

# NOAA's Digital Coast: Actionable Information for Coastal Communities

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# Coastal Populations

U.S. Coastal Shoreline  
Counties  
(including Great Lakes):

**< 10%**

of total land area

**39%**

of total population (2010)



# Coastal Economies

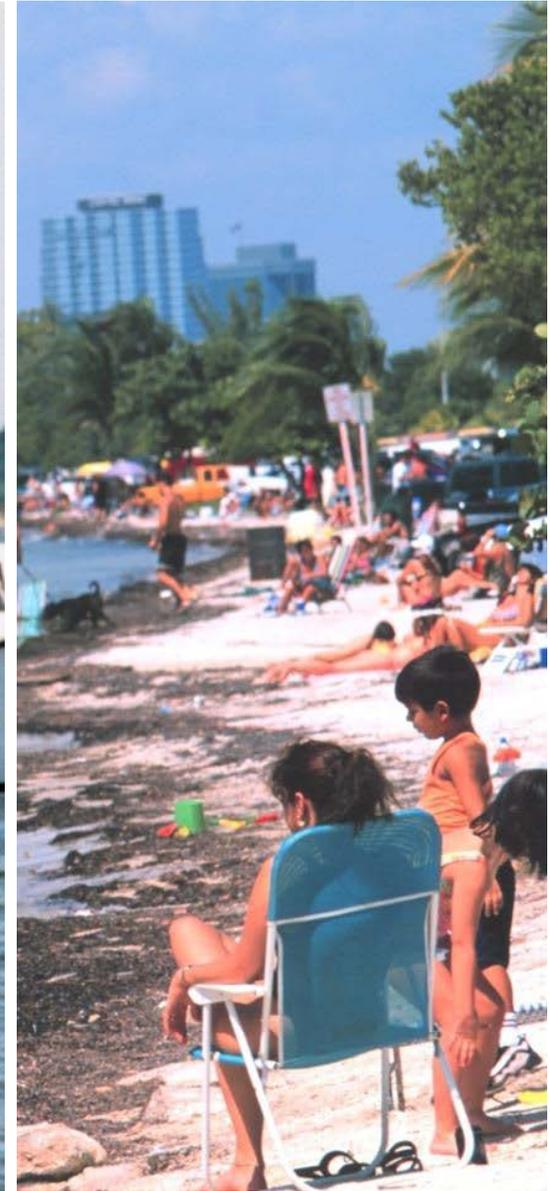
In 2010, the U.S. Ocean and Great Lakes economy produced

**2.8 million**

jobs and

**\$258 billion**

in GDP





# Coastal Challenges

## 9

Of the top ten most destructive flood events on record have occurred since 1999.

## \$24 billion

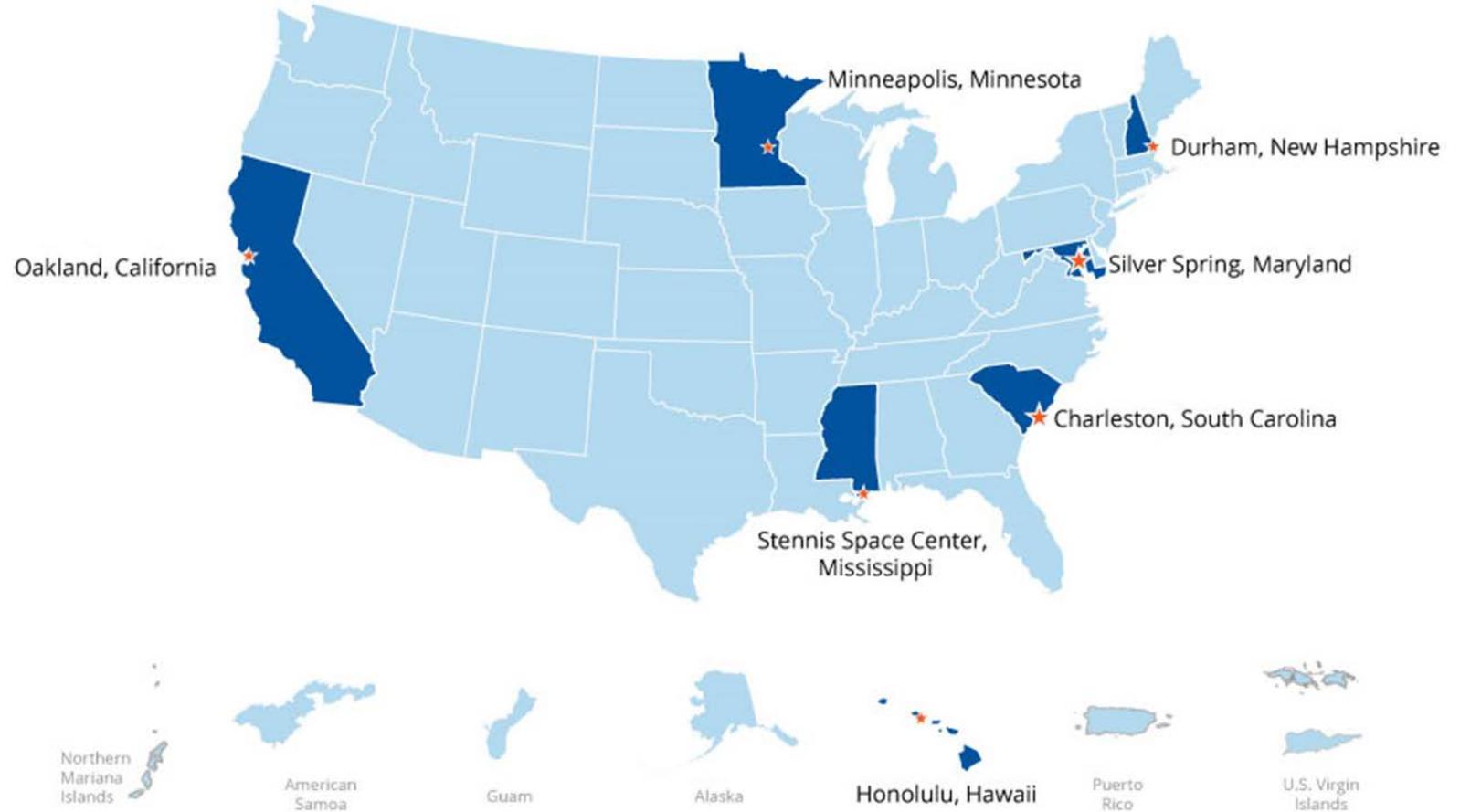
In total losses have been paid out by the National Flood Insurance Program within the coastal floodplain from 1978 to 2011.



