Priorities for the Incoming Administration

by the

ORRAP

Ocean Research & Resources Advisory Panel

A United States Federal Advisory Committee

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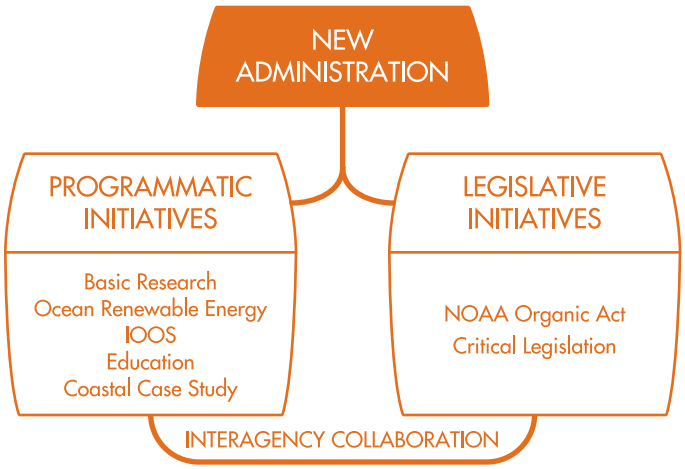
The Ocean Research & Resources Advisory Panel (ORRAP) is a non-federal committee established by the Federal Advisory Committee Act. The ORRAP provides independent advice and recommendations to the heads of federal agencies with ocean-related missions.

INTRODUCTION

The United States faces incredible challenges and opportunities in responding to climate change impacts, developing energy independence, and ensuring national security. Given our nationís dependence on our ocean, coastal waters, and lakes, we now have the opportunity to make investments and policy decisions critical to our quality of life that address energy development (non-renewable and renewable), climate and weather, food, security, and international trade.

To ensure these investments and policy decisions are done wisely, we must understand the processes that characterize these bodies of water, how humans affect them, and what we need to do as a nation to ensure they serve society sustainably. The accomplishments of our federal and academic research institutions provide a solid platform on which to build the next generation of ocean research, observing, and engineering programs – programs that are vital in an increasingly globalized and competitive world. The new administration will immediately need to come to grips with climate issues and offshore energy opportunities – subjects that have been thrust into the national consciousness. Add to these the continuing debates about chronic challenges such as obtaining food from the sea, ocean pollution, severe storms, maritime trade, port navigation, ocean diplomacy, and national security and one begins to recognize the importance of access to the best scientific information to manage the nation's largest real estate holding: its ocean, coasts, and Great Lakes.

Clear, accountable federal leadership and governance are needed. To achieve this, we argue for strengthening the National Oceanic and Atmospheric Administration (NOAA) as the nation's ocean and atmosphere agency. To ensure access to the best scientific information, we argue for leadership in ocean observing through a well-funded Integrated Ocean Observing System (IOOS).

