

NOAA Digital Coast Actionable Information for Hazard Mitigation

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NOAA OFFICE FOR COASTAL MANAGEMENT

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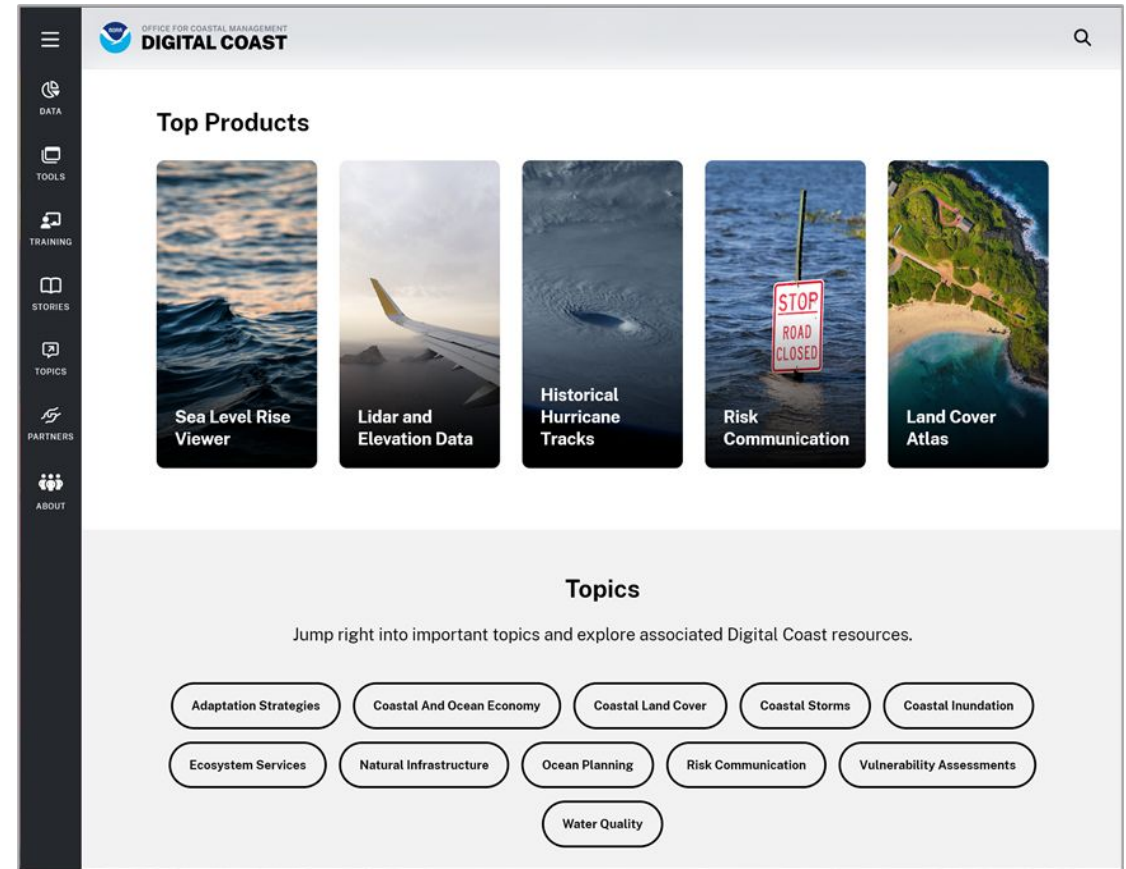
Healthy Coastal Ecosystems Resilient Coastal Communities Vibrant and Sustainable Coastal Economies



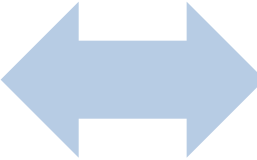
**National Coastal Zone Management Program | National Estuarine Research Reserves
Coral Reef Conservation | Digital Coast**

Digital Coast Website

- Provides effective and efficient access to coastal geospatial data, tools, training, and case studies
- Facilitates linkages between elements to enhance utility and application
- Provides opportunity to demonstrate role of geospatial information and training in decision-making



