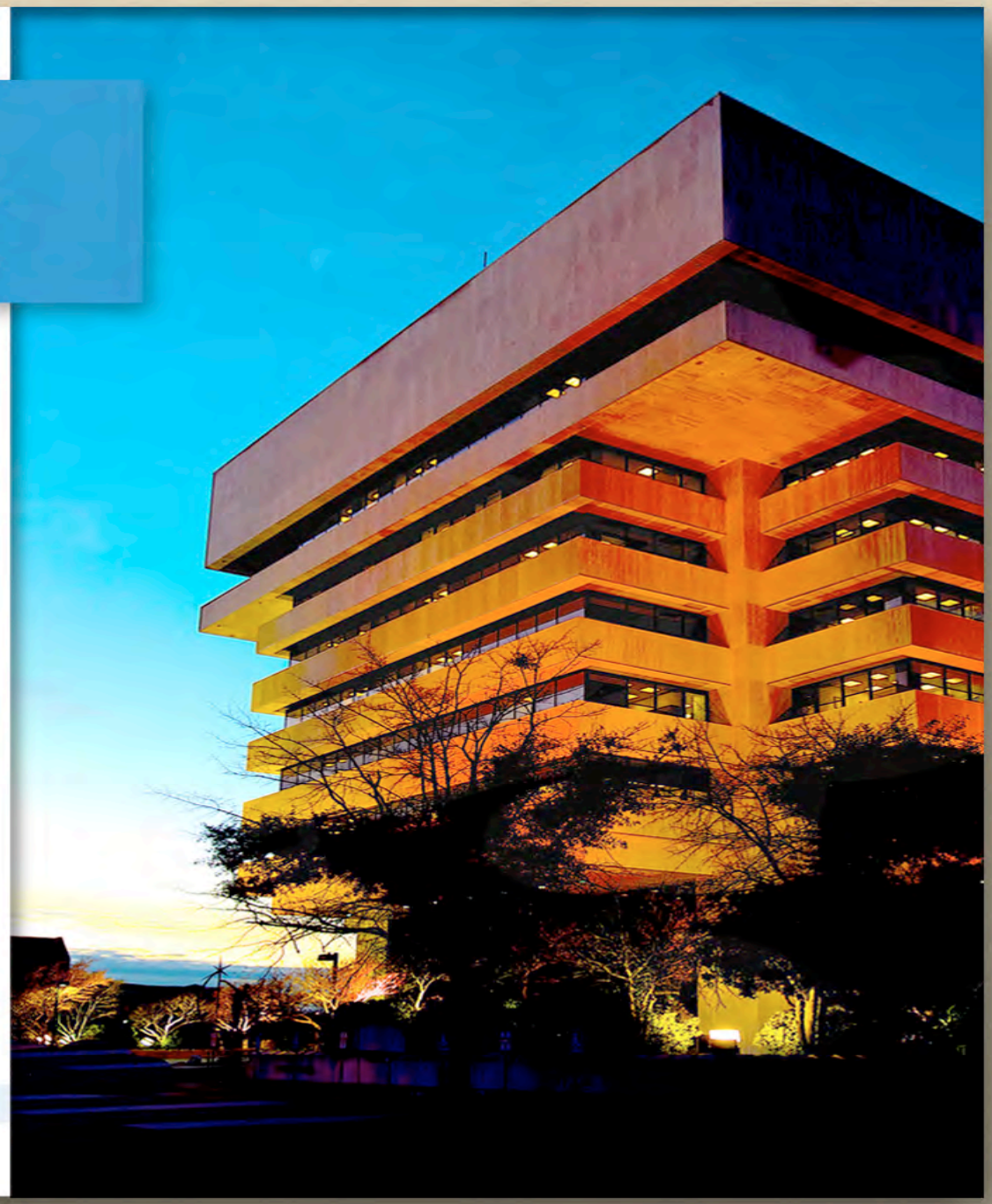
HAMPTON VA

Living with Water

Deep Dive Presentation

RESILIENT HAMPTON

City Council
January 26, 2022



Living with Water Strategic Priority

Addressing coastal resiliency, reoccurring flooding, waterways, and environmental sustainability while enhancing our tax base and quality of life.

Address the challenge of flooding

↔

Recognize & treat water resources as assets

Resilience is the bolstering of a community's **inherent strengths** in order to alleviate **chronic stresses** and enable recovery from **extreme events and shocks** in ways that make the community even **stronger than before**.

Living with Water Strategic Priority

- Shoreline protection
- Structural adaptation
- Stormwater system upgrades & maintenance

Address the challenge of flooding

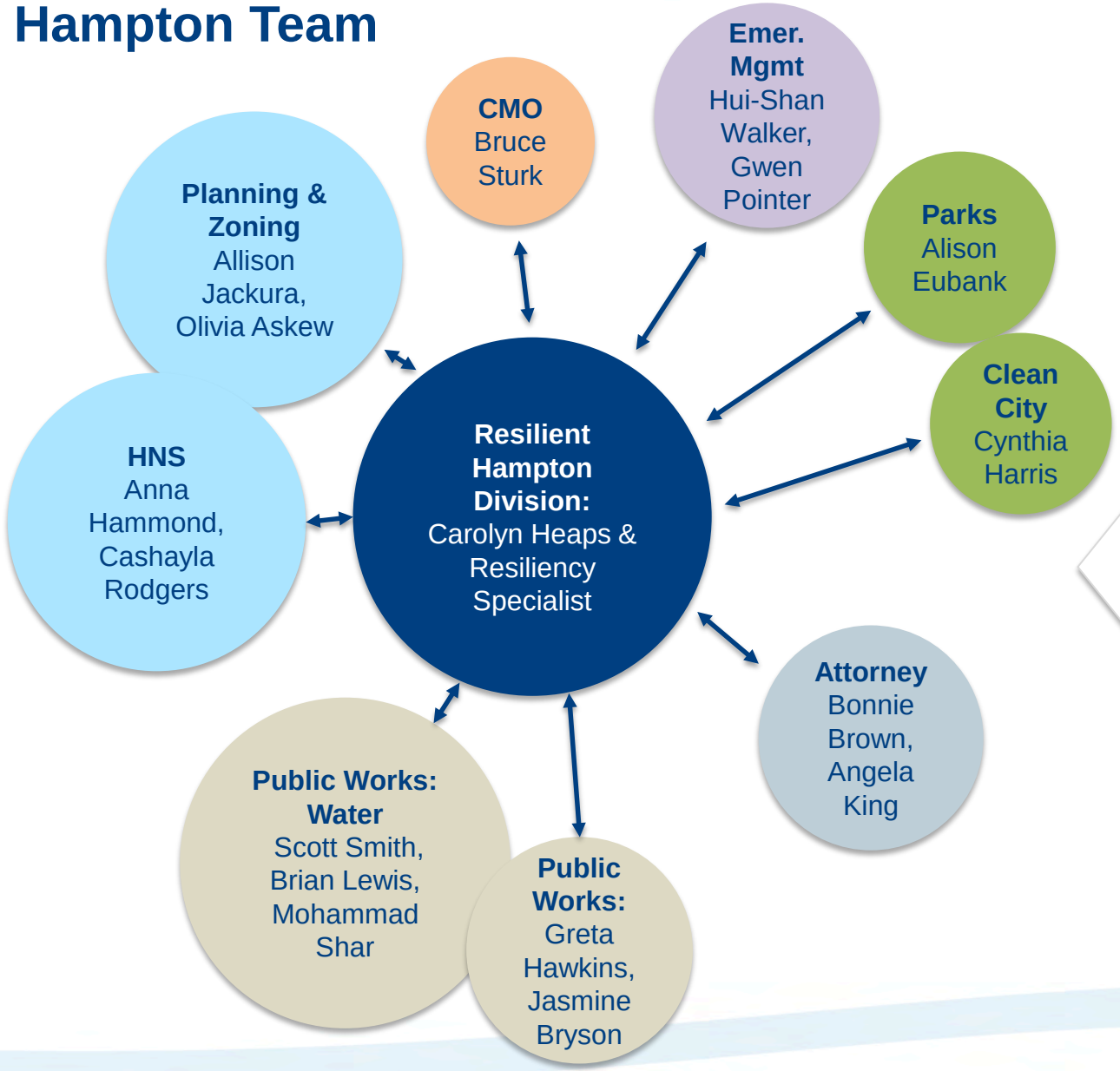
Recognize & treat water resources as assets

- Coastal place making
- Coastal dependent industry investment
- Waterway access

- Structural relocation
- Green infrastructure retrofits
- Low impact development
- Open space preservation
- Tree & habitat conservation
- Shoreline & habitat restoration

- Transportation corridor functionality
- Pedestrian, bicycle & transit connectivity and accessibility

