Sea Level Rise Visualization
&
Surface Elevation Tables (SETs)
for
Alabama, Mississippi, & Florida

2012
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USGS

K. Van Wilson, USGS

Sea Level Rise Visualization

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http://gom.usgs.gov/slr/index.html

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Sea-Level Rise Visualization for Alabama, Mississippi, and Florida

About this project

This pilot project is a collaborative effort of National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center and the U.S. Geological Survey (USGS) National Wetlands Research Center and the USGS Mississippi Water Science Center.

Sea-Level Rise Viewer

The areas shaded in blue show lands vulnerable to sea-level rise for the coasts of Alabama, Mississippi, and Florida (from the Alabama state line to the eastern boundary of St. Mark's National Wildlife Refuge). The visualization tool illustrates the scale of potential flooding, not the exact location, and does not account for erosion, subsidence, sediment accretion, or future construction. Water levels are shown as they would appear during an average high tide (the inundation data are referenced to the mean higher high water [MHHW] datum). Rising sea levels will cause daily high tides to reach farther inland.

Inundation data

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Inundation data

The inundation data displayed in this map viewer were developed by K. Van Wilson, P.E., at the USGS Mississippi Water Science Center.

The inundation zones were derived from a 3-meter resolution light detection and ranging (lidar)-based digital elevation model (DEM). The DEM is referenced to the North American Vertical Datum of 1988. All cells in the DEM grid below 1 to 6-foot thresholds were designated as inundated by potential sea-level rise regardless of hydrologic connectivity, which is similar to a ""bath-tub"" model. The map viewer does not provide inundation data for Mississippi''s barrier islands.

The population map overlay depicts population counts from the year 2010 within U.S. Census Bureau blocks. This information was included to help identify locations where large numbers of residents are vulnerable to inundation by potential sea-level rise.

Uncertainties in Elevation Data

The user of this viewer should keep in mind the given water surface elevation plus and minus 1.2 ft for Alabama & Mississippi and plus and minus 0.8 ft for Florida in estimating inundation areas for upper and lower extremes based only on the accuracy of the LiDAR. The use of the 1 ft increments of sea level rise inundations shown on this viewer can be used to assist the user in visualizing the upper and lower extremes for a selected sea level rise. For example, for a sea level rise inundation of 3 ft, the user could select the 4 ft and 2 ft sea level rise inundations to help show the upper and lower extremes of the possible inundation. The user should also keep in mind that there are errors in some areas for these selected inundations that could be larger than 1.2 ft.

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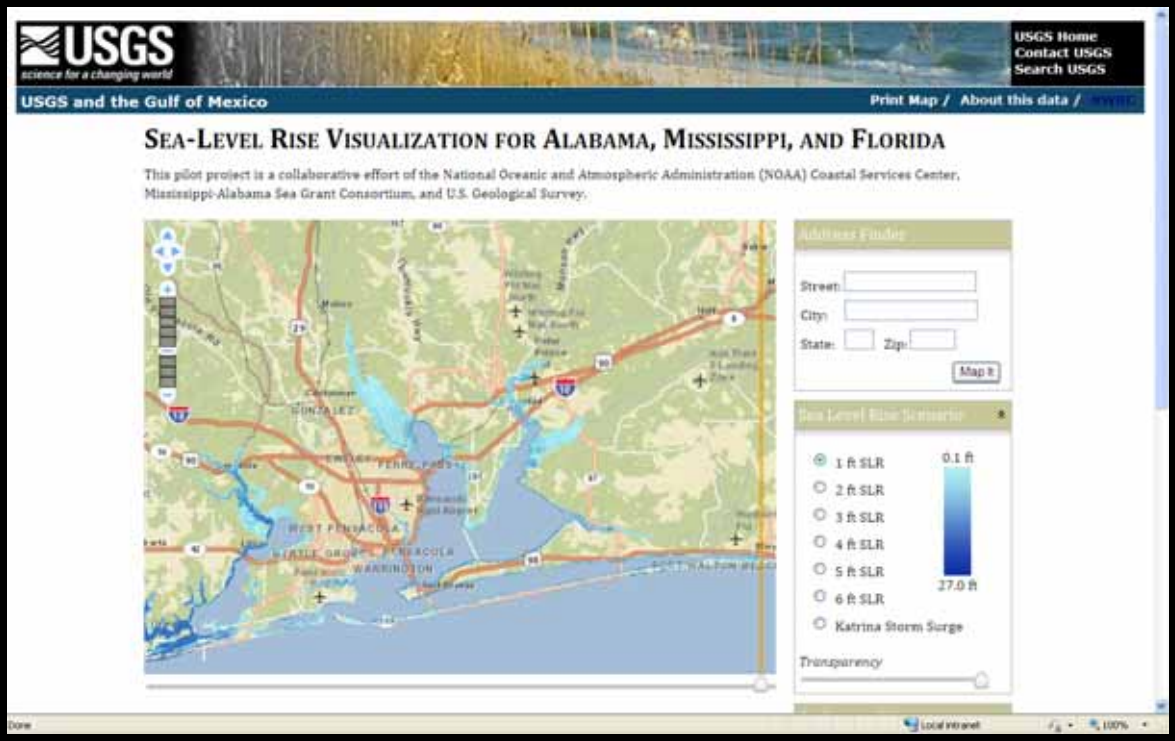