An Enabling Platform and a Partnership



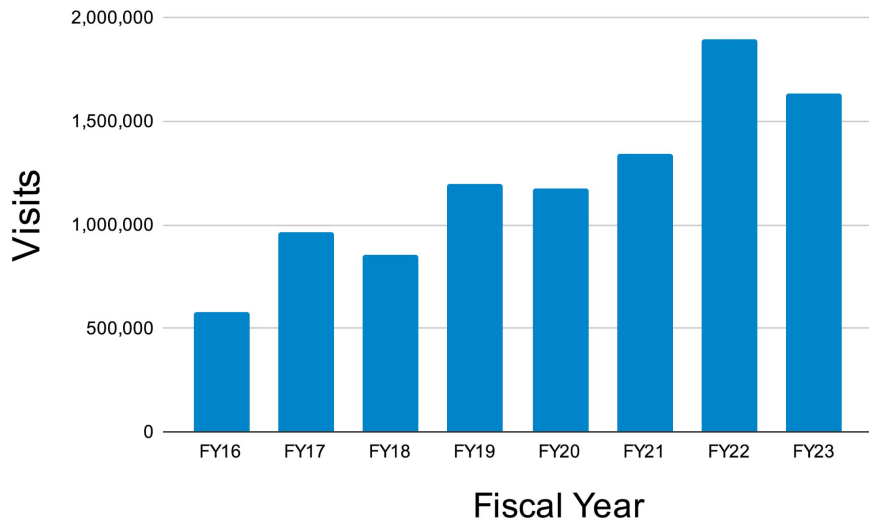
<https://coast.noaa.gov/digitalcoast>



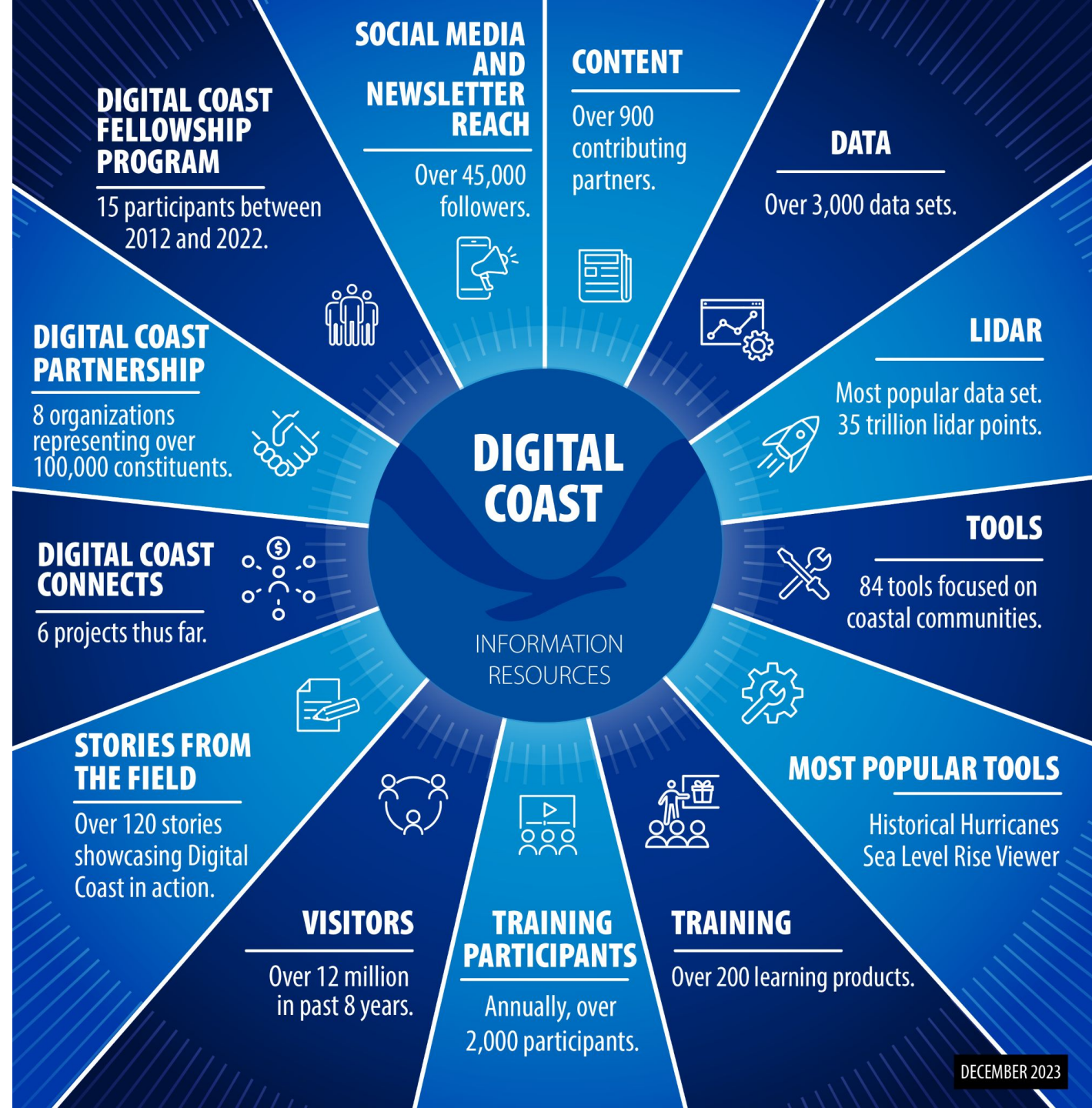


Helping Communities Address Climate Change

The goal is to increase coastal resilience by providing the data, tools, and training communities need. The website started in 2007 with 145 data sets, five tools, and a handful of training courses. It has grown to be one of the most used (and useful!) resources for coastal communities.



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coast.noaa.gov/digitalcoast



Making an Impact

Identifying Areas Vulnerable to Sea Level Rise Tybee Island, Georgia

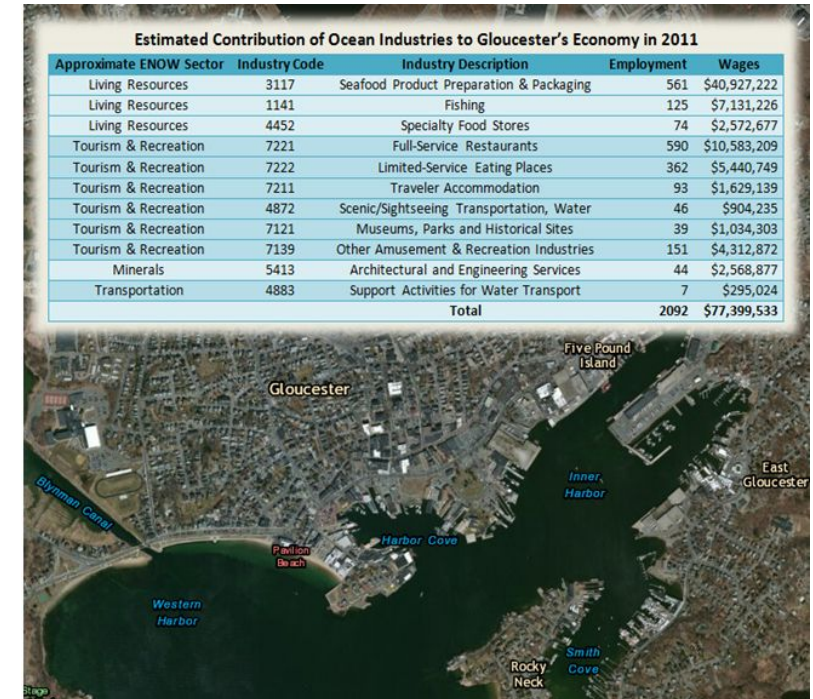
- **Partners:** City of Tybee Island, Georgia Department of Natural Resources, Georgia Sea Grant - University of Georgia, Skidaway Institute of Oceanography
- **Products:** Sea Level Rise Viewer and LIDAR Data
- **Outcome:** The City of Tybee Island unanimously adopted an adaptation plan for dealing with the current problems of flooding and frequent high tides, as well as future sea level rise.



Making an Impact

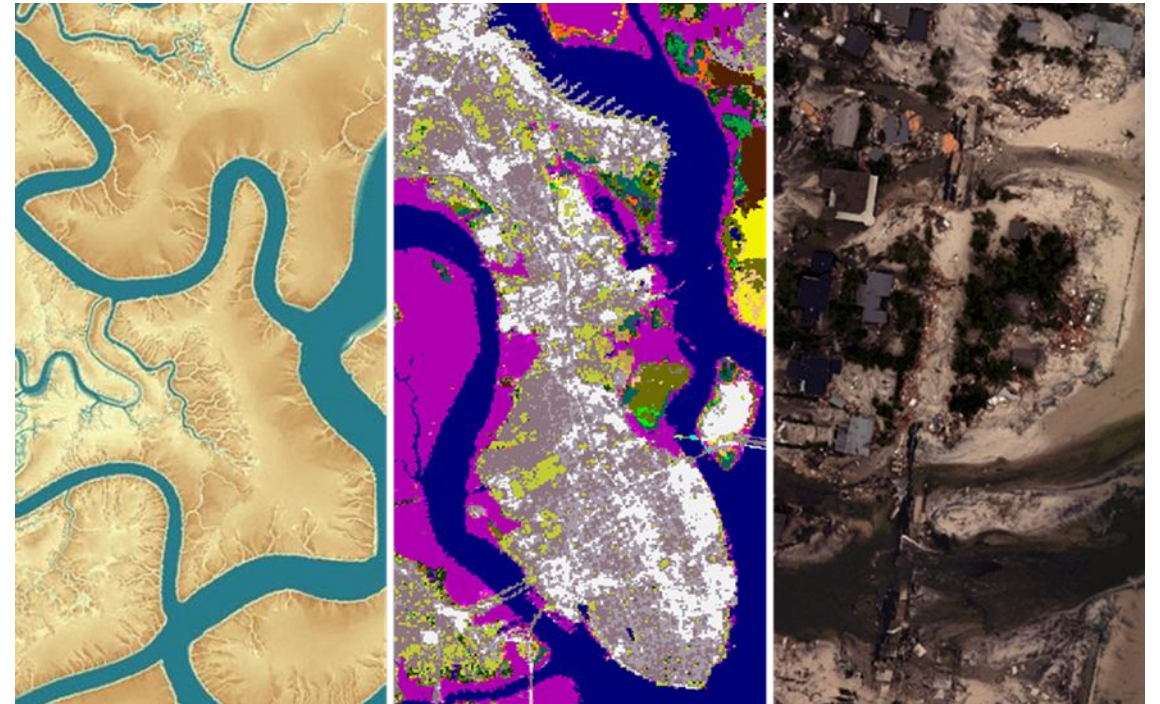
Estimating The Economic Contribution of Gloucester, Massachusetts' Working Waterfront

