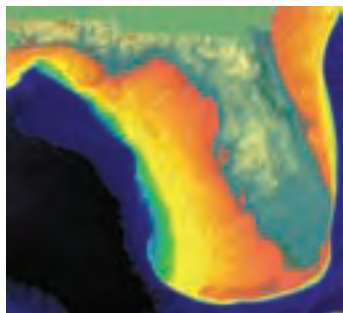




**MAPPING THE  
FLORIDA SHELF  
AND COASTLINES**



**U.S. GEOLOGICAL SURVEY** in partnership with  
**CLEAN BEACHES COUNCIL**



## Resources of the Shelf and Shore

The Florida shelf contains vast physical and natural resources. Minerals, oil, and natural gas are found there, along with sand deposits, which can be used to renourish beaches. Coral reefs teeming with biodiversity draw tourists from all over the world. Commercial and recreational fishing, diving, and other water-based activities rely on the rich fisheries, clear waters, and diverse coasts of Florida. These resources are essential to major commercial and recreational activities: in fact, beach tourism in Florida generated nearly \$40 billion in revenue in 2004.<sup>1</sup> Recreational fishing alone contributes about \$8.3 billion to the economy yearly, while commercial and shell fishing add another \$1.1 billion.<sup>2</sup>

Still, gaps remain in our knowledge of the extent and potential of coastal resources. For example, scientists are exploring carbon sequestration, a possible solution to global climate change, in which oceans and coastal wetlands serve as “sinks” for excess CO<sub>2</sub>. Fisheries management may be improved by using mapping processes to determine the habitats and migratory patterns of important species. Coastal vegetation, such as mangroves and dune grasses, acts as a powerful buffer against coastal erosion and storm damage. Corals and other benthic organisms provide a unique combination of geographic features that support multiple species and may have medicinal properties as well.

Florida’s economy depends heavily on the irreplaceable resources of the ocean and continental shelf. As Florida’s population grows, there will be even greater demands on shelf resources, and policymakers must be prepared for that challenge. The FLASH Map Project provides a way for them to visualize the links between submerged habitats, water quality, and economic development, allowing them to make informed decisions.

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<sup>1</sup> Murley, James, Lenore Alpert, William B. Stronge, TOURISM IN PARADISE: THE ECONOMIC IMPACT OF FLORIDA BEACHES, Proceedings of the 14th Biennial Coastal Zone Conference, New Orleans, Louisiana, July 17 to 21, 2005.

<sup>2</sup> <http://www.nrdc.org/water/oceans/florida/fffuture.pdf>



## The FLaSH Map Project

The FLaSH Map Project is a multi-agency effort to map and understand Florida's coastal and marine habitats. The project brings different scientific disciplines and technologies together to visualize and understand nearshore and offshore environments. The FLaSH Map Project presents existing data from airborne, ship, and underwater technologies in a user-friendly web portal.

Airborne-mounted instruments are particularly useful for mapping coastal and shallow marine features such as:

- Aerial photography—traditional method for mapping seagrass
- Hyperspectral imagery—high resolution imagery for mapping sand, corals, seagrass, and coastal habitats
- Laser altimetry (LIDAR)—for high resolution maps of shallow water bathymetry and coastal topography

Shipboard instruments are used to map shallow and deep water bathymetry, bed forms, water quality, and underlying geologic structures.

- Sonar systems are used to map the sea floor, acquire images of seabed features, and map sub-bottom features
- Cores and bottom samples are collected for evaluation of sediment type and marine processes
- Buoy systems for water quality and ocean currents are deployed and monitored from ships
- Autonomous Underwater Vehicles (AUV) are robots that carry sensors to the seafloor

The FLaSH Map Project makes data available to the public through mapping and visualization tools such as Google Earth. The USGS is working closely with the State Geospatial Assessment of Marine Ecosystems (GAME) program to locate available data sets, to identify data gaps, and to synthesize existing information into a broad and comprehensive understanding of Florida's marine and coastal resources. Potential users of this information include students, researchers, government agencies, and citizens.



To use the free Google Earth tool, simply:



1. Install the free Google Earth software (available from <http://earth.google.com>).



2. Begin downloading and viewing .kmz files from the FLaSH website (<http://coastal.er.usgs.gov/flash>).

## Clean Beaches, FLaSH, and You

Clean beaches depend on good water quality, healthy coastal habitats for plants and animals, renewable sand resources, and responsible public stewardship of resources. Beaches are a natural focus for educating the public and leaders about the shelf and shore. Yet much of the public's knowledge of the shelf is limited to what they see in films like "Finding Nemo." Will they be prompted to connect their memories of a cartoon ecosystem with the infinitely more beautiful version that lies just offshore?

