

Appendix A

Public Engagement Summary

Westbrook Town Beach POP-UP SUMMARY

Saturday, August 19 from 9AM-1PM

FACILITATORS

- Liz Podowski King, CED
- Bridget Snover, CED
- Peter Gillespie, Town of Westbrook
- Tony Cozza, Town of Westbrook

FORMAT

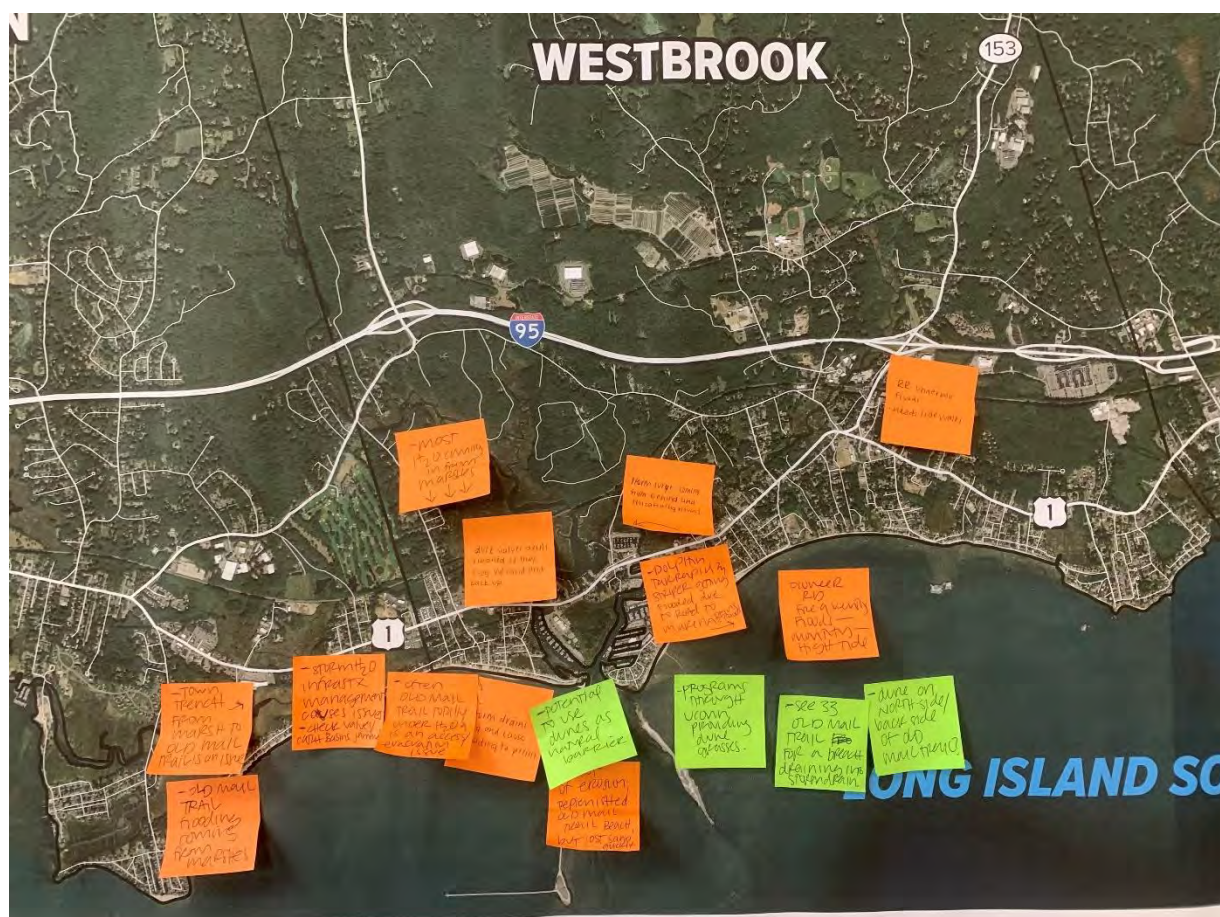
- Attendees were encouraged to provide feedback through several interactive exercises focusing on community resiliency assets and issues. The Project Team was available during this time to answer questions.
- Approximately 50 people attended the event. The sign-in sheet is attached at the end of this summary.



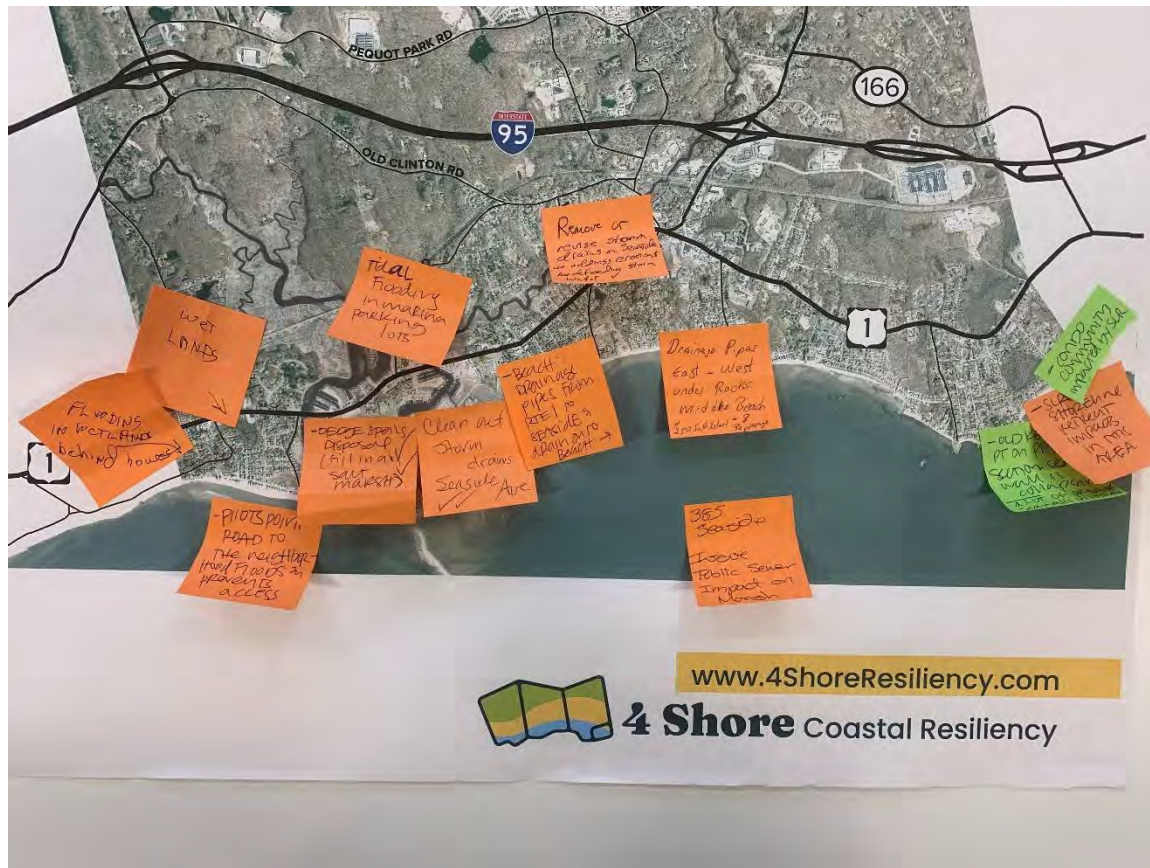
IDENTIFYING ASSETS AND ISSUES

Participants were asked to share community assets and issues related to historic flooding and erosion issues and current/future concerns.

