



CHARTING THE
COURSE FOR

OCEAN SCIENCE

IN THE
UNITED STATES
FOR THE
NEXT DECADE

Dr. Julie Morris (NSF)
Dr. Richard Spinrad (NOAA)
Dr. Dan Walker (OSTP)

Joint Subcommittee on
Ocean Science and Technology

The Ocean Sciences Meeting
March 4, 2008
Orlando, FL



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 help guide research efforts for the ocean community, including the federal agencies, for the next decade



Community Input

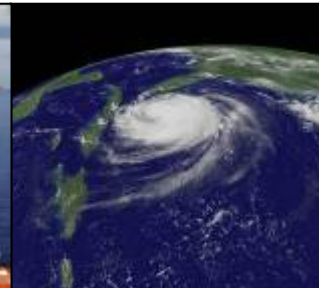
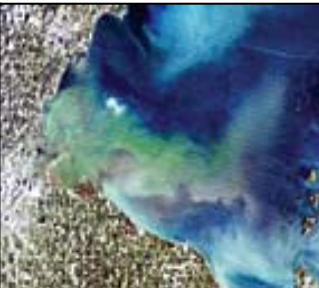
- Developed with extensive community involvement
 - Public workshop – April 2006
 - Public comment periods (March-May 2006; Sept. –Oct. 2006)
 - Regional public and conference information sessions and organization briefings
 - NRC Ocean Studies Board
 - Summary of past NRC report recommendations
 - Final Review of *Charting the Course* – August 2007



Societal Themes

20 Ocean Research Priorities Across Six 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





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
- Implementation of the near-term priorities is underway



Near Term Priorities Funding:

Fiscal Years 2008 & 2009

- FY 2008 President's Budget requested \$40 M for the NTPs.
- FY 2008 omnibus appropriations bill provided a portion of this amount (\$11.25M) and contributions from associated programs provide the following:
 - AMOC – Up to \$7.2 M
 - CAMEO – Up to \$2 M
 - Sensors for Marine Ecosystems – Up to \$4.5 M
 - Forecasting the Response of Coastal Ecosystems to Persistent Forcing & Extreme Events – Up to \$3 M
- The FY 2009 Presidents Budget included \$40 M for the NTPs.



Forecasting the Response of Coastal Ecosystems to Persistent Forcing & Extreme Events

Objective:

- Support research to enhance observational and modeling capabilities; and
- Provide decision support tools for hazard mitigation, response planning and regional resource management.

Short to Mid-Term Outcomes: Enhance existing observational and modeling frameworks to provide decision-support tools for improved planning and decision making.

Long Term Outcome: Reduce risk to coastal communities from climate and water quality related natural hazards:

- Extreme events
- Flooding
- Subsidence
- Sea-level rise
- Triggers of ecosystem collapse





Forecasting the Response of Coastal Ecosystems to Persistent Forcing & Extreme Events

FY 2008 Focus:

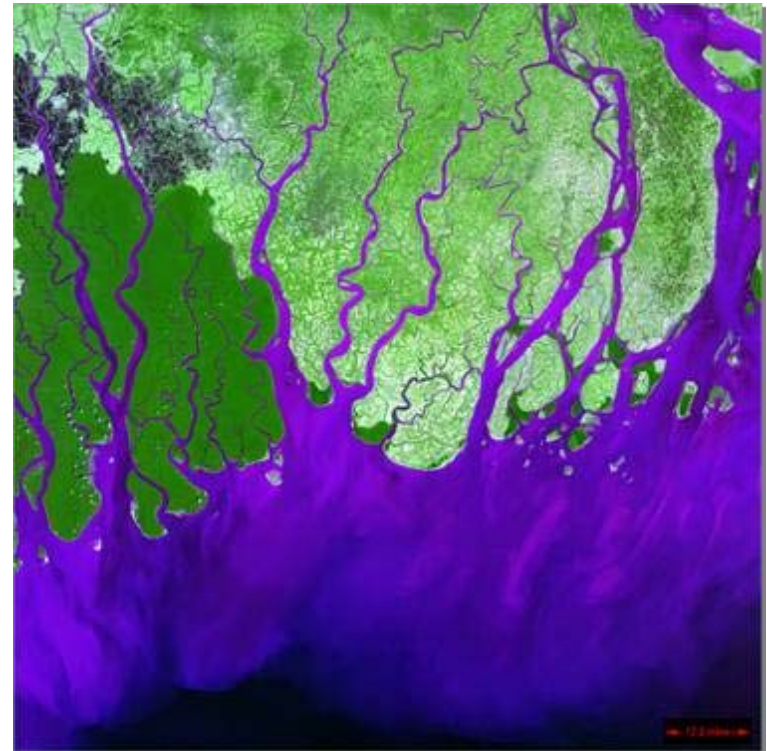
- Field issues (Gulf of Mexico, Great Lakes) supported via National Oceanographic Partnership Program solicitation and other opportunities
- Process issues

