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TAB 1
Thursday, 6 December

8:00-8:30 Assemble/Breakfast

8:30-9:00 Introduction: Jerry Schubel, Chair
- Welcome, Introductions
- Review of the agenda
- Review of the 27-28 June 2007 ORRAP meeting minutes
- Review of the 27-28 June 2007 ORRAP meeting actions

9:00-11:00 CSO-NOAA/NOS Initiative: “Envisioning the Future of Coastal Management”  
(Moderator: Debra Hernandez, Vice-Chair)
- Background and Introduction:
  Kacky Andrews, Executive Director, Coastal States Organization, and
  Ralph Cantral, Senior Advisor, NOAA NOS OCRM
- Interactive discussion:
  Session will focus on issues and priorities advocated by both the States and
  NOAA as part of their efforts to reauthorize the Coastal Zone Management Act.

11:00-11:15 Break

11:15-4:30 Inventory and Assessment of Federal Ocean Education Programs  
(Moderator: Jeff Reutter, ORRAP and Ohio State University)
Discussion will focus on how ORRAP and federal programs can collaborate to take advantage of
events and opportunities to enhance and improve ocean education programs in this country.

11:15-11:45
- Introductory discussion on the Interagency Working Group on Ocean Education (IWG-OE):
  Lisa Rom, National Science Foundation, and
  Marlene Kaplan, NOAA

11:45-12:30 Presenters
- Coastal America - Steve Kinberg, Coastal America
- DOD - Augustus Vogel, Office of the Oceanographer of the Navy
- DOL - Brad Wiggins, Employment & Training Administration
12:30-1:30 Working Lunch (on site)
Presenters:
• DOI - Terri Holman, DOI
  Lynn Murdock, National Park Service
  Barbara Wallace, Minerals Management Service
  Robert Ridky, U.S. Geological Survey
• DOT - Sharon LeGrand, Maritime Administration, Office of Workforce Development
• EPA - Lucinda Power, Oceans & Coastal Protection Division

1:30-3:00 Presenters
• NASA - Ming-Ying Wei, Education Programs, Office of Earth Science
• NOAA - Marlene Kaplan, Office of Education
• NSF - Lisa Rom, Ocean Education, Division of Ocean Sciences
• ONR - Joan Cleveland, Ocean Sensing and Systems Division
• Others - TBD

3:00-3:15 Break

3:15-4:30 ORRAP Discussion of Federal Ocean Education Programs

4:30-5:00 Wrap-up Discussion / Review Action Items: Schubel, Chair

6:30 Dinner (optional)
Friday, 7 December

8:00-8:30 Assemble/Breakfast

8:30-9:00 Reconvene: Jerry Schubel, Chair
  - Review of previous day’s presentations and discussions
  - Review of action items from previous day’s session

9:00-9:45 Code of Conduct for Scientific Collections
  - Potential recommendation that a code be uniformly adopted across agencies:
    Shirley Pomponi, ORRAP and the US National Committee of the Census of Marine Life

9:45-10:30 ORRAP Sub-panels – Reports & Future Activities
  - Ocean Observations - Review of Charge and discussion on membership:
    Molly McCammon, ORRAP and Alaska Ocean Observing System

10:30-10:45 Break

10:45-1:00 ORRAP Business Session
  - Role of ORRAP within the Ocean Governance Structure
    - Finding the niche for ORRAP to have maximum impact within the federal advisory structure
  - ORRAP Membership Issues
    - New membership status report: Jim Eckman, ONR
    - Membership gaps and niches to be filled: Schubel / Hernandez

12:00-1:00 Working Lunch (on site)
  - General ORRAP Discussion
    - Topics for future ORRAP consideration: Schubel / Hernandez
    - Open ORRAP discussion – other topics of interest
    - Review of action items from today’s sessions: Schubel / Hernandez
    - Meeting wrap-up and scheduling of next meeting: Schubel, Chair

1:00-1:30 Public Comment Period: Eckman (Alternate Designated Federal Official), ONR

1:30 Adjourn
Ocean Research and Resources Advisory Panel

National Oceanographic Partnership Program

Consortium for Oceanographic Research and Education
1201 New York Avenue NW, Suite 420
Washington, DC 20005

27-28 June 2007

Minutes

27 June

Introduction
E. Prager called the meeting to order at 0930. The minutes from the 21-22 February 2007 ORRAP meeting were approved with minor changes. E. Prager reviewed the agenda for the current meeting, focusing on the Research to Applications Task Force report.

Research to Applications Task Force Report
S. Weisberg discussed the Research to Applications Task Force (RATF) report, beginning with the background and development of the RATF. The idea for the RATF report developed after the release of the Ocean Research Priorities Plan (ORPP). S. Weisberg noted that the report has been written and asked the ORRAP if any improvements were needed. ORRAP members voiced concern over the misconception of assumed difficulty when implementing the report findings into ongoing research projects. In order to dispel the notion that the findings only apply to new research, it was agreed by the ORRAP that a strong section should be added to show the flexibility and ease of applying the findings to ongoing research projects or already completed research. It was also agreed that, as the report was not the first extant on the topic, it was essential that the language be clear so it can be utilized by federal agencies and have substantial impact.

J. Reutter expressed satisfaction with the six primary themes and the case studies that were highlighted in boxes as successful examples of transitioning research to applications. K. Masto agreed, noting that attention needs to be drawn to successful models that demonstrate ways to make better use of investments. The Office of Naval Research (ONR) case study box was discussed, including whether the Small Business Technology Transfer Program (STTR) should be added since the Small Business Innovation Research Program (SBIR) was mentioned. E. Prager believed the box should be edited as it appeared to discuss SBIR/STTR and not ONR. It was agreed that all boxes needed additional reviewing by the people involved in the mentioned projects.

End user conflicts were discussed, including possible implementation, organizational, and legal restrictions. When asked how end user restrictions and conflicts were incorporated into the document, E. Prager stated that the model suggested and placed value on the use
of expert facilitators. It was agreed that a brief comment should be added describing the different types of facilitators and how to identify those that are qualified.

A discussion was initiated on involving end users at the beginning of and throughout the process. As that adds time, costs and complexity to the process, M. McCammon believed the associated issues of involving end users should be mentioned explicitly at the beginning of the report. Examples of costs and benefits of implementing the recommendations and a discussion on fostering synthesis within federal programs could be helpful. R. Cowen stressed that there should be a clear focus on rewards on all sides, especially if rewards could help generate new funds. P. Betzer suggested promoting victories by publishing lists of successes and mechanisms to achieving success as incentives. A. Clark suggested that since there is a broad spectrum of ideas surrounding users, it might be beneficial to clarify the definition of ‘user.’

The idea of recommending a process to assess or evaluate transitions from research to applications was suggested. It was agreed that the ORRAP could recommend such a review or assessment, but that ORRAP was not capable of undertaking these reviews. J. Miller noted that using NOPP agencies could help with possible roadblocks. It was agreed that the existing draft should be sent to the Interagency Working Group on Ocean Partnerships by its 20 July 2007 meeting for suggestions and comments on whether the RATF report relates to and fits into the existing NOPP structure.

Each individual ORRAP member was urged to send specific comments or edits to S. Weisberg as soon as possible. J. Schubel plans to present the RATF report to the Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI), which is engaged and waiting to be briefed on the RATF report at its next meeting, which may take place in early August.

New Sub-panel on Ocean Observing

M. McCammon explained the creation of the new Ocean Observing Sub-panel, which ORRAP voted to establish at its February 2007 meeting. M. McCammon discussed the charge and tasks of the Sub-panel, which include reviewing the status of ocean observing systems, reviewing papers, and reporting regularly to the ORRAP on activities and progress. It was agreed that the Sub-panel can meet and representatives of the ocean observing community can attend; however, the Sub-panel should not take responsibility for hosting a forum, as was implied in the list of Sub-panel activities.

Much discussion took place on the membership of the Sub-panel. It was stated that the Sub-panel could not have more members than the ORRAP and it was agreed that 12 members would be sufficient and manageable. Proposed members should represent academia, federal agencies, industry and user groups, such as dischargers, resource managers and possibly the Environmental Systems Research Institute (ESRI). Two Global Ocean Observing System (GOOS) representatives and two ORRAP members should be included. A. Clark suggested that membership last for two years but be renewable. E. Prager agreed and commented that renewals presented opportunities for a
review of certain sectors that need to be represented on the Sub-panel. It was expected that the Sub-panel would meet once per year.

ORRAP members were urged to send specific names or groups that should be represented on the Sub-panel to M. McCammon as soon as possible. M. McCammon will then revise the charter and membership list and distribute electronically to the ORRAP members.

**Executive Technical Qualification for Ecosystem Management**

Joe Piotrowski from the Environmental Protection Agency briefed the ORRAP on the work plan for Executive Technical Qualification for Ecosystem Managers of Ocean and Coastal Programs. It was noted that Senior Executive Service (SES) positions have specific qualifications that need to be met for federal service, and perhaps a technical qualification in ecosystem science should be an added requirement. A definition for an ‘ecosystem science executive technical qualification’ needs to be developed, along with evaluation criteria for job positions. One-week training courses could be offered in ecosystem management to meet the criteria. J. Piotrowski asked ORRAP members whether they believed that the draft requirements were on the right track with the technical qualification and, most importantly, if they knew of any existing training opportunities available within the federal government.

ORRAP members discussed the term ‘ecosystem management’ saying that ‘ecosystem-based management (EBM)’ or ‘ecosystem approaches to management (EAM)’ are used more often, but are essentially terms whose precise definitions remain nebulous. A. Clark suggested that the work plan try to create a definition.

R. Seymour questioned if the trained individual would receive a certificate or license, similar to a professional engineer, or if the end result were the skills one obtained related to ecosystem management. J. Piotrowski answered that there were five core qualifications – including education, training, experience, awards and publications – that would factor into the job description and application procedure. Applicants would answer job-specific questions pertaining to the five core qualifications.

R. Cowen stated that various academic institutions are considering ecosystem management courses but that the approaches to training are as diverse as the many definitions of the term. He described the fisheries certification process that was backed by the Fishery Association as much credence was earned by an individual with the fisheries certification as by an individual with a master’s degree in the field. The certification easily applied to jobs in management at the National Marine Fisheries Service and in status and trends fields.

A discussion took place on whether it was best to deal with the whole definition of ecosystem management when trying to educate, or if a more location-based approach was more important. J. Schubel indicated the need to value knowledge of specific locations (such as Chesapeake Bay or San Francisco Bay) and their boundaries and individual processes rather than just an understanding of the general concepts.
E. Prager stated that ORRAP was supportive of the proposal, but there were questions of what comprises the training. All agreed that universities would respond well to the program and that it could create a change in graduate programs or be added to existing programs to create formal education and training in ecosystem-based management.

It was suggested that the Subcommittee on Integrated Management of Ocean Resources (SIMOR) investigate programs such as Duke and UCLA that are developing EBM/EAM programs. R. Seymour suggested speaking to the Army Corps of Engineers about their certified coastal planner program. ORRAP members were urged to contact either Dan Ashe of the U.S. Fish and Wildlife Service or J. Piotrowski with suggestions of useful programs relating to technical qualifications for ecosystem management.

**Certification Program for Oceanographic Professionals (CPOP)**

Leslie Rosenfeld from the Naval Postgraduate School briefed the members on the assessment study of a certification program for oceanographic professionals being conducted by members of the Marine Advanced Technology Education Center in Monterey, CA. She clarified that she was not advocating the program, only investigating the need for a certification program. The U.S. currently has no certification procedure for marine scientists. She stated that such a program could be very difficult in a field as broad as oceanography. The assessment will focus on determining which areas would benefit the most from a certification program.

L. Rosenfeld explained the objectives of the investigation, including determining pros and cons of a CPOP and developing an overview plan if deemed necessary. Potential benefits of a CPOP include establishing standards for professional behavior and ethics as well as for aiding employers with hiring decisions. She reported that negative aspects of the CPOP include the potential to create unnecessary career hurdles and confusion as to which organization should be in charge of the certification. She also discussed the next steps being taken, including contacting users in industries and participating in a workshop at the Ocean Sciences meeting in Orlando in March 2008.

ORRAP members commented that the presentation came across as if it was already determined that the certification program was going to be produced. A. Clark mentioned that a potential downside to consider was the liability involved if a certification was not renewed. He also mentioned that the presentation L. Rosenfeld made to the ORRAP Industry and Education Sub-panels was very well received. E. Prager asked that the ORRAP be kept up-to-date on the progress of this CPOP assessment study.

**SIMOR Update**

Gerhard Kuska from the Council for Environmental Quality (CEQ) reported on SIMOR activities since October 2006. He discussed National Oceans Month, which took place this June and reportedly was very well received within and outside the government.
Other SIMOR activities he reported on included working on an ocean education 2007-2008 implementation plan – soon to be published – in conjunction with the Joint Subcommittee on Ocean Science and Technology, and hosting a workshop on Ocean and Coastal Economics. The workshop identified and inventoried data gaps in federal, state, academics and fisheries. The workshop results are posted on the CEQ website. He stated that ICOSRMI was working to clarify relationships and communication lines between ocean-related interagency groups within the ocean governance structure laid forth in the Ocean Action Plan, and that ICOSRMI asked SIMOR to analyze how these groups will interact in the event the structure ceases to be operative.

The meeting continued with a discussion on SIMOR-ORRAP opportunities. G. Kuska stated that the next ICOSRMI meeting will most likely take place during the first week of August. He also noted that SIMOR may engage ORRAP for comments on how to enhance the scope and effectiveness of the Ocean Research Priorities Plan (ORPP).

E. Prager asked if the ORPP had garnered significant attention and made an impact. G. Kuska replied that the ORPP has played a major role but that he expects that its use will vary from year to year. He offered an update on the June 2006 Conference on Ocean Literacy, mentioning that an overarching question involves the level to which the federal government deals with education. ORRAP members stated that continued funding for NOAA’s Office of Education was critical, as it would be damaging for NOAA’s extensive research and data to not be utilized for education and outreach.

**Interagency Task Force (IATF) on Anthropogenic Sound and the Marine Environment**

Brandon Southall from NOAA’s Ocean Acoustics Program presented on the JSOST Interagency Task Force on Anthropogenic Sound and the Marine Environment. He explained the basic issue of convergence on acoustic channels as animals and humans are using sound in the ocean, stating its importance as an issue due to the fact that the protection of marine mammals from excessive sound is regulated under many conservation acts and there are often resulting legal problems and constraints on research. He discussed the history of the IATF, which was formed in fall 2006 after a briefing to ICOSRMI showed the need for interagency collaboration on the subject of anthropogenic sound and its effect on marine mammals. He explained that the IATF is working to identify what is being done within agencies, strengthen coordination among agencies, and develop an interagency plan to minimize the adverse effects of human sound-producing activities. He stressed that the task force does not advocate specific policies; rather, it determines scientific and technological needs.

