

Report to the U.S. Congress on the  
National Oceanographic Partnership Program

Fiscal Year 2008

March 2009

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## I. Executive Summary

The National Oceanographic Partnership Program (NOPP) marked its 11th year in 2008. NOPP has forged interagency and intersector cooperation through a multitude of cross-cutting research and education projects supported by the federal government over the past decade. NOPP promotes the objectives of assuring national security, advancing economic development, protecting quality of life, and strengthening science education and communication through improved knowledge of the ocean. Among the considerable benefits that a greater understanding of the global ocean, coasts, and the Great Lakes can provide the Nation is an improved scientific basis for resource management.

The National Ocean Research Leadership Council (NORLC), now merged with the Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI), guides NOPP in identifying and carrying out partnerships among federal agencies, industry, and other members of the ocean sciences community in support of those national objectives. The ICOSRMI is an Under/Assistant Secretary-level body established in 2004 in response to the U.S. Commission on Ocean Policy report and has representation from 28 federal agencies. The unprecedented breadth of federal agency involvement in NOPP, through NORLC and ICOSRMI, can be expected to further increase NOPP's scope and relevance in the coming years.

The Joint Subcommittee on Ocean Science and Technology (JSOST) was established by the National Science and Technology Council and jointly reports to the ICOSRMI. The JSOST's Interagency Working Group on Ocean Partnerships (IWG-OP, formerly the NOPP Interagency Working Group) released its Strategic Plan during Fiscal Year (FY) 2008. Under the guidance of the IWG-OP, NOPP will continue to make progress on these four strategic goals:

1. Continue and expand ocean partnership dialogues;
2. Sponsor ocean partnership activities;
3. Identify and remove obstacles and disincentives to ocean partnerships; and
4. Facilitate opportunities for dialogue with the nation's leadership.

The overall fiscal investment in NOPP generally consists of two types of efforts. NOPP-Funded Activities are those that are either solicited or managed by NOPP and involve support from two or more agencies. Overall investment in NOPP-Funded Activities has increased significantly since the program's inception to a total of more than \$295 million; the FY 2008 contribution totaled \$31.5 million. By issuing proposal solicitations from FY 1997 to FY 2008, NOPP has funded 132 projects, including 21 renewal projects. Eleven new projects were funded in FY 2008 focusing on:

- A) *Sensors for Measurement of Biological, Bio-Optical or Chemical Properties of the Ocean;*
- B) *Atlantic Meridional Overturning Circulation;* and
- C) *Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial Hard Bottom Habitats with Emphasis on Coral Communities: Reefs, Rigs and Wrecks.*

As the single ocean focused federal advisory panel, the Ocean Research and Resources Advisory Panel (ORRAP) developed a strategic transition document in FY 2008 that highlights the most imperative ocean-related challenges and promising opportunities for the new Administration. The report emphasized eight themes vital to U.S. interests and presents critical actions that can reap meaningful and immediate rewards for the nation.

As demonstrated by its achievements, NOPP is an excellent forum for development of new

interagency initiatives and priorities that transcend single agency agendas. Using the guidance provided by the JSOST-produced national plan *Charting the Course for Ocean Science in the United States for the Next Decade: An Ocean Research Priorities Plan and Implementation Strategy*, the IWG-OP will continue to use NOPP as a standing forum for discussion of ideas and priorities within that report. Among its many roles, the IWG-OP serves an invaluable function to gather and organize information and people around relevant and timely issues regarding current and potential future research priorities. For example, the IWG-OP is pursuing interagency dialogues regarding biodiversity and Arctic research as integrating programmatic issues among agencies' exploration, research, and monitoring projects.

## II. Introduction

Through the 1997 Defense Authorization Act (Public Law (P.L.) 104-201), the Secretary of the Navy was directed to establish the National Oceanographic Partnership Program (NOPP, [www.nopp.org](http://www.nopp.org)). Supplemental legislation for appointments to the NOPP oversight body, the National Ocean Research Leadership Council (NORLC), and to the Ocean Research Advisory Panel (ORAP), is contained in P.L. 105-85, the fiscal year (FY) 1998 Defense Authorization Act.

Since the release of the report by the U.S. Commission on Ocean Policy in September 2004, there has been great emphasis placed on federal coordination in the execution of ocean research to better understand the ocean, coasts, and the Great Lakes and provide an improved scientific basis for resource management. In response, a governance structure was developed which linked existing groups with new entities. The current structure, to which the NOPP committees and their functions completely transitioned during FY 2007, is described more fully in a notice posted in the Federal Register on 29 June, 2007 (Volume 72, Number 125, p. 35708-35709 and in Appendix 1 of this report). This structure built on the original NOPP legislation and continued to provide a consistent, interagency approach to ocean science and resource management in FY 2008. Greater federal coordination in the execution of ocean research was accomplished through the continued integration of the NORLC with the Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI), the Under/Assistant Secretary-level body with representatives from 28 federal agencies, councils and committees. The ORAP, the only federal advisory committee whose purview includes oceans, provides independent advice and guidance to the NORLC/ICOSRMI. The ORAP maintains the inclusion of marine resources under its guidance, functioning as the Ocean Research and Resources Advisory Panel (ORRAP), to better reflect the connectivity between ocean research, decision-making and societal benefits. The working groups of the Joint Subcommittee on Ocean Science and Technology (JSOST), a subcommittee under the National Science and Technology Council structure which also reports to the ICOSRMI, continue to reflect the main activities of the NOPP committees. The merger of the NOPP arrangement and the current governance structure underscores the significant emphasis being placed on the role of ocean science in resource management and policy development, as well as the recognition of the importance of ocean science to society as a whole. This transition is intended to maintain the progress initiated under NOPP while reducing parallel ocean governance structures.

This FY 2008 Report to Congress reflects the central role NOPP is playing in the implementation of actions described in the U.S. Commission on Ocean Policy report, such as implementing the priorities identified in the report released in 2007, *Charting the Course for Ocean Science in the United States for the Next Decade: An Ocean Research Priorities Plan and Implementation Strategy*. Prepared by the JSOST with significant input and review by the ocean community as a whole, *Charting the Course for Ocean Science* is the first report to prioritize national ocean research by focusing on key interactions between society and the oceans. As illustrated in Figure 1, the past and current activities of NOPP and the societal themes outlined in *Charting the Course*

for Ocean Science overlap, making NOPP a highly effective and appropriate tool for implementing the priorities identified. The outlook for the future is promising, as NOPP continues to further the national agenda for ocean research, education and interagency cooperation.

NOPP Strategic Goals	Charting the Course for Ocean Science Societal Themes					
	Stewardship of natural and cultural ocean resources	Increasing resilience to natural hazards	Enabling marine operations	The ocean's role in climate	Improving ecosystem health	Enhancing human health
Achieve and sustain an Integrated Ocean Observing System (IOOS)	Design studies for the Ocean Observatories Initiative					
	Establishment of IOOS Regional Associations					
	Argo Float Array					
Promote lifelong ocean education	National Ocean Sciences Bowl (NOSB)					
	COAST Internship		Ocean Science, Technology and Operations Workforce Study			
Modernize ocean infrastructure and enhance technology development			IWG-F Federal Oceanographic Fleet Status Report	Sensor development and commercialization		
Foster interagency partnerships to increase and apply scientific knowledge	LOPHELIA I and II: Deep water coral research	Four FY 2008 multi-institution projects on Atlantic Meridional Overturning Circulation	Ocean modeling from the Global Ocean Data Assimilation Experiment (GODAE)	Four FY 2007 multi-institution projects on Coastal Effects of a Diminished-ice Arctic Ocean	LOPHELIA I and II: Deep water coral research	
	Multi-disciplinary partnerships between basic and applied researchers					

Figure 1. Examples of NOPP investments and projects in ocean science, technology and education that intersect with the *Charting the Course in Ocean Science* societal goals.

