TOGETHER NORTH JERSEY.

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

WEB-BASED COASTAL RESILIENCY PLANNING TOOLS

Together North Jersey (TNJ) Resilient Task Force

Webinar 3 of the TNJ Resiliency Webinar Series

June 13, 2018

Connecting People, Places, and Potential

TOGETHER NORTH JERSEY.

WEBINAR INSTRUCTIONS

- Please mute your phone
- This webinar is being recorded and will be available at togethernorthjersey.com
- Direct questions to the bottom right chat section to be answered in last 10 minutes of webinar
- If we run out of time, please email either:
  - Stacy Krause, perrines@ejb.rutgers.edu
  - Eliot Benman, ebenman@ejb.rutgers.edu

TOGETHER NORTH JERSEY.

TNJ RESILIENCY WEBINAR SERIES

The Resiliency Webinar Series is a product of the TNJ Resilient Task Force.

Thank you to the following Resilient Task Force members for their guidance and assistance:

Rob Freudenberg, Co-Chair – Regional Plan Association
Tim Van Epp, Co-Chair – Sustainability Planning Consultant
Kelly Pflicke – New Jersey Department of Environmental Protection
Linda Weber – Sustainable Jersey
Melissa Harclerode – CDM Smith

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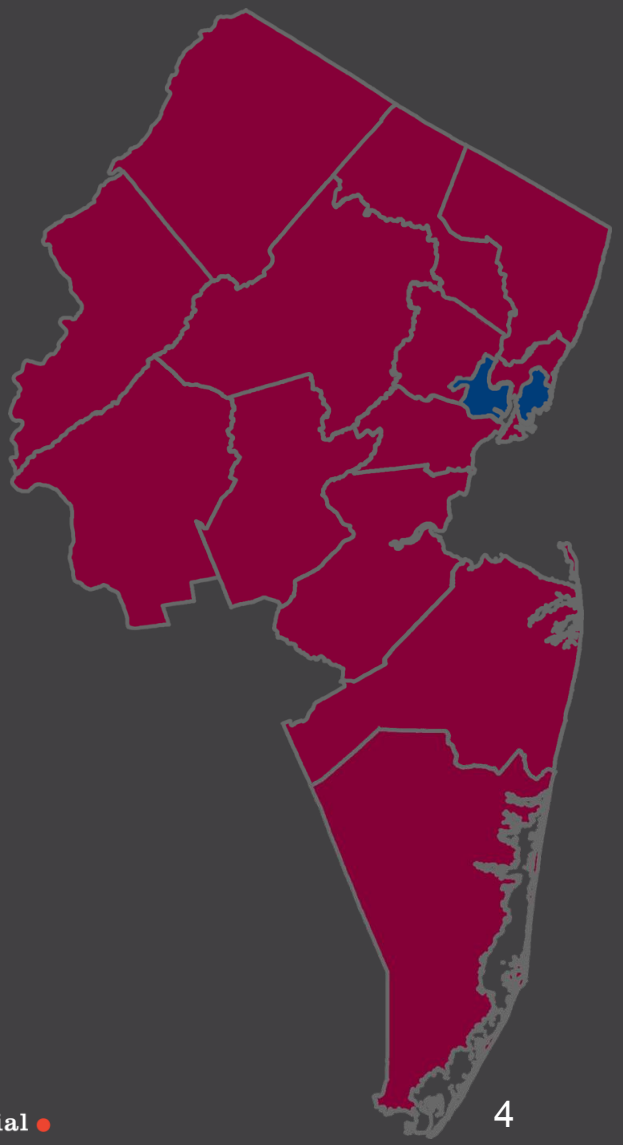
TNJ RESILIENCY WEBINAR SERIES

This webinar series is co-sponsored by the North Jersey Transportation Planning Authority (NJTPA).



NJTPA Region

Bergen	Middlesex	Passaic
Essex	Monmouth	Somerset
Hudson	Morris	Sussex
Hunterdon	Newark	Union
Jersey City	Ocean	Warren

TOGETHER NORTH JERSEY.

TOGETHER NORTH JERSEY RESILIENT VISION.

A resilient North Jersey is ready for adverse events—extreme weather, climate change, economic downturns or other major setbacks—and can quickly bounce back from them. It protects wetlands and other crucial ecosystems, and has strong, well-maintained infrastructure (transportation, utilities, water, sewer, etc.). A resilient North Jersey takes steps to be prepared and reduce negative impacts on our communities.

TOGETHER NORTH JERSEY.

SPEAKER

Stacy Krause, PP/AICP, CFM

Senior Research Associate
Environmental Analysis and Communications Group
Edward J. Bloustein School of Planning and Public Policy
Rutgers, The State University of New Jersey
perrines@ejb.rutgers.edu

TOGETHER NORTH JERSEY.

AGENDA

- Why and when to use resiliency tools
- Resiliency tools available:
  - General information
  - Data available
  - Use at the local level
  - Contacts/further resources

Images, top to bottom: NJ Flood Mapper, Coastal Hazard Profiler, Sea Level Rise Viewer

TOGETHER NORTH JERSEY.

WHY USE WEB-BASED RESILIENCY TOOLS?

1. Explore Hazards
2. Assess Vulnerability & Risks
3. Investigate Options
4. Prioritize & Plan
5. Take Action

WHY USE WEB-BASED RESILIENCY TOOLS? (cont'd)

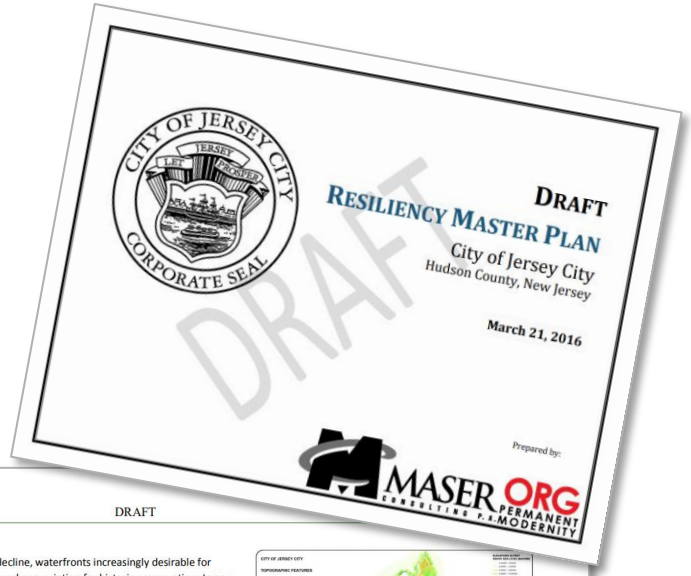
- Better understanding of complex data
- Local decision making
- Public communication support

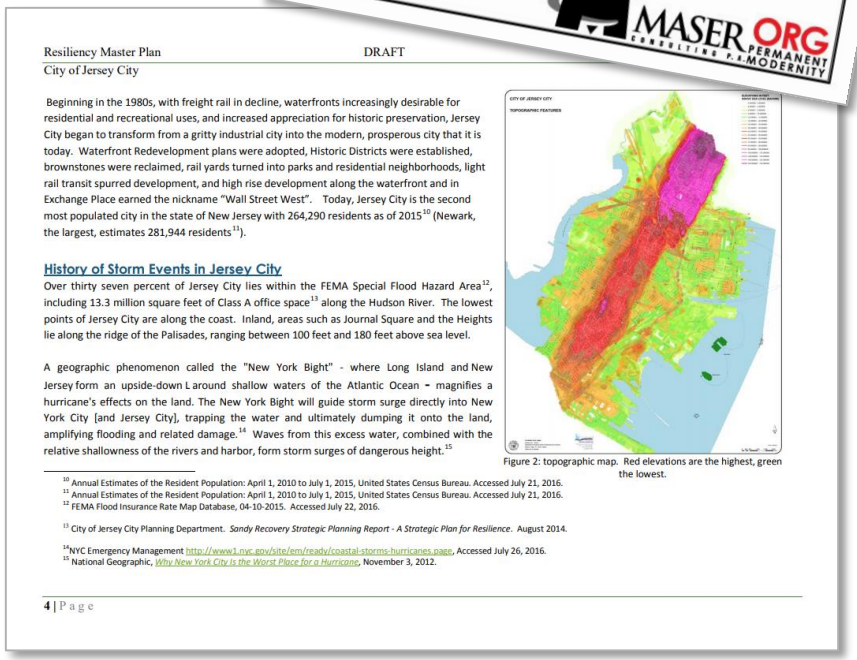

Image: Together North Jersey

WHEN TO USE WEB-BASED RESILIENCY TOOLS

- Vulnerability assessment
- Climate Action/ Adaptation Plan
- Hazard Mitigation Plan
- Data compilation and incorporation
  - Capital planning
  - Land use planning
  - Zoning
  - Open space acquisition
  - Wetlands/shoreline restoration projects

Sample page from the Jersey City Draft Resiliency Master Plan containing a city topographic map.





Resiliency Master Plan DRAFT
City of Jersey City

Beginning in the 1980s, with freight rail in decline, waterfronts increasingly desirable for residential and recreational uses, and increased appreciation for historic preservation, Jersey City began to transform from a gritty industrial city into the modern, prosperous city that it is today. Waterfront Redevelopment plans were adopted, Historic Districts were established, brownstones were reclaimed, rail yards turned into parks and residential neighborhoods, light rail transit spurred development, and high rise development along the waterfront and in Exchange Place earned the nickname "Wall Street West". Today, Jersey City is the second most populated city in the state of New Jersey with 264,290 residents as of 2015[10] (Newark, the largest, estimates 281,944 residents[11]).

History of Storm Events in Jersey City

Over thirty seven percent of Jersey City lies within the FEMA Special Flood Hazard Area[12], including 13.3 million square feet of Class A office space[13] along the Hudson River. The lowest points of Jersey City are along the coast. Inland, areas such as Journal Square and the Heights lie along the ridge of the Palisades, ranging between 100 feet and 180 feet above sea level.

A geographic phenomenon called the "New York Bight" - where Long Island and New Jersey form an upside-down L around shallow waters of the Atlantic Ocean - magnifies a hurricane's effects on the land. The New York Bight will guide storm surge directly into New York City [and Jersey City], trapping the water and ultimately dumping it onto the land, amplifying flooding and related damage.[14] Waves from this excess water, combined with the relative shallowness of the rivers and harbor, form storm surges of dangerous height.[15]

Figure 2: topographic map. Red elevations are the highest, green the lowest.

[10] Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2015, United States Census Bureau. Accessed July 21, 2016.
[11] Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2015, United States Census Bureau. Accessed July 21, 2016.
[12] FEMA Flood Insurance Rate Map Database, 04-10-2015. Accessed July 22, 2016.

[13] City of Jersey City Planning Department. *Sandy Recovery Strategic Planning Report - A Strategic Plan for Resilience*. August 2014.

[14] NYC Emergency Management http://www1.nyc.gov/site/em/ready/coastal-storms-hurricanes.page, Accessed July 26, 2016.
[15] National Geographic, *Why New York City Is the Worst Place for a Hurricane*, November 3, 2012.

4 | Page

WEB-BASED TOOLS FOR RESILIENCY PLANNING IN COASTAL NEW JERSEY

1. Surging Seas (Climate Central)
2. Sea Level Rise Viewer (National Oceanic and Atmospheric Administration)
3. Coastal Resilience Mapping Portal (The Nature Conservancy)
4. NJADAPT
   - Coastal Hazard Profiler (Rutgers University Climate Institute)
   - NJ FloodMapper (Jacques Cousteau National Estuarine Research Reserve/Rutgers University)

TOGETHER NORTH JERSEY.