Entire Project Area





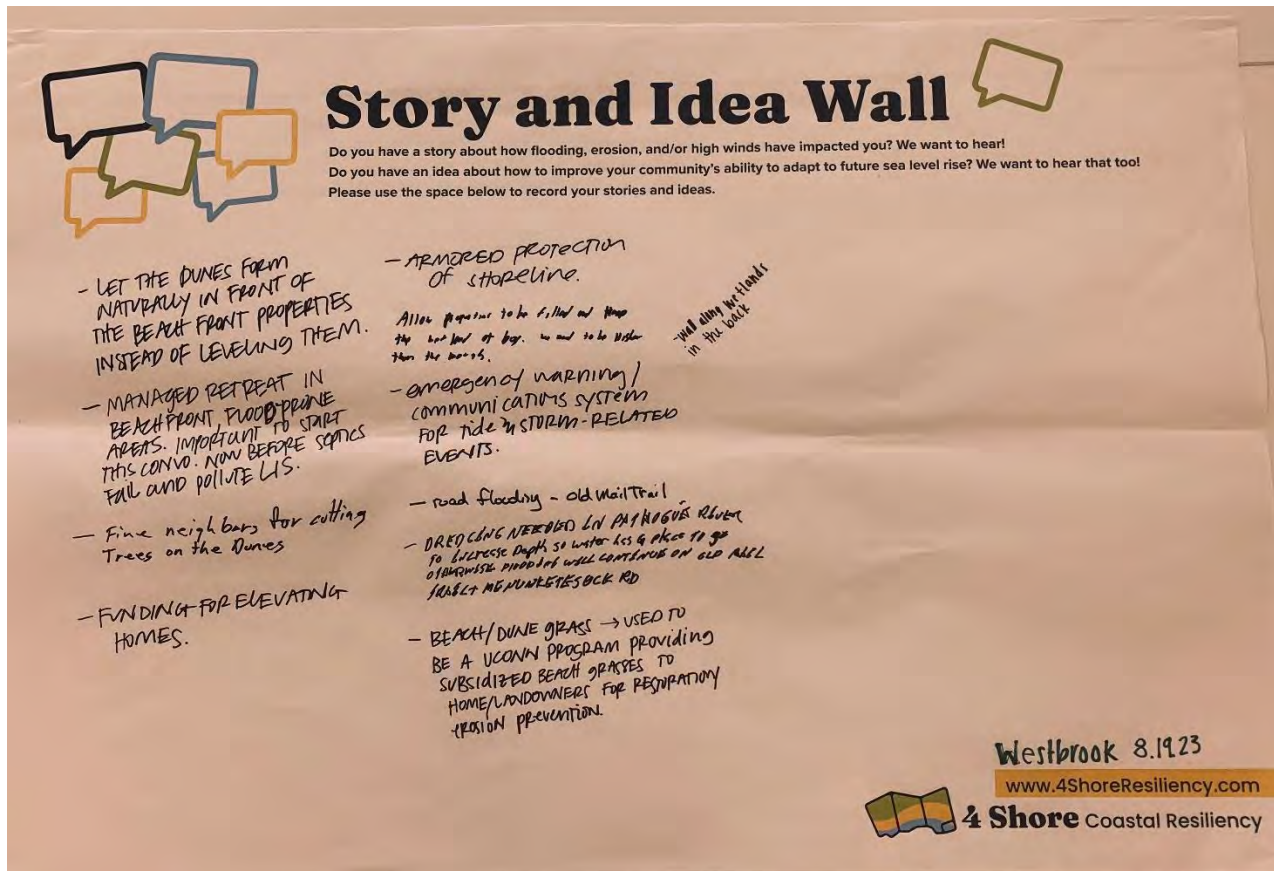


THOUGHTS SHARED – COMMUNITY ASSETS AND ISSUES:

- Flooding from marshes threatens coastal properties from behind more so than storm surges from the front
- Large drainpipes empty into the Long Island Sound with no end cap protection threatening children and wildlife
- Catch basins fill with sand and prevent water from draining resulting in heavy flooding during rain events
- The breakwaters on Duck Island are crumbling and need attention
- Frequent flooding on Old Mail Trail, Pilots Point entrance, Tarpon Ave, Dolphin Ave, and Striper Ave
- Drainage issues at the railroad underpass and it is a school route. Sidewalks should be added

STORY AND IDEAS WALL

Participants were asked to share a story about how flooding, erosion, and/or high winds have impacted them in addition to any ideas about how to improve the community's ability to adapt to future sea level rise.



THOUGHTS SHARED – STORY AND IDEA WALL:

- Let the dunes form naturally in front of the beachfront properties instead of leveling them
- Managed retreats in beachfront, flood-prone areas
- Fine neighbors for cutting trees on the dunes
- Funding for elevating homes
- Shoreline armored protection
- Build a wall that lines the marshes behind neighborhoods
- Emergency warning indication system for tide and storm-related events
- Dredge Patchogue River to increase depth so water has a place to go
- Provide beach/dune grass to property owners (UCONN program used to provide subsidized beach grasses for restoration/erosion prevention)

Clinton Summerfest POP-UP SUMMARY

Saturday, August 26 from 4PM-8PM

FACILITATORS

- Nick Dickerson, CED
- Bridget Snover, CED

FORMAT

- Attendees were encouraged to provide feedback through several interactive exercises focusing on community resiliency assets and issues. The Project Team was available during this time to answer questions.
- Approximately 10 people attended the event. The sign-in sheet is attached at the end of this summary.



IDENTIFYING ASSETS AND ISSUES

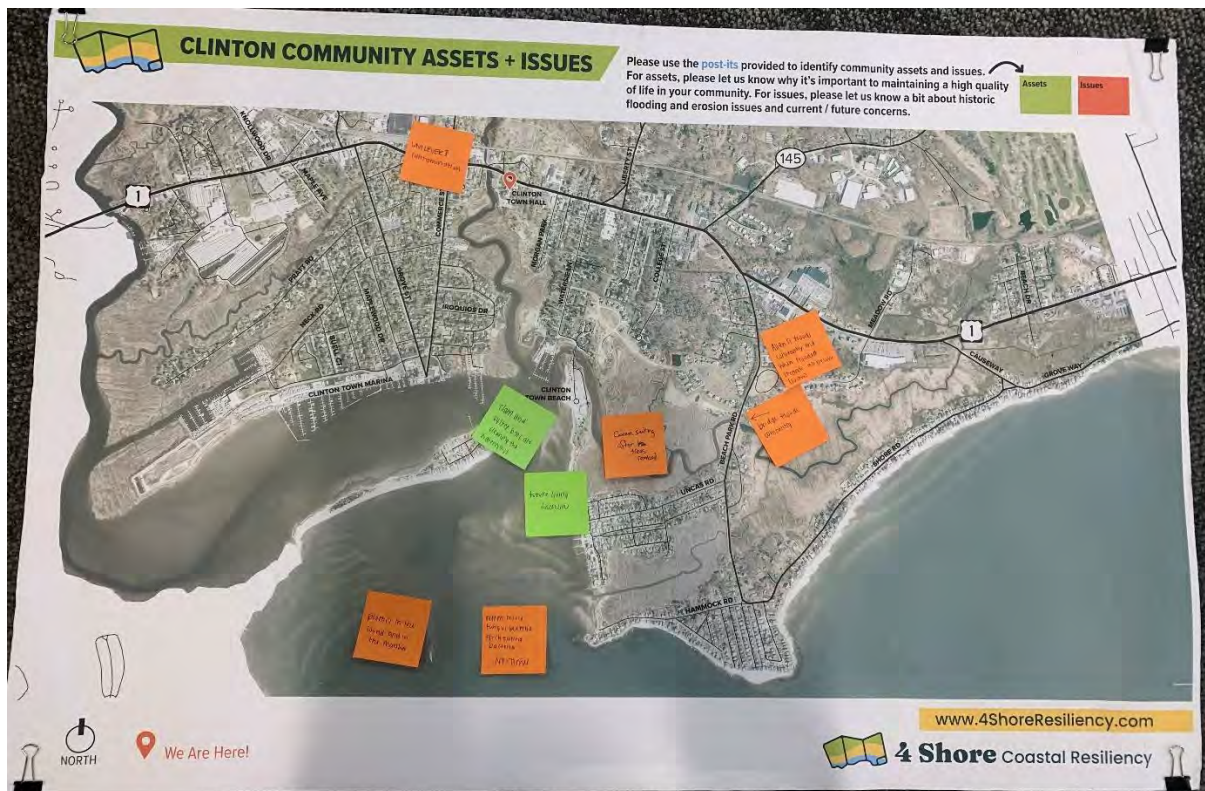
Participants were asked to share community assets and issues related to historic flooding and erosion issues and current/future concerns.