- **Partners:** City of Gloucester, Massachusetts, NOAA Office for Coastal Management
- **Product:** Economics National Ocean Watch
- **Outcome:** By scaling county-level ENOW data to the municipal level, harbor planners were able to tailor their maritime economy profile, and plan for new and emerging markets in maritime technology and industries



Digital Coast Data

- Over 700 terabytes of high-resolution elevation data, land cover data, and orthoimagery
- 200+ web mapping services
- Linkages 50 national-level coastal data sets



Digital Coast Data Access

The screenshot shows the NOAA Digital Coast Data Registry homepage. At the top, there is a navigation bar with the NOAA logo and the text "OFFICE FOR COASTAL MANAGEMENT DIGITAL COAST". Below this is a search bar and a breadcrumb trail "Home / Data". The main content area features a large background image of a coastal elevation map with the word "Data" in large white text. Below the image, there is a search box with "Find" and "Near" tabs, and a link to "Browse All 3120 Data Sets". At the bottom, there is a "Browse By Type" section with five icons representing different data categories: ELEVATION, LAND COVER, WEATHER, CLIMATE, AND HAZARDS, IMAGERY, and SOCIOECONOMI.

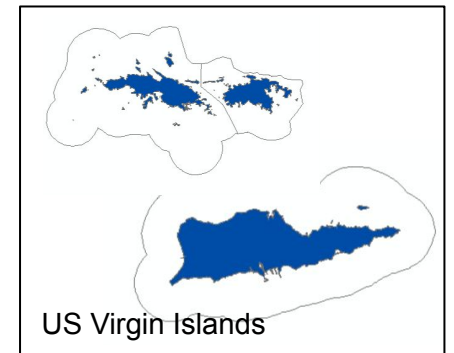
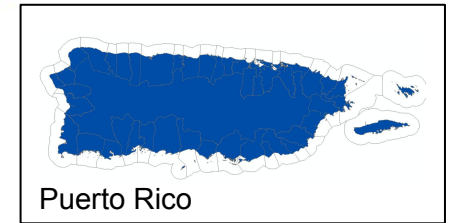
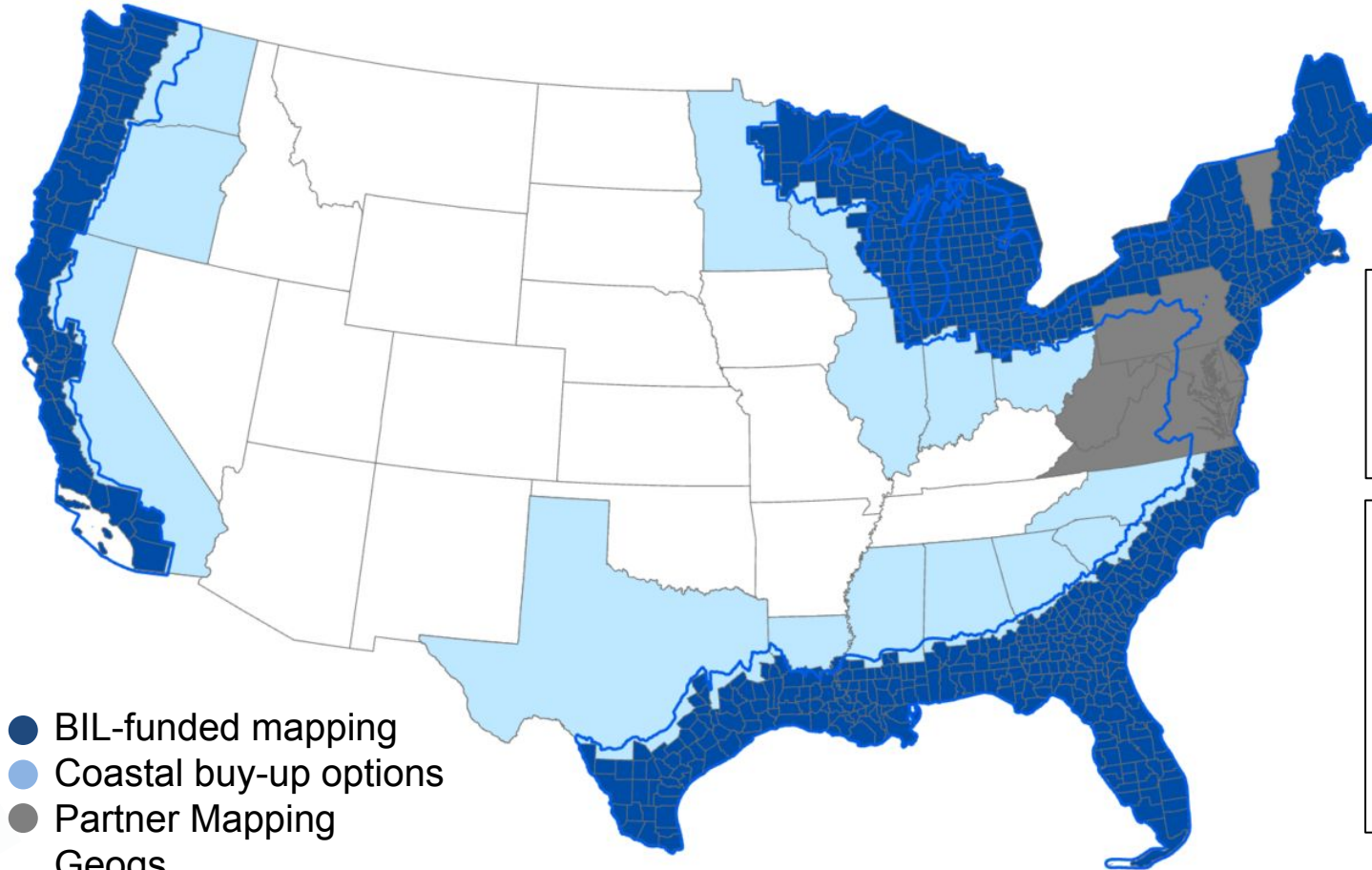
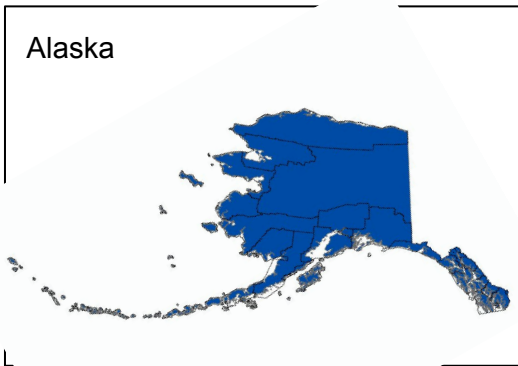
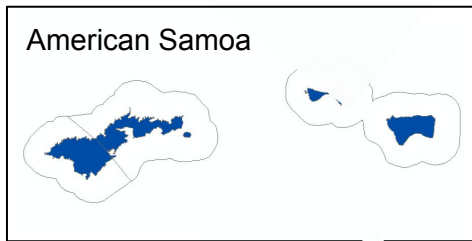
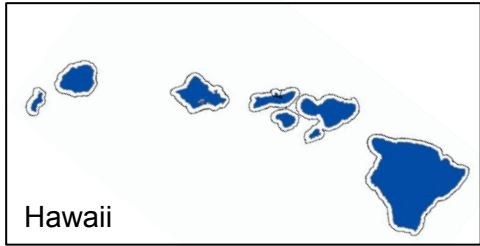
Data Registry

