Municipal Work Session on Adaptation Planning for Coastal Hazards-Narragansett, RI

Town Beach Pavilion October 1, 2015 9:00am-12:00pm

Agenda

Meeting Purpose: Increase awareness of:

- RI Mapping tools & planning resources available, where to find them(particularly STORMTOOLS);
- New state planning requirements for climate change and natural hazards, as well as the linkages between comprehensive plans and local hazard mitigation plans; and
- Example municipal adaptation strategies and where to get more information.
- 9:00 **Welcome & Overview of Issues and Ongoing Initiatives-**Teresa Crean, URI Graduate School of Oceanography Coastal Resources Center & RI Sea Grant (CRC/RISG)
 - Rhode Island Shoreline Change Special Area Management Plan- Grover Fugate, *RI Coastal Resources*Management Council
 - o Natural Hazards & Climate Change in Local Comprehensive Plans- Caitlin Greeley, RI Statewide Planning
 - o Hazard Mitigation Planning-Jess Stimson, RI Emergency Management Agency

9:50 **Discussion** –

- O Where are you at currently with your Comp Plan and Haz Mit Plan?
- o Have you started to plan for or adapt to sea level rise, storms, or erosion?
- o Issues you are struggling with related to coastal hazards & adaptation?
- 10:00 Overview of STORMTOOLS: A new RI tool developed to understand exposure to sea level rise & storm flooding Michelle Carnevale, CRC/RISG
- 10:20 **Break**
- 10:30 Review of Adaptation Strategies Teresa Crean, CRC/RISG
- 11:00 Keypad Polling & Discussion- Michelle Carnevale, CRC/RISG
- 11:30 Roadway & Infrastructure Discussion Teresa Crean, CRC/RISG
- 11:50 Wrap Up & Next Steps- Pam Rubinoff, CRC/RISG
 - o What are your challenges/barriers?
 - o What do you need help with?
 - O What are some actions that you can start working on in the short term? No regret actions?

12:00 Adjourn

This effort has been made possible through funding from the U.S. Department of Housing and Urban Development & the Rhode Island Community Development Block Grant – Hurricane Sandy Disaster Recovery

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RI CRMC Shoreline Change Special Area Management Plan

PROJECT GOAL:

 Through a public process help develop innovative and practical policies and tools for managing development along shorelines vulnerable to erosion and flooding









RI CRMC Shoreline Change Special Area Management Plan

Long-term Outcomes

- Strong erosion and inundation polices that are publically supported and implemented at state and local levels
- Best available information is supporting sound decision making
- Improved understanding of potential impacts of erosion, flooding and sea level rise will spill over to other planning initiatives (state and local).



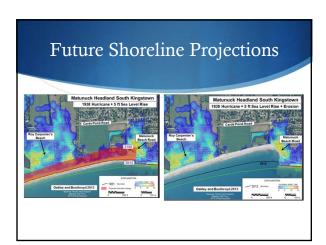






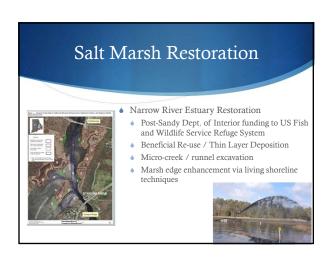
Shoreline Change Mapping

- New Shoreline Change Map Online Interface
- Chinge Map Block Island Shoreline Change Map Updating Washington County Maps currently
- Monitoring along South Shore including Misquamicut Beach Nourishment, & on Block Island
- UPCOMING-FUTURE SHORELINE PROJECTIONS









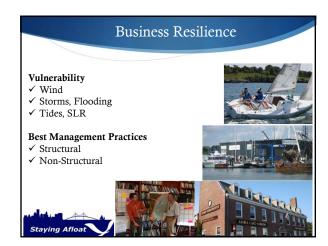
Coastal Property Guide Rhode Island COASTAL PROPERTY GUIDE

http://www.beachsamp.org/ coastalpropertyguide/

- Informs Landowners and Buyers
 - Coastal features
 - CRMC water type classifications
 - FEMA flood zones
 - Flood insurance, program/premiums
 - Coastal hazards: sea-level rise and
 - Shoreline protection structures
 - Coastal hazards: storms & floods
 - Existing buildings
 - Septic system requirements
 - Structural resilience