B. Southall noted that the IATF has nearly complete membership and held an introductory meeting in April 2007. He added that a second meeting was held in June 2007 to discuss scientific and technical efforts in assessing the effects of manmade sound. He said the IATF intends to provide a draft report to JSOST by mid-September 2007 and hopes to get the final report and recommended action plans, including recommendations for tracking implementations, cleared by JSOST by April 2008. The IATF will be terminated on 27 April 2008 unless its existence is extended by JSOST.
Comments from the ORRAP included the recommendation to engage agencies and groups outside of the federal government in the early stages of the IATF’s efforts. It was suggested that the IATF include members from organizations that are critical of government-funded sound-producing activities so that there is continued buy-in from stakeholders who have negative perceptions of these activities.

Extended Continental Shelf Mapping Program
Maggie Hayes and Brian Van Pay from the U.S. Department of State briefed the ORRAP on the Extended Continental Shelf Mapping Program. They explained that each coastal nation gets a 200-mile shelf, but that some nations can claim, under the Law of the Sea Convention, an extended continental shelf (ECS) beyond that distance, thus giving a nation rights over any natural resources of the shelf, including gas, oil, minerals and sedentary species such as sponges, as well as control over scientific research.

M. Hayes and B. Van Pay explained that 60 countries have a potential ECS and most have begun work to support a claim. She explained continental shelf extension efforts by the U.S., which is not a party to the Convention, including the formation of an informal working group on the topic. They noted that no funds have been dedicated thus far to the topic other than a NOAA-funded 2002 study. In the FY08 budget, however, there is $8M devoted to NOAA to work through the task force on the topic. The task force is meeting every month, but needs outside expertise since the amount of ECS data is enormous and there is a need to know how to analyze, store, manage and coordinate it all. They plan to hold conferences and workshops with experts across the country as well as analyze recommendations generated by Brazilian and Irish commissions.

The ORRAP inquired about Canada’s submission to the Extended Continental Shelf program. M. Hayes stated that the Canadians are already doing work in the Arctic and the U.S. hopes to put a scientist from the U.S. Geological Survey on some of the Canadian cruises. The U.S. and Canada have two boundary disputes that would have to be negotiated. C. Smith asked about determining the ECS for the Pacific Islands. B. Van Pay explained that two different formulas and two constraint lines are used to determine the ECS and that in the case of the Pacific Islands, additional expertise may need to be obtained.

In response to the need for collating existing datasets, ORRAP members made suggestions as to where M. Hayes and B. Van Pay could find assistance in retrieving bathymetric and seismic data that was previously collected and synthesized. The Navy has both bathymetric and seismic data from the Arctic that may be available (if declassified). Ocean observing systems and related associations were suggested as possible data integrators. M. McCammon noted that she would like to see any data used for ECS submission be made available for all scientists to use. Other suggestions included setting up quality controls and standards for data before any new data is collected, and prioritizing areas that may come under conflict. It was also stated that the proposed budget of $50M was far too conservative given the amount of ship time and personnel that will be needed to work on the submission.
28 June

Reconvene

E. Prager reviewed the previous day’s discussion and possibilities for recommendations generated during the day. The list of recommendations that were to be presented to ICOSRMI along with the Research to Applications Task Force report was decided upon. They included:

1. ORRAP endorses the RATF report and approves the findings within;
2. ORRAP recommends that members of ICOSRMI incorporate the outlined model for transitioning research to applications, or elements of it, in a new or existing priority project that involves multiple agencies, such as a NOPP project;
3. ORRAP further recommends that the efficacy of the model or strategies the agencies use to facilitate the research to applications process be documented and assessed; and
4. ORRAP would be pleased to assist in the process if requested.

Ocean Studies Board Update

Sue Roberts, Director of the Ocean Studies Board (OSB), updated the ORRAP on OSB activities. She began with the history of the National Academies and a brief background of their role in providing the best scientific advice to the federal agencies based on a non-conflicted consensus. She described the main OSB activities as including proposal preparation, briefings to agencies and Congress, meeting assistance, education and training as well as communications through lectures and reports. She stated that the Academy has recently started encouraging the production of report briefs that are available online and are viewed as less intimidating than a full report and more accessible to a broad audience. She noted that sales demonstrate that the reports are being used. She described some of the OSB’s pending proposals, including two congressional requests: Reducing and Preventing Marine Debris, which is focused on derelict gear and fish aggregation devices; and Review of Sea Turtle Population Assessment Methods, which partly deals with turtle excluder devices in shrimp catch. She also briefly discussed the OSB-sponsored Roger Reveille Commemorative Lecture, which has drawn widespread attendance, including from congressional staff.

S. Roberts described how the OSB is funded through outside projects. When there are no projects, the OSB is in jeopardy, which is a critical issue this year. Its most recently funded proposal was in November 2005 and its core funding, which supports about 70% of the OSB’s expenses, has decreased over the years. The remaining 30% has to come from projects.

ORRAP members discussed whether they should recommend to ICOSRMI that greater attention be paid to OSB core support and projects. The group agreed that it would be devastating to have no voice for the ocean in the National Academies and it was suggested that the situation should be mentioned in presentations and ICOSRMI briefing materials. It was also suggested that the RATF document contain a box about OSB and a...
statement to strongly support OSB in its current function as a board to take on synthesis projects. E. Prager suggested that S. Roberts contact SIMOR.

**Education Sub-panel**

M. Gilligan reported on the Implementation Plan of the Interagency Working Group on Ocean Education (IWG-OE). He briefly mentioned what tasks were ongoing or in preparation, and explained that the plan is an evolving document. He briefly described Task 1 which deals with improving coordination and collaboration amongst ocean networks. He stated NOAA was taking the lead on Task 2 – ‘Developing a Coordinated Ocean Education and Outreach Message,’ conducting much of the work with the aquarium communities because of the broad amount of contact aquariums have with the public. Task 3 (which looks to ensure data from ocean and earth observing systems are translated to usable forms for teachers, students and the public) encompasses so many issues that need to be focused on, that M. Gilligan believed the individual agencies would need to meet and deal with specific issues of particular concern to each agency. He said that Task 4 – ‘Ensure a Well-Prepared Ocean Workforce’ – is an ongoing assessment and that its second priority deals with leveraging existing career programs. He remarked that although plenty of information on careers is available online, searching was rather problematic as the career programs are very scattered and diverse in their efforts and reach. It was noted that the third priority of Task 4, focusing on underrepresented groups, evolved out of the Conference on Ocean Literacy. It was stated that NOAA and the National Association of Marine Laboratories are developing a marine science award, to be named after the African-American marine biologist Ernest Everett Just.

M. Gilligan also reported on the joint meeting of the ORRAP Industry Sub-panel and Education Sub-panel. At that meeting, he said, it was reported that many senior-level employees in the ocean sciences will soon be eligible for retirement, leading to position vacancies that will occur at a much greater rate over the next 5-10 years. One goal of that meeting was to get an overview of this workforce situation. It was declared that special efforts are needed to get talented individuals, of all races and demographics, in the job pool to fill those vacant positions. He mentioned developing a mentoring process that would help get underrepresented populations involved in the ocean sciences.

**Report on the MMS-sponsored Offshore Alternative Energy Workshop**

A. Clark gave a brief report on the MMS-sponsored Offshore Alternative Energy Workshop held on 26-28 June 2007 in Herndon, Virginia. Alternative energy sources that could be developed include wind, ocean waves, ocean currents, solar, biomass and hydrogen. Potential impacts of these alternative energy sources on the marine environment and on humans need to be evaluated before MMS can make decisions about managing and regulating activities. A goal of the workshop was to identify data needs and determine potential studies and corresponding partnerships among local, state and federal agencies.

It was stated that near-shore wind projects are already in use in other countries, such as the UK and Denmark; U.S. projects, including the Cape Wind Energy Project in
Nantucket Sound, MA, and the Long Island Offshore Wind Park, remain in the permitting phase.


Additional ORRAP briefings

C. Smith discussed the ongoing difficult situation with scientific research conducted in the Northwestern Hawaiian Islands (NWHI). The research has to be done with special consideration for the cultural heritage of the islands and their people. She described how arduous and problematic the permitting process has been, especially when dealing with the Land Board in Hawaii where public comments of opposition from the native Hawaiians are heavily considered. She attributed the difficulties and opposition to misunderstandings of the science being used and uneasiness from the Hawaiians about genetics research and the fear that it will lead to bioprospecting. ORRAP members suggested engaging the local opposition in-person to build relationships and trust, although it was pointed out that there is no guarantee of success even if the public is brought in early on. The Hawaiian Coral Reef Initiative was suggested as a potentially helpful neutral body that represents state agencies, universities and NGOs and could be used as a vehicle for stimulating dialogue between scientists and the native Hawaiians. M. Feldman added that a code of ethics is currently being created by the Census of Marine Life U.S. National Committee to address this Hawaiian permitting process issue.

Kevin Wheeler, Director of External Affairs at CORE, gave the ORRAP an update on relevant ocean-related legislation. He briefly discussed the 2007 legislative priorities for CORE. He stated that climate change is a very important topic, if not the most important topic this year. In terms of the outer continental shelf, he said that funds were being diverted from offshore oil and gas exploration to state and federal conservation and research efforts. He spoke optimistically about the Law of the Sea Convention, stating that this year was the best chance to pass a bill codifying the U.S.’s accession. He noted that hearings are currently being held and there has been a good amount of press on the topic, indicating a high level of support for the Convention. He mentioned that consideration of many bills had been postponed due to the earmarks included in the bills. He said that the release of the ORPP helped to increase the President’s budget, but because the actual appropriations could be greater than what the President’s budget called for, the President has threatened to veto any bill that costs more than what he budgeted.

ORRAP Business Session

New Membership Status Report

J. Eckman mentioned that six members were rotating off the ORRAP after this meeting. C. Huyssoon, assistant to the Designated Federal Official, explained that the names of the ORRAP nominees are currently in the approval process within the Secretary of the Navy and ultimately will be sent to the Office of the Secretary of Defense. J. Eckman noted that, by November 2007, the ORRAP should consider its 2008 membership needs,
including the desirable mix of regional and subject matter expertise from its new members. It was suggested that the topic be added to the next ORRAP meeting agenda, as the ORRAP leadership would like to aim for 40 nominations by February 2008. C. Huyssoon stated that he would be taking a terminal leave. E. Prager thanked him for all his help with ORRAP membership issues.

_Election of New Chair_

The ORRAP elected J. Schubel as the new chair. J. Eckman thanked E. Prager for her fantastic job as chair and presented her with a plaque on behalf of the ORRAP. E. Prager thanked the members for remaining engaged. D. Hernandez will remain as vice-chair.

_Topics for Future ORRAP Consideration_

J. Eckman stated that CORE is currently looking to fill an ORRAP Executive Assistant position by the next ORRAP meeting (likely October 2007). In the interim, J. Eckman and B. Chicoski (CORE) will continue as the main ORRAP points of contact.

M. McCammon asked about the status of earth observing satellites and it was suggested that the ORRAP hear a briefing from either a NASA or NOAA representative or from a member of the JSOST Interagency Working Group on Facilities. E. Prager suggested that, with the increasing relevance of ocean infrastructure, the ORRAP be briefed about its status. D. Hernandez suggested the ORRAP be briefed by Jack Dunnigan (NOAA) or Kacky Andrews (Coastal States Organization, CSO) about the CSO-NOAA partnership project entitled _Envisioning the Future of Coastal Management_. J. Schubel suggested getting Stephen Flynn from the Foreign Relations Council to present on the status and security of infrastructure such as waterways. Other ideas included email updates, to be printed for the briefing books, on projects such as the Extended Continental Shelf and the National Water Quality Monitoring Network.

It was agreed that the next meeting would be held in late October or early November at CORE in Washington, D.C. The exact meeting dates would be decided upon via email.

E. Prager adjourned the meeting at 1230.
## Meeting Attendees:

<table>
<thead>
<tr>
<th>ORRAP Members</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Peter Betzer</td>
<td>University of South Florida</td>
</tr>
<tr>
<td>Dr. Andrew Clark</td>
<td>Harris Maritime Communications, Inc.</td>
</tr>
<tr>
<td>Dr. Robert Cowen</td>
<td>University of Miami</td>
</tr>
<tr>
<td>Dr. Matthew Gilligan (via phone)</td>
<td>Savannah State University</td>
</tr>
<tr>
<td>Ms. Debra Hernandez, Vice-Chair</td>
<td>Hernandez and Company</td>
</tr>
<tr>
<td>Ms. Molly McCammon</td>
<td>National Federation of Regional Associations</td>
</tr>
<tr>
<td>Dr. Ellen Prager, Chair</td>
<td>Earth2Ocean, Inc.</td>
</tr>
<tr>
<td>Dr. Jeffrey Reutter</td>
<td>Ohio State University</td>
</tr>
<tr>
<td>Dr. Richard Seymour</td>
<td>Scripps Institution of Oceanography</td>
</tr>
<tr>
<td>Dr. Jerry Schubel</td>
<td>Aquarium of the Pacific</td>
</tr>
<tr>
<td>Dr. Celia Smith</td>
<td>University of Hawaii</td>
</tr>
<tr>
<td>Dr. Stephen Weisberg, Vice-Chair (via phone)</td>
<td>Southern California Coastal Water Research Project Authority</td>
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### Invitees and others attending

<table>
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<tr>
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<tr>
<td>Dr. Jim Eckman, FACA Designated Federal Official</td>
<td>Office of Naval Research</td>
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<tr>
<td>LCDR Cory Huyssoon, Assistant to the DFO</td>
<td>U.S. Navy</td>
</tr>
<tr>
<td>Mr. David Balton</td>
<td>U.S. Department of State</td>
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<tr>
<td>Dr. Gustavo Bisbal</td>
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<tr>
<td>Ms. Peg Brady</td>
<td>Council on Environmental Quality</td>
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<tr>
<td>Ms. Maggie Hayes</td>
<td>U.S. Department of State</td>
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<tr>
<td>Dr. Gerhard Kuska</td>
<td>Council on Environmental Quality</td>
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<tr>
<td>Dr. William Lang</td>
<td>National Science Foundation</td>
</tr>
<tr>
<td>Mr. Kalle Matso</td>
<td>Cooperative Institute for Coastal and Estuarine Environmental Technology</td>
</tr>
<tr>
<td>Mr. Joe Piotrowski</td>
<td>Environmental Protection Agency</td>
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<tr>
<td>Dr. Susan Roberts</td>
<td>Ocean Studies Board</td>
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<tr>
<td>Dr. Leslie Rosenfeld</td>
<td>Naval Postgraduate School</td>
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<tr>
<td>Dr. Brandon Southall</td>
<td>National Oceanic and Atmospheric Administration</td>
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<tr>
<td>Mr. Brian Van Pay</td>
<td>U.S. Department of State</td>
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### NOPP Office:

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<th>Office Contact</th>
<th>Details</th>
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<tbody>
<tr>
<td>Ms. Melissa Brodeur</td>
<td>NOPP Office Program Office</td>
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</table>

National Oceanographic Partnership Program Office
At the Consortium for Oceanographic Research and Education
1201 New York Avenue, NW, Suite 420, Washington, DC 20005
Phone: 202.332.0063 Fax: 202.332.9751 Email: noppo@coreocean.org
### National Oceanographic Partnership Program
### Ocean Research and Resources Advisory Panel
### 27-28 June 2007
### Action Items

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<thead>
<tr>
<th>Action</th>
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<th>Due Date</th>
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<tr>
<td>Provide S. Weisberg with specific comments on the Research to Application Task Force (RATF) document</td>
<td>ALL</td>
<td>July 12, 2007</td>
</tr>
<tr>
<td>Provide S. Weisberg with descriptive paragraph about ORRAP for forward page of RATF document</td>
<td>J. Eckman</td>
<td>July 12, 2007</td>
</tr>
<tr>
<td>Send revised RATF document to IWG-OP for comments on relationship and fit into NOPP process</td>
<td>S. Weisberg</td>
<td>Before July 20th IWG-OP (Interagency Working Group on Ocean Partnerships) meeting</td>
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<tr>
<td>Approve revised RATF document digitally</td>
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<td>July 31, 2007 (or defer to October 2007 ORRAP meeting if not prepared in time)</td>
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<tr>
<td>Present RAFT document and ORRAP recommendations to ICOSRMI</td>
<td>J. Schubel</td>
<td>Next ICOSRMI meeting (possibly August, but not scheduled) <em>dependent on above action</em></td>
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<tr>
<td>Provide M. McCammon with nominations of individuals or groups worth considering for Ocean Observing Sub-panel membership</td>
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<td>July 12, 2007</td>
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<tr>
<td>Edit and circulate updated membership list for Ocean Observing Sub-panel</td>
<td>M. McCammon</td>
<td>July 31, 2007</td>
</tr>
<tr>
<td>Edit and circulate Ocean Observing Sub-panel Terms of Reference</td>
<td>M. McCammon</td>
<td>July 31, 2007</td>
</tr>
<tr>
<td>Provide Dan Ashe (SIMOR) with suggestions of useful programs relating to technical qualifications for ecosystem management</td>
<td>ALL</td>
<td>ASAP</td>
</tr>
<tr>
<td>Contact NASA or NOAA representatives for briefing on status of earth observing satellites at next ORRAP meeting</td>
<td>J. Eckman/NOPP</td>
<td>September 1, 2007 or when agenda for next meeting is being developed</td>
</tr>
<tr>
<td>Contact IWG-F (Bob Winokur) or Stephen Flynn about presenting on status of infrastructure at next ORRAP meeting</td>
<td>J. Eckman/NOPP Office</td>
<td>September 1, 2007, see above</td>
</tr>
<tr>
<td>Contact Kacky Andrews (Coastal States Org, Executive Director) or Jack Dunnigan (NOAA-NOS Assistant Administrator) about briefing on CZM at next ORRAP meeting</td>
<td>J. Eckman/NOPP Office</td>
<td>September 1, 2007, see above</td>
</tr>
<tr>
<td>Circulate options for dates of the next ORRAP meeting in Washington, DC</td>
<td>NOPP Office/J. Eckman</td>
<td>July 12, 2007</td>
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TAB 2
State Perspectives on CZMA Reauthorization

Kacky Andrews
Executive Director
December 6, 2007
ORAPP

Caveats
- Work in Progress
- Bi-weekly phone calls of the states
- Will go to the full Board for approval in February
- Then delivery to the Hill

Narrowing the Goals
- Develop sustainable, livable coastal communities
- Protect coastal habitats, waters and unique resources
- Respond to impacts of climate change
- Encourage regional governance
- Ensure government coordination

Maintaining State Programs
- Current programs remain approved
- Federal consistency authority retained
- "Core" coastal programs receive non-competitive funding pursuant to formula
  - Core funding at $60 million total nationwide
**Strengthening State Programs**

- States encouraged to develop six-year Strategic Plans to address the four substantive national goals:
  - Improving Coastal Community Stewardship
  - Protecting Habitats and Water Quality
  - Responding to Climate Change
  - Encouraging Regional Approaches
- Preparation of plan means more funding and technical assistance from federal government.

**Six-Year Strategic Plans**

- Include strategies, program activities and outcomes to address one or more of the national priorities
- Constitute six-year funding agreement between NOAA and the states
- Guide annual implementation and funding
- Basis for technical assistance
- States may include science and monitoring component

**Regional Coordination**

- NOAA will conduct regional assessments on status and trends of coastal resources in cooperation with the states and Coastal Coordination Council
- Assessment will inform interstate ocean and coastal planning projects
- Multiple states in a region may apply for funding for shared priorities
- NOAA to establish regional field offices

**Federal Coordination**

- Federal Coastal Coordination Council
  - To assist states in implementing six-year strategic plans
  - To coordinate federal programs in coastal zone
  - To promote consistency of federal programs with state programs
- Fed members: NOAA, DOI, EPA, FEMA, USCOE, USDOT, USDA, CEQ
- State Members: three from states, one from NERRs
NOAA Technical Assistance Team

- Purpose: To coordinate programs to assist states in implementing their six-year strategic plans
- Members: OCRM, CSC, CICEET, NCCOS, Sea Grant
- States and Coordinating Council identify highest priority technical assistance; Team helps to implement and coordinate federal delivery

Program Evaluation

- Each state program and NOAA's assistance to that state will receive an external review every six years.
- Interim program reviews every three years
- States will report annually on program performance measures

Funding for National Priorities

- Coastal Community Stewardship: $50 million
- Protecting Coastal Habitats and Water Quality: $100 million (CELP will be part of this $100 million)
- Climate Change: $70 million
- Regional Governance: $40 million
- Mix of formula and competitive

Funding to the Feds

- $50 million to NOAA for technical assistance and coordination
- $20 million to NOAA to distribute to other federal Council members
- $100 million to NOAA for research related to ocean and coastal management as identified in the states' Strategic Plans
Coastal and Ocean Trust Fund

- Dedicated funding source (e.g. OCS revenues) to fund activities under the Act
- If from OCS revenues, completely lacking in any incentive for more oil and gas drilling

Questions?
Envisioning the Future of Coastal Management
Ocean Research and Resources Advisory Panel

Ralph Cantral
Office of Ocean and Coastal Resource Management, NOS

Envisioning the Future of Coastal Management

Project Purpose:
To engage stakeholders in developing a vision for an improved Coastal Zone Management Act (CZMA) and to identify methods for improving program implementation at the state and national levels. Partners: NOAA and CSO

Outcome:
A set of core principles and specific ideas for CZMA reauthorization and suggestions for improved policy implementation at the federal and state levels.

Three Project Phases

• Phase 1: Identify Challenges and Key Questions
  Discussion Paper

• Phase 2: Learn from State-Level Managers
  Interviews with 33 state coastal program managers, 13 national estuarine research reserve managers and 10 other coastal managers.

• Phase 3: Stakeholder Meetings
  5 Meetings: Boston, Chicago, Atlanta, Hawaii, San Francisco. More than 400 stakeholder participated.
  6 State-hosted Meetings: Minnesota/Wisconsin, American Samoa, Texas, Florida, Washington, New Jersey
Federal Agency & Organization Meetings

NOAA has met with many **federal agencies** including:
- FEMA - USACE
- Navy - DOT
- EPA - DOI (MMS, USGS, NPS, FWS)

CSO and NOAA have met with several **organizations**: National Ocean Industries Assoc., Restore Americas Estuaries, American Waterfront Coalition, and more...

Experts Meeting

**July 17-18, 2007 ~ Washington D.C.**

**Purpose:**
To refine stakeholders ideas for a reauthorized CZMA and other program improvements based on input from the visioning process.

What We Heard

The CZMA should improve coastal governance:

- **PRIORITIZED & STRATEGIC**
  NOAA and the states should set clear and measurable goals and objectives.

- **ACCOUNTABLE**
  National and state governments need to be held accountable for results.

- **COORDINATED**
  Federal, state, regional, and local-level entities should leverage assets by coordinating priority setting, funding, program implementation, etc.

Cornerstones and Core Principles*

*Agreed to by NOS and CSO

Office of Ocean and Coastal Resource Management
National Ocean Service
and Coastal States Organization

September 2007
**Cornerstones of an Improved CZMA**

- CZMA will ensure long term sustainability of coastal resources and communities
- CZMA will be goal-driven and results-oriented
- CZMA will coordinate and align federal, state, and local government to address issues of national importance
- National Coastal Management Program will remain a voluntary partnership in which both the federal government and states bear responsibility for achieving the goals

**Core Principles: Better Governance**

- Establish national priorities and goals
- Establish methodology to standardize geographic boundaries landward and seaward
- Retain states’ right to federal consistency
- Increase use of public process for decisions

---

**Core Principles: Strategic Approaches**

- Require NOAA and states to establish measurable goals based on national priorities
- Empower NOAA to integrate and leverage governmental funding and technical assistance
- Ensure CZMA funding is strategic and tied to results
- Promote management of special areas through planning and partnerships
- Establish protected areas for resource protection

**Core Principles: Coordination**

- Support partnerships to address regional issues
- Improve coordination across all levels of government
- Strengthen mechanisms to engage local governments
- Increase engagement of NGOs, private sector, and others
NOW: The CZMA sets a policy to “preserve, protect, develop, and where possible restore and enhance” resources of the coastal zone.

FUTURE:
- Focus on three broad goals:
  - Maintain ecosystem function
  - Strengthen coastal communities
  - Integrate and target science and capacity building
- Set national measurable objectives with assistance of a national advisory council.

Ecosystem Function

National goal: Ensure the continued productivity and biodiversity of coastal, estuarine and marine ecosystem.

Priorities:
- Maintain or enhance critical habitats
- Conserve critical habitats through acquisition
- Minimize or mitigate impacts on coastal resources and water quality from development and impacts from climate change

Coastal Communities

National goal: Ensure coastal communities are vibrant and resilient to coastal hazards and impacts from climate change.

Priorities:
- Manage growth and development to minimize impacts from hazards and climate change
- Protect and enhance public access to beaches and other coastal resources
- Improve efficiency of marine commerce; increase redevelopment of waterfronts and brownfields; protect water dependent uses; and improve the siting of energy facilities.
Integrate and Target Science and Capacity Building

National goal: Integrate capabilities of NOAA and coordinate with other federal agencies to provide the best possible natural and social science.

Priorities:
- Conduct and translate science based on needs of coastal and marine resource managers.
- Build capacity of resources managers through the development of tools and technologies.
- Educate and develop awareness of coastal and marine resource managers and the public.
- Establish a system of sentinel sites to monitor impacts to ecosystems and changes due to climate change.

Integrated NOAA Coastal Science

• Codify NOAA Coastal Programs (e.g. CSC, NCCOS, CICEET) within the CZMA and define roles of these and other programs (e.g. Sea Grant, Sanctuaries, and Navigation Services)

• Establish mechanisms and support for coordination and integration of NOAA research, science translation, and tools to address national priorities.

Partnerships

NOW:
Coastal zone management is accomplished primarily through partnerships with the states.

FUTURE:
In addition to the primary partnership with the states, the CZMA will:
- Authorize an organization to coordinate efforts with NGOs, local governments, and the private sector (similar to the National Fish and Wildlife Foundation).
- Establish regional cooperative institutes through a competitive process.

Interagency Coordination

NOW:
The CZMA does not formally support coordination of federal agencies to meet mutual goals and objectives for the coasts.

FUTURE:
- Specify that numerous agencies have roles in achieving goals of Act.
- Allow for issue-specific workgroups.
- Enable permanent regional task forces of state and federal managers.
**Special Areas**

**NOW:**
The CZMA supports the designation of NERRs and development of Special Area Management Plans, but does not include CELCP.

**FUTURE:**
- Develop regional initiatives that would incorporate place-based management into a broader context.
- Develop a coordinated national network of protected areas (e.g. CELCP, NERRS, Refuges)
- Make CELCP an integrated part of coastal management.

**NOAA’s Concepts for State Programs**

**Assessment and Planning**

**NOW:**
The CZMA does not require state CZM plans with measurable outcomes.

**FUTURE:**
Based on national priorities:
- Federal-State partnership develops robust comprehensive resource assessments.
- States and reserves develop plans with strategies and measurable objectives.
- States and reserves are evaluated on progress toward objectives.

**Competitive Funding**

**NOW:**
Funds are allocated among states through a formula based on coastal population and shoreline mileage.

**FUTURE:**
Provide three types of funding:
- Base funding for core competencies
- Funding for assessments and plan development
- Competitive funding for projects and program implementation (based on anticipated impact of project and past program performance)
Managing at Ecosystem Scales

NOW:
States delineated the geographic boundaries of their coastal programs on whatever basis they chose, leading to inconsistency and ineffectiveness.

FUTURE:
• Require establishment of coastal planning areas that, at a minimum, require inclusion of coastal watersheds and state territorial waters.
• Support and encourage regional processes to address issues at a variety of scales, involving governments at all levels and private sector.

Local Governments

NOW:
The CZMA does not provide for federal-local collaboration, nor does it direct state programs to develop state-local partnerships.

FUTURE:
• Require local government input in state and reserve plan development.
• Provide dedicated, competitively allocated funding for local demonstration projects.
• Provide better and more integrated technical assistance to states and local governments.

Ongoing Process

• The Final Report identifies Cornerstones and Core Principles for the next generation of coastal management (available online)
• NOS is developing a legislative proposal (fall-winter 2007)
• Administration bill for Coastal Zone Management Act Reauthorization introduced (early 2008?)

Your Feedback

• Initial reactions to National and State Program concepts.
• Suggestions for improving our legislative package.
For more information contact:

Donna Wieting or Ralph Cantral
Donna.Wieting@noaa.gov or Ralph.Cantral@noaa.gov

Web site: www.coastalmanagement.noaa.gov
TAB 3
Tab a
Improving Ocean Education

Presentation to the ORRAP

December 6, 2007

Lisa Rom and Marlene Kaplan (co-chairs)
Interagency Working Group on Ocean Education (IWG-DE)

The President’s response in the U.S. Ocean Action Plan

- Increase Ocean Education Coordination: The newly established Committee on Ocean Policy will coordinate Federal education and outreach activities. A high-level focus will ensure:
  - a coordinated education and outreach message;
  - the integration of education and outreach components into research, exploration and management activities;
  - data collected through ocean and Earth observations are translated into useable forms for teachers, students, and the general public;
  - that State and local educators are involved in developing high-quality education materials by participating Federal agencies;
  - the ocean workforce of tomorrow is well-prepared;
  - that we continue to expand innovative means for bringing ocean science into classrooms and reaching the broader public;
  - and that other identified needs are adequately addressed.

