
THE COASTAL ZONE MANAGEMENT ACT

Developing a Framework for Identifying
Performance Indicators

THE
HEINZ
CENTER

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Developing a Framework for Identifying Performance Indicators

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PREFACE

IN 1972, Congress passed the Coastal Zone Management Act (CZMA) to “preserve, protect, develop, and, where possible, restore or enhance the resources of the Nation’s coastal zone for this and succeeding generations.” It has been 30 years since the Act was passed. How are we doing? How well are we managing our nation’s coastal resources? Have we achieved a harmonious balance between use and conservation? If so, what has worked, and if not, are we making progress? Is the current set of policies and tools at all levels of government—federal, state, and local—sufficient to enable coastal managers to meet the needs of the public? Are the nation’s state coastal programs working? Are we receiving appropriate benefits for our time and effort?

To answer these questions, NOAA’s National Ocean Service (NOS) commissioned The Heinz Center to embark on an 18-month study to identify shared national and state coastal resource goals, based on the objectives of the CZMA, and to design a framework for effective measurement of outcomes using performance indicators. The goal of this study was to develop a framework, rather than a detailed set of specific indicators. This report is the result of the study, and we believe that the framework outlined will help federal, state, and local coastal managers improve their stewardship of the nation’s coastal resources.

We recognize and acknowledge the support received for this project. The National Oceanic and Atmospheric Administration’s National Ocean Service provided both financial support and in-kind services. Cheryl Graham, an NOS coastal management program analyst, was detailed to the Center to serve as project manager. We also appreciate all the efforts of The Heinz Center in providing mentoring, advice, and hospitality throughout the life of the project. To mention all the individuals who assisted us by reviewing the draft documents, by making constructive comments, and by participating in various meetings and telephone calls would be a monumental task. These efforts were greatly appreciated and improved the report and our understanding of local needs, and many are listed in the Acknowledgments on page xi.

However, we must single out some contributors here for their assistance in organizing the two state constituency meetings, a vital aspect of this project. Much appreciation goes to Gwynne Schultz, Director of the Coastal Zone Management Division of Maryland’s Department

of Natural Resources, and her staff and to Jeb Boyt, Director of the Coastal Management Division of the Texas General Land Office and his staff: their efforts were key to the success of the Maryland and Texas meetings. State constituency meeting participants from industry, academia, all levels of government, and nongovernmental organizations gave guidance, insightful commentary, and the benefit of their expertise. The feedback received from these meetings was most valuable. The NOAA/EPA Chesapeake Bay Office in Annapolis and Texas A&M University in Corpus Christi provided the sites for these meetings.

NOAA's National Ocean Service also enabled us to present our study in progress and obtain feedback at its 2002 Annual Ocean and Coastal Program Managers' Meeting. This resulted in constructive comments and suggestions by highly knowledgeable experts from the U.S. coastal zone management community.

Finally, we extend our gratitude to the study panelists from the four sectors who contributed their time and knowledge in developing and reviewing the various drafts of this framework. This report could not have come to fruition without them.

We are indebted to all these contributors and thank them for their efforts on behalf of this project. We share with them a dedication to finding a better future for the management of our nation's coastal resources.

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PART I

Developing a Framework



THE HEINZ CENTER STUDY

THE OBJECTIVE OF THIS HEINZ CENTER STUDY was to develop a framework for identifying indicators to assist NOAA's National Ocean Service in its task of establishing a national performance measurement system for the nation's coasts. Designing such a measurement system is complex. The success of the Coastal Zone Management Act (CZMA) lies in the broad goals and objectives of the Act and the opportunity it affords coastal states to develop individualized programs that address their own specific needs. Thus, measuring the effectiveness of the CZMA at the *national* level is challenging.

The Heinz Center assembled a panel of experts with a wide range of background and experience in the management of our coasts. As in all Center studies, panel members were drawn from industry, environmental organizations, government, and academia. The panel, working with Heinz Center staff, developed a *framework* for identifying performance indicators, rather than choosing a set of specific indicators. The framework consists of six focus areas based on the objectives of the CZMA: coastal ecosystems and populations, coastal water quality, public access, coastal hazards, coastal community development, and coastal-dependent uses. Each focus area is further divided into three or four dimensions describing the types of indicators that need to be measured. This framework can be used to organize information at the national level, but it also provides the flexibility for state decision makers to shape a performance measurement system to assess their own programs' effectiveness.

In the next chapter, we briefly describe the need for and value of performance indicators for the CZMA and its programs and explain how the study was conducted. Terminology is defined to assist the reader in understanding how the panel used terms. We also describe the importance of the state constituency meetings as means of providing input for the future implementation of a framework on a national basis. Six shared national and state coastal resource goals or focus areas, based on the objectives of the CZMA, are identified. The chapter concludes with the panel's findings and recommendations for implementing the framework.

Part II contains the substance of the panel's deliberations. In this chapter, the six focus areas of the framework are described in detail.

Three appendixes provide the reader with further information about the CZMA, the state constituency meetings, and the members of the panel.

DEVELOPING A FRAMEWORK

IN 1972, Congress passed the Coastal Zone Management Act (CZMA) to “preserve, protect, develop, and, where possible, restore or enhance the resources of the Nation’s coastal zone for this and succeeding generations.”¹ The guiding principle of the Act is to manage and use coastal resources wisely while maintaining economic prosperity.

Thirty years have passed since the Act was signed into law. During this time, the federal government has supported the development and implementation of coastal zone management programs in 34 of 35 eligible coastal states and territories covering 99 percent of the nation’s coastal areas, as well as the establishment of 25 National Estuarine Research Reserves. Included in each coastal program are mechanisms to improve cooperation and coordination among state agencies and with other levels of government and the public. The Act did not, however, require or establish the means to systematically measure the progress of the state coastal programs in achieving the Act’s objectives to preserve, protect, and develop the resources of the coastal zone. Rather, the Act outlined national objectives, which promoted both resource conservation and economic development, and granted states broad discretion in developing plans to meet those objectives.²

After 30 years, Congress, the Administration, coastal resource decision makers, and the general public still have questions: How well are we managing our nation’s coastal resources? Have we achieved a harmonious balance between use and conservation? If so, what has worked, and if not, are we at least making progress? Is the present set of policies and tools at all levels of government—federal, state, and local—sufficient to enable coastal managers to meet the needs of the public? Are the nation’s state coastal programs working? Are we receiving appropriate benefits for our time and effort?

Coastal development, habitat protection, port vitality, erosion, sea level rise, and public access to beaches are but a few of the issues facing our nation’s coastal resources, communities, and industries. Coastal managers must be able to assess the status and trends of coastal resources and communities effectively and efficiently, set goals for the protection, maintenance, and improvement of resources, and monitor the success of management strategies. Measuring the performance of management decisions to deal with increased pressures is vital to the well-being of coastal areas.

Quantitative evaluation of the impacts of the CZMA is difficult at best. The goals of the CZMA reach well beyond its immediate jurisdiction, in terms of both geographic area and program responsibility. State coastal management programs often work best in partnership with other agencies, including federal, state, and local governments, as well as private and nonprofit organizations, to achieve common goals and objectives. These partnerships often lead to a leveraging of funding and resources that cannot be readily measured or tracked, adding to the inherent difficulty of using performance indicators for coastal management. However, much information can be gathered on the status and trends of coastal concerns such as coastal population, wetland loss and restoration, and beach visitation on a local, regional and national basis. This information can demonstrate how the individual state programs are performing.

THE VALUE OF PERFORMANCE MEASURES

A common practice in the private sector, performance-based management is becoming a more acceptable means of maximizing benefits to the public and increasing government efficiency. Nationally and internationally, assessment of program performance provides accountability and measures the progress of government-funded programs. In 1993, the Government Performance and Results Act (GPRA) was enacted; it requires federal agencies to undertake efforts to measure their performance and the effectiveness of their programs. GPRA requires federal agencies to develop strategic plans describing their overall goals and objectives, annual performance plans containing quantifiable measures of their progress, and performance reports describing whether the goals, standards, and measures are being met.

In accordance with GPRA requirements, NOAA participates in annual strategic planning and budgeting process for developing performance measures. On the other hand, GPRA-required strategic planning and goal setting is at a very high level. For example, in FY1999 the objective of protecting ocean and coastal resources included four performance measures. One was the “protection or restoration of 43,000 acres of coastal habitats.” The other three measures focused on fisheries. As a tool for the Agency as a whole, performance measures have been useful and successful.

In 1997 the Department of Commerce (DOC) Inspector General reviewed the Coastal Zone Management program and concluded that “only anecdotal evidence” could be cited “to demonstrate the accomplishments of the CZM program.” Furthermore, “states have been unable to measure or evaluate ‘on the ground’ outcomes of the CZM program because the data necessary to make these decisions has not been collected.” To remedy this, the Inspector General recommended that NOAA “develop a strategy to measure the effectiveness of the CZM program.”³

To meet the DOC’s Inspector General’s recommendation, NOAA commissioned a comprehensive study of the effectiveness of state coastal programs; the results of that study were

published in the spring of 1999. Researchers concluded that state CZM programs were effective in implementing only a limited number of the CZMA objectives. However, they did not reach this conclusion by examining outcomes. Instead, they relied primarily on assessments of policies, processes, and tools. The researchers stated that “there are insufficient data for systematic, outcome-based performance evaluation of state CZM programs, largely because of the lack of a common set of outcome indicators that would link state management activities and decisions to national CZMA objectives.”⁴ They recommended that such indicators be developed and that Congress amend the CZMA to require a national outcome monitoring and performance system.

In December 2001, during the 107th Congress, Congressman Gilchrest introduced the Coastal Resources Conservation Act of 2001 (HR 3775), to amend and reauthorize the CZMA of 1972. A new provision was included in this draft legislation that directs “the Secretary of Commerce . . . [to] submit a common set of measurable outcome indicators to evaluate the effectiveness of State coastal zone management programs in the achievement of the national policy declared in section 303 of the Coastal Zone Management Act of 1972 . . .” and “. . . establish a national coastal zone management outcome monitoring and performance evaluation system using the common set of indicators prepared. . . .”⁵ The bill was referred to the House Committee on Resources, where the Subcommittee on Fisheries Conservation, Wildlife and Oceans held a hearing. In February 2002, the subcommittee forwarded the bill to the full committee. No committee action was taken.

Noting the interest of Congress, the trend toward using performance measures for government-funded programs, and the value of such a system, NOAA decided to actively pursue a study to establish a national performance measurement system. To this end, NOAA enlisted the help of The H. John Heinz III Center for Science, Economics and the Environment.

DESIGN OF THE STUDY

In July 2001, The Heinz Center, working closely and in cooperation with NOAA’s National Ocean Service, embarked on an 18-month study to identify shared national and state coastal resource goals, based on the objectives of the CZMA, and to design a framework for effective measurement of outcomes using performance indicators. The goal of this study was to develop a framework, rather than a detailed set of specific indicators. Within the framework, coastal managers can choose indicators that provide information on local, regional, and national trends and on issues affecting their interests on the coast. Using such information, coastal managers can improve internal program management, showcase their accomplishments, and identify potential needs specific to their programs.

To undertake this study, The Heinz Center created a panel of 15 knowledgeable individuals from industry, academia, all levels of government, and the environmental community. The full panel met four times, identified the issues to be examined, prepared focus area

papers, and participated in two state constituency meetings. In addition, several small-group panel meetings were held on particular subjects, and a discussion Web-board was used to develop concepts, share views, and solicit comments.

Because the goals of the CZMA are many—and state-to-state variations in natural, economic, and social environment are considerable—NOAA and the states face a difficult challenge developing a manageable number of indicators useful for national synthesis and evaluation. As a first step, the panel reviewed the current performance measurement literature and was briefed on performance measure activities taking place in the U.S. Environmental Protection Agency, New Jersey, Florida, and The Nature Conservancy. NOAA, the lead agency charged with administering the CZMA, provided an overview of the national coastal program. Finally, Professor Marc Hershman, lead author of the 1999 Coastal Zone Management Effectiveness Study,⁴ provided the panel with insight on that earlier study.

Using the CZMA, specifically Section 303, as a guide, the panel identified six focus areas or major goals: coastal ecosystems, coastal water quality, coastal hazards, public access, waterfront development, and water dependency. Although additional goals are mentioned in Section 303, the panel felt that these six broad-based focus areas captured the major objectives of the Act and, more important, that the success or failure of these objectives could and should be measured. The panel also recognized that there were a number of objectives that were not identified as focus areas, such as public participation and government coordination. These objectives, and others of this nature in Section 303, were considered tools or strategies used by coastal programs to achieve the CZMA goals or focus areas, rather than independent objectives.

Finally, the panel was acutely aware that not all activities that affect the coast are under CZMA jurisdiction or even that of NOAA or the state agencies that administer the state coastal management programs. Thus, failure to meet the goals of the CZMA is not necessarily an indication of a poorly functioning CZM program. Nevertheless, the panel stressed the need to develop indicators that, as much as feasible, focus directly on the goals and objectives of the CZMA, rather than on the tools and strategies to achieve them. The resulting framework is considered by the panel as a starting point for NOAA and the states to collaborate in the identification of specific performance indicators.

THE VOCABULARY OF THE REPORT

Although the concepts of performance measures and performance-based management are widespread, there is no standard vocabulary. This section defines the terms used throughout the remainder of the report.

The panel's task was to design a *framework* to help NOAA and the states identify a common set of indicators. The report presents a framework to assist NOAA and the states in identifying a set of *performance indicators* to help them with the task of more effective coastal zone

management. *Performance indicators* are sometimes called *performance measures*, or merely *indicators*. *Indicators* are objective descriptions of a particular aspect of our natural, economic, or social environment. A set of *performance indicators* will typically describe those aspects of the natural, economic, and social environment that we not only care about, but that we also manage in some way. Thus, a set of *performance indicators* is typically chosen to provide information about the state of something we care about (for example, how clean the water is) as well as information to help evaluate whether management actions (in this example, water pollution regulations) are achieving the intended water quality goals.

As described above, the panel agreed that any set of indicators must fully address six major goals, or *focus areas*, of the CZMA: coastal ecosystems, such as wetlands; coastal water quality; public access to the coast; the effects of coastal hazards; coastal community development; and coastal-dependent uses, such as fishing and shipping. Within each of these six focus areas, the panel identified three or four *dimensions*, specific categories of concerns that must be characterized for a complete description of the focus area. Just as length, width, and height can describe the size of a box, each of the *focus areas* needs to be characterized by its several *dimensions*. Thus, for example, the coastal water quality focus area has three dimensions: pollutant inputs, water and sediment conditions, and ecosystem effects. The result was the framework on page 19, which consists of six focus areas and 20 dimensions. Using the framework as a guide, NOAA and the states can select specific indicators for each of the focus area's dimensions.

STATE CONSTITUENCY MEETINGS

Once a working framework was in place, the panel held constituency meetings in two coastal states, Texas and Maryland, to “ground truth” the recommended framework and focus areas. These two states were selected because of their distinctive coastal regions, different lengths of time of participation in the federal program, and differences in coastal issues and priorities. The Maryland Coastal Program received federal approval in 1978, whereas the Texas Coastal Management Program is relatively new to the system, having received federal approval in 1997. Both programs are networked, with the lead state agency for the coastal program providing coordination among other state agencies and local governments with responsibilities for coastal management. Both programs provide technical and financial assistance to state agencies, local governments, universities, and nonprofits to help meet the goals and objectives of the CZMA. Both receive similar amounts of CZMA federal funds (based on a formula that includes population and length of coastline). Many of the state programs, including Maryland's, expend most of their federal funds on staff salaries and administration of the program. Texas is unique in that approximately 90 percent of the federal CZMA funds received by the Texas Coastal Management Program are provided directly to coastal communities for projects, with the remaining 10 percent retained for administrative purposes.

At the two constituency meetings, individuals from the four sectors—academia, government at all levels, environmental organizations, and industry—participated and provided feedback on the proposed framework. Several panel members and project staff also attended. Featuring small groups of participants with diverse views, the meetings provided an opportunity for frank dialogue and exchange of ideas. Discussions concentrated on the focus areas, and participants were asked questions such as: “Are we measuring the right things?” and “Is it reasonable to develop and provide indicators for these dimensions?” and “Is there anything that has been omitted?”

The meeting participants identified a number of benefits that could be achieved through a national performance measurement system, including better planning and allocation of resources and the ability to document the programs’ successes and challenges to government officials, Congress, state legislatures, and the public. Participants at both meetings agreed that the availability of environmental, economic, and programmatic data collected expressly to measure an indicator would result in improved management and accountability. The participants also noted that implementation of a national reporting system would require a commitment of fiscal and human resources.

Many participants focused on whether and how the data collected would be used. They were emphatic that data collected must both be accurate and correlate to specific management goals. In some cases, data now being collected are not useful in furthering program goals.

Participants noted that numerous organizations, both public and private, are now collecting coastal resource data. Water quality parameters, including water depth, temperature, salinity, dissolved oxygen, turbidity (cloudiness or clarity), and pH, are examples of data being collected at sites in NOAA’s National Estuarine Research Reserve System and by numerous citizen groups through programs such as the Environmental Protection Agency’s National Estuary Program. The participants identified a need for a coordinated effort to compile the coastal resource data now being collected by multiple resource agencies and organizations. Optimizing the use of these resources can assist in the establishment and implementation of a national performance measurement system and further promote collaborative efforts.

Participants at both meetings noted the need for NOAA to recognize that the 34 coastal programs are highly variable; they emphasized that any reporting system established must be flexible enough to accommodate different state priorities, data availability, and training needs. Some participants shared their concern about the possibility of being penalized, especially fiscally, for what may be perceived as nonperformance in those areas that lie beyond the control or jurisdiction of state coastal management programs. Given the complexity of coastal management and the often-conflicting objectives of conservation and use of resources, success in one measure may lead to failure to achieve the objective of another measure.

Participants felt that state and local governments, communities, and other stakeholders must be involved in the development and implementation of a national performance measurement system. This collaboration will result in a viable and useful mechanism for

reporting on the state of the coast that can be used locally as well as nationally. Furthermore, having the capability to measure state program performance individually, as well as to evaluate overall national system performance, will provide accountability and will be most helpful in identifying trends in coastal resource management. Many participants agreed that such a system would provide a snapshot of the status of the nation's coastal resources and would assist in appropriately directing fiscal and human resources.

Finally, participants at both meetings made a number of suggestions on how to refine the proposed framework and as a result, some modifications were made. Appendix B includes a list of participants, agendas, and comments received for each meeting.

FINDINGS AND RECOMMENDATIONS

The panel's findings and recommendations follow:

Finding 1 The CZMA created a network of federal–state partnerships and voluntary programs that seek to balance economic prosperity and environmental quality along the coast. However, even 30 years after passage, we still lack quantitative knowledge of the overall state of the coast. We cannot evaluate the effectiveness of the CZMA and the federal–state network it has fostered. Instead, our information about the value and contribution of the CZMA program is largely anecdotal. Embracing a system of performance measures will provide both accountability for the program and a much-needed portrait of the condition of our coasts.

■ **RECOMMENDATION 1** Congress, during the reauthorization of the Coastal Zone Management Act, should require NOAA to develop a common set of measurable outcome indicators that will help coastal managers evaluate the effectiveness of state coastal management programs in achieving the national policy goals established by the Act.

Finding 2 In this report, the Heinz Center panel, in cooperation with NOAA, has developed a methodology to better equip NOAA and state coastal managers with the tools to monitor progress in coastal resource management. Using the shared national and state coastal resource goals articulated in the objectives of the CZMA, a framework was developed to measure outcomes effectively using performance indicators. This framework can be used to organize information on local, regional, and national trends affecting the coasts. It is designed to help coastal managers improve the operations and effectiveness of state programs and identify the accomplishments and needs of individual state programs.

