CONSORTIUM FOR
Ocean Leadership

The Science Requirements for Coastal and Marine Spatial Planning

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President and CEO
Ocean Studies Board
November 10, 2009

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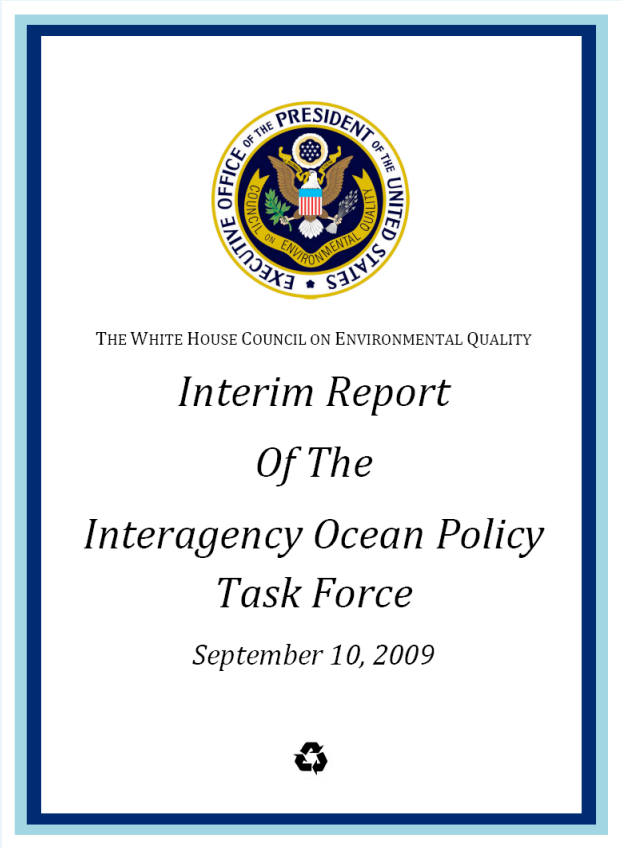
June 12th Memorandum



THE WHITE HOUSE COUNCIL ON ENVIRONMENTAL QUALITY

Interim Report

Of The

Interagency Ocean Policy Task Force

September 10, 2009

90 Days

National Ocean Policy Governance Framework Priority Areas

180 Day

Marine Spatial Planning Framework

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Role of Science in a National Ocean Policy

Sustainable management of ocean ecosystems, and mitigation of and adaptation to impacts from climate change, requires increased capacity to predict, assess and respond to future ocean risks scenarios

- **Which requires models based on sound science**
- **which requires physical, biological & chemical data obtained from:**
  - **Observations--Remote and *In Situ***
  - **Basic research on process studies**