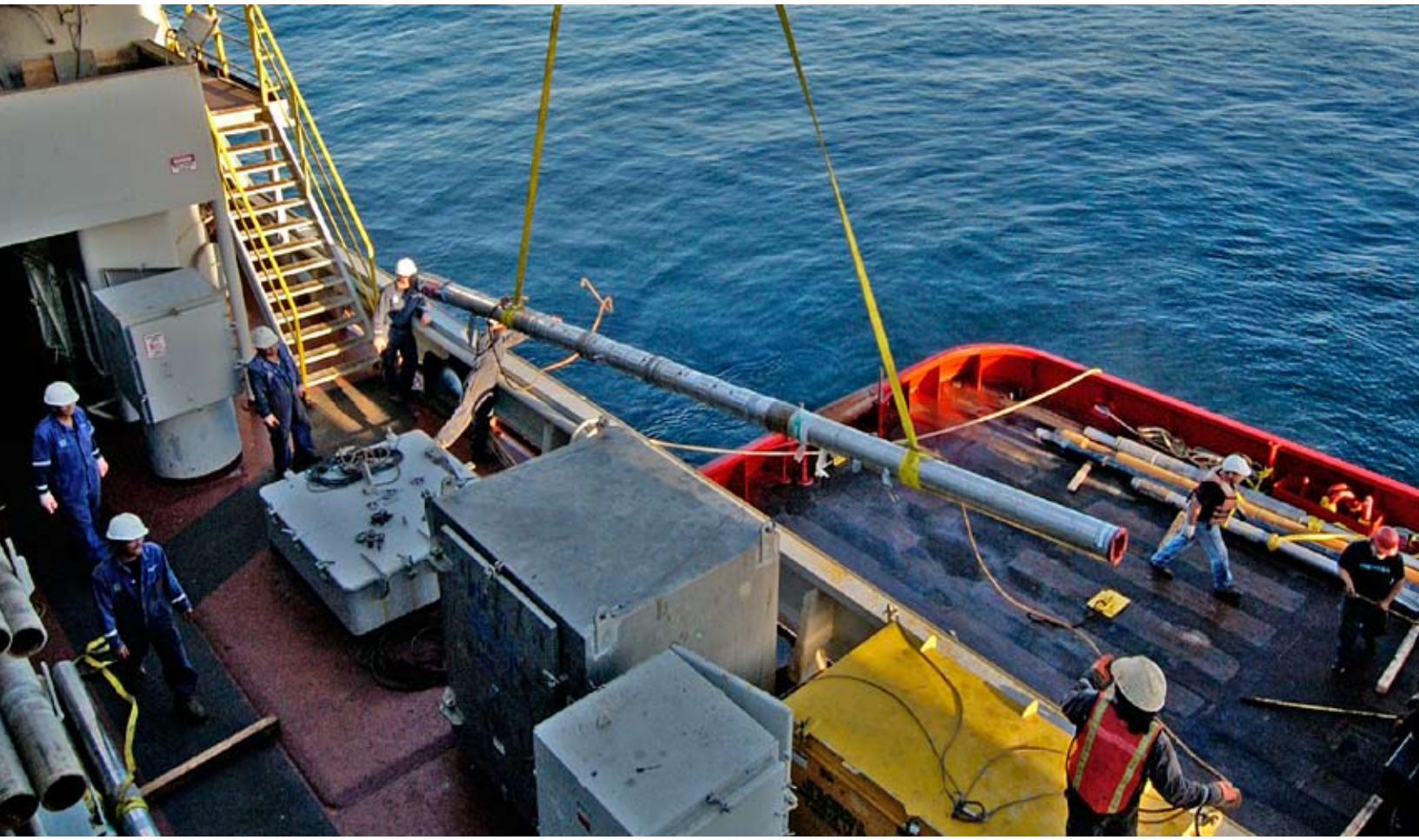


Our priorities and promising opportunities for the new administration fall into two basic categories: Administrative and Programmatic (see figure at right). All are priorities, but the keys to securing and stabilizing the nation's leadership position in ocean-related matters are (1) creating an effective federal management and governance structure and (2) providing those who must make decisions with the best, most up-to-date scientific information. Our recommendations include:

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

The incoming administration can undertake these critical actions, and begin to reap meaningful and visible rewards for the nation, immediately. Our country is now presented with new and promising opportunities for success. These opportunities should be seized without delay. Doing so will reduce the risks that currently face our nation.

BASIC RESEARCH



Crew members load drill pipe aboard the scientific drilling vessel *Joides Resolution*.

Restore the U.S. Lead in Ocean Science: A Critical Time

Outcome: Understanding of the key natural processes that occur in U.S. coastal and global ocean regimes enables the most useful ocean observations to strengthen national ocean policy, management, and operational decision-making.

Rationale: The U.S. must cope with an ever-increasing rate of change: in environmental conditions, energy access, population, security, diplomatic strategies, and international trade. Perhaps more than any other major nation in the world, America's competitiveness depends on its position within the world ocean and a major lakes system, and on its policies for using and managing these resources.

