



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

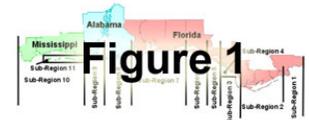
Mobile District, Northern Gulf of Mexico

ISSUE

The Northern Gulf of Mexico (NGOM) Regional Sediment Management (RSM) region encompasses approximately 375 miles of coastal shoreline (Figure 1). The region is bounded to the east by the St. Marks River, FL, and the Pearl River, MS, to the west. The region includes 3 states (Florida, Alabama, and Mississippi), 13 coastal counties, 13 Federal projects, 8 state parks, the Gulf Islands National Seashore, 5 military installations, and other state and local projects. To assist in managing the large domain, the region was divided into 11 sub-regions (Figure 1) based on coastal processes and geomorphic characteristics.

RSM DEMONSTRATION PROJECT GOALS

The Mobile District, with the NGOM RSM demonstration, was the first district to step forward with such a plan. The NGOM RSM Demonstration Program will change the Corps' paradigm of project-specific management by taking a regional project management approach—including sediment management—in cooperation with other levels of government. The goal of regional sediment management is to maximize



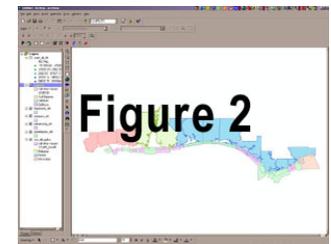
beneficial use of sediments, minimize environmental impacts, and leverage and optimize available funding. In its 3-year demonstration, the Mobile District began six initiatives.

SUMMARY

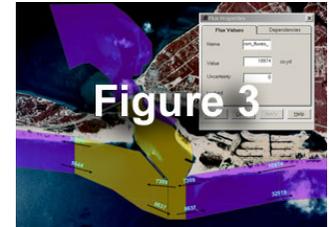
Since there are many projects with management issues, the initial RSM focus was to identify and prioritize those projects with issues that could be addressed in a timely manner. This plan would provide rapid realization of regional management benefits. The experience gained from these initiatives would be applied to other projects in the region. An RSM Technical Working Group (TWG) was established to provide guidance in developing and implementing the RSM project. TWG representation included Federal, state, and local governing agencies as well as academia in Florida and Alabama. Below are six primary initiatives of the program:

Sediment Budget Analysis

A regional sediment budget was developed over the entire 375-mile-long shoreline using a combination of regional- and local-scale numerical models, regional- and local-scale measuring techniques, the Sediment Budget Analysis System (SBAS), and creating a GIS (Figure 2). The purpose of the sediment budget was to quantify, to the extent possible, sediment sources, sinks, and transport rates throughout the region. The effort required gathering historic data and collecting new data from the district and RSM study partners.



In parallel, numerical models were applied to develop sediment transport potentials over the region. The field data and model results were then combined in the GIS to calibrate the transport potentials with field measurements. Transport cells were created in SBAS at the project scale and integrated to the regional scale (Figure 3). This sediment budget provided the first regional context to develop engineering alternatives and assess potential regional impacts. It also identified where little or no data existed prior to RSM. These areas are the focus to improve the understanding of regional processes.



Perdido Pass

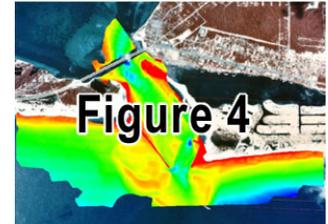
Since 1971 over 5.2 million cu yd of sediment was dredged from the navigation channels at Perdido Pass. Most of this material was placed at six disposal sites in and around the Pass. Due to upland and/or littoral zone placement, the sand is slow to return to the nearshore system. Additionally, dredged material stockpiled west of the west jetty is mined by locals for hurricane restoration. This mining permanently removes sand from the system. Sediment management practices may be improved through bypassing sand further downdrift. Initially, difficulties such as private property issues and attaining easements and rights-of-way hindered the RSM effort. In the spring of 2003, the dredging and downdrift placement began.