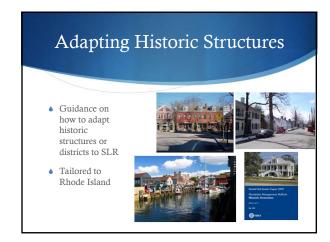
Municipal Pilot Demonstrates: Local Process and Actions Town of North Kingstown Vulnerability Assessment Sea Level Rise Salt Marsh Migration Adaptation to Natural Hazards & Climate Change Infrastructure/ Roadways at risk Local Policy Recommendations Model for all other RI Coastal Communities



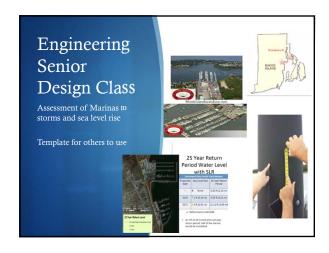












Executive Climate Change Coordinating Council

- ♦ Local Guidance
- Promoting Decision Making Tools & Best Practices
- · Recommendations at State and Local Level on adaptation/decision making



Current Beach SAMP Tools & Resources

- Memo to municipalities
 - Planners
 - Council Presidents
 - Emergency Managers
 - Boards/Commissions
- Series of memos to share Beach SAMP tools/resources, findings and recommendations

TOOLS & RESOURCES

RESILIENT COMMUNITIES: Natural Hazards and Climate Change Adaptation: A how-to guide on incorporating natural hazards planning and

Legal Workshop

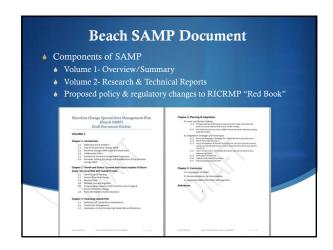
- DECEMBER 1, 2015 day long workshop focused on RI
- Co-hosted with Roger Williams Law School & RI Sea Grant Legal Program
- Focused on legal issues & challenges related to shoreline change, sea
 - Liability associated with allowing development in at risk areas
 Developing sea level rise overlay zones/ordinances
- Audience- municipal staff; solicitors; emergency managers, etc.







