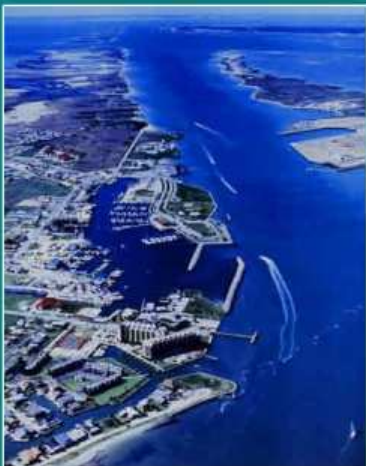




# External Evaluation of State Coastal Zone Management & National Estuarine Research Reserve System Program

*Prepared for*  
The Office of Ocean and Coastal Resource Management  
National Oceanic and Atmospheric Administration  
U.S. Department of Commerce

*Prepared by*  
SRA International, Inc. & The Council Oak



## Executive Summary

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This study is an assessment of perceived relevancy, effectiveness, and impact of two of the National Oceanographic and Atmospheric Administration's (NOAA) Coastal Zone Management Programs: the State Coastal Zone Management (CZM) Program and the National Estuarine Research Reserve System (NERRS) Program. Findings are based on information from interviews of 57 people in the following three categories: 1) State CZM Program Managers; 2) NERRS Program Managers; and 3) external parties (e.g., national experts, partners, affiliates, stakeholders).

State CZM and NERRS programs generally were perceived by parties internal and external to the programs as effective in conducting activities related to the goals of the Coastal Zone Management Act (CZMA). Both state CZM programs and NERRS programs were viewed as having been an important voice for balancing natural resource protection and economic development, but one whose effectiveness is limited by three key factors: 1) political interference; 2) span of control/authorities; and 3) funding. The mission and focus of CZMA-related programs to assess and facilitate a balance between natural resource protection and economic/human uses were viewed to be unique facets of the CZMA; the CZMA is viewed as being as relevant today as it was in 1972 when it was created. NERRS' effectiveness generally was deemed to come from the high quality, credible research it provides and its ability to synthesize that information in a useable fashion for decision makers. State CZM programs were deemed to be the most effective when playing the role of a facilitator among agencies, local governments, and nonprofits in a variety of contexts (e.g., planning, resource assessment, permitting, education, etc.).

Overall the state CZM programs have evolved to be more holistic in the way they look at problems (e.g., whole watershed) and have expanded from a focus on local permitting to issues of national or international relevance such as climate change or nitrification. NERRS programs are perceived to be innovative and on the leading edge of using communication and imaging technologies to reach intended stakeholders and decision makers. Recently, both programs have been expanding to address ecosystem-level and regional planning and research related to topics such as climate change. They also are well positioned and have been well-received in their recent work at supporting and leading regional-level spatial planning exercises.

State CZM programs are viewed as being effective to the limits of their authority and funding. They could aim at leveraging their good scientific reputation and honest broker status to increase their leverage in assisting local and state decision makers in making good long-term decisions that balance resource use, conservation, and public access. CZMA programs could build upon expertise in "making science relevant" to decision making by expanding efforts in exploring and articulating connections between natural resource degradation and economic and social well being (e.g., coastal hazards and flooding, ecological services, water scarcity, water quality). State CZM programs should continue to expand who they think of as coastal managers and increase involvement in public dialogues related to some of the key direct and indirect impacts to the coastal zone including public infrastructure development (e.g., roads and levees), national debate regarding flood insurance, and bringing forward a coastal voice.

## Background and Context

As part of its continuing efforts to monitor and improve performance of programs authorized by the Coastal Zone Management Act (CZMA), the National Oceanic and Atmospheric Administration (NOAA) contracted for an independent external review of two CZMA programs. This review was commissioned to provide information in preparation for a re-assessment of CZMA Programs through the Office of Management and Budget's (OMB) Program Assessment and Rating Tool (PART).

The 2003 PART Assessment provided feedback to NOAA's Office of Ocean and Coastal Resource Management (OCRM) that there were deficiencies in the areas of strategic planning, program results, and accountability. Strategic planning efforts were specifically identified as lacking performance measurements. Other evaluative efforts (Hershman, et al. 1998, GAO 2008) also reported that the lack of program measures/indicators hampered efforts to assess the impact (and therefore effectiveness) of state Coastal Zone Management (CZM) programs.

Since 2003, NOAA has made significant investment and progress in developing performance indicators and measures for its coastal zone management program. The collaborative development of program indicators and measures will make it possible for NOAA to better measure the impacts of its efforts with state CZM programs and the effectiveness in meeting goals for the National Estuarine Research Reserve System (NERRS) programs. However, these efforts are largely still in the development or pilot stage and, as such, cannot be relied on solely to tell the story of the on-the-ground effectiveness of the coastal zone management program. To conduct a classic effectiveness evaluation at this time would result in a repeat of previous findings; namely, there is not sufficient data to determine on-the-ground effectiveness. Such an evaluation is important, but the time is not ripe.

An evaluation that asks, *"How effective are state coastal management programs at addressing core objectives of the CZMA?"* is important and meaningful, but suffers from the same lack of on-the-ground performance measurement data as the previous example. A study similar to the effort described in Hershman, et al. (1998) could be conducted that looked at available data and interviewed state program staff. This would be useful in determining changes in attitudes, perceived effectiveness, or program activities, but would be based on the perspectives of state program staff alone. NOAA and the Coastal States Organization (CSO) conducted a similar effort in 2007, interviewing state CZM and NERRS program managers to gauge priorities and solicit recommendations.

**Table 1.** Previous Studies That Looked at Coastal Zone Management and National Estuarine Research Reserve System Programs