In recent years, the operating tempo of the various federal ocean-related committees and activities, including those of NOPP, has increased notably, as measured by increased decisions made and reports delivered; expanded breadth and number of funding solicitations issued; and establishment of sub-panels and Interagency Working Groups on specialized topics. This model of interagency collaboration has proven to be an effective and efficient method of maximizing and enhancing federal investments in ocean science, technology and education.

NOPP will develop and coordinate its activities with the structure established in response to the report of the U.S. Commission on Ocean Policy. The headings of the FY 2008 Report to Congress reflect the current governance structure. Additional details on activities and committee compositions can be found at the Council on Environmental Quality (CEQ) website at: <http://ocean.ceq.gov/>. For a description of the current and historical ocean governance, see Appendix 1. The remainder of this report summarizes the NOPP Investment Strategy, the NOPP committees' activities and investments for FY 2008, and ongoing NOPP plans and activities for FY 2009.

### III. Strategic Plan

In FY 2008, the JSOST approved a new Strategic Plan for the Interagency Working Group on Ocean Partnerships (IWG-OP), the implementation body for NOPP ([www.nopp.org](http://www.nopp.org)), outlining the evolution of this group from the NOPP Interagency Working Group and four Strategic Goals. NOPP, with guidance from the IWG-OP, will continue to pursue new strategic goals, which are reflected here. The IWG-OP is currently exploring marine biodiversity, Arctic research, and Autonomous Lagrangian Platform Systems as areas of research for future consideration.

Each of the four Strategic Goals discussed below identifies three or more actions as specific targets for which partnerships may be necessary. These actions represent measures of sufficient progress for this Strategic Plan. The challenge for NOPP is to facilitate efforts through interagency and intersector partnerships to execute the listed actions.

New actions may be added, implementation plans prepared, and metrics developed and tracked as appropriate. This Strategic Plan will be updated periodically as needed, particularly so as to reflect adjustments in the priorities and implementation strategies of *Charting the Course for Ocean Science*. Plans to address actions, and any associated metrics, will be documented separately and are intended for annual assessment and update.

The following is an excerpt from the IWG-OP Strategic Plan with accompanying examples of the accomplishments toward each goal that the IWG-OP and NOPP has made to date:

## **GOALS**

### **Goal I – Continue and expand ocean partnership dialogues**

#### **Actions...**

- 1** Build on the partnership successes of the National Oceanographic Partnership Program.
- 2** Serve as a point for dialogue on those tasks requiring interagency or intersector partnerships in order to realize success.
- 3** Form or foster partnerships necessary to support *Charting the Course for Ocean Science*, in particular its four near-term priorities.
- 4** Working with the other interagency bodies as needed, form long-term strategic partnerships on emerging science and technology needs and opportunities (for example, the issue of anthropogenic sound in the marine environment and the scientific and mapping efforts necessary to address the interagency Extended Continental Shelf initiative).
- 5** Facilitate and participate in forums on ocean research and development priorities.

#### **Accomplishments...**

During FY 2008, the IWG-OP hosted a Visioning Round Table at the Oceans '08 Marine Technology Society / Institute of Electrical and Electronics Engineers Conference in Quebec City, Canada. The event focused on furthering industry-government cooperation in research related to the ocean. The session was an opportunity to identify and understand areas of common interest among a variety of sectors. In particular, the discussion centered on where closer alignment in the planning, sponsorship, and execution phases of research could be leveraged. Over 25 representatives of the offshore energy and technology industries, academia, research institutions, and U.S. and Canadian governments participated.

### **Goal II – Sponsor ocean partnership activities**

#### **Actions...**

- 1** Invest in critical topics (e.g., Broad Agency Announcements and Requests for Proposals in support of *Charting the Course for Ocean Science* and other interagency activities).
- 2** Present awards for Excellence in Partnering to recognize the best examples of projects involving multiple sectors.
- 3** Support forums and reports on emerging ocean topics and develop priorities.

#### **Accomplishments...**

The IWG-OP continues to develop annual extramural funding opportunities through NOPP and fund selected ocean research projects. The FY 2008 funding opportunities and funded research are discussed in depth in Chapter V of this report. During FY 2008, a NOPP Excellence in Partnering Award was presented to the *U.S. GODAE: Global Ocean Prediction with the Hybrid Coordinate Ocean Model* project, led by Dr. Eric Chassignet of Florida State University.



### **Goal III – Identify and remove obstacles and disincentives to ocean partnerships**

#### **Actions...**

- 1** Improve partnership flexibility among federal agencies (financial and staffing resources) by:
  - encouraging interagency personnel rotations
  - enabling interagency transfer of resources
  - developing shared interagency objectives for complementary missions
- 2** Develop mechanisms to link federal and non-federal resources especially in the context of regional alliances, consortia and other regional partnerships.
- 3** Raise awareness of obstacles and disincentives external and internal to the federal government.

#### **Accomplishments...**

The IWG-OP has worked continually to improve the ease of interagency transfers of resources, which continues to be a challenge for various agencies. A case study of the National Ocean Sciences Bowl (NOSB<sup>®</sup>), an academic competition for high school students, was created by the IWG-OP to investigate the ongoing obstacles and successes of interagency resource transfers.

### **Goal IV – Facilitate opportunities for dialogue with the nation’s leadership**

#### **Actions...**

- 1** Achieve recognition as the leading resource on ocean partnership activities.
- 2** Facilitate/host educational forums or updates to members of Congress and their staff on ocean partnership matters, (e.g., *Charting the Course for Ocean Science* and its four near-term priorities).
- 3** Sponsor forums on emerging ocean science and technologies for government leaders specifically regarding needs, opportunities, and benefits of multi-agency and multi-sector relationships.
- 4** Report annually to Congress on partnership activities.

#### **Accomplishments...**

During FY 2008, the IWG-OP created an ad hoc group of federal representatives to address the emerging issue of marine biodiversity. Work by privately funded programs, such as the Census of Marine Life, has led to improved understanding of the relationship between marine biodiversity and ecosystem health and sustainability. This understanding of marine biodiversity, although not authorized explicitly in federal legislation, is critical to fulfill science agency missions. The IWG-OP ad hoc group is focused on agency interests in biodiversity in order to determine topical overlap and identify potential future federal agency actions and activities related to biodiversity and ecosystem functions and services.

In order to ensure wise use of the oceans and the maintenance of their health, individual agencies pursue scientific and technical information on which to base management decisions. Advancement toward appropriate stewardship of the oceans, and associated societal gains, can be more rapidly and efficiently realized through collaborative partnerships. The IWG-OP, through NOPP, will continue to focus on ocean research objectives which are too large for single agencies to tackle, but satisfy multiple agency missions and would benefit from partnerships between government, private industry, and academia.