Town of Clinton



THOUGHTS SHARED – COMMUNITY ASSETS AND ISSUES:

- Fallen trees along River Road make travel challenging
- Flooding and lack of fish along River Road
- The area around Glenwood Road floods in a heavy rain event



THOUGHTS SHARED – COMMUNITY ASSETS AND ISSUES:

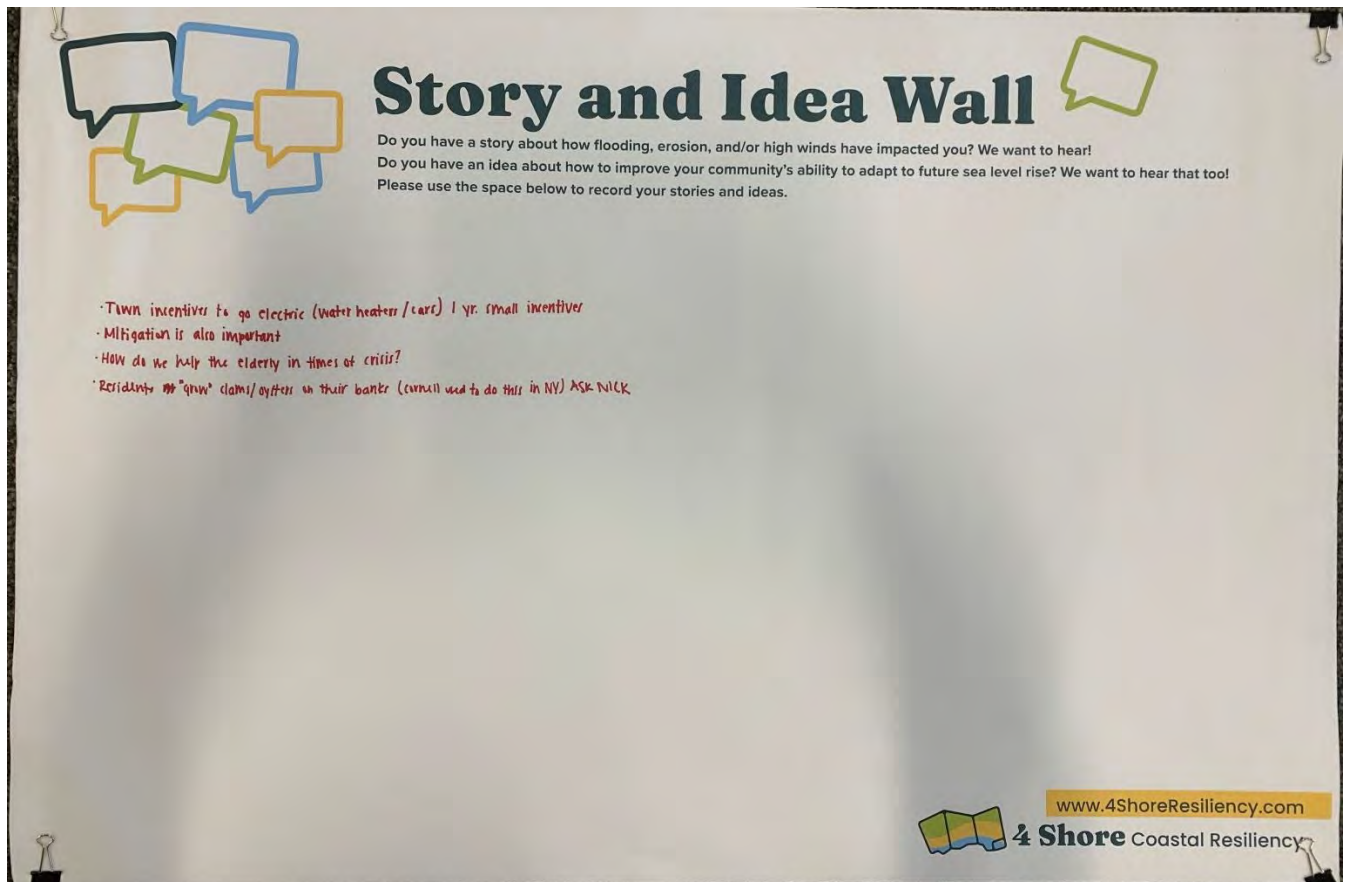
- Former Unilever facility contributed to contamination in the channel that leads to the Long Island Sound. That same channel has not been dredged in fear of unearthing contaminants from the facility and lawn care spray runoff
- Trees were removed along Waterside Lane causing the road to sink
- The bridge between Uncas Road and the Hammocks development floods constantly
- Allen Street floods constantly preventing those who live south of the road to retreat
- Plastics are all over the marshes and Long Island Sound
- The warming of the water is allowing flesh-eating bacteria to grow

OPPORTUNITIES

- There is potential to construct a living shoreline along the shoreline by Clinton Town Beach
- Clam and oyster populations on the sand bars are cleaning the waterway

STORY AND IDEAS WALL

Participants were asked to share a story about how flooding, erosion, and/or high winds have impacted them in addition to any ideas about how to improve the community's ability to adapt to future sea level rise.



THOUGHTS SHARED – STORY AND IDEA WALL:

- Town incentives for homeowners to go electric (water heaters/cars) 1 year small incentive
- Mitigation is very important
- How do we help the elderly in times of crisis?
- Residents "grow" clams/oysters on their shorelines through larvae that are provided

