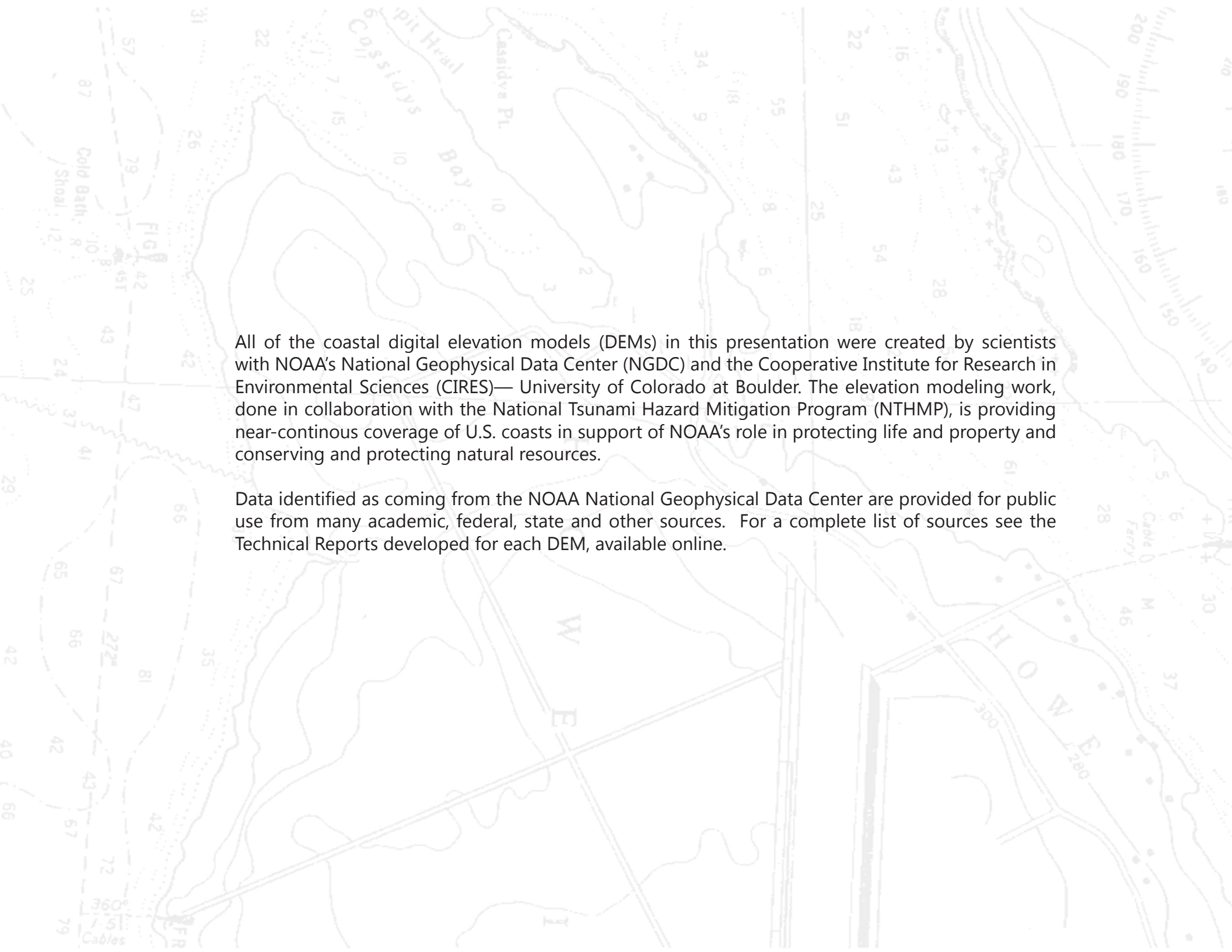




GULF COAST DIGITAL ELEVATION MODELS

Coastal Models Supporting our Nation's Needs through Science and Technology





All of the coastal digital elevation models (DEMs) in this presentation were created by scientists with NOAA's National Geophysical Data Center (NGDC) and the Cooperative Institute for Research in Environmental Sciences (CIRES)— University of Colorado at Boulder. The elevation modeling work, done in collaboration with the National Tsunami Hazard Mitigation Program (NTHMP), is providing near-continuous coverage of U.S. coasts in support of NOAA's role in protecting life and property and conserving and protecting natural resources.

Data identified as coming from the NOAA National Geophysical Data Center are provided for public use from many academic, federal, state and other sources. For a complete list of sources see the Technical Reports developed for each DEM, available online.

GULF COAST

The United States coastal region along the Gulf of Mexico includes some of the largest metropolitan cities in the country, including Houston, New Orleans, Mobile, and Tampa. Covering the five Gulf States of Texas, Louisiana, Mississippi, Alabama, and Florida—the area is known for its offshore resources, busy ports, rich history, tourist attractions, and fishing and seafood industries. The region's coastline, stretching from the Gulf Coastal Plain in southern Texas to the western Florida Panhandle is made up of a network of bays, inlets, barrier islands, and peninsulas.