WEB-BASED COASTAL
RESILIENCY PLANNING TOOLS

SURGING SEAS

Connecting People, Places, and Potential

SURGING SEAS

Agency: Climate Central

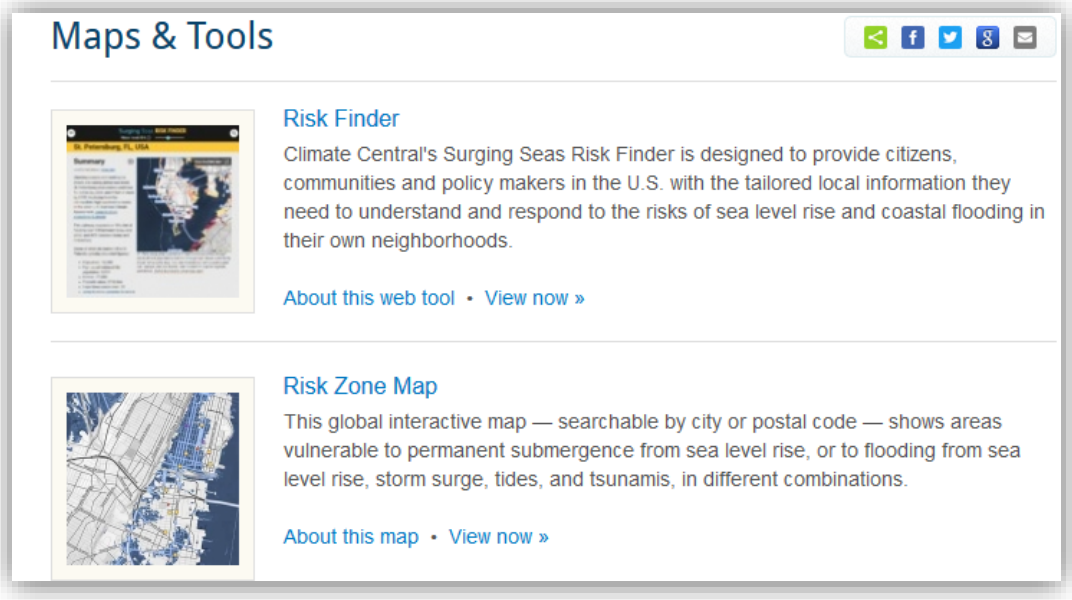
Location: https://riskfinder.climatecentral.org/

- Interactive online tool of maps and information platforms that can be used for both mapping and analysis at the municipal, county, and state level
- Target audience: Decision makers, planners, coastal managers, emergency managers, federal and state agencies, journalists and the general public
- Skill level needed: medium
- Outputs available via printable town, county, and state level reports and maps

SURGING SEAS

Interactive maps and information platforms:

1. Risk Finder
2. Risk Zone Map
3. Mapping Choices
4. Seeing Choices
5. U.S. Cities We Could Lose to the Sea
6. Energy Infrastructure Threat from Sea Level Rise



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SURGING SEAS RISK FINDER

- Enter a coastal location
- Get a summary
- Can adjust water level on slider bar
- Future flood risks
- Explanation of historical trends
- Latest numbers of flood days into 2018
- What is at risk
- Resources for reducing your risk

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SURGING SEAS RISK FINDER: HOBOKEN, NJ

Surging Seas **RISK FINDER**

Hoboken, New Jersey, USA

Water level (ft)

10 9 8 7 6 5 4 **3** 2 1

Summary

Scroll or change settings for more info | Video intro

- Warming oceans and melting glaciers and ice sheets are raising global sea levels.
- About 220 people in Hoboken live on exposed land below 3 feet (the selected level). More threats↓
- The selected sea level scenario points to a 100% risk of at least one flood over 3 feet taking place between today and 2050 in the Hoboken area. More scenarios↓
- Learn about related places↓ and how to reduce risks↓

DOWNLOADS

Local fact sheet

Local report

State report

These PDF downloads summarize key information from this tool, for Hoboken ("local" items) or for New Jersey. Find customizable slide, map and data downloads below.

Have more specific needs? Learn about our custom work

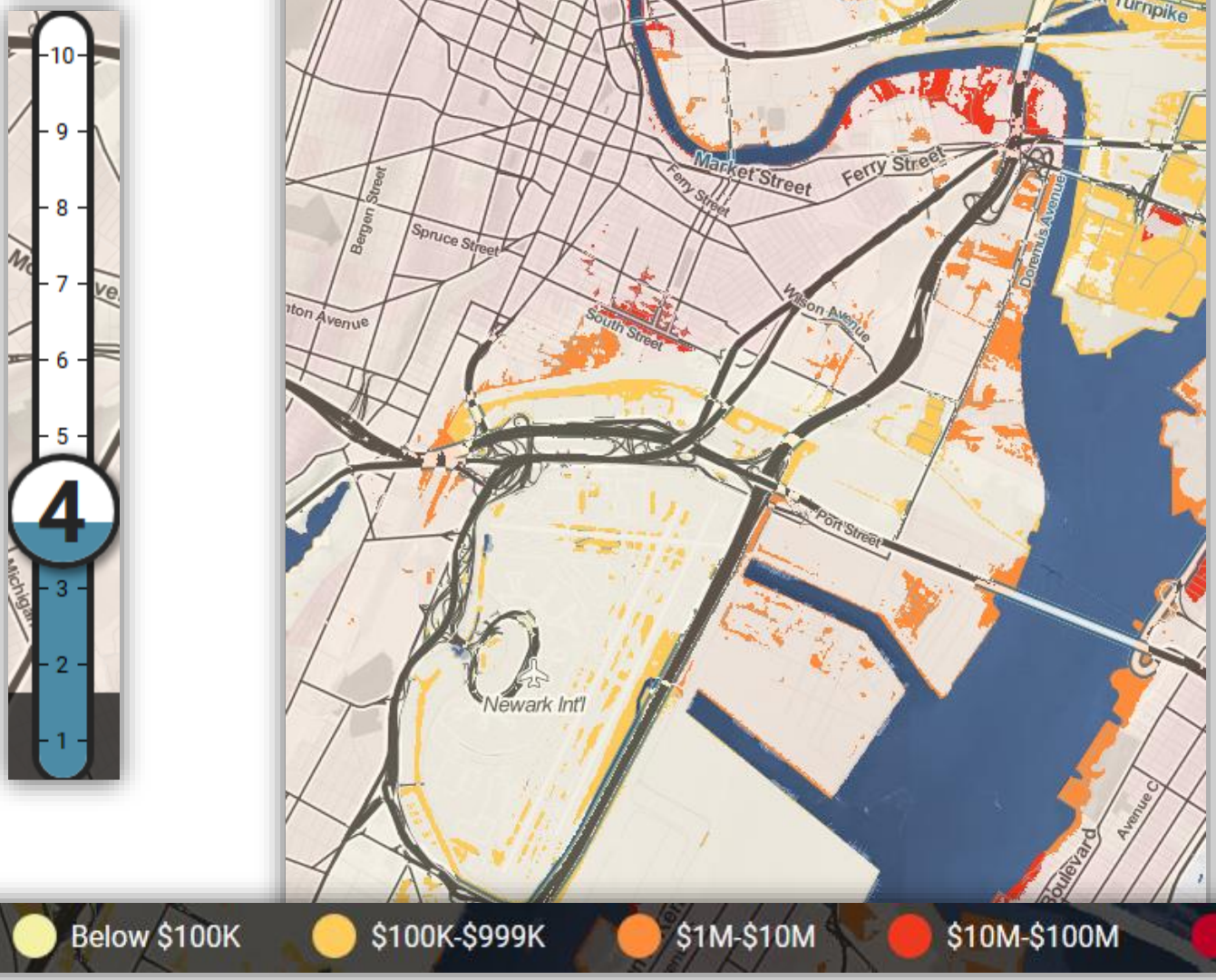
Hoboken area land below 3 feet is colored yellow through red to denote populations with low through high social vulnerability. Social vulnerability (e.g. from low income) can compound coastal risk. Maroon lines are levees. See full-feature map for legends and details. Switch to property value map layer

TOGETHER NORTH JERSEY.

SURGING SEAS RISK ZONE MAP

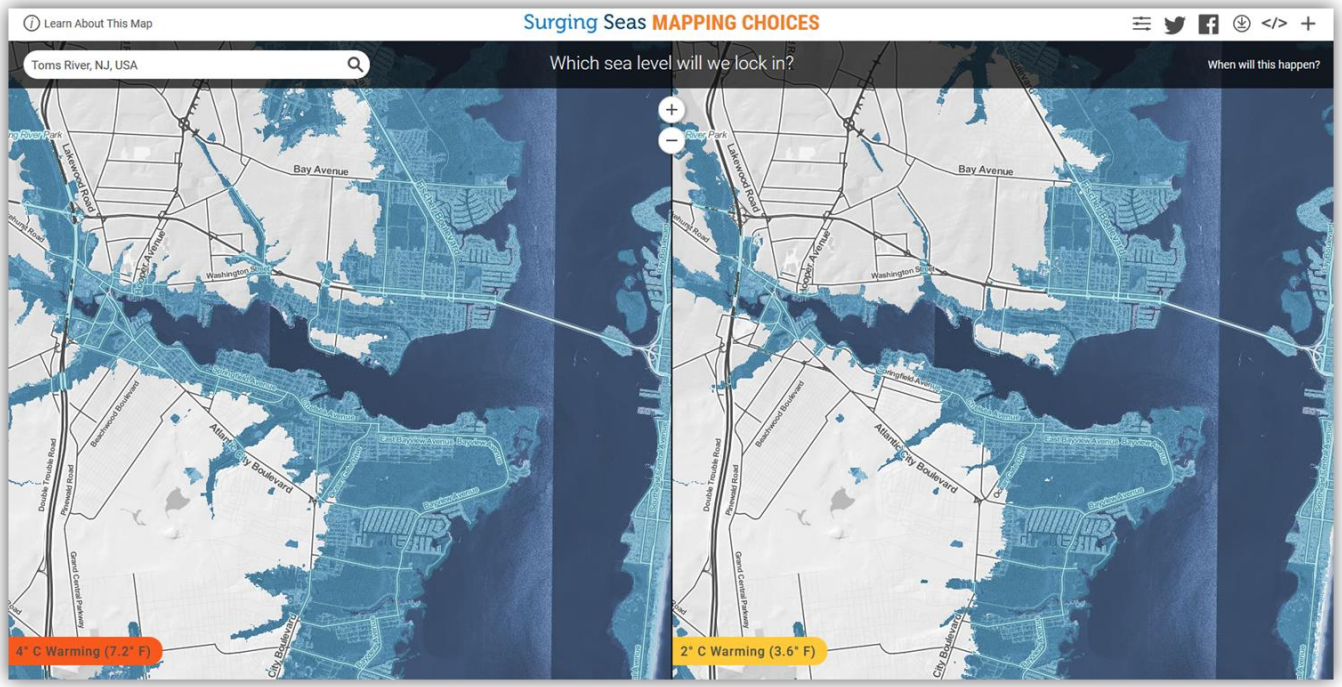
- Water level via slider bar
- Multiple scenario projections based on varying levels of carbon emissions and pollution
- Social vulnerability
- Ethnicity
- Income
- Property value
- Landmarks

SURGING SEAS RISK ZONE MAP: NEWARK AREA



SURGING SEAS: ADDITIONAL MAPS AND DATA

- Mapping Choices
- Seeing Choices
- U.S. Cities We Could Lose to the Sea
- Energy Infrastructure Threat from Sea Level Rise



SURGING SEAS: USE AT LOCAL LEVEL

CITY OF FORT LAUDERDALE

SOUTHEAST FLORIDA
REGIONAL COMPACT
CLIMATE CHANGE

- CLIMATE RESILIENCY
  - SEAWALL MAINTENANCE
  - WHY RESILIENCY NOW?
  - CLIMATE AND WEATHER IN FORT LAUDERDALE
    - THE STORY OF SEA LEVEL RISE IN FORT LAUDERDALE
      - HOW MUCH AND HOW FAST WILL THE SEA RISE?
      - WHY DOES SEA LEVEL MATTER?
      - HOW DO WE PREPARE FOR RISING SEAS?
      - TEMPERATURES OVER TIME IN FORT LAUDERDALE
      - LEARN MORE ABOUT CLIMATE CHANGE IN OUR REGION
  - VISION 2035: WE ARE READY
  - INNOVATIVE PILOT PROJECTS
  - FLOODPLAIN MANAGEMENT
  - HIGH TEMPERATURE LIVING: HEAT, FIRE & DROUGHT

TOGETHER NORTH JERSEY.

