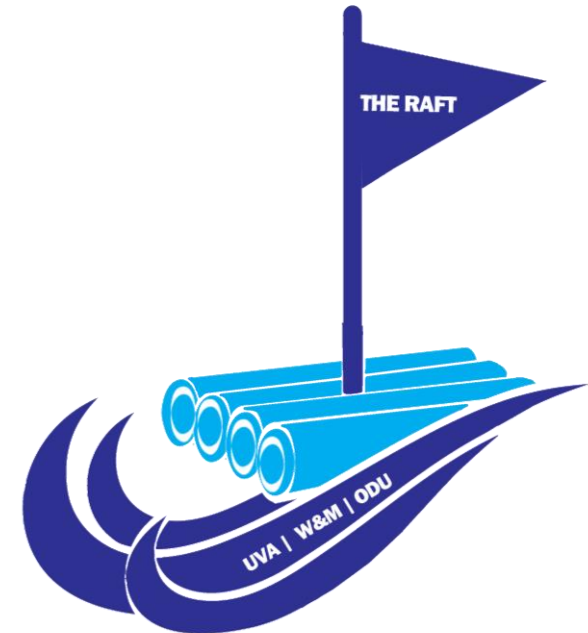


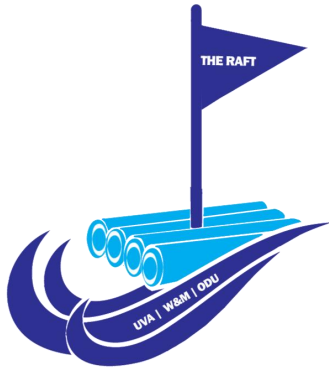
# THE RAFT

Resilience Adaptation Feasibility Tool

PRESENTATION TO  
NORTHAMPTON COUNTY PLANNING COMMISSION  
JANUARY 16, 2019



# THE RAFT GOAL



*To help Virginia's coastal localities  
improve resilience to flooding  
and other coastal storm hazards  
while remaining  
economically and socially viable.*



Cape Charles, June 2017

# THE RAFT FUNDING

**National Fish and Wildlife Foundation  
(NFWF)**



**Virginia Environmental Endowment  
(VEE)**

**Virginia  
Environmental  
Endowment**

**Virginia Department of Environmental  
Quality (DEQ) Coastal Zone  
Management Program (CZM)**

**Anonymous**

**Virginia Sea Grant**



**Virginia Coastal Zone  
MANAGEMENT PROGRAM**

# THE RAFT TEAM

- The RAFT was born of a multi-disciplinary academic partnership.
- Our Core Team:
  - **University of Virginia**
    - *Institute for Environmental Negotiation*
  - **William & Mary Law School**
    - *Virginia Coastal Policy Center*
  - **Old Dominion University**
    - *Virginia Sea Grant Resilience Program*



# THE RAFT PROCESS

## 1. Scorecard

Resilience Assessment

## 2. Community Workshop

Resilience Action Checklist

## 3. Implementation

Ongoing Assistance



# THE SCORECARD

## 1. LEADERSHIP, POLICY AND COLLABORATION

## 2. RISK ASSESSMENT AND EMERGENCY MANAGEMENT

## 3. INFRASTRUCTURE RESILIENCE

## 4. PLANNING FOR RESILIENCE

## 5. COMMUNITY ENGAGEMENT, HEALTH, AND WELL BEING

### PLANNING FOR RESILIENCE

#### 4.2 COASTAL RESILIENCY IN COMPREHENSIVE PLAN

##### DESCRIPTION

A comprehensive plan is a locality's vision for future land use, development, adaptation, and resilience. Coastal resilience can be addressed in comprehensive plans by incorporating elements such as green infrastructure, open space preservation, infill development, the National Flood Insurance Program (NFIP), the Community Rating System (CRS), and stormwater management. The ideal comprehensive plan identifies equity and the need to identify and support socially vulnerable populations as a priority for resilience, as well as a priority preference for restoration, green infrastructure and connectivity.

##### LOCALITY ACTIONS

- 4.2.a: Locality staff, residents, stakeholders, and others are involved in creating the comprehensive plan.
- 4.2.b: Locality recognizes coastal resilience as an issue for consideration in the comprehensive plan, and gathers information (either by conducting its own studies and analysis, or locating other sources) to develop strategies to enhance its coastal resilience.
- 4.2.c: The comprehensive plan identifies natural resources that help mitigate flooding, and provides strategies to preserve and protect such resources from risks associated with coastal storm hazards.
- 4.2.d: The comprehensive plan identifies critical infrastructure necessary for essential services, and provides strategies to protect such infrastructure from risks associated with coastal storm hazards.

##### SCORING

- 1 point – The comprehensive plan discusses how community engagement around coastal resilience informed the plan.
- 1 point – The comprehensive plan includes clear discussion of coastal resilience and coastal storm hazards, and incorporates assessments to inform the development of policies to reduce vulnerability to coastal storm hazards.
- 1 point – The comprehensive plan includes goals and objectives for preserving and protecting natural resources that mitigate coastal storm hazards.
- 1 point – The comprehensive plan addresses impacts on critical infrastructure and essential services from coastal storm hazards, particularly for impacts affecting socially vulnerable populations.

##### DATA SOURCES

- Comprehensive Plan.