# NOAA Office for Coastal Management

Foster sound approaches to coastal management through the following avenues:

- Collaborative and leveraged approaches
- Science-based decision making
- Capacity building
- Smart governance and investments
- Inspiring, educating, and motivating people



# Digital Coast

- **Approach:** Bring the geospatial and coastal management communities together
- **Outcome:** A constituent-driven, integrated, enabling platform supporting coastal resource management that is used

The screenshot shows the Digital Coast website homepage. At the top left is the NOAA logo and the text "DigitalCoast OFFICE FOR COASTAL MANAGEMENT". To the right is a navigation menu with links for "About", "Data", "Tools", "Training", "Stories", and "Topics", along with a search bar. The main header features a large image of a coastal building with waves crashing against its base, overlaid with the text "More Than Just Data" and the subtext "Dive into the Digital Coast to Get the Data, Tools, and Training Communities Need to Address Coastal Issues." Below this is a row of five blue buttons labeled "DATA", "TOOLS", "TRAINING", "STORIES", and "TOPICS". The main content area is divided into two columns. The left column has a section titled "Learn More about the Digital Coast" with links for "About", "Contributing Partners", "Watch the Video", and "GeoZone Blog". Below this is a section titled "What is the Digital Coast?" with a paragraph of text and a link to "Learn more in our About section". The right column has a "Top:" section with links for "Data", "Tools", "Training", and "Stories", followed by a numbered list of five items: "1 Coastal Lidar", "2 Coastal Change Analysis Program", "3 Economics: National Ocean Watch", "4 Electronic Nautical Charts", and "5 Emergency Response Imagery". At the bottom, there are sections for "News" and "Features" with navigation arrows.



