

NOAA's Digital Coast Actionable Information for Communities

**Russell Jackson
NOAA Office for Coastal Management
August 20, 2019**





America's Coasts

40% of the population, **10%** of the land mass

\$7.9 trillion in goods and services

54.6 million employed

\$3.2 trillion in wages





Office for Coastal Management

Coastal Zone Management Program

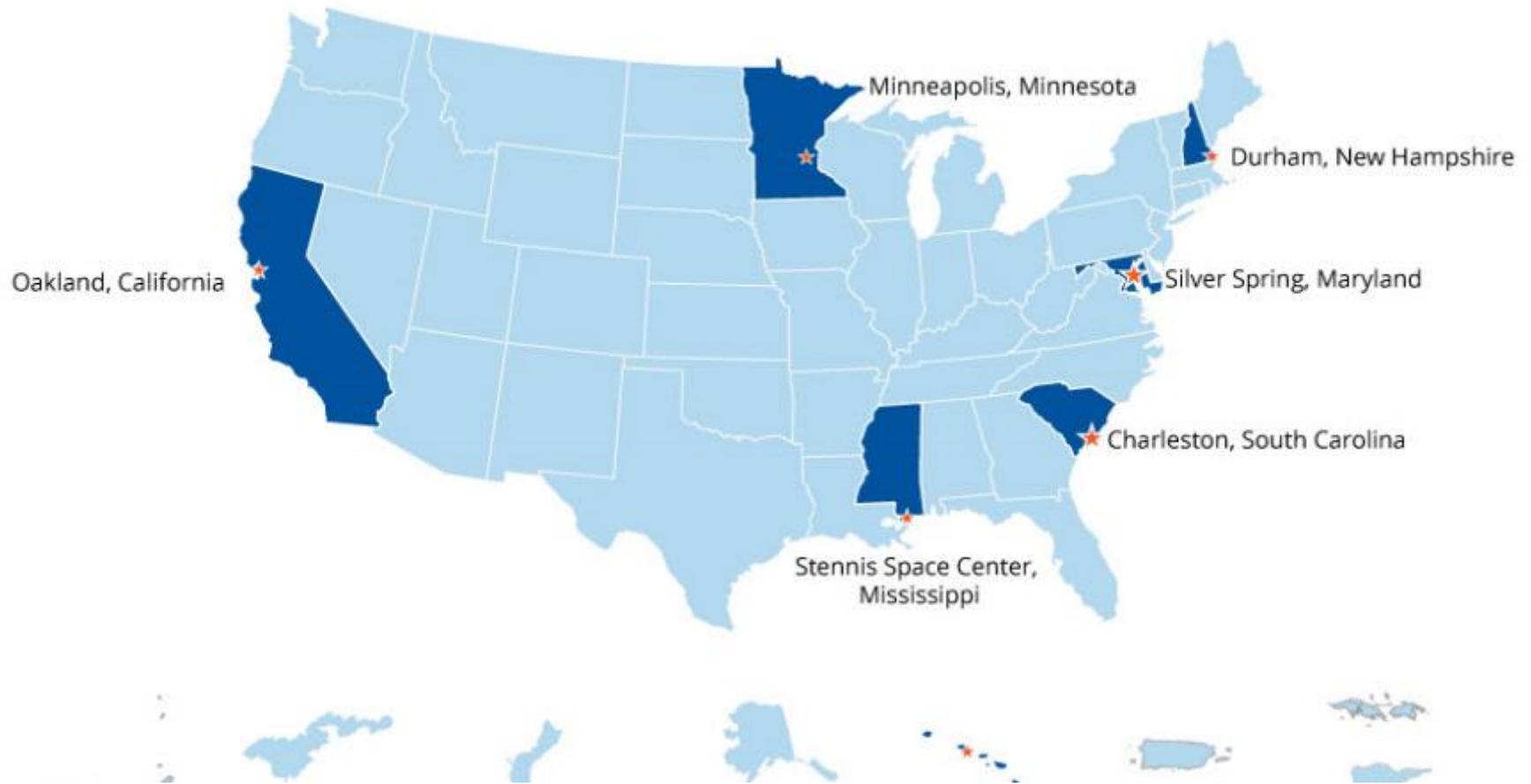
Coral Reef Conservation Program

Digital Coast

National Estuarine Research Reserves



OFFICE FOR COASTAL MANAGEMENT



Approximately 250 people around the country



Coastal Zone Management Program

34 participating states and territories
Regulatory authority
Federal consistency



LIST OF RESERVES

Great Lakes

1. Lake Superior, Wisconsin
2. Old Woman Creek, Ohio

Northeast

3. Wells, Maine
4. Great Bay, New Hampshire
5. Waquoit Bay, Massachusetts
6. Narragansett Bay, Rhode Island
7. Connecticut (*Proposed*)

Mid-Atlantic

8. Hudson River, New York
9. Jacques Cousteau, New Jersey
10. Delaware
11. Chesapeake Bay, Maryland
12. Chesapeake Bay, Virginia

Southeast

13. North Carolina
14. North Inlet-Winyah Bay, South Carolina
15. ACE Basin, South Carolina
16. Sapelo Island, Georgia
17. Guana Tolomato Matanzas, Florida

Gulf of Mexico

18. Rookery Bay, Florida
19. Apalachicola, Florida
20. Weeks Bay, Alabama
21. Grand Bay, Mississippi
22. Mission-Aransas, Texas