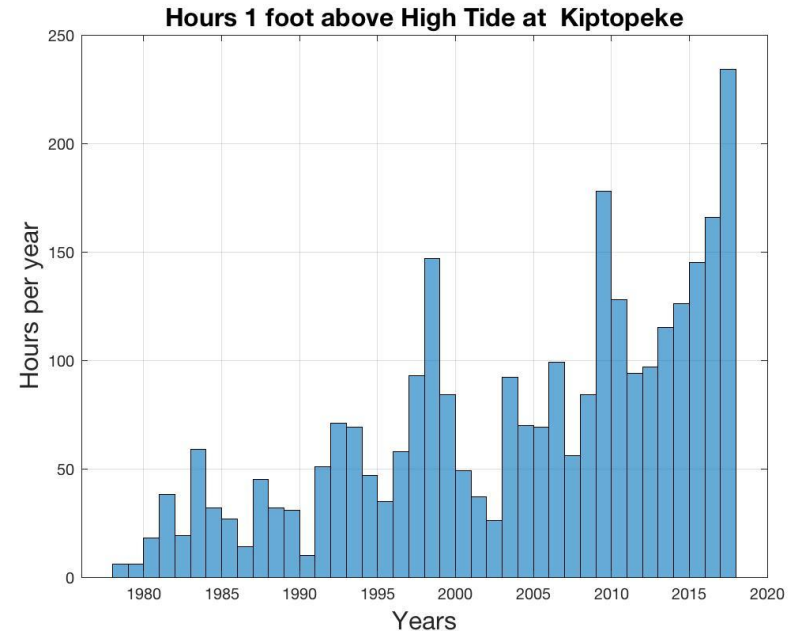
##### LOCALITY SCORE

1/4 POINTS

# WHAT IS HAPPENING NOW?

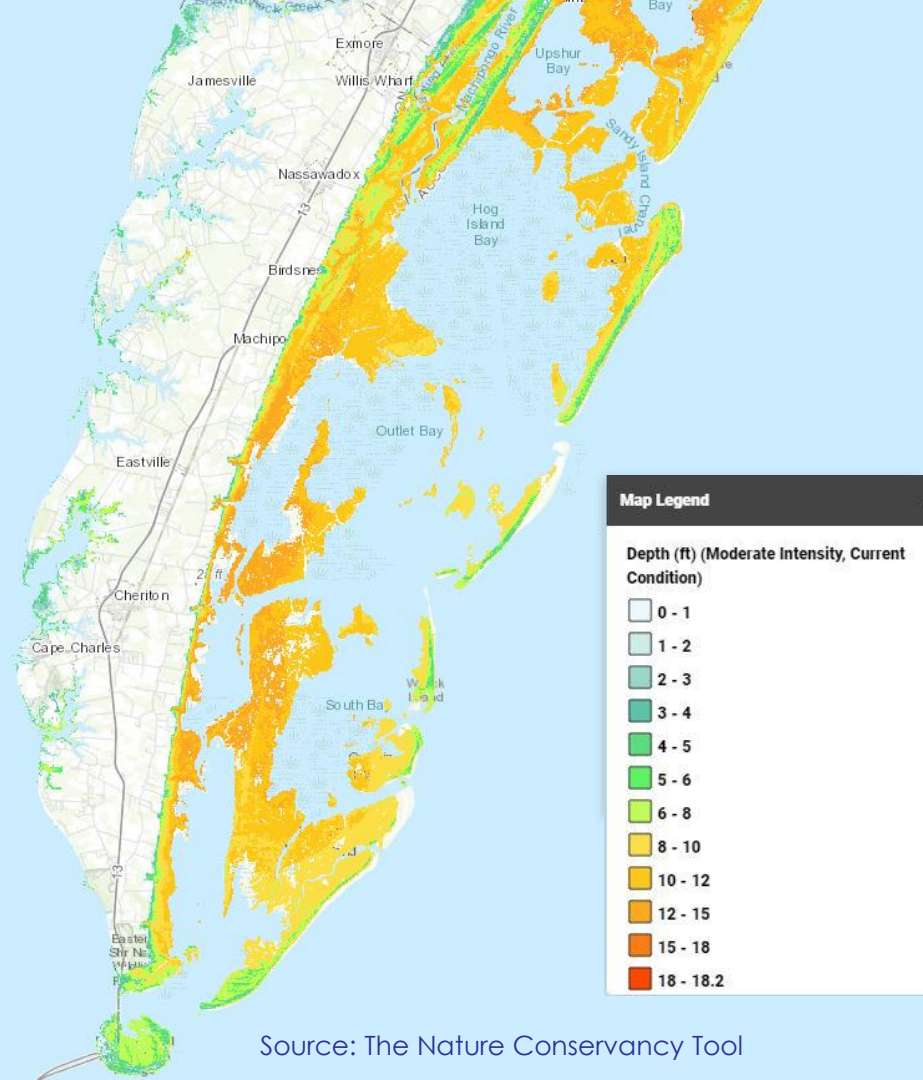


Photo Credit: NASA



Larry Atkinson, CCPO, Old Dominion University

# NORTHAMPTON: MODERATE STORM SURGE – CURRENT CONDITIONS

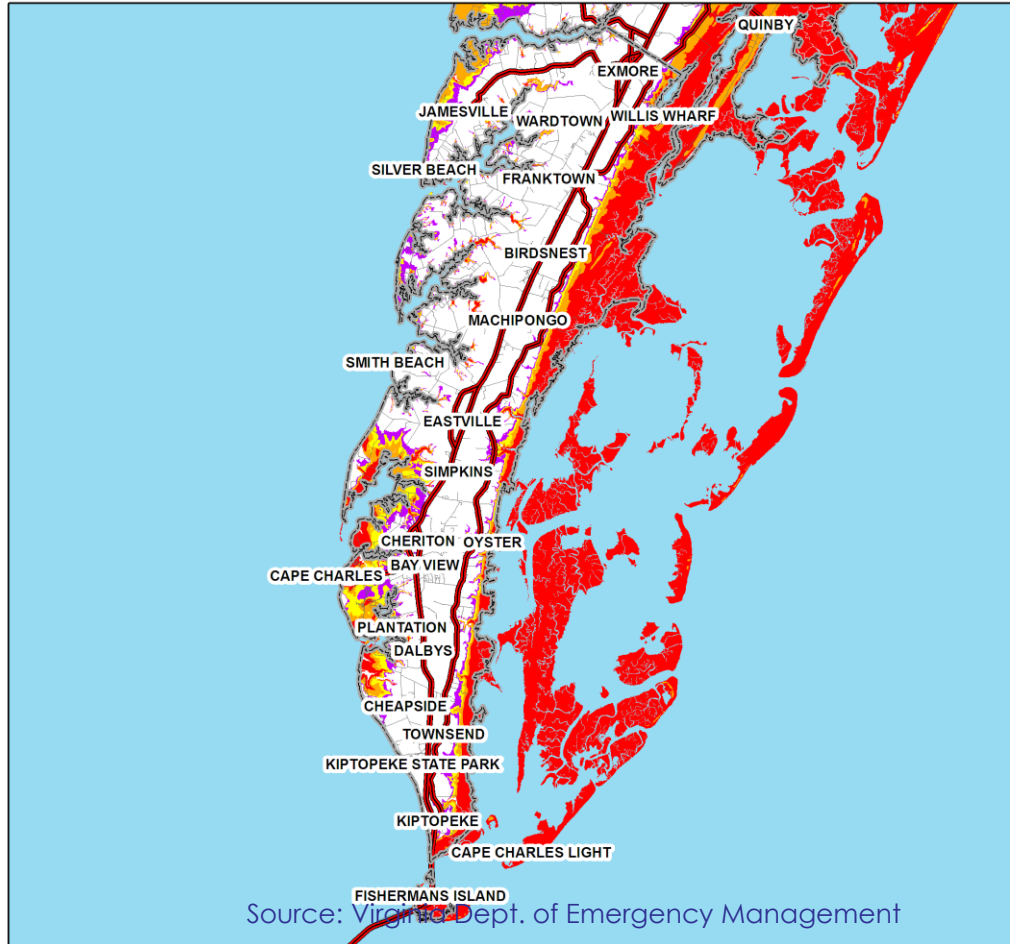


Source: The Nature Conservancy Tool



# Commonwealth of Virginia Storm Surge Inundation Maps

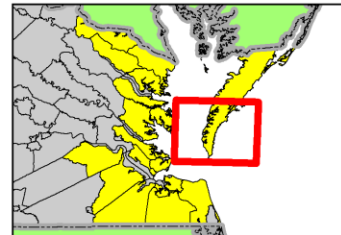
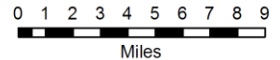
## NORTHAMPTON: MODERATE STORM SURGE – 2065



### Northampton

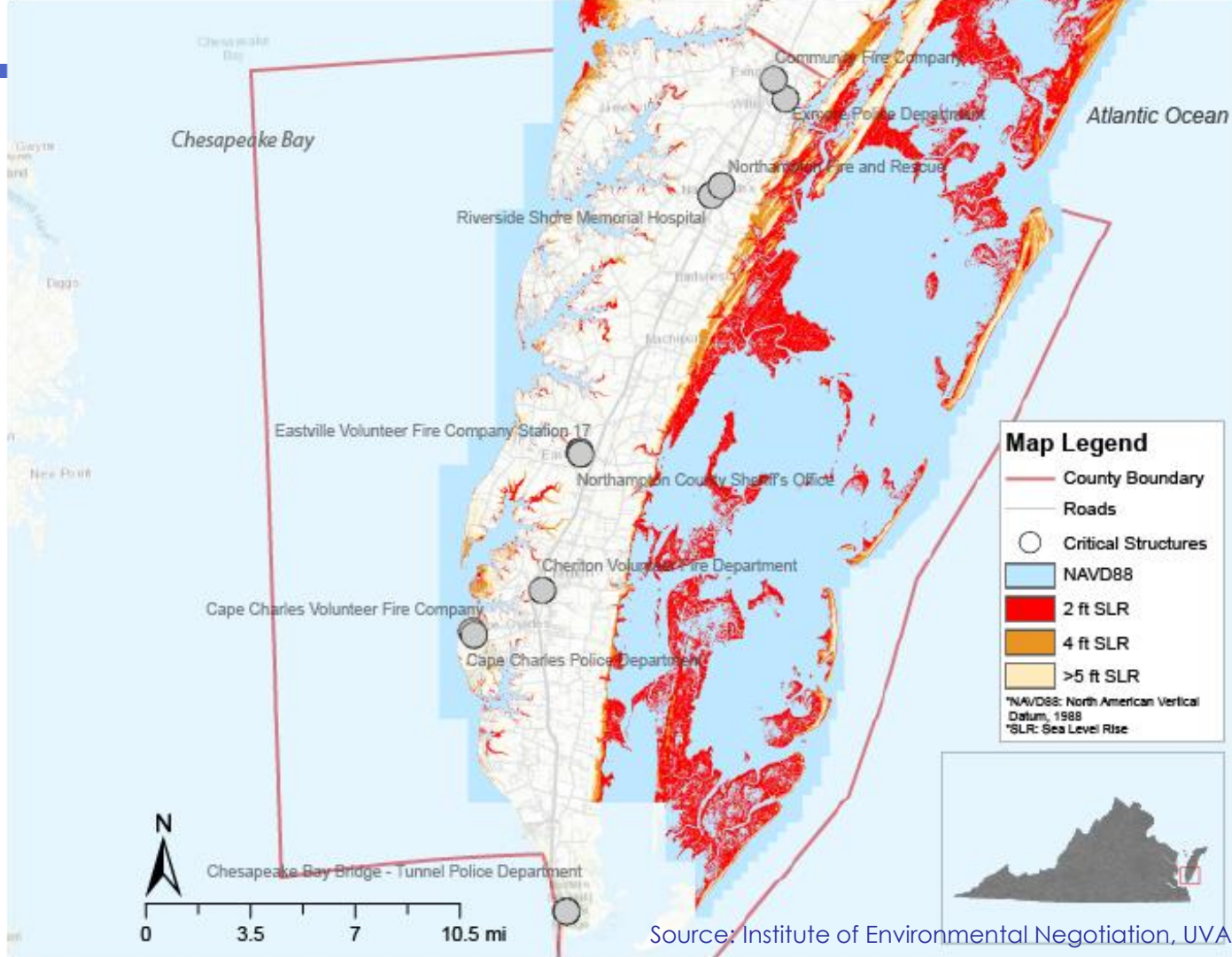
#### Storm Surge Inundation

- Area Not Included
- Category 1
- Category 2
- Category 3
- Category 4
- Interstates
- Primary Routes
- Addressed Roads
- Jurisdiction Boundaries