<b>Data Collected from Program Staff</b>	
<b>Author</b>	<b>Approach</b>
Hershman, M. J., Good J. W., Bernd-Cohen, T., Goodwin, R. F., Lee, V., Pogue, P. (1998). The Effectiveness of Coastal Zone Management in the United States. <i>Coastal Management</i> , 27, 113-138.	Surveyed every state for CZM program policies and outcomes, and then reviewed the results to describe national effectiveness of CZM programs.
NOAA and Coastal States Organization (CSO). (2007). The Future of Coastal Management: Key findings of Manager Interviews.	NOAA and CSO personnel interviewed CZM and NERRS program managers to gauge their priorities and solicit recommendations for improving coastal management.
<b>Data Collected through Legislative/Policy Review</b>	
<b>Author</b>	<b>Approach</b>
National Oceanic and Atmospheric Administration (NOAA). (2002). Report to Congress on the National Impacts of the Coastal Zone Management Program.	Provides an assessment of programmatic status for 33 CZM programs in effect at the time, as well as case studies to illustrate progress in different CZM areas.
Woglom, E. (2006). Discussion Paper: Current and Future Challenges for Coastal Management, NOAA/NOS and CSO.	Reviews the findings and recommendations of previous CZM program evaluations for the purpose of articulating challenges faced by CZM programs and initiating discussion on ways to address them.
U.S. Government Accountability Office. (2008). Coastal Zone Management: Measuring Program's Effectiveness Continues to Be a Challenge (GAO Publication No. GAO-08-1045). Washington, D.C.: U.S. Government Printing Office.	Reviewed NOAA's grant making process and its ability to track the application of grant funds, as well as NOAA's ability to determine the effectiveness of the National Coastal Zone Management Program through its program evaluations.  GAO staff reviewed NOAA's statutes and regulations, policies and procedures, funding methodologies, and interviewed state CZM managers to develop this assessment.
<b>Data Collected Reviews, Interviews, and/or Workshops</b>	
<b>Author</b>	<b>Approach</b>
Knecht, Robert W., Cicin-Sain, Biliana and Fisk, Gregory W., (1997) Perceptions of the performance of state coastal zone management programs in the United States. II. Regional and state comparisons. <i>Coastal Management</i> , 25(3), 325-343.	Mailed surveys to coastal managers, academics, and coastal interest groups. Assessed perceptions of CZM program performance in coastal protection, public access, managing development, and managing coastal hazards.

U.S. Department of Commerce, Office of Inspector General. (1997). National Oceanic and Atmospheric Administration, Coastal Zone Management and National Estuarine Research Reserve System Programs Require Management Attention to Increase Effectiveness (Inspection Report No. IPE-9044). Washington, D.C.: U.S. Government Printing Office.	Reviewed program documents to determine if CZM programs were meeting the goals of the CZMA. This effort also interviewed CZM program staff, other federal agency staff, academic experts, and representatives from the environmental community.
H. John Heinz III Center for Science, Economics, and the Environment. (2003). The Coastal Zone Management Act: Developing a Framework for Identifying Performance Indicators. Washington, D.C.	Convened a panel of coastal experts from government, the private sector, and the environmental community to develop a framework for measuring performance of CZM programs, based on the key aspects of the CZMA.
H. John Heinz III Center for Science, Economics, and the Environment. (2004). Innovation by Design: Improving Learning Networks in Coastal Management. Washington, D.C.	Focused primarily on technical knowledge transfer and information sharing among the CZM community. This study organized a committee to examine what technical assistance is available to coastal managers. Data were collected through workshops, interviews, and literature reviews.
NOAA and CSO. (2007). Envisioning Our Coastal Future.	In this effort, five public workshops were held to gather opinions from a wide array of stakeholders about the primary challenges faced in coastal management and develop recommendations for improving the CZMA.

Most of the previous evaluations of CZMA-related programs have focused primarily on interviewing state program directors and/or reviewing program documentation provided by states. While that is useful information, especially in determining operational efficiency, we view state CZM staff as neither external nor independent. State CZM program managers can help us gather information about what program activities are conducted, identify which stakeholders are involved, and understand the relationship between NOAA and the states. However, relationships between states in the program and NOAA are influenced by state program evaluations, concerns about future funding, reputations of state programs, local versus national priorities, and other related concerns.

## Purpose of this Study

This study builds on previous reviews which relied primarily on the viewpoints of state CZM and NERRS program staff. These, while valuable, do not necessarily capture the experiences and perceptions of external program partners and coastal communities that interact with these programs at a state and regional level. For that reason, this evaluation focused on collecting and assessing complementary information to:

1. Determine how state CZM and NERRS programs are perceived by parties external to their programs; and

2. Solicit information about models and approaches that are “working well” with the intent of sharing these success stories broadly.

## Methodology

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### *Sample Selection*

Given resource constraints, a detailed study of each state CZM program and each NERRS program was not feasible. In order to maximize available resources and leverage the quality of information, a sample set of state CZM and NERRS programs was selected. State CZM programs were stratified by structure and NERRS programs were selected based on geographic location.

*State CZM Programs:* State CZM programs were divided into two major categories: 1) networked programs, and 2) direct, single-agency programs. For the networked programs, we selected four states with reserves and two without reserves. Beyond that, we sought to ensure regional variability. For the direct, single-agency programs, we selected six state programs and one territory.

*NERRS Programs:* We selected six NERRS programs with an eye toward size and geographic distribution, ensuring both small and large reserves as well as one reserve on the East Coast, West Coast, Gulf Coast, and Great Lakes. In addition, we selected programs that were affiliated with the state CZM program, as well as those that were independent.

*National Experts:* In addition to interviewing people with specific state CZM or NERRS program experience, the team interviewed several individuals who collaborate and interact with these programs at the national level (e.g., other federal agencies, state associations, local government associations, coastal experts/academics). During interviews with experts, additional experts were identified to ensure that we included a variety of leaders in the field. The purpose of these interviews was to assess perceived effectiveness of the state CZM and NERRS programs in the aggregate.

*Interview Process and Data Collection:* The interview team first contacted the program managers or directors of each selected state CZM and NERRS program in order to provide context for the external partner interviews and identify external parties likely to provide the highest quality information from a partner/customer perspective. We specifically looked for a diverse set of external partners from the regulated community, local governments, non-governmental organizations, and the private sector. Between two and four external interviewees were identified for each state CZM and NERRS program and contacted to provide feedback. We then targeted our approach to ensure that parties from each subset of external partners were represented. Interview questions for the different audiences (i.e., CZM, NERRS, and National Experts) are available in Appendices B, C, and D of this document.

There were some challenges, as anticipated, in getting responses from all identified potential interviewees. The interview team was able to interview a total of 57 individuals. The affiliations of interviewees were as follows:

- Networked State CZM Programs
  - Program Managers – 6
  - External Parties – 14
- Direct, Single-Agency State CZM Programs
  - Program Managers – 8
  - External Parties – 8
- NERRS Programs
  - Program Managers – 6
  - External Parties – 9
- National CZM Experts – 6

Three interviewees, who were not able to schedule a telephone interview, submitted written responses. Finally, not every respondent answered every question. This was due to lack of experience or knowledge with a particular aspect of the program or time constraints.

## Results and Discussion

This section contains the high level analysis of the responses to the questions posed in interviews with 57 people. Where it was informative, responses also were analyzed by three major respondent groupings: 1) state CZM managers, 2) NERRS managers, and 3) external partners. As mentioned previously, this external partner group is a combination of national level experts on coastal issues and partners, affiliates, and stakeholders of a particular state CZM or NERRS program. The intent of analyzing responses by groupings was to assess whether there was a difference in perceptions as a program insider or outsider.