Pensacola Harbor (Fort McRae)

To maintain navigable waterways in the Pensacola Pass vicinity, the Corps periodically dredges the Gulf Intracoastal Waterway. Some of the dredged material is stockpiled on Fort McRae, a 40-acre, diked upland site created on an island near the eastern end of Perdido Key. The material appears to be beach quality sand; however, this disposal practice prevents material from reaching the local littoral system for shoreline stabilization and preservation of critical habitat. Use of the stockpiled sand for beach replenishment requires resolving issues such as sand ownership, funding sources, and determining a means to transport the material.

East Pass (Norriego Point)

The East Pass Inlet Management Plan (IMP) was adopted by the Florida Department of Environmental Protection and the city of Destin (Figure 4). The IMP recommends downdrift bypassing of approximately 80,000 cu yd/year, which requires placing dredged material from the navigation channels into the nearshore zone or directly on the downdrift beaches, which are U.S. Air Force property. Under current maintenance practices, most of the material is placed on Norriego Point for stabilization. The Corps has formal authorization to place the material on Eglin Air Force Base property. If the Norriego Point shoreline were stabilized, the inlet bypassing recommendations could be met. However, protecting Norriego Point may affect Corps easements, and transporting sand downdrift may increase maintenance dredging costs.



St. Andrews Inlet (Gator Lake)

Periodic maintenance dredging of the St. Andrews Inlet navigation project is conducted by the Corps (Figure 5). Traditionally, most of the beach suitable dredged material (84,000 cu yd/year) is bypassed to the western downdrift beaches. However, about 39,000 cu yd/year is placed along the western interior shoreline of the inlet fronting Gator Lake. The material is placed at Gator Lake to prevent the inlet from breaching into the environmentally sensitive freshwater habitat. Material placed along the Gator Lake shoreline does not return to the littoral system. Protecting the Gator Lake shoreline would allow more beach quality sand to be bypassed to the downdrift beaches.

**Beneficial Use of River Sand**

The Corps is responsible for maintaining the navigation channels of the Alabama, Black Warrior Tombigbee, and Apalachicola River systems. Maintenance procedures require that material dredged from these channels be placed in upland disposal sites. Because the dredged material may be beach quality sand, there are potential beneficial uses for the material along the coast. Beneficial use of the material would increase the capacity and life of the disposal sites and eliminate costs to acquire new sites. Sediment suitability tests are required before considering beneficially using the material on the coast.

STATUS

The NGOM RSM demonstration program was completed in 2002. The East Pass, FL, project's completion, with

co-sponsor Okaloosa County, produced an estimated cost savings of \$370K. The Perdido Pass project is presently ongoing with estimated cost savings of \$15 to 40K/year. The Mobile District developed a RSM GIS that is now being upgraded to spatial data standards for Corps-wide implementation as an enterprise GIS. Ongoing workshops continue to transfer the RSM GIS to Corps offices. A regional economic study, “The Regional Context of Gulf Shores and Orange Beach,” is complete, and the final report for the demonstration is in preparation. Titled “Northern Gulf of Mexico RSM Demonstration Program,” it includes recommendations for implementation of RSM nationwide.

LESSONS LEARNED

Major points that apply to the NGOM project, but may have application to other RSM demonstration projects, include:

- There is a need for public education.
- Trust and relationships among Federal, state, and local organizations are important.
- Flexibility in approach to problem-solving (e.g., Federal standard) is needed.
- There is a need to leverage existing programs. (Do not expect new authorizations.)
- Data collection versus sediment management (how much risk are you willing to take?).
- Economic and environmental benefits may be slow to be realized.

- Enhancements to project-level engineering tools are necessary for regional applications.
- The sediment budget is the primary tool to understand and manage sediments regionally.
- The key to regional sediment budget development and numerical model application is in the quality and quantity of historical and contemporary data sets for input and analysis.
- Continuous, synoptic hydrographic data sets collected annually or biannually are necessary to evaluate regional change.
- Hydrodynamic data are necessary to correlate the forcing functions resulting in sediment transport and shoreline change.
- A regional GIS is required to manage, analyze, visualize, and share data and information, and retain institutional knowledge.
- Expansion of RSM to bays, estuaries, and inland to improve boundary conditions and understanding of influences on the coastal system is needed.
- Quantification of regional impacts resulting from project-level changes requires long-term scales.