The framework offers a flexible basis for establishing a national performance measurement system for our coasts. The framework includes six focus areas that are based on the major objectives of the Act. Each focus area is further subdivided into three or four key dimensions. These provide an organized method to identify the types of indicators that should be measured. The format of the framework specifies the breadth of the important

characteristics that need to be measured, yet provides NOAA and state coastal management programs with the needed flexibility to develop specific indicators useful to their management needs. Finally, many of the broad focus areas in the framework are affected not only by the CZMA but by many other federal and state programs that manage the coast as well. Thus, while such a system can identify if the goals of the CZMA are not being met, it cannot always identify whether that failure is due to the coastal management programs.

■ **RECOMMENDATION 2** NOAA, working with the coastal states, should use the framework and dimensions developed within this report to identify performance indicators.

Finding 3 For the past 30 years, evaluation of the CZMA has been process-oriented and has not provided basic information about the state of the United States' coasts. Because CZMA established a coordinated federal–state program that took into account the unique contributions that federal, state, and local entities make to achieving the objectives of the CZMA, the evaluation of administrative processes was an important first step in measuring success of the Act. Permitting systems, public participation, and planning are valuable process-type measures for effective coastal management. However, now that partnerships among federal, state, and local governments have been solidified, it is time to implement a performance-based measurement system that can effectively measure outcomes.

■ **RECOMMENDATION 3** NOAA, working in cooperation with state coastal managers, should identify indicators that emphasize outcomes as well as effective processes.

Finding 4 Federal policymakers need to know how well the major goals of the CZMA are being achieved at the national level. While state coastal management programs differ, NOAA can identify the common goals found in most state coastal management programs and the CZMA and identify a number of indicators that should be measured nationally. The panel recognizes that some indicators may be regionally specific; however, most of the selected indicators should be able to be measured and reported nationally.

■ **RECOMMENDATION 4** So that national progress towards meeting the goals of the CZMA can be evaluated, NOAA and state coastal management programs must develop a subset of indicators that can be measured by all, or at least most, state coastal programs and thus can be aggregated nationally.

Finding 5 Federal and state collaboration is at the heart of the CZMA and must be used to develop the common slate of indicators.

■ **RECOMMENDATION 5** NOAA should strive to involve local governments, communities, and other stakeholders in the development and implementation of a national performance measurement system. This collaboration will result in a viable and useful report on the state of the coast that can be used locally as well as nationally.

Finding 6 Many organizations, including federal, state, and local government agencies, industry and nonprofit organizations' programs, are now devoted to collecting coastal resource data. Optimizing the use of these resources can assist in the implementation of a national performance measurement system and can further promote collaborative efforts. However, to measure change effectively, a data collection system will need to be continuous and long-term—that is, it must provide consistent and repetitive monitoring. Collection of performance information over time will help NOAA, state, and local coastal decision makers understand how to respond to changes and how to manage coastal resources effectively and efficiently.

■ **RECOMMENDATION 6** To help managers understand change and the underlying causes of change, information critical to evaluating coastal performance measures should be collected periodically over the long term in order to identify trends. To make the best use of limited resources, NOAA and the states should explore nongovernmental sources of data as well.

Finding 7 Funding will be necessary to support federal and state efforts to implement the framework, collect and evaluate data, identify gaps, and establish reporting requirements that can be used to develop a synthesized picture of national progress on a routine basis. Information from federal, state, and local agencies, industry, and nonprofit organizations that are now collecting coastal resource data will form the core of a national performance measurement system and will need to be coordinated. Moreover, additional monitoring will be needed to effectively measure changes in the state of our coasts.

■ **Recommendation 7** Congress will need to identify funds to support implementation of the framework for identifying specific performance indicators and to support the additional monitoring that will be required to ensure a rigorous and robust system.

PART II

The Framework

THE FRAMEWORK: FOCUS AREAS AND DIMENSIONS

AFTER CONSIDERING THE CZMA'S suite of objectives and reviewing state program activities, the panel selected six major national and state coastal resource goals, or focus areas:

- Coastal ecosystems and populations
- Coastal water quality
- Public access
- Coastal hazards
- Coastal community development
- Coastal-dependent uses

These six focus areas are intended to encompass the breadth of coastal management activities and to provide a means of determining the results of management efforts. The six focus areas, together with the dimensions associated with each one, make up the framework (see page 19) for identifying performance indicators that was the goal of this study.

However, the interrelatedness among the focus areas is as important as the individual activities that fall under a single focus area. Sometimes goals conflict—for example, encouraging access to areas that have sensitive resources that need protection. In other words, sometimes a goal can be achieved only at the expense of another goal.

Other goals may be complementary. For example, water quality is closely linked to many of the other objectives laid out in the Act. Coastal community development, public access, and coastal-dependent uses all benefit, either directly or indirectly, from the protection of water quality. Similarly, the ways in which these activities are carried out or managed have consequences on the quality of coastal water. Coastal hazards are managed in part so as not to harm water quality, and the objective of protecting coastal ecosystems and populations cannot be met without high-quality water. Achieving coastal water quality objectives is dependent upon a broad, integrated coastal management effort that takes into account that the objectives of the CZMA are, in fact, interdependent.

While one critical goal of performance measurement is to identify the national impact of coastal management, we must also recognize that each state has its own coastal management goals and priorities. It may therefore be difficult to identify a single set of measures for each focus area that would be appropriate for all states. However, common goals can be found in most state coastal management programs and the CZMA, thus allowing for the identification of a number of indicators that could be identified and measured nationally. A successful performance measurement system will need to assess the national or collective impact of program efforts while allowing for regional, state, and local variations in conditions and priorities. The six focus areas, or major coastal resource goals, identified by the panel, will provide an assessment of the nation's coasts. However, attributing success or failure to the CZMA may be difficult.

Successful coastal zone management requires comprehensive and active participation by public and private interests. State coastal management programs strive to coordinate and simplify procedures and give timely notification of and opportunities for public and local government participation in decision management. Through the CZMA, specifically Section 303(2)(G–K) and Section 303(3–6), states are provided with these types of tools and strategies, both regulatory and nonregulatory, to address coastal issues. Within the framework specified for each focus area, the panel recognized that public participation (meetings, education, and outreach) and regulatory (permit streamlining) and nonregulatory (establishing special area management plans or areas of particular concern) processes are appropriate strategies used by coastal decision makers to achieve the desired outcomes.

The panel recognizes the diversity of the 34 approved state coastal programs. However, we also recognize that the basic premise of the CZMA, its goals and objectives, is the basis of each of the 34 state coastal management programs. Therefore, NOAA, working with the state coastal programs, should be able to identify a number of indicators that can be measured nationally. The panel recognizes that while some states may need indicators that are region-specific, indicators deriving from the six focus areas should be able to be measured in each state. Experience in Texas and Maryland tells us that data for some focus area indicators are already being collected. A means of synthesizing this information, on a national level, is the missing element.

In the following chapters, each focus area is defined by

- Background information that highlights the importance of the focus area and its linkage to CZMA objectives.
- Strategies or process-type actions used by state coastal decision makers to affect the coast in such a way as to attain the goals and objectives of the Act.
- A set of dimensions (an organized method to identify the types of indicators that should be measured) and example indicators. The example indicators provide a better understanding of what is envisioned for each dimension.

FRAMEWORK FOR IDENTIFYING PERFORMANCE INDICATORS

Focus Area	Dimensions
Coastal Ecosystems and Populations	<ul style="list-style-type: none"> ■ Size ■ Condition ■ Landscape context
Coastal Water Quality	<ul style="list-style-type: none"> ■ Pollutant inputs ■ Water and sediment conditions ■ Ecosystem effects
Public Access	<ul style="list-style-type: none"> ■ Types of resources for access ■ Right to use ■ Access points ■ Quality of experience
Coastal Hazards	<ul style="list-style-type: none"> ■ Hazard identification ■ Vulnerability ■ Mitigation ■ Land use, infrastructure and transportation planning
Coastal Community Development	<ul style="list-style-type: none"> ■ Environment and land use ■ Economic ■ Public investment and infrastructure
Coastal-Dependent Uses	<ul style="list-style-type: none"> ■ Planning and management mechanisms ■ Economic health ■ Efficiency and redevelopment



COASTAL ECOSYSTEMS AND POPULATIONS

THE CZMA [§303(2)(A)] calls for

the protection of natural resources, including wetlands, floodplains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat, within the coastal zone.

The Act recognizes that the coastal ecological systems of the United States—from the kelp beds of the Bering Sea to the marshes of Louisiana to the reefs of Florida and Hawaii—contain a significant and under-recognized element of this nation’s biological diversity, i.e., biodiversity. The diversity contained and sustained within these ecosystems includes manatees, sea turtles, seahorses, otters, hermit crabs, and numerous unnamed species. These nearshore ecosystems also provide the vital nutrients that support many terrestrial species, from shorebirds to bears. Salmon drive marine nutrients up into the mountains of the Continental Divide. Along with their ecological value, the economic value of these habitats and ecosystems is becoming better recognized. Commercial fisheries alone are a \$3.6 billion-a-year industry in the United States.⁶ These habitats also provide other undervalued ecosystem services. For example, estuaries, seagrasses, and marshes are known to provide ecosystem services such as food production, recreation, and nutrient cycling.⁷

The CZMA also recognizes [§302(c)] that

the increasing and competing demands upon the lands and waters of our coastal zone occasioned by population growth and economic development . . . have resulted in the loss of living marine resources, wildlife, nutrient rich areas, permanent and adverse changes to ecological systems.

Coastal ecosystems and populations are being degraded and lost at alarming rates. Indeed, it has been noted that estuaries may represent the most anthropogenically degraded habitats on earth.⁸ In the U.S., coastal counties make up only 11% of the land area in the lower 48 states, but population density in coastal counties is nearly five times that of the rest of the country.

The effects on biodiversity and productivity are substantial. Already more than 90% of marshes have been destroyed along some of our coastlines. Extensive loss of seagrass beds in critical locations such as Florida Bay in south Florida and Galveston Bay along the Texas coast threatens not only essential feeding, nursing, and spawning grounds for many fish species, but also important habitat for turtles, manatees, migratory waterfowl, and shorebirds. Louisiana has seen some of the greatest loss of coastal ecosystems: in the last century there was a net conversion of 4000 square kilometers of wetland to open water.⁹ The loss rate peaked at about 108 square kilometers of wetland habitat per year during 1958–1974, but loss continues at about 66 square kilometers per year.¹⁰ By 2025, 75% of the United States population is expected to live within 50 miles of the coast.¹¹ With this growth, coastal ecosystems will be increasingly threatened by development, shoreline modification, and increased harvesting pressure.

The two excerpts from CZMA above show that the Act clearly calls for the protection of “ecological systems” (i.e., ecosystems) plus “fish and wildlife” (i.e., species) “and their habitats.” The concepts of ecosystems and populations broadly cover these areas of concern. The Act requires that we conserve, manage, and restore coastal ecosystems and populations. In order to do this effectively, we must measure the success of our actions towards conservation, management, and restoration. The continued losses and threats to coastal ecosystems and populations demand that we reexamine our strategies and examine CZMA effectiveness by directly measuring outcomes on coastal ecosystems and populations. Those strategies that are working should be recognized and promoted. Where strategies are not working, they should be eliminated, modified, or replaced by new ones that will be more effective. Only by consistent, continuous measurement of outcome indicators of performance can we differentiate between effective and ineffective strategies.

DIMENSIONS OF COASTAL ECOSYSTEMS AND POPULATIONS

This section presents the panel’s guidance on how to measure success in meeting the CZMA’s goals for protecting natural resources within the coastal zone. The chosen indicators should help gauge the effectiveness of the two categories of management decisions and activities commonly used: those that strive to protect and maintain healthy coastal ecosystems and populations and those that attempt to restore degraded ecosystems and heavily impacted populations while recognizing the increasing and competing demands upon these land and water resources. These goals are not always easy to meet, but failure will not secure a legacy for future generations.

The set of indicators will need to cover three different dimensions of coastal ecosystems and populations: size, condition, and landscape context. The dimensions represent very different aspects of the ecology of the ecosystems and populations.

SIZE

Size indicators measure the acreage of various ecosystem types or the abundance of the populations. They may simply be measures of patch size or geographic coverage. For animal and plant species, they may take into account the area of occupancy and number of individuals. Other common names for this dimension include quantity, extent, or inventory.

Dimensions of Coastal Ecosystems and Populations

Size
Condition
Landscape context

CONDITION

Indicators of condition measure the composition, structure, and biotic interactions that characterize populations and ecosystems. These include factors such as reproduction, age structure, biological composition (e.g., presence of native versus exotic species or percentage live coral cover), physical and spatial structure (e.g., canopy and understory in a kelp ecosystem), and biotic interactions that directly involve the target (e.g., competition, predation, and disease). Other common names for this dimension include quality and health.

LANDSCAPE CONTEXT

Indicators of landscape context measure, first, the dominant environmental regimes and processes that establish and maintain the populations and ecosystems and, second, connectivity between populations and ecosystems. Dominant environmental regimes and processes include hydrologic and water chemistry regimes (e.g., salinity), geomorphic processes, climatic regimes (e.g., temperature and precipitation), and many natural disturbances. Considerations for connectivity include connections between nearshore and offshore waters (e.g., for larval influx to nearshore habitats and for offshore migrations of species from nearshore nurseries), fragmentation of ecosystems, and the connections between estuaries and their watersheds. Another common, but not inclusive, name for this dimension is fragmentation.

STRATEGIES

True success for coastal ecosystem and population goals can be measured only by the direct outcomes on natural ecosystems and populations. Programs can also evaluate efforts made to meet these goals by assessing the process or strategies that are put in place. Implementation of strategies or programs, however, is no guarantee that the goals for protection of ecosystems and populations will be achieved. Strategies and programs include projects to restore natural systems such as wetlands and oyster beds, establishment of marine protected areas, and monitoring programs that count species, such as fish or eelgrass coverage.



COASTAL WATER QUALITY

GOOD WATER QUALITY is essential for healthy coastal ecosystems. Coastal water quality affects the amount and quality of habitat available for aquatic organisms and their ability to thrive. The condition of coastal water also affects commercial and recreational fisheries, as well as other human uses of the coast, such as boating and swimming.

Many coastal water quality problems result from the addition of pollutants to the water. These can be in the form of pathogens, toxic materials (both metals and organic compounds), suspended solids, oxygen-consuming organic matter, or nutrients. Addition of these materials can have adverse effects on coastal resources, and can result in beach closures, restrictions on fish and shellfish fishing, increases in harmful algal blooms, increases in hypoxic and anoxic events, and loss of habitat (e.g., seagrass dieback).

In recognition of the importance of maintaining coastal water quality for the economic vitality and biological health of the coastal zone, Congress included as one of the objectives of the CZMA [§303(2)(C)]

the management of coastal development to improve, safeguard, and restore the quality of coastal waters, and to protect natural resources and existing uses of those waters.

The CZMA also addresses water quality as part of the Coastal Non-point Source Pollution Control Program, which requires that each coastal state develop an enforceable non-point source pollution control program to restore and protect coastal waters with respect to their respective coastal areas (authorized by Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990).

Because poor water quality in coastal areas can result from events that occur across an entire watershed or airshed, and not just from inputs within the coastal zone, this issue clearly reaches far beyond the scope of most coastal management programs. In addition to the CZMA, both the Clean Water Act and the Clean Air Act address aspects of water quality, and numerous programs at the state, regional, and local levels focus on this issue. However, a recent study conducted by the National Research Council's (NRC) Committee on the Causes and Management of Coastal Eutrophication¹² pointed out that there is inadequate coordination

among different efforts to control nutrient input to coastal waters, and this is arguably true for other types of pollutants as well. The NRC report recommended the development of a comprehensive national strategy to address excess nutrient inputs and called for consistent measures of biological, physical, and chemical properties. We suggest that the performance indicators under development here can be used to meet these recommendations. Moreover, we recognize that we will not be in a position to evaluate water quality improvements without the resources to monitor coastal systems.

DIMENSIONS OF COASTAL WATER QUALITY

This section provides guidance on how to measure success in meeting the CZMA's goal to protect and improve coastal water quality. Success can be measured by the reduction in the amount of pollution entering coastal waters from land, the sediment, the atmosphere, and the ocean. Another facet of coastal water quality that should be measured is the effectiveness of efforts to protect and restore natural resources that help improve overall water quality along our coasts.

Dimensions of Coastal Water Quality

Pollutant inputs
Water and sediment conditions
Ecological impacts

The dimensions chosen highlight the linkages between pollutant inputs to the coast, water quality conditions within coastal systems, and

ecological impacts (in terms of the resultant consequences of changes in water quality to natural resources).

POLLUTANT INPUTS

This category allows us to examine changes in the sources and amounts of pollutants loaded to coastal systems. It recognizes that coastal water quality is a consequence of the amount and types of pollutants being added. This dimension can be subdivided in terms of both the source of the pollutant (whether it be from the land, the ocean, the atmosphere, or the underlying sediment; whether it is a point or non-point source; whether it is from a local or a distant area, etc.), as well as the type of pollutant (pathogens, toxic materials, sediment, nutrients, or organic matter). Examples of pollutant indicators include nutrient loads, combined sewer overflow incidents, and number of oil spills.

WATER AND SEDIMENT CONDITIONS

This dimension includes indicators that are direct measurements of changes in water quality. It includes measurements of different pollutants directly in the water and sediment as well as

indirect measurements (e.g., concentrations of toxic pollutants in fish tissue). Other indicators may include dissolved oxygen concentrations, Secchi depth measurements, and area of contaminated sediment.

ECOSYSTEM EFFECTS

This dimension includes measurements of the consequences of changing water quality on coastal resources. For example, loss of seagrasses would be measured directly rather than relying on such intermediate measures as nutrient concentrations. In this regard it is worth noting that the National Estuarine Eutrophication Assessment did not include a direct measurement of nutrient concentrations, since low concentrations could be the result of an increase in primary production.²⁵ Rather, they looked at the effects of concern, such as the incidence of harmful algal blooms and anoxic events. Additional indicators that measure consequences of changing coastal water quality include number of beach closure/advisory days, number of fish kills, number of harmful algal blooms, and number of acres of approved shellfish harvesting area.

STRATEGIES

There are a number of strategies that coastal management programs can use to achieve water quality goals. Participating in statewide or watershed-level programs geared toward improving water quality, coordinating information-sharing among agencies that monitor water quality, and setting up citizen monitoring networks and other education and outreach programs are programmatic activities that may lead to water quality change. Projects that work to avoid or minimize water quality impacts, such as fostering pollution prevention programs, promoting improved septic technology, or promoting best management practices (BMPs) for things like storm water in order to minimize pollutant loads also fall into this category.



PUBLIC ACCESS

THE CZMA STATES [§303(2)(E)]

It is the national policy . . . to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs . . . which programs should at least provide for . . . public access to the coasts for recreational purposes.

This mandate gave the states a much-needed tool to provide and improve coastal public access, but change came gradually. Between 1972 and 1984, the amount of public recreational lands along the coast increased by 27 percent—not enough to keep up with the increasing demand for such lands.¹³ Visitor data from federal and state parks on or near the coasts shows a dramatic increase in attendance over mid-1960s levels. The growing pressure on existing facilities has led to declining quality.

Access generally means the right to enter or to use, and thus public access means the right of the public to enter or to use. The obvious question left unanswered by this definition is “access to *what?*”

The mere presence of large bodies of water is obviously not enough to satisfy the public’s recreational needs. The waters must be open for use. That is, if people are not allowed to use them to swim, sail, travel, fish, etc., then the value of the coast is severely limited. But even if the waters are open for use by the public, this solves only a part of the problem, since the public must be able to get to the water in order to use it. Thus the completed “public access” problem: there must be some place to seek access to, and there must be some means of access to it.

Adequate public access to the coastal zone varies from state to state and is largely dependent upon the area and physical characteristics of land in the coastal zone. Rocky New England shores may require different physical types of access compared to sandy beaches in Florida.

The quality of the water is also important. If the water is terribly polluted and unfit for use, the value of those waters is diminished. By the same token, if the access is inadequate in size, location, or amenities, the value of the waters for public use is diminished. The dimensions of public access are therefore: area by type, legal availability, access points, and quality of experience.

