Florida Oceans
And Coastal Council's
Annual Science Research Plan
2009-2010

FLORIDA OCEANS AND COASTAL COUNCIL

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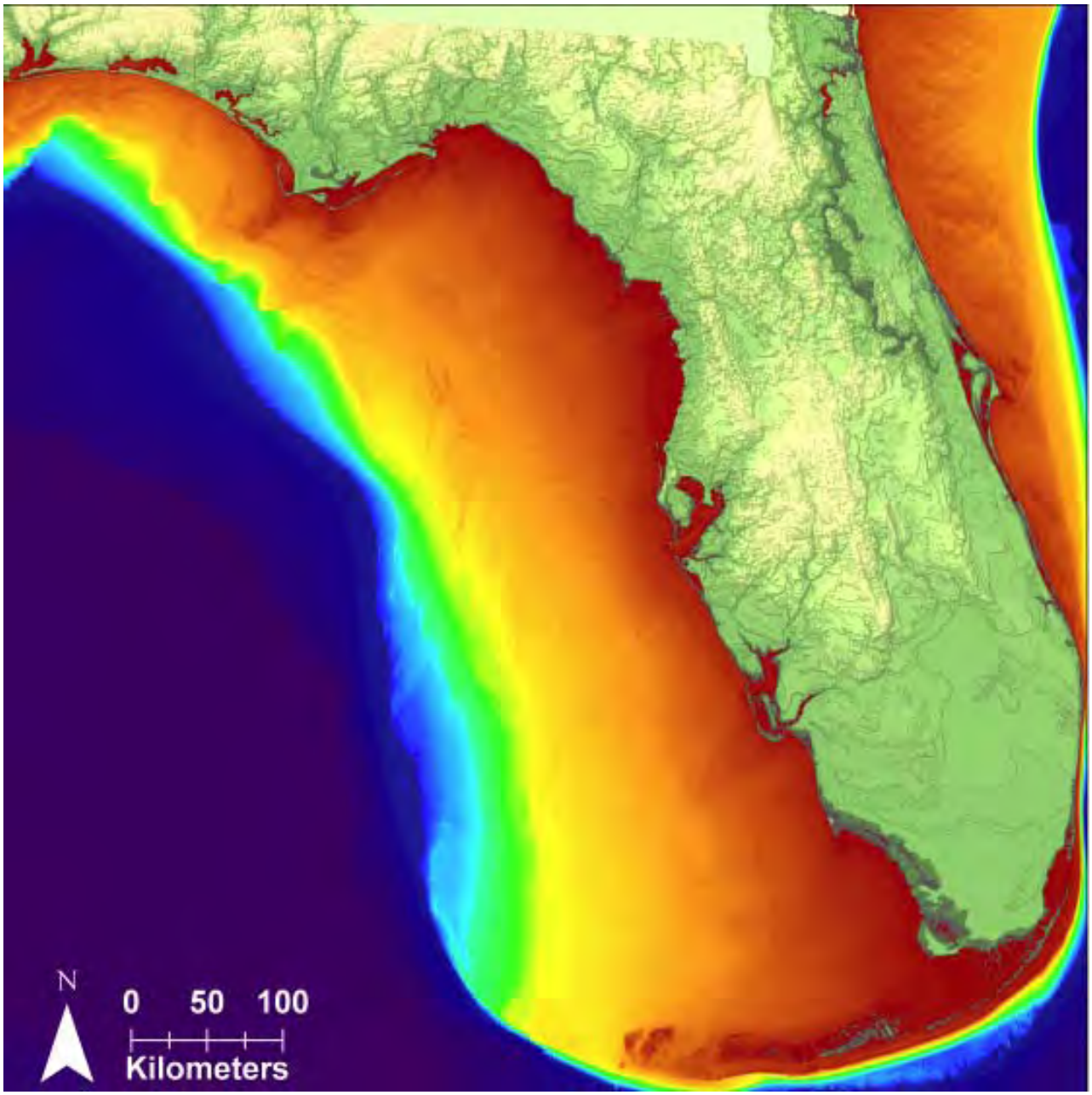


Florida shelf bathymetry (courtesy U.S. Geological Survey). Deeper water is indicated by blues, while shallow waters are shown in red.

