a) Direct EPA to develop strategies to phase in marine diesel (and other cleaner fuel options), and phase out Bunker C as fuel for shipping and cruise lines in U.S. ports.
- b) Direct EPA to develop recommendations to reduce emissions while ships are at port, including electrification and also better enforcement against bilge cleaning and other discharges.
- c) Direct EPA to establish limits on ship emissions of nitrogen dioxide, sulfur dioxide, and ozone depleting chemicals, bringing the U.S. into compliance with the international shipping treaty [MARPOL Annex VI](#).

7. Reduce plastics in the ocean. Develop a national plan to [phase out the use of plastic shopping bags](#) and encourage reusable bags, as China, Ireland and some U.S. cities and individual corporate campaigns have already done.

8. Reduce pollution from existing and emerging sources, including pharmaceuticals.

- a) Direct EPA (and urge it to coordinate with state agencies) to develop better coordination and funding of federal nonpoint source pollution programs, including alignment with agricultural policies and programs to reduce the significant amount of pollution that comes from agricultural sources.
- b) Direct EPA to continue to address chronic point sources of pollution, including septic systems, sewer overflow, wastewater treatment facilities, industrial and animal feeding operations.
- c) Direct EPA to review incentives to reward good practices and propose improvements as well as improve monitoring to ensure compliance.
- d) Direct the Food and Drug Administration to develop a national program for collection and disposal of unused medicines in ways that reduce environmental and health risks.

9. Restore coastal health. a) Direct the lead ocean agency to recommend an expansion of protections within National Marine Sanctuaries. b) Direct the lead ocean agency to identify potential conservation and withdrawal zones, where development should be prevented or existing development removed to protect and restore wetlands, estuaries and critical habitat. c) Direct federal agencies to protect wetlands, coral reefs, mangroves and sea grass beds that absorb storm surges and carbon emissions.

10. Improve the health of the nation's fisheries.

- a) Direct NOAA, through its Marine Fisheries service to:
- Reduce overfishing by expediting implementation of the [Magnuson Stevens Fishery Management and Conservation Act](#) and supporting adequate funding to carry out its reforms.
 - Work with the fishing industry and fishing communities to reduce by-catch while maintaining healthy fishing-based economies.
 - Increase U.S. commitment to international fisheries conservation, including ending destructive fishing practices and protecting vulnerable and declining species.
 - Support responsible implementation of aquaculture legislation that ensures the environmental, social, and economic health and viability of the industry.
 - Work to discourage the expansion of open ocean aquaculture of luxury carnivores (such as bluefin tuna) that use fish meal made from fish species on which the poor in other nations depend for food (e.g. anchovies in Peru).
 - Consider deferring issuance of offshore aquaculture permits until an adequate study of unintended consequences is complete.
- b) Direct the U.S. Trade Representative to continue U.S. leadership in international trade negotiations through the World Trade Organization to eliminate subsidies provided to foreign fishing fleets.

11. Protect coral reefs. Direct the U.S. Coral Reef Task Force and the U.S. Department of Agriculture to collaborate on steps to eliminate runoff from soils and other land-based sources of ocean pollution. (See related recommendations in the Fresh Water chapter.)

12. Protect threatened and endangered marine species.

- a) Defend the Marine Mammal Protection Act against attempts to weaken it to accommodate commercial and private interests.
- b) Restore and maintain U.S. leadership in regard to the International Whaling Commission moratorium on whaling.
- c) Direct the lead ocean agency to collaborate with other federal agencies to plan for the loss of ocean ecosystems and habitats, while maximizing efforts to prevent extinctions.
- d) Create an Ice-Dependent Species Preservation Team in the lead ocean agency and direct it to work with the U.S. Fish and Wildlife Service to develop a comprehensive conservation strategy for the full range of species threatened by the loss of polar sea ice. Create a similar team to develop a conservation strategy for coral reefs and mangroves, building upon the work of the [Coral Reef Task Force](#).

13. Reduce marine noise pollution. Call for the U.S. Navy to abide by multiple court decisions and limit where and how training exercises using active sonar occur. And, review opportunities to declassify quiet ship technology and research associated market opportunities.