KEY WORDS

Littoral zone, transport cells, estuary

POINTS OF CONTACT

Susan I. Rees, U.S. Army Corps of Engineers, South Atlantic Division, Mobile District, 251-694-4141.

Linda S. Lillycrop, U.S. Army Corps of Engineers, South Atlantic Division, Mobile District, 251-690-2593.

Lynn C. Hardegree, U.S. Army Corps of Engineers, South Atlantic Division, Mobile District, 251-694-3778.

Larry E. Parson, U.S. Army Corps of Engineers, South Atlantic Division, Mobile District, 251-690-3139.

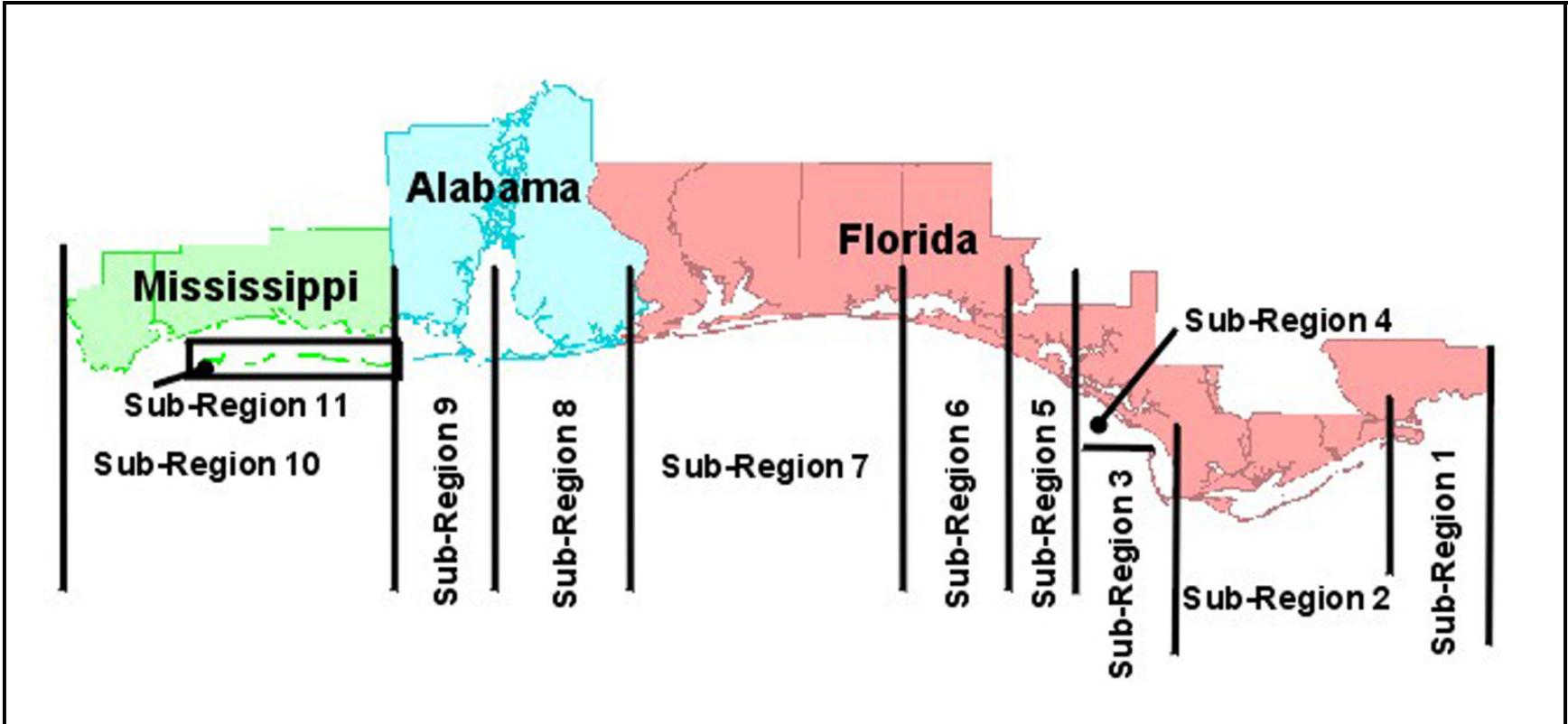


Figure 1. Mobile District RSM domain [back to text](#)