(U.S. Ocean Action Plan, page 16)

The report is available at http://ocean.ceq.gov/

ICOSRMI Resolution

Formed a Joint interagency subcommittee on ocean education
January 2006

- Assigned Four Tasks related to Ocean Education
  - Improve Coordination of Federal ocean ed. programs
  - Develop a common message
  - Promote the use of Ocean Observing Data for education
  - Promote improvements in the marine workforce
  - Complete an inventory of all ocean education programs
  - Develop annual implementation plan and associated budget
  - Report jointly to JSOST and SIMOR co-chairs

Current Membership of the IWG for Ocean Education

- ORR
  - Joan Cleveland
  - Steve Kinburg
- DOI
  - Jerry Holman
  - Lynn Murdock
- NOAA
  - Marlene Kaplan (Co-chair)
- DOD
  - August Vogel
- NASA
  - Ming-Ying Wai
- NSF
  - Lisa Rom (Co-Chair)
- DOL
  - Jean Weaver
  - Lucinda Power
- EPA
  - Jeff Reuter
  - Jeff Reuter
Task #1. Increase coordination and promote collaboration, Strengthen existing efforts, Promote regional collaboration; Identify new opportunities & partners

- 2006
  - Completed Inventory of Ocean Education programs
  - Coordinated with briefings at meetings (continuing)
  - Adaptable program (DOT) coordination - (continuing)

- 2007
  - New COSEEs with one focused on Ocean Observing
  - NOAA Environmental Literacy grants utilize Ocean Literacy Principles
  - Sponsored Hawaii coordination meeting
  - Continuing CELC network Kiosk and common messages efforts
  - Developing Climate Literacy Essential Principles to complement Ocean Principles

Task #2. Develop a Coordinated Ocean Education and Outreach Message

- 2006
  - "Ocean Literacy Essential Principles" being promoted in a variety of ways
  - Sponsored Conference on Ocean Literacy

- 2007
  - Working with Alliance of Marine Mammal Parks and Aquariums (AMMPA) on developing common messages
  - Coordinated IYOR/IPY presentations at NSTA

Task #3. Ensure data from ocean and Earth observation systems are translated to useable forms for teachers, students, and the public.

- 2006
  - Ocean.US ex officio member
  - Workforce needs assessment award made by NOPP
  - Award to MATE Center for certification assessment
  - Working with Dept. of Labor on possible collaborations

- 2007
  - MATE workforce and certification assessments continuing
  - April, 2007 meeting with MATE, funding agencies and ORRAP
  - Coordinated review/funding for the National Ocean Sciences Bowl

Task #4. Ensure a well-prepared ocean workforce; Evaluate existing workforce; Promote diversity

- 2006
  - Workforce needs assessment award made by NOPP
  - Awarded to MATE Center for certification assessment
  - Working with Dept. of Labor on possible collaborations

- 2007
  - MATE workforce and certification assessments continuing
  - April, 2007 meeting with MATE, funding agencies and ORRAP
  - Coordinated review/funding for the National Ocean Sciences Bowl
Looking Forward to 2008

Coordination and Regional Collaborations
- Ocean Hall Opens in September
- 2008 is IYOR and IPY
- Continue regional efforts, including Hawaii Ocean Literacy Alliance and GOMA
- Expansion of COSEE network with new partnerships

Ocean Messaging
- Continue to work with aquarium alliances, including CELCs and AMMPA on common messaging
- Finalize Climate Literacy Essential Principles

Observing System Education
- Find funding for an education coordinator for IOOS
- Continue DMAC Education Protocols and the IOOS Key Messages Working Groups

Workforce
- MATE Workforce Study completion
Inventory of Federal Ocean Education Activities

Marlene Kaplan, Co-Chair
Interagency Working Group
on Ocean Education
December 6, 2007

Response to Data Call
- Data received from: NOAA, DOD, DOI (NPS, & FWS), DOT, EPA, NASA, NSF
- Responses also received from: CEQ, MMS, USGS, DOJ, HHS
- No response from: DHS, DOE, DOL, MMC, USDA
- Data received in Excel format, then transferred to Access database
- Data analyzed in Access & Excel

General Observations
- 194 programs entered into database
- FY06 total spending $192.2M
- FY07 total requested $164.1M
- 149 programs have existed for more than 3 years

Caveats & Inconsistencies
- Reporting was at different scales (e.g. NOAA reported 14 sanctuaries as one program vs. NPS reported individual parks)
- Type of programs reported differed (e.g. DOD reported student & post-doc support)
- There were gaps in budget data (80 programs for FY06 & 93 programs for FY07)
- Audience size data did not account for larger audiences (119 programs reported reaching 500+)
# Programs by Agency

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Note: discrepancies in data re: program reporting

FY06 & FY07 Funding by Agency

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Note: missing $ data for 80 programs in FY06 & 93 programs in FY07

FY06 Funding by Agency

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Note: discrepancies in data re: program reporting

FY06 Funding by Agency

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</tbody>
</table>

Note: missing $ data for 80 programs
Formal Education: K-12
- 132 programs with K-12 component
- 43 student focus
- 14 teacher focus
- 75 combined

Formal Education: Higher Ed.
- 80 programs with Higher Ed. component
- 20 undergrad focus
- 16 grad focus
- 44 combined
Informal Education

- 123 programs w/ Informal Ed. component
- 12 museum focus
- 78 public focus
- 33 combined

Target Audiences by Agency

Note: categories not mutually exclusive
II. Implementation Tasks

During discussion of the options outlined above, members of the Joint Task Force on Ocean Education identified initial steps toward implementation of improved ocean education coordination as specified in the President’s Ocean Action Plan. These initial steps are outlined below. The implementation tasks listed below are examples for the working group to consider and are not all-inclusive. The working group should, in developing the plan, draw from these examples -- or the concepts embodied in them -- in developing a wide-ranging set of tasks on all matters related to ocean education. The task given the highest priority by the JSOST and SIMOR co-chairs is the first one, develop an implementation plan.

Task: Develop an Ocean Education Implementation Plan.

The foundation for implementation of educations goals in the Ocean Action Plan is development of an Ocean Education Implementation Plan. A number of existing reports and strategic plans related to improving ocean education and earth science education provide the basis for creating this Plan. The Ocean Education Implementation Plan should build off of previous efforts and add two components that do not currently exist:

1. An inventory of current ocean education activities conducted by agencies or funded by them.

   The National Oceanographic Partnership Program (NOPP) Office did an inventory of FY 2002 programs, however, this inventory needs to be expanded and updated prior to completion of the Ocean Education Implementation Plan. The resulting database of activities and programs must be updated biennially in order to monitor trends and provide input to annual implementation plan development. Ideally, automated reporting instruments used to conduct these inventories could also be used for gap analysis and project overlap.

2. Development of suitable metrics for evaluation of Federal programs in ocean education.

   Interagency coordination is required for the development of metrics and evaluation tools relative to ocean education programs supported or conducted by Federal agencies. Within the last five years and especially since the Office of Management and Budget (OMB) began using the Program Assessment Rating Tool (PART), Federal agencies have begun to grapple with the issue of education program performance measurement. Much of this work has centered around the linking of education program outcomes to agency missions and goals (e.g. NOAA, NASA,
USDA), and to a lesser extent on the establishment of specific performance metrics for program management and impact evaluation (e.g. EPA, NOAA). Most of the efforts for identifying the outcomes of environmental education programs’ are focused on the measurement of knowledge, skills, and abilities and/or stewardship actions. The long-term impacts of education, which can take years if not decades to surface, are less well understood and far more difficult to measure.

The Ocean Education Implementation Plan will provide the long range guidance for interagency collaboration and indicate the priorities of those collaborative activities. It will be used as the basis for development of annual implementation plans as well as assessment of progress towards the long term goals detailed in the Ocean Action Plan.

**Task: Increase Coordination and Promote Collaboration.**

This task seeks to create and strengthen collaborative efforts for enhancing ocean education among the public/private sectors, states/regions, scientists/educators and the Federal agencies that support these efforts. Examples of how this task might be carried out include:

- **Strengthening and promoting existing national collaborative efforts.** Two models to build on include: 1) the Centers for Ocean Sciences Education Excellence (COSEE) which seek to build effective partnerships between research scientists and educators. The COSEE network is a recognized model for bringing ocean-related education materials to the classroom and the general public and providing ocean scientists with opportunities to learn more about educational needs. The network also links those who develop ocean education materials with those who disseminate it. The existing network of seven centers and a national office is not fully institutionalized and there are geographic gaps in the location of the Centers. And, 2) the Coastal America Coastal Ecosystem Learning Centers, which is a network of twenty one federally designated aquaria and research institutions that serve as hubs providing informal education, through hands-on projects, exhibits and volunteer programs.

- **Strengthening and promoting regional collaborative efforts.** For example, there is an environmental education component to the Gulf of Mexico Alliance, a regional effort by the five Gulf States with support from Federal agencies to address regional priority coastal and ocean concerns. The Alliance is a model of regional and intergovernmental collaboration and the environmental education component of the Alliance has the potential to provide valuable lessons in collaboratively working toward the goal of lifelong ocean education. One of the goals of the education component of the Alliance is to link and coordinate regional educational activities and materials.

- **Looking for opportunities to promote collaborative efforts that bring together new combinations of partners.** For example, this could include the collaboration of scientists and educators on Federally-funded ocean-related research. A model for
this type of collaboration is a multi-disciplinary NOPP project that examined the biological and archeological aspects of deepwater World War II shipwrecks in the Gulf of Mexico. Educators were an integral part of the project team. The project included real time logs, a website, and a documentary video that brought the results into the classroom and to the general public.

- Identifying opportunities for private sector collaboration and sponsorship of education and outreach activities. For example, Adopt-A-Waterway brings together the public and private sectors to raise money for local governments to clean-up and prevent pollution caused by urban and storm runoff. Adopt-A-Waterway includes a comprehensive outreach program that provides educational materials.

**Task:** Evaluate a full range of means to enhance the public’s knowledge of ocean related matters as appropriate at the regional, state, and local level and ensure a coordinated education and outreach message.

**Task:** Ensure that data collected through ocean and Earth observations are translated into useable forms for teachers, students, and the general public.

A variety of organizations have begun to consider how to make the data collected via ocean observing systems useful to the public. Several Centers in the COSEE network have focused efforts on local use of observing data. The Ocean.US office is attempting to coordinate education-related efforts for the Integrated Ocean Observing System (IOOS) and Ocean Research Interactive Observatory Networks (ORION). Another example of how this task might be addressed includes expanding public access of Global Earth Observing System of Systems (GEOSS) data.

Ocean observation systems, including the Global Ocean Observing System (GOOS), IOOS, and ORION, fit within the broader context of the Global Earth Observation System of Systems (GEOSS), an international initiative established “to monitor continuously the state of the Earth, to increase understanding of dynamic Earth processes, to enhance prediction of the Earth system, and to further implement our international environmental treaty obligations.” The goal is to provide to all nations “timely, quality, long-term, global information as a basis for sound decision making.” This information is critical for addressing issues of concern to society.

Agencies could expand the use of ocean and earth science data by creating new electronic environments modeled on those used by the research community for students and other novice scientists. These environments would be easier to use, graphics intensive, provide a wealth of background content information and on-lining training. Such an environment would enable a new approach to teaching ocean sciences and improved access for all members of the public.
Over the last few decades, observations of the ocean from space-based and in situ sensors have altered our understanding of ocean dynamics, ocean-atmosphere coupling, and other fundamental processes of oceanography. Our understanding of how the earth operates as a system and our ability to monitor earth’s environments have reached a level sufficient for application to solution of societal needs. These capabilities also present an unprecedented opportunity for advancing science education in formal and informal settings. Satellite imagery of the earth along with the visualizations and models built from observational data provide powerful teaching tools. Open access to data and software tools provide the opportunity for research and analysis by individuals other than the oceanographic research community, including amateur scientists, educators, and students.

It is critical that the data from all the various ocean observing efforts reach educators and the public in a coordinated and coherent fashion. Each observing system would benefit from coordinated education and public outreach planning. Agencies would be able to pool their resources to accomplish common goals, and educators and the public would have seamless access to ocean observing data from a wide variety of systems.

Task: Assess the current and future ocean workforce to determine if additional effort is needed to ensure adequate preparation of the nation’s ocean workforce. If the assessment reveals gaps in workforce preparation, the committee will be tasked with developing programs and plans to address gaps.

In 2003, the National Science Board (in “The Science and Engineering Workforce: Realizing America’s Potential”) recognized both the economic importance of science and technology in the United States and the need to maintain a healthy workforce of highly skilled researchers and educators in science and mathematics. Little is known about the ocean-related workforce although it is an increasingly important part of America’s science and engineering workforce. Jobs in ocean sciences and resource management are not disaggregated in Department of Labor statistics and the small size of the workforce makes projections based on the U.S. workforce as a whole unreliable indicators of future trends in marine-related jobs.

An assessment of available information regarding the current ocean workforce, the future ocean workforce, and ocean related academic programs, in coordination with the Departments of Labor and Education, could identify additional efforts needed in this area.

III. High-level Ocean Education Event

At the July, 2005 ICOSRMI meeting, the ICOSRMI proposed a high-level Ocean Education event. The working group will seek further guidance from the ICOSRMI on what type of event should be held and explore options for moving this forward.
IWGOE Membership:

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SIMOR  Steve Kinberg  Steven.Kinberg@usda.gov  202-401-9928

Update: 10/2007
The New Investigator Program (NIP) in Earth Science was established to encourage the integration of Earth system science research and education by scientists and engineers. The program's purpose is to ensure continued training of interdisciplinary scientists to support the study of the Earth as a system.
Memorandum
From: JSOST and SIMOR Co-Chairs on behalf of the Ocean Education IWG
To: Agency Program Officers
Re: Survey of Ocean Education Programs
Date: August 9, 2006

The Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI) has requested that the Ocean Education Interagency Working Group conduct an inventory of current federal agency ocean education activities, including formal and informal education and outreach. The purpose of this inventory is to monitor trends, provide input into the Working Group’s annual implementation plan, and provide data for a gap and project overlap analysis. The survey audience includes all federal agencies that are members of SIMOR and/or JSOST. The purpose of this survey is to identify all federal projects and programs (as further defined below) that are intended to raise the level of knowledge and shared stewardship of the ocean, coastal, and marine environment.

