

Charting the Course for Ocean Science in the United States: Research Priorities for the Next Decade



Margaret Leinen, NSF
Richard Spinrad, NOAA
Dan Walker, OSTP

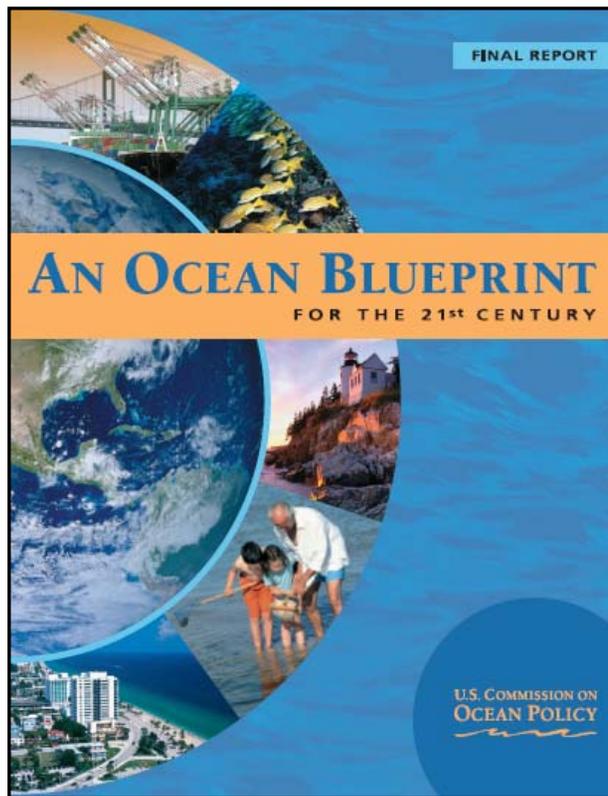
Joint Subcommittee on Ocean Science
and Technology Co-Chairs