# Digital Coast Partnership

- 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



# A Broad Spectrum Approach: Facilitating Use and Application



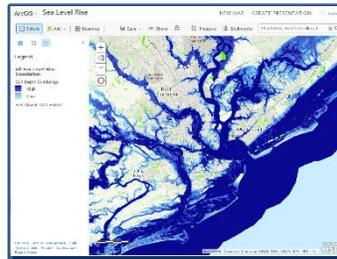
## DISCOVER

Information on sea level rise through the Coastal Inundation Toolkit



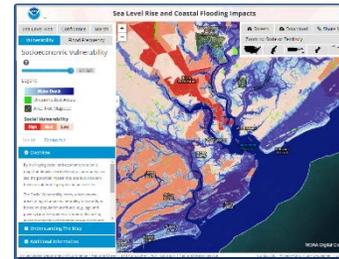
## DOWNLOAD

Sea level rise and high resolution elevation data for your community



## MAP

Develop mash-ups with ESRI and OGC map services



## ANALYZE

Potential SLR impacts with the SLR Viewer



## LEARN

How to map inundation with instructor-led trainings



## SHARE

Outcomes with others though Stories in the Field

DATA

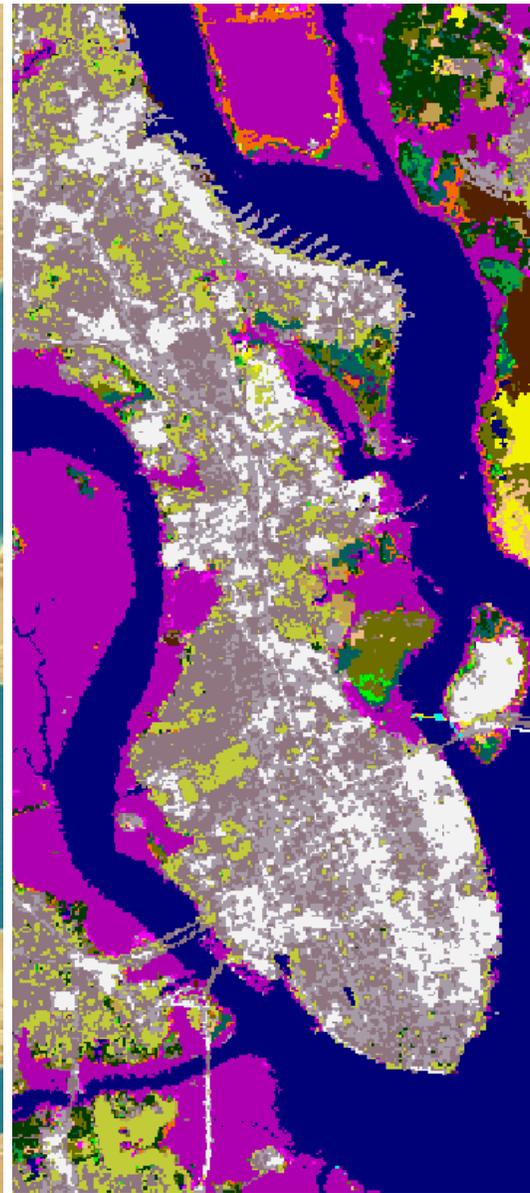
INFORMATION

ACTION

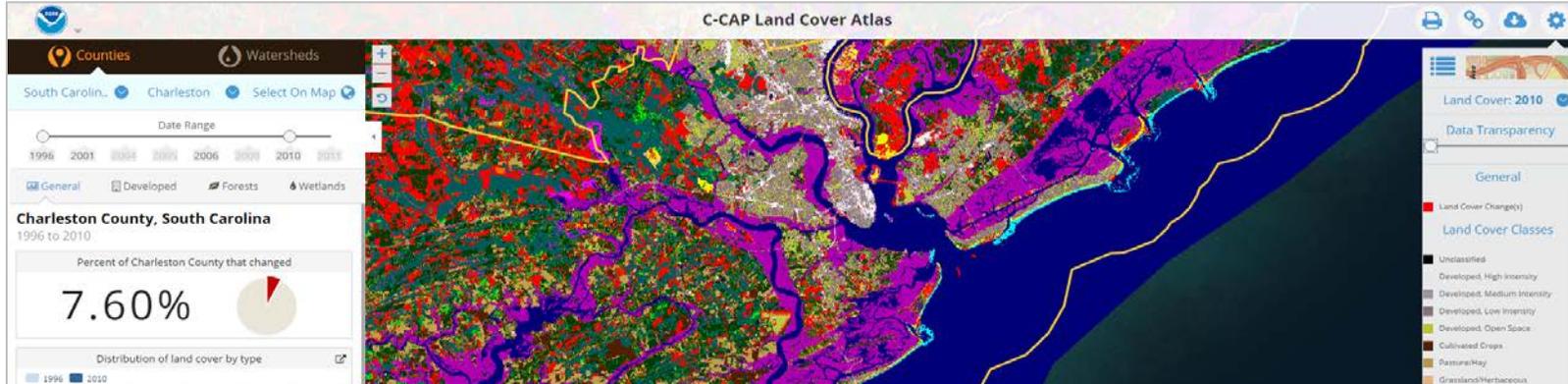
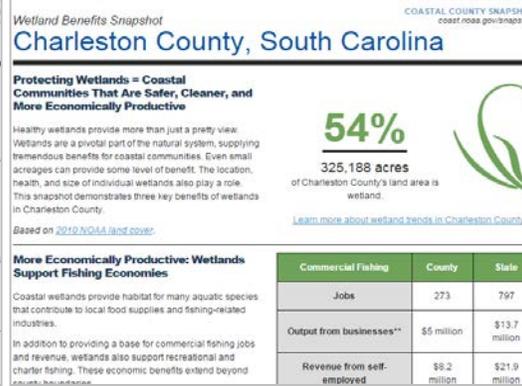
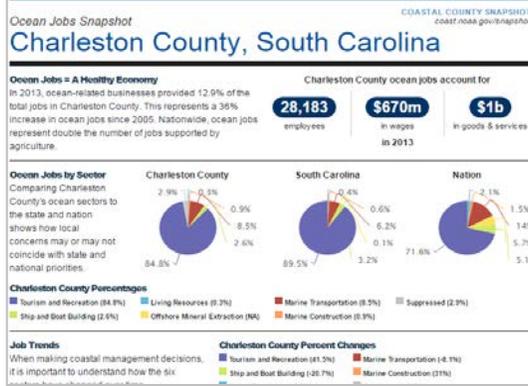
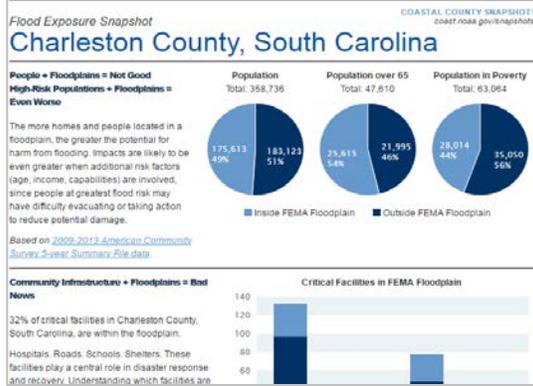
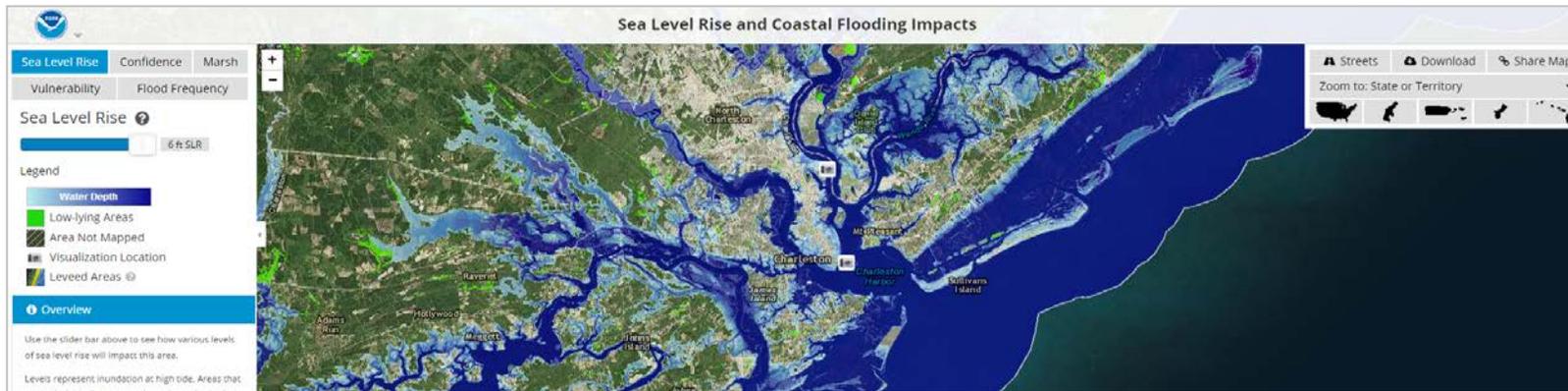