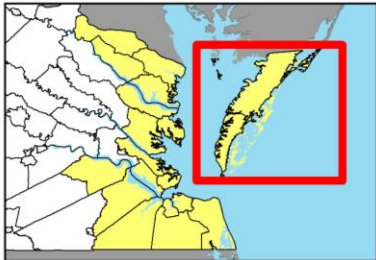
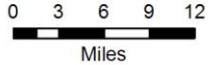
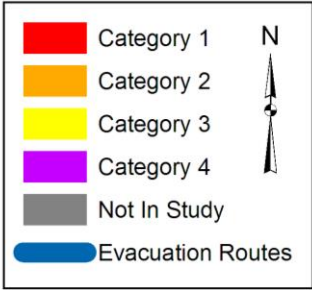


Source: Virginia Dept. of Emergency Management

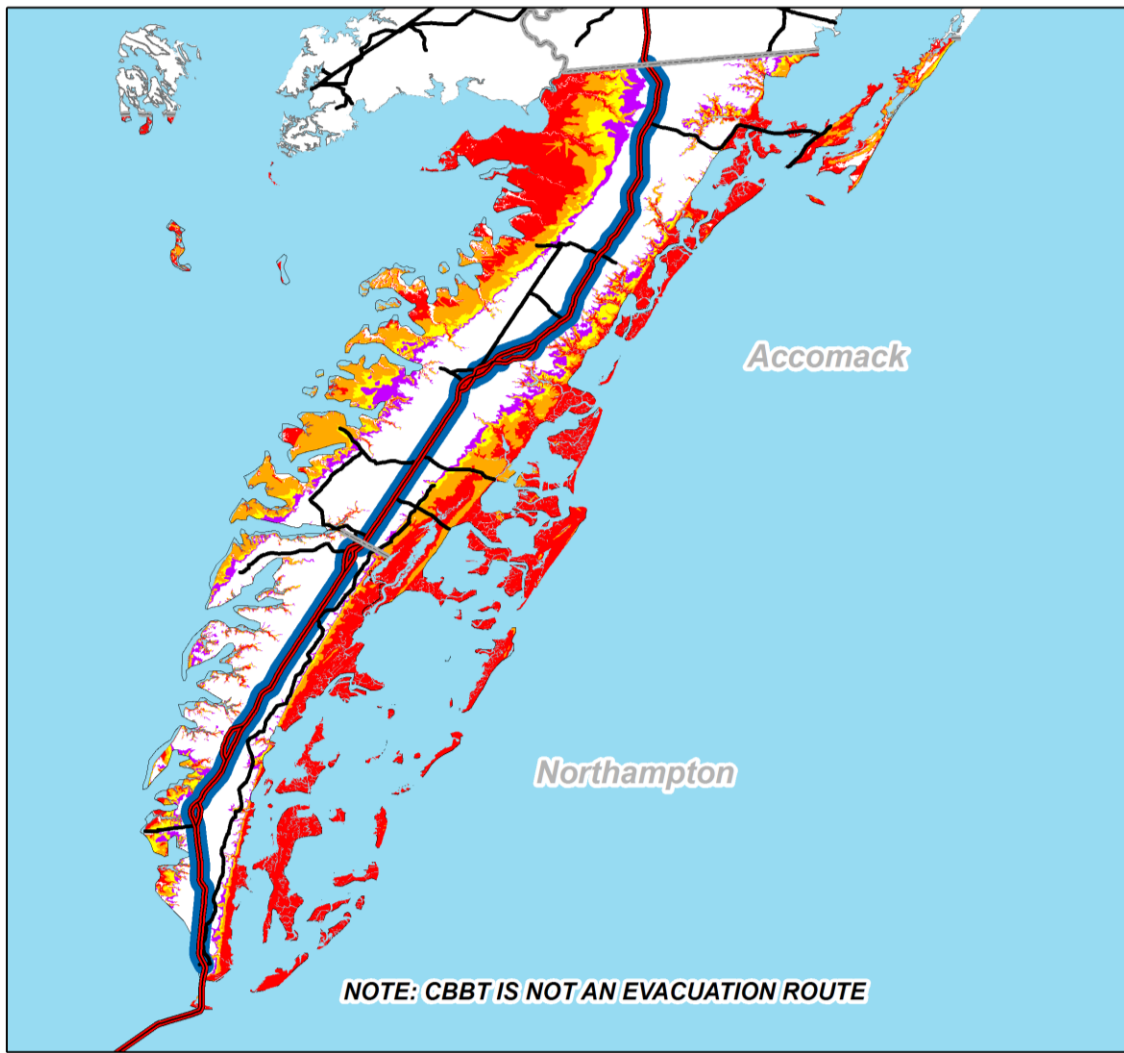
# NORTHAMPTON INUNDATION VULNERABILITY



# Eastern Shore Storm Surge Inundation Map



## NORTHAMPTON INUNDATION EVACUATION



# WHAT TO EXPECT OF COASTAL INUNDATION (SEA LEVEL RISE)

BY 2040

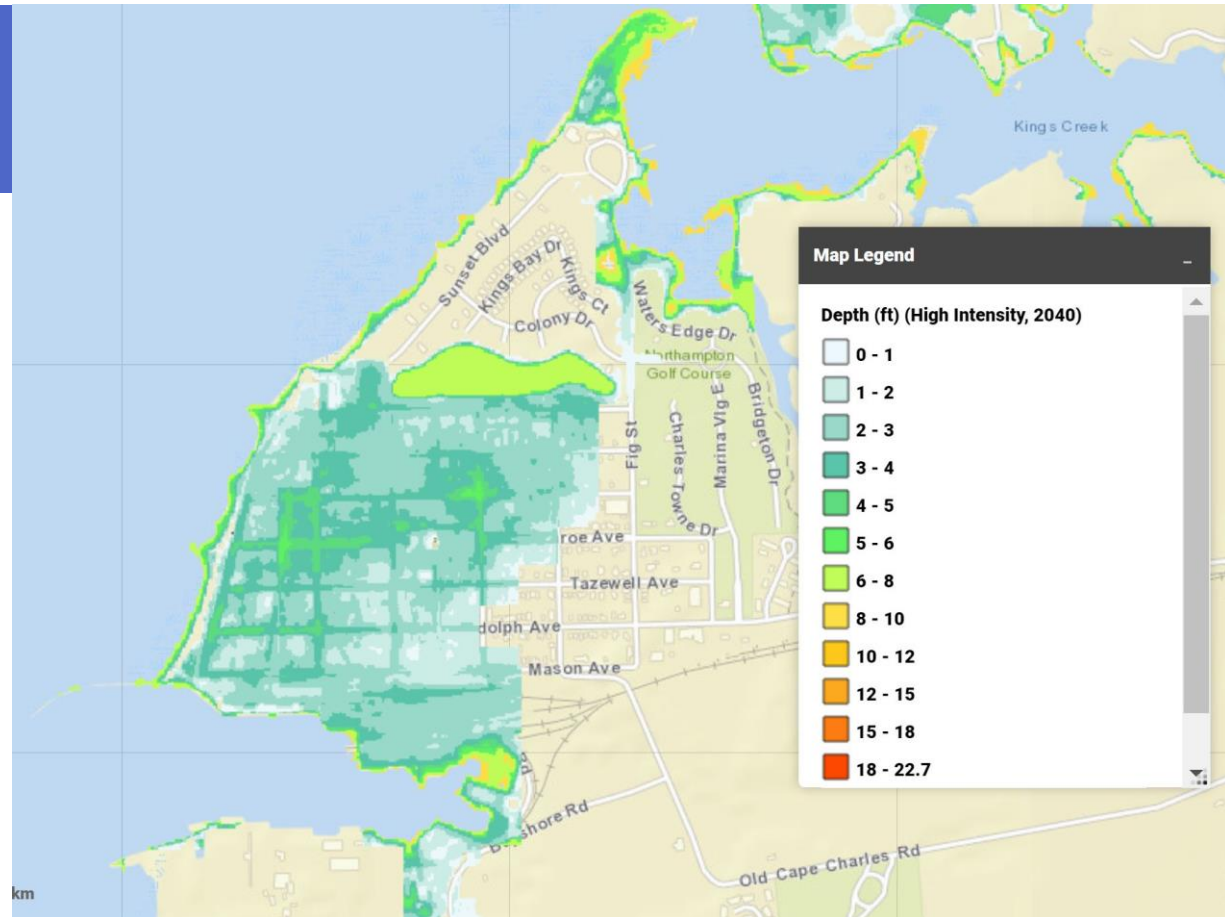
BY 2065

BY 2100

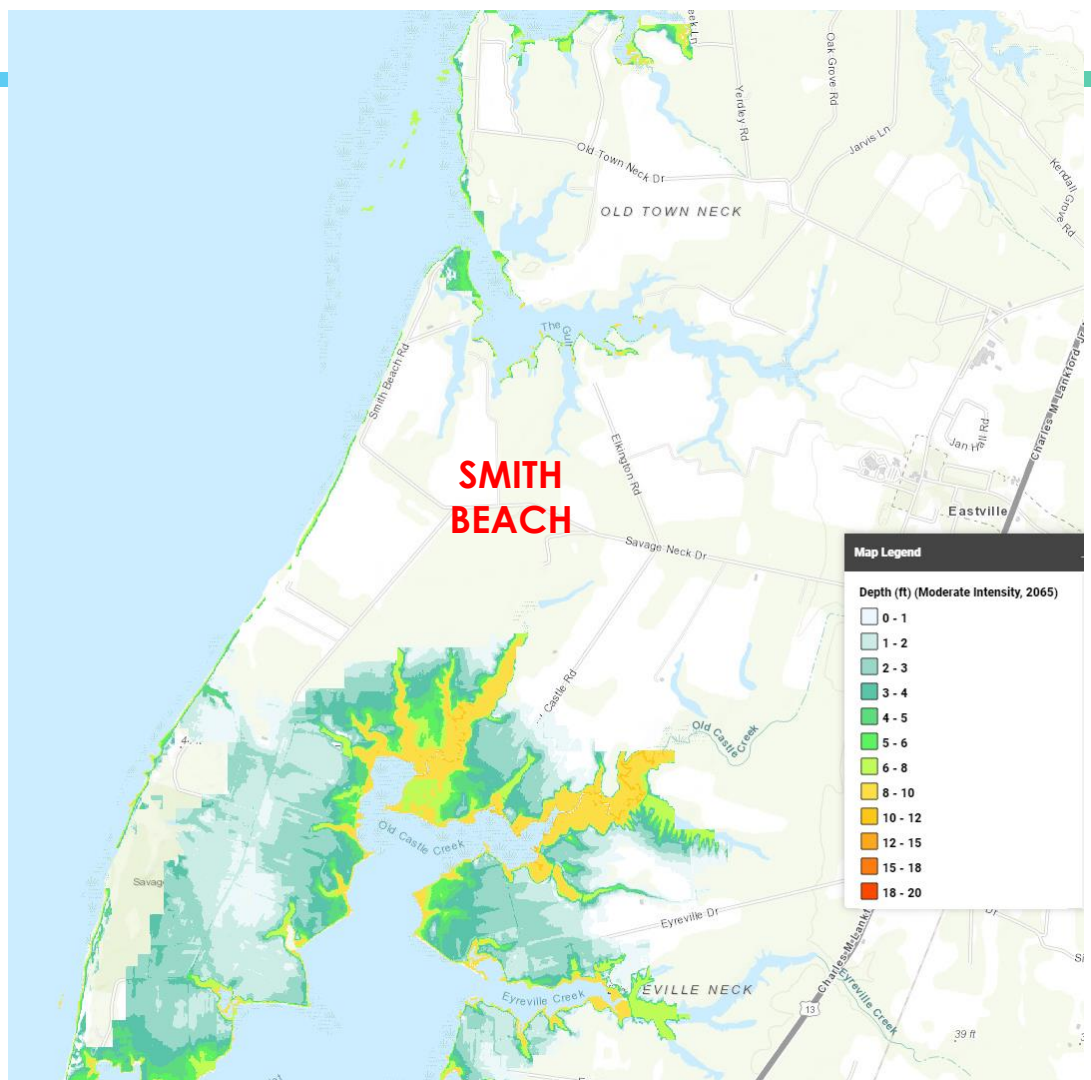
1ft. (lowest) to 1.9 ft. (highest)	1.9 ft. (lowest) to 4ft. (highest)	3.2 ft. (lowest) to 7.4 ft. (highest)
<p><b>The southern end of Bay Ave and Randolph Ave to Harbor Street</b> is at a high risk due to low elevation</p>	<p>Most of the western portion from Jefferson Avenue to Mason Avenue as far east as <b>Strawberry