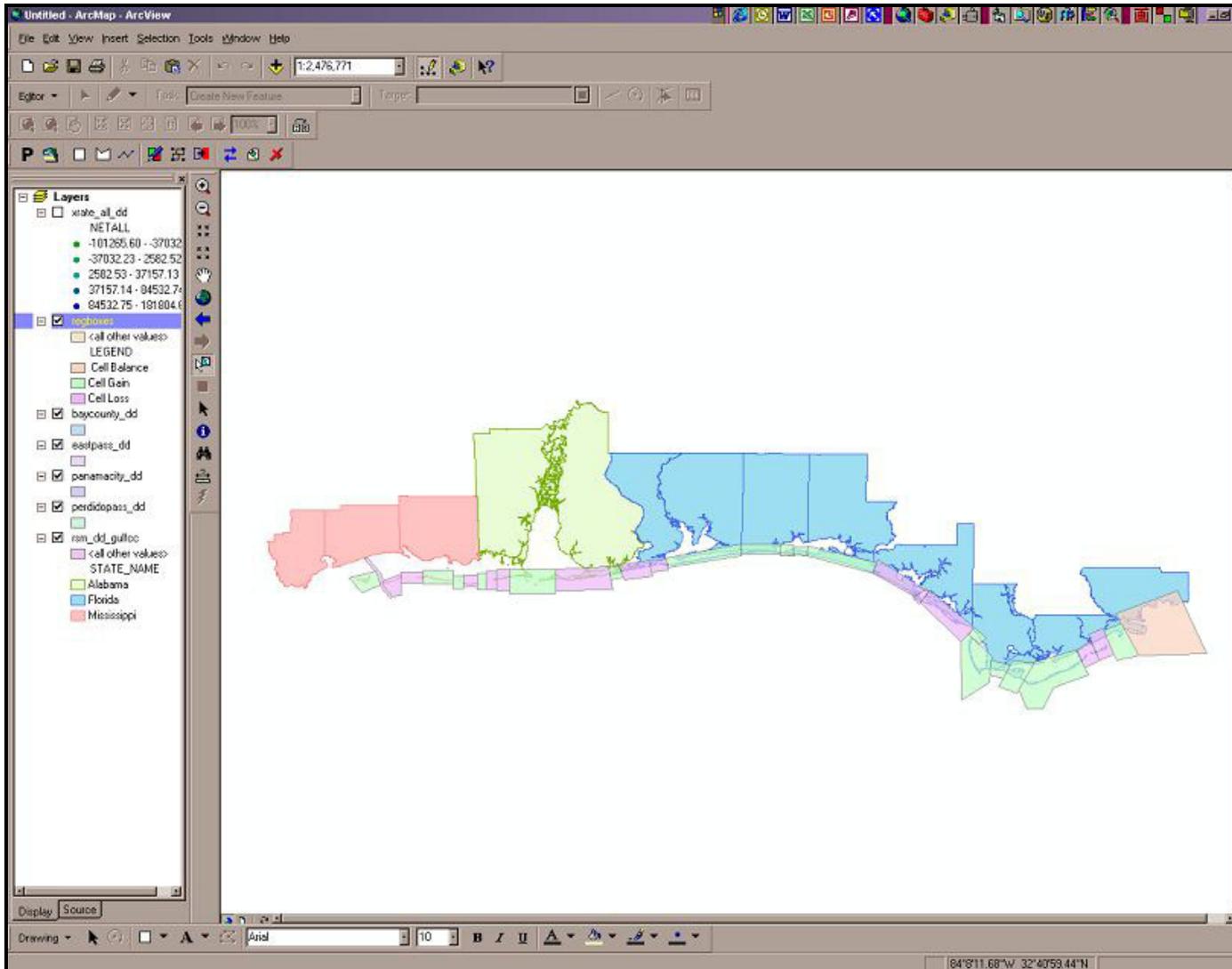


Figure 2. Mobile District regional sediment budget cells [back to text](#)