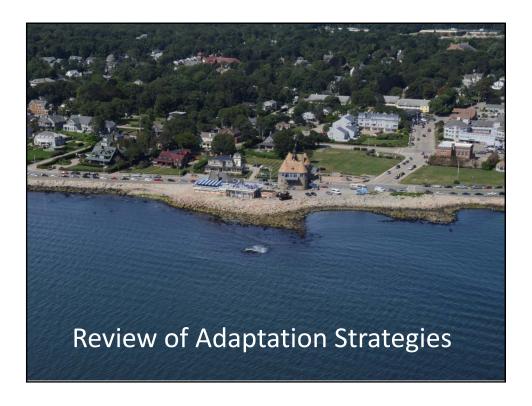








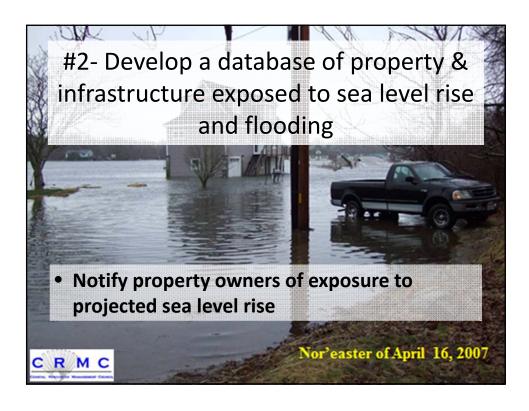


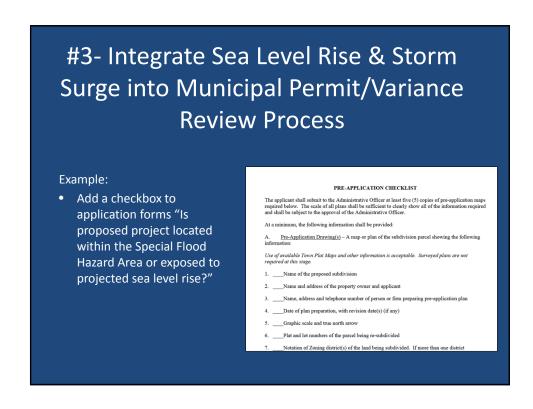


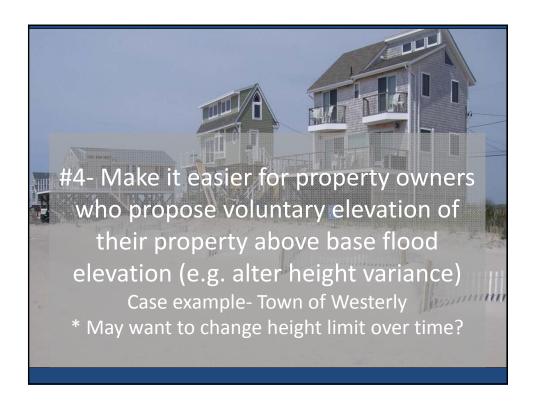
#1- Identify Areas At Risk

- Use STORMTOOLS to map:
 - 1 foot, 3 feet and 5 feet of sea level rise
 - Flood extent a 4% annual flood event (25 year return period) and a 1% annual flood event (100 year return period)
 - Examine the combined impacts of storm surge and sea level rise to better understand the impacts of future storm related flooding using the flowing scenarios:
 - 4% annual flood event (25 year return period) plus 1 foot of sea level rise; and
 - 1% annual flood event (100 year return period) plus 5 feet of sea level rise.
- Use CRMC Shoreline Change Maps to Examine Erosion Risk over Design Life of Infrastructure



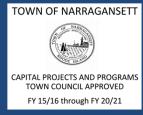


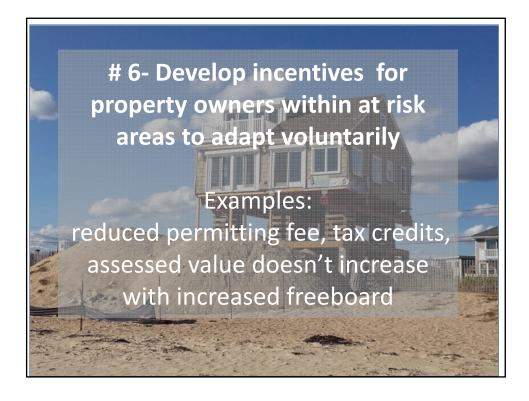




in the Capital
Improvement
Program (CIP) and
Transportation
Improvement Program
(TIP) be evaluated for
exposure to storm
surge, projected sea
level rise, and
erosion



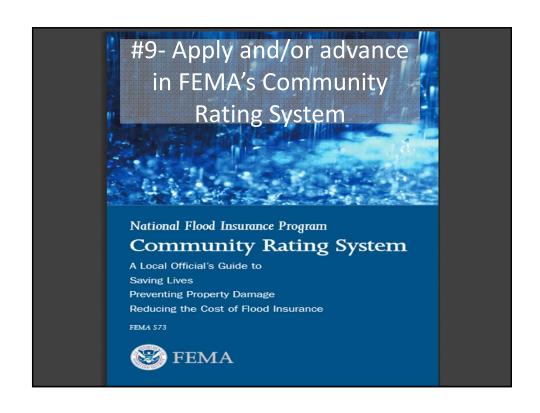






#8- Planning for Storm and Sea Leve Rise Impacts to Transportation Infrastructure

- Identify and prioritize state roads impacted & recommend upgrade in Transportation Improvement Program (TIP).
- For municipal roads & infrastructure :
 - Determine what would be required to redesign and maintain this infrastructure over the long-term
 - Look for alternate routes
 - Conduct a cost-benefit or tradeoff analysis to determine the longterm costs of maintaining or reconstructing road, against the tax revenues generated
 - Explore the feasibility of enacting a special tax district (similar to a fire district or sewer district) or impact fee assessed to the users of the roadway.
 - Minimize new or expansions to shore parallel infrastructure. Maintain roads that are perpendicular to the coast, and design the area of the road within flood zones to withstand periodic flooding





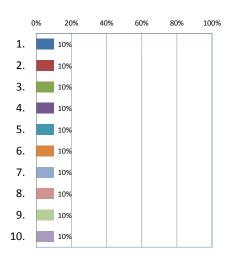


Keypad Polling Exercise

What is your role? 80% 100% 1. Planner 1. 14% 2. Department of 2. Public Works 3. Elected Official 3. 4. Appointed Official 4. 5. Application Board Member 6. 6. Concerned Citizen 7. Other 7.