Investing in Florida's Coastal and Ocean Future FY 2009–2010

Introduction

There is no greater natural influence in our lives than the sea. Our waters define Florida and we are recognizing, as never before, the inextricable links between our communities, our coasts, our ocean, and our quality of life. Our oceans control our weather and dictate the climates. They cover 70 percent of the planet, hold 97 percent of Earth's water, generate a significant portion of the oxygen we breathe, absorb carbon dioxide, supply our fresh water through rain, provide food, and are a deep source of inspiration to all.

Florida is the only continental state largely surrounded by coastal seas and ocean. In Florida you are never more than 75 miles from salt water. Now, more than ever before, we as Floridians recognize how our decisions individually and regionally can impact the oceans as a whole. Today, through cutting-edge technologies, we have access to advanced data and new, timely information. By sharing our collective resources—the best science available, the expertise of hundreds of scientists and resource managers, and our collective commitment—we can better protect the health of our complex ocean and coastal ecosystems and secure an ocean legacy for future generations.

Florida's economy and population are projected to grow rapidly over the long term, with development booming along our coasts. This is where multiple interests intersect and informed management is critical. To abate critical threats and take advantage of opportunities to use Florida's marine resources requires accurate assessments, continuous monitoring, and real-time ability to predict and interpret changes to the physical, chemical, biological, geological, and socioeconomic components of our marine ecosystems. It also requires a fully integrated system to allow resource managers and other interested parties to share data and information in making their decisions. For example, virtually all the research priorities outlined in this plan can contribute needed data and research analyses to help evaluate the positive and negative impacts on Florida's marine resources of allowing offshore oil and gas exploration.

Florida's economy is heavily dependent on its oceans and coastal ecosystems and it is important to know how to use them sustainably to strengthen our economy. For example:[1]

- **Florida's coastal Gross Domestic Product (GDP) for 2006 was almost $562 billion, which represents a 17.4% increase from 2003 totals.**
- **In 2006, Florida's coastal counties made up over 79% of the state's economic productivity, yet the shoreline counties took up only 56% of the land area.**
- **Florida's ocean economy contributed $25 billion to the state GDP during 2005.**

Together, working across local, state, regional, and international borders, we can further demonstrate the uncommon commitment that Florida has to protecting its most remarkable treasures—its oceans and coasts.

[1] Kildow, J. 2008. *Phase II, Florida's Ocean and Coastal Economies Report.* Report to the Florida Department of Environmental Protection. Office of Coastal and Aquatic Managed Areas.

The Florida Oceans and Coastal Council

The Oceans and Coastal Resources Act, §161.70, et seq., Florida Statutes, created the Florida Oceans and Coastal Council (Council) in 2005. The Secretary of the Florida Department of Environmental Protection, the Executive Director of the Florida Fish and Wildlife Conservation Commission, and the Commissioner of the Florida Department of Agriculture and Consumer Services each appoint five marine scientists and experts who serve as voting members of the Council. Designees of the three agency heads serve as ex-officio members, with the Florida Department of Environmental Protection and the Florida Fish and Wildlife Conservation Commission co-chairing the Council. This resulting Council of 18 is charged with coordinating coastal and marine research in Florida, identifying research gaps and creating an annual Research Plan, and recommending new strategies that enhance management and conservation efforts for our coastal and marine resources.