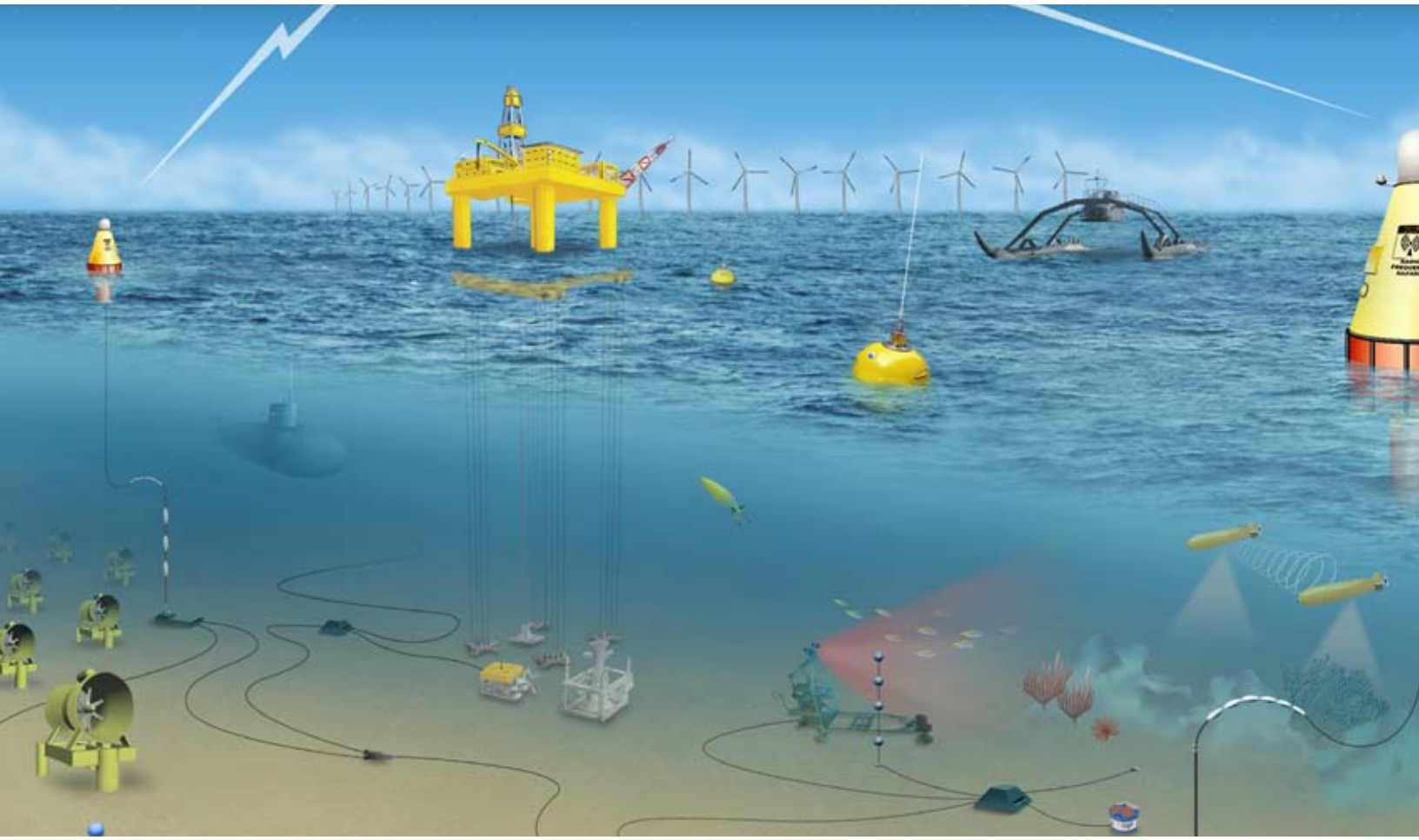
Enlightened investments in scientific research from WWII through the Cold War sought to understand the physics of the global deep ocean system, largely for security reasons. The U.S. led the world in this understanding in part because of federal investment in curiosity-driven research. More recently, the nation's relative investment in basic and applied ocean research has been reduced from seven percent of the federal research budget in 1980 to only three and a half percent today—a 50 percent reduction. And this reduction has occurred during a period when other nations are increasing their investments in ocean research. If our country is to meet the new challenges that confront it, it is essential that the U.S. reinvigorate its commitment to ocean exploration and research. Perhaps there is nothing more urgent than understanding the role of the ocean in driving climate change and how we can best cope with these changes.