Resilient Hampton Team



Partners

HAMPTON ROADS PDC PLANNING DISTRICT COMMISSION

NASA

VIMS | WILLIAM & MARY
VIRGINIA INSTITUTE OF MARINE SCIENCE

AMERICAN FLOOD COALITION

JOINT BASE LANGLEY-EUSTIS

Quantified Ventures

HAMPTON UNIVERSITY 1868

WETLANDS WATCH

SAVE THE BAY

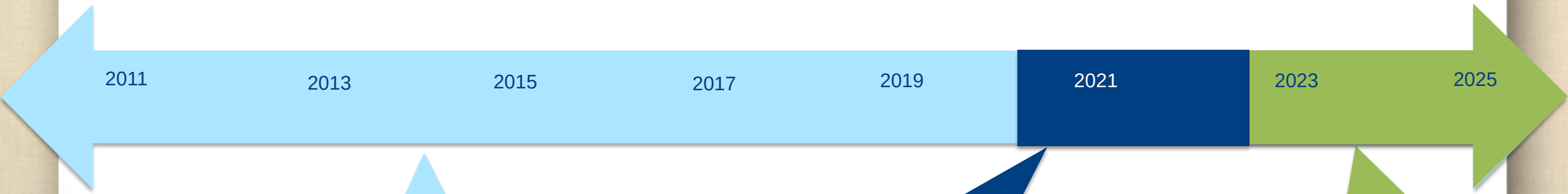
VIRGINIA TECH

CHESAPEAKE BAY FOUNDATION
Saving a National Treasure

W&M VCPC

OLD DOMINION UNIVERSITY

Deep Dive Road Map



1

The evolution of *Living with Water* in Hampton

Internal & External Contexts

2

Where we are today

Resiliency landscape

Projects & Programs

3

Where we're headed

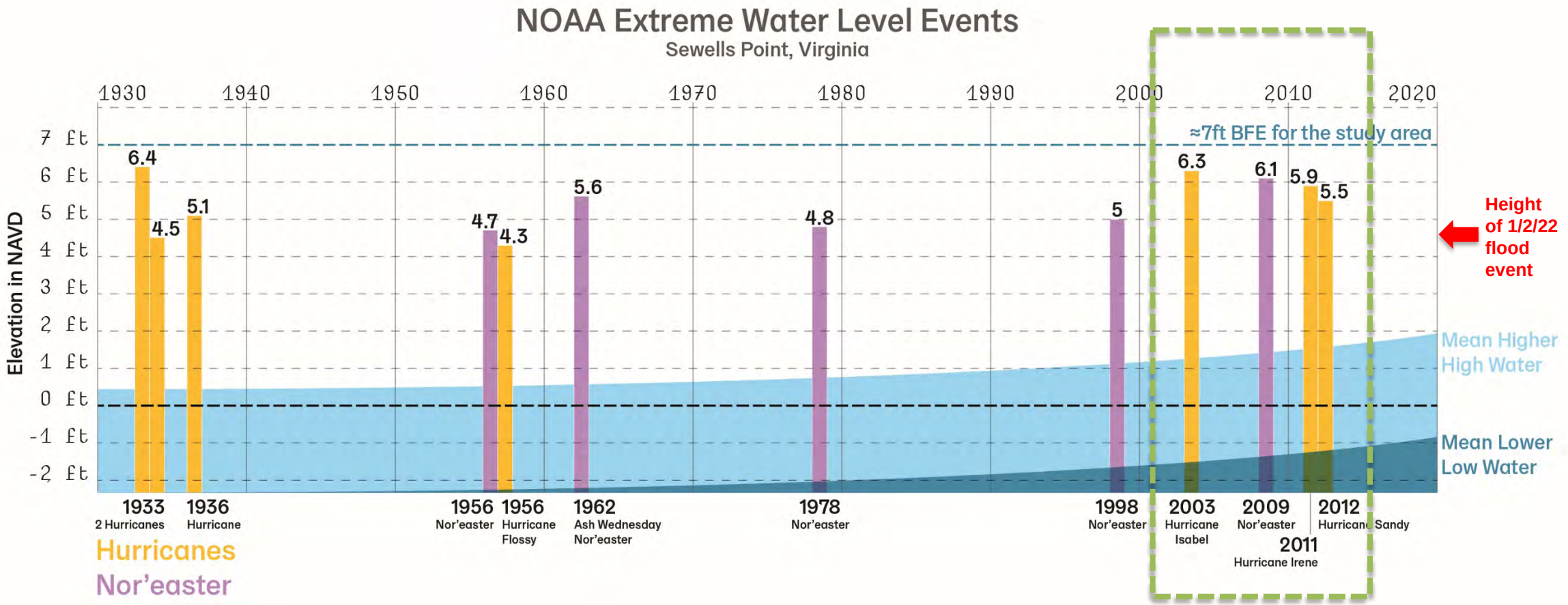
Future directions

Challenges

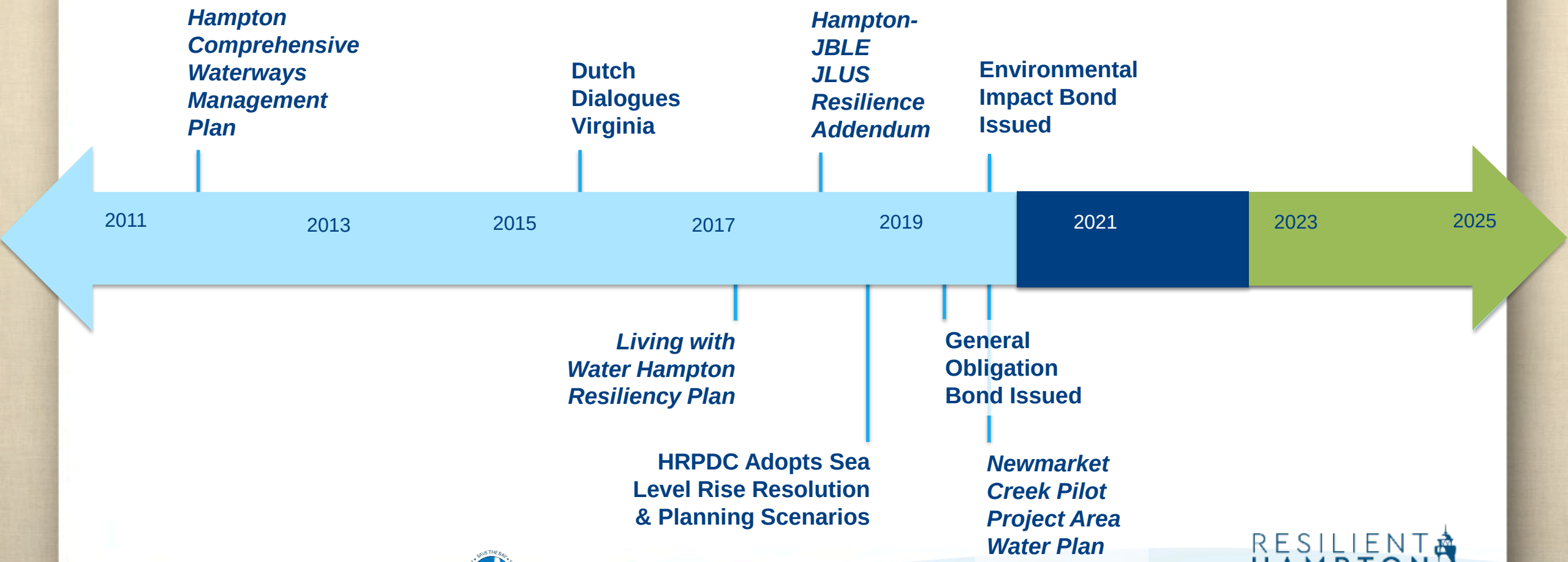
1

The evolution of *Living with Water* in Hampton

Internal & External Contexts


NOAA Extreme Water Level Events
Sewells Point, Virginia
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
Elevation in NAVD
7 ft
6 ft
5 ft
4 ft
3 ft
2 ft
1 ft
0 ft
-1 ft
-2 ft
≈7ft BFE for the study area
6.4
4.5
5.1
4.7
4.3
5.6
4.8
5
6.3
6.1
5.9
5.5
Height of 1/2/22 flood event
Mean Higher High Water
Mean Lower Low Water
1933
2 Hurricanes
1936
Hurricane
1956
Nor'easter
1956
Hurricane Flossy
1962
Ash Wednesday Nor'easter
1978
Nor'easter
1998
Nor'easter
2003
Hurricane Isabel
2009
Nor'easter
2011
Hurricane Irene
2012
Hurricane Sandy
Hurricanes
Nor'easter

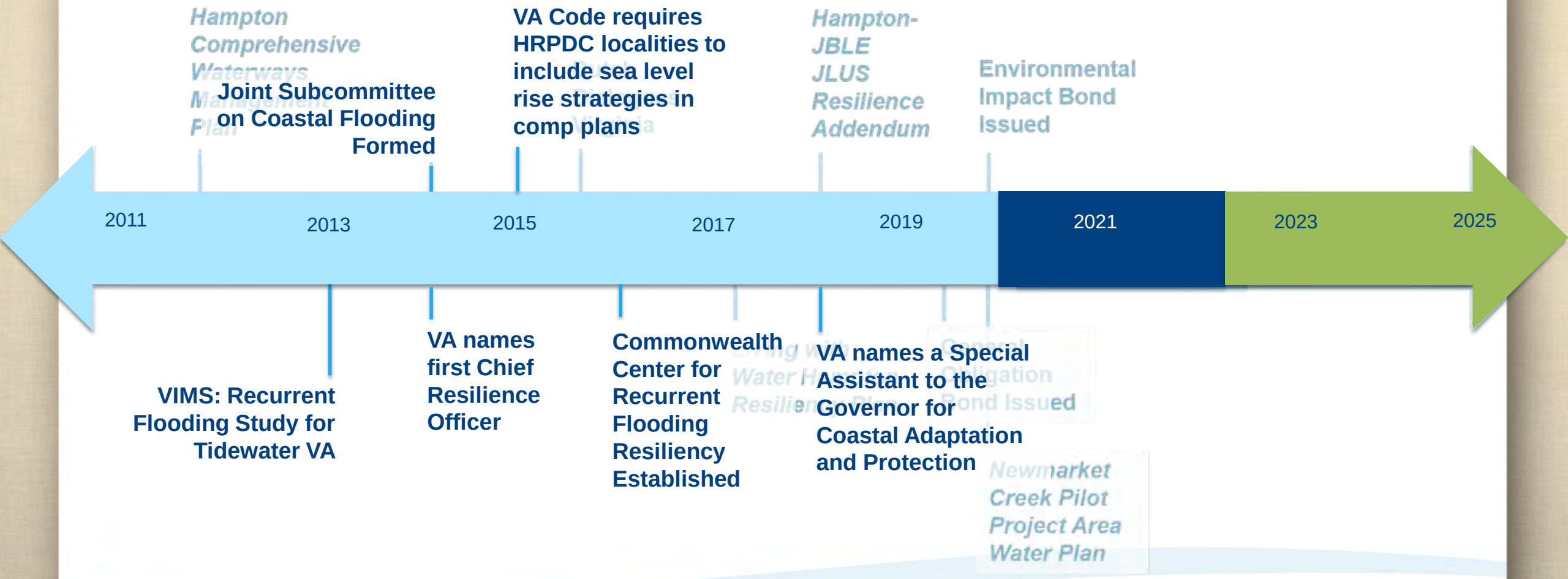
Hampton's Key Milestones



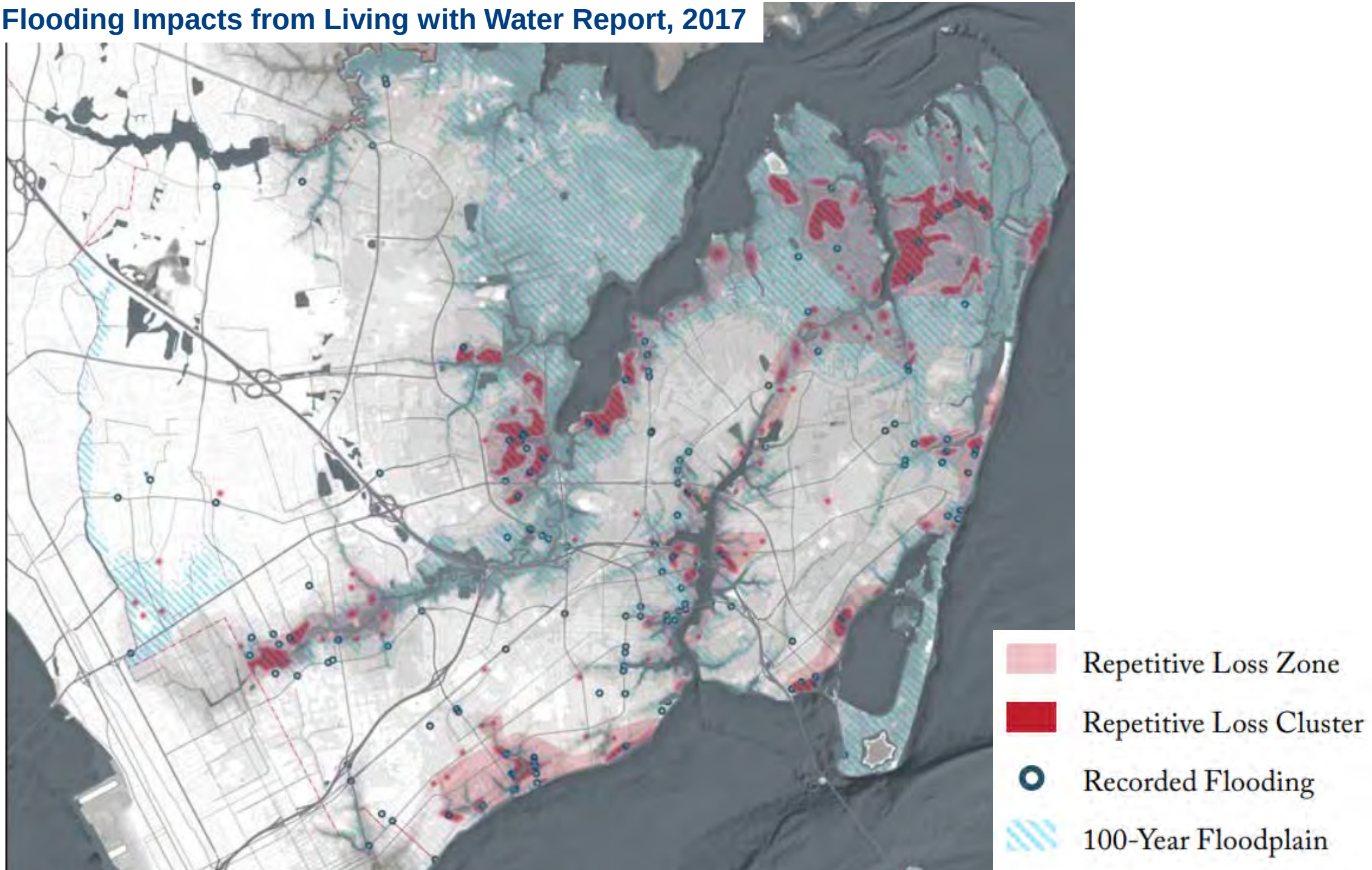
WAGGONNER & BALL · Bosch Slabbers · moffatt & nichol · CHESAPEAKE BAY FOUNDATION Saving a National Treasure · Quantified Ventures

RESILIENT HAMPTON

State Context



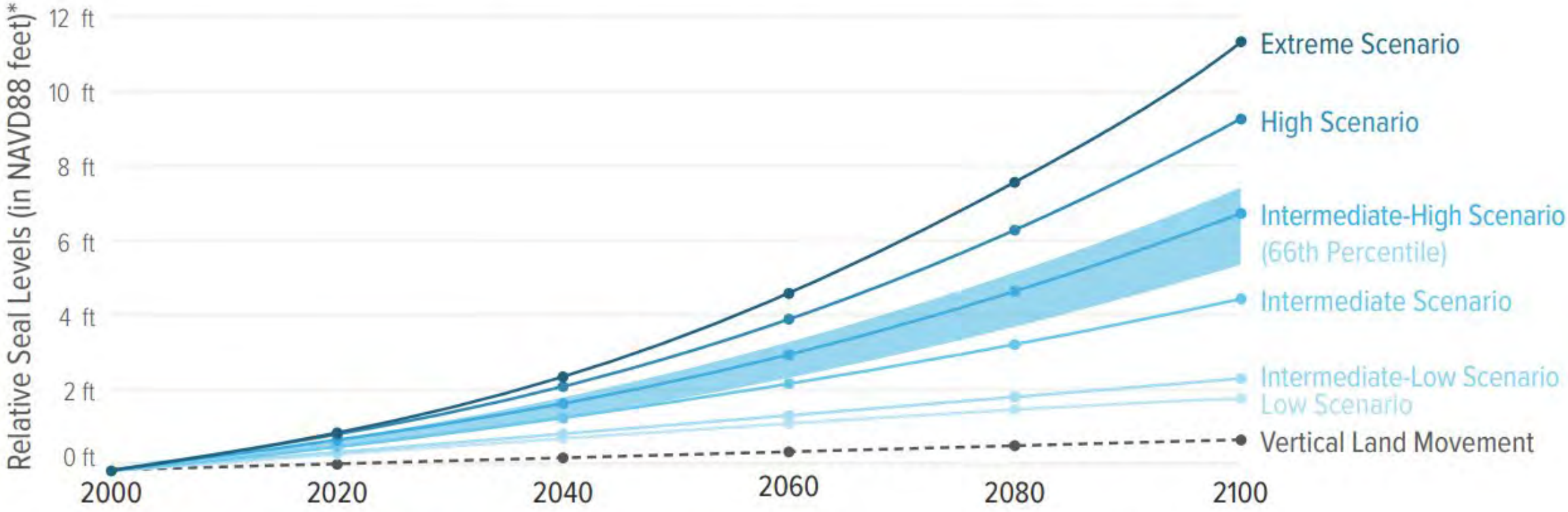
Analysis of Flooding Impacts from Living with Water Report, 2017



Local Relative Sea Level Rise

NOAA et al. 2017 Relative Sea Level Change Scenarios for Sewell's Point in Norfolk, Virginia