The screenshot shows the NOAA Digital Coast Data Access Viewer interface. At the top, there is a navigation bar with the NOAA logo and the text "DATA ACCESS VIEWER". Below this is a search bar and a breadcrumb trail "IMAGERY LAND COVER ELEVATION". The main content area features a large background image of a coastal elevation map with a yellow box highlighting a specific area. To the right of the map, there is a sidebar with the following information: "2016 USACE Post-Matthew Topobathy Lidar: Southeast Coast (VA, NC, SC, GA, FL)", "USACE National Coastal Mapping Program (JALBTCX)", "239,902,229 Pts", an "Add to Cart" button, "0 in cart", and a description of the data: "Collected by the Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX). The data includes hydrographic & topographic data depicting the elevations above and below the immediate coastal waters. Also available as a bulk download." Below this, there is an "Attributes" section with a note: "Note: Hurricane related data. Vertical Accuracy (cm): 19 - Topo data - 19.6 cm @ 95% confidence level (10 cm RMSE). Bathymetry shallow FOV data - $\sqrt{0.0075d^2+2}$ meters @ 95% confidence level. Bathymetry deep FOV data - $\sqrt{0.013d^2+2}$ meters @ 95% confidence level (d is depth). Horizontal Accuracy (cm): 100 - Compiled to".

Data Access Viewer



High-Resolution Landcover Mapping



- BIL-funded mapping
- Coastal buy-up options
- Partner Mapping Geogs

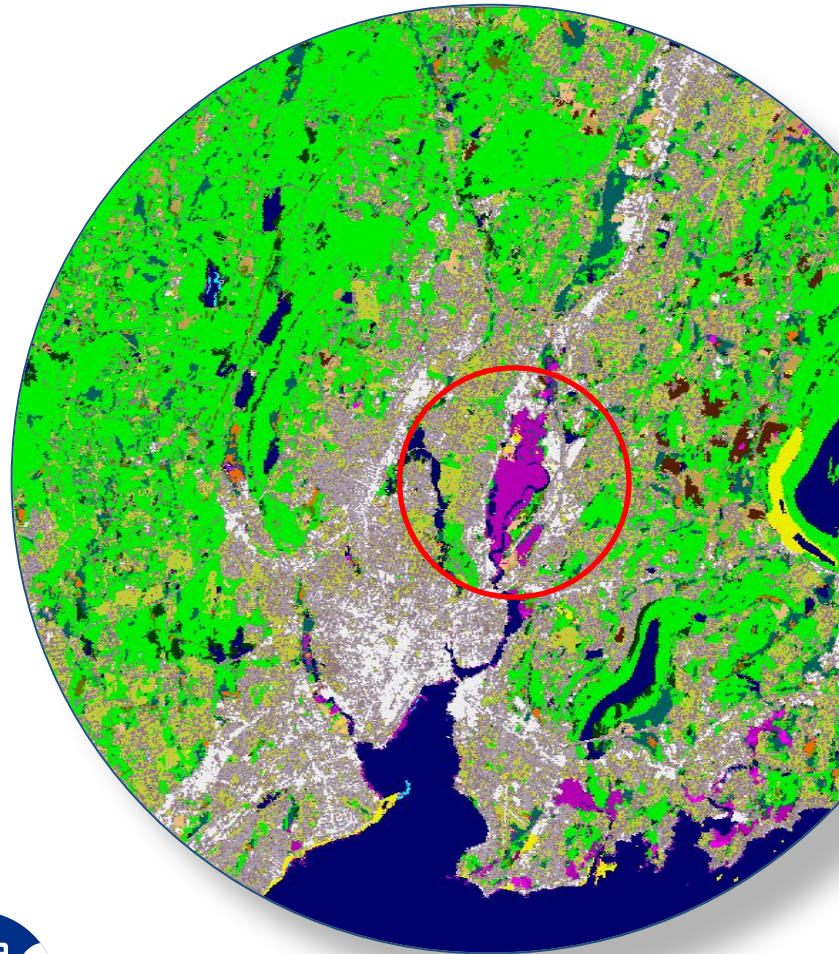


TETRA TECH



Comparison of Resolutions

REGIONAL (30 METER)

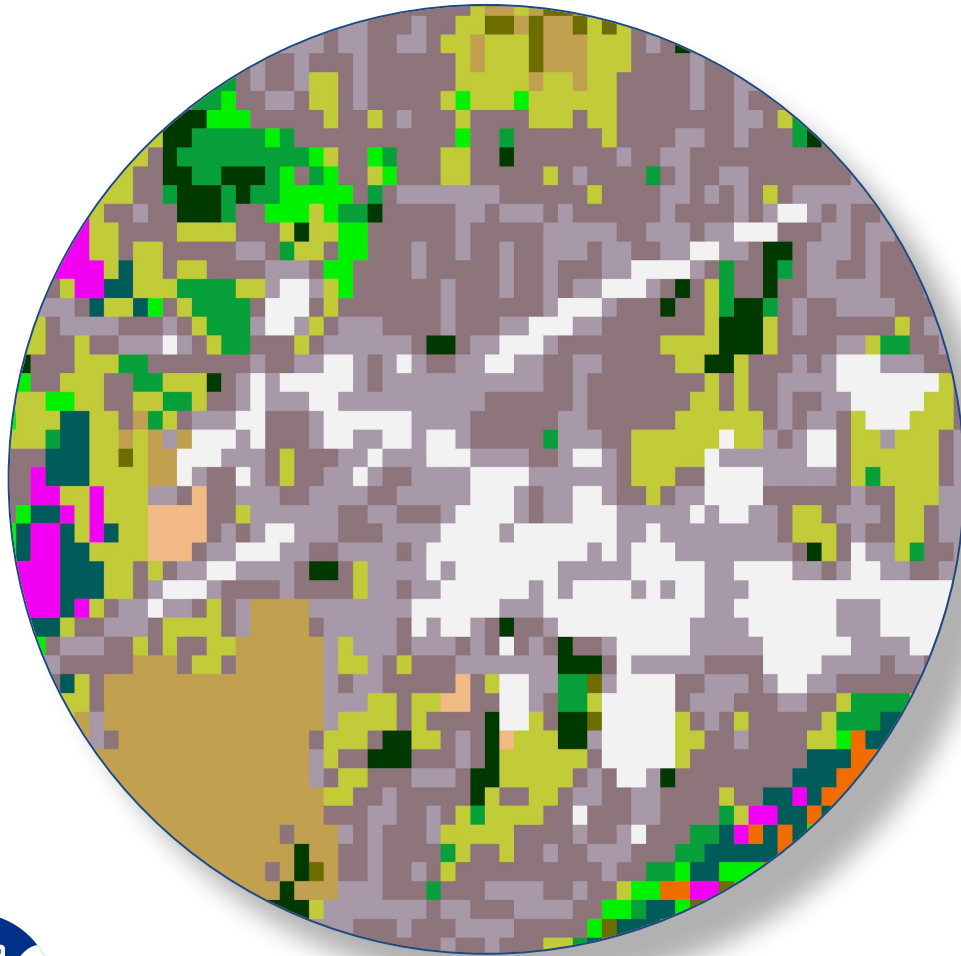


LOCAL (1 METER)



Comparison of Resolutions

REGIONAL (30 METER)



LOCAL (1 METER)



