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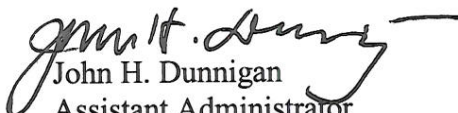
Dear Colleagues and Partners:

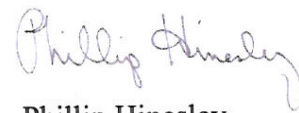
The National Oceanic and Atmospheric Administration (NOAA), with leadership from the Office of Ocean and Coastal Resource Management, and the Coastal States Organization (CSO) are embarking on an effort to envision the next evolution of coastal management under the Coastal Zone Management Act. While we foresee many benefits from this year-long effort, the primary outcome is to develop a set of core principles and specific options that we can consider in our respective proposals for reauthorization of the Coastal Zone Management Act.

To initiate the visioning effort, NOAA drafted the enclosed paper entitled "Discussion Paper: Current and Future Challenges for Coastal Management." As the title suggests, the paper was drafted to generate discussion on coastal management challenges and ways to move it forward. The paper was authored as an independent perspective and is not meant to represent or advocate any NOAA or CSO positions on the issues and questions it presents. The paper was drafted using insights from national studies such as the U.S. Commission on Ocean Policy and Pew Oceans Commission reports, and consultations with a broad array of coastal community interests.

We encourage you to participate in this nationwide dialogue. Moving forward, we are planning ways to hear from our coastal management partners and from the broader coastal community. We will keep you informed of our findings and opportunities for input throughout the effort. You can also find links to updates and related documents on the NOAA Office of Ocean and Coastal Resource Management's web site at:
<http://coastalmanagment.noaa.gov>.

Best Regards,


John H. Dunnigan
Assistant Administrator
NOAA Ocean Service


Phillip Hinesley
Chair
Coastal States Organization

Discussion Paper:

Current and Future Challenges for Coastal Management

“Coastal management” is the complex interaction of laws, programs, and efforts to evaluate trade-offs and make decisions about how to use, conserve, and value the resources and opportunities of the coastal zone. The fundamental questions coastal management seeks to address are: as a society, how do we want our coasts to function, what do we want them to look like, and what uses do we want them to accommodate? We value the ecosystem functions of coastal areas and want to preserve them for future generations. Our coastal areas are also important economic zones and need to accommodate certain coastal-dependent uses. Finding the right balance requires the engagement of all levels of government, research institutions, private citizens, industry participants, and non-governmental organizations.

Coastal management has existed as a concept and been in practice for over thirty years, dating back to the recommendations of the Stratton Commission in 1969 and the passage of the Coastal Zone Management Act in 1972. During the early 1970s other significant federal legislation affecting coastal resources was enacted including the Clean Water Act, the Clean Air Act, and the Endangered Species Act. Since that time there has been considerable work done to advance the objectives of the Acts and significant progress made in establishing governance structures to manage coastal resources in a holistic manner.

Past successes, as well as a clearer understanding of the challenges, provide a solid foundation to begin thinking about what we might prioritize, change, or modify in order to move coastal management forward. In the last several years there have been legislative and budgetary proposals to alter the way we manage coastal resources. The two blue ribbon studies by the Pew Oceans Commission and U.S. Commission on Ocean Policy (USCOP) have made recommendations for how to advance the management of coastal resources. The drafting of this paper was driven by an interest in the community and at the National Oceanic and Atmospheric Administration (NOAA) to take on the challenge of moving coastal management into the next phase of its evolution. Given the nature of coastal management, this can only be done effectively through a process that engages a broad community of coastal managers and resource users.

In drafting this discussion paper representatives from a broad spectrum of the coastal community were consulted: representatives of local governments, industry, recreational interests, and environmental and research groups; state Coastal Zone managers; National Estuarine Research Reserve managers; Sea Grant directors; academics; members of Congress; and staff from a variety of federal agencies. To frame these discussions recent legislative proposals, academic publications, and other studies and reports including the Stratton Commission, the Pew Oceans Commission and the USCOP reports were reviewed.

What follows is a discussion of the major topics and themes that arose in those documents and conversations. While there have been many accomplishments and successes of coastal management to date, this paper is focused on questions and ideas for moving forward. An

attempt has been made to represent a diversity of viewpoints, both in terms of what topics should be discussed, as well as some of the questions being asked, and options being considered. ***This paper is only intended to spark discussion, not to advocate any one position or viewpoint.*** This paper is also only a starting point, the final comprehensive understanding of the issues, possible approaches, and the pros and cons of each approach, will only be developed after a considerable effort to engage and discuss these issues with the broader coastal community. NOAA and the Coastal States Organization have committed to work with their partners to undertake this effort.

The paper begins with a discussion of the broader questions – what are the important resource issues to address, what is the right mix of roles and responsibilities, and what should define success? From there it goes on to address specific governance and resource issues. Throughout the paper, there is an attempt to promote discussion of the broad issues of coastal management; however, in order to generate concrete discussion of options within NOAA’s influence, there is also a focus on NOAA’s role and authorities. In particular, this paper considers one of NOAA’s significant mandates within coastal management, the Coastal Zone Management Act (CZMA).

We welcome feedback and comments on the issues presented here, as well as thoughts on other concerns and approaches that may have been left out.

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Part I – The Big Picture

1. Articulating the Issues

Coastal management is, in many ways, a product of the environmental legislation enacted in the 1970s. These laws were mainly resource specific pieces of legislation including the Endangered Species Act, the Clean Water Act, and the Clean Air Act. In addition, the Coastal Zone Management Act (CZMA), which authorized a more comprehensive approach and governance structure to deal with the set of issues within the “coastal zone,” was passed in 1972. Since then, significant progress has been made in accomplishing some of the goals of coastal management. However, in that time, priorities have shifted, the original statutes have been amended, new programs have been established, and new challenges have arisen. The most comprehensive look at the state of our coasts and our framework for managing them in recent years has been the work of the Pew and U.S. Ocean Commissions. Both Commissions identified a number of areas where changes could be made to enhance our ability to address coastal concerns.

To set the context for this discussion the following chart outlines the major coastal issues identified by the two Commissions, as well as the topics that are addressed, in part by the Administration’s response to the U.S. Commission on Ocean Policy (USCOP), the U.S. Ocean Action Plan (OAP).

Table 1: Coastal Management Issues	Pew	USCOP	OAP
Governance	X	X	X
Coastal hazards	X	X	
Habitat	X	X	X
Sediments and shorelines		X	X
Marine commerce and transportation		X	X
Water quality	X	X	X
Invasive species	X	X	X
Fisheries	X	X	X
Marine mammals and endangered species		X	
Coral reefs	X	X	X
Ocean resources (including living marine resources, aquaculture, offshore energy, and other mineral resources)	X	X	X
Science to support management, including ocean observing	X	X	X
Impacts of climate change	X		
Coastal development and land use	X	X	
Knowledge and understanding	X	X	X

There is general consensus on what the major issues are and that continued progress can be made to advance our efforts in these areas. These include questions about how governance structures operate and interact, as well as questions about how to improve progress toward meeting resource specific goals.

Key Questions

- Are there issues on this list that are or should be a higher priority than others?
- Is there any “low hanging fruit” – issues that are easy to address or solutions that are simple to implement?
- Which of the resource issues are most impacted by governance structures (federal, state, and/or local)?
- Are there other important coastal issues missing from this list?
- Other questions or possible approaches?

2. Articulating a Vision

One of the challenges in evaluating progress in coastal management is that it is difficult to articulate what a well managed coast looks like. For certain issues, such as water quality or endangered species, there are national limits or standards. However in other areas, such as land use or marine commerce, the answer depends, in part, on the societal values for the resources and potential uses in a given area. There is a general understanding that as a society we want vibrant coastal communities and healthy coastal ecosystems, but it has been difficult to articulate a more specific definition of what that means.

A clear vision of success would provide a common framework for the multiple state and federal efforts. It would also enable a better understanding of where significant progress has been made and where additional efforts should be focused.

Key Questions and Possible Approaches

- Can the multiple, and often competing, goals of coastal management be reconciled or accommodated within a unified vision for success?
- Who determines the vision if there are competing local, state and national interests? How is the “balance” among competing issues determined?
- At what resolution should success be measured?
- Can success be defined in a way that is flexible enough to account for geographic differences in concerns and values for resource uses? Or do these differences make any unified vision impractical or inappropriate?
- Does success need to be quantifiable?
- Would sustainable development be a useful concept for establishing an overarching goal? How could sustainable development be measured or evaluated?
- NOAA and the states, in partnership with other stakeholders and federal agencies could develop a broad goal statement for successful coastal management. The goal could be further defined at the national, regional, state, and/or local level.
- Other questions or possible approaches?

3. Appropriate Roles for Government?

Efforts to address coastal issues involve all levels of government, as well as a variety of private entities. Each level of government has different authorities and responsibilities, different interests, different connections to the resource and resource users, and different capacities for

management. As we think about ways to advance our approach to these issues, it will be helpful to consider the different roles for each level of government.

The Federal Government

The Federal Government is most appropriately involved in issues that have national interest. These issues can be ones that cross jurisdictional or international boundaries or ones that affect basic values such as human health and safety. Major economic drivers and stewardship of public trust resources are also of national concern. Federal actions can include regulatory authority (e.g. the Endangered Species Act), setting standards or guidance (e.g. water quality standards), direct activities or programs (e.g. habitat restoration or civil works projects), and provision of funding or other incentives (e.g. floodplain mitigation grants). In addition, the Federal Government can provide science and technical assistance to support state and local efforts. This includes collecting, recording, and sharing data, as well as setting standards for data collection and sharing. Finally the Federal Government has responsibility under the National Environmental Policy Act (NEPA), to consider the environmental impacts of federal actions.