Street</b> is at risk of flooding to due low elevation</p>	<p>Most of the <b>historic district</b> will be submerged, including: <b>Bay Avenue, Randolph Avenue, Monroe Avenue</b> and <b>Harbor St., Plum St.</b></p>
	<p>The area around <b>Plum and Madison Ave</b> and the <b>southern portion of Plum Street</b> to <b>Tazewell Avenue</b> is also at risk</p>	<p><b>Madison Avenue</b> experiencing the highest amount of flooding</p>

## 2040 STORM SURGE (HIGH-INTENSITY STORM EVENT)

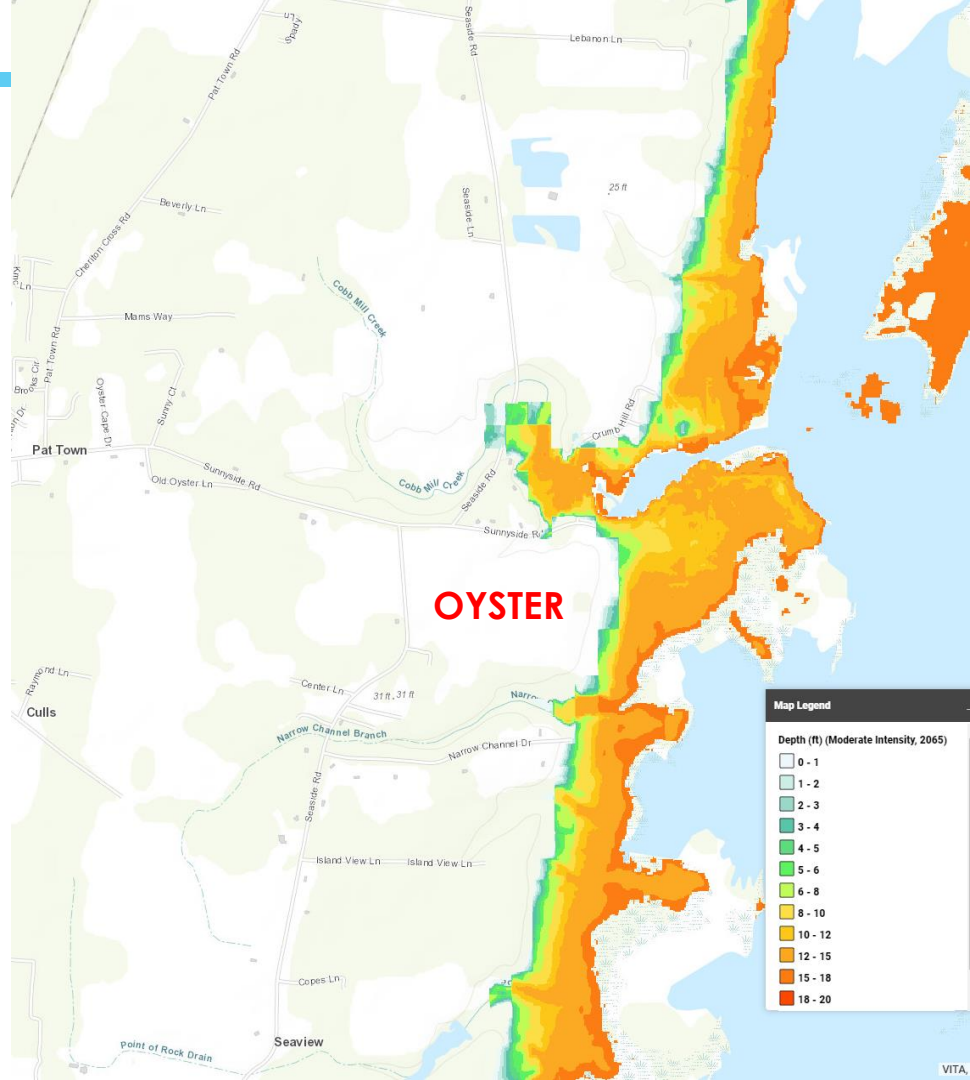
- This shows **a high intensity storm surge projection** (Category 2 and 3 hurricanes with maximum winds between 95 and 115 mph) for 2040.
- The water depth ranges from **1-2 ft. to 5-6 ft.** in the **Historic District**, and up to **8-10 ft.** in the **harbor, coastal dunes and northern peninsula.**