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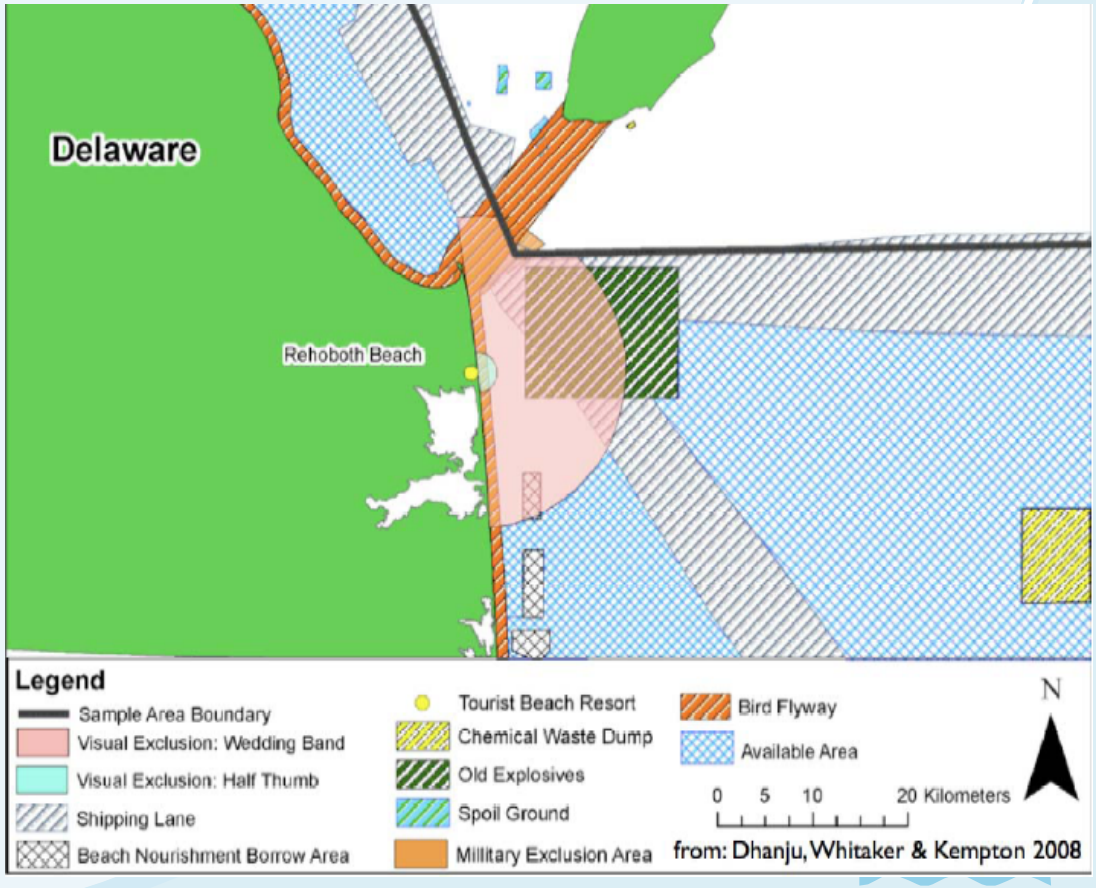
Coastal and Marine Spatial Planning (MSP)

Science underpins the development of sustainable management regimes for the future use and stewardship of ocean and coastal resources.

- Identify existing uses, risk areas, and military exclusions
- Define current physical, chemical and biological parameters
- AND forecast future coastal and ocean conditions with new uses.



Offshore Renewable Energy Development

1. Wave
2. Currents
3. Tidal
4. Thermal Conversion
5. Wind

- All promising technologies – mostly in their infancy
- Need for ecosystem assessments for facility siting
- Overlapping and competing federal and state regulations

Pelamis Wave Generator

Major Science Issues for MSP

- **The marine environment is much more dynamic than terrestrial systems (three dimensional, biology-driven, fluid environment).**
- **It is being impacted by climate change, so future conditions are increasingly difficult to predict just using historical data.**
- **Significant gaps of information exist in basic science (i.e., ecosystem processes) which need to be addressed in order to evaluate outcomes (e.g., larval transport).**
- **Multiple Agencies with varying missions, regulations and monitoring exist without a comprehensive plan for managing, integrating, and delivering products and services for MSP.**

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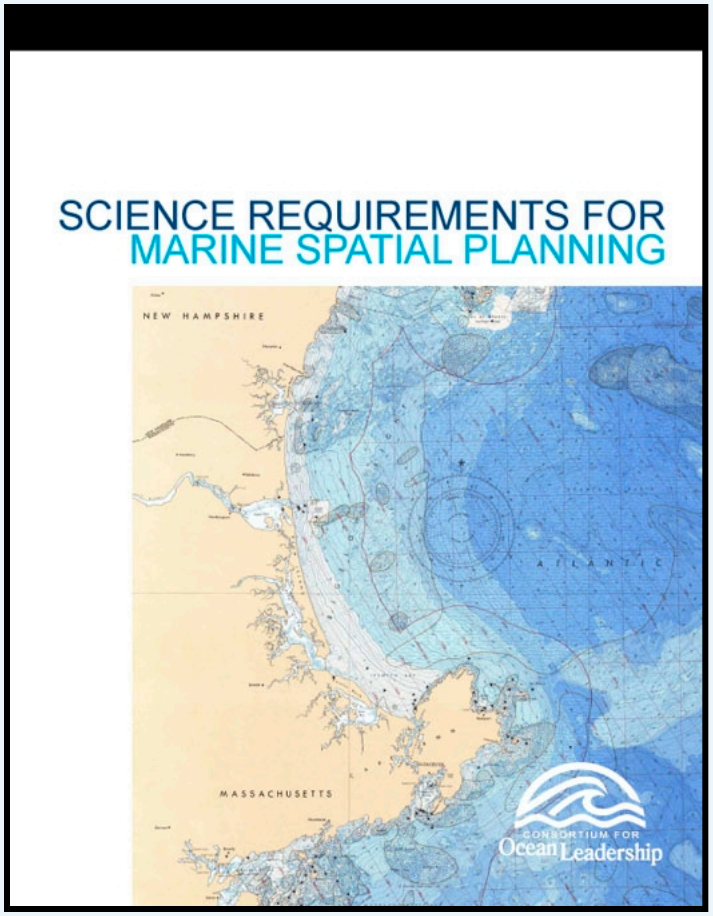
MSP Science Requirements
(download pdf at http://bit.ly/3Yfg2W)



