Ocean Research and Resources Advisory Panel
Consortium for Ocean Leadership

December 8-9, 2010

Conference Call-in: 888-387-8686
Pass code: 3232707#
Web Conference: http://go.webpresentnow.com/?meeting=4419662

Agenda

Wednesday, 8 December
8:15-8:45 Assemble/Breakfast
8:45 Call to Order (Designated Federal Official)
8:45-9:15 Review agenda; Welcome; Introductions (Paul Gaffney, Chair)
  • Welcome new members
  • Discuss ORRAP priorities and Work Statement 2010-2011
  • Review 27-28 July 2010 ORRAP Minutes and Actions
9:15-11:15 UPDATES
  • Approve Arctic Findings paper (Paul Gaffney) – 30 min
  • Ocean Observing Sub-panel (Molly McCammon) – 30 min
    o Discuss future of Sub-panel in view of IOOC FACA (Dave Kennedy)
10:15-10:30 BREAK
  • Industry Sub-panel (Paul Kelly and Randy Fisher) – 15 min
  • Education Sub-panel (Davis, St. Pé, Bartels, Yentsch) – 30 min
    o Approve courses of action for Sub-panel
    o Ocean Acidification Task Force (Dan Costa) – 15 min
11:30-12:00 DISCUSSION of future directions in view of previous session
12:00-12:30 Lunch
12:30-4:00 BRIEFINGS
12:30-1:30 ORRAP and the Gulf of Mexico oil spill (Steve Ramberg)
  • Update on Oil Spill Commission (Don Boesch)
  • Role ORRAP may/could play in Gulf Oil Spill studies in the future (Ramberg)
1:30-2:00  NOPP project selection process (Jim Kendall and Craig McLean -- IWG-OP Co-Chairs)

2:00-2:15  BREAK

- Geoengineering Session -- 2:15-4:00 (Margaret Leinen)
  * Ocean iron fertilization and the need for future research (Ken Buesseler)
  * Solar radiation management and interactions with the ocean (Phil Rasch)
  * Governance (Jane Long)

4:00-5:30  DISCUSSION

- Discussion on ORRAP input to the refresh of Charting the Course (ORPPIS) (Paul Gaffney)

5:30  Wrap-up / Review Action Items (Paul Gaffney)

6:30  Dinner

Thursday, 9 December

8:30-9:00  Breakfast

9:00-9:30  Reconvene (Paul Gaffney)

- Review previous day’s presentations, discussions and action items
- Schedule next meeting

9:30-10:30  National Ocean Council (Michael Weiss and Jerry Miller)
  - Organization, priorities, plans, CMSP activities, ORRAP engagement

10:00-11:00  Prospects for an Ocean Trust Fund (Tom Kitsos)

11:00-11:15  BREAK

11:00-1:00  DISCUSSION of future topics for consideration and focus

1:00-1:30  Lunch

1:30-1:40  ORRAP Member Information (DFO)

1:40-2:10  Public Comment Period (DFO)

2:10  Adjourn
Statutory Mission

• Advise the NORLC* on policies and procedures to implement NOPP*

• Advise NORLC* on selection of partnership projects and allocation of funds ... for implementation of projects

• Advise NORLC* on ... national oceanographic data requirements

• Any additional responsibilities [that] NORLC* [desires]

* Indicates statutory reference (10 USC 7901-7903). On July 19, 2010, the National Ocean Policy was released. Its enabling Executive Order dictates that the ORRAP will provide independent advice and recommendations to the National Ocean Council, which in turn will provide guidance and direction on areas for which it seeks ORRAP input.
ORRAP—NOC relationship

• Executive Order (19 July 2010) adopts the recommendations of the OPTF, including those relevant to ORRAP.
  – **ORRAP now provides “independent advice and guidance to the NOC”**
  – Two-way street: NOC provides “guidance and direction on the areas for which it seeks advice and recommendations”
  – Opportunity to collaborate with NOC on selecting priority topics ripe for ORRAP recommendations

• ORRAP communications with NOC structure:
  – NOC is directed to “reach out” to ORRAP in developing and revising plans to implement National Policy
  – NOC staff Director and Deputy responsible for ORRAP—NOC “coordination” Initially, ORRAP’s will work with this group to sort out lines of communication
  – Note: The NOC Tier Two group will carry out the statutory NORLC role
  – Note: IPCs and Steering Group are potential contacts for ORRAP too

• ORRAP membership would be reviewed to determine whether to include additional “representatives” to broaden the level of expertise.
  – Should not affect SECNAV’s statutory authority to approve ORRAP members
  – Law caps ORRAP membership at 18
  – Opportunity to clarify and solidify the nominations process
  – “Representatives” could mean Sub-panels

**NOTE:** The 19 July Executive Order revokes Executive Order 13366, which preceded the Ocean Action Plan. This revocation, however, does not affect ORRAP. NOPP enabling legislation still governs the existence and functions of an ORAP, which advises the NORLC*, now expected to operate as the Deputy-level membership of the NOC.
ORRAP Recent Output

• Delivered an “Ocean Research-to-Applications Transition” study. Fully endorsed by ICOSRMI.
• Commented on national “Ocean Research Priorities Plan and Implementation Strategy”
  – Worked with JSOST and commented on its draft revision in 2009
• Planned and participated in high-level Conference on Ocean Literacy
• Coordinated with Interagency Working Groups on Ocean Education and Ocean Observations
  – Joint meetings have occurred
• Received briefings on contemporary issues from Federal Offices and other issue leaders
  – Expose issues to a wider community, including Industry; public discourse
• Developed an ORRAP Ocean Priorities List for the Obama Administration; delivered immediately after the election
• Hosted Education Workshop in November 2009 with goal of revising ORRAP Education Strategy
  – Approved white paper (July 2010) as statement of education principles and priorities
• Submitted letter to Secretary of Education urging ocean content in national curricula standards
• Submitted letter to ICOSRMI strongly encouraging DoEd participation in interagency structure
• Submitted letters to JSOST/SIMOR and OPTF endorsing key ocean observing priorities
  – ORRAP Chair briefed the Ocean Policy Task Force in August 2009
• Submitted letter to NRC Board on Science Education urging inclusion of ocean science professionals in its deliberations
• Submitted letter to National Governors Association asking for endorsement of recommendation to include ocean science principles in improvements to state science teaching standards
ORRAP Recent Output, cont.

- Members individually generated ideas about ORRAP’s potential role with respect to the Gulf spill
  - A general “way forward” determined in July 2010 public session
  - Proactive, in anticipation of NORLC request and issuance of National Ocean Policy

- Industry Sub-panel held offline discussions with federal and private stakeholders in offshore renewable energy and developed prospectus for a case study for improving the permitting process
  - Considering hosting a “permitting process improvement forum” to be educated by the knowledgeable community and be able to make recommendations to full ORRAP – early 2011?

- Adopted Industry Sub-panel’s recommendations for ocean-and-energy principles

- Aggressively pursued/pursuing high-priority contemporary topics: CMSP, Arctic, ocean acidification

- **Established an Ocean Acidification Task Force (OATF)**
  - ORRAP delivered recommendations to IWGOA
  - Wrap-up report at December meeting

- New members with excellent expertise
  - Gaps remain, however. Being addressed in next round of nominations.

- Arctic Findings document to be approved at December meeting

- Chair, DFO and ORRAP staff have met with NOC staff twice to clarify expectations and logistics
  - Briefing from NOC staff at December meeting
Proposed Work 2010-11

• Respond to NOC / NORLC*. In the meantime ...

• Continue:
  – Promote recommendations in our Priorities for the New Administration report
  – Industry Sub-panel thrusts
    • Intersection of Marine Spatial Planning (MSP) and offshore industries (fish, oil/gas, trans, ports, recreation, renewable energy, research infrastructure)
  – Education Sub-panel thrusts
    • Agree on courses of action at December meeting
  – ORRAP pay close attention to Ocean Observing (IOOS principally)
  – Participate in NOPP partnership review and project review processes*
    • Addresses statutory mission
  – Provide timely advice to NOPP project selection team and future NORLC*

• New: Committee-as-a-Whole
  – Decide on role in the Gulf and execute the way forward
  – Decide on future of Ocean Observing Sub-panel in view of IOOC and IOOC FACA
  – Conduct forum on improving the Federal offshore renewable energy permitting and regulatory processes (early 2011?)
Analysis (backup)

- Good record, contributory to the Federal agencies, yet maintained independence
- "ORRAP Priorities for the New Administration" is strong and current
- Mainly connected to JSOST, less to SIMOR, not much to NORLC/ICOSRMI as they’ve not met recently
- Responsive to national priority topics. Worked quickly to stand up Ocean Acidification Task Force in response to agency plans and needs; deliver recommendations.
- Strong Ocean Observing Sub-panel
  - Strong recommendations continue on proper support for IOOS;
  - Continue to review integration of NOAA IOOS effort with NSF’s OOI effort, especially in data management and communications;
  - Strong recommendation about other agencies’ participation with NOAA (lead agency for IOOS)
- Strong recommendations from Industry Sub-panel
  - ORRAP recommendations made in report to Obama Administration
  - Reviewing contributions of offshore industry to ocean data collection needs
  - Continuing review of Federal permitting difficulties for offshore renewable energy projects
  - Intends to review intersection of marine industry sector with the concept of Marine Spatial Planning
- Trusted, credible ally of the Ocean Education community. Education Sub-panel parallels an IWG
  - ORRAP recommendations in report to Obama Administration
  - Recent focus on ocean competency standards and “out-of-the-classroom” experiences for K-12
  - New attention to education for the general public on ocean issues
- No unfulfilled taskings from NORLC/ICOSRMI
ORRAP
“Priorities for the New Administration” (backup)

• Increase and stabilize the fraction of the nation’s research budget directed at the ocean.
• **Support the Integrated Ocean Observing System (IOOS)** to provide the data and information needed to manage our ocean and Great Lakes resources.
• **Exploit advances in knowledge** to resolve major problems facing the nation.
• **Promote and “incentivize” an ocean renewable energy industry** to support America’s energy security and stimulate significant job growth.
• **Reclaim America’s leadership position in science and technology on the world stage** by building a workforce that excels in science, technology, engineering, and mathematics.
• **Pass an Organic Act for NOAA** so it has the authority, tools, and responsibility needed to lead the nation’s ocean enterprise.
• **Establish a National Ocean Advisor to the President** and promote partnerships among federal agencies.
• Pass critical pieces of ocean legislation.
Tuesday, 27 July

Linwood Vincent (Designated Federal Official – DFO) called the meeting to order and introductions were made around the room. Ian Dutton, President of the Alaska SeaLife Center, welcomed ORRAP to the location. The Mayor of Seward, Willard Dunham, greeted ORRAP with a formal proclamation welcoming the group to Seward and extending a standing invitation to return.