We ask that each agency provide one point-of-contact who will be responsible for ensuring timely coordination, compilation, and submission of the agency’s response to this survey. In particular, for those agencies that serve on both SIMOR and JSOST but have different representatives on each Subcommittee, we need you to work together to agree on only ONE person in your agency to serve as the survey point-of-contact. The agency point-of-contact should be reported to the JSOST and SIMOR Co-Executive Secretaries (Laura Snow: lsnow@nsf.gov, Emily Larkin: Emily.Larkin@noaa.gov, Peter Fippinger: Peter.Fippinger@noaa.gov, and Hazel Groman: Groman.Hazel@epa.gov) AND Jon Lilley (Jon.Lilley@noaa.gov) by August 25, 2006. Each agency’s compiled survey response should be submitted to Jon Lilley, via email at Jon.Lilley@noaa.gov, by September 29, 2006. If you have questions, Jon can be reached at (202) 482-2269.

The survey is set out below. Please provide the requested information on the attached spreadsheet for ongoing programs and projects with an intended life-span of at least 3 years, i.e. through FY 2008. Projects or programs that receive substantial "in-kind" support in terms of agency personnel time, etc. and that might benefit from interagency cooperation should be included. For externally funded programs or projects, awards of less that $15,000/year need not be included, and efforts with minimal "in-kind" support need not be included. Since we are trying to capture a broad array of projects, if you do not know the funding level, we ask that you include the project anyway.

A response spreadsheet is attached. Please fill in columns according to the questions below. The first entry is an example.

1. Agency and bureau responding. (Column A)
2. Name, phone number and e-mail of agency contact. (Column B-F)
3. Name of project or program. (Column G)
4. Brief program or project description. (Column H)
5. For public education programs/projects, what is its message, topic or objective? General example, “Smokey Bear says ‘Don’t start forest fires’” Ocean examples might include a
program to educate divers about how to dive around coral reefs without damaging them, or a program to inform beachgoers and boaters about the harm throwing plastics in the water causes to wildlife. (Column I)

6. Has the program existed for more than 3 years? Yes or No. (Column J)

7. What is the annual funding level for FY 2006? (Column K)

8. What was the fiscal year 2007 request for the project or program. (Column L)

9. Is this an Internal or In-kind Program or Project? Yes or No. (Column M)

10. Do you have non-Federal partners for this program or project? If so what is the nature of the partnership? (Column N)

11. Do the partners provide funding for the project? If so how much? (Column O)

12. Describe the intended audience; put an x in each box that applies. See definitions below. (Columns P through AF)

   a. Underrepresented Groups - supports participation of underrepresented groups in Science, Technology, Engineering, Mathematics (STEM)
   b. K-12 Proficiency - improves proficiency of low performing students
   c. K-12 High achieving – focus on high achieving students
   d. K-12 General – for all students
   e. Pre-service K-12 Teachers - Student teachers
   f. Inservice K-12 Teachers – Professional development programs
   g. Current STEM Practitioners – practicing scientists & engineers
   h. Future STEM Practitioners – students majoring in STEM
   i. Undergraduates – any program supporting undergraduates
   j. Community College – any programs supporting C.C. or C.C. students
   k. Graduate Students – any program supporting graduate students
   l. Postdoctoral Fellows – any programs supporting Post-doctoral Fellows
   m. College Faculty – any program supporting education and outreach activities of/for college faculty
   n. Workforce or job training – programs with specific job training aspects including training for resource management, ocean observing, etc.
   o. Public at Museums/Parks/Centers – “on site” programs for the public
   p. General Public – all other programs for public education.

13. Estimate the approximate number of persons served directly by this program. (Columns AG through KL)

14. Any comments on data. (Column AL)

Please note that this survey uses audience divisions that are similar to a recent American Competitiveness Council (ACC) Survey. The ACC survey did not capture data in sufficient detail to discern ocean-related programs, particularly for informal audiences. We appreciate your assistance with this project and will be happy to answer any questions that you might have. The following are members of the Ocean Education IWG and are available to answer questions about this survey.

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<table>
<thead>
<tr>
<th>Agency</th>
<th>Name</th>
<th>Email</th>
<th>Phone</th>
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<tbody>
<tr>
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Tab b
Coastal America
Supporting Ocean Science Education

Presentation to ORRAP
December 6th, 2007
Steven Kinberg
Deputy Director

Four Implementation Tasks Assigned by ICOSRMI, 2006

- Increase Coordination and Promote Collaboration
- Develop a Coordinated Ocean Education and Outreach Message
- Ensure Data From Ocean and Earth Observation Systems are Translated to Usable Forms for Teachers, Students, and the Public
- Ensure a Well-Prepared Ocean Workforce

Task #1
- Increase Coordination and Promote Collaboration
  - Strengthen existing efforts
  - Promote regional collaboration
  - Identify new opportunities/partners

Programs, Progress & Plans
- CELC Network Expansion and Initiatives
- Corporate Wetlands Restoration Partnership
- Innovative Readiness Training Program
- Coastal America Awards Program

Coastal America CELC Network

Task #2
- Develop a Coordinated Ocean Education and Outreach Message

Programs, Progress & Plans
- National Marine Debris Initiative
- Ocean Interpretive Stations Pilot Program
- National Media Coverage for Smithsonian Ocean Hall
- National Student Summit on Oceans and Coasts

Rendering of a CELC Pilot Ocean Today Kiosk
Task #3

- Ensure data from Ocean and Earth Observation Systems are translated to useable forms for teachers, students, and the public.

Programs, Progress & Plans
- CELC Network as a Public Portal for OOS information
  - Alaska SeaLife Center
  - Gulf of Mexico Coastal OOS
  - CELC network working internally to partner with national and regional IOOS

Task #4

- Ensure a well-prepared ocean workforce
  - Evaluate existing workforce
  - Promote diversity

Programs, progress & Plans
- CELC Education Efforts
- CELC Network Expansion
- CELC Ocean Literacy Messaging
- Utilizing partnerships within the CELC, CWRP, IRT and Federal Agencies

Future opportunities and plans for ocean education
- Ocean Interpretive Stations network-wide initiative
- National and Regional Art Contest
- National Student Summit
- CWRP participation in Education Initiatives
- CELC Network Expansion
- Marine Debris National and Gulf of Mexico Initiatives

Strategic plans for Ocean Education within the agency
- Does agency mission include ocean education?
  - Coastal America Federal Agency MOU
  - CA MOU with 21 Coastal Ecosystem Learning Centers
- Internal agency coordination methods?
  - Then, Coastal America Interagency Education Workgroup
  - Now, Interagency Workgroup on Ocean Education
- External agency coordination methods?
  - CELC Network
  - CELC Executive Committee
- Strategic planning methods for ocean education?
  - Annual CELC CEO/Directors Meeting
  - CELC Executive Committee Meeting
  - CELC Education Directors Monthly Meeting
Tab c
Department of Defense

Presentation to ORRAP
December 6th, 2007
By Augustus Vogel

Four Implementation Tasks
(from ICOSRMI, 2006)

- Task #1. Increase coordination and promote collaboration
- Programs, Progress & Plans
  - SATED Satellite Conference
  - Project NEMO
  - Ocean Sciences Bowl
  - Smithsonian Oceans Hall

Implementation Tasks (con’t)

- Task #2. Develop a Coordinated Ocean Education and Outreach Message

- Programs, Progress & Plans
  - Marine Mammals
    - Whales and Sonar web page
    - ESG for Maritime Issues
  - Oceanography
    - Neptune’s Web
    - Zeus’ Web
  - Freedom of Navigation
    - UNCLOS

Implementation Tasks (con’t)

- Task #3. Ensure data from ocean and Earth observation systems are translated to useable forms for teachers, students, and the public.

- Programs, Progress & Plans
  - Nothing, although Navy data may reach this audience through NOAA
Implementation Tasks (con’t)

• Task #4. Ensure a well-prepared ocean workforce
  – Evaluate existing workforce
  – Promote diversity
• Programs, progress & Plans
  – Operational Training
    • NWC (Training catalog)
    • Seabase Underwater Construction Team training
    • SPAWAR Environmental Assessment and Marine Mammals Training
    • NAVSEA Command Acquisition Intern Program
  – Undergraduate Study
    • USNA Naval Architecture and Ocean Engineering
    • USNA Center for Chesapeake Bay Observation and Modeling
  – Graduate Study
    • Naval Postgraduate School
    • WHOI/MIT Oceanography Program
  – Professional Academia
    • NRL
    • RONAPL
    • Coastal and Hydraulics Lab (USACE)
    • USD AT&L/DDR&E (funding research)
  – General

Future opportunities and plans for ocean education

• Continued workforce training
• Satellite Education Conference
• Marine debris cleanup

Strategic plans for Ocean Education within the agency

• Does agency mission include ocean education?
  – Mainly in a workforce training and public affairs sense
• Internal agency coordination methods?
  – CNO guidance
  – ESG for Maritime Sustainability
• External agency coordination methods?
  – ad hoc
• Strategic planning methods for ocean education?
  – Only in a strategic communication sense
Tab d
U.S. Department of Labor
Employment and Training Administration

Ocean Research and Resources Advisory Panel
December 6, 2007

Workforce Investment System
- $15 billion public investment in America’s workforce
  - Majority of funds available at the state and local level, allocated according to strategic plans
  - Limited number of federal discretionary investments
- Serves as convener and catalyst to address workforce challenges
- Acts as source of funds, source of talented workers, and provider of direct services to both job-seekers and businesses

Workforce System Partners
- Industry defines the workforce challenges and identifies skill sets and competency models
- Educational institutions and training providers assist in developing competency models and curricula against industry competency models
- The public workforce system accesses human capital and places trained workers in jobs

High Growth Job Training Initiative
Demonstrate new and innovative approaches to workforce development that are:
- Demand-driven
- Solutions-based
- Partnership-based
- Replicable and sustainable
- Transformational for the community partners, and particularly for the public workforce system
ETA has identified 14 High Growth sectors that:

1. are projected to add substantial numbers of new jobs to the economy or affect the growth of other industries; or
2. are existing or emerging businesses being transformed by technology and innovation requiring new skills sets for workers.

- Advanced Manufacturing
- Aerospace
- Automotive
- Biotechnology
- Construction
- Energy
- Financial Services
- Geospatial Technology
- Health Care
- Homeland Security
- Hospitality
- Information Technology
- Retail
- Transportation
- Advanced Manufacturing
- Aerospace
- Automotive
- Biotechnology
- Construction
- Energy
- Financial Services

High Growth Job Training Initiative

- Workforce Solutions for the Geospatial Technology Industry
  - Develop geospatial curricula in schools
  - Develop on-the-job training
  - Core training in K-12 & community colleges
  - Develop career awareness projects
  - Develop industry-specific tools to share salary benefits and best practices

Community-Based Job Training Grants

- Critical role of community colleges in post-secondary education and talent development
- Strengthen relationship between job training system and community college system
- Improvements to facilities, equipment, and expanded faculty

ETA Funded Solutions

- 156 High Growth grants totaling $289 million
- 142 Community-Based grants totaling $250 million
- Complete Listing at http://www.doleta.gov/business/

Current priority across these investments is to disseminate learnings and tools to the workforce system and community colleges (www.workforce3one.org)
InDemand Magazine

- Issues explore careers in different high growth industries
- Provides students as well as guidance counselors, parents, and teachers with relevant information about career opportunities, education, and the skills needed for various jobs
- Issues are available in Advanced Manufacturing, Construction, Energy, Healthcare, and STEM

What’s Next for ETA

- Competition in the global economy depends on a quality workforce
- Workforce Innovations in Regional Economic Development (WIRED) Initiative
- Public workforce system strategy for talent development to increase economic investment and development in a region
**WIRED Initiative**

**WIRED: Aligning Federal Resources**

- **Federal Partners**
  - National Science Foundation provides resources to establish ATE centers in WIRED regions
  - Department of Commerce facilitates technology transfer through its NIST MEP program
  - Department of Defense aligns resources to support STEM education in WIRED regions
  - Department of Energy/Department of Interior cooperating with ETA to conduct energy skills study through the National Academy of Sciences
  - USDA Rural Development promotes economic development of rural areas by supporting infrastructure improvement and providing technical assistance to agricultural and other cooperatives
  - The list is growing!

**Looking Ahead**

- Grant Solicitations (STEM)
- Building Industry and Inter-Agency Partnerships
- Disseminate Grant Products and Best Practices through [www.workforce3one.org](http://www.workforce3one.org)

**Contact the Business Relations Group**

Business Relations Group
U.S. Department of Labor
Employment and Training Administration
202-693-3949
businessrelations@dol.gov

BRG Acting Director: Amanda Ahlstrand
Ahlstrand.amanda@dol.gov

Aerospace & Geospatial Technology industry lead:
Brad Wiggins
Wiggins.brad@dol.gov
Table
** DOI’s Mission **
- to protect and provide access to our Nation’s natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

** Why Oceans & Coasts are Important **
- More than half of Americans live within 50 miles of the coast – 75% expected by 2025
- Wetlands, coastal forests, barrier islands, and submerged habitats protect citizens from natural disasters
- Coasts provide essential habitat for 85% of U.S. waterfowl and other birds
- Ocean resources provide 30% of the Nation’s domestic energy production
- More than 95% of U.S. trade overseas by volume, 37% by value, is waterborne – contributing $740 billion annually to the GDP

** DOI Overview **
- 35,000 miles of coastline
- 169 island and coastal refuges
- 92 million acres of coral reef ecosystems
- 3.5 million acres of coral reef
- 34 million acres in 74 coastal parks
- 1.8 billion underwater acres of outer continental shelf lands
- 4 U.S. territories (1.4 million sq. mi. of ocean) and 3 freely associated states (2.2 million sq. mi. of ocean)
President Bush’s Executive Order

On December 17, 2004, the President directed Federal Agencies to

• Coordinate and consult regarding ocean-related matters
• facilitate, as appropriate, coordination and consultation regarding ocean-related matters among Federal, State, tribal, local governments, the private sector, foreign governments, and international organizations.

Education

• DOI is a field based organization – our education and outreach programs are managed through our bureaus and implemented through our field offices.
  – Lynn Murdock, National Park Service
  – Barbara Wallace, Minerals Management Service
National Park Service

Presentation to ORRAP
December 6th, 2007
Lynne Murdock

1916-2016
•National Park Service Centennial commemorates the creation of the first ocean park at Acadia National Park, Maine, 1916 (as Sieur de Mont National Monument). The National Park System has grown to 5,100 miles of coast across 74 parks and 26 states with over 75 million visits per year, generating $2.5 billion in economic benefits.