### I. What is Driving Decisions in the Coastal Zone?

In an effort to place perceptions of current state CZM and NERRS programs in context, we asked all of our interviewees to give their opinions about what influences how decisions get made in the coastal zone and related to coastal resources, irrespective of the actions of the state CZM or NERRS programs. This allows us to compare the focus of the state CZM and NERRS programs to those factors people believe are driving results on the ground in the coastal zone, and gives us information about whether programs are focused meaningfully (i.e., influencing decision makers). We asked two main questions to assess these factors in an open-ended fashion.

- *What are the strongest drivers/influences on decisions related to coastal resources?*
- *Who are the most influential parties or partners?*

### Results

The predominant drivers/influences were reported to be economic in nature. Of the 79 individual drivers cited in responses, 34 could be categorized as economic. Within this category, the most commonly cited were residential and tourism development (12 responses), oil and gas development (6 responses), and fishing/shellfish operations (5 responses). The next most cited drivers were politics and government programs/regulations (each with 9 responses). All respondents who cited politics as a major driver were external to the programs; external parties seemed more focused on economic, governmental, and political/legal drivers as a group.

#### Factors Cited as Influencing/Driving Decisions in the Coastal Zone

- Residential Development
- Tourism Development
- Oil and Gas
- Fishing and Shellfish Operations
- Politics
- Agriculture
- Wetlands Permitting
- Local Development Controls
- Climate Change
- Sea level rise
- Storm Hazard Reduction
- Subsidence
- Erosion
- Endangered species
- Fear of "Takings"
- Public Sentiment
- Money
- Offshore Wind Development
- Tax Revenue
- Ocean Action Plan
- Science
- Lack of Recognition that there is a Resource Problem
- Historical State Attitudes toward Development



State CZM and NERRS managers, proportionally, cited more resource changes such as storm hazards, subsidence, and erosion as drivers. Program managers were also the only group that viewed funding as a driver (5 responses).

The parties that were deemed to be most influential tracked consistently with the expressed drivers. People and entities with economic power were deemed to be the most influential. These included developers, oil and gas companies, commercial fishing interests, and marine trades. Out of 62 parties mentioned, 21 were types of economic interests in roughly the same ranking as drivers mentioned previously (e.g., developers, oil and gas, fishing, marine trade). States also were deemed influential (17 responses), but with a variety of types of state agencies included: legislature (3 responses); Departments of Natural Resources and/or Environmental Protection (3 responses); land commissions/offices (2 responses); and one mention of a State Department of Parks and Wildlife. The federal government was mentioned as being influential, particularly by external parties. Included were: U.S. Army Corps of Engineers/Clean Water Section 404 Program (3 responses); NOAA/OCRM (2 responses); and U.S. Environmental Protection Agency and U.S. Fish and Wildlife Service (refuges) were each mentioned once. Local governments were only mentioned twice as being influential.

### **Discussion**

- Economics (and those who create economic opportunity) continue to wield important influence on decisions in the coastal zone. The need to balance economic forces with natural resources remains as relevant today as when the CZMA was first passed.
- The type and mix of economic interests vary across the nation. The influence of these forces varies as well. Where there is a predominant industry, that industry type is relatively more influential. For example, in one state where oil and gas revenue make up 85 percent of the tax base, that industry is extremely influential.
- Where economic interests (e.g., types of tourism) align with or are dependent on some natural resource functions (e.g., commercial and recreational fishing), economic forces can be a force for natural resource protection. For example, where fisheries are important, there tends to be more of a push for a more natural ecosystem (e.g., wetlands) so as to promote/protect habitat and spawning ground.
- States have different histories and attitudes related to what constitutes public trust. Some states have a pro-development or pro-business definition of public trust, while others

#### **Most Influential Parties or Partners**

- Developers
- Oil and Gas Interests
- Fishing
- Marine Trades
- State Legislatures
- State Departments of Natural Resources
- State Department of Environment
- State Land Commission
- State Department of Parks and Wildlife
- U.S. Army Corps of Engineers
- National Oceanographic and Atmospheric Administration
- OCRM/NOAA
- U.S. Fish and Wildlife Refuge
- NGOs
- Conservation Law Foundation
- Sea Grant
- Universities and Scientists
- Tribes
- District Court
- Community Champions
- Politicians
- Local Governments
- Agriculture

define public trust as public access or protection from degradation. These historical attitudes are reflected in laws, regulations, and expectations of industry and the public. These attitudes influenced, and continue to influence, development of coastal zone programs. While actual regulations and policies are important drivers, state “personality” also was deemed to be important. This is not a factor that is easy to measure in program evaluation.

- While some respondents were specific about the federal and state programs they felt were influential, many were not and cited “regulations” or programs generally. It is the opinion of the interviewers that a subset of these influencers/drivers refers to state CZM programs that are often administered in state governments, enabled by federal programs. All respondents, both internal and external, in the State of California expressed that the California Coastal Commission has a lot of influence. It is the opinion of the interviewers that the actual perceived influence of state CZM programs is likely underreported in this assessment.
- It is interesting to note that local governments were rarely cited as influential parties considering that nearly all land use management decisions are made at a local government level. Programs like the state CZM programs spend a fair amount of time and resources trying to educate and influence local decision makers, whether it is through training, state legislative efforts, or planning.

## **II. How has the work of the state CZM and NERRS programs influenced decisions in the coastal zone and to what degree?**

Having looked at perceptions of what is driving decisions in the coastal zone and who the most influential parties are, we analyzed the responses to a set of questions designed to solicit the degree and nature of influence state CZM and NERRS programs are having in decision making in the coastal zone and their impacts. The following five questions were analyzed to provide this summary.

- *To what degree have activities and changes (positive/negative) in the coastal zone been influenced by the state CZM/NERRS programs?*
- *Do you view your state CZM/NERRS program as effective? Why?*
- *What role do state CZM/NERRS programs play in assisting coastal decisions at the state and regional level?*
- *If state CZM programs did not exist, what would be the impact in the coastal zone?*
- *If NERRS programs did not exist, what would be the impact in the coastal zone?*

## **Results**

**State CZM and NERRS program roles and their perceived influence:** When asked about the degree of influence that state CZM and NERRS programs have on decision making, there was near unanimity that the programs have “some influence.” Of the 23 responses, seven considered the programs to be of “significant influence,” with one of those saying the state

CZM program was the “most relevant of any programs in the state.” Those that perceived a high level of influence generally cited regulatory influence as the reason. One respondent noted that the influence of state CZM programs is more prevalent in smaller communities that do not have the same research and analytical capacity or political clout as larger communities.

