The Coastal Change Analysis Program and the Land Cover Atlas

Rebecca Love

NOAA Office for Coastal Management

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Natural Infrastructure = Greater Resilience

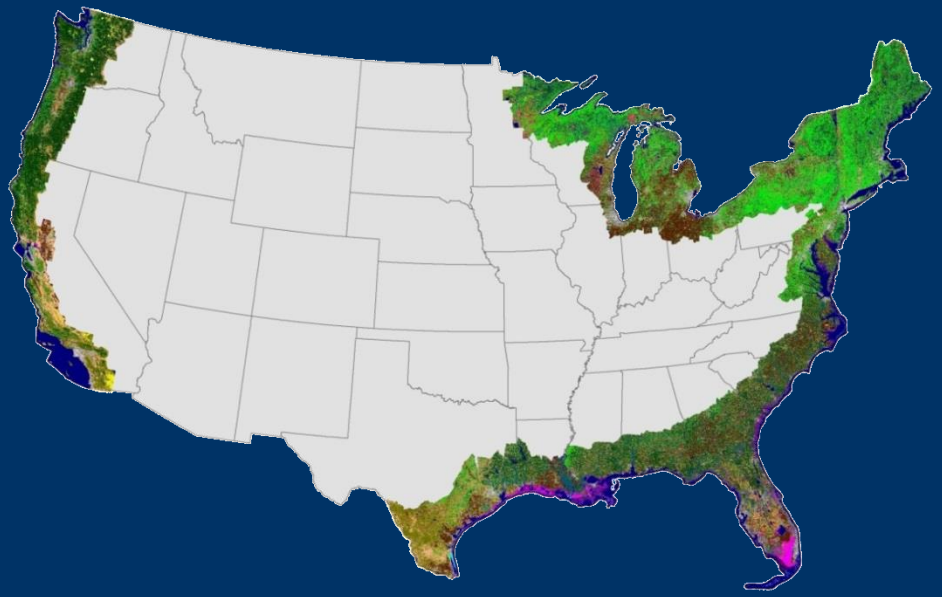
NOAA

C-CAP Regional Land Cover and Change

coast.noaa.gov/digitalcoast/data/ccapregional

- **NOAA maps 25% of the contiguous U.S. + Hawaii and Caribbean**
- **Coastal expression of the NLCD** (National Land Cover Database)
- **Added focus on wetland detail**
- **25 land cover categories at 30 meter resolution**
- **Updated every five years** (1996, 2001, 2006, 2010)

  *Some areas go further back



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Currently Funded 2015/2016 Updates

planning to complete full CONUS area by the fall-winter of 2018

Land Cover Atlas

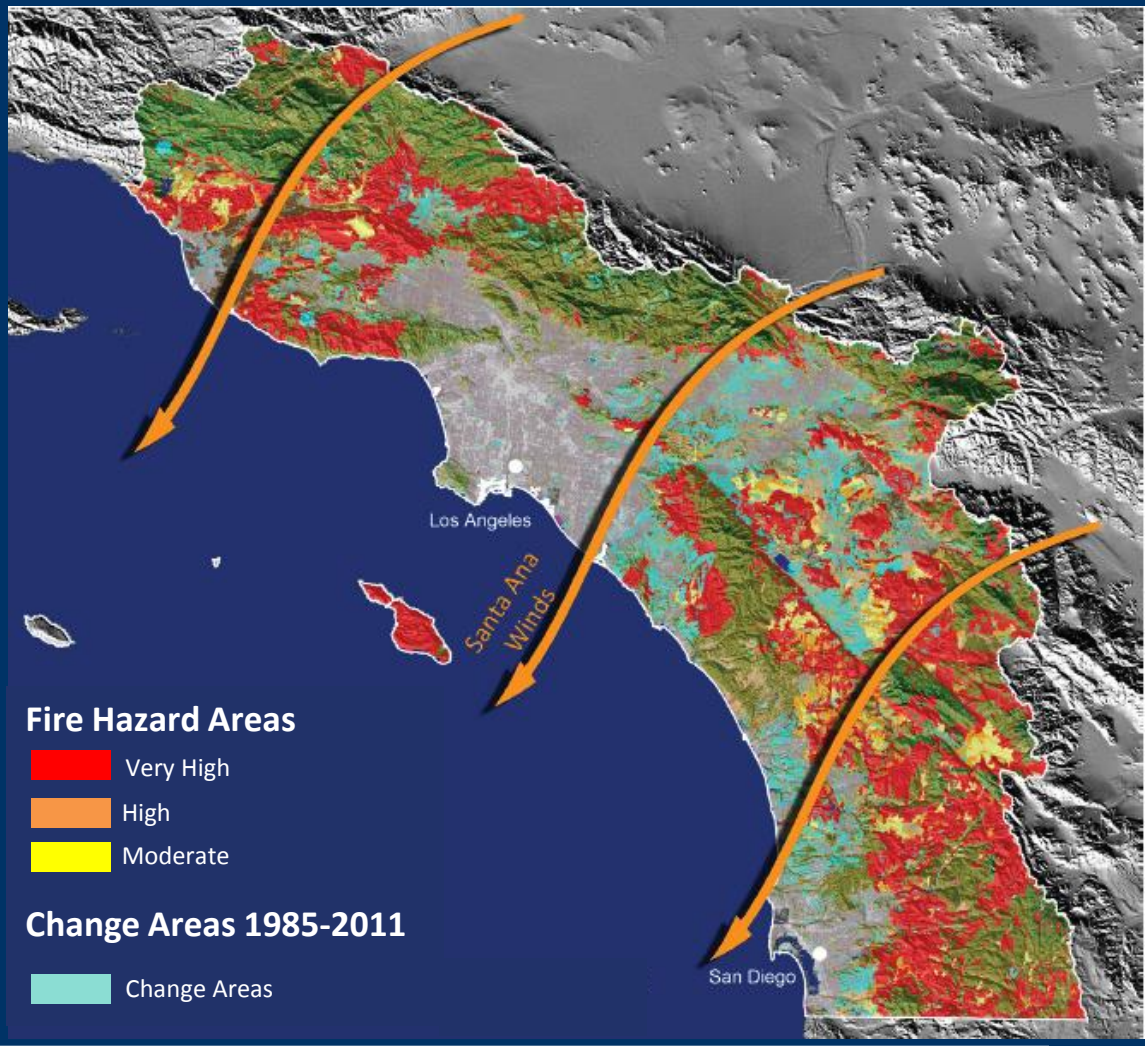
coast.noaa.gov/digitalcoast/tools/lca

- Provides maps and statistics for land cover change throughout the coastal U.S.
- Offers land cover change information at the county and watershed level
- Eliminates the need for GIS software or advanced technical expertise

http://coast.noaa.gov/digitalcoast/tools/lca

Assessing Fire Hazard Risk in Southern California

- Increased fire risk due to drought and encroaching development
- Examined land cover change over time
- Highest rates of urban growth between Los Angeles and San Diego



How To Use Land Cover Data as a Water Quality Indicator

A story map

1 Identify Potential Impacts from Impervious Surfaces

Impervious surfaces and other forms of development reduce the infiltration of water into the ground. Impervious surfaces often contribute to higher storm water runoff, greater sediment yields, and increased pollutant loads, all of which can degrade water quality. Sensitive streams, for instance, can be impacted by as little as 5 to 10 percent impervious surface area, with greater impairments expected when rates exceed 20 to 25 percent.

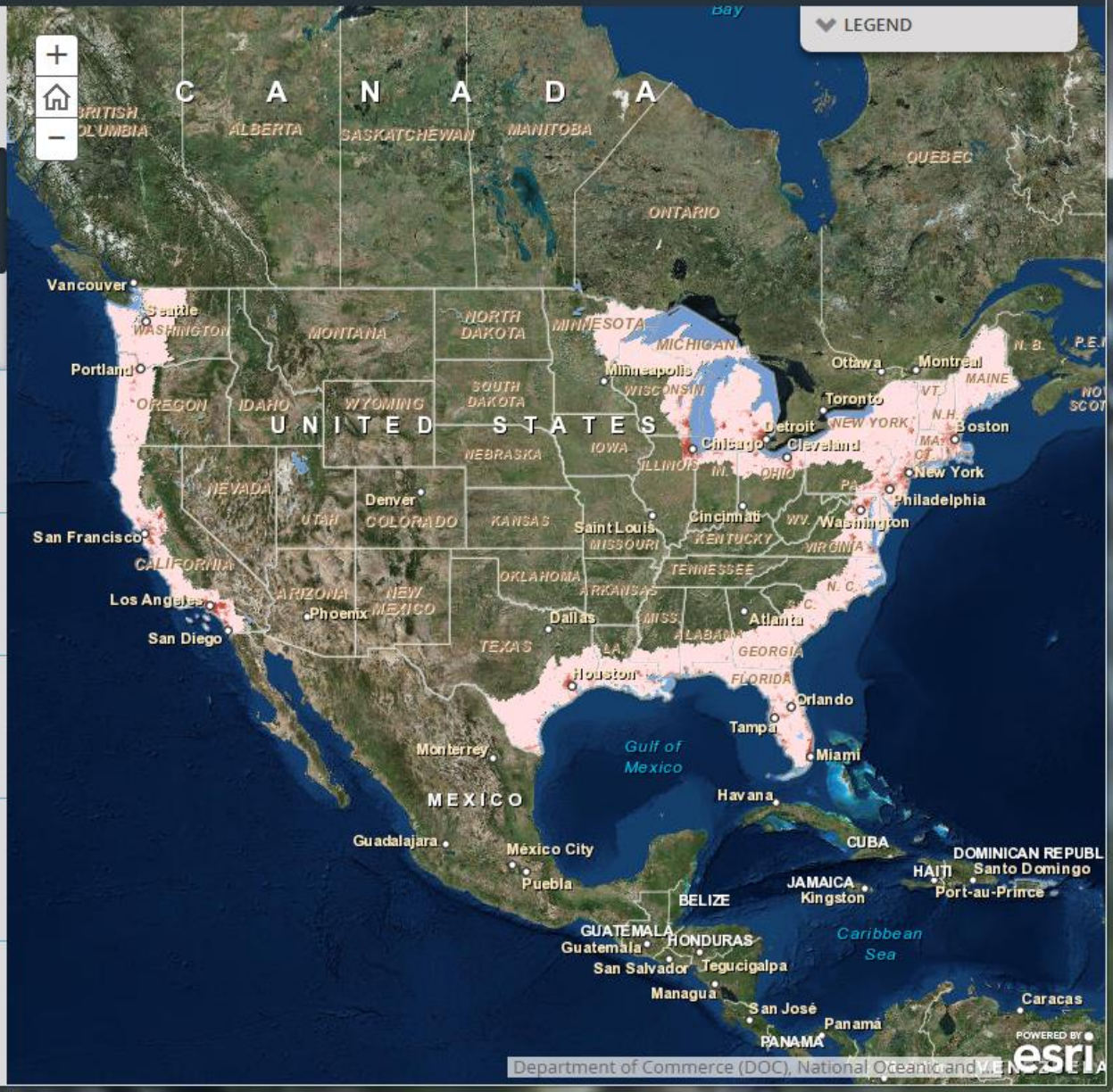
2 Identify Potential Effects of Forest Cover

3 Examine Relationship of Forest Cover to Impervious Area

4 Identify Whether Developed Grasses Could be a Factor

5 Examine Riparian Buffers

6 Examine Other Potential Water Quality Factors



coast.noaa.gov/digitalcoast/data/ccapregional

How To Use Land Cover Data as a Water Quality Indicator

A story map

1 Identify Potential Impacts from Impervious Surfaces

2 Identify Potential Effects of Forest Cover

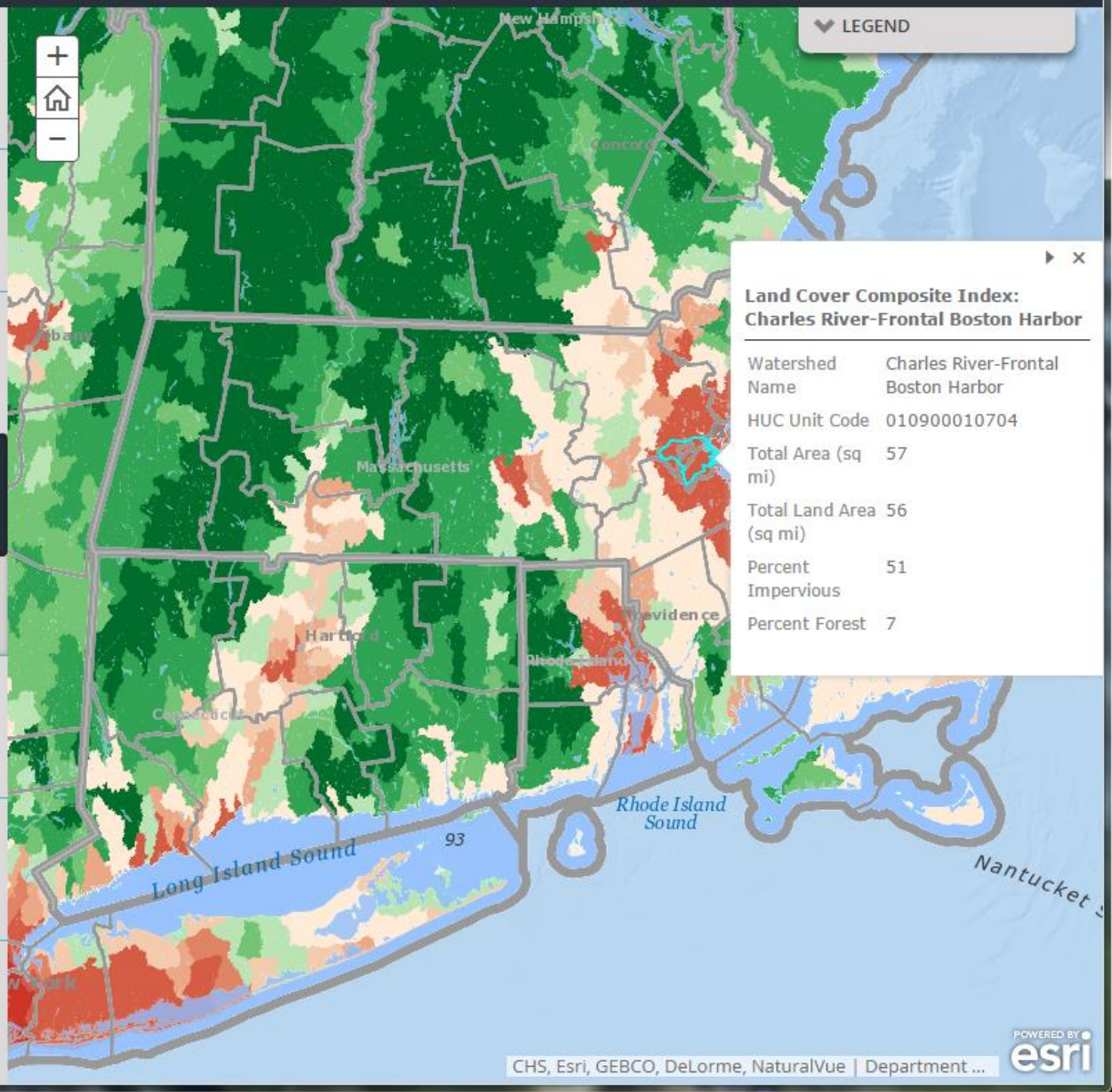
3 Examine Relationship of Forest Cover to Impervious Area

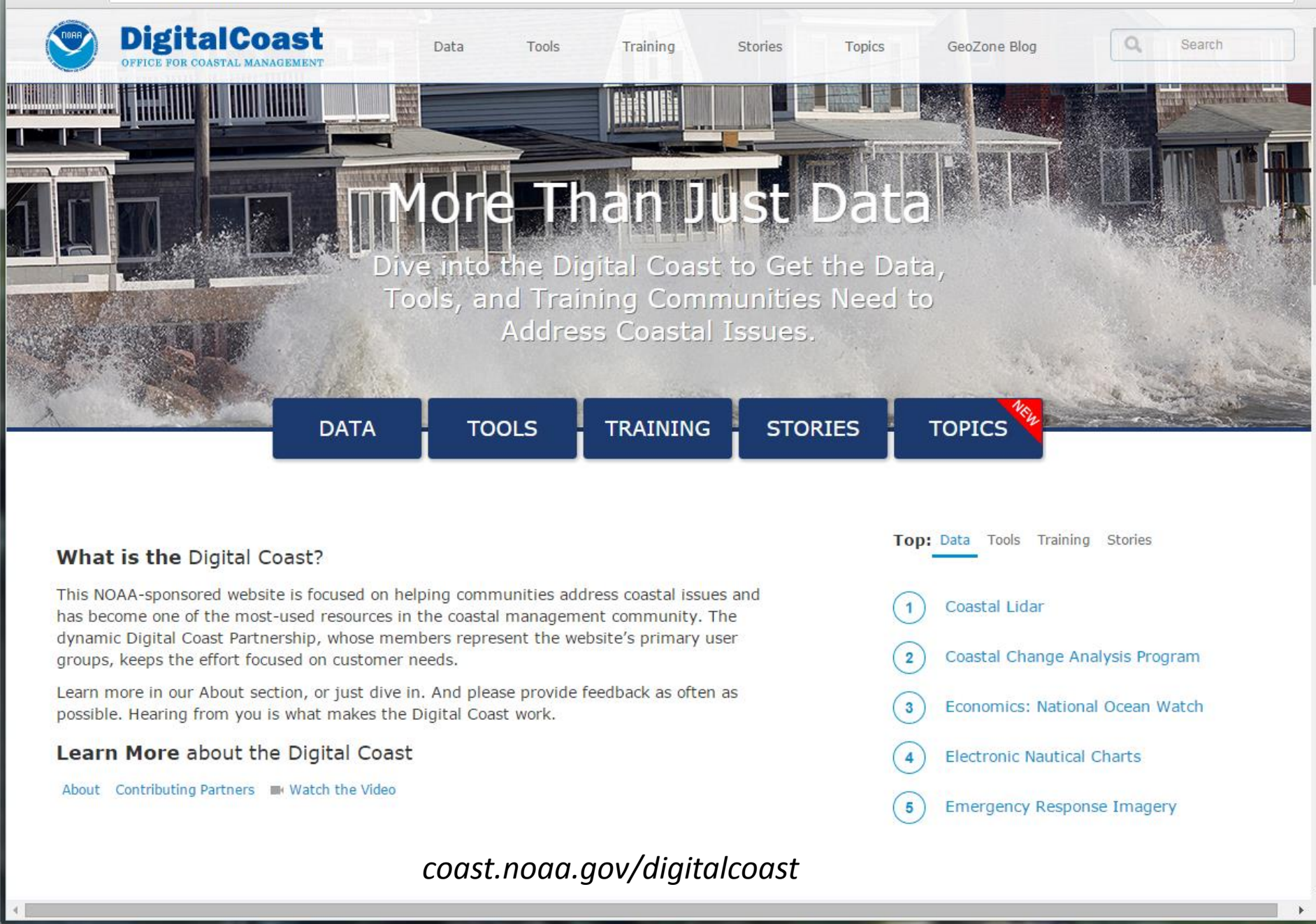
Watersheds are composed of groundwater recharge and storm water runoff generation areas. Forests and impervious surfaces represent the two ends of that continuum, with other land covers falling in between. In general, where impervious surfaces are limited in size and scope, forest cover exerts the most influence on water quality. Once impervious surfaces exceed a threshold, they are the determining factor.

4 Identify Whether Developed Grasses Could be a Factor

5 Examine Riparian Buffers

6 Examine Other Potential Water Quality Factors





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Topics

Partnerships Keep It Real

- NOAA Office for Coastal Management
- American Planning Association
- Association of State Floodplain Managers
- Coastal States Organization
- National Association of Counties
- National Estuarine Research Reserve Association
- National States Geographic Information Council
- The Nature Conservancy
- Urban Land Institute

Connect with the Digital Coast

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Lake Level Viewer *coast.noaa.gov/llv*	**Brandon.Krumwiede@noaa.gov**
Coastal Flood Exposure Mapper *coast.noaa.gov/floodexposure*	**Lauren.Long@noaa.gov**
C-CAP data &Land Cover Atlas *coast.noaa.gov/ccapatlas*	**Rebecca.Love@noaa.gov** **Nate.Herold@noaa.gov**

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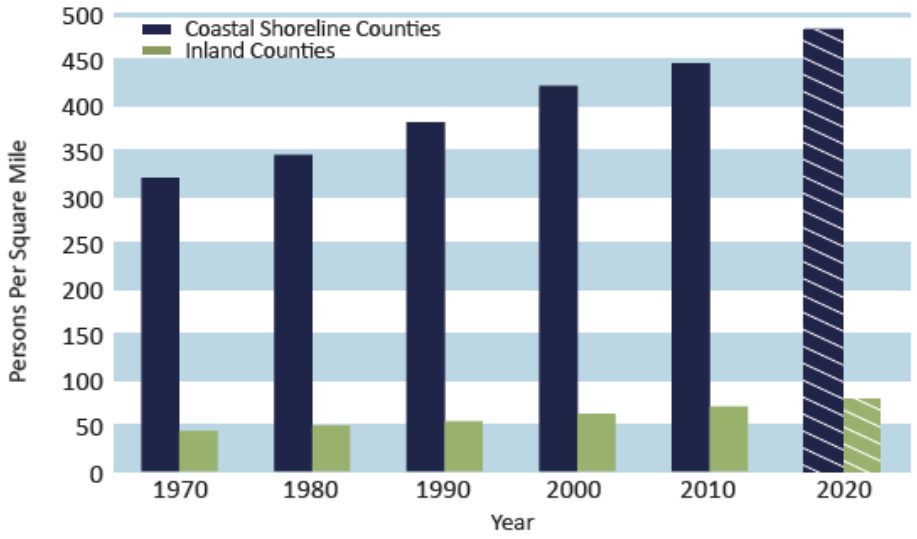
Today's Agenda

- **The Importance of Hazard Resilience in Coastal Communities**
- **Visualize the Impacts: The Lake Level Viewer**
  - Brandon Krumwiede
- **Communicate Hazard Vulnerabilities: Coastal Flood Exposure Mapper**
  - Lauren Long
- **See What's on the Ground: C-CAP Land Cover Data & Land Cover Atlas**
  - Rebecca Love
- **Questions & Answers**

More People in Coastal Communities

Population Density

Figure 5 | Population Density Change in Coastal Shoreline Counties and Inland Counties from 1970 to 2020



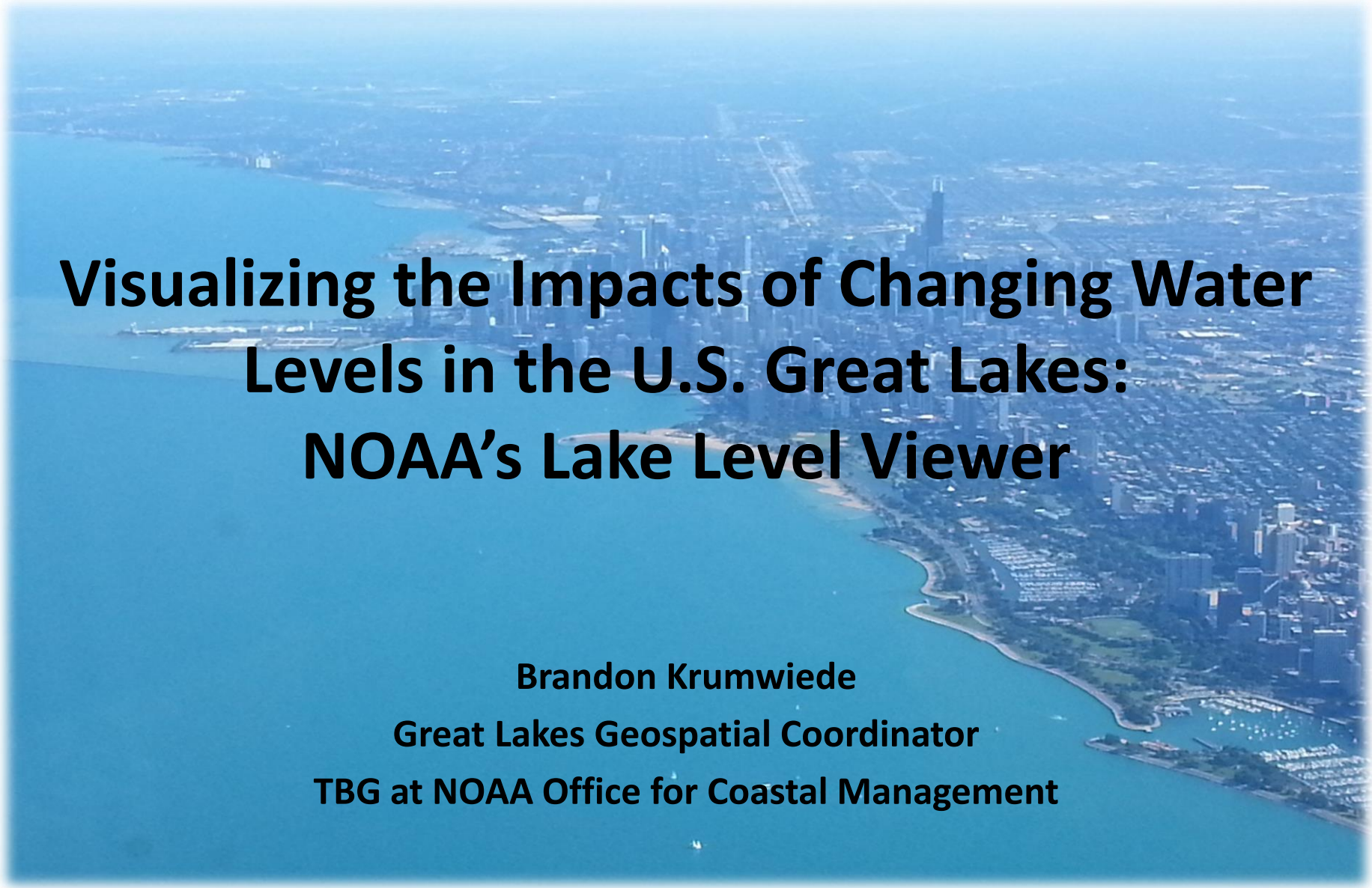
The Bottom Line

In 2010, 39 percent of the U.S. population lived in Coastal Shoreline Counties (less than 10 percent of the total land area excluding Alaska). The population density of Coastal Shoreline Counties is over six times greater than the corresponding inland counties.

Note: Density values include U.S. Territories and exclude Alaska.

Source: U.S. Census Bureau, 2011b; NOAA, 2012; Crowell et al., 2010

Coastal Communities Are at Risk



Visualizing the Impacts of Changing Water Levels in the U.S. Great Lakes: NOAA's Lake Level Viewer

Brandon Krumwiede

Great Lakes Geospatial Coordinator

TBG at NOAA Office for Coastal Management

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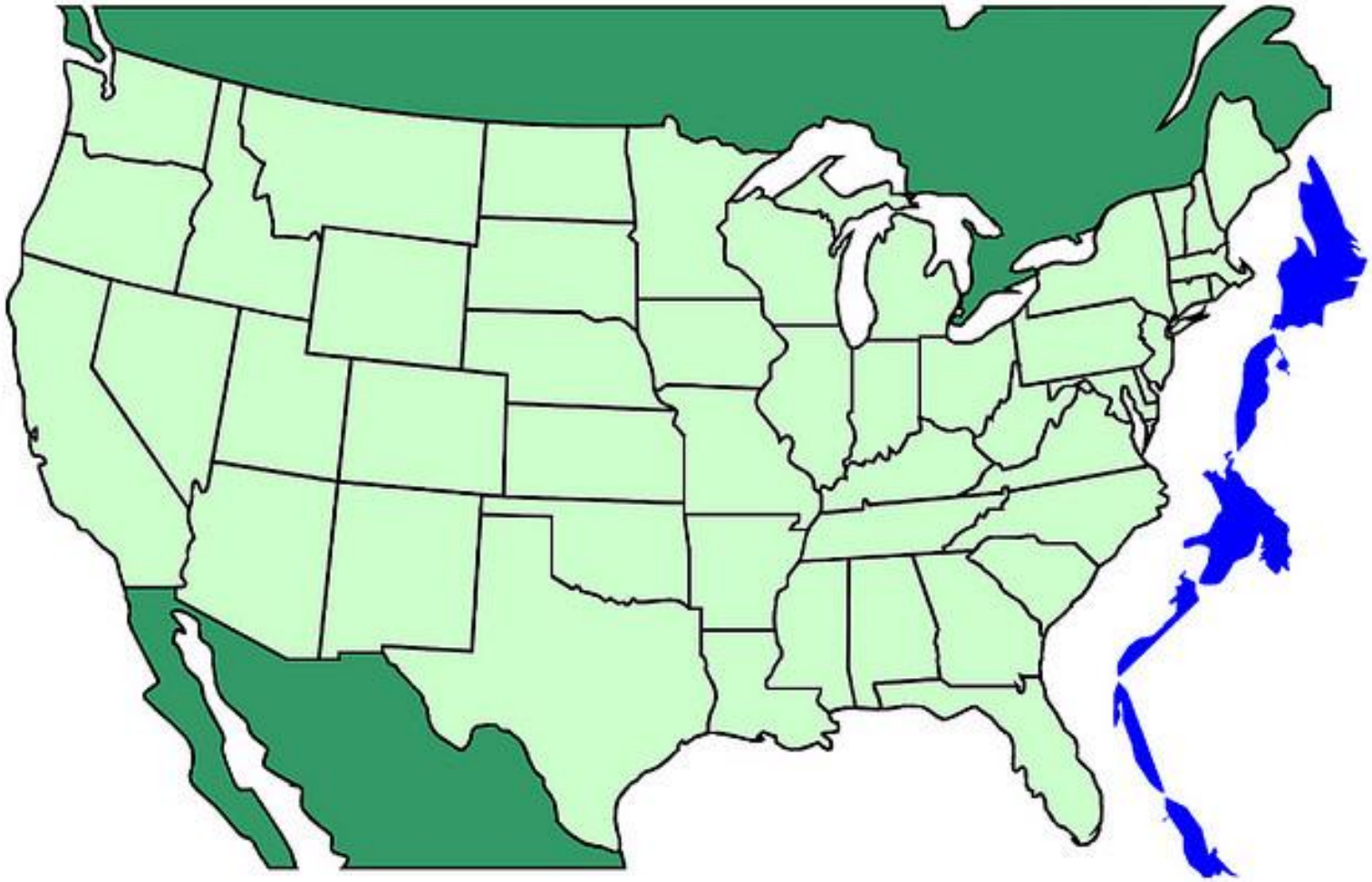
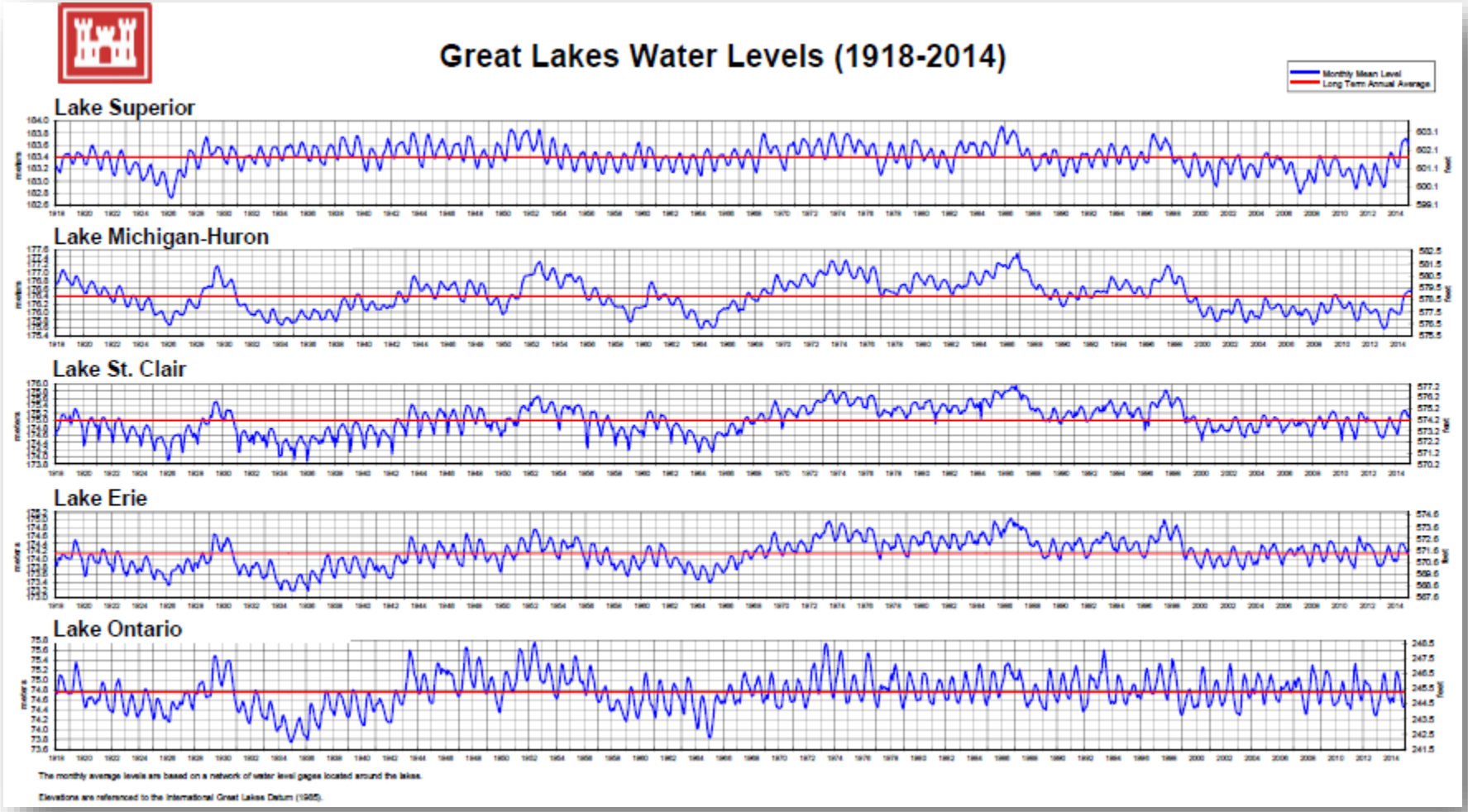
Great Lakes Coastlines