Westbrook Community Workshop Summary

Wednesday, September 13 from 6:30PM-8PM

FACILITATORS

- Liz Podowski-King, CED
- Jackie Fernandez, CED

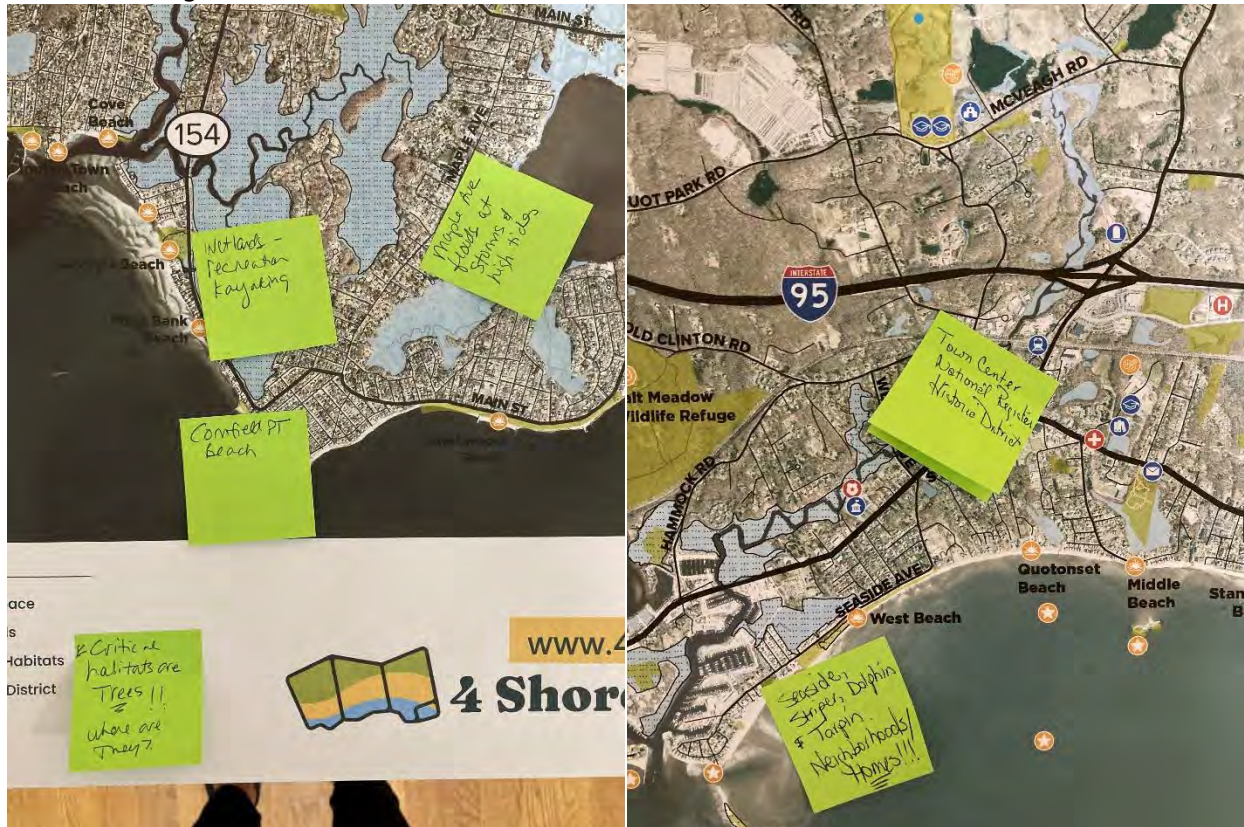
FORMAT

- A presentation about the need for the project, its impact, and the importance of community input. The presentation lasted about 40 minutes and the remaining time was dedicated to community engagement.
- Attendees were encouraged to provide feedback through several interactive exercises focusing on community resiliency assets and issues. The Project Team was available during this time to answer questions.
- Approximately 37 people attended the event. The sign-in sheet is attached at the end of this summary.



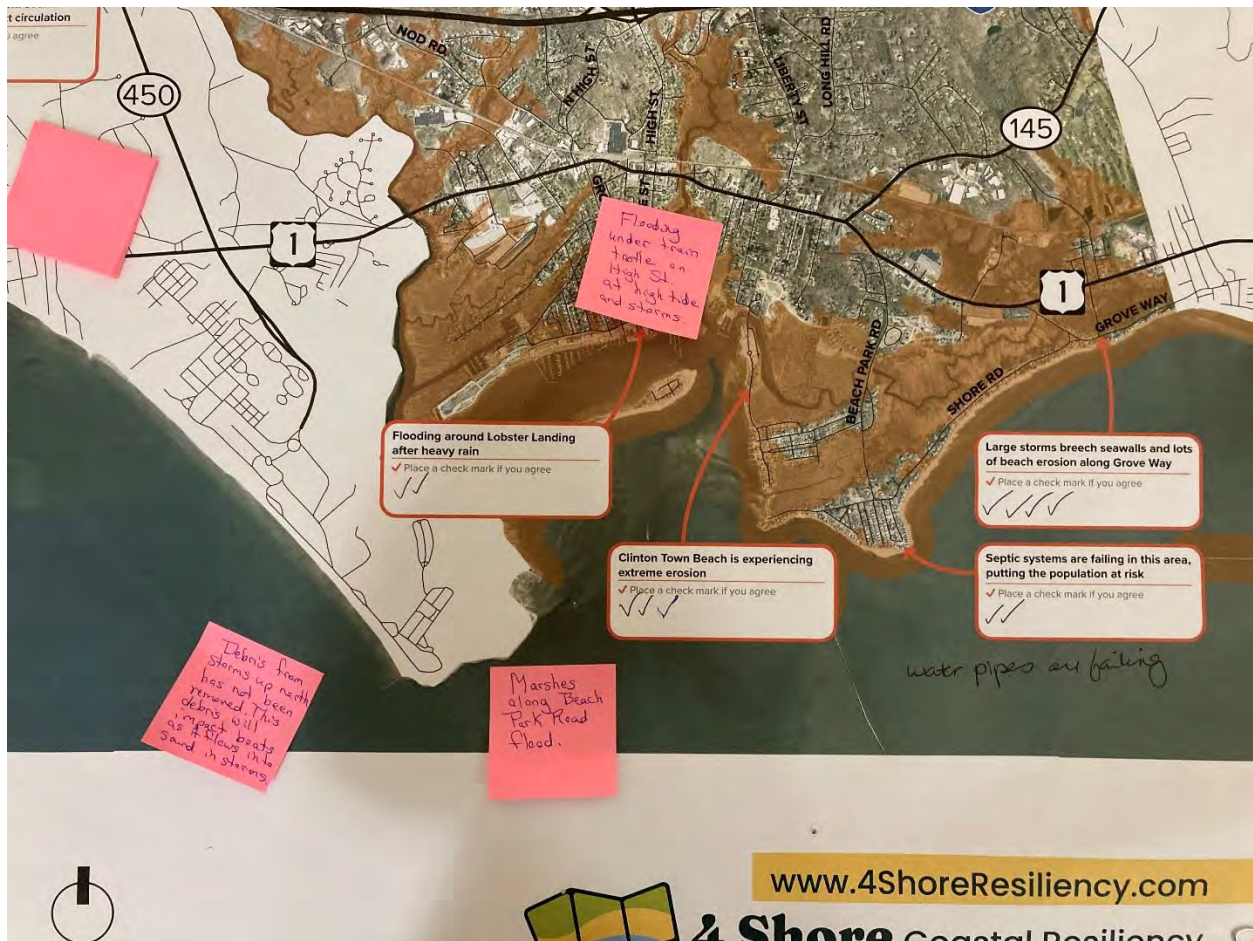
IDENTIFYING ASSETS AND ISSUES

Participants were able to ask questions and share comments during the presentation. During the hands-on portion of the workshop, participants were asked to share community assets and issues related to historic flooding and erosion issues and current/future concerns.