Where programs were perceived to be “somewhat influential” (15 responses) it was largely in areas relating to the ability to bring data and information to bear in facilitating problem solving. This took several forms including: actual provision of data; developing baseline information; ability to translate relevant, large-scale data into useful information; or degree to which programs brought information and data to bear on an issue in a meaningful manner – either by translating relevant data to useful information, or actually conducting research (e.g., NERRS). One federal agency partner said that state CZM and NERRS programs, “do a fabulous job at providing data and factual information...sort out issues to allow them to arise for decision making...utilize new technologies and diversified teams to communicate information.” Another external partner thought their influence lies in, “the ability to look at a problem broadly and bring information to bear.” Nearly half of the state CZM program managers (6 respondents) mentioned their role in federal consistency as being an important influence.

One respondent stated that the programs were “not very influential” largely due to politics.

### ***Likert Scale Responses***

In order to assess the strength of the opinions expressed in the discussions about influence, we also solicited numeric assessments of the influence of the role the state CZM and NERRS programs played in key objectives of the CZMA. Using a 1-5 Likert Scale with “1” representing “not at all important” and “5” representing “very important” we asked respondents to assess how important a role the state CZM program played in meeting a particular objective of the CZMA. For the actual scale and study questions, see Appendices C and D. Numbers included in parenthesis are the number of responses for each question by category of respondents (e.g., state CZM/NERRS managers, external Partners).

***\*\*\*Disclaimer:*** it is important to understand that due to the small sample size, results from the analysis are descriptive only and should not be deemed to be statistically significant or representative of the larger body of state CZM or NERRS programs for which significant variety exists.

**Table 2: Likert Scale Results for State CZM Programs  
Regarding Importance of Meeting CZMA Objectives**

CZM Program Likert Scale Response Averages (number of respondents in parentheses) Regarding the role of the program						
	Question 1: protecting or enhancing natural resources	Question 2: enhancing public awareness	Question 3: reducing harmful coastal development	Question 4: supporting compatible economic development	Question 5: increasing public access for recreation	Question 6: assisting in the coordination of decision- making
Managers	4.75 (4)	4 (4)	4.63 (4)	4.25 (4)	3.88 (4)	4.5 (3)
Partners	4.43 (17)	3.68 (16)	3.99 (17)	3.63 (16)	4.07 (16)	3.68 (14)
Combined	4.49 (21)	3.74 (20)	4.27 (21)	3.75 (20)	4.03 (20)	3.82 (17)

**Table 3: Likert Scale Results for NERRS Programs Regarding Importance of Meeting CZMA Objectives**

NERRS Likert Scale Response Averages (number of respondents in parentheses) regarding the role of the program		
	Question 1: enhancing public awareness	Question 2: identifying and establishing priorities
Managers	5 (2)	5 (1)
Partners	4.57 (7)	4.13 (4)
Combined	4.67 (9)	4.3 (5)

**Roles and perceived effectiveness:** When asked if CZMA programs were effective, 37 of the 42 individuals that responded to this question said “yes.” Three of the 37 “yes” respondents thought the programs were “very effective.” Five of the 42 responded that the programs were effective in one area and not in others and that this varied across programs. There was no difference in perceived effectiveness between external parties and state CZM and NERRS program managers.

Roles believed to contribute to effectiveness align well with where respondents generally feel programs are most influential, although they differ somewhat between state CZM and NERRS programs.

NERRS program effectiveness and importance were generally deemed to come from the high quality, credible research they provide (15 responses). Aspects of this effectiveness included the ability of NERRS programs to conduct policy-relevant research, make information relevant and understandable to decision makers, and translate technical information rather than have it be “trapped in journals.” This was their vision of themselves as well as the vision external partners had of them. One interviewee talked specifically about the flexibility of the research to solve relevant problems such as partnering with the State Department of Health to look at water quality at bathing beaches. Also viewed as particularly effective were the high quality and relevant education and training conducted by NERRS programs across the spectrum of stakeholders (e.g., local officials, K-12 education, developers, real estate brokers, etc.).

Where state CZM programs were deemed to be the most effective was as their role as a facilitator (12 responses). This can take several forms. Their role in state programs is crucial in helping to bring multiple state agencies, federal agencies, and local governments together to focus on a particular issue or permit. They also lead efforts in facilitating planning efforts and exploring emerging issues, as was oft mentioned in their role as facilitators in marine spatial planning.

It also should be noted that the state CZM programs that have permitting responsibility are deemed both by program managers and their external partners as having a stronger influence on final land use decisions; however, they also report being more subject to political pressure than those without such responsibility.

Where effectiveness for state CZM programs was deemed to be “mixed” (5 responses), understaffing was cited as the main reason. One external respondent explained that they advocated for the “state CZM program to assume the role of local administrative enforcement” but they did not have enough staff to play that role. Another federal government respondent said that he did not have an opinion regarding whether the state CZM program was effective at protecting the environment, but he did think that it was “effective at blocking federal actions and projects.” Criticisms of the programs included lack of consistency among state programs with contiguous coastlines and an overly burdensome regulatory function in some states. In some cases he explained, states were using the federal consistency authorities to require additional activities for federal projects in order to meet state CZM goals such as wetlands creation requirements for dredging projects, irrespective of project costs. Where costs increased, states were sometimes not willing to pay an increased portion of state/federal cost share.

***If the state CZM program did not exist:*** Without hesitation, 48 out of the 55 respondents that answered this question felt that there would be a negative impact on the coastal zone if these programs did not exist. The primary area of impact anticipated would be natural resource degradation, largely due to additional and harmful development in the coastal zone. More than half predicted significantly negative impacts including “unbridled coastal development up to the water’s edge.”

Of the 56 impacts identified, 23 focused on the likely on-the-ground impacts that would lead to degradation of natural and cultural resources. The obvious impact also was expressed – NERRS programs' land would become developed, converting important habitat, while at the same time reducing our scientific understanding. All of the external NERRS respondents and all the national experts expressed the important "reserve" function of the NERRS, simply in maintaining undeveloped space, regardless of the value of research.

In addition to the actual resource degradation, 10 respondents felt that we would know less about emerging trends and hazards, lose significant ability to interpret/translate technical information for decision makers and the public, lose ability to look nationally across state CZM and NERRS programs on similar issues, and lose baseline data. This would impede our ability to respond to significant events (e.g., oil spills), have meaningful public debate, and very likely lead to inconsistent and ill-informed decisions in the coastal zone. For example, we "would not have understood the impacts of contaminated sediments" nor the importance of coastal hazard setbacks. In short, as a society, "we would make more mistakes."