# Data

- Over 70 terabytes of high-resolution elevation data, land cover data, and orthoimagery
- 200+ web mapping services
- Linkages to over 40 national-level coastal data sets



# Tools



- An inventory of over 50 decision-support and information visualization tools
- Many provide visualization and analysis capabilities without need for GIS software





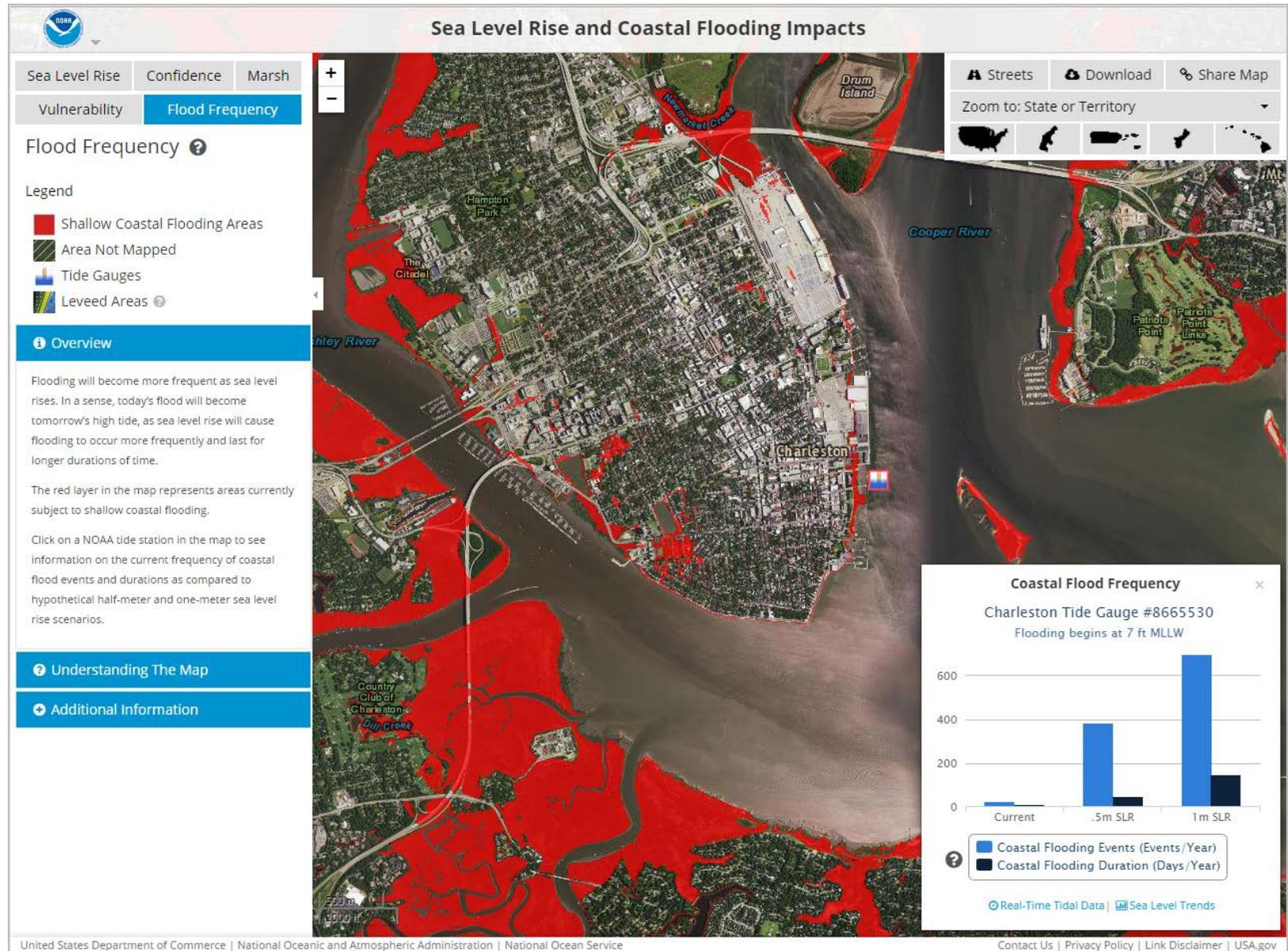
## Sea Level Rise Viewer

Visualize scenarios and impacts  
using local maps and photos



# Sea Level Rise Viewer

- Simulate future sea level rise or coastal flooding 1 to 6 feet above MHHW
- Provides information about marsh impacts, nuisance flood frequency, and socioeconomic impacts.
- Confidence maps are also provided so users can visualize uncertainty levels in flooded areas.





# Coastal County Snapshots

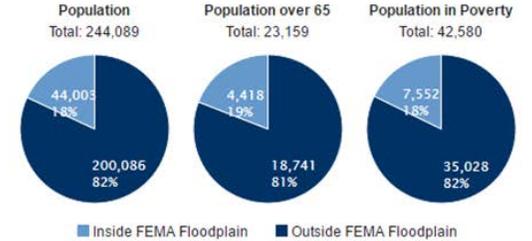
Complex Data Made Simple  
 Flooding | Economics | Wetlands

## Flood Exposure Snapshot Norfolk city, Virginia

COASTAL COUNTY SNAPSHOTS  
[coast.noaa.gov/snapshots/](http://coast.noaa.gov/snapshots/)

### People + Floodplains = Not Good High-Risk Populations + Floodplains = Even Worse

The more homes and people located in a floodplain, the greater the potential for harm from flooding. Impacts are likely to be even greater when additional risk factors (age, income, capabilities) are involved, since people at greatest flood risk may have difficulty evacuating or taking action to reduce potential damage.

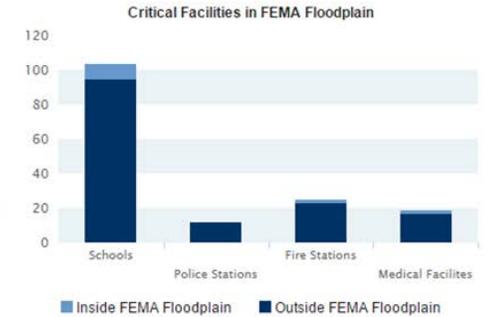


Based on [2009-2013 American Community Survey 5-year Summary File data](#).

### Community Infrastructure + Floodplains = Bad News

9% of critical facilities in Norfolk city, Virginia, are within the floodplain.

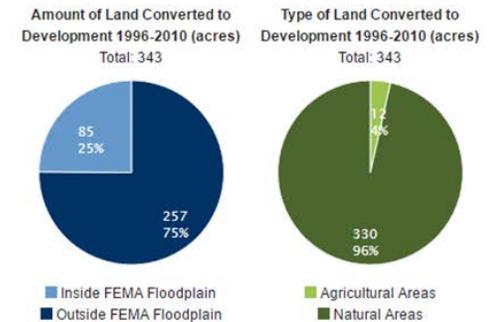
Hospitals, Roads, Schools, Shelters. These facilities play a central role in disaster response and recovery. Understanding which facilities are exposed, and the degree of that exposure, can help reduce or eliminate service interruptions and costly redevelopment. Incorporating this information into development planning helps communities get back on their feet faster.



Based on [USGS Structures Database](#).

### Increasing Development in Floodplains = More People in Harm's Way Loss of Natural Buffers = Less Protection

A county with more natural areas (wetlands, forests, etc.) and less development within floodplains typically has lower exposure to flooding. A county that monitors land cover changes within the floodplain will detect important trends that indicate whether flood exposure is increasing or decreasing. Armed with this information, local leaders can take steps to improve their safety and resilience.



Based on [NOAA Land Cover Data](#).



# Coastal County Snapshots

- Turns complex data into easy-to-understand handouts, complete with charts and graphs
- Three snapshots available – County's Flood Exposure; Ocean or Great Lakes Economy; Wetland Benefits
- Allows users to download a PDF report for the snapshot of their choice

Print  
Total: 2 sheets of paper (3 pages)

Print Cancel

Destination \\CSC-S-PRINT-64\OCM...  
Change...

