

Statement to the U.S. Commission on Ocean Policy
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Good morning, Admiral Watkins, Members of the Commission, ladies and gentlemen. Thank you for the opportunity to speak here today on these issues of critical importance to our Nation's future. I am Chip Groat, Director of the U.S. Geological Survey, representing the Department of the Interior.

The DOI has significant responsibility for coastal and ocean environments:

- Approximately 30% of Wildlife Refuges protect marine, estuarine, Great Lakes or coastal habitats.
- The National Park Service manages 39 marine national parks and over 60 coastal parks with more than 7,300 miles of shoreline.
- Minerals Management Service is responsible for leasing and environmental studies associated with Outer Continental Shelf mineral resources.
- DOI has responsibility for West Indian manatee, American crocodiles, and northern and southern sea otters, and shares with the Marine Fisheries Service endangered species responsibility for sea turtles, Atlantic salmon, and Gulf sturgeon.
- DOI co-chairs the Coral Reef Task Force.
- Bureau of Indian Affairs and Fish and Wildlife Service: Tribal dependence on subsistence fishing, hunting and cultural resources

Clean coastal waters, healthy ecosystems, sustainable environments and marine resources, safe communities, private sector development, and reliable marine transport are all part of the essential infrastructure of the Nation – critical to a sustainable and growing economy and a shared responsibility.

This situation was recognized in the Congressional charge to the USGS to develop a comprehensive and integrated national Coastal Program, partnering with other Federal and State agencies and universities to address the diversity of issues facing coastal communities.

The impacts of rapidly growing coastal populations place increasing demands on developing ocean resources and space for economic benefit. Understanding and mitigating the economic and environmental impacts of coastal and ocean development is critical. As coastal populations continue to increase, our economic dependence on coastal and ocean resources also increases--as does our vulnerability to coastal hazards.

The DOI recognizes that increasing populations require a balance between sustainable resource use, environmental protection, and assurance of safe communities and reliable

marine commerce systems. Several of our agencies face these challenges across the United States daily. These are issues of national importance, and the Federal Government faces the challenge of providing the information and tools to understand and mitigate resource and hazard vulnerability, to support and assess development of public policy, and to assess the consequences of policy, resource-management, and development decisions.

The DOI has a long history of conducting investigations in coastal areas. For example, USGS has conducted research in San Francisco Bay since 1968, examining processes in time scales that range from seconds to decades. Currently, we also are working in the Chesapeake Bay, Mid-Atlantic Coastal zone, Gulf of Mexico, Southern California, Pacific Northwest, Hawaii and Alaska. Today I want to focus on our work in Tampa Bay.

The Tampa area has been the focus of several DOI studies. For example, recent work conducted by USGS has combined historical mapping with sophisticated modeling techniques to show potential development, projected to the year 2030. This study provides essential baseline information on growth patterns. The USGS has also begun an effort to develop a program of coastal studies with the initiation of the Tampa Bay Pilot study (additional information will be provided at the meeting). This study engages a variety of stakeholders and partners in planning and implementation. Initial stakeholder input made clear that the issues facing the Tampa Bay community are diverse, including:

- degradation of critical coastal and marine habitats (including wetlands and submerged aquatic vegetation) in response to natural and human impacts,
- increasing vulnerability of coastal communities and resources to storms, erosion, and sea-level rise, and
- impacts on coastal systems of the delivery, cycling, and accumulation of contaminants, nutrients, sediment and freshwater.

These issues, identified in consultation with local stakeholders, are consistent with issues identified at the local and regional level throughout the country. It is clear that, while priorities and specifics may have a local expression, the issues facing coastal communities are national in scope and impact. It is also clear that developing solutions requires integrated science, including biologic, geologic, geographic, and hydrologic aspects, so that the consequences of management decisions can be assessed with respect to the complete range of issues of local concern. This is critical to us because a central underpinning of Secretary Norton's 4 C's – Consultation, Cooperation, Communication all in the service of Conservation – is ensuring local concerns and input are included in developing solutions.

A tremendous range of activities is underway, and many local, State, and Federal agencies are working together to gather information and achieve the science-based

understanding needed to address issues in Tampa Bay – and across the Nation. The breadth of such efforts must continue in order to develop solutions to critical problems. However, current levels of coordination in assembling and synthesizing information, reporting results, and developing solutions fall short of what is required if management programs are to be effective. Successful solutions to coastal problems must reflect an integration of information on stressors and primary and secondary impacts. Relevant information must be made available in a form that resource managers can easily understand and apply.