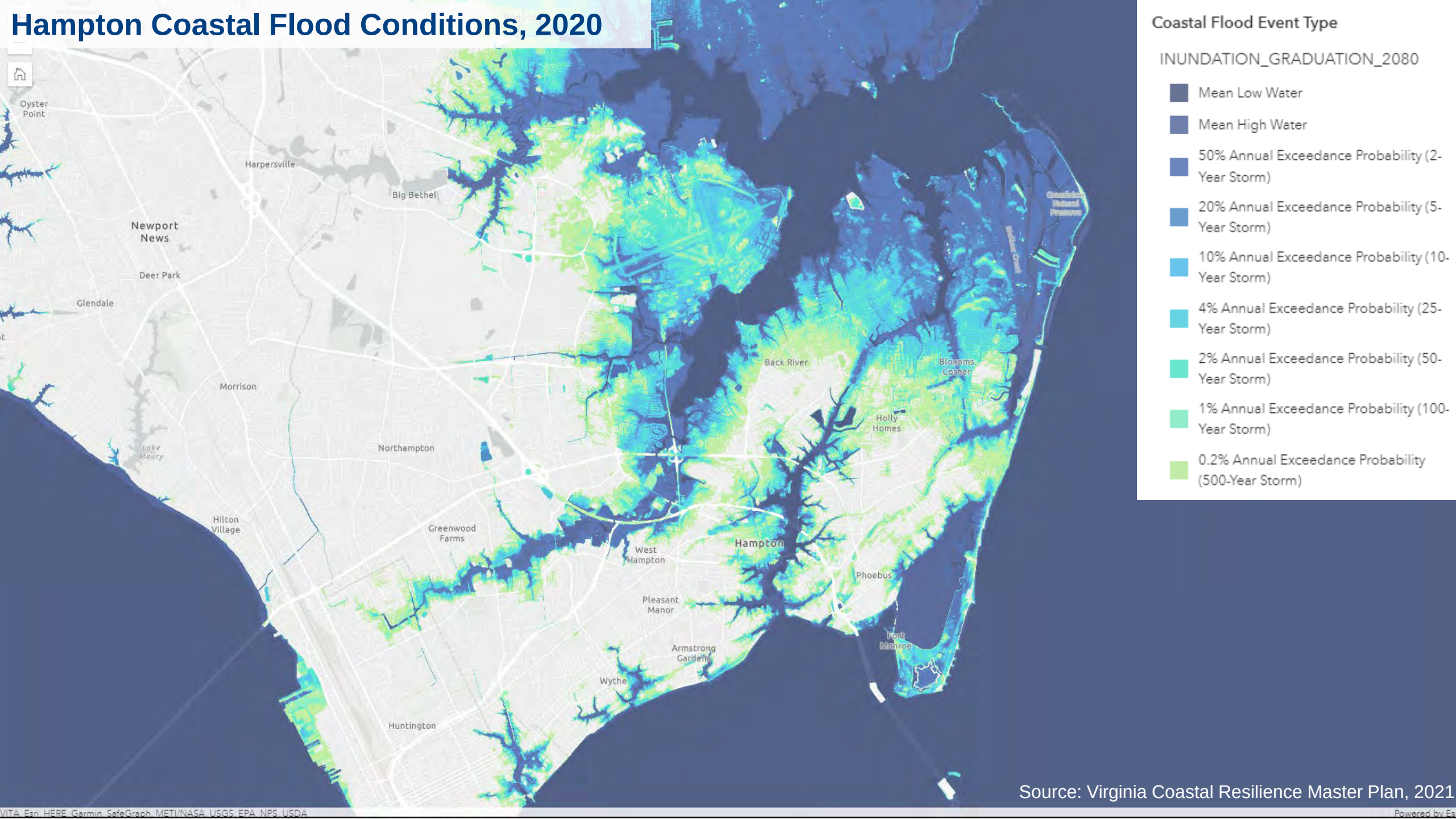
Source: U.S. Army Corps of Engineers (2021)[45]



* Note the North American Vertical Datum of 1988 (NAVD88) is a land-based elevation and is relevant to first-floor elevations and other land-based engineering criteria.

Source: Virginia Coastal Resilience Master Plan, 2021

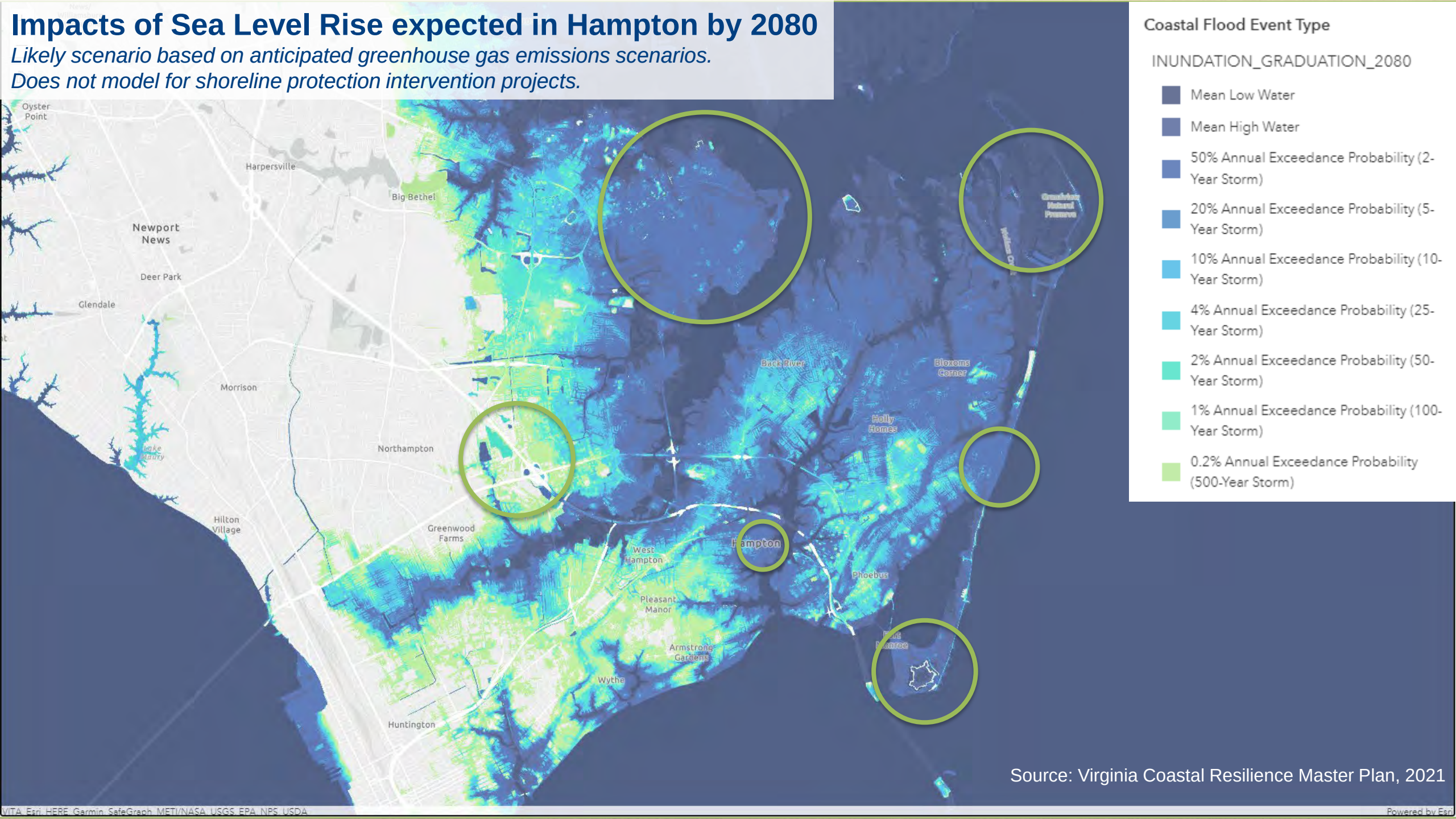
Hampton Coastal Flood Conditions, 2020



Source: Virginia Coastal Resilience Master Plan, 2021

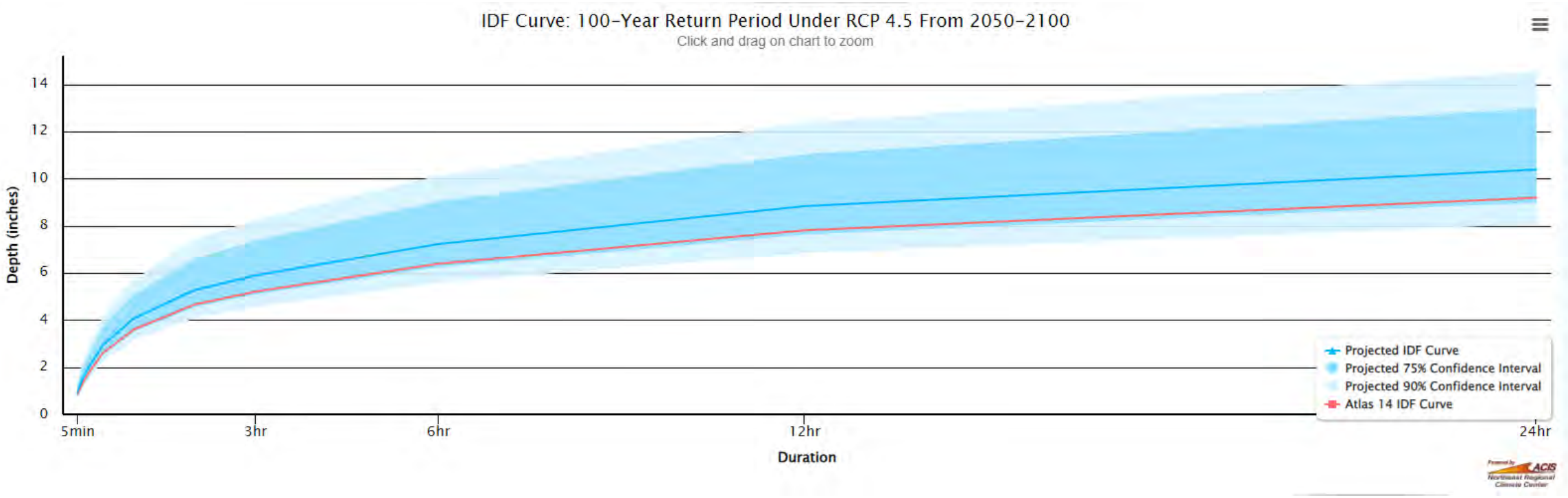
Impacts of Sea Level Rise expected in Hampton by 2080

Likely scenario based on anticipated greenhouse gas emissions scenarios.
Does not model for shoreline protection intervention projects.



Source: Virginia Coastal Resilience Master Plan, 2021

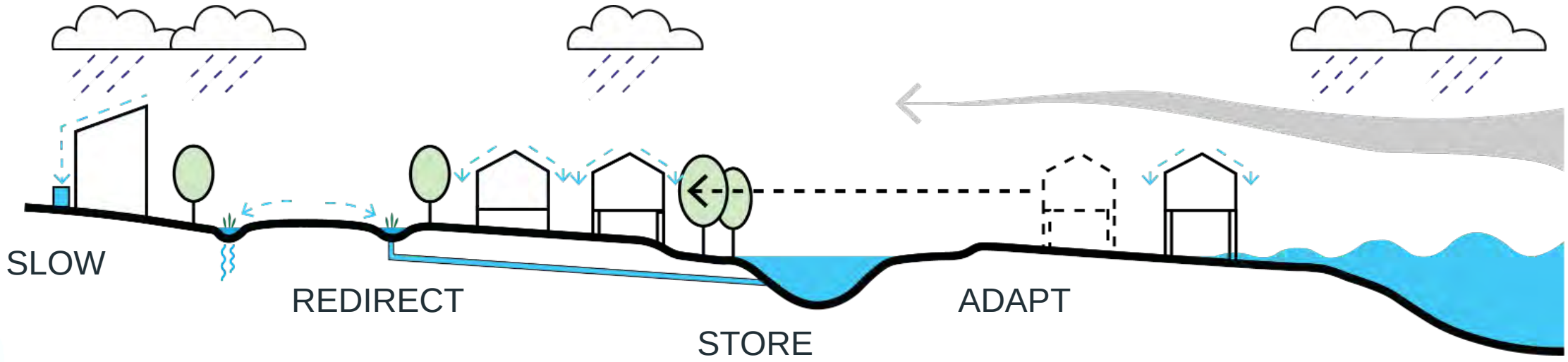
Wetter Storm Events



Studies suggest a need to increase our predictions for rainfall by 20% for the period 2020-2070.

RESILIENT HAMPTON

Our mission is to envision, create, and empower Hampton to live and thrive with water and the impacts of climate change through approaches driven by data and values.



Resiliency Guiding Principles

- Create Value-Driven Solutions
- Reinforce Assets
- Layer Public Benefits
- Strengthen Partnerships
- Use Good Data
- Share Knowledge and Resources

Resiliency Values

- Safe
- Equitable
- Natural
- Heritage
- Integrated
- Sufficient
- Nimble
- Innovative

Resilient Hampton Initiative Goals

RH1. Address the challenges.

RH2. Believe in the initiative.

RH3. Practice nimbleness, adaptation, and accountability.

RH4. Adopt higher standards for resiliency.

RH5. Act at multiple scales.

RH6. Support the community to become highly educated.

RH7. Follow our guiding principles.

RH8. Lead the way.

RH9. Evaluate decisions.

Next Steps Identified in the *Living with Water* plan

PLAN:

- Create a Hampton-Langley JLUS Addendum for Resilience
- Create watershed-level area plans to identify implementable resilience projects

OPERATIONALIZE:

- Update the Community Plan, codes, and ordinances to incorporate resilience
- Establish a tool to evaluate decisions for alignment with resiliency values

MEASURE:

- Set resiliency targets and establish a measurement process

ENGAGE:

- Create a community education plan

Hampton-Langley JLUS Resilience Addendum

Update to the 2010 JLUS to integrate resilience and adaptation

Published August 2018

Goal: maintain mission readiness while improving resilience

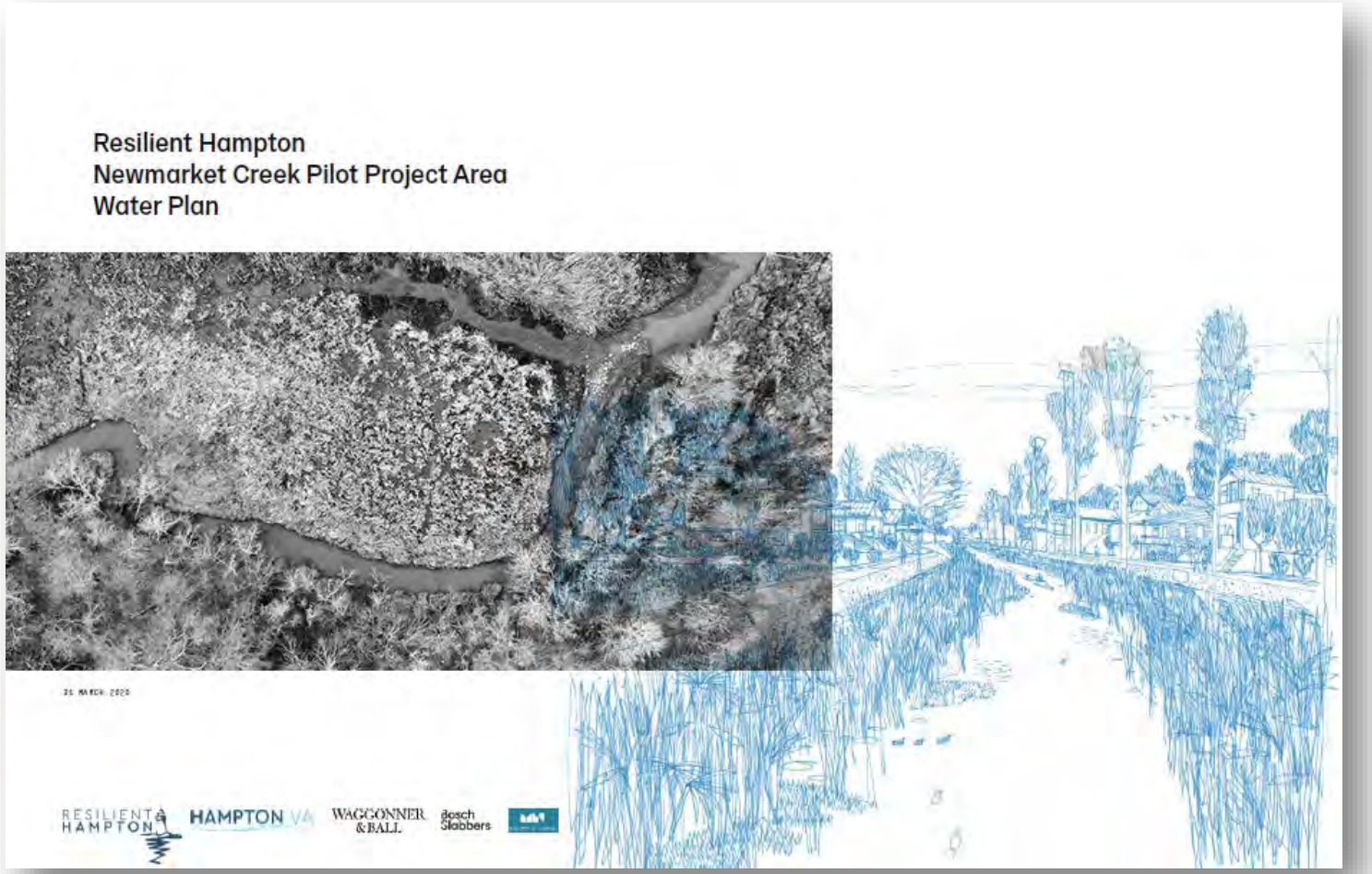
19 recommended strategies in implementation plan