#### **Reported Impacts if a CZM Program Did Not Exist**

- Gaps in K-12 Education
- More Coastal Armoring
- Loss of Habitat
- Decline in Fisheries
- Tourism Would Suffer
- No Ability to Stand Up to Development Pressures
- No Wetland Restoration Projects
- Unwise Development
- Reserve Lands Would Get Developed
- Inconsistent Approaches Between Jurisdictions
- Increase in Coastal Hazards
- Lack of Ability to Address Emerging Issues
- No Check to Federal Activities
- Increased Financial Burden on State and Local Governments
- Less Baseline Data
- Environmental Literacy Would Decline
- Permitting Would Slow Down
- Ability to Respond to Emergency Events Would Decline
- Fewer Local Ordinances

#### **Discussion**

- As can be seen from the Likert Scale responses and the narrative comments, both state CZM and NERRS programs generally receive high marks for program effectiveness across all CZMA objectives. That said, the influence they are deemed to wield in decisions in the coastal zone is mixed. There are several factors that may explain this apparent disconnect. First, the narrow geographic scale of the CZMA has not set the programs up well to influence all factors affecting the coastal zone (e.g., freshwater recharge of estuaries, nonpoint source pollution, etc.). Second, state CZM programs generally were seen to have great influence on planning and setting a statewide agenda, but not as much influence on actual on-the-ground decision making, which is believed by many to be unduly influenced by local and state politics or hampered by lack of regulation. The most often cited shortfall is their lack of staffing and resources to address the intense economic and political pressure from the development community (e.g., residential, energy, etc.).
- There is a mutually beneficial interplay between state CZM programs' role in balancing resource use and protection and the training/education at the NERRS programs. NERRS programs are playing an important role in raising awareness of coastal decision makers and

the public on environmental issues and maintaining and expanding the network of interests that have coastal issues on their radar screen. This expands the network of people that can be tapped into for problem solving and decision making when an issue arises. Where NERRS programs are reaching out to non-traditional interests (e.g., real estate, insurance, etc.), this influence is felt particularly keenly.

- Much of the effectiveness of the programs also was deemed to come directly from the quality of program staff. Their passion and dedication keeps “coastal issues in the forefront” for decision makers and the public, and their high quality products combined with inclusivity and an ability to be politically savvy or apolitical (or both) contribute to their effectiveness. This is viewed as one of the programs’ greatest assets.
- While previous studies have found it difficult to assess effectiveness of on-the-ground resource health due to lack of data, it is clear that respondents believe the programs to be effective in stemming resource degradation, both by the people who work in them and those external parties affiliated with them. There is well articulated and extreme concern that coastal resources would become degraded should the state CZM program cease to exist.
- If the state CZM programs did not exist, there would be no national “voice for the coast.”

### III. How has the role of State CZM and NERRS programs changed over time?

We asked three questions to assess the actual role the state CZM and NERRS programs are playing in coastal decision making as well as solicit opinions on whether these roles have changed or evolved over time.

- *How has the role changed over time?*
- *What is the unique niche of state CZM and NERRS programs?*
- *How are state CZM and NERRS programs positioning themselves to understand and affect time sensitive resource decisions?*

### **Results**

In the first decade of the program, those states that decided to have a strong permitting or regulatory role spent their energy developing and passing legislation to set up those authorities and mostly have been working to implement and improve that role over time. However, the core programmatic functions of education, legislation, advocacy/facilitation, data provision, and analysis that were hallmarks of early programs are still important to the state CZM programs today. The particular mix and emphasis is dependent upon state/regional culture, coastal zone stressors and drivers, and the personalities and skill sets of the state CZM program managers.

#### **Improving Ability to Respond to Time Sensitive Issues**

- Work with USACE and FEMA to improve post-hurricane response
- Increase availability of legal resources in areas such as ocean zoning, real estate, etc.
- Continue to collect baseline data
- Continue focus on making science relevant to decision making

While the core programs and capabilities have not changed, it was emphasized by more than half the respondents that significant adaptations and adjustments have been made as the programs have matured, mostly taking advantage of the relationship and trust developed over the last 20 years and taking advantage of opportunities such as technology. There was observed to be a gradual, but steady increase in influence over time as programs earned the trust of key decision-makers and the public. Three program managers felt as though the administration of the programs has improved at a federal level.

- Overall the state CZM program is viewed to have evolved to be more holistic in the way they look at problems (e.g., whole watershed). They have expanded from a focus on local permitting to issues of national or international relevance such as climate change or nitrification.
- Education and outreach programs also have evolved. They have had to change their approach and develop specialty areas to respond to a more sophisticated public. They have embraced new imaging and communication technologies and are viewed nationally to be leaders in the field of environmental education, outreach, communication, and training. Several respondents mentioned the Coastal Services Center by name.
- Programs have moved toward developing decision-making tools that communities can use to test their own scenarios, not simply provide the data or analysis.
- Some regulatory programs have moved from an arm's length permit approval role to actively assisting developers in project design. A corollary of that on the non-regulatory side – one state CZM and one NERRS program mentioned they had actively expanded their outreach and expertise to all aspects of development, not just the natural resource aspects. They contend this ability to understand the land use, economic, legal, lending, aesthetic, and other needs of developers has helped them be better problem solvers and has resulted in better projects and lower impact development. It also has increased their credibility with the development community.

***Ability to respond to time-sensitive coastal decisions.*** The 20 respondents who chose to answer this question felt as though one of the *current* strengths of both the state CZM and NERRS programs is an ability to anticipate and quickly respond to important coastal issues. State CZM programs tend to be on the cutting, innovative edge of recent policy issues such as coastal zoning, off-shore energy production, and resiliency. For example, it was a state CZM program that was the first to have a climate change policy and an Urban Coastal Zone Development policy to prevent development shifts from urban areas to suburbs and exurbs (e.g., greenfields policy). NERRS are the “go-to” people for innovative field experiments on everything from stormwater management to wetlands restoration. They are viewed to be leaders in applied synthesis activities, and get high praise for bringing data/information to bear in a timely and meaningful way. One respondent summed it up when he said he thought existing programs “responded well in reacting to new challenges.” Nearly every one of these comments was tempered by the desire for even more resources for scientific synthesis and meaningful applied studies.



**Reported organizational and structural changes:** Two programs have changed to a less regulatory approach (focusing more on education); one took a greater focus on regulation. One state CZM program moved from regional commissions to a central state commission. Another state expressed challenges in reviewing permits and holding hearings resulting from staff reductions.

