Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure: Public Comments Received 1/24/2011-4/29/2011

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Name

Jean Paul Gauto

Organization

EnergySolution.tv

Which Priority Objective would you like to provide comment on?

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

What near-term, mid-term, and long-term actions would most effectively help the Nation achieve this policy objective?

I bring two issues to the table. Both ideas are simple opean and close resolvments. First there is a natrual deposite of garbage in the middle of the pacifc ocean. Debree from all dirrection migrate to this natrural garbage under water dump. The problem here is looking at this situation effeiciently. What i am proposing, is creating a ocpuss technolagical machine wich will work as a under water refinary. Its prime derective is to seperate life forms from the debree and dispense it out to the under water ocean. The "ocpuss" primary mission is to recycle the naturaul resource that man has left behind. The octapuss will create recycle products for under habitation for animals and man, as well as create molds for mariene vessel, ranging from cars, boats, trailer, plains, and space vessels. Basically a glorified Fiberglass recycler. The octupuss will be monerting our polution footprint, and converting it as profitable material. Tho, also help building molds for and under water habitation.

secondly, this issue strikes a resent event, and is sad that it wasn't implemented correctly. Petreleum, under water gas extracting, and any thing that falls in relation to this matter. The bottom line is when there is a spill or disaster, the congressinal oder is to contain the problem with out hesitation. What i propose is to have a council guidline on who is to be responsible to inform the current president at the time. The ceo of our nation needs compitent infromation, guidelines, inoder to make the correct desicion, at the cost of private capitol intrest. The rules are there, the counsil is not a paid position that meets yearly to discuss coffee conversation, rather than the counsil are guide lines of who informs the president when the situation occurs. As a example it could be a cobination of NASA chief executive, FDA Cheif executive, and a suprem court justice. The counsil is there to advise the president on specific predetermine emergency. Offcoure my suggestion of personal can be inter changed with better representitive, whe our ceo is ready to sign the direct oder.

Jean Paul G

What are some of the major obstacles to achieving this objective; are there opportunities this objective can further, including transformative changes in how we address the stewardship of the oceans, coasts, and Great Lakes?

Issue 1 obstacle Capitol greed. The octupuss should be treated in the same manner the stealth arrowhead prodgect was created. we must stick with a game plan that has proven to be effiecnt in its completion. Itstead of a technolgy design for war, it technology design for advancment, tho onnce the goverment is able to produce a profitable machinary, it can be sold on wall street to cover its intial investments cost.

The obsacle for the second issue is, finding the right members to be part of the president counsil. Tho the counsil will be from other department in the goverment, the selection of the right leaders is impertive, to inform our president of the proper procedure for emergency ocean, coastal, and great lake implementation.

What milestones and performance measures would be most useful for measuring progress toward achieving this priority objective?

Mile stone for the under water "octupuss"

1 Govermental reward for a goverment contrator contest

2 effect the recycle Product market

3 The new technolgy pays it own start up cost

Emergency conunsil

1 all reletive emergency goverment procedure is brought together

2 congress decide on who would be the best counsil during the state of emergency

3 the counsil readyness sucsseeds in a emergency situation.

Attachment:

Name

Patrick Welsh

Organization

University of North Florida

Which Priority Objective would you like to provide comment on?

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

What near-term, mid-term, and long-term actions would most effectively help the Nation achieve this policy objective?

Make this the first objective in line with its importance, none of the other items can make significant progress without observations. We need data, data, and data. Then we can start to achieve our National objectives.

What are some of the major obstacles to achieving this objective; are there opportunities this objective can further, including transformative changes in how we address the stewardship of the oceans, coasts, and Great Lakes?

Federal Agencies quibbling over authority and budgets. Lack of maintenance funding for ocean buoys and systems.

What milestones and performance measures would be most useful for measuring progress toward achieving this priority objective?

Doubling the number of ocean buoys in 3 years. USWRP recommended one buoy every 100 kilometers of coast, but also commented that that was not nearly enough.

Name

John Beebe

Organization

Sailaway Charters

Which Priority Objective would you like to provide comment on?

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

What near-term, mid-term, and long-term actions would most effectively help the Nation achieve this policy objective?

Paragraph 1 page 2: Final Recommendations; "Overlapping uses and differing views about which activities should

occur where can generate conflicts and misunderstandings."

Start by correcting all errors and making sure the article is fully readable. Remove the word "where" or change the sentence structure.

To effectively help the Nation achieve the policy objectives....enforcement tools with very very sharp teeth must be in place. Other countries with ocean borders should be encouraged to sign on.

What are some of the major obstacles to achieving this objective; are there opportunities this objective can further, including transformative changes in how we address the stewardship of the oceans, coasts, and Great Lakes?

One major obstacle to achieving the objective, are the conflicts of interests in our own government. Proven example: Gulf Oil Spill 2010.

How can "We the People" expect our own government to safeguard the policies it makes when the elected officals are receiving contributions from big oil companies. How can we trust our government agency overseeing the drilling process when they are partying with the company they are charged with overseeing?.

What milestones and performance measures would be most useful for measuring progress toward achieving this priority objective?

I would consider the establishment of an international task force to enforce protection of the earths oceans and the completion of cleaning up the huge area in the pacific ocean of human pollution floating on the surface, as a milestone in measuring progress with the objectives.

Another performance measure would be in the form of reports by accredited scientists on improvements in water and habitat qualities being made possible by these policies.

Name

Sara Friedman

Organization

USAF

Which Priority Objective would you like to provide comment on?

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

What near-term, mid-term, and long-term actions would most effectively help the Nation achieve this policy objective?

Re Aquaculture- I received an e-mail from CT Congressman - they loved the policy. It creates jobs and helps the economy of the coastal areas.

What are some of the major obstacles to achieving this objective; are there opportunities this objective can further, including transformative changes in how we address the stewardship of the oceans, coasts, and Great Lakes?

I have not heard of any.

What milestones and performance measures would be most useful for measuring progress toward achieving this priority objective?

Increased revenue/job creation in the coastal areas. I have only heard from CT but this would benefit all coastal areas East and West Coast as well as the south.

Name

George Taft

Organization

Retired lawyer

Which Priority Objective would you like to provide comment on?

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

What near-term, mid-term, and long-term actions would most effectively help the Nation achieve this policy objective?

Acceding to the Law of the Sea Convention. We not only gain access to leadership positions within the Convention structure, including on the Commission on the Limits of the Shelf (CLCS), the International Seabed Authority and the Law of the Sea Tribunal, but could directly avail ourselves of guaranteed access, under reasonable conditions and security of tenure to explore and exploit the deep seabed. We could help avoid a scandal brewing in the CLCS- you might ask State Department (OES)about this.