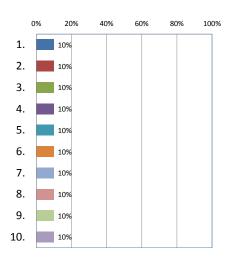
What are the top 3 most important strategies for your town to implement?

- 1. Identify Areas at Risk
- 2. Develop a database of at risk property/infrastructure
- 3. Integrate into municipal permitting
- Zoning changes for height variances
- Require CIP & TIP evaluate for SLR impacts
- 6. Develop incentives for voluntary adaptation
- 7. Emergency Permitting Process
- 8. Planning process for impacts to transportation infrastructure
- Apply & advance in CRS
- 10. Increase open space/reduce density in at risk areas



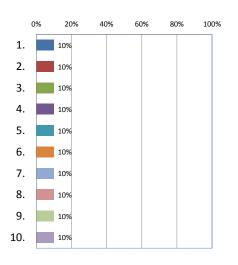
What are the top 3 strategies most likely to be implemented in your town?

- 1. Identify Areas at Risk
- 2. Develop a database of at risk property/infrastructure
- 3. Integrate into municipal permitting
- 4. Zoning changes for height variances
- Require CIP & TIP evaluate for SLR impacts
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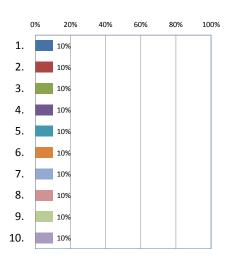
What are the top 3 strategies that would be most cost-effective for your town?

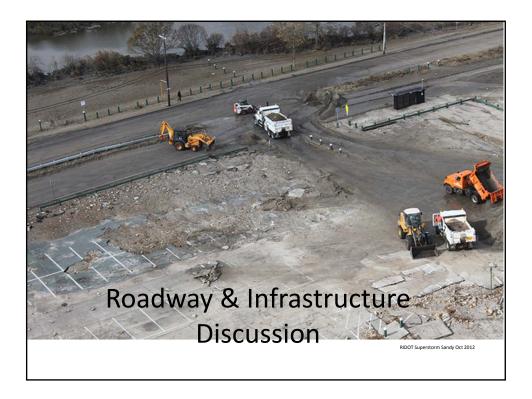
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What are the top 3 strategies that you would like more information about?

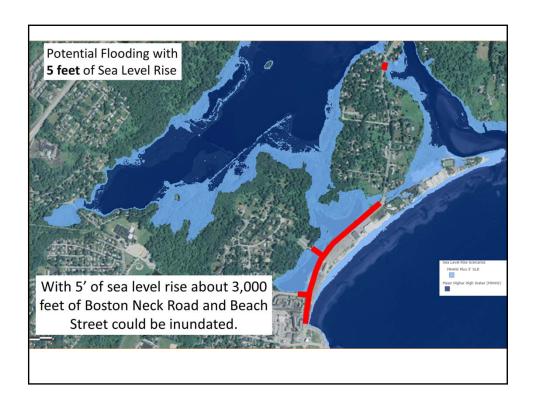
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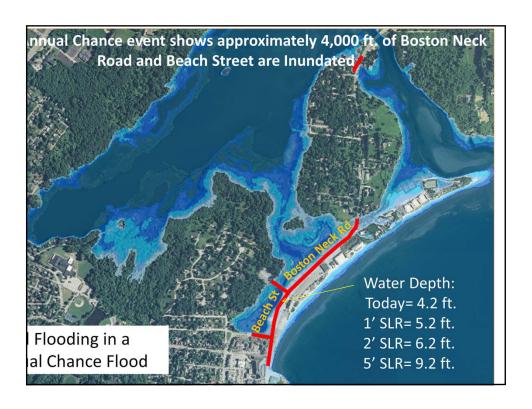