Pages All  
e.g. 1-5, 8, 11-13

Copies 1 + -

Layout Portrait

Color Color

Options  Simplify page  Two-sided

+ More settings

Print using system dialog... (Ctrl+Shift+P)

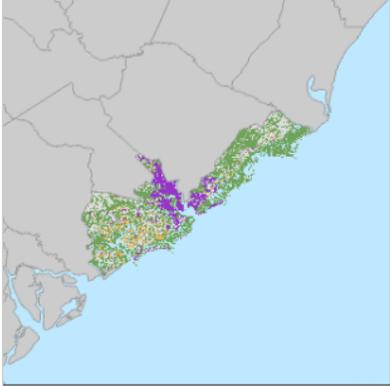
### Cleaner: Wetlands Improve Water Quality

Runoff associated with concrete, asphalt, rooftops, and other impervious surfaces is a leading cause of water pollution.

Wetlands near developed and agricultural areas trap pollutants and excess nutrients in surface runoff, keeping water bodies cleaner. This natural filtering helps prevent water use restrictions, such as beach and shellfish closures, and reduces the need for costly treatment systems.

Based on 2010 NOAA land cover.

- Wetland
- Developed
- Agriculture
- Other (grasslands, forests, scrub vegetation, and barren land)



### Next Steps

Understanding how wetlands benefit a coastal community can provide strong incentives for wetland protection. The following suggestions and resources provide guidance in moving forward with these efforts.

**Integrate wetland protection priorities into community planning** – Encouraging wetland protection and development in appropriate places makes communities more resilient. Resources are available to help communities incorporate wetland protection considerations into existing planning efforts.

- [Introducing Green Infrastructure for Coastal Resilience training](https://coast.noaa.gov/digitalcoast/training/green) (<https://coast.noaa.gov/digitalcoast/training/green>)
- [Coastal Flood Exposure Mapper](https://coast.noaa.gov/digitalcoast/tools/flood-exposure) (<https://coast.noaa.gov/digitalcoast/tools/flood-exposure>)
- [Using Flood Exposure Maps webinar](https://coast.noaa.gov/digitalcoast/training/flood-exposure) (<https://coast.noaa.gov/digitalcoast/training/flood-exposure>)

**Prioritize wetlands for protection** – Additional factors can influence wetland protection priorities. Consult local experts regarding wetland size, location, and quality; fish and wildlife considerations; regulatory requirements; and tourism, recreation, and other benefits. Resources are available to help communities with the selection and prioritization process, including

- [C-CAP land cover data](https://coast.noaa.gov/dataregistry/search/collection/info/ccapregional) (<https://coast.noaa.gov/dataregistry/search/collection/info/ccapregional>) and [online atlas](https://coast.noaa.gov/digitalcoast/tools/lca) (<https://coast.noaa.gov/digitalcoast/tools/lca>)
- [National Wetlands Inventory data](http://www.fws.gov/wetlands/) (<http://www.fws.gov/wetlands/>)
- [Habitat Priority Planner tool](https://coast.noaa.gov/digitalcoast/tools/hpp/) (<https://coast.noaa.gov/digitalcoast/tools/hpp/>)
- [Green Infrastructure Mapping Guide](https://coast.noaa.gov/digitalcoast/training/gi-mapping/) (<https://coast.noaa.gov/digitalcoast/training/gi-mapping/>)

**Discover additional helpful resources** – More tools, data, and information, including funding sources, are highlighted on the [frequently asked questions page](https://coast.noaa.gov/snapshots/faq/wetland-benefits.pdf) (<https://coast.noaa.gov/snapshots/faq/wetland-benefits.pdf>)

### Data Sources for This Snapshot

- [Land Cover Data](https://coast.noaa.gov/dataregistry/search/collection/info/ccapregional) (<https://coast.noaa.gov/dataregistry/search/collection/info/ccapregional>) – NOAA Coastal Change Analysis Program
- [Flood Zones](http://msc.fema.gov/portal/) (<http://msc.fema.gov/portal/>) – Federal Emergency Management Agency 1% Annual Chance Flood Zones
- [Economics Data](https://coast.noaa.gov/dataregistry/search/collection/info/enow/) (<https://coast.noaa.gov/dataregistry/search/collection/info/enow/>) – NOAA Economics: National Ocean Watch
- [Self-Employed Workers](https://coast.noaa.gov/dataregistry/search/collection/info/enow-nes/) (<https://coast.noaa.gov/dataregistry/search/collection/info/enow-nes/>) – NOAA Economics: National Ocean Watch for Self-Employed Workers



# Training

- 22 training courses, including many web-based options
- An archive of recorded webinars highlighting Digital Coast tools and data



# Stories from the Field



- 100+ place-based narratives highlighting the application of Digital Coast resources to coastal management issues
- Focus on partners and outcomes