ORRAP members whose terms recently expired (Debra Hernandez, Peter Betzer, Robert Cowen, Shirley Pomponi, Celia Smith) were recognized for their outstanding service to the nation and were presented with commemorative plaques.

Minutes from the 15-16 March 2010 meeting were approved as written and action items from that meeting were reviewed. P. Gaffney reviewed the agenda for this meeting as well as ORRAP priorities captured in its 2010-2011 Work Statement.

Briefings – Alaska and the Arctic

ORRAP heard briefings on various high-priority topics related to Alaska and the Arctic: Collaborations (domestically and internationally); Ocean acidification; Methane hydrates; Oil and gas development and the industry’s research; Indigenous communities; and Coastal inundation and loss.

HIGHLIGHTS from the presentations and discussion:

- J. Farrell called attention to the need to act more aggressively on the following:
  - Implementing the Arctic Research & Policy Act as intended and to be consistent with the Coastal and Marine Spatial Planning (MSP) principles of the new National Ocean Policy
  - Implementing the Arctic Observing Network
  - Building the icebreaker fleet, which has applications beyond science missions
  - Oil-spill-in-ice research
  - Ocean research infrastructure
- There is a dearth of longitudinal studies on the effect of informal education on a person’s decision to pursue a career in natural sciences.
- The effectiveness of wetlands restoration projects is not being assessed well enough, as very little money is available for follow-up and long-term monitoring.
HIGHLIGHTS (continued):

- The robustness of ocean observing networks needs strengthening in order to measure ocean acidification, both in situ and – eventually – remotely.
- There is an immediate need to identify the likely range of human activities (e.g., oil and gas development, fishing, and tourism) in the coastal and offshore waters of the North Slope over the next 20 years, in order to get a sense of topics requiring further study.
- Industry environmental studies mainly focus on Environmental Impact Statements required by the NEPA process, but there is little focus on downstream monitoring and long-term environmental effects. University programs training people in industrial environmental science are needed in order to fill an oil and gas industry workforce need.
- Currently, western science has used an ad hoc or experimental approach when engaging indigenous knowledge in learning about climate change and the environment. A critically thought-out approach that values input from indigenous leaders is needed. Indigenous knowledge provides contextual information and can be used to pinpoint initial markers of environmental change.
- **ACTION:** ORRAP staff will draft a document encapsulating the major findings from the Arctic-related sessions ORRAP has heard over the past few years. It will be circulated for review this fall in time to be approved at the next ORRAP meeting.

**Ethics training**

Luis Leme from the Office of Naval Research administered mandatory Ethics training for ORRAP members.

**ORRAP Sub-panels – Issues for Attention and Action**

**Education Sub-panel:** The white paper describing ORRAP’s education strategy was approved as a statement of ORRAP’s education principles, priorities, and likely courses of action.

**ACTION:** ORRAP decided that it will rely on the Education Sub-panel to implement the following courses of action:

- Review the status and plans to use ocean data as an education tool, especially for public outreach.
- Continue the effort to include the use of ocean examples in general STEM education (this may require state, regional, and/or U.S. Department of Education involvement).
- Insist that the focus on ocean literacy expands beyond the formal education system and the informal science network to include the general public and members of Congress.
- Emphasize innovative workforce development efforts that stress diversity.
- Make the case for educational funding as an investment in the economy.
- Additional areas of focus include ocean acidification education and helping agencies find ways to devote funds to education without the agencies running afoul of their mandates.
ACTION: In ORRAP’s initial interactions with the newly created National Ocean Council (NOC), ORRAP will include a statement on education that explains ORRAP’s role in ocean education, describes the work it has completed, and presents opportunities for near-term engagement and impact.

Industry Sub-panel: A document describing the way forward for the Industry Sub-panel was endorsed. The way forward includes hosting a forum to identify specific improvement opportunities in the permitting process affecting the timely implementation of ocean renewable energy projects. This proposed forum would be held in late 2010 at the Consortium for Ocean Leadership. P. Kelly thanked Sub-panel member Jim Fahey for taking a leadership role in advancing the Sub-panel’s efforts.

Ocean Acidification Task Force: ORRAP approved a report, with minor changes, developed by the OATF designed to allow ORRAP to make informed recommendations to the federal government regarding ocean acidification. Approval of the report was particularly important in order to provide timely input for the Interagency Working Group on Ocean Acidification (IWGOA) as it develops plans and it reports to Congress. ORRAP staff will transmit the report, containing the ORRAP-approved recommendations, to the IWGOA.

Presentation of NOPP Excellence in Partnering Award

P. Gaffney presented the NOPP Excellence in Partnering (EiP) Award to Dr. Cameron Wobus, who was representing this year’s winning NOPP research project, entitled ”Toward a Predictive Model of Arctic Coastal Erosion in a Warming Climate.” The EiP award is issued to a NOPP project that best demonstrates the value of partnering that is the central tenet of NOPP. Presentation of the award was followed by a presentation about the motivation, methods, and results of the project.
Wednesday, 28 July

L. Vincent called the meeting to order. P. Gaffney reviewed the highlights of the previous day’s presentations and discussions. Given the importance of CMSP to the ocean community and its high profile in the National Ocean Policy, ORRAP considered establishing a CMSP Sub-panel, although no decision was made.

Margaret Leinen and Steve Ramberg were selected as Vice-Chairs, effective immediately.

**ACTION:** P. Gaffney agreed to prepare a brief statement to the NOC highlighting recent and current ORRAP work, summarizing key accomplishments, and requesting the opportunity to brief the NOC.

**ORRAP and the Gulf of Mexico oil spill**

D. Boesch described the work to date of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, which is a Federal Advisory Committee Act body charged with examining the cause of the accident, develop options for safeguarding against future accidents, and reporting to the President on its findings. He explained that the Commission is making a concerted effort to interact with other groups that have expertise beyond that of the Commission members. The Commission must submit its final report within six months of its first meeting, which occurred on 12-13 July 2010.

M. Leinen described the establishment of a BP Advisory Committee to advise on the administration of BP’s $500 million research fund in support of high-quality science projects. The fund would be administered by a third party organization and projects would be required to place their data in a publicly held database. The future of the fund is unclear, however, as Gulf States are pushing hard to gain control over the fund.

P. Gaffney informed the group that several current and former ORRAP members held informal discussions – for consideration by the full ORRAP – about potential roles ORRAP could play with respect to the Gulf spill. Key points from those discussions include:

- A central theme is uncertainty, specifically regarding fate and effects of oil, coordination of efforts, and availability of data;
- Effective coordination and communications have been severely lacking;
- ORRAP should self-initiate involvement and also avoid duplicating the efforts of other groups. Its specific focus should be data because it falls within ORRAP’s statutory charge, it falls within ORRAP member expertise, and its coordinated collection and distribution is critically important to understanding the current situation and avoiding uncertainty in the future.
P. Gaffney and M. Leinen excused themselves from the remainder of the session in order to avoid any conflicts of interest. ORRAP held discussions on its possible role and the types of recommendations it could make to the federal agencies.

**HIGHLIGHTS from the discussion:**

* Communications and the flow of information has been stymied and politicized.

* Recommendations should focus on:
  - Making use of data to increase the nation’s scientific capacity to understand the fate and effects of a spill;
  - Ensuring peer review and academic freedom for any research that is conducted;
  - Developing a comprehensive science plan;
  - Learning lessons from the Exxon Valdez spill;
  - Setting up a tracking database to make interested parties aware of data and studies;
  - Employing the science community to be useful in responding to (and preventing) an event such as this in the future.

**ACTION:** S. Ramberg and D. Boesch will visit Steve Murawski, who is leading NOAA’s science response to the spill, to recap these discussions and ask how ORRAP can be helpful.

**Briefings on Ocean Observing**

Continuing its focus on ocean observing as a priority topic, ORRAP heard two briefings, and group discussion followed the presentations.

- E. Lindstrom described an international partnership effort to get governments and organizations to embrace an integrated framework for a global sustained ocean observing system. His intention was to use ORRAP as a focus group to review the nascent framework and suggest modifications. Then, once his working group develops recommendations for such a framework by October 2010, he would return to present the framework for ORRAP validation.

  The Global Ocean Observing System (GOOS) synergizes with the U.S. Integrated Ocean Observing System (IOOS) in that nations’ observing systems are considered “business units” of GOOS. One benefit of many of the national systems is that they already have well-defined requirements and outputs.

- M. McCammon described the priorities and activities of the Alaska Ocean Observing System (AOOS), which is a regional component of IOOS. The primary objectives of AOOS are to deliver information (as opposed to merely data) to end users and to improve models. AOOS is working on partnerships with industry in order to share and make the best use of data. She also offered various recommendations, available in her presentation posted on the ORRAP website.

A question was raised about the formal connection between ORRAP and the eventual Advisory Committee to the Interagency Ocean Observation Committee (IOOC). The Advisory Committee was called on in legislation to advise the IOOC on matters pertaining to IOOS. One possible connection could be made by designating an
ORRAP member to sit as an ex officio member of the Advisory Committee. ORRAP will reach resolution on this issue at a future meeting.