People who live in communities along the Gulf Coast, especially around low lying marshlands near estuaries, inlets, and bays, are at risk for severe storms and coastal inundation events—including sub-marine landslide-induced tsunamis. Destructive hurricanes and storms frequently travel up the coast, fueled by currents in the Gulf Stream - causing coastal flooding, coastal erosion, and high-gust winds. Each year these disasters cause millions of dollars in damage, significant loss of life, and natural disturbances.

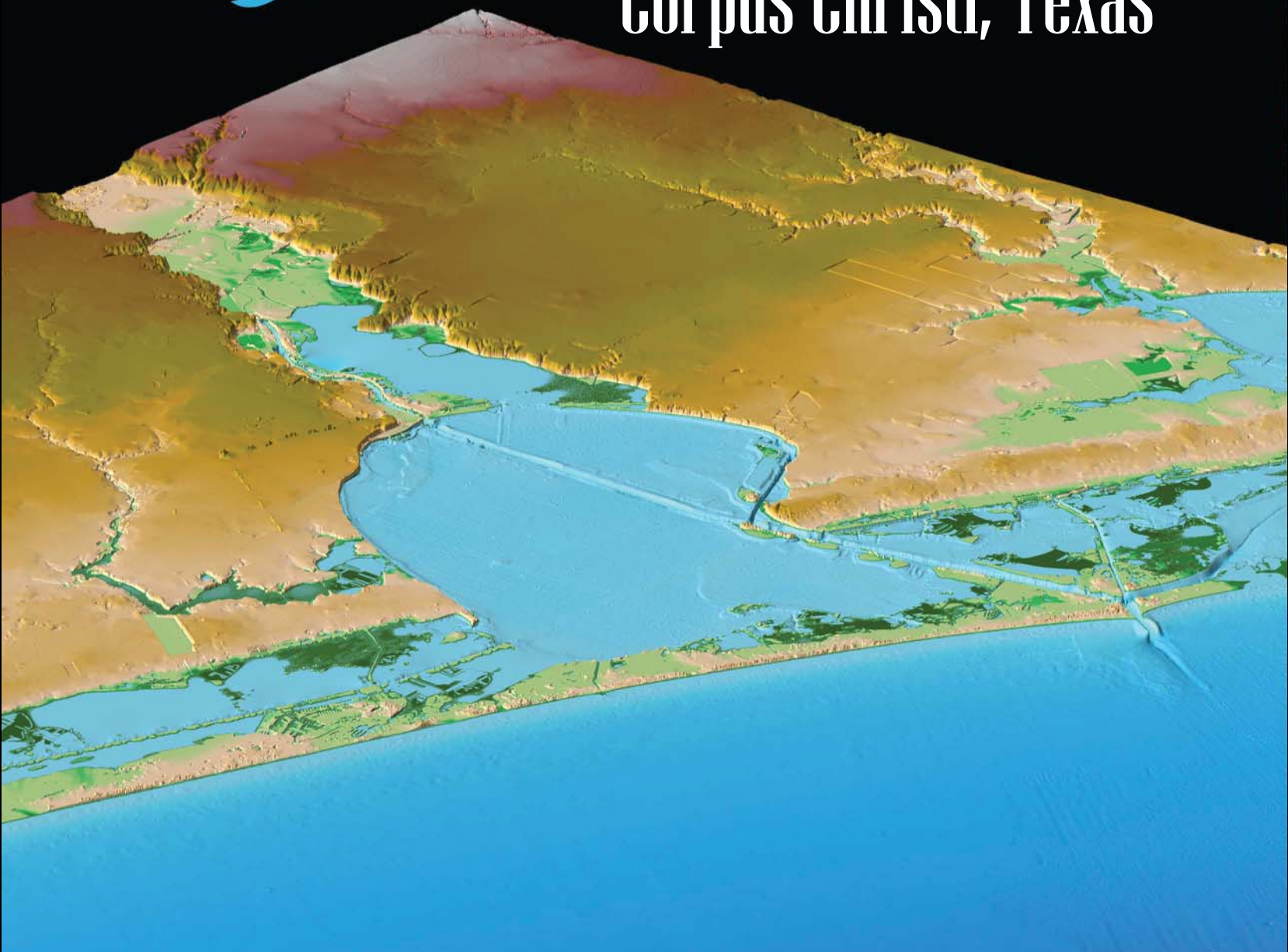
NOAA's DEMs provide detailed, accurate depictions of U.S. coasts that are used by our state partners in the National Tsunami Hazard Mitigation Program. NOAA DEMs and the underlying data can also support scientists, coastal managers, and policy makers in effectively managing marine systems and coastal resources, coordinating planning and mitigation efforts, and better understanding the impacts of coastal hazards. The DEMs in this booklet provide a glimpse of the coastal relief for some of the cities along the U.S. Gulf Coast.