High Resolution Example Applications

<https://coast.noaa.gov/states/stories/landcover.html>

Improved Flood Modeling and Risk Assessment

- SLOSH Modeling in the Caribbean
- Transportation Infrastructure in Texas
- Lowering Flood Insurance Rates (FEMA CRS)

Stormwater management and Water Quality

- Stormwater Mapping in Jacksonville, FL
- Assessing Stream Health in Snohomish, WA
- Drinking Water Sources and Health in CT
- Balancing Development and the Environment in Guam

Heat Risk, Urban Forestry, and Tree Equity

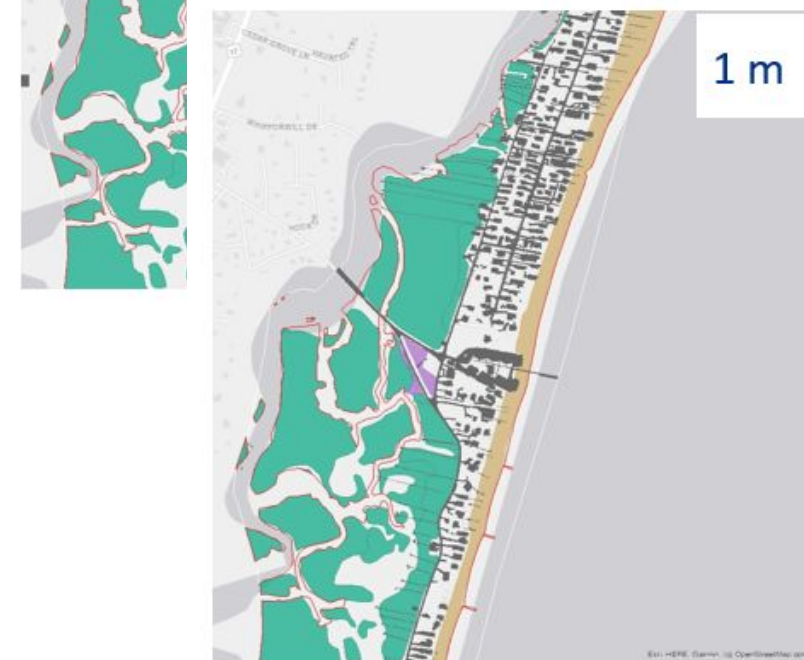
- Mitigating Urban Heat Risks in Charleston, SC

Wetland Conservation and Restoration

- Marsh Resilience and Comprehensive Management in NH

Broadband Infrastructure Access

- Discovering Gaps in Broadband Access in AK



High Resolution Example Applications

<https://coast.noaa.gov/states/stories/landcover.html>

SAVOONGA



ADAK



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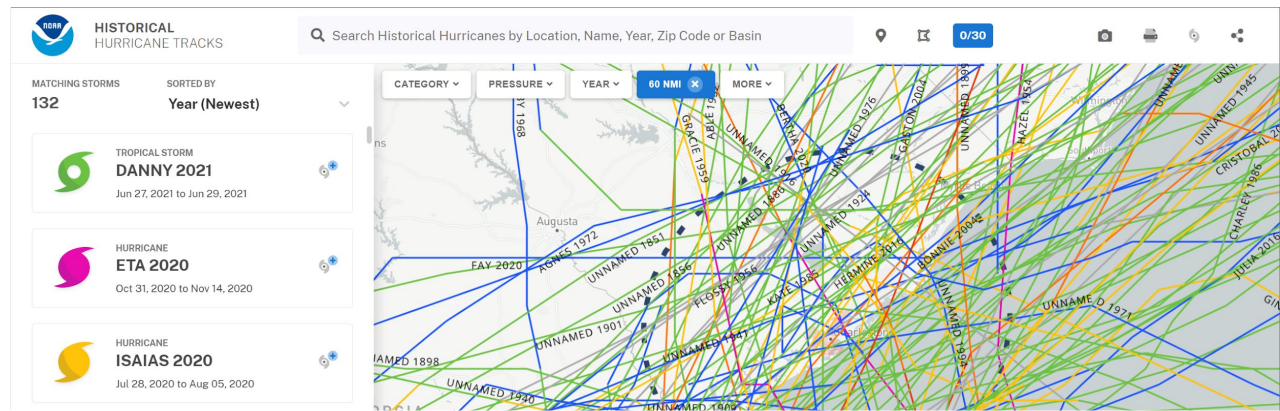
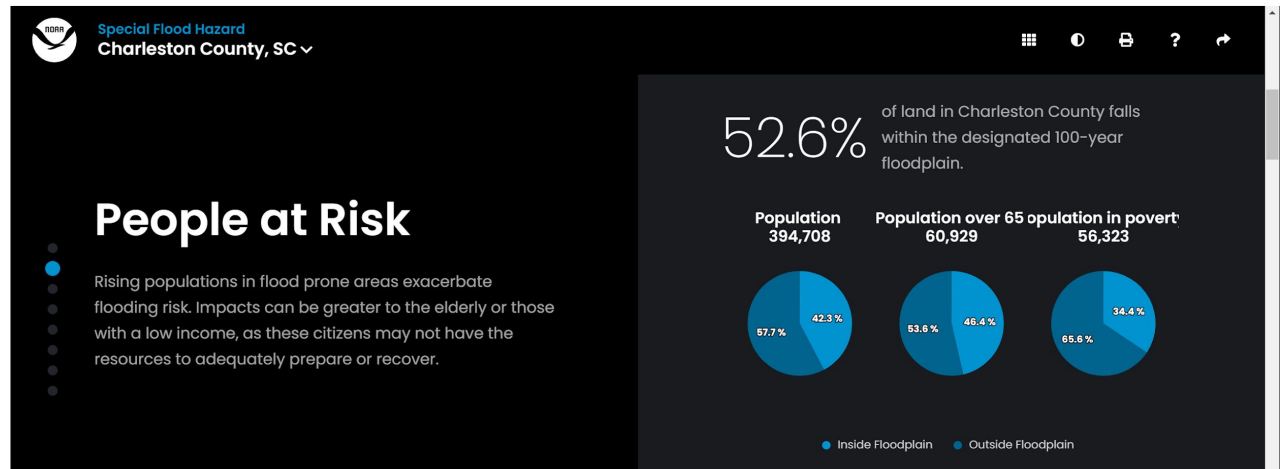
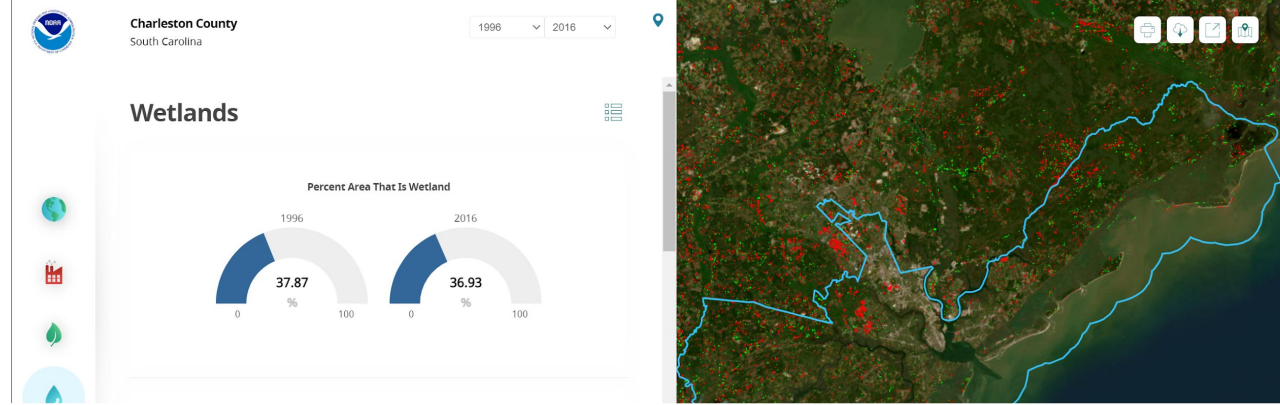
Broadband Infrastructure Access