The issue of public access only gets more complicated when one considers how tightly correlated public access is with other goals of the CZMA. Many believe that as water quality increases along our coastal areas, so will demand for public access. And just as improvements in water quality may increase public use, this increased use will place additional pressures on water quality.

DIMENSIONS OF PUBLIC ACCESS

This section presents the panel's guidance on how to measure the success in meeting the CZMA's goal of providing public access to recreational resources. Success should be measured by the

Dimensions of Public Access

Types of resources for access
Right to use
Access points
Quality of experience

improvements in the amount and quality of access to natural, historical, cultural, and recreational coastal resources, while at the same time ensuring that these resources are not damaged or degraded. Another facet of access that should be measured is the effectiveness of efforts to increase public awareness of public access points while improving public awareness of the rights and responsibilities of resource users.

TYPES OF RESOURCES FOR ACCESS

Which coastal resources does the public want to use? This will vary from state to state and from place to place within states. The most obvious coastal resource that the public will want to make use of is water bodies: the ocean, the Great Lakes, estuaries, bays, sounds, rivers, etc. However, there are other resources that the public will want to use as well and in some cases will need to use in conjunction with their use of coastal waters, such as beaches. Additional coastal resources that the public may want to use include islands, coral reefs, promontories, dune fields, natural areas, dive sites, etc. This dimension inventories the types of resources that the public may want to use.

RIGHT TO USE

Does the public have the legal right to use these resources? This also varies from state to state and within states from resource to resource. For example, in most states the public trust doctrine assures the public of the right to use ocean waters from mean high tide seaward. However, the right to use the beach landward of mean high tide may rely on some variant of the public trust doctrine or on some completely different legal doctrine such as a constructive easement or on a statute such as the Texas Open Beaches Act which codifies the public's common law rights. In other cases, such as parks, the right to use the resource may have been obtained by

deed as an “exaction” during the development process or by purchase. This dimension examines the current legal framework existing in each coastal state.

ACCESS POINTS

Does the public have the ability to access or “enter” the resource? It is well and good for the public to know that they may legally swim in Lake Michigan, but it does them very little good if there is no way for them to get to the water. The Texas Open Beaches Act ensures that the Texas Gulf beaches are open for the public to use from the natural line of vegetation to the line of mean low tide. The problem of getting across the privately owned land that separates the beach from the road is the dimension that is addressed here. This dimension determines the extent to which the public can in fact use the coastal resources that the public has the right to use because they can “enter” them legally, without trespassing on private land. Several examples of indicators for this dimension are number of boat ramps, number of piers, miles of coastal trails, acres of public parks, and number of public view corridors.

QUALITY OF EXPERIENCE

This dimension embraces a number of factors that go beyond the legal right to “enter and use” a resource. It measures the most obvious quantitative elements such as signage, parking, facilities, and dune crossovers. But it should measure other qualitative elements as well, such as beauty, solitude, and preservation of coastal ecosystems and populations.

This dimension, perhaps the most difficult, attempts to measure the pleasure a diverse population derives from “entering and using” the coastal resources of the state. The dimension should recognize that for some visiting a crowded beach on the Fourth of July is a wonderful experience, while others would much prefer a less crowded beach even if they have to walk some distance for access. Indicators of the public’s satisfaction with the availability and quality of access may include number of restrooms, number of wheelchair-accessible sites, days of restricted access due to water quality, and parking capacity.

STRATEGIES

Strategies for improving access to coastal resources have traditionally focused primarily on access to beaches and other coastal waters. They have included the provision of grants to local governments for a variety of uses, such as identification of existing access points and unimproved rights-of-way, development of access plans, land acquisition, and small capital improvements. A number of states, including North Carolina, California, and Florida, have developed access signage programs and guidebooks to improve public knowledge of access points and the rules for using public resources without degrading them. A few states have addressed access to other resources, such as submerged archaeological resources and other cultural features.



COASTAL HAZARDS

THE COASTLINES OF THE UNITED STATES are vulnerable to a variety of natural hazards, including tropical storms, hurricanes, flooding, shoreline erosion, tornadoes, tsunamis, and wildfires. Tropical storms, hurricanes and flooding receive the most attention, especially in the southeastern United States. In 1992, Hurricane Andrew, a Category 4 storm, leveled communities in south Florida, killing 43 people and causing more than \$25 billion in damages, making it one of the most costly storm events in history.¹⁴ But a year never passes without some sort of storm event that causes damage to both public and private property.

Storm events and other natural occurrences are not the only threats to life and property in the coastal zone. Urban, industrial, and agricultural activities can generate hazards that can affect both coastal residents and ecosystems. These hazards include vessel accidents and groundings, material and oil spills, and other unintentional events.

A goal of the CZMA [§303(B)] is to

minimize the loss of life and property caused by improper development in flood-prone, storm surge, geological hazard, and erosion prone areas and in areas likely to be affected by or vulnerable to sea level rise, land subsidence, and saltwater intrusion, and by the destruction of natural protective features such as beaches, dunes, wetlands, and barrier islands.

Many programs have been put in place across the nation to encourage mitigation of the impacts of natural hazards and to promote public awareness of coastal hazards. To adequately mitigate the impacts of coastal hazards, several types of information are needed. First, the potential hazards must be identified and the geographic areas that are most vulnerable to each of the various hazards must be identified. Within each of these areas, one must then tally what is at risk—that is, the people, property, and other resources that might be harmed if one or more of the hazards identified were to occur. Finally, this information must be combined with the probability that such an event will take place in a particular area to understand the overall risk each community faces.

DIMENSIONS OF COASTAL HAZARDS

This section provides guidance on how to measure the success in achieving the goals of the CZMA related to coastal hazards. A central goal, of course, is to reduce economic losses and loss of life from hazard events. But because such events are so infrequent and sporadic, it is very difficult to judge progress from direct measurement of losses of life and property. It is possible, however, to track information about changes in the *potential* for harm. For example, one can measure changes in land area subject to hazards and changes in the population and property

Dimensions of Coastal Hazards

Hazard identification
Vulnerability
Mitigation
Land use, infrastructure,
and transportation planning

value in these high-hazard regions. Additional measures that may prove useful would address the implementation of programs to mitigate the impacts of coastal hazards, should they occur, and to improve public awareness of both the hazards themselves and the opportunities for mitigation. Similarly, it is helpful to track the adoption of specific land use control programs to decrease the number of structures and facilities vulnerable to hazards in coastal areas.

HAZARD IDENTIFICATION

Identification of the types of hazards that may affect a coastal area is an essential first step to management. Natural hazards may be coastal storms such as hurricanes and tropical storms or the impact of faraway events such as tsunamis. Other coastal areas are especially prone to earthquakes. Man-made hazards may be important alone or in combination with natural hazards. Examples would be oil or chemical spills from shipping or spills caused by hurricanes. Possible indicators for this dimension of coastal hazards include the geographic area subject to coastal or riverine flooding and the number and locations of facilities with hazardous chemical storage adjacent to coastal waters.

VULNERABILITY

Identifying the people, property, and other resources vulnerable to harm from coastal hazards is not an easy task. Past efforts have looked primarily at individual types of hazards—for example, mapping flood-prone areas and estimating the number of homes likely damaged from a 100-year (1 percent chance) flood. Recent efforts have attempted to map the vulnerability of areas to multiple hazards. Providing better information about the vulnerability of land and structures to a variety of coastal hazards and the risks involved may lead to better coastal management decisions. Example indicators for this dimension of coastal hazards include population in coastal high-hazard areas, number of miles of accreting or eroding beach, and number and value of structures in vulnerable areas.

MITIGATION

Property owners and government agencies mitigate the impacts of hazards in a number of ways, such as providing better standards for development (through building codes, for example) or relocating structures to a less hazardous location. These standards may range from providing better information to potential developers to adopting regulations to require certain construction practices. Mitigation includes a broad range of activities ranging from improving evacuation to early warning systems to mitigation planning and redevelopment planning. Indicators of mitigation efforts might include the percentage of building retrofits (hurricane shutters, elevation change, roofing reinforcements, flood-proofing) and the level of awareness (for example, through survey results) of coastal hazards and the availability of mitigation measures.

LAND USE, INFRASTRUCTURE, AND TRANSPORTATION PLANNING

The CZMA specifically identifies the role of management of coastal development to minimize loss of life and property from coastal hazards. Before an area is developed or redeveloped, a thorough analysis of the area can help to avoid inappropriate development in hazardous areas. All levels of government have some role in planning to reduce hazards.

For example, at the federal level, the National Flood Insurance Program reduces financial risks to homeowners but may also encourage development in hazardous areas. Thus the set of indicators under this dimension might include the percentage of insured structures.

State governments make crucial decisions related to coastal development, such as planning transportation facilities. These facilities may have both positive and negative impacts by providing improvements that may increase development but that may also increase the ability to evacuate in hazardous situations. Dollars of public investment in high-hazard areas is another possible indicator.

Local governments may actually control where development takes place through land use regulations, provision of infrastructure, and other mechanisms. The number of communities with current, approved mitigation plans (compared to the number of required to develop plans) is helpful to track.

All levels of government may participate in land acquisition programs to purchase lands for public use and to remove the possibility of unsuitable development. Thus, one might tally the number of acres acquired in hazardous areas to provide access, habitat protection, or mitigation.

STRATEGIES

Strategies for reducing the impact of coastal hazards on life and property have generally focused on two areas: reducing vulnerability to hazards and reducing the degree of harm when

a hazard strikes. Reducing vulnerability is typically a matter of planning and regulation aimed at keeping development out of hazardous areas. Strategies to reduce the degree of harm attempt to minimize the physical and financial impacts of hazards in areas known to be vulnerable.

Hazardous areas have been identified in a number of ways. Perhaps the most common method has been the mapping of flood-prone areas by the Federal Emergency Management Agency (FEMA). States have used a number of additional techniques, such as mapping of shoreline erosion rates and areas affected by storm surge.

A number of states have adopted regulations to reduce vulnerability to coastal hazards. Oceanfront setbacks and land use plans that recognize hazardous areas have been used in a number of states, including North Carolina, South Carolina, and Massachusetts. These efforts have used a number of methods to reduce vulnerability by keeping development and/or public investment out of areas that have been identified as vulnerable.

Additional efforts to reduce loss of life and property have focused on reducing the impacts of hazards by improving building construction standards or establishing programs to assist homeowners in vulnerable areas with retrofitting their structures to reduce damage from hazards.

The state of Florida established a program to provide assistance to all the coastal counties in preparing and adopting hazard mitigation plans. These plans identify areas that are vulnerable and thus could direct redevelopment away from them, or could identify capital improvements that would reduce damages from storms. Hazard mitigation plans are now required by federal law to be eligible for disaster assistance.

Efforts to reduce risk have been made by both private and public entities. The Federal Flood Insurance Program uses actuarial rates to transfer the costs of disasters from public disasters assistance programs to property owners. Lending institutions require mortgage holders to purchase flood insurance. Local governments have relocated and/or improved public infrastructure to reduce financial impacts of coastal hazards.





COASTAL COMMUNITY DEVELOPMENT

THE CZMA ENCOURAGES PROGRAMS [§303(2)]

. . . to assist the states with exercising their responsibilities in the coastal zone through development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone. . . .

The Act specifically encourages public participation and comprehensive planning.

In earlier decades, many coastal cities would typically see their populations rise and fall with the seasonal tides of the tourist—with beaches as the number-one tourist destination. In the past 15 years, however, what used to be seasonal resort towns have seen above-average year-round resident population increases and booming economies. Retirees and aging baby boomers who used to rent beach homes during the summer have decided to stay year-round. Improved technology and the economic boom of the 1990s also made the U.S. workforce more mobile. As people moved to coastal communities, so did more businesses and jobs.

This trend is most dominant along the eastern seaboard and the Gulf of Mexico. *USA Today* reported in July of 2000 that 100 coastal counties on the East and Gulf coasts grew on average almost 50 percent faster than the rest of the country.²⁶ According to NOAA, more than 53 percent of Americans now live in coastal regions that take up only 17 percent of the nation's land.¹⁵ The Pew Ocean Commission reports that approximately 50 percent of all new residential, industrial, office, retail, and recreational buildings are constructed in coastal areas.¹⁶

For a variety of reasons, including population growth and a lack of code enforcement, some areas are experiencing an increased number of improperly functioning septic systems. This, in turn, has meant increased waste loads seeping into local coastal waters and causing rapid algal growth and damage to some fisheries and recreational uses. Shellfisheries have been restricted due to high coliform levels, and numerous commercially valuable fish that begin their lives in the estuaries have had their life cycles disrupted. There is some natural ability of our coastal ecosystems to filter and absorb pollutants, but in some areas coastal development has outstripped the ability of the natural system to protect itself.

The CZMA defines the coastal zone as “coastal waters and the adjacent shore lands strongly influenced by each other. . . .” This influence extends beyond land use to economy

and culture. Inasmuch, the Act requires a balance between economic development and resource protection within the coastal zone. Specifically, §303(2) of the CZMA declares that it is national policy for states

. . . to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development.

The Act also factors in the need to provide assistance in the redevelopment of these same areas.¹⁷

DIMENSIONS OF COASTAL COMMUNITY DEVELOPMENT

This section provides guidance on how to measure the success of the Act's goals for balanced coastal community development and redevelopment. Success will be judged by the extent to which community growth is well planned and based on the combined needs of the ecosystem, the economy, and community culture. Measures are also needed of the effectiveness of governmental leadership, in particular, through the use of public involvement and infrastructure.

Dimensions of Coastal Community Development

Environment and land use
Economic
Public investment and infrastructure

The most effective plans for managing growth and (re)development integrate decision making in a mix of areas—environment, economy, and other societal goals—with means and methods that engage people to participate better in civic affairs. Taking time to revisit and understand the collective impacts of these individual decisions—how a place changes over time—is how a community learns the right

balance of market and regulatory tools to shape growth and redevelopment. The following categories, or *dimensions*, can be used to develop indicators of change.

ENVIRONMENT AND LAND USE

Environment and land use indicators should measure the extent to which coastal programs and policies balance the demands of pressing new development and redevelopment with practices that preserve and restore land and water quality. Another component of this dimension is the extent to which natural and cultural resources are conserved and stewarded to safeguard the heritage and values that attract and keep residents. The panel offered the following indicators as examples: existence of comprehensive plans and implementation ordinances, percentage of impervious surface, and per capita acreage of public parks and trails.

ECONOMIC

Community development indicators should show whether an economy is diverse and attractive to business, whether it maintains and expands assets and capital, and whether it promotes the well-being of a community and its workforce. Coastal communities will benefit most from their location if they incorporate recognition of natural and historic resource values as they work to nurture the local economy. Several examples of indicators are number of new businesses and/or a measure of net growth of local businesses in those zones, net employment change, ratio of water-dependent jobs to total jobs, and existence of maritime zoning or special districts.

PUBLIC INVESTMENT AND INFRASTRUCTURE

It is the responsibility of local government to make sure that public investments meet the larger planning goals of the community. Investments and incentives that shape and mitigate the impacts of growth—public funding for transportation, water and sewer, and land conservation—need to be aligned with community-driven core values and policies. These investments need to be regularly reviewed for their impact, leveraging power, and their strategic adherence to community goals. Public infrastructure investment in waterfront redevelopment, water and sewer improvements/added capacity, and transportation is one example indicator offered by the panel. Another is per capita local or state funding for land conservation, especially monies used to match federal CZM funds.

STRATEGIES

Strategies to help meet CZMA's community development goals include a mix of regulation and incentives. The Act lays out a number of tools, which many states are already taking advantage of, for encouraging a process of community development that is in concert with CZMA goals. These tools include comprehensive planning, interjurisdictional cooperation, public participation, and technical assistance programs.

Maryland's "Smart Growth" program, for example, restricts state spending on roads, sewers, schools, and other public infrastructure to areas adjacent to Washington, D.C., and Baltimore and other established cities and towns across the state. The objective is to preserve over 500,000 acres of open space and farmland. In Florida, Oregon, and New Jersey, rules have been adopted to lessen the environmental impacts of development and to preserve open space. In Orlando, Florida, the city government has entered into partnership with the owners of several tracts southeast of the city. The purpose is to develop the large parcel (12,000 acres) in a manner that preserves more than 40 percent of the total land area as parks or natural open spaces in a clustered pattern.¹⁵



COASTAL-DEPENDENT USES

HISTORICALLY, coastal communities relied upon coastal-dependent uses of their shorelines, such as commercial fishing and shipping, for their livelihood. Today, in coastal communities throughout the United States, coastal-dependent uses are threatened with displacement or have given way to non-coastal-dependent uses, such as residential development, hotels, offices, restaurants, and retail shops. Some state and local governments have responded by developing policies and techniques for preserving and encouraging water-dependent uses of coastal waterfronts, usually as part of states' coastal management programs. Others have encouraged waterfront conversions to less traditional uses by rezoning decisions and funding public infrastructure.

Coastal-dependent uses clearly have a significant economic value. Maritime commerce accounts for 95 percent of imports to and exports from the United States. Cargo shipped through public ports alone accounts for \$1.7 trillion in foreign trade. Tax revenues associated with shipping contribute over \$200 billion annually in federal, state, and local taxes.¹⁸ The Outer Continental Shelf today accounts for about 30 percent of domestic oil and about 27 percent of domestic natural gas production.¹⁹ At \$20 a barrel, the 1.7 million barrels per day of product would be worth approximately \$12.7 billion per year. In 2000 commercial fish landings totaled 9.1 billion pounds and were valued at \$3.6 billion. Recreational harvest in the same year totaled 254 million pounds.²⁰

The demand for coastal-dependent recreational use of the coast has increased significantly over the past 25 years. In 2001, Americans spent \$25 billion on boating, including purchasing new and used boats, boat equipment, maintenance, and storage. In 2001, there were over 12,000 marinas, boatyards, and other boating facilities nationwide. There were also nearly 10 million registered boats in the coastal states and territories, out of a national total of nearly 12.8 million.²¹

Changes in technology, consolidation of port facilities, and declines in fishing stocks have all taken their toll on local waterfronts. Economic trends, such as the transition from an economy based on manufacturing and distribution of goods to a more diversified, service-oriented economy have also affected coastal communities. Due to foreign competition, the number of mariners employed on U.S. ships declined from more than 90,000 in 1970 to

20,000 in 1993.²² Declines in some fish stocks have also contributed to the loss of coastal-dependent uses. For example, commercial oyster landings declined from 45 million pounds in 1985 to 30 million pounds in 1989.²³

The CZMA [§303(2)(D)] requires participating states and territories to give

priority consideration to coastal-dependent uses and orderly processes for siting major facilities related to national defense, energy, fisheries development, recreation, ports and transportation, and the location, to the maximum extent practicable, of new commercial and industrial developments in or adjacent to areas where such development already exists.

The Act encourages states and territories to develop policies to balance the competing demands on finite coastal resources, such as sites suitable for coastal-dependent uses, and to implement these policies by preserving existing coastal-dependent uses; reserving appropriate vacant lands for coastal-dependent uses; and designating lands for redevelopment with coastal-dependent uses.

Coastal dependency is clearest in the case of economic activities that must have access to water to function at all—commercial docks and facilities that support international and coastwise trade, fishing, and offshore resource development and recreational boating are clearly in this category. But there are other examples, like coastal tourism, extraction of resources, and such businesses as commercial greenhouses, that may be considered coastal-dependent uses in some states but not in others. It is important to remember that CZMA intends to balance economic development with resource management according to the states' needs and policies.

DIMENSIONS OF COASTAL-DEPENDENT USES

This section includes the panel's guidance on how to measure success in meeting the CZMA's goal of providing and preserving coastal-dependent uses.