**Next Meeting**

It was agreed that the next ORRAP meeting would occur in late November or December in Washington, DC, at the Consortium for Ocean Leadership. The exact dates are subject to member and DFO availability. Possible meeting topics include:

- Briefing from an NOC member and/or staff on NOC organization, priorities, business plans, and interaction with ORRAP;
- Update from NOC staff on CMSP activities;
- Update from a Joint Ocean Commission Initiative (JOCI) representative on the potential Ocean Trust Fund;
- Briefings on geoengineering;
- Approval of the Arctic findings document;
- Updates and proposed paths forward for the ORRAP Sub-panels;
- Future of the Ocean Observing Sub-panel in view of the IOOC and IOOC Advisory Committee;
- Discussion of future ORRAP topics and paths forward.

**Public Comment Period**

B. Chicoski relayed comments from former ORRAP member Bob Wayland, who wished to express concern that decision makers in the Gulf States were making hasty decisions based on the principle of “doing something is better than doing nothing.” He noted that certain current and proposed coastal engineering projects will do little – if any – good, and that they pose great potential to change the nature of the Gulf Coast in ways that have not been investigated and are likely to be more harmful than helpful. He stressed the need for thoughtful, science-based decision making.

**Adjourn**

The meeting adjourned at 1:00pm.
### Meeting Attendees

<table>
<thead>
<tr>
<th>ORRAP Members</th>
<th>Organization</th>
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<tr>
<td>Dennis Bartels</td>
<td>Exploratorium</td>
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<tr>
<td>Peter Betzer <em>(term expiring)</em></td>
<td>University of South Florida</td>
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<td>Don Boesch</td>
<td>University of Maryland; Ocean Studies Board</td>
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<td>Dan Costa</td>
<td>University of California, Santa Cruz</td>
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<tr>
<td>Bob Cowen <em>(term expiring)</em></td>
<td>University of Miami</td>
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<tr>
<td>Jane Davis</td>
<td>Walt Disney World Animal Programs</td>
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<tr>
<td>Randy Fisher</td>
<td>Pacific States Marine Fisheries Commission</td>
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<td>Paul Gaffney, Chair</td>
<td>Monmouth University</td>
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<td>John Gannon</td>
<td>International Joint Commission</td>
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<td>Debra Hernandez, Vice-Chair <em>(term expiring)</em></td>
<td>Southeast Coastal Ocean Observing Regional Association</td>
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<tr>
<td>Paul Kelly</td>
<td>Energy &amp; Ocean Policy Consultant</td>
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<td>Margaret Leinen</td>
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<td>Steve Ramberg</td>
<td>Areté Associates</td>
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<td>Andrew Rosenberg <em>(via phone)</em></td>
<td>Conservation International</td>
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<td>Kerry St. Pé</td>
<td>Barataria-Terrebonne National Estuary Program</td>
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<td>Clarice Yentsch</td>
<td>Nova Southeastern University</td>
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<th>Invitees and others attending</th>
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<tr>
<td>Linwood Vincent, Designated Federal Official (DFO)</td>
<td>Office of Naval Research</td>
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<tr>
<td>Russ Andrews</td>
<td>Alaska SeaLife Center</td>
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<td>Peter Brewer</td>
<td>Monterey Bay Aquarium Research Institute</td>
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<td>Mayor Willard Dunham</td>
<td>City of Seward</td>
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<td>Ian Dutton</td>
<td>Alaska SeaLife Center</td>
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<tr>
<td>Jim Fahey <em>(via phone)</em></td>
<td>California Arts &amp; Sciences</td>
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<tr>
<td>John Farrell</td>
<td>U.S. Arctic Research Commission</td>
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<tr>
<td>Jeanne Hanson</td>
<td>National Oceanic and Atmospheric Administration</td>
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<td>Anne Hoover-Miller</td>
<td>Alaska SeaLife Center</td>
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<tr>
<td>Eric Lindstrom</td>
<td>National Aeronautics and Space Administration</td>
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<td>Michael Macrander</td>
<td>Shell Global Solutions</td>
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<td>Jeremy Mathis</td>
<td>University of Alaska Fairbanks</td>
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<tr>
<td>Molly McCammon</td>
<td>Alaska Ocean Observing System</td>
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<tr>
<td>Larry Merculieff</td>
<td>Seven Generations Consulting</td>
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<td>Shirish Patil</td>
<td>University of Alaska Fairbanks</td>
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<td>Orson Smith</td>
<td>University of Alaska Anchorage</td>
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<td>Bill Streever</td>
<td>BP</td>
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<td>Cameron Wobus</td>
<td>Stratus Consulting</td>
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<td><strong>NOPP Office</strong></td>
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<tr>
<td>Kamil Arnaiz-Nolla</td>
<td>Consortium for Ocean Leadership</td>
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<tr>
<td>Mel Briscoe</td>
<td>Consortium for Ocean Leadership</td>
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<td>Ben Chicoski</td>
<td>Consortium for Ocean Leadership</td>
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<td>Hilary Goodwin</td>
<td>Consortium for Ocean Leadership</td>
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Actions

1) Topic: OATF *(DONE – OATF meeting 6-7 Dec)*
   
   **Action:** Meet with IWGOA leadership (via phone?) to agree on next OATF steps
   
   **Deadline:** September
   
   **Who:** Costa, with Betzer and Brewer

2) Topic: NOC *(OBE – ORRAP Chair and DFO have met with NOC staff)*
   
   **Action:** Draft letter to NOC Tier Two co-chairs (NORLC)
   
   **Deadline:** Before NOC meeting (September?)
   
   **Who:** Ben

3) Topic: ORRAP findings on the Arctic *(For approval in December)*
   
   **Action:** Draft a findings document
   
   **Deadline:** September - ORRAP review;
   December meeting - approval
   
   **Who:** Ben

4) Topic: Ocean Science Educators Retreat (OSER) on October 20 *(DONE – Yentsch attending)*
   
   **Action:** Tell Ben if you want an invitation – At least one Education Sub-panel member should attend
   
   **Deadline:** August 27
   
   **Who:** All ORRAP
5) **Topic: Next meeting (DONE – Decided on Dec 8-9)**
*Action*: Reply to Ben on preferred dates
*Deadline*: ASAP
*Who*: All ORRAP

6) **Topic: Gulf of Mexico oil spill**
*Action*: Proceed with courses of action decided upon at July meeting
*Deadline*: ASAP
*Who*: Sub-group (Ramberg, Kelly, St. Pe, Rosenberg) with Ben’s help
*Action*: Meet with Steve Murawski (NOAA)
*Who*: Ramberg, Boesch

7) **Topic: Board on Science Education (BoSE) (DONE)**
*Action*: Send to BoSE the ORRAP ocean education white paper, with cover letter
*Deadline*: August 27
*Who*: Gaffney, with Ben’s help

8) **Topic: Education Sub-panel**
*Action*: Confer with Sub-panel to propose courses of future action;
*Action*: Propose at December ORRAP meeting
*Deadline*: October 15
*Who*: Davis and St. Pe, with Bartels and Yentsch and Ben’s notes
9) Topic: Thank you notes to presenters (DONE)
   Deadline: ASAP
   Who: Ben

10) Topic: ORRAP nominees
    Action: Shepherd approval of 4 nominees
    Deadline: ASAP
    Who: Linwood

11) Topic: OATF report (DONE)
    Action: Send OATF report, with ORRAP-approved recommendations, to IWGOA
    Deadline: ASAP
    Who: Ben

12) Send ORRAP’s BoSE letter to Bartels for use in future discussions with BoSE (DONE)
    Deadline: ASAP
    Who: Ben
NEXT MEETING

• Washington, DC
  – **Confirmed:**
    • 8-9 December 2010 (Wed—Thurs)

• Agenda items to include:
  – NOC rep briefing on organization, priorities, business plans
  – MSP update from NOC staff
  – JOCI Ocean Trust Fund update
  – Geoengineering
  – Approve Arctic findings
  – Sub-panel updates and paths forward
  – Future of Ocean Obs Sub-panel in view of IOOC and IOOC FACA
  – Discussion of future topics and paths forward
  – Other…. 
Subject: Key findings and recommendations related to Arctic research and resource management

Background:
Over the past 14 months, ORRAP requested and received 19 presentations by subject matter experts on Arctic and/or Alaskan coastal and ocean issues. The presenters come from academia, industry, government and native peoples. This paper synthesizes the presentation key points and ORRAP member discussions.

ORRAP notes that, in approximately the same period, the Department of Defense (Navy), the National Research Council, the CIA-funded MEDEA project and others – especially those concerned about a better understanding of climate change – have addressed Arctic ocean issues. We also note ramped-up rhetoric and investment by our Arctic neighbors and others (e.g., China) for resources, security and climate-driven opportunity reasons.

To punctuate the point, ORRAP notes the President’s recent approval (Executive Order 135347 of 19 July 2010) of the White House Ocean Policy Task Force Report made 28 references to the Arctic and designates the Arctic as one of its national priority objectives.

Findings and Recommendations:

1. General. The nation and the State of Alaska have jurisdictionally-inspired responsibility for understanding the oceanographic and coastal environmental processes and conditions surrounding Alaska, which bears the largest Exclusive Economic Zone (EEZ) and largest coastline in the United States (nearly 44,000 miles according to the Alaska Department of Natural Resources) and includes four Large Marine Ecosystems (Beaufort Sea, Chukchi Sea, Bering Sea, and Gulf of Alaska). While ORRAP agrees that Federal and state ocean/coastal planners show a definitive responsibility for Alaska, we note that understanding the processes and conditions of the entire Arctic Ocean region – its coasts, bottom, water volume and ice cover – is also critically important to understanding climate, EEZ claims, resource management, maritime transportation, military security and maritime safety. Therefore, we will refer to the Arctic throughout this paper, noting that all Alaskan coastal and ocean references are included by our references to the Arctic.

There is an immediate need to identify the likely range of human activities (e.g., oil and gas development, fishing, tourism, industry, etc.) in the coastal and offshore waters of the North
Slope over the next 20 years. ORRAP recommends that Federal, state, tribal, academic and commercial entities collaborate to assess current and forecasted coastal and near-coastal development activities so as to inform science and ocean observing planning.

ORRAP supports the Arctic Research & Policy Act and sees its implementation as supportive of the principles of Coastal and Marine Spatial Planning (CMSP) in the new National Ocean Policy.