2008–2009 Accomplishments

- The Council finalized a report for the new Energy and Climate Commission entitled *The Effects of Climate Change on Florida's Oceanic and Coastal Resources.*
- The Council sponsored the National Ocean Economics Program at Monterey Bay Aquarium Research Institute to complete *Phase II: Florida Ocean and Coastal Economies Report*:
    - Made presentations to the Governor and Cabinet and the Coastal Cities Summit on the economic impact of Florida's ocean and coastal economy; and
    - Hosted the Florida Coastal and Ocean Economics Forum to present the work to the public and Florida's marine industries.
- Multiple Coastal Ocean Observing System projects were completed through a contract with the Florida Coastal Ocean Observing System Consortium involving about 200 scientists, staff, and students, leveraging $2.5 million in nonstate funding. These projects include the following:
    - Production of the Florida Coastal Ocean Observing System Strategic Implementation Plan. (Florida Coastal Ocean Observing System Consortium, with input from other interested parties)
    - Addition of a nitrate chemical sensor which aids in understanding nutrient fluctuations and water quality at a location off northwest Florida that already makes physical and meteorological observations, to continue the development of an interdisciplinary ocean observing system. (Florida State University)
    - Installation of two high-frequency radars along the coast of southeast Florida to expand the existing array northwards and obtain high-resolution surface current and wave data that are used in search and rescue and for safe maritime operations. (University of Miami)
    - Deployment of three sub-surface physical oceanographic moorings and one sub-surface biological observing system on the Central East Florida Shelf to begin observations in a data-sparse region, including the *Oculina* Bank, a Habitat Area of Particular Concern. (Florida Institute of Technology, Harbor Branch Oceanographic Institute at Florida Atlantic University, Nova Southeastern University)
    - Deployment of one physical oceanographic and meteorological surface mooring off northeast Florida to begin observations in a data-sparse region in the protected north Atlantic right whale breeding area. (University of North Florida, with assistance from the University of South Florida)
    - Production of high-resolution, Florida-specific satellite data images and movies of sea-surface temperature and ocean color to show fronts, eddies, and biological productivity; these are used for snapper, grouper, king mackerel, and sardine fisheries. (Roffer's Ocean Fishing Forecasting Service, Inc. [ROFFS™])
    - Development of a Florida-wide ocean–atmosphere model by incorporating influences such as the Loop Current and the Gulf Stream System to provide boundary conditions for high-resolution, smaller-domain (e.g., estuarine) models, to move towards three-dimensional forecasting capabilities. (Florida State University)
    - Development of a high-resolution estuarine and shelf model for the northeast Florida region, using boundary conditions provided by the Florida-wide model, which will provide initial steps for modeling water quality from the St. Johns River to Ponce de Leon Inlet. (University of Florida)
    - Conducting Florida Coastal Ocean Observing System Consortium planning workshops and an Ocean Tracking Network workshop that discussed a worldwide network of transmitters to

track the movement of marine life such as sharks, tunas, billfishes, and sea turtles. (Florida Coastal Ocean Observing System Consortium, Mote Marine Laboratory, Florida Institute of Oceanography)

- Data management to provide access to ongoing observations, models, and products. (Florida Coastal Ocean Observing System Consortium)
- Outreach activities, including the development of a DVD. (Florida Coastal Ocean Observing System Consortium)

- Work continued on the Resource Assessment for Florida, which provides internet-based information about the location and status of Florida's natural and human resources.
- Work continued on the Research Review for Florida, which provides internet-based information on existing ocean and coastal research in Florida. This helps identify research gaps and prevent duplication of effort.
- The Council co-sponsored three conferences/workshops:
  - 11th Annual International Coral Reef Symposium;
  - Coastal Cities Summit; and
  - Florida Fish and Wildlife Conservation Commission's Florida's Wildlife: On the Frontline of Climate Change
- The Council's support of the Florida Water Resources Monitoring Council enabled the Monitoring Council to draft a Florida Coastal Monitoring Action Plan.
- The Council co-sponsored the Gulf of Mexico Alliance's Monitoring Forum, which focused on data comparability and coastal nutrient criteria.

Council Reports & Products

- *The Effects of Climate Change on Florida's Ocean and Coastal Resources, A Special Report to the Florida Energy and Climate Commission*, 2009
- *Phase II: Florida Ocean and Coastal Economies Report*, 2008
- *Florida Coastal Ocean Observing System Strategic Implementation Plan*, 2008
- *Integrated Data Management Functional Requirements and Metadata Elements*, 2008
- *Resource Assessment User and Functional Requirements*, 2008
- Research Review, internet-based information on existing ocean and coastal research in Florida (available: http://ocean.floridamarine.org/focc/overview.cfm), 2007–2008
- *Current Status and Opportunities for Marine Stock Enhancement and Aquaculture in Florida*, 2007
- *Coastal and Ocean Research Management Needs*, 2007

Reports are available at:
www.floridaoceanscouncil.org

Accomplishments in Prior Years

The Council has already made significant achievements and has been able to influence a broad range of activities. Among these are the following:

- The Council solicited and incorporated input from 17 Florida resource-management agencies and entities. This information was used to perform a broad-based assessment of resource management needs and to prioritize the research needed to address those needs.