Gulf of Mexico Objective: Integrate regionally based data/models to address the impacts of coastal inundation

Great Lakes Objective: Integrate enhancements into proven approaches to improve:

- Predictions of beach water quality
- Management decisions for human health.

Funds to be disbursed through NOPP in response to August 2007 BAA, and via competitive peer-reviewed extramural programs and internal agency programs.





Comparative Analysis of Marine Ecosystems

Objective: Improve basis for ecosystem-based management by:

- **Developing science to better quantify ecosystem processes, dynamics and responses in relation to human activities**
- **Evaluating the effectiveness of Marine Protected Areas in achieving management objectives**

A basis to compare ecosystems & elucidate responses:

- **A Modeling Framework for Ecosystem Comparisons**
- **Complete analytical framework from which to collect necessary information**
- **Simulation component to understand sensitivity to model parameters**
- **Basis to deduce underlying ecosystem responses**

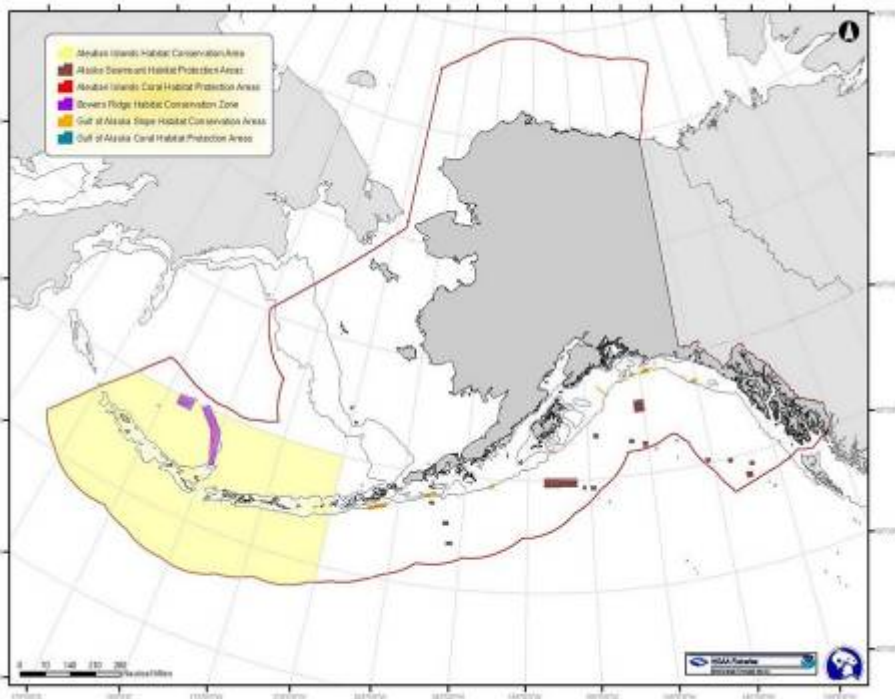
Funds anticipated to be disbursed through call for proposals expected for February 2008 release.