What are some of the major obstacles to achieving this objective; are there opportunities this objective can further, including transformative changes in how we address the stewardship of the oceans, coasts, and Great Lakes?

There is opposition in the Senate from perhaps 10 Senators. And the President has shown no willingness to fight for this Convention. In the first case, CIA, Defense and Commerce should be pressing the objective, with direct briefings, of the not so usual arguments. The oil, gas, and hard minerals interest should press as well, indicating, in addition to the obvious, the minerals that are so essential to modern technology may be available on the deep seabed.

What milestones and performance measures would be most useful for measuring progress toward achieving this priority objective?

Senate action.

Name

David Dow

Organization

Cape Cod Grassroots Environmental Activist

Which Priority Objective would you like to provide comment on?

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

What near-term, mid-term, and long-term actions would most effectively help the Nation achieve this policy objective?

Even though some components of a national ocean observations program are in place:ocean observation sampling buoys; satellite systems for observing the ocean; underwater laboratories with remotely operated vehicles and instrumented sampling stations; ship borne surveys for living marine, protected and natural trust resources ; water quality surveys; sediment mapping and sampling programs; mussel watch surveys for toxic chemical monitoring; etc.., this is distributed network of public and private sector efforts. Many of these programs are experimental (operating with grant funding), while others are operational programs carried out by state/federal agencies (i.e. fishery surveys). The first priority should be for the Regional Ocean Councils (ROCs) to organize these separate efforts into a coherent whole. The mid-term priority should be to find the data gaps in the current efforts and find ways to fill them. This would include the information technology infrastructure to covert data from various sources into the information required to support Adaptive, Ecosystems-based Management (A,EbM) that allows the ocean to be utilized compatibly by multiple sectors, while at the same time ensuring environmental protection of biotic components & their habitats/preventing pollution of the water column/sediments. In the longer term the ROCs will need to develop Public Advisory Committee (PAC) that includes a variety of constituents to provide input on this program. This PAC should be implemented under FACA (Federal Advisory Committee Act) which is why it is likely to occur in the longer term. There should also be a separate, independent Scientific Advisory Panel (SAP). Finally in the longer term suitable resources (people and $) will be required to operate this distributed program.

What are some of the major obstacles to achieving this objective; are there opportunities this objective can further, including transformative changes in how we address the stewardship of the oceans, coasts, and Great Lakes?

The major obstacles from my perspective are lack of adequate resources (people and $); absence of an operational definition of what A,EbM entails and the mechanism to coordinate private and public sector actions to support this Strategic Action Plan. The Canadian Department of Fisheries and Ocean (DFO) Eastern Scotian Shelf Integrated Management Plan (ESSIM) could provide some useful lessons learned. The Gulf of Maine Council on the Marine Environment (GOMC) has held a number of workshops on indicators; monitoring, mapping and relating these to policy that should be considered. Finally the Massachusetts Water Resources Authority (MWRA) Ocean Outfall monitoring program provides a good example of public outreach and linking the monitoring program reference points to issues in which the public has concerns. The MWRA monitoring program has caution and warning levels for the reference points which requires the agency to explain in a report to the regulators (EPA Region 1 and Ma. DEP).

What milestones and performance measures would be most useful for measuring progress toward achieving this priority objective?

Not being a regulatory bureaucrat, it is hard for me to determine the difference between a milestone and performance measure and how these should be sequenced. ASs a grassroots environmental activist my concerns include: avoid being date rich, but information poor; needs for scientific data to be translated into something that

accessible to the public; having proactive public engagement in the process (the development of Rhode Island Special Area Management Process instead of BOEMRE process for locating wind energy projects in the ocean);and the need to address ocean issues in a more holistic, integrated fashion.

Name

Todd Harwell

Organization

Florida Institute of Technology

Which Priority Objective would you like to provide comment on?

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

What near-term, mid-term, and long-term actions would most effectively help the Nation achieve this policy objective?

i. Near-Term:

1. Establish and maintain a national integrated network of ocean, coastal, and Great Lakes observing systems, allowing agencies and organizations to compile and share observations, data, and information. Cooperating international partners and organizations may also access this network.

2. Formal technology training programs should be created and delivered for governmental and environmental agency employees. This will ensure that new technologies are not only accessible, but also able to be used properly in order to observe and monitor coastal areas.

ii. Mid-Term: Introducing and integrating new technologies and techniques of monitoring and collecting coastal information, such as unmanned autonomous vehicles (UAVs) and remote sensing satellites and technology. Using sophisticated forms of data collection, the Council would be able to monitor the health and productivity of coastal zones, and address any potential threats as they are discovered.

iii. Long-Term:

1. Development and launching of more satellites that measure and record environmental and geographical data. This data should be linked and shared on an accessible national or global network as previously mentioned.

2. Expansion of the National Oceanographic fleet of ships and facilities. More vessels should be added to the fleet in order to monitor and manage for coastal areas.

3. Facilities and laboratories should be expanded and updated so that they are equipped to address any potentially hazardous threats to the health of our ecosystems as they are discovered.

What are some of the major obstacles to achieving this objective; are there opportunities this objective can further, including transformative changes in how we address the stewardship of the oceans, coasts, and Great Lakes?

i. Cooperation among agencies and organizations to share observations among the coastal systems network.

ii. Funding and maintenance of proposed new monitoring technologies in the form of UAVs and remote sensing satellites.

iii. Full and complete integration of ocean, coastal, and Great Lakes observations and data.

iv. Cohesive and well-coordinated infrastructure related to the national observing systems integrated network.

What milestones and performance measures would be most useful for measuring progress toward achieving this priority objective?

i. Immediate implementation of the National Ocean Policy and the Nine Priority Objectives.

ii. Willingness and agreement from agencies and organizations to participate in the observing systems network.

iii. Implementation of UAV and remote sensing technologies in coastal monitoring.

iv. Assessment and evaluation of the effectiveness and efficiency of the new monitoring technologies.

v. Creation of an accessible database of observations and recorded data related to coastal monitoring.

Attachment: Attachment included in index: "Todd A. Harwell." Found on page 30 of document.

Name

Michael De Luca

Organization

National Estuarine Research Reserve Association

Which Priority Objective would you like to provide comment on?

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

What near-term, mid-term, and long-term actions would most effectively help the Nation achieve this policy objective?

Technological advances in observation, modeling, and data assimilative methodologies have enabled us to enter a new era in oceanography that of the well-sampled ocean. New remote sensing and autonomous systems now allow us to sample the ocean at time and space scales never before achieved, and computer models can generate forecasts of the ocean in real time.