1. Corpus Christi, TX
2. Galveston, TX
3. New Orleans, LA
4. Biloxi, MS
5. Mobile, AL
6. Panama City, FL



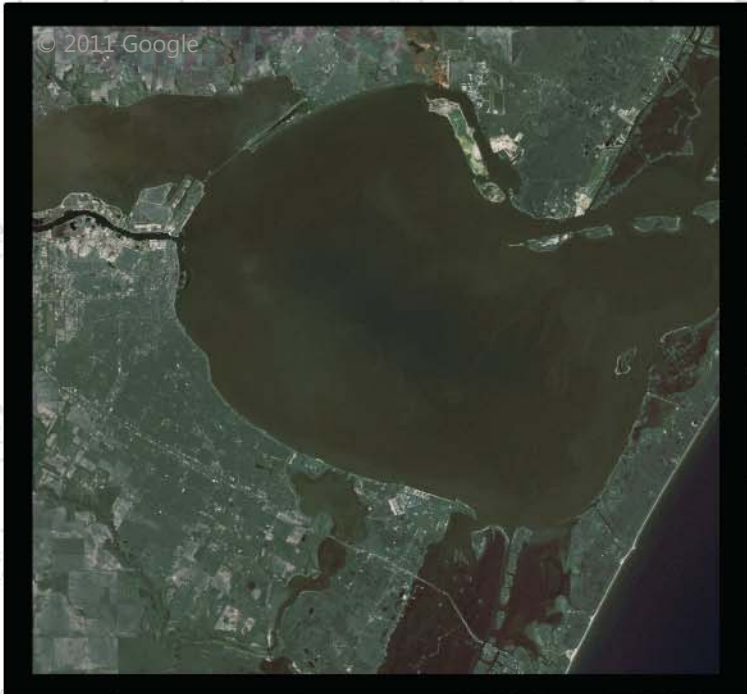


DIGITAL ELEVATION MODEL Corpus Christi, Texas





CORPUS CHRISTI, TEXAS



Why Model Corpus Christi, Texas?

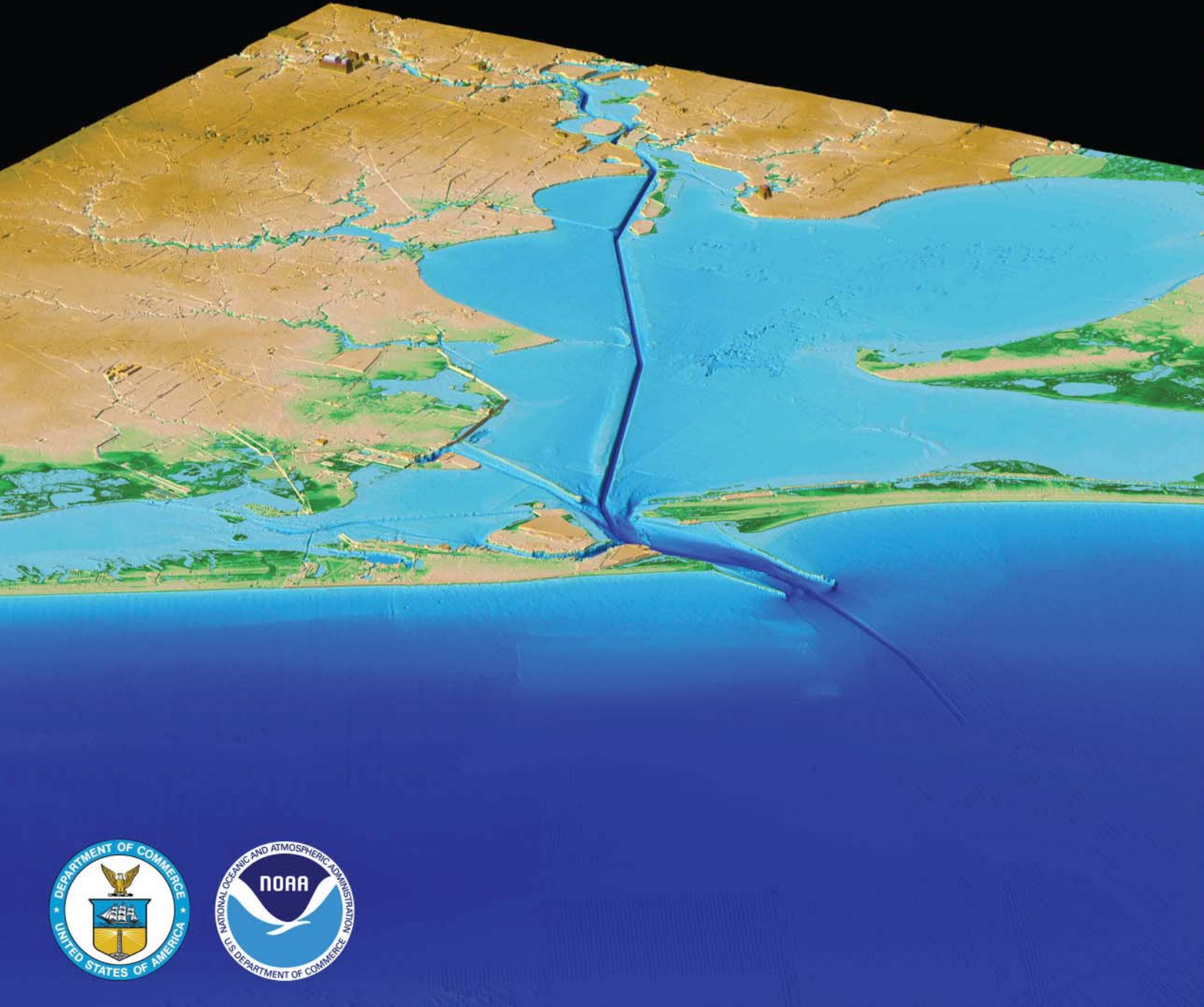
Corpus Christi is located on the south coast of Texas and is home to roughly 286,000 people- making it the eighth largest city in the state. The Corpus Christi DEM covers the coastal region of the Gulf coast of Texas known as the Coastal Bend, centered on the city of Corpus Christi. The DEM includes the communities of Corpus Christi, Port Aransas, Aransas Pass, Ingleside, Portland, and Rockport. The southern area of the DEM includes the northern tip of the Padre Island National Seashore separated from the mainland by Laguna Madre. Encompassing 130,434 acres, the shores support a wide variety of natural wildlife and local recreational activities. This National Seashore is the longest remaining undeveloped stretch of barrier island in the world. This coastal area is vulnerable to storm surge, flooding, and erosion. Therefore, this DEM is an important tool to understand how these changes will affect possible flood waters and natural changes within the Corpus Christi community.