Ocean Park Stewardship Action Plan

•The President’s U.S. Ocean Action Plan called on the National Park Service to develop a Plan to conserve ocean and coastal resources. On December 1, 2006 NPS Director Mary Bomar announced the release of the Ocean Park Stewardship Action Plan at the 50th Anniversary of Virgin Islands National Park.

Restore and Maintain

•The Ocean Park Plan establishes goals and priorities to restore and maintain ocean and coastal resources across the National Park System, in collaboration with state and federal agencies and park stakeholders.
Regional Action Plans

- Consistent with the national-level Ocean Park Stewardship Plan, the Northeast, Pacific West and Alaska Regions have developed strategic plans that identify goals and action items with 4 major topics:

Action Items

- Establish a seamless network of ocean parks, sanctuaries, refuges and reserves
- Discover, map and protect ocean parks
- Engage visitors and the public in ocean park stewardship
- Increase technical capacity for ocean exploration and stewardship

Shared Common Mandates for protection of marine resources

- NPS/NOAA Point Reyes National Seashore, Gulf of Farallones National Marine Sanctuary
- NPS/USFS Olympic National Park, Olympic National Forest
- NPS/State Redwoods National and State Parks
- NPS/Private Channel Islands National Park, The Nature Conservancy - Santa Cruz Island.

Targeted Messages for Different User Groups

- Citizen Science: All Taxa Biological Inventory (ATBI) in Tomales Bay, Point Reyes N.S.
- REEF: Reef Environmental Education Foundation “Make Every Dive Count”
- Great Annual Fish Count: Channel Islands, Biscayne and U.S. Virgin Islands National Park
- Restoring SeaGrass beds in Biscayne National Park through BOAT U.S. partnership
- Channel Islands Live! Live underwater interpretive programs fed via Internet 2 to Ventura Department of Education school system
RLC’s Facilitate research and provide educational opportunities

Ocean Alaska Science and Learning Center (Seward, Alaska)
Pacific Coast Research Learning Center (Point Reyes, California)
Schoodic Education and Research Center (Acadia National Park, Maine)
Old Growth Forest Research Center, (Congaree National Park, South Carolina)
California Mediterranean Research Learning Center (Santa Monica, California)

Making Data Useable: Research Learning Centers

Future Opportunities, Plans for Ocean Education & NPS Future Workforce

SCEP, STEP and Research Intern Positions exist in RLCs and Region Offices.

Enhance effective programs Through Challenge Cost Share Grants and Centennial Challenge Funding

NPS Mission

"to promote and regulate the use of the...National Parks...which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."
Four Implementation Tasks (from ICOSRMI, 2006)

• Task #1. Increase coordination and promote collaboration

• Activities, Progress & Plans
  – Partner with others to leverage funds and opportunities
    ▪ National Oceanographic Partnership Program (NOPP)
    ▪ Coastal Marine Institutes (CMI)
    ▪ Other university partnerships

Implementation Tasks (con’t)

• Task #1. Increase coordination and promote collaboration (con’t)

• Activities, Progress & Plans
  – Partner with others to promote education
    ▪ Local schools
    ▪ Programs to promote science, engineering, and mathematics
    ▪ Museums
    ▪ Coastal Marine Institutes
Implementation Tasks (con’t)

• Task #2. Develop a Coordinated Ocean Education and Outreach Message

• Activities, Progress & Plans
  – Member, IOOS Education: Key Messages Working Group
  – Member, Coral Reef Task Force Education and Outreach Working Group (IYOR messaging project)
  – Strive for ocean education message that is consistent with the essential principles of ocean sciences

Implementation Tasks (con’t)

• Task #3. Ensure data from ocean and Earth observation systems are translated to useable forms for teachers, students, and the public

• Activities, Progress & Plans
  – Nothing to report

Implementation Tasks (con’t)

• Task #4. Ensure a well-prepared ocean workforce

• Activities, Progress & Plans
  – Financial support to:
    • Workforce study
    • NOSB
    • Selected conferences/workshops
  – Incorporate interns (high school to post college) into our offices
  – Provide research opportunities for university scientists and their students
  – Include teachers at sea in selected research
  – Prepare and distribute posters, teachers’ packets, and activity books for classroom use

Future opportunities and plans for ocean education

• Components of our education efforts
  – Partnerships
  – Printed materials and distribution mechanisms
  – Coastal Marine Institutes
  – Internships
  – Financial contribution in support of relevant activities
Strategic plans for Ocean Education within the agency

• Does agency mission include ocean education?
  — No
• Internal agency coordination methods?
  — Environmental Studies Program-related, program processes
  — Informal coordination among Regions, public affairs, and Headquarters
• External agency coordination methods?
  — Meetings and committees
• Strategic planning methods for ocean education?
  — A strategy, yes
  — A strategic planning process, no
Tab f
Maritime Administration (MARAD)

Presentation to ORRAP
December 6, 2007

Sharon LeGrand
Program Analyst
Office of Workforce Development

Task #1. Increase Coordination and Promote Collaboration

Programs, Progress & Plans

- **Adopt-A-Ship Program**
  - Educate students in grades 5-8 of the need for an educated American Merchant Marine for domestic and foreign shipping. Program fosters interest in transportation, foreign and domestic trade, geography, history and English.
  - Foster interest in geography, history, transportation, trade, science, ocean environmental activities, math and English.
  - Students and the ship's crew interact and learn by exchanging information relating marine science and transportation, ocean science, sea life, maritime maps and charts, etc.
  - 40 Classrooms participate for the 2007-2008 school year.
  - Increase classroom participation for the 2008-2009 school year by 5%.
  - Increase shipping industry participation.
  - Partner with other Federal Agencies such as NOAA to utilizing available ships.

- **Maritime Careers Outreach Program**
  - Educate and inform our nation's youth and young adults about maritime industry career paths and employment opportunities.
  - Raise awareness of the important role the maritime industry serves to our nation.

- **State Maritime Academies Program**
  - Partnership between MARAD and State maritime academies that educate, train and graduate future U.S. merchant marine officers.

- **U.S. Merchant Marine Academy**
  - Federally funded Maritime Academy educating and graduating merchant marine officers to contribute to the intermodal transportation system.

Careers Outreach and Educational Programs

- **Adopt-A-Ship Program**
  - Educate students in grades 5-8 of the need for an educated American Merchant Marine for domestic and foreign shipping. Program fosters interest in transportation, foreign and domestic trade, geography, history and English.

- **Maritime Careers Outreach Program**
  - Educate and inform our nation's youth and young adults about maritime industry career paths and employment opportunities.
  - Raise awareness of the important role the maritime industry serves to our nation.

- **State Maritime Academies Program**
  - Partnership between MARAD and State maritime academies that educate, train and graduate future U.S. merchant marine officers.

- **U.S. Merchant Marine Academy**
  - Federally funded Maritime Academy educating and graduating merchant marine officers to contribute to the intermodal transportation system.

Task #1. (Con't)

Programs, Progress & Plans

- **Maritime Careers Outreach Program**
  - Participate in high, middle and elementary school activities such as career day.
  - Participate in career fairs, local maritime and shipping events, and educational activities (e.g., Public Recognition Week).

- **State Maritime Academies Program**
  - Disseminate informational/promotional materials regarding employment, educational and training opportunities.

- **U.S. Merchant Marine Academy**
  - Collaborate efforts with the maritime industry, with particular emphasis on maritime unions, the Department of Labor and Education and targeted school districts.
  - Develop internship programs to shadow reserve fleets.
  - Partner with the Maritime Academies to utilize training ships for outreach activities.
Task #2. Develop a Coordinated Ocean Education and Outreach Message

- **Programs, Progress & Plans**
  - Develop and direct external marketing and publicity activities for maritime career outreach activities with maritime industry organizations.
  - Facility discussions and information exchange with SOCP, maritime industry organizations, unions and educational institutions.
  - Public Service Announcement video on maritime careers/shipping industry.

Task #3. Ensure Data from Ocean and Earth Observation Systems are Translated to Useable Forms for Teachers, Students, and the Public.

- **Programs, Progress & Plans**
  - Utilize tools such as web pages, job fairs, printed material, Adopt-A-Ship program, workforce development conferences to distribute information regarding marine transportation and ocean environmental issues.
  - Public service announcement promoting maritime careers and the importance of ocean going vessels to transport cargo.
  - Dialog with guidance educational instructors/guidance counselors by distributing quarterly Maritime CAREERS e-NEWSLETTER.
  - Schedule field trips for students (PG/DC &VA area schools) to visit ships in Baltimore and/or local ports to see how the transportation system works.

Task #4. Ensure a Well-Prepared Ocean Workforce (Evaluate existing workforce; Promote diversity)

- **Programs, Progress & Plans**
  - Collaborate efforts with the maritime industry, with particular emphasis on maritime unions, the Department of Labor and Education and targeted school districts.
  - Disseminate informational/promotional materials regarding employment and training opportunities.
  - Support maritime education institutions and training facilities such as:
    - State Maritime Academies
    - U.S. Merchant Marine Academy
    - MarVista High School Maritime Technologies & Training Program
    - CAL-Maritime’s Summer Bridge Program
    - Philadelphia City Sail Maritime Education Program
    - Transportation Education Academy, St. Cloud State University
    - American Sail Training Association
    - sitesALIVE Foundation, Inc.
  - Develop a shared understanding of the current state of merchant mariner recruiting and retention for careers afloat.

Future Opportunities and Plans for Ocean Education

- Expand the Adopt-A-Ship Program
- Maritime and Intermodal Education for Primary and Secondary Schools in America Conference (“Onboard to a Future Career”) - April 1-2, 2008
- Guidance and support to Mariner Apprentice Programs in educational systems
- Establish relationship with regional/local school systems to promote and coordinate maritime career related activities.
### Strategic Plans for Ocean Education

- **Does agency mission include ocean education?**
  - MARAD promotes the development and maintenance of an adequate, well-balanced United States merchant marine, sufficient to carry the Nation's domestic waterborne commerce and a substantial portion of its waterborne foreign commerce, and capable of service as a naval and military auxiliary in time of war or national emergency.

- **Internal agency coordination methods?**
  - Establish relationship with MARAD regional offices to promote and coordinate maritime career-related activities in local school systems within their district.

- **External agency coordination methods?**
  - Mariner Recruitment and Retention Working Group was established in partnership with maritime industry representatives and unions to execute initiatives to educate and inform our nation's youth and young adults about the shipping industry.

- **Strategic planning methods for ocean education?**
  - Facilitate discussion and exchange of information regarding the maritime industry.
  - Disseminate informational materials to educational institutes.
Tab g
Environmental Protection Agency: Overview of Environmental Education

Presentation to ORRA
December 6th, 2007

Lucinda P. Power
U.S. Environmental Protection Agency
Office of Wetlands, Oceans, & Watersheds
Oceans & Coastal Protection Division

History

- The National Environmental Education Act of 1990
- EPA’s Environmental Education Division
  - Mission & vision
  - Strategic goals

Environmental Outreach
Focus: Changing people’s behavior for improved environmental quality

- Youth
- General Public
- Decision Makers
- Watershed Leaders

EPA Videos

- “What’s an Estuary? Now You Know”
- “After the Storm”
  - Co-produced by The Weather Channel and EPA
  - Addresses problems and solutions to today’s water quality problems
  - Focused on three watersheds:
    - Santa Monica Bay
    - MS River Basin/Gulf of Mexico
    - New York City
Partnering with the Girl Scouts

- EPA Water Drop Patch Project:
  - Collaboration between EPA and Girl Scouts of the USA
  - Part of the Linking Girls to the Land Initiative
- Project offers learning opportunities in watersheds, nps pollution, and wetlands
- Participating Girl Scouts gain hands-on skills in watershed management and resource conservation efforts

OSV Bold – Public Education and Outreach

- Supports EPA's Coastal and Ocean Program mission: public education & outreach
- Serves as a tangible symbol to public of EPA's scientific work
- Supports EPA Regions, HQ, federal and other partners, and the general public
- Enhances public awareness and understanding of ocean issues
- Supports one of EPA's most important activities
- Demonstrates EPA's sophisticated techniques used to study and protect ocean and coastal waters

Increase Coordination & Promote Collaboration

- Environmental Education Grants Program
- Environmental Education and Training Partnership
- Participation on Advisory Groups
- EPA Partnerships

An example: National Estuary Program – Santa Monica Bay

- Partners on the local level
- Public Education: vital to the protection of the Bay
- Gaps in existing coordination
Develop a Coordinated Ocean Education and Outreach Message

- Linking land-based sources of pollution to the oceans
- Changing people’s behavior: social marketing
- “Save the Crabs...Then Eat ‘Em”

IOOS: Translating data to the public

- Monitoring: two-pronged approach
- Regional systems: feedback from stakeholders

Ensure a Well-Prepared Ocean Workforce

- National Network for Environmental Management Studies

Future opportunities: Think Outside the Boundaries

- Challenges:
  - Funding
  - Visibility
  - Program specific
- Opportunities:
  - Strong relationships with the states and regions
  - Increased coordination within OWOW
  - Collaboration with the Weather Channel: Earth Gauge
  - Nonpoint Source Outreach Toolbox
Thank you

Questions?
Tab h
#1. Increase Coordination and Promote Collaboration

- Strengthen existing efforts
  - Continued support of programs/projects listed in 2006 inventory
    - Workforce: MS PhD’S, New Investigator Program, NESSF-Earth Science, DIALOG, graduate training in optics & remote sensing, IOCCG-ocean color data use
  - Elementary/Secondary: GLOBE, NSG Atlas of the Ocean Teacher Guide, Signal of Spring, Semester at Sea-SEA
  - Informal/Public Outreach: NOSB, Ocean World, OceanMotion, mission web learning resources (ocean surface topography, wind & salinity), Earth Observatory, Scientific Visualization, SCUBAnauts International
    - New collaboration with NOAA on Rising Tides Journal, an electronic journal targeted at high-school science teachers and students
- Promote regional collaboration
  - SCUBAnauts, based in Tampa Bay, establishing new chapters (e.g., Hawaii)
- Identify new opportunities/partners
  - SCUBAnauts to explore opportunities with GLOBE international partners

#2. Develop a Coordinated Ocean Education and Outreach Message

- “Ocean Literacy Essential Principles” being used to guide development of programs
  - NSF to lead on Climate and Terrestrial Geo-science literacy groups and NASA to lead on Biosphere
- Encouraging learning resources developers to work with education expertise in ocean education (e.g., NMEA)
#3. Ensure Data are Translated to Useable Forms for Teachers, Students, & Public

- MY NASA DATA (http://mynasadata.larc.nasa.gov) allows individual teachers and students to create their own micro-sets for classes or personal interests
  - Organized into basic, intermediate, and advanced levels
  - NASA and NOAA ocean-related data linked at intermediate and advanced levels

#4. Ensure a Well-prepared Ocean Workforce

- NASA focusing primarily on the research workforce
- MS PHD’S making a difference in advanced degrees awarded to minorities in ocean and environmental sciences

Strategic Plans for Ocean Education within NASA

- Does NASA mission include ocean education?
  - Not explicitly, but included as a component of Earth System Education as part of the Earth Science Division (see back-up)
- Internal agency coordination methods?
  - An agency-wide Education Coordination Committee focused on STEM (see back-up)
- External agency coordination methods?
  - Formal and informal interagency coordination groups
  - Program Officer to Program Officer
- Strategic planning methods for ocean education?
  - Only as a component of STEM or Earth System Education planning
  - May explicitly encourage ocean (and climate change) education in future program announcements

Back-up
NASA Mission

- To pioneer the future in space exploration, scientific discovery, and aeronautics research
  - Goal 3: Develop a balanced overall program of science, exploration, and aeronautics consistent with the redirection of the human spaceflight program to focus on exploration
    - Sub-goal 3A: Study Planet Earth from space to advance scientific understanding and meet societal needs
      - Atmospheric Composition
      - Weather
      - Carbon Cycle and Ecosystems
      - Water and Energy Cycle
      - Climate Variability and Change
      - Earth Surface and Interior
Tab i
NOAA Education

A Presentation to
Ocean Research and Resources Advisory Panel

Marlene Kaplan
NOAA Deputy Director of Education

December 6, 2007

NOAA Vision

An informed society that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions.