- Discovering Gaps in Broadband Access in AK



Digital Coast Tools

- An inventory of over 80 decision-support and information visualization tools
- Many provide visualization and analysis capabilities without need for desktop GIS software



Sea Level Rise Viewer

VIEW BY SCENARIO | VIEW BY YEAR

Scenario Year
2022 Projections

Sea Level Rise

Local Scenarios

Mapping Confidence

Marsh Migration

Vulnerability

High Tide Flooding

8ft	High
7ft	
6ft	Intermediate High
5ft	
4ft	Intermediate
3ft	
2ft	Intermediate Low
1ft	
Current	

2100 : 3.87ft

2080 : 2.53ft

2060 : 1.64ft

2040 : 0.95ft

2020 : 0.39ft

NOAA

CHARLESTON, SC
FOR INTERMEDIATE SCENARIO



+

-

?

Fort Sumter National Monument

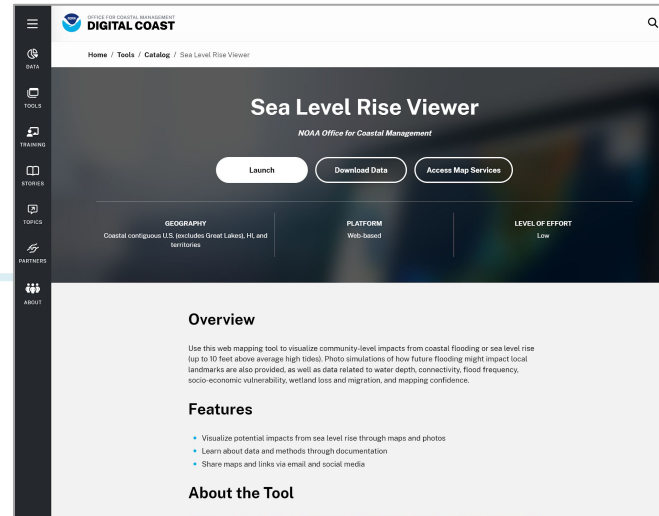
Digital Coast Sea Level Rise Viewer Resources

<https://coast.noaa.gov/digitalcoast/tools/slr.html>

Data

Downloads & Web Mapping Services

- SLR Extent and Depth
- Mapping Confidence
- DEMs
- Flood Frequency
- Marsh Migration
- Local SLR Scenarios



Training

- Documented Mapping Methods
- Tutorials for Local Scenarios and Marsh Migration
- Coastal Inundation Mapping
- 27 “Stories from the Field” Example Applications

Tools

- Sea Level Rise Viewer





Charleston, SC, USA

CREATE My Map

ACTIVE LAYERS SAVED MAPS

Coastal Flood Exposure Mapper

High Tide Flooding

- FEMA Flood Zones
- Tsunami
- Storm Surge
- Sea Level Rise

SOCIETAL EXPOSURE

- Population Density
- Poverty
- Elderly
- Employees

INFRASTRUCTURE EXPOSURE

- Development
- Critical Facilities
- Development Patterns

ECOSYSTEM EXPOSURE

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



Coastal Flood Exposure Mapper Data

Flood Hazard Layers

- Coastal Flood Hazard Composite
- High Tide Flooding
- FEMA Flood Zones
- Storm Surge Scenarios
- Sea Level Rise Scenarios
- Tsunami Run Up

Societal Layers

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

Infrastructure Layers

- Development
- Critical Facilities
- Development Patterns

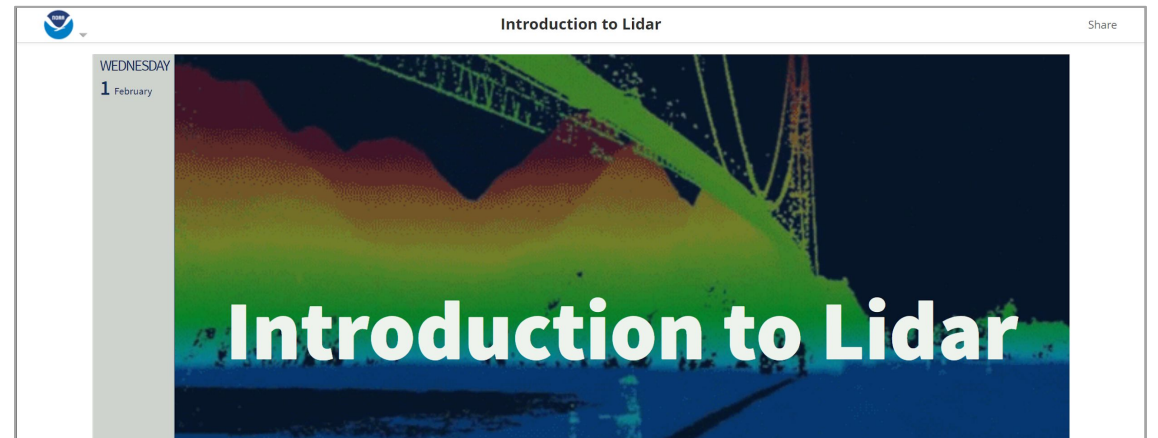
Ecosystem Layers

- Natural Areas and Open Space
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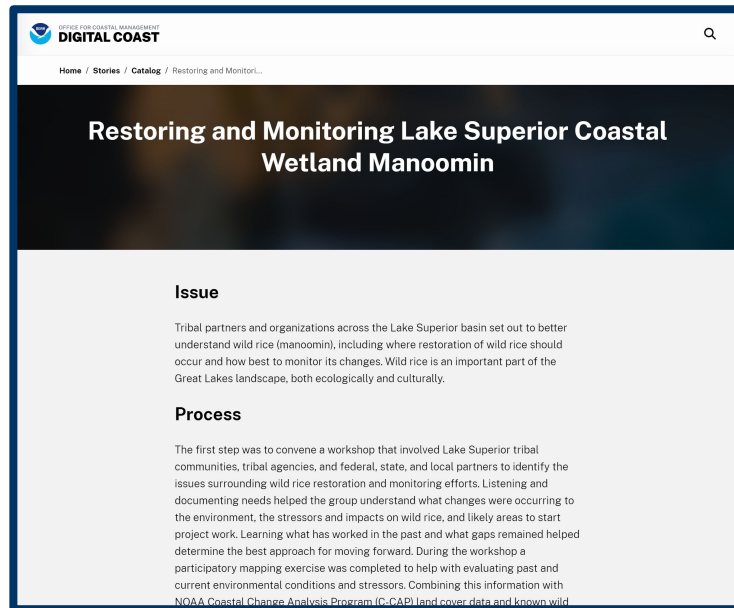
Digital Coast Academy

- 190 learning resources covering a variety of coastal topics
- Includes:
 - Classroom and online instructor-led trainings
 - Interactive modules
 - Self-guided resources
 - Case studies
 - Publications and quick references
 - Videos and webinars



Stories from the Field

- Demonstrate application of Digital Coast resources to coastal issues
- Highlight partnerships and impact