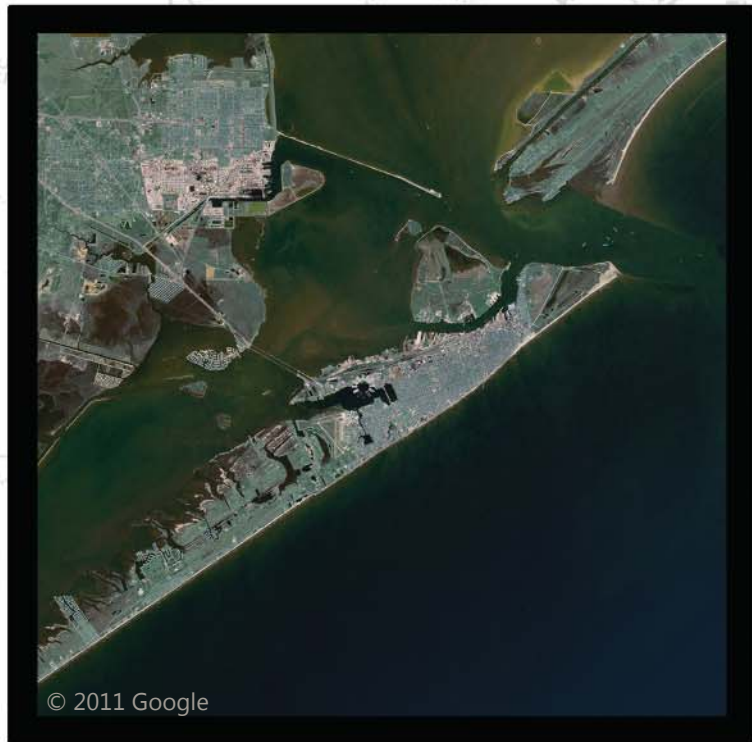
Who Provided the Data?

- NOAA's National Ocean Service (NOS)
- National Geospatial- Intelligence Agency
- National Geophysical Data Center (NGDC)
- U.S. Geological Survey (USGS)



DIGITAL ELEVATION MODEL Galveston, Texas





Why Model Galveston, Texas?