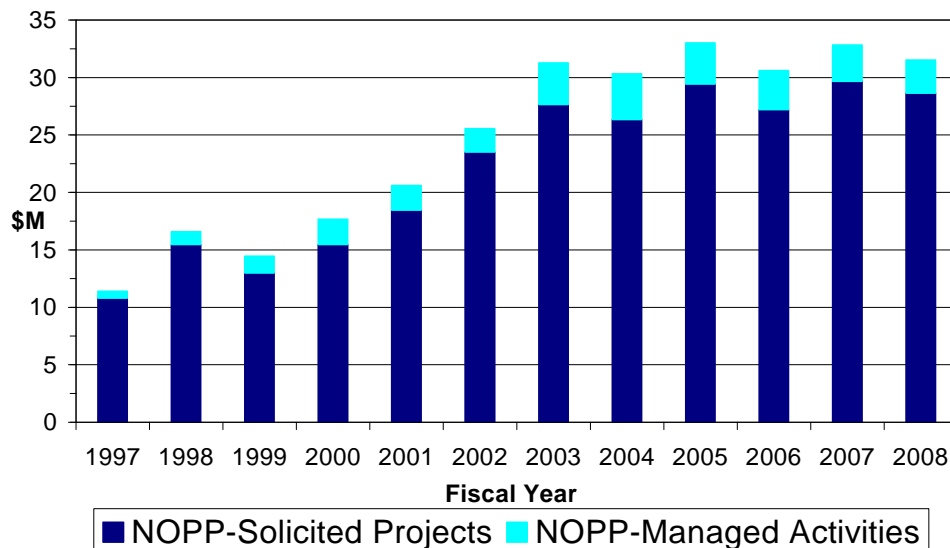
## IV. NOPP Investment Profile

### NOPP-FUNDED ACTIVITIES

Figure 2 shows the growth of NOPP-Funded Activities from FY 1997-2008, as well as the breakdown by subcategories for Solicited Projects and Managed Activities. In FY 2008, total funding reached \$31.5M.

### NOPP-Solicited Projects

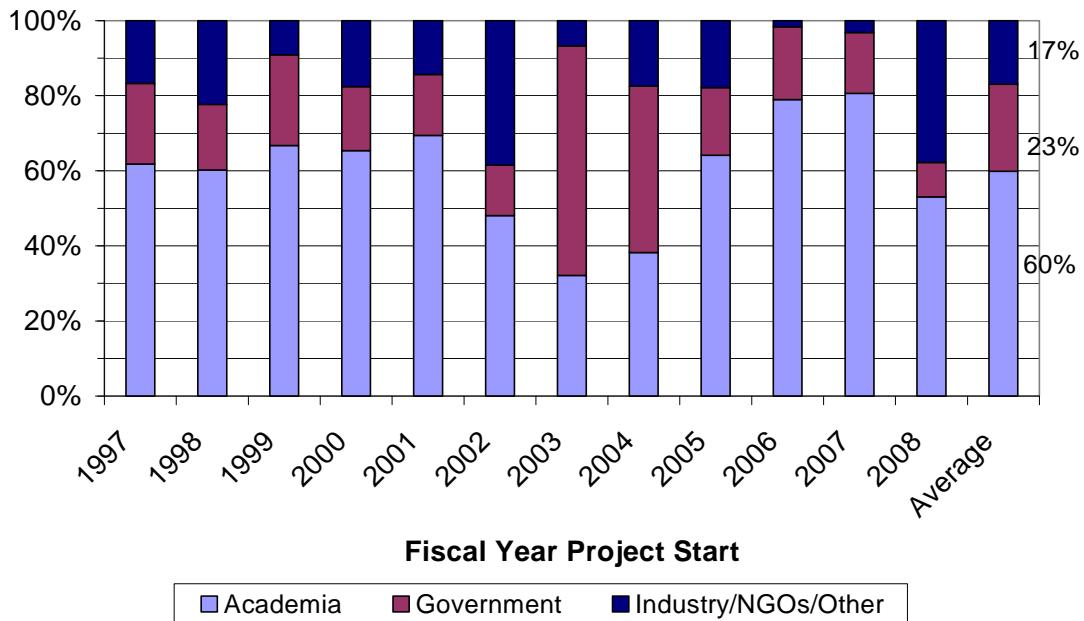
NOPP-Solicited Projects are those funded as a direct result of a formal NOPP BAA or RFP. The funding level for solicited projects has grown from \$10.8M in FY 1997 to \$28.6M in FY 2008 (does not account for inflation, Figure 2). The cumulative investment from FY 1997-2008 is \$265.7M. Through FY 2008, there have been 132 funded projects, including 21 renewal projects. On average, 11 new projects are initiated each year, with a typical duration of three years.



**Figure 2.** FY 1997-2008 investment in NOPP-Funded Activities, including both NOPP-Solicited Projects and NOPP-Managed Activities. Note that the dollar amounts shown are those spent each year; out-year commitments are not shown.

One of the primary functions of NOPP is to promote partnerships within the federal government and between the federal government and other members of the ocean sciences community, including academia, industry and non-governmental organizations. Figure 3 shows the annual distribution of funding for new awards across sectors within the ocean science community. When averaged over NOPP's twelve-year history, approximately 60 percent, 23 percent and 17 percent of the funds have been awarded to academic, government and industry (including non-governmental and other organizations) partners, respectively.





**Figure 3.** The distribution of annual NOPP funding for new solicited project awards by sector from FY 1997-2008 for academia, government, and industry (includes NGOs/others). The bar on the far right indicates the twelve-year sector averages.

### NOPP-Managed Activities

FY 2008 NOPP-Managed Activities include expenditures for the NOPP Office, the Ocean.US office, and the NOSB. Funding for managed activities has grown from \$0.6M in FY 1997 to \$2.9M in FY 2008 (Figure 2). The cumulative expenditure for these activities is \$30.2M.

### NOPP-RELATED ACTIVITIES

NOPP-Related Activities include new investments in activities overseen by NOPP entities. These investments fulfill the broad cross-cutting oceanographic goals and partnerships embraced by NOPP, but they are primarily single-agency expenditures.

## V. Fiscal Year 2008 Activities

Overall fiscal investment in NOPP has increased since its inception in 1997 and can best be described in terms of NOPP-Funded Activities and NOPP-Related Activities. NOPP-Funded Activities are those that are either solicited or managed by NOPP and involve support *from two or more agencies*. NOPP-Related Activities are those that are funded primarily *by a single agency* in response to plans produced by NOPP entities. Both types of activities have grown since the inception of NOPP.

### NOPP-FUNDED ACTIVITIES

#### NOPP-Solicited Projects

NOPP agencies invested approximately \$14.4M in new NOPP-Solicited projects in FY 2008 in response to two solicitations, issued in August 2007 through the Office of Naval Research (ONR) and March 2008 through the Minerals Management Service (MMS), respectively, on behalf of NOPP and the ICOSRMI. A BAA called for proposals on the topics of: A) *Forecasting the*

*Response of Coastal Ecosystems to Persistent Forcing and Extreme Events*, B) *Sensors for Measurement of Biological, Bio-Optical or Chemical Properties of the Ocean* and C) *Atlantic Meridional Overturning Circulation*. These topics are three of the four Near-Term Priorities from *Charting the Course for Ocean Science* and represent the first efforts by NOPP to help implement the national plan. The Near-Term Priorities were developed by the JSOST to focus initial research efforts. A Request for Proposals (RFP) called for proposals on D) *Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial Hard Bottom Habitats with Emphasis on Coral Communities: Reefs, Rigs and Wrecks* (see Table 1). In response to the solicitations, 65 proposals were received that included collaborations among approximately 260 institutions (academia, industry and government). The proposals underwent a peer-review process from April through June 2008 to determine which would be funded; overall, eleven projects were approved for funding by the IWG-OP on behalf of the ICOSRMI. The URL links to the full text of these solicitations are included in Appendix 3, and summaries of the funded projects are provided in Appendix 4.