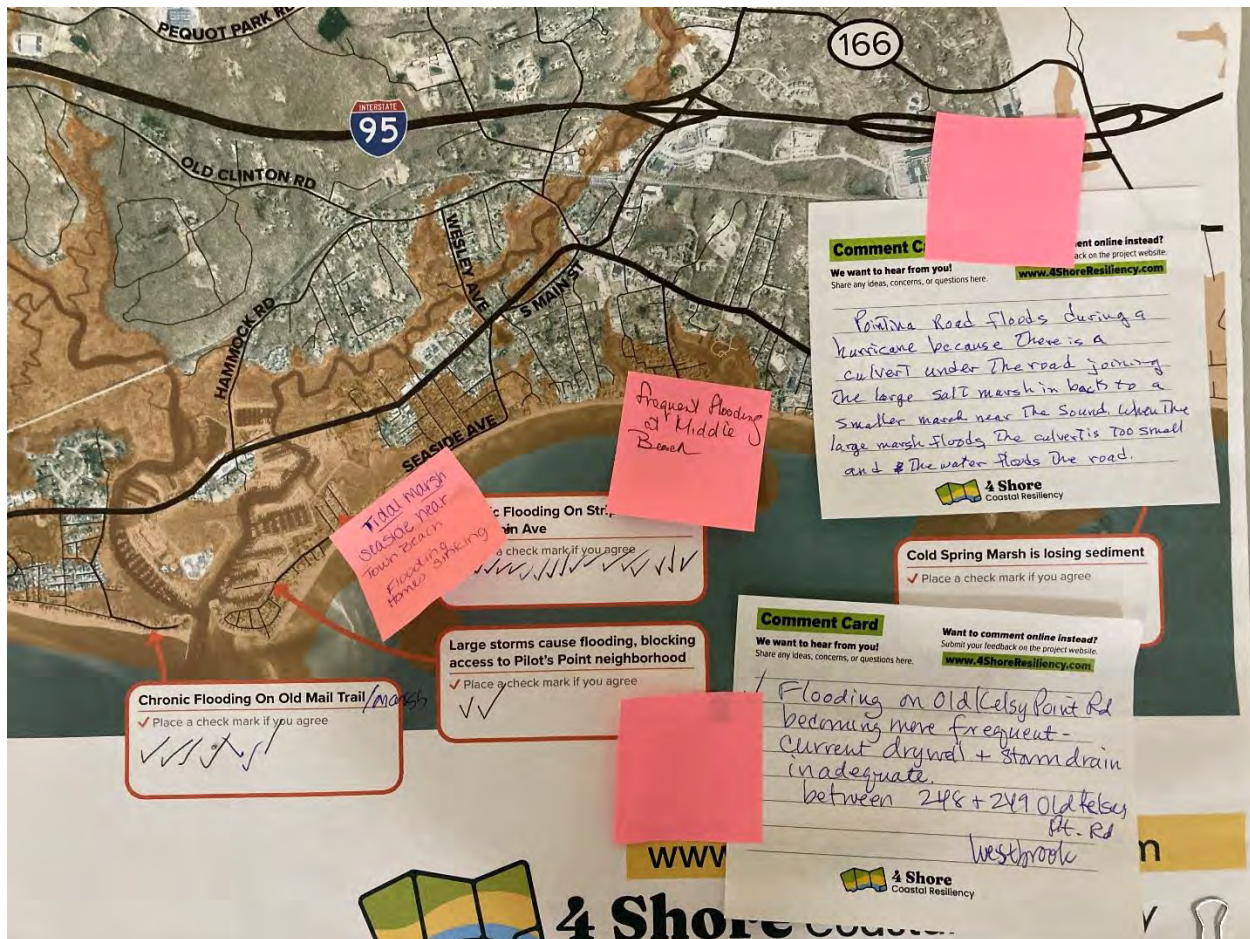
THOUGHTS SHARED – COMMUNITY ASSETS:

- Wetlands for recreation and kayaking
- Cornfield Pt Beach
- Trees are critical habitats
- Westbrook Town Center National Register Historic District
- Duck Island Breaker Wall



THOUGHTS SHARED – FLOODING / EROSION ISSUES:

- Flooding along Seaside Ave, Striper Rd, Dolphin Rd, and Tarpon Rd
- Flooding along Maple Ave
- More frequent flooding after rain events and high tide
- Marshes along Beach Park Rd flood -- causing homes to sink
- Debris from storms up north has not been removed and will impact boats as it flows into the Sound in storms
- Water pipes are failing
- Flooding under the trail trestle on High St at high tide and during storms
- Cornfield Point and Old Saybrook Town Beach Road floods and become isolated



THOUGHTS SHARED – FLOODING / EROSION ISSUES:

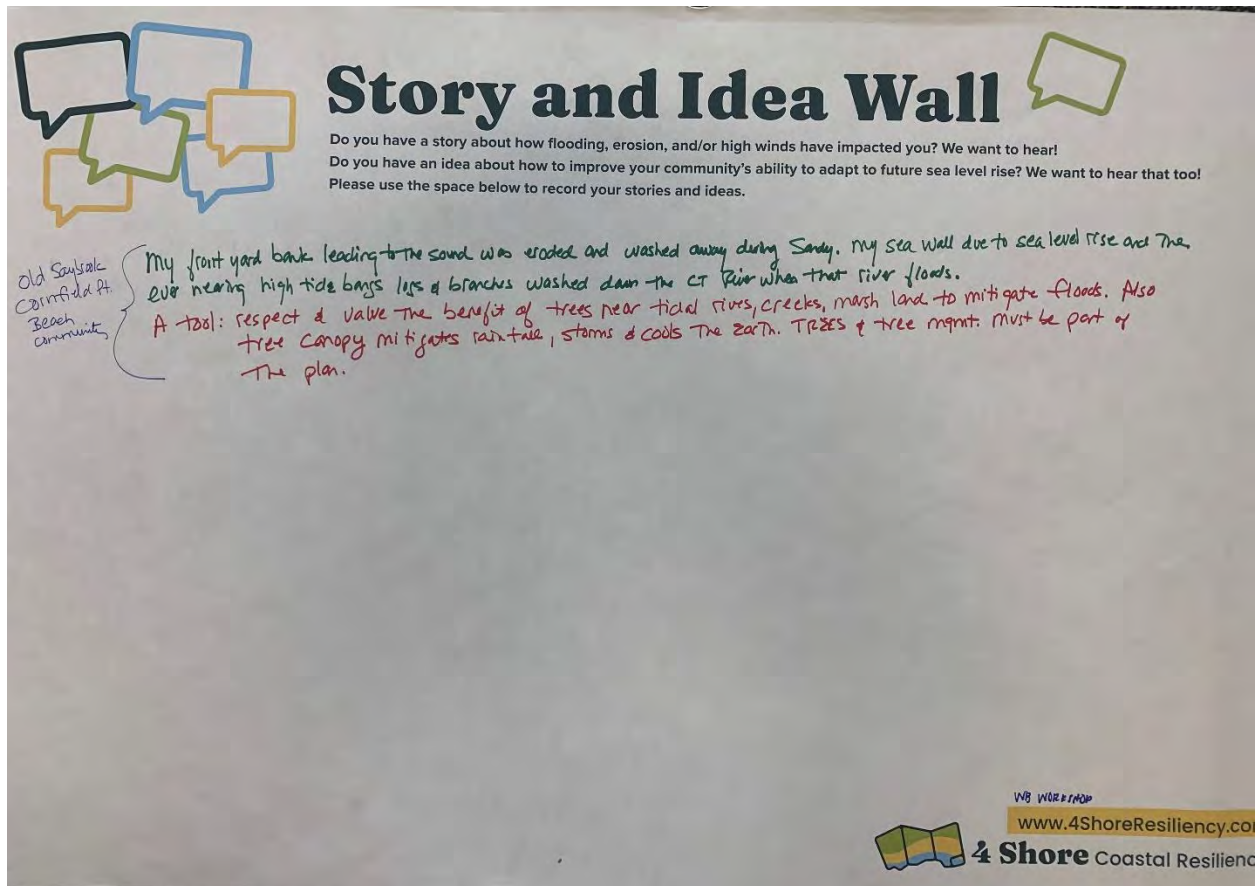
- Participants were concerned about funding the possible outcomes of the plan
- Frequent flooding at Middle Beach
- Tidal marsh seaside near Town Beach flooding and homes are sinking
- Flooding on Old Kelsey Point Rd is becoming more frequent – current dry well and storm drain is inadequate (between 248 and 249 Old Kelsey Pt Rd in Westbrook)
- Pointina Rd floods during a hurricane because there is a culvert under the road joining the large salt marsh in back to a smaller marsh near the Sound. When the large marsh floods, the culvert is too small and the water floods the road.
- There were multiple questions regarding the process of the plan

OPPORTUNITIES

- Reducing impervious surfaces
- Trees are important in mitigating floods

STORY AND IDEAS WALL

Participants were asked to share a story about how flooding, erosion, and/or high winds have impacted them in addition to any ideas about how to improve the community's ability to adapt to future sea level rise.