USING SURGING SEAS WITH THE COMMUNITY RATING SYSTEM

CRS Manual pg. 510-4

CRS Activity 512a, Floodplain Management Planning (FMP)

CRS MANUAL: *The maximum credit for this element is 382 points.*

FMP credit is provided for a community-wide floodplain management plan that was prepared by following a standard planning process. To receive any credit under this activity, the planning process must receive some credit under each of the 10 steps listed below. If the plan was approved by FEMA as a multi-hazard mitigation plan and one step is missing, the mitigation plan may receive credit, but FMP credit will be limited to 50 points. If two steps are missing, there is no credit for a multi-hazard mitigation plan.

What you get in the web tool

- Users can obtain risk information within *Surging Seas* related to flood hazards in foot or meter increments above the high tide line, or for other hazard disclosure.
- *Surging Seas* provides analysis related to flood and sea level rise risk, projections, and maps.

Reminders from CRS experts

- FEMA representatives tell us *Surging Seas* could be utilized within steps 4(b) and (c).
- In particular, the mapping layers found in Section 2 of this document could be utilized within step 5(e) and (f) and step 7.
- We would be interested in hearing from additional CRS implementers, coordinators and experts regarding this section in order to expand this part of the guide.

Multi-hazard Mitigation Planning	CRS	Maximum
Phase I – Planning process		
§201.6(c)(1)	1. Organize	10
§201.6(b)(1)	2. Involve the public	120
§201.6(b)(2) & (3)	3. Coordinate	35
Phase II – Risk assessment		
§201.6(c)(2)(i)	4. Assess the hazard	35
§201.6(c)(2)(ii) & (iii)	5. Assess the problem	52
Phase III – Mitigation strategy		
§201.6(c)(3)(i)	6. Set goals	2
§201.6(c)(3)(ii)	7. Review possible activities	35
§201.6(c)(3)(iii)	8. Draft an action plan	60
Phase IV – Plan maintenance		
§201.6(c)(5)	9. Adopt the plan	2
§201.6(c)(4)(i)	10. Implement, evaluate, revise	35
Total		382

Get started: To access *Surging Seas* customizable maps, analysis, and downloads follow the step-by-step guide starting on page 22.

Please note: Your ISO/CRS Specialist determines whether you may receive points.

Surging Seas Risk Zone Map step-by-step guide

***Surging Seas* Risk Zone Map** allows you to see, customize, download, and share maps that show areas vulnerable to coastal flooding from storm surge, tides, and permanent submergence from sea level rise.

1. GO TO SS2.CLIMATECENTRAL.ORG AND SEARCH FOR YOUR LOCATION IN THE SEARCH BOX LOCATED IN THE TOP RIGHT CORNER

- Zoom into neighborhoods, or out to broader regions using the round + and - buttons located in the bottom right corner.

2. ADJUST THE WATER LEVEL ON THE LEFT SIDE TO EXPLORE RISK FROM COASTAL FLOODING, SEA LEVEL RISE, OR BOTH

- Land shaded in blue is below the selected water level.
- Land shaded in green indicates areas potentially protected by natural ridges or levees.
- Elevation data supplied by NOAA.

3. SELECT THE "POPULATION" LAYER AT THE BOTTOM OF THE SCREEN

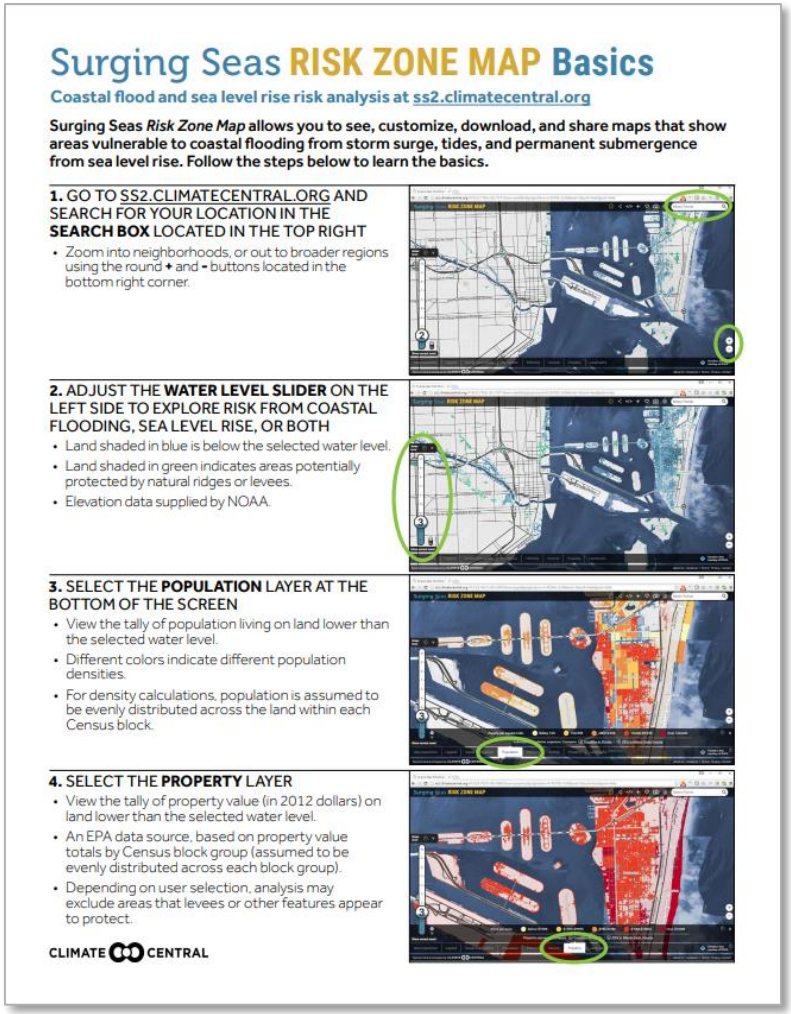
- View the tally of population living on land lower than the selected water level.
- Different colors indicate different population densities.
- For density calculations, population is assumed to be evenly distributed across the land within each Census block.

4. SELECT THE "PROPERTY" LAYER

- View the tally of property value (in 2012 dollars) on land lower than the selected water level.
- An EPA data source, based on property value totals by Census block group (assumed to be evenly distributed across each block group).
- Depending on user selection, analysis may exclude areas that levees or other features appear to protect.

SURGING SEAS: CONTACT AND TUTORIAL

- Contact
  - Dan Rizza, drizza@climatecentral.org
- Tutorial
  - http://sealevel.climatecentral.org/ssrf/help-page
  - Includes PDF guides/tutorials and videos



Surging Seas RISK ZONE MAP Basics

Coastal flood and sea level rise risk analysis at ss2.climatecentral.org

Surging Seas *Risk Zone Map* allows you to see, customize, download, and share maps that show areas vulnerable to coastal flooding from storm surge, tides, and permanent submergence from sea level rise. Follow the steps below to learn the basics.

1. GO TO SS2.CLIMATECENTRAL.ORG AND SEARCH FOR YOUR LOCATION IN THE **SEARCH BOX** LOCATED IN THE TOP RIGHT

- Zoom into neighborhoods, or out to broader regions using the round + and - buttons located in the bottom right corner.

2. ADJUST THE **WATER LEVEL SLIDER** ON THE LEFT SIDE TO EXPLORE RISK FROM COASTAL FLOODING, SEA LEVEL RISE, OR BOTH

- Land shaded in blue is below the selected water level.
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CLIMATE CENTRAL

TOGETHER NORTH JERSEY.

WEB-BASED COASTAL
RESILIENCY PLANNING TOOLS

SEA LEVEL RISE VIEWER

Connecting People, Places, and Potential

SEA LEVEL RISE VIEWER

Agency: NOAA Office for Coastal Management

Location: https://coast.noaa.gov/digitalcoast/tools/slr

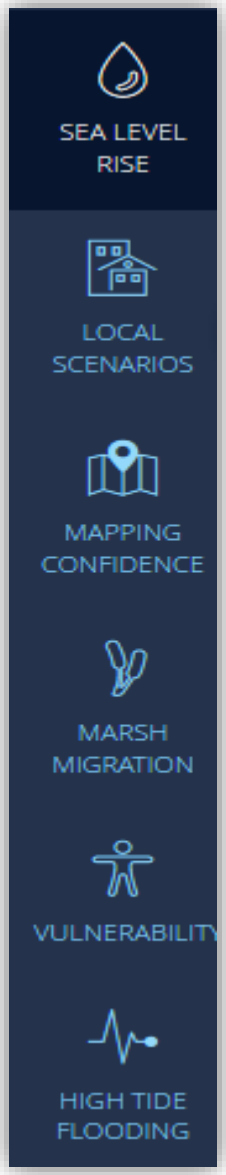
- Mapping tool to visualize community-level impacts from coastal flooding or sea level rise
- Target audience: coastal management
- Skill level needed: low to medium
- Outputs available via high tide flood tables, links to real-time tidal data and sea level rise trends and downloadable data at county level

TOGETHER NORTH JERSEY.