<b>BAA Topic (Issuing NOPP Agency; Release Date)</b>	<b>Associated NOPP Goal</b>	<b>Funding Available</b>	<b>Number of Awards Issued</b>
<i>Sensors for Measurement of Biological, Bio-Optical or Chemical Properties of the Ocean</i> (ONR; August 2007)	GOAL 4. Collaborate to strengthen U.S. interagency initiatives in research and their connections to operations	\$7.8M over three years	Six
<i>Atlantic Meridional Overturning Circulation</i> (ONR; August 2007)	GOAL 4. Collaborate to strengthen U.S. interagency initiatives in research and their connections to operations	\$2.9M over three years	Four
<i>Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial Hard Bottom Habitats with Emphasis on Coral Communities: Reefs, Rigs and Wrecks</i> (MMS; March 2008)	GOAL 4. Collaborate to strengthen U.S. interagency initiatives in research and their connections to operations	\$3.7M over four years	One

**Table 1.** Summary of NOPP BAA and RFP issuance and results for FY 2008.

### **NOPP-Managed Activities**

The NOSB is an academic competition that engages high school students in the ocean sciences. Now in its twelfth year, the NOSB has grown to encompass 25 regional sites that include over 300 high schools, and has involved more than 18,000 students and their teacher/coaches. The 2008 NOSB Finals Competition was held in Seward, AK on 25-27 April 2008. The University of Alaska Fairbanks provided substantial supplementary financial support for student travel and activities during the NOSB competition in order for the competition to be held in this remote and unique location.

NOSB continues to reach students beyond the structure of the academic competition through additional programs like the National Ocean Scholar Program and the Coastal and Ocean Science Training Internship Program internship. These supplemental programs extend the NOSB experience by creating opportunities for students to further their interest in ocean and coastal sciences through their studies and participation in conservation activities. NOSB also continues to implement a diversity initiative that started in 2005 to increase the participation of historically underrepresented populations in ocean sciences. The program provides regional sites with

additional funding to offer specialized science mentoring and field trips for the students to experience science in action.

In FY 2008, NOSB released the results of its most recent longitudinal study report, which tracks the college majors and career choices of NOSB alumni and can be found at: [http://www.oceanleadership.org/files/NOSB\\_LongStudy.pdf](http://www.oceanleadership.org/files/NOSB_LongStudy.pdf). The study is ongoing. Initial results provide a strong indication that NOSB is accomplishing its mission to enrich science teaching and learning across the U.S. through a high-profile national competition that increases high school students' knowledge of the oceans and enhances public understanding and stewardship of the oceans.

NOSB was highlighted at the American Geophysical Union (AGU) meeting in San Francisco, CA in December 2007 and was represented at the Ocean Sciences meeting in Orlando, FL in March 2008. In addition, NOSB hosted an exhibit booth at the National Science Teachers Association national convention in Boston, MA in March 2008 and at the National Marine Educators Association conference in Savannah, GA in July 2008.

For additional information on NOSB, please visit [www.nosb.org](http://www.nosb.org)

### **NOPP-RELATED ACTIVITIES**

In addition to the NOPP-Funded Activities described above, individual agencies invested in NOPP-Related Activities during FY 2008.

Significant examples of such investments included several projects related to the development of the Integrated Ocean Observing System (IOOS<sup>®</sup>). One example is the Coastal Observation Technology System (COTS) project grants, currently funded by the National Oceanic and Atmospheric Administration (NOAA), which are designed to further the development of integrated coastal ocean observing systems on a regional basis. The overarching goal of COTS projects is to develop regional capacity for coastal/ocean observations by creating infrastructure (e.g., sensors, data management systems) and methodologies to collect, share, and integrate environmental data and create useful information products. These projects are creating an initial observing system capacity that will form the nucleus of the regional coastal ocean observing system. These projects address a range of topics and approaches related to IOOS, including sensor technologies, coastal inundation, coastal ecosystem dynamics, harmful algal blooms, maritime navigation, sediment resources, fisheries, and the use of IOOS information in education. In addition, these projects have assumed a key role in developing standards and protocols for IOOS data management and sharing.

As part of an initial demonstration of data sharing and access capabilities of IOOS, COTS partners and recipients of congressionally-directed ocean observing grants continued collaborating on the development of a web-accessible data portal (available at [www.openioos.org](http://www.openioos.org)) that provides access to real-time and near real-time sea surface temperature, winds, and other data from satellites and buoys located in coastal waters of the continental U.S.

Currently, NOAA engages a competitive award process to fund COTS projects; previous COTS project funding resulted from congressional earmarks. NOAA will continue to work with the COTS partners and other federal agencies to ensure that projects conform to the vision and implementation requirements of an integrated ocean observing system.

Summaries of past COTS projects can be found at:  
<http://www.nopp.org/Dev2Go.web?id=205279>.

## **NOPP INTERAGENCY INTERACTIONS**

### **Interagency Committee on Ocean Science and Resource Management Integration**

At its 22 February 2008 meeting, the ICOSRMI and the NORLC Executive Committee of ICOSRMI continued to coordinate the mandated responsibilities of the NORLC undertaken by the ICOSRMI. Those responsibilities include submission of the NOPP Annual Report to Congress, approval of NOPP partnership projects, and requests for guidance from the ORRAP.

In May 2008, the ICOSRMI submitted a response to the ORRAP to express interest in dovetailing the ORRAP *Best Practices for Increasing the Impact of Research Investments* report and the *Charting the Course for Ocean Science*. In order to assist in the adoption of the principles articulated in the ORRAP report, such as collaboration between producers and users at each step of the process and the need for a shift in institutional culture to place high value on timely transitioning, the ICOSRMI suggested the use of the *Forecasting the Response of Coastal Ecosystems to Persistent Forcing and Extreme Events* Near-Term Priority from *Charting the Course for Ocean Science* as a monitored pilot for the transition models laid out in the ORRAP report. Efforts by the ORRAP, the JSOST and the IWG-OP continue to implement this Near-Term Priority as a pilot for the best practices of transitioning research to applications.

The minutes of all past NORLC meetings are posted on the NOPP website at [www.nopp.org](http://www.nopp.org).

### **Ocean Research and Resources Advisory Panel**

The ORRAP continued its trend of meeting three times annually, in light of its additional responsibilities of addressing resource management issues and providing advice and guidance to the ICOSRMI. The FY 2008 ORRAP meetings took place on 6-7 December 2007 in Washington, DC; 15-16 April 2008 in Washington, DC; and 4-5 August 2008 in Redmond, WA.

Recognizing its mandate and the opportunity to advise the incoming Obama Administration on ways to maximize the benefits of ocean research and resources, the ORRAP released a strategic transition document in late 2008. The report, emphasizing eight themes vital to U.S. interests, presents the Administration with critical actions that can reap meaningful and immediate rewards for the nation. The document highlights the most pressing ocean-related challenges and promising opportunities for the new Administration. The transition document can be accessed via the NOPP web page ([www.nopp.org](http://www.nopp.org)).

The December 2007 meeting featured an inventory and assessment of federal ocean education programs, with discussion on ways in which the ORRAP can collaborate with federal agencies to take advantage of events and opportunities to enhance ocean education programs in the U.S. The ORRAP was updated on the status and activities of education programs and initiatives within nine federal agencies, one non-governmental organization (NGO) and the Interagency Working Group on Ocean Education (IWG-OE), a joint JSOST and Subcommittee on Integrated Management of Ocean Resources working group. Further discussion at the meeting focused on issues and priorities advocated by both the States and NOAA as part of their efforts to reauthorize the Coastal Zone Management Act. Additional topics included endorsing a uniform code of conduct for scientific collections and finding the niche for the ORRAP to have maximum impact within the federal advisory structure.

During the April 2008 meeting, the ORRAP was briefed on the state of the ocean energy industry and its progress assimilating into the broader U.S. renewable energy portfolio. Seven ORRAP nominees were welcomed as full members, increasing ORRAP membership to 17. Additionally, the ORRAP hosted a joint session with the JSOST to discuss: 1) mechanisms for ORRAP to advise on strategic issues, including *Charting the Course for Ocean Science*; 2) ways in which

*Charting the Course for Ocean Science* is being addressed via budget processes; and 3) obstacles to interagency fund transfers.

At the August 2008 meeting, the ORRAP continued its consideration of ways to increase the presence of ocean energy on the national stage, heard presentations from large systems integrators on advancing the IOOS, and received an update on IWG-OE activities.