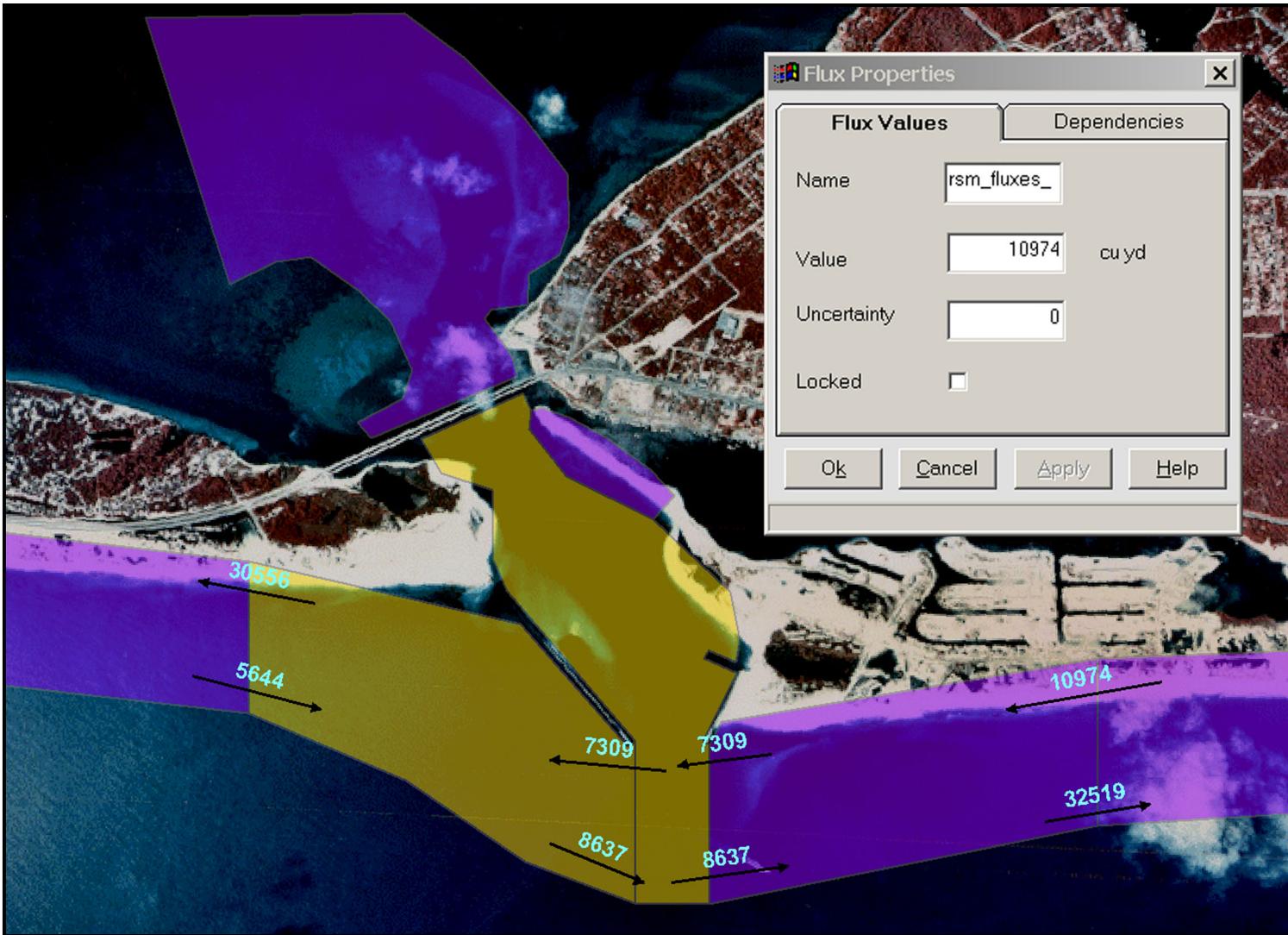


Figure 3. East Pass preliminary transport rates [back to text](#)