The issues facing our coastal regions require persistent efforts to develop national, consistent information. Mapping, inventory, and monitoring to characterize the physical and biological resources of our lands and waters are an essential first step to developing policy and management approaches. The resources of the U.S. Exclusive Economic Zone, that area for which the United States has sovereign rights and jurisdiction, remain poorly described. These efforts must be defined in order to assess vulnerability to change that reflects humans and the environment. These efforts must be defined to result in assessments of vulnerability to change that reflects the multiple drivers, conflicting demands, and interdependent issues impacting coastal communities and resources. Partnerships across the Federal sector, including the academic community, are necessary to develop (1) solutions to critical problems, (2) tools to assess the consequences of policy and management decisions, and (3) models based on science that are exportable beyond local and regional boundaries and that adapt to the unique features of local areas.

A critical component of science at all stages of research is the peer review process, which helps ensure that the conclusions are soundly reached and supported with good data and analysis. DOI is committed to ensuring the effectiveness of the peer review process, so decisionmakers and stakeholders can have confidence in the credibility and impartiality of results.

As the identified science agency within the Department of the Interior, the USGS has an essential role in understanding and monitoring ocean processes, including estuaries and the coastal zone-- the critical interface between land and water, earth and atmosphere, the natural and the human world. DOI and USGS have substantial science capabilities, including:

- 10,000 USGS scientists, technicians, and support staff located in nearly 400 offices in every State and in several foreign countries.
- USGS partners with more than 2,000 agencies of State, local, and tribal government, the academic community, other Federal allies, nongovernmental organizations, and the private sector.
- World-class expertise in marine and coastal mapping, marine geochemistry, and oceanography.
- Three Coastal and Marine Science Centers co-located with major university marine science programs in Woods Hole, MA, St. Petersburg, FL, and Santa Cruz, CA.

- 17 Biological Science Centers with particular expertise in coral reef research, wetlands and estuaries, marine mammals and seabirds, anadromous fish, and fish health.
- Information holdings that offer an amazing gateway to rich data bases, manipulatable maps, newly acquired satellite images, real-time information, and a wealth of reports spanning more than a century of science.

Consistent with these capabilities, our priorities include the following:

Information and Monitoring

A sustained investment in monitoring is crucial if we are to understand both natural and human drivers of change. Long-term monitoring must focus on the flux of materials (nutrients, fresh water, sediments, contaminants) to coastal systems. Monitoring and research are needed to develop models of how human and natural alterations to watersheds impact delivery of materials. Information is needed to develop an understanding of how such materials cycle and accumulate in coastal systems, impacting ecosystem health. Information and monitoring must also address the potential for extreme impacts resulting from storms, recognizing that the immediate wind and water damage from a coastal storm may be dwarfed by the release of contaminants into the ecosystem, as we saw after Hurricane Floyd.

We still lack critical information on the physical and biological components of coastal systems. We need better information on the location, quantity, and quality of key biological habitats; descriptions of coastal land-use and estimates of rates of change; and increased geologic and topographic mapping. Recent cooperative work with NOAA to develop a merged topographic-bathymetric data model in the Tampa Bay area is an important step towards standardizing Federal map data so local stakeholders can tailor information to their specific needs and answer complex environmental questions that neither the topographic nor the bathymetric model alone adequately supports. The protocols developed in Tampa Bay will be useful in other areas. DOI is also working with NOAA to develop protocols for habitat mapping. There is additional need to understand the effects of coastal and near-shore ecology on ocean systems.