The ORRAP Ocean Observing Sub-panel completed populating its membership, finalized its Terms of Reference, and held its inaugural meeting on 17 June 2008. At that meeting, the Sub-panel heard status report briefings from leaders of several of the country's major ocean observing initiatives. The Sub-panel then developed recommendations for full ORRAP consideration, which were presented to the full ORRAP on 4-5 August 2008 and used, in part, to inform the content of the transition document. Those recommendations included:

- 1) NOAA should be formally declared the lead agency in developing, acquiring and implementing a U.S. integrated ocean observing and prediction system that serves operational, research, infrastructure and data standardization roles.
- 2) The appropriate agencies should detail employees to the NOAA IOOS Program Office to work on interagency coordination activities as IOOS shifts from concept planning to program execution.
- 3) The ocean-related federal agencies should use the Regional Associations (RAs) as a mechanism for fostering interagency and industry collaborations to address coastal and ocean resources and ecosystems issues, and develop ocean information systems, at the regional level.
- 4) NOAA, in addition to their continued work with *in-situ* sensors, should meet with other Federal agencies that conduct satellite observations to determine the most appropriate sensors to acquire ocean observing data. As well as sensor selection, such parameters as acquisition schedule, orbit selection, resolution, data transmission, data archiving, and other such variables should be evaluated.

The Sub-panel is developing a list of other topics to review, accompanied by a timeline. Some of these topics include (not in prioritized order):

- a. Further assessment of the Ocean Observatories Initiative (OOI)-IOOS collaboration;
- b. Further assessment of satellite and other remote sensing needs;
- c. The relationship between the NOAA IOOS Office and the proposed NOAA National Climate Service;
- d. The potential access to and use of defense and intelligence data;
- e. The role of industry in developing our ocean monitoring programs;
- f. The state of water monitoring (quality, flow, and sediment transport) and mechanisms that may be available to ensure the output of water monitoring in the watershed is integrated into IOOS.

The ORRAP Education Sub-panel held a virtual meeting on 9 July 2008, which focused on three areas of interest: 1) strategies to elevate education to a higher priority within federal agencies, 2) continued interaction with the IWG-OE, and 3) review of the NOAA Education Strategic Plan in an interagency context. The Sub-panel will continue to interact with the IWG-OE and meet as necessary in FY 2009.

The ORRAP Industry Sub-panel will meet as necessary in FY 2009 to facilitate a means for the U.S. industrial sector to provide their input, views and expertise on the NOPP Strategic Goals.

### **Interagency Working Group on Ocean Partnerships**

The IWG-OP met 12 times in FY 2008 in support of partnership efforts across the ocean community. The IWG-OP Strategic Plan, designed to complement the NOPP Strategic Plan, was finalized and published. The IWG-OP intends to make progress on the goals and actions of this Strategic plan in order to achieve significant integrative value for the ocean science and resource management missions of the member agencies and partners.

The IWG-OP continued to explore strategies for simplifying interagency interactions for transferring funds between agencies. During FY 2008, the National Ocean Sciences Bowl was examined as a case study on interagency funding transfers; this case study has resulted in the development of a multi-year Memorandum of Understanding template and cover letter, as well as many lessons learned. These lessons learned include effective communication strategies for the legal departments of agencies, realistic timelines for the establishment of agreements and tactics for easing future amendments to the agreement.

The group developed solicitations on four topics: A) *Forecasting the Response of Coastal Ecosystems to Persistent Forcing and Extreme Events*, B) *Sensors for Measurement of Biological, Bio-Optical or Chemical Properties of the Ocean* and C) *Atlantic Meridional Overturning Circulation*, and D) *Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial Hard Bottom Habitats with Emphasis on Coral Communities: Reefs, Rigs and Wrecks*. Eleven multi-year proposals were funded.

The IWG-OP was instrumental in the celebration of the ten-year anniversary of NOPP, which included a NOPP-sponsored session at Capitol Hill Ocean Week in June 2008, entitled *A Decade of Successful Ocean Partnerships: The National Oceanographic Partnership Program*. Highlighting the importance of partnerships to our ocean's future, speakers showcased ten years of meaningful interagency, community-wide collaborations, including collaborations that address the ocean's role in global climate change. During this session, the IWG-OP presented its annual *Excellence in Partnering Award* to U.S. *GODAE: Global Ocean Prediction with the HYbrid Coordinate Ocean Model (HYCOM)* during a celebration which included a formal presentation from Senator Bill Nelson (D - FL) to the project team.

In July 2008, the IWG-OP hosted a *Federal Interests in Biodiversity* workshop to build upon efforts begun in 2006 by the Census of Marine Life, to explore current federal agency interests in biodiversity. This workshop engaged agency representatives in a roundtable discussion of future actions. All participants expressed a desire for increased understanding of the implications of biodiversity loss and quantifying the roles of biodiversity in maintaining ecosystem function, services and resiliency to environmental change. Consensus was reached that all interested agencies would continue to meet quarterly, as a voluntary ad hoc group of the IWG-OP. The intent of the group is to develop actions and activities, including but not limited to NOPP BAAs and RFPs, starting with four categories: 1) biodiversity science and technology, 2) biodiversity metrics, indices and proxies, 3) applications and data sharing, and 4) international conventions and frameworks.

In September 2008, representatives from the IWG-OP hosted a Visioning Round Table at the Oceans '08 Marine Technology Society / Institute of Electrical and Electronics Engineers Conference in Quebec City, Canada. The round table discussion focused on furthering industry-government cooperation in ocean related research, specifically through NOPP. The session was an opportunity to identify and understand areas of common interest among a variety of sectors. In



particular, the discussion centered on where closer alignment in the planning, sponsorship, and execution phases of research could be leveraged. Over 25 representatives of the offshore energy and technology industries, academia, research institutions, and U.S. and Canadian governments participated.

### **Interagency Working Group on Facilities**

The JSOST Interagency Working Group on Facilities (IWG-F) met twice during FY 2008. The IWG-F continued to consider a long-term vision for the federal oceanographic research and operational facilities in the U.S. and focused on future interagency ocean facility, technology, and infrastructure priorities. Continuing from FY 2007 activities, the IWG-F began developing an inventory of current and planned federal facility retirements, closures, or gaps and incoming federal infrastructure available to accomplish the priorities of *Charting the Course for Ocean Science* with emphasis placed on the Near-Term Priorities. This inventory, with a completion goal of FY 2009, will assist in:

- Utilizing existing infrastructure to maximize science and effectively use agency support for operations and maintenance;
- Coordinating the use of assets to minimize duplication and ensure that agency assets are used wisely to accomplish interagency goals;
- Establishing a framework for annual updates on infrastructure priorities in support of ocean research, as called for in *Charting the Course for Ocean Science*; and
- Building a foundation from which to assess future infrastructure needs beyond the decadal timescale, given the long planning and budgeting process necessary for major infrastructure.

### **Interagency Working Group on Ocean Observations and the Integrated Ocean Observing System**

Ocean.US, the National Office for Integrated and Sustained Ocean Observations, was established in 2000 to coordinate the planning activities of federal agencies as they worked together to design a roadmap for establishing IOOS as a national program and as the U.S. contribution to the Global Ocean Observing System (GOOS). Today the ocean observing community can see the results of these efforts with the establishment of a solid foundation upon which to implement IOOS. With completion of the planning phase of IOOS, the sponsoring federal agencies that belong to the Interagency Working Group on Ocean Observations (IWGOO) determined that the activities of Ocean.US were completed, and it was decided to close Ocean.US at the end of FY 2008.