Comparative Analysis of Marine Ecosystems

- Study a representative series of MPAs in an intensive and systematic way
- Predict the Success of MPA Placement



- Protect target stocks
- Define and preserved biodiversity
- Human behaviors in relation to MPAs
- Movement patterns and demographic impacts
- Predict ecosystem “succession”
- Network potential and dispersal of larvae



Sensors for Marine Ecosystems

Objective: Improve understanding of ocean ecology by improving measurements of ocean parameters on scales from individual cells to the global ocean:

- **Biological (e.g., genomic)**
- **Biogeochemical**
- **Chemical**
- **Bio-optical**



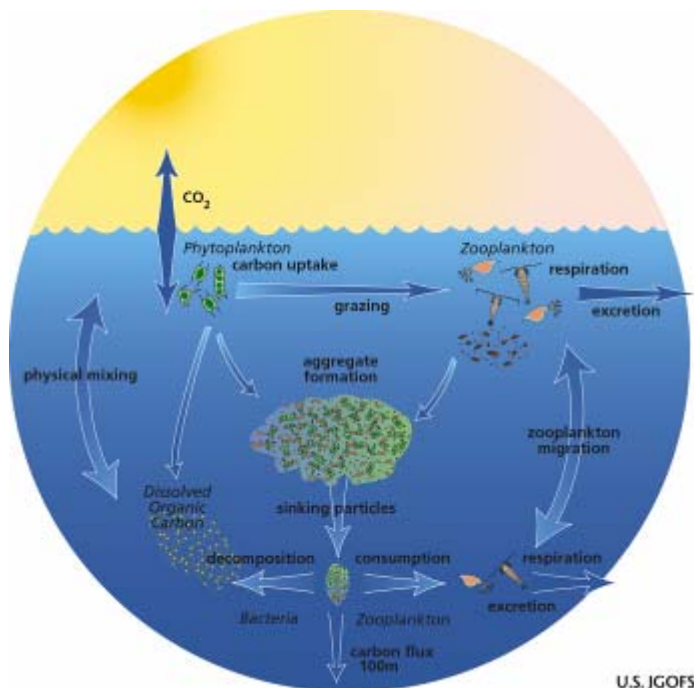
- **Limitations in observational capabilities with present in-water sensors**
- **Multi-scale sensor development and integrated scientific observations needed to provide ecological information at temporal and spatial scales not currently available**



Sensors for Marine Ecosystems

Outcomes:

- New sensors
- Improvement to existing sensors
- Validation by research community
- Transition to “operational” status or commercial viability
- Field application of new and improved sensors



National Oceanographic Partnership Program Solicitation:

- Transition of *in situ* biological or chemical sensors toward a commercially viable status.
- Development of the next generation of biological, chemical, optical and bio-optical field sensors.

Internal agency programs and peer reviewed proposals



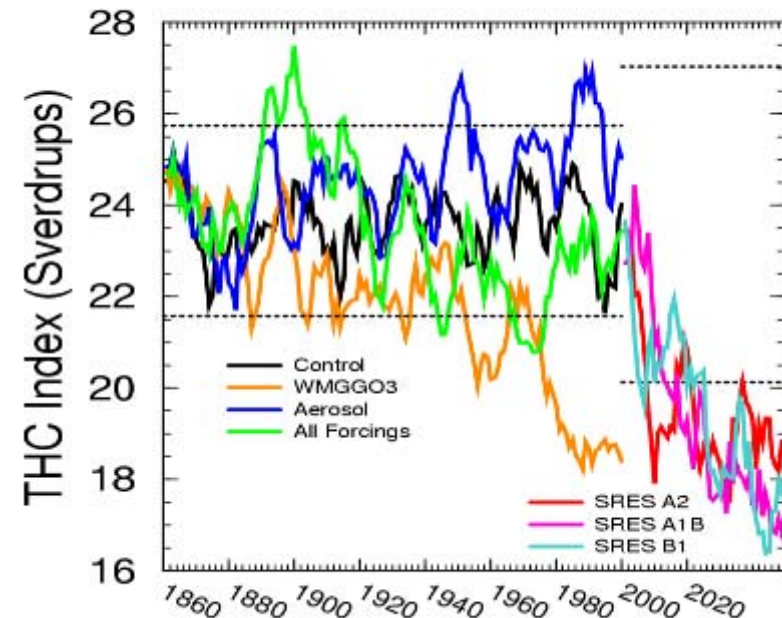
Abrupt Climate Change and the Atlantic Meridional Overturning Circulation (AMOC)

Objective: Improved understanding of mechanisms behind fluctuations of AMOC to provide capabilities for monitoring and making predictions of AMOC changes.