- The Council's Annual Science Research Plan has been used by state agencies to guide their actions in the areas of research and resource assessment.
- Priorities identified by the Council are being used to shape the newly formed regional collaborations of the Gulf of Mexico Alliance and South Atlantic Alliance.
- A Resource Assessment to provide internet-based information about the location and status of Florida's natural and human resources has been initiated.
- A Research Review to provide internet-based information on existing ocean and coastal research in Florida has been initiated. This will help identify research gaps and prevent duplication of effort.
- The Council completed a white paper on aquaculture that explores opportunities and hindrances for expanding aquaculture's role in Florida.
- The Council partnered with the Florida Water Resources Monitoring Council to support establishing metadata standards to improve the use of existing Florida data.
- Council actions stimulated the creation of an organized ocean-observing effort for Florida that includes public/private partnerships.
- The Geospatial Assessment of Marine Ecosystems (GAME) Project is gathering existing biological and physical information in a web-based geographic information system (GIS) format. The goals are to identify critical information gaps and to define and map Florida's marine ecosystems.
- The Council's emphasis on mapping prompted a joint state–federal interagency workshop to assess existing information and identify and prioritize mapping needs for Florida. Results from the workshop have already influenced projects funded through other sources. For example, a website was established with information to help with the coordination of mapping within the state (http://www.dep.state.fl.us/MarineMapping). The information was integrated into the U.S. Geological Survey's Florida Shelf Habitat Mapping Project, the Response of Florida Shelf Ecosystems to Climate Change, and a pending project to establish habitat and resource baselines within the boundaries of an impact zone on a test and training range in northwest Florida (for the U.S. Department of Defense).
- Priorities identified by the Council influenced the National Ocean Research Priorities Plan.

The 2009–2010 Annual Science Research Plan

This fourth Annual Science Research Plan is based on prioritized resource management needs. These were collected from a comprehensive array of state and local government agencies with coastal and oceans resource management responsibilities and augmented by input from nongovernmental organizations regarding their view of the state's resource management needs. This information was used to identify research gaps and guide research priorities. The Council compared the management needs with available research to identify where research funding was needed. Two common themes throughout the lists of priorities were the need to understand and predict environmental change on an ecosystem level and develop science-based solutions to environmental problems.

More details and the foundation on which this Research Plan is constructed are available at: www.FloridaOceansCouncil.org. The Full Science Research Overview contains the areas of research needs identified by the Council and an explanation of their importance. The research needs are based on a survey of resource management agencies that is also available on this website.

The Future of Florida's Oceans

Florida's Constitution states that it "shall be the policy of the state to conserve and protect its natural resources…"[2] Success mandates that we use creative public and private partnerships, pursue opportunities to leverage funds, use our universities and research laboratories, and coordinate our efforts with local, state, and federal agencies. A discussion of the Council's overall research priorities is contained in the Full Science Research Overview (v 1/4/08) (available at: www.FloridaOceansCouncil.org).

The Council recommends the following areas of research emphasis in FY2009–2010:

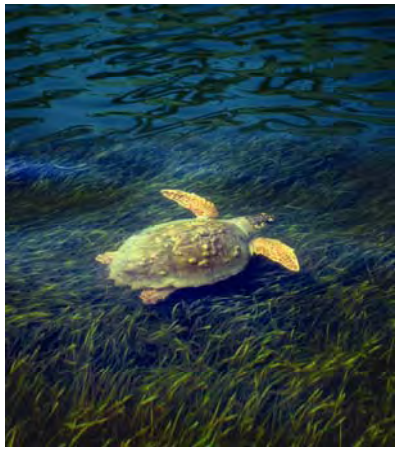
Climate Change

The world's changing climate has the potential to dramatically impact Florida's marine resources, disrupt marine-based economies, and cause significant damage to coastal development, thereby creating the need for mitigation and adaptive management strategies.