14. Strengthen response capacity to climate change impacts on ocean health.

- a) Create a Climate Change Response Office to support and implement basic and applied research, monitoring and analysis, modeling and forecasting, and ocean observations; and to translate data collected into useful information that can inform management decisions.
- b) Support development and implementation of state and regional strategies to better understand, adapt to and mitigate climate change impacts on oceans and coastal areas.

15. Protect oceans in energy development. Support efforts to design a conflict resolution framework to: a) resolve jurisdictional claims between Minerals Management Service, Federal Energy Regulatory Commission, the National Marine Fisheries Service and other agencies related to siting of alternative energy proposals in oceans and coastal areas, and b) ensure that carbon-based energy facilities are designed and located to minimize immediate effects on the marine ecosystem and calamitous effects in hurricane zones such as the Gulf of Mexico.

16. Participate in the international process to organize an IPCC for Oceans. The U.N. General Assembly is currently conducting an “assessment of assessments” to establish whether existing ocean assessments are adequate. This process is being led by the United Nations Environment Programme (UNEP) and the Intergovernmental Oceanographic Commission (IOC). Work should be concluded in 2009 and it is expected that at that time, the team will recommend the organization of an Intergovernmental Panel on Climate Change specifically focused on Oceans.

LEGISLATIVE ACTIONS

- 17. Work closely with the Senate to approve U.S. participation in the [Law of the Sea Convention](#).** The United States should accede to the United Nations Convention on the Law of the Sea to give us a voice in international negotiations on open access, mineral rights and boundary disputes. The ability to influence international access to ocean resources and the preservation of ocean ecology is becoming particularly critical with nations beginning to vie for oil and gas deposits exposed as ice sheets melt in the Arctic.
- 18.** Create a single cabinet-level lead oceans agency (a Department of the Oceans) to better chart and coordinate federal action on ocean and coastal issues. This “NASA of the oceans” will combine elements of the National Oceanic and Atmospheric Administration (NOAA), the Environmental Protection Agency, the Department of Interior and other agencies. As an initial step, ask Congress to codify NOAA as the lead ocean agency until a Department of Oceans is established and organized.
- 19.** In the president’s first budget, propose doubling core funding for ocean science, research, management and infrastructure.
- 20.** Establish a permanent ocean trust fund to provide a dedicated source of funding to state and federal programs.
- 21.** Work with Congress to adopt a spill assessment and response model akin to our nation’s fire departments, rather than the current, often sluggish, model of industry funded and managed assessment and response.
- 22.** Propose legislation to reduce packaging and related waste, as well as single-use disposable products.
- 23.** Propose comprehensive legislation to reduce the runoff of excess nutrients into water bodies. (See also recommendations in Fresh Water and Agriculture chapters).

- 24.** Work with Congress to improve fisheries management in order to sustain healthy fisheries stocks and sustain a strong U.S. fishing industry.
- 25.** Work with Congress to develop national policies that address declines in vulnerable and declining marine species.
- 26.** Support passage of the [Coral Reef Conservation Act Reauthorization](#).
- 27.** Support the establishment of marine reserves for coral reef habitat protection.
- 28.** Propose sufficient budget to remove ghost gear from all coral reefs in U.S. waters, and ban bottom trawling in areas near tropical or cold-water corals.
- 29.** Support full funding of federal salmon recovery plans under the Endangered Species Act.
- 30.** Support legislation that addresses ocean acidification research, ocean exploration, ocean mapping, oceans and human health; and that implements the Integrated Ocean Observing System.
- 31.** Fund and implement the national [Ocean Research Priorities Plan and Implementation Strategy](#).
- 32.** Propose full funding and implementation of the [2000 Beaches Environmental Assessment and Coastal Health \(BEACH\) Act](#).

¹ For a summary of the recommendations from these commissions and subsequent action by the administration and Congress, see H.F. Upton et al., "Ocean Commissions: Ocean Policy Review and Outlook," Congressional Research Service, report prepared for the 110th Congress, 1st session, February 1, 2007, <http://cnie.org/nle/crsreports/07March/RL33603.pdf>.

² The majority of recommendations under this heading are adapted from "A Coastal and Ocean Policy for the Next Administration," a nonpartisan consensus document produced by The Oceans Foundation.