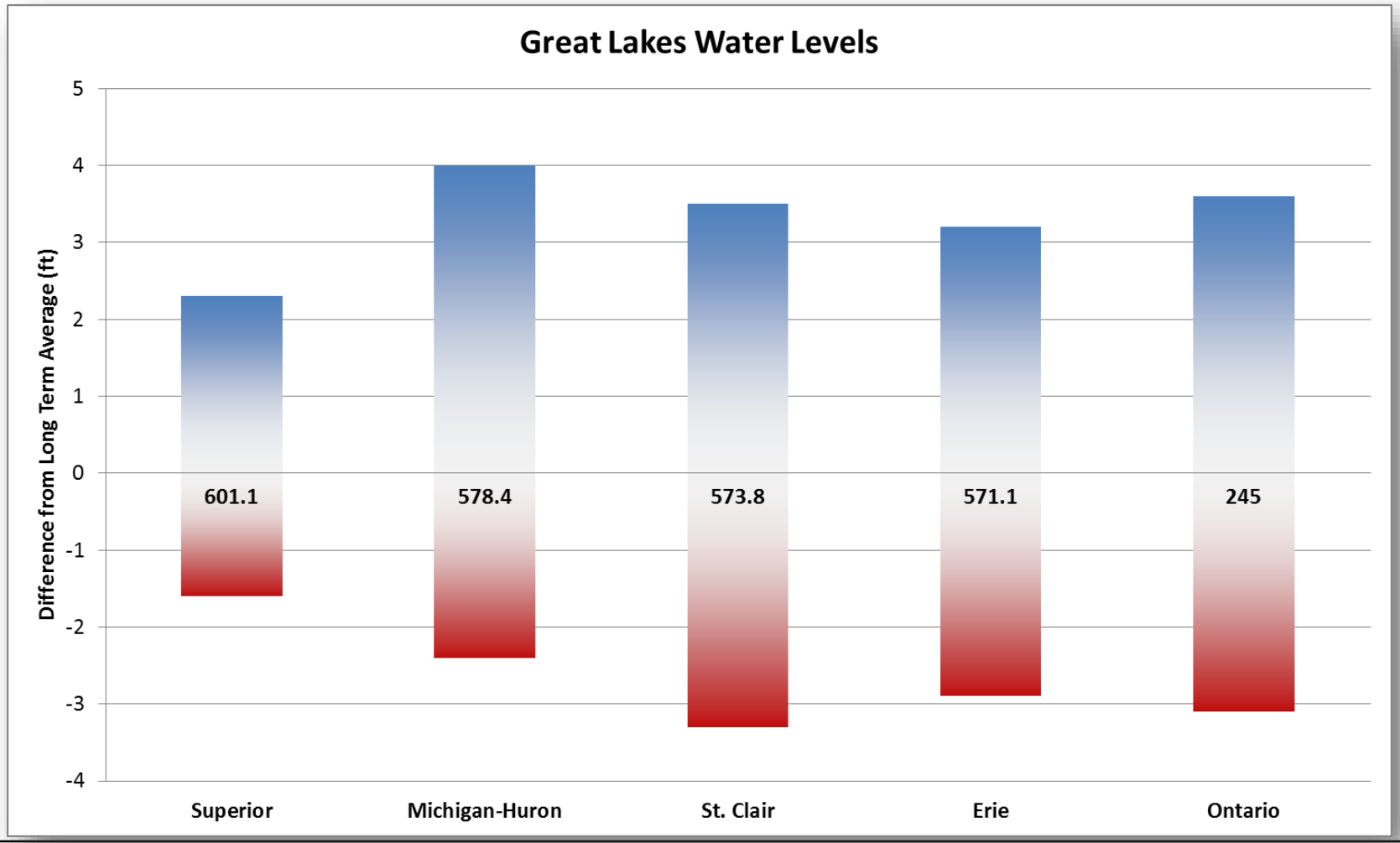
The Challenge…

The Impacts of Changing Water Levels

Water Level Variability



Water Level Variability



2013 Record Lows

2 Great Lakes Hit Record Low Water Levels

John Flesher | Associated Press

Published: February 6, 2013

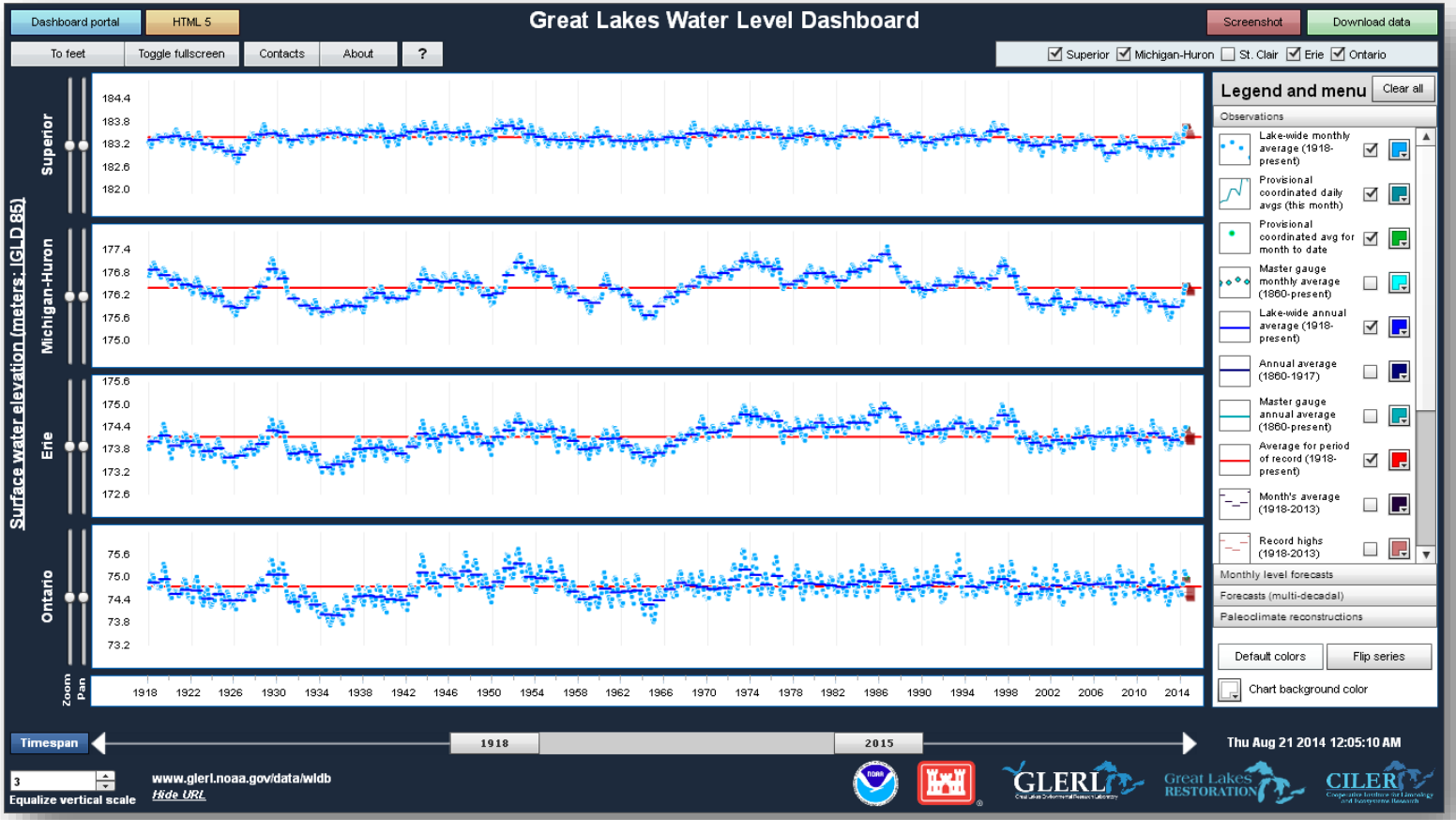
The sun rises over Chicago on the shores of Lake Michigan, which – along with Lake Huron – has hit its lowest water level ever recorded.

What is the Lake Level Viewer?

- Work on the Lake Level Viewer began over 2 years ago
- First official release in November 2014
- Funded by the Great Lakes Restoration Initiative
- Fills a critical information data gap:
  1. 40% of Coastal Storms Program survey respondents said current data on future lake level changes are inadequate
  2. Only 26% said existing tools to work with or visualize these data are adequate

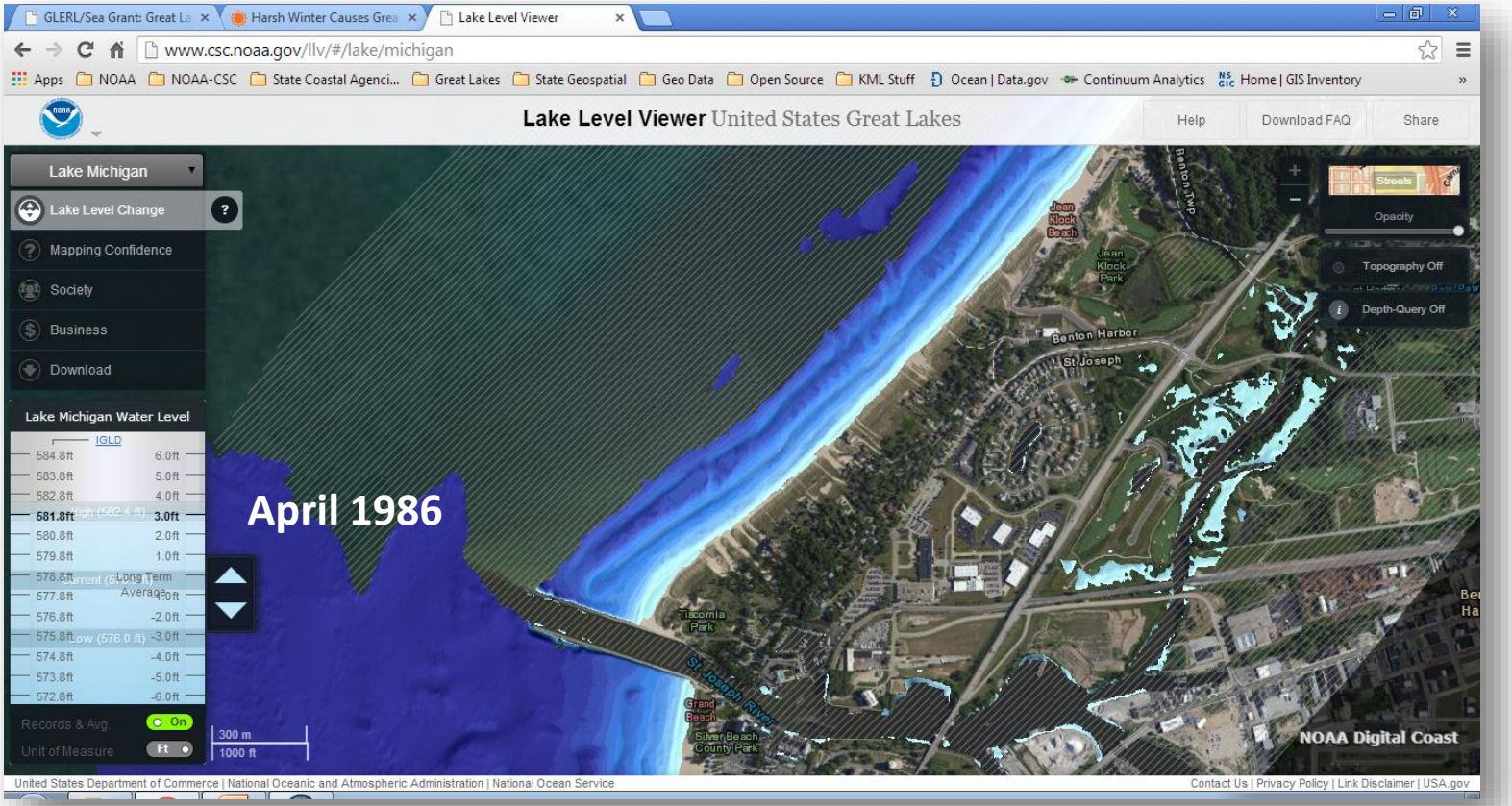
Source: 2013 Shoreline Change Workshop: Perspectives on the Great Lakes Survey

What is the Lake Level Viewer?



Use this data…

What is the Lake Level Viewer?



…to visualize the impacts

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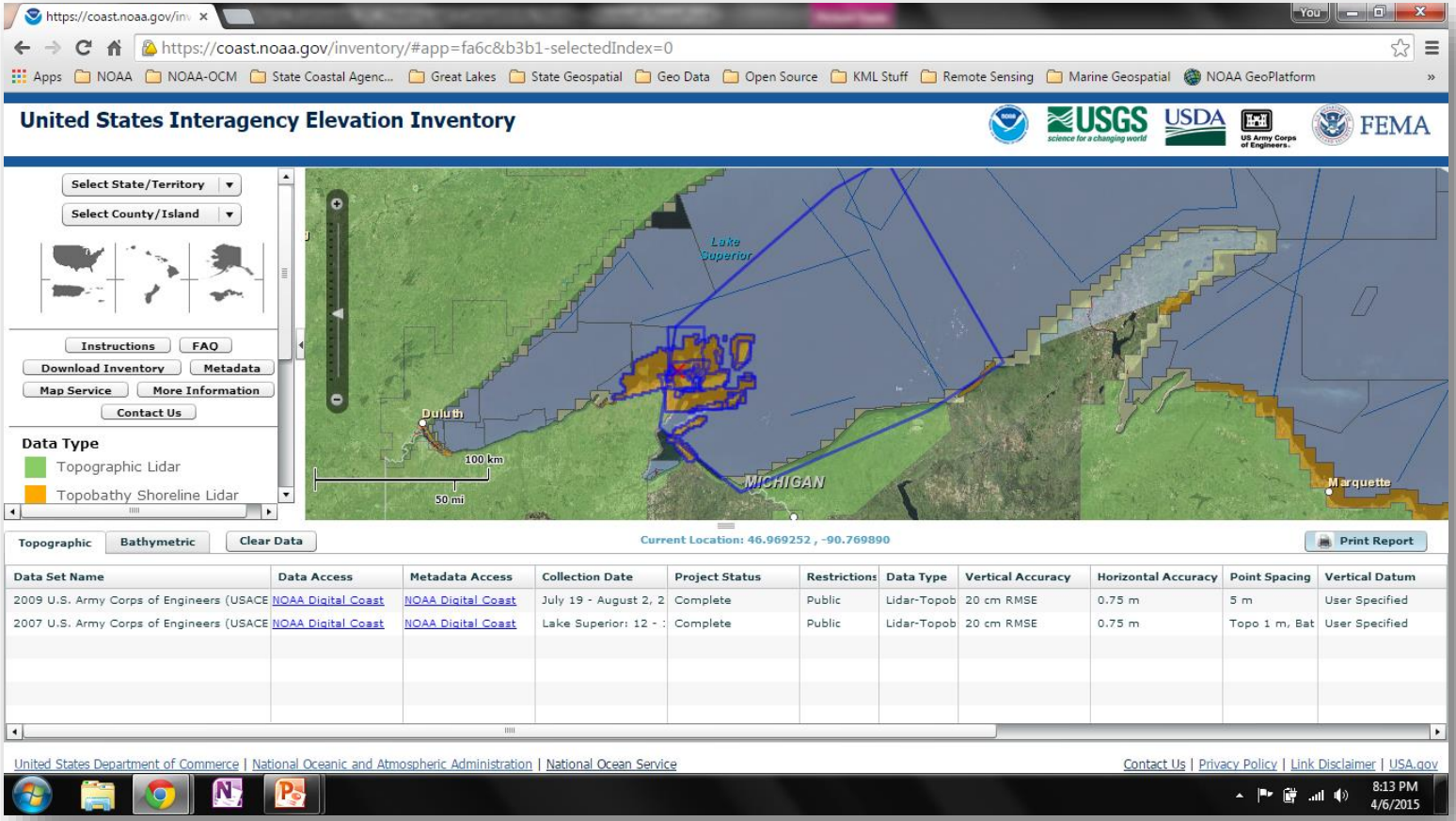
Lake Level Viewer Development

Requirements

- Use best available, high accuracy topo/bathy Lidar data to build a seamless Digital Elevation Model (DEM) for Great Lakes coastline
- Map lake levels below and above each lake's long term average water to visualize the impacts of both flooding and low lake levels (+/- 6 feet)
- Develop photo simulations at local landmarks to see impacts
- Make the data available

Lake Level Viewer Development

US Interagency Elevation Inventory: coast.noaa.gov/inventory/



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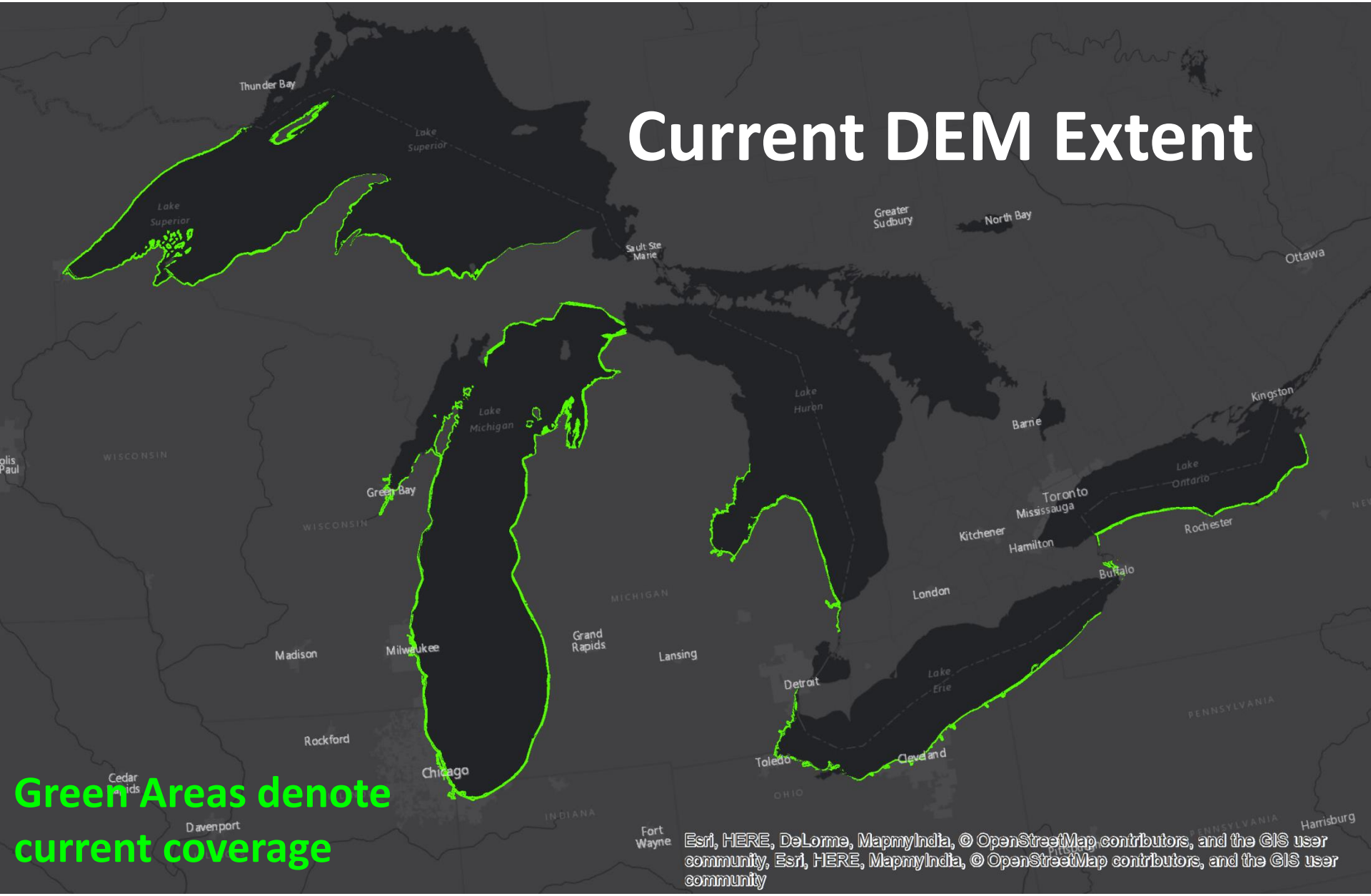
Current DEM Extent



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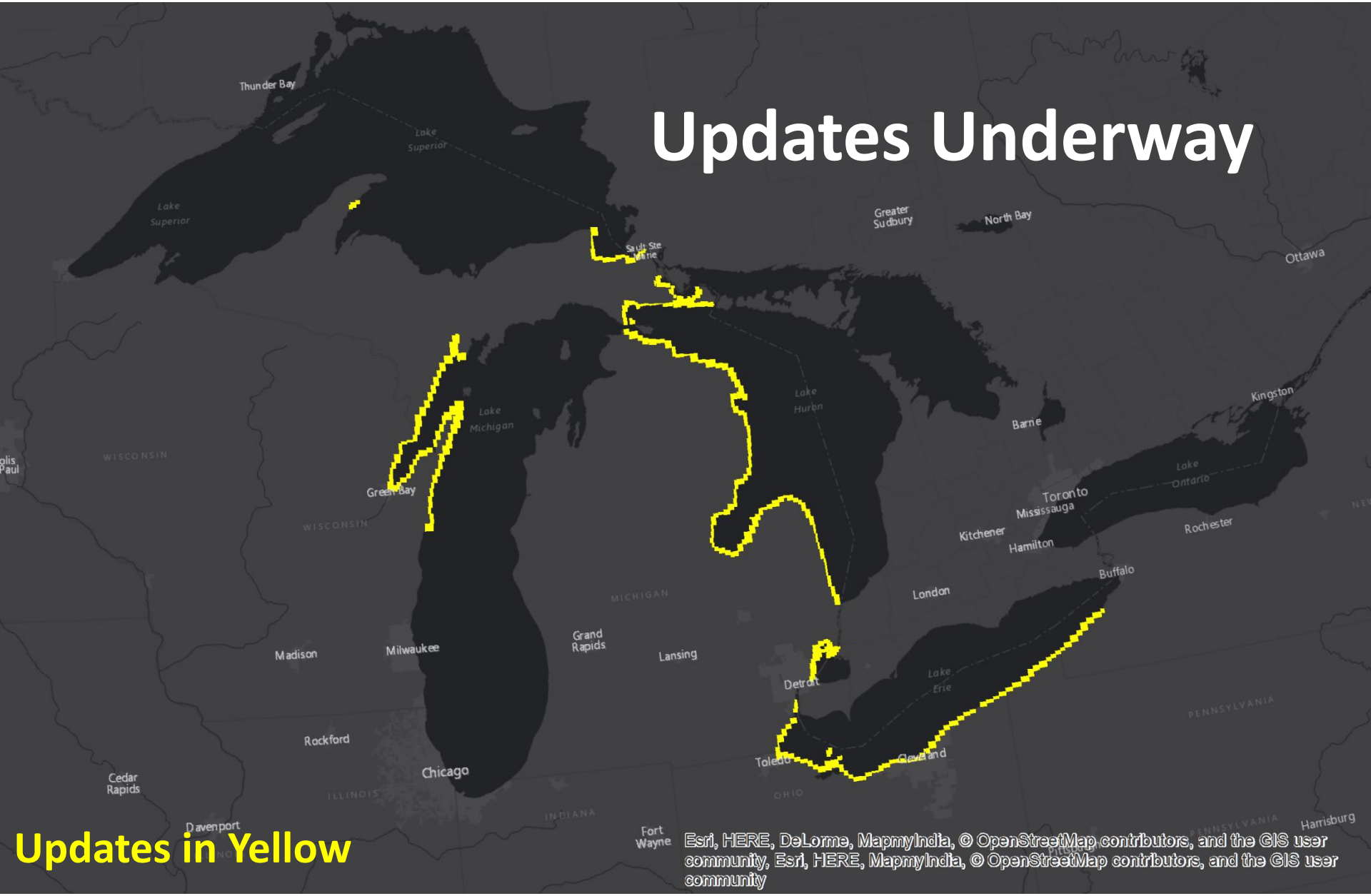
Lake Level Viewer Demonstration

Lake Level Viewer Next Steps

- Update with new topo/bathy data and fill in data gaps (LiDAR, USACE Dredge Surveys, multibeam)
- Adjust buffers and extend coverage to reflect full inundation areas
- Continue to collect user feedback on Version 1.0
- Enhancements for management applications based on user feedback

Updates Underway



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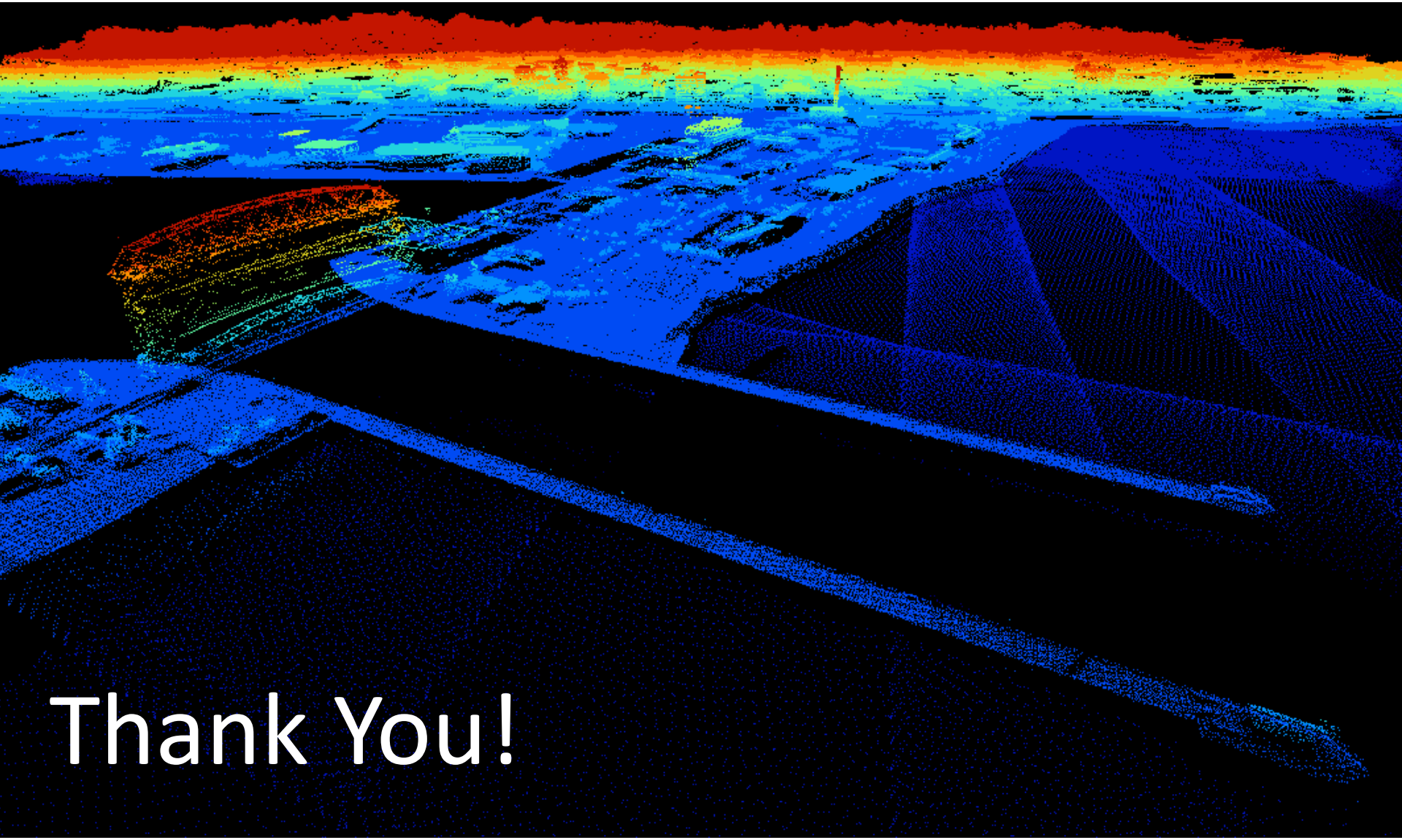
Thank You!

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Coastal Flood Exposure Mapper

Contributing Partners: NOAA Office for Coastal Management

Overview | Support

Get It Now

This tool supports users undertaking a community-based approach to assessing coastal hazard risks and vulnerabilities by providing maps that show people, places, and natural resources exposed to coastal flooding. This product is based on knowledge and experiences the Office for Coastal Management has in community-based risk and vulnerability assessments.

The current geography includes the East Coast and Gulf of Mexico.

Features

- **Allows** users to select a location and explore maps that show people, places, and natural resources exposed to coastal flood hazards
- **Creates** a collection of maps to download or share online to communicate flood exposure
- **Provides** guidance for using the maps to engage community members and stakeholders in conversations about potential coastal flood impacts
- **Offers** access to map services and tips on using them in an online mapping platform

Related Data

- Coastal Change Analysis Program Regional Land Cover
- Spatial Trends in Coastal Socioeconomics

Related Training

- Climate Adaptation for Coastal Communities
- Coastal Inundation Mapping
- Introducing Green Infrastructure for Coastal Resilience
- Roadmap for Adapting to Coastal Risk

Related Tools

- C-CAP Land Cover Atlas
- Sea Level Rise Viewer

www.coast.noaa.gov/digitalcoast/tools/flood-exposure

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Select the Flood Hazards Map or One of the Community Exposure Maps

Select a section below to view maps showing flood hazards or different aspects of community exposure to those flood hazards.

First-time user? Starting with Flood Hazards is a good idea.

Flood Hazards

Flooding events are among the more frequent, costly, and deadly hazards that can impact coastal communities. There are two types:

- Short-term (episodic) – Temporary flooding caused by extreme conditions, including storm surge, tsunamis, inland flooding, and shallow coastal flooding.
- Long-term (chronic) – Flooding caused by a rise in relative sea level or some other change in conditions.