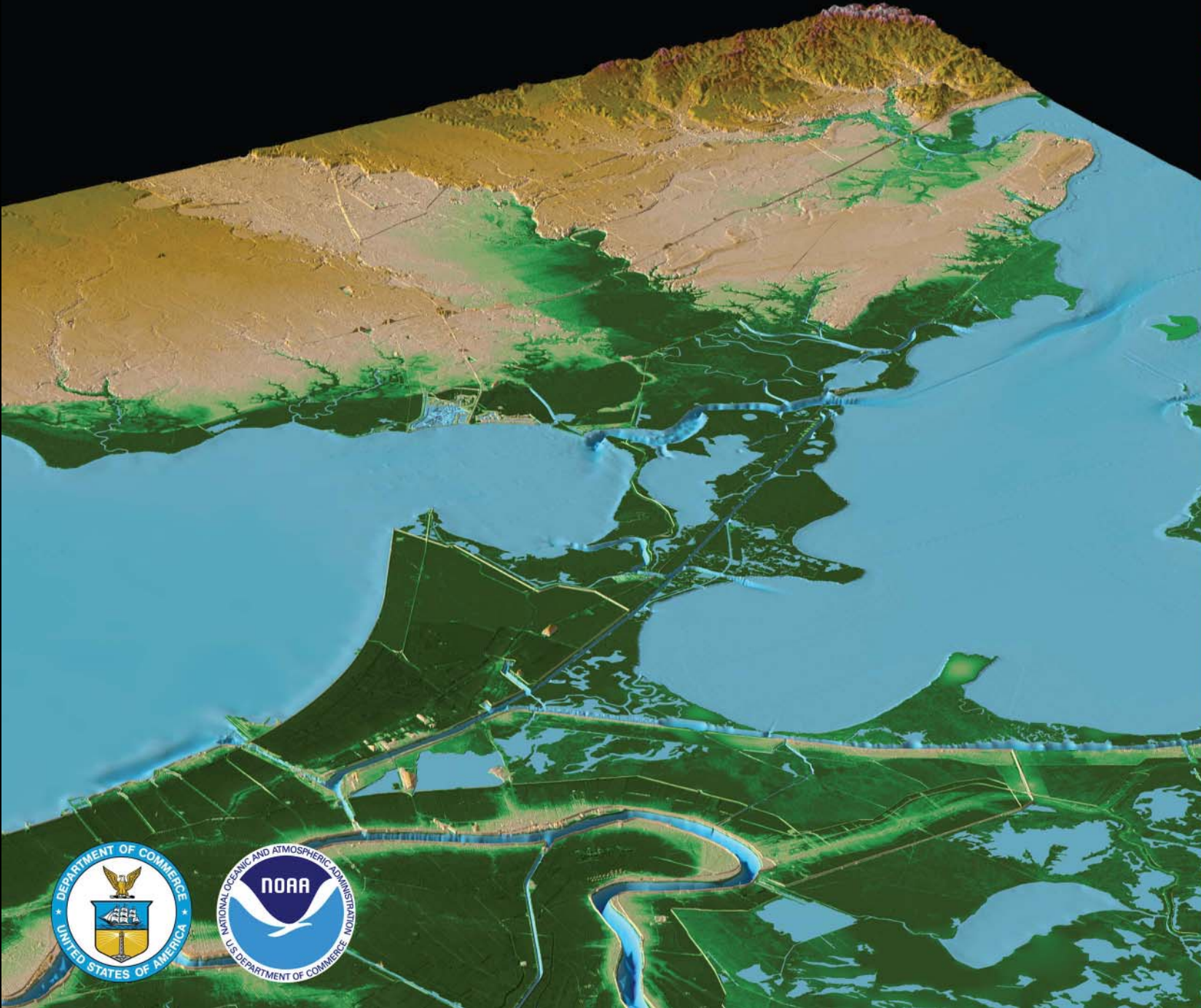
The Galveston DEM includes the communities of Galveston, Texas City, Dickinson, La Porte, Baytown and Gilchrist. The Galveston Bay estuarine system and its tributaries consist of complex of sub-bays. The region supports a wide variety of uses, including industrial processing, shipping, fisheries, recreation, and tourism. Development along the shoreline often creates problems through disturbance or destruction of habitats, modification of flood plains, and increasing erosion. The bay provides nursery and spawning grounds for large amounts of marine life, and is important for fishing. The smoothly curved sides of Trinity and Galveston Bays have been sculpted by the scouring action of successive hurricane storm surges and runoff events. Galveston has also recorded inundation from tsunami events originating near Puerto Rico in 1918 and 1922. Following the devastating hurricane of 1900, Galveston Island's pencil-straight coastal margin was reinforced with a 17-foot high seawall. However, most of the beach along the Galveston seawall was lost during Hurricane Carla in 1961. The Galveston DEM will help hazard managers and planners prepare for future storm events and coastal inundation.

Who Provided the Data?

- NOAA National Ocean Service (NOS)
- U.S. Geological Survey (USGS)
- Texas Water Development Board
- Harris County, Texas
- Texas General Land Office (TGLO)
- NOAA National Geophysical Data Center (NGDC)



DIGITAL ELEVATION MODEL New Orleans, Louisiana





NEW ORLEANS, LOUISIANA



Why Model New Orleans, Louisiana?

New Orleans is both the largest city and metropolitan area in Louisiana. The city has a population of roughly 1.4 million people and is known as one of the most culturally diverse hubs in the United States, often referred to as the birthplace of jazz. Geographically, the city is located in the Mississippi River Delta, upriver from the Gulf of Mexico. The majority of the urban interface is built atop marshland and swamp, often below sea level. Historically, the city has always been at high risk for hurricanes, as seen after the tragic 2005 storm season. However, current threats continue to grow due to urban development and coastal erosion. The New Orleans DEM will help local managers and planners protect the city against future inundation associated with hurricanes, storm surge events, and potential submarine landslides.

Who Provided the Data?

- NOAA National Geophysical Data Center (NGDC)
- Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX)
- Louisiana State University (LSU)
- U.S. Army Corps of Engineers (USACE)
- NOAA Office of Coast Survey (OCS)
- NOAA National Ocean Service (NOS)
- Louisiana State Lidar
- Mississippi State Government