Ocean Policy

Oceans Act
2000



USCOP Report
2004

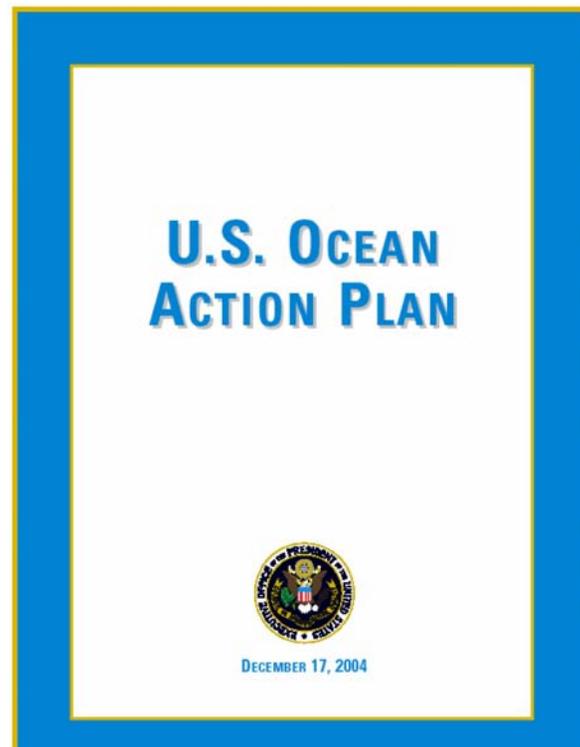


Bush Response
2004



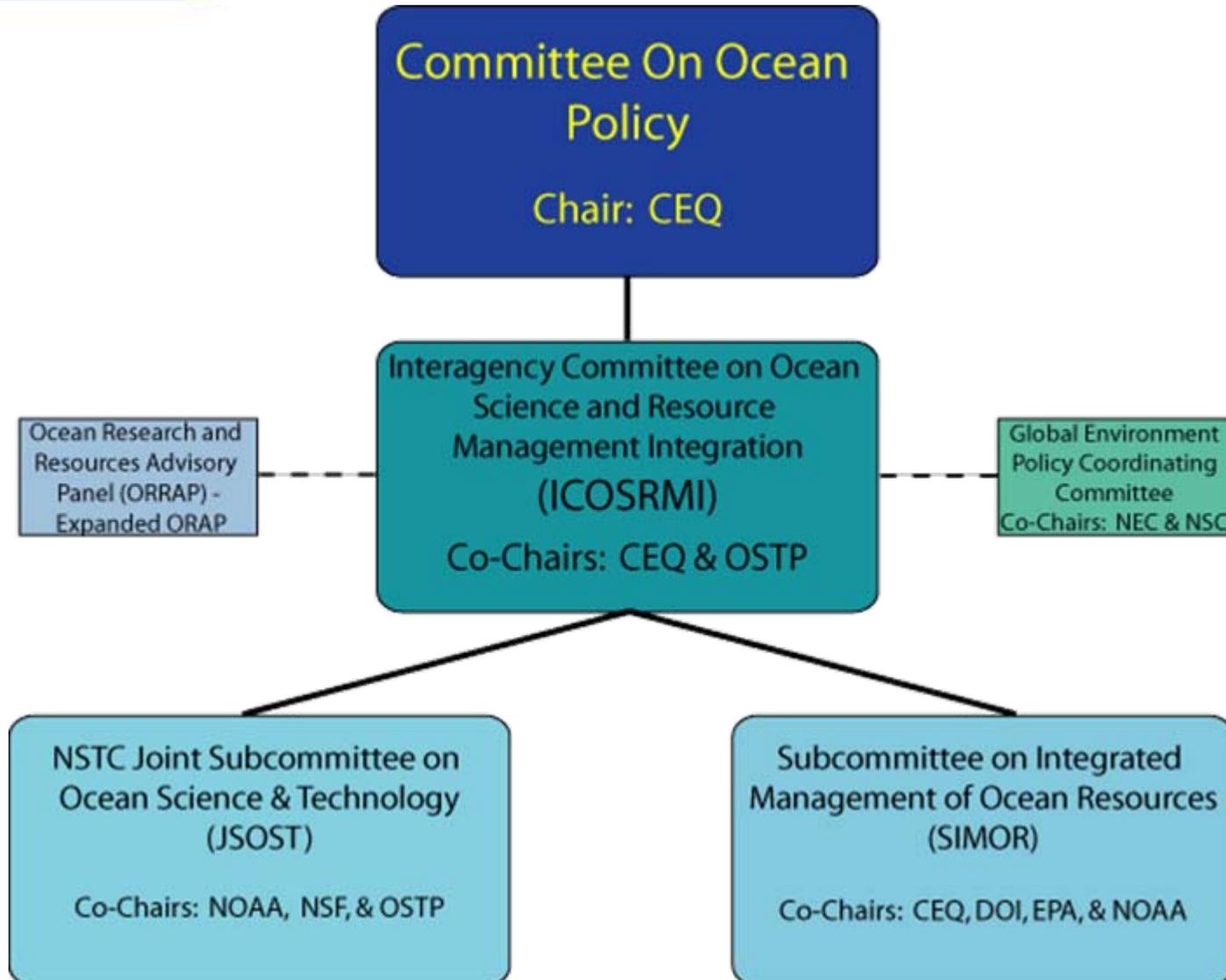
U.S. Ocean Action Plan, 2004

“...the administration supports ocean, coastal, and Great Lakes research including exploration for discovery, hypothesis-driven science, infrastructure and technology development, data and information management, improvements of forecasting and data products, new observations and continuing research observations that have substantial societal benefits...”
(U. S. Ocean Action Plan)