Elevation

The topography of Hampton has a significant amount of low elevations near water, the cause of many flooding issues. Much of JBLE-Langley sits between 5-8' in elevation. Surrounding low wetlands with proximity to the bay and higher ground nearby allow for varied shore conditions and types of access to water.

-1'- 0'
1'- 2'
3'-4'
5'-6'
7'-8'
9'-10'
11'-12'
13'-14'
15'+

Newmarket Creek Pilot Project – Water Plan



Scale	Project	Near Term 1 yr	Mid Term 5 yrs	10 yrs	Long Term 15 yrs
Citywide / Policy	Critical Infrastructure Relocations and/or Retrofits				
	Education Initiative				
	Engagement Plan				
	Evaluation Tool				
	NASA Flood Risk Tool				
	Newport News Coordination				
	Ordinance: Revise Stormwater and Site				
	Policy: Development Buffer Around Floodways				
	Real Time Water Level Sensors				
	10. Buyout Property Conversions				
Projects: Large	02. Government Ditch				
	07. Mercury Boulevard Retrofits				
	09. Big Bethel Blueway				
	13. Mercury Boulevard Connectors/Ditch Retrofits				
	15. N. Armistead Ave. Green Infrastructure & Road Raising				
	17. Coliseum Central Master Plan				
	18. Lasalle Ave. Buffer and East Side Adaptation				
	20. Billy Woods Canal Pathway				
	Loop Trail				
	Room for the Creek				
Projects: Small	01. Sandy Bottom Nature Park				
	03. NetCenter Parking Lot				
	04. Newmarket Square				
	06. Tarrant School				
	09. Former Mallory School				
	11. Briarfield Park				
	12. Patriot Center and Newmarket Creek Water Walk				
	14. Crossroads Parking Lot				
	16. Lake Hampton				
	19. Kmart Site Redevelopment				
	Parcel Grant Program				
	Sentara Parking Lot				

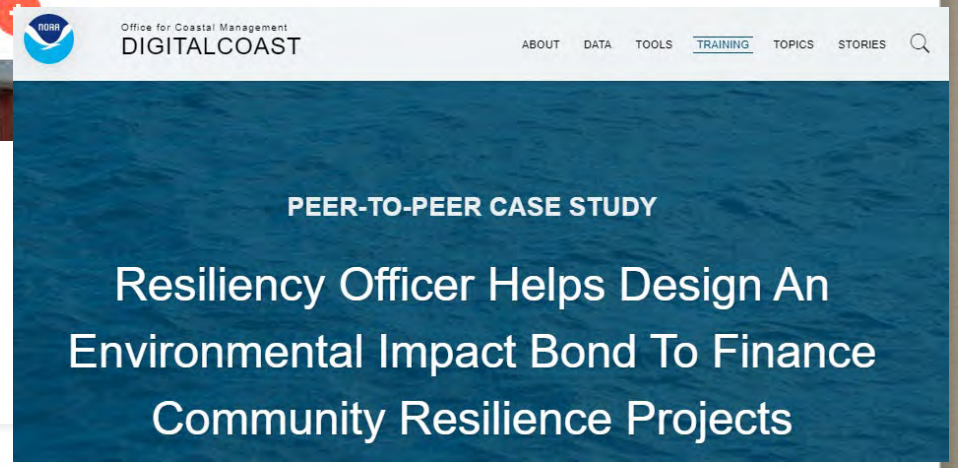
Pilot Projects Organized by Scale and Expected Time for Implementation

Environmental Impact Bond

$12 million in financing for three projects in the Newmarket Creek Watershed.

Transparent outcome evaluation and disclosure on environmentally and socially beneficial projects.

Our goal is to add 8.6 million gallons of stormwater storage capacity.



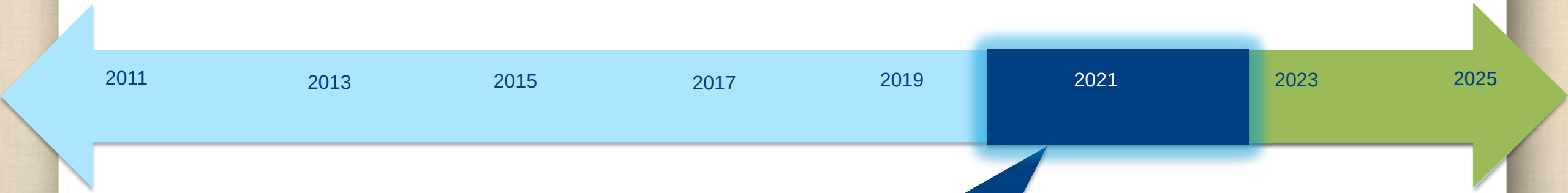
Key Takeaways & Questions

1. Climate change is creating extreme challenges for Hampton's future.

2. Through Resilient Hampton, the City has been a dedicated innovator in anticipating and planning to adapt to climate impacts over the past decade.

3. The State has increasingly stepped into a leadership role to address flooding challenges.

Are there any observations or feedback Council would like to share with staff when looking back on Hampton's resiliency work since the Dutch Dialogues?



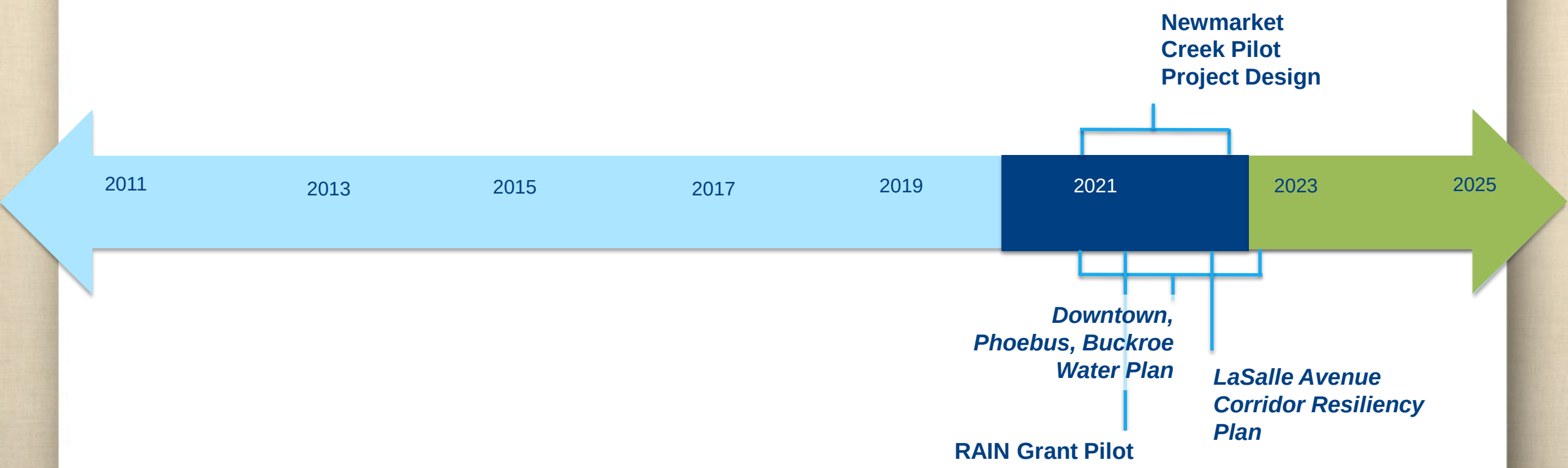
2

Where we are today

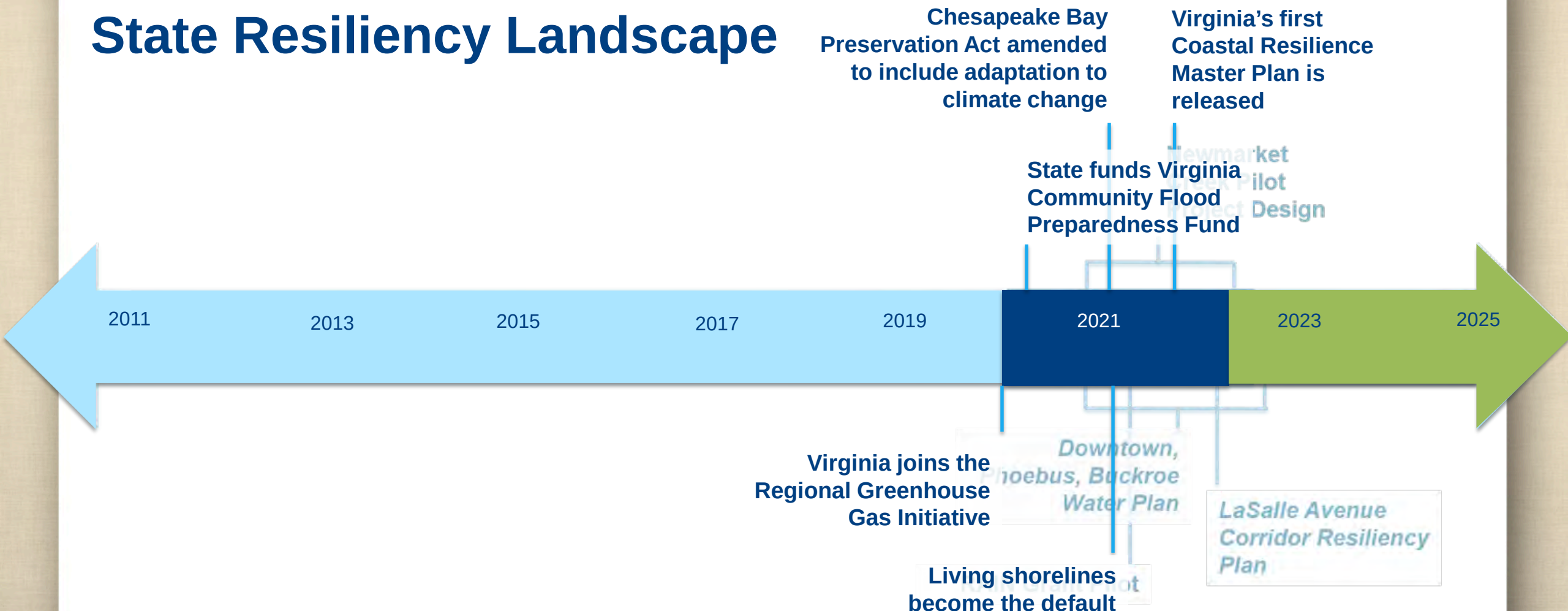
Resiliency Landscape

Projects & Programs

Hampton's Recent and Ongoing Efforts



State Resiliency Landscape



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RESILIENT HAMPTON

Context of Resiliency

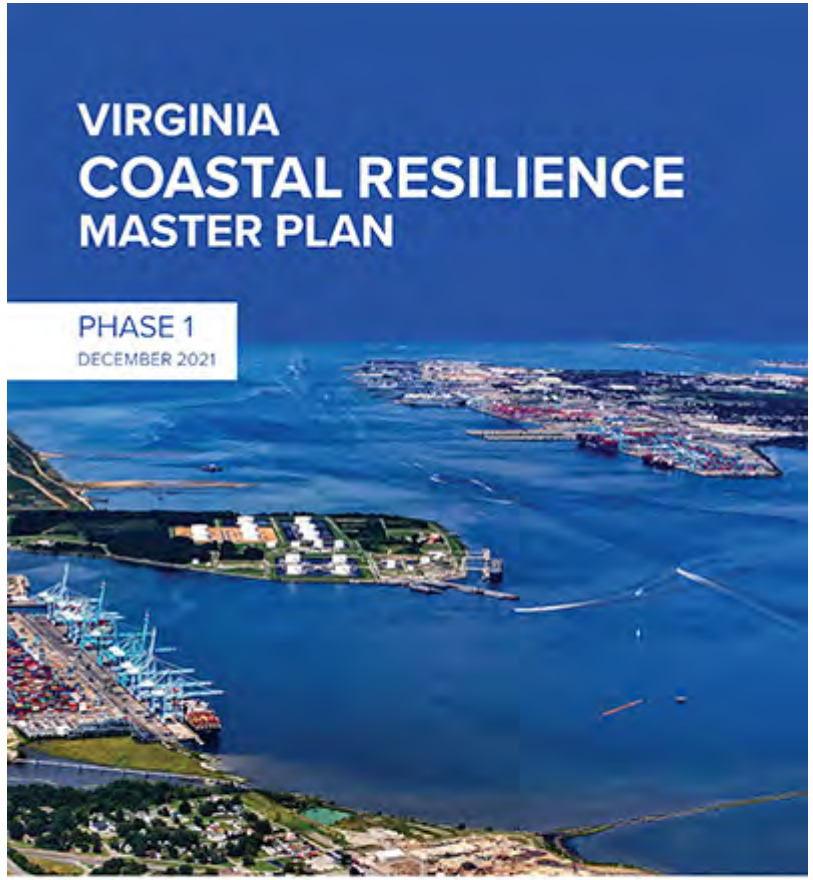
At the state and federal levels:

- Recognition of impacts of climate change, and addressing them as a function of government.
- Focus on integrated approaches to resilience:
  - Water quantity *and* water quality
  - Socioeconomic equity in approach and outcomes – set-asides
  - Built and natural infrastructure
- Increasing funding for resiliency: ARPA, IIJA, Virginia Community Flood Preparedness Fund

Virginia Coastal Resilience Master Plan

- Released December 7th, 2021
- Identifies coastal risk and impacts of climate change on:
  - Community resources
  - Critical Sectors
  - Natural Infrastructure
- Identifies existing projects (3 in Hampton)
- Outlines next steps for state leadership

www.dcr.gov/crmp/plan



Office of Governor Ralph S. Northam
Commonwealth of Virginia

DCR

Chesapeake Bay Program

Improving water quality in the Chesapeake Bay

- EPA established Total Maximum Daily Load (TMDL) “pollution diet” in 2010
  - Designated use and pollution loads for 92 tidal segments of Bay
- Compliance guidelines tied to Municipal Separate Storm Sewer System (MS-4) Permitting Cycle. For Hampton:
  - 2016-2021: achieve 5% of TMDL - $7 million
  - 2022-2027: achieve 40% of TMDL - $40 million
  - 2028-2032: achieve 100% of TMDL - $84 million

Funding: Community Flood Preparedness Fund

- Funded with portion of proceeds from Regional Greenhouse Gas Initiative (RGGI).
- $102.1 million in funding generated between March and December 2021. To date, $32.3 million awarded.
- Hampton received funding for **7 projects**, totaling more than **$9.5 million** (29% of all awarded funds)

DCR Virginia Department of Conservation & Recreation

VRA Virginia Resources Authority

Funding: ARPA and Living with Water

Funding for Infrastructure Needs Category

Living with Water / Resiliency projects: $25.7 million

- $3 million Dredging Waterways
- $6 million Maximizing Stormwater Capacity
- $6.4 million Neighborhood Drainage
- $7 million Buckroe Beach Nourishment
- $3.3 million Coliseum Lake Weir

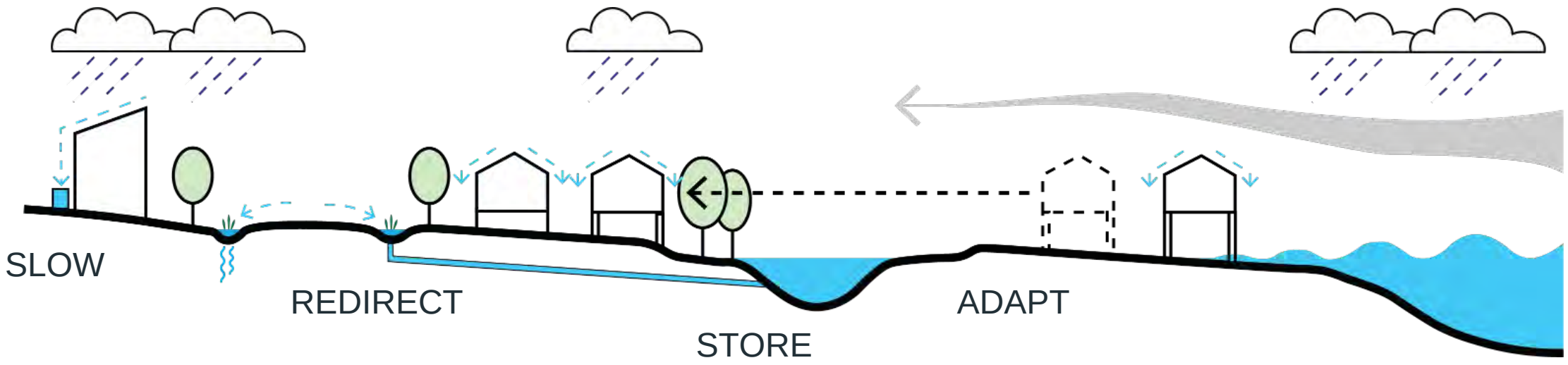
Funding: Infrastructure Investment and Jobs Act

$1 Trillion Infrastructure Bill

- More than $13.7 billion in grants over 5 years for resilience:
  - Structural flood mitigation
  - Resilience loan fund creation for infrastructure projects
  - Hazard mitigation and risk reduction
  - Transportation resiliency
- Additional funding for roads, bridges, rail, climate mitigation

Projects & Programs

Living with Water Approach



Stormwater Management Approach

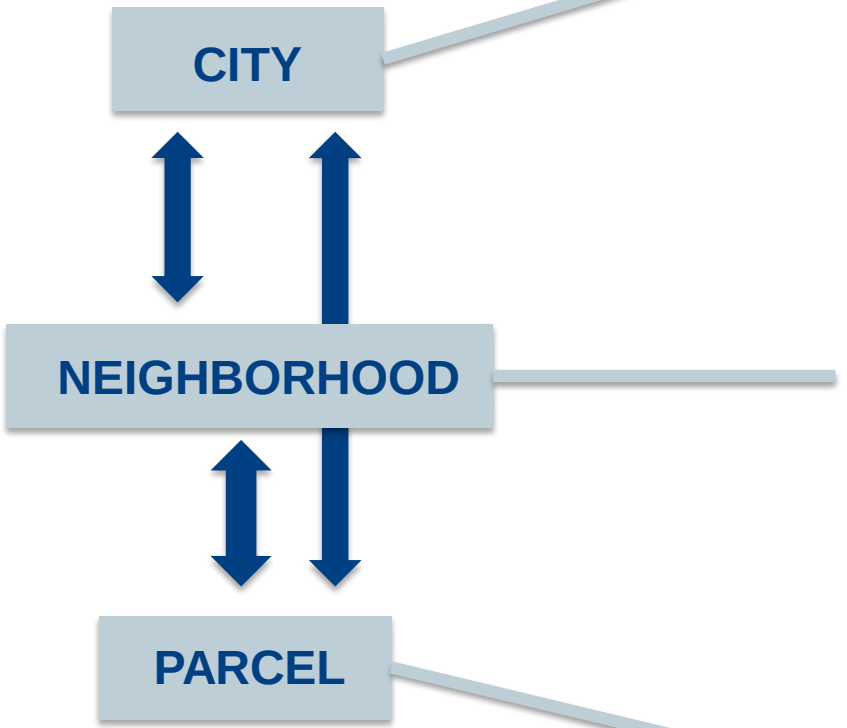
Meet water quality requirements

- 40% TMDL reduction by 2027

Reduce nuisance flooding

- Upgrade stormwater system to accommodate 10 year storm
- Increase stormwater storage throughout the entire system

Living with Water Key Projects Underway



- Evaluation Tool
- Engagement Plan

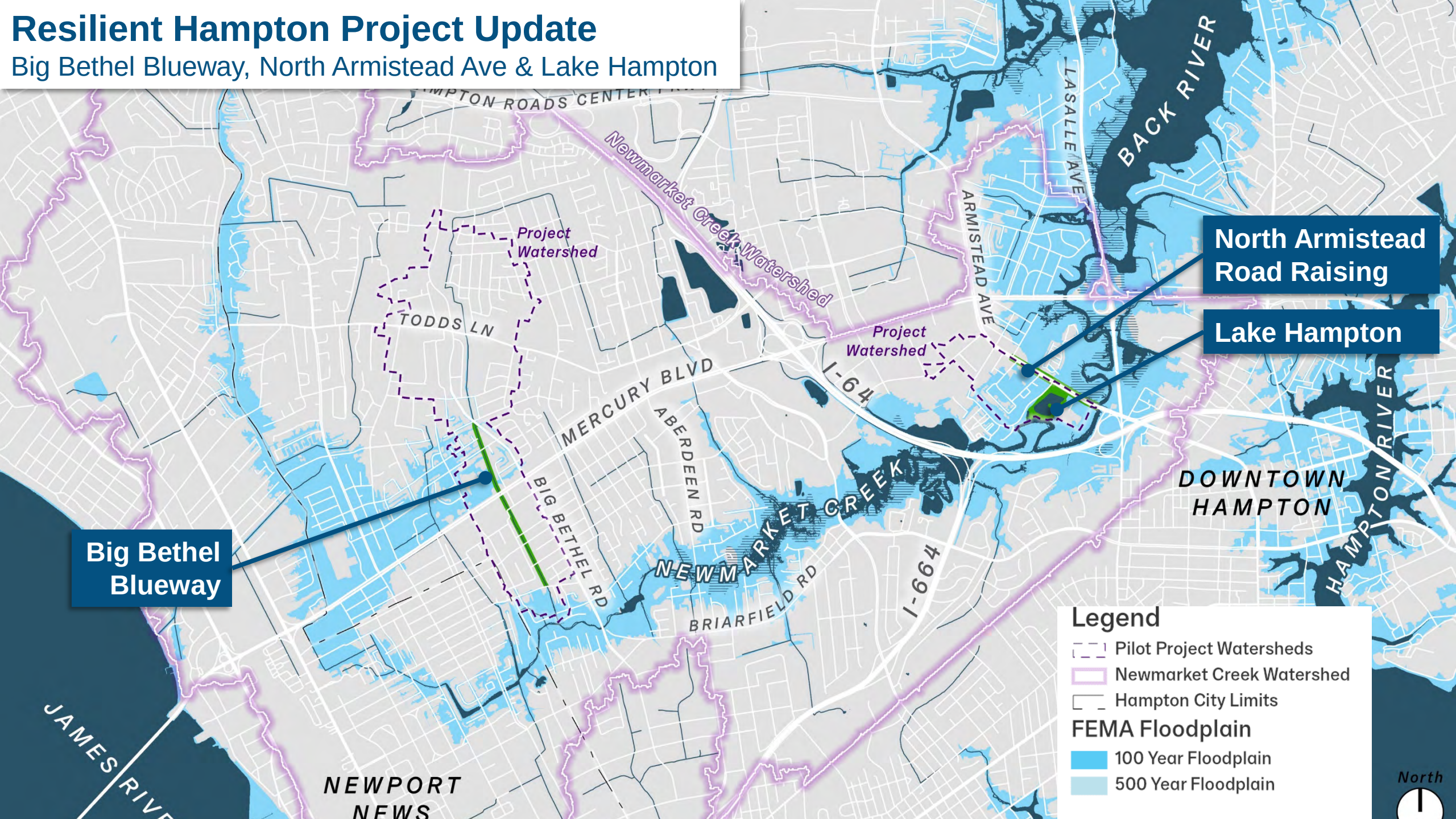
- **Big Bethel Blueway**
- **N Armistead Ave Green Infrastructure and Road Raising**
- LaSalle Ave Corridor Resiliency Plan
- US Army Corps of Engineers Newmarket Creek Study
- **Downtown, Buckroe Phoebus Water Plan**
- **Mill Point Living Shoreline**
- **Honor Park Resilience Park**
- **Neighborhood Level Stormwater System Improvements** (Aberdeen Gardens, Dunbar Gardens, Shell Road, Salter's Creek)
- Phoebus Waterfront Park Partnership (Adopt-A-Spot)