West

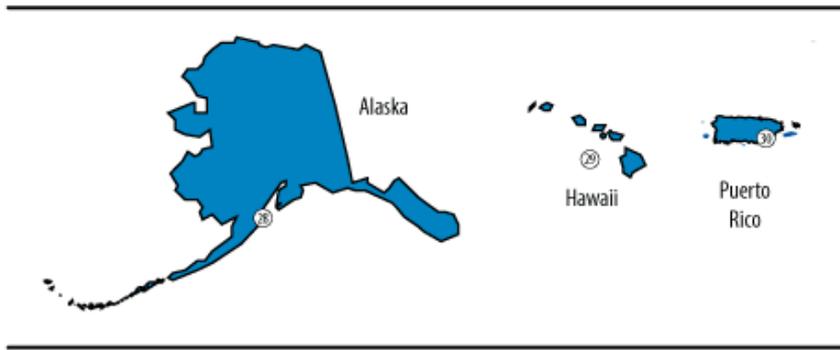
23. Tijuana River, California
24. Elkhorn Slough, California
25. San Francisco Bay, California
26. South Slough, Oregon
27. Padilla Bay, Washington
28. Kachemak Bay, Alaska

Pacific

29. He'eia, Hawai'i

Caribbean

30. Jobos Bay, Puerto Rico



OFFICE FOR COASTAL MANAGEMENT



Coral Reef Conservation Program



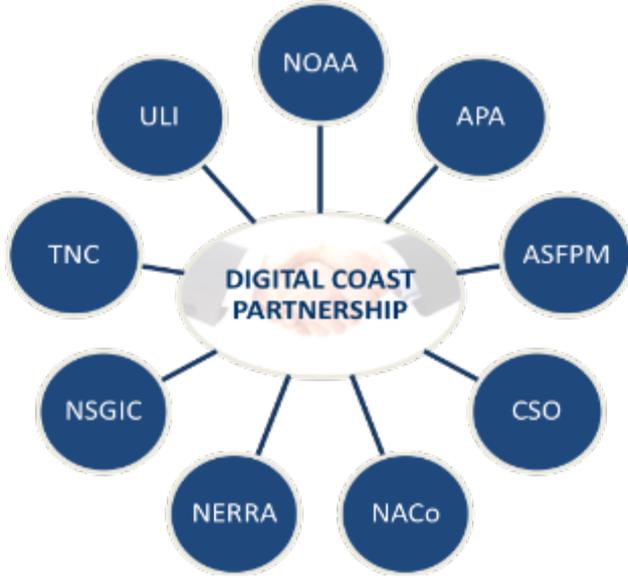
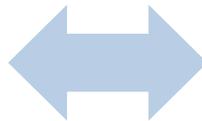
Digital Coast Partnership

- 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
- NOAA Office for Coastal Management





Digital Coast Enabling Platform

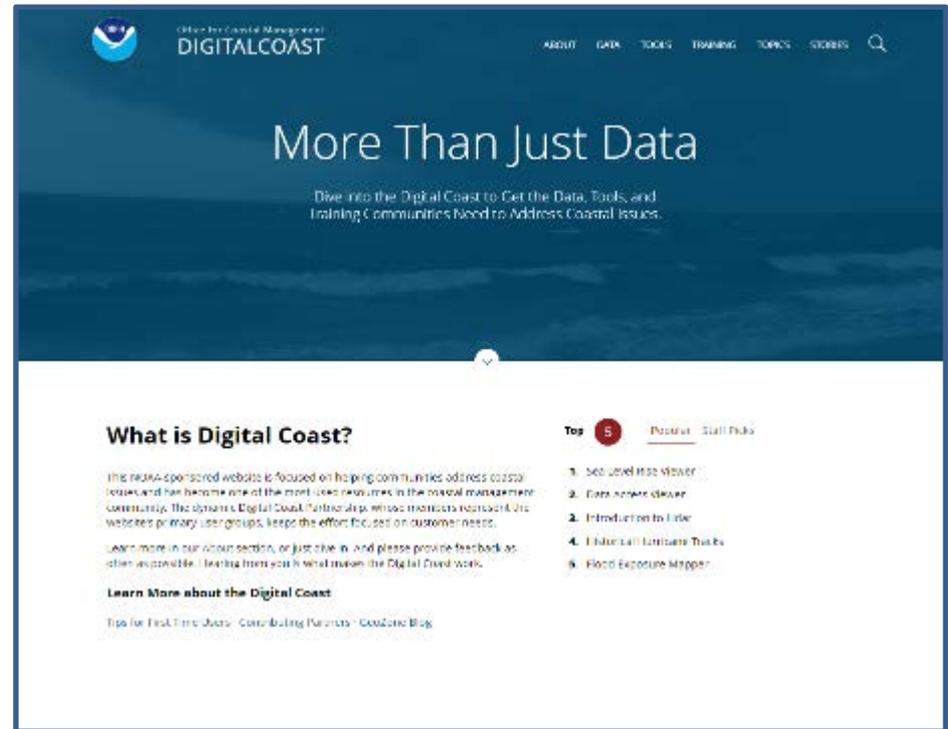


coast.noaa.gov/digitalcoast



Digital Coast Website

- Data, tools, training, and case studies
- Enhanced utility and application
- Demonstration of geospatial information



Sample of Coastal Community Questions

How many people in county's coastal floodplain?

What are potential impacts of coastal storms and sea level rise?

Where can I find training and other learning resources?

How is the coastal landscape changing over time?

How can I assess stormwater flooding risk?

How many jobs in my state or county are supported by the ocean?

Where do I find lidar and other geospatial data for my area?