The U.S. needs its best minds and the technological tools to resolve questions about how our coupled ocean-atmosphere system works, not only with respect to climate change, but also with regard to renewable and resource-based energy sources, coastal hazards, sustainable protein production, human health, port capacity, recreation, tourism, and national security. Ocean research must embrace and entrain a wider range of activities, including economics and social sciences, that are necessary in order to seize opportunities and mitigate and manage risks. Application of existing knowledge is critical to the design and deployment of an ocean observing system and vital to achieving and maintaining global leadership. The resultant increased understanding and new data will allow scientists to formulate and test new hypotheses about the important climatic and oceanic processes critical to U.S. interests.

Opportunities for the New Administration:

1. Create and sustain ocean research and development programs that will attract the nation's best minds and invigorate intense growth in America's workforce.
   a. Review basic research funding levels across all relevant federal agencies and restore investment in basic research to levels more appropriate to today's challenges and to those of a leading maritime nation.
   b. Make a clear statement in 2009 with the new administration's first budget.
2. Once a baseline of research support is established, commit to holding that level in real dollar terms. Wild fluctuations in annual research investments do not attract the best talent or deliver the best results.
3. Review and reverse the chronic deficiencies that exist in infrastructure necessary to support U.S. ocean science and engineering.

INTEGRATED OCEAN OBSERVING SYSTEM



The IOOS is a sophisticated system of observing platforms to gather data critical for understanding the ocean and for effective decision making to benefit society.

Achieving a Sustained, Integrated Ocean Observing System (IOOS): A Critical Investment for the Nationís Safety, Economy, and Environment

Outcome: The Integrated Ocean Observing System (IOOS) is an integral component of the U.S. science-management system that involves all federal ocean agencies and a rich diversity of end users throughout the observations-to-applications process. Informational products based on IOOS data, including decision-making tools, are used routinely in ecosystem-based management to create resilient coastal communities and to manage living resources.

Rationale: The IOOS is a vital tool for tracking, predicting, managing, and adapting to changes in our ocean, coasts and coastal watersheds, and Great Lakes, as well as a critical component of the global climate observing system. The development and deployment of observation systems remains critical to advancing our monitoring and understanding of the ocean and coasts. This need is becoming increasingly important given the key role the ocean plays in climate and climate change decisions. A fully implemented IOOS, spanning local to global scales and utilizing key domestic and international collaborative activities, will ensure that credible and timely information is available to decision makers and diverse users and stakeholders to predict, manage, and respond to changes in our ocean, coastal areas, and Great Lakes.

Image courtesy of HARRIS Corporation

Today, the U.S. cannot comprehensively measure or monitor the waters that surround us. A fully developed IOOS will provide one of the most significant opportunities available to the nation to advance our understanding of the changes currently occurring in our ocean, coastal zones, and Great Lakes. Energy, climate change, population shifts, and water quality issues will force policy makers to make decisions affecting our way of life and our economic future. Only a fully operational IOOS will allow the nation to formulate the most informed policies, to measure the effectiveness of these policies, and to provide the data and information needed for adaptive management.