Ocean Action Plan

Governance Structure

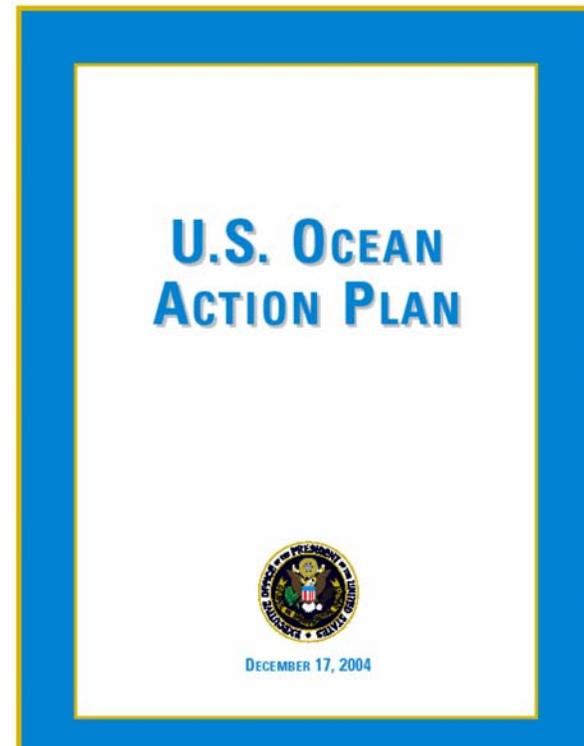




Ocean Research Priorities Plan & Implementation Strategy

“Develop an Ocean Research Priorities Plan and Implementation Strategy. The NSTC Joint Subcommittee on Ocean Science and Technology will develop an Ocean Research Priorities Plan and Implementation Strategy by December 31, 2006. The Ocean Research Priorities Plan and Implementation Strategy will seek enhanced collaboration, coordination, cooperation, and synergies, and will identify gaps and deficiencies along with related infrastructure needs.”

(U. S. Ocean Action Plan)





Ocean Research Priorities Plan & Implementation Strategy

Principles for Ocean Research

- Seek enhanced coordination, collaboration, and synergies between USG, academia, nongovernmental organizations, state and local governments, and industry
- Address challenges through integration of capabilities of federal, state, & local governments; academia; industry; & NGOs
- Identify how all ocean sectors should be engaged in preparation and execution of the Plan and Strategy
- Develop the Plan and Strategy in an open and transparent manner
- Develop performance metrics on meeting goals
- Identify areas of highest priority and opportunity



Ocean Research Priorities Plan & Implementation Strategy

Development Steps

- Document framework
 - released by JSOST in April 2005
- Research recommendation summaries
 - provided by National Research Council
- Public workshop
 - Denver, CO; April 18-20, 2006
- Public comment period on planning materials
 - March 27-May 15, 2006



Plan Outline

- Executive Summary
- Introduction
- Focusing The Nation's Ocean Research Enterprise
 - Protecting Lives, Enhancing Livelihoods, and Improving Quality of Life
 - Framing the Approach
 - Expanding the Scientific Frontier: The Need for Fundamental Science
 - Identifying Ocean Research Priorities
- Societal Themes
 - Stewardship of Our Natural and Cultural Ocean Resources
 - Increasing Resilience to Natural Hazards
 - Enabling Marine Operations
 - The Ocean's Role in Climate
 - Improving Ecosystem Health
 - Enhancing Human Health
- Opportunities for Success
 - Developing the Tools
 - Making a Difference
- The Path Forward
- Next Steps



Prioritization Criteria

- Transformational?
 - Impact many societal theme areas?
 - Address high priority needs of resource managers?
 - Provide understanding of high value to the broader scientific community?
- 



Prioritization Criteria *(cont.)*

- Promote partnerships to expand our capabilities?
 - Serve to contribute to or enhance the leadership of the United States in ocean science?
 - Contribute to a greater understanding of ocean issues at a global scale?
 - Address mandates of governing entities?
- 



Expanding the Scientific Frontier

- Unconstrained research has provided the understanding necessary for many current efforts
 - Fundamental research is integral to the national ocean research priorities
 - Document focuses on underscoring, rather than defining, fundamental research efforts that provide the foundation for understanding the ocean
- 



Societal Themes- Research Priorities

- A total of 21 research priorities were developed for the societal themes
 - Stewardship of Our Natural and Cultural Ocean Resources
 - Increasing Resilience to Natural Hazards
 - Enabling Marine Operations
 - The Ocean's Role in Climate
 - Improving Ecosystem Health
 - Enhancing Human Health



Stewardship of Our Natural and Cultural Resources

- Understand the status and trends of resource abundance and distribution through more accurate, timely, and synoptic assessments.
- Understand interspecies and habitat/species relationships as a basis for forecasting resource stability and sustainability.
- Understand human use patterns that may influence resource stability and sustainability.
- Apply advanced technologies to enhance the benefits of various natural resources from our open ocean, coasts, and Great Lakes.