The Ocean.US record stands as one of the most successful U.S. interagency collaborations of the past decade. Significant accomplishments from Ocean.US include:

- Defining the path forward for overall implementation of a national IOOS.
- Successfully developing the IOOS concept as a major recommendation in the U.S. Commission on Ocean Policy's Report;
- Promoting the establishment of eleven Regional observing Associations that coordinate the state, academic and local ocean observations, and research activities;
- Producing 17 key IOOS planning documents, and contributed to many others;
- Initiating the establishment of common data standards; and
- Sponsoring a series of significant IOOS-related, community-building workshops.



FY 2008 was a transition year for Ocean.US with several significant new and continuing activities:

#### **1. Data Management and Communications (DMAC) Plan and Actions**

The DMAC Steering Team, led by Anne Ball, met in May 2008 to continue to work on the coordination of the data management component of IOOS. Significant in 2008 was the development of a process for submitting, reviewing and adopting data standards for IOOS implementation. This is an ongoing, formal process. DMAC activities and accomplishments can be found at: <http://dmac.ocean.us>

#### **2. Modeling and Analysis**

The Modeling and Analysis Steering Team (MAST), under the leadership of Dr. Chris Mooers, held a workshop 22-24 July 2008 in Arlington, VA with the objective of developing an implementation plan for the prediction and analysis component of the IOOS. The workshop resulted in nine specific recommendations which have been presented to the IWGOO for consideration. One specific recommendation resulting from the workshop was to amend the group's name to the Ocean Prediction and Analysis Joint Working Group to highlight the outcome-based worth of the subject matter to policy makers and the public. The workshop report can be found at: [http://www.ocean.us/files/MAST\\_Report\\_2008.pdf](http://www.ocean.us/files/MAST_Report_2008.pdf)

#### **3. Summit Proceedings: Embracing the Full Spectrum of IOOS Environmental Information for Maritime Domain Awareness**

The proceedings of the summit, held 24-26 September 2008, between the Maritime Domain Awareness (MDA) and IOOS communities was published as Ocean.US report #17. The workshop was organized by the national interagency Office for Global Maritime Situational Awareness and by Ocean.US and hosted by EPA at their headquarters in Washington, DC. The summit brought together 50 experts who worked on developing an execution strategy for achieving MDA/IOOS integration through effective partnerships. The workshop report can be found at: [http://www.oceanleadership.org/files/MDA\\_Proceedings\\_lowres.pdf](http://www.oceanleadership.org/files/MDA_Proceedings_lowres.pdf)

#### **4. IOOS Messaging Material Development**

Ocean.US collaborated with the NOAA IOOS program office, the National Federation of Regional Associations and others on the development of IOOS media materials and messages that provide a clear and consistent framework for explaining what IOOS is and why it is important nationally and globally. These materials have been widely adopted with IOOS logos and PowerPoint backgrounds showing up frequently at conferences and on IOOS-related websites.

#### **5. Engaging the Private Sector**

One of the responsibilities that Ocean.US had was to engage all sectors supporting or depending on ocean observations. In FY 2008, Dr. Ralph Rayner served Ocean.US as the Industry Liaison to ensure that the needs of the private sector are addressed and their assets integrated into IOOS. He also began reaching out to other industries that use and require ocean information, but which typically are not familiar with IOOS (for example, companies that depend on marine transportation and weather for their success).

## **VI. Fiscal Year 2009 Activities and Plans**

Continued efforts toward implementation of *Charting the Course for Ocean Science* by NOPP included incorporating the *Sensors for Measurement of Biological, Bio-Optical or Chemical Properties of the Ocean* Near-Term Priority from that report into the annual NOPP BAA for FY 2009. JSOST has further articulated the science and technology priorities for FY 2010 via an

interagency priorities memo; NOPP agencies may use the NOPP BAA process to implement corresponding collaborative research activities in response to these guidance memos. NOPP, with the guidance of the IWG-OP, plans to investigate innovative research areas to help inform future implementation of *Charting the Course for Ocean Science* by the JSOST.

### NOPP-FUNDED ACTIVITIES

FY 2009 anticipated agency contributions for NOPP-Funded Activities are indicated in Table 2.

	NOPP–Solicited Projects	NOPP–Managed Activities	FY 2009 Anticipated Expenditure (\$M)
NOAA	X	X	13.5
NAVY	X	X	8.7
NSF	X	X	2.2
NASA	X	X	3.3
MMS	X	X	0.6
EPA	X	X	*
USACE	X	X	0.5
USGS	X	X	1.1
USCG		X	*
<i>*anticipated expenditures of less than \$100K</i>			<b>Total: ~29.9</b>

**Table 2.** Anticipated FY 2009 Agency Contributions to NOPP-Funded Activities by Investment Area. This includes solicited projects (projects solicited through NOPP RFPs and BAAs) and managed activities.

### NOPP-Solicited Projects

A BAA was issued in December 2008 for funding in FY 2009. Up to \$6.5 M is expected to be available over three years for projects addressing three topics: *Improving Wind Wave Predictions: Global to Regional Scales; Sensors for Measurement of Biological, Bio-Optical, Optical or Chemical Properties of the Ocean; and Improving Tropical Cyclone Intensity Forecasting*. The proposal reviews are anticipated to take place in April and May 2009. The URL link to the solicitation is included in Appendix 3.

### NOPP-Managed Activities

FY 2009 is an exciting year for the NOSB, as the theme of the 2009 competition was biodiversity. The NOSB worked closely with the Census of Marine Life ([www.coml.org](http://www.coml.org)) to develop biodiversity-related questions for the competition. The 2009 NOSB Finals Competition were held in Washington, DC on 26-27 April 2009 at the Sant Ocean Hall in the Smithsonian’s National Museum of Natural History. This recently opened gallery provided a remarkable backdrop for the competition.

In FY 2009, the NOSB hosted the *Living on the Ocean Planet* Video Contest to engage additional students in NOSB opportunities. The video competition is designed to reach beyond established NOSB teams to those students who are interested in oceans, but may not be interested in participating in a structured academic competition. This innovative and creative challenge is a way to allow these individuals the opportunity to showcase their passion for oceans. For this inaugural competition, students highlighted biodiversity in a short video using one or more of the Ocean Literacy Principles, knowledge required to be ocean literate in accordance with the National Science Education Standards. The winning video is posted on the NOSB and the Census of Marine Life websites and was presented by the team at the 2009 NOSB Finals Competition.

The NOSB presented at the National Council for Science and the Environment's 9<sup>th</sup> National Conference on Science Policy and the Environment: *Biodiversity in a Rapidly Changing World*, 8-10 December, 2008 in Washington, DC. NOSB will also present at the National Marine Educators Association conference in Pacific Grove, CA in 29 June - 3 July, 2009.

### **NOPP-RELATED ACTIVITIES**

Individual agencies will continue to invest in NOPP-Related Activities in FY 2009. For example, some agencies of the IWG-OP will continue to support marine biodiversity activities and research, such as NASA's continued role in the development of the Group on Earth Observations Biodiversity Observation Network (GEOBON). GEOBON is a partnership between many global programs which aims to develop and implement a biodiversity observation network. The IWG-OP has become more active in marine biodiversity issues through the Biodiversity Ad Hoc group, where synergies between GEOBON and the IWG-OP can be explored. As partnership opportunities focused on marine biodiversity arise, the IWG-OP will support and coordinate as appropriate through the Biodiversity Ad Hoc group.

### **NOPP INTERAGENCY INTERACTIONS**

#### **Interagency Committee on Ocean Science and Resource Management Integration**

In FY 2009, the ICOSRMI is expected to continue meeting and building on the progress made through NOPP.

#### **Ocean Research and Resources Advisory Panel**

The ORRAP met on 4-5 December 2008 and on 6-7 April 2009 in Washington, DC.