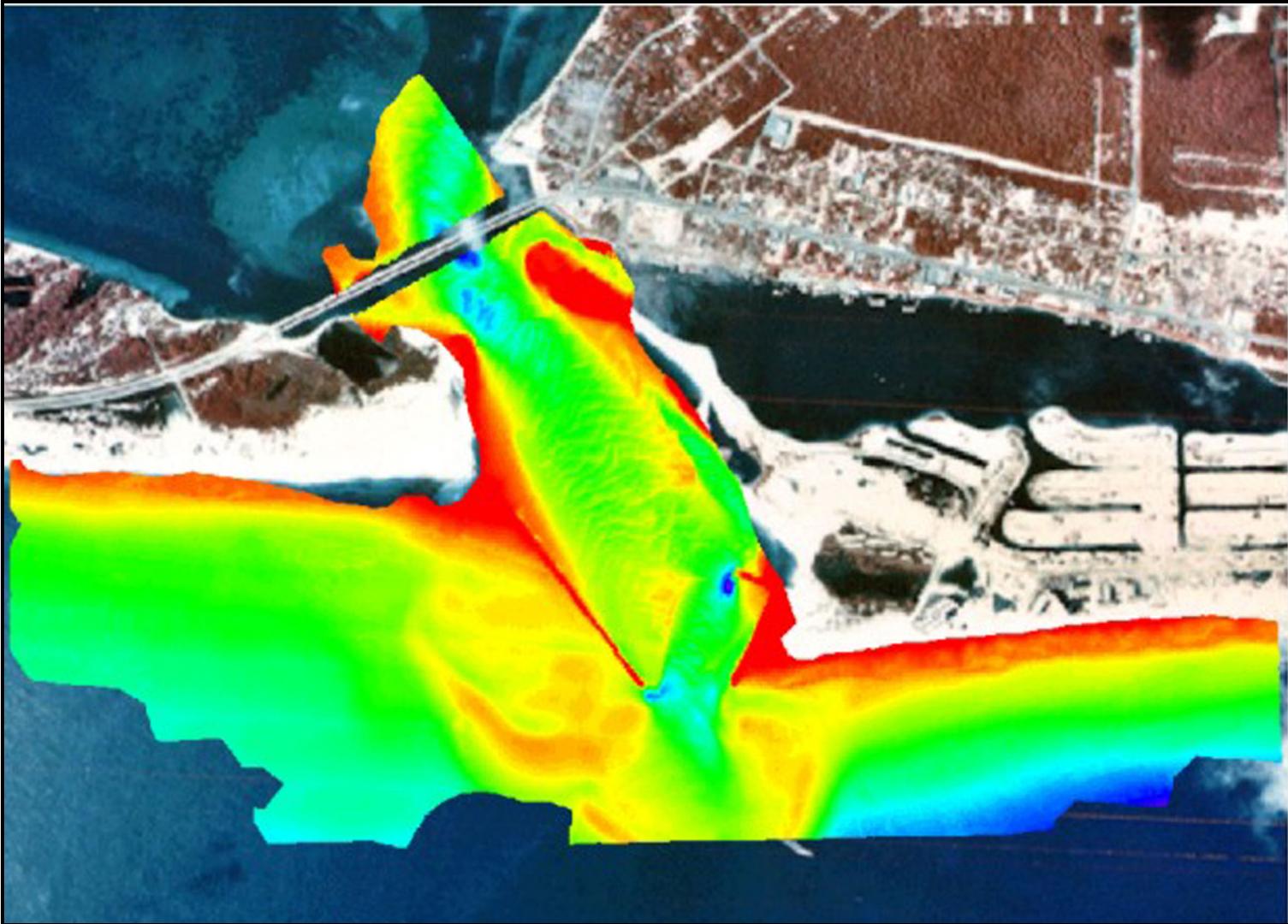


Figure 4. East Pass, Destin, FL [back to text](#)