Societal Exposure

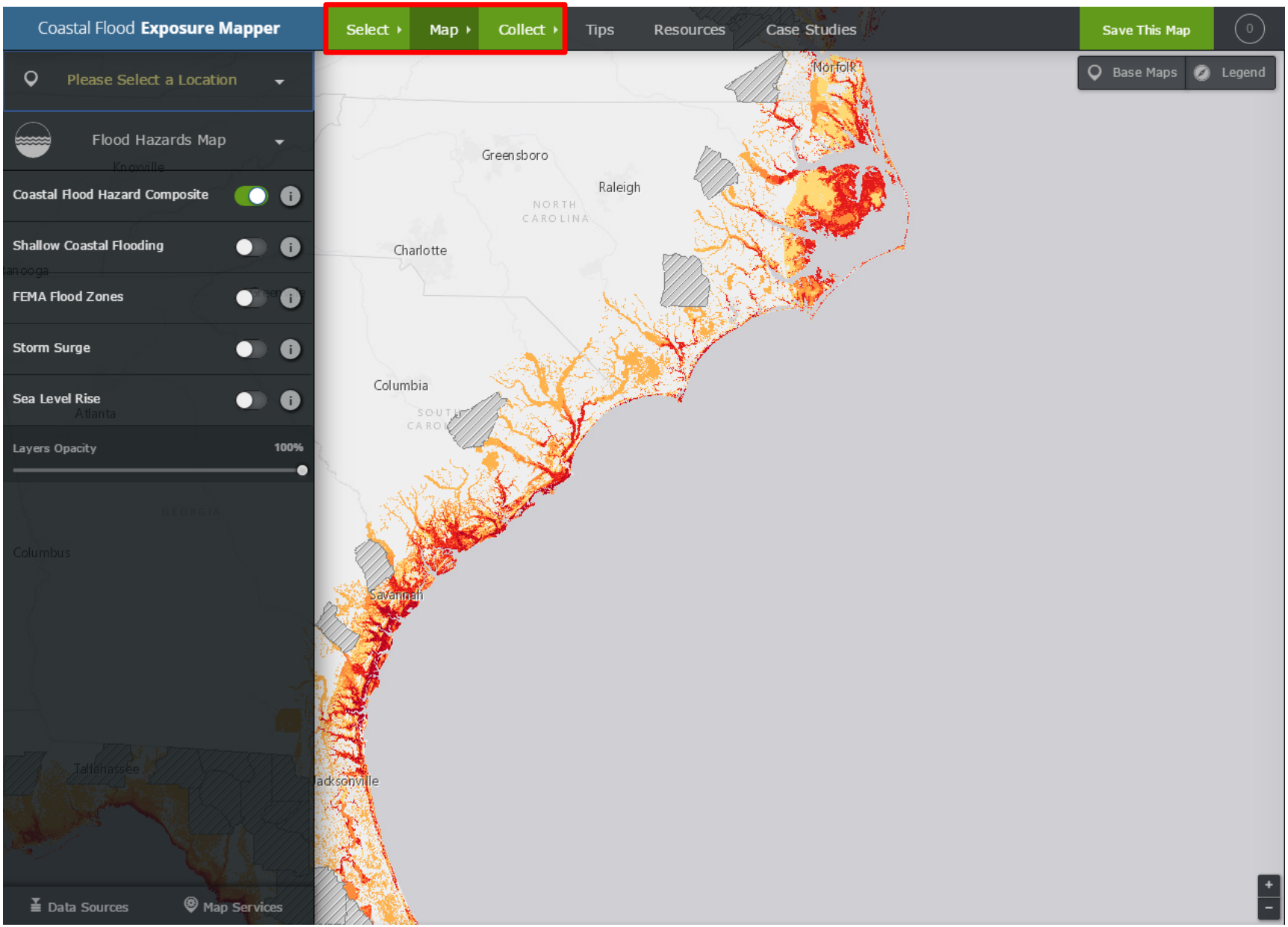
Understanding the populations that live in or near coastal flood-prone areas is an important information need, since residents who are elderly, who live in high-density areas, or who are impoverished may merit special considerations.

Infrastructure Exposure

Community infrastructure, including roads, bridges, and water and sewer systems, can be damaged by coastal flooding. Communities should first assess infrastructure vulnerabilities and associated environmental and economic issues to determine what steps are needed to protect these assets.

Ecosystem Exposure

Natural areas provide important benefits to coastal communities, including hazard protection, flood storage, water quality maintenance, fisheries support, and recreational opportunities. Communities can increase resilience by protecting natural areas along the coast that are exposed to flooding and adjacent inland areas.



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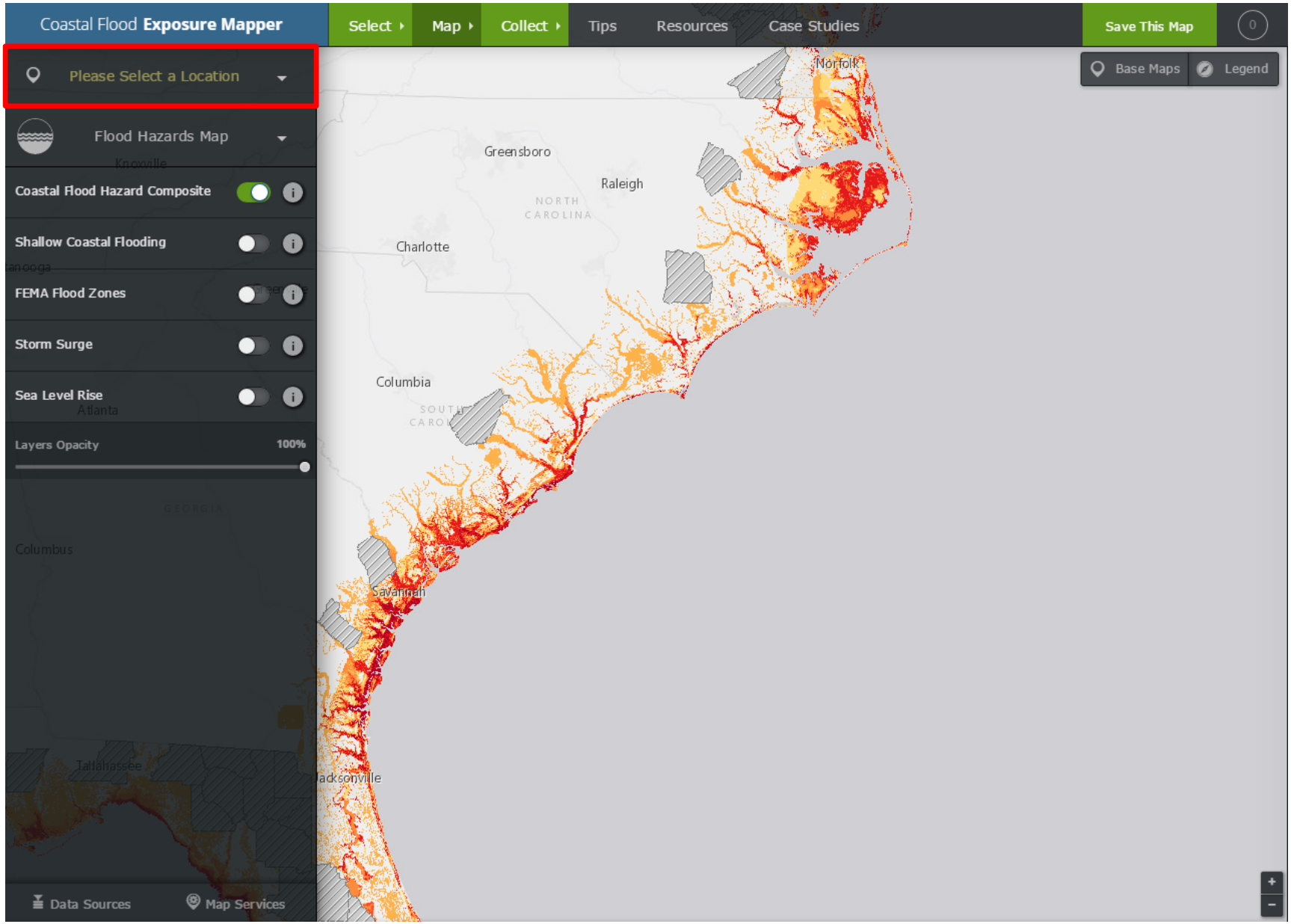

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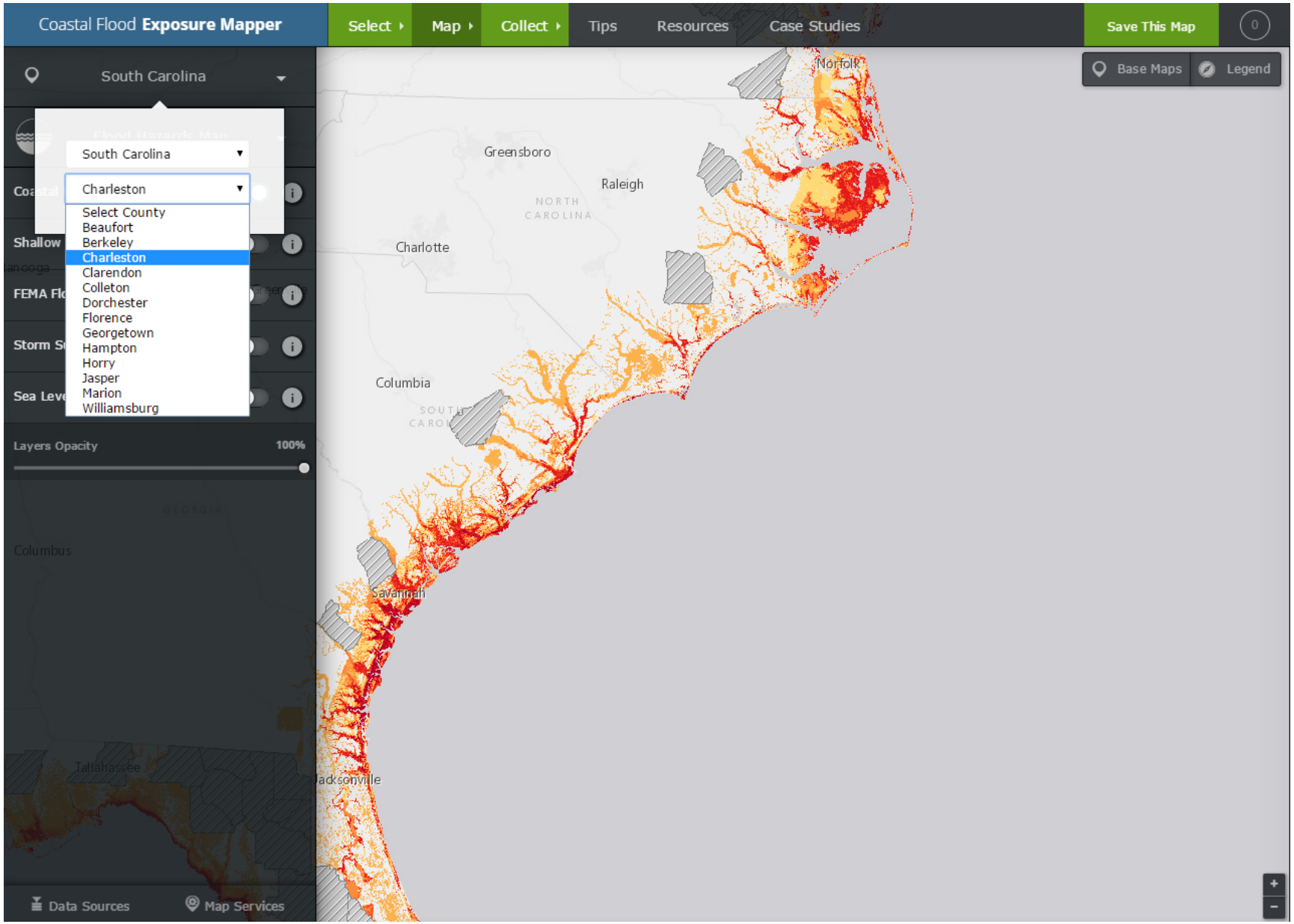

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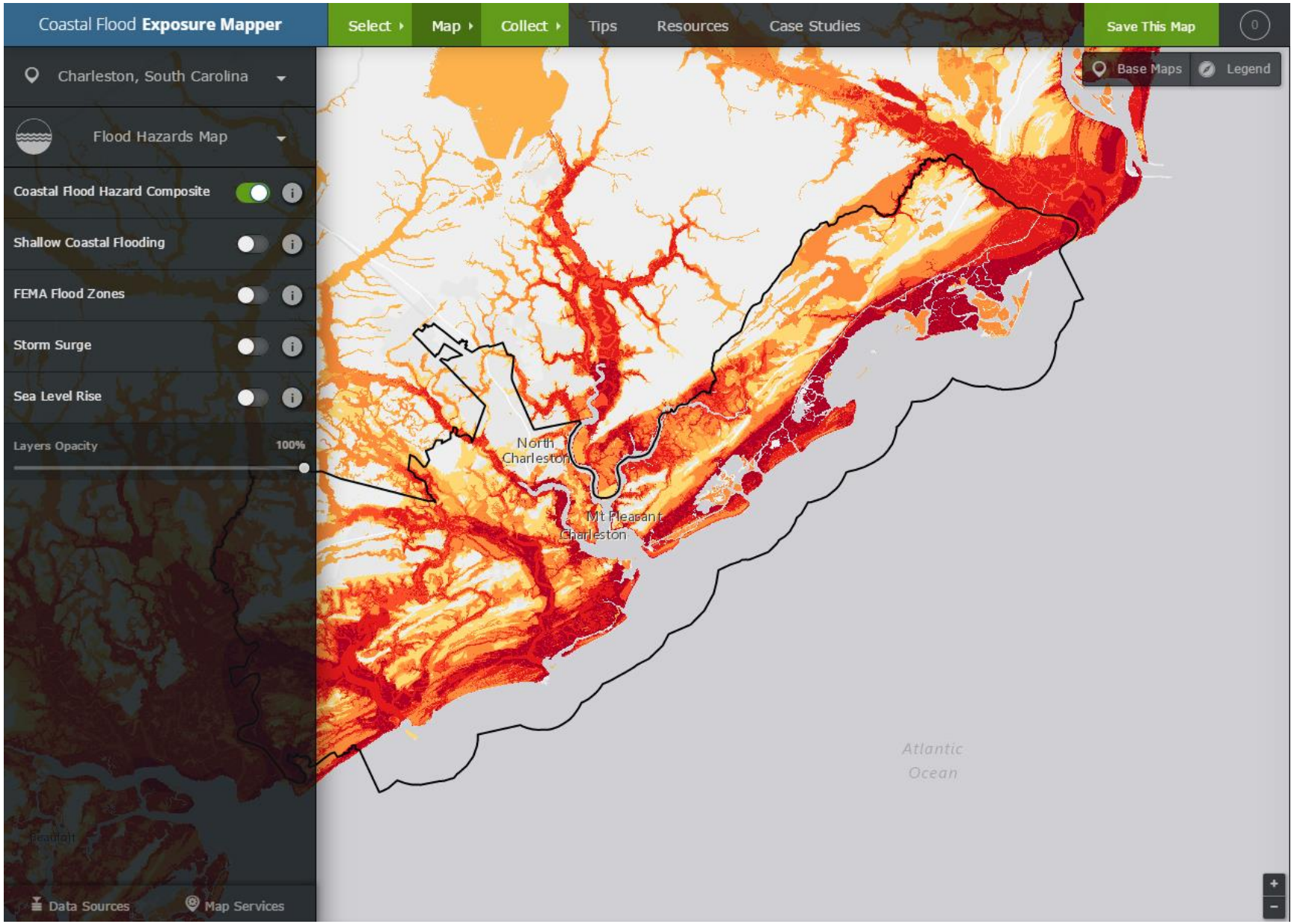

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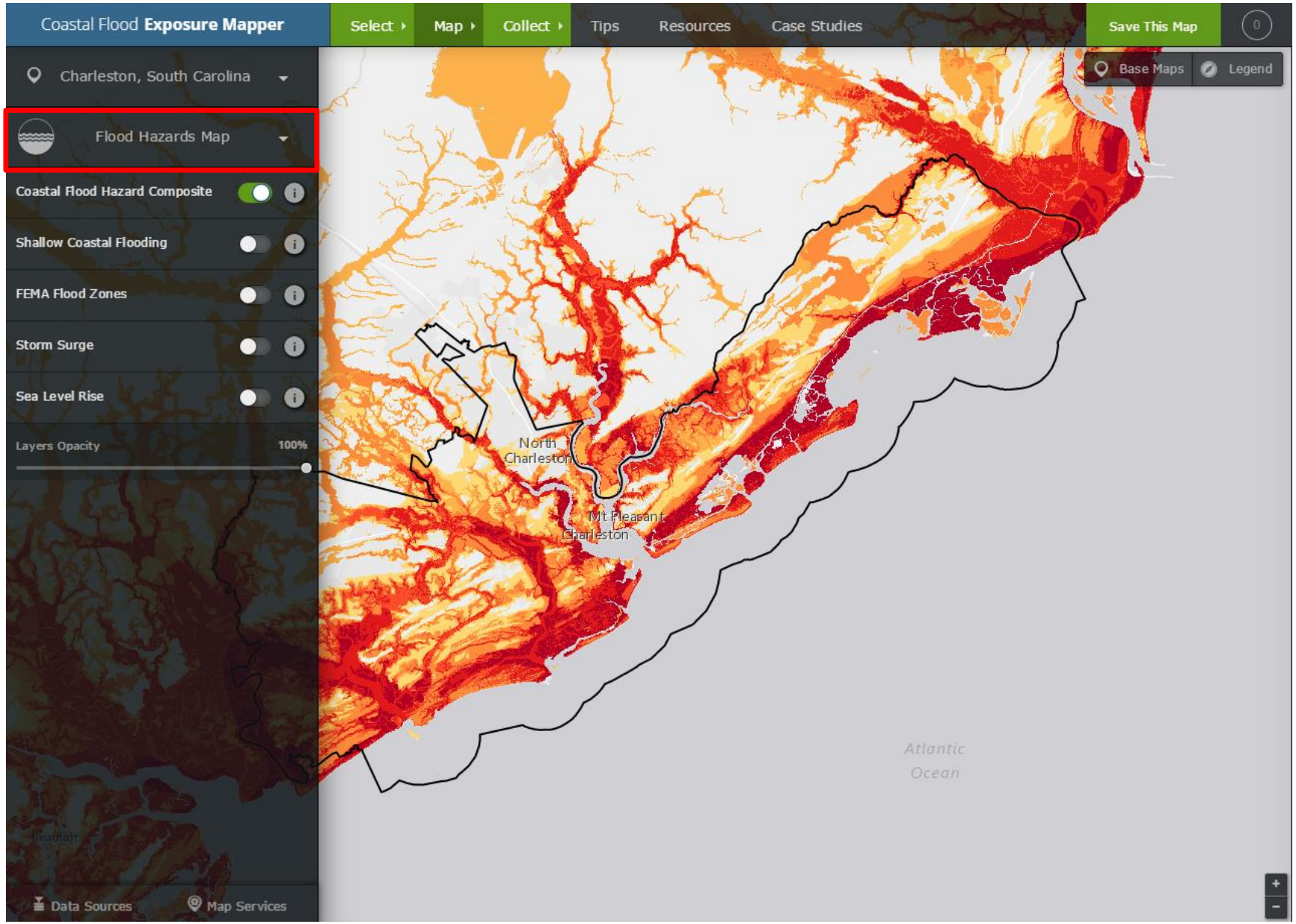

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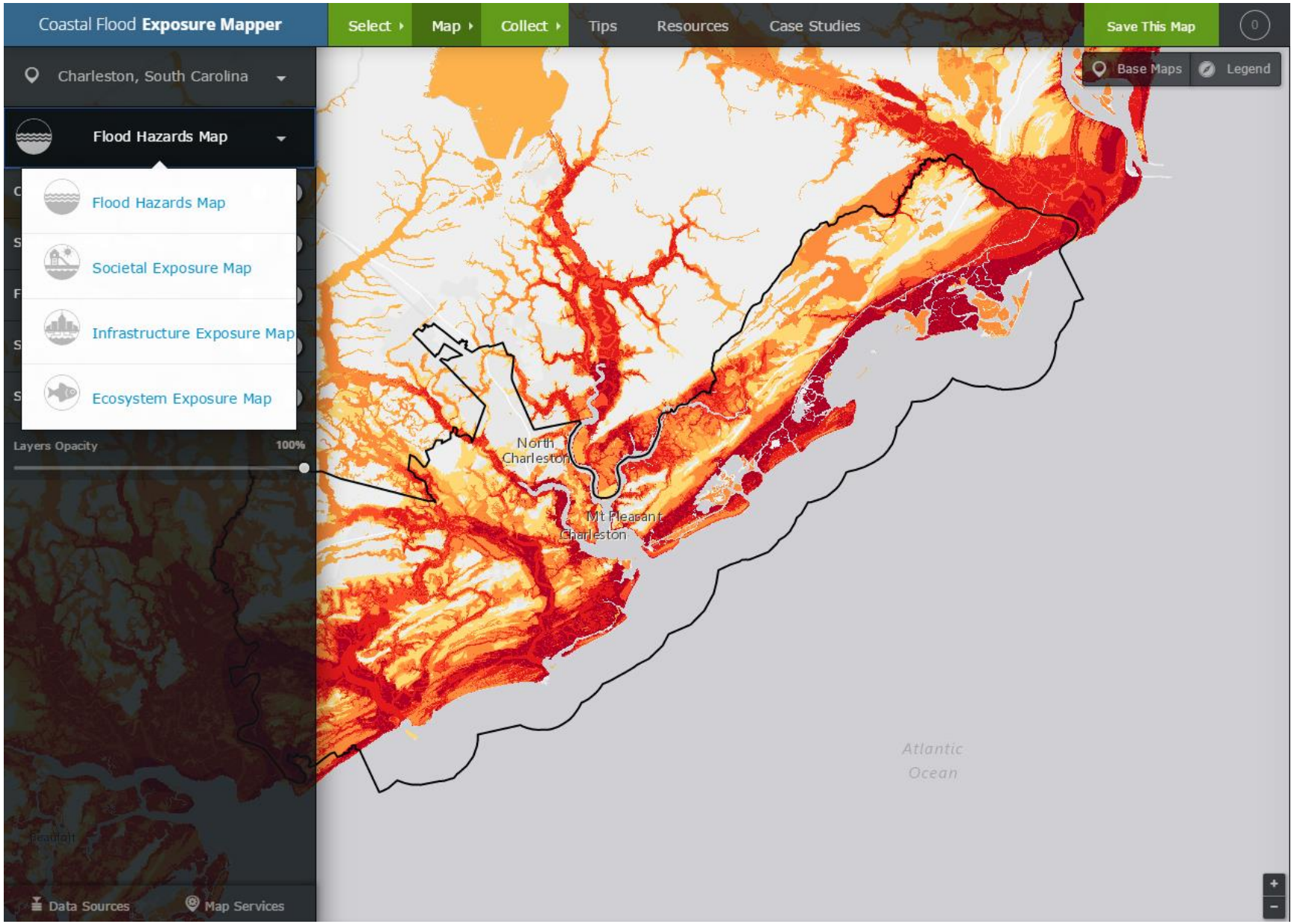

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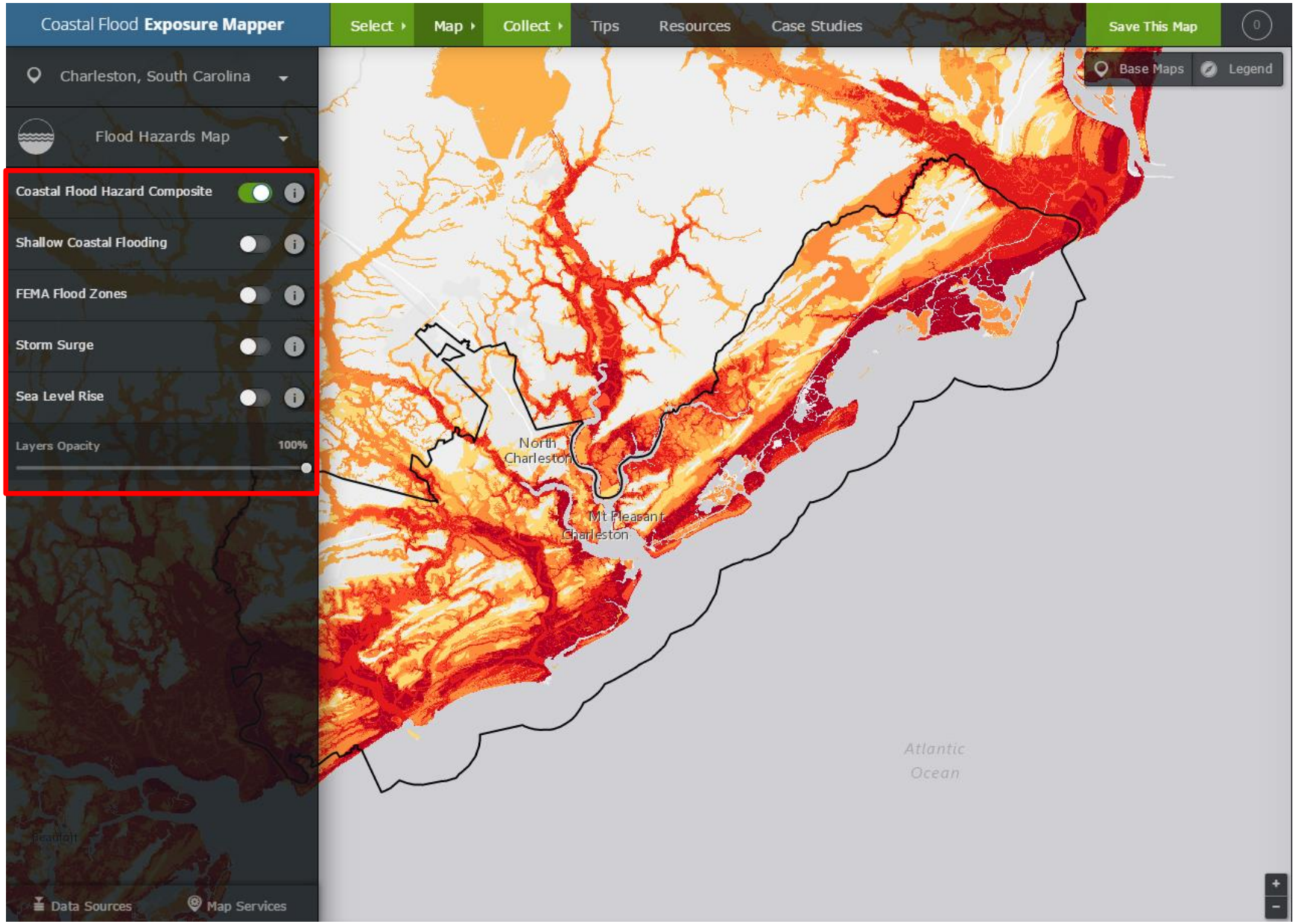

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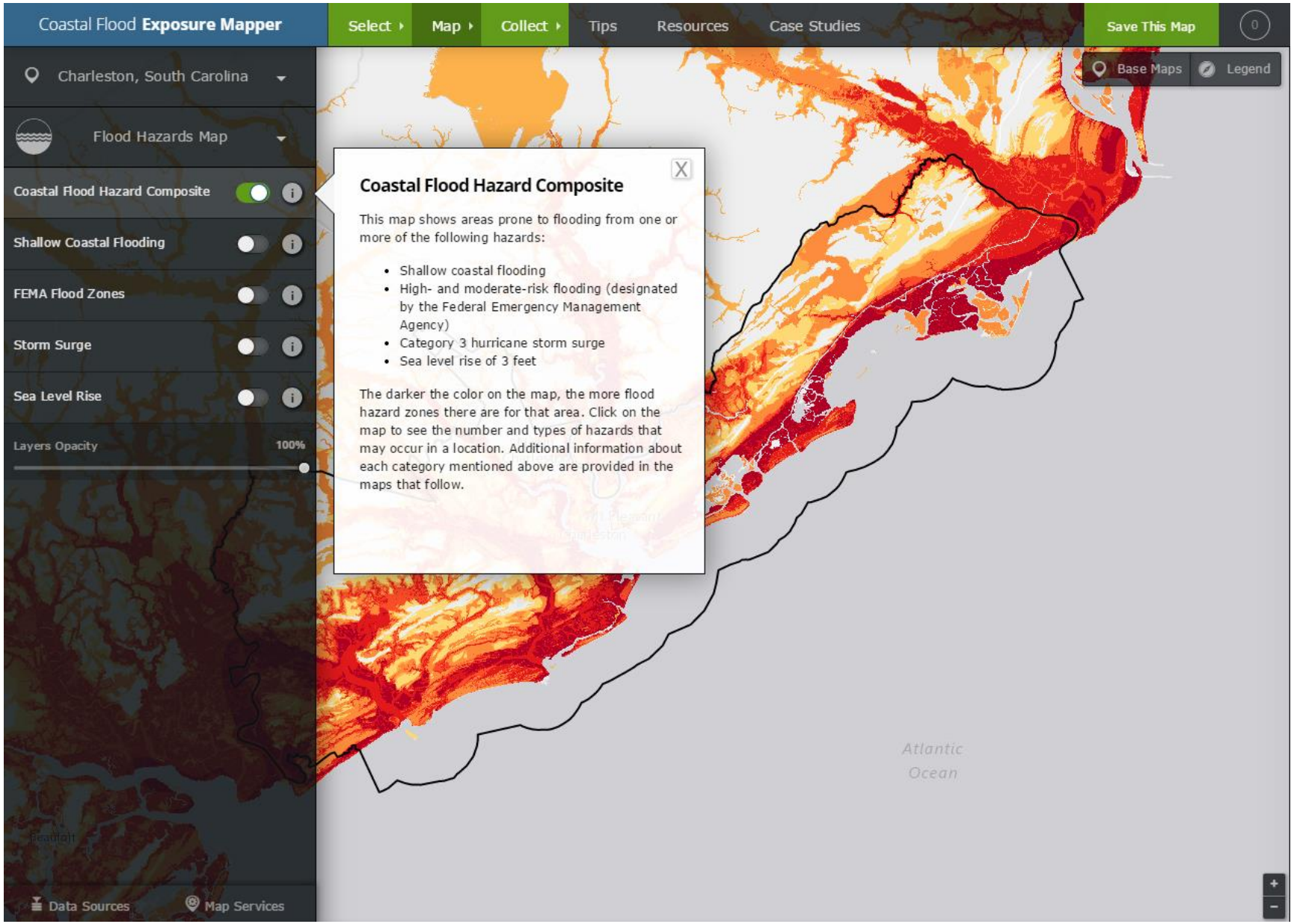

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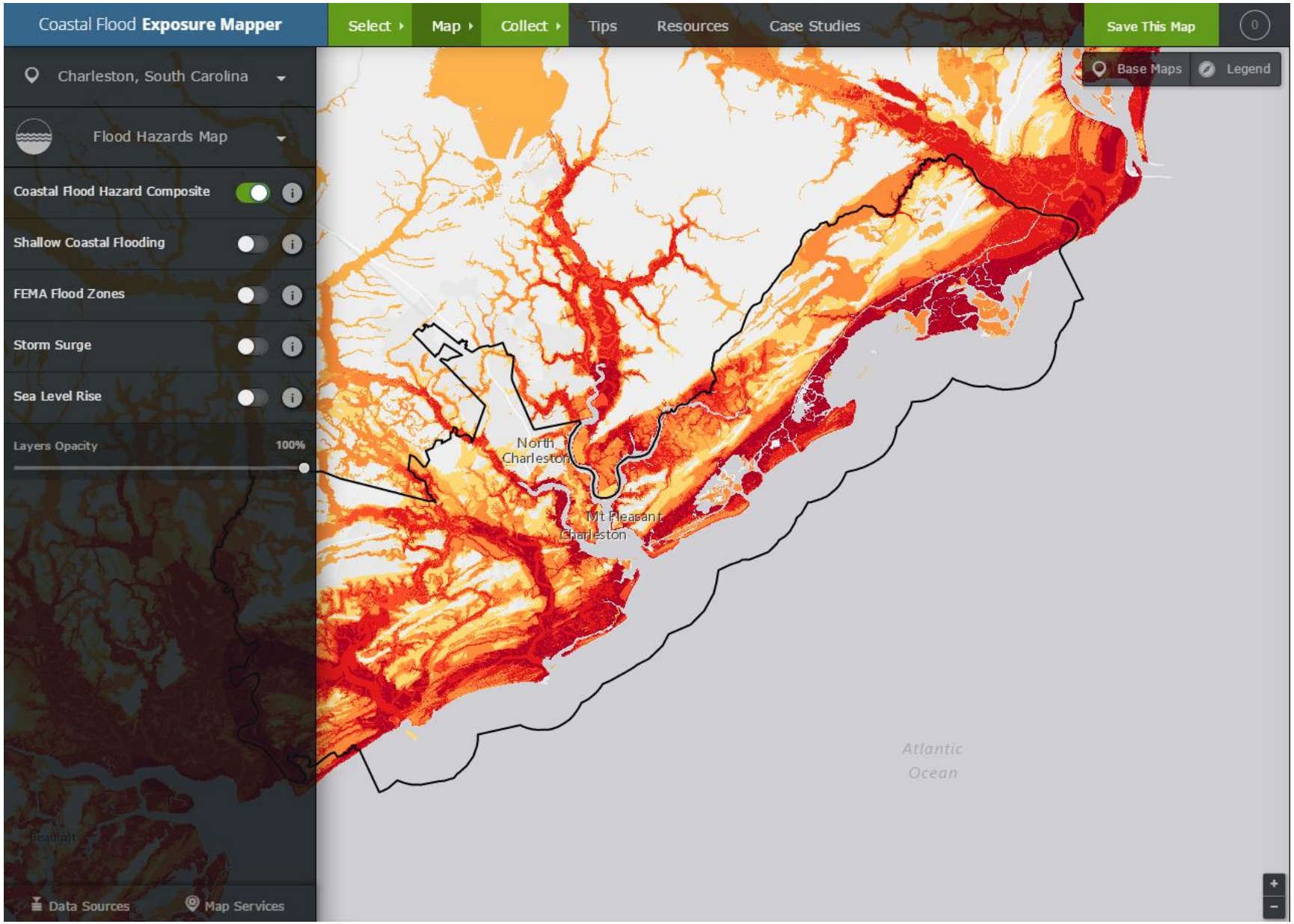