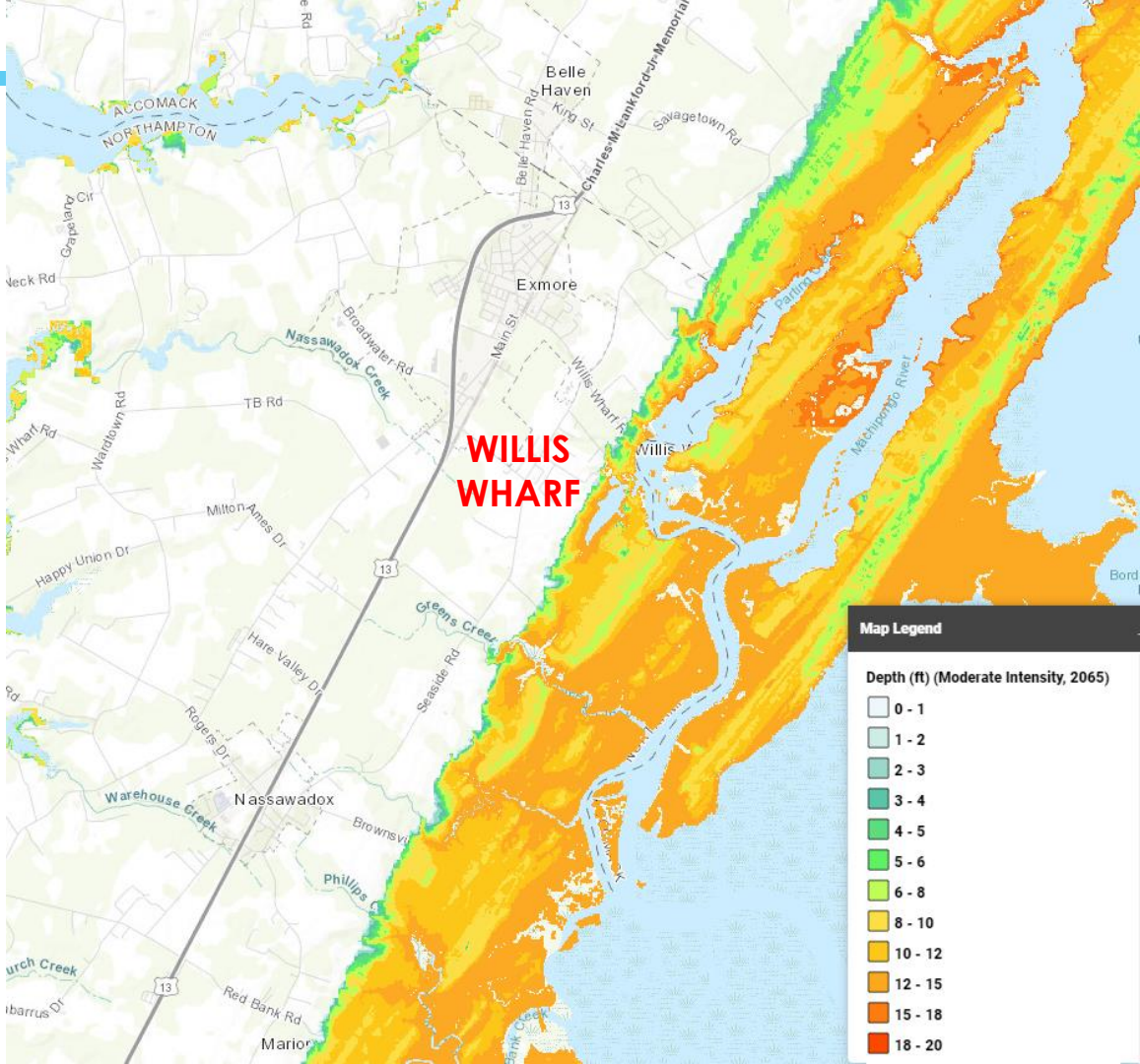
# SMITH BEACH: MODERATE STORM SURGE – 2065



# OYSTER: MODERATE STORM SURGE – 2065

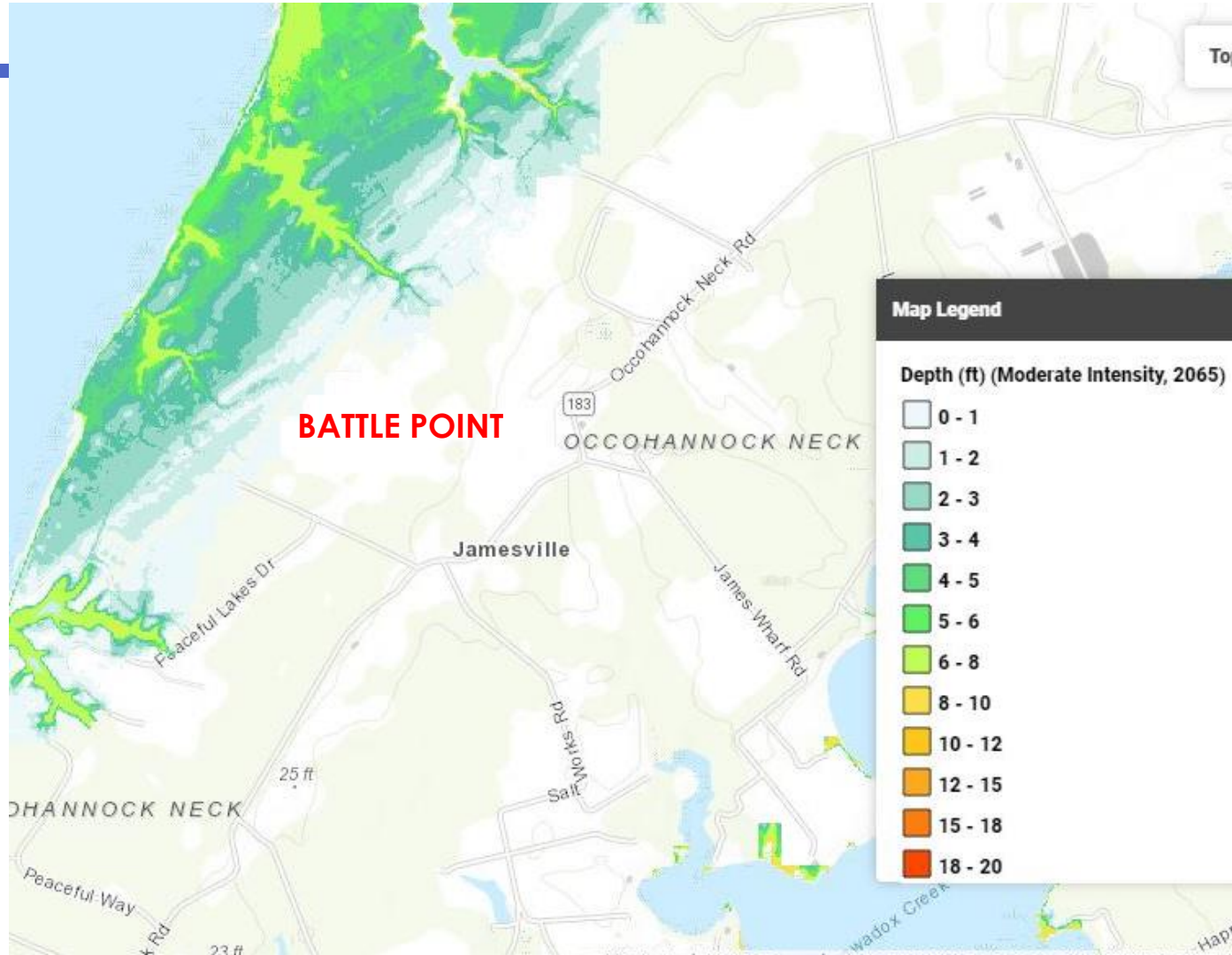


# WILLIS WHARF: MODERATE STORM SURGE – 2065





# BATTLE POINT: MODERATE STORM SURGE – 2065



# NORTHAMPTON SCORECARD : TOP 5 STRENGTHS

SECTION	SCORE
Locality Leadership and Planning for Resilience	4/4
Hazard Mitigation	4/4
Critical Transportation Infrastructure	4/4
Budget, Funding, and State & Federal Assistance	4/4
Providing Coastal Resilience Information to the Public	4/4

# PRIMARY OPPORTUNITIES

SECTION	SCORE	WAYS TO IMPROVE
2.1 Flood Exposure and Vulnerability Assessment	1/4	Complete a <b>flood exposure and vulnerability assessment</b> that includes <b>maps</b> .
2.3 Business and Economic Risk Assessment	2/4	Provide programs for small businesses for <b>emergency preparation and business continuity</b> .
3.1 Stormwater Infrastructure	1/4	Provide <b>incentives for private property</b> activities that manage <b>stormwater and demonstrational BMPs</b> on public property for stormwater education.
3.5 Natural and Nature-Based Features	1/4	Create a <b>green infrastructure plan</b> that outlines use of natural and nature-based features to <b>enhance coastal resilience</b> .

# PRIMARY OPPORTUNITIES

SECTION	SCORE	WAYS TO IMPROVE
3.3 <b>Water Supply and Wastewater Management Services</b>	0/4	<b>Update water supply</b> plan to include coastal hazards and dangers they pose to <b>potable water</b> .
4.2 <b>Coastal Resilience in Comprehensive Plan</b>	2/4	Provide clear discussion in comprehensive plan of coastal resilience and <b>discuss strategies to mitigate coastal hazards</b> .
5.1 <b>Public Involvement in Resilience Planning</b>	2/4	Adopt a <b>written policy statement</b> regarding the roles of residents, commercial, and other stakeholders in coastal resilience.