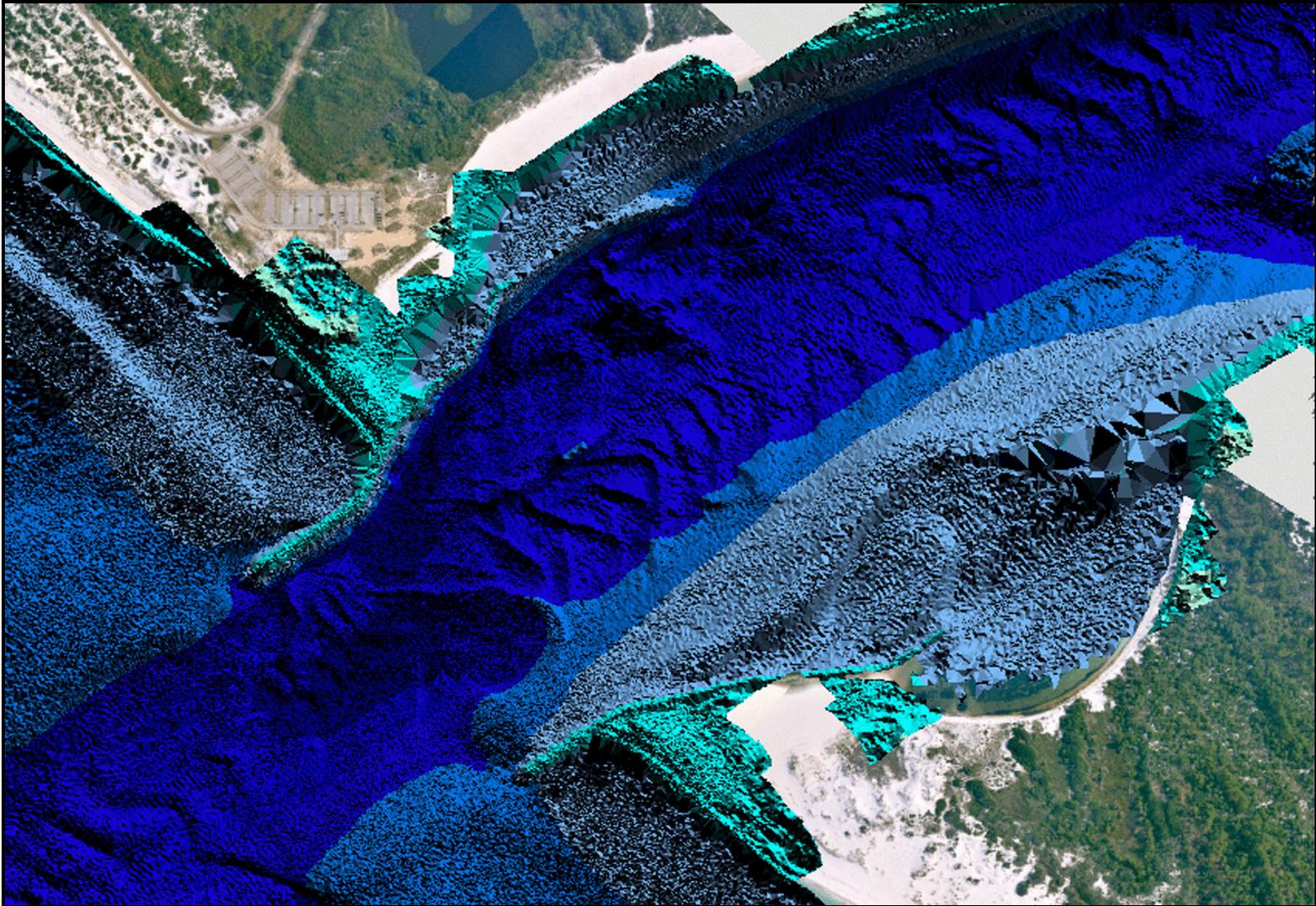


Figure 5. St. Andrews, Panama City, FL [back to text](#)