Research Priorities—Climate Change:

Providing guidance to minimize effects on Florida's population and natural resources must begin with investigation into three key areas:

1. Model sea-level rise based on Intergovernmental Panel on Climate Change (IPCC) scenarios and the development of cost estimates for resulting effects in terms of natural resource impacts and adaptation of existing coastal development. Emphasis is on collaborative, statewide efforts with peer review. These can include steps that may be necessary to improve model accuracy, such as improved topography for coastal uplands.
2. Assess the impact on fisheries productivity from changes in Florida's estuarine habitats due to climate change.
3. Monitor, model, and map natural system responses with an emphasis on predicting the effects of climate change on coral reef communities. To establish baseline data, it will be necessary to map and characterize Florida's coral reef communities.



Water Quality

Water quality is of critical importance to Florida—it determines what biological communities can live in a waterbody, whether the water is harmful to humans, and whether the water is suitable for other designated uses. With an economy driven by our environment, maintaining water quality to support coral reefs, seagrass beds, fishing, and beach activities must be a high priority.

Research Priorities—Water Quality:

1. Carry out research and monitoring that examines the effects of excess nutrients on living coastal resources and relates them to causes and sources, and to human activities. The intent is to support cost-effective resource management programs to improve oceans and human health.

[2] Florida Constitution, Article II, Section 7.

2. Carry out statewide coastal observing that guides water quality management, marine resource management, and navigation and hazard response.
3. Implement harmful algal bloom (HAB) research to protect tourism and commercial and recreational fisheries, and to inform watershed management for ocean health. The emphasis is on non-red tide HABs, as red tide HABs are already being addressed.
4. Model hydrodynamics, water quality, and coastal/ocean ecosystems to support a better understanding of cause and effect between uplands activities, coastal freshwater discharges, and the resulting effects on estuarine and marine biological communities.

Ocean and Coastal Ecosystems

Florida's ocean and coastal ecosystems are critical to maintaining the economic activity they support, from beachgoing to fishing. It is also critical to maintain these ecosystems as sustainable natural systems. These resources are shaped by geology, water movement, and the plants and animals themselves interacting on a variety of scales, from hundreds of kilometers to millimeters. Having a comprehensive understanding of these ecosystems through reliable baseline information is critical to supporting wise management decisions.

Research Priorities—Ocean and Coastal Ecosystems:

1. Map and characterize the sea floor and coast, including the distribution and abundance patterns of coastal marine organisms. Emphasis is on the gaps in mapping identified by the state resource management agencies at the Florida Mapping Workshop in February 2007.[3]
2. Improve understanding of coastal and ocean hydrology, including the linkages between freshwater input and coastal waters. Emphasis should be on water budgets, hydrologic modeling, and factors affecting and controlling freshwater input to coastal and nearshore waters.
3. Carry out research and modeling to understand and describe linkages between ocean and coastal habitats and the living marine resources they support. One area of emphasis is the effects of marine protected areas (MPAs) on surrounding populations. Fisheries and their linkages to habitats are an important part of these studies.
4. Increase understanding of ocean and coastal economics, including the values of nonmarket resources and the costs and benefits of beach nourishment and beach restoration.

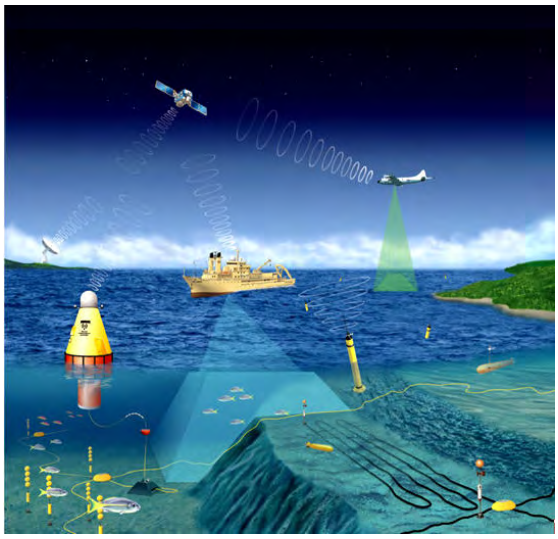
Tools and Technology

Fulfilling Florida's need to observe and predict environmental change and the ecosystem responses of its coastal waters provides abundant opportunity for the development and implementation of cost-effective tools and technologies to understand, monitor, and improve the health of Florida's resources.