# Northampton Resilience Actions CHECKLIST

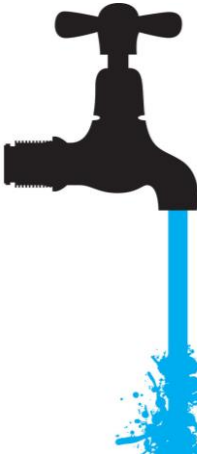
Project	Why this is important
<p><b>Conduct tour</b> for County Administrators, Planners, Staff, Wetlands Boards, etc.</p>	<p>Tour of both bayside and oceanside natural areas and Best Management Practices (BMPs) to <b>demonstrate what resilient natural systems look like</b> - now scheduled for April 2019</p>
<p><b>Conduct information sessions with the</b> Planning Commission + Board of Supervisors</p>	<p><b>Share information about resilience with these groups</b> to help inform the new Comp Plan</p>
<p><b>Identify areas</b> for tree planting</p>	<p><b>Identify spaces</b> on both ocean and bay sides where County and others can slow erosion &amp; sedimentation</p>
<p><b>Create mapping</b></p>	<p><b>Create 5 maps to support decision-making</b> – showing risks to vulnerable populations, cultural and natural resources, economic resources, other key county resources</p>
<p><b>Coordinate preparedness meetings</b></p>	<p><b>Share information with County residents about preparedness</b>, through meetings and distribution venues (website or in-person events)</p>
<p><b>Establish a basic need list</b></p>	<p>Gather baseline information and what is currently being done <b>to determine needs for water, shelter, food, medicine, etc.</b></p>
<p><b>Organize a Task Force</b> For Vulnerable Populations</p>	<p><b>Identify different types of risks for vulnerable populations</b> and customize the message for those groups</p>

# How The RAFT Can Help With GROUND WATER



## The RAFT Helps By Identifying These Gaps in Northampton County Drinking Water Resilience:

- Conduct assessment of drinking water supply – both public and private well owners – to identify vulnerabilities to coastal storm hazards
- Expand water supply plan to address coastal flooding impacts on safe drinking water supply
- Conduct resident education program on safe drinking water pre- and post-event for public health and safety
- Establish communication with private well and water system owners to protect and increase water system resiliency



# How The RAFT Can Help With Protecting Natural Resources



## The RAFT Helps By Identifying These Gaps in Northampton County Natural Resources Resilience

- Identify natural and nature-based features (NNBF) that are protective and can assist with coastal resilience
- Develop plans and policies that use NNBF to enhance coastal resilience
- Conduct a flood vulnerability assessment every 5 years and use it in developing policy and programs
- Identify sources of flooding (tidal, and precipitation driven) and update every 5 years
- Identify and map flooding probability
- Fund actions that implement the NR Preservation Plan

# How The RAFT Can Help With Economic Vitality

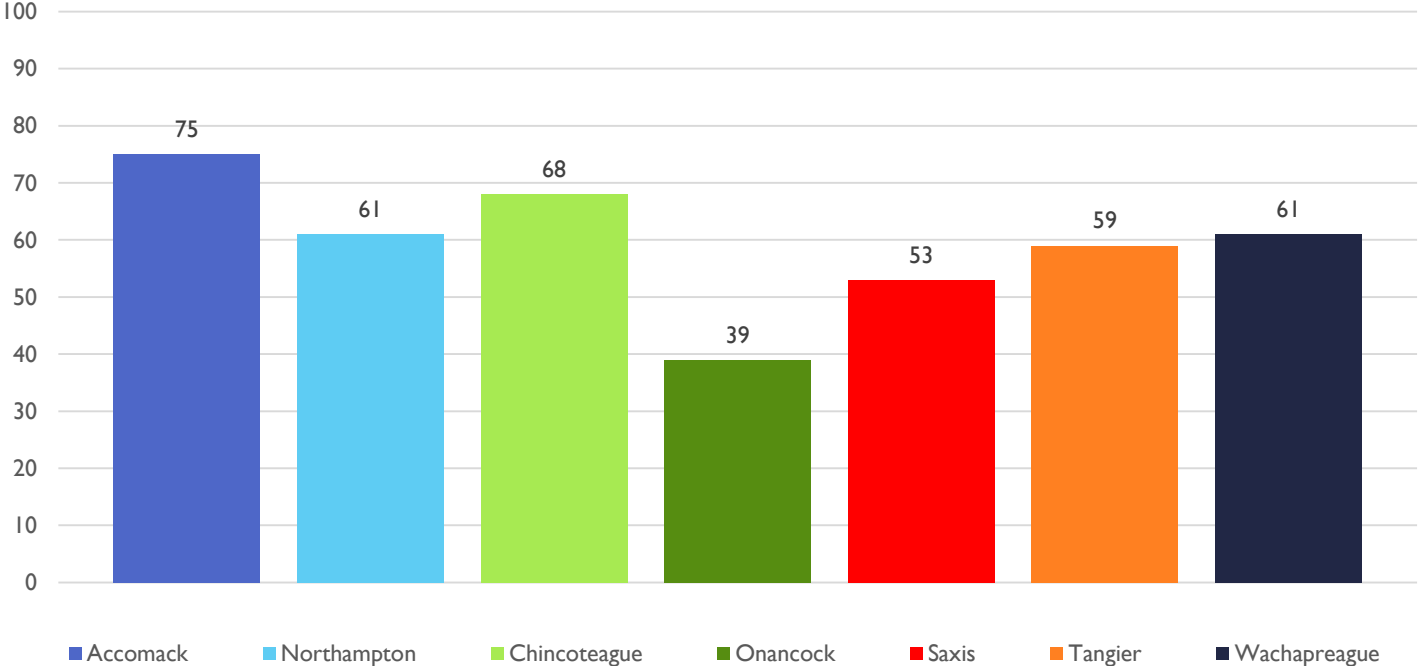


## The RAFT Helps By Identifying These Gaps in Northampton County Economic Resilience

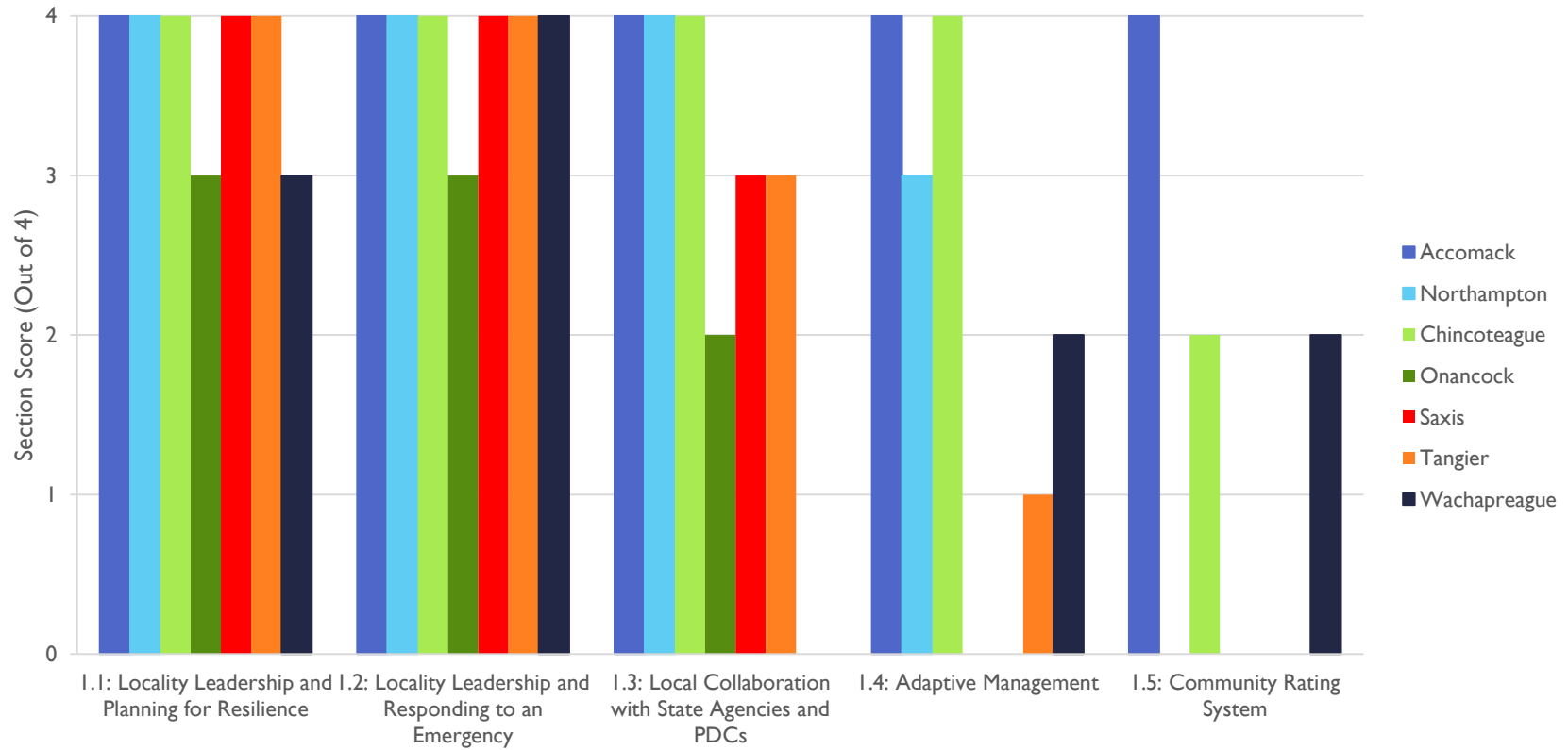
- Emergency preparedness program for small businesses, particularly those serving the socially vulnerable.
- Emergency communication plan with business sector
- Incentives for private property activities that manage storm-water.
- Comp plan discusses resilience and coastal storm hazards, includes assessments to inform policies and reduce vulnerability.
- Comp plan addresses impacts of coastal hazards on critical infrastructure and essential services.
- Written policy on role of different stakeholders in coastal resilience, including businesses.