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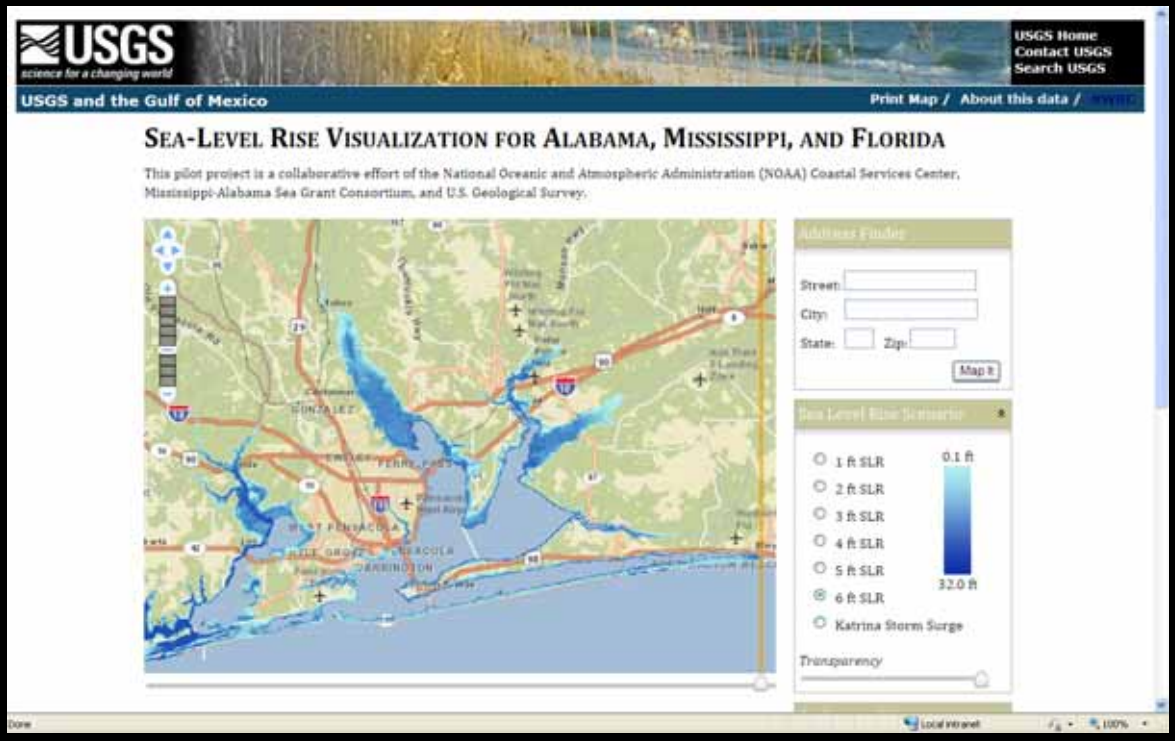