Today, most beach-based education or public awareness efforts are passive. Posted "Don't tread the dunes" signs warn of a fragile ecosystem, but the shelf's more subtle warning signs generally go unrecognized. Threats to water quality such as antiquated septic systems are adversely affecting recreational water quality and healthy fisheries. Symptoms of water contamination threaten both wildlife and beachgoers. Diminished coastal vegetation due to unsustainable development compromises the ability of fragile dune ecosystems to protect coastal infrastructure.

The FLaSH Map Project will give scientists and managers a better understanding of the mechanics and sources that lead to polluted beaches, enabling them to prevent problems before they arise.

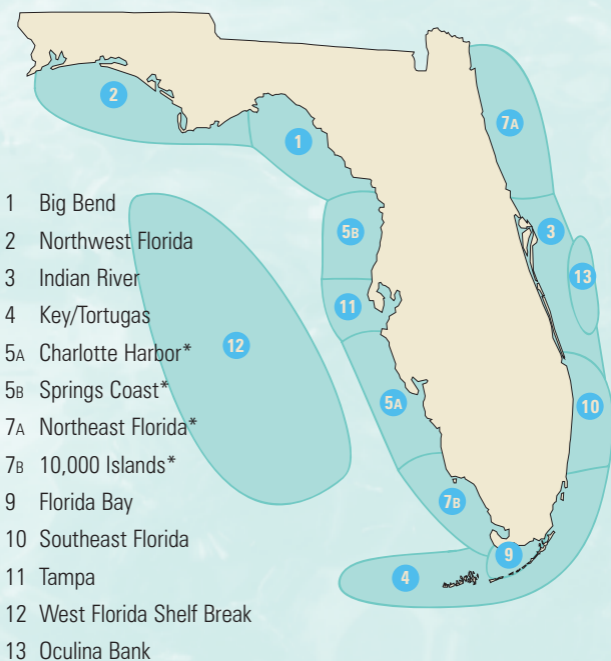
Ultimately, though, the measure of the value of clean beaches depends on you. Whether you are a teacher, scientist, fisherman, diver, or elected official, we encourage you to learn about the fascinating world below the water at the beach. **With wide public usage, the FLaSH Map Project may one day lead us to our ultimate goal: clean beaches and sustainable resources for everyone.**



## State Priorities

In January 2007, the USGS sponsored a workshop in partnership with the Florida Department of Environmental Protection and the Southeast Regional Partnership for Planning and Sustainability (SERPPAS) to discuss the mapping priorities for the state. The meeting was a historic success, resulting in a blueprint for future research on the complex and fragile ecosystems of the Florida shelf. Workshop participants identified high priority areas for mapping projects. The researchers prioritized the sites first by region and then by needs (i.e., habitat information). Underlying the prioritization process was the understanding that critical mapping of habitats is needed in these “high priority” zones.

## 2007 Florida Shelf State Mapping Priority Areas



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## **Background**

Florida is a state virtually surrounded by the Gulf of Mexico and Atlantic Ocean. Much of the state's economy is based on the resources drawn from the continental shelf. Yet the submerged resources of the shelf are all but invisible to most Florida residents and visitors. Few suspect the beauty, vitality, and economic value of the submerged ecosystems that lie just offshore.

Detailed maps of the Florida shelf and coastline are unveiling valuable natural resources and marine processes to researchers, policy makers, and the interested public. Mapping technologies designed to analyze specific habitats and regions allow people to better understand coastal processes on a multitude of scales, from miles down to inches.

The USGS and Clean Beaches Council have partnered to produce this guide to raise public awareness of and understanding about the shelf and shoreline. The guide will improve public science literacy with respect to the complex and dynamic processes that define this incredible resource.

## **USGS and the Florida Integrated Science Center, Saint Petersburg**

The U.S. Geological Survey is a federal multi-disciplinary science organization with research in biology, water, geography, geology, and geospatial information. The Florida Integrated Science Center in St. Petersburg, FL is the lead federal partner for the Florida Shelf Habitat (FLaSH) Map Project. FLaSH makes existing information about the shelf and shoreline available and useful to the public, decision makers, and educators, and improves understanding of our dynamic coastal and marine systems.

## **Clean Beaches Council**

The mission of the Council is to promote public awareness and volunteer participation in sustainability while ensuring a legacy of clean beaches for all generations to come. The Council envisions a global effort to protect the Earth's pristine coastal regions and promote sustainable habitation between humans and the environment.



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### **CLEAN BEACHES COUNCIL**

*Clean Beaches Council is a not-for-profit organization devoted to increasing public awareness and volunteer participation in beach sustainability.*

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