



CHARTING THE  
COURSE FOR  
**OCEAN SCIENCE**  
IN THE  
UNITED STATES  
FOR THE  
NEXT DECADE

AN OCEAN RESEARCH PRIORITIES PLAN  
AND IMPLEMENTATION STRATEGY

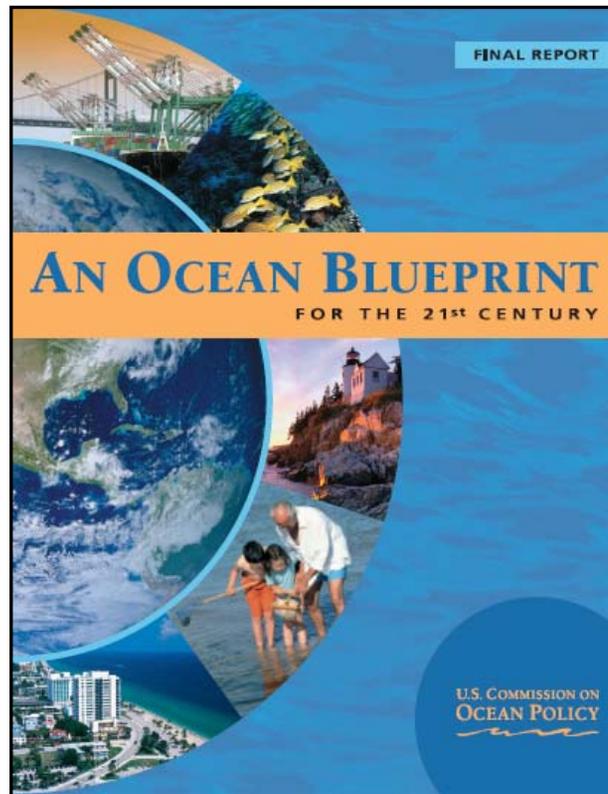
NSTC JOINT SUBCOMMITTEE ON OCEAN SCIENCE AND TECHNOLOGY  
JANUARY 26, 2007

# Ocean Policy

**Oceans Act  
2000**



**USCOP Report  
2004**

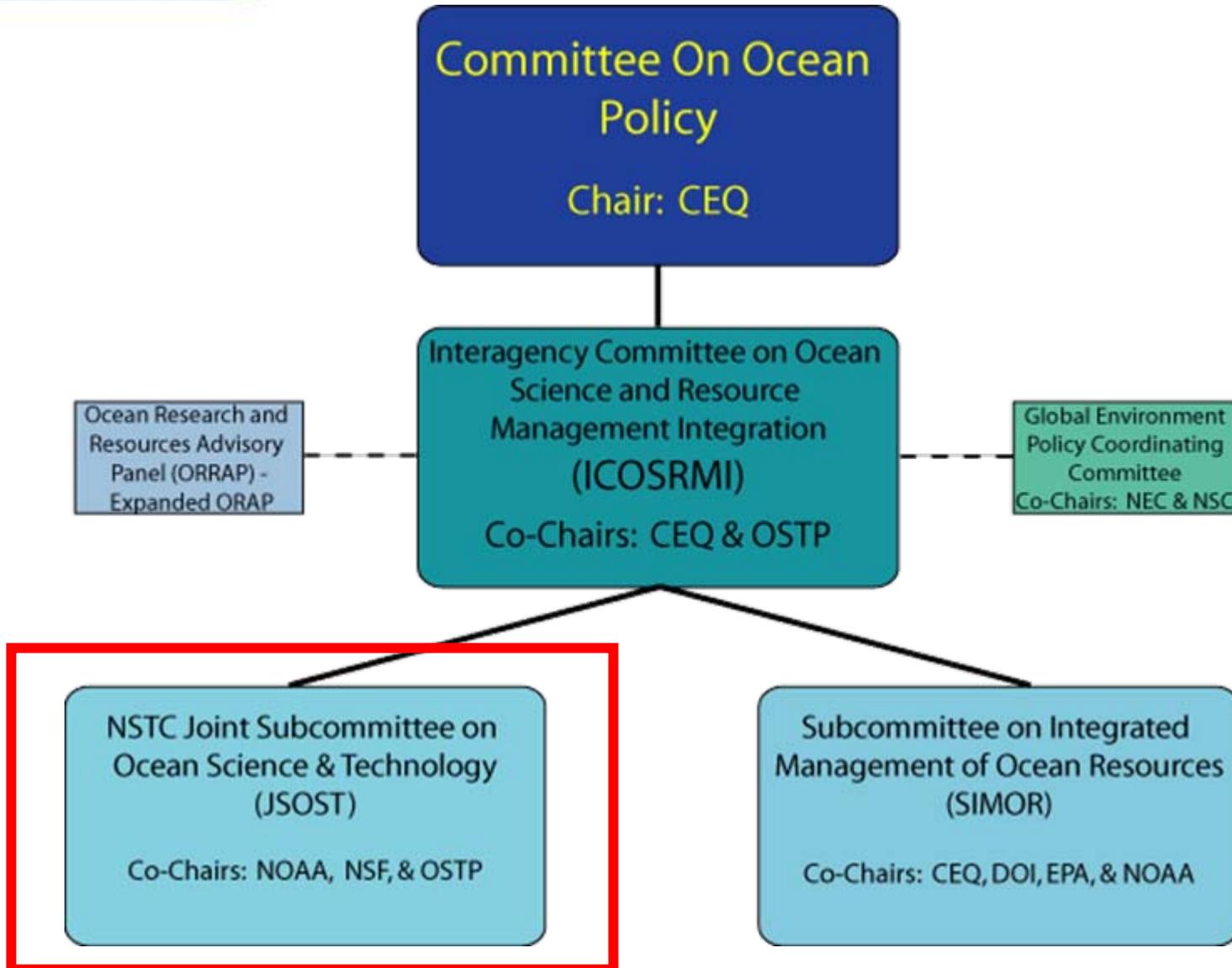


**Administration Response  
2004**



Recent ocean policy efforts that provide the foundation for the development of the Ocean Research Priorities Plan and Implementation Strategy.

# Ocean Action Plan Governance Structure



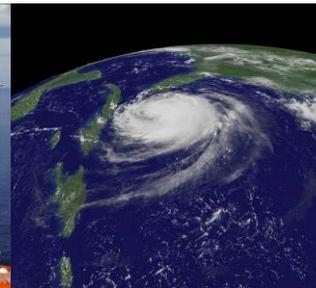
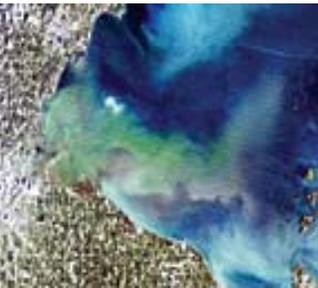


# Charting the Course for Ocean Science

- First national effort to identify research priorities that address key interactions between society and the ocean-six societal themes
- Will guide research efforts for the ocean community, including the federal agencies, for the next decade
- Developed with extensive community involvement
  - Public workshop-April 2006
  - Public comment periods (March-May 2006; Sept.-Oct. 2006)
  - Regional public and conference information sessions and organization briefings
  - NRC Ocean Studies Board
    - Summary of past NRC report recommendations
    - *Ad hoc* committee review of draft plan (Sept.-Nov. 2006)

# Societal Themes

- Stewardship of 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 Natural and Cultural Ocean Resources

- *Research Priority (RP) 1:* Understand the status and trends of resource abundance and distribution through more accurate, timely, and synoptic assessments.
- *RP 2:* Understand interspecies and habitat/species relationships to support forecasting resource stability and sustainability.
- *RP 3:* Understand human use patterns that may influence resource stability and sustainability.
- *RP 4:* Apply advanced understanding and technologies to enhance the benefits of various natural resources from the open ocean, coasts, and Great Lakes.



# Increasing Resilience to Natural Hazards

- *RP 5:* Understand how hazard events initiate and evolve and apply that understanding to improve forecasts of future hazard events.
- *RP 6:* Understand the response of coastal and marine systems to natural hazards and apply that understanding to assessments of future vulnerability to natural hazards.
- *RP 7:* Apply understanding to develop multi-hazard risk assessments and support development of models, policies, and strategies for hazard mitigation.