In the near-term, continue to build out the IOOS infrastructure to inform stewardship of marine and coastal resources. Gaps in this system exist were evident following the Gulf oil spill last year. Also, capitalize on existing sampling and observation networks fully such as the System-wide Monitoring Program that exists in the National Estuarine Research Reserve System. Use the NERRS as sentinels or indicators of environmental change in coastal systems.

In the long-term, we need to capitalize on advances in diverse scientific fields to enhance the capacity and efficiency of ocean sampling and sensing.

What are some of the major obstacles to achieving this objective; are there opportunities this objective can further, including transformative changes in how we address the stewardship of the oceans, coasts, and Great Lakes?

Much of the IOOS infrastructure has been driven by the physical oceanographic community. Satellites, buoys and AUVs serve as the backbone of the ocean observing system. It is now time to build in capacity available at local scales (such as the NERRS and NEPs), and to engage end users more directly in project definition to ensure timely, relevant products and services.

What milestones and performance measures would be most useful for measuring progress toward achieving this priority objective?

Accurate forecasts of environmental change and episodic events that enable ocean stakeholders and coastal communities to mitigate environmental and economic impacts.

Name

Peter Saundry

Organization

National Council for Science and the Environment

Which Priority Objective would you like to provide comment on?

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

What near-term, mid-term, and long-term actions would most effectively help the Nation achieve this policy objective?

To strengthen and integrate federal and non-federal ocean observing systems, sensors, data collection platforms, data management, and mapping capabilities into a national system, and integrate that system into international observation efforts:

A. Implement an ocean observing system.

B. The National Ocean Council (NOC) should endorse and implement a national marine biodiversity observing network (BON) to support the national ocean priorities (see Attaining an Operational Marine Biodiversity Observation Network Synthesis Report, available at www.nopp.org). To advance this goal:

i. Federal agencies should support demonstration projects for a national marine BON, through an interagency mechanism such as the National Oceanographic Partnership Program (NOPP).

ii. Entities overseeing ocean observing systems such as the Integrated Ocean Observing System (IOOS) should incorporate observations of biodiversity.

iii. Federal agencies with ocean-related missions should support the principle of data sharing. An early priority in establishing a marine BON is to establish a mechanism to encourage data sharing among agencies and to establish standardized policies about data. Data standards, interoperability and accessibility for physical and chemical data are well established; the same level of standards, interoperability and accessibility should be established for biodiversity observations, enabling their incorporation in analysis and modeling of global climate change.

iv. The State Department should support the establishment of an operational marine biodiversity observing network (BON) and coordinate with similar international efforts, and ensure incorporation in the International Mechanism of Scientific Expertise on Biodiversity (IMoSEB) and Global Earth Observing BON (GEO BON).

C. Monitor for and Forecast Health Threats from the Oceans by:

i. NOAA should lead a collaborative interagency effort to support research, development, evaluation, and deployment of biological sensors for multiple applications, including health of humans and marine animals. The effort should include agencies working on chemical and biological weapons detection of leverage expertise and resources to overcome common technical challenges.

ii. NOAA should lead an interagency effort to coordinate marine sensors into a comprehensive system of surveillance of pollution and ecosystem monitoring that includes humans, marine animals, and terrestrial animals in order to detect trends, changes, and health risks. These efforts should include the U.S. Global Change Research Program (USGCRP) Climate Change and Human Health Group and the Interagency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health.

iii. Ocean Observing Systems should integrate marine sensors into a comprehensive surveillance system for monitoring and forecasting health risks.

iv. Supporting development of marine sensors to measure human and animal health.

v. NOAA and the interagency effort should define system requirements and facilitate development of real-world performance in order to support translation research and operations of marine sensors for human and animal health.

vi. Agencies should support analysis of existing data from marine sensors, including sentinel species, to determine baselines and to inform risks to human health.

vii. Agencies should utilize knowledge derived from marine sensors to educate policy and decision makers about the connections between ocean health and human health.

D. Establish more robust climate observing and modeling system to provide strategic planners at the Department of Defense (DoD) with actionable intelligence that can influence future planning and budgeting decisions.

E. Advance essential data for Marine Spatial Planning by:

i. ensuring interoperability of existing data systems, for example, IOOS, OBIS, MMC, NAMERA, National Atlas of Ecosystem Services

ii. acknowledging and acting on the fact that Coastal and Marine and Spatial Planning (CMSP) transcends static planning for 2-dimensional areas, CMSP should take into account the water column, benthos and changes over time.

iii. supporting Regional Planning Bodies (RPBs) to improve and evaluate relevant data sets as an integral part of adaptive management of CMSP plans.

iv. have the CMSP data subgroup establish a web-based community that provides best practices, recommended standards, implementation specifications, and ensures interoperability across regions.

What are some of the major obstacles to achieving this objective; are there opportunities this objective can further, including transformative changes in how we address the stewardship of the oceans, coasts, and Great Lakes?

What milestones and performance measures would be most useful for measuring progress toward achieving this priority objective?

Attachment:

Attachment included in index: “National Council for Science and the Environment’s 11th National Conference on Science, Policy and the Environment: Our Changing Oceans.” Found on page 20 of document.

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Attachments to Comments

And Letters Received

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

Coastal States Organization
444 N Capitol St NW, Suite 322
Washington, DC 20001
202-508-3860
www.coastalstates.org

April 28, 2011

Ms. Nancy Sutley, Dr. John Holdren and Members
National Ocean Council
c/o Council on Environmental Quality
722 Jackson Place NW
Washington, DC 20503

Re: CSO Recommendations on *Objective 9: Ocean, Coastal and Great Lakes Observation, Mapping and Infrastructure*

Dear Chairs Sutley and Holdren, National Ocean Council Members:

On behalf of the Coastal States Organization (CSO), we offer the following recommendations to the National Ocean Council (NOC) for use in developing a Strategic Action Plan for *Objective 9: Ocean, Coastal and Great Lakes Observations, Mapping and Infrastructure.*

Since 1970, CSO has represented the interests of the Governors of the nation's thirty-five coastal states and territories, including the Great Lakes states, on issues relating to the sound management and development of coastal and ocean resources. CSO applauds the *Final Recommendations of the Interagency Ocean Policy Task Force* as it represents the evolution of the nation's management of ocean and coastal resources in a balanced approach. With respect to Objective 9, Coastal Ocean Observing Systems (COOS), developed as part of the U.S. Integrated Ocean Observing System (IOOS), will play an important role in meeting long-standing and future information needs of the coastal management community. However, the linkages between the observing community and coastal resource management community have only recently begun to be explored. More robust coastal and nearshore observations will be critical to addressing current coastal zone management issues, including rapid coastal population growth and land use change, offshore energy activities, aquaculture, water quality and nearshore habitat degradation, coastal storms and hazards, sea level rise, and other emerging threats.