A Broad Spectrum Approach: Facilitating Use and Application



DISCOVER



DOWNLOAD



MAP



ANALYZE



LEARN



SHARE

DATA

INFORMATION

ACTION

Digital Coast by the Numbers

Data

- 80+ terabytes
- 40+ national-level data sets

Tools

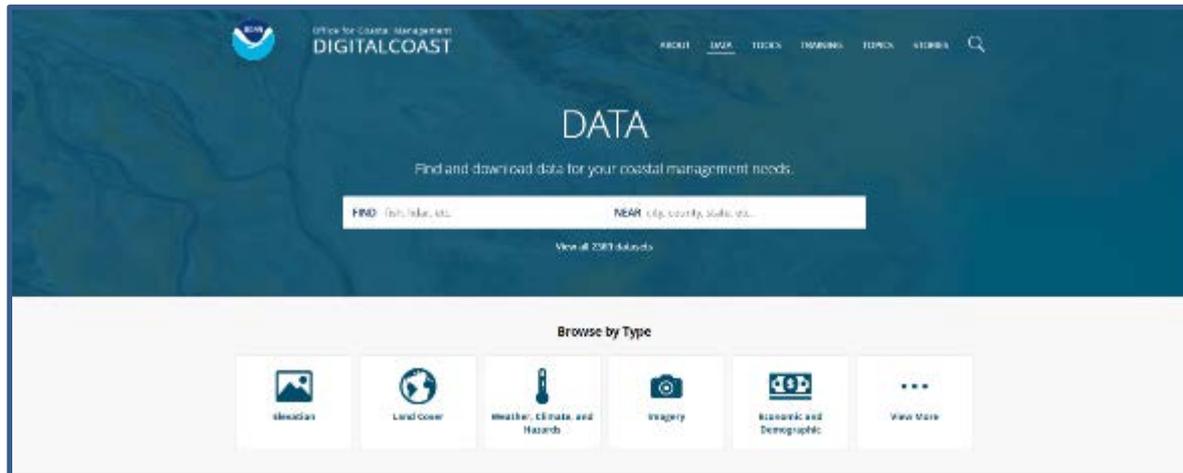
- 50+ tools

Training

- 190+ learning resources

Stories from the Field

- 140+ narratives





Coastal County Snapshots

Complex Data Made Simple

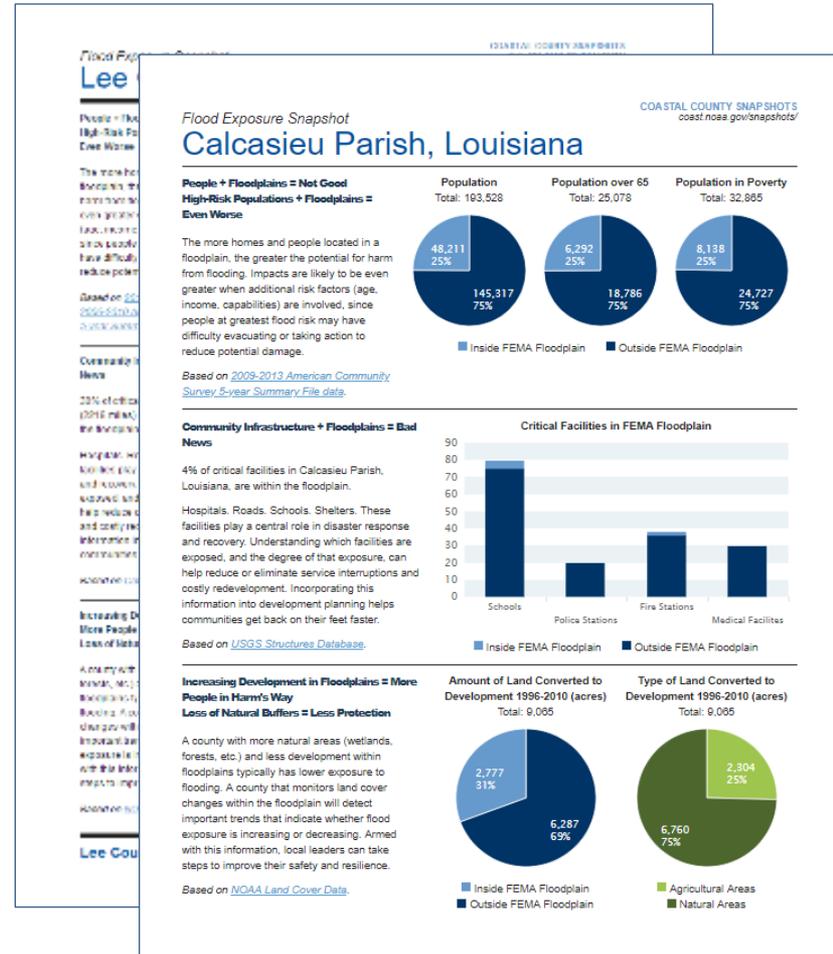