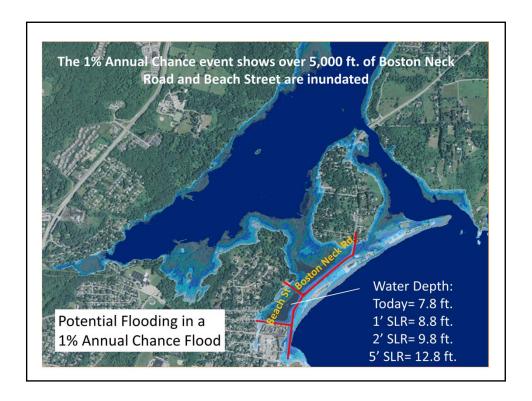


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Return Period	Example RI Storm of this Size	Chance in any given year	Percent Chance of Occurring During a 30- year Mortgage	Percent Change of Occurring During a 100 Year Design Life (e.g. Municipal Infrastructure)
25 years	Superstorm Sandy Along the Southern RI Coast	4 in 100 (4%)	71%	98%
100 years	1938 Hurricane (Category 3)	1 in 100 (1%)	26%	63%





Town of Narragansett - October 1, 2015









TO: Municipal Planners; Planning Boards; Municipal Administrators; Public Works Officials; Emergency Managers; and Floodplain Coordinators

FROM: CRMC Rhode Island Shoreline Change Special Area Management Plan (Beach SAMP) Team

DATE: June 3, 2015

RE: Tools and Resources to Assist in Natural Hazard and Climate Change Planning

INTRODUCTION

The purpose of this memo to coastal municipalities is to share resources and tools that may assist coastal cities and towns in planning for the impacts of natural hazards and climate change. Some of these tools are new or recently adopted by the Rhode Island Coastal Resources Management Council (CRMC), and others are existing planning maps that have been made easier to locate and use.

These tools and resources will aid in planning for natural hazards and climate change in municipal comprehensive plans as required by the *Rhode Island Comprehensive Planning and Land Use Act* (RIGL 45-22.2). In particular, these resources will help to assess the impacts of:

- Storm surge and sea level rise;
- Salt marsh migration in response to sea level rise; and
- · Shoreline change and erosion.

TOOLS & RESOURCES

RESILIENT COMMUNITIES: Natural Hazards and Climate Change

Adaptation: A how-to guide on incorporating natural hazards planning and climate change adaptation into local comprehensive plans.

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By 2016, Rhode Island cities and towns will need to plan for natural hazards and the impacts of climate change within their community's local comprehensive plan. This how-to guide and presentation was created as a resource for coastal municipalities on how to conduct a preliminary vulnerability assessment and adopt climate change adaptation strategies into the local comprehensive plan. While every community is different and will follow a unique planning process, this

Current Beach SAMP Tools & Resources

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 - Planners
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StormTools:

Maps of Storms+Sea Level Rise

Visualizations

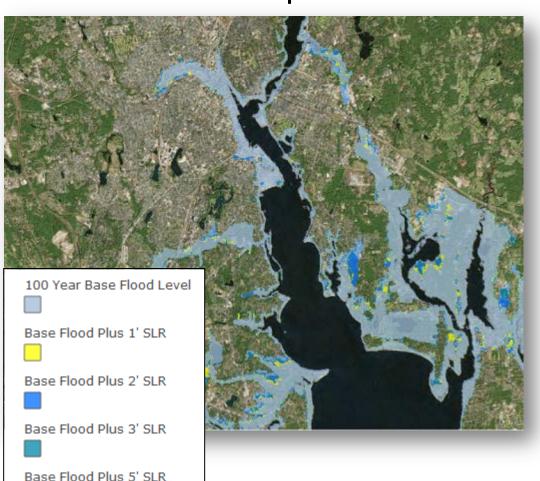
Maps flooding from a 25, 50, 100-year storm PLUS Sea Level Rise