As the development of the Strategic Action Plan moves forward, CSO urges the National Ocean Council to consider CSO's recommendations and to value state and territorial input in order to successfully advance this objective and institutionalize the effort within the federal government. CSO's top three recommendations for Objective 9 are the following.

1. Improve Data Acquisition and Availability

   Coastal states and territories cite the following as continuing research and information needs.

   - ***High Resolution Topography and Bathymetry***
     Consistent temporal and spatial coverage of high-resolution topography and bathymetry data (for example, LIDAR, shallow water-penetrating LIDAR) is needed, as well as more training opportunities for coastal program managers in shoreline delineation, mapping, vertical and horizontal reference datums, and legal definitions.

   - ***Inundation Mapping vs. Shoreline Change Modeling***
     Federal guidance for modeling local- and subregional-scale shoreline changes associated with varying sea level rise projections as well as for monitoring offshore and ocean front coastal changes, including "sheltered" coastlines is needed.

   - ***Impacts of Accelerated Sea Level Rise***
     Federal guidance is needed on best practices, case studies, trainings, workshops, and/or software tools focused on community-level and statewide vulnerability assessments and adaptation planning for state coastal programs. Improved models that predict coastal wetland and beach migration and vertical accretion in response to accelerated sea level rise, information on the costs of response options, and the consequences of taking no action are needed. Assessments of social, legal, and economic issues related to shoreline "retreat," armoring, renourishment, and "no action" alternatives across developed and urbanized coastlines would also be valuable for coastal resource managers.

   - ***Other Climate Change Impacts***
     More data, research, guidance, and examples of best management practices are needed on a variety of other climate change issues, including the introduction of invasive species, ocean acidification, ecosystem migration, freshwater resources, and storm surge models. Additional federal guidance is also needed for modeling local/regional-scale effects of storm events coupled with rainfall, river flooding, and sea level rise projections.

2. Improve Coordination and Reduce Duplication of Efforts

   Research efforts conducted by the states and federal government agencies should be well coordinated and not duplicative. CSO encourages building upon existing integrated research, observation, and modeling programs that provide timely information to inform marine and coastal management decisions as well as climate change adaptation and resilience strategies. There is an opportunity to take advantage of the multiple applications of data that is collected by Coast and Ocean Observing Systems.

3. Create a Mechanism to Provide Consistent Funding

   Current IOOS funding levels are insufficient to meet the needs of coastal managers. CSO recommends exploring options to provide a more consistent funding mechanism to support ocean and coastal observation and mapping efforts.

Short Term Action
In the short-term development of the Action Plan, CSO recommends that the National Ocean Council acknowledge the following recommendation.

Prioritize Data Collection and Improve Availability of Decision Support Tools
Coastal programs are interested in decision-support tools that compile historical shorelines, geomorphology, socioeconomic data, and model projections. Coastal managers have also identified top technology needs, including: improved models for prediction and simulation; high resolution remote sensing; and cost effective, long-term monitoring and sampling capabilities. CSO recommends maintaining satellite observations of sea level rise change as a priority, and addressing the need for consistent temporal and spatial coverage of high-resolution topography and bathymetry.

Mid Term Actions
In the mid-term development of the Action Plan, CSO recommends that the National Ocean Council acknowledge the following recommendations.

Improve Shoreline Modeling Methods
CSO recommends developing uniform methods for modeling local- and regional-scale shoreline changes associated with varying sea level rise projections.

Increase Information Sharing
CSO recommends considering public-private partnerships whereby data is collected and government agencies can pool resources to get the data processed at the scales and resolutions needed for decision-making.

Long Term Action
In the mid-term development of the Action Plan, CSO recommends that the National Ocean Council acknowledge the following recommendation.

Monitor Change/Provide Continued Assessments
CSO recommends maintaining a scientific network monitoring change at local and regional levels. Examples of questions that should be addressed with the data: Are sea level rise projections correct? Is coastal flooding more frequent? Are storm waves larger? Are large storms more common?

Related Obstacles
Existing coastal zone management programs and policies were based upon a relatively predictable rate of sea level rise and climate scenarios. The challenge for coastal managers is to devise adaptations strategies for a variety of sea level rise projections and potential climate impacts, and to adjust these in the future as forecasting improves. Improved sea level rise modeling and climate change risk/vulnerability assessments are needed. There is also a lack of national support for additional data collection and no centralized portal to access data resources. Additionally, metadata descriptions are needed to make data sets more robust and useful.

Transformative Opportunities

There is an opportunity to build on existing capacity, increase coordination, and reduce duplicative research and data collection efforts. Areas of particular importance to state coastal programs include: historic shoreline position maps and erosion rates; acquisition of high resolution topography and bathymetry; hazard risk and vulnerability assessments; sea level rise inundation models; storm surge - sea level rise linked inundation models; shoreline change modeling based on sea level rise projections; sea level rise vulnerability and socio-economic studies; and environmental/habitat changes associated with sea level rise.

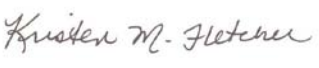
The NOAA Coastal Services Center's Digital Coast project presents another transformative opportunity. CSO is actively involved with the Digital Coast partnership, which is working to leverage resources from multiple agencies (Federal, state, and local) and other stakeholders improve data collection and transform this data into products that support sound coastal and ocean management decisions. The Digital Coast not only provides coastal state resource managers easy access to relevant geospatial data and tools (including various inundation and storm mapping tools), but it also offers training opportunities to ensure that users get the most out of the data and tools available as well as best practices and lessons learned. The technical assistance resources help to inform coastal management issues and decision-making, from sea level rise adaptation, to offshore renewable energy planning, to habitat conservation. All of which are among the priority issues for coastal states. Supporting the growth of a more robust Digital Coast would help address the need for better surveying, charting, remote sensing and geospatial data for the nation's coasts, harbors and ports, shoreline and ocean resources.

Milestones and Performance Measures

CSO recognizes that the milestones and performance measures will play an important role in providing credibility to the implementation of this objective. Depending on the steps contained within the Action Plan, CSO looks forward to discussing in more detail appropriate milestones and performance measures.

The states and territories strongly support the NOC in its work to implement *Objective 9: Ocean, Coastal and Great Lakes Observation, Mapping and Infrastructure*. CSO appreciates the opportunity to comment and work with the National Ocean Council on this Action Plan.

Sincerely,



Braxton Davis
Chair
Coastal States Organization

Kristen M. Fletcher
Executive Director
Coastal States Organization

Comments for the National Ocean Policy Strategic Action Plans from the National Council for Science and the Environment's 11th National Conference on Science, Policy and the Environment: Our Changing Oceans

For three days in January 2011, the National Council for Science and the Environment (NCSE) convened 1,250 leaders in ocean science, policy, management and education, conservation and business to explore issues affecting the world's changing oceans. Their objectives were to advance science based decision-making on oceans by:

1. sharing the most current state of the science;
2. linking science to policy and other decisions;
3. communicating key messages and reframing issues;
4. developing targeted and actionable recommendations; and,
5. catalyzing long-term collaborations

Meeting participants put forth a spectrum of ideas on specific challenges facing the world's oceans. Here we present those recommendations that are germane to the National Ocean Policy process, mapped onto the nine Priority Objectives from the Final Recommendations of the Interagency Ocean Policy Task Force. Recommendations that were not targeted for the National Ocean Policy Strategic Action Plans (e.g., recommendations directed at Congress or the private sector) are not included here.

Because there is considerable overlap among these priority areas, some recommendations are included in more than one area, but we also encourage those working on individual priorities to view recommendations in related areas (for example, ecosystem-based management is very much connected with marine and spatial planning).

Because of the nature of the conference, there is considerable diversity in the types of ideas put forth - research, policy, education and outreach; regional, national and international; single agency, multi-agency and public-private partnerships. There is also considerable diversity in the budgetary implications of the recommendations. We recognize that the current budgetary situation places considerable constraints on the NOC process; constraints that may limit that ability of the government to implement some excellent ideas contained in this document. We ask you to be a forward looking as possible in considering the recommendations included here and "do your best."

In addition to the nine priority areas, we encourage the National Ocean Council to develop sets of cross-cutting recommendations in the areas of education (including public education, and pre-professional STEM and workforce education as well as attention to diversity of those knowledgeable about the oceans) and science (inventory and monitoring, observations, and fundamental and applied research). We are concerned that without such cross-cuts, the need for a comprehensive and integrated approach to ocean and coastal education and research, is not likely to be addressed.

We also encourage cross-cutting looks at particular issues such as the importance of oceans for human health and well-being and energy – both traditional (oil and gas) and alternative (wind and waves).

These recommendations are presented in spirit of constructive suggestions from the conference participants. Not all of the conference participants endorse all of the recommendations, and no recommendation should be interpreted as official input from the organizations where conference participants work. For additional information about the conference please go to www.OurChangingOceans.org.

We hope that you find this input helpful. We would be pleased to meet with the members of the National Ocean Council and your various teams and to assist in other ways.

Best wishes and success with your important work.

Margaret Leinen
Conference Chair

Peter Saundry
Executive Director

Priority Area 9. Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure

To strengthen and integrate federal and non-federal ocean observing systems, sensors, data collection platforms, data management, and mapping capabilities into a national system, and integrate that system into international observation efforts:

A. Implement an ocean observing system.

B. The National Ocean Council (NOC) should endorse and implement a national marine biodiversity observing network (BON) to support the national ocean priorities (see *Attaining an Operational Marine Biodiversity Observation Network Synthesis Report*, available at www.nopp.org). To advance this goal:

   i. Federal agencies should support demonstration projects for a national marine BON, through an interagency mechanism such as the National Oceanographic Partnership Program (NOPP).

   ii. Entities overseeing ocean observing systems such as the Integrated Ocean Observing System (IOOS) should incorporate observations of biodiversity.

   iii. Federal agencies with ocean-related missions should support the principle of data sharing. An early priority in establishing a marine BON is to establish a mechanism to encourage data sharing among agencies and to establish standardized policies about data. Data standards, interoperability and accessibility for physical and chemical data are well established; the same level of standards, interoperability and accessibility should be established for biodiversity observations, enabling their incorporation in analysis and modeling of global climate change.

   iv. The State Department should support the establishment of an operational marine biodiversity observing network (BON) and coordinate with similar international efforts, and ensure incorporation in the International Mechanism of Scientific Expertise on Biodiversity (IMoSEB) and Global Earth Observing BON (GEO BON).

C. Monitor for and Forecast Health Threats from the Oceans by:

i. NOAA should lead a collaborative interagency effort to support research, development, evaluation, and deployment of biological sensors for multiple applications, including health of humans and marine animals. The effort should include agencies working on chemical and biological weapons detection of leverage expertise and resources to overcome common technical challenges.

ii. NOAA should lead an interagency effort to coordinate marine sensors into a comprehensive system of surveillance of pollution and ecosystem monitoring that includes humans, marine animals, and terrestrial animals in order to detect trends, changes, and health risks. These efforts should include the U.S. Global Change Research Program (USGCRP) Climate Change and Human Health Group and the Interagency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health.

iii. Ocean Observing Systems should integrate marine sensors into a comprehensive surveillance system for monitoring and forecasting health risks.

iv. Supporting development of marine sensors to measure human and animal health.

v. NOAA and the interagency effort should define system requirements and facilitate development of real-world performance in order to support translation research and operations of marine sensors for human and animal health.

vi. Agencies should support analysis of existing data from marine sensors, including sentinel species, to determine baselines and to inform risks to human health.

vii. Agencies should utilize knowledge derived from marine sensors to educate policy and decision makers about the connections between ocean health and human health.

D. Establish more robust climate observing and modeling system to provide strategic planners at the Department of Defense (DoD) with actionable intelligence that can influence future planning and budgeting decisions.

E. Advance essential data for Marine Spatial Planning by:

i. ensuring interoperability of existing data systems, for example, IOOS, OBIS, MMC, NAMERA, National Atlas of Ecosystem Services

ii. acknowledging and acting on the fact that Coastal and Marine and Spatial Planning (CMSP) transcends static planning for 2-dimensional areas, CMSP should take into account the water column, benthos and changes over time.

iii. supporting Regional Planning Bodies (RPBs) to improve and evaluate relevant data sets as an integral part of adaptive management of CMSP plans.

iv. have the CMSP data subgroup establish a web-based community that provides best practices, recommended standards, implementation specifications, and ensures interoperability across regions.

9. Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure: Strengthen and integrate Federal and non-Federal ocean observing systems, sensors, data collection platforms, data management, and mapping capabilities into a national system and integrate that system into international observation efforts.

1. What near-term, mid-term, and long-term actions would most effectively help the Nation achieve this policy objective?

Near-term actions should focus on defining the parameters to be measured and reported as needed to establish baseline information on key regional ecosystems for subsequent monitoring. Mid-term and long-term actions would include providing data as needed to monitor progress towards EBM goals, as well as to improve predictions of hurricanes, major storm events, and other forces affecting coastal communities and the ecosystems upon which they depend. Near-term actions should also place a high priority on providing the necessary infrastructure for integrating the above mentioned systems into a national system capable of supporting CMSP efforts within and across regions. This should include a good system of integrated observations on a regional scale, with the supporting infrastructure.

2. What are some of the major obstacles to achieving this objective; are there opportunities this objective can further, including transformative changes in how we address the stewardship of the oceans, coasts, and Great Lakes?

Please see our comments on Strategic Action Plan 2, CMSP. We were able to access the Multipurpose Marine Cadastre, jointly hosted by BOEMRE and NOAA, and found it was national in scope, but very limited in the data layers available through the viewer provided to the general public. The MORIS system hosted by the State of Massachusetts CZM program had data layers relevant to our needs, including mappings of sightings per unit effort for several whale species, but key data layers were cut off at the state boundary. We need a host system for CMSP that is national in scope, with the richness of detail found within some state CMSP systems. Lack of such a host system is currently a major obstacle for organizations such as ours seeking to use CMSP tools in preparing our public comments on key actions, such as wind energy area leasing processes, which are now underway in coastal waters.

In a broader context, some current observation systems are scientific experiments not intended for widespread operational use. We need an operational, as opposed to experimental, infrastructure support system including the following: an ocean observation network, benthic sonar surveys, sediment/habitat sampling for ground truthing, and similar capabilities. We also need data synthesis efforts to convert data into useful information for the broad range of policy makers, managers, and stakeholders involved in implementing the National Ocean Policy.

3. What milestones and performance measures would be most useful for measuring progress toward achieving this priority objective?

From our perspective, the most important milestone would be the availability of a host CMSP system national in scope, with a viewer allowing access to stakeholders seeking to use CMSP tools for developing public comments or otherwise participating in decision making under the National Policy Act, with sufficient depth in data layers as required for such purpose. Relevant performance measures would include ease of access and usefulness of information provided.

Other milestones would include the development and implementation of a set of indicators for key environmental variables, with target/reference levels for the key biotic components as required to determine whether the milestones and performance measures for ecosystem-based management have been achieved.

Objective 9: Ocean, Coastal, and Great Lakes Observations, Mapping and Infrastructure: Strengthen and integrate Federal and non-Federal observing systems, sensors, data collection platforms, data management, and mapping capabilities into a national system and integrate that system into international observation efforts.

- *Regional Mapping*: Support and coordinate among regional ocean observation systems and mapping efforts.
- *Ocean Observing Systems*: Keep existing systems at current capacity so that significant state investment to date is not compromised.

West Coast leaders have long understood the value in sustained ocean observations and mapping efforts. Ocean observation systems exist from the California-Mexico border north into the waters off British Columbia. These systems assist with a variety of important economic and environmental issues, such as safe and efficient marine operations, assessing the effects and trends of climate change, and helping to provide important information for ecosystem-based management and planning. These systems are all part of the US Integrated Ocean Observation System and include the Northwest Association of Networked Ocean Observing Systems (NANOOS) for Oregon and Washington, Central and Northern California Ocean Observing System (CeNCOOS) off central California, Southern California Coastal Observing System (SCCOOS), and Alaska Ocean Observing System (AOOS). We also have a system of seafloor observation systems comprised of cabled seafloor observatories in British Columbia (e.g., Victoria Experimental Network Under the Sea – VENUS), North East Pacific Time-Series Undersea Networked Experiments (NEPTUNE) and the U.S. Ocean Observatory Initiative efforts in Washington, Oregon, and California (e.g., Regional Scale Nodes [RSN]), and the Monterey Accelerated Research System (MARS). Build partnerships to continue to develop and to provide long-term operational funds for existing and any additional coastal ocean currents monitoring and other ocean observing systems. Finally, the WCGA is committed to mapping the seafloor for all coastal state waters. This mapping has been critical for fisheries management studies, coastal sediment research, tsunami vulnerability assessment, and location of offshore faults.

The WCGA remains committed to the partnerships among the federal government, states, academic institutions, industry, and non-governmental entities that are essential to maintaining these systems. We believe that the ongoing operation and maintenance of these mapping systems as well as advancing these systems needs to be a major NOP goal.

Index:

Attachments to Comments

And Letters Received

Pertaining to Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure and Other Strategic Action Plans

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April 29, 2011

National Ocean Council
Nancy Sutley, Co-Chair
Dr. John P. Holdren, Co-Chair
Washington, DC 20503

Dear Ms. Sutley and Dr. Holdren:

As the nation's largest organization of recreational boaters, with over one-half a million members nationwide, BoatU.S., the Boat Owners Association of The United States, appreciates the opportunity to comment on National Ocean Council's strategic action plans. Recreational boating is a significant contributor to our nation's economy and society. It supported $30.4 billion of economic activity in 2010 and nearly 300,000 jobs. Boating is one of the most popular outdoor family activities with 75 million participants last year and can be a key element in achieving the objectives of the America's Great Outdoors initiative.

We have reviewed the Council's nine priority objectives and are pleased to provide our views on some of the proposed actions.

1. Ecosystem-Based Management: Adopt ecosystem-based management as a foundational principle for the comprehensive management of the ocean, our coasts, and the Great Lakes.

Management actions must consider current uses as their starting point. While it is laudable to take a holistic approach to management of marine resources, it must be recognized that there are many long-standing stakeholders who will want to see tangible benefits from policy prescriptions. Management actions undertaken to implement ecosystem-based management must be based in firm science coupled with public input from those stakeholder most affected. Such actions must receive periodic reviews of their effectiveness from both a socio-economic and scientific perspective with timely reports to stakeholders and the public.

Any actions undertaken in pursuit of this goal must guarantee public access to marine resources for both consumptive and non-consumptive uses. For any ecosystem-based management policy prescriptions to achieve support from the boating public will require as few restrictions as possible on how they currently enjoy their boating activities.

Participation rates in the various recreational boating activities would provide a gauge of the impact of new management practices. Thoughtful use of consumer surveys, market

research and public data such as boat registration and fishing licenses sales could provide valuable insight to inform regional planning efforts.

A particularly tangible measure of participation in boating and fishing is revenue generated for the Sport Fish Restoration and Boating Trust Fund (SFRBTF), long supported by the boating and angling communities. These funds are generated by taxes placed on fishing tackle and equipment, motorboat fuel, imported boats and fishing equipment, and small engines. These funds are then directly used to support a myriad of aquatic resources conservation programs, boating access and infrastructure, and aquatic education programs.

2. Coastal and Marine Spatial Planning: Implement comprehensive, integrated, ecosystem-based coastal and marine spatial planning and management in the United States.

Maine spatial plans should reflect a bias for shared use of resources among a wide range of stakeholders. While certain user groups may seek to create exclusive use areas (security zones, no-take areas, energy extraction, etc…) marine spatial plans must be based on the premises that our oceans, lakes and rivers are held in common by all citizens. The development of these plans must provide ample opportunity for recreational boating stakeholder input. It should also be noted that the full range of recreational users should be consulted, not just one "recreational" representative i.e. beach-goers would not represent the interests of power-boaters particularly well.

In order for CMSP to receive recreational boating stakeholder support the benefits of such activities must be clearly articulated. Without a clear understanding of what CMSP is and is not, boaters will likely draw the conclusion that such planning is only being undertaken to exclude them from large areas to which they currently have access or in some ill-define objective of "protection."

3. Inform Decisions and Improve Understanding: Increase knowledge to continually inform and improve management and policy decisions and the capacity to respond to change and challenges. Better educate the public through formal and informal programs about the ocean, our coasts, and the Great Lakes.

The recreational boating community could support policy initiatives based upon objective science. If they perceive that a particular policy action is being undertaken based on agenda-driven science they will strongly object. If policies are put in place to restrict activities with the objective of achieving a particular goal, catch limits to rebuild fish stocks for example, a mechanism for periodic review and revision of the restrictions must be in place.

Recreational boating has a long-standing history of supporting marine education. As the direct beneficiaries of clean water, vibrant ecosystems, and abundant fish populations, boaters have a keen appreciation for these resources. Support for recreational boating in decision making will expose a broader cross-section of the public to the aquatic

environment, enhancing their understanding and appreciation while building advocates, not adversaries, for broader National Ocean Policy goals.

4. Coordinate and Support: Better coordinate and support Federal, State, tribal, local, and regional management of the ocean, our coasts, and the Great Lakes. Improve coordination and integration across the Federal Government and, as appropriate, engage with the international community.

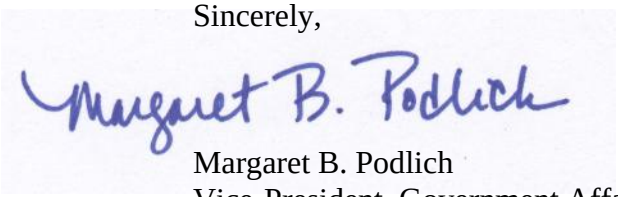
The recreational boating community supports this policy objective. Particular emphasis should be place on the coordination of the various, often duplicative, permitting regimes now required to complete boating access projects. National guidance to regional planning councils should also be used to promote uniformity in management policies among the various agencies.

9. Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure: Strengthen and integrate Federal and non-Federal ocean observing systems, sensors, data collection platforms, data management, and mapping capabilities into a national system and integrate that system into international observation efforts.

The full range of observation and mapping functions of Federal agencies along with state, local and tribal undertakings in this field is strongly supported by the recreational boating community. As consumers of many of these products (weather reports, navigation charts, tide and current tables, etc…) we have direct interest in the promotion of these efforts. In particular we would encourage emphasis on making these products widely available in forms that are usable in day-to-day operation of recreational boats.

Again, we appreciate the opportunity to provide our views on the strategic objectives of the National Ocean Council. Please call upon us at anytime to provide the perspective of recreational boaters as this effort moves forward.

Sincerely,



Margaret B. Podlich
Vice-President, Government Affairs

National Ocean Council
Priority Objectives for Implementation of the National Ocean Policy
Public Comment Letter
Todd A. Harwell

To Whom It May Concern:

Thank you for the opportunity to provide public comments in regards to the nine priority objectives of the National Ocean Policy proposed by the National Ocean Council. This comment letter will address four of the nine objectives, presented in the order of perceived priority.

I. *Objective 3: Inform Decisions and Improve Understanding*
   a. Actions that would most effectively help the Nation achieve this policy objective
      i. Near-Term:
         1. Identify and prioritize the most important issues and topics that are influencing coastal zones the most in the United States. This should not be limited to those that are most apparent or immediate, but also those that will have a large and significant impact over time, such as sea level rise and climate change.
         2. Formal and non-formal curriculum should be developed and implemented to better educate youth as well as the general public about scientific and environmental information pertaining to climate change and the current environmental state of not only the United State but also globally.
         3. Develop and implement educational programs to be delivered in K-12 classrooms throughout the United States. Attention should be given to adhering to national and/or state science curriculum standards.
      ii. Mid-Term:
         1. Develop and provide a more comprehensive awareness of environmental conditions and trends, as well as human impacts and activities that affect the coastal zones. This awareness and educational information needs to be developed and presented for specific audiences in both formal and informal settings, whether it be school children, young adults, baby boomers, senior citizens, potential stakeholders, businessmen and women, blue-collar individuals, or any other demographic.
         2. Continued education curriculum should be delivered to more isolated audiences that are unknowledgeable of climate change.
      iii. Long-Term:
         1. Implement routine integrated ecosystem assessments and forecasts involving a collaborative and comprehensive approach. The assessments should include impacts related to climate change and areas of vulnerability, risks, and resiliency.
         2. Continued delivery of formal and non-formal educational programs.
   b. Major obstacles to achieving this objective
      i. Funding to develop and introduce educational programs.
      ii. Difficulty in reaching isolated or smaller populations that are unfamiliar with scientific evidence related to climate change.
      iii. Lack of basic scientific and environmental knowledge and understanding by the general public audiences.
      iv. Gaps in linking ecosystem conditions to human health.

v. Ignorance or indifference of audiences to understand the importance of coastal, marine, and Great Lakes health, and how these ecosystems impact human life and well-being.
vi. Funding and nationwide adoption of formal and informal educational programs that provide awareness of the current state of our coastal ecosystems, as well as the current work being done to improve coastal areas.

c. Milestones and performance measures most useful for measuring progress toward achieving this priority objective
    i. Immediate implementation of the National Ocean Policy and the Nine Priority Objectives.
    ii. Creating, delivering, and evaluating assessments related to the knowledge currently held by the public in terms of coastal zone health and the impacts of global climate change.
    iii. Creating and delivering awareness and education programs related to coastal zones and ecosystem health, tailored to specific audiences based on the previous knowledge assessments.
    iv. Establishing a visible web-based platform for the importance and significance of the health of coastal ecosystems, and how it can be linked to human life.
    v. Using widespread and varied techniques to gather information related to the current state of the nation's coastal zones, including new technologies of remote sensing and unmanned aerial vehicles in addition to the latest scientific data available.
    vi. Assessing and analyzing the effectiveness of the educational programs after they have been developed and delivered by distributing surveys to those who participated.
    vii. Revising educational programs and information based on assessment feedback, and delivery of new programs developed from public input.

