

# Existing Recommendations

## *Highlights*

Lara Whitely Binder, UW CIG  
Bonnie DeJoseph, WA Sea Grant  
OA Panel Meeting #3 | *May 23, 2012*



# Purpose

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To provide an overview of existing recommendations at the Federal level or other levels for addressing ocean acidification.

Where relevant, could reference or tie into these recommendations as points of leverage.

# Recommendations From

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- Federal Ocean Acidification Research and Monitoring Act of 2009
- National Research Council  
*Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean (2010)*
- National Ocean Policy  
*Draft National Ocean Policy Implementation Plan (2012)*
- Washington State Integrated Climate Response Strategy (2012)

*Pending: Strategic Plan for Federal Research and Monitoring of Ocean Acidification*

# Common Themes

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Most are very general given scale (exception: WA). Common themes were:

- Increased & more coordinated monitoring
  - Relate: improved data collection, management, standardization
- Identifying & filling capacity gaps
  - E.g., in monitoring, research facilities, technical resources, training & education, etc.)
- Research
  - Physical science, biological impacts, and socioeconomic impacts
- Increased interagency coordination

# FOARAM (2009)

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## *Federal Ocean Acidification Research and Monitoring Act of 2009*

- (1) development and coordination of a **comprehensive interagency plan** to:
  - A. monitor and conduct research on the processes and consequences of ocean acidification on marine organisms and ecosystems; and
  - B. establish an interagency research and monitoring program on ocean acidification;
- (2) **establishment of an ocean acidification program** within the National Oceanic and Atmospheric Administration;
- (3) **assessment and consideration of regional and national ecosystem and socioeconomic impacts** of increased ocean acidification; and
- (4) **research adaptation strategies and techniques** for effectively conserving marine ecosystems

# National Research Council (2010)

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*Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean (163pp)*

NRC's recommendations identified six key elements of a successful *National Ocean Acidification (OA) Program*:

## **(1) A robust observing network**

- Support a chemical monitoring program, e.g., for temperature, salinity, oxygen, nutrients, pH
- Support an adaptive monitoring program to assess the effects of acidification
- Support efforts to make “clear and consistent” methods of acquiring chemical and biological data
- Support identification and standardization of biological parameters for monitoring OA
- Identify existing chemical and biological measurements that could become part of a comprehensive OA observing network
- Identify and work to fill critical spatial or temporal gaps in the current monitoring capacity
- Plan for the long-term sustainability of an integrated OA observation network

## National Research Council (2010) cont'd

*Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean*

### **(2) Research priorities** for federal and federally-funded research on OA

#### Understand:

- processes affecting acidification in coastal waters;
- physiological mechanisms of biological responses;
- ecosystem-level consequences;
- implications for biogeochemical cycles; and
- socioeconomic impacts and inform decisions

#### Assess:

- the potential for acclimation and adaptation

#### Investigate:

- response of individuals, populations, and communities; and
- interactive effects of multiple stressors

## National Research Council (2010) cont'd

*Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean*

### **(3) Assessment and Decision Support**

- Clearly define the problem and the stakeholders (i.e., who is this a problem for and at what time scales?)
- Work with stakeholders to develop a broad strategy for decision support

### **(4) Data Management**

- Create a data management office and provide it with adequate resources.
- Develop policies to ensure data and metadata quality, access, and archiving.
- Provide timely research results, syntheses, and assessments that are of value to managers, policy makers, and the general public.

## National Research Council (2010) cont'd

*Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean*

### **(5) Facilities and training** of ocean acidification researchers

- Inventory and identify gaps in existing community facilities that can support high-quality field- and laboratory-based research
- Assess community data resources such as genome sequences for organisms vulnerable to ocean acidification.
- Support development of facilities or data resources that are lacking
- Support the development of human resources through workshops, short-courses, or other training opportunities.

*Noted in the report:* Development of analytical facilities, wet-labs, and near-shore coastal mesocosms at Friday Harbor Laboratories

## National Research Council (2010) cont'd

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*Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean*

### **(6) Program Planning, Structure, and Management**

- Create a detailed implementation plan and program office for the National Ocean Acidification Program

# National Ocean Council (2012)

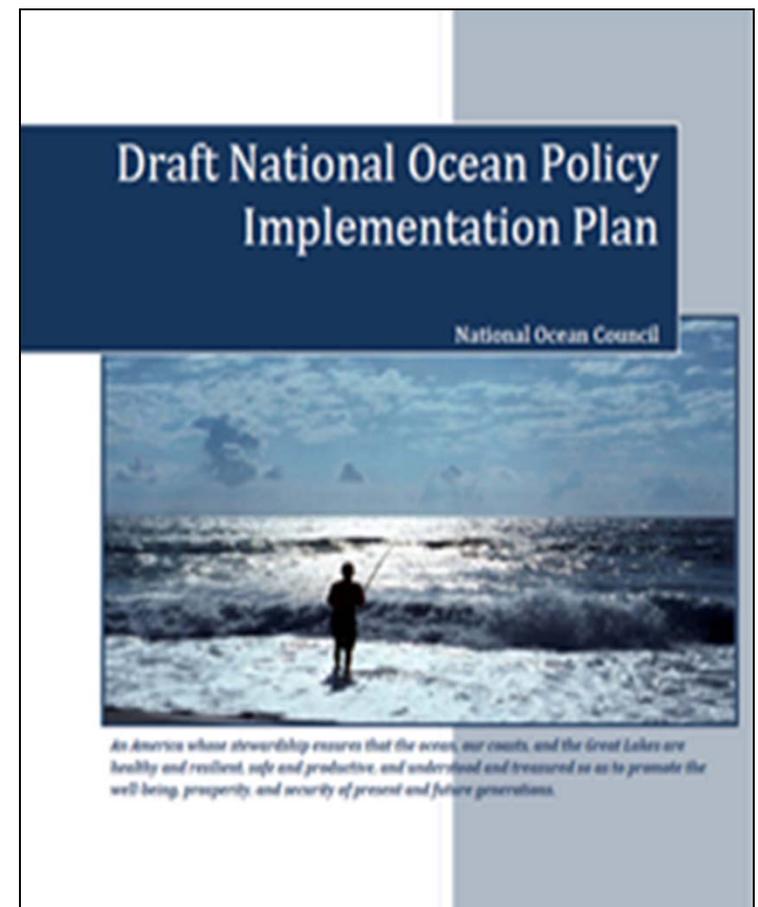
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*Draft National Ocean Policy Implementation Plan (118 pp)*  
<http://www.whitehouse.gov/administration/eop/oceans/implementationplan>

*OA identified as a “National Priority Objective”*

## **Resiliency and Adaptation to Climate Change and Ocean Acidification**

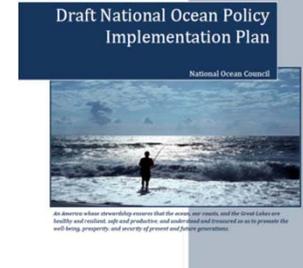
Strengthen resiliency of coastal communities and marine and Great Lakes environments and their abilities to adapt to climate change impacts and ocean acidification.



# National Ocean Council (2012)

*Draft National Ocean Policy Implementation Plan (118 pp)*

<http://www.whitehouse.gov/administration/eop/oceans/implementationplan>



## Related Actions

- **Strengthen and integrate observations** from the Nation's protected areas, research sites, and observing systems into a coordinated network of sentinel sites to track changes in the condition of ocean, coastal, and Great Lakes environments and communities.
- **Determine the impacts** of climate change, ocean acidification, and interacting stressors on ecological, economic, and social systems.
- **Provide critical projections** of climate change impacts on coasts and oceans at decision-relevant scales.
- **Assess the vulnerability** of coastal and ocean environments and communities to climate change and ocean acidification.
- **Strengthen interagency coordination** on the development and provision of information, training, guidance, tools, and support for adaptation practitioners.
- **Design, implement, and evaluate adaptation strategies** to reduce vulnerabilities and promote informed decisions.

# WA Climate Adaptation Response Strategy (2012)

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**Reduce shellfish vulnerability to ocean acidification by reducing land-based contributions of carbon and polluted runoff to the marine environment.**

**Strategy C-5.** Enhance our understanding and monitoring of ocean acidification (pH) in Puget Sound and coastal waters as well as our ability to adapt to and mitigate effects of seawater acidity on shellfish, other marine organisms, and marine ecosystems. (p96)

## Related Actions:

- Support the work of **Blue Ribbon Panel** on Ocean Acidification
- **Expand collaboration** with NOAA Fisheries, other federal agencies, nonprofit organizations, academic groups, and the shellfish industry **to enhance monitoring** to track biological and chemistry changes
- **Coordinate** with state and federal agencies **to improve monitoring** by evaluating and adopting improved pH measurement protocols.
- **Continue to actively address problems of pollutants** in marine waters by studying toxics and nutrients entering Puget Sound, and develop models to determine the effects of nitrogen discharges on dissolved oxygen levels in Puget Sound.
- **Continue to explore how Clean Water Act authorities can be used** to prevent or reduce localized effects from ocean acidification and climate change.