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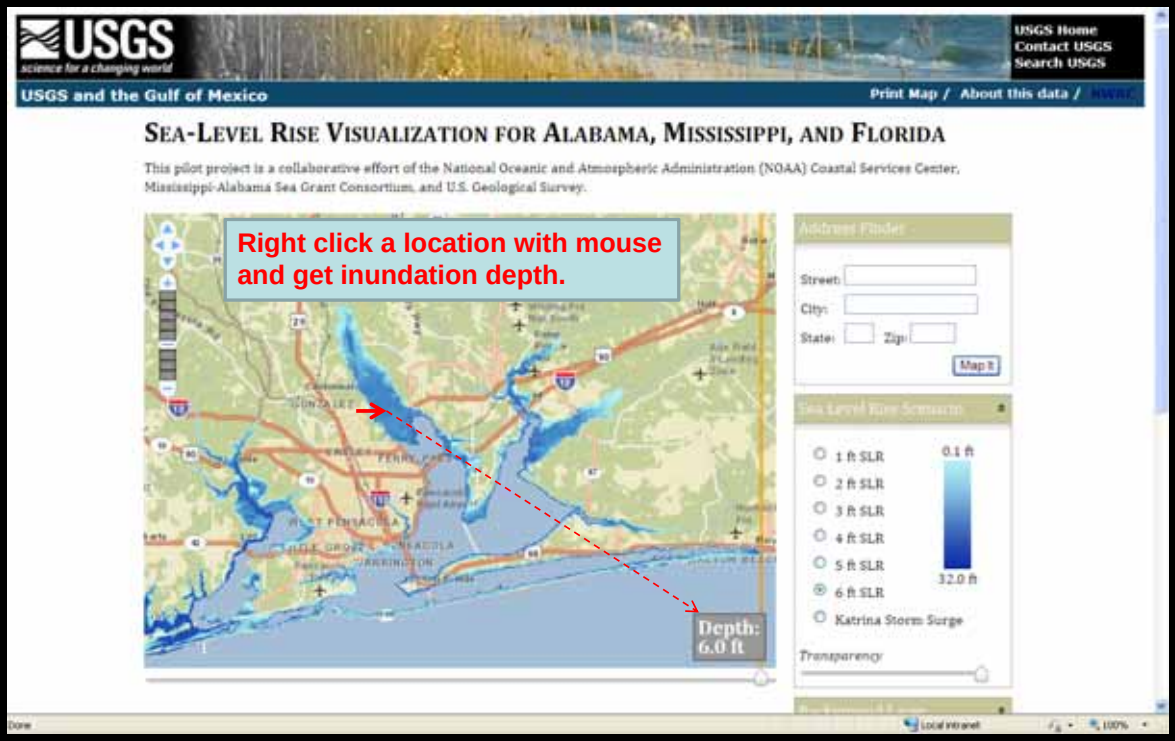

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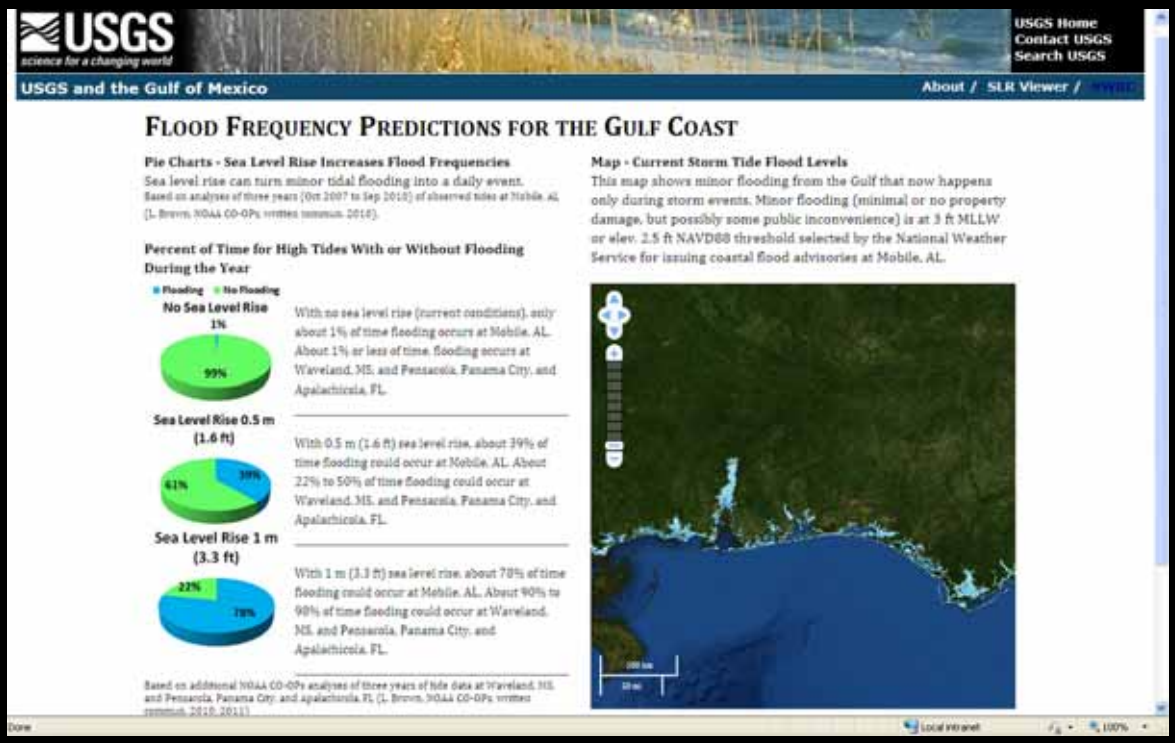

