

New Mapping Tool and Techniques for Visualizing Sea-Level Rise and Coastal Flooding Impacts

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NOAA Coastal Services Center

FMA 2011

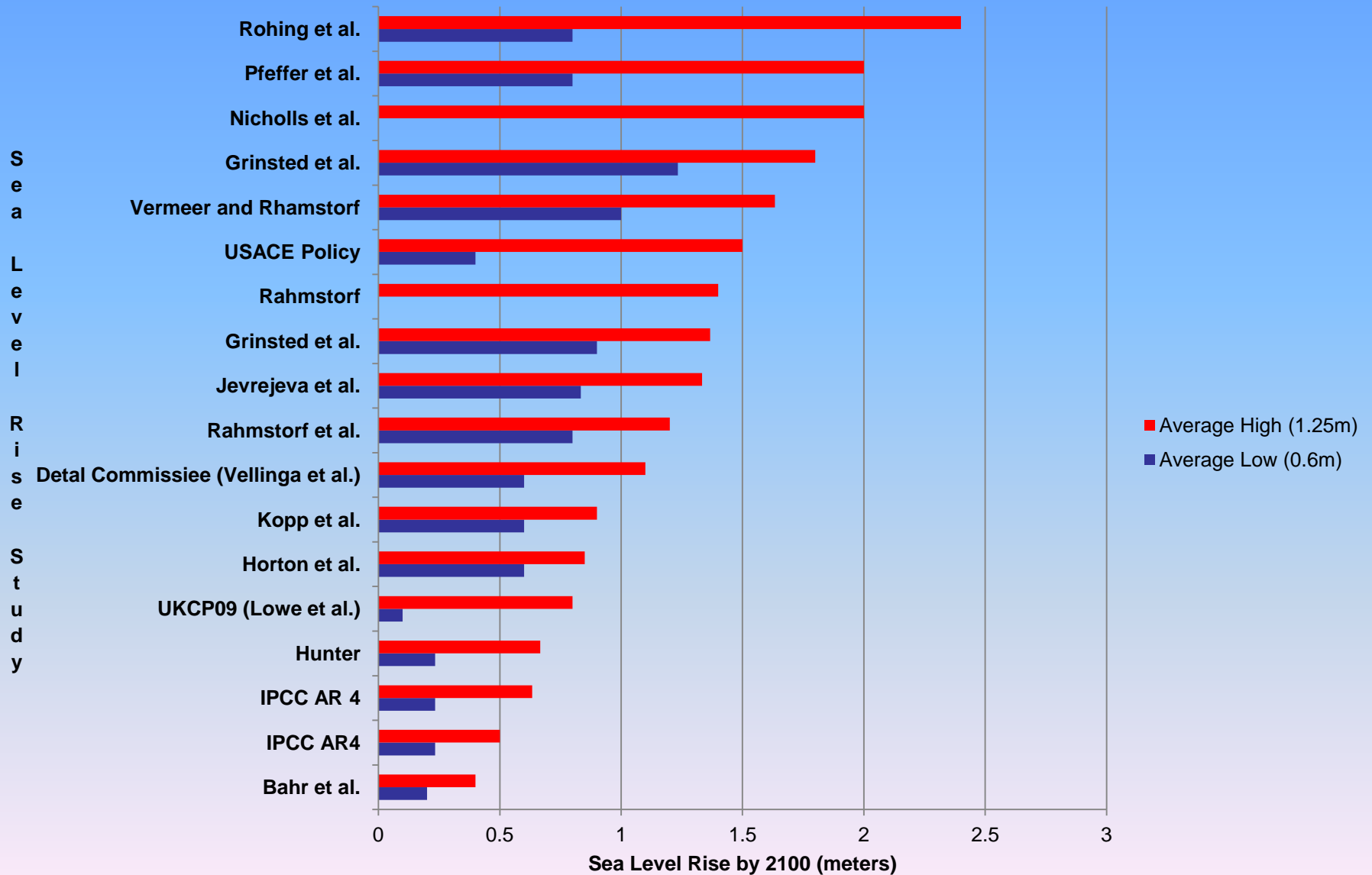
**The Perfect Coastal Storm: Unlocking The West Coast
Flood Risk Mystery and Exploring The Policy and Planning
Implications**