[3] February 2007 joint Florida Department of Environmental Protection/U.S. Geological Survey/Southeast Regional Partnership for Planning and Sustainability workshop on Florida mapping priorities. Available at: http://www.dep.state.fl.us/MarineMapping/priorities.htm.

Research Priorities—Tools and Technology:

1. **Implement integrated coastal and ocean observing systems**—A mix of in-water platforms and buoys, shipboard surveys, remote sensing, and computer models is required for the continuous monitoring of climate change, water quality, and status of marine resources. The goal is to create a sustained interdisciplinary observing system that spans all of Florida's waters from the outer shelf to coastal estuaries and rivers. Emphasis is on extending, and integrating capabilities, and filling gaps in existing coastal observations by implementing the Florida Coastal Ocean Observing System Strategic Implementation Plan.
2. **Develop sensors to provide improved abilities to determine the status and trends of our coastal waters and their inhabitants**—Emphasis is on sensor development for biological and chemical sensing, as well as tagging and tracking of wildlife.



3. **Improve integrated data management and prediction**—Coordinated collection, handling, quality control, sharing, and interpretation of research and monitoring data are critical to improving the state's resource management capabilities. The centralized coordination of model development to provide predictions and user-friendly web-based posting of information and model predictions are needed to inform and support science-based decisions by management agencies and the general public.
4. **Develop innovative tools and integrate data to decrease the costs of mapping and monitoring the state's coasts and oceans**.
5. **Develop assessment tools, particularly for assessments of biological community status and trends, for rapid assessments of natural resources, and for evaluation of management efforts.**

Ongoing Research Efforts

The Oceans and Coastal Resources Act seeks better coordination of coastal and ocean research. The Council stresses that this Research Plan is not generally intended to replace ongoing state-funded research efforts and partnerships. These research recommendations are based on identified research gaps to supplement research already under way, eliminate duplication of efforts, and advance agency missions.

Communication and Interagency Coordination

The Council encourages the agency or agencies charged with investigating the priority research areas to use existing mechanisms, or to develop new mechanisms as appropriate, to fund innovative collaborative work between the private sector and Florida universities and research institutions, in order to maximize the expertise of each and effectively link research with the education of the next generation of scientists.

In efforts to improve collaboration and coordination, the Council recognized the critical importance of organizing and communicating the data that are collected and analyzed in ocean and coastal-related

research and monitoring efforts. It is widely acknowledged that data sharing and access has been extremely problematic on a statewide scale among and between agencies, their stakeholders, and the public at large. For this reason, the Council began the development of an **Integrated Data Management (IDM) and Dissemination system** that would allow discipline-specific querying capabilities of project data. Efforts to date from Council IDM projects include:

- Leveraging an existing body of water quality officials (i.e., the Florida Water Resources Monitoring Council) to solicit input from the research and monitoring community in Florida to assist in addressing this issue;
- Enlisting experts in a wide range of scientific disciplines, from groundwater to ocean observing, to identify core descriptors (i.e., metadata elements) of their work to aid in discovering and sharing data of interest; and
- Identifying an internet-based approach for researchers and other data generators to post these metadata elements and also to enable the larger scientific community and the public to query and access them.

The Council's creation of the IDM's core metadata elements and the internet system approach for posting and sharing them come at an opportune time with the Legislature's newly authorized Agency for Enterprise Information Technology (AEIT). The AEIT will be a centralized enterprise information technology (IT) agency with a primary responsibility to oversee strategies for implementing services established in law as well as developing new enterprise IT policies. For this reason, the Council has decided to share the results of the IDM project to date and then coordinate future efforts based on new AEIT policies. The Council's ex-officio members will keep the Council informed of progress in future IDM activities and opportunities with the new AEIT.