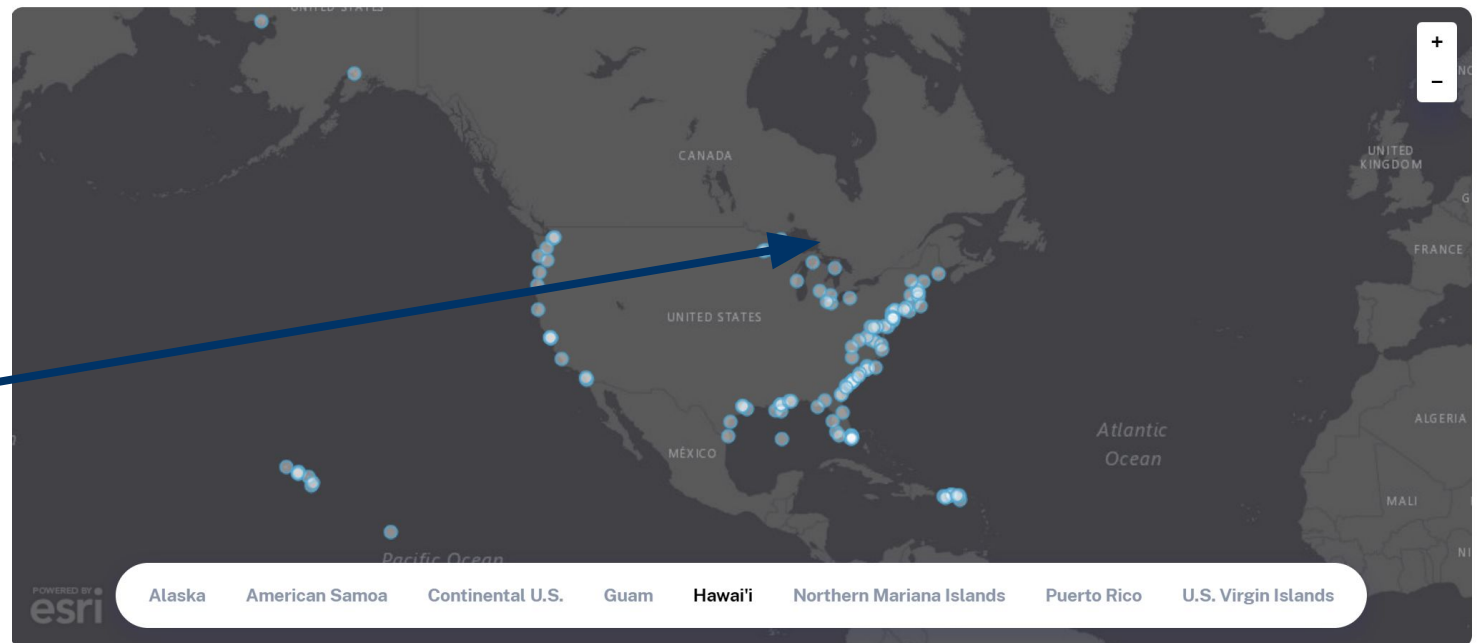
The screenshot shows the Digital Coast website interface. At the top, the logo and navigation menu are visible. The main heading is "Restoring and Monitoring Lake Superior Coastal Wetland Manoomin". Below the heading, there are two sections: "Issue" and "Process".

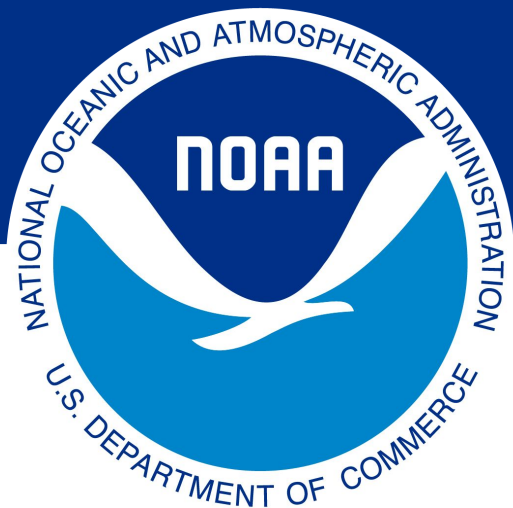
Issue

Tribal partners and organizations across the Lake Superior basin set out to better understand wild rice (manoomin), including where restoration of wild rice should occur and how best to monitor its changes. Wild rice is an important part of the Great Lakes landscape, both ecologically and culturally.

Process

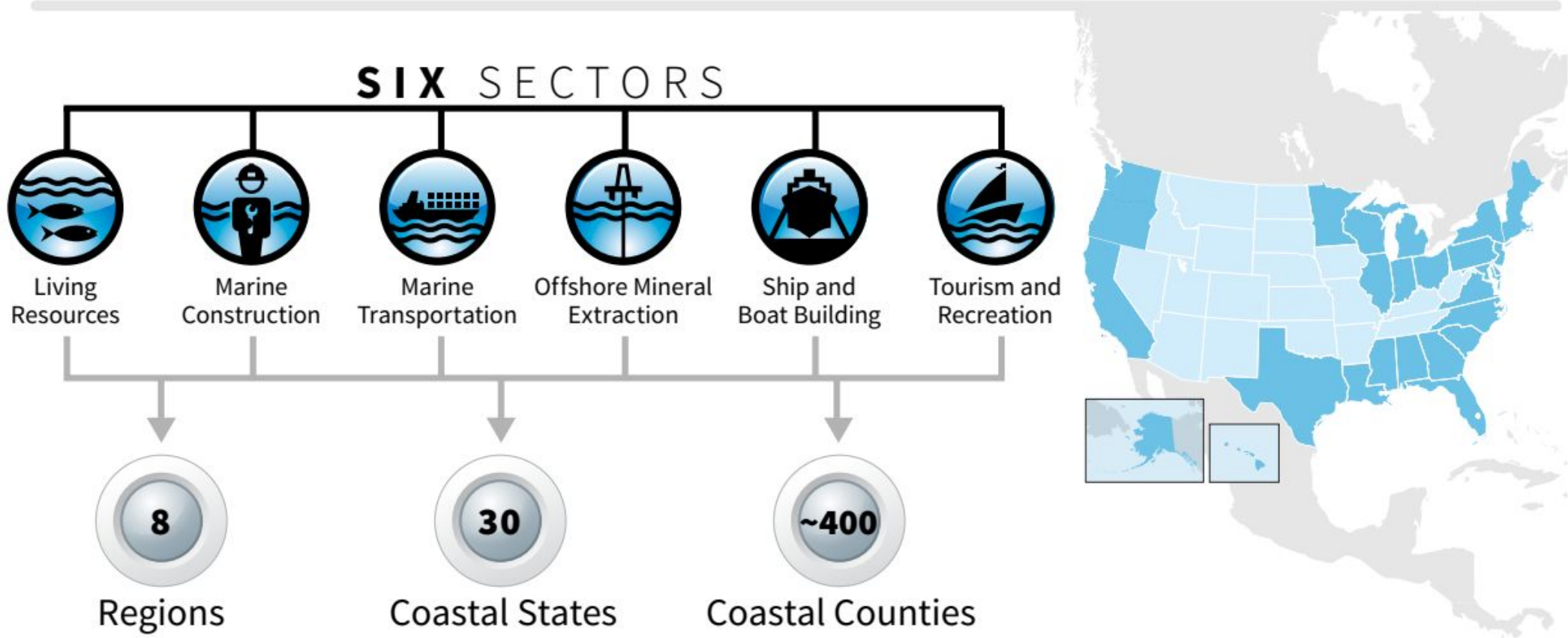
The first step was to convene a workshop that involved Lake Superior tribal communities, tribal agencies, and federal, state, and local partners to identify the issues surrounding wild rice restoration and monitoring efforts. Listening and documenting needs helped the group understand what changes were occurring to the environment, the stressors and impacts on wild rice, and likely areas to start project work. Learning what has worked in the past and what gaps remained helped determine the best approach for moving forward. During the workshop a participatory mapping exercise was completed to help with evaluating past and current environmental conditions and stressors. Combining this information with NOAA Coastal Change Analysis Program (CCAP) land cover data and known wild





Economic Tools, Trainings, and Technical Assistance

Economics: National Ocean Watch (ENOW)



What else is included in ENOW?