Implementation and prioritization of MSP science requirements will be regional and goal-specific.

- **Conduct Regional Ecosystem Assessments**
- **Support Continuity of Funding for Observations**
- **Data Integration and Cyberinfrastructure – get away from stovepiping of datasets. Will require accountability too.**

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MSP Science Requirements

- **Implementation and prioritization of MSP science requirements will be regional and goal-specific.**

- **However, there are some basic observation requirements**
  - **Physical – temperature, salinity, bathymetry, currents**
  - **Geochemical – pH, oxygen, nutrients, water quality, dissolved carbon**
  - **Biological – chlorophyll, pathogens, population and diversity information**

- **There are other use-specific high priority informational needs (e.g. avian migration, wind fields for siting wind farms)**

- **Observations must be coupled with process studies for ecosystem assessments to be accurate.**

- **Data from various observing systems must be integrated into models, forecasts and other products for planners and resource managers** (this one is difficult but important)

Examples of Existing Federal Observing & Modeling Programs

- Integrated Ocean Observing System – Multiple Agencies
- Ocean Observatories Initiative - NSF
- National Data Buoy Center - NOAA
- Ocean Biological Information System – USGS
- PORTS – NOAA
- NMFS Surveys - NOAA
- Oil Platform Data – MMS
- Stream Flow – USGS
- Stormwater - EPA
- Remote Sensing Data – NOAA/NASA

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Examples of Existing Federal Observing & Modeling Programs

- **Issues which need to be addressed:**

  1. **The compatibility and sustainability of these systems**
  2. **Data integration and dissemination**
  3. **Management and integration of their *budgets***

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Recommendations (1 of 3)

1. Conduct Regional Ecosystem Assessments:

   - There are fundamental gaps in ecosystem-based science, which is required for ecosystem based management.
   - Regional assessments at varying temporal and spatial scales would provide a foundation to identify gaps in basic science and information concerning biological and ecological parameters.
   - These studies would develop a dynamic basis for agencies to collaborate and could provide a common framework to support NEPA analysis and consultations.
   - Regional assessments need to be integrated and on-going to evaluate the impacts and accuracy of MSP plans. (need to validate plans in case they need to be changed)

Recommendations (2 of 3)

2. Support Continuity of **Funding** for Observations:

   - The patchwork of current ocean observing programs and systems (e.g., IOOS) are inadequate to provide the information necessary for MSP.
   - Sustained observations and monitoring capabilities are essential to build baseline data, make forecasts, and evaluate success of MSP decisions.
   - **One body needs the authority to coordinate and manage a dedicated climate/ocean observation system and science budget.**
     - Someone in OMB responsible for climate and oceans (would lend interagency support and implementation)

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Recommendations (3 of 3)

3. Create a Data Integration and Cyber Infrastructure Process

    - Existing patchwork of agencies and programs is insufficient to meet the growing demand for information and data integration.
    - A centralized data management system is needed for integrating, disseminating information products and services required for MSP.

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