Dimensions of Coastal-Dependent Uses

Planning and management mechanisms
Economic health
Efficiency and redevelopment

PLANNING AND MANAGEMENT MECHANISMS

With authority to enact laws and ordinances to protect public health, safety, and welfare, state and local governments play a key role in land use decisions. A variety of tools and techniques are available to give

priority consideration to the preservation and encouragement of coastal-dependent uses of their shorelines. These include zoning regulations, ordinances, and designations; harbor

management plans; tax policies; and direct public funding. The fact is that lands for coastal-dependent uses are limited. A basic inventory of current land use and the availability of land for siting coastal-dependent uses is necessary. Providing local and state government with better information will allow for the creation of more efficient and orderly planning and permitting processes that take into account expansion needs; maintenance, such as dredging for ports; the adequacy of local transportation infrastructure; the accommodation of community needs (such as tourism); and the protection of natural resources. This inventory, and the associated regulatory mechanisms to give priority to coastal-dependent uses, is the initial step toward creating measurable policies. Measurement can include the number of permits issued for coastal-dependent development or changes in land use or zoning.

ECONOMIC HEALTH

Coastal-dependent uses have a clearly significant impact on the economic health of the coastal zone. The unique characteristics of waterfront property and associated areas provide a wide array of public benefits involving the economy and jobs, the culture of the community, and the physical environment, as well as simply providing access to the waterfront. Two aspects of this dimension are important: trends in land use (number of marinas, ports, etc.) and trends in economic development (revenues, employment figures, and conditions).

EFFICIENCY AND REDEVELOPMENT

Coastal-dependent uses may conflict with other CZMA goals, such as increasing public access or sustaining coastal ecosystems. Thus, it is essential that land be used efficiently when it is being designated for coastal-dependent uses. This would include redevelopment of lands currently in coastal-dependent uses, development where appropriate of brownfields, and developing new uses by consuming as little land as possible. Measures of production per unit of land would be appropriate here.

STRATEGIES

Policies for coastal-dependent uses vary according to the state or territory in which they apply. Each reflects its own political climate and legal authorities, the amount of available coastline and natural resources, and the competing interests and demands for use of the shoreline. Most participating state coastal programs have guidelines; over half have regulations regarding coastal-dependent uses. These specify either what types of development are allowable along the coast or what areas of the coast are suitable for development. In most cases, coastal-dependent uses are given a higher priority than non-coastal-dependent uses in the coastal zone.²⁴ In addition to regulatory measures, economic incentives can be used to encourage incorporation of

coastal-dependent uses into limited coastal areas. Federal funds are available for infrastructure through direct improvement of federal navigational channels and through grants for transportation improvements (e.g., NEXTEA). Other federal and state grants and tax policies, such as redevelopment authority or funding through the Economic Development Agency, can be used to encourage redevelopment of brownfield areas or construction of support facilities to maintain commercial fishing.

AFTERWORD

SINCE 1974, approximately \$1.6 billion in federal funds has been appropriated for coastal management, this amount has been matched by state funds. Because the CZMA provided states with broad sweeping objectives, there is huge variation in state program implementation. There are significant differences in the level of importance of an issue from state to state and even at the national level. This intentionally broad-based effort was meant to give flexibility to states and to be results-oriented. A 1999 study⁴ of the program found evidence for successful implementation of CZMA goals; this evidence was based on policies and processes, however, not on measurable changes, or outcomes, in the coastal environment.

This report proposes another approach—a framework to measure success that is simple and common to all states—and that by its nature will focus success indicators on outcomes, rather than on processes alone. Using this framework, NOAA must now work with its state partners—and states must in turn work with their local partners—to determine what set of indicators can be collected from the majority of state programs to help achieve and advance the goals of the CZMA.

Thirty-four coastal states have federally approved coastal management programs for which they collect data, grouped roughly around the proposed six focus areas discussed in this report. There is thus a wealth of information to focus on, choose from, and adapt.

NOAA's task in developing the indicators that will be used with the framework should be to set clear goals for performance and to recognize the audience for whom data is collected. The indicators should be both achievable and ambitious. They should be adaptive and iterative, and they should allow federal and state partners to learn from each other. Most important, NOAA should recognize that the national measures that are chosen from this collection of state efforts will define what we value about our coastal resources because they will be what we come to understand through these more focused measures of performance. And what we understand and can measure will be what we steward and protect.



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Appendixes

APPENDIX A

THE COASTAL ZONE MANAGEMENT ACT

COASTAL ZONE MANAGEMENT ACT OF 1972

[As Amended through P.L. 106–580, Dec. 29, 2000]

TITLE III MANAGEMENT OF THE COASTAL ZONE

SHORT TITLE

SEC. 301. This title may be cited as the “Coastal Zone Management Act of 1972”. (16 U.S.C. 1451 note)

CONGRESSIONAL FINDINGS

SEC. 302. The Congress finds that—

(a) There is a national interest in the effective management, beneficial use, protection, and development of the coastal zone.

(b) The coastal zone is rich in a variety of natural, commercial, recreational, ecological, industrial, and esthetic resources of immediate and potential value to the present and future well-being of the Nation.

(c) The increasing and competing demands upon the lands and waters of our coastal zone occasioned by population growth and economic development, including requirements for industry, commerce, residential development, recreation, extraction of mineral resources and fossil fuels, transportation and navigation, waste disposal, and harvesting of fish, shellfish, and other living marine resources, have resulted in the loss of living marine resources, wildlife, nutrient-rich areas, permanent and adverse changes to ecological systems, decreasing open space for public use, and shoreline erosion.

(d) The habitat areas of the coastal zone, and the fish, shellfish, other living marine resources, and

wildlife therein, are ecologically fragile and consequently extremely vulnerable to destruction by man’s alterations.

(e) Important ecological, cultural, historic, and esthetic values in the coastal zone which are essential to the well-being of all citizens are being irretrievably damaged or lost.

(f) New and expanding demands for food, energy, minerals, defense needs, recreation, waste disposal, transportation, and industrial activities in the Great Lakes, territorial sea, exclusive economic zone, and Outer Continental Shelf are placing stress on these areas and are creating the need for resolution of serious conflicts among important and competing uses and values in coastal and ocean waters.

(g) Special natural and scenic characteristics are being damaged by ill-planned development that threatens these values.

(h) In light of competing demands and the urgent need to protect and to give high priority to natural systems in the coastal zone, present state and local institutional arrangements for planning and regulating land and water uses in such areas are inadequate.

(i) The key to more effective protection and use of the land and water resources of the coastal zone is to encourage the states to exercise their full authority over the lands and waters in the coastal zone by assisting the states, in cooperation with Federal and local governments and other vitally affected interests, in developing land and water use programs for the coastal zone, including unified policies, criteria, standards, methods, and processes

for dealing with land and water use decisions of more than local significance.

(j) The national objective of attaining a greater degree of energy self-sufficiency would be advanced by providing Federal financial assistance to meet state and local needs resulting from new or expanded energy activity in or affecting the coastal zone.

(k) Land uses in the coastal zone, and the uses of adjacent lands which drain into the coastal zone, may significantly affect the quality of coastal waters and habitats, and efforts to control coastal water pollution from land use activities must be improved.

(l) Because global warming may result in a substantial sea level rise with serious adverse effects in the coastal zone, coastal states must anticipate and plan for such an occurrence.

(m) Because of their proximity to and reliance upon the ocean and its resources, the coastal states have substantial and significant interests in the protection, management, and development of the resources of the exclusive economic zone that can only be served by the active participation of coastal states in all Federal programs affecting such resources and, wherever appropriate, by the development of state ocean resource plans as part of their federally approved coastal zone management programs.

CONGRESSIONAL DECLARATION OF POLICY

SEC. 303. The Congress finds and declares that it is the national policy—

(1) to preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations;

(2) to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development, which programs should at least provide for—

(A) the protection of natural resources, including wetlands, floodplains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat, within the coastal zone.

(B) the management of coastal development to minimize the loss of life and property caused by improper development in flood-prone, storm surge,

geological hazard, and erosion-prone areas and in areas likely to be affected by or vulnerable to sea level rise, land subsidence, and saltwater intrusion, and by the destruction of natural protective features such as beaches, dunes, wetlands, and barrier islands.

(C) the management of coastal development to improve, safeguard, and restore the quality of coastal waters, and to protect natural resources and existing uses of those waters,

(D) priority consideration being given to coastal-dependent uses and orderly processes for siting major facilities related to national defense, energy, fisheries development, recreation, ports and transportation, and the location, to the maximum extent practicable, of new commercial and industrial developments in or adjacent to areas where such development already exists,

(E) public access to the coasts for recreation purposes,

(F) assistance in the redevelopment of deteriorating urban waterfronts and ports, and sensitive preservation and restoration of historic, cultural, and esthetic coastal features,

(G) the coordination and simplification of procedures in order to ensure expedited governmental decisionmaking for the management of coastal resources,

(H) continued consultation and coordination with, and the giving of adequate consideration to the views of, affected Federal agencies,

(I) the giving of timely and effective notification of, and opportunities for public and local government participation in, coastal management decisionmaking,

(J) assistance to support comprehensive planning, conservation, and management for living marine resources, including planning for the siting of pollution control and aquaculture facilities within the coastal zone, and improved coordination between State and Federal coastal zone management agencies and State and wildlife agencies, and

(K) the study and development, in any case in which the Secretary considers it to be appropriate, of plans for addressing the adverse effects upon the coastal zone of land subsidence and of sea level rise; and

(3) to encourage the preparation of special area management plans which provide for increased specificity in protecting significant natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be

affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decisionmaking;

(4) to encourage the participation and cooperation of the public, state and local governments, and interstate and other regional agencies, as well as the Federal agencies having programs affecting the coastal zone, in carrying out the purposes of this title;

(5) to encourage coordination and cooperation with and among the appropriate Federal, State, and local agencies, and international organizations where appropriate, in collection, analysis, synthesis, and dissemination of coastal management information, research results, and technical assistance, to support State and Federal regulation of land use practices affecting the coastal and ocean resources of the United States; and

(6) to respond to changing circumstances affecting the coastal environment and coastal resource management by encouraging States to consider such issues as ocean uses potentially affecting the coastal zone.

DEFINITIONS

SEC. 304. For the purposes of this title—

(1) The term “coastal zone” means the coastal waters (including the lands therein and thereunder) and the adjacent shorelands (including the waters therein and thereunder), strongly influenced by each other and in proximity to the shorelines of the several coastal states, and includes, islands, transitional and intertidal areas, salt marshes, wetlands, and beaches. The zone extends, in Great Lakes waters, to the international boundary between the United States and Canada and, in other areas, seaward to the outer limit of State title and ownership under the Submerged Lands Act (43 U.S.C. 1301 et seq.), the Act of March 2, 1917 (48 U.S.C. 749), the Covenant to Establish a Commonwealth of the Northern Mariana Islands in Political Union with the United States of America, as approved by the Act of March 24, 1976 (48 U.S.C. 1681 note), or section 1 of the Act of November 20, 1963 (48 U.S.C. 1705), as applicable. The zone extends inland from the shorelines only to the extent necessary to control shorelands, the uses of which have a direct and significant impact on the coastal waters, and to control those geographical areas which are likely to be affected by or vulnerable to sea level rise. Excluded from the coastal zone are lands the use of which is by law subject solely to the discretion of or which

is held in trust by the Federal Government, its officers or agents.

(2) The term “coastal resource of national significance” means any coastal wetland, beach, dune, barrier island, reef, estuary, or fish and wildlife habitat, if any such area is determined by a coastal state to be of substantial biological or natural storm protective value.

(3) The term “coastal waters” means (A) in the Great Lakes area, the waters within the territorial jurisdiction of the United States consisting of the Great Lakes, their connecting waters, harbors, roadsteads, and estuary-type areas such as bays, shallows, and marshes and (B) in other areas, those waters, adjacent to the shorelines, which contain a measurable quantity or percentage of sea water, including, but not limited to, sounds, bays, lagoons, baysou, ponds, and estuaries.

(4) The term “coastal state” means a state of the United States in, or bordering on, the Atlantic, Pacific, or Arctic Ocean, the Gulf of Mexico, Long Island Sound, or one or more of the Great Lakes.

For the purposes of this title, the term also includes Puerto Rico, the Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, and the Trust Territories of the Pacific Islands, and American Samoa.

(5) The term “coastal energy activity” means any of the following activities if, and to the extent that (A) the conduct, support, or facilitation of such activity requires and involves the siting, construction, expansion, or operation of any equipment or facility; and

(B) any technical requirement exists which, in the determination of the Secretary, necessitates that the siting, construction, expansion, or operation of such equipment or facility be carried out in, or in close proximity to, the coastal zone of any coastal state;

(i) Any outer Continental Shelf energy activity.

(ii) Any transportation, conversion, treatment, transfer, or storage of liquefied natural gas.

(iii) Any transportation, transfer, or storage of oil, natural gas, or coal (including, but not limited to, by means of any deepwater port, as defined in section 3(10) of the Deepwater Port Act of 1974 (33 U.S.C. 1502(10))). For purposes of this paragraph, the siting, construction, expansion, or operation of any equipment or facility shall be “in close proximity to” the coastal zone of any coastal state if such siting, construction, expansion, or operation has, or is likely to have, a significant effect on such coastal zone.

(6) The term “energy facilities” means any equipment or facility which is or will be used primarily—

(A) in the exploration for, or the development, production, conversion, storage, transfer, processing, or transportation of, any energy resource; or

(B) for the manufacture, production, or assembly of equipment, machinery, products, or devices which are involved in any activity described in subparagraph (A). The term includes, but is not limited to (i) electric generating plants; (ii) petroleum refineries and associated facilities; (iii) gasification plants; (iv) facilities used for the transportation, conversion, treatment, transfer, or storage of liquefied natural gas; (v) uranium enrichment or nuclear fuel processing facilities; (vi) oil and gas facilities, including platforms, assembly plants, storage depots, tank farms, crew and supply bases, and refining complexes; (vii) facilities including deepwater ports, for the transfer of petroleum; (viii) pipelines and transmission facilities; and (ix) terminals which are associated with any of the foregoing.

(6a) The term “enforceable policy” means State policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a State exerts control over private and public land and water uses and natural resources in the coastal zone.

(7) The term “estuary” means that part of a river or stream or other body of water having unimpaired connection with the open sea, where the sea water is measurably diluted with fresh water derived from land drainage. The term includes estuary-type areas of the Great Lakes.

(8) The term “estuarine sanctuary” means a research area which may include any part or all of an estuary and any island, transitional area, and upland in, or adjacent to such estuary, and which constitutes to the extent feasible a natural unit, set aside to provide scientists and students the opportunity to examine over a period of time the ecological relationships within the area.

(9) The term “Fund” means the Coastal Zone Management Fund established under section 308(b).

(10) The term “land use” means activities which are conducted in, or on the shorelands within, the coastal zone, subject to the requirements outlined in section 307(g).

(11) The term “local government” means any political subdivision of, or any special entity created by, any coastal state which (in whole or part) is located in, or has authority over, such state’s coastal zone and which (A) has authority to levy taxes, or to

establish and collect user fees, or (B) provides any public facility or public service which is financed in whole or part by taxes or user fees. The term includes but is not limited to, any school district, fire district, transportation authority, and any other special purpose district or authority.

(12) The term “management program” includes, but is not limited to, a comprehensive statement in words, maps, illustrations, or other media of communication, prepared and adopted by the state in accordance with the provisions of this title, setting forth objectives, policies, and standards to guide public and private uses of lands and waters in the coastal zone.

(13) The term “outer Continental Shelf energy activity” means any exploration for, or any development or production of, oil or natural gas from the outer Continental Shelf (as defined in section 2(a) of the Outer Continental Shelf Lands Act (43 U.S.C. 1331(a))), or the siting, construction, expansion, or operation of any new or expanded energy facilities directly required by such exploration, development, or production.

(14) The term “person” means any individual; any corporation, partnership, association, or other entity organized or existing under the laws of any state; the Federal Government; any state, regional, or local government; or any entity of any such Federal, state, regional, or local government.

(15) The term “public facilities and public services” means facilities or services which are financed, in whole or in part, by any state or political subdivision thereof, including, but not limited to, highways and secondary roads, parking, mass transit, docks, navigation aids, fire and police protection, water supply, waste collection and treatment (including drainage), schools and education, and hospitals and health care. Such term may also include any other facility or service so financed which the Secretary finds will support increased population.

(16) The term “Secretary” means the Secretary of Commerce.

(17) The term “special area management plan” means a comprehensive plan providing for natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone.

(18) The term “water use” means a use, activity, or project conducted in or on waters within the coastal zone.

MANAGEMENT PROGRAM DEVELOPMENT GRANTS

SEC. 305. (a) In fiscal years 1997, 1998, and 1999, the Secretary may make a grant annually to any coastal state without an approved program if the coastal state demonstrates to the satisfaction of the Secretary that the grant will be used to develop a management program consistent with the requirements set forth in section 306. The amount of any such grant shall not exceed \$200,000 in any fiscal year, and shall require State matching funds according to a 4-to-1 ratio of Federal-to-State contributions. After an initial grant is made to a coastal state pursuant to this subsection, no subsequent grant shall be made to that coastal state pursuant to this subsection unless the Secretary finds that the coastal state is satisfactorily developing its management program. No coastal state is eligible to receive more than four grants pursuant to this subsection.

(b) Any coastal state which has completed the development of its management program shall submit such program to the Secretary for review and approval pursuant to section 306.

ADMINISTRATIVE GRANTS

SEC. 306. (a) The Secretary may make grants to any coastal state for the purpose of administering that State's management program, if the State matches any such grant according to the following ratios of Federal-to-State contributions for the applicable fiscal year:

(1) For those States for which programs were approved prior to enactment of the Coastal Zone Act Reauthorization

(2) For programs approved after enactment of the Coastal Zone Act Reauthorization Amendments of 1990, 4 to 1 for the first fiscal year, 2.3 to 1 for the second fiscal year, 1.5 to 1 for the third fiscal year, and 1 to 1 for each fiscal year thereafter.

(b) The Secretary may make a grant to a coastal state under subsection (a) only if the Secretary finds that the management program of the coastal state meets all applicable requirements of this title and has been approved in accordance with subsection (d).

(c) Grants under this section shall be located to coastal states with approved programs based on rules and regulations promulgated by the Secretary which shall take into account the extent and nature of the shoreline and area covered by the program, population of the area, and other relevant factors. The Secretary shall establish, after consulting with the coastal states, maximum and minimum grants

for any fiscal year to promote equity between coastal states and effective coastal management.

(d) Before approving a management program submitted by a coastal state, the Secretary shall find the following:

(1) The State has developed and adopted a management program for its coastal zone in accordance with rules and regulations promulgated by the Secretary, after notice, and with the opportunity of full participation by relevant Federal agencies, State agencies, local governments, regional organizations, port authorities, and other interested parties and individuals, public and private, which is adequate to carry out the purposes of this title and is consistent with the policy declared in section 303.

(2) The management program includes each of the following required program elements:

(A) An identification of the boundaries of the coastal zone subject to the management program.

(B) A definition of what shall constitute permissible land uses and water uses within the coastal zone which have a direct and significant impact on the coastal waters.

(C) An inventory and designation of areas of particular concern within the coastal zone.

(D) An identification of the means by which the State proposes to exert control over the land uses and water uses referred to in subparagraph (B), including a list of relevant State constitutional provisions, laws, regulations, and judicial decisions.

(E) Broad guidelines on priorities of uses in particular areas, including specifically those uses of lowest priority.

(F) A description of the organizational structure proposed to implement such management program, including the responsibilities and interrelationships of local, areawide, State, regional, and interstate agencies in the management process.

(G) A definition of the term "beach" and a planning process for the protection of, and access to, public beaches and other public coastal areas of environmental, recreational, historical, esthetic, ecological, or cultural value.

(H) A planning process for energy facilities likely to be located in, or which may significantly affect, the coastal zone, including a process for anticipating the management of the impacts resulting from such facilities.

(I) A planning process for assessing the effects of, and studying and evaluating ways to control, or lessen the impact of, shoreline erosion, and to restore areas adversely affected by such erosion.