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The Sea Level Rise Visualization was built upon previous work, which included the development of:

Internet Map Serving the Hurricane Katrina Maximum Storm Tide in Alabama, Mississippi, and Louisiana

http://gisdata.usgs.gov/website/gulf

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Surface Elevation Tables (SETs)

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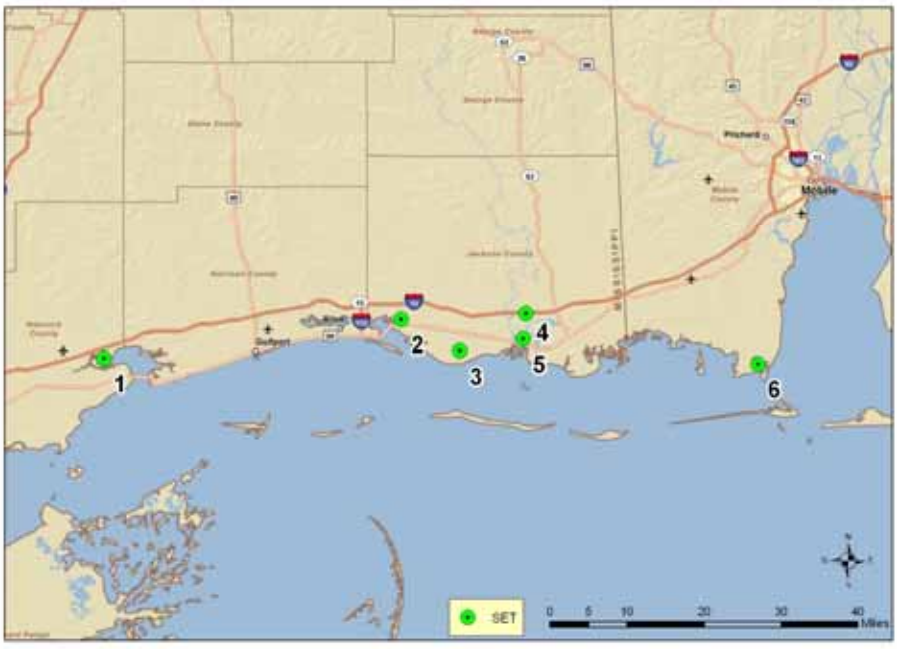
Six Surface Elevation Tables (SETs) installed in AL and MS