Most respondents could not answer this question in that they had not been with the program long enough to have seen changes over time. Several respondents mentioned that the location of a state CZM program within the state government impacted the program's perceived effectiveness because of the limitations a parent agency placed on program scope or independence. The NERRS programs were largely immune to this type of restriction with their mission of science and education clearly understood.

**The unique niche of state CZM and NERRS programs:** Two areas emerged from responses as unique niches for state CZM programs. First was facilitating multi-purpose, regional level collaboration for the purposes of data collection, integration, and problem solving. The second was serving as the "voice for the coast." No other agency is deemed to have a broad a public mandate in balancing use and preservation.

The unique role that emerged for the NERRS program was that of data synthesizer. There can be many data providers in a given area, but the NERRS program often plays the role of bringing data sets together in a meaningful way to support decision-making – very important and often unique.

## **Discussion**

- Those programs that had sole regulatory responsibility or influence felt that was valuable. However, those programs employing a networked model did not express a desire for a greater regulatory role and saw a great advantage to being outside of political pressures.
- It appears that the mission of state CZM programs to achieve a "balance of use and protection" is, in and of itself, unique as well as an asset. There are many interests and forces in the coastal zone but many are single-interest in nature. This duty to balance is a unique niche and an asset; as such, programs are well positioned to serve as facilitators and problem-solvers across a variety of interests.
- One area where state CZM programs (supported by NERRS science and education) are particularly well suited in the future is in leading and facilitating Regional Coastal/Ocean Alliances, particularly those that can retain their credibility over time and serve as an "honest broker" for coastal resources and balancing competing uses.
- While the role of the state CZM programs has not changed much over time, in some places the external drivers and context have changed significantly. For example, in Florida changes in how local governments consider private property rights and "takings" have changed the nature of the dialogue about coastal issues.

#### IV. What is Working Well in the state CZM and NERRS Programs?

This second type of interview question was designed to draw from interviewees inside and outside the state CZM and NERRS programs examples of the topics, approaches, and models that are working well in the program today, as well as identification of future areas of investment. The intent of this section of the report is not one of assessment, but rather for information sharing across among programs. As such, there is less of a focus on analysis and more on effective articulation of future program vision and suggestions.

- *What are the most exciting types of work that are being conducted at the state CZM and NERRS programs? Why?*
- *How do state CZM and NERRS programs identify and weigh future challenges? How should they prepare to address them in the future?*
- *How much connectivity between state CZM and NERRS programs exists at a state/regional level? How has this been helpful or harmful?*

#### Results

***Exciting work being conducted by programs today:*** Overall the most exciting efforts that respondents feel are being conducted fall within three major areas: 1) activities related to the topic of sea level rise/climate change; 2) ocean management/marine spatial planning; and 3) regional alliances at a national level.

There also was excitement about the crucial and timely nature of the state CZM program response in relation to strategy and problem solving activities related to the Deepwater Horizon Oil Spill.

- ***Sea Level Rise and Climate Change:*** Fifteen respondents named activities related to sea level rise and/or climate change as the most exciting work being done in the state CZM and NERRS programs right now. The NERRS program responses focused on the development of good scientific baselines aimed at improving the understanding of climate change impacts on coastal communities. Specifically, this included efforts to develop good baseline data, monitor sea level rise, assess and predict impacts of sea level rise, evaluate impacts of freshwater inputs from melting glaciers, and determine the relationship between climate change and coastal erosion. Another set of activities focused more on adaptation strategies and the tools and policy needs that accompany them. For example:
  - Two state CZM programs are developing and testing stewardship tools and models that, when finalized, could be used by communities to assess and predict areas of expected impacts from sea level rise.
  - One state CZM program is working to develop a climate adaptation framework, collaborating with other state and local agencies to compile and bring the latest research to bear on areas such as hazard mitigation, resource protection, and coastal erosion, with the goal of improving and adapting state and local laws to anticipate sea level rise and more intensive coastal storms. This focuses on the relationship between climate change and coastal erosion.

- One state CZM program is beginning to look at the possible impacts of ocean acidification.
  - One state CZM program is participating with other state agencies in a waterfront revitalization effort.
  - One NERRS program is developing a standard national data set for water quality, including time series information that will be extremely relevant when it comes to assessing impacts from climate change.
- ***Ocean Special Area Management Plans/Marine Spatial Planning:*** Ten respondents named activities related to ocean management plans, marine spatial planning, or ocean zoning. Some of the reasons why these efforts are deemed so exciting are that they generally engage a wide variety of stakeholders and are aimed at identifying disparate and common interests among stakeholder groups, mapping compatible and incompatible ocean uses, and negotiating where various activities (e.g., fishing, energy generation, marine mammal protection, etc.) should be focused. Respondents spoke generally of this idea being overdue and largely driven by recent proposals for renewable energy projects. Specific examples include:
- One state CZM program is facilitating the development of a territorial sea plan that extends out into federal waters. It has been driven by conflicts between fishing interests and proposals for wave energy generation.
  - One state CZM program is studying the impacts of transmission lines from coastal sources of renewable energy.
  - One NERRS program is working on technologies to better link partner/ stakeholder databases and help evaluate habitat impacts.
  - One NERRS program is conducting benthic mapping to increase understanding/ baseline of ocean resources.
- ***Regional Alliances:*** Four respondents discussed the value in the trend toward development of regional coastal/ocean alliances. The benefit of these alliances generally is touted to be improved consistency across the coast in multiple states, increased focus on projects, and synchronized budgeting across local, state, and federal agencies. Please note, there is some overlap in function between regional alliances and marine spatial planning; however, the regional alliances generally are broader than that topic alone. Specific examples included:
- The Gulf of Mexico Alliance is working on resiliency for coastal communities and water quality. As a partner, the U.S. Army Corps of Engineers is utilizing dredged material to effectively create additional wetlands and enhance the natural environment. Under this effort, the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency aligned their funding in the Gulf of Mexico.
  - The Regional Mid-Atlantic Alliance is focusing on marine spatial planning and mapping out compatible uses, filling a long term gap in looking at the ocean more holistically.