NOAA Goals have a Literacy Focus

Ecosystems
A well informed public that acts as a steward of coastal and marine ecosystems.

Climate
Climate-sensitive sectors and the climate-literate public effectively incorporating NOAA’s climate products into their plans and decisions.

Weather & Water
Enhance environmental literacy and improve understanding, value, and use of weather and water information and services.

Commerce & Transportation
Build public understanding of the science & technology involved and the role of the environment in commerce and transportation through outreach, education, and industry collaboration.

NOAA 2006 Budget

Education and Outreach
$95.4M (2.7%)

Total NOAA Budget $3.5B
Major E&O Programs*

- Office of Education
- Sea Grant (SG)
- National Marine Sanctuaries Program (NMSP)
- National Estuarine Research Reserves (NERRS)
- Ocean Exploration
- Teacher at Sea
- Climate
- Weather Forecast Office

* See backup slides for program descriptions.

NOAA in the Field

NOAA resources to support education and outreach are extensive and diverse

Coordination Across Agencies & Common Messages

Many programs participate in interagency coordination and partnerships:
- International Year of the Reef and International Polar Year
- Smithsonian Ocean Hall
- Regional partnerships, e.g., Chesapeake Bay Program, Gulf of Mexico Alliance
- Climate Essential Principles and Fundamental Concepts
- Participate in COSEE, NOSB, NMEA and Hands on the Land
- Many partnerships in the field

Ocean Observing Systems

- NERRs, NMSP, and Sea Grant are developing education materials using data from ocean observing systems and are involved in regional OOS networks
Workforce

• Sponsor of the MATE workforce study
• Support student scholarships and fellowships
• Educational Partnership Program with Minority Serving Institutions

Internal Coordination

NOAA Education Council:
• Includes a representative from each NOAA line office and major education program
• Sets NOAA’s education agenda and policies
• Develops the NOAA Education Plan
• Makes recommendations to NOAA leadership
• Meets monthly and is chaired by NOAA’s Director of Education

Internal Coordination

NOAA Education Plan:
• 2004 Plan established 3 goals and 6 strategies for NOAA Education (http://www.oesd.noaa.gov/NOAA_Ed_Plan.pdf)
• NOAA Education Council will update the Plan in FY 2008

Authority & Funding

• Specific legislative authority for NMSP, NERRs and Sea Grant.
• Broad legislative mandate for education from the America COMPETES Act (PL 110-69), enacted in August, 2007.
• Funding is a combination of Administration and Congressionally supported programs.
Major E&O Programs

- **Office of Education: Educational Partnership Program with Minority Serving Institutions ($14.2M)**
  - Provides financial assistance to minority serving institutions to support cooperative science centers and undergraduate and graduate scholarships
  - Five Cooperative Science Centers are established; 270 students have graduated with degrees in NOAA-related sciences
  - 32 students have been hired by NOAA with advanced degrees in NOAA-mission related sciences
  - Performance measures: number of students who obtain NOAA related STEM degrees; number of students hired by NOAA and related organizations; financial support leveraged, peer-reviewed research papers published
  - Significant impacts: doubling the number of African American Ph.D.s in atmospheric and environmental science
  - Evaluation methodologies: Comprehensive programmatic and financial analysis

- **Office of Education: Hollings Undergraduate Scholarship Program ($4M)**
  - Funds 100+/year students in NOAA science, technology, engineering, math and education
  - 2005 (first) HSP class completed NOAA internships in August 2006; (second) class completed NOAA orientation in May 2006
  - Performance measures: number of students who obtain degrees related to NOAA’s mission; number of students hired by NOAA and related organizations; number of students who become educators in NOAA related areas
  - Significant impacts: first Hollings class graduated
  - Evaluation methodology: administrative tracking

- **National Sea Grant Program ($21.1M)**
  - Nationwide network of 30 university-based programs
  - Involves ~500 outreach professionals who provide science-based information to educators/decision-makers
  - Supports ~650 undergraduate & graduate students/year
  - Educator workshops held for curriculum development, training and recertification opportunities
  - Sea Grant Extension agents focus on topics such as improving fisheries management, and developing sustainable coastal communities
  - Performance measures:
    - Extension – sponsorship of education programs; internal evaluation process for products/programs; staff & product awards; changes in behavior of targeted audience.
    - Education – number of graduate & undergraduate students supported; staff & product awards; number of theses completed; tracking of graduate students after S&G support; use of products for K-12 education; number of teachers using S&G products in curriculum.
National Sea Grant Program (cont’d)
- Significant impacts: Delaware Sea Grant helped ~150 teachers receive recertification hours; provided seed funds to COSEE; over 644 Knauss fellows trained
- Evaluation methodologies – Sea Grant Program Assessment Team (PAT) Review
  - PAT review: high-level, external review comprised of 5-6 team members who conduct an onsite visit
  - Established criteria, benchmarks and procedures guides the review in the areas of program management, connecting with users, long-range planning and significant results
  - Sea Grant programs, including the education component, are evaluated by a PAT every four years
  - NOAA’s National Sea Grant Office relies on the PAT Review to rate each Sea Grant program. Performance of the outreach/education programs affects a program’s ratings

Major E&O Programs

National Marine Sanctuaries Program ($6.1M)
- 13 National Marine Sanctuaries and 1 National Marine Monument promoting public understanding of national marine sanctuaries and the marine environment
- Performance measures:
  - By 2010, all education programs implemented in national marine sanctuaries will be assessed for effectiveness against stated program goals & objectives and National Science Education Standards.
  - By 2010, increase by 25% the number of volunteer hours dedicated to NMSP science, public awareness and resource protection activities.
  - By 2015, increase by 20% public awareness of national marine sanctuaries and the sanctuary system.
  - By 2007, NMSP is assessing the effectiveness of all significant partnerships across the sanctuary system.
- Significant impacts: in partnership with National Geographic & NPS, created OceansLive to deliver real-time data and images
- Evaluation methodologies: evaluation teams, administrative records, and survey data

Major E&O Programs

National Estuarine Research Reserves ($2.0M)
- 27 protected estuarine areas promoting estuary stewardship
- Provides a nation-wide coastal training program (CTP) that offers science-based information to coastal-decision-makers
- Performance measures:
  - Performance measures assess ability to engage key audiences
  - Graduate Research Fellowships (54/year)
- Significant impacts:
  - 25,315 participants in the EstuaryLive program.
  - ~70,000 students participate in K-12 programs and 3000 teachers participate in professional teacher training programs
  - CTP increases in knowledge, skills, abilities, increases in contacts, and awareness of opportunities for collaboration
  - ~10 students/yr completing M.S. or Ph.D. degrees annually
- Evaluation methodologies:
  - EstuaryLive: pre/post assessments of students; interviews with teachers; and post program survey of teachers
  - CTP: literature review, survey of stakeholders, focus groups

Major E&O Programs

Ocean Exploration ($1.4M)
- Uses excitement of near real-time ocean discoveries to enhance environmental literacy
- Performance measures: number of lessons produced, number of professional development offerings for teachers
- Significant impacts:
  - Over 270 hands-on, inquiry-based lessons developed, over 300,000 education pages downloaded in 2005; 470,771 to date for 2006
  - 13 Education Alliances established with major aquariums for teacher professional development in NOAA science content
  - Classroom Exploration of the Ocean Virtual Teacher Workshops – 1,030 participants, all 50 states, 37 countries (Fall 2006 Series)
- Evaluation methodologies: pre/post workshop surveys, formal external evaluations
  - 86% of PIs (n = 21) said “conducing exploration education activities for teachers through NOAA caused them to reflect on the role they can play as scientists in enhancing environmental literacy.”
**Major E&O Programs**

- **Teacher at Sea ($0.2M)**
  - Teachers from elementary school through college go to sea to work with scientists aboard NOAA research and survey ships
  - Performance measures: number of teachers participating, number of scientists participating
  - Significant impacts: more than 460 teachers have participated in this program since its inception in 1990, bringing their newfound knowledge back to their students
  - Evaluation methodologies: administrative tracking and formal and informal feedback from teachers and scientists

- **Weather Forecast Office Staffing ($10.5M)**
  - StormReady & TsunamiReady accreditation for local communities
  - 2,400 school visits annually (cover general meteorological principles & can include StormReady & TsunamiReady information)
  - Performance measures:
    - 10 TsunamiReady communities per year
    - 100 StormReady communities per year
  - Significant impacts:
    - Directly promotes our environmental literacy goal
    - Working relationships with schools at the local level
    - NOAA in your Neighborhood presence throughout the country
    - Lives saved in Van Wert Co., OH (a StormReady community) after a movie theater was evacuated before a tornado destroyed it in 2002
  - Evaluation methodologies:
    - Customer and partner feedback
    - Local stakeholder steering groups for certain programs (i.e. marine)

- **Office of Education: Bay Watershed Education & Training Programs (B-WET) - Chesapeake Bay, California, & Hawaii ($6.9M)**
  - Integrates classroom curricular requirements with meaningful first-hand experiences
  - Performance measures: student environmental stewardship & academic achievement; tangible benefits to watershed; teacher professional development; effectiveness of Meaningful Watershed Education Experiences
  - Significant impacts: (B-WET Chesapeake Bay evaluation 2006)
    - Statistically significant improvement in students’ environmental stewardship
    - Little impact on state test scores
    - Teacher professional development increased teachers’ confidence & ability to teach about the watershed
  - Evaluation methodologies: pre/post questionnaires, statistical analysis of test scores

- **Office of Education: NOAA Education Initiative ($6M)**
  - 2007 Environmental Literacy Grant awards:
    - Lawrence Hall of Science, University of California: Ocean Sciences Curriculum sequence for Grades 3-5
    - National Mississippi River Museum and Aquarium: Ocean Interpretive Stations: A Pilot Program for Coastal America Coastal Ecosystem Learning Centers
    - Eastern Michigan University: Sailing Teachers Towards Ocean Literacy Using Familiar Water Resources
    - Maine Mathematics and Science Alliance: Earth as a System is Essential – Seasons and the Seas
    - The Ocean Project: Building Environmental Literacy: How the Ocean Community can Connect More Effectively With the American Public
    - Science on a Sphere awards TBA early 2008.
  - Performance measures: all individual grants have an evaluation component which varies with project (both formative & summative).
Tab j
National Science Foundation and Ocean Education

Presentation to ORRA
December 6th, 2007
Lisa Rom
Program Director for Ocean Education
Division of Ocean Science

Sources of Funding for NSF Ocean Science Education Programs

- Division of Ocean Sciences FY 2007
  - $7.5 M in the Ocean Education Program
  - $17.5 M in graduate/undergraduate support from research funding

Other Sources of Ocean Education Funding at NSF

- Geoscience Directorate (~$0.5M in ’06)
  - Geoscience Education Program
  - Opportunities to Enhance Diversity in Geosciences (OEDG)

- Directorate of Education ($~6.0M in ’06)
  - Division of Graduate Education - IGERT/GK-12
  - Division of Undergraduate Education
  - Division of Research on Learning in Formal and Informal Settings

NSF Contributions to IWG-OE Implementation Tasks

- Task #1. Increase coordination and promote collaboration
  - Strengthen existing efforts
  - Promote regional collaboration
  - Identify new opportunities/partners

  NSF programs
  - Expand the Centers for Ocean Science Education Excellence (COSEE) network
  - National Ocean Sciences Bowl
Task #2. Develop a Coordinated Ocean Education and Outreach Message

NSF Programs
- Expand Communicating Ocean Science (COS) & Communicating O.S. to Informal Audiences (COSIA)

Task #3. Ensure data from ocean and Earth observation systems are translated to useable forms for teachers, students, and the public.

NSF Programs:
- COSEE Networked Ocean World (COSEE NOW)
  - Primary partners: Rutgers, WHOI, Liberty Science Center
  - Working with the Ocean Observing Initiative to promote ocean education within the program.
    - Expect an education effort of up to $5 M in the construction phase (2008-2012).
    - Continued funding of about $600K for the duration of the program.

Task #4. Ocean workforce

NSF Programs:
- Undergraduate Research Internships $1.5M/year at ~20 Sites
- Graduate student education ~ $17.5 M/year
- Graduate student training programs
- COSEE - community college & Tech. Ed.
- Funding for diversity programs that:
  - Support undergraduate internships
  - Support graduate education and training programs ~$1M/year
- COSEE Southeast and COSEE West focus on K-12 diversity programs.

Future opportunities and plans for ocean education

Focus within OCE for next 5-10 years will be to:
- Expand COSEE network
- Expand Ocean Observing Initiative education
- Continue support for diversity efforts
- Continue strong support for ocean workforce/graduate student education
- Respond to workforce evaluation studies by MATE
Strategic plans for Ocean Education within the agency

• Does agency mission include ocean education?
  - NSF has authorization to promote science education.
• Internal agency coordination methods?
  Program officer collaboration
• External agency coordination methods?
  Via the JSOST/SIMOR/IWG-OE structure
• Strategic planning methods for ocean education?
  - COSEE process and External advisory committees
Tab k
The mission of the Office of Naval Research is to foster, plan, facilitate and transition scientific research in recognition of its paramount importance to enable future naval power and the preservation of national security.