State Governments

The States can function through many of the same mechanisms as the Federal Government, but are usually more narrowly focused on issues of interest within state boundaries. These state interests often overlap the federal interest, particularly in areas of economics and management of public trust resources. State governments are one level closer to the actual resources of the coastal zone, and often implement activities authorized, mandated, or funded at the federal level. In addition, authority for land use and planning concerns is located at the state or local level, with the majority of the decision-making done at the local level. Finally, many states play a role in coordinating on the ground actions of multiple federal agencies.

Local Governments

Local governments are the most closely connected to the resources and to the resource users. They also often implement programs authorized, mandated, or funded at the levels above them. Local governments typically have authority over local land use decisions and planning efforts. They often rely on state and federal efforts to provide science and technical assistance to achieve local, state, and national policy goals. Local issues like land use can have significant impacts that are of state or national interest, such as impacts to water quality and vulnerability to natural hazards.

Tribal Governments

In some areas tribal governments have jurisdiction over coastal resources. These entities are sovereign governments and may have treaties or other agreements with the U.S. that ensure certain uses of natural resources. Tribal governments work in partnership with federal, state, and local governments on variety of resource issues on a regular basis.

Key Questions and Possible Approaches

- Are these roles and responsibilities clearly defined, appropriate and preferable? Are there issues for which the Federal Government should be more or less involved? What about state governments? Local governments?
- Are local governments appropriately engaged in coastal management? Do they have the appropriate capacities to manage coastal issues?
- Do the current authorities governing coastal management give states the appropriate authority and flexibility over resource decisions? What are the responsibilities that accompany those authorities?
- Is the Federal Government providing appropriate guidance on issues of national interest or national policy? Is it doing enough to support and develop capacity at the state and local levels?
- How do we ensure effective coordination across levels of government? Are there issues for which this is more important than for others? What are the examples of programs where this coordination is occurring and effective?
- Are there appropriate/sufficient feedback loops between levels of government?
- Other questions or possible approaches?

4. NOAA's Role in Coastal Management

As outlined above, coastal management involves multiple resource issues that are addressed by a variety of federal, state, and local efforts. What is and should be NOAA's role in advancing coastal management?

NOAA has formally adopted the principle of ecosystem approaches to management in its strategic goal to "Protect, restore and manage the use of coastal and ocean resources through an ecosystem approach to management." NOAA defines ecosystem approaches as "management that is adaptive, specified geographically, takes into account ecosystem knowledge and uncertainties, considers multiple external influences, and strives to balance diverse social objectives." Coastal management is an example of an ecosystem approach to managing the geographic area of the coastal zone that considers both natural and human components of the ecosystem.

NOAA has a number of programs that provide services, technical support, research, and education to the coastal management community. These programs include Sea Grant, the National Centers for Coastal Ocean Science (NCCOS), the Coastal Services Center (CSC), the Habitat Restoration Center, the Center for Operational Oceanographic Products and Services (CO-OPS), and joint institutes such as the Cooperative Institute for Coastal and Estuarine Technology (CICEET). Through the National Estuarine Research Reserve System (NERRS) and the National Marine Sanctuary Program (NMSP), NOAA participates in the direct management of certain coastal areas. NOAA also has natural resource management authorities under a variety of statute including the Magnuson-Stevens Fisheries Conservation and Management Act, the Endangered Species Act, and the Marine Mammal Protection Act. At a broad level, NOAA's authority to influence the management of coastal resources across the country is implemented through the CZMA.

The CZMA Program was originally focused around a governance mission – establishing a federal-state partnership to promote comprehensive land and water use planning and

management to address priority coastal issues. This is different from other federal programs with missions to achieve a specific outcome for a given resource issue, such as fisheries management or water quality. Within this partnership NOAA's role is to look out for the national interest in coastal issues as well as provide incentives, guidance, and technical support to the states.

Key Questions and Possible Approaches

- Is NOAA's role simply to advance the governance mission and provide technical support, or does/should its partnership role in the CZMA give it responsibility for some of the resource-specific goals as well?
- Is NOAA fulfilling its role in the state-federal partnership established by the CZMA? Is NOAA articulating the national interest expressed by federal statutes, and helping to identify how state programs advance that interest?
- Are there resource issues, such as land use planning or public access that aren't also substantially addressed by other federal agencies? Should these receive a higher priority within NOAA's programs?
- Could NOAA improve the coordination of its programs that provide services and technical support to coastal managers? Sea Grant, in particular has a similar structure to the CZMA program as a partnership between NOAA and state or local institutions. One way to better align these programs could be through strategic plans and priorities that are designed to achieve common goals and reinforce similar programs. Significant collaboration between these programs at the local level may occur already. However, a better strategic alignment could reinforce on-the-ground efforts and could better position NOAA to tell a unified story about its approach to coastal issues.
- The CZMA program in many ways facilitates the coordination of other federal efforts at the state and local level. Arguably, by approaching these issues within a comprehensive framework, the other federal investments are made more efficient and effective. With this focus, the role of NOAA headquarters and field staff could be more directly targeted at improving coordination: working with other agencies to find complementary programs, working to eliminate duplicative programs, and assisting states with pulling together different federal resources.
- Other questions or possible approaches?

5. Best Use of CZMA Tools

As noted above, the CZMA is one of NOAA's broadest authorities to affect management of coastal resources across the country. The CZMA program was designed to encourage states to develop institutional structures, policies, programs, and other mechanisms to consider and plan for coastal resources in a comprehensive and coordinated fashion. Its findings and goals address the broad spectrum of issues that are at play in the coastal zone including: hazards, sea level rise, habitat and wetlands, siting energy facilities, use of ocean resources, public access, and water quality. This focus on comprehensive planning, as opposed to a resource-specific or sector-specific approach, makes the CZMA program somewhat unique. This comprehensive focus is also aligned with the concept of ecosystem approaches to management and can accommodate a watershed-based approach to resources issues, depending on the geographic extent to which it is applied.

A modified version of Table 1 is included below with additional entries showing the issues identified by the findings and purposes sections of the CZMA as they compare to those highlighted by the two Ocean Commissions and the U.S. Ocean Action Plan. As shown in the table, the CZMA offers a mechanism to address a broad array of today’s priority coastal issues.

Table 2: Coastal Management and the CZMA	Pew	USCOP	OAP	CZMA
Governance		X	X	X
Coastal hazards	X	X		X
Habitat	X	X	X	X
Sediments and shorelines		X	X	X
Marine commerce and transportation		X	X	X
Water quality	X	X	X	X
Invasive species	X	X	X	
Fisheries	X	X	X	X
Marine mammals and endangered species		X		
Coral reefs	X	X	X	X
Ocean resources (including living marine resources, aquaculture, offshore energy, and other mineral resources)	X	X	X	X
Impacts of climate change	X			X
Coastal development and land use	X	X		X
Public access and recreational uses				X
Cultural and historic values				X
Energy siting				X
Science to support management, including ocean observing	X	X	X	X
Knowledge and understanding	X	X	X	X

Today’s management culture looks to evaluate the outcomes of federal programs. In theory, a more comprehensive approach to coastal issues should lead to improvements in the actual resources – better water quality, protection of habitats and wetlands, reduced vulnerability to coastal hazards, etc. In practice, these outcomes depend on a combination of efforts across federal, state, local, and private institutions, and it can be difficult to tease out the specific contribution of the coordinating mechanism of the CZMA program. This has led to questions from Congress and the Office of Management and Budget (OMB) about the effectiveness of the CZMA program. Arguably there is considerable variation among the different state programs, with some more effective in certain areas than others. This also stems, in part, from the varying degrees of political and organizational support that state programs receive within each state.

In addition, since the passage of the CZMA, other programs to address coastal issues, such as the National Estuary Program and the Coastal Barrier Resources Act have been developed apart from the CZMA. This has led to questions about the extent to which CZM programs are empowered to achieve a comprehensive management structure for coastal issues.

Key Questions and Possible Approaches

- What are the benefits of the comprehensive planning approach? What critical role do CZMA programs perform? How is that role different from activities of other federal and state programs that manage coastal resources?
- What gaps would exist if the state CZMA programs disappeared?
- Should the CZMA be refocused on the governance aspects such as improving comprehensive planning and management and effective coordination or policy at the state and local level? This could be done through providing an additional mix of incentives and disincentives to 1) improve policy coordination and comprehensive management, 2) develop special area management programs, and 3) greater participation by local governments with appropriate state or regional oversight.
- Do we have adequate governance structures in place? Should there now be a shift to focus more on achieving measurable goals for resource specific issues?
- Are the issues within the scope of the CZMA still the right set of concerns?
- Other questions or possible approaches?

Part II – Specific Challenges

Governance Issues

6. Federal Coordination

The USCOP and Pew Oceans Commission both highlighted the need for improved coordination of federal programs. One way the Administration is currently working to address this is through the Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI) and its subcommittees: the Subcommittee on Integrated Management of Ocean Resources (SIMOR) and the Joint Subcommittee on Ocean Science and Technology (JSOST). This is in addition to efforts such as the Coastal Coordination Committee and Coastal America which bring agencies and other stakeholders together around coastal resource issues. One challenge is to figure out how these different efforts can fit together and enhance each other. Coordination of federal efforts can be achieved at the federal, state, and/or local level. For example, the state CZMA programs frequently bring together federal efforts and may be able to provide feedback on where additional coordination would be helpful.