September 8, 2011

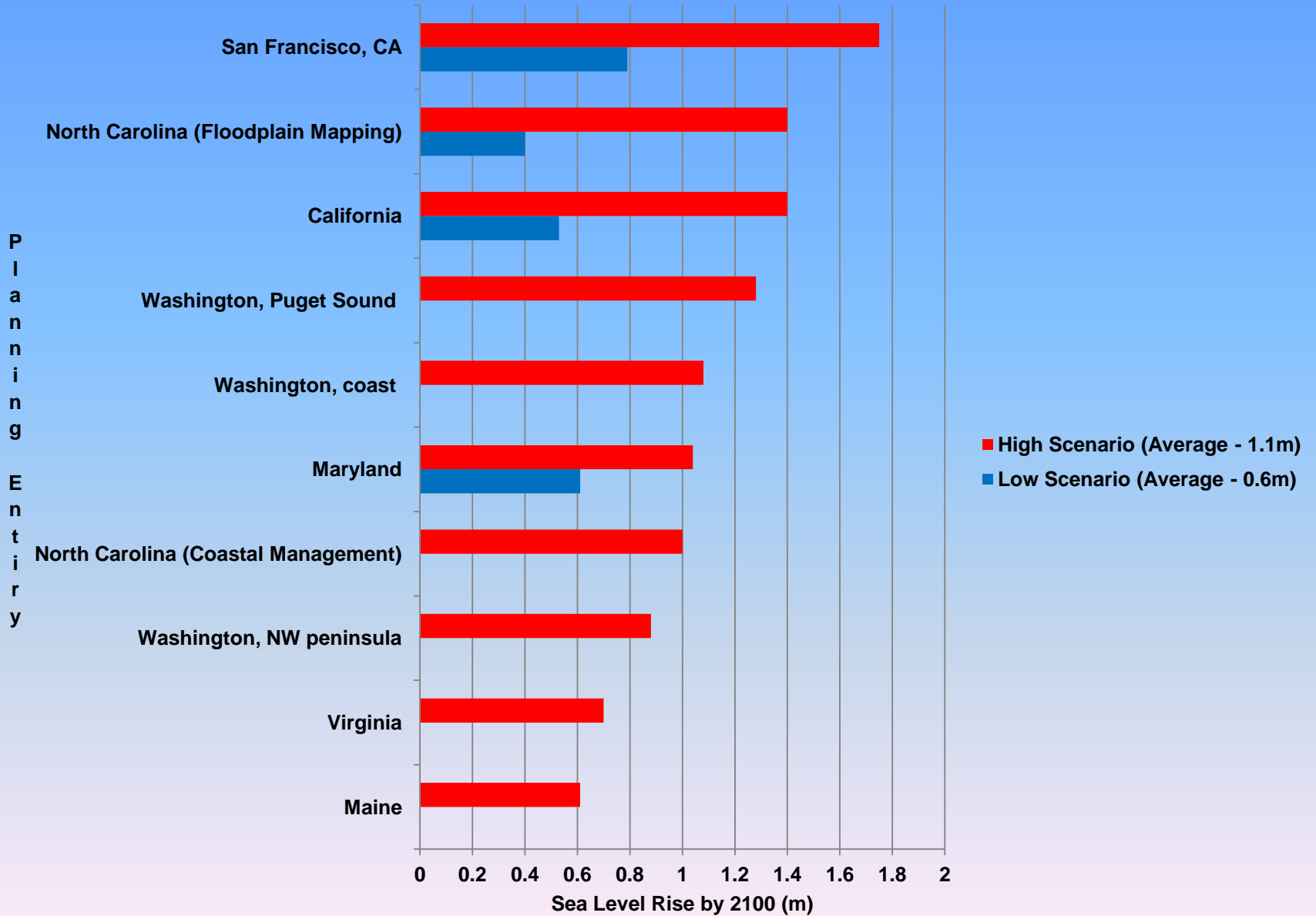


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Sea Level Rise Projections (based on various climate scenarios)



Planning for Sea Level Rise



State, Regional, and County Needs

- Assistance with collection of consistent, standardized elevation data and avoidance of duplication
- Federal agency guidance and justification for flood, tide, and storm elevations for coastal areas to use for creating inundation models
- Methods and standards for mapping coastal inundation
- Simple sea level rise (SLR) visualization tools that show high-risk areas with possible future flooding problems so that land acquisition and adaptation planning can start now