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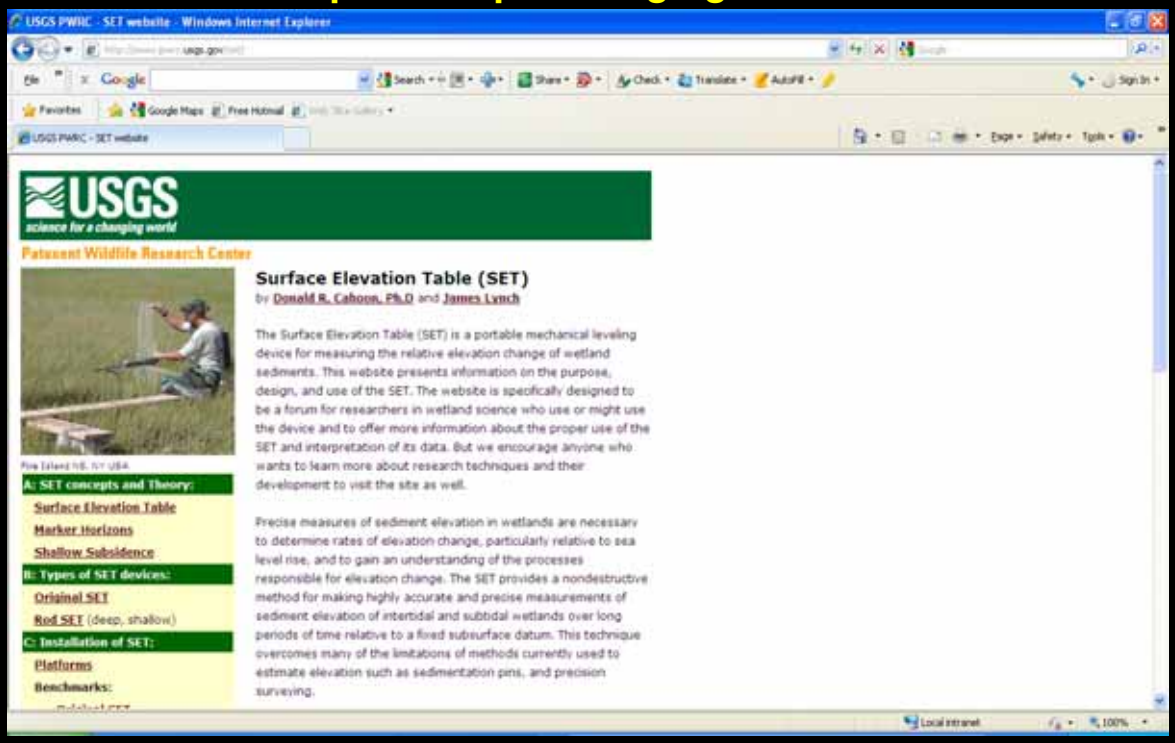

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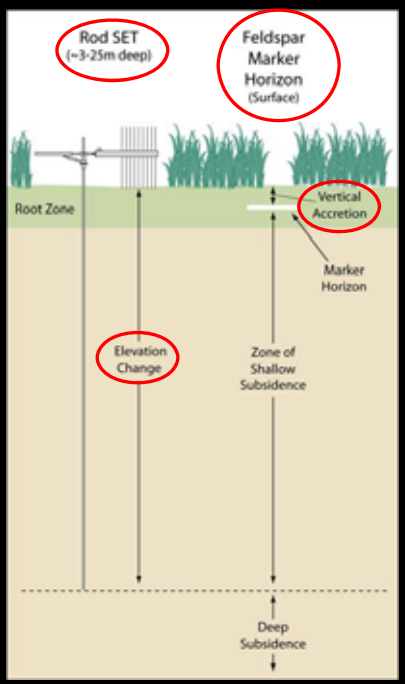

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SET Installs




SETs with and without tidal inundation of marsh


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SET Readings




GPS for SET elevation


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SET Elevations above NAVD88

- Tops of all SETs near elev. 2 ft
- Ground at all SETs near elev. 1 ft
- Minimum steel rod tip elev. -44 to -79 ft (or 44 to 79 ft below NAVD88)

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SET Marker Horizon Plots

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SET Marker Horizon Plots



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We need to continue SET readings and analyses to better understand vertical change that is taking place on the Gulf Coast.

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We are still seeking funding to continue these readings and possibly include readings for SETs installed by FGS and FSU in Apalachicola Bay that have not been read in the last 7-8 years.