The USCOP and the Pew Commission both recommended reorganizing federal agencies to consolidate coastal and ocean programs. ICOSRMI and SIMOR provide a forum to consider such changes; however, regardless of where the programs reside and how the lines are drawn, there will be a continuing need for collaborative and coordinated efforts. Moreover, even within a single agency like NOAA there is often a need for greater coordination and strategic alignment of similar programs.

Key Questions and Possible Approaches

- Would the benefits of moving programs from one agency to another outweigh the costs and disruptions associated with such reorganizations?
- What areas or issues would most benefit from a more coordinated approach at the federal level?
- How can states, local governments, and other stakeholders provide feedback and guidance to the federal agencies on where coordination is needed?
- Would NOAA better serve the coastal community by providing more coordinated services at the national level?
- Have recent efforts where federal agencies coordinated (e.g. the Great Lakes and Gulf of Mexico) been successful? What improvements are needed to advance this model?
- Other questions or possible approaches?

7. Inter-state Collaboration/Regional Governance

Coastal resource issues do not fit neatly within socio-political boundaries. In many situations managers have found that multiple jurisdictions need to work collaboratively to address specific concerns. Existing regional collaborations include the Gulf of Mexico Alliance, the Gulf of Maine Council on the Marine Environment, the Chesapeake Bay Agreement, and the Great Lakes Regional Collaboration. The USCOP recommended a move towards formal regional governance organizations to address a broad set of coastal and ocean concerns.

Formal regional governance organizations could provide a stable structure to handle a wide range of current and emerging issues. However, to be effective, any regional governance organization would need sufficient authorities, which may be problematic legally or politically. Another option would be to develop multi-state initiatives around specific issues. This might allow for more focused integration around a specific problem or need and would allow for tailoring the structure and composition of the multi-state group to fit the particular issue to be addressed. At one time the CZMA contained an authorization for competitive grants to fund multi-state initiatives and for states to form inter-state compacts. This section was replaced during the 1990 amendments because the program was viewed as unsuccessful.

Key Questions and Possible Approaches

- Seek authorization for formal regional ocean governance structures. This should consider and allow for existing collaborations. What authorities would be needed to make these effective? At what scale should this focus? Could CZMA be a vehicle or should separate legislation be pursued?
- Reauthorize CZMA grant funding for interstate initiatives in order to encourage issue-specific, multi-state collaborations and/or authorize interstate compacts.
- Include multi-state initiatives as a possible or priority area for CZMA funding through a competitive or performance-based grants mechanism.
- Support and encourage multi-state collaboration through NOAA regional representation.
- Other questions or possible approaches?

8. Local Governments

Many of the decisions that affect coastal resources are made by local governments. This can present a challenge in achieving consistent outcomes across coastal areas. Federal and state programs often affect decisions made at the local level by establishing national standards or requirements and providing funding and technical assistance to meet those standards. Local governments feel strongly that any state or national requirement be accompanied by adequate funding to take the necessary actions. In addition, local governments are strongly committed to maintaining local authority over issues such as land use decisions.

While many federal programs exist to address coastal issues, the CZMA is one of the few that is specifically designed to address governance issues within the coastal zone. When the CZMA was first established the focus was on major land use changes, such as ports and power plants, which had “greater than local impacts.” However, as the extent of development increased in the coastal zone, those land use changes which have traditionally been seen as local in effect (e.g., residential development) are now understood to have more significant and far reaching cumulative impacts. The current CZMA program is focused primarily at the state level, but does provide for a local role if the state desires local participation. However, only seven state CZMA programs have full blown local coastal programs and a little more than one half of the programs have local implementation of one or more program elements. Some state programs have broad permitting authority, a few states have comprehensive planning at the state level, but fewer have formal input into local land use decisions. This is, in part, a result of the flexibility states have been given in designing their coastal programs, as well as the variability among states in their governance structures and political support for coastal programs.

Key Questions and Possible Approaches

- One approach would be to call more attention to the connection between state coastal zone management programs and local decision makers. Specific language could be added to the CZMA to emphasize the importance of an effective connection between state coastal and land use policy and decisions made at the local level. States might be encouraged/required to update their programs and include a more detailed or strategic explanation of how they intend to affect local decision makers. NOAA could prioritize providing assistance to help states achieve better connections with local decision makers and this could play a more significant role in the section 312 evaluations of state programs.
- Senate bill S. 360, a recent CZMA reauthorization proposal, uses a voluntary, incentive based approach to try to reach local communities. The bill contains authorization for a grants program for coastal communities to address growth issues and fund demonstration projects which have potential for improving coastal management at the local level.
- Another approach to affecting local decision makers would be to expand upon current efforts to provide technical assistance, training and capacity building. NOAA already provides many of these services through the CSC, the NERRS Coastal Training Program, and Sea Grant extension agents. These efforts could be better coordinated and strategically driven to address this issue.
- The state CZMA community has for a number of years identified providing more resources to local governments as a priority need. Other than (or perhaps in addition to) more resources, what new tools (mandate, policy, requirement, information, or mechanism) would enable more effective local implementation of coastal management?
- Other questions or possible approaches?

9. Private Sector and Non-Governmental Organization Partnerships

Non-governmental organizations (NGOs) are often key partners in coastal projects. These non-profit, private entities often have flexibilities in how they operate that government agencies do not. In addition, they can access private funds and coordinate government funds in order to implement conservation and restoration activities. For-profit private entities can also bring resources to the table and be productive partners in coastal projects. Coastal America's Corporate Wetlands Restoration Partnership is a good example of a public-private partnership. The recent Executive Order on Cooperative Conservation emphasizes the importance of these partnerships.

Key Questions and Possible Approaches

- What are the barriers to public-private partnerships?
- Does NOAA have the appropriate authorities to encourage and participate in these partnerships? The Administration's proposed NOAA Organic Act would provide broad authority for entering into contracts and agreements with private entities. Would this be sufficient if enacted?
- Are there program specific authorities that could be pursued if broad organic legislation is not passed? For example, NGOs are not currently eligible to receive section 306A funding.
- Language could be added to key pieces of legislation, such as the CZMA or Cooperative Conservation legislation, to specifically encourage partnering with NGOs and other private entities.
- Other questions or possible approaches?

Resource and Management Issues

10. Habitat Conservation and Restoration

A. Coordination of Habitat Programs

Coastal habitats support populations of coastally dependent species, including many that are threatened or endangered and many that are commercially and recreationally important. These areas also provide protection against the effects of coastal storms, filter nutrients and other pollution from runoff, and support local recreation and tourism opportunities. They are critical to the long term economic vitality and livability of coastal communities.

In recognition of these benefits, as well as the pressures exerted by development and other human activities, a wide variety of programs and efforts have been developed to conserve and restore significant habitats. These efforts exist at all levels of government, emphasize different goals, and are carried out by a range of different agencies as well as private entities. The tools to protect and provide habitat include regulatory and permitting efforts, land acquisition programs, restoration activities, creation of protected areas such as parks, refuges, and reserves, as well as methods to direct where development occurs through land use planning, tax incentives, and tradable development rights programs. Research efforts at universities and government agencies also support habitat restoration and conservation efforts.

Different habitat programs often have different goals and objectives. Some efforts are specifically focused on coastal habitats; others have a broader geographic focus but can benefit coastal areas. As a result of the myriad of programs and purposes, the conservation and restoration community has long been interested in ways to coordinate efforts to achieve a more holistic and effective approach. This is consistent with the principles of ecosystem approaches to management. Both the USCOP and the Pew Commission advocated for more comprehensive approaches to habitat protection, with planning either at the state or regional level. Some attempts at comprehensive approaches already exist. Examples include the salmon restoration efforts in the Pacific Northwest and the National Fish Habitat Action Plan and habitat plans within the National Estuary Program (NEP).

Key Questions and Possible Approaches

- Where should efforts to coordinate federal, state, local, and private efforts be focused? What objectives are better met through coordination?
- Are there examples of coordination efforts that we could learn from or lend support to? Coastal Wetlands Planning Protection and Restoration Act? National Fish Habitat Action Plan? What about those efforts has been successful or problematic?
- How are habitat conservation efforts coordinated with other coastal management objectives – such as flood control, water quality improvements, etc?
- The USCOP recommended directing a larger share of federal conservation programs to coastal and estuarine lands. In order to facilitate these efforts, the USCOP recommended that states should identify priority coastal habitats and develop plans to establish partnerships to provide for their conservation.
- The USCOP and Pew Commission advocated that comprehensive restoration strategies be developed at the state or regional level. State CZMA programs could provide leadership in coordinating these efforts. NERRs are to some extent already playing a role in facilitating these types of planning efforts. Where plans are already developed (e.g. NEPs), could there be improved coordination on plan implementation?
- Other questions or possible approaches?

B. NOAA's Habitat Efforts

Within NOAA there are a variety of programs and tools to address habitat concerns, including (but not limited to):

- Restoration efforts: NOAA's Community Based Restoration Program, Damage Assessment, Remediation, and Restoration Program,
- Regulatory/Permitting: Endangered Species Act, Essential Fish Habitat
- Planning and coordination: CZMA Program
- Protected Areas: NERRS, NMSP
- Land Acquisition: NERRs, Coastal and Estuarine Land Conservation Program (CELCP)
- Science and Technical Support: CICEET, NERRS, NCCOS, Sea Grant

Without a broad authorizing statute, NOAA conducts these programs under a network of program specific legislation such as the Endangered Species Act, Estuaries Restoration Act, CZMA, and Magnuson-Stevens Fishery Conservation and Management Act. This has encouraged a more fractured approach to habitat issues, which NOAA is working to address through administratively organizing these efforts under the NOAA Habitat Program. The network of programs may also leave gaps in authority that hinder NOAA's ability to pursue habitat goals in a more comprehensive manner.