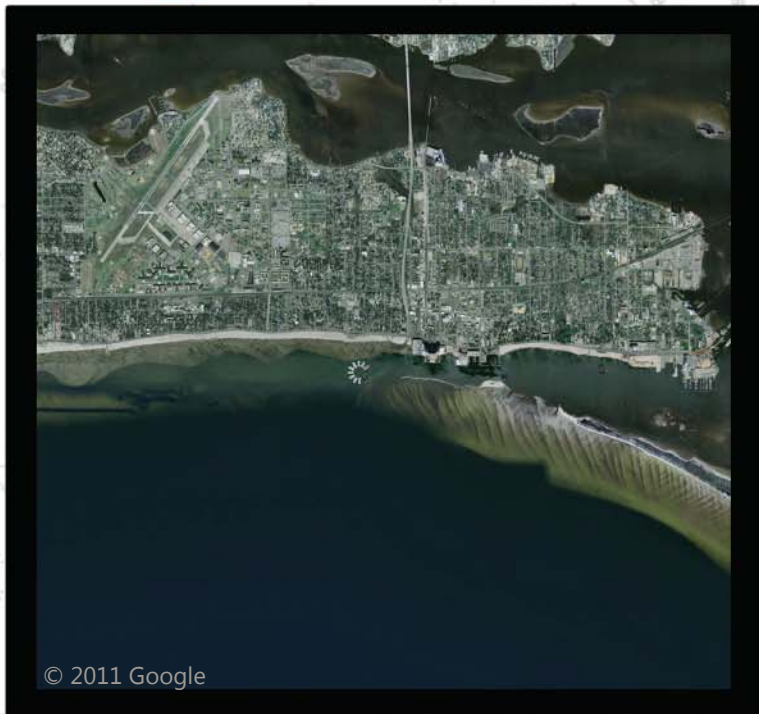
DIGITAL ELEVATION MODEL

Biloxi, Mississippi





BILOXI, MISSISSIPPI



Why Model Biloxi, Mississippi?

The Biloxi DEM covers the coastal region surrounding Biloxi, including the communities of Gulfport and Pascagoula, as well as the offshore areas of the Mississippi Sound, Chandeleur Sound, and the Gulf Islands. The city is comprised of roughly 50,000 residents and pre-Hurricane Katrina was one of the largest cities along the Mississippi Coast. The nearby Chandeleur Islands have undergone coastal erosion and changes in sediment deposition that have modified the shoreline in the geologically short time span of 150 years. More recently, the 2005 hurricane season severely impacted the landscape and economy of the Mississippi Gulf Coast region. Hurricanes Arlene, Cindy, Dennis, and Katrina made landfall in the area between June and August 2005, dramatically changing the shape of the coastline. The DEM of Biloxi is an important tool in understanding how these changes and future coastal inundation events can impact the region.

Who Provided the Data?

- NOAA National Ocean Service (NOS)
- NOAA Coastal Services Center (CSC)
- NOAA National Geophysical Data Center (NGDC)
- U.S. Army Corps of Engineers (USACE)
- U.S. Geological Survey (USGS)
- Mississippi Office of Geology (MOG)
- Coastal Geology and Energy Division
- Mississippi Automated Resource Information System (MARIS)



DIGITAL ELEVATION MODEL

Mobile, Alabama





MOBILE, ALABAMA



Why Model Mobile, Alabama?

Mobile is located in the central Gulf Coast of the United States along the Mobile River and is the only seaport in Alabama. Approximately 200,000 people live within the Mobile city limits and thousands more live in the surrounding urban interfaces. Mobile is well known for its local museums, strong music culture, historic architecture, seafood, and carnival celebrations. The Mobile DEMs provide coverage of the southern coast of Alabama including the city of Mobile and the Mobile Bay estuary. Mobile Bay is enclosed by the Mobile River delta to the north, and the Fort Morgan Peninsula and the dynamic barrier island, Dauphin Island, to the south. Barrier islands and coastal beaches are unstable environments with constant erosion, deposition, and migration of sediment under wave action. In combination with coastal storms and surge events, the Mobile DEM is an important tool in understanding how future changes will affect the local community and surrounding landscape.

Who Provided the Data?

- NOAA National Geophysical Data Center (NGDC)
- NOAA Coastal Services Center (CSC)
- Office of Coast Survey (OCS)
- National Geodetic Survey (NGS)
- U.S. Army Corps of Engineers (USACE)
- National Aeronautic and Space Administration (NASA)
- Mobile County, AL
- Baldwin County, AL
- City of Gulf Shores, AL