Work on hypoxia in the Gulf of Mexico demonstrates the value of such monitoring and coordinated effort. DOI networks monitoring streamflow and nutrient levels provided information that was critical to assessing hypoxia in the Gulf of Mexico. Combined with NOAA-supported studies in the hypoxic zone, the USDA's agricultural, economic, and environmental programs, and contributions from academic scientists, DOI water programs in the Mississippi Basin have supported compelling analyses that enabled a scientific consensus about causes, consequences, and solutions. Information from the long-term water monitoring programs made it possible to determine that nitrate concentrations and flux in the Mississippi River have more than doubled in the past 50 years. From these data, scientists were also able to delineate the predominant source areas for nitrogen in the basin and to identify the human and land-use activities most responsible for contributing to the increased nitrogen loads to the Gulf of Mexico. This

same monitoring information currently allows us to make predictions about the size of the hypoxic zone and measure the effects of watershed management activities on nutrient flux. This multi-agency effort illustrates the essential characteristics of the type of assessment increasingly demanded from the scientific and policy communities. Such assessment must be broadly integrative and synthetic, answer policy-relevant questions, involve solid peer review and public participation, be based on high quality monitoring data, and be predictive.

Research

Further DOI and NOAA research is needed to better understand the physical/chemical/biological interactions that result in ecosystem sustainability and change. This is true for the coastal and near-shore environments as well as ocean environments. As we face the potential for significant sea-level rise in the 21st century, research is also needed to help understand the impacts of both extreme (storm-driven) and persistent (sea-level rise) change in coastal systems. The accelerated subsidence of the Louisiana delta and the consequent risk to New Orleans and the surrounding population and economic centers are of particular concern. The loss of wetlands may also mean a major decline in habitat for fish, shrimp and other species of concern.

Integrated Information, Decision-Support Tools, Models, and Assessments

Research and understanding must be planned and implemented toward shared objectives. Uncoordinated efforts to address specific issues will fall short of providing the tools and models required to forecast coastal change. Interagency planning must provide not just coordinated information but also integrated assessments, broadly applicable models, and decision support tools designed for resource managers.

These three components—monitoring, research, and integrated information tools—are the organizing structure for the USGS Coastal Plan, an approach that focuses on providing science and information required to address national issues at the regional scale of coastal systems appropriate for the development of management strategies. To be effective, this Coastal Plan must be coordinated with other agency and university efforts. To achieve this goal, the USGS is collaborating with other Federal agencies to address critical issues, including, for example, working with NOAA on the impacts of coastal storms. The USGS, NOAA, and EPA are also supporting a National Research Council study of needs for geospatial information to address coastal issues.

Partnerships and Collaboration

Numerous interagency panels have assessed the need for a coordinated Federal effort to meet the science needs of ocean and coastal environments. All these efforts have identified similar issues and pointed to the need for programs leading to integrated information and solutions.

Coastal issues affect many states in this country. Maintaining and restoring the environmental quality and ecosystem health of coastal systems, ensuring sustainable resource use, and protecting life and property from hazards are national objectives

appropriate for Federal mission agencies. Meeting those objectives will require advances in fundamental science and technology that can only be achieved through engagement of the academic research community.

A critical first step is an accurate inventory of projects and programs currently underway throughout Federal, State, and local governments, academia, and the private sector. With that in hand, the goal of coordinating and integrating the programs will become, if not easy, at least possible.

In addition to the examples of collaboration described above, there is already an excellent model for interagency cooperation: the National Ocean Research Leadership Council, the governing body for the National Ocean Partnership Program. NORLC, with its advisory panels for both agency and academic research, provides a forum to design coordinated programs. With the establishment of the Oceans.US effort, focusing on Ocean Observing Systems, the NORLC is defining the coordinated approach to information provision that is required by the complex coastal and marine issues that we face. Ultimately, the scope of this effort, which provides infrastructure for agency mission and academic programs, must be expanded to include, for example, mapping of resources at risk, physical characterization to constrain model development, and mapping and monitoring of human impacts and alterations to coastal systems.

Tampa Bay is an outstanding setting for this meeting. Here, as in many places across the Nation, the economic vitality, environmental health, and safety of the community are intimately related to the adjacent coastal and marine systems. Ensuring that the benefits of the coastal and marine resources continue to contribute to the vitality of the region is important. The local management and research community clearly grasps the scope of the issues. The Federal research community must provide the consistent infrastructure that, building toward national objectives, supports the development of local solutions. These solutions must reflect the need to balance resource use, preservation, economic development, and public safety in coastal systems that will continue to respond to increasing populations and associated development pressures.

We look forward to working with our partners, here in Tampa and throughout the Nation, to provide the sound, accessible, impartial science needed to harness the power of our natural environment and preserve and protect the future of our citizens.