The major focus for FY 2009 has been the production, distribution and presentation of the ORRAP's Administration transition document, which highlights what the ORRAP sees as the highest priority opportunities in ocean science and resource management for the new Administration. This document was completed in late November 2008 and has undergone a targeted distribution, including members of the Obama transition team, Congress, and the oceanographic community. The document is available on the NOPP web page ([www.nopp.org](http://www.nopp.org)).

The ORRAP will continue to focus on informing interagency collaboration, paying particular attention to the transfer of science to ecosystem-based policy and applications; the economic and workforce development implications of expanded ocean observing activities; and government performance in implementing *Charting the Course for Ocean Science*. Other topics of importance to the ORRAP include:

- a. Testing the best practices laid out in the report by the ORRAP's Research to Applications Task Force by using the *Charting the Course for Ocean Science* Near-Term Priority on coastal hazards as a case study.
- b. Providing input on the JSOST's annual interagency science and technology priorities memo.
- c. Encouraging federal oversight and transitional funding for the Census of Marine Life program in the U.S. after it completes its first phase in December 2010.
- d. Increasing interactions and collaborations among the various regional ocean education activities.
- e. Ensuring that data collected from earth sensing and observing systems is incorporated into usable applications, the integration of those systems, and the long-term monitoring of environmental conditions to inform decision making.

- f. Monitoring and tracking usage of Marine Protected Areas.
- g. Assessing the implications of current and future activities in the Arctic.

The ORRAP will continue to interface with the ICOSRMI in FY 2009, offering advice and recommendations as needed.

### **Interagency Working Group on Ocean Partnerships**

The IWG-OP will continue to meet monthly in FY 2009. Efforts will continue along its strategic planning and implementation process, specifically in support of *Charting the Course for Ocean Science*. The IWG-OP will also continue working toward improved interagency partnership flexibility, specifically in the area of transferring funds. Other FY 2009 activities will focus on ocean education efforts such as the NOSB, processing of proposals from solicitations, compiling annual research reports, developing the Annual Report to Congress for review by the NORLC/ICOSRMI, and generating topics for FY 2010 solicitations.

One way to increase participation in partnerships is to introduce members of industry to the NOPP program and process. The IWG-OP plans to continue and expand its outreach efforts to potential industry partners. Appropriate conferences and meetings will be attended by members of the IWG-OP, where they will host town halls and round table discussions in order to better engage industry in partnerships with government to fund ocean research.

As part of the NOPP ten-year anniversary celebration, a special NOPP-related issue of *Oceanography* magazine will be released in June 2009. The NOPP issue of *Oceanography* poses an unprecedented opportunity to highlight the profound impact of past and present NOPP research. The issue will include several articles that highlight the origins and accomplishments of the program, as well as 15 articles focused on individual NOPP projects that have proliferated beyond the bounds of the original project or resulted in benefits that were not originally anticipated. The IWG-OP leadership is serving as guest editors for this edition and several IWG-OP agencies are involved in the production.

Other FY 2009 planned activities include: a workshop focused on agency interest and activities in Arctic research, continued progress by the biodiversity ad hoc group, and a follow-on to the 2007 Autonomous and Lagrangian Platforms and Sensors workshop to pursue a national implementation plan. These focused forums allow the IWG-OP to explore innovative areas of ocean research and develop new partnership opportunities.

### **Interagency Working Group on Facilities**

The IWG-F plans to release its facilities inventory during FY 2009. This inventory will build on the 2007 *Federal Oceanographic Fleet Status Report* and complement the Ocean Studies Board's *Ocean Infrastructure of U.S. Ocean Research in 2030* study, as well as the ONR-funded *Evolution of the National Oceanographic Research Fleet* study. The group has met twice in FY 2009 and will continue to meet as necessary.

### **Interagency Working Group on Ocean Observations and the Integrated Ocean Observing System**

Beginning in FY 2009, IWGOO activities will be supported through the Consortium for Ocean Leadership. The Ocean.US web site will be maintained as a legacy resource, and a timeline of Ocean.US activities including access to all workshop reports and documents can be found at <http://www.ocean.us>.

To date in FY 2009, the ocean observing community continues to move forward into the next phase of IOOS and coordination among the federal agency partners has remained the responsibility of the IWGOO along with NOAA as the designated lead federal agency for IOOS. The IWGOO will also serve as the lead coordinating group to oversee coordination of IOOS with other major ocean initiatives nationally and internationally, such as the National Science Foundation's Ocean Observatories Initiative (OOI), the Census of Marine Life's Ocean Biogeographic Information System, the National Water Quality Monitoring Network, and NOAA's Integrated Ocean and Coastal Mapping Program, along with critical research conducted by NASA, the Navy, NOAA, EPA, USACE, NSF and other agencies. The IWGOO will continue to coordinate with regional entities. The IWGOO will also provide interagency coordination of major, continuing activities such as data management and communications, as well as modeling and analysis and other issues.

As the IOOS implementation process begins, the focus turns to the development of an "end-to-end" enterprise architecture for IOOS. Such a system requires many players from different sectors, and IWGOO will continue to clarify the roles and responsibilities of the research/academic community, government agencies and the private sector.

Work plans have been developed to accomplish the most critical objectives in FY 2009. Anticipated FY 2009 highlights include:

- Creation of a Memorandum of Agreement amongst IWGOO agencies to detail responsibilities of each IOOS federal agency partner;
- Establishment of procedures for the distribution of federally appropriated funding to non-federal partners, such as the RAs;
- Continuation of the DMAC standards process and approval of the second round of standards;
- Constant involvement with members of the private sector in an effort to further develop community support of IOOS;
- Continued modification and enhancement of IOOS with newly proven technologies, such as sensors and associated algorithms;
- Sustained participation in the international GOOS arena; and
- Inventory of existing IOOS components to identify critical gaps in infrastructure.

In March 2009, the Omnibus Public Land Management Act of 2009 passed into law, which established the Integrated Coastal and Ocean Observation System Act of 2009 and authorized the Integrated Ocean Observing System.

## **VII. Fiscal Year 2010 Plans**

Because the agency-specific budget requests for the FY 2010 Administration's Budget have not yet been announced, precise funding levels and associated programmatic issues are not yet firmly established. The IWG-OP agencies anticipate contributions to NOPP to be comparable to those of FY 2009 and anticipate supporting interagency collaborations and extramural research partnerships.

As previously mentioned, NOPP has continued contributing to the implementation of *Charting the Course for Ocean Science* in the FY 2009 BAA by showcasing the Near-Term Priorities. Continuing this trend, topics for FY 2010 and FY 2011 BAAs are expected to complement and support the priorities of *Charting the Course for Ocean Science*, ensuring continued success for

NOPP and advancement of *Charting the Course for Ocean Science* principles.

## **VIII. Interagency Coordination Activities**

The central tenet of NOPP is interagency partnership. The most recent activities are described in previous sections of this report. The solicitations funded in FY 2008 focused on deepwater corals in the Gulf of Mexico and two of the four Near-Term Priorities in *Charting the Course for Ocean Science*: developing biological, bio-optical and chemical ocean sensors and studying the Atlantic Meridional Overturning Circulation. The FY 2009 topics focus on: improving wind wave predictions on global and regional scales; improving high-resolution, tide-resolving global ocean predictions; improving tropical cyclone intensity forecasting; and one of the Near-Term Priorities in *Charting the Course for Ocean Science*, developing sensors for measurement of biological, bio-optical, optical, or chemical properties of the ocean. In the near term, the primary thrust of NOPP will be to continue to pursue novel areas of research by cultivating an increased emphasis on partnership solicitations that facilitate the integration of science and technology with resource management. It is anticipated that *Charting the Course for Ocean Science* will be a catalyst for partnership activities over the next decade.