Opportunities for the New Administration:

1. Strongly encourage passage of legislation to create the National Integrated Coastal and Ocean Observing System described in the omnibus bill S 3297.
2. Fully fund IOOS Program Office activities as a top priority within the NOAA budget, including priority NOAA support for U.S. regional coastal components managed by the IOOS "regional associations," which provide the links to stakeholders and integration with state and local governments.
3. Recognize NOAA's IOOS Program Office as the national executive and lead agency to develop, acquire, implement, and operate the U.S. IOOS.
4. Detail employees of ocean agencies to work in NOAA's IOOS Program Office on interagency coordination activities as IOOS shifts from concept to program execution.
5. Direct NOAA to collaborate with and leverage the National Science Foundation's Ocean Observatories Initiative, especially in areas of data management, sensor and technology development, cyber-infrastructure, and education and outreach.
6. Expand collaboration among NOAA, the Minerals Management Service, and the private sector for use of offshore platforms to augment NOAA's efforts to obtain meteorological and ocean observations to more accurately understand and forecast severe storms.

OCEAN EDUCATION

Education in the earth sciences is crucial to creating an informed public and productive workforce that can find innovative solutions to societal problems.

Protect the Future: Restore Leadership in "STEM" Disciplines Through Ocean Education

Outcome: Our ocean, coastal zones, and Great Lakes grow in popularity and importance, thus attracting more students and workers to the STEM disciplines – science, technology, engineering, and mathematics.

Rationale: Focusing American ingenuity on scientific, technological, and societal ocean issues – both challenges and opportunities – will measurably improve our economy and lead to the development of innovative solutions to problems. It also will lead to new opportunities associated with climate change, sustainable energy production, water quality and human health, water and food shortages, security, fisheries, and aquaculture.

Restoring American competitiveness in world markets, ensuring homeland security, and solving crises and seizing opportunities related to climate change, sustainable energy production, disease, water and food shortages, fisheries and aquaculture, and water quality are intimately tied to our ability to produce superior students in the STEM disciplines, enlighten and engage citizens, replace an aging scientific workforce, and train workers.

Unfortunately, many of our education programs at the K-12 levels have fallen behind in these disciplines; if we do not reverse the trends, we will soon be surpassed as the most powerful nation in the world. Expanding STEM education, outreach and extension (EOE) programs on ocean, coastal, and Great Lakes issues in our educational institutions, communities, and businesses promises to restore America's advantages on the world stage.

Ensuring collaboration of EOE programs is a formidable challenge, one no previous administration has accomplished fully. However, with over half the U.S. population living within 50 miles of a coast, and the growing public interest in our ocean resources, we can attract more students to the STEM disciplines and retrain workers for new jobs in growth industries such as ocean renewable energy, mineral extraction, seafood production, and transportation. This new generation of highly trained students and workers, coupled with an informed citizenry and an engaged business community, will catalyze economic development and address society's most pressing problems.

Creating requirements and incentives for this collaboration will be extremely popular with voters and yield unparalleled results. These efforts will garner strong support from groups seeking improvement in the three E's: environment, economy and education.

Opportunities for the New Administration:

1. Restore America's strength in STEM disciplines by making ocean, coastal, and Great Lakes EOE a priority on par with research priorities at all relevant federal agencies.
2. Designate NOAA as the lead agency to coordinate the integration and evaluation of ocean EOE nationally to maximize the impact of federal investments across all agencies.
3. Establish standards and evaluate EOE effectiveness to ensure that EOE priorities and outcomes are documented and reported by federal agencies to the appropriate advisory/oversight groups.
4. Engage the private sector and governmental agencies at all levels to work collaboratively with colleges and universities to retrain and retool our existing workforce.

OCEAN RENEWABLE ENERGY

The Pelamis Wave Power device, developed in Scotland and deployed in Portugal, is the worldís first commercial scale wave energy machine to generate electricity into the power grid. The U.S. trails Europe in the development of ocean energy technologies.

The Future of Energy: Harness the Inexhaustible Power of Our Ocean

Outcome: The vast sustainable energy potential of U.S. waters is harnessed to make the ocean a major component of the nation's renewable energy portfolio.