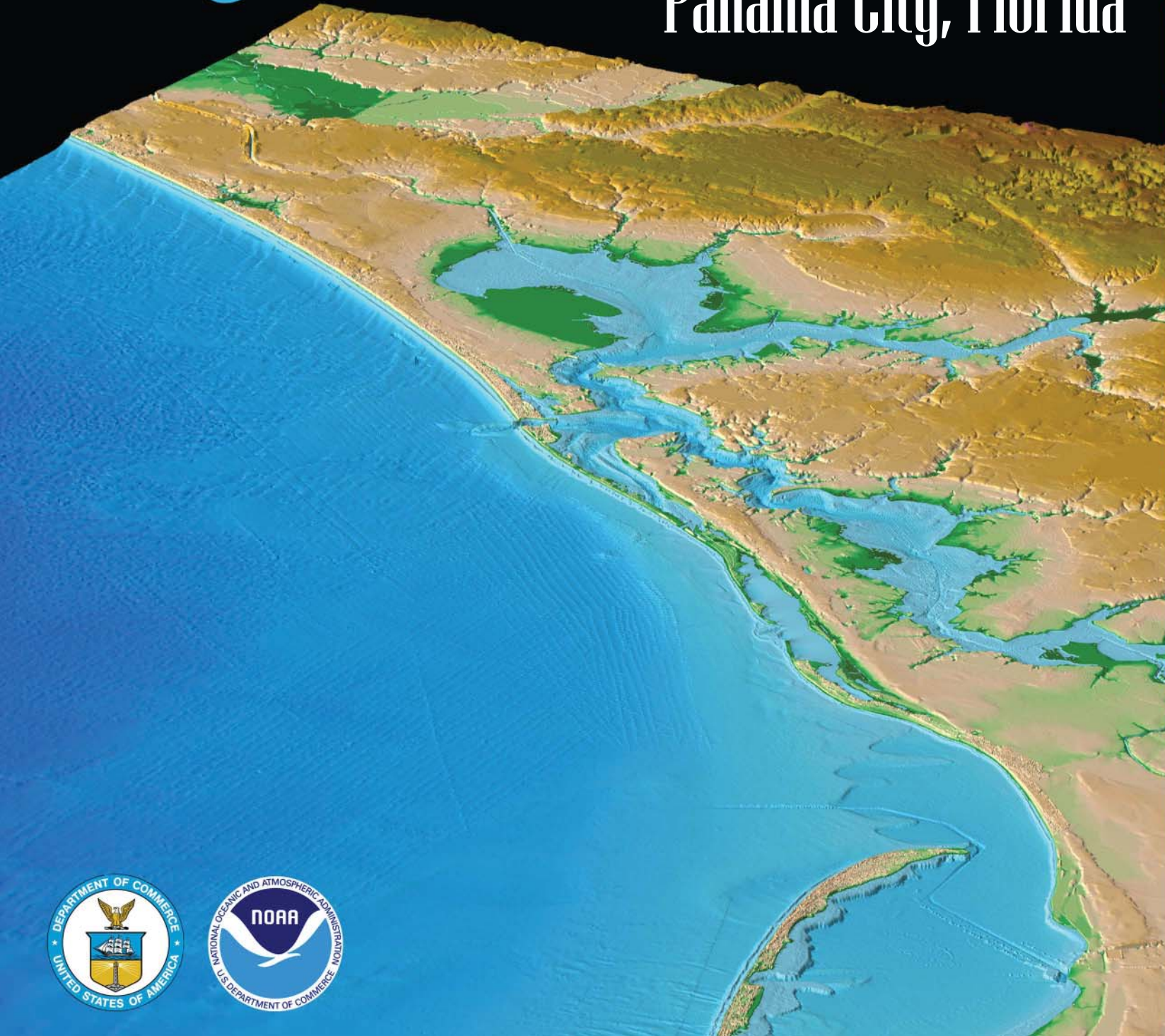


Photo Credit: sandia.gov, nationalgeographic.com

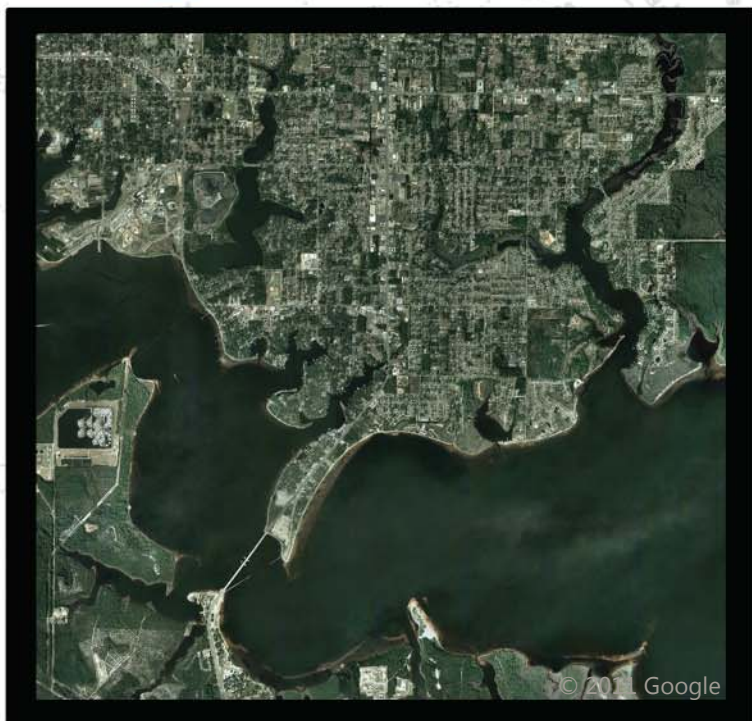


DIGITAL ELEVATION MODEL

Panama City, Florida



PANAMA CITY, FLORIDA



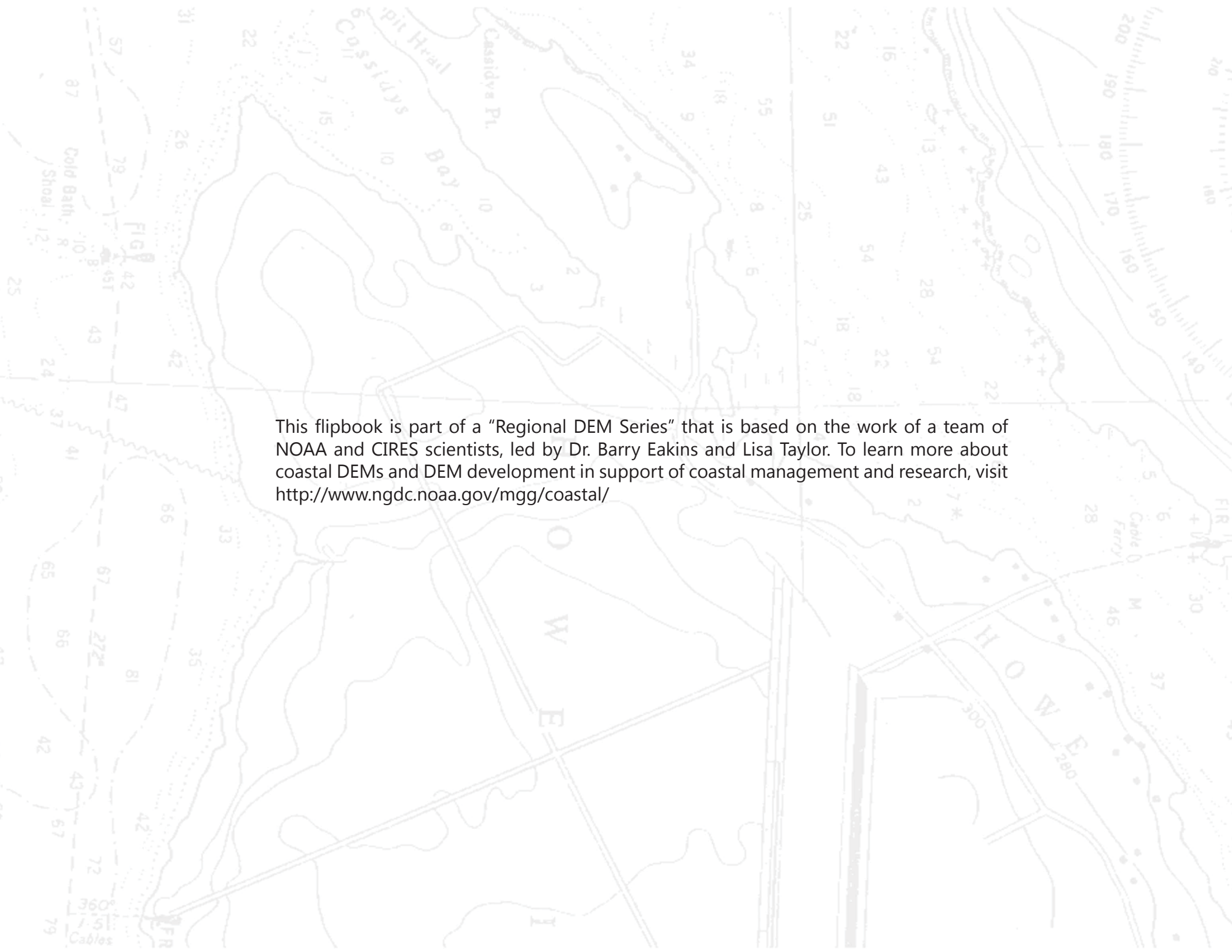
Why Model Panama City, Florida?

The Panama City DEM covers the coastal region centered around Panama City including the communities of Laguna Beach, Panama City Beach, Tyndall Air Force Base, Mexico Beach, and Port St. Joe. The beaches and barrier islands in the region are severely impacted by seasonal storms and coastal erosion processes. Recent hurricanes dramatically affected the shape and geomorphology of the coastline in the area. Beach restoration projects are part of the continuing effort to maintain the tourist-based economy by mitigating the severity and type of hurricane damage caused during the 2005 hurricane season. These seasonal storm events result in substantial storm tide flooding, rock displacement, road damage, extreme erosion, and bluff recession. Some of the areas covered in this DEM are the most severely eroding areas in Florida; therefore, this model is an important tool for local decision makers and planners to prepare for future storm events.

Who Provided the Data?

- NOAA National Ocean Service (NOS)
- NOAA Coastal Services Center (CSC)
- NOAA National Geophysical Data Center (NGDC)
- U.S. Geological Survey (USGS)
- U.S. Army Corps of Engineers (USACE)
- Florida Department of Environmental Protection (FDEP)
- Bay County Florida GIS Office



A topographic map of Howe Island, showing contour lines and various geographical features. The map includes labels for 'Cassidy Pt.', 'Cossigny Bay', 'Howe Island', and 'Howe Pt.'. There are also labels for 'Cold Bath Shoal', 'Cables', and 'Cable Ferry'. The map is overlaid with a grid of latitude and longitude lines. The text is centered on the map.

This flipbook is part of a "Regional DEM Series" that is based on the work of a team of NOAA and CIRES scientists, led by Dr. Barry Eakins and Lisa Taylor. To learn more about coastal DEMs and DEM development in support of coastal management and research, visit <http://www.ngdc.noaa.gov/mgg/coastal/>

2011, NOAA NGDC

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<http://www.photolib.noaa.gov/>

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