Integrated Data Management

Stakeholder Participants:

- *Florida Department of Agriculture and Consumer Services*
- *Florida Department of Environmental Protection*
- *Florida Department of Health*
- *Florida Fish and Wildlife Conservation Commission*
- *Local Governments*
- *Private Sector*
- *Water Management Districts*

Scientific Discipline Experts:

- *Ocean Observing*
- *Geospatial*
- *Lab Analytical*
- *Aerial Remote Sensing*
- *Groundwater*
- *Biological Sampling*
- *Field Sampling*

Additionally, the Council developed a special report entitled *The Effects of Climate Change on Florida's Ocean and Coastal Resources*, which will be presented to the Legislature's new Energy and Climate Commission. This document summarizes current state-specific ocean and coastal scientific knowledge that will provide a foundation for Commission discussions.

The Council will continue to engage scientists, managers, and members of the public on priority issues through workshops, Oceans Day, and other forums.

Recommended Funding Priorities for FY 2009–2010

The Council recommends the following three items in order of importance. This list is also expected to provide guidance on state research priorities for state, regional, and federal research; ocean observation; and natural resource data management programs.

1. *Council administration and operation:*

Operating costs for Oceans Council – costs for Council meetings and support staff to create annual Research Plan and oversee research proposals and contracts.

Recommended funding = $300K

2. *Legislatively defined duties:*

a) **Research Review** – maintain publicly available Research Review detailing past and present coastal and ocean research in Florida at $100K;

b) **Resource Assessment** – complete publicly available Resource Assessment providing information on the location and status of the natural and human resources in Florida's coastal and ocean realm at $300K.

Recommended funding = $400K

3. *Priority research in Climate Change, Water Quality, Ocean and Coastal Ecosystems, and Tools and Technology, including coastal ocean observing that supports these priorities:*

Recommended funding = $2.3M

Nearly 80% of Florida's economy is dependent on a coastal zone potentially at high risk from climate change. Therefore, among the priority research areas listed in this plan, the Council has identified research to quantify coastal impacts from climate change, at scales that will be useful for regional and local community planning, as a priority for 2009–2010.

Note: The "*Areas of Research Priority*" listed below are elaborated on in the "Future of Florida's Oceans" section of this report. The descriptions below after "*Priority Task*" are those aspects of the Research Priority that the Council feels are most urgent.

Climate Change

Areas of Research Priority: **Modeling, monitoring, mapping, and natural system responses, including fisheries.**

Priority Task: **Model sea-level rise in Florida and its effects on human and natural resources. Requires collaborative, statewide sharing of ideas, peer review, and a defined timeline. Additional topographic data may be required.**

Priority Task: **Predict impacts of climate change on coral communities.**

Water Quality

Areas of Research Priority: **Nutrient loading, observing systems, harmful algal blooms (HABs), modeling.**

***Priority Task*: Evaluate effects of nonpoint or point sources of nutrients on coastal ecosystems; including the relative impacts of point versus nonpoint sources, ties to land use, and ability to distinguish sources of nitrogen and/or corresponding response conditions.**

Ocean and Coastal Ecosystems

Areas of Research Priority: Mapping, **hydrology, modeling, harmful algal blooms (HABs), marine protected areas (MPAs), fisheries, economics, beach nourishment/restoration, aquaculture.**

Priority Task: **Fill in mapping gaps from state agencies' priority list[4] to improve decision support tools for resource managers.**

Priority Task: **Evaluate effectiveness of MPAs to include habitats, spawning sites, and development of rapid assessment tools. There is a need for statewide area(s) of study and creation of** decision support tools for managers.

Tools and Technology

Areas of Research Priority: **Integrated coastal ocean observing systems, sensor development, tagging and tracking technologies, innovative new mapping tools, tools for biological and other types of assessment.**

Priority Task: **Develop sensors for measuring biological activity, add sensors to existing observing systems, and address gaps in existing systems. Leverage capabilities from existing state investments.**

Priority Task: **Develop biological community hea**lth and rapid assessment tools.

[4] Results of February 2007 joint Florida Department of Environmental Protection/U.S. Geological Survey/Southeast Regional Partnership for Planning and Sustainability workshop on Florida mapping priorities. Available at: http://www.dep.state.fl.us/MarineMapping/priorities.htm.

Florida Oceans and Coastal Council

Vision Statement

The Florida Oceans and Coastal Council envisions the bountiful ocean and coastal resources of Florida as a perpetual life-support system and the foundation of our economy and society.