Rationale: The ocean represents an immense resource for renewable energy that could revolutionize energy production and job creation in the U.S. If only a small fraction (<10%) of the tidal, wave and current energy in the ocean that is directly adjacent to our country were captured, we would substantially reduce our dependence on hydrocarbons, especially foreign oil. A public utility in the State of Washington estimates that the tidal energy focused in a small portion of Admiralty Inlet (WA) could support a 40 MW power plant. Within 20 miles of Florida's southeast coast, the Gulf Stream flows northward at speeds of up to four knots. This enormous current carries 30 times more water than all of the rivers on earth combined, and its energetic, high-speed core contains more than five times the energy used to power all of the homes in Florida. Simply put, the immense amount of energy in the U.S. territorial ocean represents a sustainable and technically feasible solution to the economically crippling energy problems currently confronting our nation. Modest financial and legislative support for ocean renewable energy would help tremendously in capturing the vast emission-free and renewable energy resources near our shores, feeding them into U.S. power grids, and creating hundreds of thousands – if not millions – of new jobs in this revolutionary and underexplored new sector.

Opportunities for the New Administration:

1. Create a National Ocean Advisor to be the lead advocate for ocean renewable energy in the White House.
2. Mandate to federal agencies that ocean renewable energy shall be an important component of the nation's future portfolio of renewable energy sources and federal investments.
3. Encourage private investment by establishing a new process for offshore renewable energy siting and permitting that eliminates uncertainty and is more efficient, less costly, and more predictable.
4. Provide financial incentives for ocean renewable energy development and production.[§]
5. Provide federal research and development support for studies to assess the economic and ecological results of ocean renewable energy installations.
6. Protect groups that invest in ocean renewable energy projects by giving them preference in expanding successful demonstration projects into full-scale commercial projects.

§ Example incentives include the Production Tax Credit, the Investment Tax Credit, the Renewable Energy Production Incentive, and the Clean Renewable Energy Bond program.

RESEARCH TO APPLICATIONS

The application of research results is just as important as the research effort itself.

Make Research Results Count: Instill a Commitment to Research Synthesis and Application

Outcome: The results of research conducted by the nation's mission agencies are efficiently and effectively synthesized and transformed into products and services that are utilized to solve society's most pressing ocean management problems, and to exploit new opportunities to benefit the nation.

Rationale:* The number and sizes of dead zones in our nation's coastal waters are increasing. Many fisheries are threatened by over-fishing, pollution, and stresses associated with climate change. However, decision makers at all levels of government and in the public and private sectors are not fully utilizing available scientific information to develop management strategies to deal with these issues and to protect valuable natural resources. America's investment in science and technology has generated a steady stream of new knowledge and technologies, but it has failed to develop a network of institutional mechanisms that transition these advances to applications that address major social, environmental management, and regulatory emerging challenges and opportunities. The nation's mission and research agencies make huge contributions to scientific understanding both through the extramural research they support and through research done by agency scientists. However, even though society eventually benefits from most scientific advances, the magnitude and urgency of present social and environmental challenges indicate the need for an increase in the rate, efficiency, and effectiveness of transitioning research to management and other societal decision-making applications. In this time of economic exigency, it is critical that efficient and effective application of knowledge be integrated into the decision-making process.

Leadership is required to establish a new culture within federal agencies that not only encourages, but requires and rewards, successful transitioning of research to applications. With relatively modest changes in agency research policies and practices, the nation could benefit more quickly from the federal investment in agency and agency-sponsored research. Successful models, such as the Strategic Environmental Research and Development Program and the Small Business Administration Innovative Research and Technology Transfer programs, exist for transitioning research to applications. The nation's future research endeavors should exploit the lessons learned from these and other success stories to maximize the impact of our research investment.

Opportunities for the New Administration:

1. Charge a high-level task force with determining best practices from case studies‡, developing performance metrics for evaluating the research to application processes within federal agencies, and tracking progress in carrying out those processes.
2. Establish a "Making Research Count" Award program with monetary awards for the agency and program that demonstrate the most successful transition of new research to application.