Flooding | Economics | Wetlands

Flood Exposure Snapshot

Flood risk information

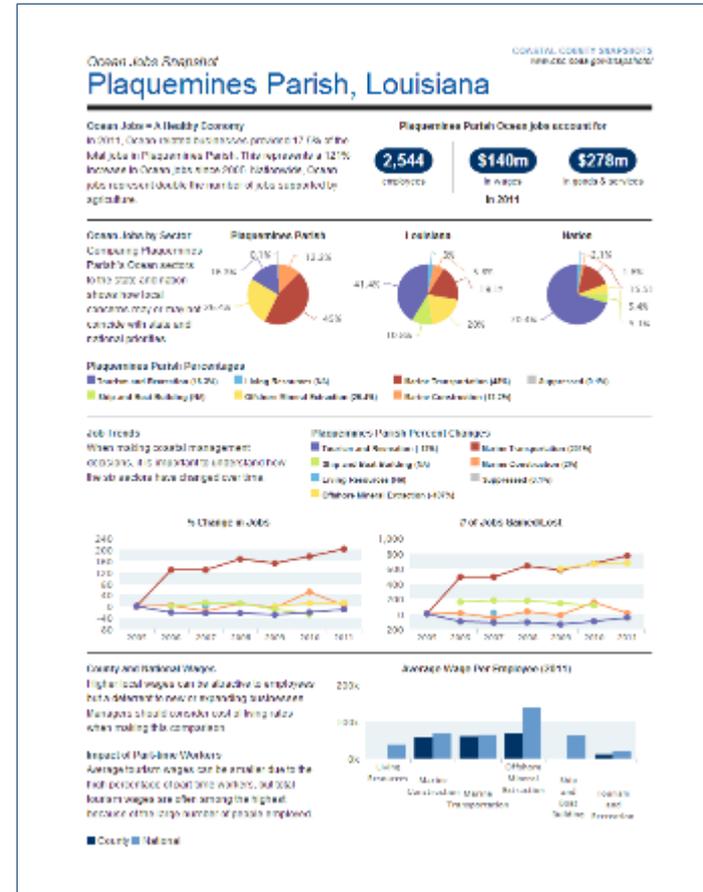
- Vulnerable populations
- Critical facilities
- Land cover change over time

Based on FEMA, U.S. Census, and NOAA data



Ocean Jobs Snapshot

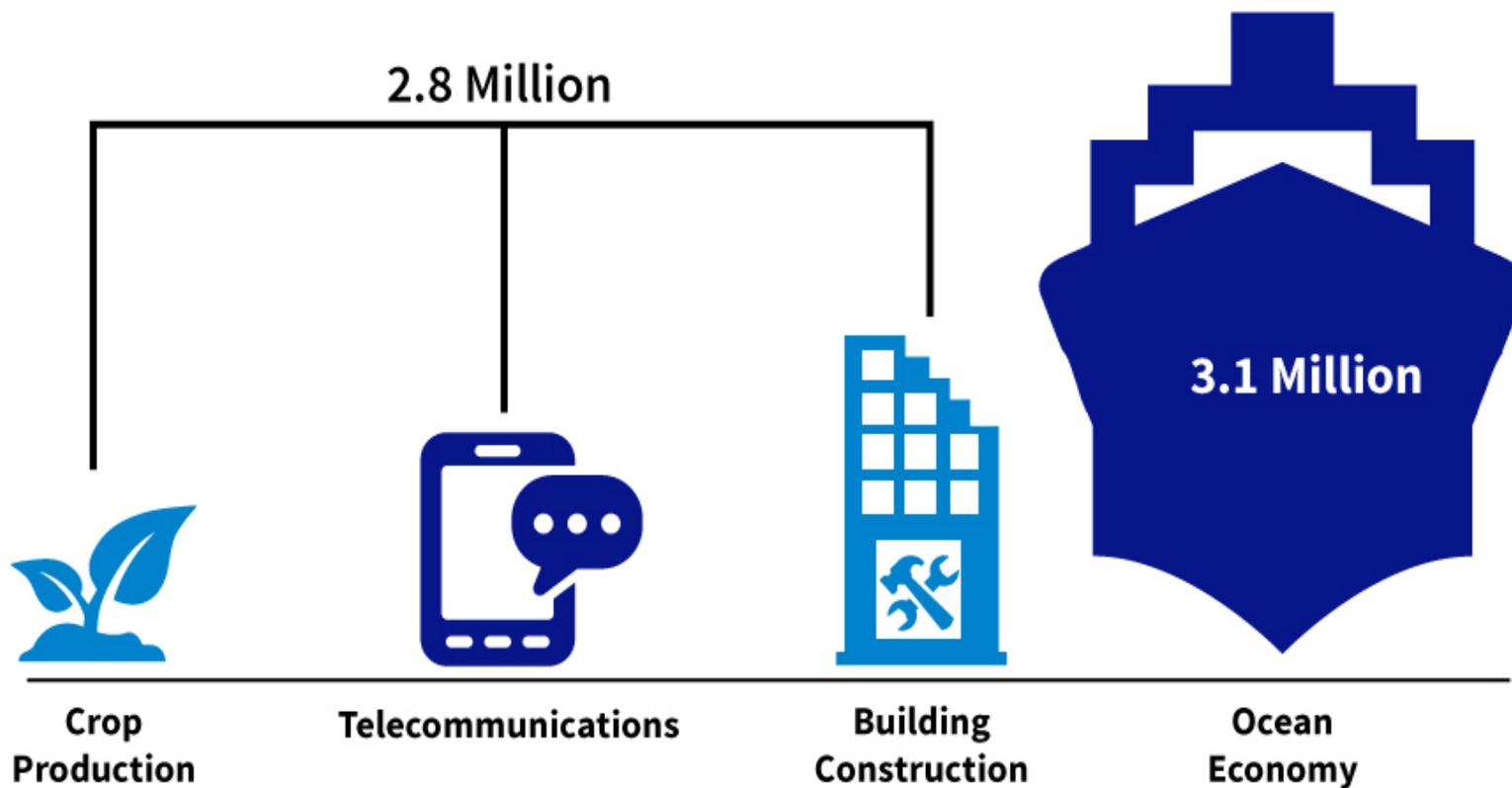
- Easy-to-understand ocean economy visuals and stats
- Quick comparisons to other communities, states, and the nation