The Council will promote innovative research and the use of scientific results to guide the management and stewardship of Florida's ocean and coastal resources for future generations.

The Council will support the enhancement of Florida's academic and marine research institutions into an integrated network, cooperating and partnering with public agencies, industries, environmental organizations, and citizens.

Florida will be an internationally recognized leader in marine science and ecosystem-based management.

Department of Environmental Protection

Fish and Wildlife Conservation Commission

Michael W. Sole
Secretary

Kenneth D. Haddad
Executive Director

January 28, 2008

The Honorable Charlie Crist
Governor of Florida
PL05, The Capitol
Tallahassee, FL 32399-0001

The Honorable Jeff Atwater
President, The Florida Senate
312 Senate Office Building
404 South Monroe Street
Tallahassee, FL 32399-1100

The Honorable Ray Sansom
Speaker, Florida House of Representatives
420 The Capitol
402 South Monroe Street
Tallahassee, FL 32399-1300

Dear Governor Crist, President Atwater and Speaker Sansom:

On behalf of the Florida Oceans and Coastal Council (Council), we are pleased to deliver the 2009-2010 Annual Research Plan. The enclosed plan recommends strategies to focus marine research within the state while enhancing the management of our coastal and marine resources. The 18-member Council includes five appointees from each of the following representative agencies: Department of Environmental Protection, Florida Fish and Wildlife Conservation Commission and Department of Agriculture and Consumer Services. By Florida Statute 161.73, the Council is co-chaired by the Department of Environmental Protection and Florida Fish and Wildlife Conservation Commission, while a non-voting ex-officio member from each of the representative agencies sits on the Council.

The Oceans and Coastal Resources Act of the 2005 legislative session created the Florida Oceans and Coastal Council and charged it with coordinating coastal and marine research, identifying research gaps and creating an annual research plan. To identify research gaps, the Council received prioritized management needs from state agencies tasked with coastal and oceans management as well as nongovernmental organizations. The Council collectively evaluated current research initiatives and identified where prioritized research funding should be allocated.

The Research Plan addresses the most pressing needs of the State's resource management agencies. Highlights of the Council's recommendations include:

- Quantifying coastal impacts from climate change at scales that will be useful for regional and local community planning.
- Improving the storage, availability and exchange of data among agencies and researchers to reduce duplication and facilitate informed, science-based decision-making.
- Monitoring and modeling the movements of water along our coasts to protect and improve water quality.
- Developing methods to monitor and assess the health of our marine systems through real-time data.
- Characterizing and mapping Florida's coastal and marine habitats to develop a comprehensive understanding of the environment, its change over time and the impact of natural and human-induced impacts.

The Council's annual Research Plan provides a foundation for an integrated, scientific and ecosystem-based approach to coastal management, establishing an ongoing process through which scientists and resource managers can jointly determine Florida's research priorities. These steps constitute an investment in Florida's ocean and coastal future and are needed to protect the $562 billion contributed by Florida's coastal and ocean economies.

We look forward to your review and consideration of the recommendations.

Sincerely,

Michael W. Sole
Secretary
FL Department of Environmental Protection

Sincerely,

Kenneth D. Haddad
Executive Director
FL Fish & Wildlife Conservation Commission

MWS/rmp

Enclosure

cc: The Honorable Charles H. Bronson, Commissioner of Agriculture and Consumer Services
The Honorable Ken Pruitt, Chairman, Joint Legislative Budget Commission
The Honorable James E. King, Chairman, Senate Committee on Energy, Environment, and Land Use
The Honorable Lee Constantine, Chairman, Senate Committee on Environmental Preservation and Conservation
The Honorable JD Alexander, Chairman, Senate Policy and Steering Committee on Ways and Means
The Honorable Carey Baker, Chairman, Senate Committee on Government Appropriations
The Honorable Trudi Williams, Chairwoman, House Committee on Agriculture and Natural Resources Policy
The Honorable Marcelo Llorente, Chairman, House Council on General Government and Health Care Full Appropriations
The Honorable Ralph Poppell, Chairman, House Committee on Natural Resources Appropriations
The Honorable Baxter G. Troutman, Chairman, House Council on General Government Policy