The CZMA program provides broader authority and requires state programs to provide for the protection of fish and wildlife and their habitat within the coastal zone. However, certain sections of the Act focus more specifically on wetlands rather than coastal habitat in general.

In addition to addressing habitat concerns directly with CZMA funded projects, many states have been able to use their CZMA programs to coordinate other federal, state, and private efforts. Often the CZMA funds provide planning and staff support in order to leverage projects funded through other means.

Key Questions and Possible Approaches

- In what areas could NOAA improve coordination of its own habitat efforts? State coastal managers who deal with implementing many of these efforts on the ground may be able to provide useful feedback on what their priorities are and where greater coordination could be helpful.
- The Administration has already proposed broader authority to “manage, protect and restore” coastal habitats through the proposed NOAA Organic Act. If this authority is not provided, are there other options for achieving a more comprehensive approach?
- Through state CZMA programs, NOAA may be able to provide tools and support to address broader issues within coastal areas. For example, NOAA could develop guidance on habitat issues associated with liquefied natural gas (LNG) and alternative energy projects that could be helpful to states in reviewing those proposals.
- NOAA, with interests and connections to both the CZMA and fisheries management communities, could encourage or facilitate collaboration between these groups on fisheries habitat issues such as mapping, habitat characterization, and habitat protection or restoration planning.
- Would changes within the CZMA program lead to improved habitat efforts? Possible approaches might include:
 - Amending Section 309 of the CZMA to include more general habitat conservation and restoration activities, instead of focusing on wetlands
 - In partnership, NOAA and the states could develop a set of national criteria or standards to guide habitat efforts under the CZMA. This could include a focus on threatened and endangered species, water quality, or other priority areas. Alternatively this could identify habitat infrastructure or blue/green infrastructure such as riparian habitats, high value animal habitats and large habitat blocks.
- Other questions or possible approaches?

C. Land Acquisition

Land acquisition is one tool for protecting sensitive areas and coastal habitats. There are multiple funding sources for land acquisition, including annual appropriations through NOAA for NERRS, Congressionally earmarked funds for CELCP, funding for other federal agencies including the U.S. Fish and Wildlife Service, the National Park Service, and private funds from land trust organizations and other NGOs. Both NGOs and state CZMA programs often play a significant role in coordinating multiple federal, state, local and private partners in order to implement land acquisition projects. Land acquisition in particular could benefit from comprehensive planning efforts to guide acquisition choices and identify common priorities. In many cases, acquisition priorities are based largely on feasibility and other practical concerns.

While many programs fund land acquisition in coastal areas, only a few are specifically targeted at the coasts. NOAA annually requests and is appropriated funds that can be used for acquisition of lands within the boundaries of existing NERRs. In addition, for several years now Congress has appropriated \$30-\$50 million for acquisition through CELCP. To date these funds have been entirely earmarked for specific projects. The CELCP program guidelines, published in 2003, require that states develop a CELCP plan for NOAA approval in order to participate in a competitive selection process. These plans describe a state’s coastal land conservation priorities and identify project areas that will serve as strategic conservation targets within the state. In

developing its plan, each state can choose whether to use its state coastal zone boundary, its coastal watershed boundary, or something in between, as the geographic boundary for CELCP purposes. CELCP plans will be used in combination with national ranking and selection criteria to prioritize and evaluate projects for a competitive selection process.

Key Questions and Possible Approaches

- Encourage/facilitate/require development of state or regional comprehensive coastal acquisition plans. These should be developed in collaboration with other federal, local, and private partners to consider the full suite of acquisition goals within the coastal zone. Such plans could then be used to coordinate multiple funding sources to address priority concerns within each state or region. These plans should consider and incorporate existing efforts such as state CELCP plans, acquisition goals associated with National Estuaries Program sites, and the Department of the Interior's (DOI) State Wildlife grant programs.
- Seek formal authorization of the CELCP program as part of the CZMA program.
- NERRs acquisition funding could be folded into CELCP by giving NERRs projects priority in the selection process or designating a certain percentage of funding to go to NERRs projects.
- Consider other programs with habitat goals (e.g. the National Estuary Program) for priority within the CELCP program.
- Amend land acquisition provisions for NERRs so that uplands outside of their management plan boundaries can be acquired. Alternatively NERRs sites may be able to administrative amend their management plans to include upland acquisition priorities.
- Other questions or possible approaches?

D. Protected Areas

In addition to acquiring land, many federal agencies and state and local governments designate and manage areas of particular importance. These areas may be managed in order to preserve habitat, provide recreational and cultural opportunities, or both. These programs include National Marine Sanctuaries, National Parks, National Estuary Program sites, National Estuarine Research Reserves, National Fish and Wildlife Refuges, as well as state and local parks and reserves. Both the Pew and the U.S. Ocean Commissions recognized the value of protected areas as a tool for ecosystem-based management.

Again, coordination of efforts across these programs could improve effectiveness and provide efficiencies. Some coordination efforts are already underway. For example, NOAA and DOI are partnering on efforts to develop a national framework for marine protected areas.

In many cases, protected areas are well integrated into the overall management strategy for coastal areas. However, some protected areas seem to exist on their own, without much connection to the management goals of the broader area.

Protected areas, both marine and coastal, can also serve as important tools for advancing our understanding of ecosystem processes. For example, the NERRs serve both as protected areas as well as platforms for research activities.

Key Questions and Possible Approaches

- What benefits of increased coordination among protected area programs would be of greatest value? (Coordinated research, efficiencies through shared resources, leveraging of research or educational opportunities, etc.)
- Should connections between protected area programs and coastal managers be strengthened or better institutionalized? Could state CZMA programs play a role in bringing together or making greater connections to this community? As a starting place, are state CZMA and NERRS programs maximizing opportunities for integration?
- Additional authority could be provided to reinforce the goal of advancing restoration science efforts through the NERRS or other protected area programs.
- Large federal land holdings, while not actually protected areas, are in many places some of the only remaining large, undeveloped habitat areas. As more development occurs the habitat value of these areas will continue to increase. Are there opportunities to work cooperatively with other federal managers to maintain the habitat value of these areas?
- Other questions or possible approaches?

11. Non-point Source Pollution

Non-point source pollution refers to nutrients and contaminants that are washed by rain water and snowmelt into streams and groundwater. According to the Environmental Protection Agency (EPA), ninety percent of impaired water bodies do not meet water quality standards at least in part because of non-point source pollution. Non-point source pollution is a concern throughout the country, and can be particularly significant in coastal areas.

EPA, the U.S. Department of Agriculture (USDA), and NOAA all conduct programs to address non-point sources of pollution. Through USDA significant amounts of funding are directed at reducing runoff from agricultural lands. EPA works to set standards for water quality and provides funding to states for developing watershed plans, implementing management measures and monitoring programs. NOAA participates in coastal non-point efforts through the CZMA, but has relatively little funding dedicated to addressing non-point source pollution.

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) created the Coastal Non-point Program as a partnership between NOAA, EPA, and state water quality agencies. All states that participate in the CZMA program are required to develop enforceable policies and mechanisms to ensure implementation of technology-based management measures for non-point sources of pollution. States that did not complete an approvable non-point plan within the specified timeline were to be penalized through reduced funding of their CZMA grants and Clean Water Act Section 319 non-point source grants. However, as CZMA is a voluntary program, assessing these penalties creates an incentive for states to drop out of the CZMA program rather than complete their coastal non-point source plan. All of the coastal states have received conditional approval of their coastal non-point source plans, but only half have received full approval. Federal funding has been provided for the development of programs and policies to define the management measures, but implementation will be significantly more costly. As a result, states have only been able to implement targeted portions of their non-point plans due to funding limitations.

The Coastal Non-point Program is focused on managing a single issue, water quality. As such it is a departure from the comprehensive approach of the overall CZMA. It is also more prescriptive, providing very specific national standards, than other provisions of the CZMA.

Key Questions and Possible Approaches

- Is it important/effective/appropriate to treat non-point source pollution in the coastal zone in a unique manner? Are coastal areas sufficiently different from other regions of the country?
- What is the appropriate role for the CZMA Program/NOAA in addressing coastal non-point source pollution?
- What are the major impediments to effectively addressing non-point source pollution? Is this different in the coasts than in the interior?
- The funding penalty provisions of the Coastal Non-Point Program could be removed and NOAA efforts could focus on implementing state coastal non-point programs in all coastal states, enhancing policies where necessary via Section 309 of the CZMA to achieve pollution reductions.
- CZARA could be amended to create a coastal non-point program implemented solely by NOAA that is focused on the prevention of non-point source pollution in critical coastal areas as defined by state CZM programs. This could be supported through collaboration with the NERRS Coastal Training Program, Sea Grant extension agents, and research, technical assistance, and training provided by NCCOS and the CSC.
- CZARA could be eliminated.
- If CZARA is not modified or eliminated, the roles of EPA/NOAA could be re-evaluated and formally redefined. For example, roles in program and management measure review could be explicitly defined based on agency expertise (e.g., it may not make sense for NOAA review measures that address agriculture and forestry).
- NOAA and CZMA efforts could focus on priority issues including management of development in coastal watersheds, clean marinas, and septic system siting, design and maintenance. NOAA expertise in planning assistance, project selection and design, policy advice, training, and technical assistance could be emphasized.
- An expansion of community planning and development activities could be supported through a reauthorized CZMA to address prevention oriented approaches to coastal development that mitigate non-point source pollution impacts in the planning and design of coastal development, such as residential subdivisions, redevelopment, and related infrastructure.
- The requirement that the states must meet all the management measures could be eliminated. Allowing the states to meet the majority, rather than all, of the measures could greatly increase the number of states with approved programs.
- The CZMA could be amended to provide funding to CZMA programs to specifically develop pilot innovative land/water use controls, programs, or processes at the state or local level within the coastal zone. Specific monitoring and evaluation could be built into the projects, which, if found to be effective, could then be transferred more broadly into other parts of the state.
- Other questions or possible approaches?