- **Response to Deepwater Horizon Oil Spill:** Four respondents discussed how impressed they were with state CZM and NERRS programs' responses to the recent oil spill in the Gulf of Mexico. Specific aspects of this work included:
  - Providing background/baseline data to direct oil spill response; mapping out nature, severity, and location of impacts; and sequencing recovery efforts
  - Monitoring and assessing impacts
  - Ensuring cleanup technologies and approaches were most appropriate for different types of ecosystems
  - Setting up a research consortium to share information and focus future data collection
  - Conducting on-the-ground activities including moving sea turtle nests, locating oyster beds, and rescuing dolphins

**Table 4. Examples of Exciting Work Being Conducted at State CZM and NERRS Programs**

<b>Education and Training</b>	<ul style="list-style-type: none"> <li>• NERRS technical assistance programs moving into new technical areas as public officials' and communities' understanding of coastal issues/value increases (e.g. sea level rise, ecosystem/marshland restoration, and public access)</li> <li>• NERRS programs developing new relationships with museums, aquaria, leisure tourism, and kayaking interests = more people exposed to the reserve and appreciating/protecting coastal resources</li> <li>• Delivering cutting edge resources to K-12 teachers</li> </ul>
<b>Applied Research</b>	<ul style="list-style-type: none"> <li>• Study interactions between docks and marshes</li> <li>• Increased monitoring at a marine park</li> <li>• Methods for treating eutrophication</li> <li>• LIDAR to better map flood risk</li> <li>• Exploration of green infrastructure projects</li> <li>• Predicting and addressing invasive species (impacts to tourism, impacts to commercial fishing). Translate science into meaningful terms for decision-makers and the public.</li> <li>• Studies that explore water quality benefits of shellfish production</li> </ul>
<b>Planning and Decision-Making</b>	<ul style="list-style-type: none"> <li>• Approach in involving partners in needs assessment and research agenda to jointly identify directions for next 5-years of the program = increased ability to identify emerging issues and partner to address them</li> <li>• Improved partnership with state geologic survey to improve data sets</li> <li>• Conflict resolution regarding siting of shellfish aquaculture</li> <li>• Serving as expert witness in court case on water scarcity and impacts on ecosystem—providing a true analysis to look at trends and impacts of lack of freshwater</li> <li>• Assisting with zoning ordinances for stormwater management</li> <li>• Restoration of riparian areas</li> </ul>

**Identification of future challenges:** When asked the question of how the state CZM or NERRS programs should identify and weigh future challenges, there were very few responses. Rather, the discussion tended to focus on sharing respondents' opinions of the future challenges themselves. The following future challenges and possible responses were mentioned:

- **Sea level rise.** This issue extends beyond any electoral cycle and is best positioned to expand coastal issues to the watershed. Without looking at watershed, programs miss a large component of the conservation problem.
  - Programs could raise awareness of about connectivity even if actual authorities are narrow.
  - Many groups are working on these issues. Coastal programs could be the integrator.
- **Land conversion.** Should put land into reserves to protect it from development. States should do it now because land values are only going to rise. They can worry about managing it later. If we wait for perfect management, we will have missed the opportunity.
- **Coastal erosion.** Issues related to this are standards to protect life and property, more activities/regulations needed to protect estuaries, and actions to protect water quality between the coast and the high tide mark. This could include a structures inventory, actions for stabilizing the estuary, and methods of shoreline stabilization.
- **Invasive species.** In areas without robust baseline surveys on many species, it is difficult to know what is invasive.
- **Wetlands mitigation.** It is going to become more costly to do this in the future.
- **Limited Jurisdiction.** Not able to influence impacts to coastal zone such as upstream nonpoint source pollution.
- **Common metrics and measures.** One state CZM program mentioned the need to have detailed and consistent mapping up the watershed similar to what NOAA is doing in the coastal zone.
- **Inadequate funding to be proactive.** While it was the view of many that the state CZM programs do a good job of identifying and reacting to hot topics, the program managers nearly to a person said the lack of funding and capability to do some proactive research and synthesis is an ongoing challenge.

Respondents gave many process suggestions to identify and address emerging issues and future challenges. Overall it was suggested that increased dialogue and coordination with other federal and state agencies and the public could be the primary means for identifying and responding to future challenges, but here are some specific examples:

- Change the approach to 5-year strategy development in a couple of ways. First, look more broadly from a geographic perspective and include influences and drivers in the watershed as a whole (define the CZMA more broadly). Second, continue to use topic areas as a guide, but do not force all programs to speak to each one (allow programs to focus on areas that they determine fit their local and regional needs best). Third, allow for some actions to not have to result in “program change.” This is too narrowly defined and may cause programs to not do some important activities.
- Increase partnerships to assist with identification of future challenges, emerging issues, and technical gaps. Examples include:
  - Create permanent or ad hoc committees at local/regional level to look at particular emerging issues.

- Have a standing Advisory Committee focused on incorporating knowledge and input from a variety of constituents on an ongoing basis.
- Create a national level Blue Ribbon Commission to address sea level rise in a comprehensive fashion, not just through coastal storms. Need to get baseline information.
- Create national or local panels to evaluate existing policies and look at how we apply or update practices, policies, and laws – conduct comparison with future needs. This approach could ask, “Should we work harder to implement and enforce existing regulations or develop new ones?” A benefit of this approach is that it serves to educate local government about impacts of sprawl on coastal resources.
- Use Steering Committee for Coastal Training to identify issues and topics for the future.
- Engage Councils of Government on regional planning to address the relationship between population growth, location, and resource impacts – better regional planning related to topics such as public transportation. Consider impacts, not just geography.
- Create more NERRS programs. Even if you cannot manage them, it will keep land from being developed and preserve options for future on-the-ground research. Land is only going to get more expensive.

***Importance of connectivity between state CZM Programs and Reserves:*** Of the 16 state CZM and NERRS program managers that answered this question, seven reported that there was a close working relationship on a variety of topic areas such as training for local governments, ensuring research at NERRS programs is connected with policy questions and education. Two are co-located, and one reported greater efficiencies by sharing administrative support. Of these that work together, all reported a positive experience. Five state CZM and NERRS programs reported little connectivity between the programs. The two other state CZM and NERRS programs showed interest in strengthening relationships, particularly in the areas of “targeting NERRS research toward policy needs.”

The connectivity issues were generally not deemed to be important by external parties. More than half of the external parties did not know the level of connectivity or expressed that “the links between them blurred.” The general feeling was “as long as the work is getting done, it doesn’t matter who is doing it or getting credit.”

### **Discussion**

- One respondent said it thought that less connectivity was preferable in that the NERRS program “doesn’t get caught up in politics – can maintain some autonomy.”
- Where relationships are good and there is regular interaction, science works in response to the coastal program. Sometimes NERRS programs feel marginalized, which could be because they sit in another agency.
- One external partner suggested combining all coastal related programs (e.g., National Estuary Program, National Estuarine Research Reserves, Marine Sanctuaries, and State Coastal Zone programs) into one coordinated coastal program, and increasing the role of that program to coordinate planning at the watershed level. This would require a change in regulatory definitions. They suggested using California’s Marine Life

Management and Protection Act as a model. It is a piece of state legislation that consolidated 108 protected areas in the state and manages them as a consolidated system. Another example suggested is the collaboration between the state CZM/NERRS, Sea Grant, and Lake Erie Commission where all parties share information and support each other's missions.