# Topics

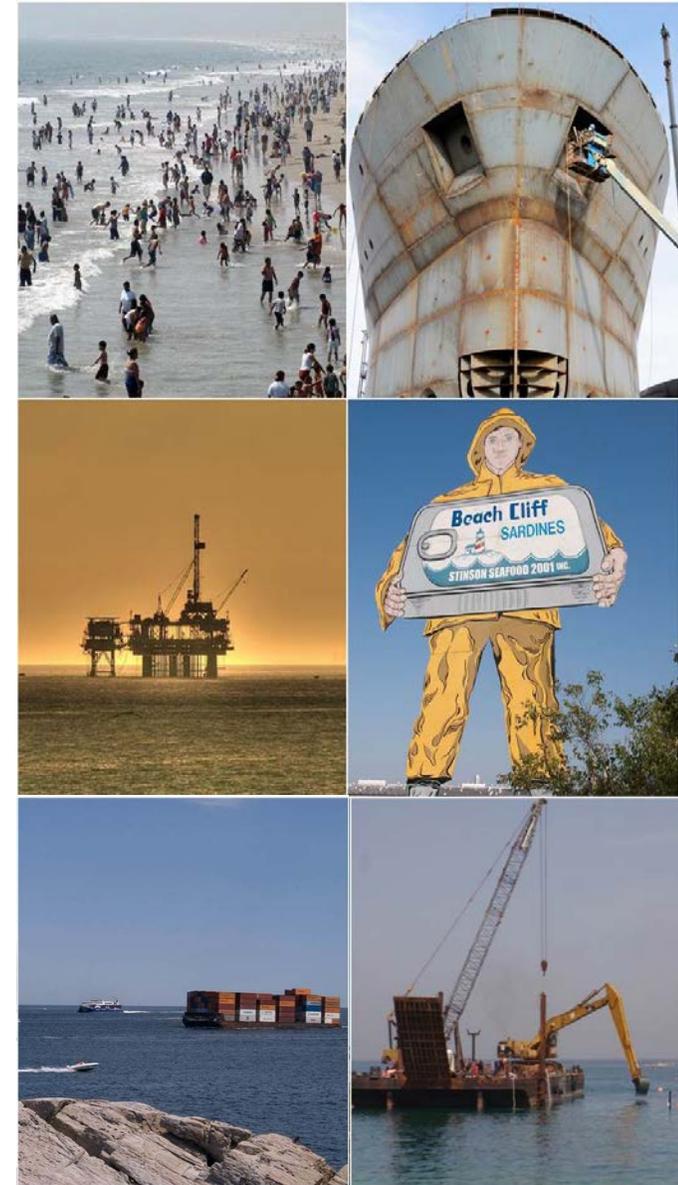
- Provide quick links to the top Digital Coast resources communities use to address common coastal management issues.
- Five topics online; more on the way