**More accurate depiction of future flooding risk

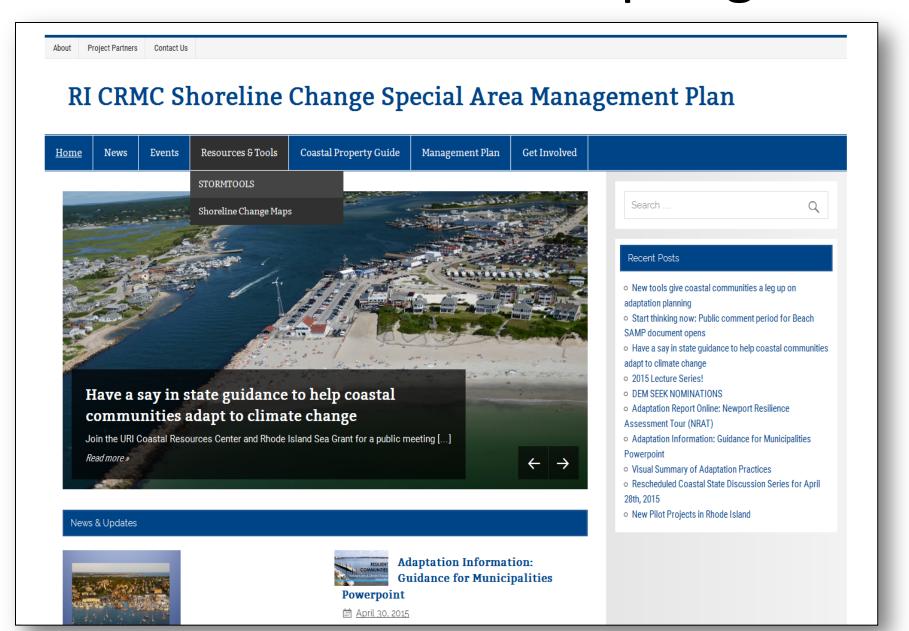
Applications

Day-to-Day operations

Long term planning/financing



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STORMTOOLS for Beginners

STORMTOOLS for Beginners is a one-map stop for all residents of Rhode Island to better understand their risk from coastal inundation. This map allows you to enter an address in Rhode Island, and get answers to 3 questions about your property:

- 1. Is my property vulnerable to STORM SURGE?;
- 2. How DEEP will the water be on my property during a 100-year (1% chance) coastal storm?; and
- 3. Will projected SEA LEVEL RISE affect my property?

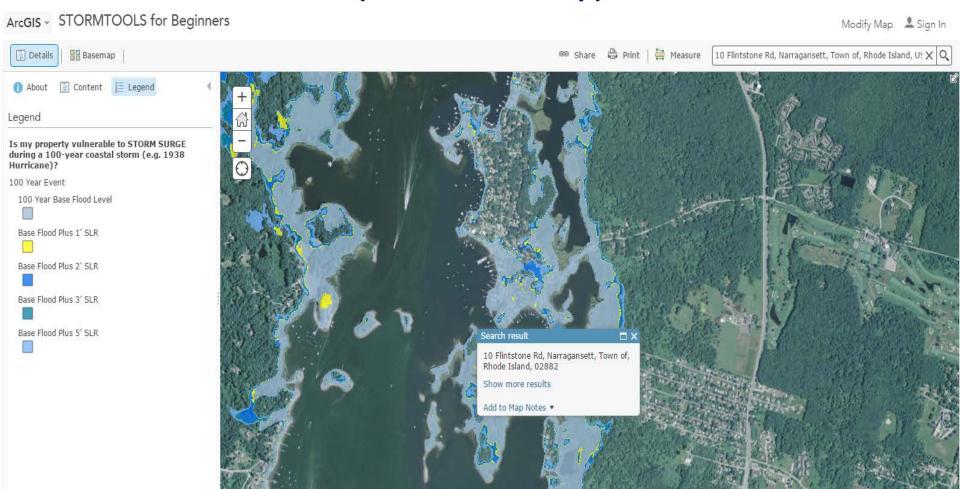
"STORMTOOLS FOR BEGINNERS"

Step 1: Enter an address

Step 2: Click on the question you want to answer

"Is my property vulnerable to STORM SURGE during a 100-year coastal storm (e.g. 1938 Hurricane)?"

(flood extent map)

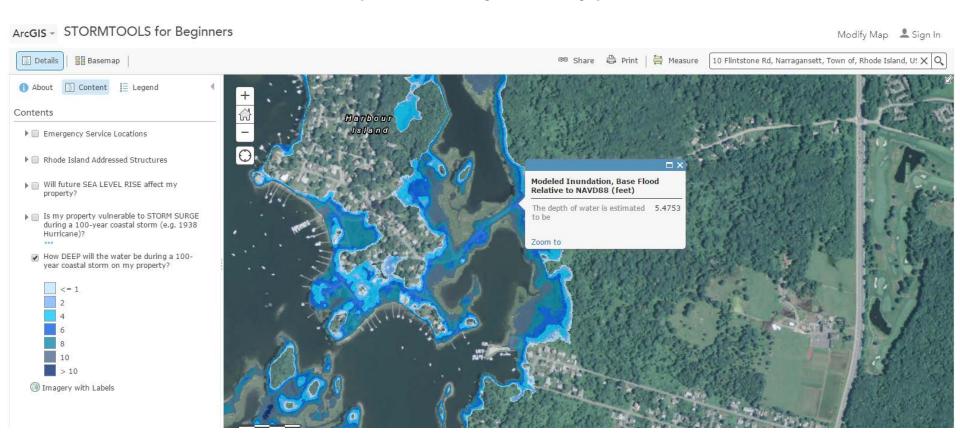


"STORMTOOLS FOR BEGINNERS"