ECONOMICS

U.S. Total Employment Comparison





Sea Level Rise Viewer

Visualize scenarios and impacts
using local maps and photos



Sea Level Rise Viewer

331 Fort Johnson Rd, Charleston, SC, 29412, USA



Sea Level Rise

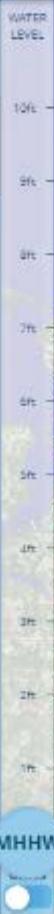
Local Scenarios

Mapping Confidence

Marsh Migration

Vulnerability

High Tide Flooding



MHHW





Sea Level Rise Viewer

331 Fort Johnson Rd, Charleston, SC, 29412, USA



WATER LEVEL

10ft

9ft

8ft

7ft

6ft

5ft

4ft

3ft

2ft

1ft

Current MHHW

UNITS

ft



Sea Level Rise



Local Scenarios



Mapping Conference



Marsh Migration



Vulnerability



High Tide Flooding





Sea Level Rise Viewer

331 Fort Johnson Rd, Charleston, SC, 29412, USA



WATER LEVEL

10ft

9ft

8ft

7ft

6ft

5ft

4ft

3ft

2ft

1ft

Current SHOW

UNITS

Sea Level Rise

Local Scenarios

Mapping Confidence

Marsh Migration

Vulnerability

High Tide Flooding



Fort Sumter National Monument

Wattle Sho

Charleston

Holy Cross Cemetery

Schooner Creek





Sea Level Rise Viewer

331 Fort Johnson Rd, Charleston, SC, 29412, USA



WATER LEVEL

10ft

9ft

8ft

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6ft

5ft

4ft

3ft

2ft

1ft

Current MHHW

UNITS

4ft

3ft

2ft

1ft

Current MHHW

UNITS



Sea Level Rise



Local Scenarios



Mapping Confidence



Marsh Migration



Vulnerability



High Tide Flooding





- Sea Level Rise
- Local Scenarios
- Mapping Confidence
- Marsh Migration
- Vulnerability
- High Tide Flooding



OCM

Use the slider to view a simulation of sea level rise at this location.