Increasing Resilience to Natural Hazards

- Understand the initiation and evolution of hazard events and apply that understanding to improve forecasts of future hazard events.
- Understand the response of coastal and marine systems to natural hazards and apply that understanding to assessments of future vulnerability.
- Apply understanding to develop multi-hazard risk assessments and to support development of models, policies, and strategies for hazard mitigation.



Enabling Marine Operations

- Understand the interactions between marine operations and the environment.
- Apply understanding of environmental factors to characterize and predict conditions in the maritime domain.
- Apply understanding of human behavior to develop the information and tools necessary to carry out effective, safe, and secure marine operations.
- Apply understanding of marine operations to enhance the marine transportation system.



The Ocean's Role in Climate

- Understand ocean-climate interactions across regions.
- Understand the impact of climate variability and change on the ocean, including its biogeochemistry and ecosystems.
- Apply understanding of the ocean to help project future climate changes and their impacts.



Improving Ecosystem Health

- Understand and predict the impact of natural and anthropogenic processes that govern the overall level of ecosystem productivity.
- Apply understanding of ocean-related socioeconomic activities to assess the ability of marine ecosystems to provide essential goods and services.
- Apply understanding of marine ecosystems to develop appropriate indicators and metrics for their sustainable and effective management.

A photograph of white-capped ocean waves crashing against a dark blue background, positioned in the top-left corner of the slide.

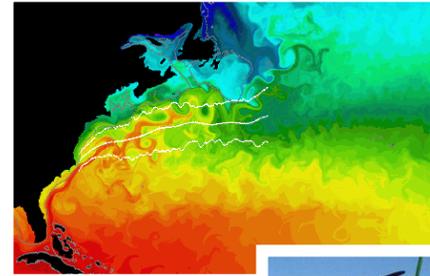
Enhancing Human Health

- Understand, forecast, and reduce ocean-related risks to human health pathogens, biotoxins, and chemical contaminants.
- Understand human health risks associated with the ocean and the potential benefits of ocean resources to human health.
- Understand how human use and valuation of ocean resources can be affected by ocean-borne threats and how human activities can influence these threats.
- Apply understanding of ocean ecosystems and biodiversity to develop products and biological models to enhance human well being.