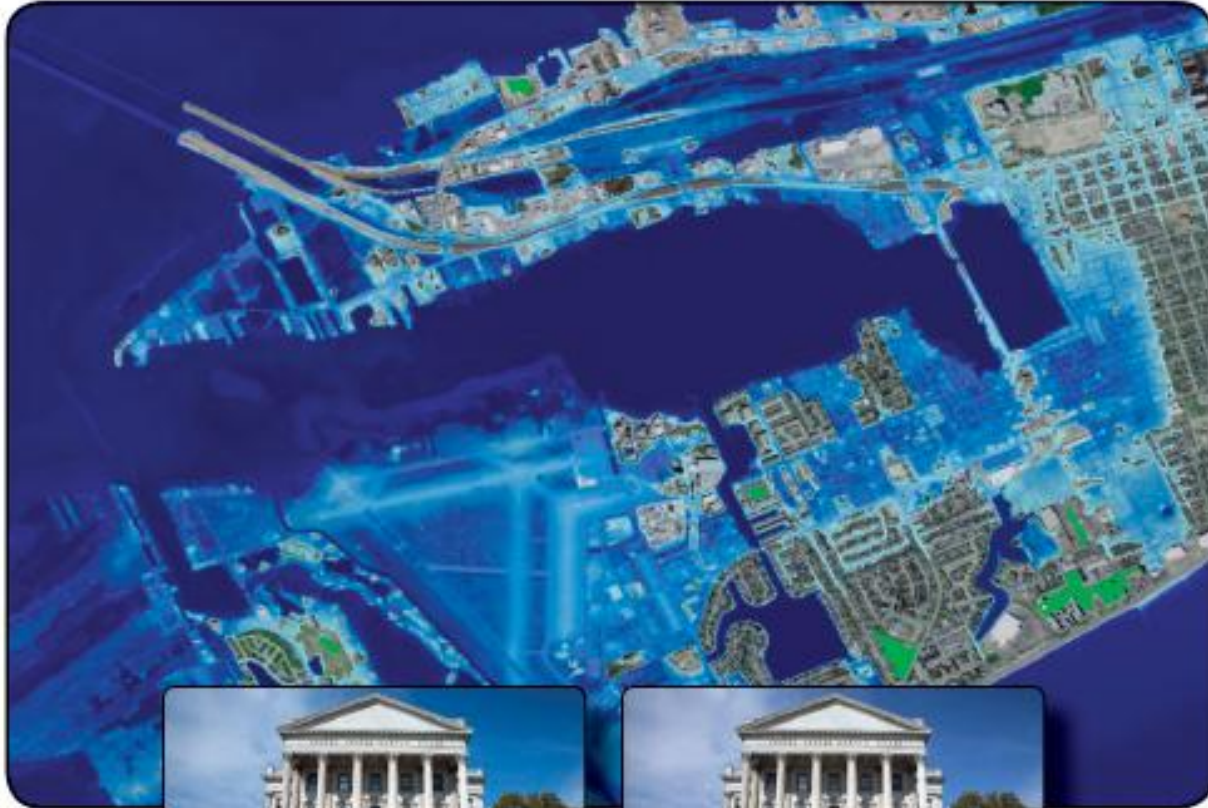
State, Regional, and County Needs

- Simple visualization tools
- Show potential impacts of SLR scenarios
- Show how everyday tidal flooding will become worse and more frequent