12. Ocean Resources Management – living marine resources, energy, sediments, aquaculture

Jurisdiction over ocean resources is split between state and federal government: within 3 nautical miles (or 9 nautical miles for Texas and the Gulf coast of Florida) states have jurisdiction, beyond that federal agencies have jurisdiction. In federal waters ocean resources are managed by a variety of different agencies. NOAA and DOI have jurisdiction over living marine resources including commercially and recreationally valuable fish, as well as marine mammals and other protected species. DOI's Mineral Management Service (MMS) is the lead federal agency for offshore oil, gas, and other mineral resources and the National Energy Policy Act recently named MMS as lead for managing new offshore energy uses such as wind energy. The Coast Guard, EPA, and the Army Corps of Engineers also have authorities over ocean resource issues. Recently, the Administration has submitted a proposal to give NOAA additional authority for aquaculture permitting in federal waters.

Within state waters, state governments face a similarly complex set of authorities and user groups. Increasingly states are beginning to confront issues of new activities in state and federal waters including siting of LNG terminals, use of sand resources, and siting of aquaculture facilities.

Both the USCOP and Pew Oceans Commission recommended the establishment of regional governance structures to coordinate management of ocean resources. While these governance structures have yet to be thought out or established, the nexus of state and federal concerns over ocean resources will need to be addressed.

The CZMA provides mechanisms for states to comprehensively plan for uses of ocean resources within state waters, as well as authority to influence some ocean resource issues under federal jurisdiction. The seaward boundary of each state's coastal zone is established by the Act as the edge of state waters. As such, the states could consider and develop comprehensive management programs for ocean resource uses within the current framework. However, most state programs are focused primarily on the land/water interface or very near shore component of their coastal zone. Some ocean uses might also be better considered within a multi-state or regional context.

Further, the CZMA requires that federal actions that affect coastal uses and resources be consistent, to the extent practicable, with a state's approved CZMA program. These "consistency" requirements provide an avenue for states to participate in or influence management of ocean resources under federal jurisdiction.

Data gaps that may hinder development of robust ocean management programs include: a lack of benthic habitat mapping and characterization, the lack of models for multiple ocean use planning, and a lack of expertise in doing ocean planning and management. Resources assessments may be a necessary first step or goal for successful interstate or regional collaboration.

Key Questions and Possible Approaches

- Are states adequately addressing ocean resource issues within state waters? Some states (Massachusetts and California) have made recent efforts to take on ocean management issues. What have the impediments and challenges been? To what extent have these states had success?
- The current CZMA provides authority for states to outline a plan for managing these resources. States could be encouraged to amend and update their programs in order to address these concerns.
- Language could be added to the CZMA to explicitly call attention to these issues and encourage/require states to address management of ocean resources in their state coastal management plans.
- Multi-state or regional efforts could be authorized to define an approach to managing these resources. For example, a group of neighboring states could come together to map out preferred areas for siting aquaculture or LNG projects. Incentives could then be provided to guide development towards those areas and away from less desirable locations. Incentives could include differential permitting times or differential consistency reviews.
- For any of the options above, NOAA, working with other federal agencies could issue guidance on how states might approach these uses. Historically, NOAA and the CZMA have provided the states a significant amount of flexibility over what structures or tools are used to implement the programs. NOAA could continue this approach and issue general guiding principles for managing ocean uses. Alternatively NOAA could be more prescriptive in requiring certain tools or approaches such as ocean zoning.
- What role should states play in influencing management of ocean resources outside of state waters? Are the consistency requirements of the CZMA enough/too much? If regional ocean governance structures were to be formed, what role should states play, what authorities should the states have?
- Are there adequate connections between the fisheries management and coastal zone management communities? Could NOAA, as a lead federal agency in both of these areas, promote greater collaboration on fisheries issues?
- Other questions or possible approaches?

13. Coastal Hazards

Vulnerability to coastal hazards has always been an issue of national significance. However, the impacts of the 2005 hurricane season were a dramatic illustration of why this issue affects all citizens, whether or not they live in coastal areas.

The primary federal agency responsible for providing relief and mitigation efforts for natural disasters is the Federal Emergency Management Agency (FEMA). FEMA has been the subject of much scrutiny following the 2005 hurricanes and there are ongoing efforts to try to reform and improve many of their programs that affect coastal hazards, including the National Flood Insurance Program.

DOI's Coastal Barrier Resources Act program (CoBRA) was developed to minimize development, and therefore hazard risk, in vulnerable barrier islands. Development in vulnerable areas that have been identified as part of the CoBRA system are not eligible for federal flood

insurance or other federal assistance. However, despite this disincentive, development in these areas continues.

NOAA works in partnership with the states to reduce vulnerability to coastal hazards through comprehensive planning under the CZMA program. In principle, wise planning and land use decisions should reduce vulnerability to coastal hazards, and, in turn, should reduce the need for FEMA mitigation and relief efforts. As such, there is reason for solid connections between hazard mitigation and land use planning efforts. Numerous opportunities exist to coordinate efforts including comprehensive mapping efforts, and use of CZMA Special Area Management Plans to address areas with significant vulnerabilities to erosion and coastal hazards. However, in practice, there seem to be significant divisions between floodplain and emergency managers, and coastal managers.

Key Questions and Possible Approaches

- States could strengthen connections between CZMA programs and the state floodplain and emergency management communities. Section 309 of the CZMA program may be a useful tool to provide funding and guidance for these efforts.
- Are there other options for creating better institutional connections between these communities?
- NOAA could partner with the CoBRA program to increase awareness of CoBRA areas and work with the states to ensure coastal management plans appropriately incorporate these concerns.
- NOAA could work with FEMA and other federal partners to produce more comprehensive maps of coastal hazards that include information on erosion and storm surge vulnerability.
- One of the performance goals of the CZMA program could be a measure of the number or percentage of coastal communities that participate in FEMA's Community Rating System (CRS).
- Public-private partnerships, possibly with the insurance industry, should be explored. Perhaps federal rating systems like the CRS or NOAA's efforts to develop a community resiliency index might be tied to financial incentives offered by insurance agencies.
- Federal assistance (mitigation assistance, disaster relief, economic and community development grants) could also be tied to participation in programs to lower vulnerability or risk.
- NOAA could target its outreach programs, including the Coastal Training Program, the Coastal Services Center, and Sea Grant extension agents, to work in a coordinated fashion with floodplain and emergency managers to promote risk awareness.
- Other questions or possible approaches?

14. Promoting Economic Growth and Sustainable Development

Coastal management is supposed to promote vibrant coastal communities while ensuring the health of coastal ecosystems. One approach this has been to actively promote economic growth that can be achieved in a sustainable manner.

The permitting process is an important issue at the intersection of development and coastal management. Lengthy timelines and multiple requirements at the local, state, and federal levels can lead to uncertain timeframes and costly delays for developers. More streamlined processes could ease the burden on both industry and government. The current CZMA includes a policy objective to reduce red tape in government decision making. States can use section 306 funding and in some cases section 309 funding to develop joint permitting processes, general permits or other streamlining mechanisms. Streamlined or differential permitting processes and requirements could also be used as incentives for sustainable development practices.

Key Questions and Possible Approaches

- Certification programs or other guidelines could be developed to promote best-practices. Developers that use these practices could then be eligible for a streamlined or fast tracked permitting process.
- Permit streamlining mechanisms could be made explicitly eligible for section 309 funding through the CZMA.
- Are there federal permitting issues that could be streamlined? What are the priority issues for coastal-dependent industries?
- Other questions or possible approaches?

15. Public Access

Many coastal and ocean resources are public trust resources. As the coasts are developed and open space is reduced, opportunities to access these public trust resources may be diminished. As such, providing access to coastal resources has been a significant focus of managing these areas. Federal and state agencies may provide access to special areas by designating parks, refuges, or other types of reserves. At a broader scale, state CZMA programs consider and provide for public access to coastal resources across the state. For example, CZMA funding has been used to construct and improve beach access points and to produce outreach materials to educate the public about where access points are located.

Historically, efforts under the CZMA programs have been focused on beach access. In recent years the recreational boating community has become concerned about boat access. Coastal development has led to the loss of boat launch sites and public marinas. In general, many areas do not have a full understanding of what access is available or a sense of what amount of access would be optimal or sufficient. In other areas, like Alaska, coastal areas are still relatively undeveloped and providing specific access points is not considered a priority or even necessary.