# Enabling Marine Operations

- *RP 8:* Understand the interactions between marine operations and the environment.
- *RP 9:* Apply understanding of environmental factors affecting marine operations to characterize and predict conditions in the maritime domain.
- *RP 10:* Apply understanding of environmental impacts and marine operations to enhance the marine transportation system



# The Ocean's Role in Climate

- *RP 11:* Understand ocean-climate interactions within and across regions.
- *RP 12:* Understand the impact of climate variability and change on the biogeochemistry of the ocean and implications for its ecosystems.
- *RP 13:* Apply understanding of the ocean to help project future climate changes and their impacts.



# Improving Ecosystem Health

- *RP 14:* Understand and predict the impact of natural and anthropogenic processes on ecosystems.
- *RP 15:* Apply understanding of natural and anthropogenic processes to develop socioeconomic assessments and models to evaluate the impact of multiple human uses on ecosystems.
- *RP 16:* Apply understanding of marine ecosystems to develop appropriate indicators and metrics for sustainable use and effective management.

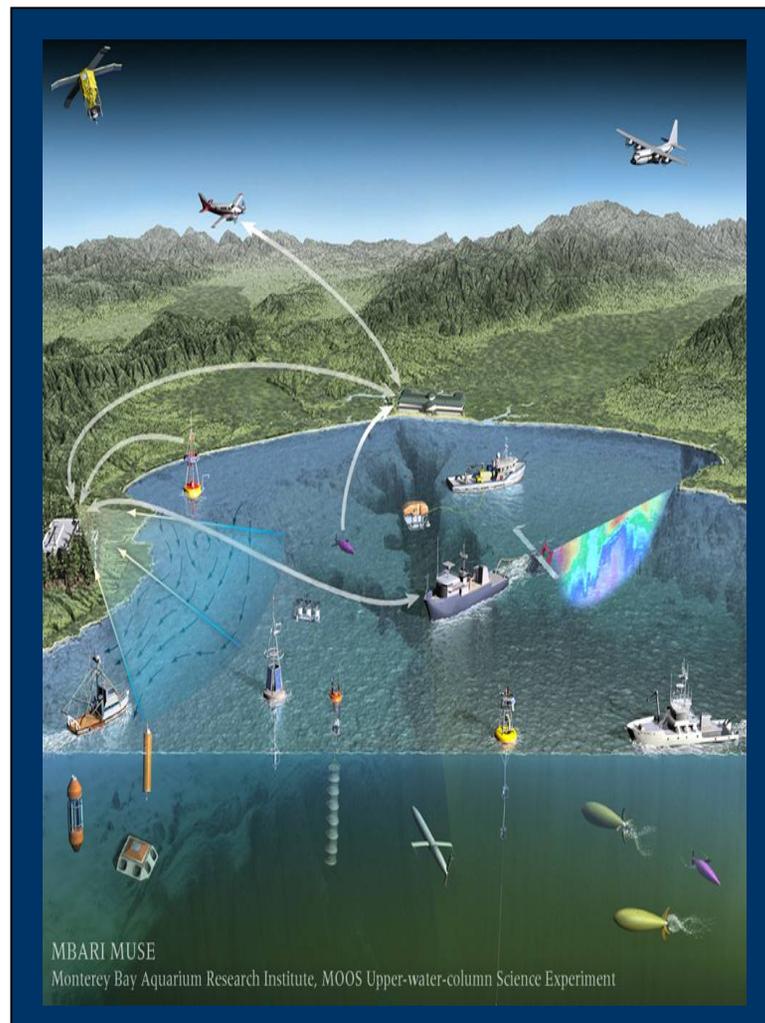


# Enhancing Human Health

- *RP 17:* Understand sources and processes contributing to ocean-related risks to human health.
- *RP 18:* Understand human health risks associated with the ocean and the potential benefits of ocean resources to human health.
- *RP 19:* Understand how human use and valuation of ocean resources can be affected by ocean-borne threats and how human activities can influence these threats.
- *RP 20:* Apply understanding of ocean ecosystems and biodiversity to develop products and biological models to enhance human well being.