## Appendix 1. NOPP Solicitations

### FY 2008 ONR BROAD AGENCY ANNOUNCEMENT #ONR-BAA-07-040

#### Topics:

- Forecasting the Response of Coastal Ecosystems to Persistent Forcing and Extreme Events
- Sensors for Measurement of Biological, Bio-Optical or Chemical Properties of the Ocean
- Atlantic Meridional Overturning Circulation

Full BAA text can be found at: [http://www.onr.navy.mil/02/BAA/docs/07-040\\_ONR%20NOPP%20BAA%20FY08.pdf](http://www.onr.navy.mil/02/BAA/docs/07-040_ONR%20NOPP%20BAA%20FY08.pdf).

### FY 2008 MMS REQUEST FOR PROPOSALS #M08PS00032

#### Topics:

- Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial Hard Bottom Habitats with Emphasis on Coral Communities: Reefs, Rigs and Wrecks

RFP text can be found at: .

<https://www.fbo.gov/?s=opportunity&mode=form&id=d6ec83b9e3fc494e063df23066cd6b8e&tab=core&cvie w=1>.

### FY 2009 ONR BROAD AGENCY ANNOUNCEMENT #ONR-BAA-08-

#### Topics:

- Improving Wind Wave Predictions: Global to Regional Scales
- Sensors for Measurement of Biological, Bio-Optical, Optical, or Chemical Properties of the Ocean
- Improving Tropical Cyclone Intensity Forecasting

Full BAA text can be found at: <http://www.onr.navy.mil/02/BAA/docs/09-012.pdf>.



## Appendix 2. NOPP-Funded Projects Initiated in Fiscal Year 2008

### SENSORS FOR MEASUREMENT OF BIOLOGICAL, BIO-OPTICAL OR CHEMICAL PROPERTIES OF THE OCEAN

#### “An Autonomous Indicator-based pH Sensor for Oceanographic Research and Monitoring”

**Lead Principle Investigator (PI):** Dr. Michael DeGrandpre, University of Montana

**Funding Requested:** \$980,000

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=326133&rand=23844#DEGRANDPRE>.

#### “Developing ChemFin™, a Miniature Biogeochemical Sensor Payload for Gliders, Profiler, and Other AUVs”

**Lead Principle Investigator (PI):** Dr. Alfred Hanson, SubChem Systems, Inc.

**Funding Requested:** \$1,400,000

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=326133&rand=23844#HANSON>.

#### “Long-term *in situ* Chemical Sensors for Monitoring Nutrients: Phosphate Sensor Commercialization and Ammonium Sensor Development”

**Lead PI:** Dr. Andrew Barnard, WET Labs, Inc.

**Funding Requested:** \$1,500,000

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=326133&rand=23844#BARNARD>.

#### “Development and Deployment of a Modular Autonomous *in situ* Isotope Analyzer”

**Lead PI:** Dr. Peter Girguis, Harvard University

**Funding Requested:** \$940,000

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=326133&rand=23844#GIRGUIIS>.

#### “Plankton Analysis by Automated Submersible Imaging Flow Cytometry: Transforming a Specialized Research Instrument into a Broadly Accessible Tool and Extending its Target Size Range”

**Lead PI:** Dr. Robert Olson, Woods Hole Oceanographic Institute

**Funding Requested:** \$1,500,000

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=326133&rand=23844#OLSON>.

#### “Autonomous Measurements of Oceanic Dissolved Nitrate from Commercially Available Profiling Floats Equipped with ISUS”<sup>7</sup>

**Lead PI:** Dr. Steve Riser, University of Washington

**Funding Requested:** \$1,480,000

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=326133&rand=23844#RISER>.

### ATLANTIC MERIDIONAL OVERTURNING CIRCULATION

#### “A NOPP Partnership for Atlantic Meridional Overturning Circulation (AMOC): Focused Analysis of Satellite Data Sets”<sup>7</sup>

**Lead PI:** Dr. Peter Minnett, University of Miami

**Funding Requested:** \$630,000

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=326153&rand=26418#MINNETT>.

#### “Variability and Forcing Mechanisms of the Atlantic Meridional Overturning Circulation”<sup>7</sup>

**Lead PI:** Dr. Tong Lee, California Institute of Technology / Jet Propulsion Laboratory

**Funding Requested:** \$600,000

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=326153&rand=26418#LEE>.

**“Atlantic MOC Observing System Studies Using Adjoint Models”<sup>7</sup>**

**Lead PI:** Dr. Carl Wunsch, Massachusetts Institute of Technology

**Funding Requested:** \$843,000

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=326153&rand=26418#WUNSCH>.

**“Observing System Simulation Experiments for the Atlantic Meridional Overturning Circulation”**

**Lead PI:** Dr. George Halliwell, University of Miami

**Funding Requested:** \$853,000

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=326153&rand=26418#HALLIWELL>.

**EXPLORATION AND RESEARCH OF NORTHERN GULF OF MEXICO  
DEEPWATER NATURAL AND ARTIFICIAL HARD BOTTOM HABITATS  
WITH EMPHASIS ON CORAL COMMUNITIES: REEFS, RIGS AND WRECKS**

**“Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial  
Hard Bottom Habitats with Emphasis on Coral Communities: Reefs, Rigs and Wrecks”**

**Lead PI:** Dr. James Brooks, TDI Brooks International, Inc.

**Funding Requested:** \$3,690,687

A project summary can be found at: <http://www.nopp.org/Dev2Go.web?id=327740&rand=14460#BROOKS>.

*These research projects received funding in FY 2009, but were part of the FY 2008 call.*

## Acronyms and Abbreviations

AGU	American Geophysical Union
BAA	Broad Agency Announcement
CEQ	Council on Environmental Quality
COTS	Coastal Observation Technology System
DARPA	Defense Advanced Research Projects Agency
DEQ	Department of Environmental Quality
DHS	Department of Homeland Security
DMAC	Data Management and Communications
DoA	Department of Agriculture
DoC	Department of Commerce
DoD	Department of Defense
DoE	Department of Energy
DoI	Department of Interior
DoJ	Department of Justice
DoL	Department of Labor
DoS	Department of State
DoT	Department of Transportation
DPC	Domestic Policy Council
EPA	Environmental Protection Agency
EOP	Executive Office of the President
FY	Fiscal Year
GEOBON	Group on Earth Observations Biodiversity Observation Network
GEOS	Global Earth Observation System of Systems
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System
HHS	Department of Health and Human Services
HSC	Homeland Security Council
ICOSRMI	Interagency Committee on Ocean Science and Resource Management Integration

IEOS	Integrated Earth Observing System
IOOS	Integrated Ocean Observing System
IWG	Interagency Working Group
IWG-F	Interagency Working Group on Facilities
IWG-OE	Interagency Working Group on Ocean Education
IWGOO	Interagency Working Group on Ocean Observations
IWG-OP	Interagency Working Group on Ocean Partnerships
JCS	Joint Chiefs of Staff
JSOST	Joint Subcommittee on Ocean Science and Technology
MAST	Modeling and Analysis Steering Team
MDA	Maritime Domain Awareness
MMS	Minerals Management Service
MOA	Memorandum of Agreement
NASA	National Aeronautics and Space Administration
NEC	National Economic Council
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NOPP	National Oceanographic Partnership Program
NOPPO	National Oceanographic Partnership Program Office
NORLC	National Ocean Research Leadership Council
NOSB	National Ocean Sciences Bowl
NSC	National Security Council
NSF	National Science Foundation
OMB	Office of Management and Budget
ONR	Office of Naval Research
OOI	Ocean Observatories Initiative
ORAP	Ocean Research Advisory Panel
ORRAP	Ocean Research and Resources Advisory Panel
OSTP	Office of Science and Technology Policy

OVP	Office of the Vice President
PL	Public Law
RA	Regional Association
RFP	Request for Proposals
SIMOR	Subcommittee on Integrated Management of Ocean Resources
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USN	United States Navy