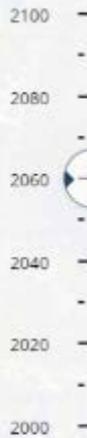


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Sea Level Rise Viewer

Enter an address or city





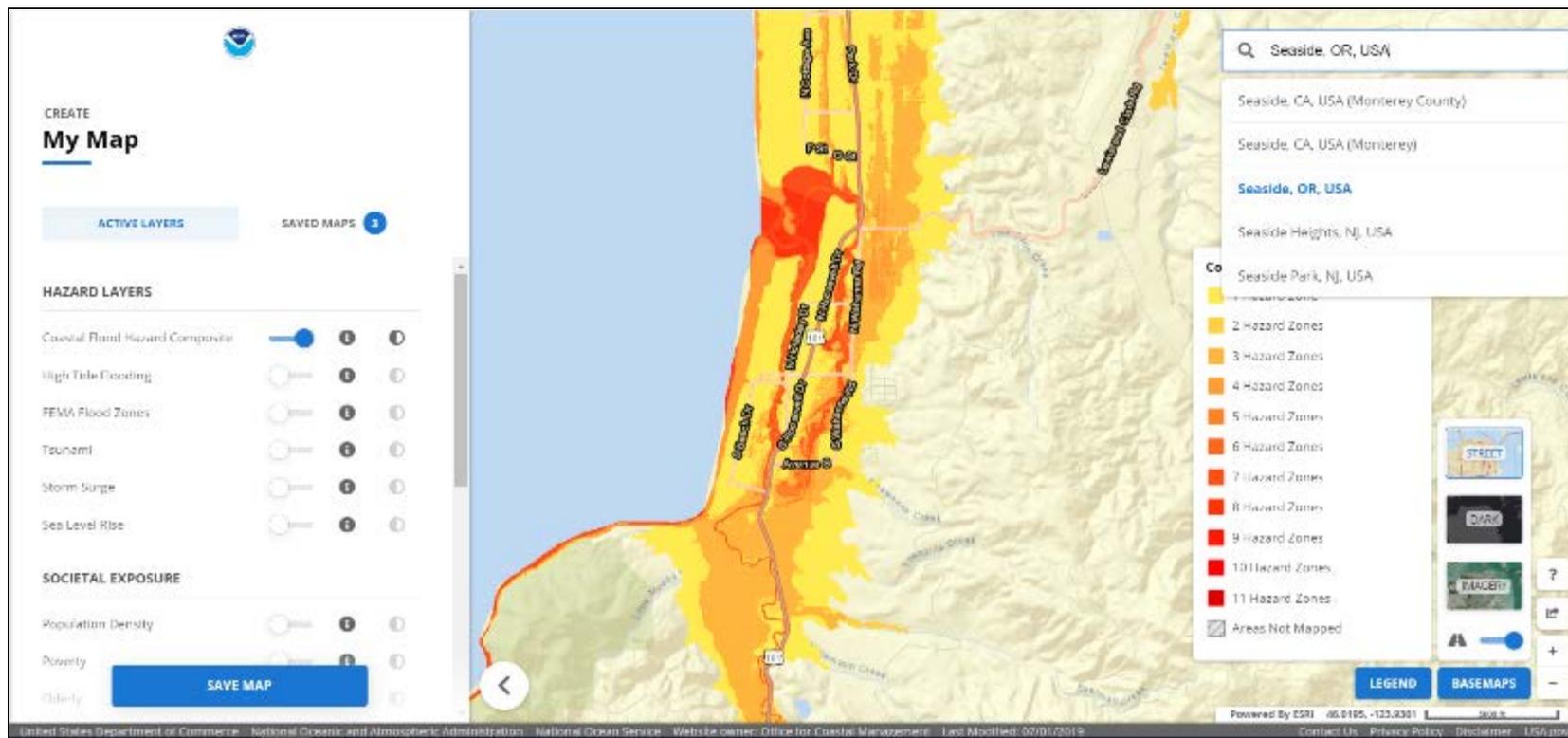
Coastal Flood Exposure Mapper

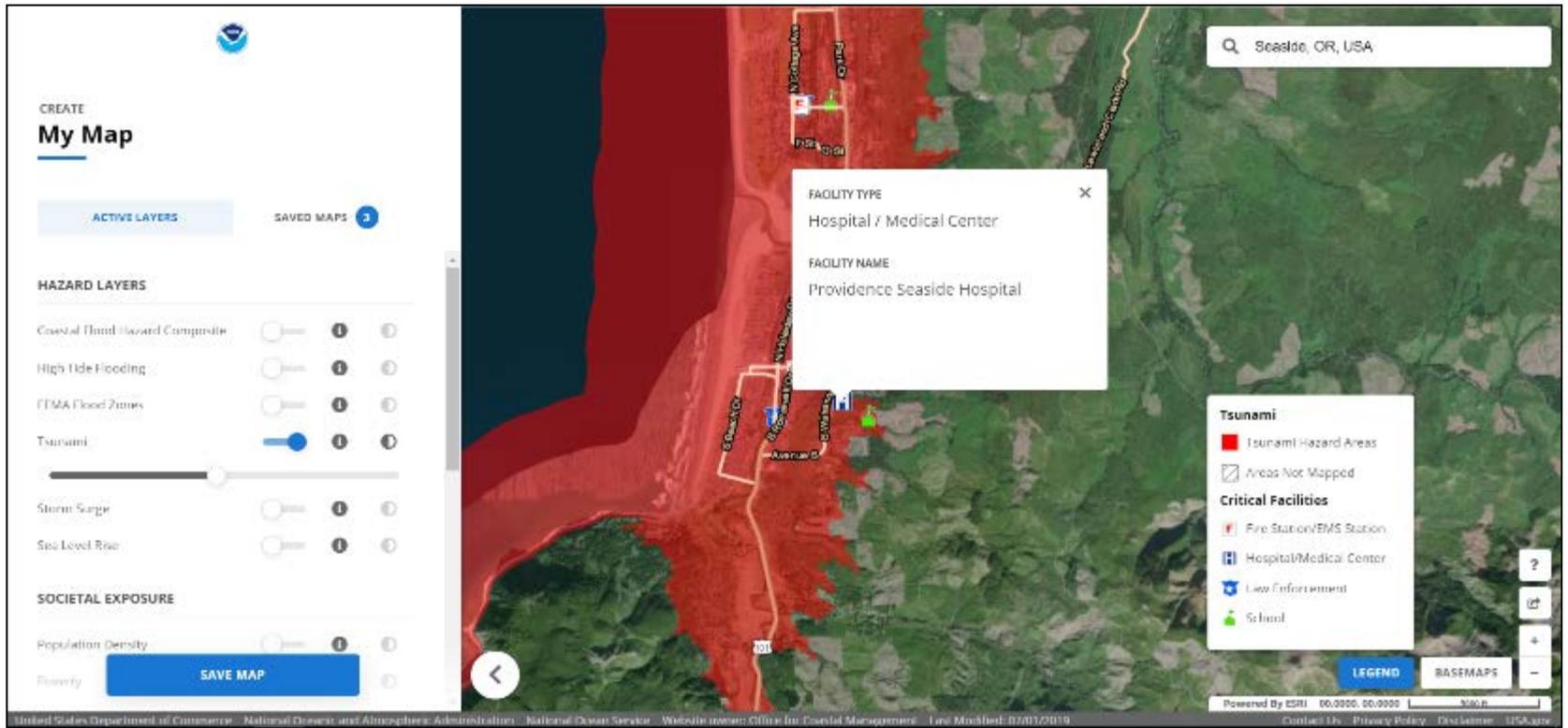
Visualizing Community Risk

People | Places | Natural Resources

NATIONAL
U.S. DEPARTMENT

Coastal Flood Exposure Mapper





CREATE My Map

ACTIVE LAYERS

- Coastal Flood Hazard Composite: 0 0
- High Tide Flooding: 0 0
- FEMA Flood Zones: 0 0
- Tsunami: 0 0
- Storm Surge: 0 0
- Sea Level Rise: 0 0