- Where state CZM and NERRS programs were integrated, connectivity was viewed as a positive, with a shared vision and complementary resources. Where it was viewed negatively, state CZM and NERRS programs were housed within agencies that had missions or programmatic directions that were not focused on coastal protection. In these cases, the effects were increased bureaucracy and limitations on state CZM and NERRS program activities. Finally, where state CZM and NERRS programs were perceived to collaborate with each other, this was viewed positively (as long as the NERRS program had autonomy in its research); where the programs did not collaborate much, this was viewed negatively.

## Recommendations

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- ***State CZM programs should attempt to regain direct access to governors in all coastal states.*** State CZM programs should strive to be policy relevant, but apolitical in nature. One of the greatest assets is the credibility and meaningful, honest science that programs bring to bear on local decision making. This credibility is dependent upon being viewed as an “honest broker.” State CZM programs have taken a while to get established and have built up a great deal of expertise and credibility with the public and decision makers in their states. While their credibility increased, their profile has diminished in some states, particularly when programs were embedded within existing state programs that do not have as broad a mission. In order to take advantage of this credibility, work to ensure that programs have institutionalized communication with the highest levels of government, even if they are not part of that branch. States, with the help of OCRM, should try to re-establish a direct line of communication to the governor’s office regardless of where the program resides in state government.
- ***State CZM programs are playing important and valued roles in coastal decision making, but significant changes are needed to ensure that the programs can continue to meet increasing pressures on coastal resources.*** CZMA authorities should be revised and expanded to authorize programs to reach up the watershed. Understanding, facilitating, and influencing activities that are impacting the coastal zone and coastal resources will become increasingly difficult without the ability incorporate key upstream impacts. State CZM programs have an opportunity to leverage their scientific credibility and facilitation skills to further articulate tradeoffs to local and state governments, increase coastal literacy of the public, and develop/sponsor/advocate for larger scale and more meaningful coastal restoration projects. Such an expansion would help realize the oft-lauded, but difficult to implement, watershed approach. State CZM programs are well-positioned to play this role. This may provide an opportunity to look at a consolidation of programs (e.g., Marine Sanctuaries, National Estuary Program, etc.). The State of California has been held up by some as a model.
- ***There is a natural synergy between traditional State CZM programs, flood risk management programs, emergency management, and levee and dam programs that could be advantageous to State CZM and NERRS programs both.*** There is an opportunity for common messaging, joint fact finding and development, and support of legislative efforts to develop a set of more integrated federal policies. Specifically, the Federal Interagency Floodplain Management Task Force (FIFM-TF), a 15-agency executive level task force has recently been reconvened after being dormant since 1994. OCRM would have much to offer to this effort as it attempts to articulate a national vision or “unified national program” for floodplain management and flood risk reduction. NERRS programs are well positioned to bring to bear their national coastal data sets, syntheses, and other information about ecological services in the coastal and estuarine zones.
- ***Relevancy assessments should be completed at every State CZM program.*** Overall the state CZM programs are viewed to be effective. There is no need for an overhaul to improve



effectiveness, simply continue the current path toward the development of meaningful indicators. But the time is ripe, especially for some of the older programs, to do a reassessment that goes beyond the typical Section 312 Review of Performance assessments. What is needed are state-wide (perhaps region-wide) dialogues to explore the relevancy of the state CZM program related to aspects such as structure, focus, skill sets of staff, etc. An effective state CZM program that is focused on yesterday's challenges and opportunities, using outdated approaches may be working efficiently but not maximizing its impact. After two decades, it is time for a different sort of critical look – one that determines whether the state programs are strategically focused, not only whether they are accomplishing what is include in their plans. Section 309: Coastal Zone Enhancement Grants could be utilized to provide resources for states to conduct a critical, strategic assessment developed in conjunction with existing and potential stakeholders and partners.

- ***Beware of getting spread too thin as programs take on more responsibility for broad scale issues such as ocean zoning, spatial planning, and community resilience.*** State CZM programs are considered a good value for the dollar by external stakeholders, but frustration also exists because they are chronically underfunded to meet the pressures of development, perform coastal zone science, and fulfill all the mandates of the CZMA. As reported by both internal and external partners, the greatest amount of effort goes into balancing coastal development and the impacts on industries such as energy production, fisheries, and agriculture. New trends such as ocean planning and zoning and climate change adaptation are important and a great role for state CZM and NERRS programs alike; however, they are not without risk. Spreading existing resources too thin may cause traditional training, analysis, brokering, and permitting activities that help control unwise development to languish. New resources will be required to continue existing efforts as well as take on broad scale tasks such as spatial planning and the like. If the private sector stands to benefit from spatial planning, it may be willing to pick up part of the tab for the increased level of effort.
- ***Get involved in National Flood Insurance Program and levee debates in order to be a voice for coastal resources.*** NERRS programs should build upon their expertise in “making science relevant” to decision making by expanding their efforts in exploring and articulating the connections between natural resource degradation and economic and social well being (e.g., coastal hazards and flooding, ecological services, water scarcity, water quality). They are well-positioned to conduct and synthesize this type of research as well as develop tools to assist local decision makers in assessing and articulating trade-offs and informing permitting decisions. One place where this would be most timely and relevant is with local communities’ relationships with levees. Many communities along the coast (and rivers that empty in the coastal zone) have long relied on levees to protect people from flooding, but this has come at a cost – channelization of rivers, intensification of development along the coast and in productive floodplains, disruption of natural hydrological functions, degradation and loss of aquatic habitat, and loss of local and regional resource-dependent industries. Many coastal communities are already, or will soon be, reassessing their reliance on levees as costly repairs to these aging structures will be needed to comply with U.S. Army Corps of Engineers’ safety standards. These levees are now under scrutiny after levee

and floodwall failures in New Orleans. Further, updated mapping efforts by the Federal Emergency Management Agency are showing that some of our levees are not as good as we thought they were, which results in expensive insurance requirements for individuals and business. Communities are lacking analytical and decision-making tools that help them weigh long term benefits and costs of levees and other more natural flood control approaches (e.g. wetlands reconstruction, relocating parts of communities, impacts to drinking water and waste water, etc.). The NERRS programs are well positioned to assist in bringing data and information to bear and assist in the development of decisional tools.

- ***NERRS can be a great tool for land preservation alone.*** Even if there is little NOAA funding to run a full-fledged research, training, and education program, there is significant value simply in preserving pieces of the coast for future research or ecological preserve areas. As land prices have become slightly more affordable in recent years, opportunities for more cost-effective land acquisition should be explored.