** This text has largely been modified from Best Practices for Increasing the Impact of Research Investments: A Report by the Research to Applications Task Force of the Ocean Research and Resources Advisory Panel.*

‡ Case studies should include examples of ecosystem-based science informing policy, such as "Response of Coastal Ecosystems to Extreme Weather Events," a near-term priority in Charting the Course for Ocean Science in the United States for the Next Decade: An Ocean Research Priorities Plan and Implementation Strategy.

INTERAGENCY COLLABORATION

Programs like the National Oceanographic Partnership Program are motivated by, and predicated upon, the benefits of sharing responsibility for those endeavors that might otherwise be left undone but which are needed by all.

Achieve More Together Than Can Be Achieved Alone

Outcome: Administrative leadership and partnerships in dealing with ocean issues lead to achieving the nation's societal, economic, and environmental goals that are far beyond the scope of the mission and resources of any single federal agency.

Rationale: The Joint Ocean Commission Initiative notes that the "Oceans are managed pursuant to 140 different federal laws, implemented by 18 federal agencies, with no overarching policy or coordinated implementation to carry out that policy….The implementation of one law is disconnected and uncoordinated from the implementation of the others. As a result, the federal government is able to manage specific problems but not address the bigger picture of ocean health and the ability of the oceans to both provide us with basic services and recover from changes, including those anticipated from climate change." The federal agencies whose missions touch the ocean understand that only through genuine agency collaboration will the U.S. accomplish its research and monitoring goals and successfully transition the resulting advances in understanding into management, regulatory, and operational decisions in a cost-effective way.

The new administration is presented with a unique opportunity to achieve outstanding success in accomplishing the nation's research, policy, and management goals and objectives by increasing interagency collaboration. To do so, agencies must act now to build on the successes of such programs as the National Oceanographic Partnership Program, and follow the recommendations of the U.S. Commission on Ocean Policy (USCOP) and the Pew Oceans Commission. The structure created under the U.S. Ocean Action Plan has enhanced interagency cooperation and collaboration. It should be retained and strengthened, or if a new structure is created, it should preserve the gains made through interagency partnerships. In addition, we recommend a number of initiatives below.

Opportunities for the New Administration:

1. Strengthen federal leadership and coordination by establishing a National Ocean Advisor to the President with responsibility for overseeing all federal ocean activities. Empower this position to improve federal agency collaboration in support of a unified National Ocean Policy.
2. Establish a unified National Ocean Policy, formally stating that it is overarching U.S. policy to understand, monitor, use responsibly, protect, and restore our ocean resources, as well as enhance the sustainability of the ocean and the coastal economies that depend on these resources. Implement a process, led by the National Ocean Advisor, for evaluating federal agencies' performance in carrying out this policy.

NOAA LEADERSHIP

The National Oceanic and Atmospheric Administration must be given the authority and tools to understand and manage our ocean resources.

Designate NOAA as Lead Federal Agency for Ocean Management and Domestic Policy

Outcome: The National Oceanic and Atmospheric Administration (NOAA) is widely recognized as the nation's lead agency on most science, policy, and management issues for the U.S. ocean areas, coastal zones, and Great Lakes. Its collaborative leadership results in effective implementation of ocean roles, laws, and regulations by 18 different federal agencies.

Rationale: As the world's preeminent source of oceanic and atmospheric data and information, NOAA should coordinate federal ocean research and monitoring activities, operations, management, regulatory and education programs, and efforts to improve responses to climate change. The U.S. Commission on Ocean Policy (USCOP) reported that, "Immediate strengthening of NOAA's ability to carry out its many ocean and coastal-related responsibilities is critical." NOAA was established in 1970 by a presidential reorganization order and has functioned as an "operating unit" within the Department of Commerce ever since, despite the fact that NOAA funds account for roughly half of the Department's FY09 Presidential Budget Request. Establishing NOAA in law through an Organic Act would codify its focus on these critical ocean and atmosphere topics: understanding and monitoring, prediction and assessment, education, and resource management.