Step 1: Enter an address

Step 2: Click on the question you want to answer

"How DEEP will the water be during a 100-year coastal storm on my property?" (water depth map)



"STORMTOOLS FOR BEGINNERS"

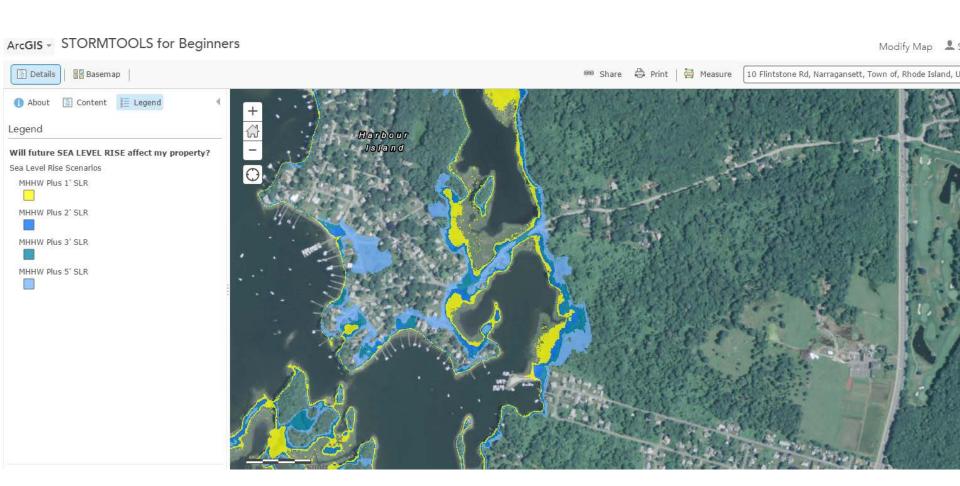
Step 1: Enter an address

Step 2: Click on the question you want to answer

"Will future SEA LEVEL RISE affect my property

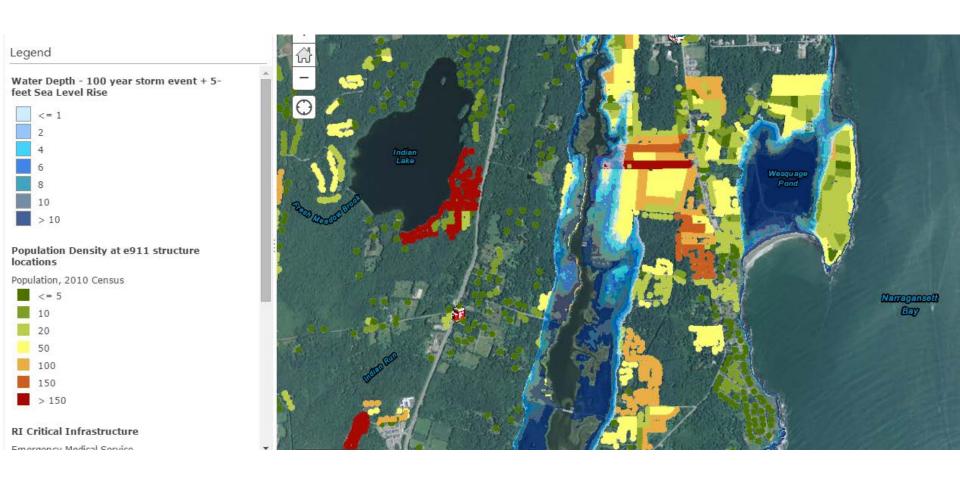
(with 2 tides per day, every day)?"