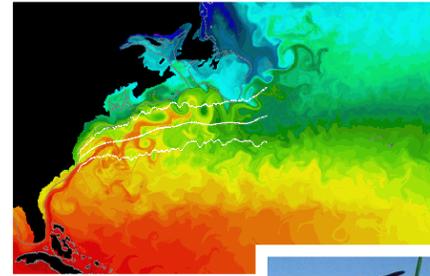
# Critical Elements

- Evident throughout the national ocean research priorities
  - Understanding and Capability to Forecast Ocean Processes
  - Enhanced Scientific Support for Ecosystem-Based Management
  - Targeted Deployment of an Ocean Observing System



# Cross-Cutting Themes

- Common among the societal themes
  - Developing the Tools
    - Observing Systems
    - Models
  - Making a Difference
    - Information to Support Decision-Making
    - Establishing an Ocean Literate Nation



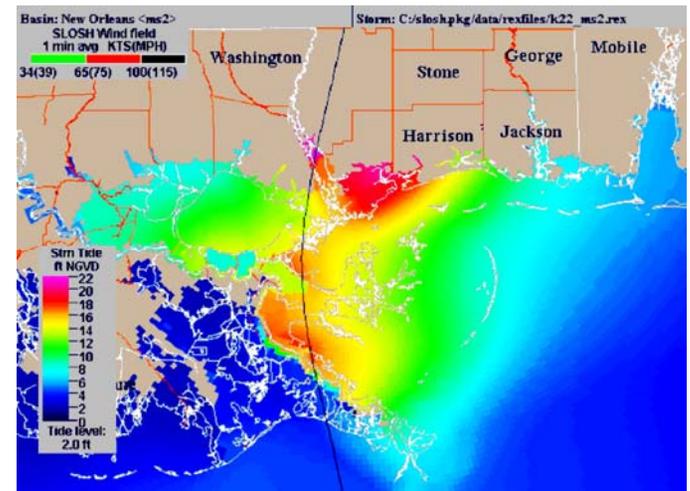


# Near-term Priorities

- Near-term priorities
  - Developed to initiate rapid progress towards the 20 national ocean research priorities
  - To be pursued in the next 2-5 years
  - Selected using priority criteria, with an added emphasis on impact, urgency and partnerships

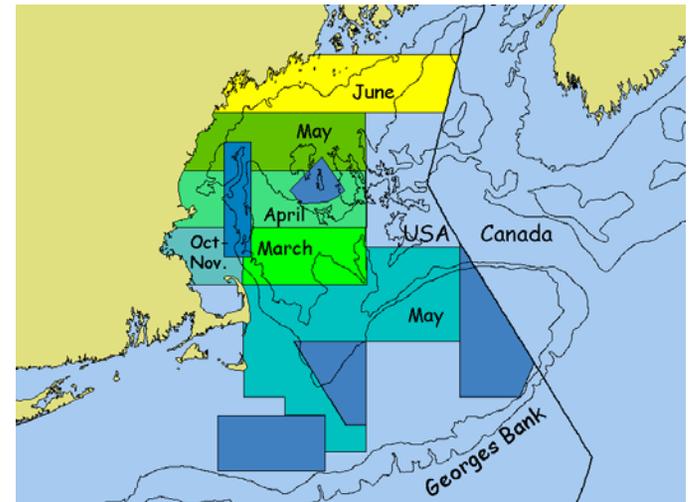
# Forecasting the Response of Coastal Ecosystems to Persistent Forcing and Extreme Events

- Coastal ecosystems are subject to a variety of forcings: extreme events, human activities, changing ocean conditions.
- Community and ecosystem resilience requires:
  - Understanding response of systems to forcings
  - Forecasting frequency, intensity, and impact
  - Providing tools for decision-making
- 2008 Budget Request
  - NOAA-NOS: \$5M
  - DOI-USGS: \$1.5M (NTP); \$1.5M (National Water Quality Monitoring Network)
  - NSF-GEO: \$2M