SEA LEVEL RISE VIEWER

Tabs:

1. Sea Level Rise
2. Local Scenarios
3. Mapping Confidence
4. Marsh Migration
5. Vulnerability
6. High Tide Flooding



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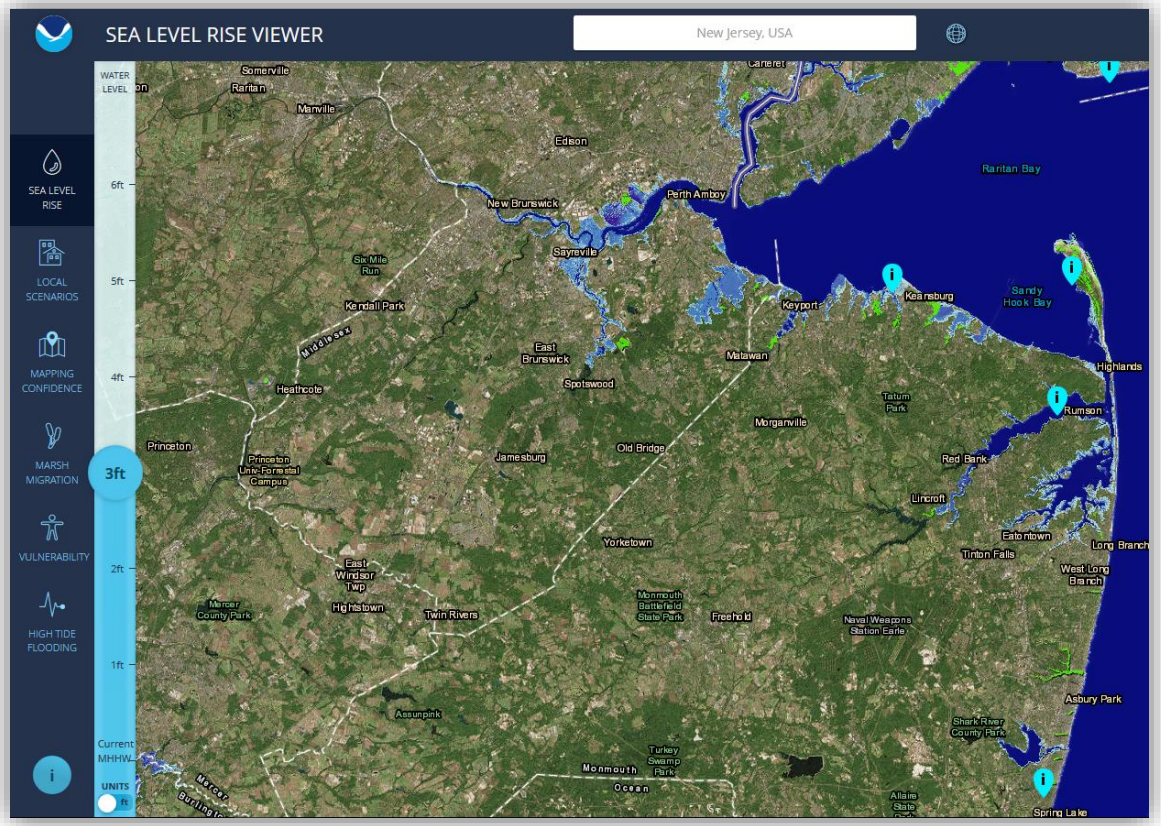
SEA LEVEL RISE VIEWER: SEA LEVEL RISE

Slider bar of depths from current day mean higher high water (MHHW) up to 6 feet



SEA LEVEL RISE VIEWER: LOCAL SCENARIOS

- Zoom to your area of interest and click on the closest Scenario Location icon in the map
- View water level by scenario or year
- Scenarios: depths of current MHHW – 6 feet
- Years: 2020-2100 (10 year intervals)

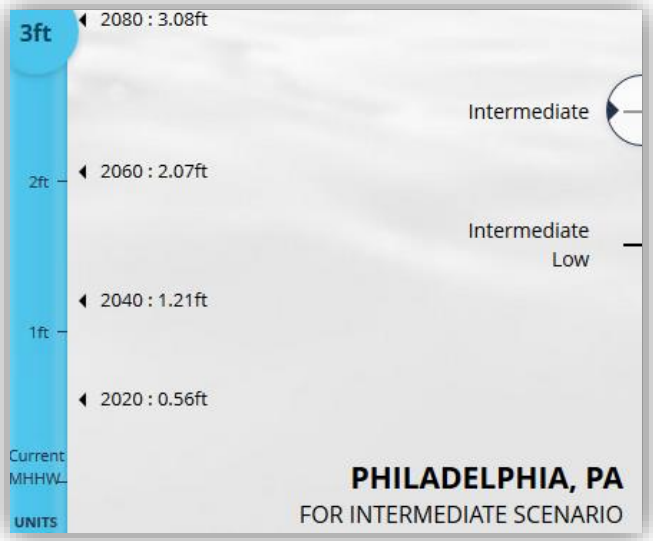
SEA LEVEL RISE VIEWER LOCAL SCENARIO: PHILADELPHIA

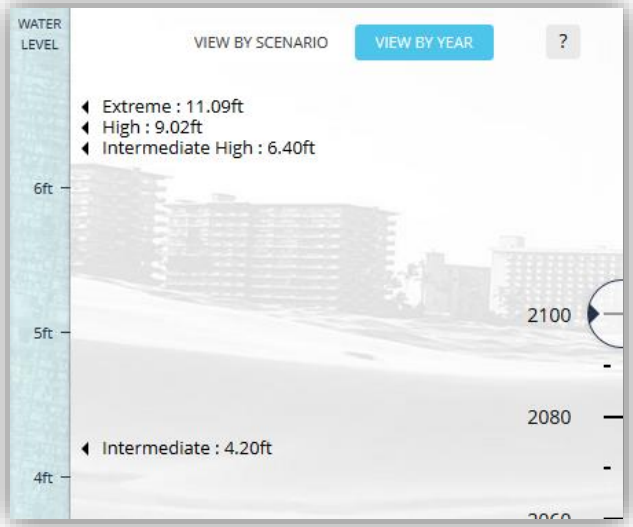
View by Scenario (Intermediate)

- 3 feet seen at 2080

View by Year: (2100)

- 4.2 feet is the intermediate scenario





TOGETHER NORTH JERSEY.

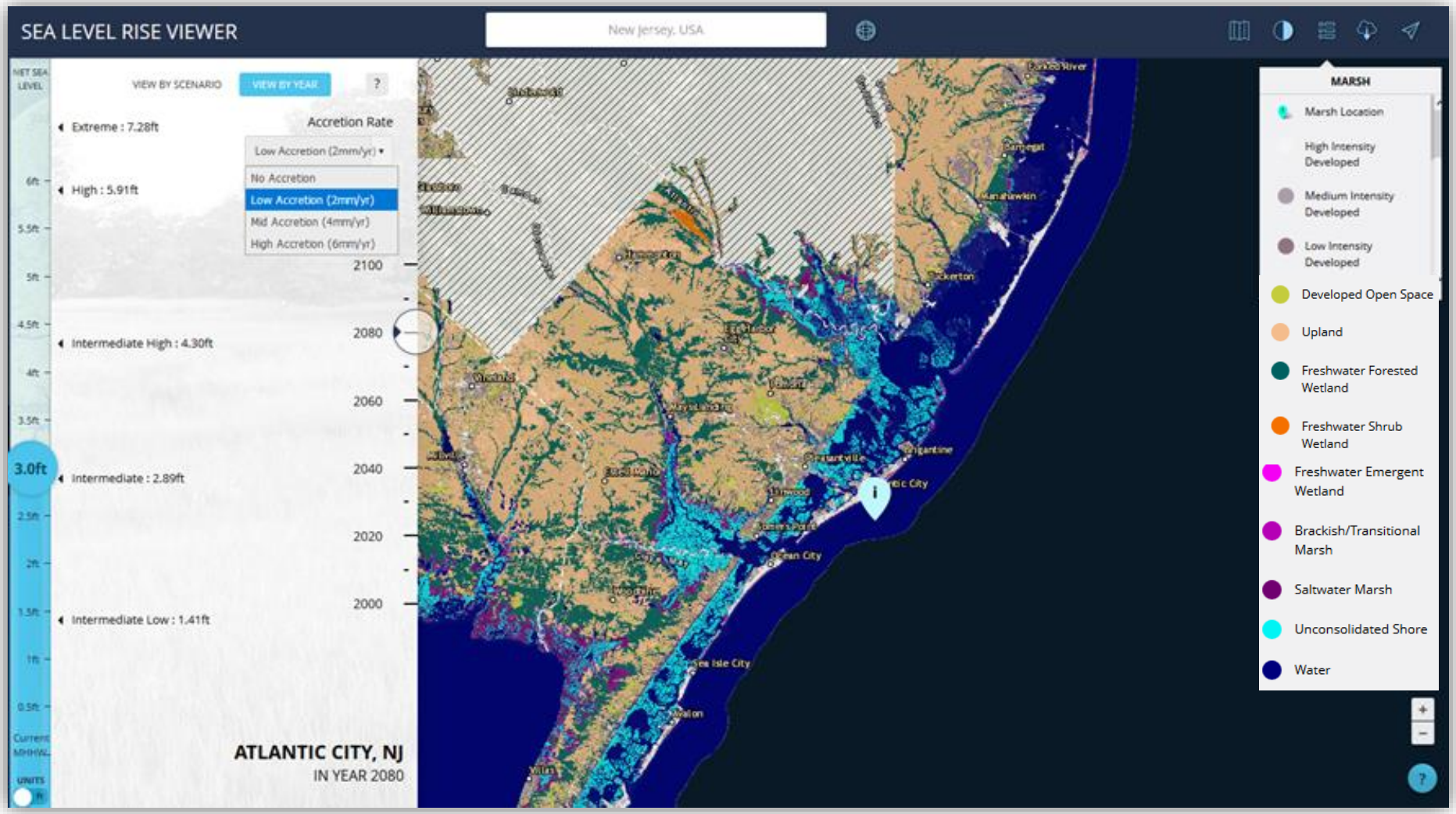
SEA LEVEL RISE VIEWER: MAPPING CONFIDENCE

- Inundation is not precise due to unknowns and data limitations
  - Blue shading denotes a high confidence of inundation
  - Orange denotes high degree of uncertainty
  - Unshaded areas denote a high confidence that these areas will be dry given the chosen water level

SEA LEVEL RISE VIEWER: MARSH MIGRATION

- Can be viewed by a water depth scenario or by year
- Zoom to your area of interest and click on the closest Scenario Location icon in the map
- Select "Accretion Rate" to reflect sediment accumulation conditions that best reflect your area
- Predictions represent the potential distribution of each wetland type based on elevation and frequency of inundation under each scenario