Building on local pilot studies and recommendations from communities of practice



Sea Level Rise and Coastal Flooding Impacts Viewer



Current Geographies

Texas

- Harris
- Chambers
- Brazoria
- Galveston

Alabama

- Mobile
- Baldwin

Mississippi

- Jackson
- Harrison
- Hancock

Florida

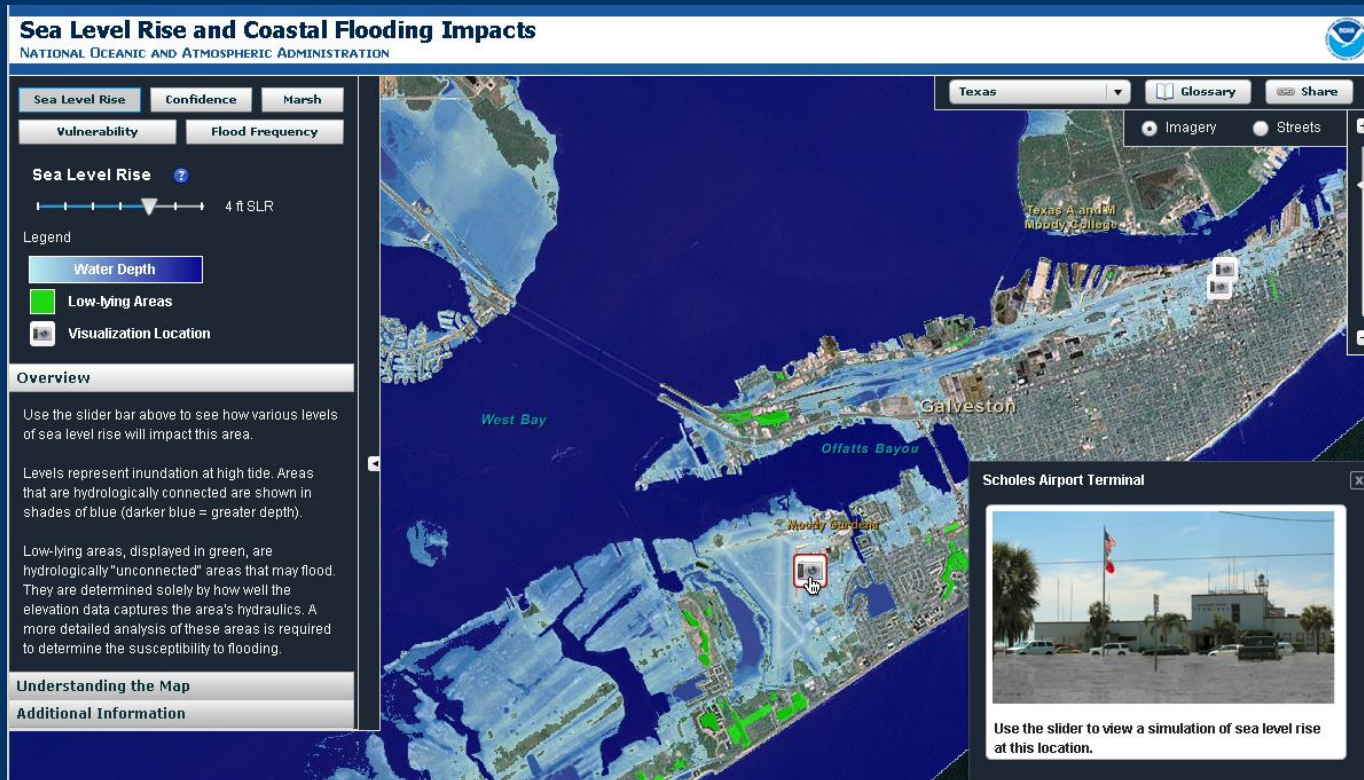
- Escambia
- Santa Rosa
- Okaloosa
- Walton
- Bay
- Gulf
- Franklin
- Wakulla
- Jefferson
- Taylor
- Dixie
- Levy

Working with U.S. Geological Survey, Sea Grant, Gulf Coast Services Center, Digital Coast Partners, National Ocean Service's Center for Operational Oceanographic Products and Services (CO-OPS), Dewberry, University of South Carolina, Bureau of Labor Statistics

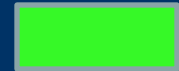
Components

Impacts of Sea Level Rise

- Visualize impacts for mean higher high water (MHHW) 6-foot SLR scenarios overlaid on aerial imagery, street map, and terrain map. Photos of SLR on individual structures will illustrate site-specific impacts.