- **Lake Hampton**
- RAIN Grant
- **Coliseum Lake Weir Replacement**

Newmarket Creek Pilot Projects

Resilient Hampton Project Update

Big Bethel Blueway, North Armistead Ave & Lake Hampton

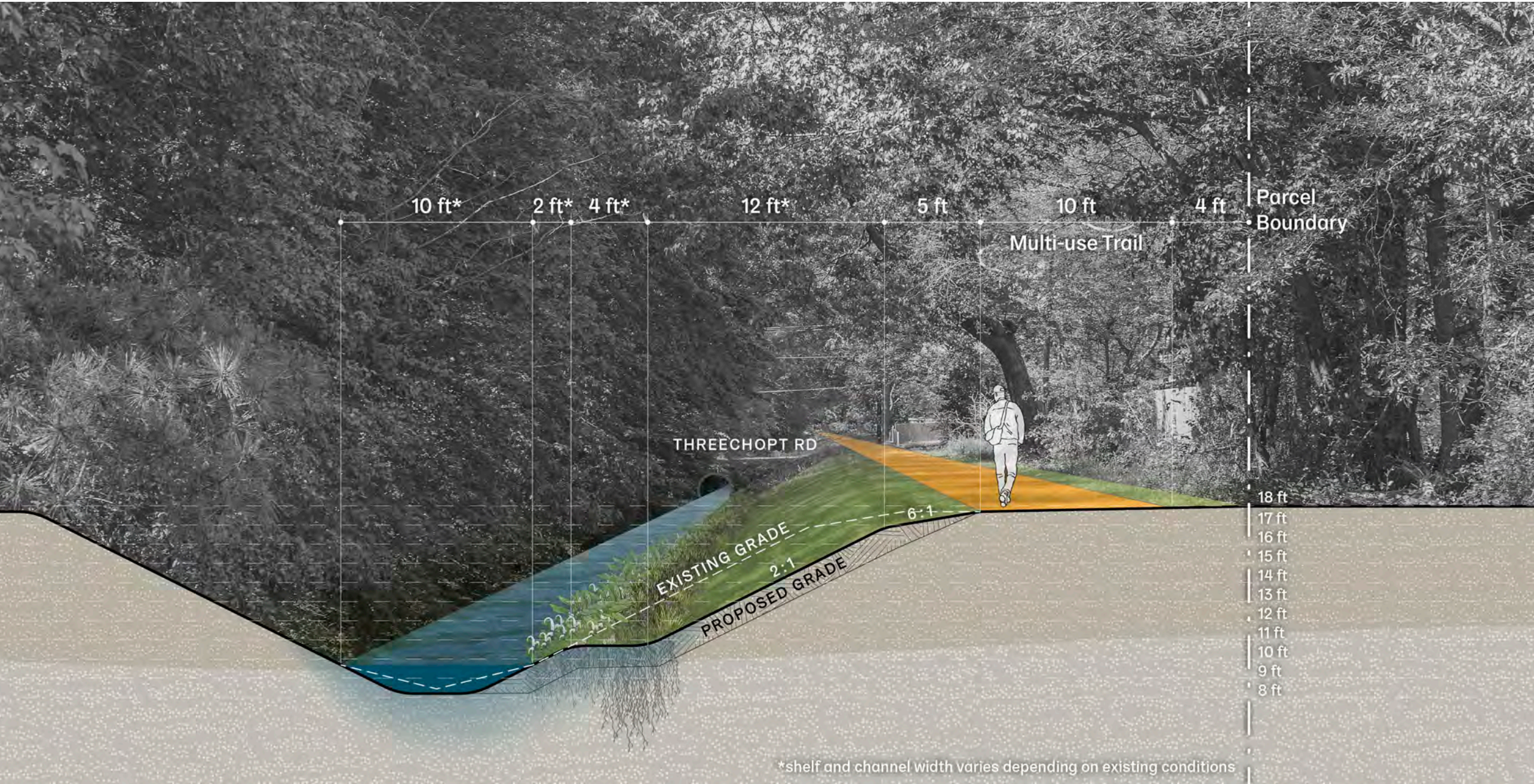


Big Bethel Blueway Project

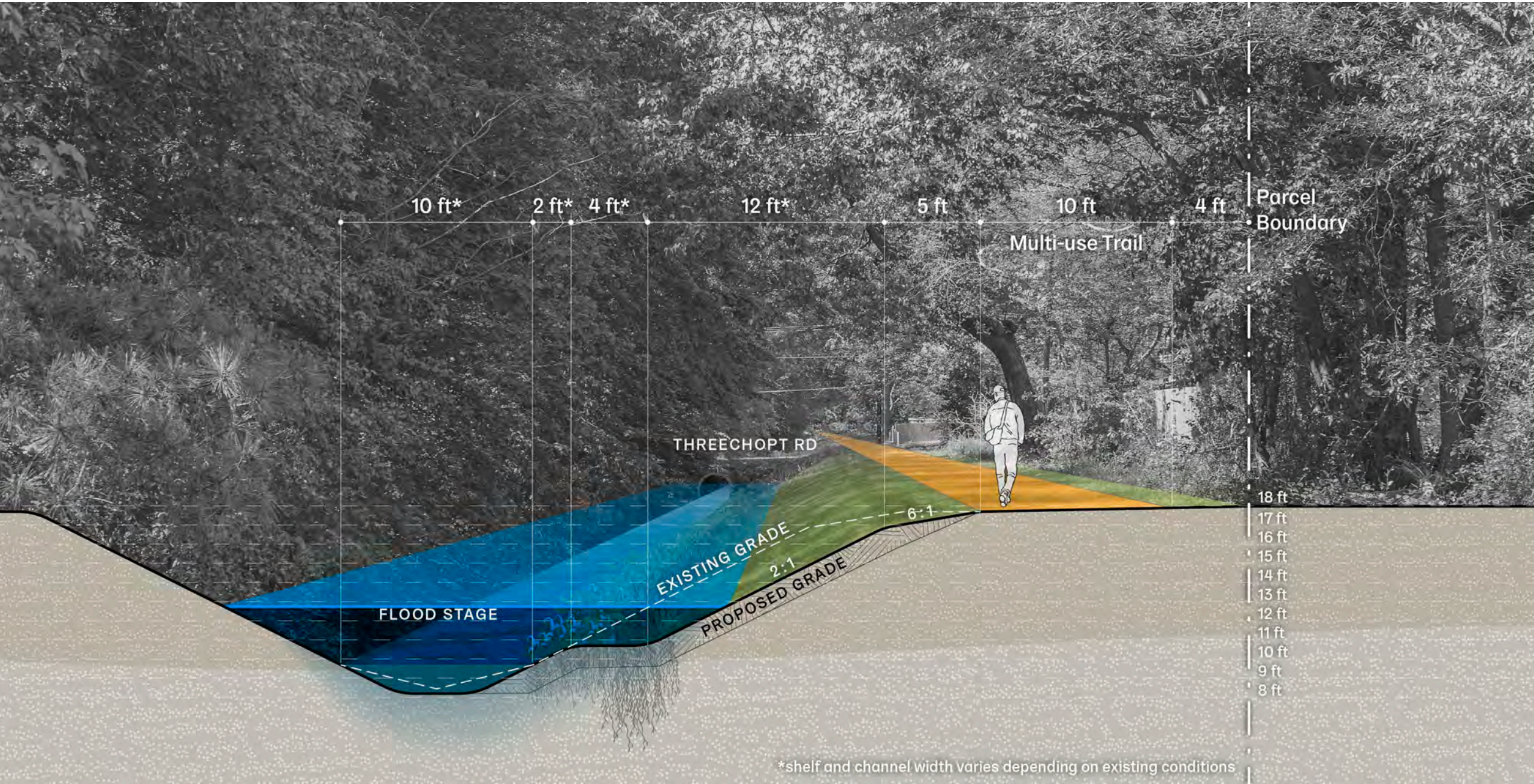
8.3 acre-feet of water storage	→	**Introduce less total water volume into Newmarket Creek to reduce the frequency and severity of local flooding events.**
6,000 linear feet of multi-use path	→	**Connect residents to the water, and create more opportunity for non-vehicular mobility.**
Native plant installation	→	**Create habitat and improve water quality.**

Existing Condition

Big Bethel Blueway: After Construction



Big Bethel Blueway: After Construction



Big Bethel Blueway: Weir

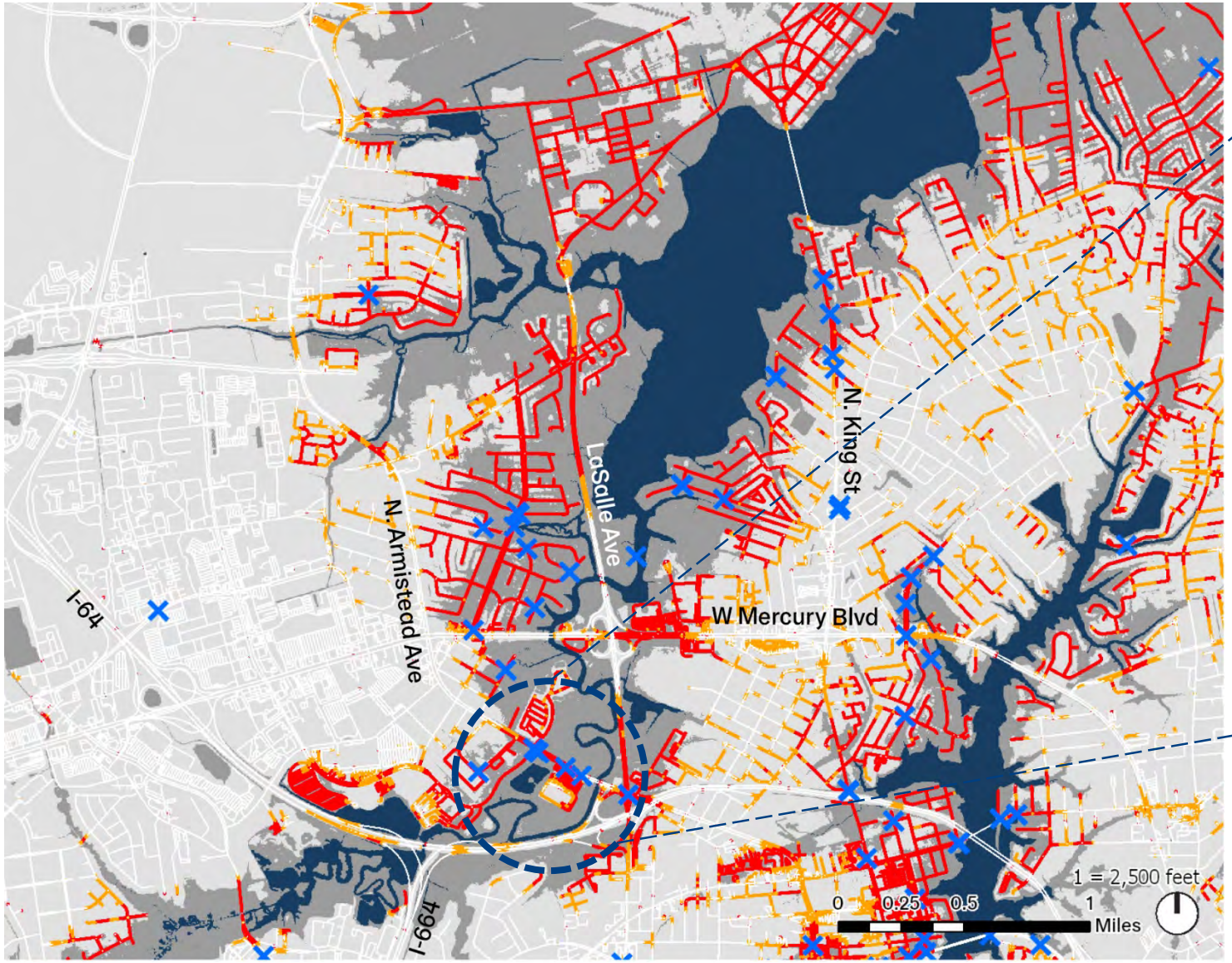
Sculpture Garden Weir
New Orleans City Park
Reed Hilderbrand

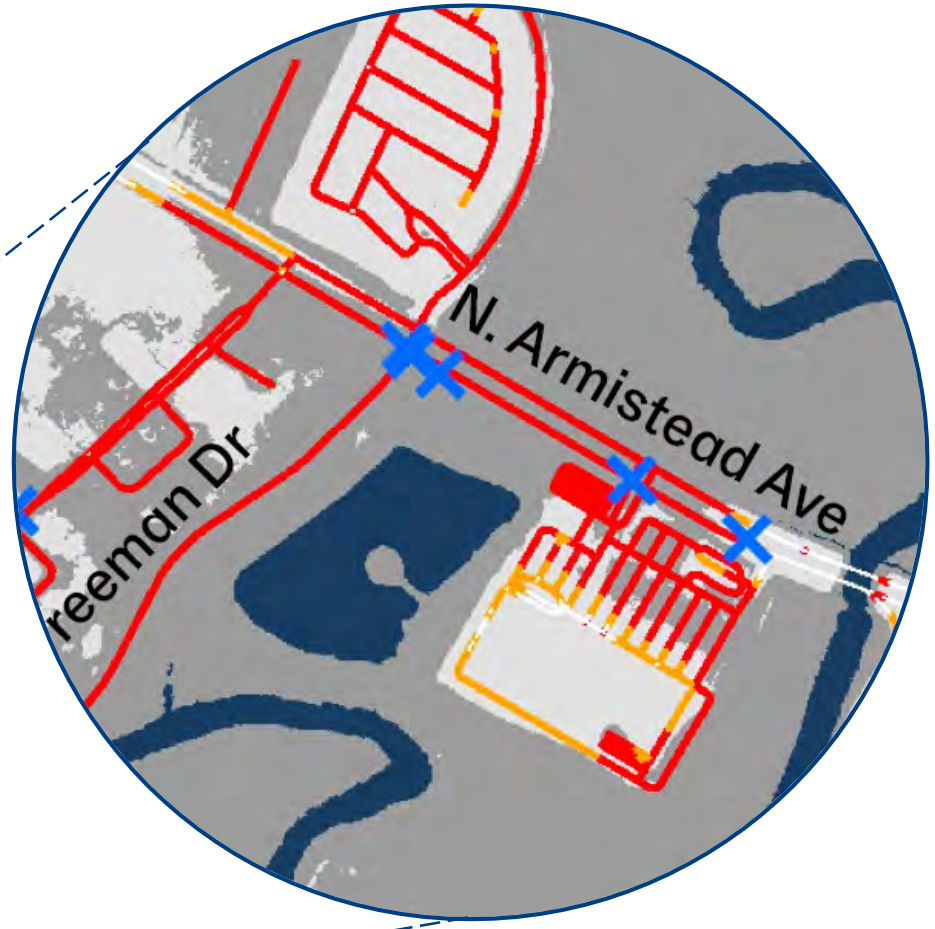
Weir at Coliseum Lake
Hampton, VA

N Armistead Ave & Lake Hampton Project

Road elevated to at least 7.5ft above sea level	→	**Reduce roadway flooding from tidal floods and storm surge.**
18.9 acre-feet of water storage	→	**Store more water in the lake from the roadway and surrounding properties.**
1.25 miles of sidewalk and trails	→	**Create connections to WaterWalk Trail, and improve bicycle and pedestrian safety.**
0.5 acres of new wetlands, 0.2 acres of bird habitat	→	**Create and protect habitat.**

Roadways at Flood Risk





Roadways at Risk

- ≤ +7 feet NAVD88
- +8 feet
- Frequently Flooded Streets

Land Elevation

- ≤ 0 feet NAVD88
- ≤ +7 feet
- > +7 feet


CREEK FLOODING
HAMPTON COLISEUM
I-64
LAKE HAMPTON
RUNOFF
ARMISTEAD AVE
TIDAL BACKFLOODING
TIDAL FLOODING
LASALLE AVE
NEWMARKET CREEK
AIR POWER PARK
NORTH


CREEK FLOODING
HAMPTON COLISEUM
I-64
BERM
LAKE HAMPTON
RE-DIRECTED RUNOFF
ARMISTEAD AVE
ROAD RAISING
TIDAL FLOODING
LASALLE AVE
NEWMARKET CREEK
AIR POWER PARK
NORTH


Legend
Existing Paths
New Path Network
Boardwalk
Wetland Water Storage
Bioswale Water Storage
Drainage Paths Pipe
Drainage Path Overland
Extent of Armistead Ave Road Raising
Lake Hampton Park
1/8 Mile
North
FINDLEY ST
MERCER AVE
AIR POWER PARK
MAPLE LN
DETENTION BASINS
BIOSWALES
BOARDWALK
ARMISTEAD AVE
LAKE HAMPTON
HAMPTON COLISEUM
FREEMAN DR
NEWMARKET CREEK
HOME DEPOT
BIRD ISLAND
BERM
WEIR BOX
WETLAND SHELF
NEWMARKET CREEK