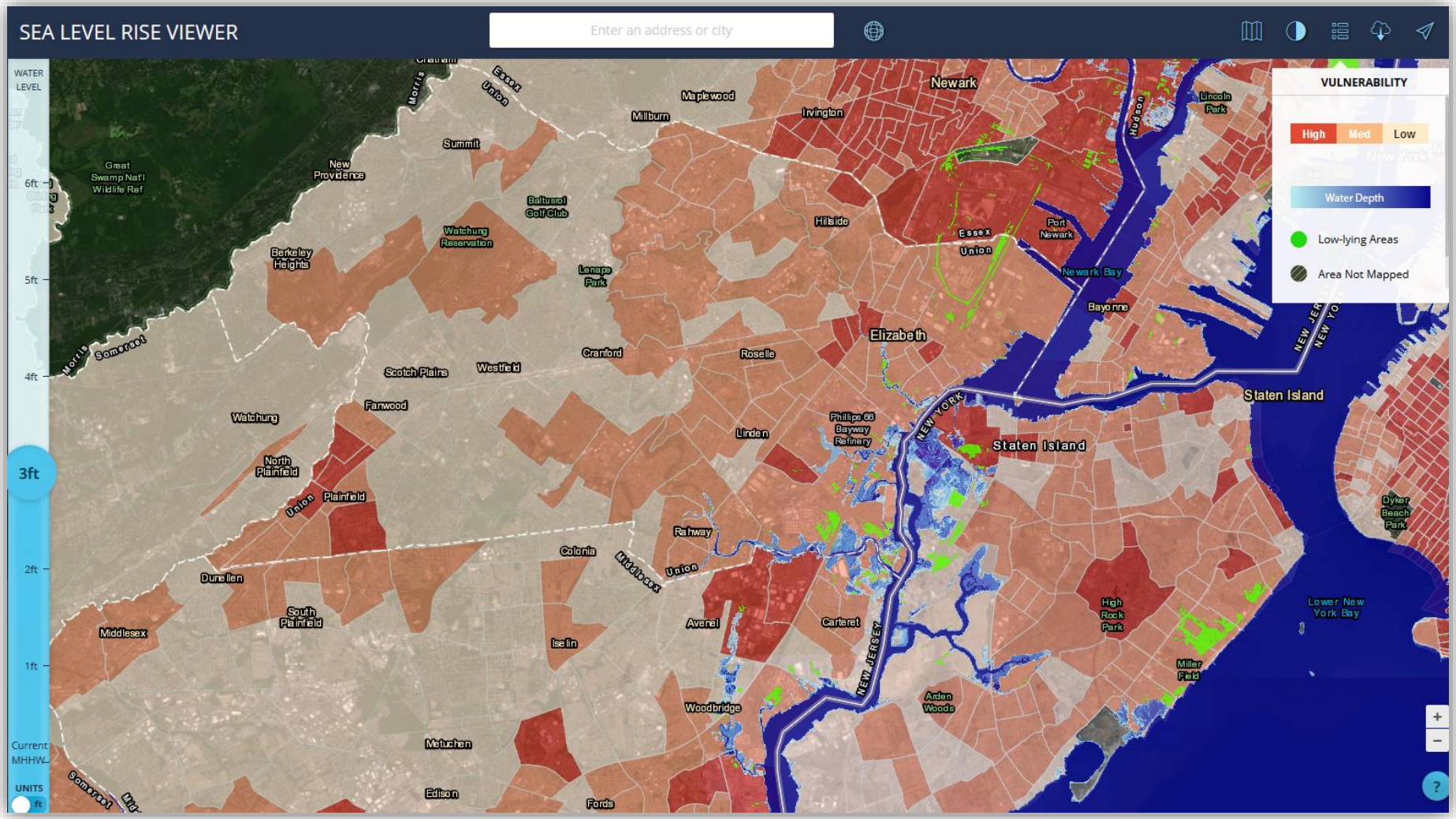
SEA LEVEL RISE VIEWER MARSH MIGRATION: ATLANTIC CITY



SEA LEVEL RISE VIEWER: VULNERABILITY

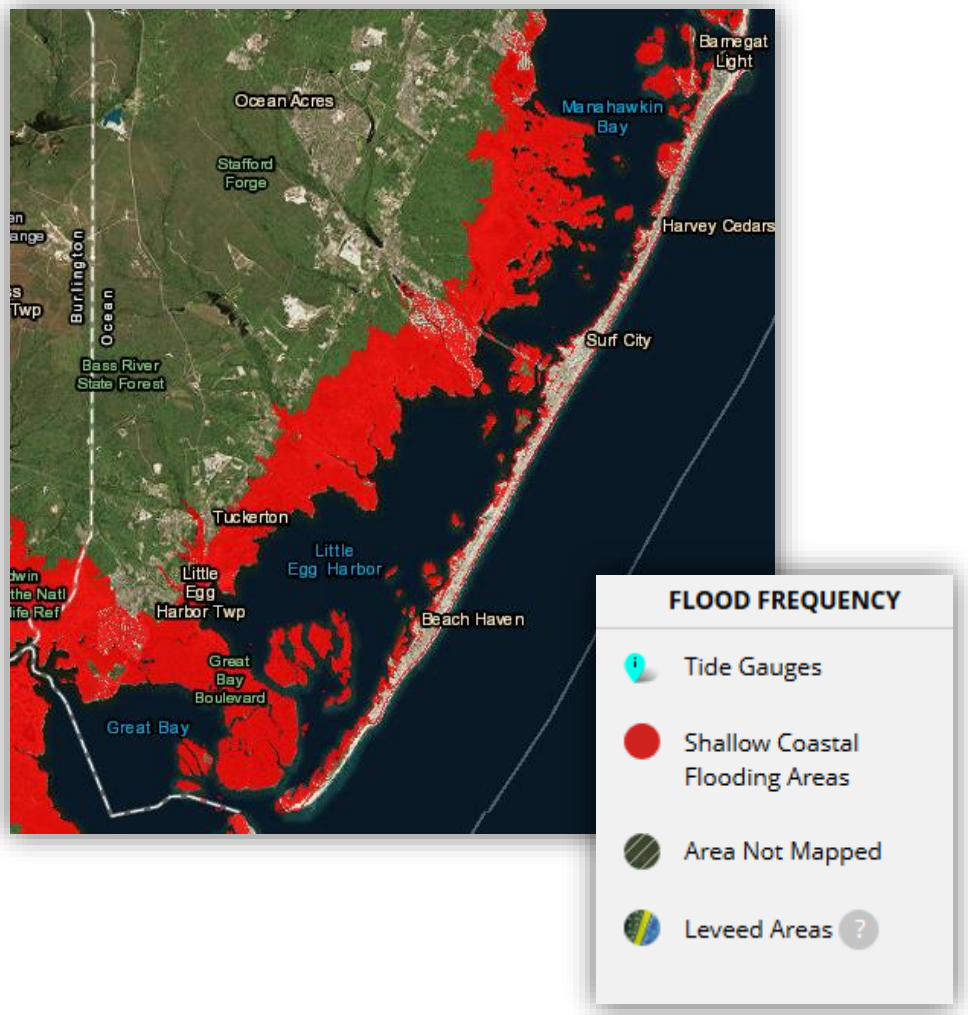
- Uses social vulnerability data developed by University of South Carolina with 2010 US Census
- Synthesizes 29 socioeconomic variables
- 8 main variable components:
  - Wealth
  - Race with socio status
  - Age
  - Ethnicity
  - Special needs population
  - Service sector employment
  - Race
  - Gender
- For detailed information on analysis, see link on resources slide

SEA LEVEL RISE VIEWER: VULNERABILITY

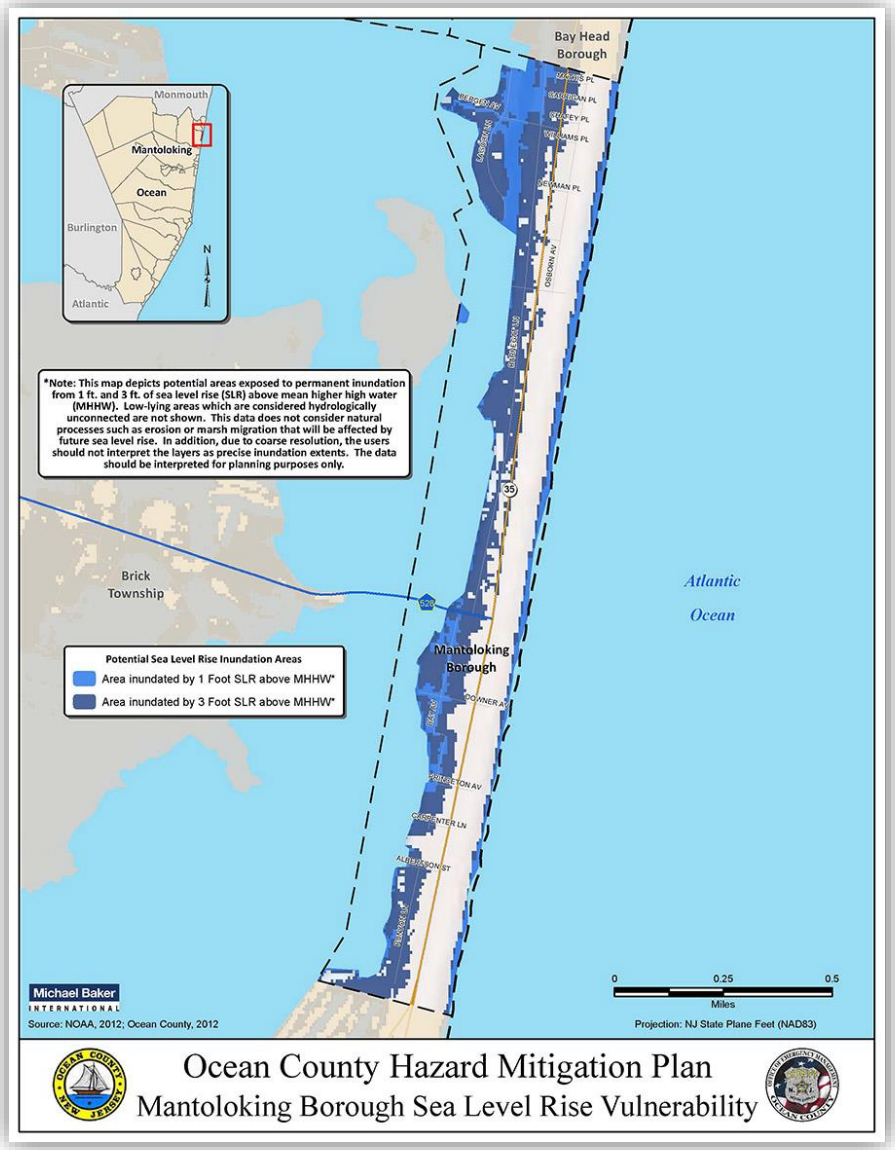


SEA LEVEL RISE VIEWER: HIGH TIDE FLOODING

- The red layer in the map represents areas currently subject to tidal flooding ("recurrent or nuisance flooding")
- The coastal flood event frequencies and durations for tide gauges were calculated using observed tidal data over a five year period (2010-2015)



SEA LEVEL RISE VIEWER: LOCAL LEVEL



SEA LEVEL RISE VIEWER: CONTACT AND TUTORIAL

- Contact:
  - Darlene Finch, darlene.finch@noaa.gov
- Tutorials:
  - Trainings: https://coast.noaa.gov/digitalcoast/training/home.html
  - Video (101): https://coast.noaa.gov/digitalcoast/tools/slr.html
  - Tutorial: https://coast.noaa.gov/digitalcoast/training/slr-tutorial.html

TOGETHER NORTH JERSEY.

WEB-BASED COASTAL
RESILIENCY PLANNING TOOLS

COASTAL RESILIENCE MAPPING PORTAL

Connecting People, Places, and Potential

COASTAL RESILIENCE

Agency: The Nature Conservancy

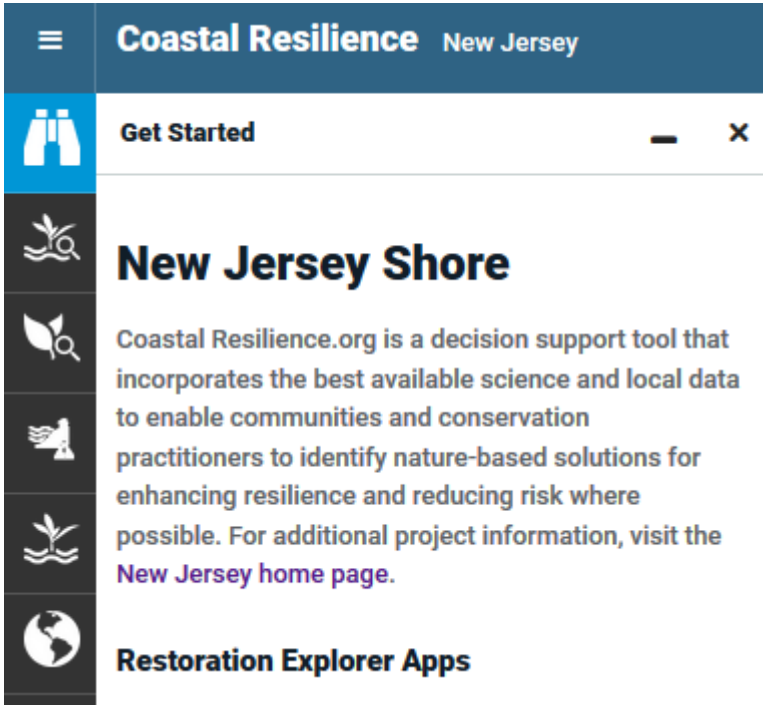
Location: http://maps.coastalresilience.org/newjersey/#