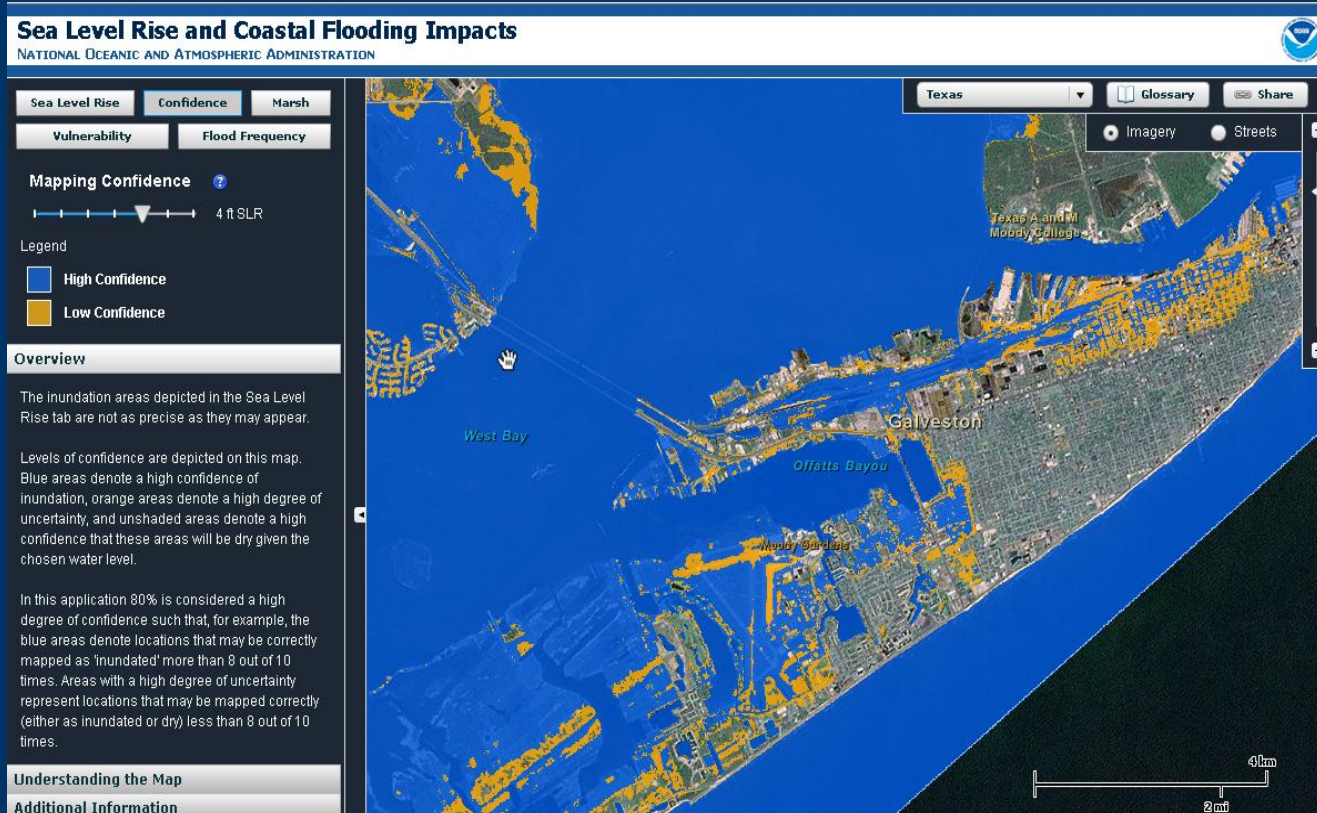
Unconnected
Low-Lying Areas



Components

Communicate Mapping Confidence

- Visualize the mapping confidence of inundation area based on uncertainty of elevation data and MHHW tidal surface.