SOCIETAL EXPOSURE

- Population Density: 0 0
- Poverty: 0 0
- Elderly: 0 0
- Employees: 0 0

SAVED MAPS 3

SAVE MAP

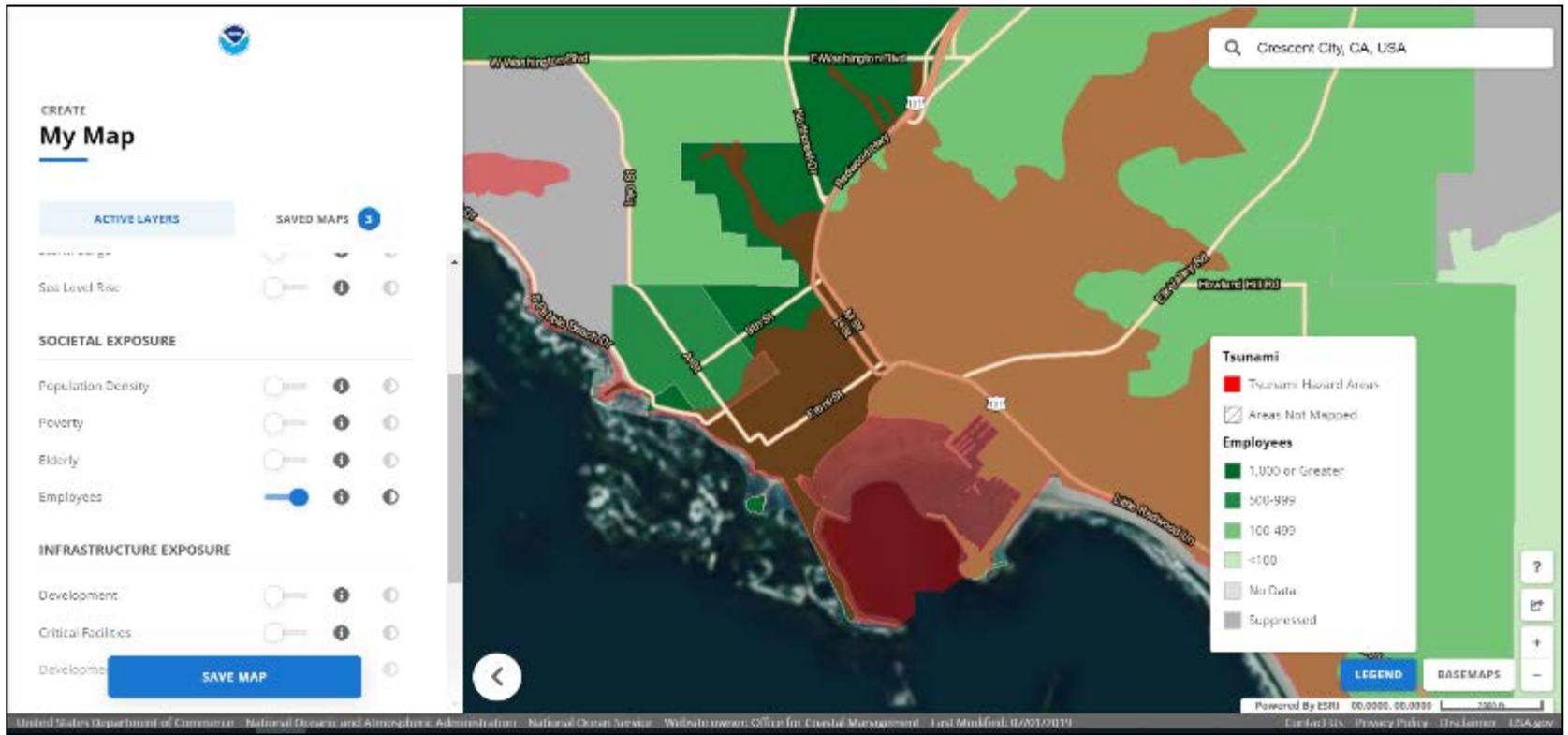
Facility Information Popup:

- FACILITY TYPE:** Toxic Chemicals
- FACILITY NAME:** HAMPTON LUMBER MILLS INC WARRENTON
- FACILITY URL:** http://oaspub.epa.gov/enviro/fac_gateway.main?p_regid=110000816831

Map Legend:

- Tsunami**
 - Tsunami Hazard Areas
 - Areas Not Mapped
- Potential Pollution Sources**
 - Brownfield Property
 - Hazardous Waste
 - Superfund Site
 - Toxic Chemicals
- Natural Areas and Open Space**
 - Wetlands
 - Other Natural Areas and Open Space
 - Beaches and Dunes

United States Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service. Website owner: Office for Coastal Management. Last Modified: 07/01/2019. Contact Us, Privacy Policy, Disclaimer, USA.gov





MANAGE
Saved Maps

ACTIVE LAYERS SAVED MAPS 3

Tsunami
Seaside Oregon

SHARE COLLECTION

Share your map collection

- Tsunami - Seaside Oregon
<https://bit.ly/2M07rH1>
- SLR - 2ft above MHHW
<https://bit.ly/2M07rH1>
- Storm Surge - Category 3 Hurricane / Population Density
<https://bit.ly/2M07rH1>

DOWNLOAD AS .TXT COPY ALL

Digital Coast Academy

Over 190 learning resources

- Classroom and online instructor-led
- Self-guided
- Case studies
- Publications and quick references
- Videos and webinars



RISK COMMUNICATION ASSISTANCE
coast.noaa.gov/digitalcoast/topics/risk-communication

We need better planning

What about flooding?

Our safety is important

Home repairs are expensive!

“Ultimately, this training reduced the chances of an inadvertent misstep and positioned the State of Rhode Island to work cooperatively with water suppliers to address changing flood risks.”