Lake Hampton: Existing Shoreline

Lake Hampton: Crescent Boardwalk

Pilot Projects: Key Impacts

20,217 people

# of residents living in census tracts where the projects are located

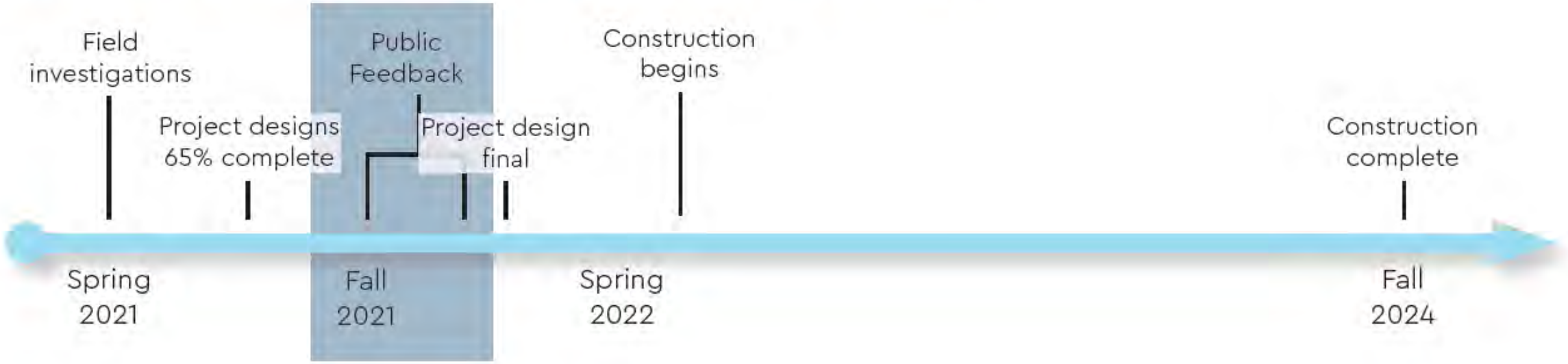
92 hours

Reduction in annual average flooding on stretch of N Armistead Ave

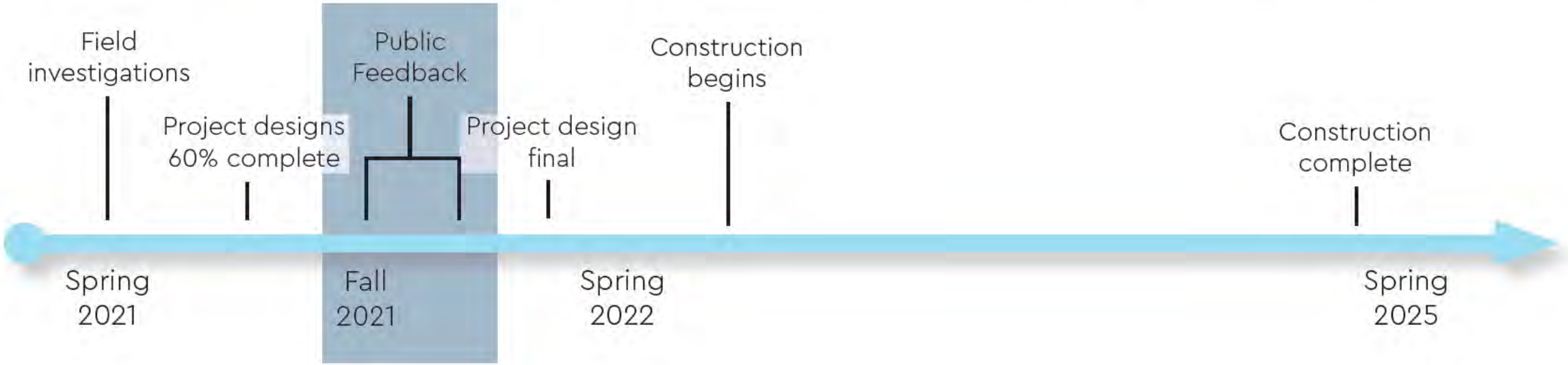
10.2%

Of nearby stormwater runoff will be managed by the projects during a 10-year storm event

BIG BETHEL BLUEWAY PROJECT TIMELINE



LAKE HAMPTON & N ARMISTEAD AVE PROJECT TIMELINE



Community Outreach

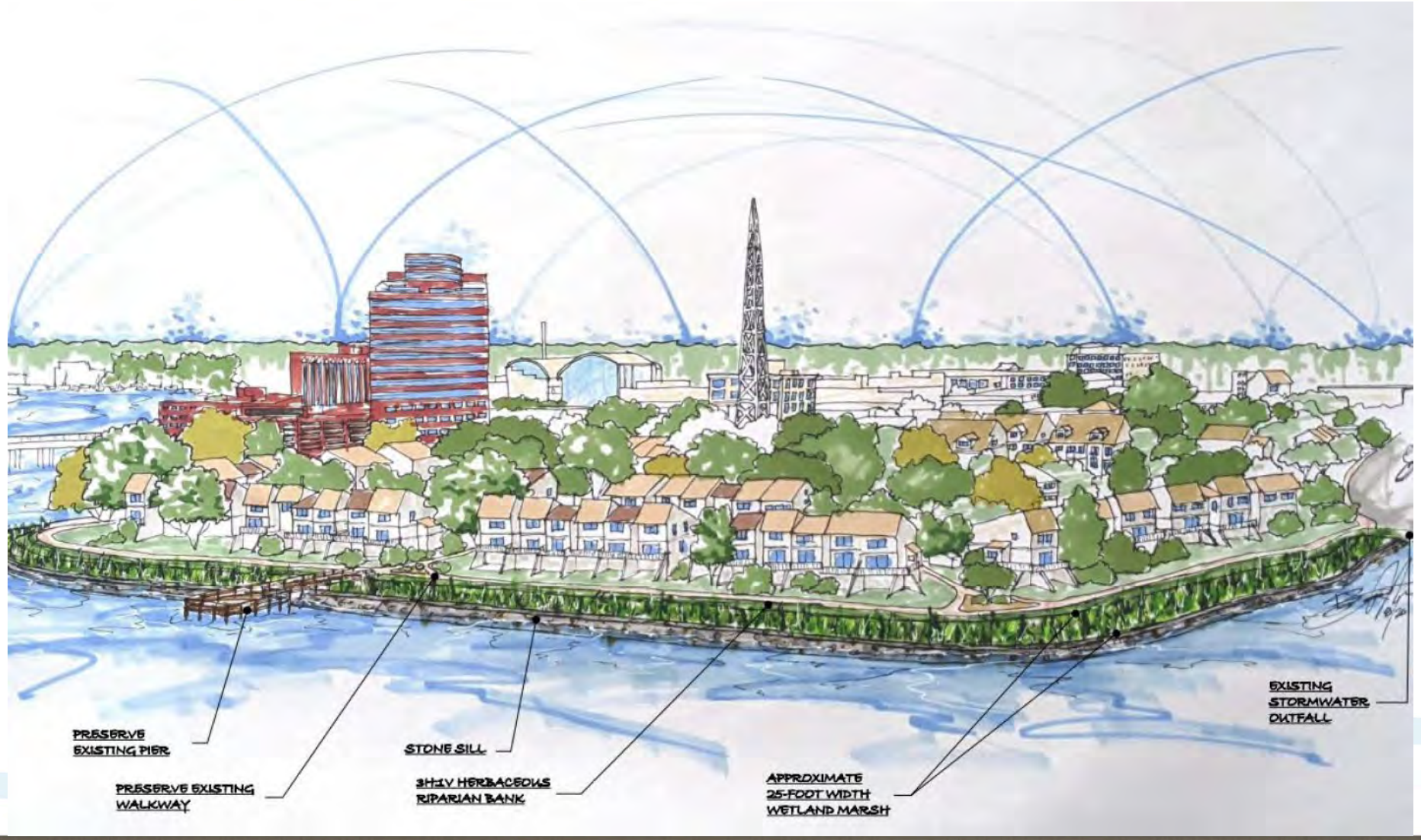
Some things we've heard:

- Support for investment in flood mitigation in these areas
- Positive sentiment around new walking trails, with hesitations around nuisances
- Interest in maintaining habitat and tree canopy
- Interest in increased water access
- Strong sense of community and desire to maintain it

Additional Living with Water Projects

Phoebus Waterfront Park

Mill Point Living Shoreline



Honor Park Resilience Park

Coliseum Lake Weir Replacement

Neighborhood Drainage Improvements

Proposed project areas:

- Aberdeen Gardens
- Dunbar Gardens
- Phoebus – Sherwood Ave, Hygeia Ave and North Street
- Shell Road Neighborhood
- Salter’s Creek

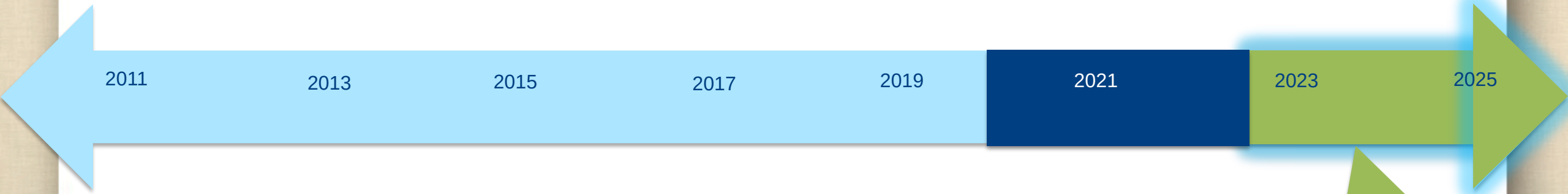
Key Takeaways & Questions

1. There is more attention and funding available from state and federal sources for cities for climate change adaptation and resilience than ever before.

2. There is increasing urgency around aligning water quality and quantity efforts.

3. Hampton's investment in resiliency has established the City as a leader and innovator in the resilience field. Key challenges we will face to maintain that role will be driven principally by:
   - Funding
   - Staff Capacity

Does City Council have any general thoughts for how we can maintain our role as a resiliency leader, and expand our reach and impact?