Cross-Cutting Themes

- **Developing the Tools**

- Observing Systems
- Models



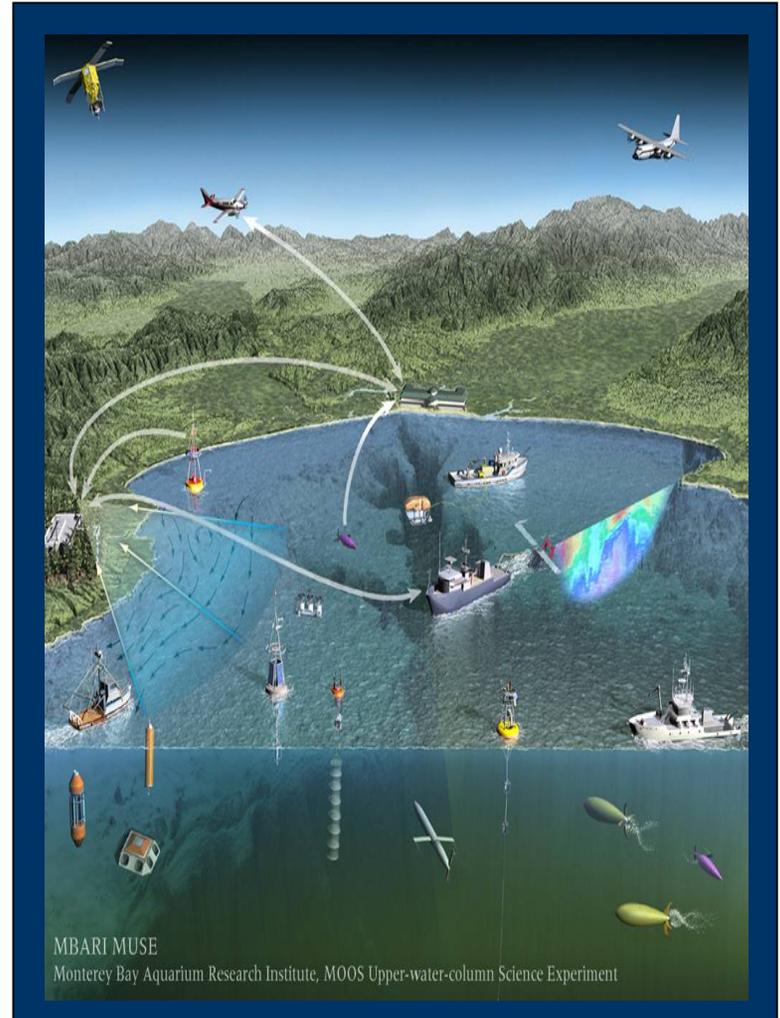
- **Making a Difference**

- Information to Support Decision-Making
- Establishing an Ocean Literate Nation



Overarching Opportunities

- Understanding and Capability to Forecast Ocean Processes
- Enhanced Scientific Support for Ecosystem-Based Management
- Targeted Deployment of an Ocean Observing System





Near-term Priorities

- Discrete, actionable steps that could be taken in the next 2-5 years
- Derived from the 21 research priorities and incorporate aspects of the three overarching priorities
- Developed using the prioritization criteria, with added emphasis on impact, urgency, and partnerships



Near-term Priorities (cont.)

- Near-term priorities:
 - Forecasting the Response of Coastal Ecosystems to Persistent Forcing and Extreme Events
 - Comparative Analysis of Marine Ecosystem Organization
 - Sensors for Marine Ecosystems
 - Assessing Meridional Overturning Circulation Variability: Implications for Rapid Climate Change



Timeline

- **May-July**

- Develop draft ocean research priorities document, incorporating workshop input and public comments

- **August-November**

- Finalize near-term priorities
- NRC review of document
- Public comment on draft document (45 days)
- Development of Implementation Strategy

- **November ->**

- Incorporate NRC and public comments
 - Internal review of 3rd draft
 - Release of final plan
- 



Outreach

Regional Briefings

- New England
- Mid-Atlantic
- Florida
- Gulf Coast
- Hawaii
- Pacific Northwest
- Alaska
- Great Lakes
- California

Panels and Town Halls

- California and the World Ocean 2006
- Oceans 2006
- American Fisheries Society Annual Meeting

Organization Briefings

- Coastal States Organization
 - National Dredging Team
- 



Implementation Strategy

- **Articulate a set of operational principles and conceptual guidelines defining how to address the identified priorities.**
 - Roles and responsibilities of each constituent sector in planning, programming, budgeting, and execution of the priorities defined herein.
 - Use of existing mechanisms for collaboration among the federal agencies and with international, state, local, and tribal entities, and the private sector.
 - Concepts for new public/private mechanisms of coordination.



Implementation Strategy (*cont.*)

- Enhanced coordination between resource management communities and the ocean science community.
- Emphasis on enhanced translation of ocean research to expand ocean literacy and promote public discourse.
- Articulate and implement meaningful performance measures and regular evaluation mechanisms for ensuring continued progress on the research priorities.
- Develop and implement an annual planning cycle that will allow the JSOST to coordinate planning for ocean research investments among the federal agencies in support of their budget requests.

For More Information:

<http://ocean.ceq.gov/about/jsost.html>



Joint Subcommittee on Ocean Science and Technology