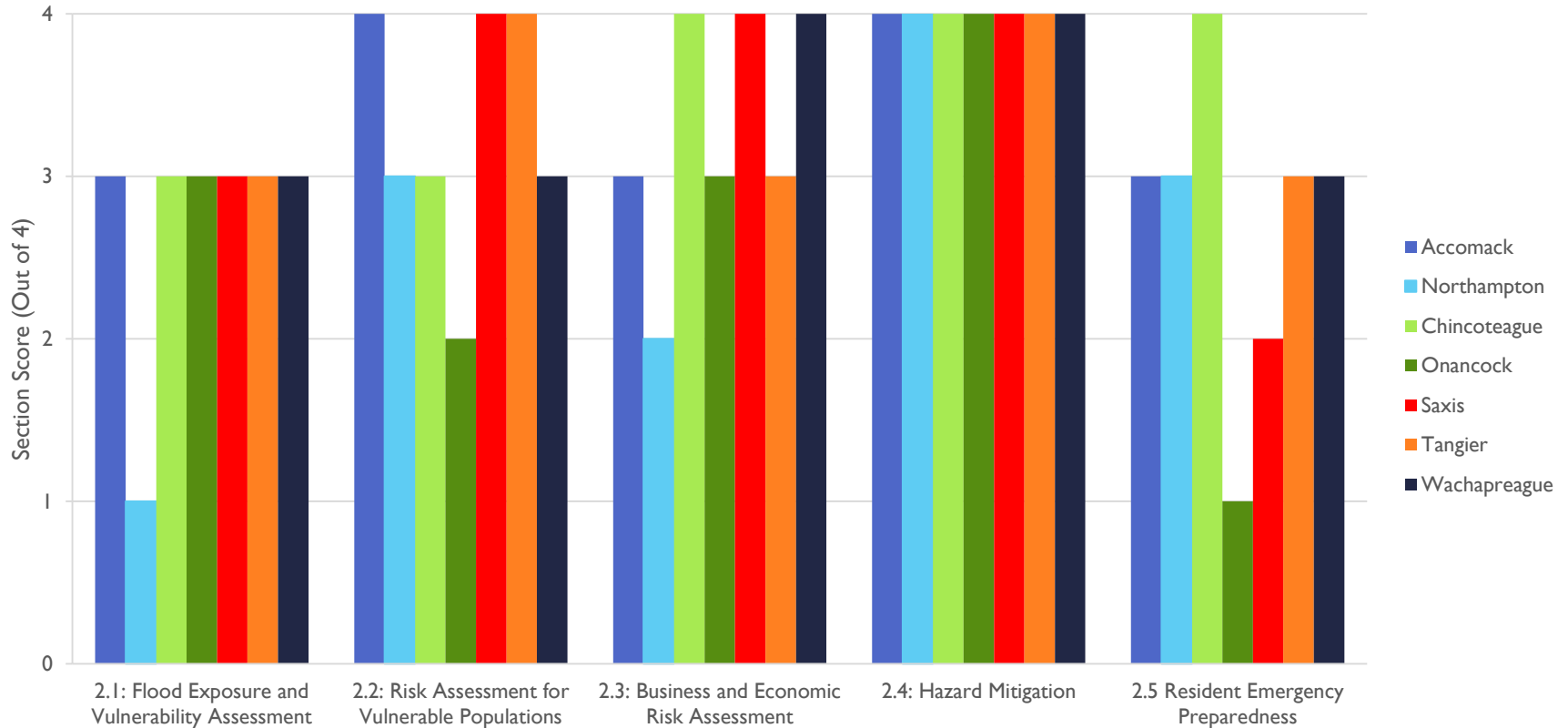
# Total RAFT Score Comparison



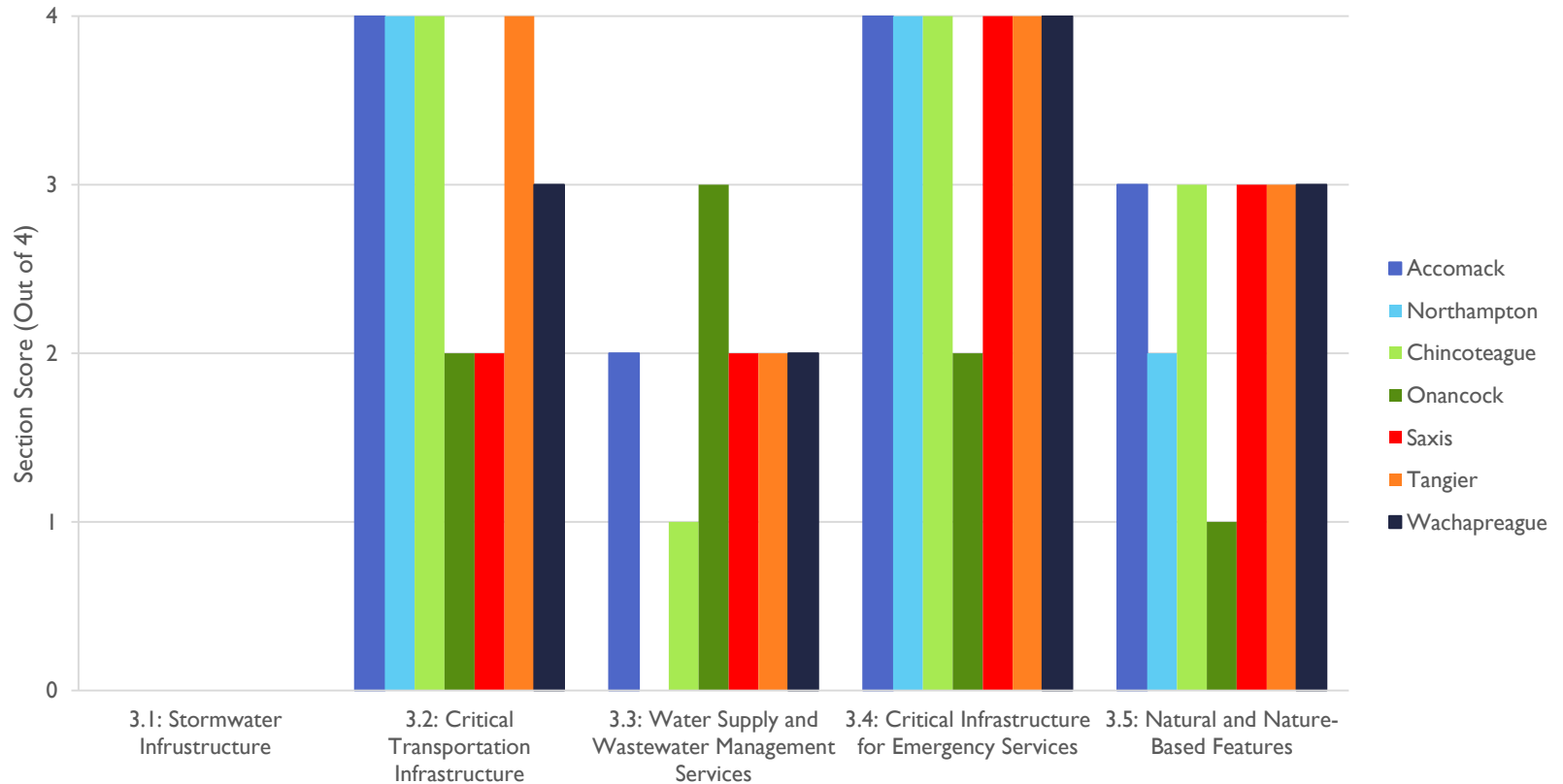
## Section 1. Cross-Locality Comparison



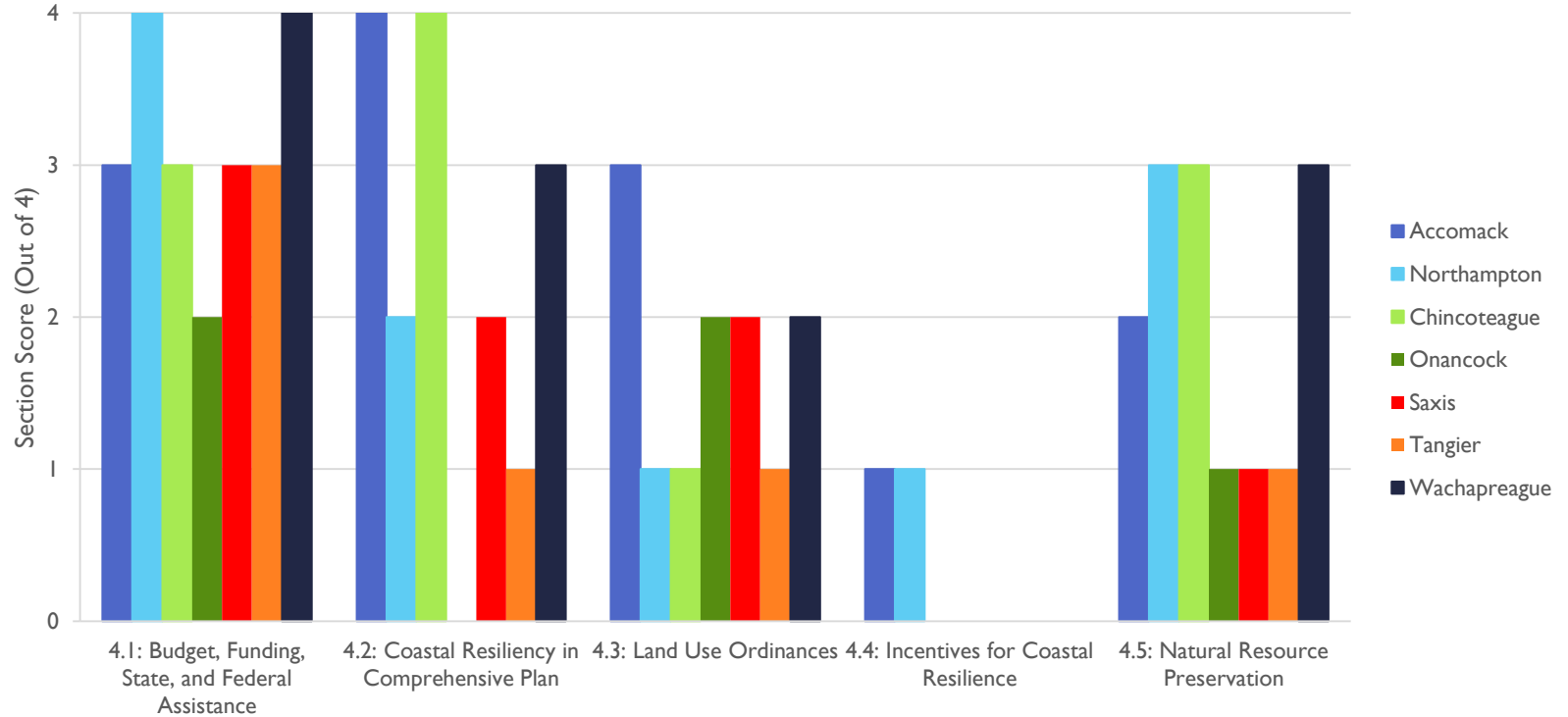
## Section 2. Cross-Locality Comparison



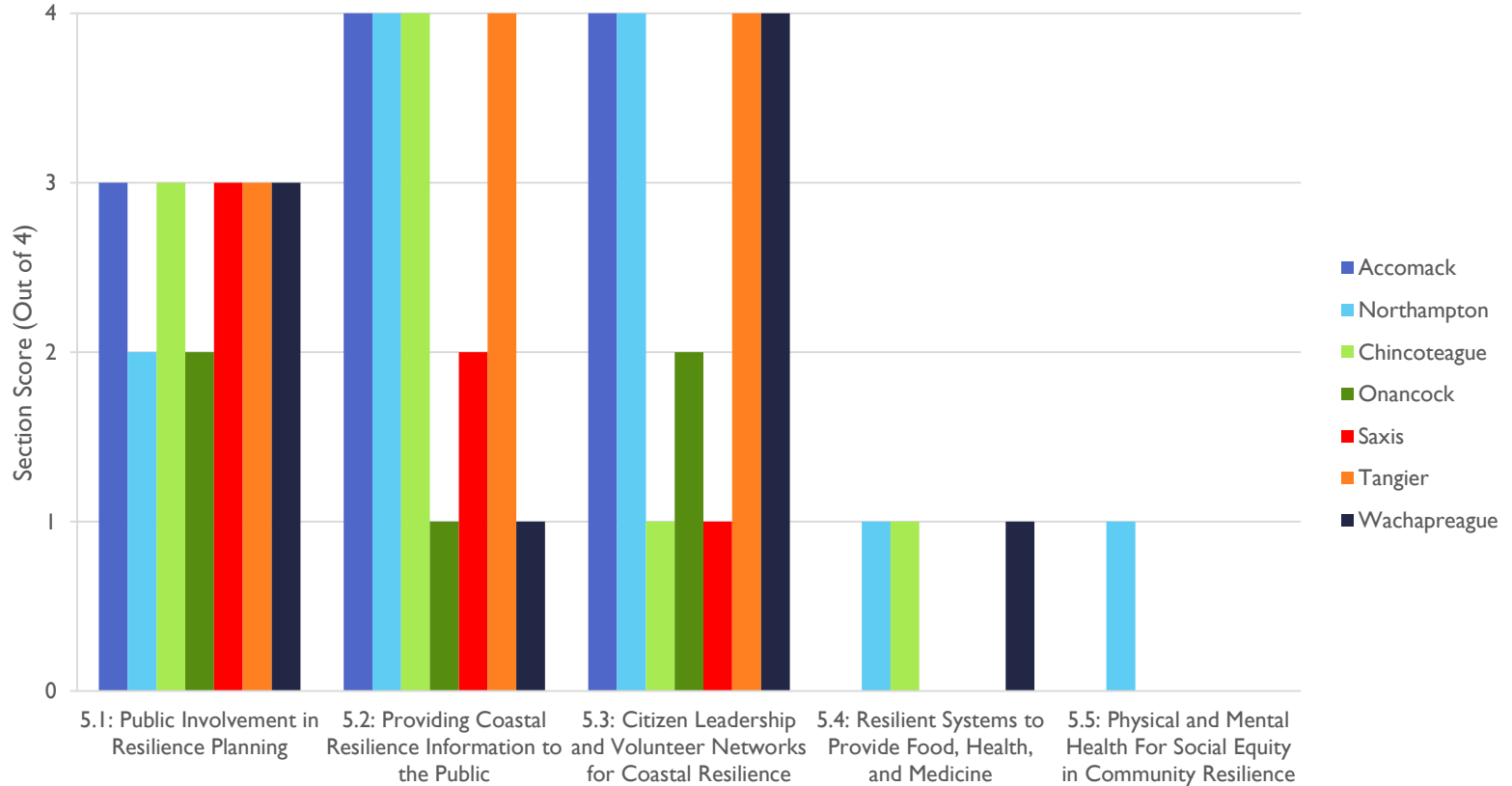
## Section 3. Cross-Locality Comparison



## Section 4. Cross-Locality Comparison



## Section 5. Cross-Locality Comparison



## NEXT STEPS

Implement the  
Resilience Action Checklist



# Northampton Resilience Actions - NEXT STEPS

PROJECT IDEA	Next Steps
<b>Conduct Tour</b> for County Administrators, Planners, etc.	Tour scheduled for April, coordinator Dot Field/DCR.
<b>Conduct information sessions with the</b> Planning Commission + Board of Supervisors	Tonight! Presentation to BOS date still TBD.
<b>Identify areas</b> for tree planting	Staff working with Public Works to do this.
<b>Create mapping</b>	Mapping underway by UVA grad students.
<b>Coordinate preparedness meetings</b>	Implementation Team identifying best community events for distribution.
<b>Establish a basic need list</b>	Implementation Team working to determine best path forward.
<b>Organize a Task Force</b> For Vulnerable Populations	Implementation Team working with Community Partners of the Eastern Shore (CPES) to identify vulnerable populations and distribute messages.



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# THE RAFT CORE TEAM

## Northampton Support Team:

Tanya Denckla Cobb: [td6n@virginia.edu](mailto:td6n@virginia.edu)

Kelly Altizer: [kaltizer@virginia.edu](mailto:kaltizer@virginia.edu)

Elizabeth Andrews: [eaandrews@wm.edu](mailto:eaandrews@wm.edu)

Angela King: [amking02@wm.edu](mailto:amking02@wm.edu)

Michelle Covi: [mcovi@odu.edu](mailto:mcovi@odu.edu)

Grace Walker: [gdwalker@odu.edu](mailto:gdwalker@odu.edu)



**QUESTIONS ?**