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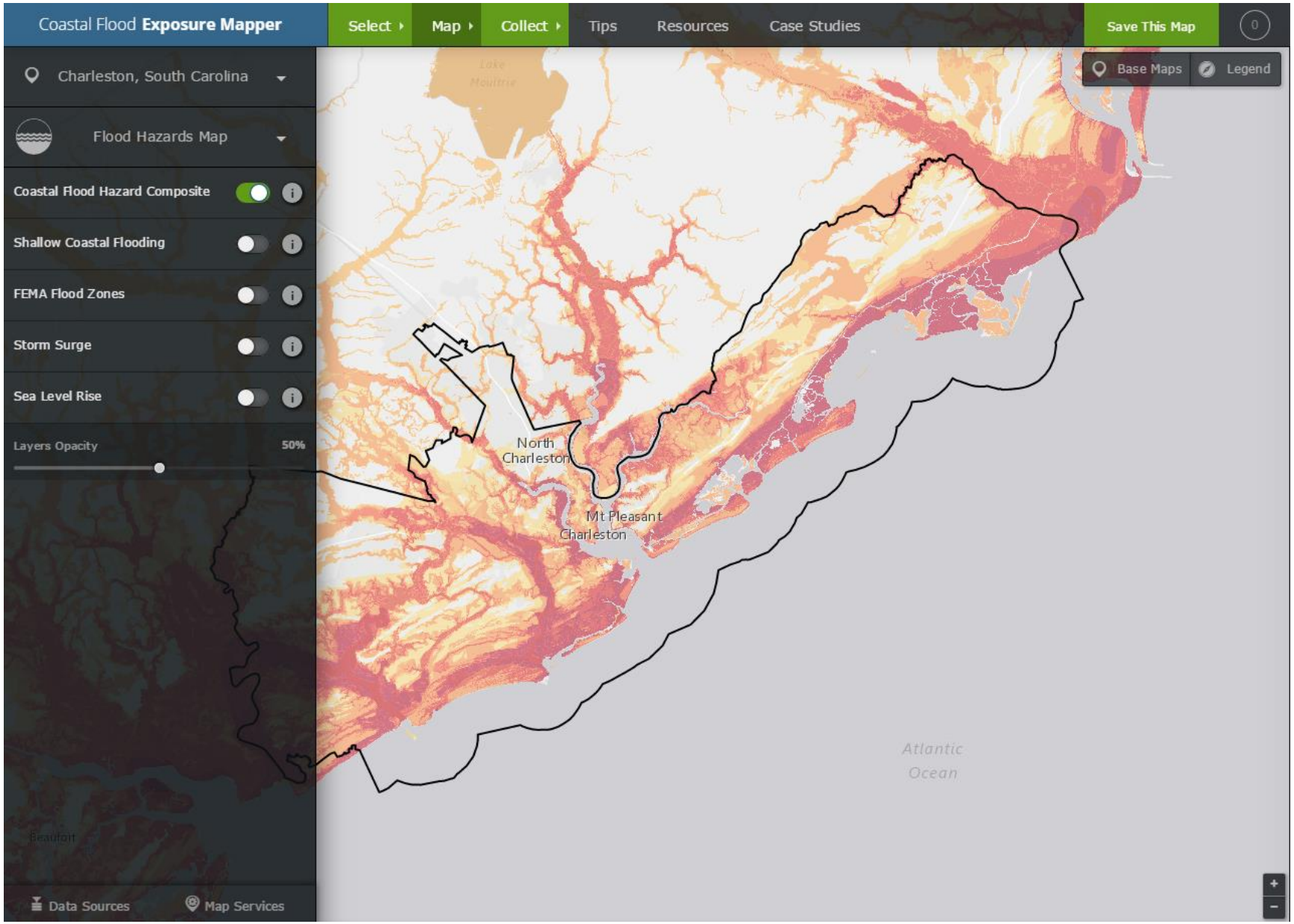

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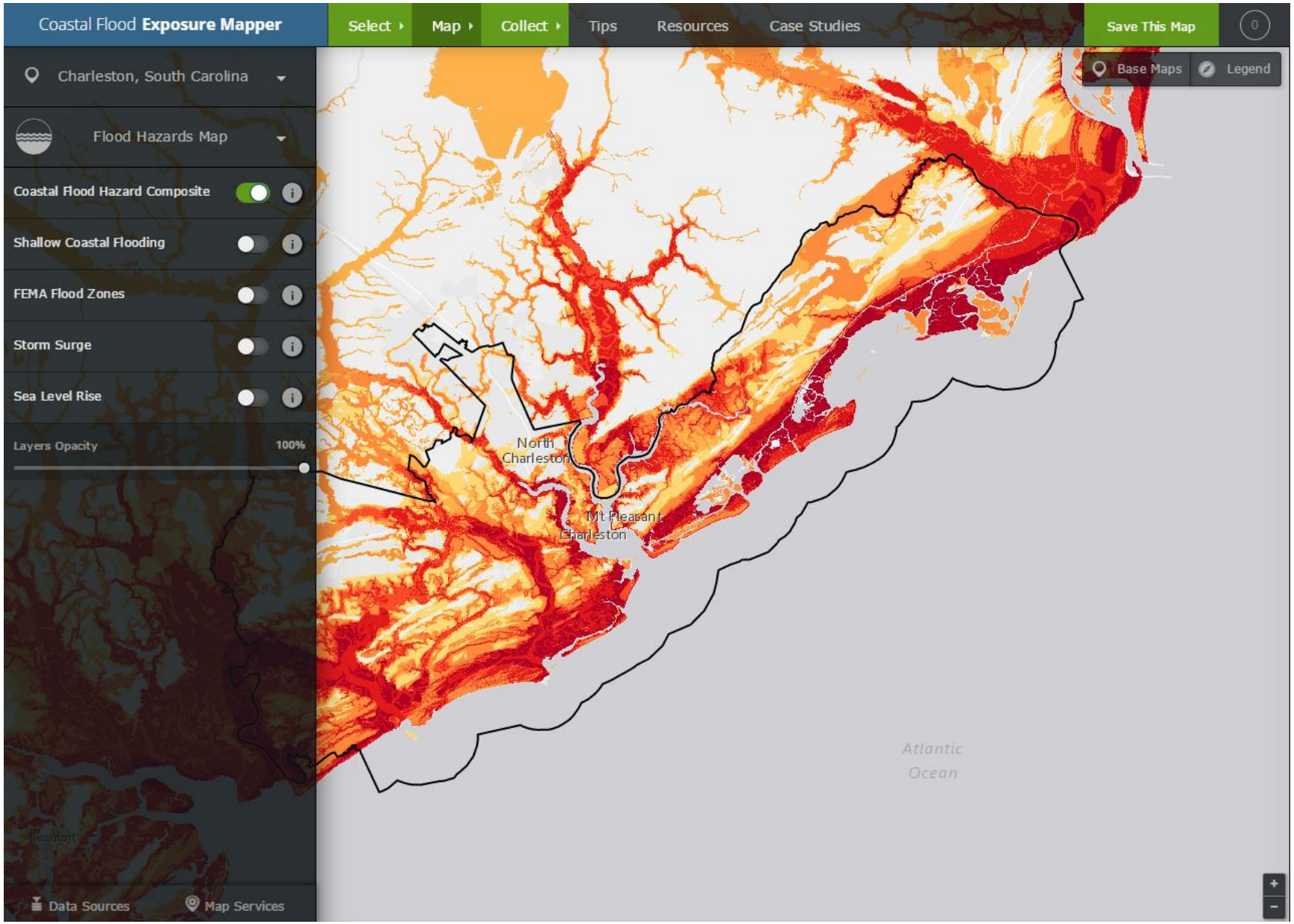

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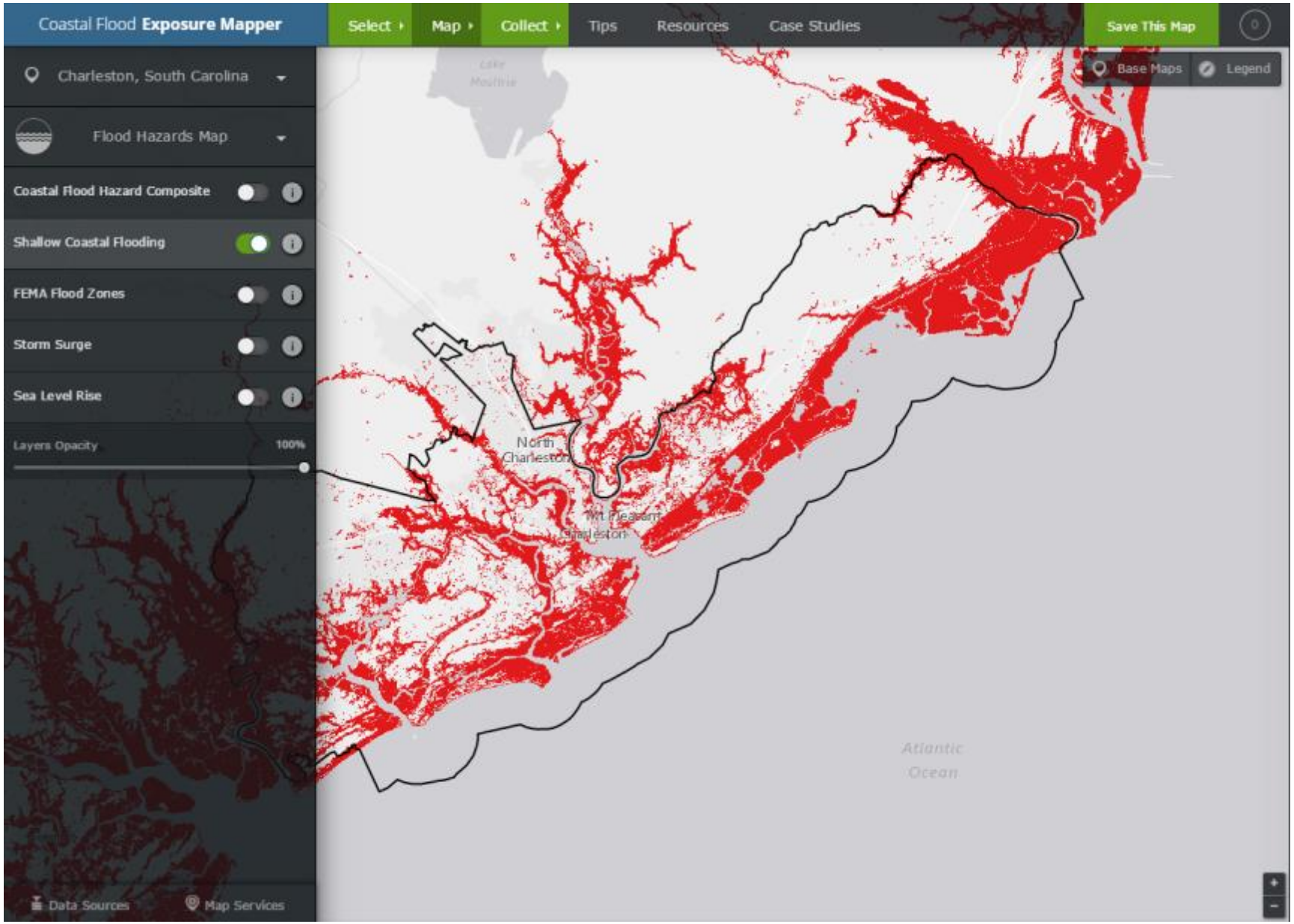

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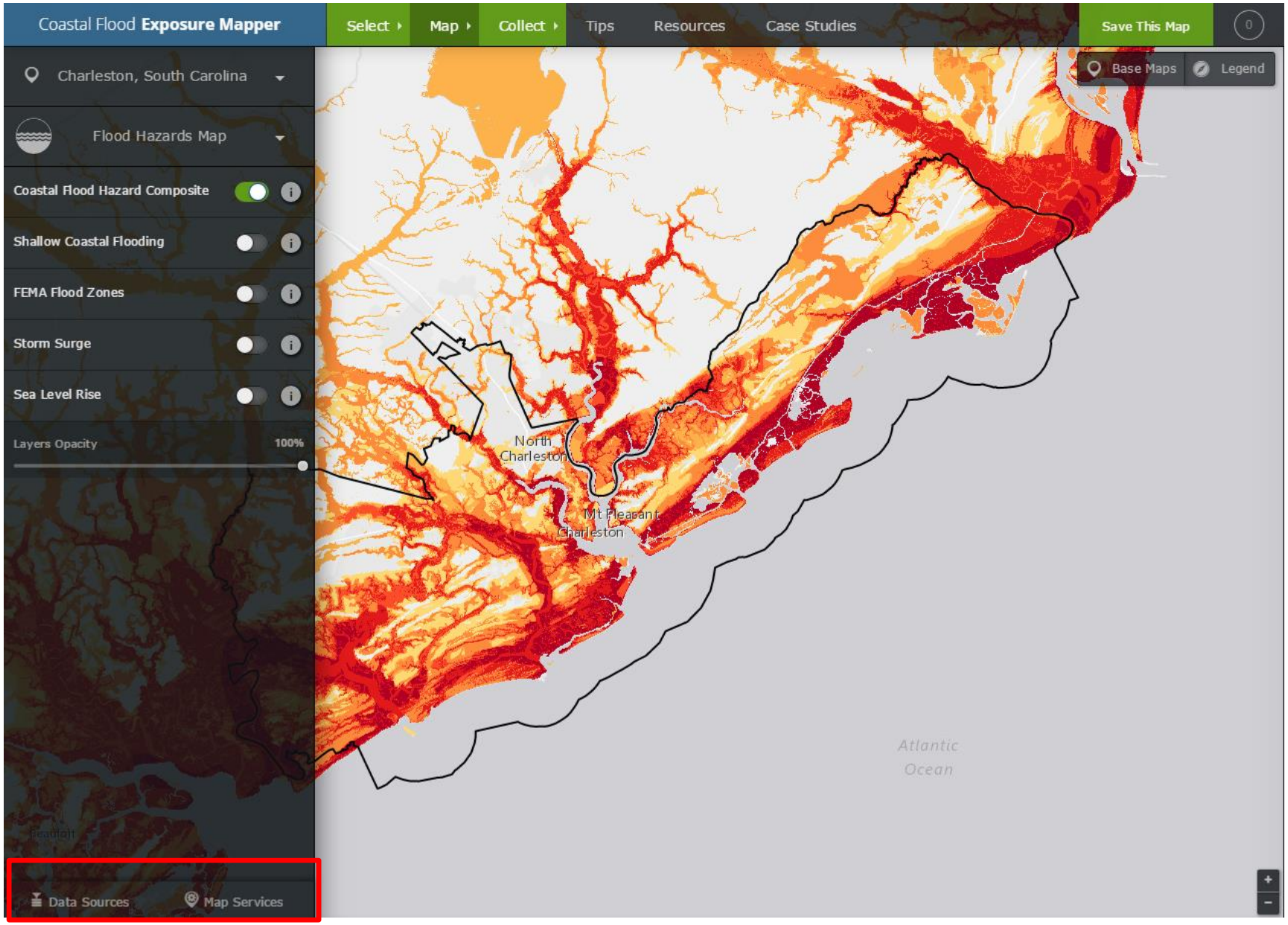

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Exposure Data and Information

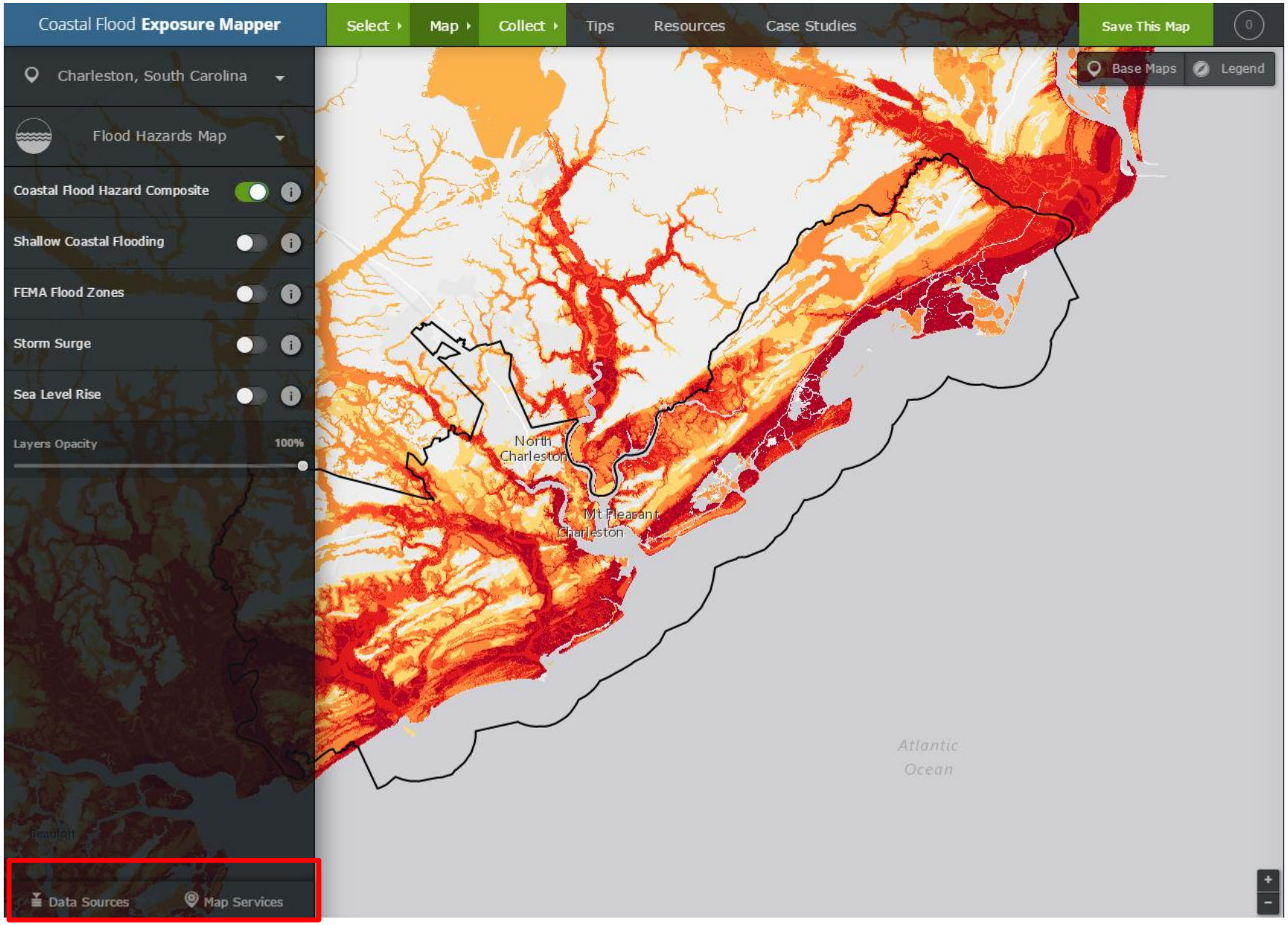
This page provides information on the data used in the Coastal Flood Exposure Mapper, map services available for use in ArcGIS Online or other online mapping platforms, and instructions on using map services within ArcGIS Online. Click here to directly access all map services.

Flood Hazards

Name	Description	Where to Get It		Significance
		Map Service	Authoritative Source	
Coastal Flood Hazard Composite	Spatial extents of multiple flood hazard data sets combined. Flood hazard data sets include shallow coastal flooding, Federal Emergency Management Agency (FEMA) flood data (V zones, A zones, and 500-year zones treated as individual layers), storm surge for Category 3 hurricane, and sea level rise of three feet above mean high tide.	Coastal Flood Hazard Composite Map Service	Coastal Flood Exposure Mapper	Provides a quick visual assessment of areas most prone to flood hazard events.
Shallow Coastal Flooding	Areas that flood when coastal flood warning thresholds are exceeded. Derived from the flood frequency layer within the Sea Level Rise and Coastal Flooding Impacts Viewer.	Shallow Coastal Flooding Map Service	Sea Level Rise and Coastal Flooding Impacts Viewer	Areas subject to shallow coastal flooding.
FEMA Flood Zones	Digital FEMA flood data. The data represent the digital riverine and coastal flood zones available as of June 2014 and are a combination of Digital Flood Insurance Rate Maps and Q3 flood data.	FEMA Flood Zones Map Service	FEMA's Map Service Center	Areas at risk from flooding.
Storm Surge	Areas of near-worst-case storm surge flooding scenarios for coastal areas along the Gulf of Mexico and Continental U.S. Atlantic coasts. Data were derived from storm surge inundation maps created by the National Hurricane Center (NHC) Storm Surge Unit with the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model.	Storm Surge Map Service	National Hurricane Program Center Storm Surge Unit	Areas at risk from storm surge.
Sea Level Rise	Sea level rise inundation scenarios ranging from zero to six feet above mean higher high water (MHHW). Derived from data created for the Sea Level Rise and Coastal Flooding Impacts Viewer.	Sea Level Rise Map Service	Sea Level Rise and Coastal Flooding Impacts Viewer	Areas likely to be inundated by sea level rise.

Step-by-Step Instructions for Using Registered Services in ArcGIS.com

1. Setup
   - Go to ArcGIS.com
   - Click Sign In
   - If needed, register for new account
2. Build a Map
   - Click the MAP button in the top banner
   - Click the Basemap button
   - Select a basemap from the available options
3. Add a Layer From ArcGIS Online
   - Click the Add drop-down list
   - Select Search for Layers
   - In Find: type a keyword to search (example: Hurricane Evacuation Routes)
   - Click Add to get layers to appear in the map
   - Click Done Adding Layers when finished
4. Add a Layer that is not published to ArcGIS Online
   - Go to the ArcGIS Service Directory where you can find services (example: Coastal Service Center, www.coast.noaa.gov/ArcGISPUB/rest/services)
   - Browse to the REST page for the service you want (example: Social Vulnerability Block Groups, www.coast.noaa.gov/ArcGISPUB/rest/services/sovi/sovi_blockgroups/Ma...)
   - Copy the URL for the map service (example: same URL as previous step)
   - In your arcgis.com map, click Add
   - Click Add Layer from Web
   - In URL: paste path to the map service from earlier step
   - Click Add Layer



www.coast.noaa.gov/digitalcoast/tools/flood-exposure

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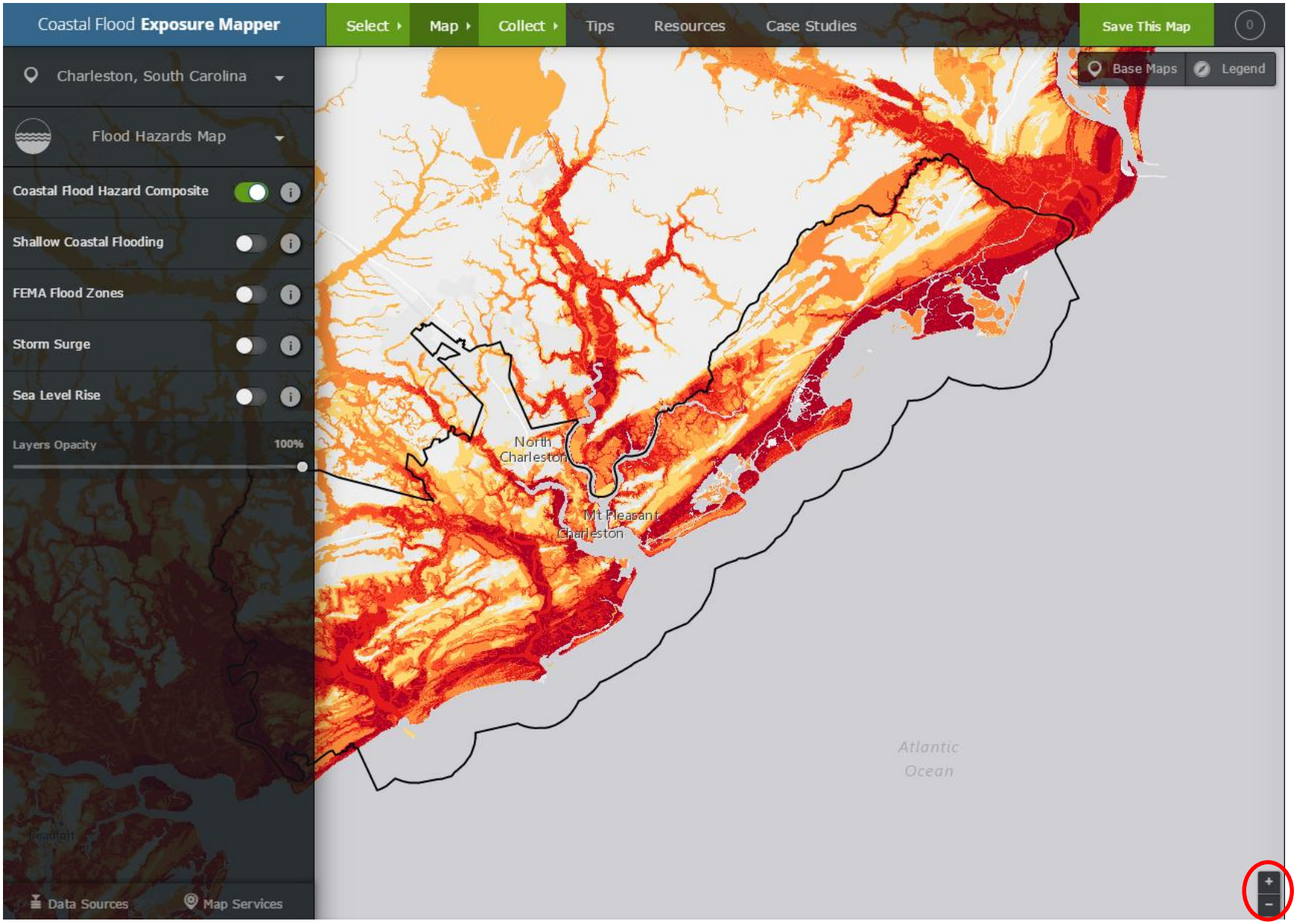
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



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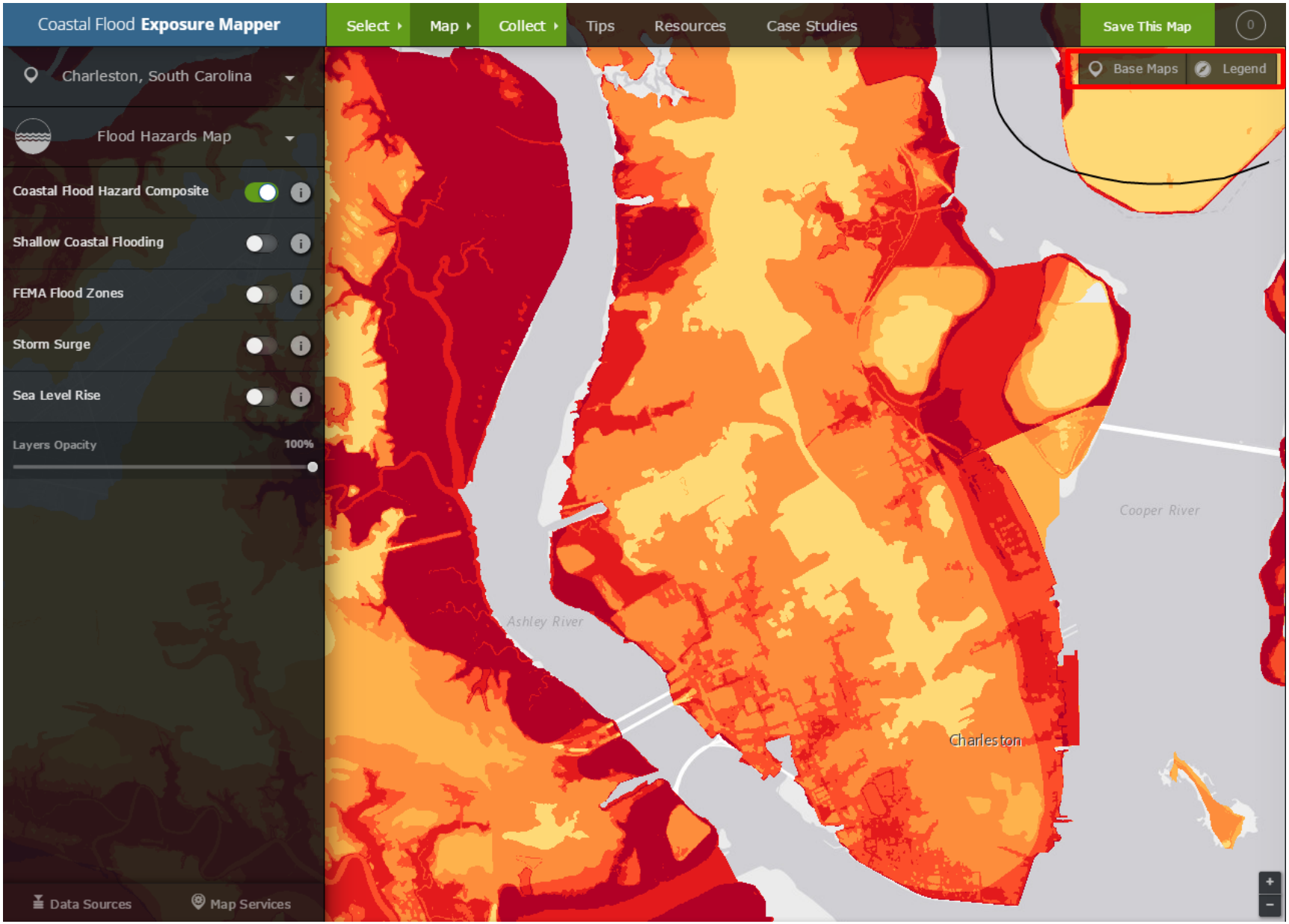

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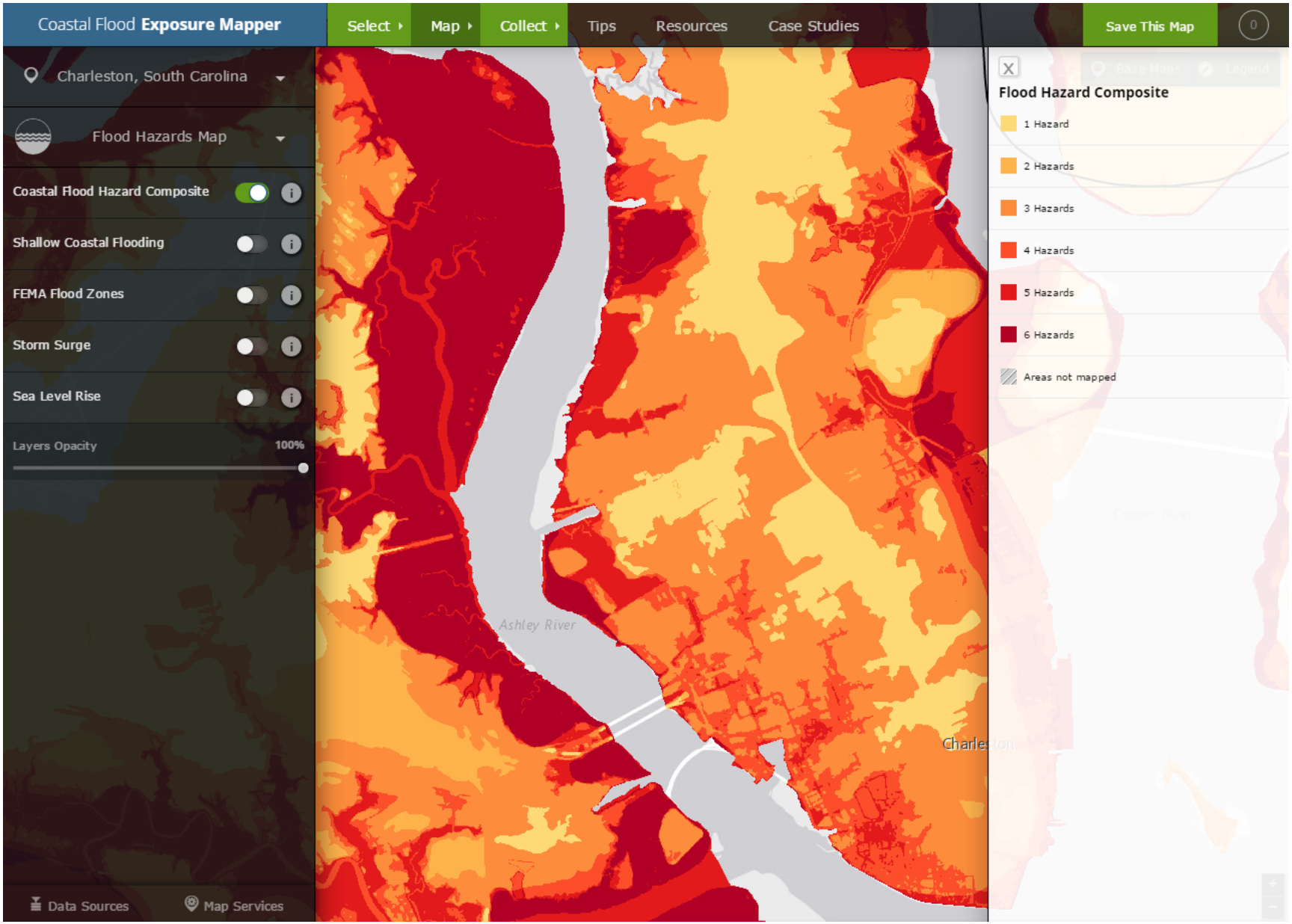