Key Question and Possible Approaches

- Is public access still a priority issue that should be addressed comprehensively by the CZMA? If so where should it rank in the list of priorities (Neither Ocean Commission specifically addressed this issue in their recommendation, though both Commissions address the impacts of coastal development more broadly.)
- To what extent is public access an issue of national interest? Could it be left primarily up to state and local governments to address?
- Other questions or possible approaches?

16. Climate Change

Climate Change is increasingly a topic of national discussion and debate. While there may be uncertainty about the specific form and magnitude of impacts from climate change, coastal areas will likely be affected. Significant resources are dedicated to studying and forecasting these changes. However, few formal programs exist to encourage planning and mitigation efforts.

One of the goals of the current CZMA is to enable states to anticipate and plan for potential changes in sea level as a result of changing climatic conditions. However, the vast scope of climate change issues has made it difficult for states to get a handle on what the potential impacts might be and what could be done to address them.

Key Questions and Possible Approaches

- Is this a priority issue for coastal management?
- Is the CZMA an appropriate mechanism through which to address impacts of climate change?
- Are there other mechanisms or programs through which states and coastal managers are, or could, address climate change concerns?
- NOAA and other federal agencies could continue to improve their provision of technical support and research on the potential implications of climate change. For example some efforts have already been initiative to develop climate applications for decision makers.
- CZMA section 309 funds could be made available to address these concerns.
- Other questions or possible approaches?

17. Marine Commerce and Transportation

Marine commerce and transportation are important components of coastal and national economies. Federal agencies maintain waterways, provide aids to navigation, set and enforce maritime safety standards, as well as environmental protection standards. The OAP called for the elevation of the Interagency Committee on the Marine Transportation System to a cabinet-level committee to improve federal coordination and promote environmentally sound integration of marine transportation with other modes of transportation and with other ocean, coastal, and Great Lakes uses.

Marine commerce and transportation are examples of issues that are of both local and national importance and are included in the list of issues states are required to consider in executing their

CZMA programs. More specifically, the CZMA directs that it is the duty of states to facilitate water dependent uses, including the siting of facilities.

Key Questions and Possible Approaches

- Is there an adequate understanding of marine transportation issues by coastal managers and of coastal management by the marine transportation industry?
- Are there adequate connections and communication between coastal zone managers and marine transportation industry groups?
- As federal, state, and local efforts to address marine transportation needs evolve, what are the issues that will require coordination with other parts of the coastal management community?
- Should there be a national approach to development of ports – such as decisions regarding the number of deep water ports?
- Other questions or possible approaches?

18. Invasive Species

Both the USCOP and the Pew Oceans Commission identified invasive species as a significant concern for coastal areas. The Nonindigenous Aquatic Nuisance Prevention and Control Act, as amended by the National Invasive Species Act created an Aquatic Nuisance Species Task Force to coordinate federal and state actions and encourage states to develop plans for managing invasive species. However, few resources have been made available and only a few states have developed management plans or are taking steps towards implementing them. The National Invasive Species Council, comprised of ten federal departments and agencies, has also been established and has made some progress towards identifying strategies for managing invasives. Federal coordination will play a significant role in addressing invasive species, however, actual monitoring and control efforts will likely fall to state and local agencies.

Key Questions and Possible Approaches

- What contributions can existing coastal programs make to support development and implementation of invasive species plans? Programs like state CZM programs, National Estuary Programs, National Estuarine Research Reserves, and Sea Grant are all existing state-federal partnership that address coastal issues. Some of these programs, such as Sea Grant, already support invasive species work. Is there additional capacity in these programs that individually or collectively could be harnessed to address invasive species?
- The CZMA does not currently list invasives species as one of the program purposes. Should this be added to the CZMA? Where does it fall within the other issues in terms of priority?
- Other questions or possible approaches?

19. Knowledge and Understanding

Education on ocean and coastal issues has received broad support in recent years. Both of the Ocean Commissions recommended additional investments in ocean education; Congress has

expressed interest in ocean education; and the Administration has shown support for ocean education in the OAP. Multiple federal agencies participate in a variety of ocean and coastal education programs and are working to coordinate these efforts through the ICOSRMI. At the center of these initiatives, is the common understanding that creating a stewardship ethic within American society will enhance all efforts to manage and protect natural resources. These education programs include formal and informal efforts to educate the public at all levels including K-12 programs, programs for the general public, and targeted education for decision-makers.

Key Questions and Possible Approaches

- Are there specific education needs that are specifically tied to achieving coastal management goals? Are there certain priority areas that can be pursued strategically?
- A number of coastal programs have identified state and local decision-makers as a priority target audience for education and training programs. Are there other priority audiences?
- A number of programs exist to deliver education services. Just within NOAA this includes the NOAA Education Program, the NMSP, Sea Grant, CSC, NERRS, CZMA and others. Are these efforts appropriately coordinated with each other and other federal, state, and local efforts?

Decision Support

20. Resource Assessments

One of the barriers to evaluating progress in coastal management is the lack of baseline data about the health and status of coastal resources. For this reason the USCOP recommended that state CZM programs provide for comprehensive, periodic assessments of the state's natural, cultural, and economic resources. These assessments would most likely be resource intensive, though NOAA may be able to provide some support through its science and research offices that have a coastal focus. Other federal agencies, including EPA and the U.S. Geological Survey (USGS), also provide relevant information that can fill some of these requirements. In addition, some state and local programs are already investing in developing GIS-based databases that house some of this data.

Comprehensive resources assessments would also be of value to many of the other federal and state coastal efforts. Collaboration with these partners could ensure development of assessments that could meet multiple needs.

Key Questions and Possible Approaches

- Periodic resource assessments could be required by the CZMA. What geographic extent should be included in these assessments? A possible minimum requirement could be the National Estuarine Research Reserves. Clear standards and guidelines should be established by NOAA, partner federal agencies, and the states in order to ensure consistency across states. These assessments could be performed by state agencies, or a mix of state and federal programs, including NOAA's science programs as well as those of other agencies.
- Resource assessments could also be authorized by the CZMA, but not required. NOAA could provide incentives to complete these assessments by providing easy access to support from NOAA offices and programs such as Sea Grant, the NCCOS, and the CSC. NOAA could also work with other agencies to facilitate broader analysis that incorporates the data and expertise of agencies such as MMS, USGS, EPA, FWS etc...
- Federal agencies, through the Council on Environmental Quality (CEQ) or the Subcommittee on Integrated Management of Ocean Resources (SIMOR), could gather national-level baseline data for a set of indicators. EPA already produces a National Coastal Conditions Report which could be expanded or used as a starting point for other efforts.
- Section 309 of the CZMA could be reauthorized to allow for and provide incentive funding for conducting resource assessments at the same time as the management program assessment and strategies are conducted, every five years.
- Given the reality of limited resources, where are resource assessments in the list of priorities for coastal management?
- Other questions or possible approaches?

21. Science to Support Management

Both the USCOP and Pew Oceans Commission articulated the importance of sound science to support ocean and coastal management. Matching research and science objectives with the needs of resource managers has been an issue of particular concern in the efforts to develop an Integrated Ocean Observing System (IOOS). In addition, efforts need to be made to translate relevant science and observations into useable formats that managers can apply to on-the-ground decisions. In the past attention has been focused on identifying and providing for needs within the natural sciences. Increasingly there is an awareness that there are also many important uses and requirements for social science. Understanding the socio-economic framework in which resource use decisions must be made can help decision-makers better understand and monitor the societal values they are implicitly or explicitly trying to accommodate.

The capacity to provide and translate both natural and social science exists at a variety of programs within NOAA, at other federal agencies, and at numerous universities. Applying this capacity to meet managers' needs requires the ability to elicit and effectively communicate what the science needs of coastal managers are. In the past the Coastal States Organization has conducted surveys of state managers to try to identify and coordinate this type of information. Other efforts such as IOOS and the Joint Subcommittee on Ocean Science and Technology (JSOST) research priority planning have sought out advice and reviews from representatives of the management community. In some states, the connection between science and management is

developed through a strong relationship between the state coastal management programs (such as CZMA programs) and local research institutions including Sea Grant or a NERR.

Key Questions and Possible Approaches

- The onus for articulating their science needs could be placed more directly on the coastal managers. On some recurring basis, state coastal programs could be encouraged/required to articulate their science needs. This could be done as part of the CZMA section 312 evaluation, as part of the CZMA section 309 process or another strategic planning effort, or as a periodic independent process. This would provide a tool to communicate and encourage science programs to address managers' concerns. For example, as part of its assessment of Sea Grant programs NOAA could evaluate the degree to which a Sea Grant office's strategic plan reflects the science needs of the state CZMA program. One concern is that CZMA managers may not represent the entire breadth of "coastal managers" so there may be additional issues not considered through this process.
- Coastal managers could also be encouraged to play a more active advisory role to institutions like NERRs and Sea Grant offices
- The onus for eliciting science needs could be placed more directly on the federal agencies. NOAA has several offices including the Office of Ocean and Coastal Resource Management (OCRM), NCCOS, NERRS or CICEET, that could participate with other federal agencies to conduct a survey of the coastal management science needs on a periodic basis.
- Status Quo. The current approach is somewhat ad hoc but allows for flexible collaborations where they make sense.
- Are efforts across agencies well coordinated and effectively communicated to the resource management community?
- Managers, federal agencies, and other research institutions, might come together to evaluate the challenges and identify solutions to improve science translation. One option might be to require federal research programs to set aside a percentage of their research dollars for translation efforts.
- Other questions or possible approaches?