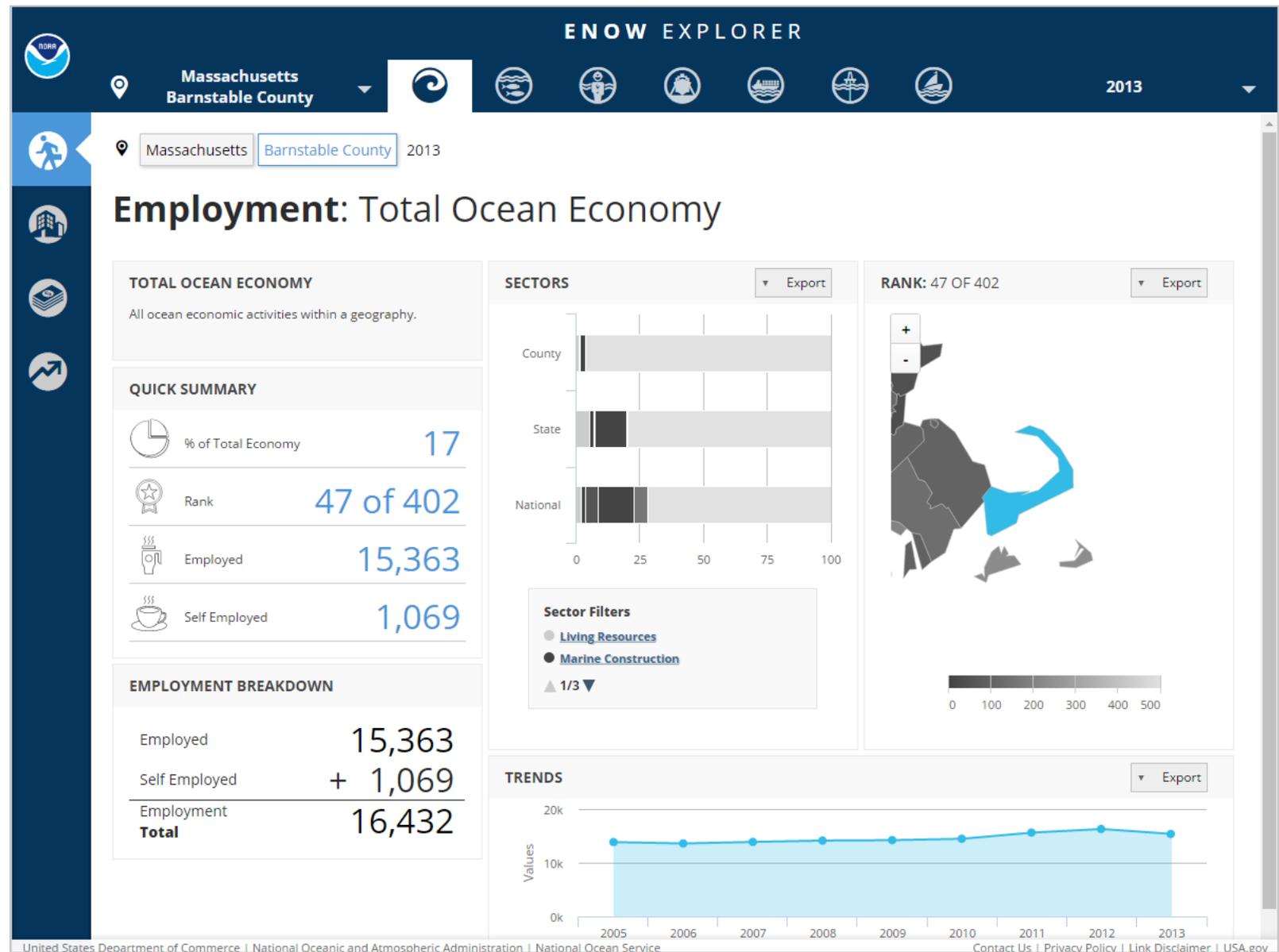
# Coastal and Ocean Economics

Local and national data | Reports  
Educational materials | Tools



# Economics: National Ocean Watch (ENOW)

- Includes six economic sectors:
  - living resources, marine construction, marine transportation, offshore mineral resources, ship and boat building, tourism and recreation
- Provides data for four economic indicators:
  - business establishments, employment, annual wages, and GDP



# Demonstrating Value

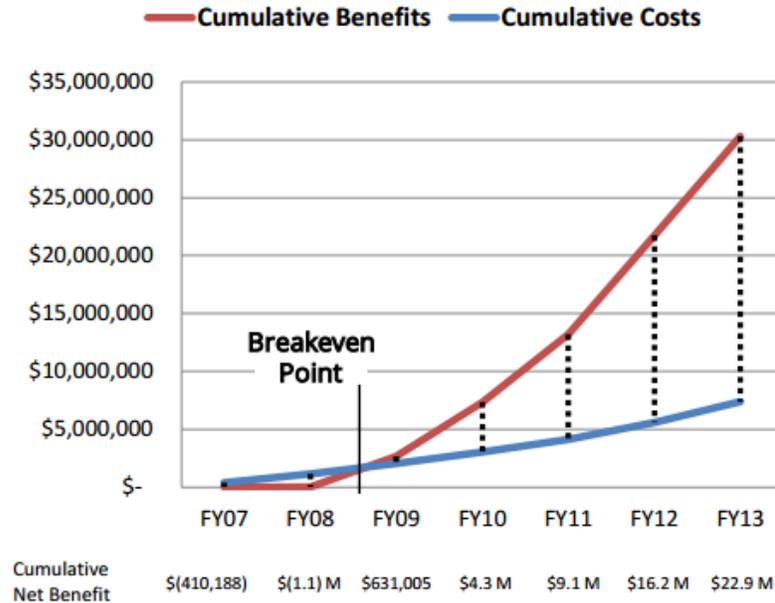
- “Projected Benefits and Costs of the Digital Coast” report examines past and expected costs and benefits associated with creating and operating this resource.

## Digital Coast Return on Investment through Fiscal Year 2013

<b>Net Benefits</b>	<b>ROI</b>
<b>\$22,915,419</b>	<b>311%</b>

– Cumulative values from fiscal year (FY) 2007 (project initiation) to FY13  
 – ROI (Return on Investment) = Cumulative Net Benefits / Cumulative Costs

### Historical Benefits and Costs



Data Downloads 153,391	Data Services Visits 42,510	Partner Data Page Visits 39,303
Tool Downloads 51,056	Tool Visits 167,786	Map Services Visits 893,971
		Partner Tool Page Visits 46,466

### Projected Values

15 Years (through FY28)

- Net Present Benefits: \$117 million
- ROI: 411%

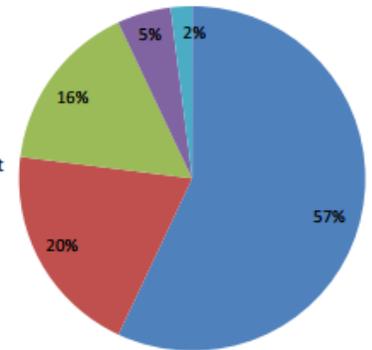
– Net present benefit (NPB) is the cumulative net benefit in the future that is discounted to show its present values in 2013  
 – Values are based on conservative estimation of future benefits and costs

### Survey Results

NSGIC survey respondents represented 197 professionals and described more than 300 projects that use Digital Coast resources

#### Project Results without Digital Coast

- conduct lower quality work without the resources or with less suitable resources
- could not do the project without the resources
- conduct comparable work by extra effort (time/cost)
- conduct higher quality work with additional effort
- conduct comparable work without the resources



# Connect with the Digital Coast

<http://coast.noaa.gov/DigitalCoast>



[Digital.Coast@noaa.gov](mailto:Digital.Coast@noaa.gov)



<http://www.facebook.com/NOAADigitalCoast>



[@NOAADigCoast](https://twitter.com/NOAADigCoast)