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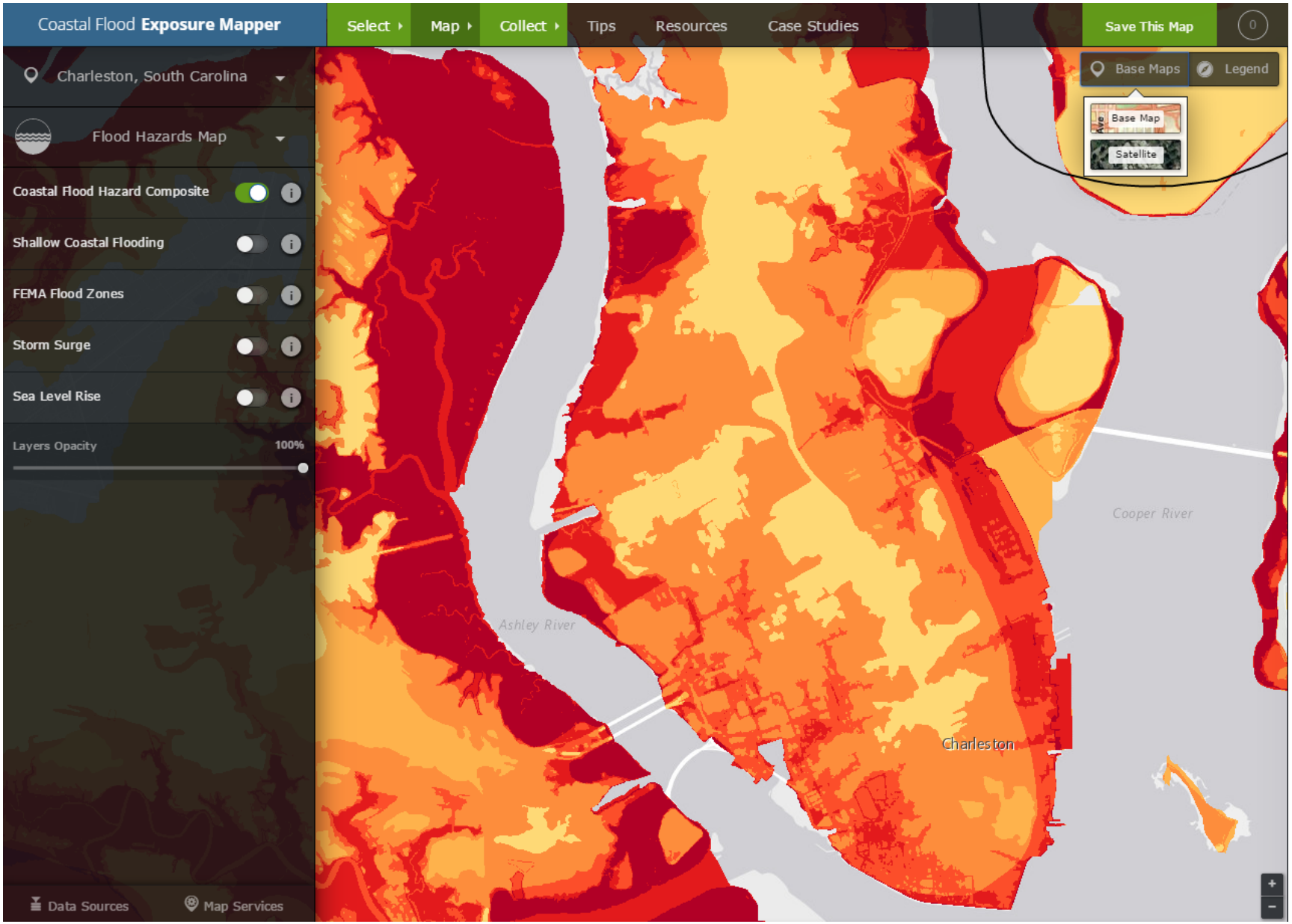

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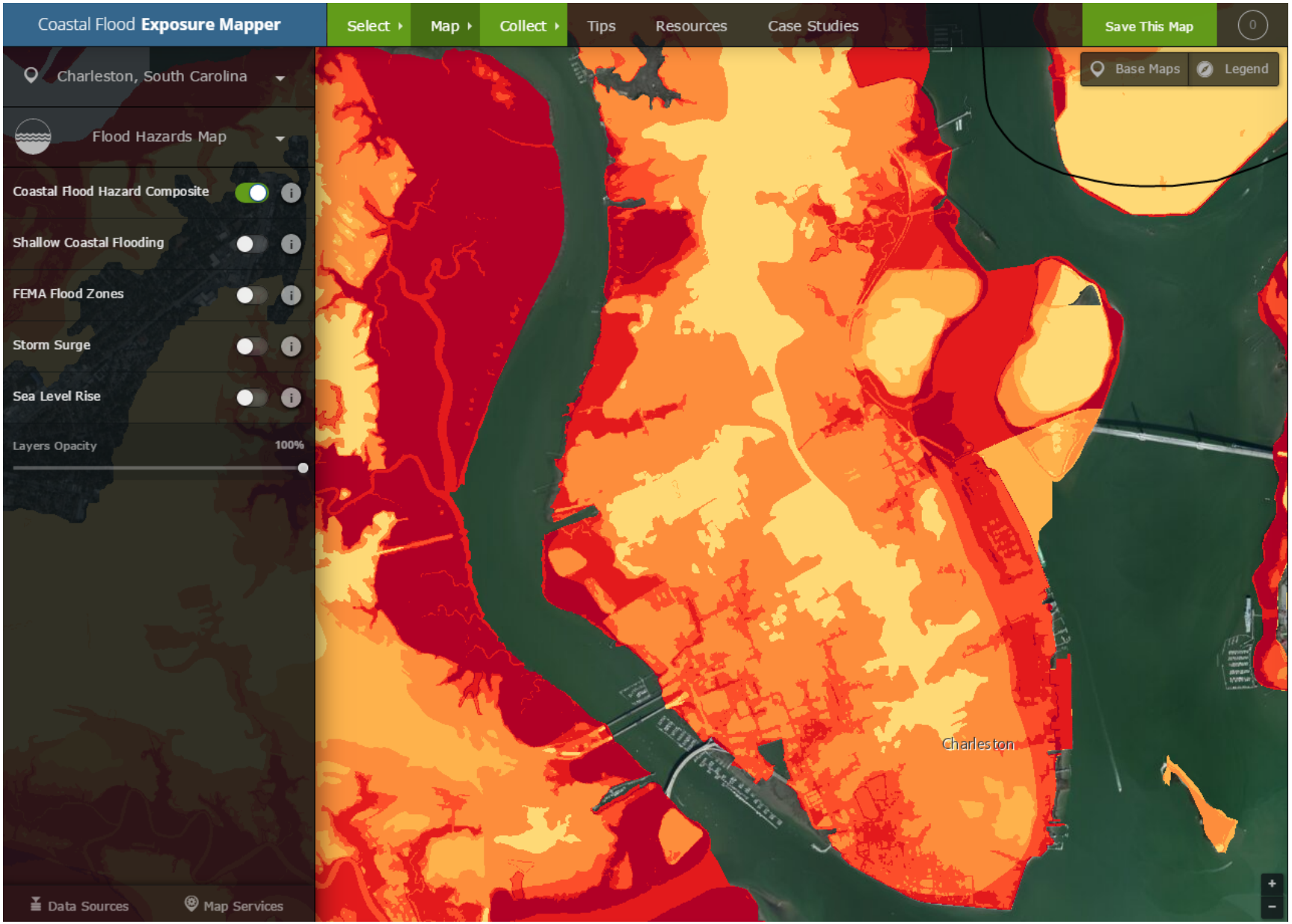

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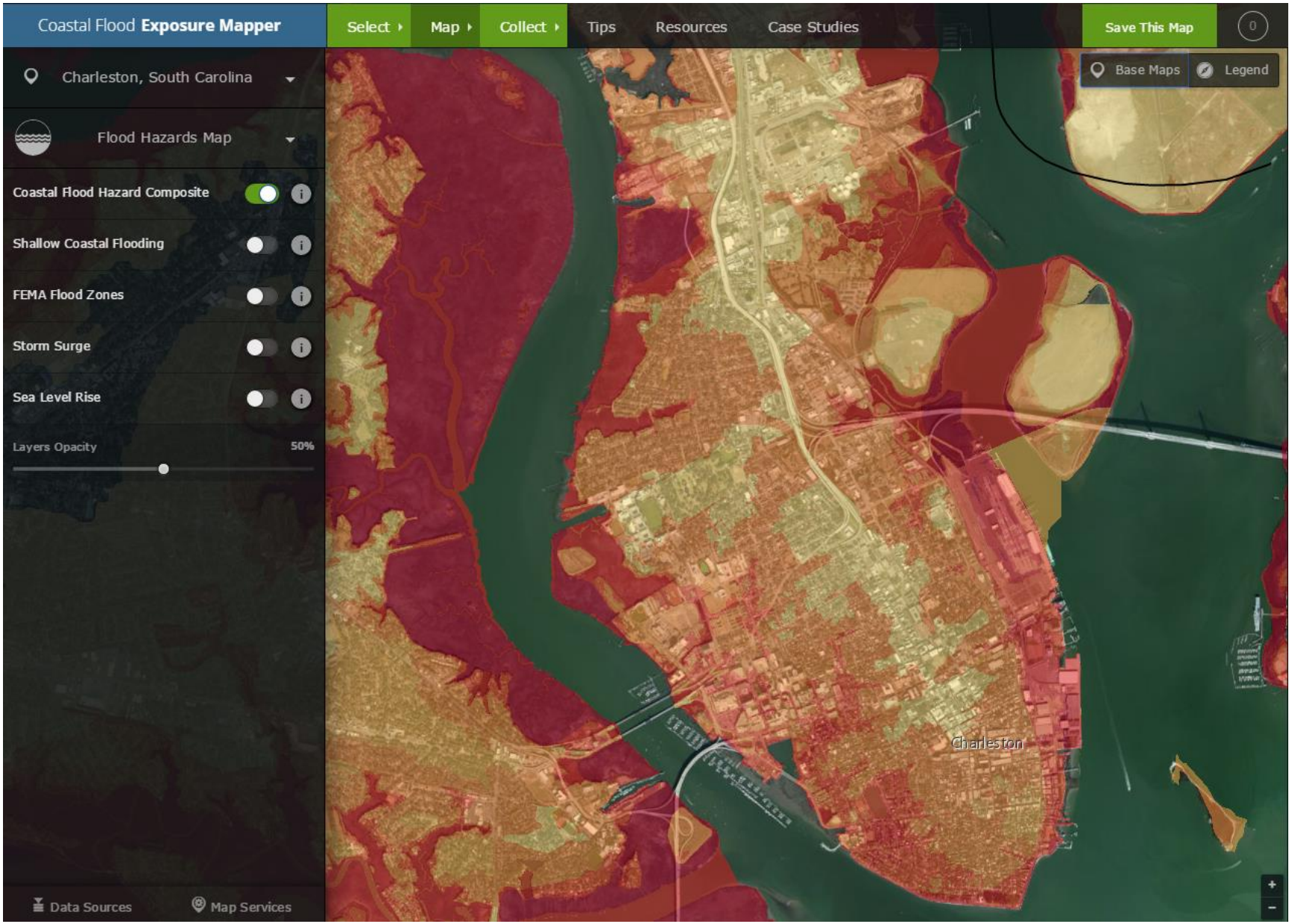

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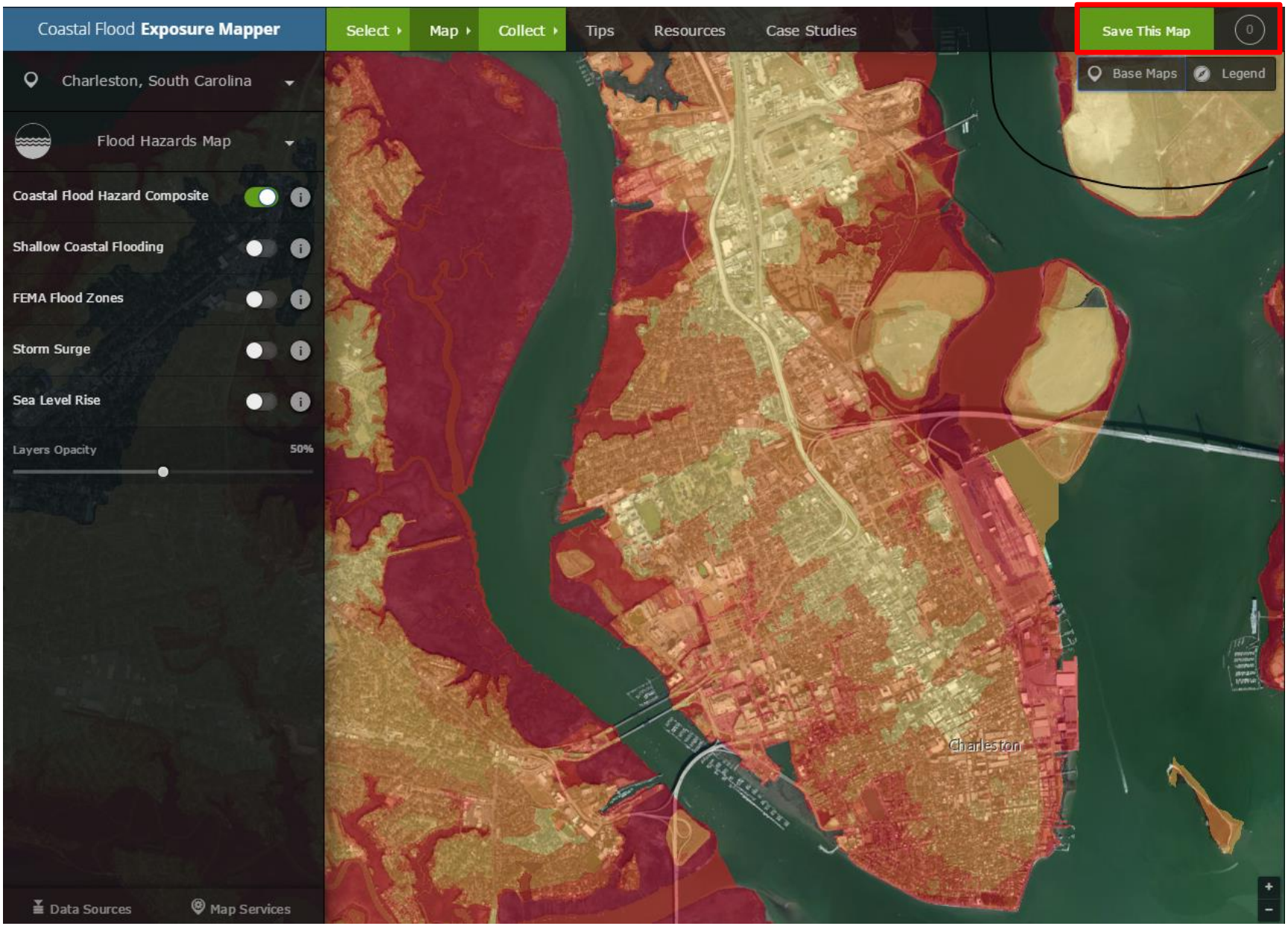

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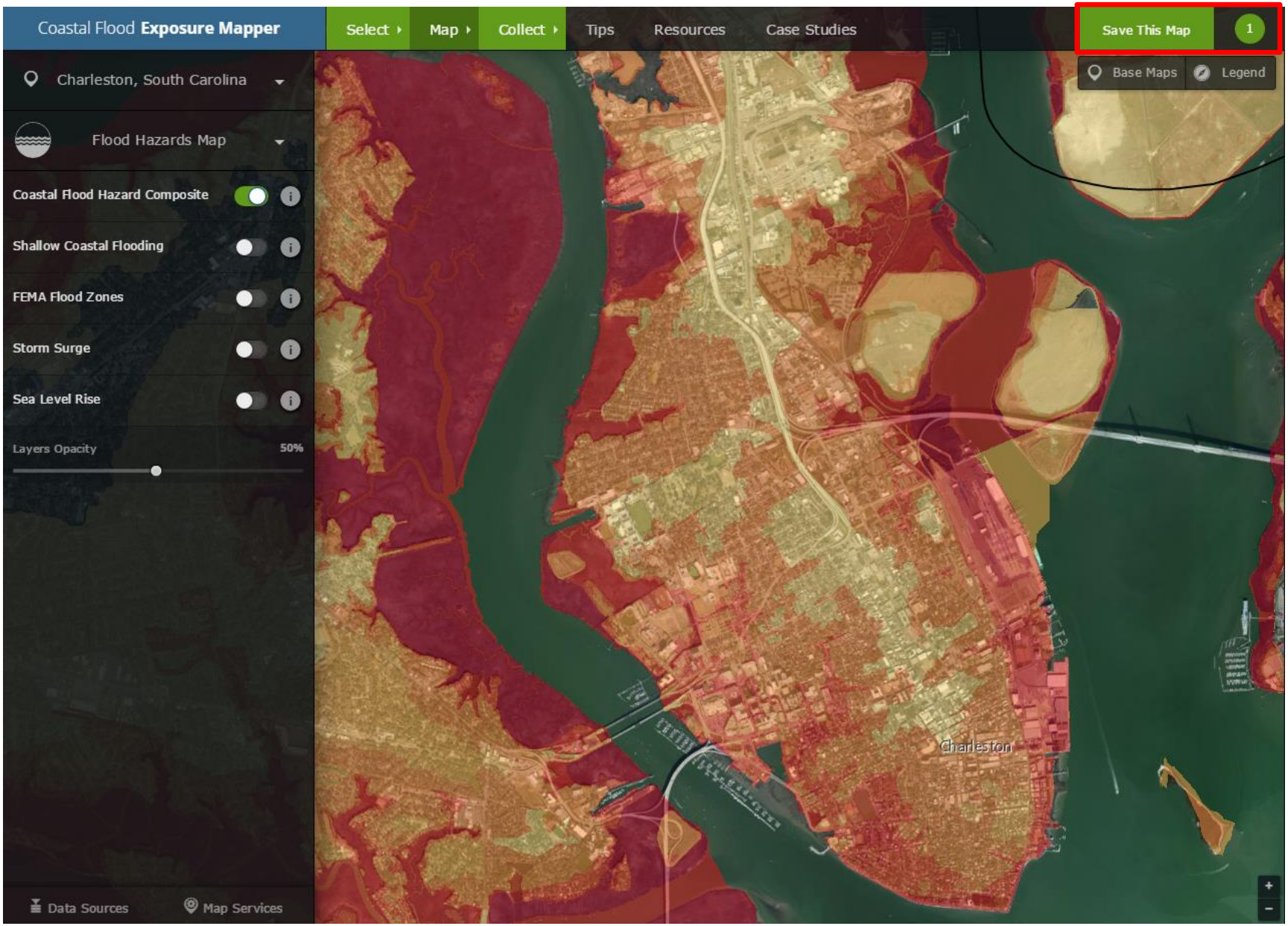

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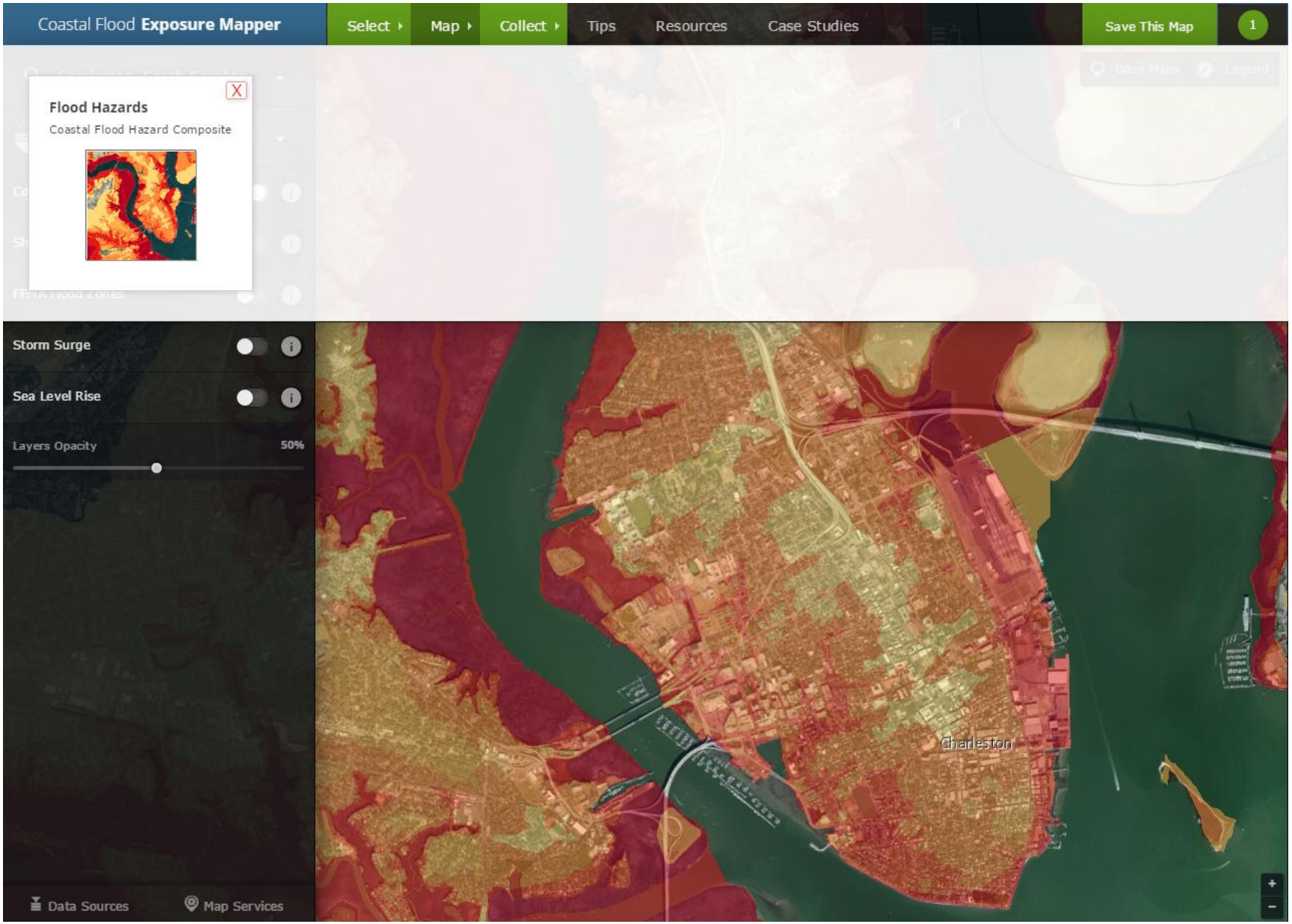

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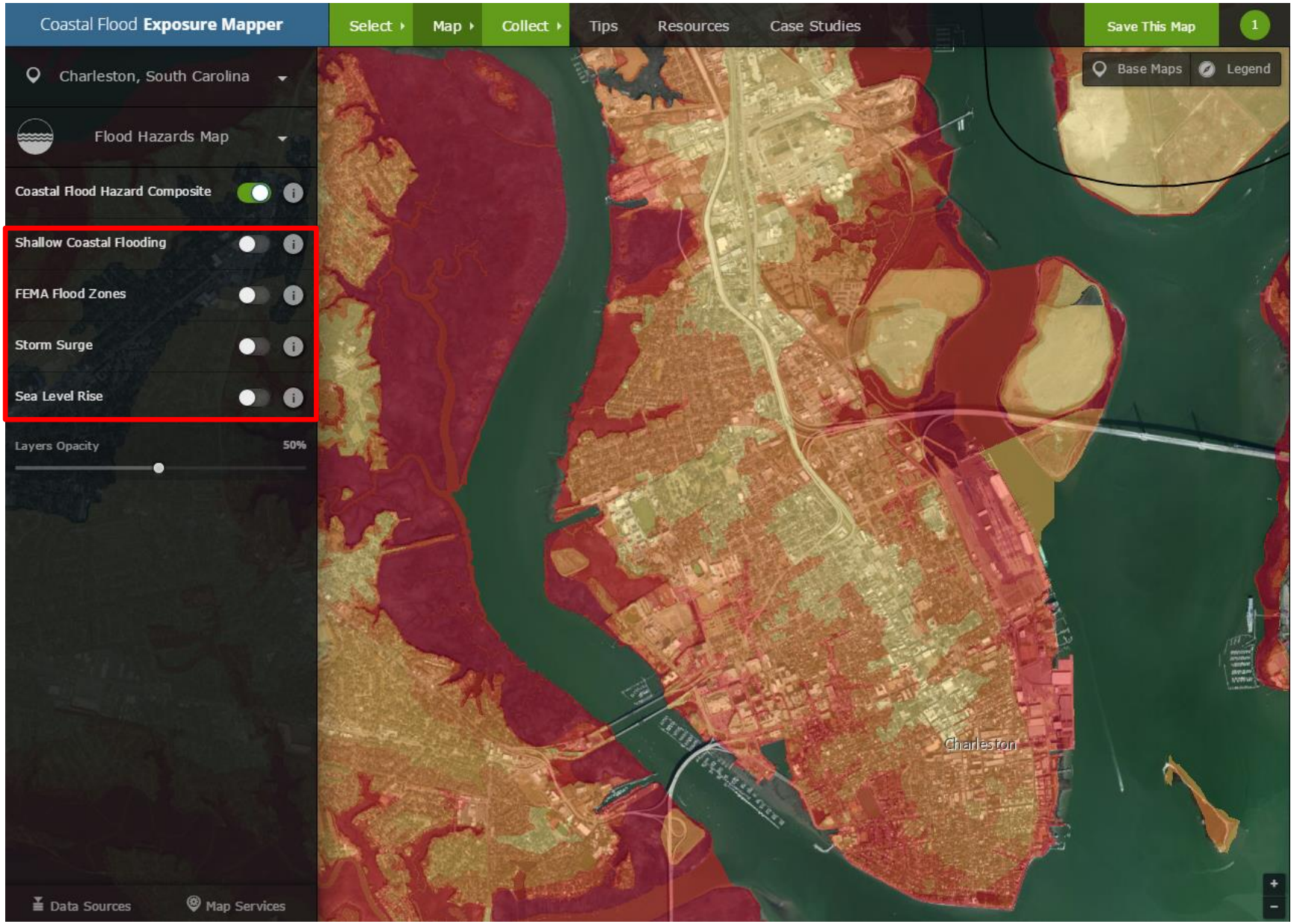

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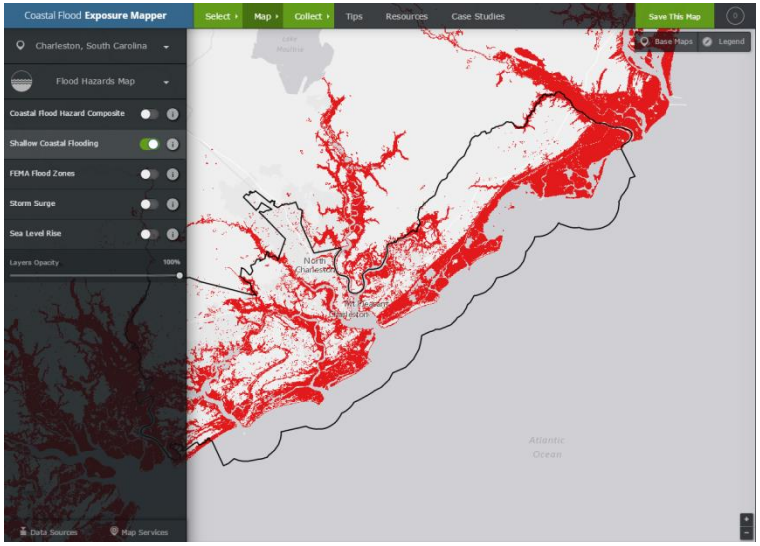
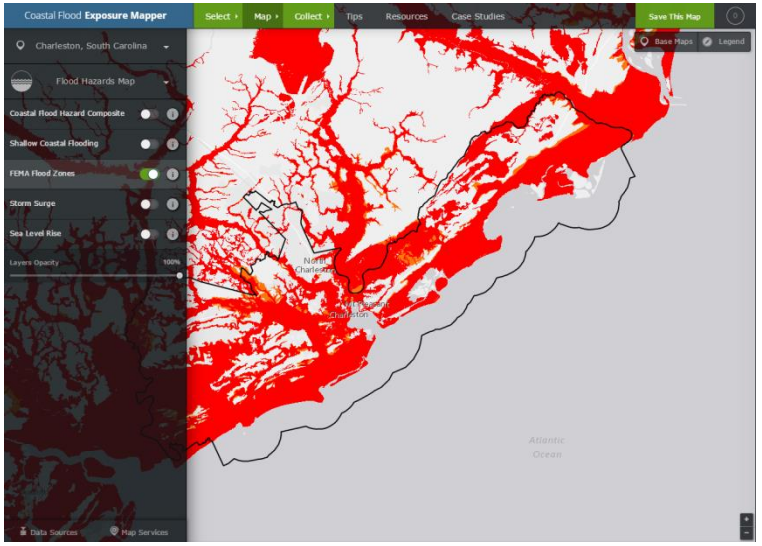
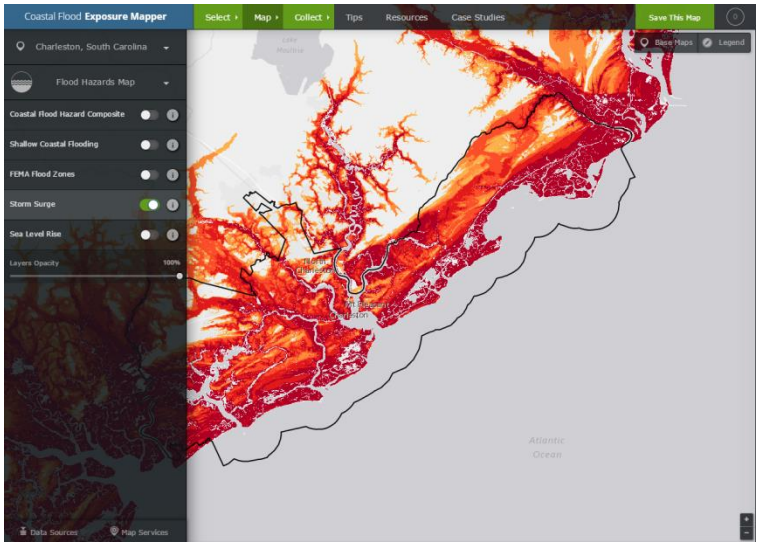
Shallow Coastal Flooding