(3) The State has—

(A) coordinated its program with local, area-wide, and interstate plans applicable to areas within the coastal zone—

(i) existing on January 1 of the year in which the State's management program is submitted to the Secretary; and

(ii) which have been developed by a local government, an areawide agency, a regional agency, or an interstate agency; and

(B) established an effective mechanism for continuing consultation and coordination between the management agency designated pursuant to paragraph (6) and with local governments, interstate agencies, regional agencies, and areawide agencies within the coastal zone to assure the full participation of those local governments and agencies in carrying out the purposes of this title; except that the Secretary shall not find any mechanism to be effective for purposes of this subparagraph unless it requires that—

(i) the management agency, before implementing any management program decision which would conflict with any local zoning ordinance, decision, or other action, shall send a notice of the management program decision to any local government whose zoning authority is affected;

(ii) within the 30-day period commencing on the date of receipt of that notice, the local government may submit to the management agency written comments on the management program decision, and any recommendation for alternatives; and

(iii) the management agency, if any comments are submitted to it within the 30-day period by any local government—

(I) shall consider the comments;

(II) may, in its discretion, hold a public hearing on the comments; and

(III) may not take any action within the 30-day period to implement the management program decision.

(4) The State has held public hearings in the development of the management program.

(5) The management program and any changes thereto have been reviewed and approved by the Governor of the State.

(6) The Governor of the State has designated a single State agency to receive and administer grants for implementing the management program.

(7) The State is organized to implement the management program.

(8) The management program provides for adequate consideration of the national interest involved

in planning for, and managing the coastal zone, including the siting of facilities such as energy facilities which are of greater than local significance. In the case of energy facilities, the Secretary shall find that the State has given consideration to any applicable national or interstate energy plan or program.

(9) The management program includes procedures whereby specific areas may be designated for the purpose of preserving or restoring them for their conservation, recreational, ecological, historical, or esthetic values.

(10) The State, acting through its chosen agency or agencies (including local governments, areawide agencies, regional agencies, or interstate agencies) has authority for the management of the coastal zone in accordance with the management program. Such authority shall include power—

(A) to administer land use and water use regulations to control development to ensure compliance with the management program, and to resolve conflicts among competing uses; and

(B) to acquire fee simple and less than fee simple interests in land, waters, and other property through condemnation or other means when necessary to achieve conformance with the management program.

(11) The management program provides for any one or a combination of the following general techniques for control of land uses and water uses within the coastal zone:

(A) State establishment of criteria and standards for local implementation, subject to administrative review and enforcement.

(B) Direct State land and water use planning and regulation.

(C) State administrative review for consistency with the management program of all development plans, projects, or land and water use regulations, including exceptions and variances thereto, proposed by any State or local authority or private developer, with power to approve or disapprove after public notice and an opportunity for hearings.

(12) The management program contains a method of assuring that local land use and water use regulations within the coastal zone do not unreasonably restrict or exclude land uses and water uses of regional benefit. (13) The management program provides for—

(A) the inventory and designation of areas that contain one or more coastal resources of national significance; and

(B) specific and enforceable standards to protect such resources.

(14) The management program provides for public participation in permitting processes, consistency determinations, and other similar decisions.

(15) The management program provides a mechanism to ensure that all State agencies will adhere to the program.

(16) The management program contains enforceable policies and mechanisms to implement the applicable requirements of the Coastal Nonpoint Pollution Control Program of the State required by section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990. (e) A coastal state may amend or modify a management program which it has submitted and which has been approved by the Secretary under this section, subject to the following conditions:

(1) The State shall promptly notify the Secretary of any proposed amendment, modification, or other program change and submit it for the Secretary's approval. The Secretary may suspend all or part of any grant made under this section pending State submission of the proposed amendments, modification, or other program change.

(2) Within 30 days after the date the Secretary receives any proposed amendment, the Secretary shall notify the State whether the Secretary approves or disapproves the amendment, or whether the Secretary finds it is necessary to extend the review of the proposed amendment for a period not to exceed 120 days after the date the Secretary received the proposed amendment. The Secretary may extend this period only as necessary to meet the requirements of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.). If the Secretary does not notify the coastal state that the Secretary approves or disapproves the amendment within that period, then the amendment shall be conclusively presumed as approved.

(3)(A) Except as provided in subparagraph (B), a coastal state may not implement any amendment, modification, or other change as part of its approved management program unless the amendment, modification, or other change is approved by the Secretary under this subsection.

(B) The Secretary, after determining on a preliminary basis, that an amendment, modification, or other change which has been submitted for approval under this subsection is likely to meet the program approval standards in this section, may permit the State to expend funds awarded under this section to begin implementing the proposed amendment, modification, or change. This preliminary approval shall not extend for more than 6 months and

may not be renewed. A proposed amendment, modification, or change which has been given preliminary approval and is not finally approved under this paragraph shall not be considered an enforceable policy for purposes of section 307.

RESOURCE MANAGEMENT IMPROVEMENT GRANTS

Sec. 306A. (a) For purposes of this section—

(1) The term "eligible coastal state" means a coastal state that for any fiscal year for which a

(A) has a management program approved under section 306; and

(B) in the judgment of the Secretary, is making satisfactory progress in activities designed to result in significant improvement in achieving the coastal management objectives specified in section 303(2)(A) through (K).

(2) The term "urban waterfront and port" means any developed area that is densely populated and is being used for, or has been used for, urban residential recreational, commercial, shipping or industrial purposes.

(b) The Secretary may make grants to any eligible coastal state to assist that state in meeting one or more of the following objectives:

(1) The preservation or restoration of specific areas of the state that (A) are designated under the management program procedures required by section 306(d)(9) because of their conservation recreational, ecological, or esthetic values, or (B) contain one or more coastal resources of national significance, or for the purpose of restoring and enhancing shellfish production by the purchase and distribution of clutch material on publicly owned reef tracts.

(2) The redevelopment of deteriorating and underutilized urban waterfronts and ports that are designated in the state's management program pursuant to section 306(d)(2)(C) as areas of particular concern.

(3) The provision of access to public beaches and other public coastal areas and to coastal waters in accordance with the planning process required under section 306(d)(2)(G).

(4) The development of a coordinated process among State agencies to regulate and issue permits for aquaculture facilities in the coastal zone.

(c)(1) Each grant made by the Secretary under this section shall be subject to such terms and conditions as may be appropriate to ensure that the grant is used for purposes consistent with this section.

(2) Grants made under this section may be used for—

(A) the acquisition of fee simple and other interests in land;

(B) low-cost construction projects determined by the Secretary to be consistent with the purposes of this section, including but not limited to, paths, walkways, fences, parks, and the rehabilitation of historic buildings and structures; except that not more than 50 per centum of any grant made under this section may be used for such construction projects;

(C) in the case of grants made for objectives described in subsection (b)(2)—

(i) the rehabilitation or acquisition of piers to provide increased public use, including compatible commercial activity,

(ii) the establishment of shoreline stabilization measures including the installation or rehabilitation of bulkheads for the purpose of public safety or increasing public access and use, and

(iii) the removal or replacement of pilings where such action will provide increased recreational use of urban waterfront areas, but activities provided for under this paragraph shall not be treated as construction projects subject to the limitations in paragraph (B);

(D) engineering designs, specifications, and other appropriate reports; and

(E) educational, interpretive, and management costs and such other related costs as the Secretary determines to be consistent with the purposes of this section.

(d)(1) The Secretary may make grants to any coastal state for the purpose of carrying out the project or purpose for which such grants are awarded, if the state matches any such grant according to the following ratios of Federal to state contributions for the applicable fiscal year: 4 to 1 for fiscal year 1986; 2.3 to 1 for fiscal year 1987; 1.5 to 1 for fiscal year 1988; and 1 to 1 for each fiscal year after fiscal year 1988.

(2) Grants provided under this section may be used to pay a coastal state's share of costs required under any other Federal program that is consistent with the purposes of this section.

(3) The total amount of grants made under this section to any eligible coastal state for any fiscal year may not exceed an amount equal to 10 per centum of the total amount appropriated to carry out this section for such fiscal year.

(e) With the approval of the Secretary, an eligible coastal state may allocate to a local government, an areawide agency designated under section 204 of the Demonstration Cities and Metropolitan Devel-

opment Act of 1966, a regional agency, or an interstate agency, a portion of any grant made under this section for the purpose of carrying out this section; except that such an allocation shall not relieve that state of the responsibility for ensuring that any funds so allocated are applied in furtherance of the state's approved management program.

(f) In addition to providing grants under this section, the Secretary shall assist eligible coastal states and their local governments in identifying and obtaining other sources of available Federal technical and financial assistance regarding the objectives of this section.

COORDINATION AND COOPERATION

SEC. 307. (a) In carrying out his functions and responsibilities under this title, the Secretary shall consult with, cooperate with, and, to the maximum extent practicable, coordinate his activities with other interested Federal agencies.

(b) The Secretary shall not approve the management program submitted by a state pursuant to section 306 unless the views of Federal agencies principally affected by such program have been adequately considered.

(c)(1)(A) Each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs. A Federal agency activity shall be subject to this paragraph unless it is subject to paragraph (2) or (3).

(B) After any final judgment, decree, or order of any Federal court that is appealable under section 1291 or 1292 of title 28, United States Code, or under any other applicable provision of Federal law, that a specific Federal agency activity is not in compliance with subparagraph (A), and certification by the Secretary that mediation under subsection (h) is not likely to result in such compliance, the President may, upon written request from the Secretary, exempt from compliance those elements of the Federal agency activity that are found by the Federal court to be inconsistent with an approved State program, if the President determines that the activity is in the paramount interest of the United States. No such exemption shall be granted on the basis of a lack of appropriations unless the President has specifically requested such appropriations as part of the budgetary process, and

the Congress has failed to make available the requested appropriations.

(C) Each Federal agency carrying out an activity subject to paragraph (1) shall provide a consistency determination to the relevant State agency designated under section 306(d)(6) at the earliest practicable time, but in no case later than 90 days before final approval of the Federal activity unless both the Federal agency and the State agency agree to a different schedule.

(2) Any Federal agency which shall undertake any development project in the coastal zone of a state shall insure that the project is, to the maximum extent practicable, consistent with the enforceable policies of approved state management programs.

(3)(A) After final approval by the Secretary of a state's management program, any applicant for a required Federal license or permit to conduct an activity, inside or outside the coastal zone, affecting any land or water use or natural resource of the coastal zone of that state shall provide in the applicant to the licensing or permitting agency a certification that the proposed activity complies with the enforceable policies of the state's approved program and that such activity will be conducted in a manner consistent with the program. At the same time, the applicant shall furnish to the state or its designated agency a copy of the certification, with all necessary information and data. Each coastal state shall establish procedures for public notice in the case of all such certifications and, to the extent it deems appropriate, procedures for public hearings in connection therewith. At the earliest practicable time, the state or its designated agency shall notify the Federal agency concerned that the state concurs with or objects to the applicant's certification. If the state or its designated agency fails to furnish the required notification within six months after receipt of its copy of the applicant's certification, the state's concurrence with the certification shall be conclusively presumed. No license or permit shall be granted by the Federal agency until the state or its designated agency has concurred with the applicant's certification or until, by the state's failure to act, the concurrence is conclusively presumed, unless the Secretary, on his own initiative or upon appeal by the applicant, finds, after providing a reasonable opportunity for detailed comments from the Federal agency involved and from the state, that the activity is consistent with the objectives of this title or is otherwise necessary in the interest of national security.

(B) After the management program of any coastal state has been approved by the Secretary under section 306, any person who submits to the Secretary of the Interior any plan for the exploration or development of, or production from, any area which has been leased under the Outer Continental Shelf Lands Act (43 U.S.C. 1331 et seq.) and regulations under such Act shall, with respect to any exploration, development, or production described in such plan and affecting any land or water use or natural resource of the coastal zone of such state, attach to such plan a certification that each activity which is described in detail in such plan complies with the enforceable policies of such state's approved management program and will be carried out in a manner consistent with such program. No Federal official or agency shall grant such person any license or permit for any activity described in detail in such plan until such state or its designated agency receives a copy of such certification and plan, together with any other necessary data and information, and until—

(i) such state or its designated agency, in accordance with the procedures required to be established by such state pursuant to subparagraph (A), concurs with such person's certification and notifies the Secretary and the Secretary of the Interior of such concurrence;

(ii) concurrence by such state with such certification is conclusively presumed as provided for in subparagraph (A), except if such state fails to concur with or object to such certification within three months after receipt of its copy of such certification and supporting information, such state shall provide the Secretary, the appropriate federal agency, and such person with a written statement describing the status of review and the basis for further delay in issuing a final decision, and if such statement is not so provided, concurrence by such state with such certification shall be conclusively presumed; or

(iii) the Secretary finds, pursuant to subparagraph (A), that each activity which is described in detail in such plan is consistent with the objectives of this title or is otherwise necessary in the interest of national security.

If a state concurs or is conclusively presumed to concur, or if the Secretary makes such a finding, the provisions of subparagraph (A) are not applicable with respect to such person, such state, and any Federal license or permit which is required to conduct any activity affecting land uses or water uses in the coastal zone of such state which is described in

detail in the plan to which such concurrence or finding applies. If such state objects to such certification and if the Secretary fails to make a finding under clause (iii) with respect to such certification, or if such person fails substantially to comply with such plan as submitted, such person shall submit an amendment to such plan, or a new plan, to the Secretary of the Interior. With respect to any amendment or new plan submitted to the Secretary of the Interior pursuant to the preceding sentence, the applicable time period for purposes of concurrence by conclusive presumption under subparagraph (A) is 3 months.

(d) State and local governments submitting applications for Federal assistance under other Federal programs, in or outside of the coastal zone, affecting any land or water use of natural resource of the coastal zone shall indicate the views of the appropriate state or local agency as to the relationship of such activities to the approved management program for the coastal zone. Such applications shall be submitted and coordinated in accordance with the provisions of title IV of the Intergovernmental Coordination Act of 1968 (82 Stat. 1098). Federal agencies shall not approve proposed projects that are inconsistent with the enforceable policies of a coastal state's management program, except upon a finding by the Secretary that such project is consistent with the purposes of this title or necessary in the interest of national security.

(e) Nothing in this title shall be construed—

(1) to diminish either Federal or state jurisdiction, responsibility, or rights in the field of planning, development, or control of water resources, submerged lands, or navigable waters; nor to displace, supersede, limit, or modify any interstate compact or the jurisdiction or responsibility of any legally established joint or common agency of two or more states or of two or more states and the Federal Government; nor to limit the authority of Congress to authorize and fund projects;

(2) as superseding, modifying, or repealing existing laws applicable to the various Federal agencies; nor to affect the jurisdiction, powers, or prerogatives of the International Joint Commission, United States and Canada, the Permanent Engineering Board, and the United States operating entity or entities established pursuant to the Columbia River Basin Treaty, signed at Washington, January 17, 1961, or the International Boundary and Water Commission, United States and Mexico.

(f) Notwithstanding any other provision of this title, nothing in this title shall in any way affect any

requirement (1) established by the Federal Water Pollution Control Act, as amended, or the Clean Air Act, as amended, or (2) established by the Federal Government or by any state or local government pursuant to such Acts. Such requirements shall be incorporated in any program developed pursuant to this title and shall be the water pollution control and air pollution control requirements applicable to such program.

(g) When any state's coastal zone management program, submitted for approval or proposed for modification pursuant to section 306 of this title, includes requirements as to shorelands which also would be subject to any Federally supported national land use program which may be hereafter enacted, the Secretary, prior to approving such program, shall obtain the concurrence of the Secretary of the Interior, or such other Federal official as may be designated to administer the national land use program, with respect to that portion of the coastal zone management program affecting such inland areas.

(h) In case of serious disagreement between any Federal agency and a coastal state—

(1) in the development or the initial implementation of a management program under section 305; or

(2) in the administration of a management program approved under section 306; the Secretary, with the cooperation of the Executive Office of the President, shall seek to mediate the differences involved in such disagreement. The process of such mediation shall, with respect to any disagreement described in paragraph (2), include public hearings which shall be conducted in the local area concerned.

(i)(1) With respect to appeals under subsections (c)(3) and (d) which are submitted after the date of the enactment of the Coastal Zone Act Reauthorization Amendments of 1990, the Secretary shall collect an application fee of not less than \$200 for minor appeals and not less than \$500 for major appeals, unless the Secretary, upon consideration of an applicant's request for a fee waiver, determines that the applicant is unable to pay the fee.

(2)(A) The Secretary shall collect such other fees as are necessary to recover the full costs of administering and processing such appeals under subsection (c).

(B) If the Secretary waives the application fee under paragraph (1) for an applicant, the Secretary shall waive all other fees under this subsection for the applicant.

(3) Fees collected under this subsection shall be deposited into the Coastal Zone Management Fund established under section 308.

COASTAL ZONE MANAGEMENT FUND

SEC. 308. (a)(1) The obligations of any coastal state or unit of general purpose local government to repay loans made pursuant to this section as in effect before the date of the enactment of the Coastal Zone Act Reauthorization Amendments of 1990, and any repayment schedule established pursuant to this title as in effect before that date of enactment, are not altered by any provision of this title. Such loans shall be repaid under authority of this subsection and the Secretary may issue regulations governing such repayment. If the Secretary finds that any coastal state or unit of local government is unable to meet its obligations pursuant to this subsection because the actual increases in employment and related population resulting from coastal energy activity and the facilities associated with such activity do not provide adequate revenues to enable such State or unit to meet such obligations in accordance with the appropriate repayment schedule, the Secretary shall, after review of the information submitted by such State or unit, take any of the following actions:

(A) Modify the terms and conditions of such loan.

(B) Refinance the loan.

(C) Recommend to the Congress that legislation be enacted to forgive the loan.

(2) Loan repayments made pursuant to this subsection shall be retained by the Secretary as offsetting collections, and shall be deposited into the Coastal Zone Management Fund established under subsection (b).

(b)(1) The Secretary shall establish and maintain a fund, to be known as the "Coastal Zone Management Fund" which shall consist of amounts retained and deposited into the Fund under subsection (a) and fees deposited into the Fund under section 307(i)(3).

(2) Subject to amounts provided in appropriation Acts, amounts in the Fund shall be available to the Secretary for use for the following:

(A) Expenses incident to the administration of this title, in an amount not to exceed for each of fiscal years 1997, 1998, and 1999 the higher of—

(i) \$4,000,000; or

(ii) 8 percent of the total amount appropriated under this title for the fiscal year.

(B) After use under subparagraph (A)—

(i) projects to address management issues which are regional in scope, including interstate projects;

(ii) demonstration projects which have high potential for improving coastal zone management, especially at the local level;

(iii) emergency grants to State coastal zone management agencies to address unforeseen or disaster-related circumstances;

(iv) appropriate awards recognizing excellence in coastal zone management as provided in section 314;

(v) program development grants as authorized by section 305, in an amount not to exceed \$200,000 for each of fiscal years 1997, 1998, and 1999; and

(vi) to provide financial support to coastal states for use for investigating and applying the public trust doctrine to implement State management programs approved under section 306.

(3) On December 1 of each year, the Secretary shall transmit to the Congress an annual report on the Fund, including the balance of the Fund and an itemization of all deposits into and disbursements from the Fund in the preceding fiscal year.

COASTAL ZONE ENHANCEMENT GRANTS

SEC. 309. (a) For purposes of this section, the term "coastal zone enhancement objective" means any of the following objectives:

(1) Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands.

(2) Preventing or significantly reducing threats to life and destruction of property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level rise.

(3) Attaining increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.

(4) Reducing marine debris entering the Nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris.

(5) Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources.

(6) Preparing and implementing special area management plans for important coastal areas.

(7) Planning for the use of ocean resources.

(8) Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance.

(9) Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable States to formulate, administer, and implement strategic plans for marine aquaculture.

(b)(1) Subject to the limitations and goals established in this section, the Secretary may make grants to coastal states to provide funding for development and submission for Federal approval of program changes that support attainment of one or more coastal zone enhancement objectives.

(2)(A) In addition to any amounts provided under section 306, and subject to the availability of appropriations, the Secretary may make grants under this subsection to States for implementing program changes approved by the Secretary in accordance with section 306(e).

(B) Grants under this paragraph to implement a program change may not be made in any fiscal year after the second fiscal year that begins after the approval of that change by the Secretary.