2. **Ocean and Coastal Observations.** ORRAP is on record as stating that the United States must adequately capitalize and operate an Integrated Ocean Observing System (IOOS). ORRAP has consistently stated that IOOS should be treated as a top priority within existing budgets, not just if new funding is assigned to the lead or partner agencies. The Alaska Ocean Observing System (AOOS), as the IOOS regional association for the U.S. Arctic, stands poised to help develop and implement a comprehensive, ocean observing system to meet the multitude of operational stakeholder needs in the U.S. Arctic, but needs funding to do so. AOOS is the only entity with the mission of compiling and integrating ocean data collected by federal and state agencies, academia, NGOs, and the private sector.

Because of the NSF-centric Arctic Observing Network’s (AON) role in contributing to a better scientific understanding of the entire Arctic, ORRAP sees IOOS attention to the AON as a top-tier priority. AON while a science program, has a long term observing character and potential. Therefore, we also believe that Federal funding of the AON should be considered a top priority, and encourage the program to commit to long-term programs to address research needs in the U.S. Arctic.

ORRAP was impressed by a presentation from the oil extraction industry in Alaska regarding its ocean, coastal and ice observing capabilities and investments. We noted that this quality and comprehensive capability is driven by NEPA-EIS requirements. ORRAP sees downstream benefit to continuing the oil industry measurements even when no longer needed by industry and to providing public access to the data; funding to continue these oil industry-initiated “observatories” may require new funding sources and extensive collaborations and partnerships.

In Alaska, and throughout the Arctic, various groups collect various kinds of ocean/coastal data for various reasons: research, resource management, marine operations, governmental purposes, regulatory reasons, to support short-term projects, etc. ORRAP sees benefit in regional, collaborative Arctic observing planning and data exchange. Further, noting the logistical difficulty and cost of long time series observations in the Arctic, we see such a deliberate collaborative process as valuable in prioritizing observing goals and investments, and encourage those federal agencies, regional research entities, academic institutions and
industry working in the Arctic to make development and implementation of a comprehensive Arctic research and monitoring program a top priority.

ORRAP heard compelling and practical advice on coastal observing from the perspective of Alaska’s only true “long term observers” – its indigenous peoples. We are convinced of the value of collecting advice from native peoples along the coasts when establishing observing networks.

MEDEA visited the USCG Icebreaker HEALY and heard about the state of the U.S. ice-capable research and icebreaking fleet. Clearly this national capability has atrophied and does not match the priority for research and operational ocean/ice observation in and around the Arctic ice sheet. The role of the icebreaker will likely increase in an increasingly ice-free summer Arctic, even as that statement may sound contradictory. ORRAP joins others in calling for a greater investment in ice-capable scientific ships for use in the Arctic.

ORRAP heard presentations from the Navy-led multi-agency National Ice Center and the CIA-funded MEDEA project. We find that these two national security-inspired programs are capitalizing on capabilities that the broad national security community (defense and intelligence communities) can bring to civil Arctic researchers and scientific and operational observers. We see such deliberate observation-centered cross-agency collaboration as a model for others. We recommend that the new National Ocean Council (NOC) be fully briefed on the MEDEA project and its lessons for cross-agency collaboration.

When reviewing the state of Arctic observations, especially those desired from under the ice, there is no continuous measuring system, nor is there a volumetric system, in place or planned. While environmental regulation concerns must be considered, ORRAP saw great value in revisiting acoustic tomographic techniques pursued successfully in the early 1990s jointly with the Russians.

Sea level rise can be one of the more troubling results of global warming theories. The loss of land ice, especially of Greenland’s glacial ice mass, to the Arctic Ocean is most concerning. The mechanisms are not well known, especially for those geophysical situations in which ice sheets extend over the Arctic Ocean’s waters but are still attached to land. ORRAP is supportive of Federal investment in research, in collaboration with international partners, to better understand the contribution the ocean might be playing to the loss of these overhanging land ice sheets.

3. **Exclusive Economic Zone (EEZ).** There remain in the Arctic many unsolved submarine geology mysteries. Collecting Arctic Ocean bottom geophysical data has always been difficult. Ice camps, oil industry exploration, icebreaker/ice-strengthened research cruises and Navy/NSF-supported SUBICEX expeditions are all episodic at best. In view of the
UNCLOS rules that govern scientific rationale for extending a nation’s EEZ beyond 200 nautical rules, ORRAP sees the value in deliberate planning and investing in geophysical surveys off the north coast of Alaska to make the best case for the U.S. extending its EEZ poleward.

4. **Hydrocarbons in the Arctic.** As ORRAP concluded its Arctic review, the Gulf of Mexico oil spill occurred. ORRAP, therefore, notes that research about oil in/on/under the ice is sparse and should be considered when oil spill research funds are distributed as a result of BP “fines.”

Methane hydrates (clathrates) received some national attention during the oil spill capping attempts in the Gulf of Mexico. We know that methane in hydrate form, in many of the world’s coastal ocean sediments and ashore in high latitude, is an enormous energy resource. ORRAP sees value in continued, deliberate Federal review and discussion of research on methane hydrate exploration, extraction and environmental benefits and concerns.
The National Oceanographic Partnership Program (NOPP) 2009-2010 Update

Overview of Presentation

- Brief history of NOPP & ORRAP Legislation
- NOPP and the National Ocean Policy
- NOPP Funded Research
- Looking forward
NOPP Legislation

The 1997 Defense Authorization Act (Public Law 104-201) established the National Oceanographic Partnership Program (NOPP) for two purposes:

1 To promote national goals of assuring national security, advancing economic development, protecting quality of life, and strengthening science education and communication through improved knowledge of the ocean; and

2 To coordinate and strengthen oceanographic efforts in support of those goals by:
   a) Identifying and carrying out partnerships among federal agencies, academia, industry, and other members of the oceanographic scientific community in the areas of data, resources, education, and communication, and
   b) Reporting annually to Congress on the Program.

NOPP Legislation

The 1998 Defense Authorization Act (Public Law 105-85) defined responsibilities of ORAP [now ORRAP]:

RESPONSIBILITIES.—The Council [NORLC] shall assign the following responsibilities to the Advisory Panel:

1 To advise the Council on policies and procedures to implement the National Oceanographic Partnership Program.

2 To advise the Council on selection of partnership projects and allocation of funds for partnership projects for implementation under the program.

3 To advise the Council on matters relating to national oceanographic data requirements.

4 Any additional responsibilities that the Council considers appropriate.
NOPP and the National Ocean Policy

NOPP is an effective forum for development of new interagency initiatives and priorities that transcend single agency agendas. As strategic action plans are developed for each of the National Priority Objectives of the National Ocean Policy, it is critical that the interagency ocean community recognize that partnerships and collaboration are critical for the execution of the national priority objectives.

- NOPP and IWG-OP have demonstrated success at **Coordinating & Supporting** (4) management of our marine environments.
- NOPP and IWG-OP have focused and dedicated resources to **Ocean, Coastal, and Great Lakes Observations, Mapping and Infrastructure** (9)
- **Informing Decisions and Improving Understanding** (3) is strongly related to one of the goals from the NOPP strategic plan to promote lifelong ocean education
- The NOPP and IWG-OP agencies have held a long interest in the **Changing Conditions in the Arctic** (8)

NOPP Funding Criteria

Two or more agencies collaborate on the funding announcement. This collaboration can include in-kind support.

For Proposers - Team efforts are required among two of the three sectors: academia, industry (including NGOs), and government (including State and Local).
Between 1997 and 2010, $312.4 million** was spent on 163 research projects.

![Graph showing investment in NOPP-funded activities from FY 1997 to FY 2009.](image)

**Figure: FY 1997-2009 investment in NOPP-funded activities, including both NOPP-Solicited Projects and NOPP-Managed Activities. Note that the dollar amounts shown are those spent each year; out-year commitments are not shown.

Examples of the diverse range of NOPP-funded research topics include:

- Long Term Impacts of Deployments of Tags on Whales
- Atlantic Deepwater Canyons
- Offshore Renewable Energy
- Acoustic Technologies to Monitor Aquatic Organisms
- Autonomous Sensors for Measurement of Chemical & Biological Properties of Ocean
- Many others!
FY09 NOPP-Funded Topics

FY09
• Improving Wind Wave Predictions: Global to Regional Scale
• Sensors for Measurement of Biological, Bio-Optical, Optical or Chemical properties of the ocean
• Improving Tropical Cyclone Intensity Forecasting

Results
• 19 total funded projects
• $18.7 M in total funding
• USACE, BOEMRE (formerly MMS), NASA, NOAA, NSF, and ONR sponsored

More detailed information available at www.nopp.org/funded-projects/.

FY10 NOPP-Funded Topics

FY10
• Improving Attachments of Electronic Data Loggers to Cetaceans
• Developing Environmental Protocols and Monitoring to Support Ocean Renewable Energy and Stewardship
• Exploration and Research of Mid-Atlantic Deepwater Hard Bottom Habitats and Shipwrecks with Emphasis on Canyons and Coral Communities

Results
• 13 total funded projects
• $21.7 M in total funding (~$27 M with in-kind contributions)
• BOEMRE, DOE, Exxon-Mobil, NFWF, NOAA, NSF, ONR, USGS sponsored

More detailed information available at www.nopp.org/funded-projects/.
Case Study: Federal Leveraging

- NOPP FY 2010 Topic- Exploration and Research of Mid-Atlantic Deepwater Hard Bottom Habitats and Shipwrecks with Emphasis on Canyons and Coral Communities
- $3M funding contribution from BOEMRE
- $3M contribution from NOAA OER for research vessels and Jason ROV (3 cruises)
- $3.4M contribution from USGS for 4 PIs and associate staff time for 4 years
- While the awarded project, led by CSA International, receives $3M in funding, the total project worth is $9.4M

Development of NOPP-Funded Topics

- **Typically initiated via interactions among agency program managers.**
- Member agencies (plural!) informally propose NOPP research topics to IWG-OP, which encourages or discourages.
- Preliminary interagency partnerships are formed, tentative levels of support are pledged, and draft solicitation (Broad Agency Announcement or Request for Proposals) language is developed.
- IWG-OP approves funding announcement language, which is then announced by the lead agency as a BAA or RFP.
- Then comes the hard part…
**NOPP Funding Process**

1. Research topics developed by agencies.
2. Announcement for funding.
3. Submission deadline.
4. Proposal processing by lead agency and NOPP Office.
5. Peer reviewers (panel) solicited.
6. Written reviews submitted for each proposal by panelists.
7. In-person panelists meeting led by program managers.
8. Proposal discussion and scoring made by panel.
9. Review of panel scores by agency program managers.
10. Funding agreements, selection and announcement of funded projects.