FEMA Flood Zones



Storm Surge



Sea Level Rise

www.coast.noaa.gov/digitalcoast/tools/flood-exposure

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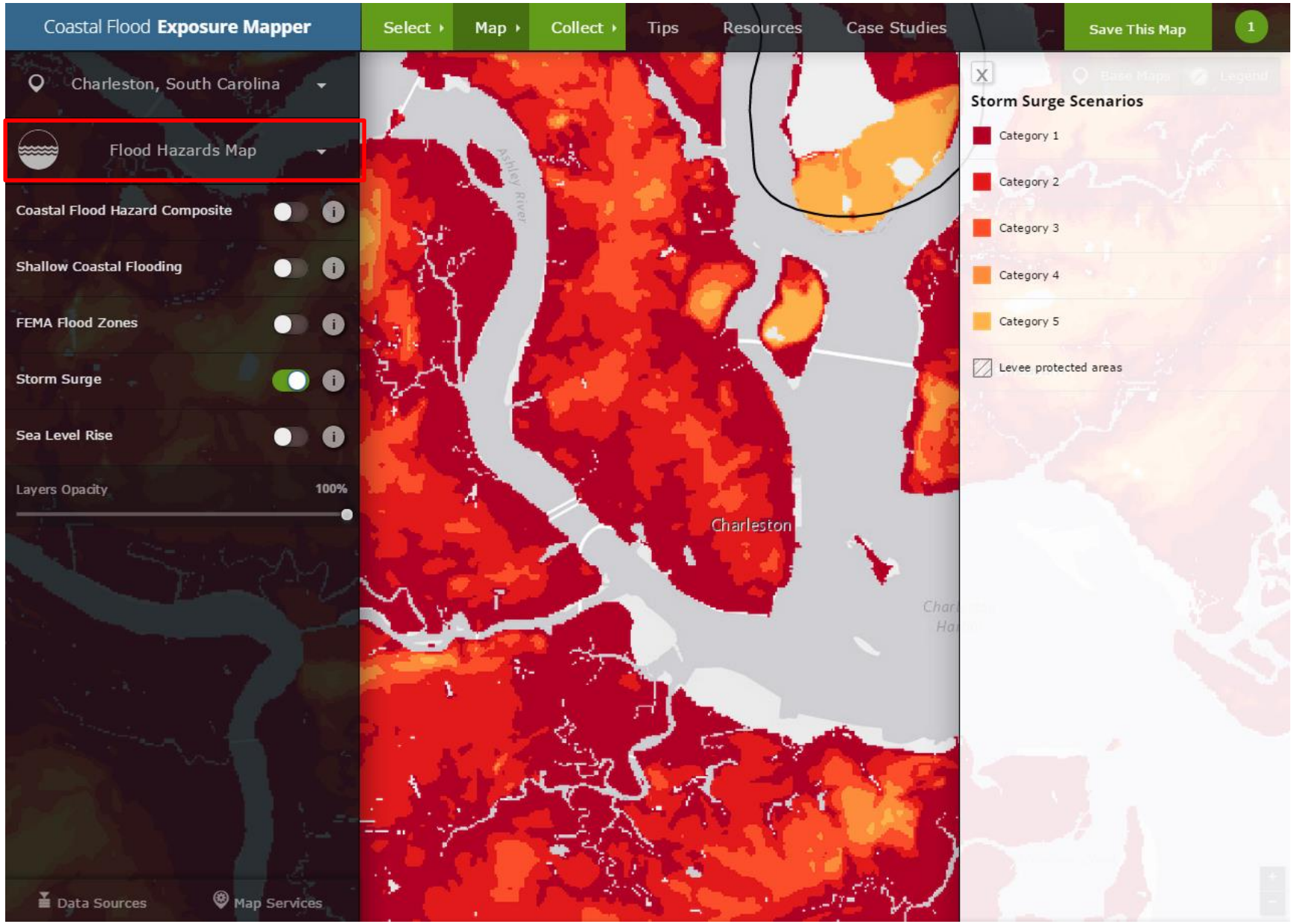

www.coast.noaa.gov/digitalcoast/tools/flood-exposure

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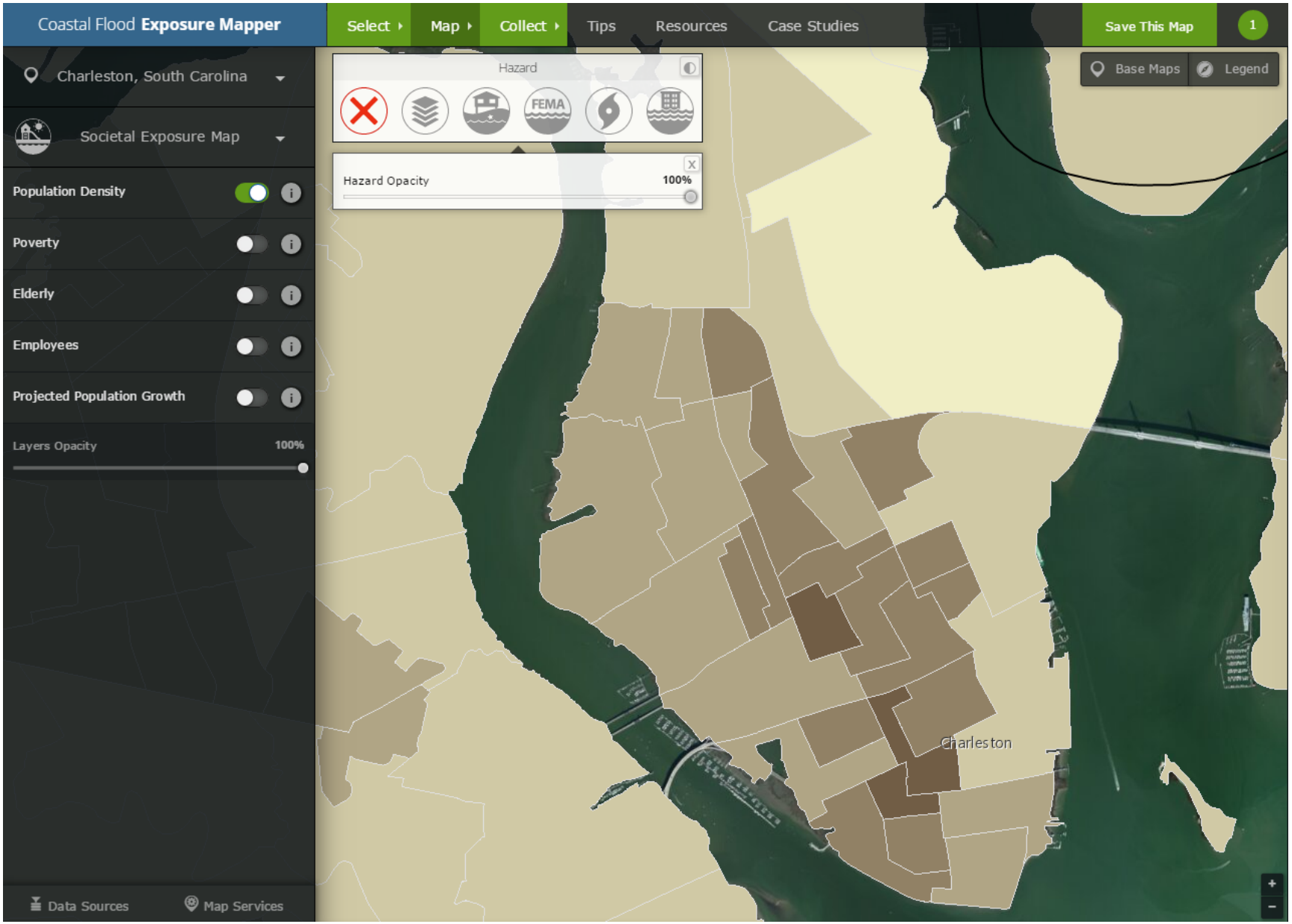
Societal Exposure Maps



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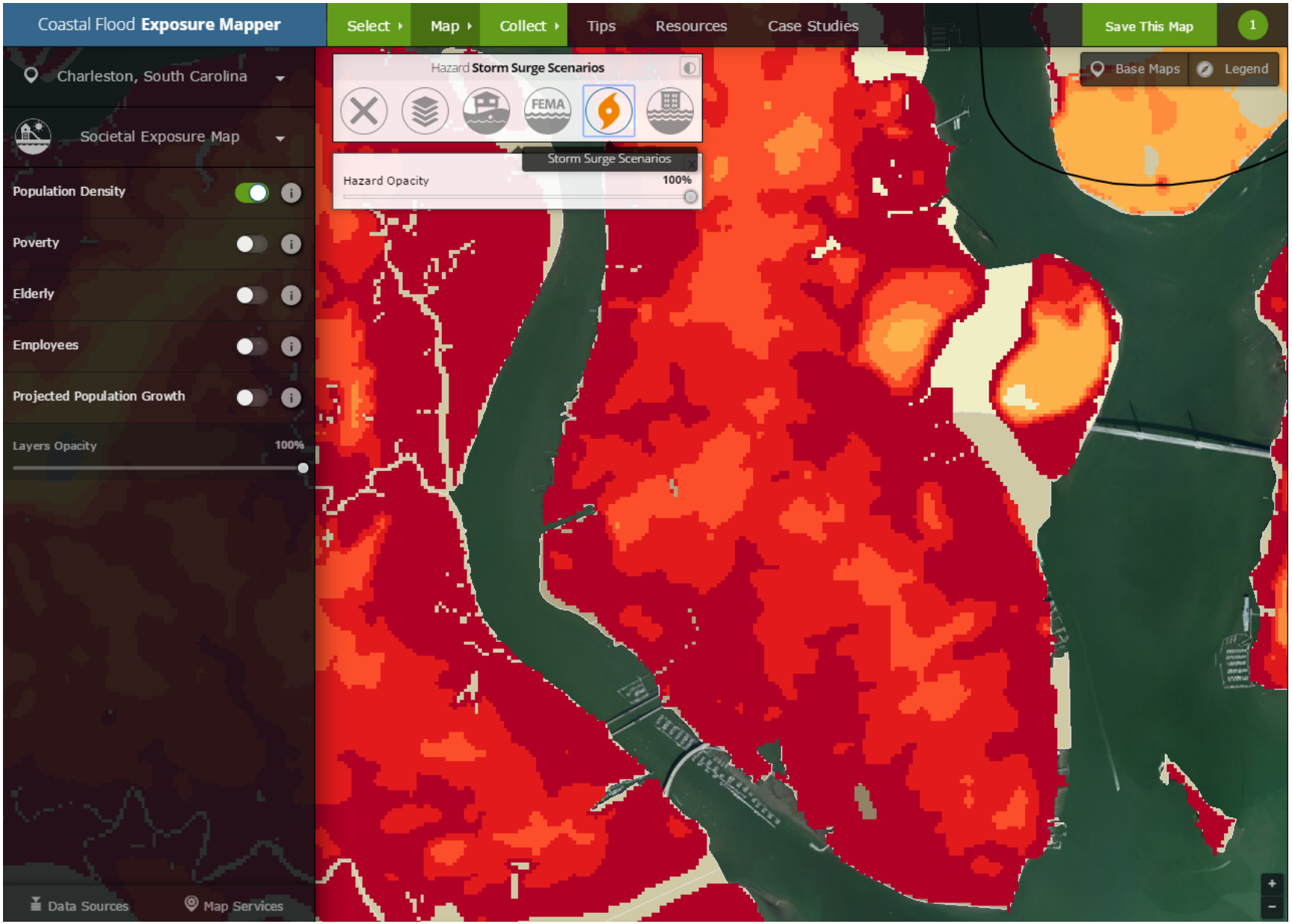

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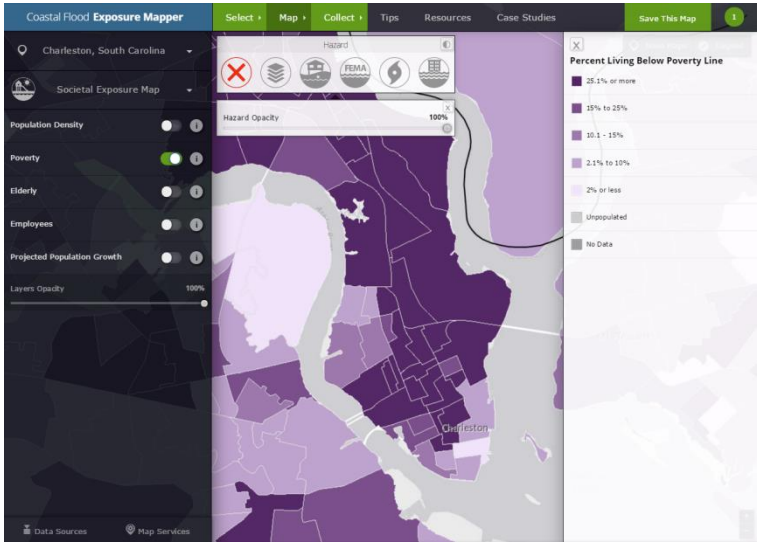
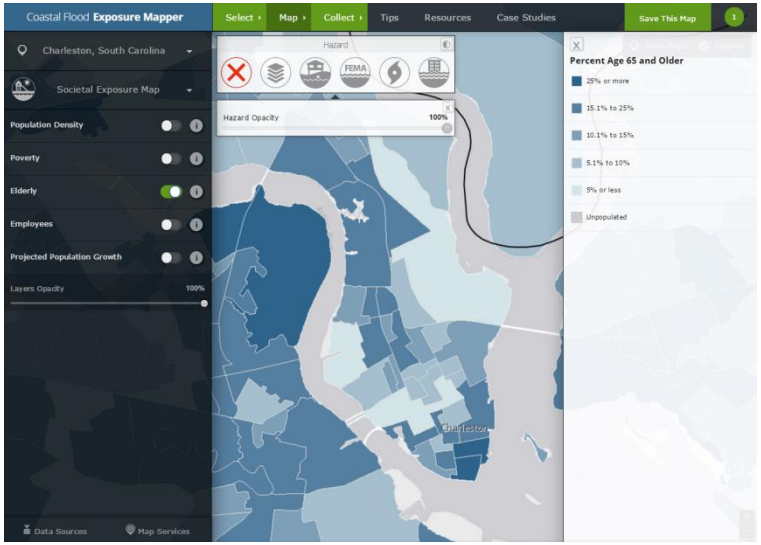
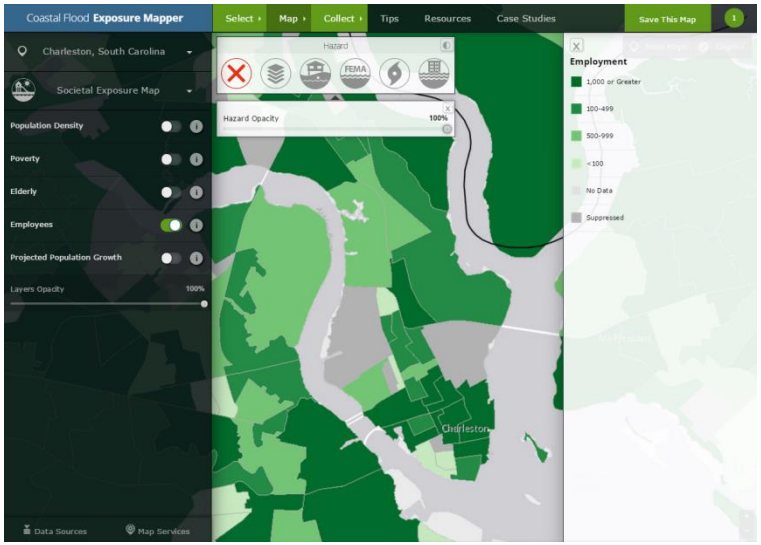
Poverty



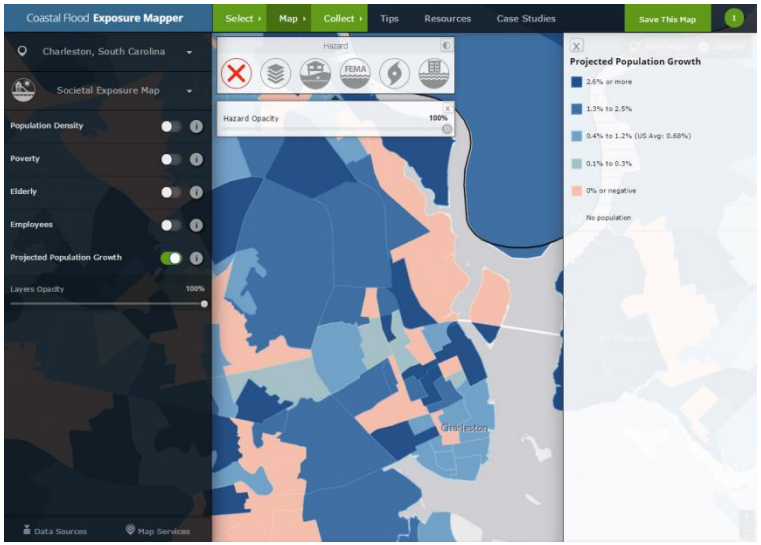
Elderly



Employment



Projected Population Growth



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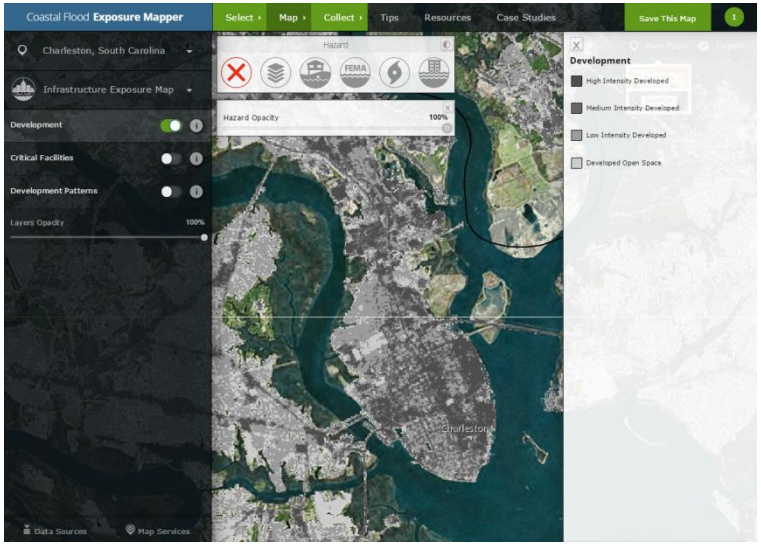
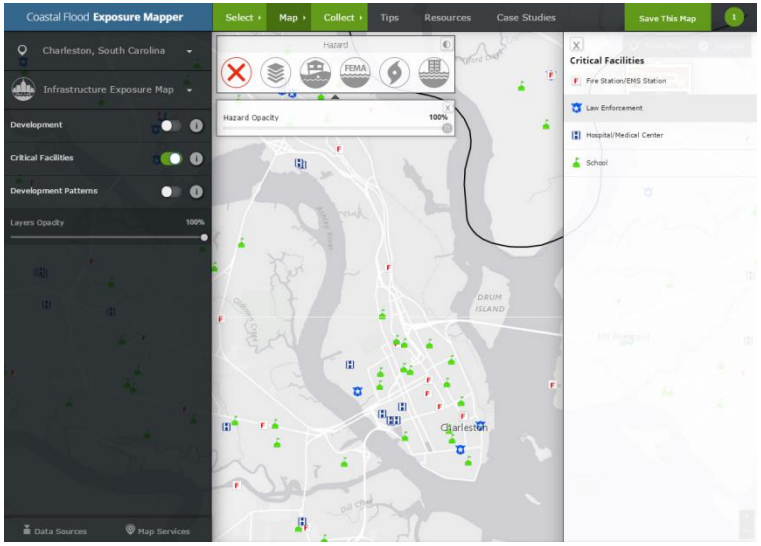
Infrastructure Exposure Maps

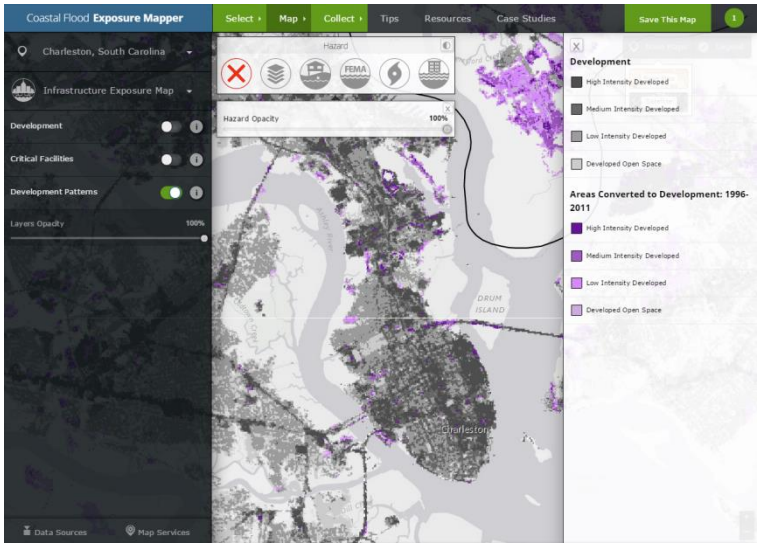
Development



Critical Facilities



Development Patterns



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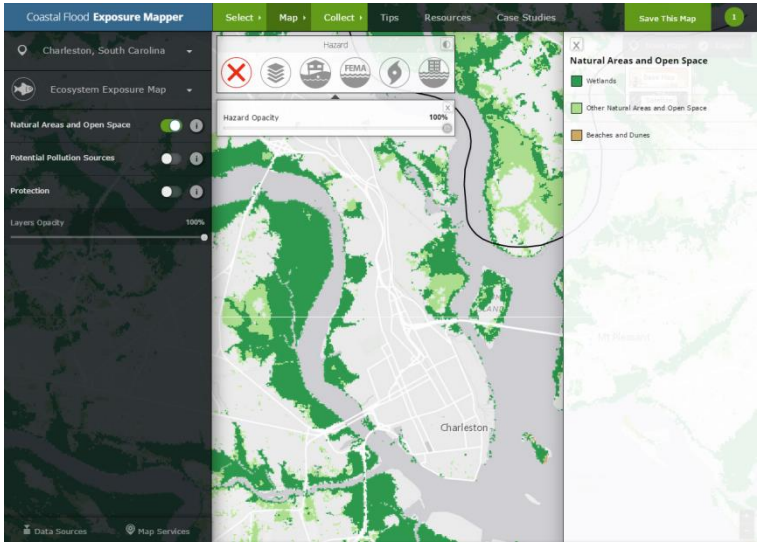
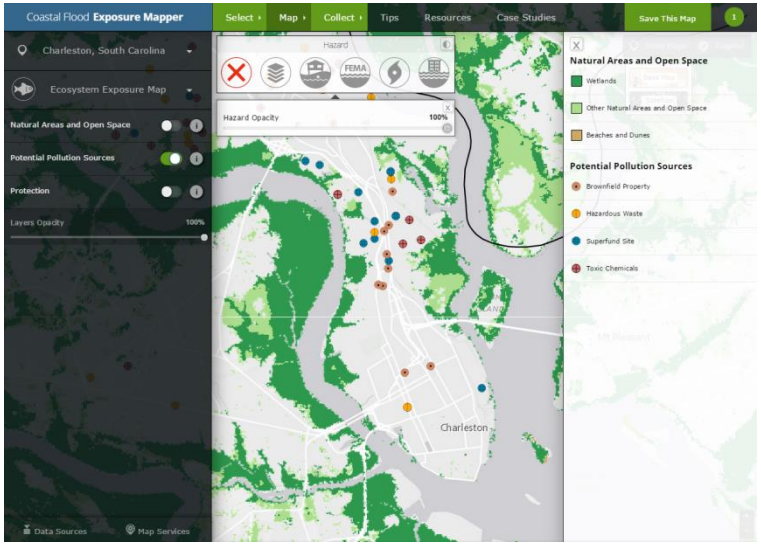
Ecosystem Exposure Maps

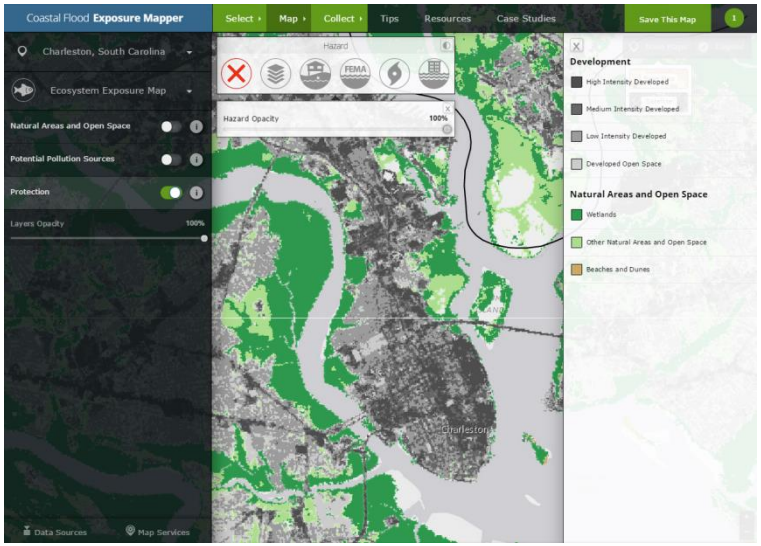
Natural Areas and Open Space



Potential Pollution Sources



Natural Protection



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Flood Hazard Layers

- Coastal Flood Hazard Composite
- Shallow Coastal Flooding
- FEMA Flood Zones
- Storm Surge Scenarios
- Sea Level Rise Scenarios

Societal Exposure Maps

- Population Density
- Percent in Poverty
- Percent Elderly (65 and Up)
- Employees
- Projected Population Growth

Infrastructure Exposure Maps

- Development
- Critical Facilities
- Development Patterns

Ecosystem Exposure Maps

- Natural Areas and Open Space
- Potential Pollution Sources
- Natural Protection

Coastal Flood **Exposure Mapper** | Select | Map | Collect | Tips | Resources | Case Studies | Save This Map | 3

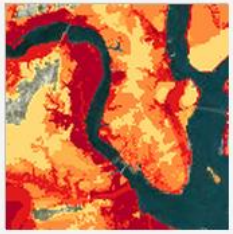
Collect and Share Your Maps

Download and print these maps or copy the link to share online with colleagues or in a community workshop.

Important: These maps will not be saved once you leave this site. To ensure your work is safe, either create and download a PDF or save and share the map URLs.

Tips for using these maps

Coastal Flood Hazard Composite



View Map

Map URL

http://go.usa.gov/3aXxd

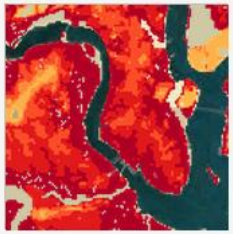
Population Density

View Map

Map URL

http://go.usa.gov/3aXCw

Population Density



View Map

Map URL

http://go.usa.gov/3aXCe

Print Maps

Coastal Flood **Exposure Mapper** | Select | Map | Collect | Tips | Resources | Case Studies | Save This Map | 3

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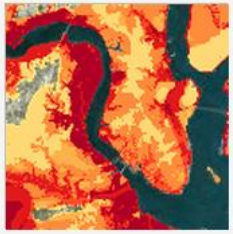
Tips for using these maps

Coastal Flood Hazard Composite



View Map

Map URL

http://go.usa.gov/3aXxd

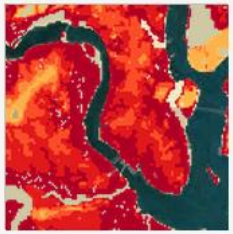
Population Density

View Map

Map URL

http://go.usa.gov/3aXCw

Population Density



View Map

Map URL

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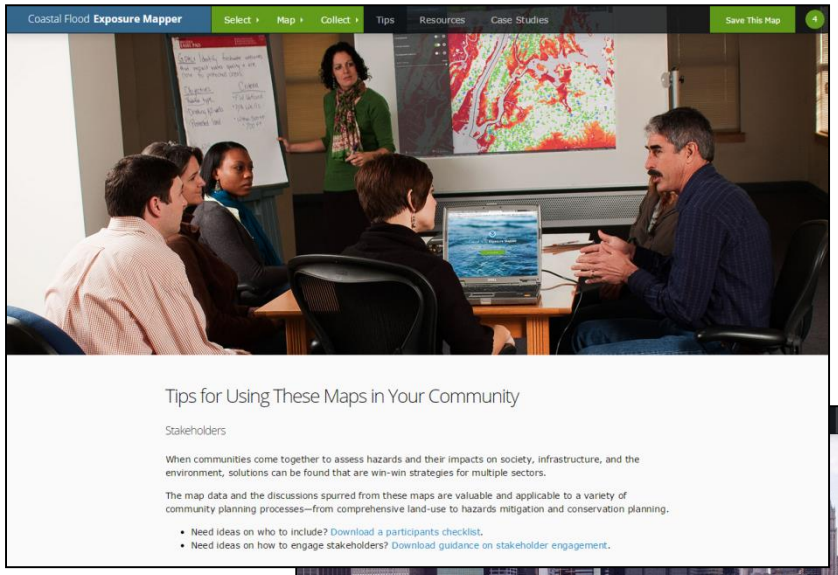
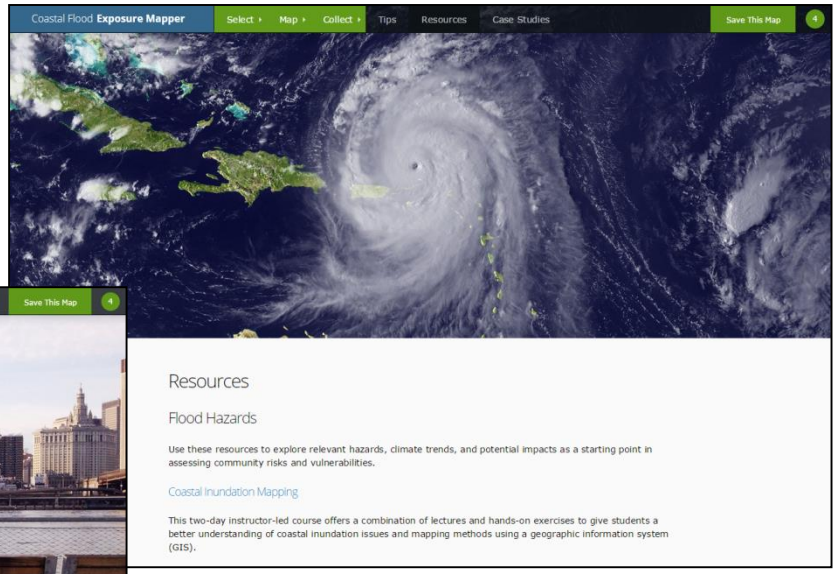
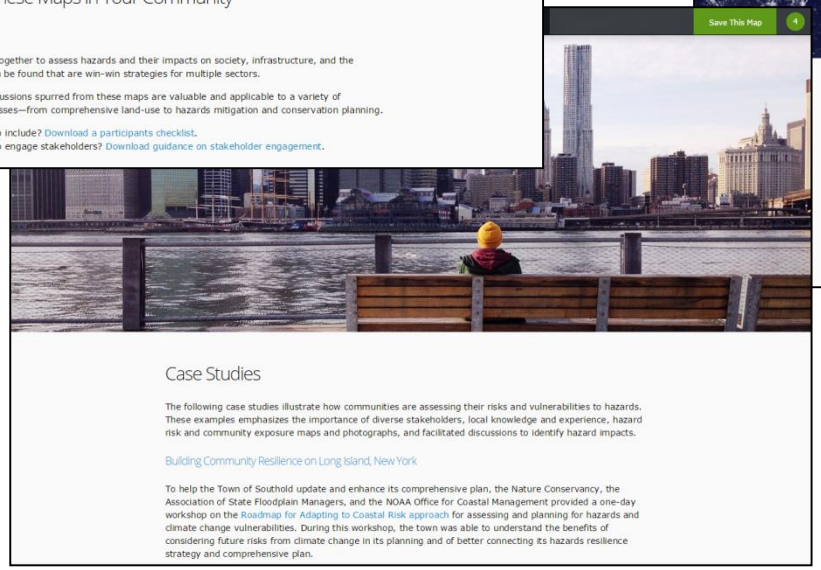
Print Maps

Tips, Resources, and Case Studies







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Tips for Using These Maps in Your Community

Stakeholders

When communities come together to assess hazards and their impacts on society, infrastructure, and the environment, solutions can be found that are win-win strategies for multiple sectors.

The map data and the discussions spurred from these maps are valuable and applicable to a variety of community planning processes—from comprehensive land-use to hazards mitigation and conservation planning.

- Need ideas on who to include? Download a participants checklist.
- Need ideas on how to engage stakeholders? Download guidance on stakeholder engagement.

Discussion Questions

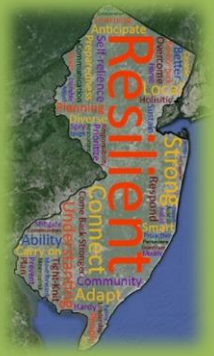
Along with the profile messages, the following questions can help facilitate a discussion about exposure to hazards.

- What's driving your need to discuss and better plan for hazards?
- What types of societal, infrastructure, and environmental resources are located in the hazard-prone areas?
- What are the implications of these resources being located in hazard-prone areas?
- What other data and information are needed to assess societal, infrastructure, and environmental vulnerabilities to hazards?
- Who can provide the additional information needed to help your community learn more about potential damages to societal, infrastructure, and environmental resources?
- How, and when, can the information discussed be used to best inform existing community plans, policies, and projects?
- What other coastal hazards would you want to include in your assessment? Earthquake, liquefaction, coastal erosion, landslides, wind, fire, tsunami, or debris flow potential?