(c) The Secretary shall evaluate and rank State proposals for funding under this section, and make funding awards based on those proposals, taking into account the criteria established by the Secretary under subsection (d). The Secretary shall ensure that funding decisions under this section take into consideration the fiscal and technical needs of proposing States and the overall merit of each proposal in terms of benefits to the public.

(d) Within 12 months following the date of enactment of this section, and consistent with the notice and participation requirements established in section 317, the Secretary shall promulgate regulations concerning coastal zone enhancement grants that establish—

(1) specific and detailed criteria that must be addressed by a coastal state (including the State's priority needs for improvement as identified by the Secretary after careful consultation with the State) as part of the State's development and implementation of coastal zone enhancement objectives;

(2) administrative or procedural rules or requirements as necessary to facilitate the development and implementation of such objectives by coastal states; and

(3) other funding award criteria as are neces-

sary or appropriate to ensure that evaluations of proposals, and decisions to award funding, under this section are based on objective standards applied fairly and equitably to those proposals.

(e) A State shall not be required to contribute any portion of the cost of any proposal for which funding is awarded under this section.

(f) Beginning in fiscal year 1991, not less than 10 percent and not more than 20 percent of the amounts appropriated to implement sections 306 and 306A of this title shall be retained by the Secretary for use in implementing this section, up to a maximum of \$10,000,000 annually.

(g) If the Secretary finds that the State is not undertaking the actions committed to under the terms of the grant, the Secretary shall suspend the State's eligibility for further funding under this section for at least one year.

TECHNICAL ASSISTANCE

SEC. 310. (a) The Secretary shall conduct a program of technical assistance and management-oriented research necessary to support the development and implementation of State coastal management program amendments under section 309, and appropriate to the furtherance of international cooperative efforts and technical assistance in coastal zone management. Each department, agency, and instrumentality of the executive branch of the Federal Government may assist the Secretary, on a reimbursable basis or otherwise, in carrying out the purposes of this section, including the furnishing of information to the extent permitted by law, the transfer of personnel with their consent and without prejudice to their position and rating, and the performance of any research, study, and technical assistance which does not interfere with the performance of the primary duties of such department, agency, or instrumentality. The Secretary may enter into contracts or other arrangements with any qualified person for the purposes of carrying out this subsection.

(b)(1) The Secretary shall provide for the coordination of technical assistance, studies, and research activities under this section with any other such activities that are conducted by or subject to the authority of the Secretary.

(2) The Secretary shall make the results of research and studies conducted pursuant to this section available to coastal States in the form of technical assistance publications, workshops, or other means appropriate.

(3) The Secretary shall consult with coastal States on a regular basis regarding the development and implementation of the program established by this section.

PUBLIC HEARINGS

SEC. 311. All public hearings required under this title must be announced at least thirty days prior to the hearing date. At the time of the announcement, all agency materials pertinent to the hearings, including documents, studies, and other data, must be made available to the public for review and study. As similar materials are subsequently developed, they shall be made available to the public as they become available to the agency.

REVIEW OF PERFORMANCE

SEC. 312. (a) The Secretary shall conduct a continuing review of the performance of coastal states with respect to coastal management. Each review shall include a written evaluation with an assessment and detailed findings concerning the extent to which the state has implemented and enforced the program approved by the Secretary, addressed the coastal management needs identified in section 303(2)(A) and (K), and adhered to the terms of any grant, loan, or cooperative agreement funded under this title.

(b) In evaluating a coastal state's performance, the Secretary shall conduct the evaluation in an open and public manner, and provide full opportunity for public participation, including holding public meetings in the State being evaluated and providing opportunities for the submission of written and oral comments by the public. The Secretary shall provide the public with at least 45 days' notice of such public meetings by placing a notice in the Federal Register, by publication of timely notices in newspapers of general circulation within the State being evaluated, and by communications with persons and organizations known to be interested in the evaluation. Each evaluation shall be prepared in report form and shall include written responses to the written comments received during the evaluation process. The final report of the evaluation shall be completed within 120 days after the last public meeting held in the State being evaluated. Copies of the evaluation shall be immediately provided to all persons and organizations participating in the evaluation process.

(c)(1) The Secretary may suspend payment of any portion of financial assistance extended to any

coastal state under this title, and may withdraw any unexpended portion of such assistance, if the Secretary determines that the coastal state is failing to adhere to (A) the management program or a State plan developed to manage a national estuarine reserve established under section 315 of this title, or a portion of the program or plan approved by the Secretary, or (B) the terms of any grant or cooperative agreement funded under this title.

(2) Financial assistance may not be suspended under paragraph (1) unless the Secretary provides the Governor of the coastal state with—

(A) written specifications and a schedule for the actions that should be taken by the State in order that such suspension of financial assistance may be withdrawn; and

(B) written specifications stating how those funds from the suspended financial assistance shall be expended by the coastal state to take the actions referred to in subparagraph (A).

(3) The suspension of financial assistance may not last for less than 6 months or more than 36 months after the date of suspension.

(d) The Secretary shall withdraw approval of the management program of any coastal State and shall withdraw financial assistance available to that State under this title as well as any unexpended portion of such assistance, if the Secretary determines that the coastal State has failed to take the actions referred to in subsection (c)(2)(A).

(e) Management program approval and financial assistance may not be withdrawn under subsection (d), unless the Secretary gives the coastal state notice of the proposed withdrawal and an opportunity for a public hearing on the proposed action. Upon the withdrawal of management program approval under this subsection (d), the Secretary shall provide the coastal state with written specifications of the actions that should be taken, or not engaged in, by the state in order that such withdrawal may be canceled by the Secretary.

RECORDS AND AUDIT

SEC. 313. (a) Each recipient of a grant under this title or of financial assistance under section 308, as in effect before the date of the enactment of the Coastal Zone Act Reauthorization Amendments of 1990, shall keep such records as the Secretary shall prescribe, including records which fully disclose the amount and disposition of the funds received under the grant and the proceeds of such assistance, the total cost of the project or undertaking supplied by

other sources, and such other records as will facilitate an effective audit.

(b) The Secretary and the Comptroller General of the United States, or any of their duly authorized representatives, shall—

(1) after any grant is made under this title or any financial assistance is provided under section 308, as in effect before the date of the enactment of the Coastal Zone Act Reauthorization Amendments of 1990; and

(2) until the expiration of 3 years after—(A) completion of the project, program, or other undertaking for which such grant was made or used, or

(B) repayment of the loan or guaranteed indebtedness for which such financial assistance was provided, have access for purposes of audit and examination to any record, book, document, and paper which belongs to or is used or controlled by, any recipient of the grant funds or any person who entered into any transaction relating to such financial assistance and which is pertinent for purposes of determining if the grant funds or the proceeds of such financial assistance are being, or were, used in accordance with the provisions of this title.

WALTER B. JONES EXCELLENCE IN COASTAL ZONE MANAGEMENT AWARDS

SEC. 314. (a) The Secretary shall, using sums in the Coastal Zone Management Fund established under section 308 and other amounts available to carry out this title (other than amounts appropriated to carry out sections 305, 306, 306A, 309, 310, and 315), implement a program to promote excellence in coastal zone management by identifying and acknowledging outstanding accomplishments in the field.

(b) The Secretary shall elect annually—

(1) one individual, other than an employee or officer of the Federal Government, whose contribution to the field of coastal zone management has been the most significant;

(2) 5 local governments which have made the most progress in developing and implementing the coastal zone management principles embodied in this title; and

(3) up to 10 graduate students whose academic study promises to contribute materially to development of new or improved approaches to coastal zone management.

(c) In making selections under subsection (b)(2) the Secretary shall solicit nominations from the

coastal states, and shall consult with experts in local Government planning and land use.

(d) In making selections under subsection (b)(3) the Secretary shall solicit nominations from coastal states and the National Sea Grant College Program.

(e) Using sums in the Coastal Zone Management Fund established under section 308 and other amounts available to carry out this title (other than amounts appropriated to carry out sections 305, 306, 306A, 309, 310, and 315), the Secretary shall establish and execute appropriate awards, to be known as the "Walter B. Jones Awards", including—

(1) cash awards in an amount not to exceed \$5,000 each;

(2) research grants; and

(3) public ceremonies to acknowledge such awards.

NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

SEC. 315. (a) Establishment of the System.—There is established the National Estuarine Research Reserve System (hereinafter referred to in this section as the "System" that consists of—

(1) each estuarine sanctuary designated under this section as in effect before the date of the enactment of the Coastal Zone Management Reauthorization Act of 1985; and

(2) each estuarine area designated as a national estuarine reserve under subsection (b). Each estuarine sanctuary referred to in paragraph (1) is hereby designated as a national estuarine reserve.

(b) Designation of National Estuarine Reserves.—After the date of the enactment of the Coastal Zone Management Reauthorization Act of 1985, the Secretary may designate an estuarine area as a national estuarine reserve if—

(1) the Government of the coastal state in which the area is located nominates the area for that designation; and

(2) the Secretary finds that—

(A) the area is a representative estuarine ecosystem that is suitable for long-term research and contributes to the biogeographical and typological balance of the System;

(B) the law of the coastal state provides long-term protection for reserve resources to ensure a stable environment for research;

(C) designation of the area as a reserve will serve to enhance public awareness and understanding of estuarine areas, and provide suitable opportunities for public education and interpretation; and

(D) the coastal state in which the area is located has complied with the requirements of any regulations issued by the Secretary to implement this section.

(c) Estuarine Research Guidelines.—The Secretary shall develop guidelines for the conduct of research within the System that shall include—

(1) a mechanism for identifying, and establishing priorities among, the coastal management issues that should be addressed through coordinated research within the System;

(2) the establishment of common research principles and objectives to guide the development of research programs within the Systems;

(3) the identification of uniform research methodologies which will ensure comparability of data, the broadest application of research results, and the maximum use of the System for research purposes;

(4) the establishment of performance standards upon which the effectiveness of the research efforts and the value of reserves within the System in addressing the coastal management issues identified in paragraph (1) may be measured; and

(5) the consideration of additional sources of funds for estuarine research than the funds authorized under this Act, and strategies for encouraging the use of such funds within the System, with particular emphasis on mechanisms established under subsection (d). In developing the guidelines under this section, the Secretary shall consult with prominent members of the estuarine research community.

(d) Promotion and Coordination of Estuarine Research.—The Secretary shall take such action as is necessary to promote and coordinate the use of the System for research purposes including—

(1) requiring that the National Oceanic and Atmospheric Administration, in conducting or supporting estuarine research, give priority consideration to research that uses the System; and

(2) consulting with other Federal and State agencies to promote use of one or more reserves within the System by such agencies when conducting estuarine research

(e) Financial Assistance.—(1) The Secretary may, in accordance with such rules and regulations as the Secretary shall promulgate, make grants—

(A) to a coastal state—

(i) for purposes of acquiring such lands and waters, and any property interests therein, as are necessary to ensure the appropriate long-term management of an area as a national estuarine reserve,

(ii) for purposes of operating or managing a national estuarine reserve and constructing appropriate reserve facilities, or

(iii) for purposes of conducting educational or interpretive activities; and

(B) to any coastal state or public or private person for purposes of supporting research and monitoring within a national estuarine reserve that are consistent with the research guidelines developed under subsection (c).

(2) Financial assistance provided under paragraph (1) shall be subject to such terms and conditions as the Secretary considers necessary or appropriate to protect the interests of the United States, including requiring coastal states to execute suitable title documents setting forth the property interest or interests of the United States in any lands and waters acquired in whole or part with such financial assistance.

(3)(A) The amount of the financial assistance provided under paragraph (1)(A)(i) with respect to the acquisition of lands and waters, or interests therein, for any one national estuarine reserve may not exceed an amount equal to 50 percent of the costs of the lands, waters, and interests therein or \$5,000,000, whichever amount is less.

(B) The amount of the financial assistance provided under paragraph (1)(A) (ii) and (iii) and paragraph (1)(B) may not exceed 70 percent of the costs incurred to achieve the purposes described in those paragraphs with respect to a reserve, except that the amount of the financial assistance provided under paragraph (1)(A)(iii) may be up to 100 percent of any costs for activities that benefit the entire System.

(C) Notwithstanding subparagraphs (A) and (B), financial assistance under this subsection provided from amounts recovered as a result of damage to natural resources located in the coastal zone may be used to pay 100 percent of the costs of activities carried out with the assistance.

(f) Evaluation of System Performance.—(1) The Secretary shall periodically evaluate the operation and management of each national estuarine reserve, including education and interpretive activities, and the research being conducted within the reserve.

(2) If evaluation under paragraph (1) reveals that the operation and management of the reserve is deficient, or that the research being conducted within the reserve is not consistent with the research guidelines developed under subsection (c), the Secretary may suspend the eligibility of that reserve for financial assistance under subsection (e) until the efficiency or inconsistency is remedied.

(3) The Secretary may withdraw the designation of an estuarine area as a national estuarine reserve if evaluation under paragraph (1) reveals that—

(A) the basis for any one or more of the findings made under subsection (b)(2) regarding that area no longer exists; or

(B) a substantial portion of the research conducted within the area, over a period of years, has not been consistent with the research guidelines developed under subsection (c).

(g) Report.—The Secretary shall include in the report required under section 316 information regarding—

(1) new designations of national estuarine reserves;

(2) any expansion of existing national estuarine reserves;

(3) the status of the research program being conducted within the System; and

(4) a summary of the evaluations made under subsection (f).

COASTAL ZONE MANAGEMENT REPORT

SEC. 316. (a) The Secretary shall consult with the Congress on a regular basis concerning the administration of this title and shall prepare and submit to the President for transmittal to the Congress a report summarizing the administration of this title during each period of two consecutive fiscal years. Each report, which shall be transmitted to the Congress not later than April 1 of the year following the close of the biennial period to which it pertains, shall include, but not be restricted to (1) an identification of the state programs approved pursuant to this title during the preceding Federal fiscal year and a description of those programs; (2) a listing of the states participating in the provisions of this title and a description of the status of each state's programs and its accomplishments during the preceding Federal fiscal year; (3) an itemization of the allocation of funds to the various coastal states and a breakdown of the major projects and areas on which these funds were expended; (4) an identification of any state programs which have been reviewed and disapproved, and a statement of the reasons for such action; (5) a summary of evaluation findings prepared in accordance with subsection (a) of section 312, and a description of any sanctions imposed under subsections (c) and (d) of section 312; (6) a listing of all activities and projects which, pursuant to the provisions of subsection (c) or subsection (d) of section 307, are not consistent with an applicable approved state management program; (7) a summary of the regulations issued by the Secretary or in effect during the preceding Federal fiscal year; (8) a

summary of a coordinated national strategy and program for the Nation's coastal zone including identification and discussion of Federal, regional, state, and local responsibilities and functions therein; (9) a summary of outstanding problems arising in the administration of this title in order of priority; (10) a description of the economic, environmental, and social consequences of energy activity affecting the coastal zone and an evaluation of the effectiveness of financial assistance under section 308 in dealing with such consequences; (11) a description and evaluation of applicable interstate and regional planning and coordination mechanisms developed by the coastal states; (12) a summary and evaluation of the research, studies, and training conducted in support of coastal zone management; and (13) such other information as may be appropriate.

(b) The report required by subsection (a) shall contain such recommendations for additional legislation as the Secretary deems necessary to achieve the objectives of this title and enhance its effective operation.

(c)(1) The Secretary shall conduct a systematic review of Federal programs, other than this title, that affect coastal resources for purposes of identifying conflicts between the objectives and administration of such programs and the purposes and policies of this title. Not later than 1 year after the date of the enactment of this subsection, the Secretary shall notify each Federal agency having appropriate jurisdiction of any conflict between its program and the purposes and policies of this title identified as a result of such review.

(2) The Secretary shall promptly submit a report to the Congress consisting of the information required under paragraph (1) of this subsection. Such report shall include recommendations for changes necessary to resolve existing conflicts among Federal laws and programs that affect the uses of coastal resources.

RULES AND REGULATIONS

SEC. 317. The Secretary shall develop and promulgate, pursuant to section 553 of title 5, United States Code, after notice and opportunity for full participation by relevant Federal agencies, state agencies, local governments, regional organizations, port authorities, and other interested parties, both public and private, such rules and regulations as may be necessary to carry out the provisions of this title.

AUTHORIZATION OF APPROPRIATIONS

SEC. 318. (a) There are authorized to be appropriated to the Secretary, to remain available until expended—

(1) for grants under sections 306, 306A, and 309—

- (A) \$47,600,000 for fiscal year 1997;
- (B) \$49,000,000 for fiscal year 1998; and
- (C) \$50,500,000 for fiscal year 1999; and

(2) for grants under section 315—

- (A) \$4,400,000 for fiscal year 1997;
- (B) \$4,500,000 for fiscal year 1998; and
- (C) \$4,600,000 for fiscal year 1999.

(b) Federal funds received from other sources shall not be used to pay a coastal state's share of costs under section 306 or 309.

(c) The amount of any grant, or portion of a grant, made to a State under any section of this Act which is not obligated by such State during the fiscal year, or during the second fiscal year after the fiscal year, for which it was first authorized to be obligated by such State shall revert to the Secretary. The Secretary shall add such reverted amount to those funds available for grants under the sec-

tion for such reverted amount was originally made available.

APPEALS TO THE SECRETARY

SEC. 319. (a) NOTICE.—The Secretary shall publish in the Federal Register a notice indicating when the decision record has been closed on any appeal to the Secretary taken from a consistency determination under section 307(c) or (d). No later than 90 days after the date of publication of this notice, the Secretary shall—

(1) issue a final decision in the appeal; or

(2) publish a notice in the Federal Register detailing why a decision cannot be issued within the 90-day period.

(b) DEADLINE.—In the case where the Secretary publishes a notice under subsection (a)(2), the Secretary shall issue a decision in any appeal filed under section 307 no later than 45 days after the date of the publication of the notice.

(c) APPLICATION.—This section applies to appeals initiated by the Secretary and appeals filed by an applicant.

A SECTION-BY-SECTION SUMMARY OF THE COASTAL ZONE MANAGEMENT ACT OF 1972 [As Amended (CZMA)(16 U.S.C. §§ 1451 to 1464)]

THE CZMA WAS PASSED IN 1972 to manage uses and resources of the nation's coastal zone.

- A major premise of the CZMA is that such management is best achieved at the state and local level.
- Voluntary program: coastal states, including Great Lakes states and U.S. territories, may elect to participate in the national CZMA program.
- State programs must develop comprehensive coastal management programs that meet federal approval standards.
- Once a state program is approved by NOAA, a coastal state receives annual operating funds, and federal actions must be consistent with the enforceable policies of a state's program.
- There are 33 approved state and territory coastal management programs. One state is developing a program and one state is not participating. There was an important reauthorization in 1990 and again in 1996.

The CZMA includes the following sections:

Section 302—Congressional Findings describes the national interest in coastal management, the need for coastal management, the competing uses of the coastal zone, and the natural resources and human development at risk from natural and man-made hazards.

Section 303—Congressional Declaration of Policy describes the national policy to protect, preserve, develop, and where possible restore or enhance the resources of the coastal zone for this and succeeding generations. This section also describes the minimal contents of a state coastal management program.

Section 304—Definitions defines important terms used in the CZMA: “coastal zone,” coastal resource of national significance,” “coastal waters,” “coastal state,” “coastal energy activity,” “energy facilities,” “enforceable policy,” etc.

Section 305—Management Program Development Grants provides for funds for states that are developing a coastal management program.

Section 306—Administrative Grants provides for annual implementation grants to states on a 1-to-1 ratio for most states (newly approved states have different ratios for the first 3 years after approval). Funds are allocated by a formula based on shoreline mileage and the population of the coastal area. Section 306(d) contains the requirements for program approval. A state’s program must describe the coastal zone boundary, permissible land and water uses, areas of particular concern, the means that the state will use to exert control over the land and water uses, the program’s organizational structure, a planning process for public access, a planning process for energy facilities, and a planning process for assessing the effects of shoreline erosion. The section also contains requirements for how to develop a program, including public participation requirements and adequately considering the views of federal agencies. Section 306 also allows a state to amend its program.