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**Excellence in Partnering Award**

**Toward a predictive model of Arctic coastal retreat in a warming climate, Beaufort Sea, Alaska**

- Research partners include the University of Colorado (Cooperative Institute for Research in Environmental Sciences & Institute of Arctic and Alpine Research), Naval Postgraduate School, U.S. Dept. of Interior
- Funding partners for this topic included ONR, BOEMRE, NSF, and Shell

*A core principle in NOPP collaborations has been cross-sector researcher partnerships and multiple agency funding partnerships.*
Looking into the Future

- Currently reviewing FY 2011 U.S. Integrated Ocean Observing System submitted Proposals
- FY 2011 Marine Mammal Detection and Monitoring Funding Period just closed; ___ proposals submitted
- Currently developing a NOPP funding opportunity on near term research for the Deepwater Horizon oil spill
- Developing a NOPP fast response mechanism

What is the bottom line?

Long-term collaboration of federal agencies motivated by common needs

The NOPP Approach
Identify areas that are important to two or more agencies, and that would most benefit from a partnership approach

Value Proposition
Working together achieves more, and does so more efficiently, than working alone
Questions/Discussion?

Reference Slides

Photo by Tom Weingartner
Why is Partnering Important?

1) Address critical national priorities that cannot be accomplished by a single agency or sector;

2) Address priority issues that bridge the mandates of individual federal agencies;

3) Contribute to the cutting edge or forefront of interdisciplinary and intersector science and technology;

4) Help ensure that institutional resources are invested and leveraged wisely, while planning for the future; and

5) Provide the necessary flexibility for supporting new, emerging issues that may not yet be part of a “mandate” but are of interest and value to many.

NOPP Funding Process

- Research topics developed by agencies.
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- Review of panel scores by agency program managers.
- Funding agreements, selection and announcement of funded projects.
Proposal Review Criteria

Proposals are reviewed based on:
• Relevance of the proposed research to NOPP objectives;
• Overall scientific and technical merits of the proposal;
• Level of support of critical research objectives or operational goals;
• Quality of proposed partnerships;
• The offeror’s capabilities, related experience, and facilities that are critical to the proposal objectives;
• The long-commitment of the partners to the proposed objectives;
• The qualifications and experience of the proposed PI and key personnel; and
• Reasonableness of cost.
“Give me half a tanker of iron and I’ll give you the next ice age”

J. Martin, quote from WHOI talk in 1988

Ken Buesseler
Woods Hole Oceanographic Institution
http://cafethorium.whoi.edu
Summary of Ocean Geoengineering & C mitigation options

1. Ocean fertilization to increase carbon sequestration
   ✔ adding iron, nitrogen, other nutrients
   - ocean pumps to bring deep water nutrients (and CO₂) to surface

1b. Ocean fertilization to increase DMS production
   - dimethyl sulfide stimulates cloud formation

2. Dispose of carbon in the deep sea (or below sea floor)
   - liquid CO₂, crop wastes, charcoal/biochar
   - must also consider impacts/costs of massive C removal from land

3. Change ocean chemistry to increase CO₂ uptake
   - takes mega tons of chemical reagents to change alkalinity

4. Make the ocean white (clouds/floats)
   - treats climate symptoms, so no decrease in CO₂
   - ocean acidification is not improved by solar management
   - decreases light, hence algal CO₂ uptake decreases
Can iron (dust) enhance ocean’s “biological pump”?

Natural pathway for rapid carbon sequestration in deep sea

Small changes to biopump can have big impacts:

✓ 10 Gt C/yr
✓ Increase remineralization depth by 24 meters, decrease atmos. CO₂ by 10-27 ppm
1. “Just add iron” — small amounts of iron enhance algal growth in some locations

- Graph showing chlorophyll levels with and without iron

2. Can iron increase ocean carbon sequestration?

- Most carbon does not reach deep sea, <10%
  (range 1-50%)

- Deeper = longer sequestration

- Diagram showing carbon cycle:
  - Seasonal
  - Decadal
  - Centennial
13 major iron fertilization experiments since 1993
& studies of natural Fe sources


Map of surface ocean nitrate
Increase in phytoplankton seen after iron addition

1. add iron
2. see “bloom”
   - 13 experiments
3. see $CO_2$ decrease
   - but only in surface

R. Barber et al.
What controls the ocean response to iron?

“Location, location, location…”

Phil Boyd, U. Dunedin, NZ

Initial conditions matter both for C uptake and C sequestration

- light
- temperature
- season
- winds
- biota
- currents etc.

Maximum Chl a [mg.m-3]

De Baar et al., 2005
Multiple iron experiments resulted in variable biomass & CO₂ uptake
- what about other consequences?

Numerous biogeochemical and biophysical "side effects". Some may help combat climate change, some exacerbate it

Andrew Watson - Univ. East Anglia

- other greenhouse gases (DMS, CH₄, N₂O)
- biophysical effects (light)

Law and Ling, 2001
What happens below the surface?

- Add iron here
- Collect C on sinking particles here

Boyd et al. 2004

- Not so easy to measure
- Need longer experiments
Ocean Iron Fertilization

Science is certain regarding-
1. Small iron additions can stimulate algal blooms & CO$_2$ uptake
2. Natural iron rich seas are productive & sequester more CO$_2$

Science is uncertain regarding-
1. Will it work? how much CO$_2$ & how long (potential - 100’s million tons C/yr)
2. What are the ecological consequences? intended & unintended
3. What is variability & predictability? especially at larger & longer scales
What comes next?

Scientific research priorities are clear
✓ Larger & longer experiments
✓ Follow subsurface fate of C
✓ Study ecological consequences
✓ Studies of other gases- $O_2$, $N_2O$, $CH_4$, DMS
✓ Improve models

But who will step up to the plate? NSF? NOAA? DOE? commercial?

International regulation important- London Convention
Some new science results- Indian/German cruise Jan. 2009

The LOHAFEX eddy

Temperature: 6-7°C
Silicic acid: ~1 μM
Nitrate: 20 μM
10 t in 300 km²

Controversy in Their Wake, Geoengineering Experiment in Southern Ocean to Begin

V. Smetacek & Naqvi et al.
Some scientific conclusions of **LOHAFEX**

1. **Iron addition stimulated production.** Accumulation rates of phytoplankton increased for a very short time only (if at all) because of heavy grazing pressure by zooplankton.

2. **LOHAFEX showed** that iron fertilization of nutrient-rich \( \text{(NO}_3,\text{PO}_4) \) waters does not necessarily lead to carbon export and thus \( \text{CO}_2 \) uptake

   \[-\] Only diatoms, which are protected against grazing, are able to transport large amounts of carbon to the deep sea.

3. The state and functioning of the whole ecosystem plays an essential role; in particular: the plankton assemblage (initial conditions) and the amount of silicic acid.

\[\Rightarrow\] **Iron fertilization makes no sense here!** (from C. Klaas, July '10)

**DISCOVERY April 2009**

**Adding Iron to Ocean Won't Stop Warming**
What can be learned from natural OIF events?

Volcanic ash fuels anomalous plankton bloom in subarctic NE Pacific
Hamme et al. GRL Sept. 2010
“Despite the huge area of iron addition and the optimal time of year when there was plenty of sunlight, the impact of this August 2008 event in terms of carbon dioxide absorption was quite small,” Hamme said.

**BUT**

- 0.01 Pg C sequestered = 0.01 Gt C = 40 million tons CO₂
  or equivalent to 85 million barrels of oil;
- 940 million tree seedlings grown for 10 years
- no harmful effects (no reported decline O₂, increase HABs)
- pH increased from 8.08 to 8.12 (reduces acidification)
- “some evidence” that much of the 0.01 Pg C was exported from the surface ocean
- short event/small area
Sparks fly over theory that volcano caused salmon boom - Could volcanic ash feed ailing fish populations?

“Tim Parsons, one of Canada’s most eminent fisheries researchers, has suggested that iron in the ash from the volcanic eruption on Kasatochi island, which spurred a phytoplankton bloom, could have indirectly provided a feast for the salmon”
Still some skeptical voices-

Ocean fertilization: time to move on

Adding iron to the ocean is not an effective way to fight climate change, and we don’t need further research to establish that, say Aaron Strong, Sallie Chisholm, Charles Miller and John Cullen.  

"The specific effects of global-scale ocean fertilization are hard to predict, because ocean's response is dependent upon scale.... Small-scale experiments are inherently inadequate to verify model predictions"

Iron enrichment stimulates toxic diatom production in high-nitrate, low-chlorophyll areas

Charles G. Trick\textsuperscript{a,1}, Brian D. Bill\textsuperscript{b,c}, William P. Cochlan\textsuperscript{b}, Mark L. Wells\textsuperscript{d}, Vera L. Trainer\textsuperscript{c}, and Lisa D. Pickell\textsuperscript{d}

PNAS March, 2010

"The findings establish potential consequences for developing toxic algal blooms in pelagic ecosystems"
Workshop on Ocean Iron Fertilization Research
July 12-14, 2010, Woods Hole (WHOI sponsored)

An international group of scientists met to discuss the scientific motivation for future ocean iron fertilization (OIF) research.

The development of ocean observing systems now make this assessment of OIF possible.

A long-term, large-scale effort will be required to resolve many of the critical questions about OIF and carbon sequestration.

Importantly, OIF type experiments provide unique ways to study how the ocean functions, and have advanced our field in many ways.