Using the Maps

Share knowledge, experiences, and concerns to encourage different perspectives and cross-sector connections by

- Showing the online maps during a community meeting and discussing the messages. Record conversations on flip charts and share with the larger group.
- Sharing specific maps by sending associated Web links.
- Downloading and printing maps for community meetings to write on to show where hazard concerns are located. Record conversations on flip charts and share with the larger group.



Jacques Cousteau
National Estuarine Research Reserve

NOAA
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

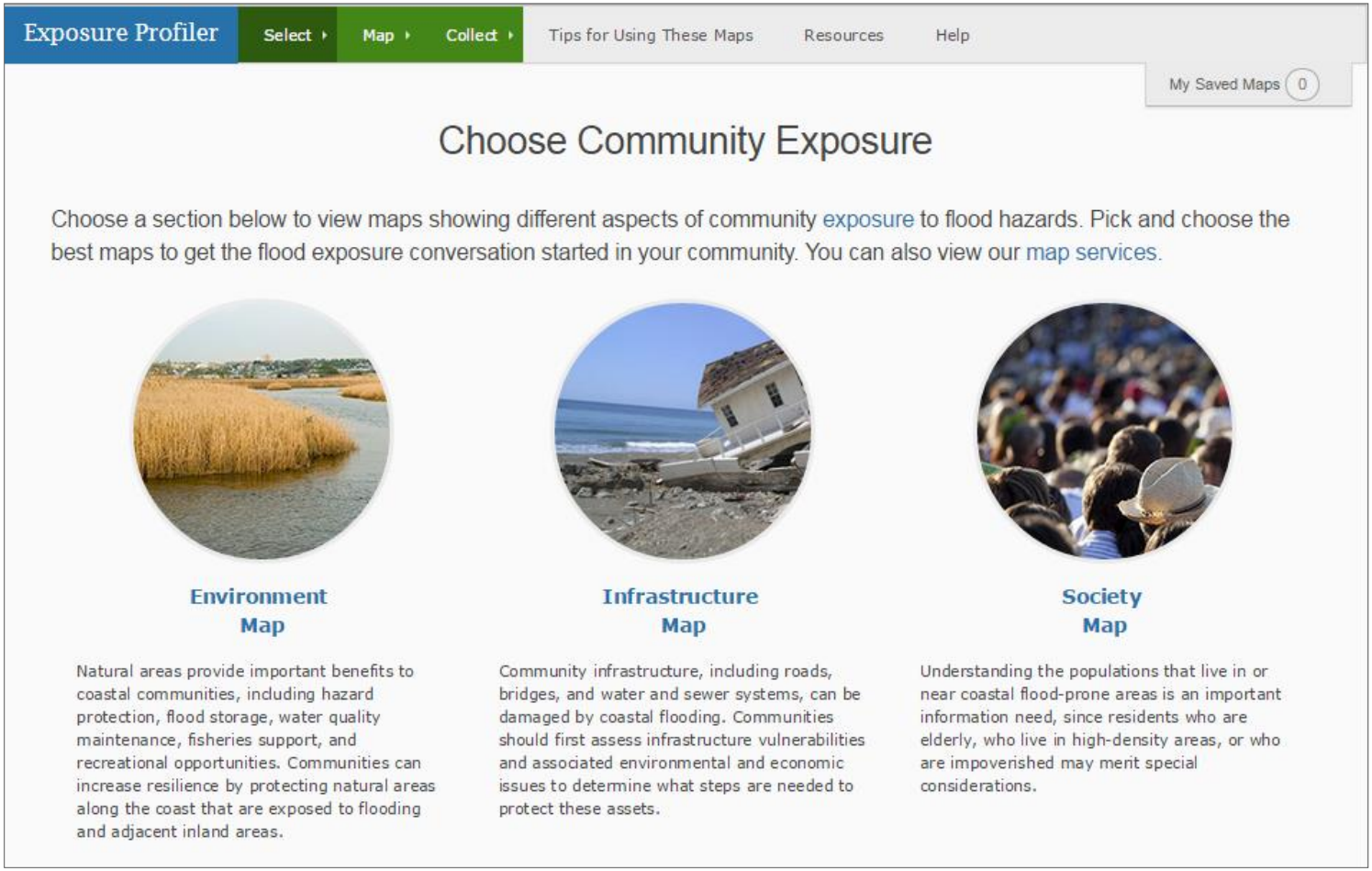
NEW JERSEY
RESILIENT
COASTAL
COMMUNITIES
INITIATIVE

Increasing Coastal Resilience in New Jersey

Hurricane Sandy

Assess

Evaluate Your Municipal Risks and Vulnerabilities



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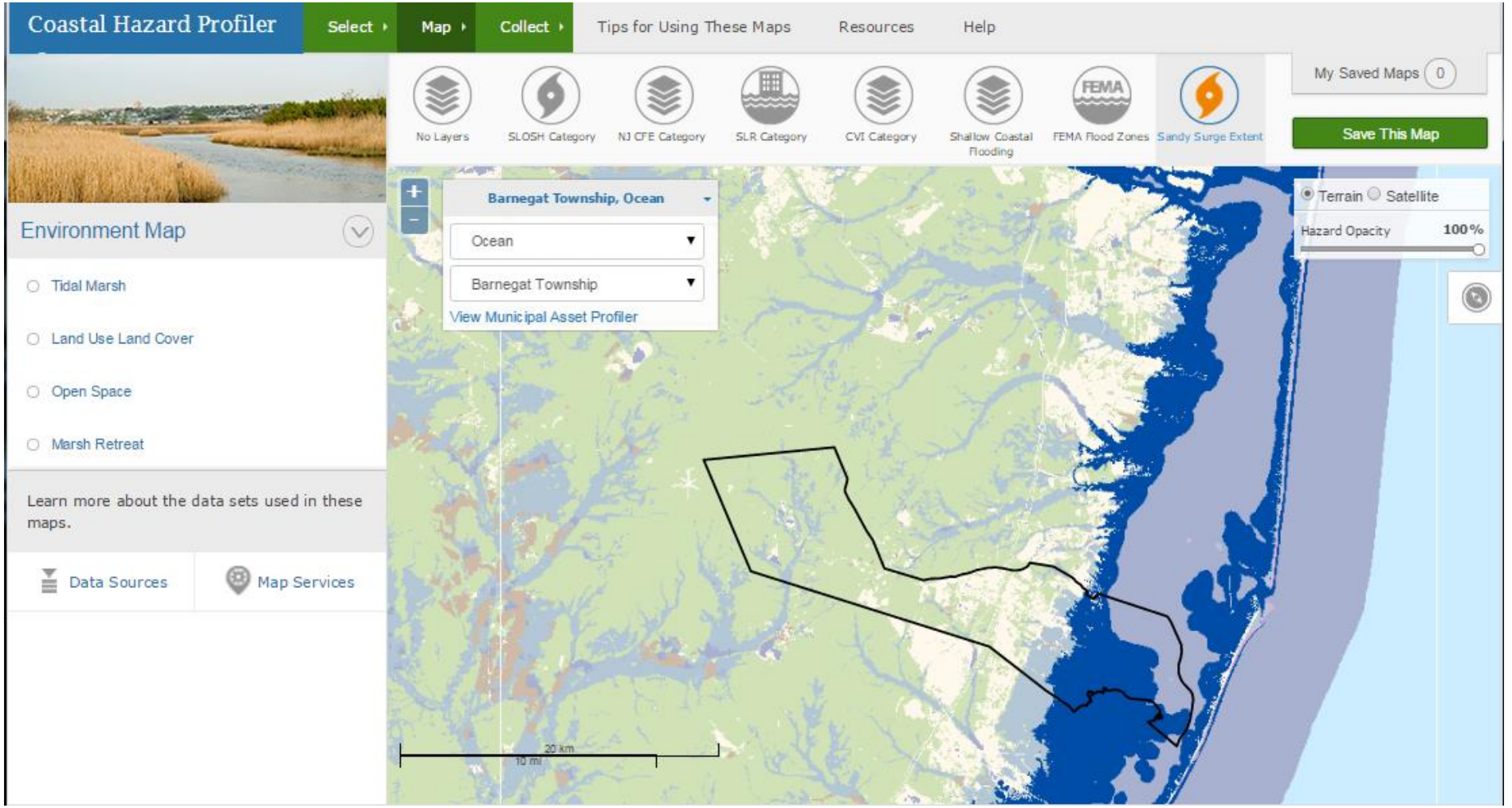

New Training!!

Using Flood Exposure Maps (flipped webinar)

Part 1 (August 4): email with information to watch a self-guided demo (1 hour) and submit questions to be addressed during the live portion.

Part 2 (August 11): live interview with Lisa Auermuller from Jacques Cousteau National Estuarine Research Reserve on how they've been using the maps in coastal New Jersey for resiliency planning.

Also time for Q&A from participants

To register, visit
http://noaacsc.adobeconnect.com/floodexposuremaps/event/event_info.html
or **email** Liz.Lasicki@noaa.gov

Thank you!

Lauren.Long@noaa.gov

Land Cover Atlas

coast.noaa.gov/digitalcoast/tools/lca

http://coast.noaa.gov/digitalcoast/tools/lca

C-CAP Land Cover Atlas

Contributing Partners: NOAA Office for Coastal Management

Overview Requirements In Action Support

Get It Now

This online data viewer provides user-friendly access to regional land cover and land cover change information developed through NOAA's Coastal Change Analysis Program (C-CAP). The Land Cover Atlas eliminates the need for desktop geographic information system software, or advanced technical expertise, by processing C-CAP data for the user and providing easy access to that distilled information. The tool summarizes general change trends (such as forest losses or new development) and can highlight specific changes of interest (salt marsh losses to open water, or evergreen forest losses to development, for instance).

Features

- **Helps** users to visually analyze and explore NOAA's geospatial land cover data by county for areas of user interest
- **Allows** users to query specific types of land cover changes for specific date ranges and potentially evaluate their amount and location in relation to past management practices
- **Creates** summary reports and data tables to enhance communication and the decision-making process

Related Data

- Coastal Change Analysis Program Regional Land Cover

Related Tools

- C-CAP Coastal Comparison Tool

C-CAP Land Cover Atlas

Counties | Watersheds

State/Territory | County/Island | Select On Map

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

Visualize and explore observed land cover changes for your region and time frame of interest.

To Start

- Select a state
- Pick a county or watershed
- Select a time frame
- Explore!

See Hints

New in this version

- Choose between Counties or Watersheds
- Year 2010 data available for all regions
- "Region Map" to select a geography using a map
- "Share Map" now provides shortened URL
- "Share Map" lets you share via Facebook or Twitter or Google+

View Disclaimer

C-CAP Land Cover Atlas | C-CAP Land Cover Atlas

www.coast.noaa.gov/ccapatlas/

C-CAP Land Cover Atlas

Counties | Watersheds

State/Territory | County/Island | Select On Map

Alabama
American Samoa
California
Connecticut
Delaware
District of Columbia
Florida
Georgia
Guam

Date Range

2005 2006 2009 2010 2011

Developed | Forests | Wetlands

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View Disclaimer

Land Cover: 2010

Data Transparency

CANADA
UNITED STATES
MEXICO
Gulf of Mexico
Caribbean Sea
Vancouver
Portland
San Francisco
Los Angeles
San Diego
Las Vegas
Phoenix
Salt Lake City
Denver
Sacramento
El Paso
Dallas
Austin
Houston
Kansas City
Saint Louis
Indianapolis
Cincinnati
Columbus
Pittsburgh
Detroit
Toronto
Ottawa
Montreal
Boston
New York
Philadelphia
Orlando
Tampa
Miami
Havana
Monterrey
Guadalajara
México City
Puebla
Guatemala
San Salvador
Tegucigalpa
Managua
San José
Kingston
Port-au-Prince
Barranquilla
Maracaibo
Hudson Bay
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
IDAHO
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MISSOURI
IOWA
TENNESSEE
KENTUCKY
ARKANSAS
BELIZE
GUATEMALA
HONDURAS
CUBA
JAMAICA
HAITI
DOMINICA

500 km
200 mi

Scale = 1 : 28M

Long: -134.1650 Lat: 12.3400

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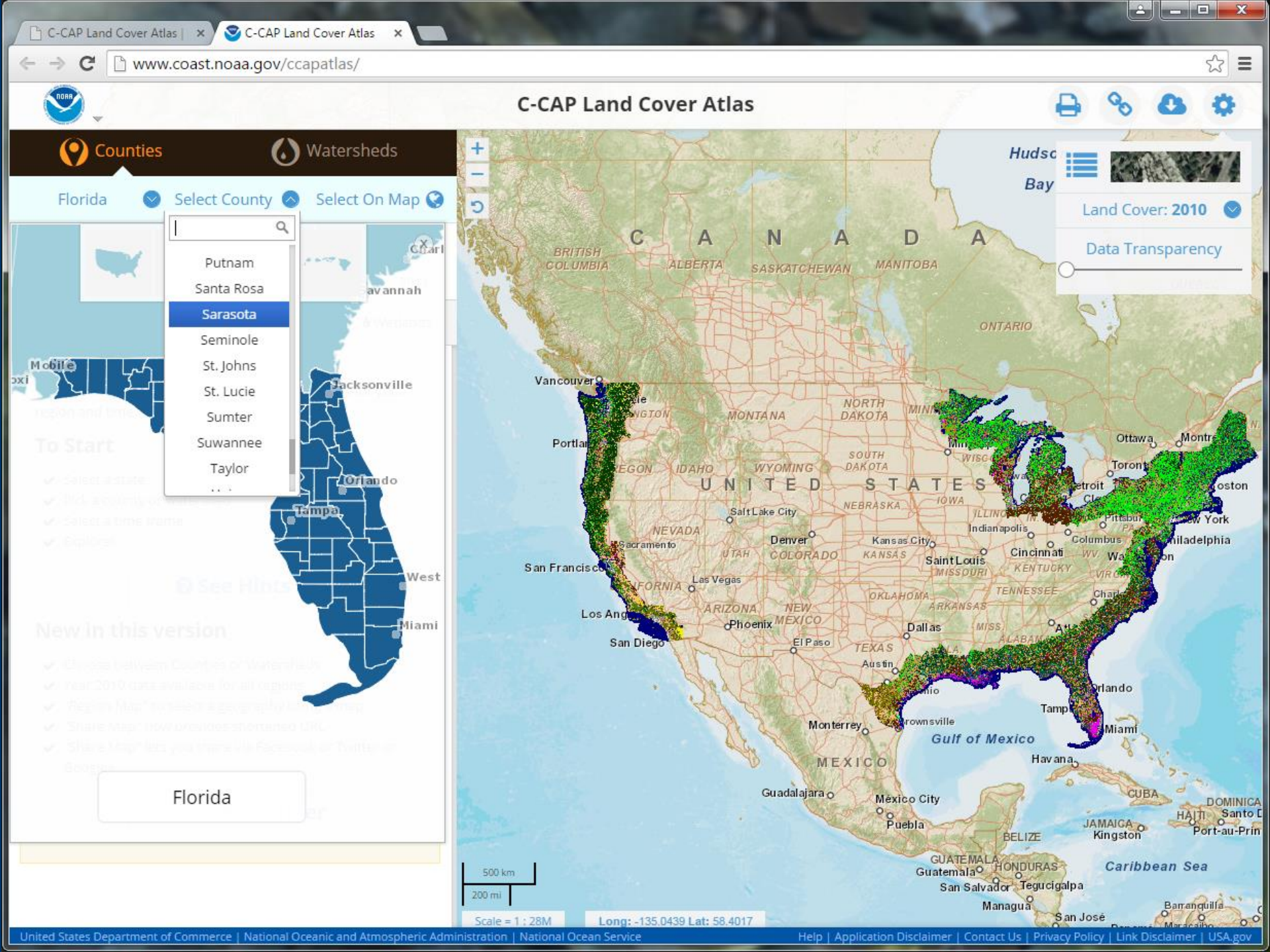
C-CAP Land Cover Atlas
www.coast.noaa.gov/ccapatlas/
C-CAP Land Cover Atlas
Counties
Watersheds
Florida
Select County
Select On Map
Putnam
Santa Rosa
Sarasota
Seminole
St. Johns
St. Lucie
Sumter
Suwannee
Taylor
Florida
Land Cover: 2010
Data Transparency
C A N A D A
UNITED STATES
MEXICO
Gulf of Mexico
Caribbean Sea
Vancouver
Portland
San Francisco
Los Angeles
San Diego
Las Vegas
Phoenix
Salt Lake City
Denver
Sacramento
Dallas
El Paso
Austin
Houston
Monterrey
Guadalajara
México City
Puebla
Havana
Kansas City
Saint Louis
Indianapolis
Columbus
Cincinnati
Detroit
Toronto
Ottawa
Montreal
Boston
New York
Philadelphia
Pittsburgh
Chicago
Minneapolis
Jacksonville
Orlando
Tampa
Miami
Mobile
Savannah
Charleston
Brownsville
Tampico
Kingston
Port-au-Prince
Santo Domingo
Guatemala
San Salvador
Tegucigalpa
Managua
San José
Barranquilla
Maracaibo
500 km
200 mi
Scale = 1 : 28M
Long: -135.0439 Lat: 58.4017
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C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

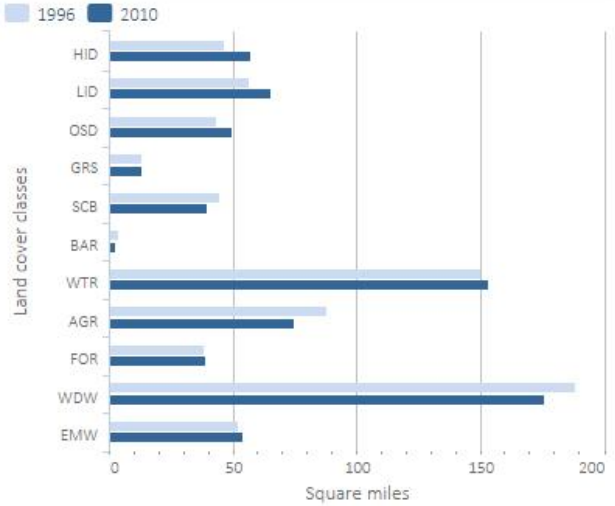
Sarasota County, Florida

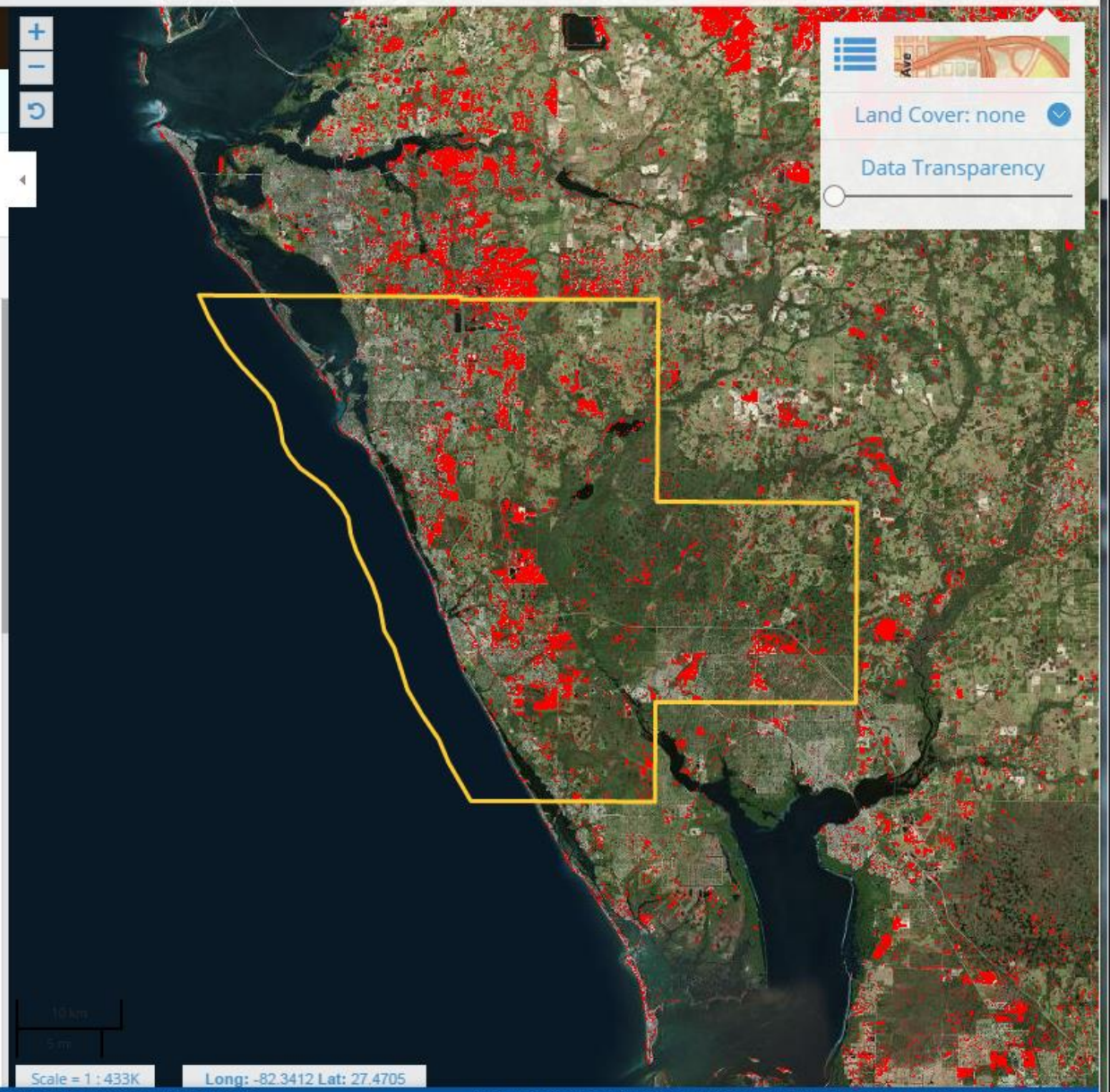
1996 to 2010

Percent of Sarasota County that changed

7.01%

Distribution of land cover by type





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C-CAP Land Cover Atlas | C-CAP Land Cover Atlas

www.coast.noaa.gov/ccapatlas/

C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

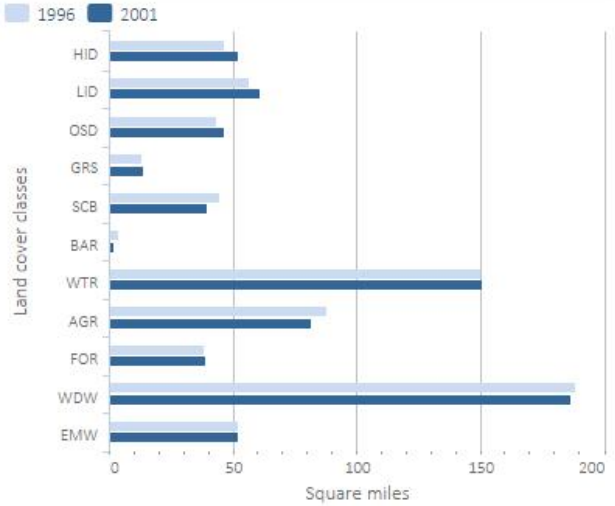
Sarasota County, Florida

1996 to 2001

Percent of Sarasota County that changed

3.77%

Distribution of land cover by type



Land Cover: none

Data Transparency

Scale = 1 : 433K

Long: -82.8850 Lat: 27.2388

www.coast.noaa.gov/ccapatlas/#

Administration | National Ocean Service

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C-CAP Land Cover Atlas | C-CAP Land Cover Atlas

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C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

Sarasota County, Florida

1996 to 2010

Percent of Sarasota County that changed

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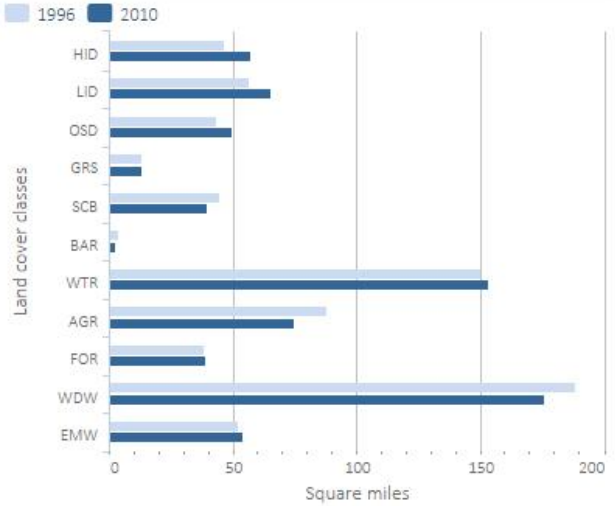
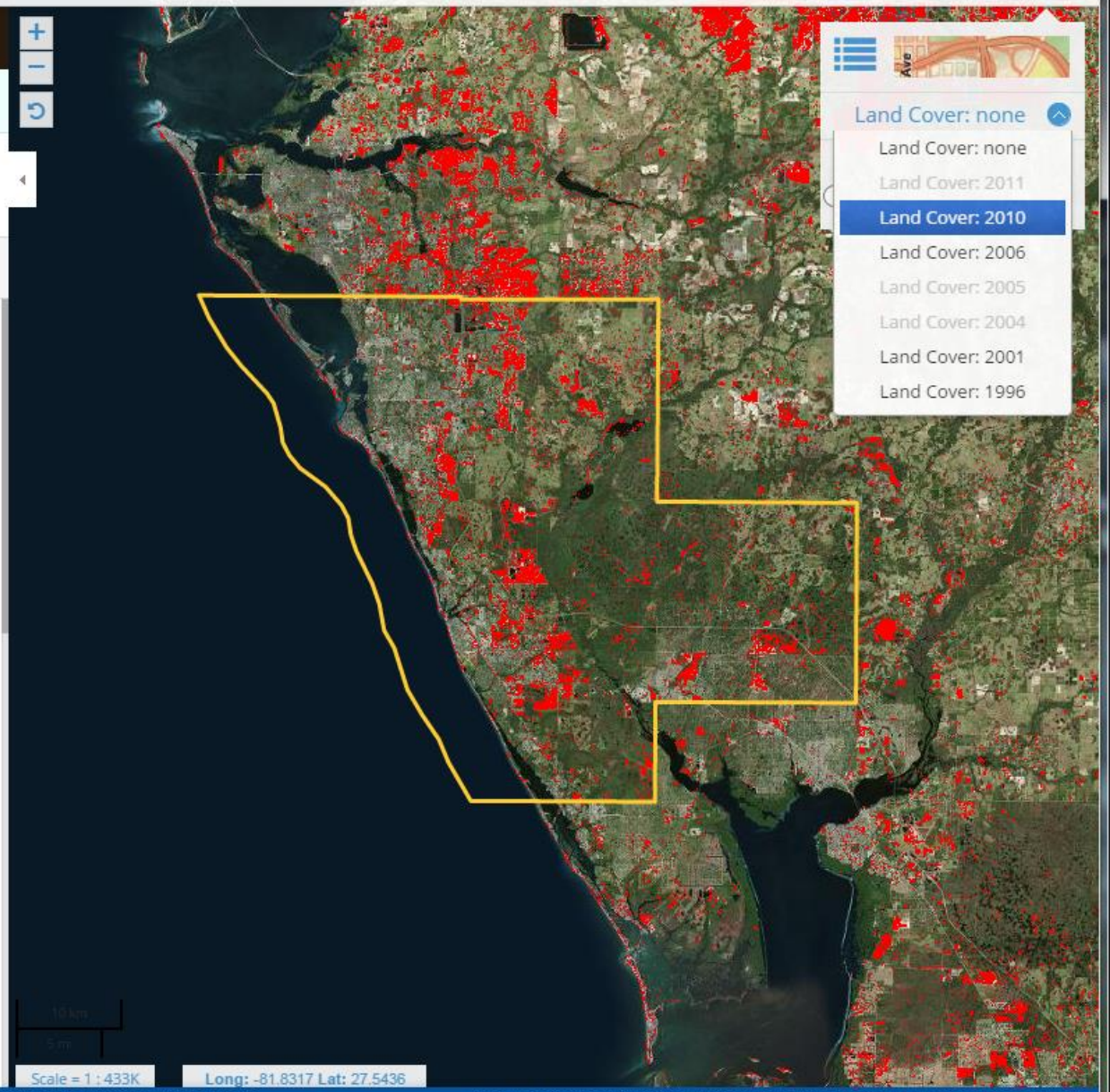
Distribution of land cover by type





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C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

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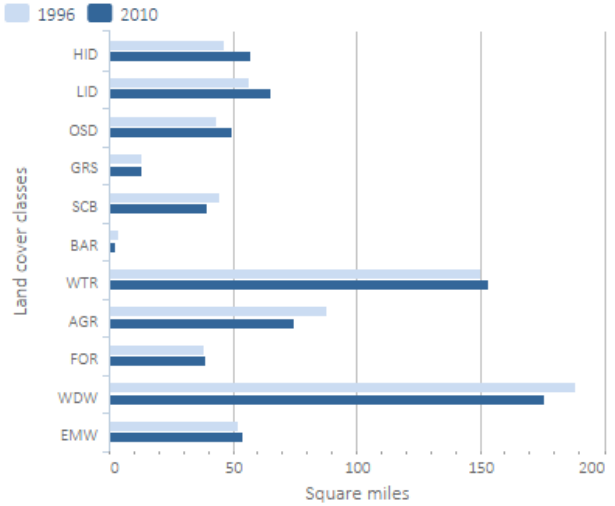

Land Cover: 2010

Data Transparency

General

Land Cover Change(s)

Land Cover Classes

- Unclassified
- Developed, High Intensity
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, Open Space
- Cultivated Crops
- Pasture/Hay
- Grassland/Herbaceous
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Scrub/Shrub
- Palustrine Forested Wetlands
- Palustrine Scrub/Shrub Wetlands
- Palustrine Emergent Wetlands
- Estuarine Forested Wetlands

10 km
5 mi

Scale = 1 : 433K

Long: -82.2340 Lat: 27.6410

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C-CAP Land Cover Atlas | C-CAP Land Cover Atlas

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C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

Distribution of change (losses & gains) by land cover

Land Cover and Change Distribution

Land Cover	Area 1996	Area Lost	Area Gained	Area 2010	Net Change	Percent Change
HID	46.29	0.03	9.25	55.51	9.22	19.91%
LID	56.60	0.20	6.88	63.28	6.68	11.81%
OSD	43.36	0.29	6.41	49.48	6.12	14.12%
GRS	13.05	1.62	1.36	12.79	-0.26	-1.97%
AGR	87.90	11.94	1.50	77.46	-10.44	-11.88%

Land Cover: none

Data Transparency

General

Land Cover Change(s)

Scale = 1 : 433K

Long: -81.8317 Lat: 27.5180

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C-CAP Land Cover Atlas | C-CAP Land Cover Atlas

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C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

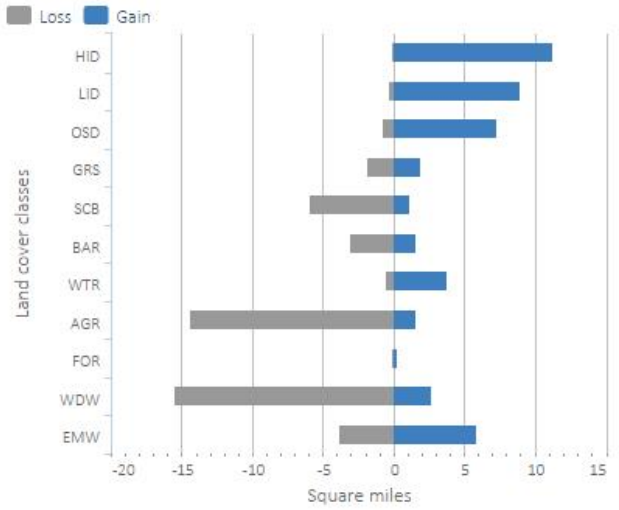
1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