- Task #1. Increase coordination and promote collaboration
  - Strengthen existing efforts
  - Promote regional collaboration
  - Identify new opportunities/partners
- ONR Programs, Progress & Plans
  - Contributed education information to inventory
  - Continue to contribute financially to NOSB (multi-agency) & to review of NOSB in 2006 (with NSF)
  - Contribute financially to MATE workforce study
  - Continue to participate in NSF’s REU / DoD’s ASSURE (Awards to Stimulate & Support Undergrad Research)
  - Continue to contribute to DIALOG and PODS

- Task #2. Develop a Coordinated Ocean Education and Outreach Message
- ONR Programs, Progress & Plans
  - ONR agrees with the “Ocean Literacy Essential Principles”
• Task #3. Ensure data from ocean and Earth observation systems are translated to useable forms for teachers, students, and the public.

• Programs, Progress and Plans
  – Not part of the ONR mission
  – Many ONR PIs maintain websites with both data and educational aspects — examples —
    • N Pac Acoustic Lab http://www.npal.ucsd.edu/
    • Coastal Ocean Optics Lab http://marine.rutgers.edu/cool/
    • Tidal Flats DRI http://tidalflats.org/index.html
    • Wave/Mud MURI http://www.eas.psu.edu/psu eminent/MURI
    • Sediment – Acoustics https://www.nsf.gov/awardsearch/award.jsp?awardid=0070954
    • EuroStrataform http://instaar.colorado.edu/deltaforce/projects/euro_strataform.html
    • ROMS / Explorer of the Sea http://www.myroms.org/applications/ias/intro/outreach.php
    • Surface Currents http://oceancurrents.rsmas.miami.edu/

• continued Task #4. Ensure a well-prepared ocean workforce

• ONR Programs, progress & plans
  – Undergraduate Student Research (205 in FY06)
  – Graduate Student Research (465 in FY06)
  – Post Doctoral Fellow Research (119 in FY06)
  – National Ocean Sciences Bowl (high school)
  – International AUV Competition (with AUVSI; high school, undergrad, grad)
  – Discovery of Sound in the Sea (www.dosits.org)
  – DoD Awards to Stimulate and Support Undergraduate Research Experiences (ASSURE) Program in conjunction with NSF Research Experiences for Undergraduates (REU) Program
  – David Chapman Lectureship in Coastal Physical Oceanography (WHOI)
  – Dissertations Initiative for the Advancement of Limnology and Oceanography (DIALOG)
  – Physical Oceanography Dissertation Symposium (PODS)

Future opportunities and plans for ocean education

• Continue existing programs.
Strategic plans for Ocean Education within the agency

• Does agency mission include ocean education? No.
  ONR focuses on supporting the future workforce of researchers interested in Navy-relevant issues via training, research experience and travel to present research results.
• Internal agency coordination methods? Informal.
• External agency coordination methods? via IWG-OE and IWG-OP.
• Strategic planning methods for ocean education? ONR is presently looking for an IPA to assist in Education and Outreach (not limited to Ocean)
TAB 4
CODE OF CONDUCT for SCIENTIFIC COLLECTIONS

1.0 Purpose

Conservation requires the collection of accurate scientific information that will advance understanding of marine species and their role in the ecosystem. This understanding is based in part on the collection of critical taxonomic and population dynamics information that informs our understanding of ecosystem health and evolutionary processes. Scientists who collect these types of information are committed to having minimal impacts on the species and its ecosystem. The purpose of this Code of Conduct of Scientific Collections (Code) is to clearly identify the practices and procedures that will guide scientists in their collection efforts.

The Code recognizes that accurate identification of species is essential and often requires the examination of dead specimens. Genetic connectivity and biogeographical analyses also require sampling in such numbers that careful evaluation of costs/benefits to the natural resources must be made. However, available evidence indicates that many vertebrate, invertebrate, and algal populations are not generally harmed by careful scientific collection of specimens. Nevertheless, localized populations and/or those that have been seriously impacted by habitat loss and fragmentation could potentially be harmed. Thus, the COML U.S. National Committee believes that collecting should always be limited to the minimum necessary for the scientific purpose intended and done in full compliance with legal requirements relating to particular sites and species. This principle is maintained in the following Code, with guidance on the safeguarding of collections and associated data.

The Committee acknowledges that lethal sampling is a common necessity, and desirable to advance conservation and wildlife management goals. We commend and promote the restraint that is already exercised by most scientists who study marine organisms. Furthermore, this committee maintains that, by subscribing to this Code, scientists demonstrate that they are concerned and committed marine biologists who wish to maximize the value of their data for scientific, public information and conservation. This Code is not meant to supercede any requirements of current animal care and use guidelines for institutions and agencies.

2.0 General Principles

The U.S. National Committee of CoML recommends that all organizations and individuals undertaking CoML research activities adopt this Code of Conduct for Scientific Collections. Its operating guidelines are based on the following principles:

1. Ascertain and comply with international, national and sub-national laws and policies.
2. Minimize or eliminate adverse environmental impacts through all stages of research activities.
3. Minimize or eliminate actual or potential conflicts or interference with existing or
planned marine science research activities.
4. Maximize the benefit that can be derived from collected specimens.
5. Involve local scientists in research activities when possible to foster the
development of scientific knowledge and research capacity within the host
country.
6. Keep the local community engaged; respect the traditional culture of the region as
part of the COML commitment.

3.0 Collecting - General

1. Capture only those specimens strictly required for a specific research purpose.
   Recognize that even an apparently common species may be locally vulnerable.
2. Examine live specimens and, whenever possible, release them near the place of
capture.
3. Avoid removal of readily identified species from the wild, unless they are strictly
   required as voucher specimens for scientific or educational purposes.
4. Whenever possible, high resolution photography or videography should be
   considered as an alternative to collecting.
5. Rare species and locally uncommon varieties should not be taken repeatedly from
   the same locality.
6. Specimens should not be collected for exchange or disposal to other scientists
   without prior arrangements that comply with this code.
7. Scientists will not collect marine organisms from the wild for commercial
   purposes, including the manufacture of jewelry, art or ornamental display.
8. Maintain data on specimens from captive-bred stock or from old collections,
   including details of provenance.
9. Commit to protect and avoid damage to the habitat.
10. Keep adequate records, as indicated in article 8.1.
11. Properly curate and house research collections to maximize scientific value and
    prevent deterioration or damage by pests.
12. Safeguard the future value of research collections. For collections made with
    COML funding, identify the museum, learned society, or university that will care
    for and curate the collection.

4.0 Collecting - Permissions and Conditions

1. Obtain appropriate permit(s) for access and/or collecting on any site controlled by
   the appropriate legal authority.
2. Always comply with any conditions laid down by those responsible for granting
   access and the permission to collect. Activities not explicitly allowed in permits
   are forbidden.
3. Report your findings to the community or person(s) who provided permission.
   The local community should receive findings from marine protected areas, marine
reserves and other important sites to the appropriate authority, including lists of
the species recorded, annotated with habitat data.

5.0 Collecting – Protecting the Environment

1. Commit to the basic principle for research in the marine environment that the
design of the study should provide for protection of the habitat. Markers and tags
used in the study should be removed after the study.

2. Record the location of semi-permanent placement of instruments and markers and
provide plans for the safe removal of these markers/instruments in the research
design.

3. Do not anchor vessels in vulnerable benthic environments such as coral reefs.

6.0 Collecting - Rare, Local and Endangered Species

1. Taxa listed as being of ‘Conservation Concern’ should not be collected except
with the utmost restraint. If justified for study, obtain license from the relevant
authority to collect the listed species. (Please refer to the IUCN list of threatened
species and other listings.)

2. Research on endangered species should have direct benefits to conservation.
Endangered species should not be used to forward research goals that can be
accomplished with other species.

3. If it can be reasonably expected to have no damaging effects on a population of
listed species, provide justification for taking of larger or annually-repeated
samples for scientific study.

4. Do not repetitively sample species in any locality where they are low in
abundance.

5. Report newly discovered localities of rare species to the appropriate conservation
organizations, records centers and organizers of recording schemes.

7.0 Collecting - Trapping

1. Release catch in traps after examination, except for specimens that must be killed
for voucher purposes or required for scientific study. The release should be made
in the same locality, but away from the immediate trap site.

2. Return unwanted by-catch organisms to the environment at the same locality.

3. Re-site traps used for scientific purposes if found to be catching rare or local
species.
8.0 Data Preservation

1. Keep records of full and relevant data with all retained specimens; include attached data labels for all preserved samples. These data may be repeated and amplified in databases, notebooks and other media.

2. Lodge species lists, together with any other data with the relevant local, regional and national recording schemes. Whenever possible, enter the data in the Ocean Biogeographic Information System (OBIS) or another database readily accessible to the local community and the scientific community.
TAB 5
The ORRAP voted on February 22, 2007 to establish an Ocean Observations Sub-panel. ORRAP members Molly McCammon, Ray Toll, Steve Weisberg, and Jim Coleman volunteered to serve on that panel, and McCammon agreed to serve as Chair for the initial organizing period. ORRAP also voted to include U.S. GOOS Steering Committee Chair Mark Luther as a member of the new Sub-panel.

The ORRAP members of the Sub-panel met by teleconference on March 16, 2007 to draft a charge and suggest possible members for the new panel. The ORRAP discussed the proposed charge and membership at its meeting on June 27-28, 2007, and adopted the following:

**Ocean Observations Sub-panel Charge:**

The Ocean Observations Sub-panel is convened to provide a forum for expert input to ORRAP on issues relating to interagency federal ocean observing initiatives. These include, but are not limited to:

- The Integrated Ocean Observing System (IOOS), both global and U.S. coastal components, as addressed through cooperative and collaborative international, national and regional programs;
- The U.S. Global Ocean Observing System (GOOS) and its relationship as the U.S. contribution to the Global Earth Observing System of Systems (GEOSS);
- The National Science Foundation’s Ocean Research Interactive Observatories Network (ORION), including the Ocean Observatories Initiative (OOI) and the Arctic Observing Network (AON);
- NASA’s and NOAA’s satellite ocean observation programs; and
- Education programs related to ocean observing.

The Sub-panel shall

- Regularly review the status of current and planned federal ocean observing programs and their coordination with local, state, and regional ocean observing activities, and provide opinions and assessments to ORRAP;
- Undertake special reviews as requested by ORRAP of papers, studies, plans, and activities related to these programs and provide opinions and assessments to ORRAP; and
- Regularly report to ORRAP on activities and progress.

Specifically, in the near-term, the Sub-panel shall

- Review the relationship between IOOS and OOI;
- Review the roles and responsibilities of the IOOS Interagency Planning Office (Ocean.US) and the NOAA IOOS Program Office; and
- Review the IOOS Strategic Plan.
The Sub-panel shall consist of approximately 18 members representing a broad, diverse spectrum of the ocean user community: state agencies, academia, industry and other private sector groups, and non-governmental organizations, and including at least one representative of the NFRA. Representatives of federal agencies may not serve on the Sub-panel but will be encouraged to attend Sub-panel meetings. The Sub-panel members shall serve two-year terms, subject to removal. The initial membership shall include some members of the current U.S. GOOS Steering Committee. The chair and/or the vice-chair of the Sub-panel shall be an ORRAP member. To the extent possible, the Sub-panel shall work electronically, but it shall have at least one face-to-face meeting annually. The Sub-panel works at the pleasure of ORRAP and may be terminated with three months’ notice.
ORRAP Ocean Observations Sub-Panel membership

The Sub-panel shall consist of approximately 18 members representing a broad, diverse spectrum of the ocean user community: state agencies, academia, industry and other private sector groups, and non-governmental organizations, and including at least one representative of the NFRA. The members shall serve two-year terms, subject to removal. The initial membership shall include some members of the current U.S. GOOS Steering Committee. The chair and/or the vice-chair of the Sub-panel shall be an ORRAP member. To the extent possible, the Sub-panel shall work electronically, but shall have at least one face-to-face meeting annually. The Sub-panel works at the pleasure of ORRAP and may be terminated with three months’ notice.

Proposed Initial Membership, representing:

State interests: 1. Molly McCammon - AK (ORRAP member, chair of Natl Federation of Regional Associations for Ocean Observing)
2. Steve Weisberg - CA (ORRAP until June 07; former USGSC)
3. Evan Richert – ME (former USGSC) or recommendation of Coastal States Organization
4. Paul Siri

Industry/private sector interests:
1. Ray Toll – SC (former ORRAP member, NFRA exec com)
2. Andy Clark - (former ORRAP member; former USGSC) or Carroll Hood or ESRI
3. Paul Kelly (former USGSC) – Rowan Industries
4. Port Authority person
5. Fisheries person
6. Emergency management
7. Utilities/energy

Academic interests: 1. Mark Luther – FL (former USGSC)
2. Jeff Reutter – OH (ORRAP member & former USGSC)
3. Jim Coleman - (ORRAP member)
4. Charlie Colgan (former USGSC)
5. Dwayne Porter, University of South Carolina (active in SCOOS or SECOORA; coordinates the NERRs System wide monitoring program)

NGO: 1. ____________ (foundation or non-profit) (Molly asking contact at Packard Foundation)
2. Terry George Castle Foundation HI – fish and coastal & outreach
A. **Official Designation:** The Committee shall be known as the Ocean Research Advisory Panel (hereafter referred to as the Panel).

B. **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.

C. **Panel Membership:** 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 or designated representative, who are not Federal officers or employees, shall serve as Special Government Employees under the authority of 5 U.S.C. § 3109.

Panel Members, under the provisions of 10 U.S.C. § 7903, shall be appointed on an annual basis by the Secretary of Defense or designated representative, and shall serve no more than four years. The Panel Membership shall select the Chairperson and Vice-Chairpersons 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.

D. **Panel Meetings:** The Panel shall meet at the call of the Designated Federal Officer, in consultation with the Chairperson, and the minimum number of Panel meetings is one per year. The Panel shall be authorized to establish subcommittees, as necessary, to fulfill its mission, and these subcommittees shall operate under the provisions of the Federal Advisory Committee Act of 1972, as amended.

E. **Duration of the Panel:** The need for this advisory function is on a continuing basis; however, it is subject to renewal every two years.

F. **Agency Support:** The Department of Defense, through the Secretary of the Navy and the Office of Naval Research, shall provide support as deemed necessary for the performance of the Panel’s functions, and shall ensure compliance with the requirements of 5 U.S.C. § 6.

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

H. **Operating Costs:** It is estimated that the operating costs, to include travel costs and contract support, for this Board is $192,000.00. The estimated personnel cost to the Department of Defense is 0.6 full-time equivalents (FTEs).

I. **Charter Filed:** January 20, 2006
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