A Consortium is being formulated to coordinate research, provide oversight, seek funding and communicate results.
## Workshop participants list

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<thead>
<tr>
<th>Last</th>
<th>First</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Buesseler</td>
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<td>Winslow</td>
<td>Chris</td>
<td>WHOI CFO</td>
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<td>Whaley</td>
<td>Dan</td>
<td>Climos</td>
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<td>Wuebbles</td>
<td>Don</td>
<td>U. Illinois</td>
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Mission statement:

To resolve the impact of iron fertilization on marine ecosystems, to quantify its potential for removal of atmospheric carbon dioxide, and to improve our collective understanding of the changing ocean.

ISIS Consortium
✓ seeking government, private, corporate sponsors
✓ multi Institutional, international
✓ open research, peer review, independent participants
✓ work within London Convention/London Protocol
ORRAP Input to the Refresh of the Ocean Research Priorities Plan and Implementation Strategy

8 December 2010

Discussion Points and JSOST Response

• ORPPIS 2010’s taxonomy is more difficult to follow and is too long by 50%.
  – The aim should be to inspire readership.

The taxonomies actually are rather similar. The original ORPP includes 6 Societal Themes, 4 Cross-cutting Topics and 4 Near-term Priorities (NTPs). Science for an Ocean Nation includes 6 Societal Themes, 7 Cross-cutting Topics, and an overview of progress on the NTPs.

Science for an Ocean Nation is 34,000 words, including Executive Summary and Front Matter. The original ORPP is 23,000. The length of the revised version is a result of additional materials the JSOST wanted addressed (link to the new policy, link to national issues, discussion of progress made, regional aspects, etc.) while not eliminating a significant amount of content from the original ORPP.
• There is no reference to an Implementation Strategy (the “IS” in ORPPIS).
  – ORPPIS 2007 was much shorter but included implementation strategies.

An Implementation Strategy was purposely not included as the new National Ocean Policy sets out the course for the nation. Text has been added to Looking Ahead, clarifying this.

• The linkage of the Research Priorities to the central CMSP theme is not clear.

CMSP is only one theme of the National Ocean Policy. The connection between the ORPP and the National Ocean Policy is made within the text of the Cross-cuts and in a matrix linking the Societal Themes with the policy objectives (see final Discussion Point below). We also are developing a graphic to demonstrate the connection between CMSP and the ORPP.
• There were 20 Research Priorities in ORPPIS 2007 and the same 20 in ORPPIS 2010, plus two Emerging Topics.
  – Ocean Acidification and Arctic could be listed as the 21st and 22nd Priorities.

The JSOST gathered considerable input from external sources, as well as discussing the update of the ORPP among the members. While there was input that emerging issues should be addressed, such as ocean acidification and the Arctic, there was confirmation that not only are the original six Societal Themes still valid, but the 20 original research priorities are still areas in need of attention. A sentence has been added to the Introduction under Revisiting the Ocean Research Priorities to clarify this.

• There is no clear endorsement of the need for fundamental ocean science as was done in ORPPIS 2007.

  A section (pulled from the original ORPP) has been added to the Introduction expressing this need.
  A small paragraph has also been added to Looking Forward to refer back to need fundamental research to achieve priorities/policy/goals.
• Each Research Priority discusses regional applicability, but applicability beyond U.S. waters is often missing.

The Regional Applicability section in each of the Societal Themes was included because the JSOST saw this as a critical element to address in an updated ORPP. It reflects the regional focus of the Final Recommendations of the Interagency Ocean Policy Task Force. Though applicability beyond U.S. waters is not specifically called out in a similar fashion, it is frequently noted as appropriate throughout the document.

• National/homeland security references are mostly absent.

A decision was made during development of the original ORPP to include homeland/national security as a text box in the Societal Theme on Marine Operations. Science for an Ocean Nation follows this model. Provided that the text box on national and homeland security is retained, the Oceanographer of the Navy is comfortable with the way the draft currently is written.
• Over-the-horizon issues that need research now (e.g., geo-engineering, identification of tipping points, etc.) are conspicuously absent.

The JSOST feels the basic science needed to address the 20 research priorities serves to provide the same building blocks underlying the topics noted as examples of over-the-horizon issues in the discussion point. Each of the 20 priorities listed could be classified as immediate, on-the-horizon or over-the-horizon, and each needs research now.

• There needs to be a discussion of the 2007 Near-Term priorities, their successes and their transition to the four “advancing National Policy Priorities” in ORPPIS 2010.

The section titled “Achieving National Ocean Policy Priorities: Progress through Ocean Research” addresses the NTPs and progress made through them. Text in this section has been edited to indicate that the nine policy objectives are the new way ahead and the 20 research priorities lend the science to achieve the policy.
• There is simply not enough linkage of the new “9 National Ocean Policy Priorities” assigned by the President to the “20 Research Priorities” in ORPPIS 2010
  – One may consider making the linkage between the ORPPIS 2010’s “Cross Cutting Topics” and the President’s “9 National Ocean Policy Priorities”
  
  Each of the Cross-cutting Topics includes a text box on Supporting the National Ocean Policy, noting the connection between that theme and related policy objectives.
  
  In addition, we have prepared a matrix showing the connection between the Societal Themes and the nine policy objectives. The draft report you received for review did not include the matrix. It is attached here and is intended as a visual indicator of the link between each Societal Theme and each policy objective.
**Vision Statement**

An America whose stewardship ensures that the ocean, our coasts, and the Great Lakes are healthy and resilient, safe and productive, and understood and treasured so as to promote the well-being, prosperity, and security of present and future generations.
E.O. 13547 & Final Recommendations

• Establishes our Nation’s first ever *National Policy for Stewardship of the Ocean, our Coasts, and the Great Lakes*

• Creates an interagency *National Ocean Council* to provide sustained, high-level, and coordinated attention to advance the National Policy

• Prioritizes *9 categories for action* that seek to address the most pressing challenges facing the ocean, our coasts, and the Great Lakes

• Establishes a *flexible framework for effective coastal and marine spatial planning* to address conservation, economic activity, user conflict, and sustainable use of ecosystem services

Recommendations do NOT

• Establish any new regulations

• Restrict any ocean uses or activities

• Include a zoning plan or map

• Slow down or halt current or pending actions

National Ocean Council
Final Recommendations

1) our Nation’s first ever National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes (National Policy);

2) a strengthened governance structure to provide sustained, high-level, and coordinated attention to ocean, coastal, and Great Lakes issues

3) a targeted implementation strategy that identifies and prioritizes nine categories for action that the United States should pursue

4) a framework for effective coastal and marine spatial planning (CMSP) that establishes a comprehensive, integrated, ecosystem-based approach to address conservation, economic activity, user conflict, and sustainable use

It is the Policy of the United States to:

- Protect, maintain, and restore the health and biological diversity of ocean, coastal, and Great Lakes ecosystems and resources;

- Improve the resiliency of ocean, coastal, and Great Lakes ecosystems, communities, and economies;

- Bolster the conservation and sustainable uses of land in ways that will improve the health of ocean, coastal, and Great Lakes ecosystems; and

- Use the best available science and knowledge to inform decisions affecting the ocean, our coasts, and the Great Lakes, and enhance humanity’s capacity to understand, respond, and adapt to a changing global environment.
It is the Policy of the United States to:

- Support **sustainable, safe, secure, and productive access** to, and uses of, the ocean, our coasts, and the Great Lakes;

- Respect and preserve our Nation’s **maritime heritage**, including our social, cultural, recreational, and historical values; and

- Exercise rights and jurisdiction and perform duties in **accordance** with applicable **international law**, including respect for and preservation of navigational rights and freedoms, which are essential for the global economy and international peace and security.

It is the Policy of the United States to:

- **Increase scientific understanding** of ocean, coastal, and Great Lakes ecosystems as part of the global interconnected systems of air, land, ice, and water, including their relationships to humans and their activities;

- **Improve our understanding and awareness** of changing environmental conditions, trends, and their causes, and of human activities taking place in ocean, coastal, and Great Lakes waters; and

- **Foster a public understanding** of the value of the ocean, our coasts, and the Great Lakes to build a **foundation for improved stewardship**.
• Establishes a National Ocean Council
• Stronger decision-making and dispute-resolution process
• Formally engage state, tribal, and local entities through establishment of a coordinating committee
• Strengthen the link between science and management through a establishment of a steering committee
• Renewed and sustained high-level engagement with clear requirements for meetings

Working groups could be retained or established as standing or ad hoc Interagency Policy Committees (IPCs) for Coastal and Marine Spatial Planning, Ocean Acidification, Ocean Observations, Managing Ocean Information, Ocean Resource Management, Regional Ecosystem Protection and Restoration, Water Quality and Sustainable Practices on Land, and Arctic.

The Extended Continental Shelf Task Force and other designated interagency committees, as appropriate, would report to the Steering Committee and coordinate with the new OCE.

Reporting Coordination Communication
Governance Coordinating Committee

State/Tribal/Local

one State legislative representative (1)

two at-large representatives from Inland States (2)

one State representative each from:
- Alaska
- Caribbean
- Great Lakes Region
- Gulf of Mexico Region
- Mid-Atlantic Region
- Northeast Region
- Pacific Islands
- South Atlantic Region
- West Coast Region (9)

three at-large tribal representatives (3)

three local government representatives from coastal States (3)

Nine Priority Objectives

- Four priority objectives to improve the way we do business:
  - Ecosystem-based management
  - Coastal and marine spatial planning
  - Inform decisions and improve understanding
  - Coordinate and support
- Five areas of special focus:
  - Resiliency/adaptation to climate change and ocean acidification
  - Regional ecosystem protection and restoration
  - Water quality and sustainable practices on land
  - Changing conditions in the Arctic Ocean
  - Ocean, coastal, and Great Lakes observations and infrastructure

National Ocean Council
Ecosystem-Based Management

Rather than managing for individual species, considers the entire ecosystem.