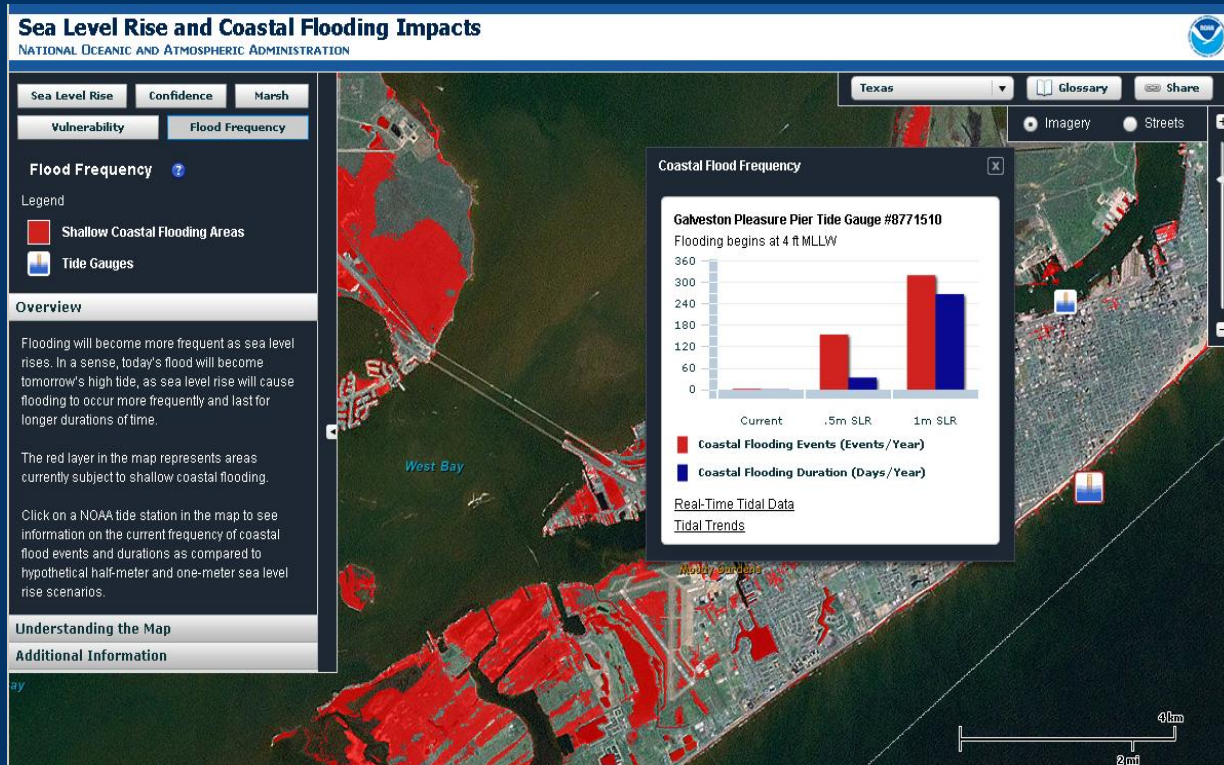
Zone of Uncertainty



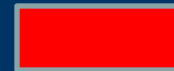
Components

Coastal Flood Frequency

- Communicate that today's flood is tomorrow's high tide. Use three years of observed water level data at National Ocean Service National Water Level Observation Network (NWLON) stations to show increased frequency of everyday flooding.



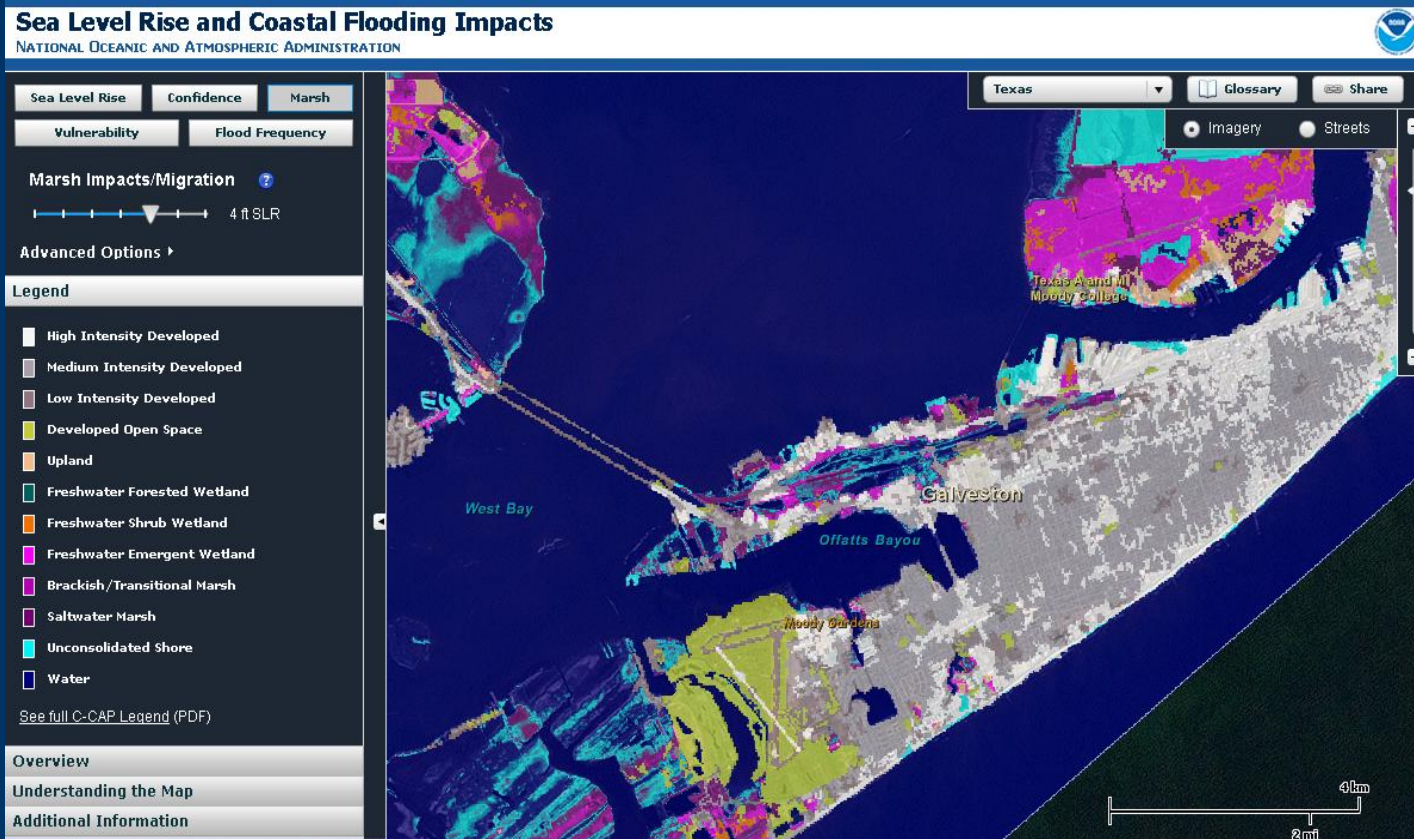
National Weather Service
Coastal Flood
Warning Areas



Components

Visualize Marsh Impacts

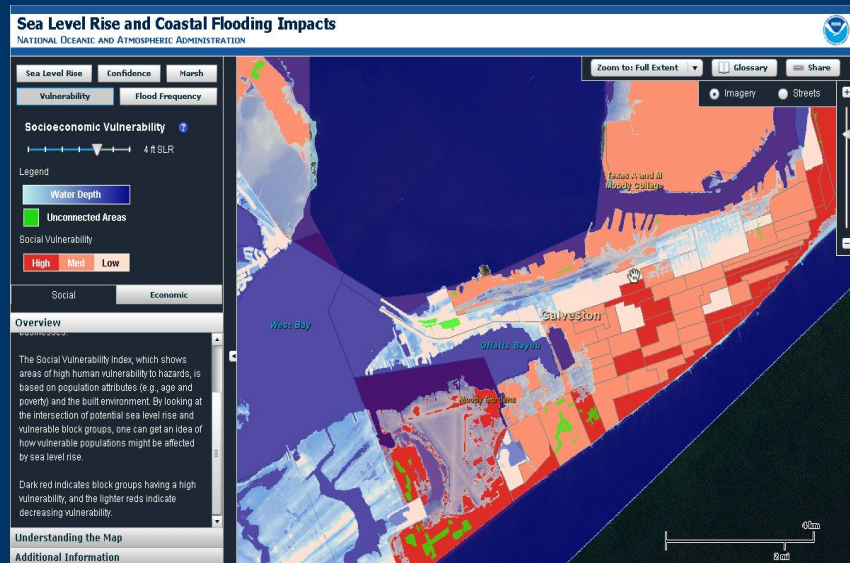
- Visualize the impacts of SLR scenarios on marshes using Coastal Change Analysis Program (C-CAP) data.



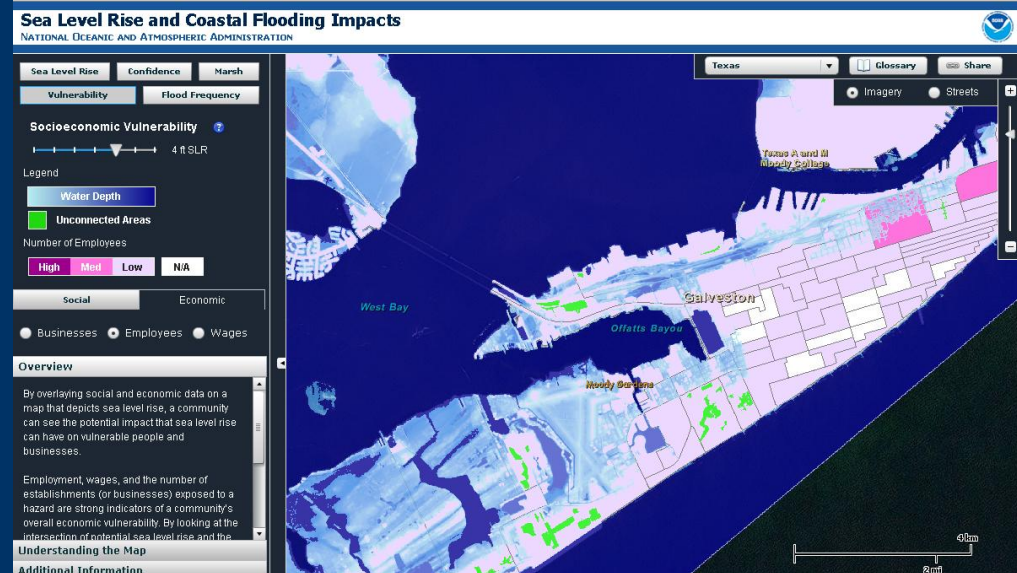
Components

Social and Economic Vulnerability

- Include Social Vulnerability Index (SOVI) from USC and data from Bureau of Labor Statistics (BLS) showing impacts on society and economy.