Learning Resources for Community Resilience



Instructor-Led Training

- Adaptation Planning for Coastal Communities
- Introducing Green Infrastructure for Coastal Resilience
- **Building Risk Communication Skills**
- **Coastal Inundation Mapping**

Publications

- Green Infrastructure Costs and Benefits
- Introduction to Stakeholder Participation

Quick References

- Assessing Adaptation Options
- Green Infrastructure Options to Reduce Flooding

Self Guided Resources

- Adapting Stormwater Management for Coastal Floods
- How to Calculate Coastal Flood Frequency
- How to Map Open Space for Community Rating System Credit

Case Studies

- Investing In Flood Mitigation Pays Off Immensely
- Increasing Flood Risk Awareness Through A Real Estate Professional Training Program
- Louisiana Parish Creates A Model Subdivision Ordinance To Enhance Public Safety And Resilience To Coastal Storms And Flood Events

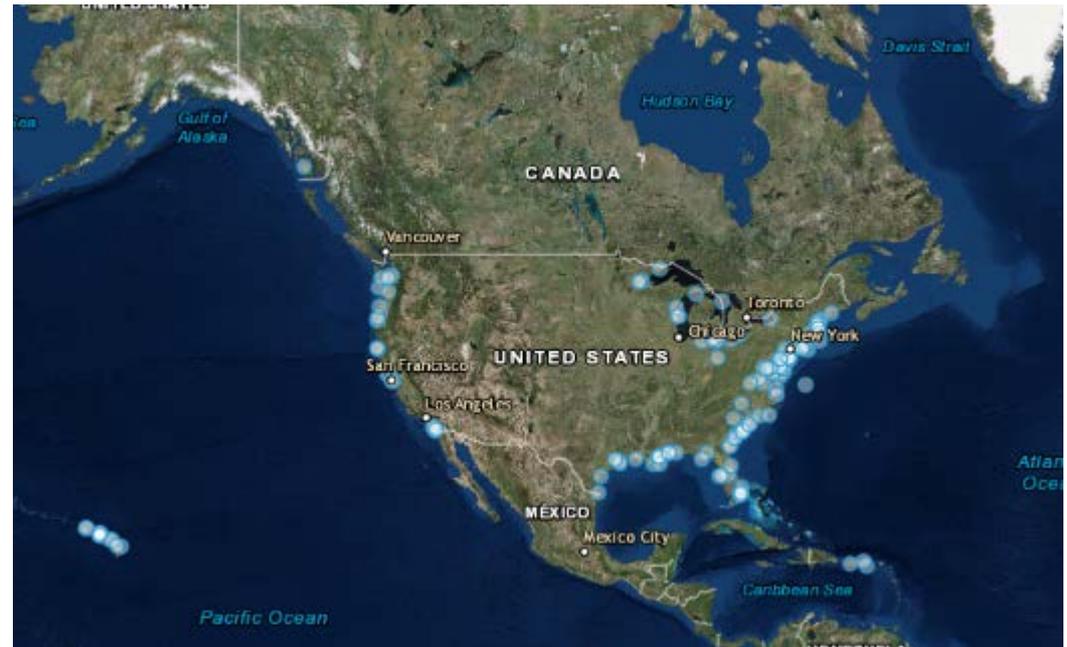


Seven Best Practices for Risk Communication Training

Learn to Engage Diverse Audiences
About Weather and Climate Hazards

Stories from the Field

- Almost 150 narratives that demonstrate how users are applying Digital Coast resources to coastal issues
- Highlight partnerships and impact



STORIES FROM THE FIELD

Assessing The Vulnerability Of Transportation Infrastructure On The Eastern Shore

Issue

Studies suggest that relative sea-level rise is not only occurring on the Eastern Shore of Virginia, but also appears to be accelerating, with several areas already vulnerable to road closures during storm and flooding events. Future elevated water levels will likely have increasingly significant impacts on transportation infrastructure and the communities, facilities, and economies that depend on them.

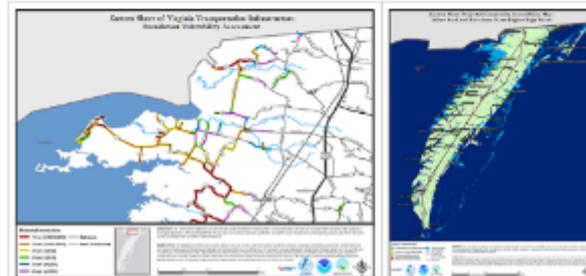
PRINT

Process

To address these long-range sea-level rise issues, a screening-level assessment was conducted to determine the possible effects on transportation infrastructure and communities, and when these changes were projected to occur. Output data sets from the NOAA Sea Level Rise and Coastal Flooding Impacts Viewer were utilized to perform two separate assessments: a regional transportation infrastructure inundation vulnerability assessment, and a community and critical facility accessibility assessment. The lidar utilized in the model provided the surface elevations of roads, with adequate resolution for long-range planning purposes. The data were combined with road data from the Virginia Department of Transportation to determine which road segments were vulnerable under various inundation scenarios. Relative sea level rise projections by the Virginia Institute of Marine Science were used to project the timing of various inundation scenarios.

Impact

The studies provided critical information to planners and officials about how inundation could affect their communities. The inundation vulnerability assessment determined that 33 miles of roads in the region would be vulnerable to inundation within the next few decades with 1-foot of sea-level rise. With a 6-foot rise, almost a quarter of all roads could be vulnerable as early as 2050. The accessibility assessment evaluated over 50 communities and found various problems, with seven communities possibly inaccessible during high tide beginning sometime between 2025 and 2050 with 1-foot of sea-level rise. Additionally, the Chincoteague Causeway, which serves as the sole access route to the Town of Chincoteague, the Chincoteague National Wildlife Refuge, and the Assateague Island National Seashore, was found to be vulnerable to inundation beginning sometime between 2045 and 2050.



Making an Impact

Vulnerability Assessment:

The Eastern Shore of VA

- **Partners:** Virginia Department of Transportation, Virginia Coastal Zone Management Program
- **Products:** Sea Level Rise Viewer and Lidar Data
- **Outcome:** Determined that 33 miles of roads in the region would be vulnerable to inundation within the next few decades with 1 foot of sea-level rise