THOUGHTS SHARED – STORY AND IDEA WALL:

- A resident's front and back yard was eroded and washed away during Sandy washed away and eroded yards in Old Saybrook
- Debris from storms has traveled down the Connecticut River and into the Long Island Sound
- Respect and value the benefit of trees near tidal rivers, creeks, and marshes to mitigate floods. Trees are valuable and beneficial. Adding trees and tree management must be part of the plan.

Virtual Community Workshop Summary

Tuesday, September 26 from 6:30PM-8PM

FACILITATORS

- Debbie Lawlor, CED (virtual)
- Bridget Snover, CED (virtual)

FORMAT

- A presentation outlining the project goals, schedule, and outcomes. The presentation lasted about 40 minutes.
- Attendees were encouraged to provide feedback through the online interactive map. The Project Team was available during this time to answer questions.
- Approximately 10 people attended the event.

Old Saybrook Katherine Hepburn Theater POP-UP SUMMARY

Saturday, September 30 from 12PM-4PM

FACILITATORS

- Debbie Lawlor, CED

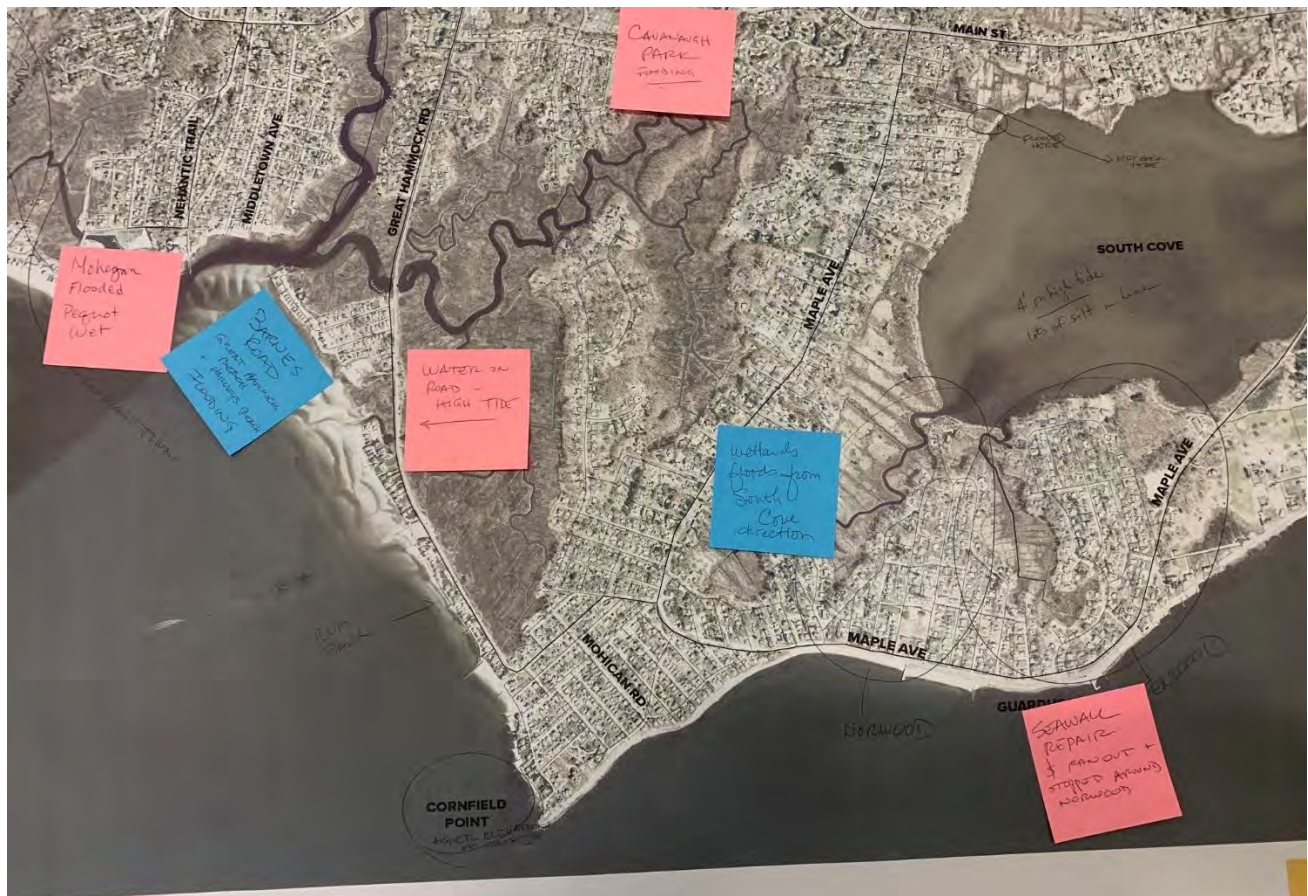
FORMAT

- Attendees were encouraged to provide feedback through several interactive exercises focusing on community resiliency assets and issues. The Project Team was available during this time to answer questions.

IDENTIFYING ASSETS AND ISSUES

Participants were asked to share community assets and issues related to historic flooding, erosion, and current/future concerns.

Old Saybrook and Fenwick



THOUGHTS SHARED – COMMUNITY ASSETS AND ISSUES:

- Wetlands floods from the South Cove direction
- Fenwood seawall repair money ran out and stopped around Norwood
- Water on Great Hammock Road at high tide
- Flooding on Great Hammock Road, Harvey Beach, and Barnes Road
- Mohican Trail floods and Pequot Trail gets wet during storms
- Kavanaugh Park floods

Old Saybrook + Fenwick Community Workshop Summary

Tuesday, October 10 from 6:30PM-8PM

FACILITATORS

- Debbie Lawlor, CED
- Bridget Snover, CED

FORMAT

- A presentation about project goals, schedule, and outcomes. The presentation lasted about 40 minutes.
- Attendees were encouraged to provide feedback through several interactive exercises focusing on community resiliency assets and issues. The Project Team was available during this time to answer questions.
- Approximately 45 people attended the event.



QUESTIONS AND ANSWERS

Q. What area is Anchor QEA mapping and where are they pulling their data from?

A. They will start with baseline data and then go into databases and pull existing data for the study area comprised of the Towns of Clinton, Westbrook, Old Saybrook, and the Borough of Fenwick. After that, the data will be overlayed on the area and we will focus our recommendations on the area identified by the public on the interactive mapper.

Q. Can this project help finish the sea wall in Fenwick?

A. Yes. This project can help any shovel-ready project. Shovel-ready projects are necessary for obtaining grants for the implementation of recommendations or existing projects.