There is no greater natural driver of U.S. prosperity and quality of life than the global ocean. It has a direct bearing on weather, agriculture, food resources, navigation, port operations, security, and recreation and tourism, not only along the coasts of 35 states and territories, but in every U.S. community. All are affected by the ocean and its variability, as well as its effects on weather and climate. The agency that has the tools to understand and manage the ocean's role in climate change and weather is as important to the fisherman in Maine as it is to the farmer in Nebraska as it is to the surfer in California. The USCOP clearly stated that "America is a nation intrinsically connected to and immensely reliant on the ocean." For the sake of all Americans, NOAA must be empowered to lead the nation—and the world—in understanding and managing ocean resources.

Opportunity for the New Administration:

1. Establish NOAA in law. Act immediately on the USCOP recommendation to codify NOAA as the lead agency with responsibility for the ocean, coasts, and Great Lakes. A NOAA Organic Act will strengthen NOAA's role in federal ocean exploration, research and monitoring activities, management, and education programs; provide support for regional and state efforts; and improve our responses to climate change.

CRITICAL LEGISLATION

Passage of critical legislation will allow for the coordinated formulation and implementation of effective policy.

Critical Ocean Legislation ñ Immediate Action

Outcome: Critical legislation is passed that enables effective governance and increases our ability to predict, manage, and cope with changes to our ocean resources and processes and the impacts of those changes on our way of life.

Rationale: Our ability to properly manage coastal and offshore areas, and address the larger picture of the ocean's role in a changing environment, particularly relating to climate, is strongly dependent on effective policy. The current complexity of ocean-related legislation has made coordinated implementation of coherent policy difficult. Passage of a number of critical pieces of legislation presents opportunities for immediate success in helping the U.S. overcome these obstacles and formally recognize the heretofore undervalued significance of the ocean in meeting some of the nation's most pressing needs.

Opportunities for the New Administration:

1. NOAA Organic Act. Improves the stewardship of our ocean, coastal, and Great Lakes resources. Solidifies NOAA as the lead ocean agency, thereby (1) providing a statutory basis for its existence and ability to conduct its missions, and (2) improving its ability to coordinate with other federal agencies and with the states.
2. National Integrated Coastal and Ocean Observation System. Legislation described in omnibus bill S 3297 (1) establishes an observing system; (2) supports national defense, maritime commerce, offshore energy production, basic and applied research, ecosystem-based marine and coastal resource management, and public safety; (3) promotes public awareness of ocean, coastal, and Great Lakes resources; (4) improves the ability to measure, track, explain, and predict weather and environmental variability that drive climate; and (5) solidifies the nation's role as the international leader in global earth and ocean observation systems.
3. The Convention on the Law of the Sea. Ratification provides the U.S. with official standing in the international management of shipping and navigation, fisheries, and natural resources. The ocean research community, the military, and the major U.S. ocean industries—including offshore oil and gas, maritime transportation and commerce, fishing, and shipbuilding—support the U.S. joining the Convention.
4. Reauthorization of the Coastal Zone Management Act. Provides communities, particularly those in coastal states, with resources and legal tools to adapt to climate change, plan for and evaluate siting of energy facilities, protect and restore valuable habitat, grant public access to coastal waters, and guide coastal development.
5. Federal Ocean Acidification Research And Monitoring (FOARAM) Act of 2007 Act. Creates a high-level committee to oversee the development and coordination of a plan to improve our understanding of increasing acidification on marine ecosystems and our strategies and tactics to protect and conserve marine ecosystems.
6. Ocean and Coastal Exploration and NOAA Act (OCEAN Act). Authorizes the national Ocean Exploration Program and the Undersea Research Program within NOAA.
7. Reauthorization of the National Estuary Program. Establishes a multi-year program through which federal agencies can promote and track restoration of vital estuaries.
8. Ocean and Coastal Mapping Integration Act. Directs NOAA to establish an integrated mapping program for the Great Lakes and coastal waters, the territorial sea, the exclusive economic zone, and the continental shelf to enhance ecosystem approaches in decision-making for conservation and management of habitats and living resources.

NOPP

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