(sea level rise scenario map)



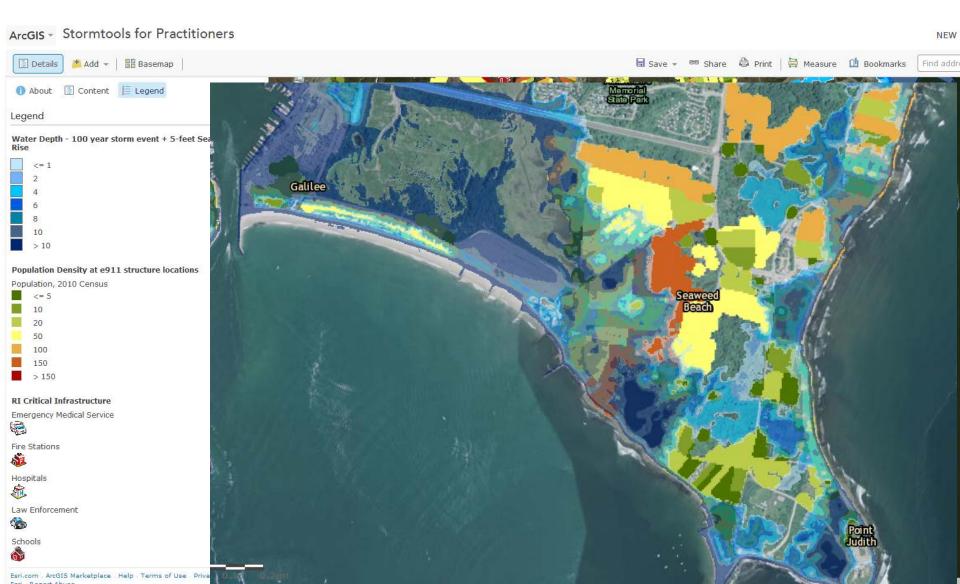
"STORMTOOLS FOR PRACTITIONERS"

Train professionals who will use the tool to access and import data sets for more advanced analysis



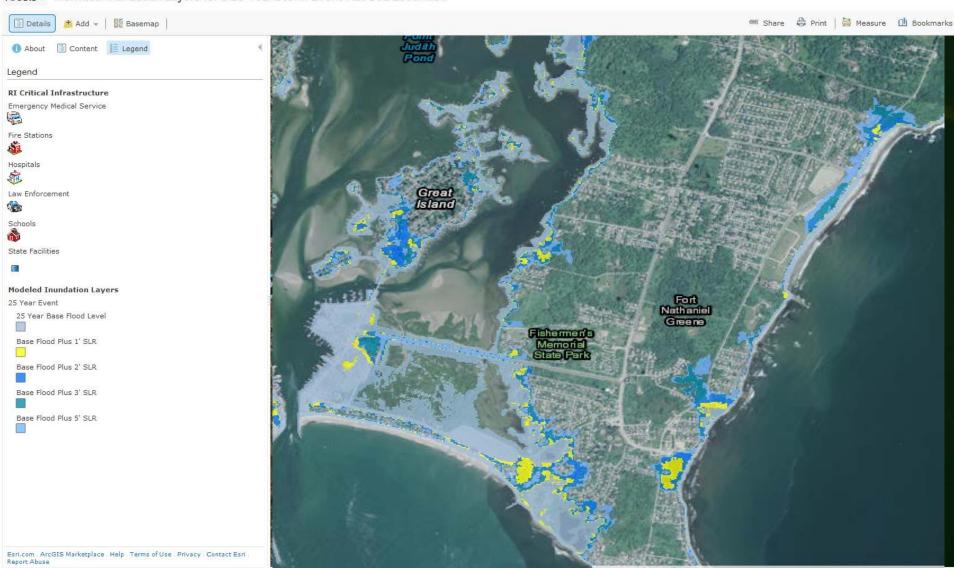
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STORMTOOLS 25-year Storm Event +SLR

ArcGIS - Individual Inundation Layers for a 25-Year Storm Event Plus Sea Level Rise



STORMTOOLS 100-year Storm Event +SLR

Police / Fire / EMA

- Service areas cutoff or limited by flooding?
- Facilities at risk of being offline from flooding?

- Transportation

- Evacuation routes
- Functionality and service areas
- Alternate routes / road relocations
- Design life of infrastructure/assets



STORMTOOLS 100-year Storm Event +SLR

Critical Infrastructure
-Wastewater Treatment
Facilities