Q. How do projects get funded once we identify them?

A. Through transformational grants and federal / state funding

Q. Will CED (Colliers Engineering & Design) and the project team help in finding funding sources?

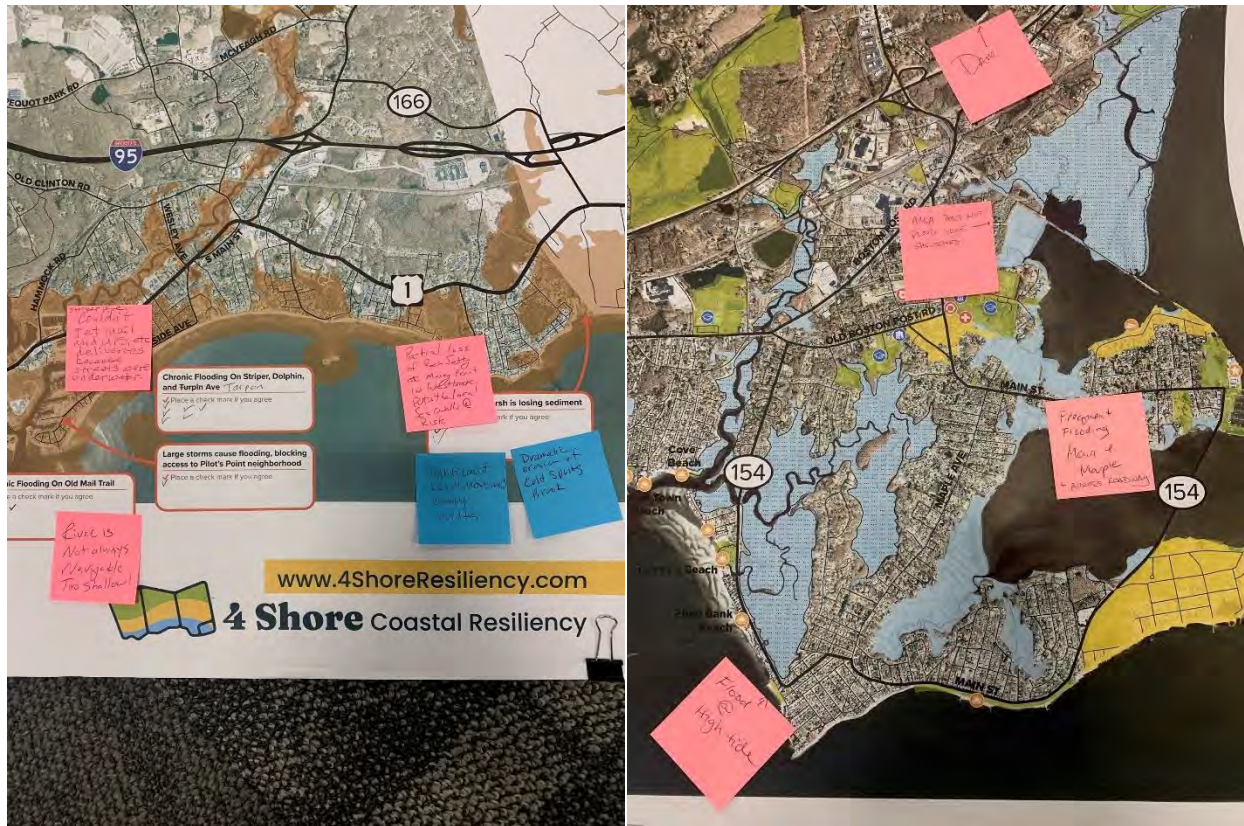
A. Yes. CED has a department dedicated to grants and funding sources. We will provide information on funding once it becomes available and we think it would suit the project in question.

Q. What are the 3-4 projects per municipality?

A. It depends. A seawall differs from a living shoreline. These could apply to one or all of the municipalities. The projects set you up for funding because you have a plan and estimate of cost. Another example is we could provide a template for zoning changes that could translate into all municipalities.

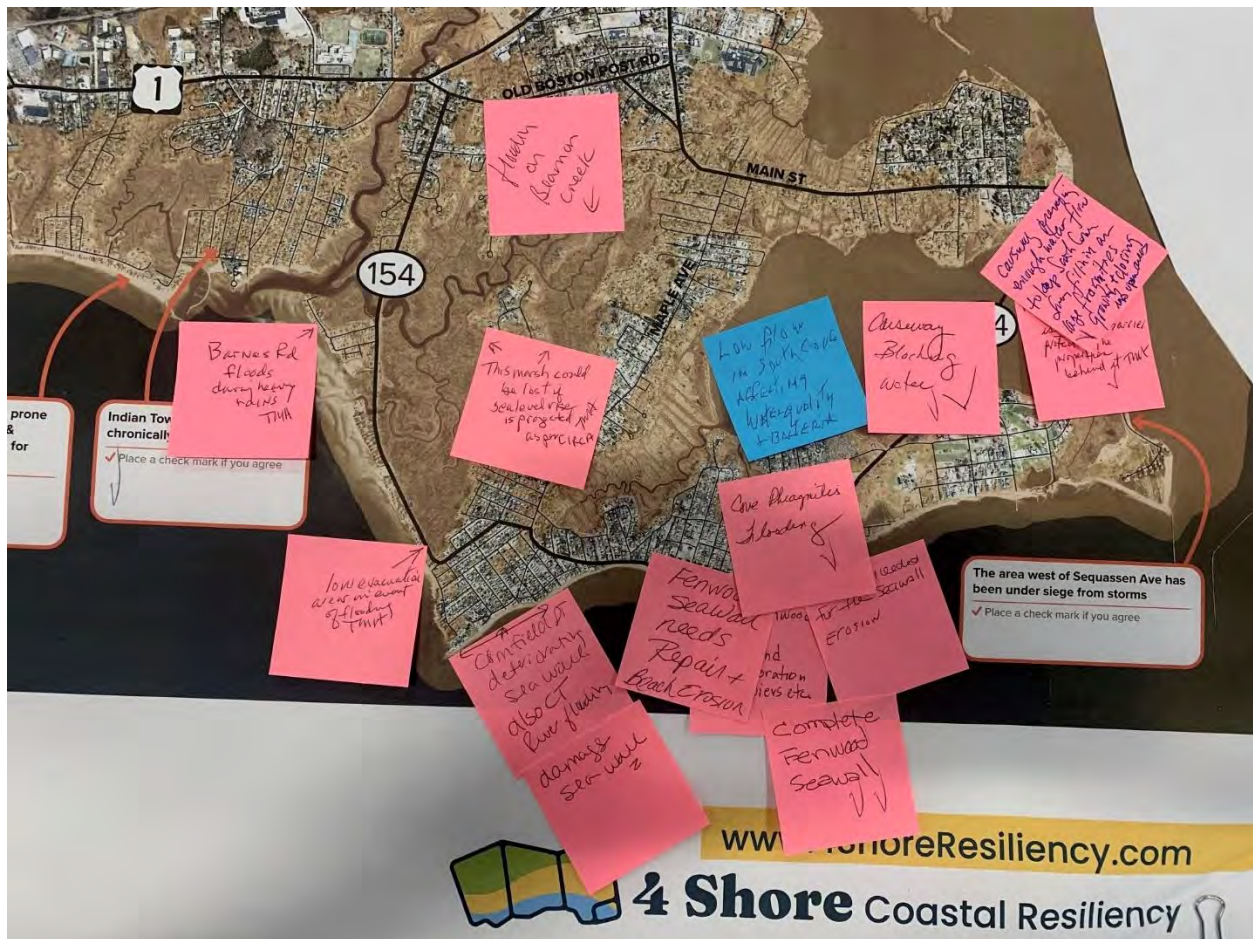
IDENTIFYING ASSETS AND ISSUES

Participants were able to ask questions and share comments during the presentation. During the hands-on portion of the workshop, participants were asked to share community assets and issues related to historic flooding and erosion issues and current/future concerns.