Dataset which describes the ocean economy across four economic indicators:

- Businesses
- Employees
- Wages
- Contribution to GDP



Photo Credit: NOAA Blue Economy Strategic Plan 2021-2025

Significance of ENOW

- Describe your coast's economic significance
- Help describe your region's blue economy
- A baseline for planning efforts
- Advocacy for 46+ industries and 6+ sectors
- Describe ocean dependence and vulnerability



ENOW Explorer

Understand your local marine economy by using E-NOW to obtain and compare baseline economic data on a county, state, or territory level.

Choose State or Territory ▼

Choose County ▼

Go

<https://coast.noaa.gov/enowexplorer/>

Massachusetts Barnstable 2021

Employment: Total Ocean Economy

All ocean economic activities within a geography.

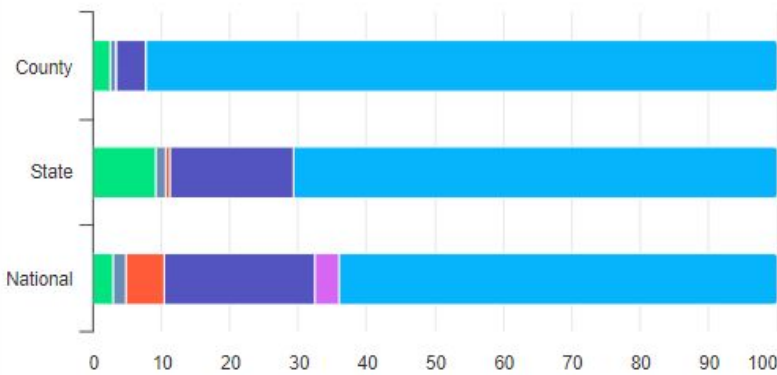
QUICK SUMMARY

% of Total Economy	15.9%
Rank	61 of 402
Employed	13,619
Self Employed	Suppressed

TOTAL EMPLOYEES

	13,619
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SECTOR

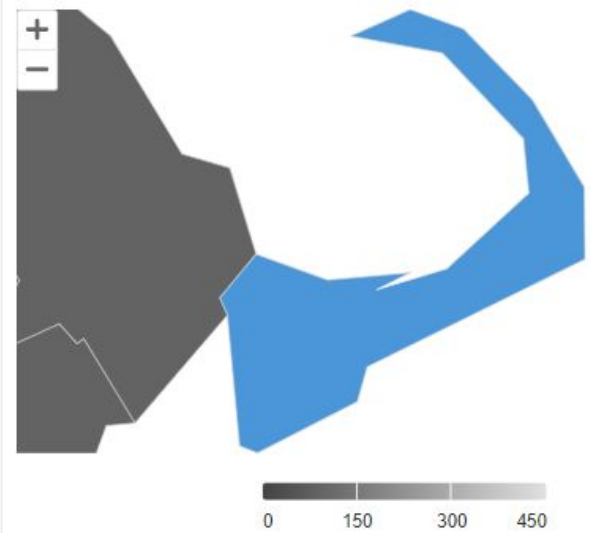


Sector Filters

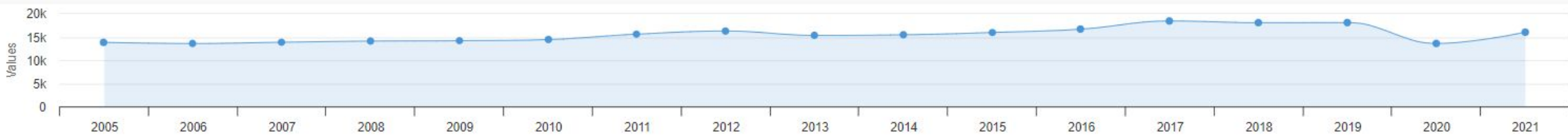
- Living Resources
- Ship and Boat Building
- Offshore Mineral Resources
- Marine Construction
- Marine Transportation
- Tourism and Recreation

▲ 1/2 ▼

RANK: 61 OF 402



TRENDS



Employment in Coastal Inundation Zones

Reports the number of businesses and employees that fall within various coastal inundation footprints.

- FEMA Special Flood Hazard Areas
- NOAA Sea, Lake, and Overland Surge from Hurricane (SLOSH) categories 1 to 4
- NOAA Tsunami Inundation Zones
- NOAA Sea Level Rise (1 to 10 feet)

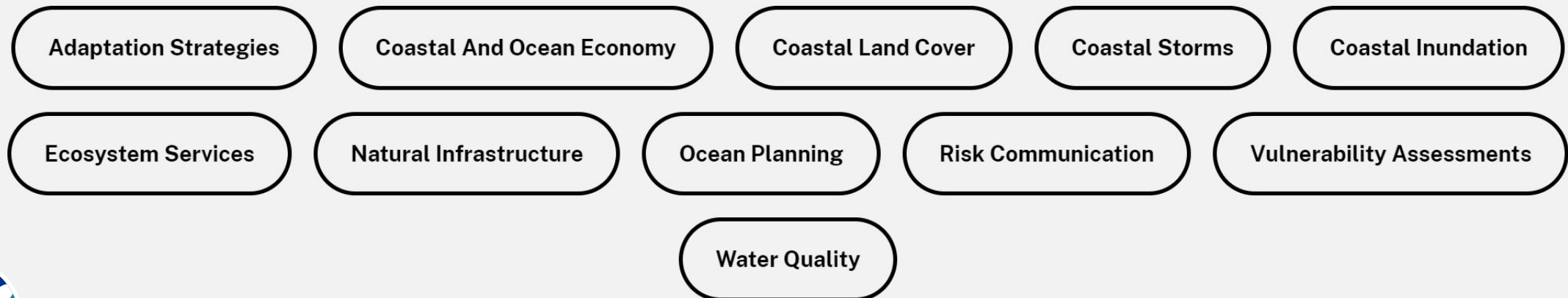
Trainings: Economic Guidance for Coastal Management Professionals

- Module 1: Introduction to Economic Analyses and Valuation
 - [Using Economics to Inform Decisions](#) (virtual self-guided)
- Module 2: Pathways to Valuing Ecosystem Services
- Module 3: Introduction to Benefit-Cost Analysis

Offered [virtually](#) or [in-person](#)

Digital Coast Topics Pages

- A collection of Digital Coast and related coastal information resources organized by thematic topic
- Resources are organized into sections representing actions that should be employed to explore or address the topic at-hand



For More Information

Please Visit:

<https://coast.noaa.gov/digitalcoast/>

Or Contact:

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Nicholas.Schmidt@noaa.gov