Land Cover: none

Data Transparency

Distribution of change (losses & gains) by land cover



Land Cover and Change Distribution

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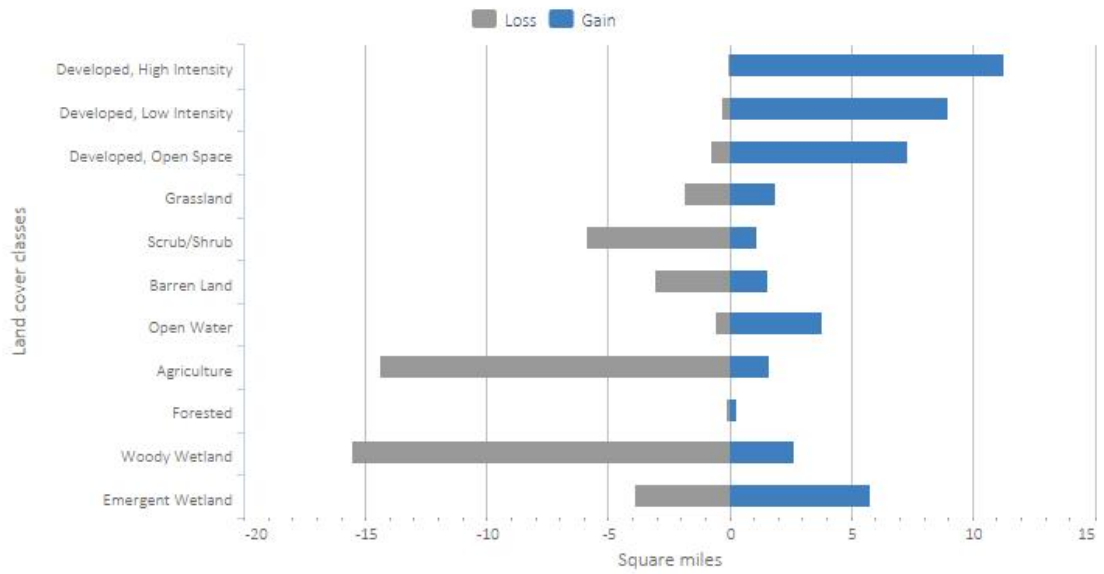
Distribution of change (losses & gains) by land cover



Scale = 1 : 433K

Long: -82.0349 Lat: 27.6410

C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

Sarasota County, Florida

1996 to 2010

More Info

Percent of Sarasota County that is developed

1996	2010
20.17%	23.82%

Percent of Sarasota County impervious surface area

1996	2010
6.89%	8.33%

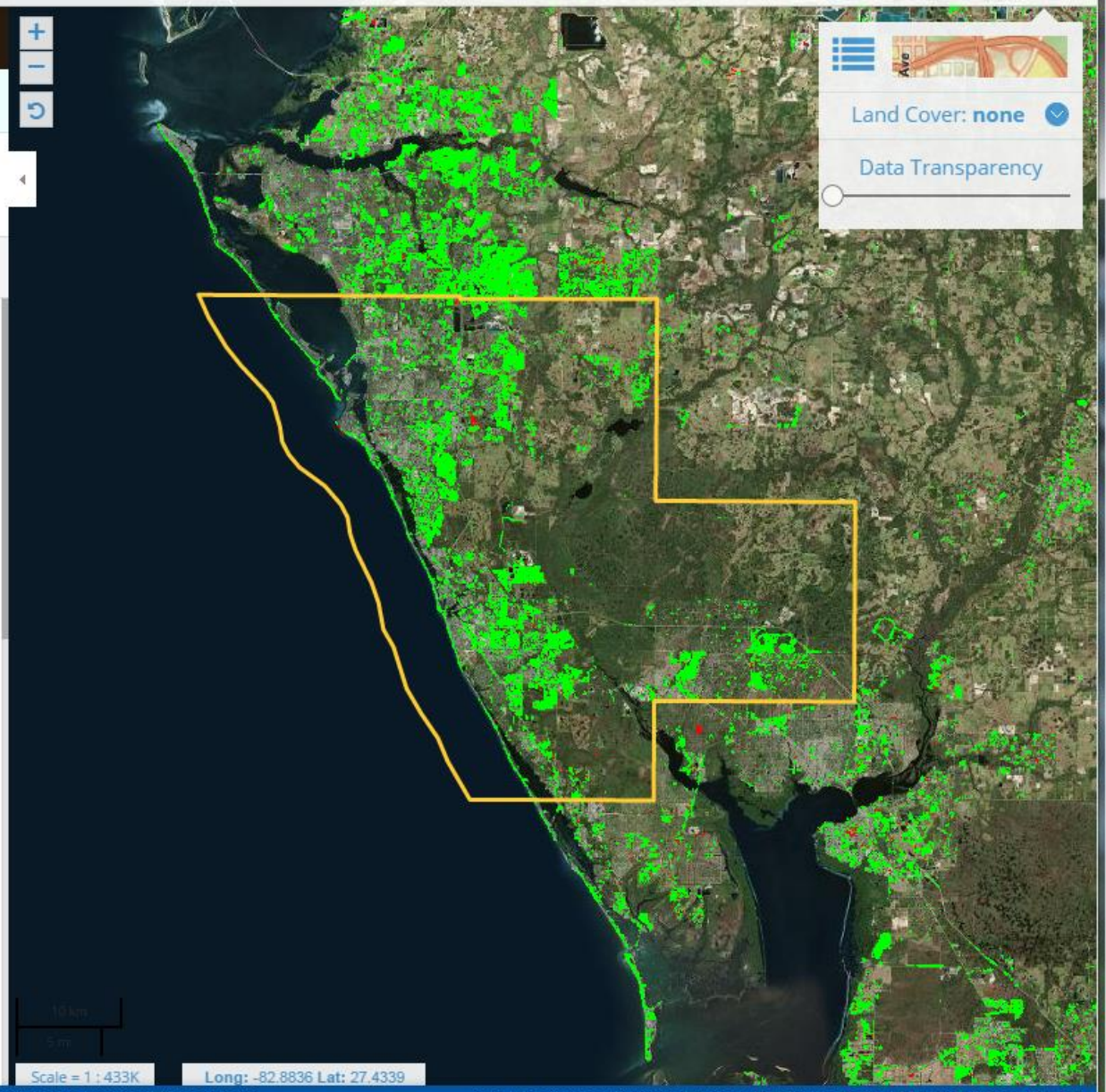
Percent net increase in developed area

18.11%

Percent net increase in impervious surface area

20.95%

Distribution of developed change by developed type



C-CAP Land Cover Atlas | C-CAP Land Cover Atlas

www.coast.noaa.gov/ccapatlas/

C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

Percent of Sarasota County impervious surface area

1996	2010
6.89%	8.33%

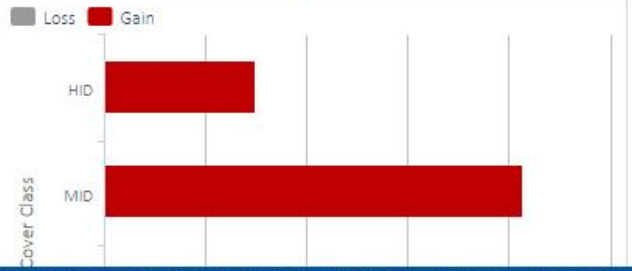
Percent net increase in developed area

18.11%

Percent net increase in impervious surface area

20.95%

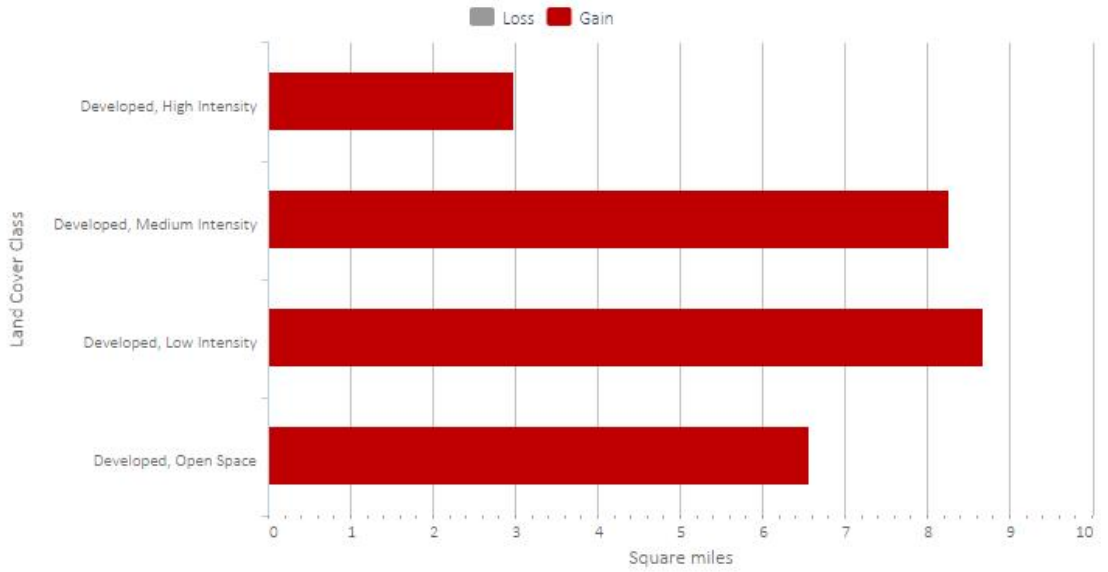
Distribution of developed change by developed type



Land Cover: none

Data Transparency

Distribution of developed change by developed type



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Long: -82.3988 Lat: 27.4571

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C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

Sarasota County, Florida

1996 to 2010

More Info

Percent of Sarasota County that is developed

1996	2010
20.17%	23.82%

Percent of Sarasota County impervious surface area

1996	2010
6.89%	8.33%

Percent net increase in developed area

18.11%

Percent net increase in impervious surface area

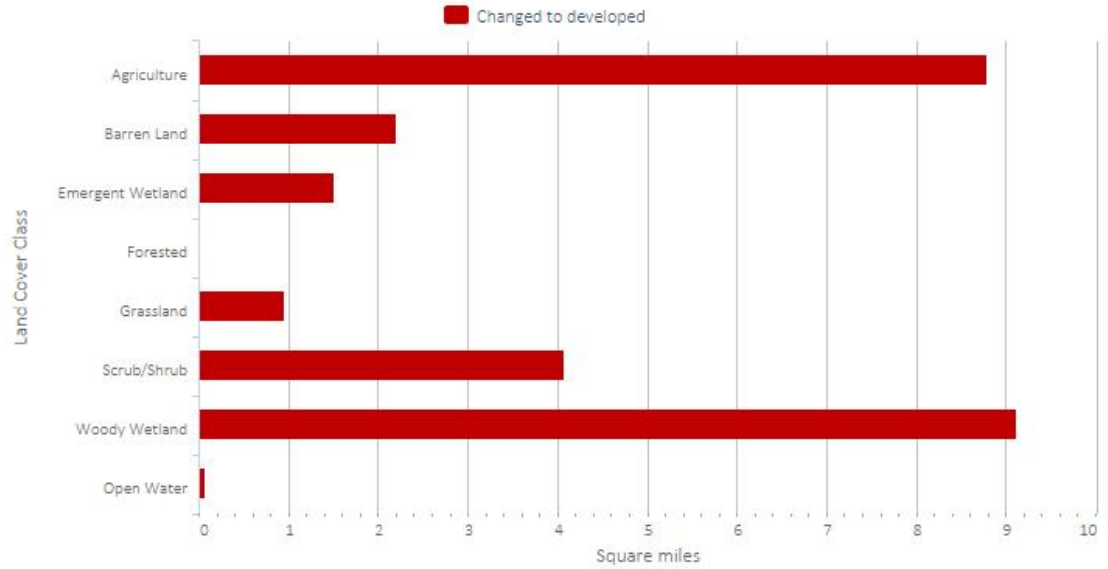
20.95%

Distribution of developed change by developed type

Land Cover: none

Data Transparency

Distribution of areas lost to development by land cover



1000 m
2000 ft

Scale = 1 : 54K

Long: -82.4299 Lat: 27.0362

C-CAP Land Cover Atlas | C-CAP Land Cover Atlas

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C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

Sarasota County, Florida

1996 to 2010

More Info

Percent of Sarasota County that is forested

1996	2010
24.72%	23.23%

Percent net decrease in forested area

-6.00%

Percent net decrease in core forested area

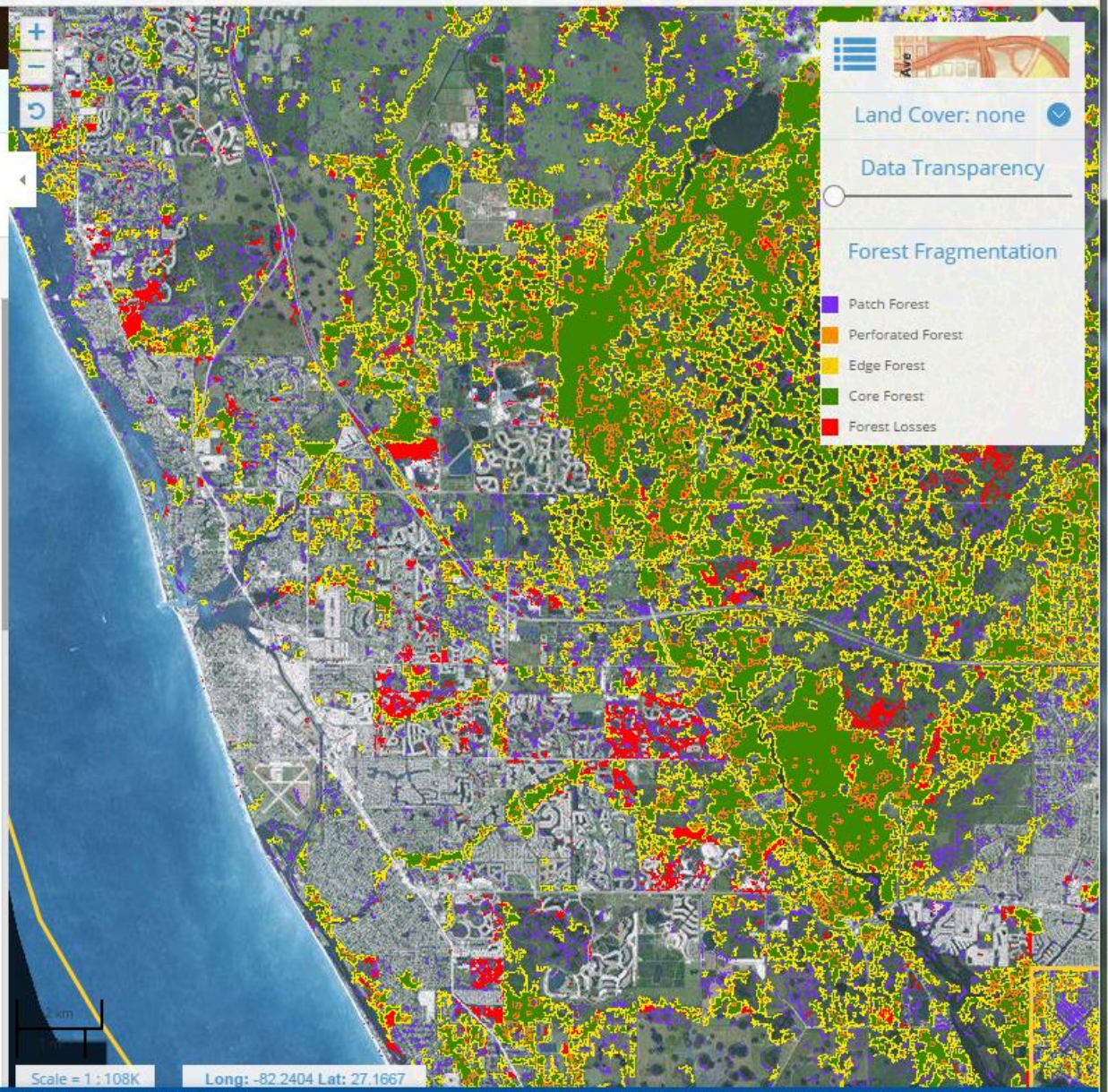
-8.46%

Percent net decrease in non core forested area

-4.83%

Percent net increase in new forested area gained

0.91%



C-CAP Land Cover Atlas

Counties | Watersheds

Florida | Sarasota | Select On Map

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

Sarasota County, Florida

1996 to 2010

More Info

Percent of Sarasota County that is wetland

1996	2010
33.25%	31.72%

Percent net decrease of total wetlands

-4.60%

Percent net decrease of freshwater (palustrine) wetlands

-4.53%

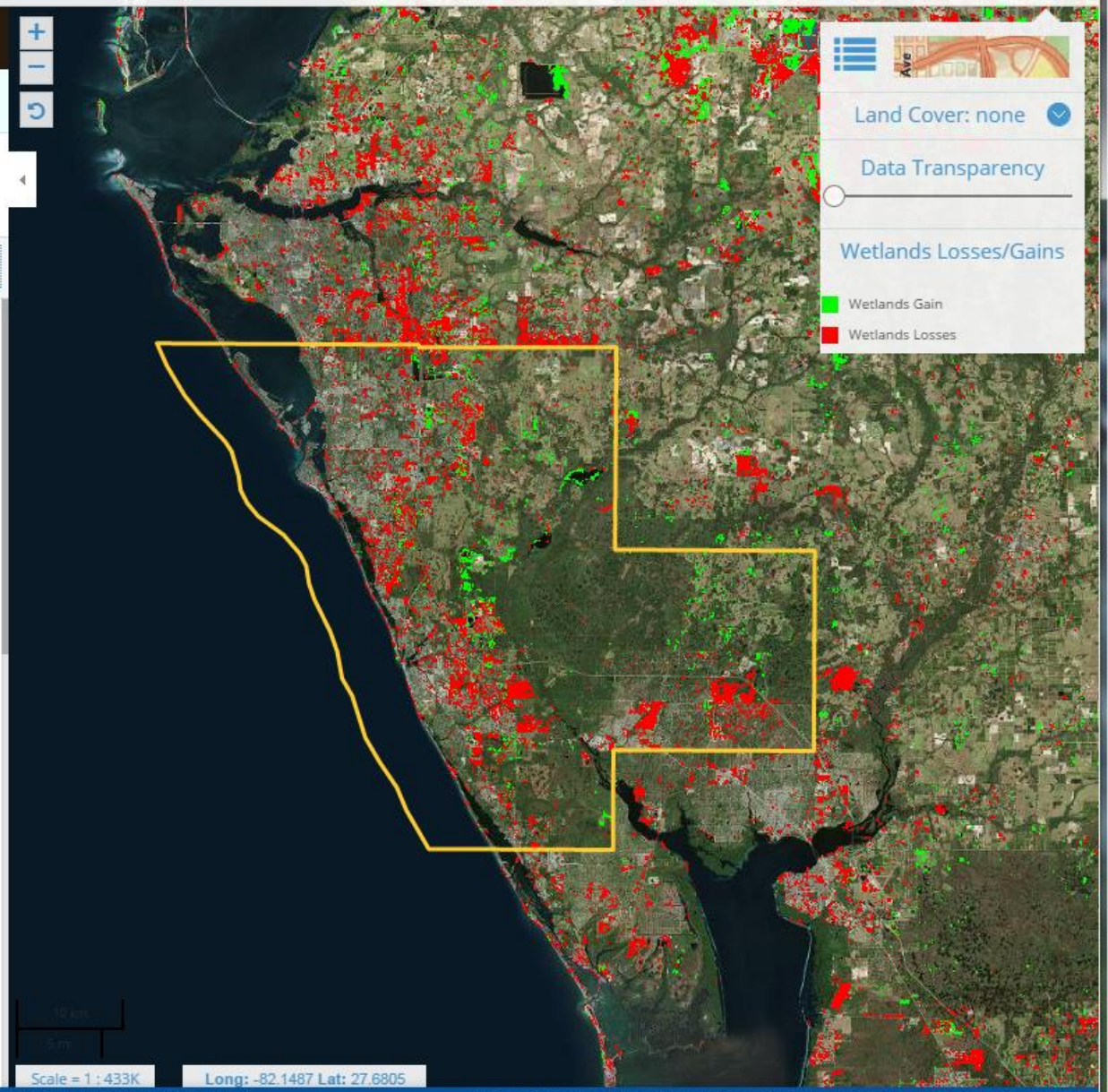
Percent net decrease of saltwater (estuarine) wetlands

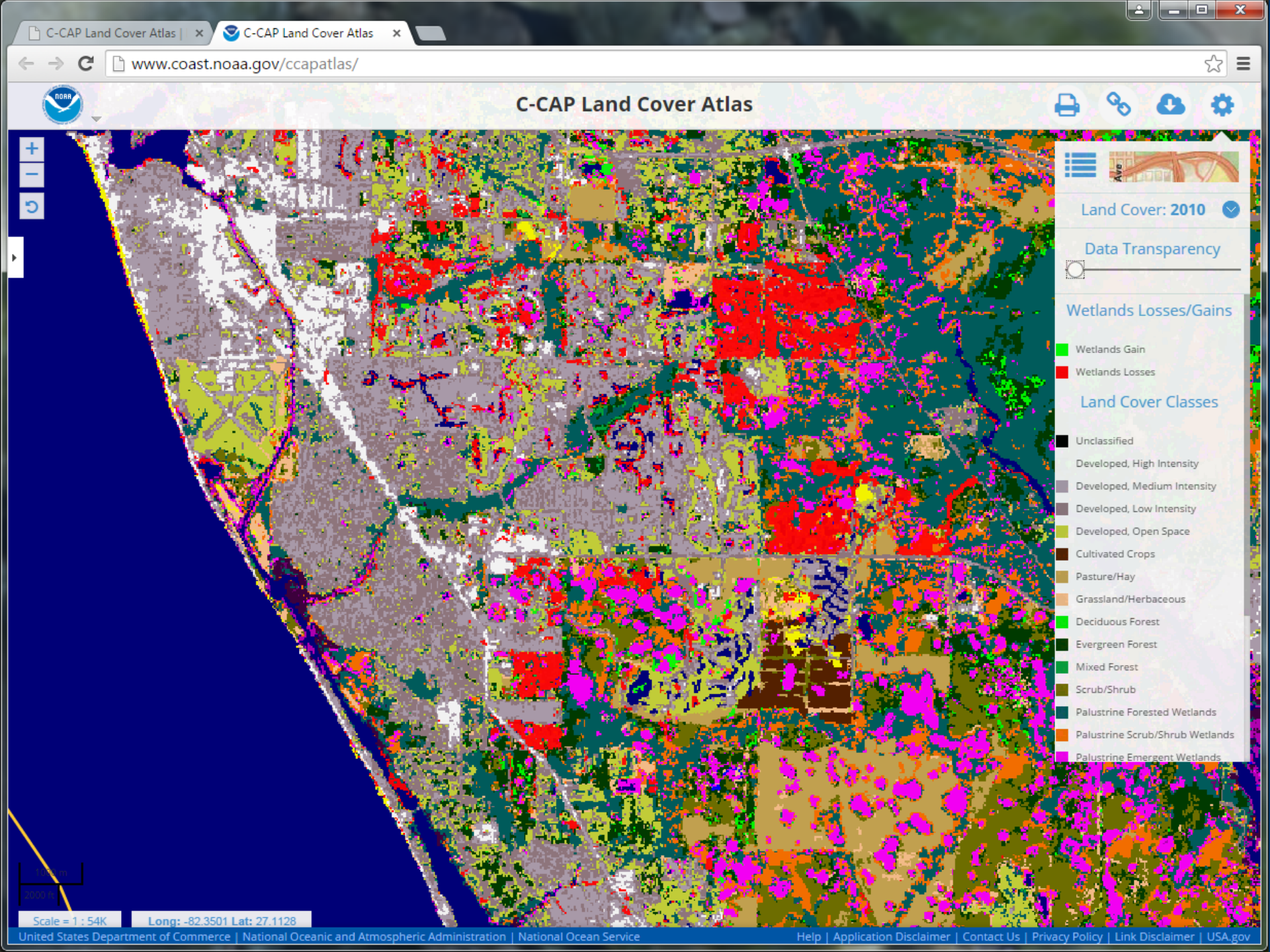
-4.10%

Distribution of wetland change by wetland type

Loss Gain

PFW




C-CAP Land Cover Atlas
C-CAP Land Cover Atlas
www.coast.noaa.gov/ccapatlas/
C-CAP Land Cover Atlas
Land Cover: 2010
Data Transparency
Wetlands Losses/Gains
Wetlands Gain
Wetlands Losses
Land Cover Classes
Unclassified
Developed, High Intensity
Developed, Medium Intensity
Developed, Low Intensity
Developed, Open Space
Cultivated Crops
Pasture/Hay
Grassland/Herbaceous
Deciduous Forest
Evergreen Forest
Mixed Forest
Scrub/Shrub
Palustrine Forested Wetlands
Palustrine Scrub/Shrub Wetlands
Palustrine Emergent Wetlands
Scale = 1 : 54K
Long: -82.3501 Lat: 27.1128
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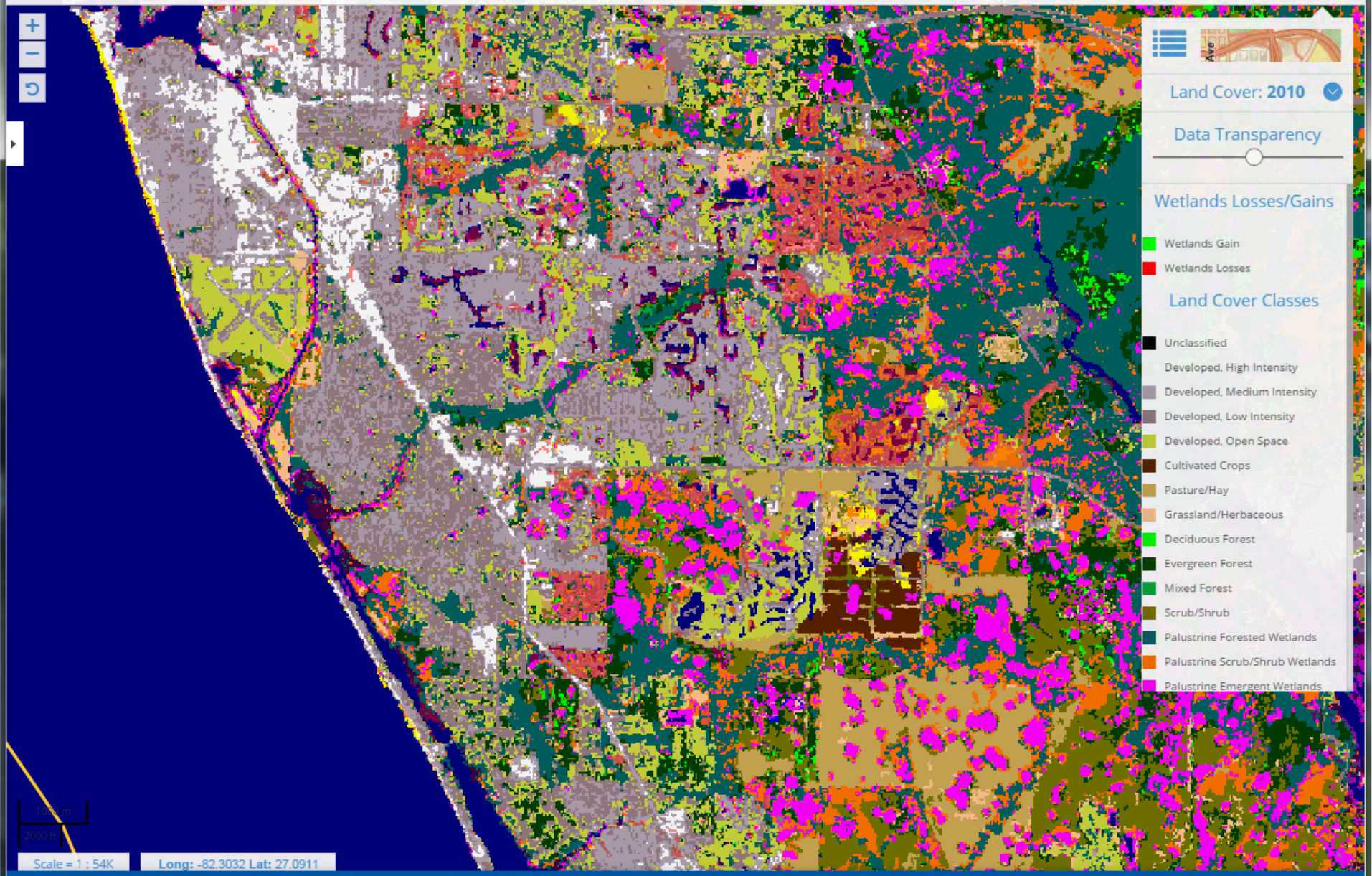


C-CAP Land Cover Atlas | C-CAP Land Cover Atlas

www.coast.noaa.gov/ccapatlas/

C-CAP Land Cover Atlas

Print Report

Counties | Watersheds

Florida | Sarasota | Select On Map

Land Cover: none

Data Transparency

Date Range

1996 2001 2004 2005 2006 2009 2010 2011

General | Developed | Forests | Wetlands

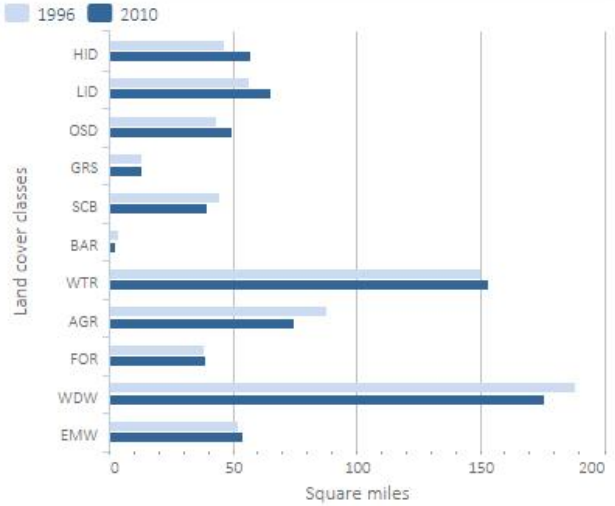
Sarasota County, Florida

1996 to 2010

Percent of Sarasota County that changed

7.01%

Distribution of land cover by type



Scale = 1 : 433K

Long: -82.1369 Lat: 27.6156

Land Cover Report - Google Chrome

www.coast.noaa.gov/ccapatlas/report.html?sn=Florida&r=Sarasota&rt=County&geoid=12115&ys=19

Print Report

Land Cover Data Sheet
www.coast.noaa.gov/ccapatlas

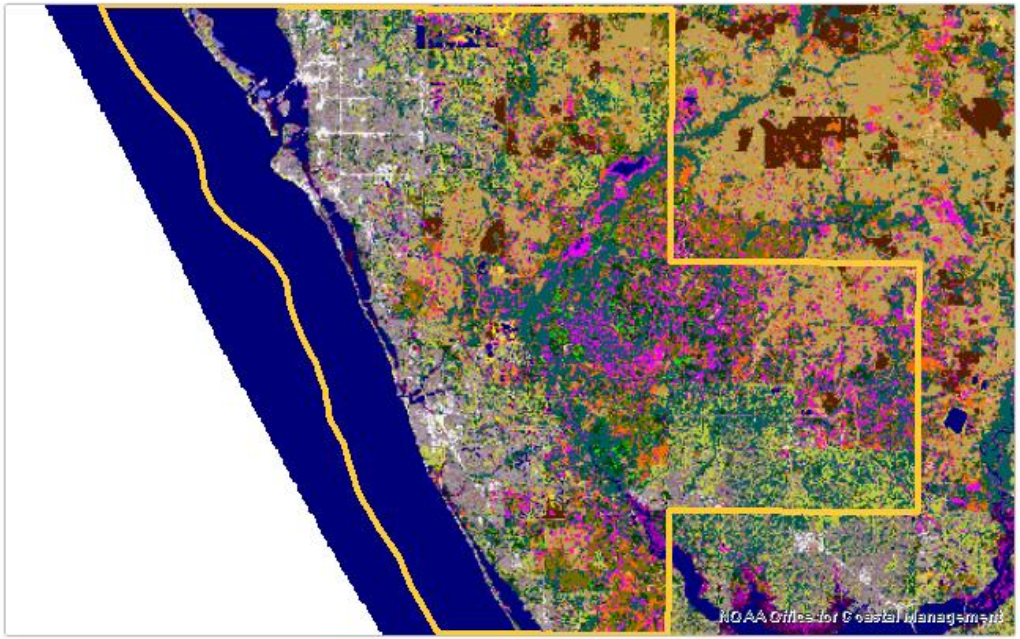
Sarasota County, Florida

2010 Land Cover

Having an accurate picture of an area's landscape and understanding how that landscape is changing is important information for any planning effort. Land cover data can help provide that big-picture view.

The data seen in the map below was derived through NOAA's Coastal Change Analysis Program (C-CAP). C-CAP produces nationally standardized land cover and land change information for the coastal regions of the U.S. Multiple dates of satellite imagery are used to document changes in various types of land cover. The 2010 land cover for Sarasota County can be seen below.

These summary sheets provide an easy way to understand some of the important information derived from these data for Sarasota County.



- Unclassified
- Developed, High Intensity
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, Open Space
- Cultivated Crops
- Pasture/Hay
- Grassland/Herbaceous
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Scrub/Shrub
- Palustrine Forested Wetlands
- Palustrine Scrub/Shrub Wetlands
- Palustrine Emergent Wetlands
- Estuarine Forested Wetlands
- Estuarine Scrub/Shrub Wetlands
- Estuarine Emergent Wetlands
- Unconsolidated Shore
- Barren Land
- Open Water
- Palustrine Aquatic Bed
- Estuarine Aquatic Bed
- Perennial Ice/Snow