Section 306A—Coastal Resources Improvement Program was added in 1980 (with funds available in 1985) to allow states to purchase ecologically sensitive areas, construct low-cost public access facilities, revitalize deteriorating urban waterfronts, restore shellfish beds, etc.

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA)—the Coastal Nonpoint Pollution Control Program was created in 1990 by CZARA. While not actually part of the CZMA, the Coastal Nonpoint Pollution Control Program is an integral part of the national CZMA program and state program. Section 6217 requires states to develop programs to manage the effects of nonpoint pollution in the coastal zone.

Section 307—Coordination and Cooperation, more popularly known as the Federal Consistency Requirement, requires that federal agencies; nonfederal applicants for federal permits, licenses, and other approvals; and state and local government applicants for federal financial assistance conduct their activities in a manner consistent with the enforceable policies of state coastal management programs.

Section 308—Coastal Zone Management Fund creates a fund, based in part on loan repayments from previous Coastal Energy Impact Loans, to be used for a variety of purposes: demonstration projects, emergency grants to states, workshops, development grants under section 305, etc.

Section 309—Coastal Zone Enhancement Grants provides funds to states to make improvements in their coastal management programs in the areas of wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management plans, ocean management, energy facility siting, and aquaculture.

Section 310—Technical Assistance requires the Secretary of Commerce to provide technical assistance and management-oriented research in support of the national and state programs.

Section 311—Public Hearings contains requirements for the conduct of any public hearing.

Section 312—Review of Performance requires the Secretary to conduct a continuing review of state programs to ensure that the state is adhering to its federally approved program. The Secretary may withdraw funds if a state is in noncompliance.

Section 313—Records and Audit contains financial record requirements for CZMA grant recipients.

Section 314—Walter B. Jones Excellence in Coastal Zone Management Awards provides for annual awards to citizens, local governments, graduate students, and others for excellence in coastal management. Awards are paid out of Section 308.

Section 315—National Estuarine Research Reserve System provides for the designation of estuarine research reserves in states to enhance public awareness and understanding of estuarine areas, to provide opportunities for public education, and for research to support the protection of these areas and a state's coastal management program. There are 25 reserves that represent different biogeographic regions of the United States.

Section 316—Coastal Zone Management Reports requires the Secretary to report to Congress on the implementation of the CZMA on a biennial basis.

Section 317—Rules and Regulations requires the Secretary to promulgate rules to implement the CZMA.

Section 318—Authorization of Appropriations authorizes funds to implement the CZMA.

COASTAL ZONE MANAGEMENT ACT

The following language from the CZMA, specifically Section 303, identifies the relationship of the six focus areas or major goals, as determined by the panel: coastal ecosystems, coastal water quality, coastal hazards, public access, coastal community development, and coastal-dependent uses. The panel felt that these broad-based focus areas captured the major objectives of the Act. While other objectives are contained within Section 303, such as public participation and government coordination, the panel identified these objectives, and others of this nature in Section 303, as tools or strategies used by coastal programs to achieve the CZMA goals or focus areas.

FOCUS AREAS

Coastal habitats/biodiversity—Section 303(2)(A)

- The **protection of natural resources**, including wetlands, floodplains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat, within the coastal zone

Coastal hazards—Section 303(2)(B)

- The management of coastal development to minimize the loss of life and property caused by improper development **in flood-prone, storm surge, geological hazard, and erosion-prone** areas and in areas likely to be affected by or vulnerable to sea level rise, land subsidence, and saltwater intrusion, and by the destruction of natural protective features such as beaches, dunes, wetlands, and barrier islands

Coastal water quality—Section 303(2)(C)

- The management of coastal development to improve, safeguard, and restore the **quality of coastal waters**, and to protect natural resources and existing uses of those waters

Coastal-dependent uses—Section 303(2)(D)

- Priority consideration being given to **coastal-dependent uses** and orderly processes for siting major facilities related to national defense, energy, fishery development, recreation, ports and transportation, and the location, to the maximum extent practicable, of new commercial and industrial developments in or adjacent to areas where such development already exists.

Public access—Section 303(2)(E)

- **Public access** to the coasts for recreation purposes

Coastal community development—Section 303(2)(F)

- Assistance in the **redevelopment of deteriorating urban waterfronts and ports**, and sensitive preservation and restoration of historic, cultural, and esthetic coastal features

TOOLS AND STRATEGIES

Government efficiency and interagency coordination—Section 303(2)(G)

- The **coordination and simplification** of procedures in order to ensure **expedited governmental decision making** for the management of coastal resources;

Government efficiency and interagency coordination—Section 303(2)(H)

- Continued **consultation and coordination with**, and the giving of adequate consideration to the views of, **affected Federal agencies**;

Public participation—Section 303(2)(I)

- The giving of timely and effective notification of, and **opportunities for public and local government participation** in, coastal management decision making;

Comprehensive planning and policy framework

Government efficiency and interagency coordination—Section 303(2)(J)

- Assistance to support **comprehensive planning**, conservation, and management for living marine resources, including planning for the siting of pollution control and aquaculture facilities within the coastal zone, and **improved coordination between state and federal coastal zone management agencies and state and wildlife agencies**;

Comprehensive planning and policy framework

Coastal areas of national significance/areas of critical concern/special area management planning—Section 303(2)(K)

- **The study and development**, in any case in which the Secretary considers it to be appropriate, **of plans for addressing the adverse effects upon the coastal zone** of land subsidence and of sea level rise;

Government efficiency and interagency coordination

Coastal areas of national significance/ areas of critical concern/special area management planning—Section 303(3)

- To encourage the preparation of **special area management plans** which provide for increased specificity in **protecting significant natural resources**, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and **improved predictability in governmental decision making**;

Government efficiency and interagency coordination

National interest/local implementation—Section 303(4)

- To **encourage the participating and cooperation** of the public, **state and local governments**, and interstate and other regional agencies, as well as of the federal agencies having programs affecting the coastal zone, in **carrying out the purposes** of this title;

Comprehensive planning and policy framework

Government efficiency and interagency coordination—Section 303(5)

- To encourage **coordination and cooperation** with and **among the appropriate federal, state, and local agencies, and international organizations** where appropriate, **in collection, analysis, synthesis, and dissemination of coastal management information, research results, and technical assistance**, to support state and federal regulation of land use practices affecting the coastal and ocean resources of the United States;

National interest/local implementation—Section 303(6)

- To respond to changing circumstances affecting the coastal environment and coastal resource management by encouraging states to consider such issues as **ocean uses potentially affecting the coastal zone**

APPENDIX B

STATE CONSTITUENCY MEETINGS

TEXAS STATE CONSTITUENCY MEETING COASTAL ZONE MANAGEMENT: PERFORMANCE INDICATORS STUDY Corpus Christi, Texas, March 19, 2002

Invited Participants

Ray Allen
Coastal Bend Bays and Estuaries Program
Corpus Christi, TX

Tony Amos
University of Texas at Austin Marine
Science Institute
Port Aransas, TX

John Barrett
Coastal Coordination Council (Agriculture)
Edroy, TX

Jeb Boyt
General Land Office
Austin, TX

Tommy Brooks
City of Port Aransas
Port Aransas, TX

Bob Cornelison
Texas Ports Association
Port Isabel, TX

Sally Davenport
General Land Office
Austin, TX

Bob Dunkin
Coastal Coordination Council (Business)
San Benito, TX

Janet Fatheree
General Land Office
Austin, TX

Paul Montagna
University of Texas at Austin Marine
Science Institute
Port Aransas, TX

Bruce Moulton
Texas Natural Resource Conservation Commission
Austin, TX

Bernard Paulson
Port of Corpus Christi Authority
Corpus Christi, TX

Ellis Pickett
Surfriders Foundation
Liberty, TX

Chemaine Sahadi
Naismith Engineering
Corpus Christi, TX

Robert Stickney
Texas Sea Grant
College Station, TX

Pat Suter
Coastal Bend Sierra Club
Corpus Christi, TX

Study Panelists Attending

Ralph Cantral
NOAA National Ocean Service
Silver Spring, MD

Jim McGrath
Port of Oakland
Oakland, CA

Elizabeth Nisbet
Coastal Coordination Council
Corpus Christi, TX

Donald Ross
EarthBalance, Inc.
North Port, FL

Heinz Center Staff Attending

Cheryl Graham Daman Irby Jeffery Rank

TEXAS STATE CONSTITUENCY MEETING AGENDA
Corpus Christi, Texas
March 19, 2002

8:30 AM	Continental Breakfast
9:00 AM	<p>Welcome and Opening Remarks, Purpose and Goals of Meeting <i>Cheryl Graham</i>, Project Manager, The Heinz Center</p> <ul style="list-style-type: none"> ■ Introductions ■ The Heinz Center Mission ■ Brief Introduction to the Study
9:30 AM	<p>Texas Coastal Management Program Overview “Overview of the Texas Coastal Management Program” <i>Jeb Boyd</i>, Acting Director, Coastal Management Division, Texas General Land Office “A Texas Tourism Community’s Association with state Coastal Zone Management” <i>Tommy Brooks</i>, City Manager, City of Port Aransas, Texas</p>
10:30 AM	<p>Coastal Zone Management: Performance Indicators and Measures Study <i>Cheryl Graham</i>, The Heinz Center <i>Ralph Cantral</i>, NOAA and Study Panel Member</p>
11:00 AM	<p>Focus Area: Public Access <i>Ralph Cantral</i>, NOAA and Study Panel Member Review of paper and group discussion</p>
Noon	Working Lunch
1:00 PM	<p>Focus Area: Coastal Hazards <i>Ralph Cantral</i>, NOAA and Study Panel Member Review of paper and group discussion</p>

1:30 PM	<p>Focus Area: Coastal-Dependent Uses <i>Donald Ross</i>, EarthBalance, Inc. and Study Panel Member Review of paper and group discussion</p>
2:00 PM	Break
2:30 PM	<p>Focus Area: Coastal Water Quality <i>Jeffery Rank</i>, The Heinz Center Review of paper and group discussion</p>
3:00 PM	<p>Focus Area: Coastal Community Development <i>Cheryl Graham</i>, Project Manager, The Heinz Center Review of paper and group discussion</p>
3:30 PM	<p>Focus Area: Coastal Habitats and Diversity <i>Donald Ross</i>, EarthBalance, Inc. and Study Panel Review of paper and group discussion</p>
4:00 PM	<p>Additional Discussion</p> <ul style="list-style-type: none"> ■ What have we missed? ■ How do we ensure success? ■ What do states fear?
5:00 PM	Adjourn

**MARYLAND STATE CONSTITUENCY MEETING
COASTAL ZONE MANAGEMENT:
PERFORMANCE INDICATORS STUDY
Annapolis, Maryland, March 25, 2002**

Invited Participants

Robert Boone
Anacostia Watershed Society
Bladensburg, MD

Steve Bunker
The Nature Conservancy
Annapolis, MD

Charlie Conklin
Alliance for the Chesapeake Bay
Glen Arm, MD

Mary Conley
Maryland Department of Natural Resources
Annapolis, MD

Tom Downs
University of Maryland
College Park, MD

Erin Fitzsimmons
City Council
Ocean City, MD

Peter Hill

NOAA Chesapeake Bay Office
Annapolis, MD

Bill Jenkins

Maryland Director Natural Resources
Annapolis, MD

Kimani Kimbrough

Morgan State University
Baltimore, MD

Jonathon Kramer

University of Maryland
College Park, MD

Debi Osborne

Trust for Public Land
Washington, DC

Don Outen

Baltimore County Department of
Environmental Protection and
Resource Management
Towson, MD

Glenn Page

The National Aquarium
Baltimore, MD

Margaret Podlich

Boat US
Annapolis, MD

Gwynne Schultz

Maryland Department of Natural
Resources
Annapolis, MD

Larry Simms

Maryland Watermen's Association
Rock Hall, MD

Pat Stuntz

Chesapeake Bay Commission

Brian Woodward

Recreation and Parks Department, Anne
Arundel County
Annapolis, MD

Sarah Woodworth

ZHA, Inc.
Annapolis, MD

*Study Panelists Attending***Kathleen Blaha**

Trust for Public Land
Washington, DC

Ralph Cantral

NOAA National Ocean Service
Spring, MD

Douglas Lipton

University of Maryland
College Park, MD

Robert Tudor

Delaware River Basin Commission
West Trenton, NJ

*Heinz Center Staff Attending***Cheryl Graham**

Daman Irby
Jeffery Rank

MARYLAND STATE CONSTITUENCY MEETING AGENDA
Annapolis, Maryland
March 25, 2002

- 8:30 AM** Continental Breakfast
- 9:00 AM** **Welcome and Opening Remarks, Purpose and Goals of Meeting**
Cheryl Graham, Project Manager, The Heinz Center
- Introductions
 - The Heinz Center Mission
 - Brief Introduction to the Study
- 9:30 AM** **Maryland Coastal Zone Management Program Overview**
“Coastal Zone Management, Maryland’s Approach”
Gwynne Schultz, Director, Coastal Zone Management Division,
Maryland Department of Natural Resources
“Developing and Using Indicators to Guide Natural Resource
Programs in Maryland”
Bill Jenkins, Director, Watershed Management and Analysis
Division, Maryland Department of Natural Resources
- 10:30 AM** **Coastal Zone Management: Performance Indicators and Measures Study**
Cheryl Graham, The Heinz Center
Ralph Cantral, NOAA and Study Panel Member
- 11:00 AM** **Focus Area: Public Access**
Ralph Cantral, NOAA and Study Panel Member
Review of paper and group discussion
- Noon** Working Lunch
- 1:00 PM** **Focus Area: Coastal Community Development**
Kathy Blaha, Trust for Public Land
Review of paper and group discussion
- 1:30 PM** **Focus Area: Coastal-Dependent Uses**
Ralph Cantral, NOAA and Study Panel Member
Review of paper and group discussion
- 2:00 PM** Break
- 2:30 PM** **Focus Area: Coastal Water Quality**
Robert Tudor, Delaware River Basin Commission
Review of paper and group discussion
- 3:00 PM** **Focus Area: Coastal Hazards**
Ralph Cantral, NOAA and Study Panel Member
Review of paper and group discussion

3:30 PM	<p>Focus Area: Coastal Habitats and Diversity <i>Doug Lipton</i>, University of Maryland Review of paper and group discussion</p>
4:00 PM	<p>Additional Discussion</p> <ul style="list-style-type: none"> ■ What have we missed? ■ How do we ensure success? ■ What do states fear?
5:00 PM	Adjourn

STATE CONSTITUENCY MEETING RESULTS

The three tables that follow summarize the results of the two state constituency meetings.

Table B1 summarizes, by focus area, comments received from participants on how the panel might refine the proposed framework, and, as a result, some modifications were made.

Table B1: State Constituency Meeting Input

Focus Area	Texas	Maryland
Public Access	<p>“Legal Availability” should cover <i>enforcement</i>. Unenforced laws are of little consequence.</p> <p>Some felt “Legal Availability” a <i>naïve term</i> and “<i>in the eye of the beholder</i>.” Others felt it was necessary to determine easement and legal rights.</p> <p>“Area by type” problematic—many could be <i>constants</i> and <i>may not indicate performance</i>.</p> <p>“Area by type” <i>definition</i> needs to be clearer.</p> <p>Some problem with “quality of experience.” Should perhaps be “<i>Quality of Access Point</i>.”</p> <p>Concerned about accounting for bay access and differentiating between bay and beach access esp. under legal availability—e.g. TX has Open Beaches Act, but bay shoreline is not covered.</p> <p>Must account for <i>commercial access</i>—perhaps another dimension.</p> <p>Must be <i>very careful</i> in defining indicators: e.g., don’t want baseball parks in coastal counties counted as “public parks on the coast.”</p> <p>Dimensions should reflect <i>maintenance of existing access</i>.</p>	<p><i>Complexity</i> of legal framework may present problem for “legal availability.”</p> <p>“Legal availability” will be very <i>hard to measure objectively</i>.</p> <p>“Area by type” should include overlay of whether or not each area is <i>developable</i> (as opposed to polluted brownfields).</p> <p>Dimensions don’t <i>measure degradation</i>.</p> <p>No indication of <i>who is doing what</i>—esp. economically. Might be achieved through looking at licensing.</p> <p>Account for <i>transportation</i>—public transit available? Parking reasonable?</p> <p><i>Information is not available</i> for some of the dimensions identified.</p>

(continued)

Table B1: State Constituency Meeting Input, *continued*

Focus Area	Texas	Maryland
Coastal Community Development	<p>Breakdown of <i>different types of land uses</i>. Land use and development intertwined with <i>transportation</i>.</p> <p><i>Tourism-related jobs</i> should be regarded as community development.</p> <p><i>Difficult to relate</i> to TX program—tools (zoning regulations, public support) generally not available.</p> <p><i>Telling communities how to develop</i> (or allowing this to be the perception) will not be well received in TX.</p> <p><i>Public involvement</i> in coastal management should be reflected.</p>	<p>Encompass <i>mixed use vs. single purpose</i>. <i>Economic sector allocation</i> should be reflected—e.g., docks being converted for yachts, property taxes rising and driving out waterman who historically occupied the waterfront.</p> <p>Must account for coastal <i>quality of life</i>. Closely tied <i>coastal dependency</i>.</p> <p>Show <i>distribution of jobs</i>—not just net economic growth.</p> <p>Add <i>organizational dimension</i>.</p> <p>Outcome statement does not have “changes.” But <i>success may be static</i>.</p>
Coastal-Dependent Uses	<p><i>Ports, fishery/traditional uses/tourism</i> all important.</p> <p>New dimension needed “<i>Safety/Security</i>.”</p> <p>Impacts of coastal use should be managed by <i>maximizing presence, minimizing impact on resources, and mitigating</i>.</p>	<p>Why is this separate from coastal <i>community development</i>? Keeping separate implies that coastal dependent uses will not be considered in coastal community development.</p> <p><i>Environmental health</i> dimension missing. Indicate <i>efficiency of use</i>.</p> <p><i>Definition</i> of “coastal dependency” will have a large impact here. MD has clearly defined “water-dependent.”</p> <p><i>Layering</i> according to distance from coast may be helpful.</p> <p>Outcome statement should be “<i>Changes in coastal-dependent economic development</i>”—eliminate “opportunities” language.</p>
Coastal Water Quality	<p><i>Freshwater inflow</i> must be included as it has a major impact on coastal water quality.</p> <p>Discuss <i>contaminated sediment</i>→ <i>impacts</i>.</p> <p>Need to acknowledge 6217 measures, BMPs, and 303D list.</p> <p><i>New dimensions</i> (subdimensions) needed—<i>Point and Nonpoint Sources</i>.</p> <p>Should <i>reflect maintaining water quality</i> as well as improving water quality.</p> <p>Must reflect <i>natural anomalies</i> e.g., Laguna Madre.</p>	<p>Should <i>reflect prevention</i>. Much of the planning is to <i>reduce loading</i>.</p> <p>Differentiate <i>inputs from inside coast and outside coast</i>.</p> <p>Consider program interactions—6217, CWA, CAA, etc.</p> <p>New dimension for <i>response, restoration, and pollution prevention</i>.</p> <p>Make room for <i>industry risk assessment</i>—nuclear plants, etc.</p> <p>Include <i>social and economic effects</i> of water quality.</p> <p>Recognize monitoring system is <i>very expensive</i>.</p>
Coastal Hazards	<p>Vulnerability must be measured against some <i>baseline</i>.</p> <p>Must have <i>education and awareness</i>.</p> <p>Is <i>terrorism</i> a hazard?</p> <p>2 major categories—flooding and wind, but should also <i>include drought, freezes (leading to fish kills), floods from upstream, oil spills, etc.</i></p> <p>Account for <i>partnerships</i>—things that get done with other people’s money; indicate coordination.</p>	<p>“<i>Risk</i>” should be added to vulnerability dimension—e.g., ability to replace things.</p> <p>Capture <i>people and property costs</i>—lives lost, etc.</p> <p><i>Planning/anticipation</i> should be accounted for.</p> <p><i>Early warning system/education</i> dimension needed.</p> <p>Account for <i>distant man-made coastal hazards</i>—e.g., inland oil spills.</p> <p>Specifically mention <i>infrastructure subsidies</i>.</p>

(continued)

Table B1: State Constituency Meeting Input, *continued*

Focus Area	Texas	Maryland
Coastal Habitats/ Biodiversity	<i>Good science, good measurements, and good baselines</i> are needed. Dimensions are wrong—need to be 3 levels of biodiversity: <i>Population level</i> (genetics), <i>species level</i> (taxonomic), and <i>community level</i> (habitat). This system keeps the same potential range of indicators, but rearranges and collapses the dimensions.	Need dimension to cover <i>MPAs, no-take zones, shellfish closures</i> . Need good selection of <i>processes and legal steps</i> . Account for community based/public <i>outreach and education</i> programs. <i>Protection</i> should be a dimension.