22. Providing Tools and Technologies

Developing and encouraging the use of innovative approaches and new tools and technologies is important for the advancement of any field. A lot of the organizational infrastructure already exists and is engaged in addressing this need. Efforts within NOAA include CZMA, NEERS, CICEET, CSC, NCCOS and Sea Grant. The diversity of state CZMA programs has led to a diversity of approaches that fosters new ideas and approaches. In addition, programs in other federal agencies and NGOs provide resources that are and can continue to be applied towards these efforts.

Key Questions and Possible Approaches

- Are current efforts to develop tools and technologies addressing the right scale to match the level at which decisions are made?
- Are tools and technologies being developed to address an identified need and are mechanisms in place to evaluate the effectiveness of the products once they are developed?
- Are there effective mechanisms in place to transfer best practices from state to state?
- Are current programs that provide tools and technologies adequately coordinated?
- The current authorization for NOAA to provide technical services could be enhanced and made more explicit. CICEET and CSC could be codified in statute. The role of partnerships with other agencies, NGOs, and industry partners could also be established.
- Grant funding could be made available to encourage states and locals to try new approaches or tools. What other sources of funds and partnerships could help in the development of innovative technologies?
- NOAA could work to assess and distribute information about new approaches or best practices already in use among the state programs.
- Other questions or possible approaches?

Part III: The Coastal Zone Management Act

23. Priorities within the Coastal Zone Management Program

The CZMA identifies a wide range of issues for states to address through their coastal programs including mitigating coastal hazards, providing public access, and improving coastal water quality. In addition, the CZMA provides states the authority to address new coastal issues as they emerge. As a voluntary program, the states have been given flexibility over how to design a coastal program to address existing and emerging concerns. This flexibility allows states to tailor their coastal program to the different resources, land and water use issues, and organizational, legal, and regulatory structures that exist within each state. The flexibility in implementing the CZMA has encouraged participation by almost all coastal states. However, the broad scope and diversity of approaches has raised questions regarding how this collection of efforts adds up to demonstrable improvement in any one area of concern. Some question whether adequate resources are available to CZMA programs in order to address all the existing issues, let alone take on any new or emerging concerns.

The diversity of approaches with the bulk of the priority setting done at the state level, has also led to the criticism that the CZMA program addresses mostly state and local concerns and is not sufficiently targeted at national priorities. This can lead to questions about the appropriateness of federal funding for state CZMA programs. To further complicate matters the majority of individual issues outlined in the CZMA overlap with issues covered by other federal agencies.

Key Questions and Possible Approaches

- What are the top two or three national priorities? These should be meaningfully connected to the vision for successful coastal management. If these can be identified and agreed upon, the CZMA could be amended to be more narrowly focused on these.
- The focus on comprehensive planning could be maintained with a broad list of interests; a process could be articulated/authorized for NOAA and the states to establish a set of priority areas on a periodic basis. Strategic planning could be used to provide additional guidance for the current 309 grants process.
- Alternatively, the primary role of states in determining priorities could be supported. In doing so the areas of interest in the CZMA might be maintained or broadened with priorities set on a state by state basis. NOAA's efforts could be focused on articulating the national interests that overlap these state priorities and on providing support and technical assistance in support of state priorities. Efforts to include participation from representatives from local government in priority setting may increase buy-in at the local level and encourage implementation.
- Other federal programs could be invited/required to assist the states in the establishing priorities, which then could affect funding, products, services, and implementation of the other federal programs that address a particular priority area and build state capability in the many programs. CZMA funding could continue to be used to support the overall comprehensive management and coordination at the state and local level.
- NOAA could be encouraged or required to periodically define/articulate the national interest in the CZMA funded state programs.
- Other questions or possible approaches?

24. Performance Goals

Today's management culture is increasingly focused on measuring and demonstrating results. Congress has posed questions about the CZMA's effectiveness. The OMB Program Assessment Rating Tool assessment found that the program was not able to demonstrate results. Most recently the USCOP recommended that state programs develop measurable goals and performance measures.

Performance goals should be measurable and should flow from the vision of success and program priorities. Over the last few years the states and NOAA have worked together to develop a suite of performance indicators. Data collection for these indicators has begun and NOAA and the states can now start to assess the usefulness and practicality of each of the indicators. Concerns have been raised about whether performance measures should be nationally focused or more reflective of individual state concerns. Moreover, some have expressed concern with the current set of measures, suggesting that there are too many, that data collection requires too many state resources, and that the initiative may be measuring the wrong things.

Once goals and measures are established, to what end are these used? Performance measures can be useful tools to communicate the impact and value of the program. They can also be useful management tools to guide program changes and improvements. The USCOP recommended that federal funding levels for state programs be based substantially on a state's progress against its goals and performance measures.

Key Questions and Possible Approaches

Determining Performance Goals and Measures

- NOAA and the states could work collaboratively to evaluate and improve upon the current performance indicator effort, possibly focusing on indicators of ecosystem based management or sustainable development. If the community works through a process to develop a vision and a set of priorities, the performance measurement system should reflect those priorities.
- States could work independently or in multi-state/regional groups to establish performance goals and measures. NOAA can provide guidance and assistance to ensure that the goals and measures meet certain criteria and standards.
- Would a combination of the nation-wide and state specific approach outlined above, better meet the needs of the program?
- Other questions or possible approaches?

Using Performance Goals and Measures

- Performance measures could be used to evaluate state programs and determine a portion of annual funding. (Sea Grant has a similar process.)
- Performance measures could be used to identify major regional or national issue areas which could be used to focus federal (NOAA and other agencies) research, outreach, technical assistance, products and services, as well as cross federal budget initiatives. These focus areas could be incorporated into NOAA or other agency strategic or annual planning.
- Other questions or possible approaches?

25. Method of Allocating Funding

Currently funds for CZMA and NERRS programs are allocated almost entirely by formula. Language in the CZMA, recent appropriations bills, and CZMA reauthorization proposals emphasize the principle of distributing funding through a process which promotes equity across states. Since the early 1990s, appropriations bill have specified that no state may receive more than \$2 million in Sections 306 and 306A grant funding. The formula based funding mechanism provides a level of predictability and certainty. Many states use their grant funding to support staff and pay other operational expenses, for which a predictable and stable funding level is useful. However, in general, formula based grant programs have been criticized as not being effective at achieving results. Moreover, some have questioned whether using these funds to pay salaries and other operational expenses is appropriate. Competitive processes are often cited as more effective at promoting excellence and encouraging greater levels of achievement. The 2007 President's Budget proposed that an increasing amount of the CZMA grant funds be allocated competitively and focused on national priorities. The USCOP also recommended a move away from strict formula allocations and suggested that funding levels should be based on each state's performance against a set of measurable goals.

The fact that many states use federal grants to pay for operational administrative expenses is a significant impediment to employing competitive processes that would direct money away from daily operational expenses and towards specific projects or initiatives. However, some question whether the use of federal funds to pay these operational expenses is appropriate. In some cases, the lack of state funding for operational expenses stems from a lack of state support for the CZMA program. States may match federal funds with state funds that do not directly tie to the operation of the CZMA program.

Funding for the National Estuarine Research Reserves is distributed by "share amounts" for program implementation. Recently, additional funds for system-wide program initiatives such as the Coastal Training Program have been distributed by equal amounts for reserves meeting eligibility criteria. Funding for facilities construction, land acquisition, and the Graduate Research Fellowships is competitive.

Key Questions and Possible Approaches

- The CZMA could be amended to ensure equity of funding across states. Ideally this would allay Congressional concerns about equity of allocation and would encourage the removal of the \$2 million per state cap currently imposed in appropriations language.
- The CZMA could be amended to explicitly authorize (additional) competitive and/or performance based funding mechanisms.
- The CZMA could be amended with some combination of the above options in order to provide a base level of formula based funding and additional funding through competitive or performance based mechanisms.
- The amount of funding that can be used for state administrative expenses could be restricted.
- Restrictions could be placed on what states can use as matching funds.
- Other questions or possible approaches?

26. The Evaluation Process

On a periodic basis, generally every 3 years, state programs are evaluated through the process mandated in Section 312 of the CZMA. This is one of the primary tools NOAA uses to suggest program changes or improvements. Programs are evaluated on whether they are successfully implementing their approved coastal zone management programs, how well they are advancing the CZMA goals and objectives, and how well they are managing their federal financial assistance. This is not the same as a re-approval process, as the sufficiency of the state program to achieve the objectives of the CZMA is not under question. As such, NOAA has limited ability to require the states to make program changes. However, there are many examples of suggested modifications that have been adopted by state programs. In addition, section 309 allows states to voluntarily develop changes to their current CZMA plan and provides funding for updates and improvements.

State CZMA programs also do not have specific requirements for periodic evaluation or re-approval at the state level.

Key Questions and Possible Approaches

- The evaluation process could be turned into a re-approval process. A state's performance in implementing its current plan as well as the sufficiency of the plan itself would be under review. This could be significantly more resource intensive, including compliance with the National Environmental Policy Act and other requirements. NOAA and the states could investigate whether a streamlined reevaluation process could be authorized to reduce some requirements. Evaluations/re-approvals could be done on less frequently, perhaps every 5 to 7 years. To evaluate whether the current program adequately addresses coastal concerns, progress against measurable performance goals (program wide and/or state specific) could be assessed.
- A preliminary evaluation finding or some other process could be used to trigger a reapproval process. This might avoid directing extensive resources to re-approving programs that are functioning well.
- One of the benefits of a federal and state reapproval process might be a periodic opportunity or requirement for the programs to demonstrate and communicate their value. Would this lead to additional or continued support at the state and federal level? Would this subject the program to excessive uncertainty given the frequent changes in the politics at the state and federal level?
- An assessment of each state's progress against measurable performance goals (program wide and/or state specific) could be included in the current evaluation framework without expanding the process to a full re-approval evaluation.
- Periodic evaluations could be tied to future funding. Sea Grant's process could be used as a model; state programs are ranked and some program funding is distributed based on relative state performance. This might require amending the CZMA's allocation by formula. A mechanism to help lagging states improve should be considered.
- The evaluations could include incentives in addition to the current penalties. For example, the evaluation findings could be used to identify state and local needs that may be met by NOAA technical and scientific assistance.
- Some combination of the above; other questions or possible approaches?