II. *Objective 5: Resiliency and Adaptation to Climate Change and Ocean Acidification*

a. Actions that would most effectively help the Nation achieve this policy objective
    i. Near-Term: Routine integrated ecosystem assessments and forecasts of factors and activities contributing to climate change should be implemented and conducted, including briefings delivered to Congress. This will allow the National Ocean Council to determine the areas or entities most prominently contributing to climate change that should be addressed on a priority level.
    ii. Mid-Term: Make efforts to transition to more renewable energy practices that will ultimately reduce greenhouse gas emissions. Such practices have been introduced in the Report to Congress by the EISA in 2009. Introducing more renewable energy practices, such as marine hydrokinetic energy in the form of offshore wind farms, will not only allow the United States to become more energy independent, but it will also reduce greenhouse gas emissions and the level of carbon dioxide in the atmosphere.
    iii. Long-Term: Institute and enforce stricter regulations on humans to protect the environmental health of our ecosystems. Some of these regulations may include introducing more National Marine Sanctuaries and reserves, stricter fishing regulations and enforcement to reduce overfishing, reduction of fertilizer use in commercial and residential coastal areas, and ultimately limiting and reducing the carbon dioxide amounts released in the atmosphere by businesses and industries.

b. Major obstacles to achieving this objective
    i. The numerous, widespread, and various impacts of climate change may be difficult to monitor, especially in collaboration with other agencies and organizations.

ii. Media, politicians, and stakeholder groups that strongly oppose and refute the validity of climate change and the scientific evidence that supports it.
iii. Increasing human impacts on our ecosystems and the increasing contributions to perpetuating climate change such as greenhouse gas emissions.

c. Milestones and performance measures most useful for measuring progress toward achieving this priority objective
   i. Immediate implementation of the National Ocean Policy and the Nine Priority Objectives.
   ii. Continued support and reporting of climate change-related findings from NASA.
   iii. Assessments and updates on the level of carbon dioxide in the atmosphere.
   iv. Assessments of industrial greenhouse gas emissions.
   v. Monitoring and reporting of continued climate change evidence such as sea surface temperatures, sea level, ice sheets in the Arctic, and levels of carbon dioxide in the atmosphere.

III. Objective 2: Coastal and Marine Spatial Planning

a. Actions that would most effectively help the Nation achieve this policy objective
   i. Near-Term: The establishment of nine regional planning areas that mirror those of the Regional Fishery Management Councils. This will allow for relief from the sector-by-sector approach to management that has been practiced in the past, as well as reduce any previous overlap or ambiguity in management jurisdictions.
   ii. Mid-Term: Improve ecosystem health and services of coastal zones by planning human uses on conjunction with conservation of important ecological areas. These improvements would lead to the protection of areas that are vital for the resiliency and maintenance of healthy ecosystems services and biological diversity, as well as providing marine resources and supporting human use.
   iii. Long-Term:
      1. Facilitate sustainable economic growth in coastal communities by introducing projects for economic investments related to coastal and marine industries.
      2. Economic incentives should be established for both public and private entities that choose to sustainably develop and manage their use of the coastal zone.

b. Major obstacles to achieving this objective
   i. Preexisting agencies and management jurisdictions that may unenthusiastic about adhering to the new federal regions and policies.
   ii. Unwillingness of agencies and governments to form cohesive partnerships and cooperation that support the Council.
   iii. Stakeholder groups that are unsupportive of the new regions, policies, and partnerships, and the impacts that each will have on their industry or cause
   iv. Possible hesitation or unwillingness of individual coastal communities to adapt to the proposed policies, and lack of support for sustainable economic growth and incentives.

c. Milestones and performance measures most useful for measuring progress toward achieving this priority objective
   i. Immediate implementation of the National Ocean Policy and the Nine Priority Objectives.
   ii. Establishment of the nine regional planning areas.
   iii. Introduction of economic incentives.
   iv. Formed partnerships and cooperation among agencies and governances.

v. Observed and measured improvement of ecosystem health based on environmental assessments and monitoring.

IV. Objective 9: Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure

a. Actions that would most effectively help the Nation achieve this policy objective
   i. Near-Term:
      1. Establish and maintain a national integrated network of ocean, coastal, and Great Lakes observing systems, allowing agencies and organizations to compile and share observations, data, and information. Cooperating international partners and organizations may also access this network.
      2. Formal technology training programs should be created and delivered for governmental and environmental agency employees. This will ensure that new technologies are not only accessible, but also able to be used properly in order to observe and monitor coastal areas.
   ii. Mid-Term: Introducing and integrating new technologies and techniques of monitoring and collecting coastal information, such as unmanned autonomous vehicles (UAVs) and remote sensing satellites and technology. Using sophisticated forms of data collection, the Council would be able to monitor the health and productivity of coastal zones, and address any potential threats as they are discovered.
   iii. Long-Term:
      1. Development and launching of more satellites that measure and record environmental and geographical data. This data should be linked and shared on an accessible national or global network as previously mentioned.
      2. Expansion of the National Oceanographic fleet of ships and facilities. More vessels should be added to the fleet in order to monitor and manage for coastal areas.
      3. Facilities and laboratories should be expanded and updated so that they are equipped to address any potentially hazardous threats to the health of our ecosystems as they are discovered.

b. Major obstacles to achieving this objective
   i. Cooperation among agencies and organizations to share observations among the coastal systems network.
   ii. Funding and maintenance of proposed new monitoring technologies in the form of UAVs and remote sensing satellites.
   iii. Full and complete integration of ocean, coastal, and Great Lakes observations and data.
   iv. Cohesive and well-coordinated infrastructure related to the national observing systems integrated network.

c. Milestones and performance measures most useful for measuring progress toward achieving this priority objective
   i. Immediate implementation of the National Ocean Policy and the Nine Priority Objectives.
   ii. Willingness and agreement from agencies and organizations to participate in the observing systems network.
   iii. Implementation of UAV and remote sensing technologies in coastal monitoring.
   iv. Assessment and evaluation of the effectiveness and efficiency of the new monitoring technologies.
   v. Creation of an accessible database of observations and recorded data related to coastal monitoring.

I would like to thank you again for the opportunity to provide comments on the National Ocean Policy and these Priority Objectives.

Regards,
Todd A. Harwell