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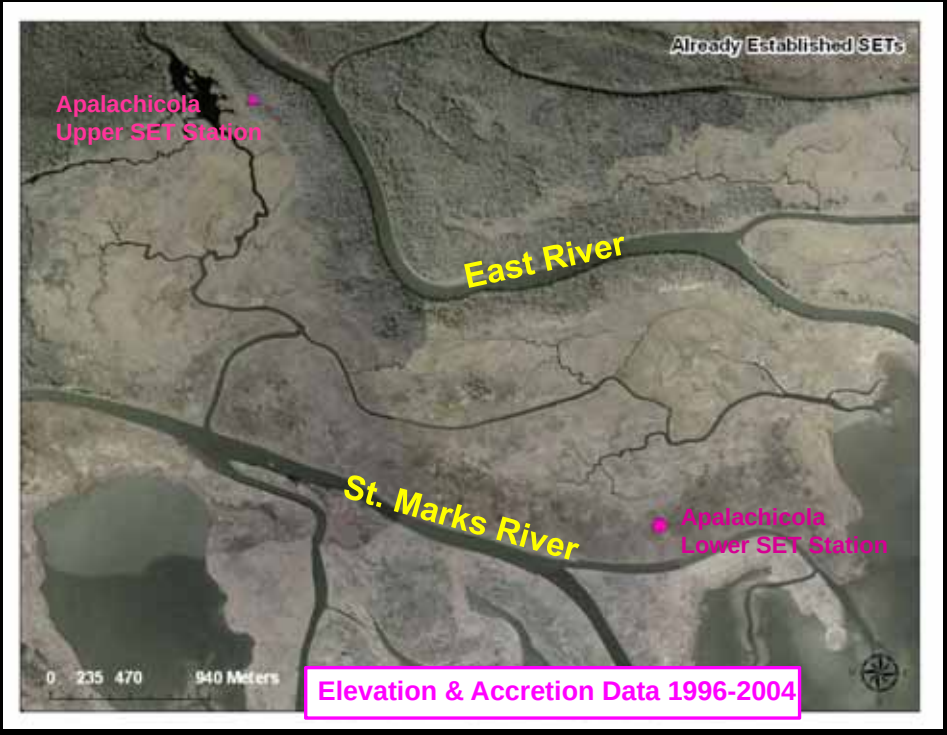
SET Station Locations in Apalachicola Delta



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Provided by Joe Donoghue (FSU) on June 22, 2011

SET readings and analyses across the Gulf Coast could also be combined with other types of data:

- historical NGS BM Surveys,
- tidal records,
- CORS, and
- InSAR.

Results of historical NGS BM surveys, tidal records, CORS, and InSAR analyses were used in a recent USGS-FHWA subsidence study of Mobile County, AL. (See following slide for data example.)

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Data used in the Mobile County, AL, study

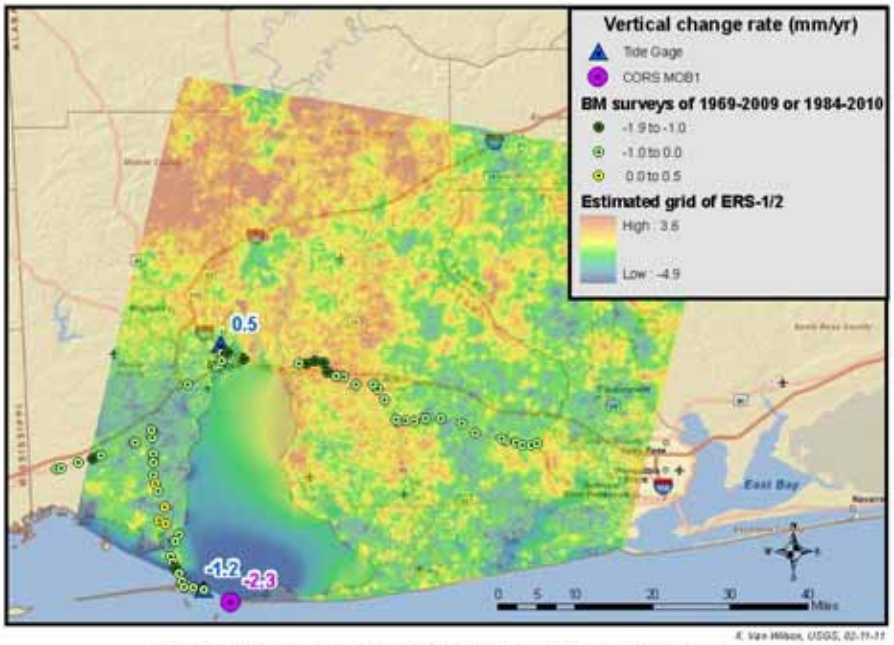

Figure 2b . Vertical change rates using ERS-1/2 in Mobile and Baldwin Counties, Alabama.

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