27. Landward Boundary of the “Coastal Zone”

Currently states have discretion over where to establish the landward boundary of their coastal zone, so long as it encompasses specific coastal resources and inland areas “necessary to control uses which have direct and significant impacts on coastal waters, or are likely to be affected by or vulnerable to sea level rise” consistent with CZMA statute and regulations. In addition, some states identify an “administrative” inland boundary which may be further inland to make it easier for potentially affected parties to determine if they are subject to the program. In some states the coastal zone includes the entire state, while in others it includes a strip of coastline only several hundred feet wide. The concept of watershed- or ecosystem-based management has been proposed as a more effective approach to coastal issues to better manage indirect or cumulative and secondary impacts from development on water quality, coastal hazards, and wetlands. Both the Pew and U.S. Ocean Commissions have recommended watershed-based approaches for addressing water quality. The USCOP specifically recommended that states should extend the landward side of their coastal boundary to include all coastal watersheds. However, depending on the nature and scope of each state’s program, this expansion could require additional resources and may be difficult for other technical or practical reasons.

Key Questions and Possible Approaches

- Amend the CZMA to require states to expand their landward boundaries to include coastal watersheds. The funding implications of this should be considered and addressed.
- Provide an incentive to states to adjust inland boundaries such as additional 306 base funding.
- Evaluate whether states have geographic boundaries that are appropriate for addressing priority management issues. The likelihood of obtaining funding to manage the geographic extent may also need to be considered.
- Require states to explicitly explain how and through what mechanisms they are addressing coastal issues on an ecosystem or watershed basis. This could be implemented either through the evaluation or any new re-approval process, or it could be a requirement for the biennial report to Congress.
- Amend the CZMA to require states to identify local, state, and federal programs in place to manage cumulative impacts of uses in coastal watersheds on coastal habitat, living resources, coastal hazards, recreation etc, and adjust boundary to address programmatic gaps. Accordingly, formula funding could be adjusted to account for differential boundaries.
- Other questions or possible approaches?

28. Federal Consistency

The Federal consistency provisions of the CZMA (16 U.S.C. § 1456 and 15 C.F.R. part 930) are usually cited as a powerful incentive for state participation in this voluntary program. In fact for some states, consistency is considered the most important component of the CZMA.

Consistency reviews have also sparked controversy, particularly in the area of offshore oil and gas where state consistency objections have stopped some outer continental shelf (OCS) oil and gas projects that were not consistent with federally approved state coastal policy.

Federal consistency requires that federal actions that affect any land or water use or natural resource of a state's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of federally approved state CZMA programs. This is true whether the action occurs within or outside of a state's coastal zone. Federal actions include:

- Federal agency activities and development projects
- Federal license or permit activities
- Outer continental shelf oil and gas plans, and
- Federal financial assistance to state agencies or local governments

States concur with the vast majority of federal actions that are reviewed, though in some cases these concurrences are negotiated between the state, the applicant, and/or the federal agency. The method of negotiating state objections depends on which type of federal action is proposed.

To some extent, states have a choice over which actions or forms of assistance are priorities for review. This helps focus limited state resources on the highest priority actions and provides notice and predictability to applicants and federal agencies. However, in some cases this may lead to missed opportunities for coordination. For example, consistency reviews might be one avenue for state CZMA programs to have a voice in decisions such as how to use federal assistance for flood planning and mitigation.

Where states have chosen to use federal consistency, some feel that the authority to comment on any action that affects resources within the coastal zone, even if the action itself takes place outside the coastal zone, is too broad. This ability to review federal actions outside the coastal zone has existed since the beginning of the CZMA.

The OCS oil and gas industry has asserted that some states have sought to prohibit all exploration and development of OCS oil and gas resources off their coasts, regardless of whether coastal effects are reasonably foreseeable. Some states have objected to a small percentage of OCS projects proposed, while others have fully supported OCS oil and gas development. In general, consistency reviews have not impeded OCS oil and gas exploration and development.¹ However, many areas of the OCS are currently under moratoria from oil and gas exploration and if the moratoria were removed, the percentage of objections would likely increase.

A substantial amount of debate and resolution of some of the contentious consistency issues has recently taken place. In addition to the 1990 CZMA amendments and NOAA's comprehensive changes to the regulations in 2000, the Vice President's National Energy Policy Development Group's Report (May 2001) (Energy Report) opened up a debate on a number of federal consistency issues, with a particular focus on the appeals process. That debate resulted in changes contained in the Energy Policy Act of 2005 (Pub. L. No. 101-58) (EPACT) and

¹ According to the Minerals Management Service (MMS), since 1978, MMS has approved over 10,600 OCS Exploration Plans (EPs) and over 6,000 Development and Production Plans (DPPs). States have concurred with nearly all of these plans. In the 30-year history of the CZMA, there have been only 18 instances where the offshore oil and gas industry appealed a state's federal consistency objection to the Secretary of Commerce. The Secretary issued a decision in 14 of those cases. The Secretary did not issue a decision for the other 4 OCS appeals because the appeals were withdrawn due to settlement negotiations between the state and applicant or a settlement agreement between the Federal Government and the oil companies involved in the projects. Of the 14 decisions (1 DPP and 13 EPs), there were 7 decisions to override the state's objection and 7 decisions not to override the state.

NOAA's recent Final Rule amending the federal consistency regulations (71 Fed. Reg. 787-831 (January 5, 2006)). The Ocean Commission did not propose any changes to federal consistency.

Key Questions and Possible Approaches

- Strengthen the consistency clause within the CZMA. This could be through an amendment that explicitly applies the authority to offshore oil and gas development, and other offshore uses such as aquaculture, or other energy developments. While this is the status quo since these activities are subject to federal consistency, Congress could more affirmatively express the ability of states to address the impacts of OCS activities on their coastal uses or resources.
- The states could strengthen their use of current authority. NOAA could work with the coastal states to evaluate how the consistency provisions are currently used and evaluate other opportunities that the states may not be capitalizing on. For example, are state coastal programs participating in decisions regarding federal assistance for flood planning and mitigation? Based on this evaluation NOAA could produce a report on "best practices" highlighting successful state approaches, and suggesting areas for increased attention. NOAA could then work with the individual states to encourage strategic use of the consistency authority to address priority coastal concerns.
- Constrain or limit the applicability of the consistency provisions. This could be done geographically – the consistency provisions could be limited to actions within the coastal zone or within a certain distance of the coastal zone (e.g., H.R. 4761, the *Deep Ocean Energy Resources Act Of 2006* if enacted would establish that OCS natural gas activities proposed outside 25 miles and OCS oil and gas activities outside 50 miles would not have reasonably foreseeable effects on resources near the coastline). It could also be achieved through inserting language stating that only federal agency activities that "directly affect" coastal resources are subject to consistency reviews. Finally, any constraint to consistency could apply broadly or only to certain national interest activities, such as energy exploration and development, that could be determined by statute or as needed by the Department of Commerce in times of critical importance to the nation.
- Leave consistency provision as is, but remove OCS oil and gas moratoria. While this would address only one industry and is not really a CZMA specific matter, it has been a matter of concern and would address the need to increase domestic sources of energy. This could also be combined with geographic limitations on the reach of federal consistency on the OCS and/or allowing states to "opt-out" of OCS oil and gas activities off their coasts, as suggested by H.R. 4761.
- States could choose to identify certain offshore areas for increased use. Permittees requesting permits in that area could get a streamlined process or be exempted from the consistency review in that zone.
- Other questions or possible approaches?

List of Acronyms Used

CELCP	Coastal and Estuarine Land Conservation Program
CEQ	Council on Environmental Quality
CICEET	Cooperative Institute for Coastal and Estuarine Technology
CoBRA	Coastal Barrier Resources Act
CO-OPS	Center for Operational Oceanographic Products and Services
CRS	Community Rating System
CSC	NOAA Coastal Services Center
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
CZMA	Coastal Zone Management Act
DOI	Department of the Interior
EPA	Environmental Protection Agency
GIS	Geographic Information Systems
ICOSRMI	Interagency Committee on Ocean Science and Resource Management
JSOST	Joint Subcommittee on Ocean Science and Technology
LNG	liquefied natural gas
MMS	Mineral Management Service
NCCOS	NOAA's National Centers for Coastal Ocean Science
NEPA	National Environmental Policy Act
NERRS	National Estuarine Research Reserve System
NGO	Non-governmental organization
NMFS	National Marine Fisheries Service
NMSP	National Marine Sanctuary Program
NOAA	National Oceanic and Atmospheric Administration
OAP	U.S. Ocean Action Plan
OCRM	NOAA's Office of Ocean and Coastal Resource Management
OCS	outer continental shelf
OMB	U.S. Office of Management and Budget
SIMOR	Subcommittee on Integrated Management of Ocean Resources
USCOP	U.S. Commission on Ocean Policy
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey