Building Resilient Communities:
Tools for Understanding and Communicating Coastal Risk

NOAA in the Carolinas 2012

Doug Marcy
NOAA Coastal Services Center

NOAA Coastal Services Center
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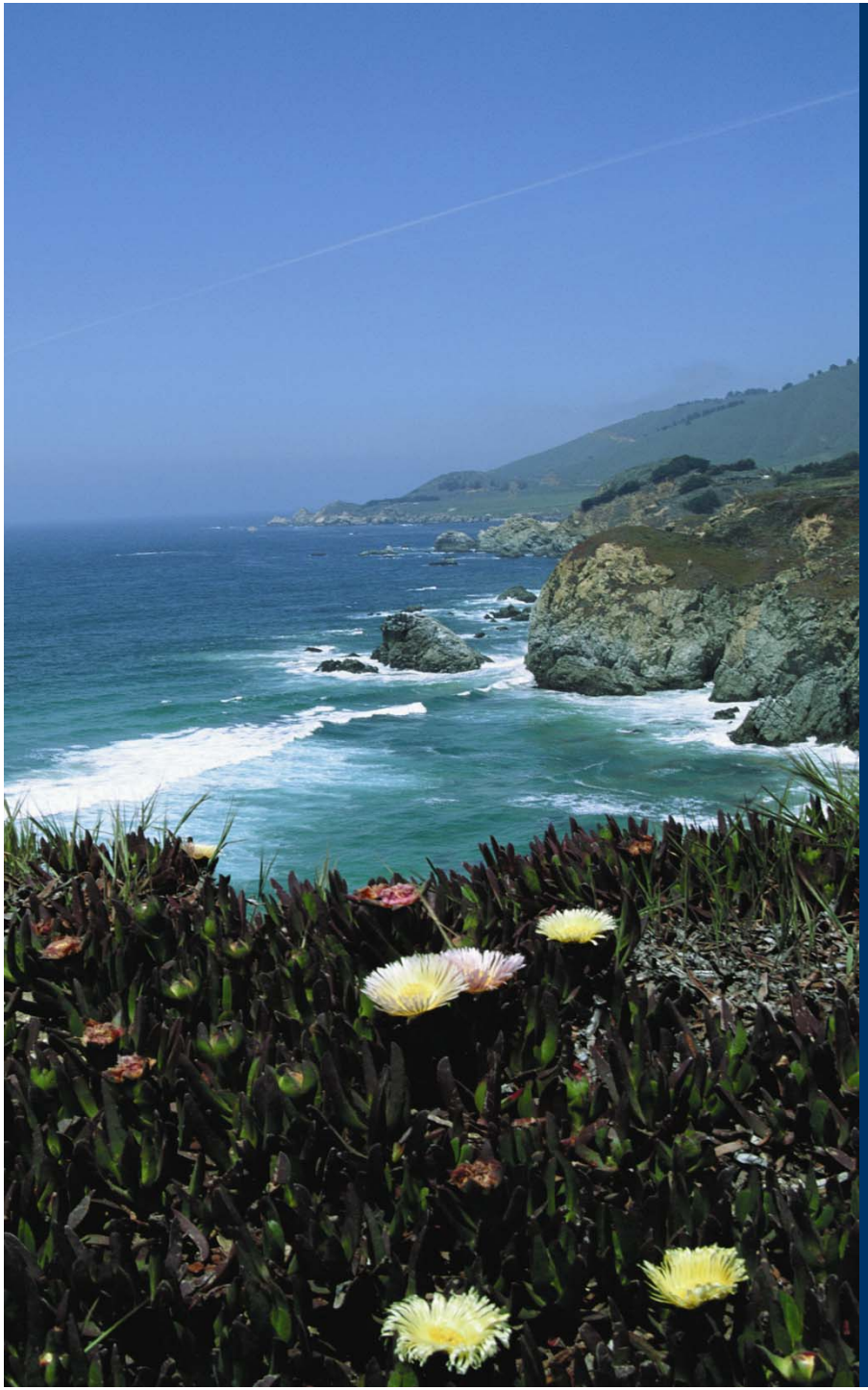

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Priority Issues

- Land-use planning
- Coastal and marine spatial planning
- Hazards and climate change

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Coastal Communities: Vital to U.S. and International Economies

- 57 percent of U.S. gross domestic product is contributed by coastal watershed counties.
- Coastal counties contain 53 percent of the nation's population—but account for only 17 percent of U.S. land area (excludes Alaska).
- Coastal habitats help reduce impacts of floods, storms, and climate change on coastal communities by absorbing water, wave energy, and other stressors.

U.S. population, 2010 census: 308 million, an increase of ~9 percent Census projects 439 million in 2050

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Everything has its price, even the weather.

- Economic Cost of Weather May Total $485 Billion in U.S.

- From wildfires to flight delays to running our AC, "This research shows that a substantial percentage of the U.S. economy is linked to variability in weather.“

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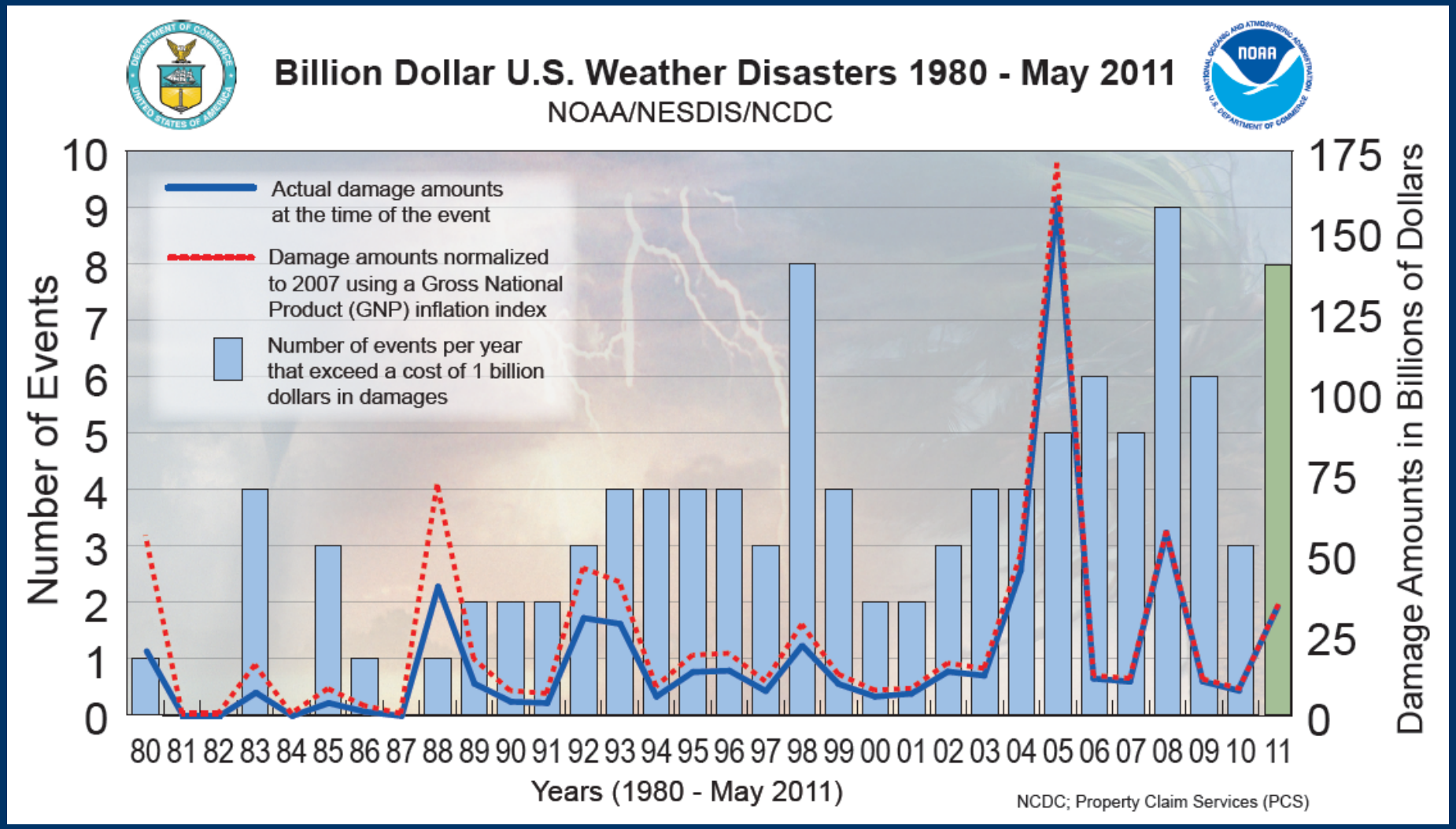
A Growth Industry?



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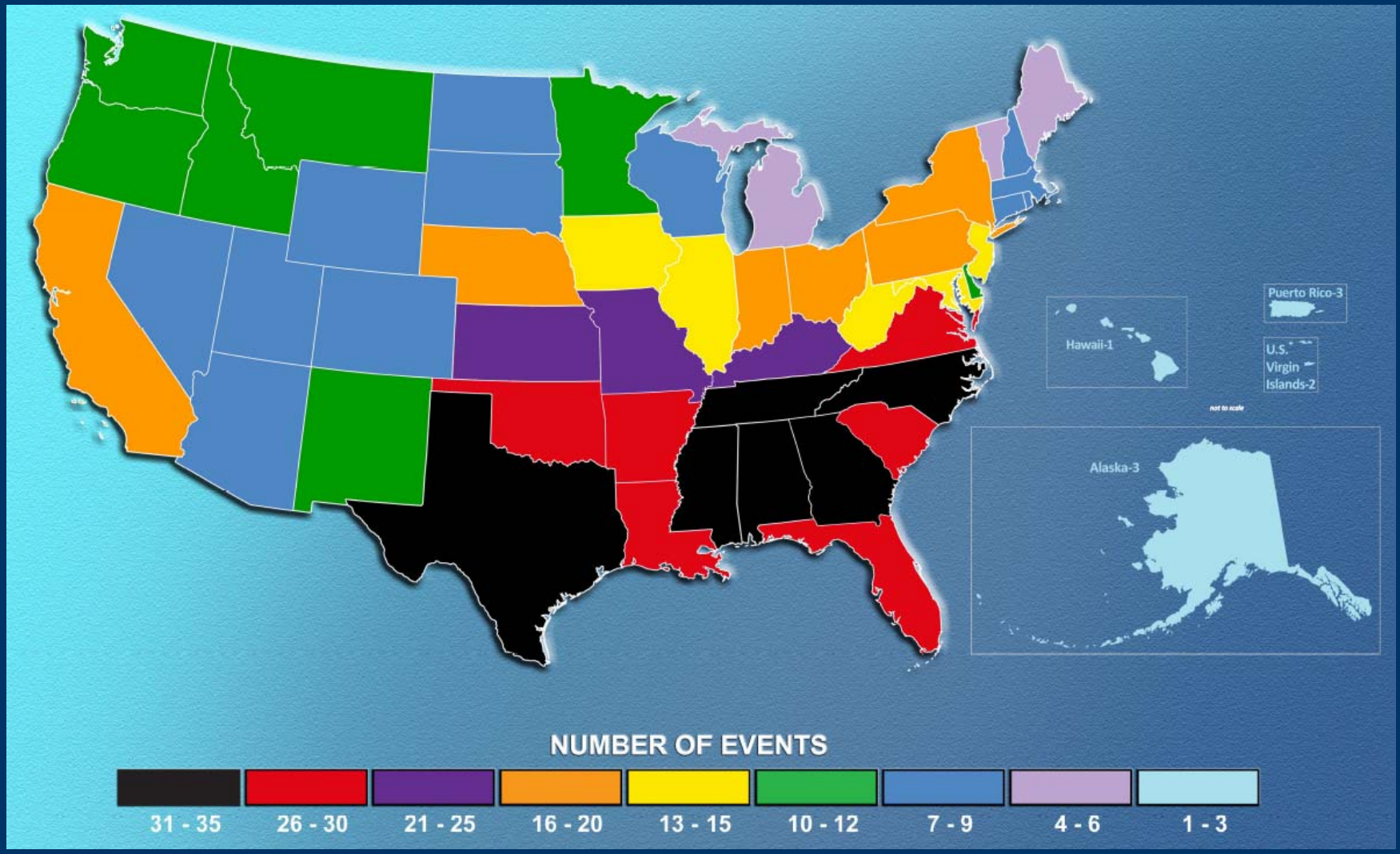
Ready to Move?



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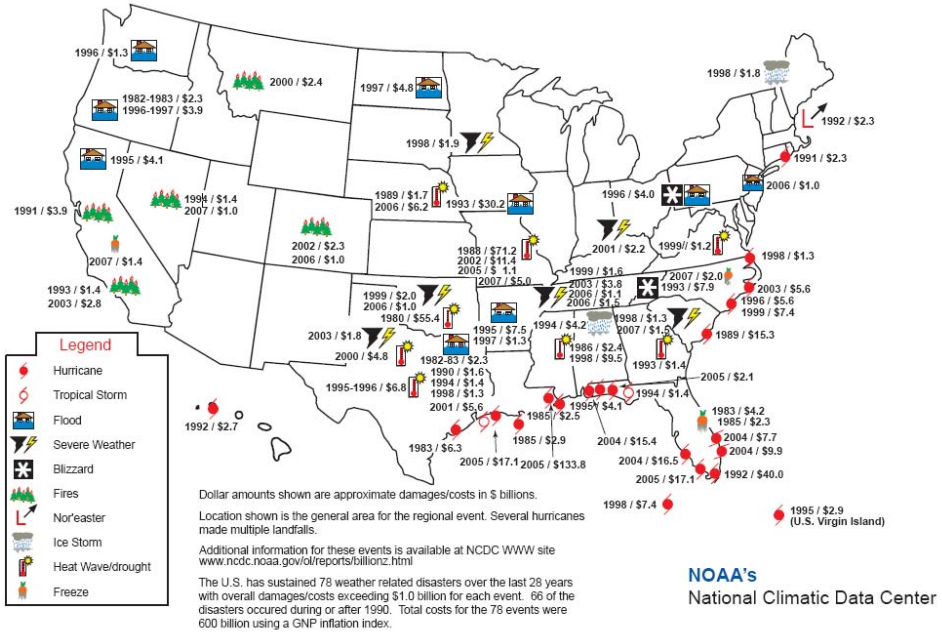
Billion Dollar Weather Disasters 1980 - 2007



Dollar amounts shown are approximate damages/costs in $ billions.

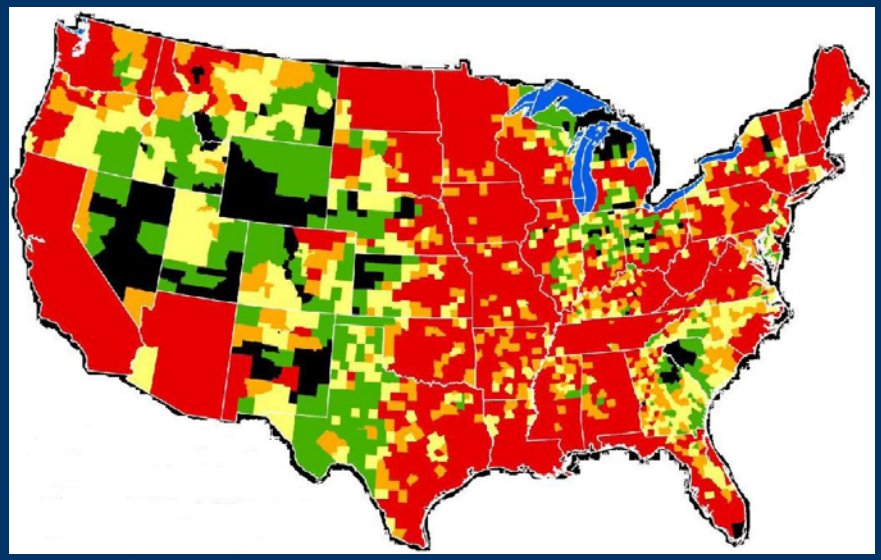
Location shown is the general area for the regional event. Several hurricanes made multiple landfalls.

Additional information for these events is available at NCDC WWW site www.ncdc.noaa.gov/ol/reports/billionz.html

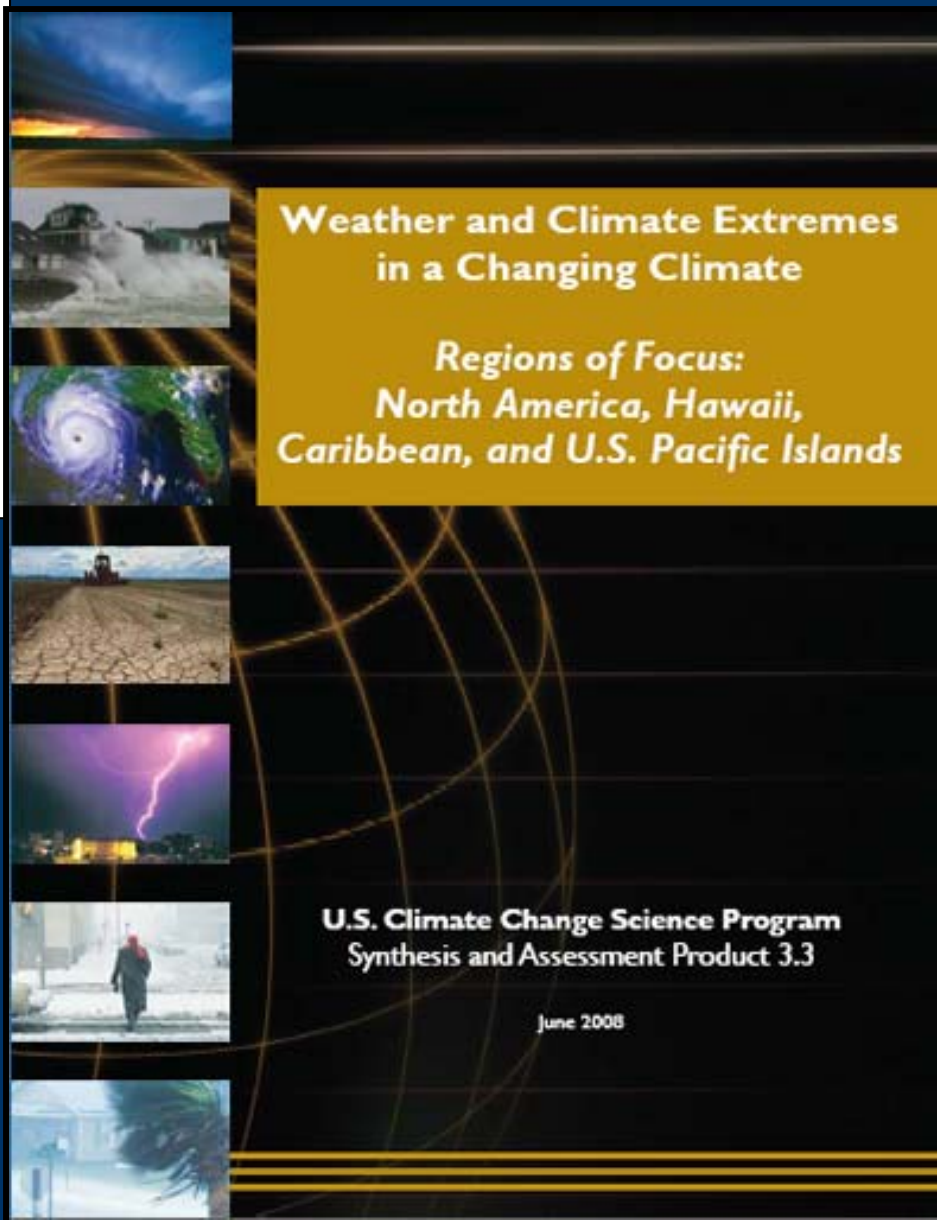
The U.S. has sustained 78 weather related disasters over the last 28 years with overall damages/costs exceeding $1.0 billion for each event. 66 of the disasters occured during or after 1990. Total costs for the 78 events were 600 billion using a GNP inflation index.

NOAA's
National Climatic Data Center

Disaster Declarations 1965-2003



Ready Or Not, Here It Comes



Providing Solutions to Barriers

- Coastal data
- Data accessibility
- Improved intergovernmental coordination
- Techie and non-techie tools
- Training
- Outreach and awareness
- Contracting for geospatial services

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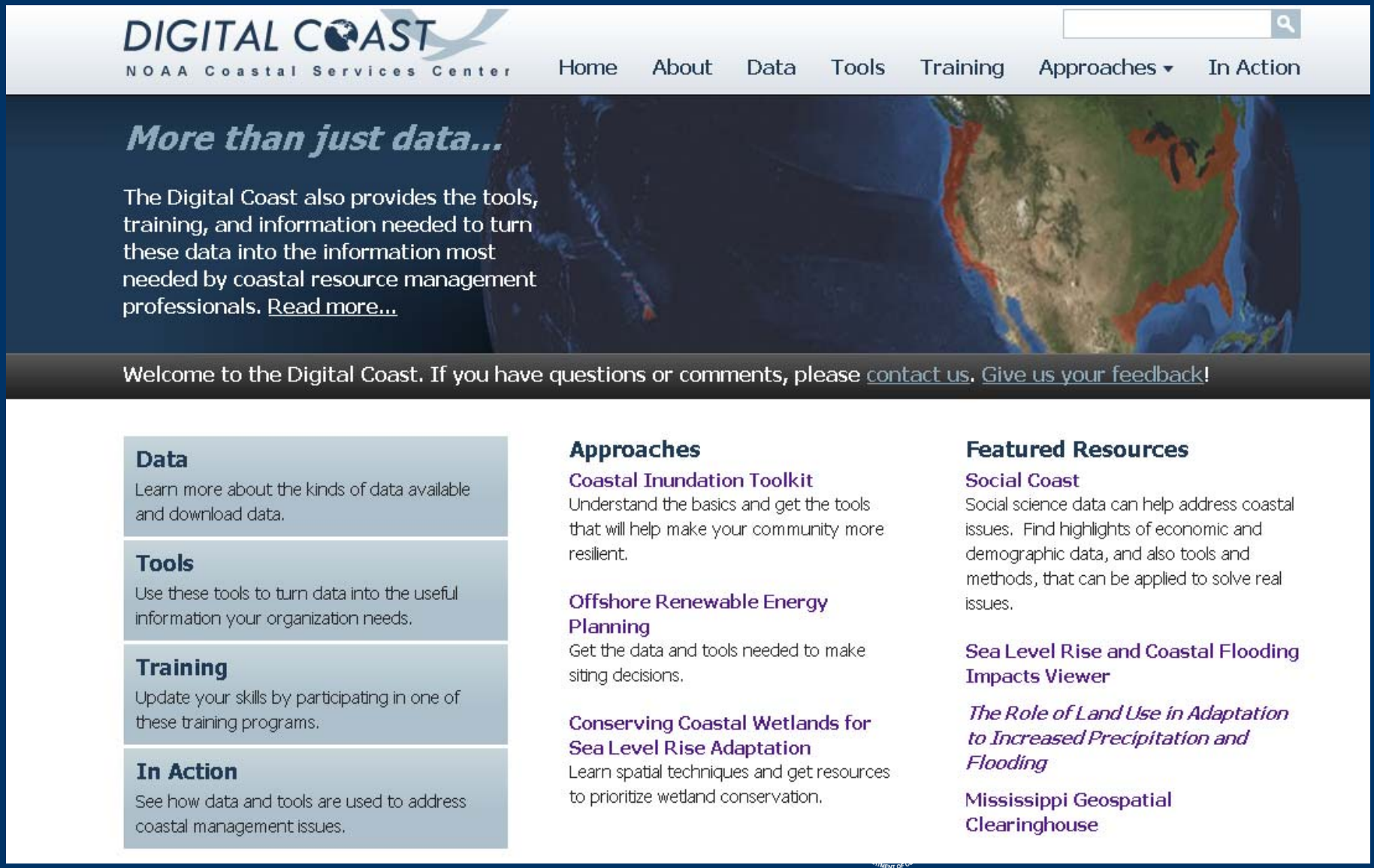
One Solution: Digital Coast



Digital Coast Partnership

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Digital Coast Contributors

Mississippi State Coordinating Council on Remote Sensing and GIS

NOAA National Geodetic Survey

U.S. Army Corps of Engineers

U.S. Geological Survey

NASA/NOAA/USGS Airborne Lidar Assessment of Coastal Erosion (ALACE)

Federal Emergency Management Agency

National Geospatial-Intelligence Agency

U.S. Department of Agriculture

Northwest Florida Water Management District

Southwest Florida Water Management District

St. Johns River Water Management District

Maryland Department of Natural Resources

Oregon Department of Geology and Mineral Resources

Texas Natural Resources Information System

Mississippi Department of Environmental Quality

Scripps Institute of Oceanography

University of Texas

Delaware Department of Natural Resources and Environmental Control

South Carolina Department of Natural Resources

Florida Division of Emergency Management

Minnesota Department of Natural Resources

Management Association for Private Photogrammetric Surveyors (MAPPS)

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Data and Tools

www.csc.noaa.gov/digitalcoast

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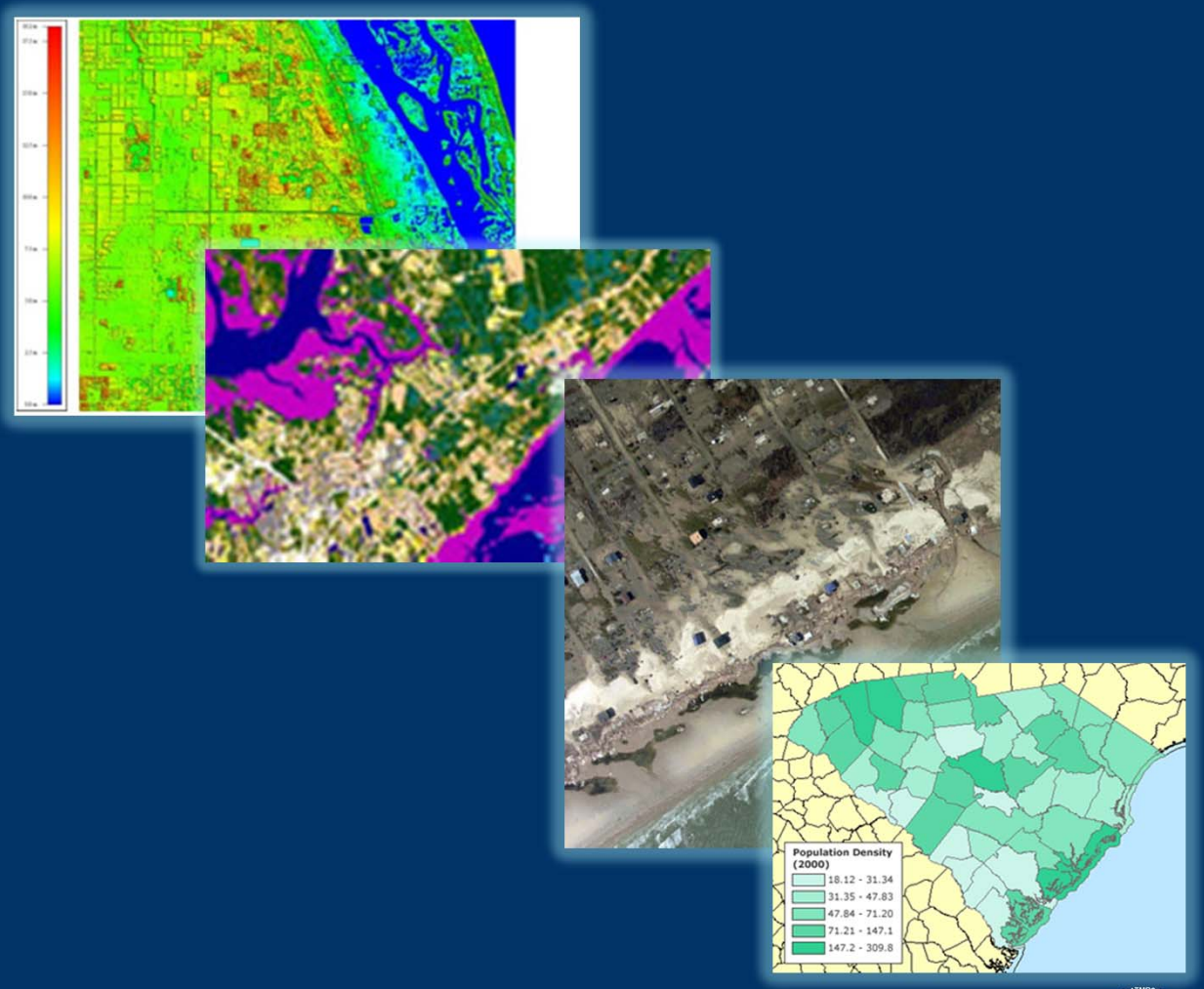
Digital Coast Data

www.csc.noaa.gov/digitalcoast/data



- Elevation
- Benthic
- Orthoimagery
- Land cover
- Hydrography
- Marine boundaries
- Socioeconomic

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Nonpoint-Source Pollution and Erosion Comparison Tool (N-SPECT)

www.csc.noaa.gov/digitalcoast/tools/nspect

Features

Provides projections and maps of surface water runoff volumes, pollutant loads, pollutant concentrations, and total sediment loads

Helps users see areas that might benefit from changes to proposed development strategies

Processes digital elevation data quickly and easily

Provides a means to analyze "what if" land use change scenarios

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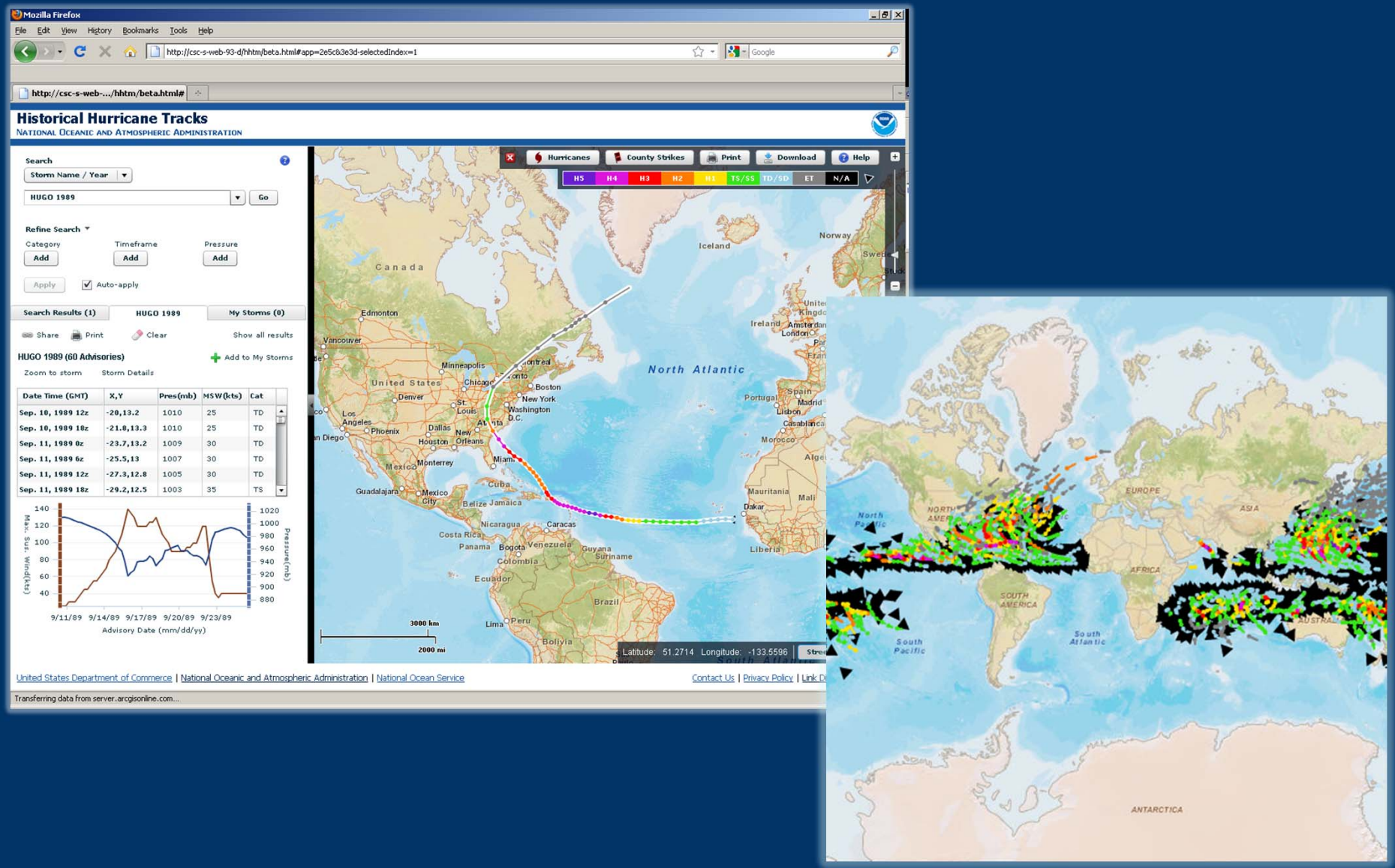
Historical Hurricane Tracks Tool

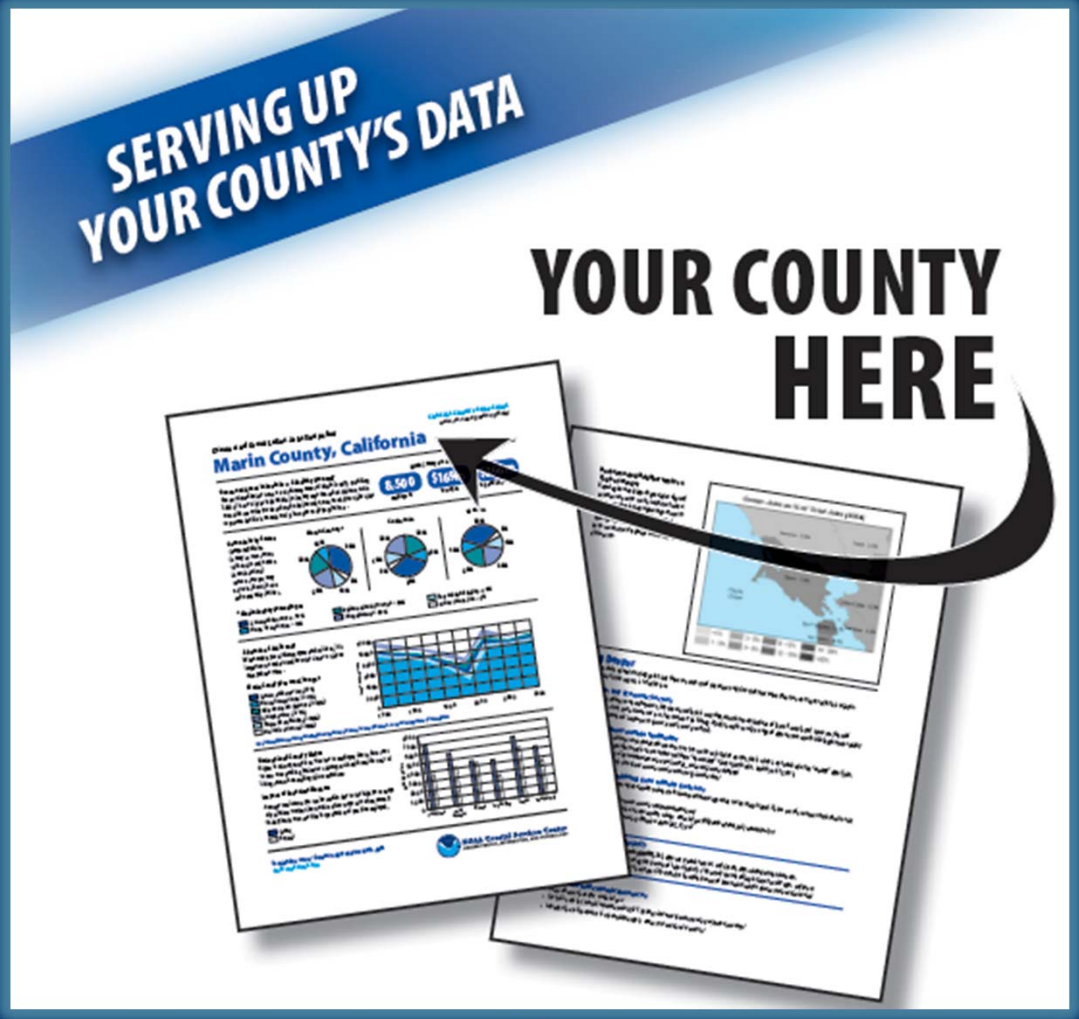
www.csc.noaa.gov/hurricanes/



County Flood Exposure Snapshot

www.csc.noaa.gov/snapshots/

- Flood exposure
- Ocean jobs
- Wetlands benefits



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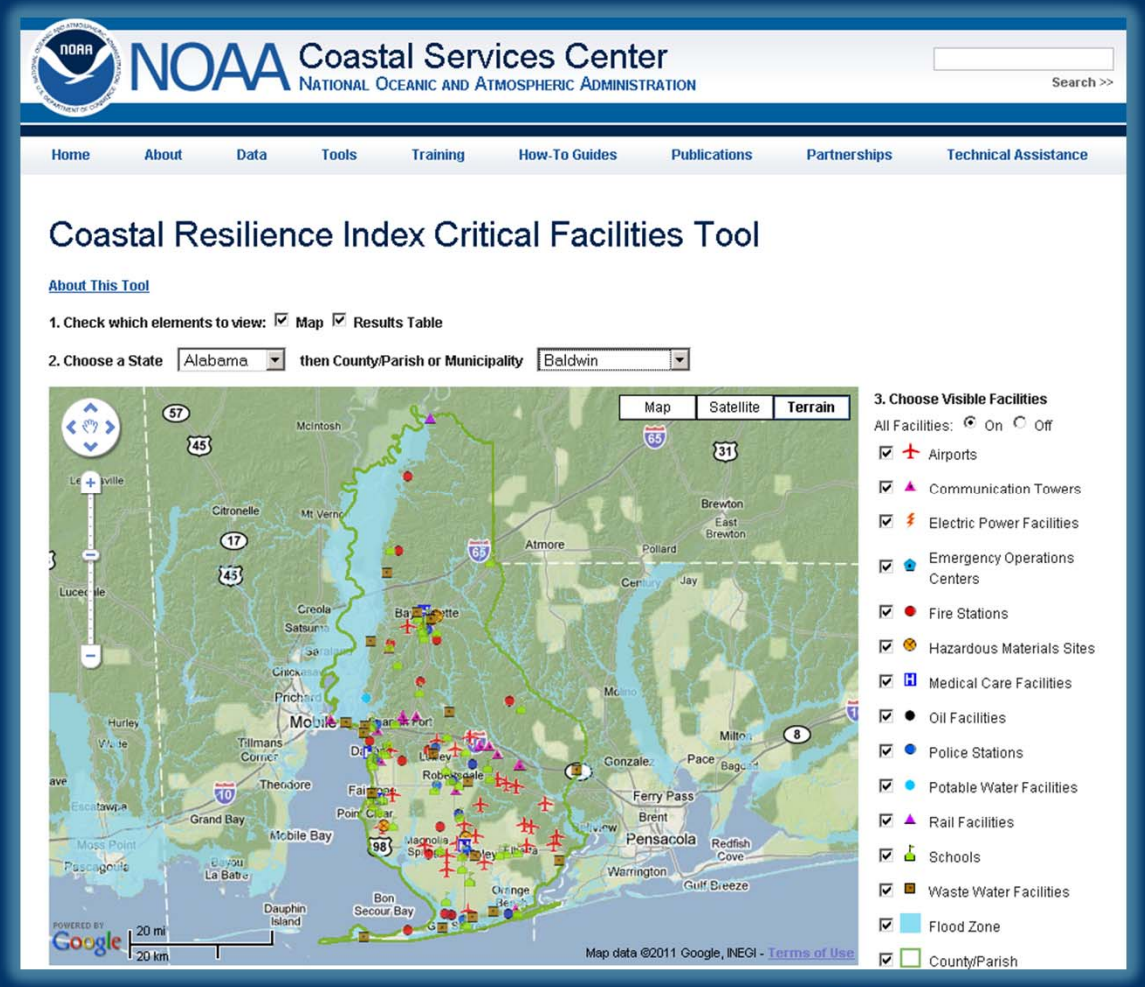
Critical Facilities Tool

www.csc.noaa.gov/criticalfacilities/



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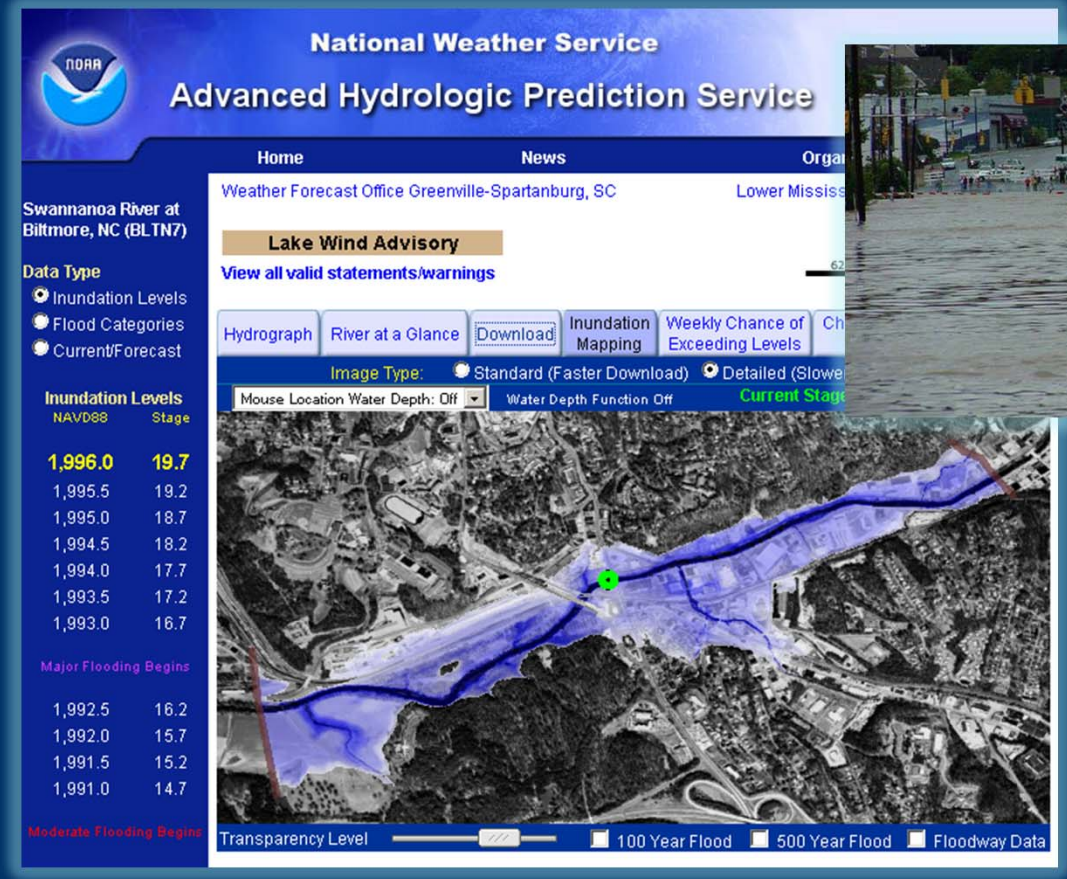
National Weather Service
Flood Severity Inundation Maps

http://water.weather.gov/ahps/inundation.php



North Carolina Floodplain Mapping Program

USGS science for a changing world

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Sea Level Rise and Coastal Flooding Impacts Viewer

www.csc.noaa.gov/slr/

CanVis

www.csc.noaa.gov/canvis/

Seattle Boardwalk– Sea Level Rise – Before

Seattle Boardwalk – Sea Level Rise – After

Charleston Customs House – 1.5m SLR - Before

Charleston Customs House – 1.5m SLR - After

Visualization Alternatives Communication

Training

www.csc.noaa.gov/training/

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Get Out Ahead of Coastal Hazards…

www.csc.noaa.gov/roadmap/

Approach that helps communities:

- analyze strengths and weaknesses to hazards and climate change
- incorporate risk and vulnerability information and data into existing plans and policies
- highlights products useful in assessing vulnerabilities

Roadmap for Adapting to Coastal Risk
technical assistance, web-based training, web resources

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The Social Vulnerability Story

What to consider…

Factors that contribute to social vulnerability

Factors that contribute to community resilience

The effects of current and projected trends on existing social conditions

The Infrastructure Vulnerability Story

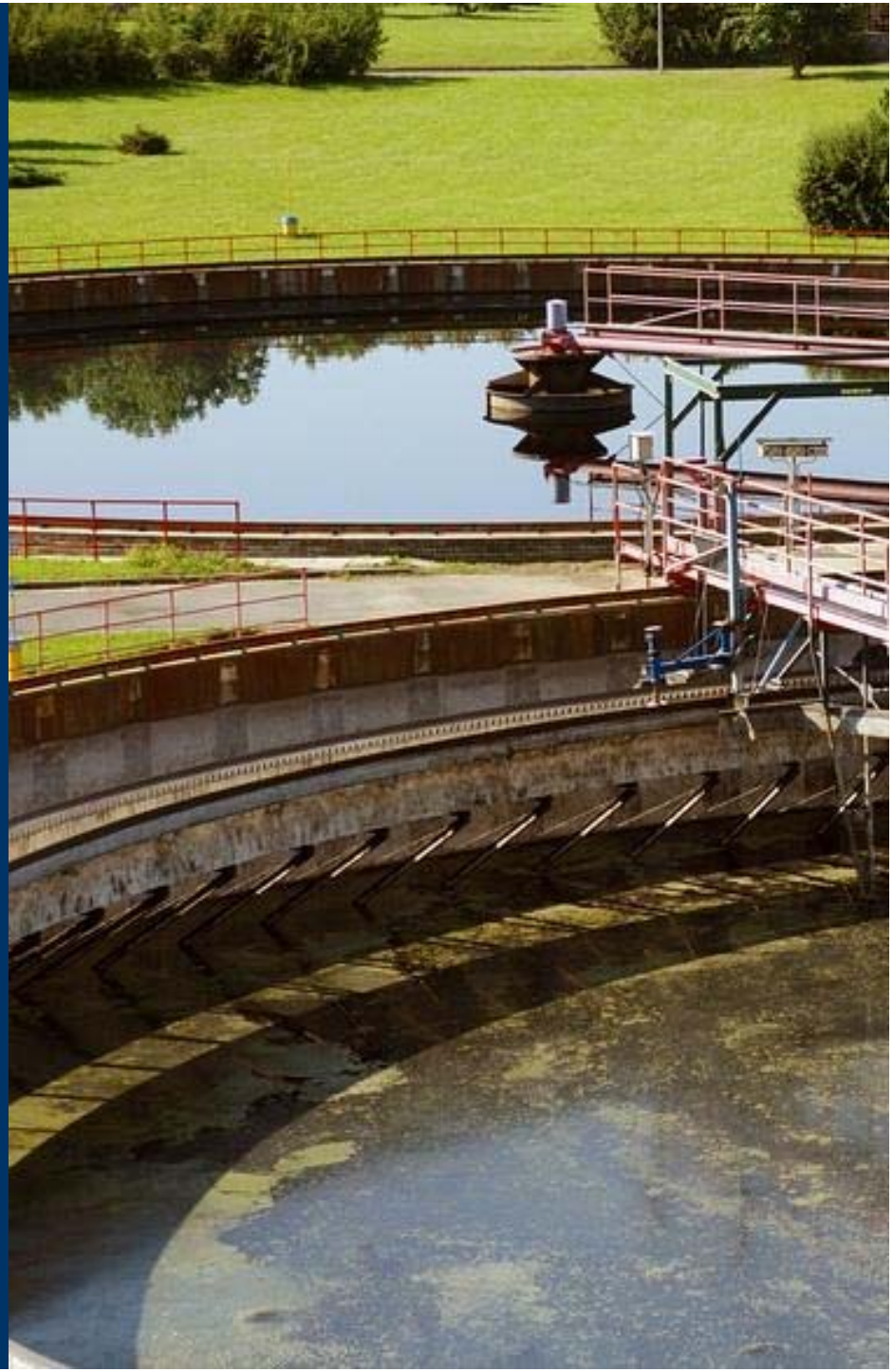
What to consider…

All types of infrastructure

What's exposed to hazards

Potential factors that contribute to infrastructure vulnerability

How existing policies will affect future infrastructure vulnerability



The Ecosystem Vulnerability Story

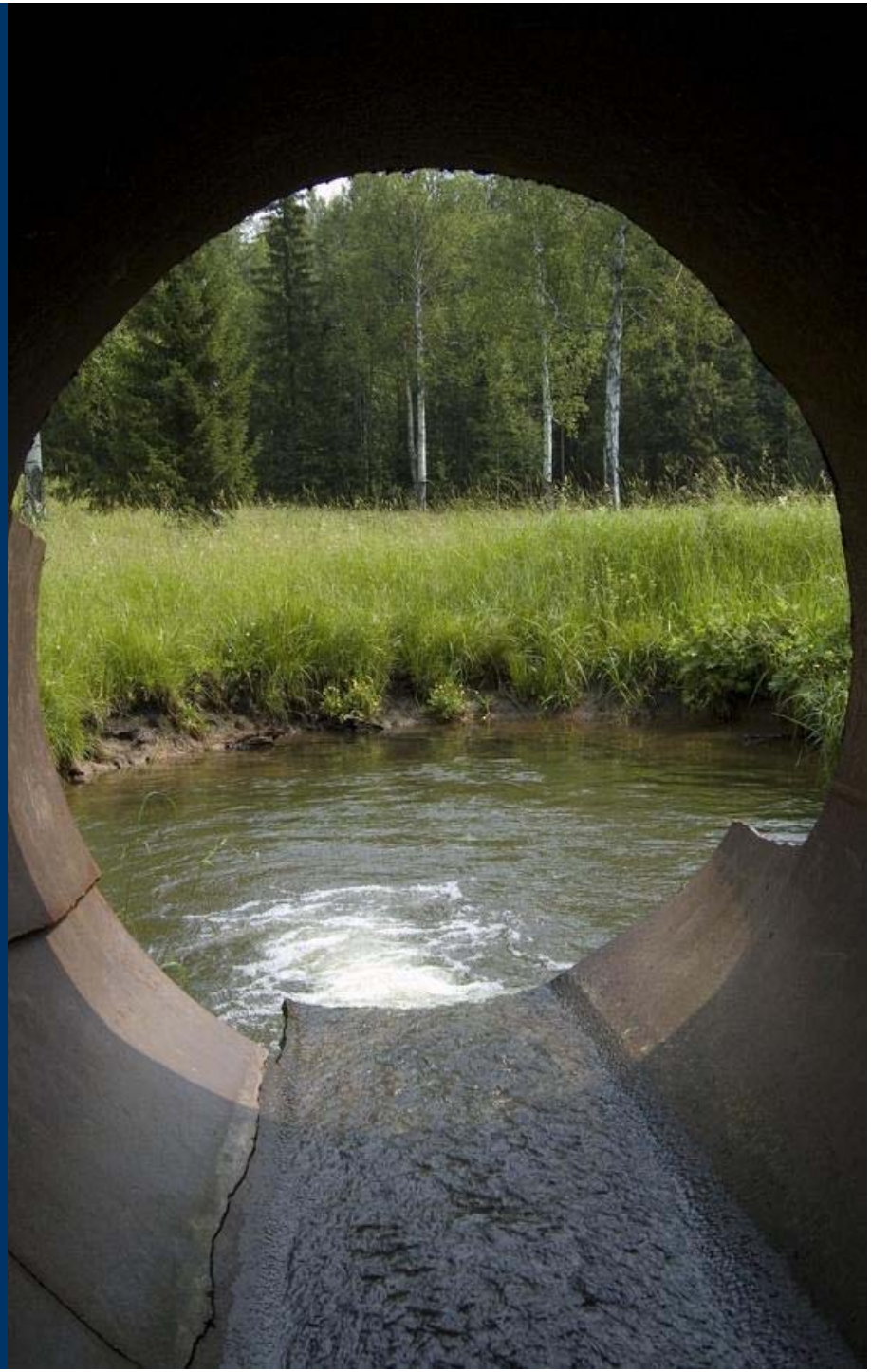
What to consider…

Protective functions of key natural resources

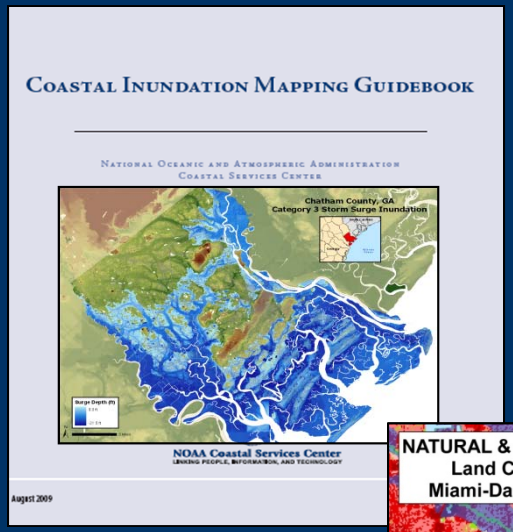
Additional benefits of key natural resources

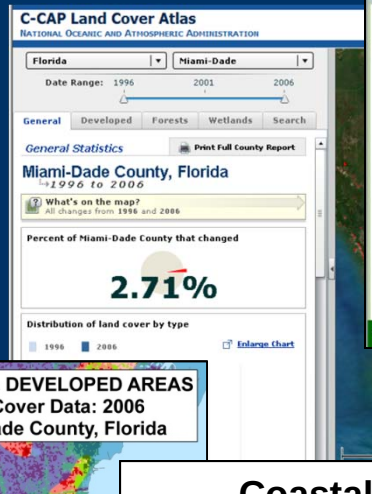
Potential stressors to ecosystem

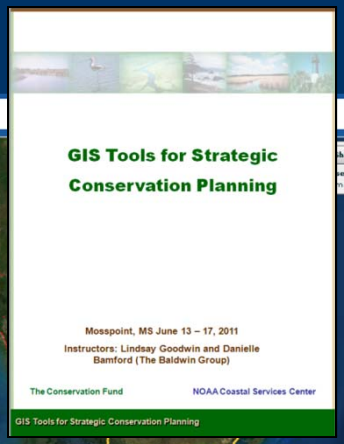
Current policy impacts on the future vulnerability of ecosystem

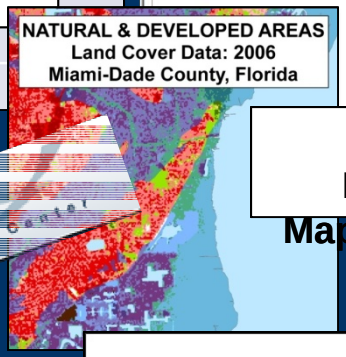


CSC Tools & Resources Included

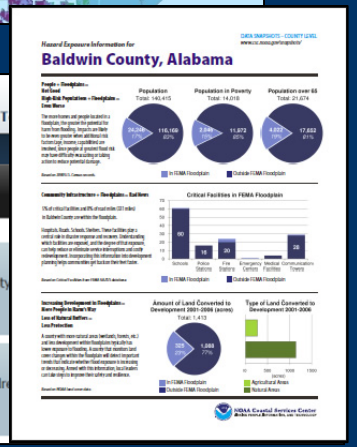


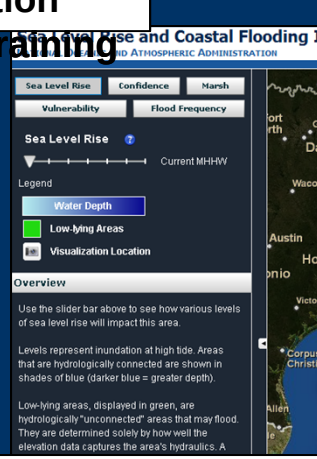


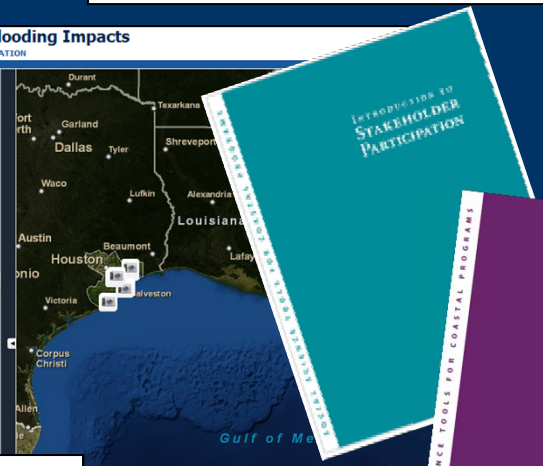




Coastal Inundation Mapping Training





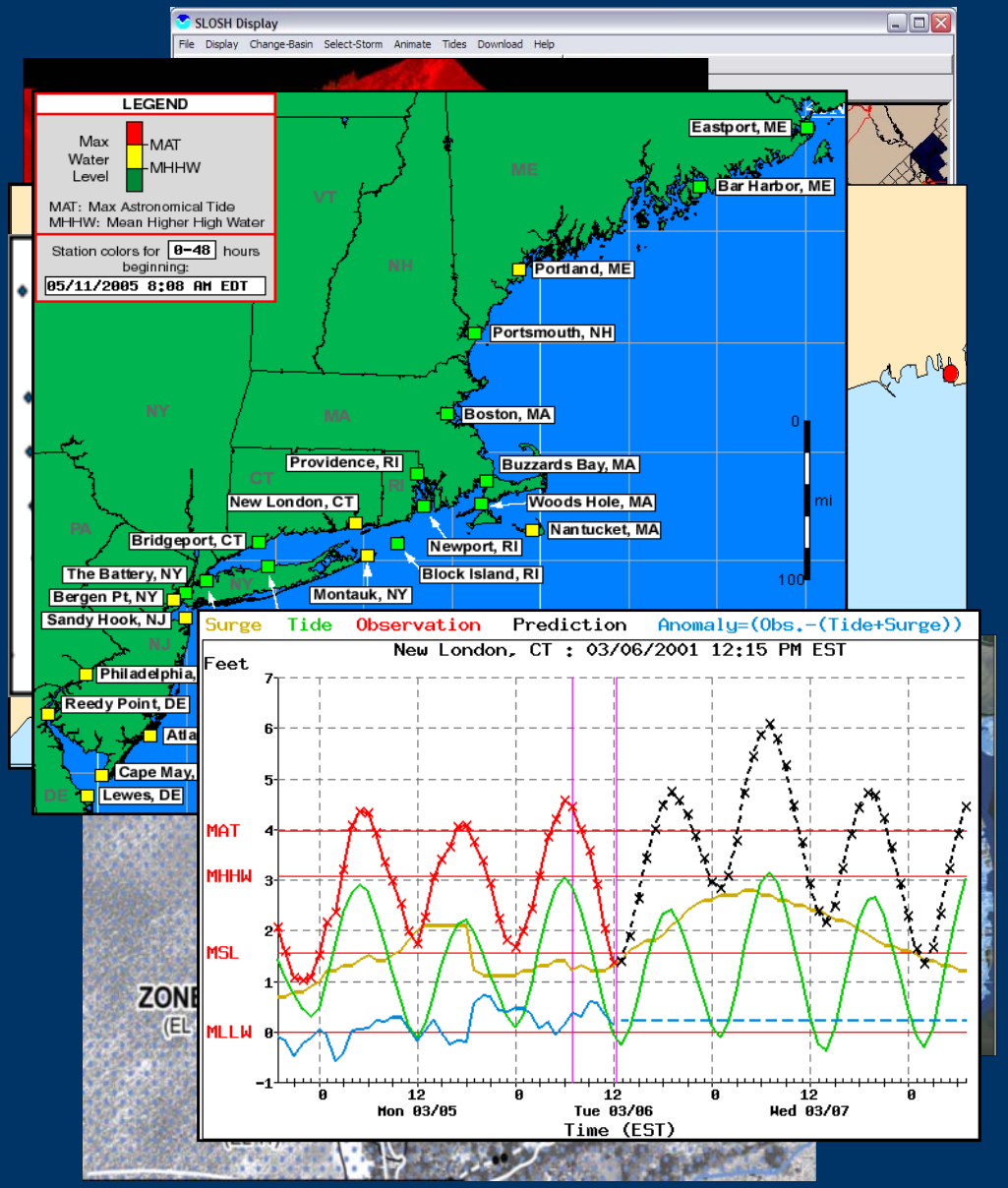


Green Infrastructure Short Course

Coastal Inundation Mapping Training

www.csc.noaa.gov/training

- Understand inundation
- Learn about mapping products
- Access data
- Perform data conversions
- Map inundation using GIS
- Identify and use coastal and ocean observation data



Climate Adaptation Training

http://www.csc.noaa.gov/training/

Recognize the changes and variability in climate and climate's influence on coastal communities

Identify opportunities to leverage a range of governance mechanisms to integrate adaptation strategies into their existing efforts

Examine methods for conducting hazard, vulnerability, and risk assessment as it relates to climate change

Evaluate the strengths and weaknesses of adaptation strategies

Apply climate communication research concepts and findings to enable effective communication with target audiences

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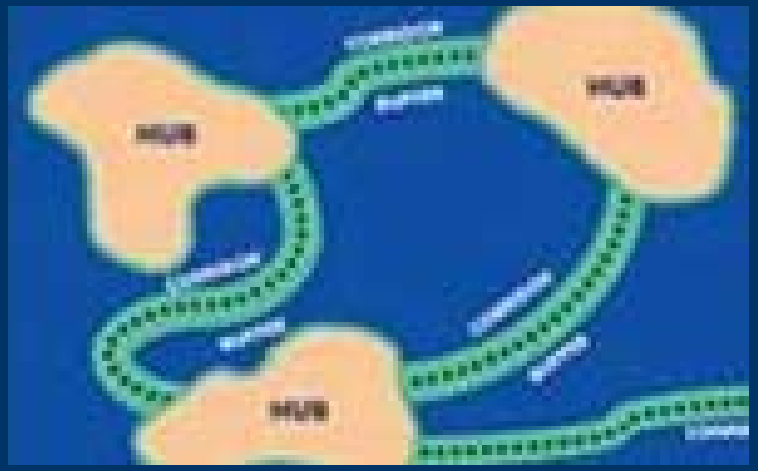
GIS Tools for Strategic Conservation

http://www.csc.noaa.gov/digitalcoast/training/gisforscp.html



Teaches green infrastructure concepts to help planners communicate and integrate natural resource conservation into planning efforts that support coastal community resilience.

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Technical Assistance

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Coastal Geospatial Services Contract

"Take the headache out of the process."

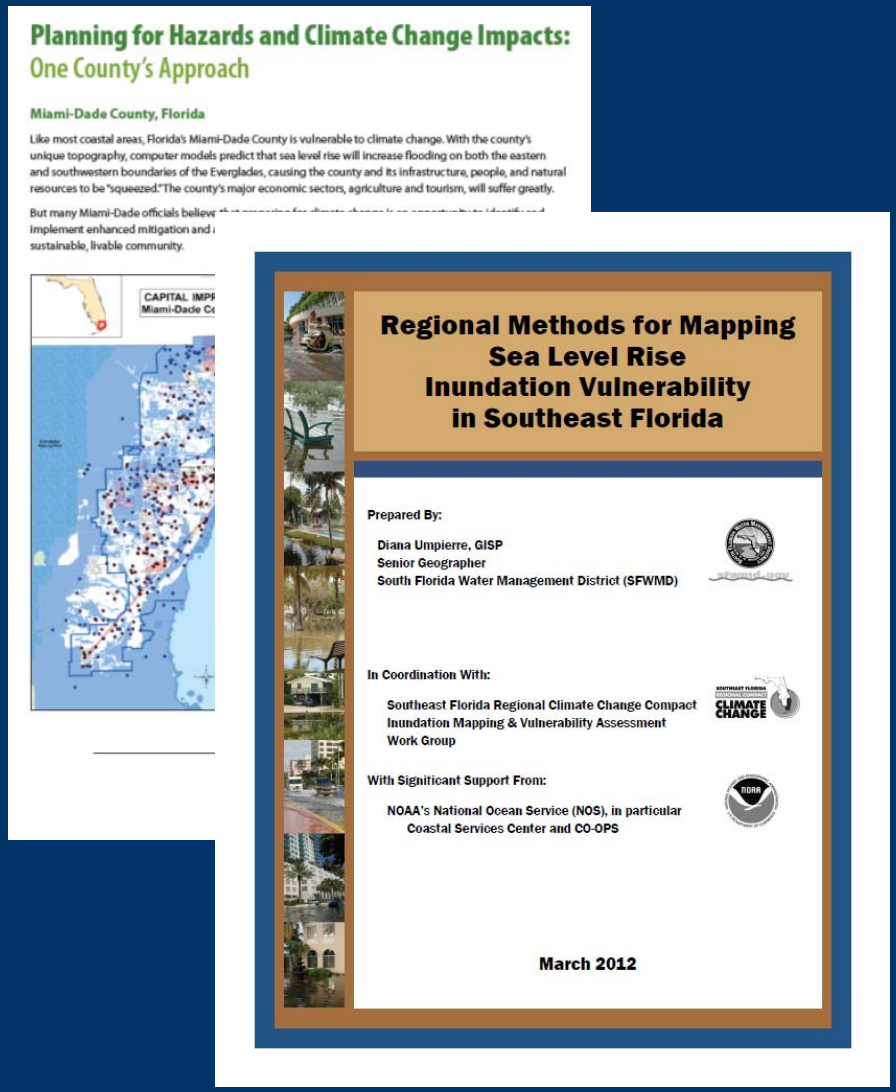
http://www.csc.noaa.gov/idiq/geospatial.html

- Four prime contractors with over 90 subs
- No overhead charges to states

Learn from others…

www.csc.noaa.gov/roadmap/

- **Miami-Dade County, FL**
  - Sustainability Plan
  - Climate Adaptation
  - Water Supply & Salt Intrusion
- **Delaware County, PA**
  - Hazard Mitigation Planning
  - Redevelopment & Brownfields
  - Watershed Planning
- **Town of Southold, NY**
  - Comprehensive Plan Update
  - Conservation Planning



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Publications, How-To Guides, Reports, Websites

www.csc.noaa.gov/publications

PUBLICATIONS

Filter by Category: All

PERIODICALS

Coastal Services Magazine
This bimonthly trade publication brings new ideas to coastal resource management programs.

Special Editions - Local Strategies for Addressing Climate Change: Volume 1 and Volume 2

Fellow News
A quarterly newsletter that provides information about the Coastal Management Fellowship Program.

Products and Services Catalog
Describes the products and services offered by the NOAA Coastal Services Center.

MAILING LISTS

Coastal Connections Newsletter
Coastal Services Magazine
Digital Coast Updates
Coastal GeoTools
Map Services Notification Group

Subscribe

COASTAL RESOURCE MANAGEMENT CUSTOMER SURVEY

Constituents of the NOAA Coastal Services Center are polled regarding their needs and capabilities.

See the Results

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Approaches and Resources

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Climate Adaptation

Join a Community of Practice.

Contribute to the website by uploading your resources

Share your thoughts on posts in the Blog.

Post upcoming climate-related events

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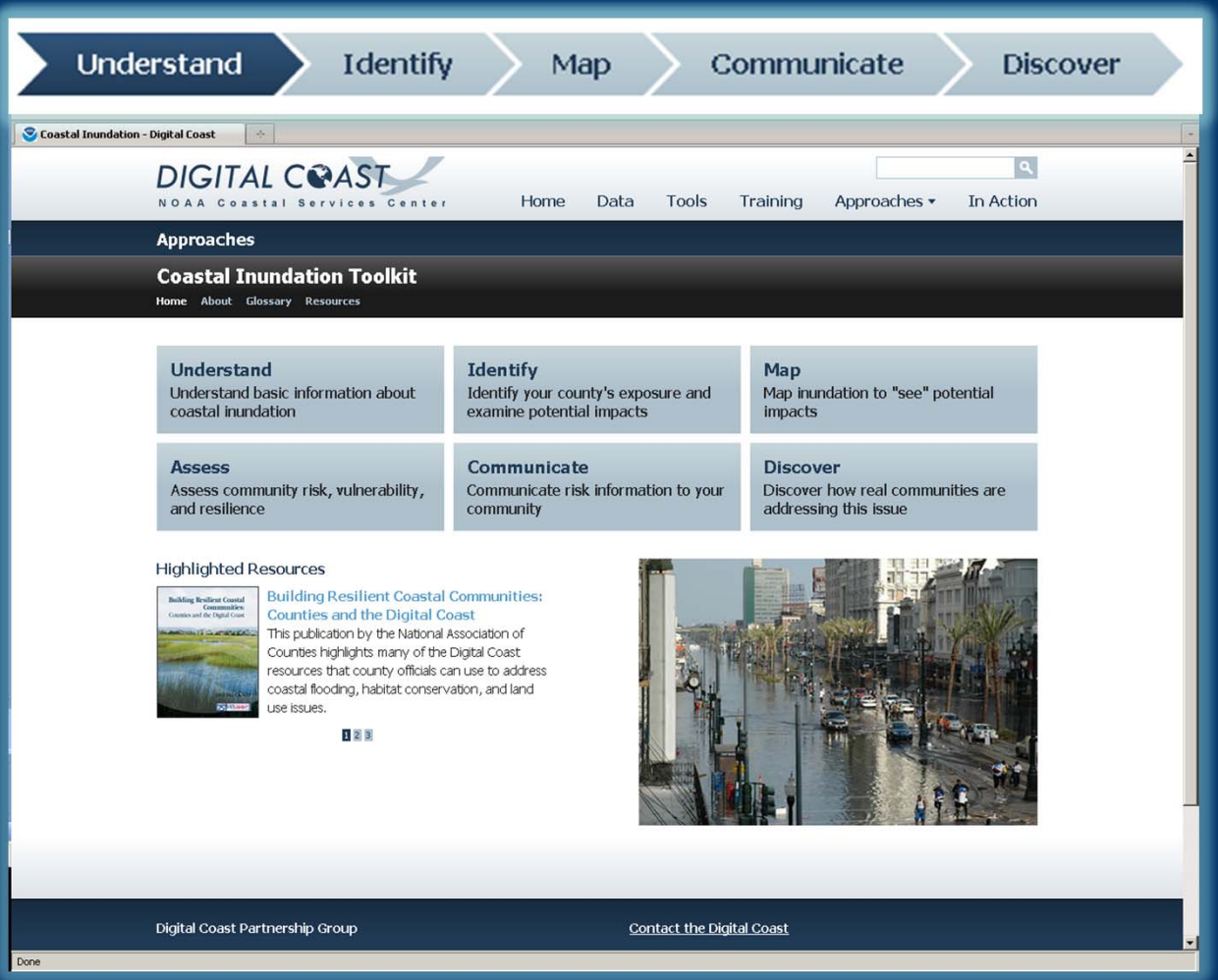
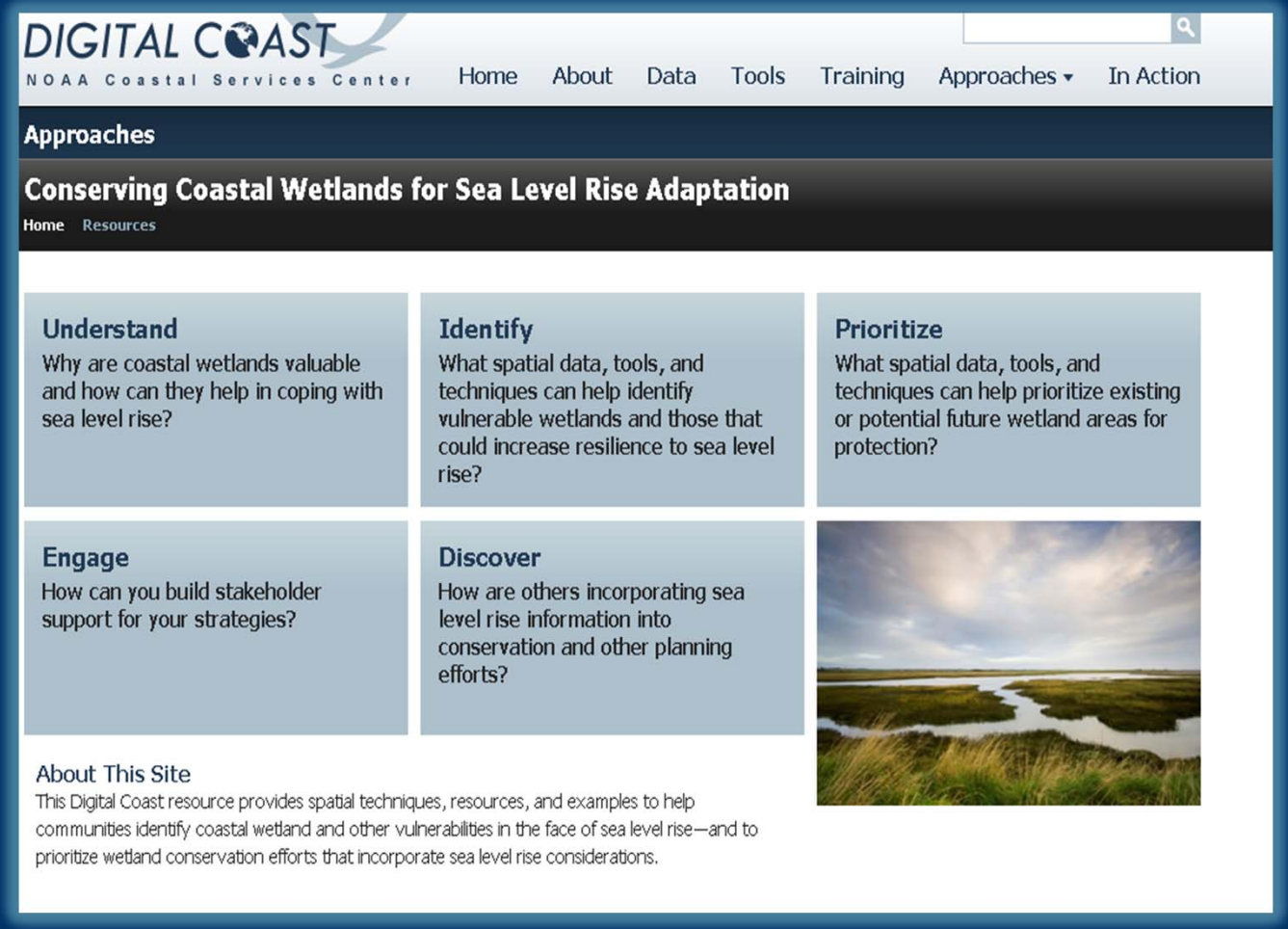
Coastal Inundation Toolkit

www.csc.noaa.gov/inundation/



Conserving Coastal Wetlands

http://www.csc.noaa.gov/digitalcoast/wetlands/



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Offshore Renewable Energy Planning

http://www.csc.noaa.gov/energy/

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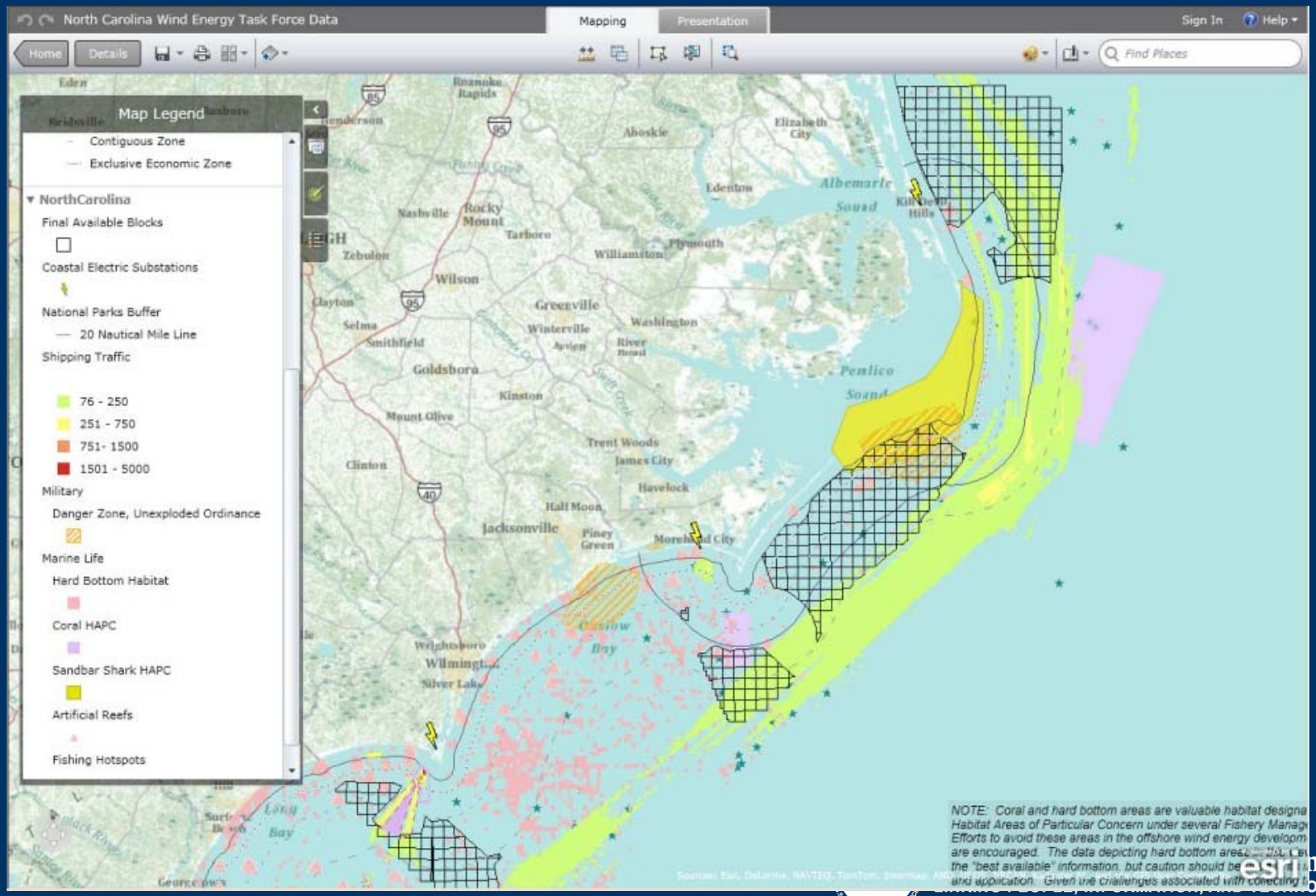
North Carolina
Renewable Energy Task Force



True Resilience !!

Source: San Francisco Water Management District

doug.marcy@noaa.gov

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