- Decision support tool that incorporates best available science and local data to identify nature-based solutions for enhancing resiliency and reducing risk where possible
- Outputs available: Printable municipal summaries for the living shoreline and future habitat apps
- Target audience: coastal management, local leaders, conservation practitioners
- Skill level needed: low to high (depending on which app being used)
- Note: layers remain on and visible while moving from app to app

COASTAL RESILIENCE

Apps:

1. Marsh Explorer
2. Living Shoreline
3. Risk Explorer
4. Future Habitat
5. Regional Planning
6. Flood and Sea Level Rise



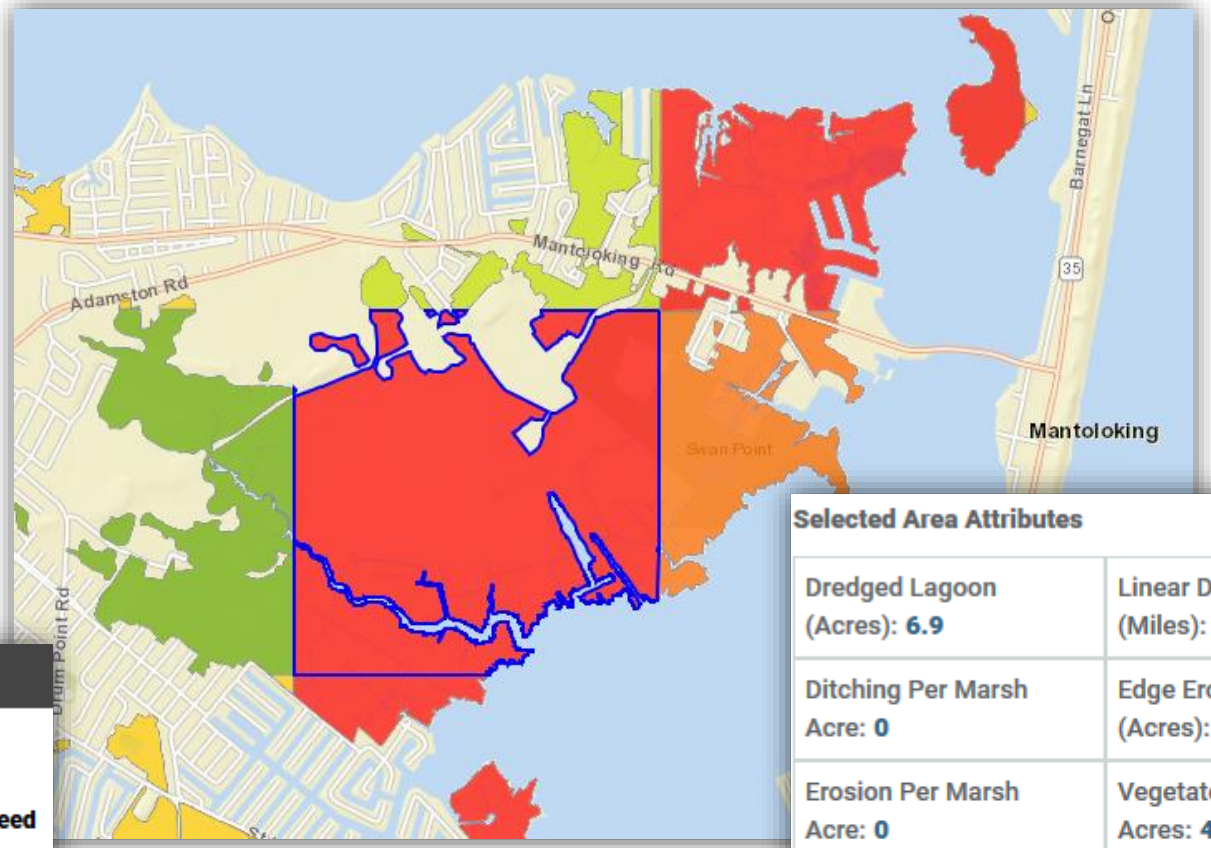
COASTAL RESILIENCE MARSH EXPLORER

- Focused on salt marshes across New Jersey's Atlantic coast
- Highlights need for tidal marsh restoration across New Jersey's ocean coast based on amount and size of linear ditches, marsh edge erosion, unvegetated marsh, and unused dredged lagoons

Image by Gregory Kats at the English Wikipedia, licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license

Marine Park Salt Marsh Nature Center in Brooklyn, NY

COASTAL RESILIENCE MARSH EXPLORER: BRICK TOWNSHIP



Map Legend

- Marsh Cell Borders

Ranking of Restoration Need

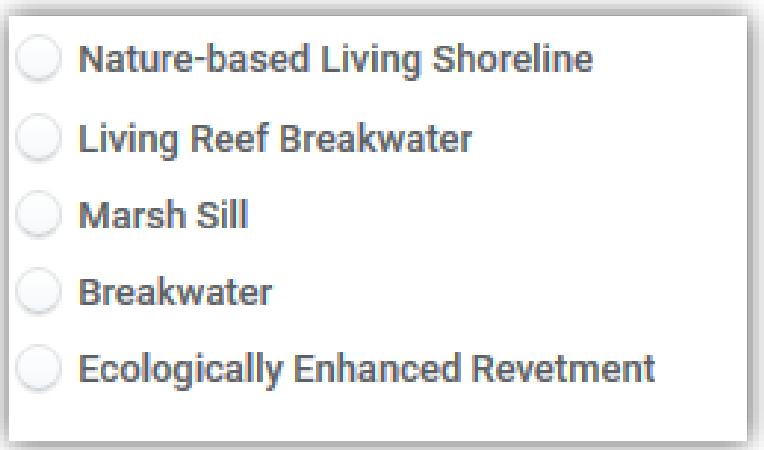
- N/A
- Lowest
- Low
- Moderate
- High
- Highest

Selected Area Attributes

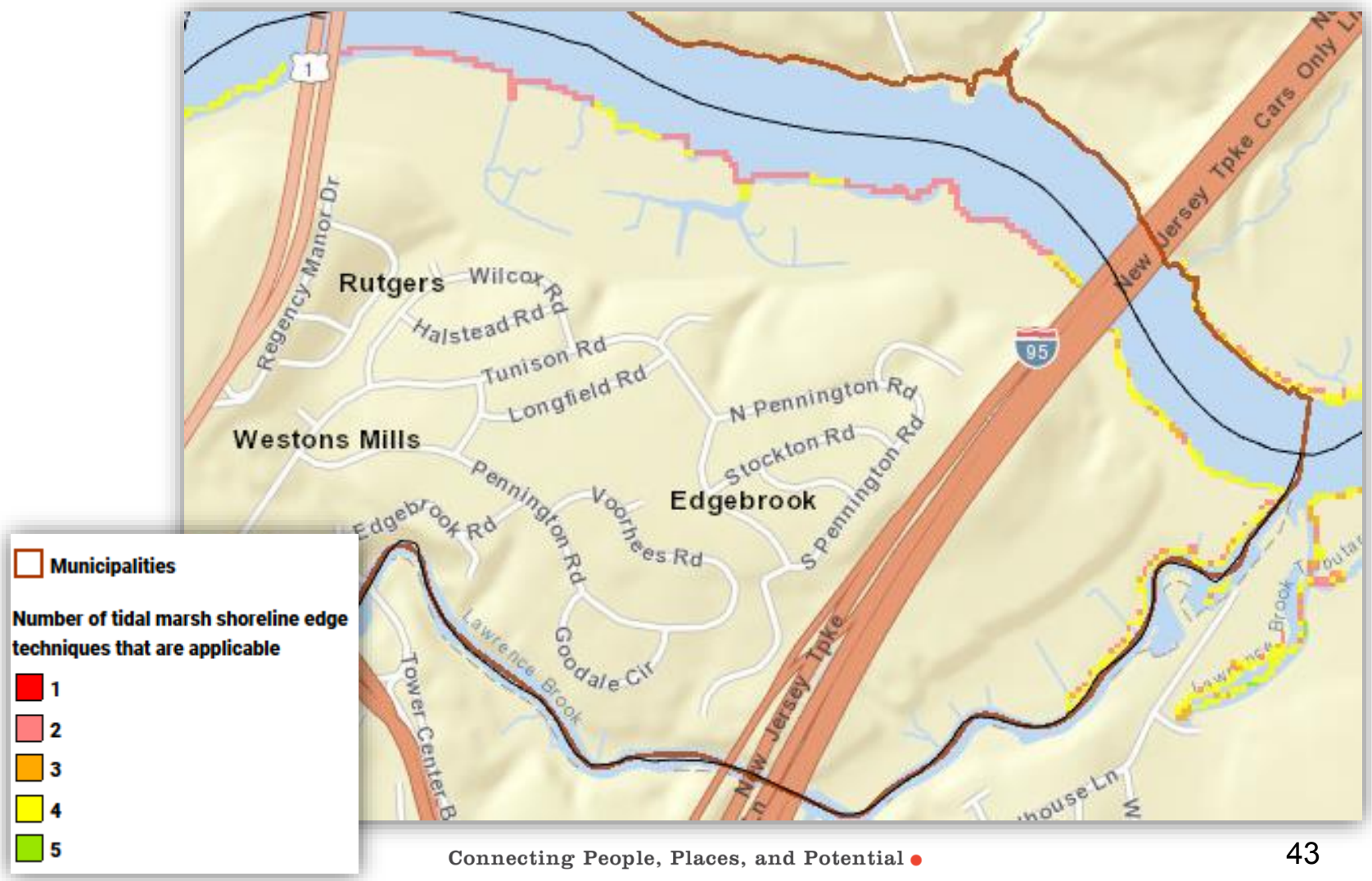
Dredged Lagoon (Acres): **6.9**	Linear Ditching (Miles): **2.5**
Ditching Per Marsh Acre: **0**	Edge Erosion (Acres): **6.2**
Erosion Per Marsh Acre: **0**	Vegetated Marsh Acres: **473.3**
Unvegetated Marsh Acres: **18.9**	% of Unvegetated Marsh Acres: **0**
Unvegetated-Vegetated Ratio: **0**	Tidal Marsh Acres: **492.2**

COASTAL RESILIENCE LIVING SHORELINE

- Analysis done at municipal level
- Shoreline types: tidal marsh, forested, beach, or bulkhead
- 5 shoreline enhancement techniques called out