Social Vulnerability Index (Cutter)



Bureau of Labor Statistics (Department of Labor)

- *Businesses*
- *Employees*
- *Wages*

Future: Increase Geography and Regional Implementation

- *Finish Texas
- *Finish Florida
- Louisiana
- CA, OR, WA
- Mid-Atlantic
- Pacific
- Southeast
- Northeast
- Great Lakes

Regional Implementation

- GOMEX RFP future research
- SF BAY – ART project
- New Jersey – Rutgers
- South Florida

*September 2011



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Data Distribution

Lots of Layers

- Conditioned DEMs
- SLR layers
- Marsh migration layers
- Uncertainty layers
- Shallow coastal flooding layer
- SOVI data
- BLS data

Lots of Ways to Distribute

- Raster geodatabases via FTP
- Representational State Transfer (REST) page
- Web map service (WMS)
- Web coverage service (WCS)
- Enabling mash-up applications



Available via NOAA Digital Coast Tools

www.csc.noaa.gov/digitalcoast/



Home Data Tools Training Approaches In Action

Tools

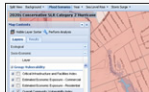
Welcome to the new Digital Coast. If you have questions or comments, please [take a video tour](#) or [contact us](#).

The tools on this page support coastal decision-making by transforming Digital Coast data into information tailored for specific issues. Some tools are Web-based, providing direct online analysis and viewing, while others are downloadable extensions that provide new functionality for desktop geographic information systems. Have an idea for a tool you would like to see in the Digital Coast? [Make a tool suggestion to the Digital Coast](#).

Filter by Category: Filter by Issue:

Data Visualization Tools

Present dynamic views of spatial data. Some may offer data download capabilities



Coastal Resilience Long Island

The Nature Conservancy

Enables users to visualize coastal hazards impacting Long Island, New York

[More Info](#) [Get It Now](#)



Community Resource Inventory (South Carolina)

Clemson University

Provides an online mapping atlas of the natural and cultural resources in a community

[More Info](#) [Get It Now](#)



Historical Hurricane Tracks IMS

NOAA

Enables viewers to find tropical cyclone data in the Atlantic and Eastern Pacific Basins

Featured Tool

Multipurpose Marine Cadastre

Provides a framework for marine spatial planning efforts

Tool Resources

Ecosystem-Based Management Tools Network

Supports the implementation of



Home Data Tools Training Approaches In Action

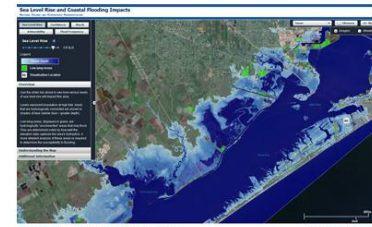
Tools

Sea Level Rise Impacts Viewer

NOAA Coastal Services Center

Overview

Being able to visualize potential impacts from sea level rise is a powerful teaching and planning tool, and the Sea Level Rise Viewer brings this capability to coastal communities. A slider bar is used to show how various levels of sea level rise will impact coastal communities. The initial project areas include Texas' Houston and Galveston coasts and Mississippi, with additional coastal counties to be added in the near future. Visuals and the accompanying data and information cover sea level rise inundation, uncertainty, flood frequency, marsh impacts, and socioeconomics.



Features

Displays potential future sea levels

Provides simulations of sea level rise at local landmarks

Communicates the spatial uncertainty of mapped sea levels

Models potential marsh migration due to sea level rise

Overlays social and economic data onto potential sea level rise

Examines how tidal flooding will become more frequent with sea level rise

[Launch Now](#)

Acknowledgements

The NOAA Coastal Services Center would like to acknowledge those organizations that provided direct content used in this tool or feedback, ideas, and reviews over the course of the tool's development. Specifically the Center would like to acknowledge the following groups.

Questions?

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