Participants at both constituency meetings were asked to identify indicators that they felt would be useful to measure under each focus area identified in the framework, and Table B2 lists these suggested indicators.

Table B2: State Suggested Indicators

Focus Area	Texas	Maryland
Public Access	Total linear miles Number of passengers on tours No. of dune walkovers built No. of showers built No. of tour operators No. of passengers for birdwatching tours	Public park availability Acres of public parks and whether or not they are filling up Licenses issued Sales records for area stores Access fees Environmental degradation Public transit Demographics of individuals using these areas No. of urban access areas Population
Coastal Community Development	Rural water and sewage development Storm water runoff Wetlands (as a means of storm water control) Total real estate values Number of tourist related jobs Density of development and growth along eroding shores Number of acres of local wetland degradation Water-dependent jobs—industrial and commercial No. of DINKs (Dual Income, No Kids)	No. of docks converted for yachts Ratio of resource lands Distribution of jobs No. of recreational boats and ships vs. no. of commercial ships
Coastal-Dependent Uses	Rate of increase in no. of shrimp trawlers Identified stable FMPs (fishery management plans) No. of fishermen converting from commercial to fish guide	No. of Combined Sewer Overflows (CSOs) Port tonnage as a percentage of land

(continued)

Table B2: State Suggested Indicators, *continued*

Focus Area	Texas	Maryland
Coastal Water Quality	No. of approved BMPs No. of management measures implemented Freshwater inflow TMDLs (total maximum daily loads) No. of pump-out stations	Turbidity Transmissivity TSS (total suspended solids) Toxic spills Pollution prevention programs “Extracoastal” inputs Sediments % closed vs. total Money for monitoring/implementation Major storm events (sediment loads)
Coastal Hazards	No. of droughts No. of freezes No. of fish kills No. of oil spills Marsh building Beach restoration Loss of life Storm surges	Cost of rebuilding Lives lost Cost of property lost Armor (e.g., rip-rap) HABs (harmful algal blooms) Infrastructure subsidies Cost to improve No. of vessel groundings Warning system plans in place
Coastal Habitats/ Biodiversity	Rate of discovery of new species Distributional range Types of coral cover	No. of MPAs, no-take zones, shellfish closures Catch Per Unit Effort (CPUE) No. of fish passes Migratory hotspots/migration route protections

Table B3 presents a summary of the input received at both constituency meetings. The full study panel was presented with all comments received. As a result of these meetings, the framework and study recommendations were refined for the final report.

Table B3: General State Concerns and Comments about Framework

Texas	Maryland
<p>How can we assign credit or blame for outcomes directly to coastal programs? Must be very careful when it comes time to define indicators. Don't know how one would take information and make it work for other places around the country. Should reflect maintenance as well as improvement. Negative of connectivity is fragmentation—can and should be measured. Consider all this in light of Pew and Presidential Ocean Commissions. Think not only of CZMA, but also some future act sprouting from commission's recommendations. Biggest potential benefit is communication, cooperation, and synergy.</p>	<p>Dimensions miss a lot of MD's program. Is information to be shared with public? Make implicit connections between focus areas explicit in overarching discussion area. Recognize high cost of monitoring programs. Are cross-cutting, overarching issue like HABs accounted for? Can't do this everywhere—state priorities vary. Don't be overly specific in roll-out. Measurements can be subjective (e.g., condition)—need standard collection and analysis techniques. Final report should include potential obstacles—cost, measurement problems, fear of ranking, etc. Get more input and buy-in from other states. Coordinate with Congress early—let them know what we are doing.</p>

APPENDIX C

STUDY PANEL BIOGRAPHIES

THE PANEL

ARTHUR NOWELL, *Chair*, is dean of the College of Ocean and Fishery Sciences, the third largest college at the University of Washington, with 200 faculty, 500 students, and 500 staff and an annual budget of \$65 million. He is responsible for undergraduate Bachelor's, Masters' and Doctoral programs and oversight of 400 research grants from eight federal agencies, in addition to gift and state budgets, and supervises operation of two research vessels, including the acquisition of first-of-the-class research vessel in the U.S. in the past 20 years. He is a faculty member and former director of the School of Oceanography. Dr. Nowell also served as president of Joint Oceanographic Institutes in 1993 and managed the 17-nation scientific drilling programs for the international consortium.

MERRYL ALBER is an Associate Professor in the Department of Marine Sciences at the University of Georgia. She is a marine ecologist who specializes in estuarine ecology and coastal policy. A major focus of her efforts is on the impact of perturbations such as changes in freshwater inflow to estuarine ecosystems, and she is involved in research on estuarine food webs, particle dynamics, and water quality. Dr. Alber is active in efforts to improve communication between scientists and coastal policymakers, and to that end she has established the Georgia Coastal Research Council, which works closely with the Georgia Coastal Management Program. Dr. Alber teaches classes in Marine Biology, Marine Ecology, and Coastal Resource Policy. She holds a B.S. in Botany and Zoology from Duke University and a Ph.D. from the Boston University Marine Program.

MICHAEL BECK is Director of the Marine Coastal Waters Program of the Nature Conservancy and a Research Associate at the University of California Santa Cruz. Before joining the Nature Conservancy, Dr. Beck received a B.A. and M.S. from the University of Virginia and a Ph.D. from Florida State University. He received a Fulbright Fellowship and Australian Postdoctoral Research Fellowship for research at the University of Sydney, Australia. In his research, he examines factors that control the diversity and abundance of animals in seagrass, mangrove, rocky intertidal, and salt marsh habitats. A major focus of Dr. Beck's work in conservation is the development of ecoregional plans that identify high-priority sites for conservation action, strategies for conservation at these sites, and methods for measuring the conservation success of our efforts.

CHARLES BEDELL is manager of environmental and government affairs at Murphy Exploration & Production Company based in New Orleans. He is responsible for regulatory compliance and government affairs for Murphy's exploration and production programs in the United States, as well as coordinating them for their U.K., Canada, and Malaysia operations. Mr. Bedell worked for the state of Ohio, practiced law, and in 1974 became Deputy Minority Counsel for the House Committee on Merchant Marine and Fisheries, where he began his involvement with the Coastal Zone Management Act. Mr. Bedell is involved in professional and industry organizations such as the American Petroleum Institute, the National Ocean Industries Association, the Offshore Operators Committee, the Environmental, Health and Safety Auditing Roundtable, and the American Bar Association and is an inactive member of the Ohio Bar. Mr. Bedell has a degree in Biology from Kenyon College and a J.D. from the University of Kentucky.

KATHLEEN BLAHA, *Co-chair*, is Senior Vice President for National Programs for the Trust for Public Land (TPL) and Director of TPL's "Greenprinting" Program, a systematic effort by TPL to help public agencies make land conservation a growth management tool. In support of TPL staff working in 40 offices across the country, Ms. Blaha manages fieldwork and research. In 1998, she developed TPL's partnership with the Urban Land Institute (ULI), which led to the production of two books, *Urban Parks and Open Space* (1998), and *Inside City Parks* (2001). Before coming to TPL, Ms. Blaha worked first as a water resource planner for the regional council of governments in Raleigh, North Carolina, and later helped to create the Triangle Land Conservancy, a private land trust in the Raleigh-Durham area of North Carolina. Ms. Blaha has a B.A. in Geography from Miami University in Oxford, Ohio, and an M.R.P. in Regional Land Use Planning from the University of North Carolina at Chapel Hill. She currently sits on the boards of the Severn River Land Trust in Annapolis, Maryland; the Washington Area Bicycling Association; and the Capitol Hill Business Improvement District in Washington, D.C.

DAVID BROWER is a Research Professor in the Department of City and Regional Planning at the University of North Carolina at Chapel Hill, where he teaches coastal zone management, an introduction to law for planners, environmental ethics, and sustainable development. He also teaches classes in land use law and coastal zone management in the summer program of the Vermont Law School in South Royalton, Vermont. His research interests include coastal zone management, reducing the vulnerability of coastal communities to natural hazards, and sustainable development. His consulting practice has included national, state, and local governments in the United States and the Caribbean. He has undergraduate and J.D. degrees from the University of Michigan.

RALPH CANTRAL is the chief of the National Policy and Evaluation Division in the Office of Ocean and Coastal Resource Management in NOAA's National Ocean Service. From 1992 through 2001, he served as Executive Director of the Florida Coastal Management Program. In 1999-2000, he also served as Acting Executive Director of the Florida Communities Trust, a \$66 million per year land acquisition program for local governments. Before moving to Florida, Mr. Cantral served in a number of coastal management, planning, and community development positions with the state of North Carolina. He has also worked for local government and regional agencies. He serves on a number of state and national boards and committees and is published in the fields of coastal management, planning, and dispute resolution. Mr. Cantral holds B.A. and M.A. degrees in Geography.

DOUGLAS HOPKINS is a Senior Attorney with Environmental Defense, where he has worked since 1990. Mr. Hopkins is a cofounder and the Program Manager of the Environmental Defense Oceans Program. He is also a member of the New England Fishery Management Council and is the only representative of a major environmental organization currently serving on any of the regional fishery management councils. He chairs the Council's Habitat and Capacity Committees and serves on its Groundfish and Sea Scallop Committees, among others. Mr. Hopkins was a partner and associate with Garvey, Schubert & Barer, a private law firm in Seattle, Washington from 1981 to 1988. In 1987 he served as a legislative assistant to Brock Adams, U.S. Senator from Washington State, with responsibility for matters before the Commerce Committee, including marine fisheries management. Mr. Hopkins received a B.A. in Geology and Geophysics/Environment and Resources from Yale University and a J.D. from the University of Virginia.

DOUGLAS LIPTON is an Associate Professor in the Department of Agriculture and Resource Economics at the University of Maryland, College Park. He is also currently the coordinator of the Maryland Sea Grant Extension Program. Since coming to College Park in 1988, he has served as Executive Director of the Mid-Atlantic Regional Marine Research Program (1993–1995) and Acting Program Director of Marine Economics and Recreation, National Sea Grant College Program (1990–1991). He was a fishery biologist and industry economist with the National Marine Fisheries Service headquarters from 1979–1988. Dr. Lipton has been a member of the Scientific and Technical Advisory Committee to the Chesapeake Bay Program since 1994. Dr. Lipton has a B.S. in Biology from the State University of New York at Stony Brook, an M.A. in Marine Science from the College of William and Mary, and a Ph.D. in Agricultural and Resource Economics from the University of Maryland.

JIM MCGRATH has been Environmental Manager at the Port of Oakland since February 1990. Before that, he spent 14 years at the California Coastal Commission and 6 years with the Environmental Protection Agency. He currently serves on the boards of the San Francisco Estuary Institute and the Bay Trail. The Environmental Planning Department at the Port of Oakland is responsible for environmental analysis and permitting for activities at the seaport and airport in Oakland. Mr. McGrath has a Master's in Civil Engineering from the University of California, and an undergraduate degree in History, with a minor in Chemistry, also from UC. In the past nine years, the Port has successfully undertaken two harbor-deepening projects, developed a new container terminal and expanded another, and is starting construction on two new large container terminals that raise important air quality issues.

NANCY MCKAY is the Environmental Program Officer for the Russell Family Foundation in Gig Harbor, Washington. Prior to joining the foundation in 2002, Ms. McKay had served three Washington governors. From 1996 to 2002, she was the Chair of the Puget Sound Water Quality Action Team, a program in the governor's office responsible for coordinating the protection of the Sound and its resources. From 1985 to 1996, Ms. McKay was Deputy Director and then Executive Director of the Puget Sound Water Quality Authority. Before joining the Authority staff, Ms. McKay worked on energy issues for the Association of Washington Cities, the Washington State Association of Counties, and the Northwest Power Planning Council. From 1973 to 1981, she was a senior staff associate for the League of Oregon Cities, working on issues including land use, juvenile justice, and election law.

She has also worked in the fields of international relations, mental health, and education. Ms. McKay is chair of the Association of National Estuary Programs; a founder and past chair of the (Washington) Governor's Council on Environmental Education; and a member of the Science and Policy Advisory Committee of the Institute for the Management of Enclosed Coastal Seas in Kobe, Japan.

ELIZABETH NISBET is currently serving her second term as Local Citizen Representative to the Texas Coastal Coordination Council, a governor-appointed position. The Council is charged with adopting uniform goals and policies to guide decision making by all entities regulating or managing natural resource use within the Texas coastal area. The Council reviews significant actions taken or authorized by state agencies and subdivisions that may adversely affect coastal natural resources to determine their consistency with the Coastal Management Program goals and policies. She also serves on numerous boards, including the Texas Aquarium Board of Trustees. Ms. Nisbet holds a B.B.A. in Marketing from Baylor University.

DON ROSS is President of EarthBalance, Inc. (formerly Florida Environmental, Inc.), an environmental services and restoration company specializing in the protection and management of natural environments. He holds a M.S. in Ecology from the University of Tennessee and is a certified Senior Ecologist by the Ecological Society of America. Mr. Ross has served as a county commissioner in a coastal Florida county, a member of the Southwest Florida Regional Planning Council, president of the Council for Sustainable Florida, a member of the Charlotte Harbor National Estuary Program Policy Committee, and director of the Myakka Conservancy, a coastal land trust. He was appointed to the Peace River Basin Board by Governor Bush and has participated in the establishment of indicators and grant review for the Florida Coastal Management Program.

HUGH "TRIP" TOLLISON joined the Savannah Area Chamber of Commerce as Vice President of Existing Industry and Legislative Affairs on January 17, 2001. He previously served as Congressman Jack Kingston's District Representative. Prior to that, Mr. Tollison was an aide to Senator Sam Nunn. Mr. Tollison holds a Bachelor of Arts and Political Science degree from the University of Georgia in Athens.

ROBERT TUDOR, *Co-chair*, is the Deputy Director for the Delaware River Basin Commission (DRBC), with responsibility for the agency's scientific, regulatory, planning and management activities and programs. The DRBC is a federal-interstate compact agency responsible for planning, regulation, and management of water resources in the 13,000-square-mile area drained by the Delaware River and Bay. He was formerly the Deputy Commissioner for Planning and Science, Land Use Management, and Natural and Historic Resources for New Jersey's Department of Environmental Protection. During his 21-year tenure with the Department of Environmental Protection, he was Assistant Commissioner for Environmental Planning and Science, where he oversaw the Division of Science, Research and Technology, Division of Watershed Management, Coastal Planning and Program Coordination, and Office of Air Quality Management. Mr. Tudor was Administrator of the Office of Environmental Planning from 1996 to 1998 and served as Program Director for the Delaware Estuary Program from 1993 to 1995; prior to that, he had been Administrator of the Land Use Regulation Program. He is a graduate of Rutgers College and the University of Connecticut.

STAFF

CHERYL GRAHAM is a program analyst from NOAA's Office of Ocean and Coastal Resource Management (OCRM) participating in an Intergovernmental Personnel Act (IPA) assignment at The Heinz Center. As a senior fellow and project manager at the Center, she is responsible for coordinating and providing staff leadership for the Coastal Zone Management Act: Developing a Framework for Identifying Performance Indicators study. With over 16 years of experience in OCRM, she has served as a federal liaison for numerous state coastal and research reserve programs. Ms. Graham also served as the headquarters staff for the Monitor National Marine Sanctuary and was responsible for expedition logistics. She continues to be the NOAA lead for the Graveyard of the Atlantic Museum, a public-private partnership to establish a shipwreck museum in Hatteras Village, North Carolina. Before starting her fellowship at the Center, Ms. Graham was responsible for conducting programmatic evaluations, required by the CZMA, of state coastal and research reserve programs. She received a B.A. in political science from Salisbury State College and an M.P.A. from the University of Houston.

MARY HOPE KATSOUROS, now a partner of MerrellKatsouros LLP, was Senior Vice President and Senior Fellow at The Heinz Center for seven years. Before coming to The Heinz Center she had been Director of the Ocean Studies Board at the National Academy of Sciences. Her research interests include the legal regime of the oceans, effects of pollutants on the marine environment, and marine fisheries management. In 1995, the National Academy of Sciences awarded her an internal grant to study the role of ecosystem management on sustainable marine fisheries. She has been responsible for the publication of over 45 National Academy of Sciences papers and studies on ocean and coastal resource issues. Ms. Katsouros has served as an advisor to the Department of State on law of the sea issues and was a U.S. delegate to the Third UN Law of the Sea Conference. In 1996, the American Geophysical Union recognized her contributions to the Ocean Sciences with its prestigious Ocean Sciences Award. Ms. Katsouros received her B.A. from the George Washington University and her J.D. from the Georgetown University Center of Law.

JENNIFER MURPHY, now an international affairs specialist with NOAA, was a research associate at The Heinz Center for the Sustainable Oceans, Coasts and Waterways program. Before joining The Heinz Center, Ms. Murphy was a Knauss Sea Grant Fellow for Marine Policy with the Subcommittee on Fisheries Conservation, Wildlife, and Oceans of the Committee on Resources, U.S. House of Representatives. Ms. Murphy received a Master of Marine Affairs and a Master of Arts of International Studies from the University of Washington in Seattle. Her master's thesis assessed the role of indicators and environmental security in the Coastal Resource Management Project in the Philippines, where she interned. She is a graduate of Tufts University.

PIERRE-MARC DAGGETT was a research associate at The Heinz Center, having previously participated in many of The Heinz Center ocean related projects such as Oceanography: The Making of a Science, Managing Summer Flounder, Individual Fishing Quota and Community Programs Workshop and Fish Performance Measures Workshop. He has a diverse background that includes over seven years at the National Academies (NAS), where he worked with the Transportation Research Board's (TRB) sections on Environmental Concerns, Management and Administration, Transportation Fore-

casting, Data, and Economics, Public Transportation, and Multimodal Freight Transportation. While at NAS, he received two TRB Staff Awards and an NAS Group Award. He has degrees from the University of Nebraska, Lincoln, including a Ph.D. in zoology.

DAMAN IRBY was a research assistant at The Heinz Center, where he worked on various projects including Oceanography: The Making of a Science, Managing Summer Flounder, the Coastal Summit Project, Fish Performance Measures Workshop, and Translating Tragedy: Lessons Learned from Hurricane Mitch. Before joining The Heinz Center in 1998, he spent a year studying economics at the University of Vienna in Austria. Mr. Irby received a B.A. in International Affairs from the George Washington University.

JEFFERY A. RANK, now the Matagorda County Marine Extension Agent in Bay City, Texas, was a research assistant at The Heinz Center. Mr. Rank came to The Heinz Center from Texas A&M University Graduate School of Oceanography, where he was a Welch Foundation Fellow. His primary research there was on population dynamics and in particular, the chaotic dynamics of discrete time metapopulation models. While at Texas A&M, Mr. Rank also used modern cave diving techniques to contribute to ongoing research on the groundwater hydrology of the Yucatan Peninsula, and he took an active interest in marine policy matters, creating a marine policy web site and listserv for the university. Before graduate school, he worked as a navigator on a marine seismic oil exploration crew in the Gulf of Mexico. He holds a Bachelor of Science degree in Marine Sciences and a Master of Science degree in Oceanography, both from Texas A&M University.