Coastal and Marine Spatial Planning

Implement comprehensive, integrated, ecosystem-based coastal and marine spatial planning and management in the United States.
Inform Decisions and Improve Understanding

Increase knowledge to continually inform and improve management and policy decisions

Better educate the public through formal and informal programs

Coordinate and Support

Better coordinate and support Federal, State, tribal, local, and regional management

Improve coordination and integration across the Federal Government
Nine Priority Objectives

- Four priority objectives to improve the way we do business:
  - Ecosystem-based management
  - Coastal and marine spatial planning
  - Inform decisions and improve understanding
  - Coordinate and support

- Five areas of special focus:
  - Resiliency/adaptation to climate change and ocean acidification
  - Regional ecosystem protection and restoration
  - Water quality and sustainable practices on land
  - Changing conditions in the Arctic Ocean
  - Ocean, coastal, and Great Lakes observations and infrastructure

Resiliency and Adaptation to Climate Change and Ocean Acidification

Strengthen resiliency of coastal communities and marine and Great Lake environments

Strengthen their abilities to adapt to climate change impacts and ocean acidification
Regional Ecosystem Protection and Restoration

Establish and implement an integrated ecosystem protection and restoration strategy that is science-based and aligns conservation and restoration goals.

Water Quality and Sustainable Practices on Land

Enhance water quality in the ocean, along our coasts, and in the Great Lakes by promoting and implementing sustainable practices on land.
Changing Conditions in the Arctic

Address environmental stewardship needs in the Arctic Ocean and adjacent coastal areas in the face of climate-induced and other environmental changes.

Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure

Strengthen and integrate Federal and non-Federal ocean observing systems, sensors, data collection platforms, data management, and mapping capabilities into a national system and integrate that system into international observation efforts.
Agency Responsibilities

- Take such action as necessary to implement the policy set forth in the executive order and the stewardship principles and national priority objectives as set forth in the Final Recommendations and subsequent guidance from the Council.
- Participate in the process for coastal and marine spatial planning and comply with Council certified coastal and marine spatial plans, as described in the Final Recommendations and subsequent guidance from the Council.
- Prepare an annual report of actions taken to implement the order.
- Coordinate and contribute resources, as appropriate, to assist in establishing a common information management system.
- Provide assistance to the Council upon request.

Update on Activities

- NOC Deputies met September 24; Principals met November 9
- Governance Coordinating Committee nominations are under consideration
- Establishing the Ocean Resource Management Interagency Policy Committee
- Incorporating the Ocean Science and Technology Interagency Policy Committee
- Planning CMSP workshop for Spring 2011
- Meeting with stakeholders, experts, and interest groups
- Developing processes for engaging the stakeholders and the general public in various aspects of NOC activities
Specific Topics of Interest to ORRAP

- Lines of Communication between NOC and ORRAP
- NOC Principal level, Deputy level and Steering Committee
- NOC Meeting Schedule
- Relationship of NOC Subcommittees and JSOST and SIMOR
- State of the IWGs
- NOC Staff Selection
- NOC’s Initial Issue to Tackle

"America’s stewardship of the ocean, our coasts, and the Great Lakes is intrinsically linked to environmental sustainability, human health and well-being, national prosperity, adaptation to climate and other environmental changes, social justice, international diplomacy, and national and homeland security."

- President Barack Obama
  Executive Order 13547

www.WhiteHouse.gov/oceans
CHARTER
OCEAN RESEARCH ADVISORY PANEL

1. Committee's Official Designation: The Committee shall be known as the Ocean Research Advisory Panel (hereafter referred to as the Panel).

2. Authority: The Secretary of Defense, under the provision of 10 U.S.C. § 7903, the Federal Advisory Committee Act of 1972 (5 U.S.C., Appendix, as amended) and 41 CFR § 102-3.50(a), established the Panel.

3. Objectives and Scope of Activities: The Panel, under the provisions of 10 U.S.C. § 7903, and the Federal Advisory Committee Act of 1972, as amended, shall provide independent scientific advice and recommendations to the National Ocean Research Leadership Council (hereafter referred to as the Council).

4. Description of Duties: The Ocean Research Advisory Panel shall:
   a. Provide advice on policies and procedures to implement the National Oceanographic Partnership Program.
   b. Provide advice on selection of partnership projects and allocation of funds for partnership projects for implementation under the program.
   c. Provide advice on matters relating to national oceanographic data requirements.
   d. Fulfill any additional responsibilities that the Council considers appropriate.

5. Agency or Official to Whom the Committee Reports: The Panel shall report to the National Ocean Research Leadership Council.


Additional information and assistance, as required, may be obtained from other DoD Components with contracting authority, support contractors, including DoD Federally Funded Research and Development Centers for studies and analysis support.

7. Estimated Annual Operating Costs and Staff Years: It is estimated that the annual operating costs, to include travel costs and meeting and contract support is approximately $200,000.00. The estimated annual personnel cost to the Department of Defense is 0.6 full-time equivalents (FTEs).
8. **Designated Federal Officer:** The Designated Federal Officer, pursuant to DoD policy, shall be a full-time or permanent part-time DoD employee, and shall be appointed in accordance with established DoD policies and procedures. In addition, the Designated Federal Officer is required to be in attendance at all meetings, however, in the absence of the Designated Federal Officer, the Alternate Designated Federal Officer shall attend the meeting.

9. **Estimated Number and Frequency of Meetings:** The Panel shall meet at the call of the Panel's Designated Federal Officer, in consultation with the Chairperson. The estimated number of Panel meetings is three per year.

10. **Duration:** The need for this advisory function is on a continuing basis; however this charter is subject to renewal every two years.

11. **Termination:** The Panel shall terminate upon recession of 10 U.S.C. § 7903.

12. **Membership and Designation:** The Panel under the provisions of 10 U.S.C. § 7903, shall consist of no less than 10 and no more than 18 members, representing the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine, ocean industries, State Governments, academia and others including individuals who are eminent in the fields of marine science, marine policy or related fields including ocean resource management. Panel Members appointed by the Secretary of Defense who are not full-time or permanent part-time federal officers or employees, shall serve as special government employees under the authority of 5 U.S.C. § 3109 and shall serve without compensation except for travel and per diem for official Panel related travel.

Panel Members, shall be appointed by the Secretary of Defense, and shall serve no more than four years. Their appointments will be renewed on an annual basis by the Secretary of Defense. The Panel Membership shall select the Chairperson and Vice-Chairperson of the Panel for renewable one-year terms. In addition, the Secretary of Defense or designated representative may invite other distinguished Government officers to serve as non-voting observers of the Panel, and appoint consultants, with special expertise to assist the Panel on an ad hoc basis.

Non-voting observers and those non-voting experts and consultants appointed by the Secretary of Defense shall not count toward the Panel's total membership.

13. **Subcommittees:** With DoD approval, the Panel is authorized to establish subcommittees, as necessary and consistent with its mission. These subcommittees or working groups shall operate under the provisions of the Federal Advisory Committee Act of 1972, the Government in the Sunshine Act of 1976 (5 U.S.C. § 552b, as amended), and other appropriate Federal statutes and regulations.
Such subcommittees or workgroups shall not work independently of the chartered Panel, and shall report all their recommendations and advice to the Panel for full deliberation and discussion. Subcommittees or workgroups have no authority to make decisions on behalf of the chartered Panel nor can they report directly to the Department of Defense or any Federal officers or employees who are not Panel members.

Subcommittee members, who are not Panel members, shall be appointed in the same manner as the Panel members.

14. **Recordkeeping:** The records of the Panel and its subcommittees shall be handled according to section 2, General Record Schedule 26 and appropriate Department of Defense policies and procedures. These records shall be available for public inspection and copying, subject to the Freedom of Information Act of 1966 (5 U.S.C. § 552, as amended).

15. **Filing Date:** January 21, 2010
Current ORRAP Membership, as of August 2010

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President, University of Maryland Center
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Designated Federal Official (DFO):  
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lzimmerrmann@oceanleadership.org
## ORRAP Membership Plan

**Goal:** Steady state of 18 members

Member start dates have nominally been July of each year.

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<td>Kerry St. Pé</td>
<td>Academia</td>
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<td>Jane Davis</td>
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<td>Paul Gaffney</td>
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<td>Larry Robinson</td>
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<td>Max Coon</td>
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<tr>
<td>Don Boesch*</td>
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* At least one ORRAP member must represent the views of NAS. Ensuring this requirement was put in the hands of the OSB Executive Director.

### Member expertise

- **Davis:** aquaculture, large marine closed sys, public ed, entrimnt
- **Bartels:** science education and policy
- **Brewer:** ocean geochem, gas hydrates, climate chg
- **Fisher:** fisheries mgmt, grant & contract mgmt
- **Gannon:** Great Lakes, res mgmt, ecology
- **Bruno:** ocean obs, engineering, maritime security, coastal dynam
- **Gaffney:** ocean survey & forecasting, S&T mgmt, ocean policy
- **Leinen:** climate science, geosciences, governance and policy
- **Kelly:** offshore O&G explo and devt, ocean & energy policy
- **Ramberg:** Science mgmt, fluid mech, remote sensing
- **St. Pé:** wetlands ecol, water quality
- **Rosenberg:** Fisheries, Bio. Management
- **Costa:** marine mammals, ecology, physiology, conservation biol
- **Weller:** phys oc’graphy, obs systems
- **Boesch:** biol oc’graphy, EBM, policy, env’tal effects of oil
- **Yentsch:** EBM, climate
Executive Order--Stewardship of the Ocean, Our Coasts, and the Great Lakes

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section 1. Purpose. The ocean, our coasts, and the Great Lakes provide jobs, food, energy resources, ecological services, recreation, and tourism opportunities, and play critical roles in our Nation's transportation, economy, and trade, as well as the global mobility of our Armed Forces and the maintenance of international peace and security. The Deepwater Horizon oil spill in the Gulf of Mexico and resulting environmental crisis is a stark reminder of how vulnerable our marine environments are, and how much communities and the Nation rely on healthy and resilient ocean and coastal ecosystems. America's stewardship of the ocean, our coasts, and the Great Lakes is intrinsically linked to environmental sustainability, human health and well-being, national prosperity, adaptation to climate and other environmental changes, social justice, international diplomacy, and national and homeland security.

This order adopts the recommendations of the Interagency Ocean Policy Task Force, except where otherwise provided in this order, and directs executive agencies to implement those recommendations under the guidance of a National Ocean Council. Based on those recommendations, this order establishes a national policy to ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources, enhance the sustainability of ocean and coastal economies, preserve our maritime heritage, support sustainable uses and access, provide for adaptive management to enhance our understanding of and capacity to respond to climate change and ocean acidification, and coordinate with our national security and foreign policy interests.

This order also provides for the development of coastal and marine spatial plans that build upon and improve existing Federal, State, tribal, local, and regional decisionmaking and planning processes. These regional plans will enable a more integrated, comprehensive, ecosystem-based, flexible, and proactive approach to planning and managing sustainable multiple uses across sectors and improve the conservation of the ocean, our coasts, and the Great Lakes.

Sec. 2. Policy. (a) To achieve an America whose stewardship ensures that the ocean, our coasts, and the Great Lakes are healthy and resilient, safe and productive, and understood and treasured so as to promote the well-being, prosperity, and security of present and future generations, it is the policy of the United States to:
• (i) protect, maintain, and restore the health and biological diversity of ocean, coastal, and Great Lakes ecosystems and resources;
• (ii) improve the resiliency of ocean, coastal, and Great Lakes ecosystems, communities, and economies;
• (iii) bolster the conservation and sustainable uses of land in ways that will improve the health of ocean, coastal, and Great Lakes ecosystems;
• (iv) use the best available science and knowledge to inform decisions affecting the ocean, our coasts, and the Great Lakes, and enhance humanity's capacity to understand, respond, and adapt to a changing global environment;
• (v) support sustainable, safe, secure, and productive access to, and uses of the ocean, our coasts, and the Great Lakes;
• (vi) respect and preserve our Nation's maritime heritage, including our social, cultural, recreational, and historical values;
• (vii) exercise rights and jurisdiction and perform duties in accordance with applicable international law, including respect for and preservation of navigational rights and freedoms, which are essential for the global economy and international peace and security;
• (viii) increase scientific understanding of ocean, coastal, and Great Lakes ecosystems as part of the global interconnected systems of air, land, ice, and water, including their relationships to humans and their activities;
• (ix) improve our understanding and awareness of changing environmental conditions, trends, and their causes, and of human activities taking place in ocean, coastal, and Great Lakes waters; and
• (x) foster a public understanding of the value of the ocean, our coasts, and the Great Lakes to build a foundation for improved stewardship.

(b) The United States shall promote this policy by:

• (i) ensuring a comprehensive and collaborative framework for the stewardship of the ocean, our coasts, and the Great Lakes that facilitates cohesive actions across the Federal Government, as well as participation of State, tribal, and local authorities, regional governance structures, nongovernmental organizations, the public, and the private sector;
• (ii) cooperating and exercising leadership at the international level;
• (iii) pursuing the United States' accession to the Law of the Sea Convention; and
• (iv) supporting ocean stewardship in a fiscally responsible manner.

Sec. 3. Definitions. As used in this order:

(a) "Final Recommendations" means the Final Recommendations of the Interagency Ocean Policy Task Force that shall be made publicly available and for which a notice of public availability shall be published in the Federal Register.

(b) The term "coastal and marine spatial planning" means a comprehensive, adaptive, integrated, ecosystem-based, and transparent spatial planning process, based on sound science, for analyzing current and anticipated uses of ocean, coastal, and Great Lakes
areas. Coastal and marine spatial planning identifies areas most suitable for various types or classes of activities in order to reduce conflicts among uses, reduce environmental impacts, facilitate compatible uses, and preserve critical ecosystem services to meet economic, environmental, security, and social objectives. In practical terms, coastal and marine spatial planning provides a public policy process for society to better determine how the ocean, our coasts, and Great Lakes are sustainably used and protected -- now and for future generations.

(c) The term "coastal and marine spatial plans" means the plans that are certified by the National Ocean Council as developed in accordance with the definition, goals, principles, and process described in the Final Recommendations.

Sec. 4. Establishment of National Ocean Council. (a) There is hereby established the National Ocean Council (Council).

(b) The Council shall consist of the following:

- (i) the Chair of the Council on Environmental Quality and the Director of the Office of Science and Technology Policy, who shall be the Co-Chairs of the Council;
- (ii) the Secretaries of State, Defense, the Interior, Agriculture, Health and Human Services, Commerce, Labor, Transportation, Energy, and Homeland Security, the Attorney General, the Administrator of the Environmental Protection Agency, the Director of the Office of Management and Budget, the Under Secretary of Commerce for Oceans and Atmosphere (Administrator of the National Oceanic and Atmospheric Administration), the Administrator of the National Aeronautics and Space Administration, the Director of National Intelligence, the Director of the National Science Foundation, and the Chairman of the Joint Chiefs of Staff;
- (iii) the National Security Advisor and the Assistants to the President for Homeland Security and Counterterrorism, Domestic Policy, Energy and Climate Change, and Economic Policy;
- (iv) an employee of the Federal Government designated by the Vice President; and
- (v) such other officers or employees of the Federal Government as the Co-Chairs of the Council may from time to time designate.

(c) The Co-Chairs shall invite the participation of the Chairman of the Federal Energy Regulatory Commission, to the extent consistent with the Commission's statutory authorities and legal obligations, and may invite the participation of such other independent agencies as the Council deems appropriate.

(d) The Co-Chairs of the Council, in consultation with the National Security Advisor and the Assistant to the President for Homeland Security and Counterterrorism, shall regularly convene and preside at meetings of the Council, determine its agenda, direct its work, and, as appropriate to address particular subject matters, establish and direct committees of the Council that shall consist exclusively of members of the Council.
(e) A member of the Council may designate, to perform committee functions of the member, any person who is within such member's department, agency, or office and who is (i) an officer of the United States appointed by the President, (ii) a member of the Senior Executive Service or the Senior Intelligence Service, (iii) a general officer or flag officer, or (iv) an employee of the Vice President.

(f) Consistent with applicable law and subject to the availability of appropriations, the Office of Science and Technology Policy and the Council on Environmental Quality shall provide the Council with funding, including through the National Science and Technology Council or the Office of Environmental Quality. The Council on Environmental Quality shall, to the extent permitted by law and subject to the availability of appropriations, provide administrative support necessary to implement this order.

(g) The day-to-day operations of the Council shall be administered by a Director and a Deputy Director, who shall supervise a full-time staff to assist the Co-Chairs in their implementation of this order.

Sec. 5. Functions of the Council. (a) The Council shall have the structure and function and operate as defined in the Final Recommendations. The Council is authorized, after the Council's first year of operation, to make modifications to its structure, function, and operations to improve its effectiveness and efficiency in furthering the policy set forth in section 2 of this order.

(b) To implement the policy set forth in section 2 of this order, the Council shall provide appropriate direction to ensure that executive departments', agencies', or offices' decisions and actions affecting the ocean, our coasts, and the Great Lakes will be guided by the stewardship principles and national priority objectives set forth in the Final Recommendations, to the extent consistent with applicable law. The Council shall base its decisions on the consensus of its members. With respect to those matters in which consensus cannot be reached, the National Security Advisor shall coordinate with the Co-Chairs and, as appropriate, the Assistants to the President for Energy and Climate Change, and Economic Policy, and the employee of the United States designated by the Vice President, subject to the limitations set forth in section 9 of this order, to present the disputed issue or issues for decision by the President.

Sec. 6. Agency Responsibilities. (a) All executive departments, agencies, and offices that are members of the Council and any other executive department, agency, or office whose actions affect the ocean, our coasts, and the Great Lakes shall, to the fullest extent consistent with applicable law:

- (i) take such action as necessary to implement the policy set forth in section 2 of this order and the stewardship principles and national priority objectives as set forth in the Final Recommendations and subsequent guidance from the Council; and
(ii) participate in the process for coastal and marine spatial planning and comply with Council certified coastal and marine spatial plans, as described in the Final Recommendations and subsequent guidance from the Council.

(b) Each executive department, agency, and office that is required to take actions under this order shall prepare and make publicly available an annual report including a concise description of actions taken by the agency in the previous calendar year to implement the order, a description of written comments by persons or organizations regarding the agency's compliance with this order, and the agency's response to such comments.

(c) Each executive department, agency, and office that is required to take actions under this order shall coordinate and contribute resources, as appropriate, to assist in establishing a common information management system as defined in the Final Recommendations and shall be held accountable for managing its own information assets by keeping them current, easily accessible, and consistent with Federal standards.

(d) To the extent permitted by law, executive departments, agencies, and offices shall provide the Council such information, support, and assistance as the Council, through the Co-Chairs, may request.

Sec. 7. Governance Coordinating Committee. The Council shall establish a Governance Coordinating Committee that shall consist of 18 officials from State, tribal, and local governments in accordance with the Final Recommendations. The Committee may establish subcommittees chaired by representatives of the Governance Coordinating Committee. These subcommittees may include additional representatives from State, tribal, and local governments, as appropriate to provide for greater collaboration and diversity of views.

Sec. 8. Regional Advisory Committees. The lead Federal department, agency, or office for each regional planning body established for the development of regional coastal and marine spatial plans, in consultation with their nonfederal co-lead agencies and membership of their regional planning body, shall establish such advisory committees under the Federal Advisory Committee Act, 5 U.S.C. App., as they deem necessary to provide information and to advise the regional planning body on the development of regional coastal and marine spatial plans to promote the policy established in section 2 of this order.

Sec. 9. General Provisions. (a) Nothing in this order, the establishment of the Council, and the Final Recommendations shall be construed to impair or otherwise affect:

- (i) authority granted by law to an executive department or agency or the head thereof; or
- (ii) functions assigned by the President to the National Security Council or Homeland Security Council (including subordinate bodies) relating to matters affecting foreign affairs, national security, homeland security, or intelligence.
(b) Nothing in this order shall be construed to impair or otherwise affect the functions of the Director of the Office of Management and Budget relating to budgetary, administrative, or legislative proposals.

(c) In carrying out the provisions of this order and implementing the Final Recommendations, all actions of the Council and the executive departments, agencies, and offices that constitute it shall be consistent with applicable international law, including customary international law, such as that reflected in the Law of the Sea Convention.

(d) This order is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

Sec. 10. Revocation. Executive Order 13366 of December 17, 2004, is hereby revoked.

BARACK OBAMA