Anticipated Outcomes:

- Enhanced understanding of MOC system;
- Comprehensive MOC observation & monitoring program;
- New forecasting capabilities;
- Improved ocean models, coupled models, & ocean analyses;
- Characterized impacts and feedbacks of changes in MOC on ecosystems, carbon budgets and regional climate.

Models indicate that a slowdown of the AMOC is imminent

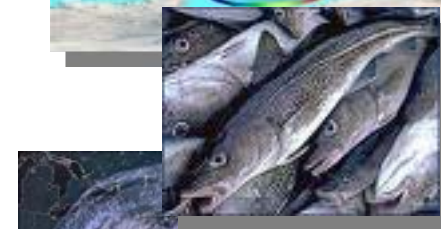




Abrupt Climate Change and the Atlantic Meridional Overturning Circulation (AMOC)

Advances planned by 2012:

- Routine capability to assess changes to AMOC.
 - Firmer understanding of the origins and structure of AMOC variability and trends, including their implications on regional and global climate and their predictability.
 - Objectively based design for the sustained ocean observing system required for an early warning system and an estimate of its economic and social benefits.
 - A prototype early warning system for some possible rapid climate changes.
-
- Funds to be disbursed through NOPP in response to August 2007 BAA, competitive peer-reviewed extramural programs and internal agency programs.
-
- Implementation Plan available at: <http://www.usclivar.org>



*Linked to CCSP/CVC
Abrupt Change Initiative*

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.



Next Steps – Ocean Infrastructure

- The JSOST and its Interagency Working Group on Facilities (IWG-F) are beginning to look at ocean infrastructure in light of the priorities in the ORPP:
 - Inventory of federal ocean infrastructure.
 - National Research Council infrastructure study.
- To inform these efforts, JSOST is considering holding a community workshop on ocean infrastructure

What is the community's feeling on the value of an ocean infrastructure workshop?



Document available at:

http://ocean.ceq.gov/about/sup_jsost_prioritiesplan.html



BACKUP SLIDES

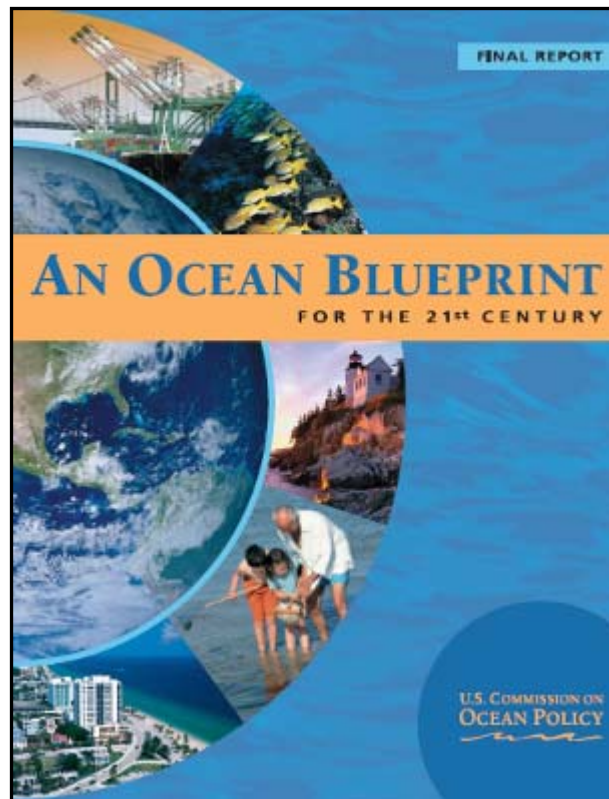


Ocean Policy

Oceans Act
2000



USCOP Report
2004



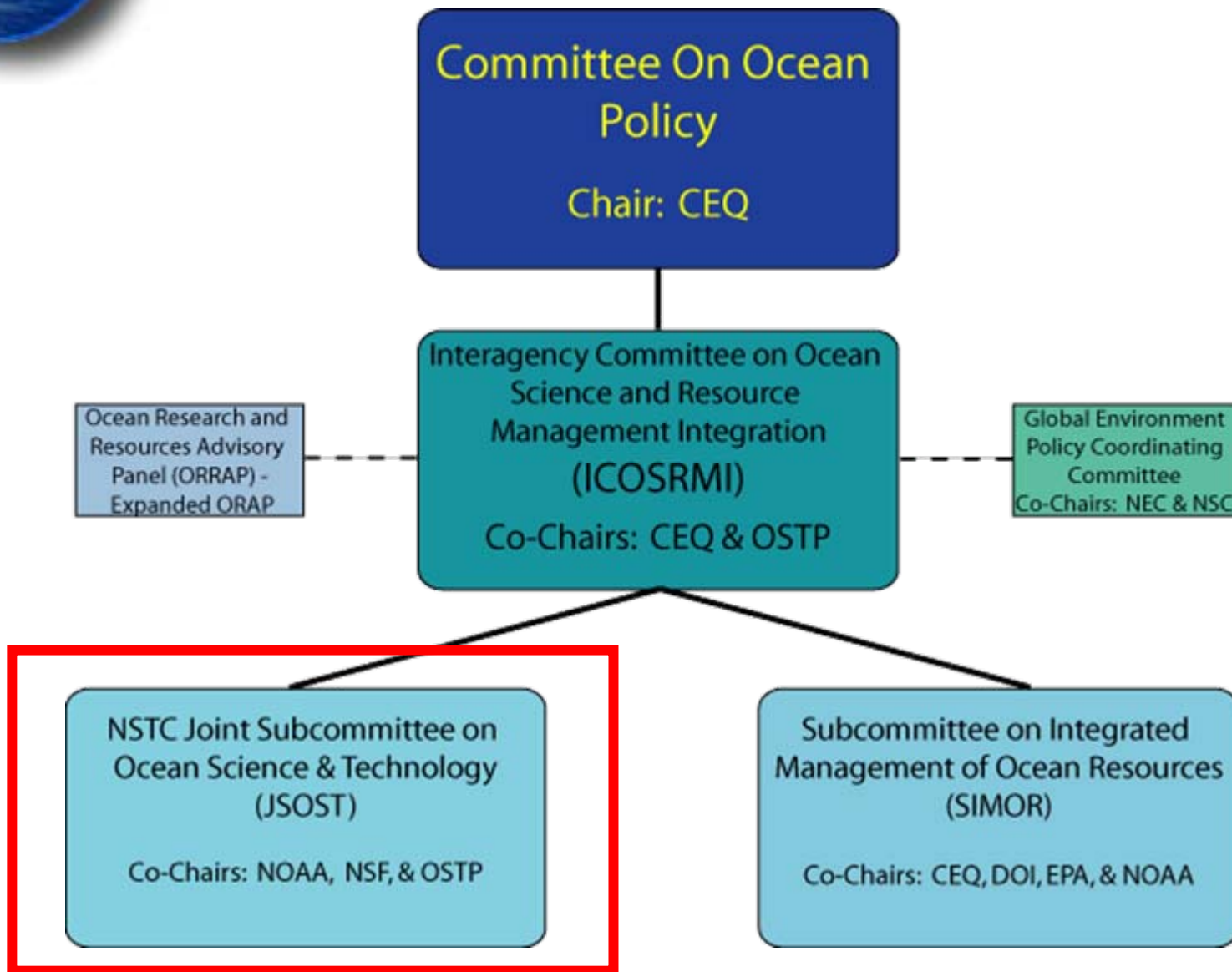
Administration Response
2004



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





ORPP Connections to Resource Managers

- ***Applying Science to Coastal Decision Making: Priorities of the Coastal States Organization*** – May 2007
 - Three focal points identified as priorities for coastal managers:
 - Land Use
 - Habitat
 - Coastal Hazards
 - ORPP Societal Themes relevant to focal points:
 - Stewardship of Natural Resources
 - Ecosystem Health
 - Natural Hazards