COASTAL RESILIENCE LIVING SHORELINE: NEW BRUNSWICK, NJ



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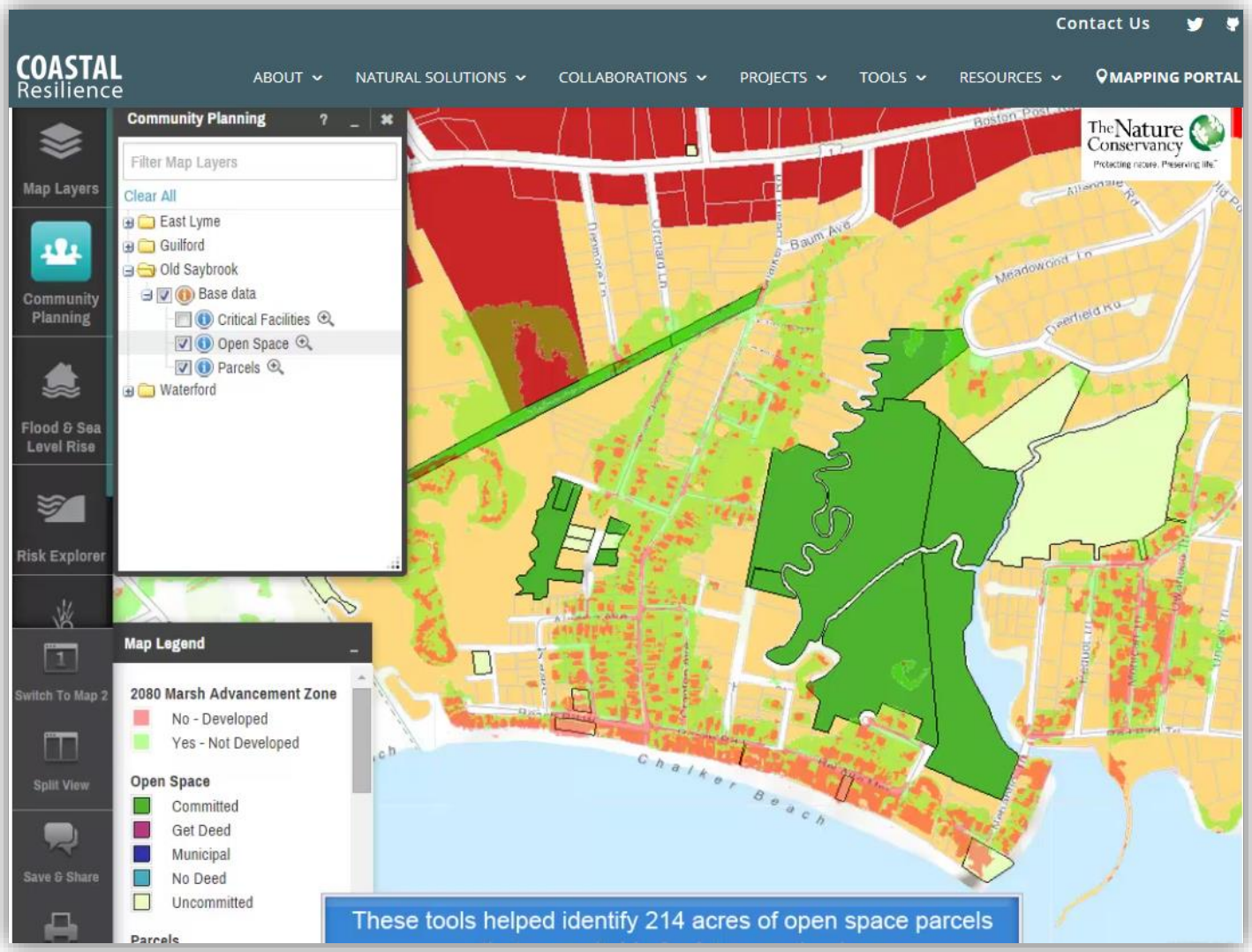
COASTAL RESILIENCE USE AT LOCAL LEVEL



COASTAL RESILIENCE: CONTACT AND TUTORIAL

- Contact:
  - Zach Ferdana, zferdana@tnc.org

- Tutorials:
  - Video and Interactive Tutorials: http://coastalresilience.org/tools/training/

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WEB-BASED COASTAL
RESILIENCY PLANNING TOOLS

NJADAPT

Coastal Hazard Profiler & NJ Flood Mapper

Connecting People, Places, and Potential

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NJADAPT

Four core functions:

1. Two web-based tools allow users to create maps:
   - Coastal Hazard Profiler (uses NOAA's coastal flood exposure platform)
   - NJ Flood Mapper
2. Understanding Climate Change Tab
3. NJ Climate Stories
4. The New Jersey Climate Adaptation Directory

NJADAPT COASTAL HAZARD PROFILER

Agency: Grant F. Walton Center for Remote Sensing and Spatial Analysis (CRSSA), Rutgers University.

Location: http://www.njfloodmapper.org/profiler/

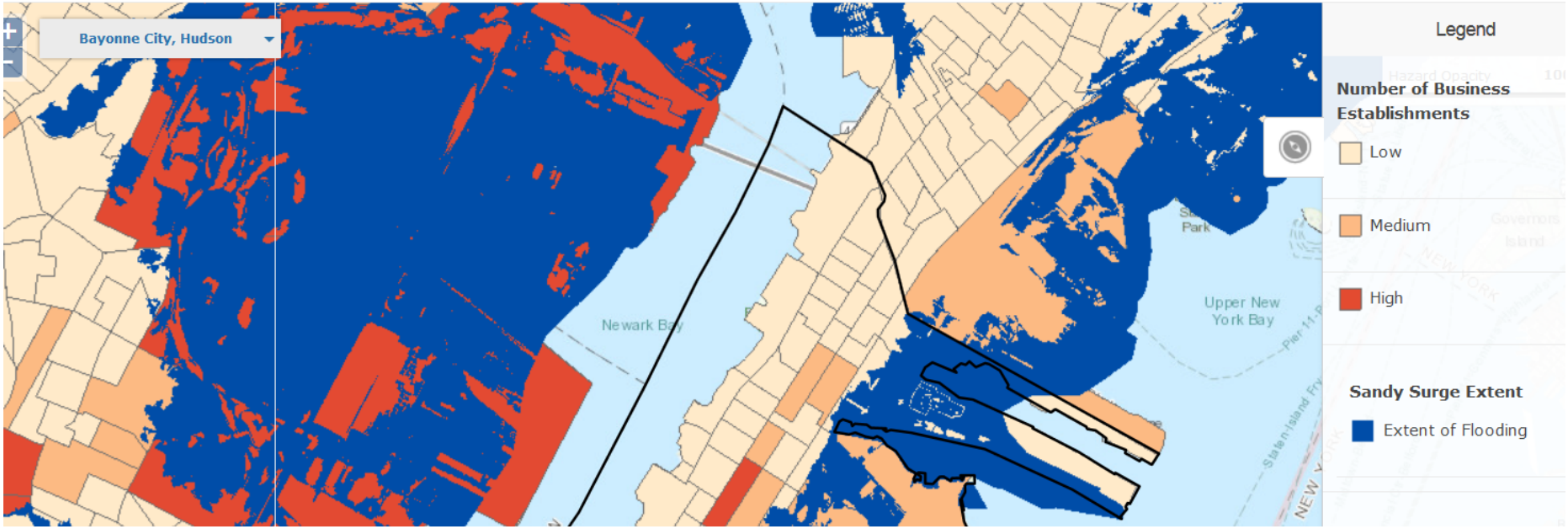
- Platform to create maps that show people, places, and assets exposed to coastal flooding
- Target audience: the general public, government officials, businesses, and non-governmental professionals
- Skill level needed: medium

NJADAPT COASTAL HAZARD PROFILER

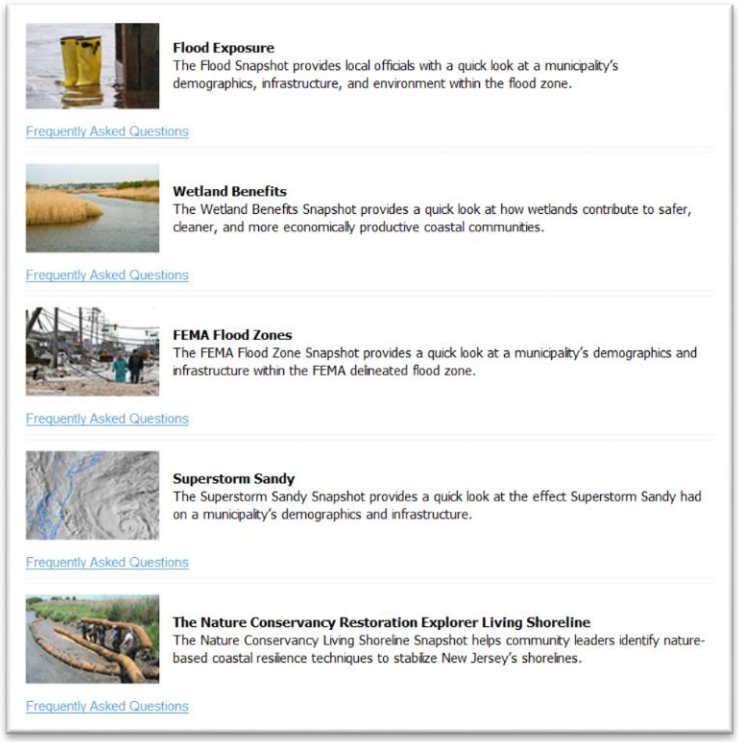
- 3 map categories:
  - Societal
  - Environmental
  - Infrastructure

- All available to be overlaid with hazard data
  - Storm surge
  - FEMA zones
  - SLR
  - Coastal Flood Exposure (CFE)
  - Coastal Vulnerability Index (CVI)
  - Shallow Coastal Flooding
  - Sandy Surge Extent

NJADAPT COASTAL HAZARD PROFILER: BAYONNE, NJ



NJADAPT COASTAL HAZARD PROFILER: BAYONNE, NJ MUNICIPAL SNAPSHOT



Flood Exposure
The Flood Snapshot provides local officials with a quick look at a municipality's demographics, infrastructure, and environment within the flood zone.

Frequently Asked Questions

Wetland Benefits
The Wetland Benefits Snapshot provides a quick look at how wetlands contribute to safer, cleaner, and more economically productive coastal communities.

Frequently Asked Questions

FEMA Flood Zones
The FEMA Flood Zone Snapshot provides a quick look at a municipality's demographics and infrastructure within the FEMA delineated flood zone.

Frequently Asked Questions

Superstorm Sandy
The Superstorm Sandy Snapshot provides a quick look at the effect Superstorm Sandy had on a municipality's demographics and infrastructure.

Frequently Asked Questions

The Nature Conservancy Restoration Explorer Living Shoreline
The Nature Conservancy Living Shoreline Snapshot helps community leaders identify nature-based coastal resilience techniques to stabilize New Jersey's shorelines.

Frequently Asked Questions

Bayonne City, Hudson County

Introduction

Floodplains are areas that are supposed to flood. The more buildings in the floodplain, the higher the potential is for flood damage. This means that floodplain management is a critical planning focus. Superstorm Sandy occurred in October, 2012 and caused record coastal flooding in New Jersey. In **Bayonne City**, the flooding caused by Sandy's storm surge covered **50 percent** of the FEMA floodplain. Community officials can use Sandy's flooding as an example of how severe storms can affect their town.

Who is most vulnerable to floods?

Sandy's didn't affect residents equally. Some people needed help evacuating. Others could not afford to repair the flood damage to their homes. Low wage workers also suffered more financially because they couldn't get to work or lost their jobs due to storm damage. Even though residents may be familiar with flood risks, they may not have been able to afford to take steps to reduce damage before the storm. Knowing who in the floodplain was most vulnerable to Sandy's floods can help community leaders prepare for flooding and allocate resources for future planning.

2,006	11%	23%	58
number of residents living in the Sandy surge area	percentage of Sandy surge area residents older than age 65	percentage of Sandy surge area residents 18 years old or younger	number of households in Sandy surge area with annual income below poverty line

* These are estimates based on US Census demographics, please see the FAQ for more information about how these numbers were calculated.