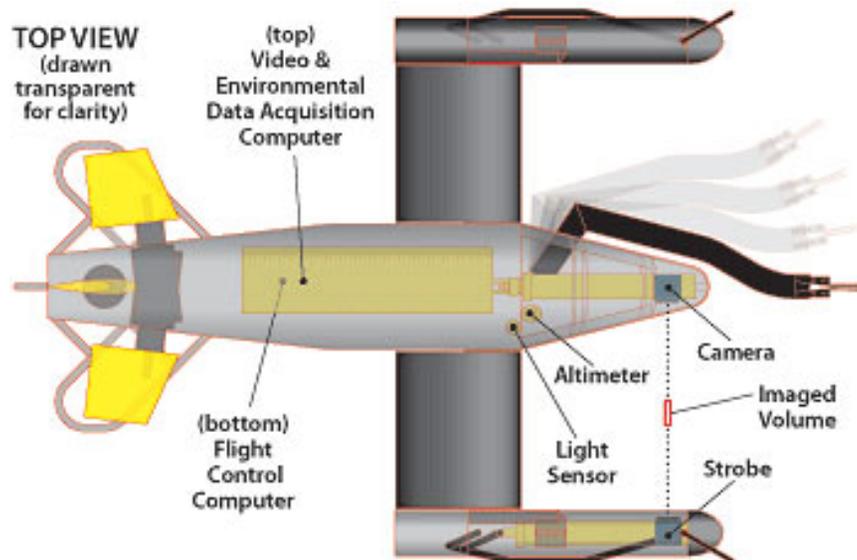
# Comparative Analysis of Marine Ecosystem Organization

- Management of marine ecosystems can be improved by determining the underlying dynamics of these systems at a variety of scales. This effort will provide:
  - Greater basic understanding of ecosystem processes
  - Practical tools for evaluating effectiveness of ecosystem-based management efforts
- 2008 Budget Request
  - NOAA-NMFS: \$5M
  - NSF-GEO: \$5M



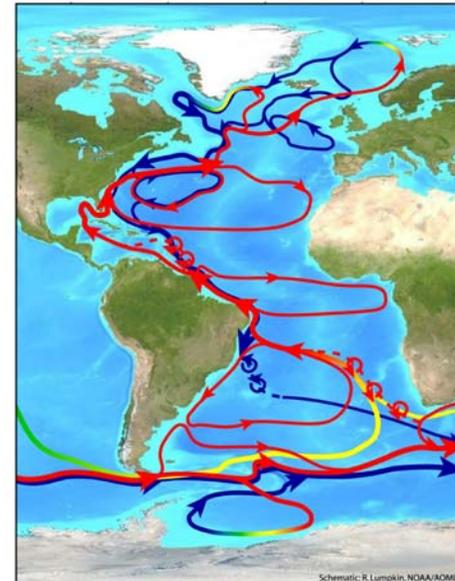
# Sensors for Marine Ecosystems

- Development of new sensors will help realize the full potential of *in situ* and satellite-based observations and enhance understanding of marine ecosystems
- 2008 Budget Request
  - NOAA-NOS: \$5M
  - NSF-GEO: \$5M



# Assessing Meridional Overturning Circulation Variability: Implications for Rapid Climate Change

- Assessing potential for future abrupt climate changes and developing the capability to predict their occurrence will require:
  - Ocean observations; nowcasting; model development for decadal forecasting; past climate-change reconstructions; climate-impact assessments
- 2008 Budget Request
  - NOAA-OAR: \$5M
  - NSF-GEO: \$5M





# Implementation Strategy

- Integral to the successful pursuit of these research efforts is the participation of the many sectors of the ocean community.
- Partnerships using existing or new mechanisms for collaboration between multiple entities is a critical component.
- National priorities will be addressed at a variety of scales (global to local) and tailored to account for differences in geographic regions, different ocean uses, interactions, and phenomena.



# Implementation Strategy (cont.)

- Infrastructure/technology issues will be evaluated as well as mechanisms to address and support research translation (decision support, research to operations, ocean education)
- An annual memo generated by JSOST will articulate interagency priorities for consideration in federal budget process
- Consultation workshops will be held ~3 years with major non-federal sponsors, participants and end-users to enhance partnerships
- Formal review of priorities (near- and long-term) will occur every 5 years



# Next Steps

- OSB *ad hoc* committee review of the final ORPP/IS due 6 months from release of plan
- Dialogue with ocean community through outreach briefings on status of plan and next steps
- Implementation activities for near-term priorities via interagency coordination and collaborative mechanisms

*Document available at:*

[http://ocean.ceq.gov/about/sup\\_jsost\\_prioritiesplan.html](http://ocean.ceq.gov/about/sup_jsost_prioritiesplan.html)



Joint Subcommittee on Ocean Science and Technology