3

Where we're headed

Future directions

Challenges

Water Plans

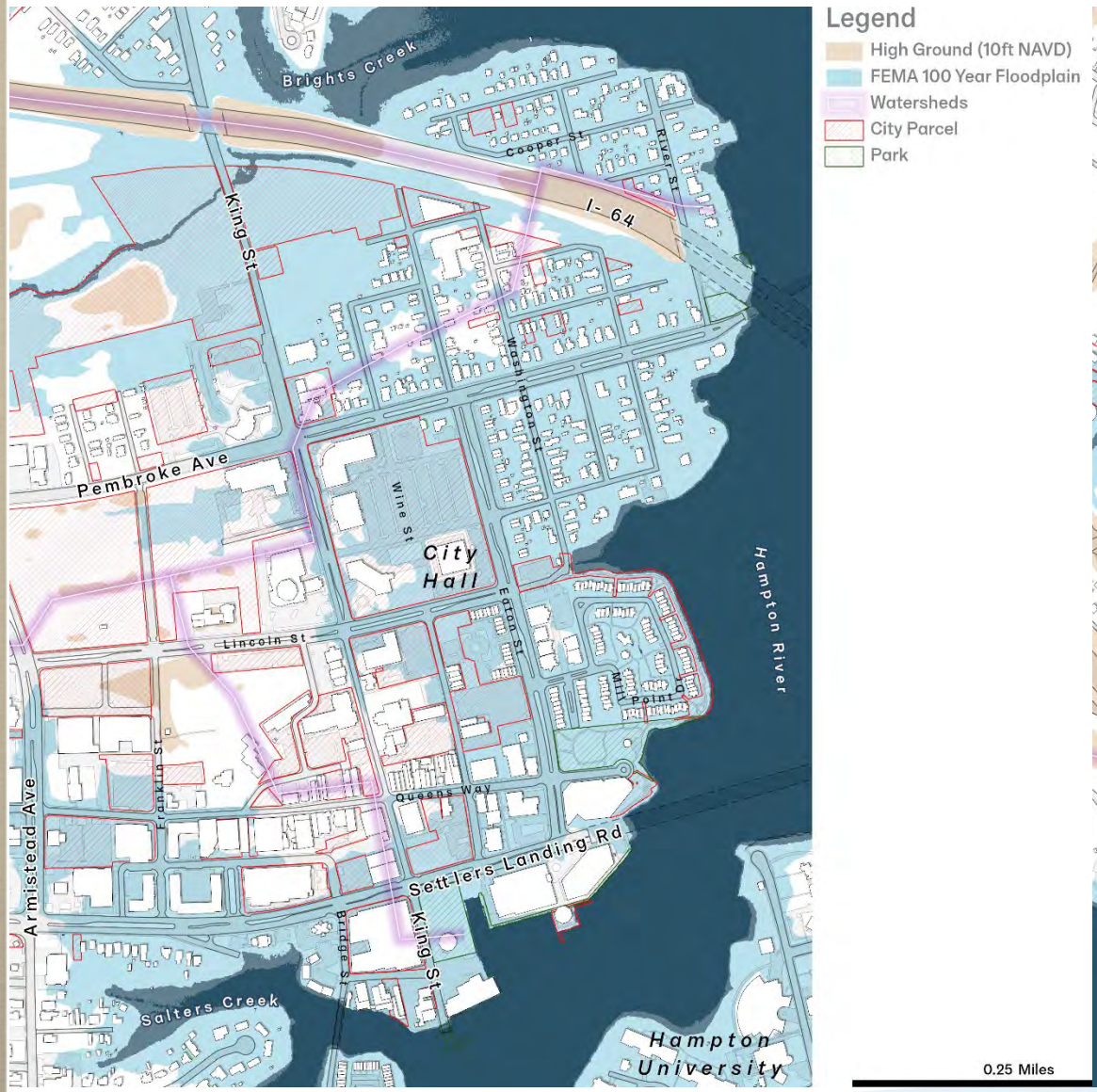
1. **Newmarket Creek:** Complete

2. **Downtown, Phoebus and Buckroe:** In early planning stage

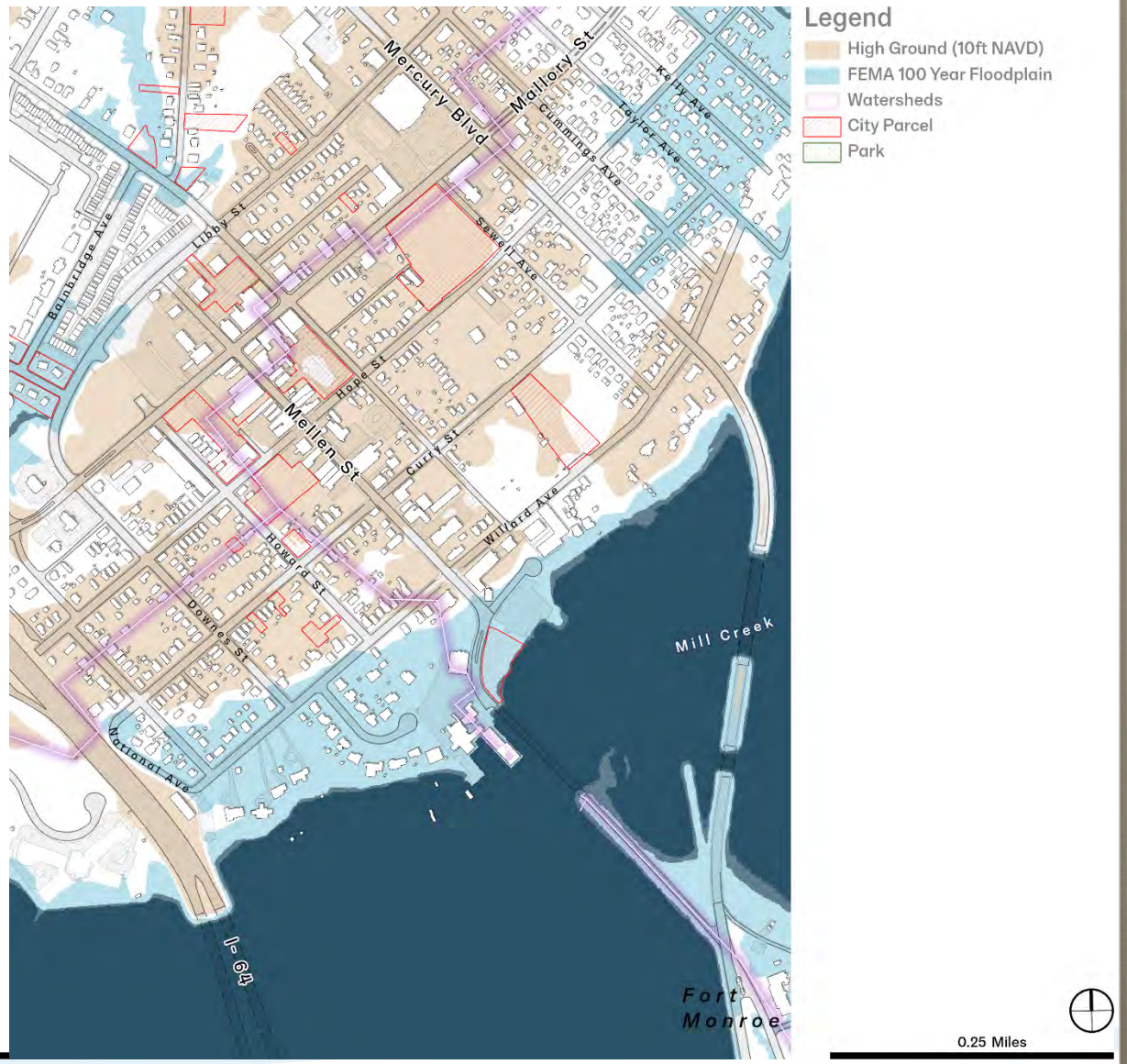
Additional Areas to Cover:

- Low-Lying
- Harbor Facing
- Southwest Branch Back River

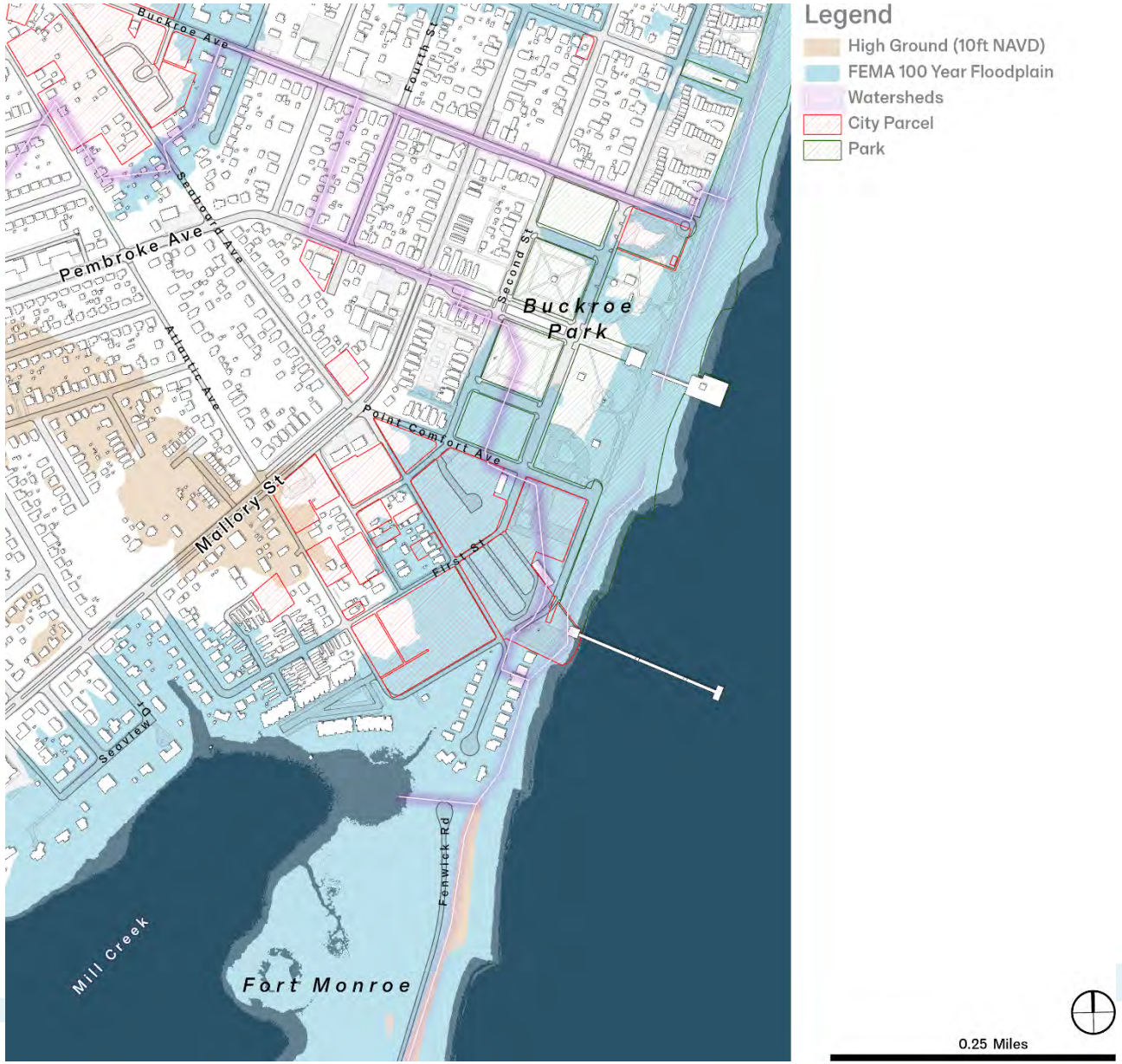
Downtown



Phoebus



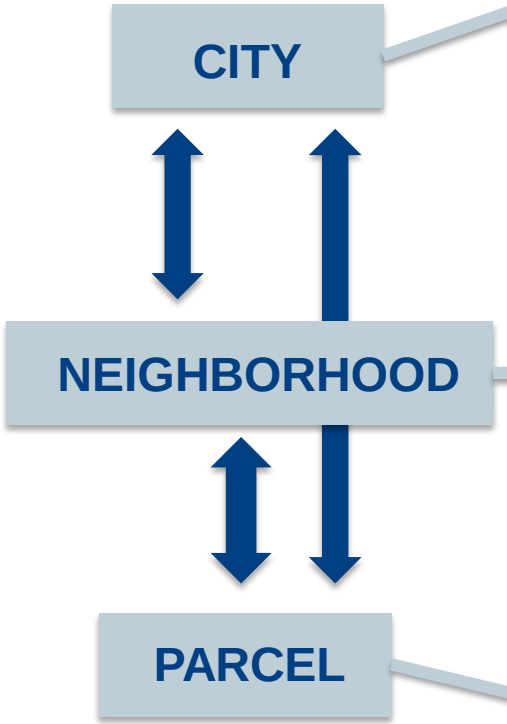
Buckroe



Preliminary Key Findings

- Impacts of flooding are already significant.
- Sea level rise will expand flood hazard areas in each of the study areas to cover nearly their entirety in the next 60 years.
- Impervious surface creates challenges for stormwater management and heat in Downtown and Phoebus.
- Older structures are prevalent and more at-risk.
- At-risk roadways create challenges for transportation.

Living with Water Key Projects Underway



- **Evaluation Tool**
- **Engagement Plan**

- Big Bethel Blueway
- N Armistead Ave Green Infrastructure and Road Raising
- **LaSalle Ave Corridor Resiliency Plan**
- US Army Corps of Engineers Newmarket Creek Study
- Downtown, Phoebus, Buckroe Water Plan
- Mill Point Living Shoreline
- Honor Park Resilience Park
- Neighborhood Level Stormwater System Improvements (Aberdeen Gardens, Dunbar Gardens, Shell Road, Salter's Creek)
- Phoebus Waterfront Park Partnership (Adopt-A-Spot)

- Lake Hampton
- **RAIN Grant**
- Coliseum Lake Weir Replacement

LaSalle Avenue Corridor Resiliency Plan

- Identified in JLUS Resiliency Addendum and Newmarket Creek Water Plan.
- Funded by federal Department of Defense grant.
- Goal: Maintain access to LAFB via LaSalle Ave Gate.
  - Gate currently serves 35% of base's traffic, and expected to increase.
  - Access corridor faces risks from flooding and sea level rise.
- Recommends 12 mitigation measures in 6 construction phases.

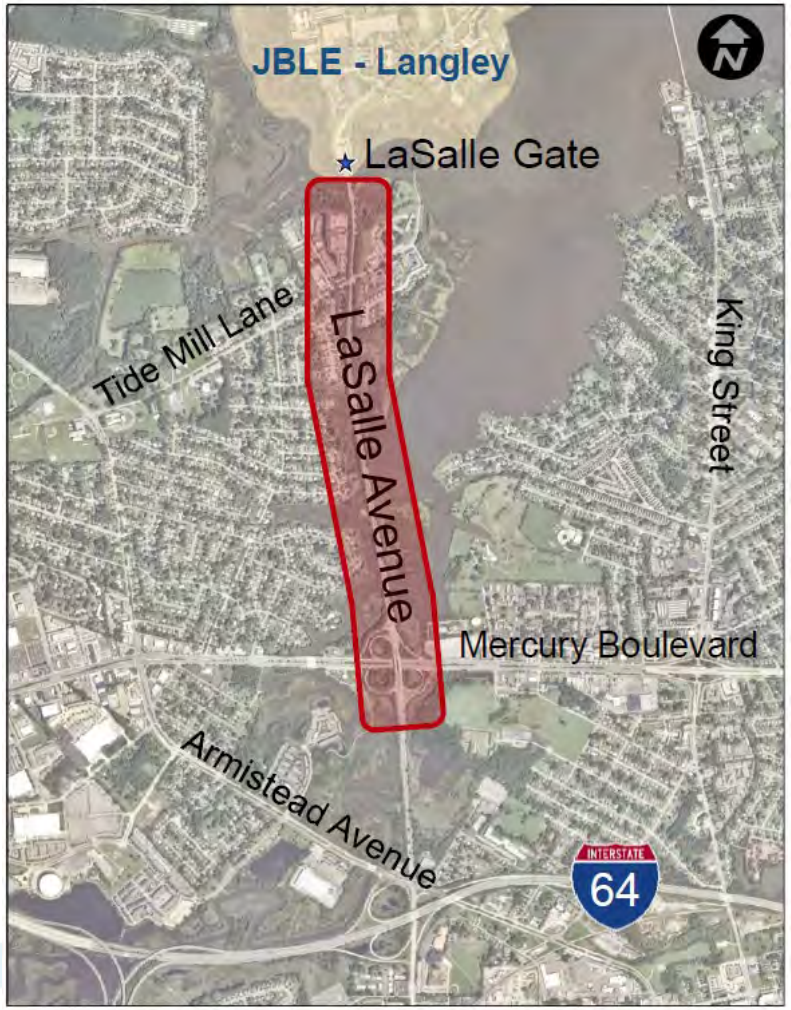


Figure 1.1: LaSalle Avenue Corridor Study Area

Pacing Work to Match External Factors

Simultaneously **address regulatory requirements** and **accelerate our work** to take advantage of imminent funding opportunities and address threats.

- Grant application development and management with limited staff resources
- Increasing demands of TMDL “pollution diet”
- Implementation of changing Chesapeake Bay regulations

Expanding the Reach of the Decentralized Team

Integrate resiliency values and principles into all relevant work in the City, and build bridges between departments and entities.

- Broadly educating staff to understand the challenge of climate change and their opportunities to address it
- Developing tools to support staff to make sound decisions and trade-offs based on resiliency principles and climate realities
- Building bridges with economic development, schools, HRHA, and other entities to identify opportunities to maximize impact

Sharing Responsibility for Resiliency with the Community

Support and create a framework for **whole-of-community resilience action**.

- Develop and dedicate resources to carrying out a holistic engagement plan for resiliency for residents and businesses.
- Align education and outreach initiatives with other City outreach, including the Community Plan.
- Operationalize a successful funding stream for individual resilience action (RAIN Grant), and other resiliency incentives.
- Arrive at a regulatory environment that is responsive to environmental challenges and predictable for developers.

Key Takeaways & Questions

1. Watershed level resilience planning efforts are continuing throughout the City, and will identify more projects.
2. Staff sees opportunity at the City-wide scale to institutionalize and disseminate resiliency work more broadly.
3. Successful resiliency work will require increasing regional, state, and federal cooperation.

As we look to the future, are there any course corrections or new priorities that you would like staff to explore?

Do you have initial ideas for how Hampton can take an even greater role in establishing cooperation and partnership with regional, state, and federal entities?

HAMPTON VA

Thank you!

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