NJADAPT COASTAL HAZARD PROFILER: USE AT LOCAL LEVEL

Monetary Damages for Coastal Flooding: Toms River Case Study

Toms River was severely impacted by Hurricane Sandy. This map story examines how Sandy's storm surge affected property values, as well as how those values may be affected by future flooding due to sea level rise. **For full report click HERE.**

Newark - East Ferry

The East Ferry part of Newark is particularly vulnerable to flooding and other environmental impacts. This map story provides an overview of the impacts to the area from Hurricane Sandy as well as how future flood hazards could affect the neighborhood as a result of sea level rise.

The Borough of Tuckerton

The Borough of Tuckerton sits on the western shore of Barnegat Bay. This map story, developed through a partnership of several programs at Rutgers University, examines how flooding from Hurricane Sandy affected Tuckerton as well as how flooding could change in the future due to sea level rise.

Images: NJADAPT

NJ FLOOD MAPPER

Agency: JCNERR and CRSSA, Rutgers University.

Location: http://njfloodmapper.org/

- A user-friendly mapping visualization tool that provides information to local communities who need to make decisions concerning flooding hazards and sea level rise.
- The purpose is to promote enhanced preparedness and land use planning decisions with considerations for possible future conditions
- Target audience: coastal management, local decision makers
- Skill level needed: low

NJ FLOOD MAPPER

Data Tabs:

1. Sea Level Rise
2. Confidence
3. Flooding
4. Marsh
5. Economic Vulnerability
6. Social Vulnerability
7. Facilities
8. STAP – currently under development

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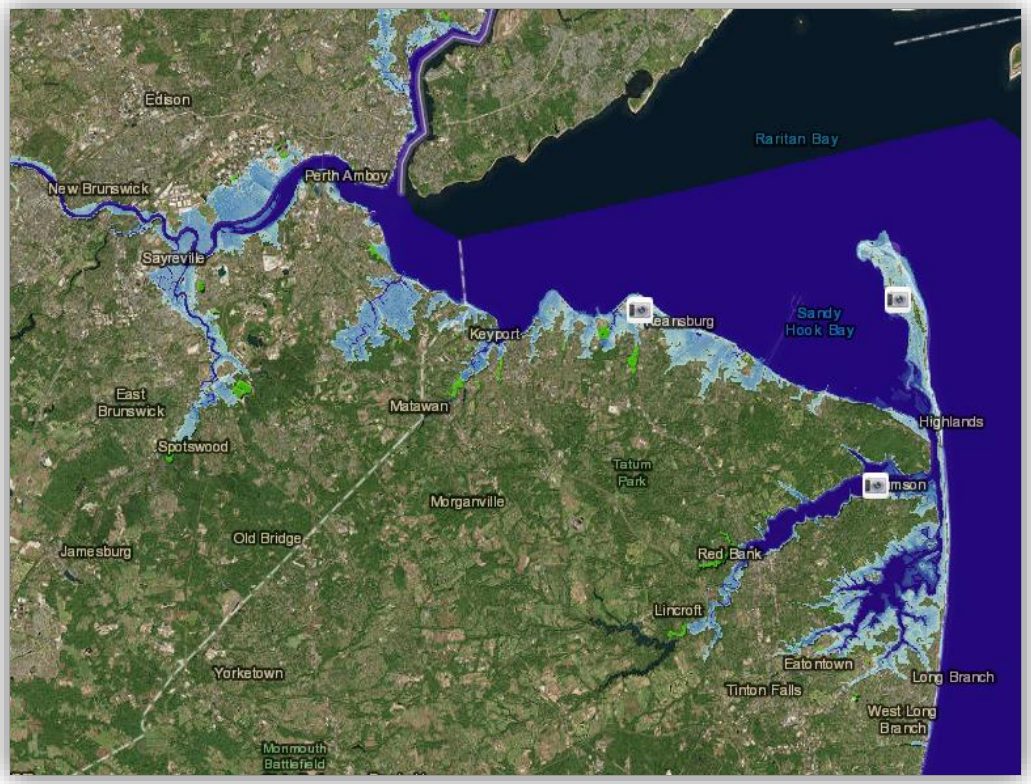
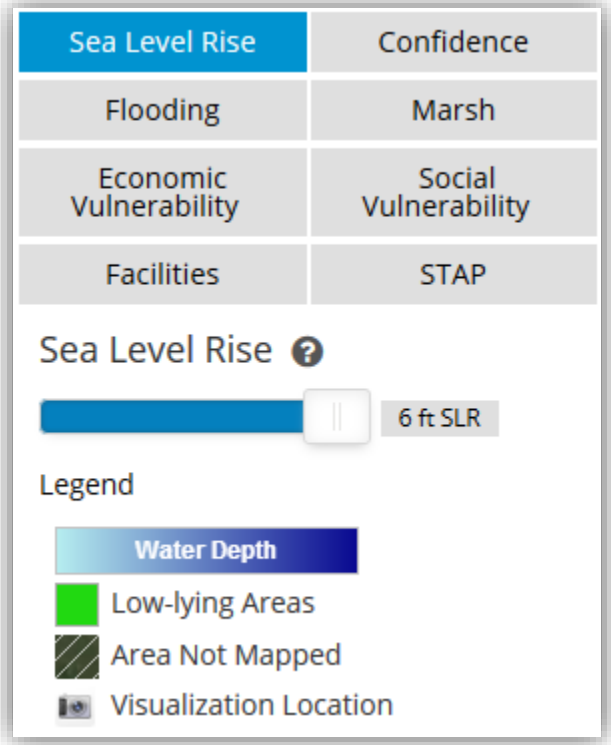
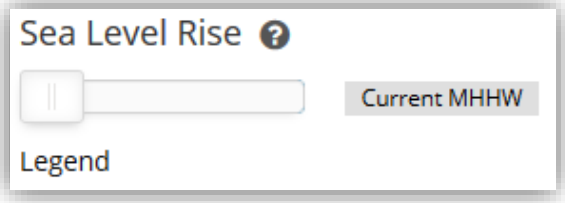
NJ FLOOD MAPPER SEA LEVEL RISE

Slider bar shows current MHHW to up to 6 feet, in 1 foot increments

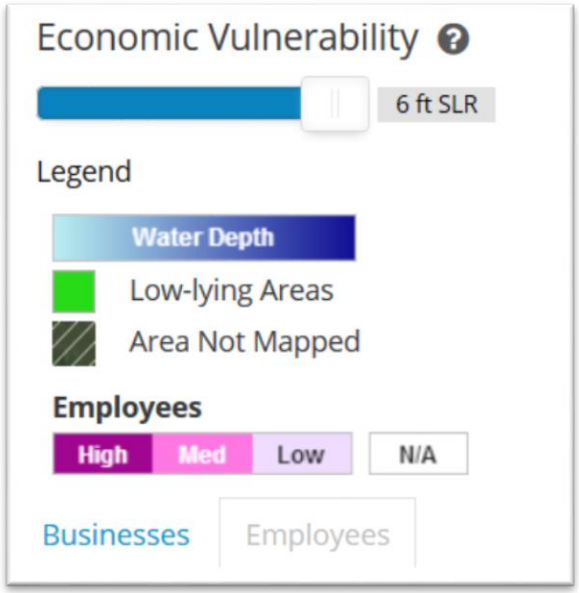




NJ FLOOD MAPPER SLR VISUALIZATIONS



NJ FLOOD MAPPER ECONOMIC VULNERABILITY



NJ FLOOD MAPPER: USE AT LOCAL LEVEL

NJADAPT: CONTACTS AND TUTORIAL

- Contact:
  - Richard Lathrop, athrop@crssa.rutgers.edu

- Tutorials:
  - NJADAPT: Video and Printed Tutorial, http://www.njfloodmapper.org/profiler/#/help
  - NJ Flood Mapper: Tool FAQ linked within the tool itself

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WEB-BASED COASTAL

RESILIENCY PLANNING TOOLS

RESOURCES

Connecting People, Places, and Potential

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RESOURCES

- US Climate Resilience Toolkit
  - Location: https://toolkit.climate.gov/
- Surging Seas
  - Location: riskfinder.climatecentral.org
  - Using Surging Seas with the Community Rating System: http://sealevel.climatecentral.org/crs
  - Tutorial: http://sealevel.climatecentral.org/ssrf/help-page
  - Local use, Fort Lauderdale, FL City Resiliency Program: https://gyr.fortlauderdale.gov/greener-government/climate-resiliency/climate-and-weather-in-fort-lauderdale/the-story-of-sea-level-rise-in-fort-lauderdale/how-much-and-how-fast-will
- Sea Level Rise Viewer
  - Location: https://coast.noaa.gov/digitalcoast/tools/slr
  - Trainings: https://coast.noaa.gov/digitalcoast/training/home.html
  - Video (101): https://coast.noaa.gov/digitalcoast/tools/slr.html
  - Tutorial: https://coast.noaa.gov/digitalcoast/training/slr-tutorial.html
  - University of South Carolina social vulnerability data: http://artsandsciences.sc.edu/geog/hvri/sovi%C2%AE-0

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RESOURCES

- Coastal Resilience Mapping Portal
  - Location: http://maps.coastalresilience.org/newjersey/#
  - Video and interactive tutorials: http://coastalresilience.org/tools/training/
- NJADAPT Coastal Hazard Profiler
  - Location: http://www.njfloodmapper.org/profiler/
  - Video and print tutorial: http://www.njfloodmapper.org/profiler/#/help
- NJ Flood Mapper
  - Location: http://njfloodmapper.org/
  - Local use, Manasquan, NJ "Know Your Flood Risks" website: http://www.manasquan-nj.gov/office-emergency-management/pages/know-your-flood-hazard
- NOAA Coastal Flood Exposure Mapper
  - Location: https://coast.noaa.gov/floodexposure/#/splash

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10 MINUTE Q&A

Questions taken from chat log at bottom right section of the screen

If we run out of time, please email either:

- Stacy Krause, perrines@ejb.rutgers.edu
- Eliot Benman, ebenman@ejb.rutgers.edu

Thank you!

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WEBINAR Q&A, Question #1

Q: What data does the Surging Seas tool pull from?

A: Water level data is from NOAA and population data is from the US Census. Depending on which tool is being used and which map is being viewed, there are generally sources listed on the screen.

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WEBINAR Q&A, Question #2

Q: As more weather and rising sea info is developed, how often will any of these tools be updated?

A: Since the tools pull from NOAA data, they are generally updated as new projections become available. The NJADAPT tool created and maintained by Rutgers University is updated as funding for specific data and platform needs becomes available.

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WEBINAR Q&A, Question #3

Q: How can I find which blocks within a municipality have a 2 percent (for example) chance of flooding?

A: The tools will not clearly illustrate this detailed information. A locally created floodplain map may be a better resource.

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WEBINAR Q&A, Question #4

Q: Generally would you agree that the non-NJ data tools are good for "local" use?

A: While the tools generally offer the same flood data, using a tool that limits the geographic scope to NJ may be a bit easier to use solely due to the fact that you cannot zoom out beyond state borders, the case studies presented will be more applicable, and it may be easier to speak with a contact should you have a question or need assistance.

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WEBINAR Q&A, Question #5

Q: Example of local NJ use?

A: The flood mapping in the Ocean County, NJ Hazard Mitigation Plan uses flood data from the NOAA platform. Also, the work done by the Jacques Cousteau National Estuarine Research Reserve (or JCNERR) in Tuckerton, NJ and JCNEERS's municipal outreach efforts utilize the NJ Flood Mapper. As climate change data is incorporated more and more into local planning efforts and documents, there may be updated master plans and other planning documents utilizing these web-based tools.

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