THOUGHTS SHARED – COMMUNITY ASSETS:

- River is not always navigable – too shallow
- Dramatic erosion of Cold Spring Brook
- Significant sand movement every winter in Cold Spring Marsh
- Partial loss of rock jetty at Money Point in Westbrook. This puts the local sea walls at risk.
- Striper Ave couldn't get mail and UPS, etc. deliveries because streets were underwater
- Beaches along Plum Bank Road flood during high tide
- Frequent flooding on Main Street and Maple Ave. Water flows across the roadway



THOUGHTS SHARED – FLOODING / EROSION ISSUES:

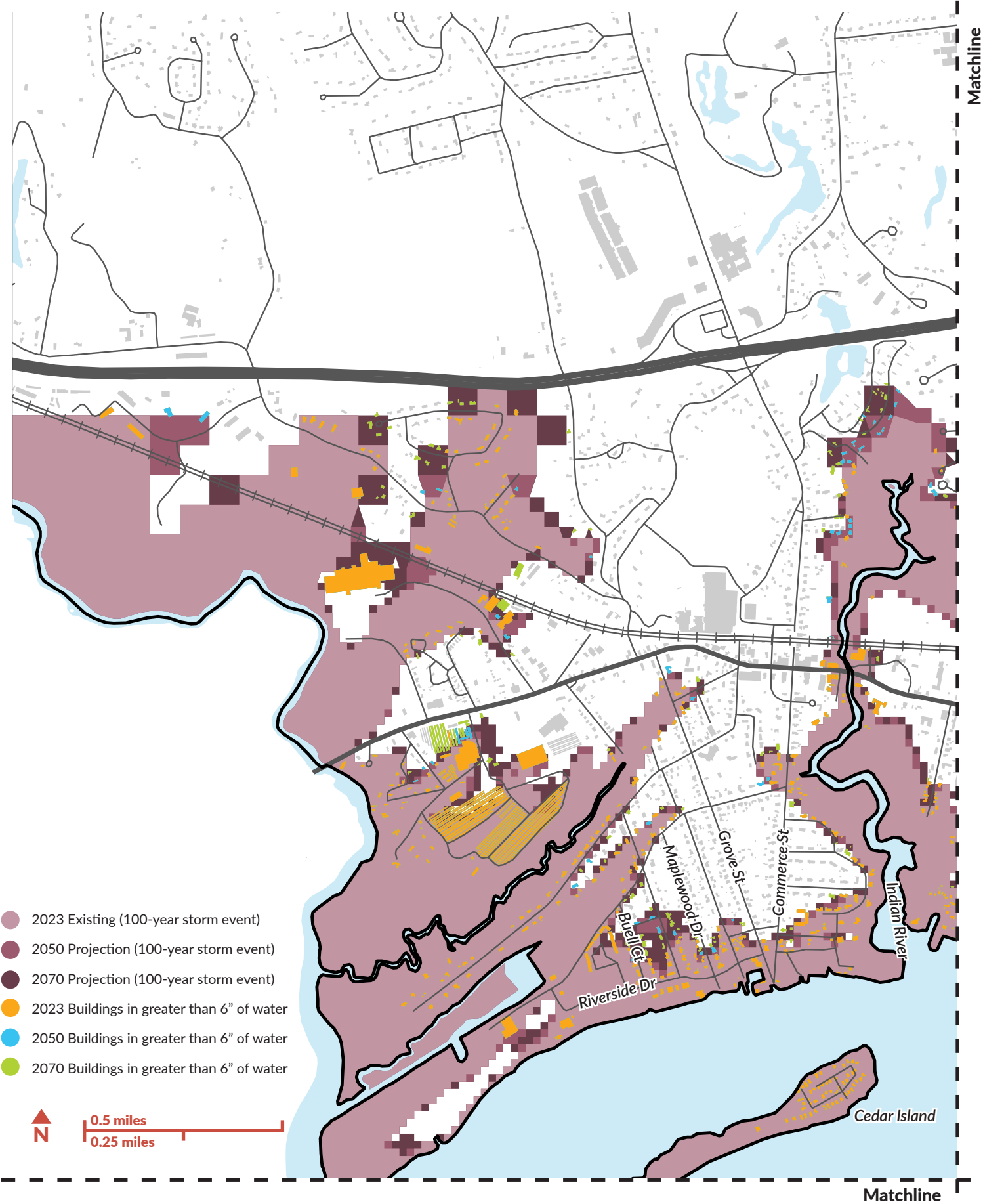
- Barnes Rd floods during heavy rains
- Low elevation area along Plum Bank Rd frequently floods
- Large marshlands could be lost if sea level rise is projected as per CIRCA
- Cornfield Point seawall deteriorating and river flooding damages seawall
- Fenwood seawall needs repair and there is beach erosion
- The Fenwood seawall needs to be completed
- Causeway blocks water
- Low flow in South Cove affecting the water's quality and bacterial growth

Appendix B

Enlarged Maps

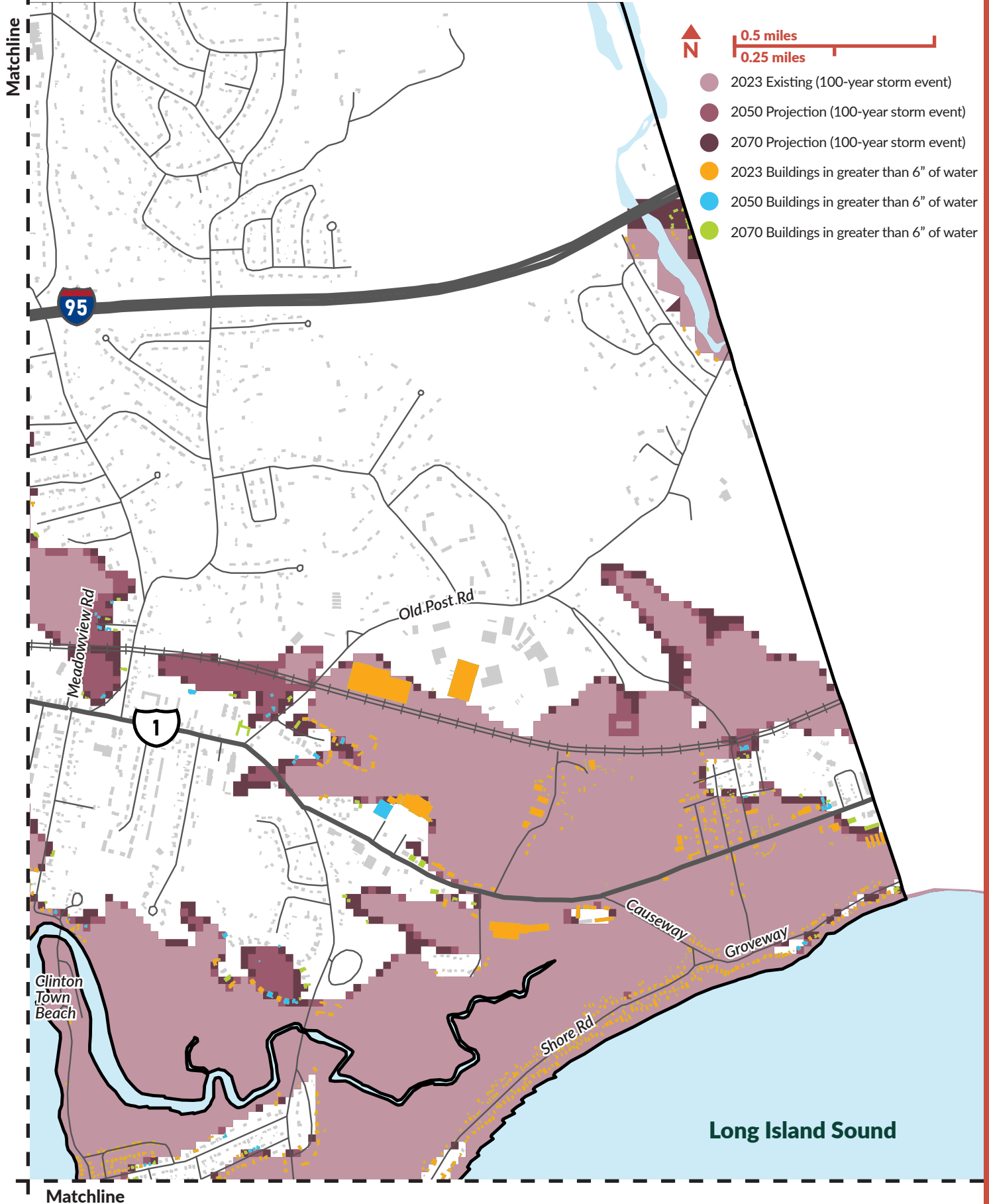
Clinton 100-Year Storm Scenario Map Enlargement

Map 1 of 4



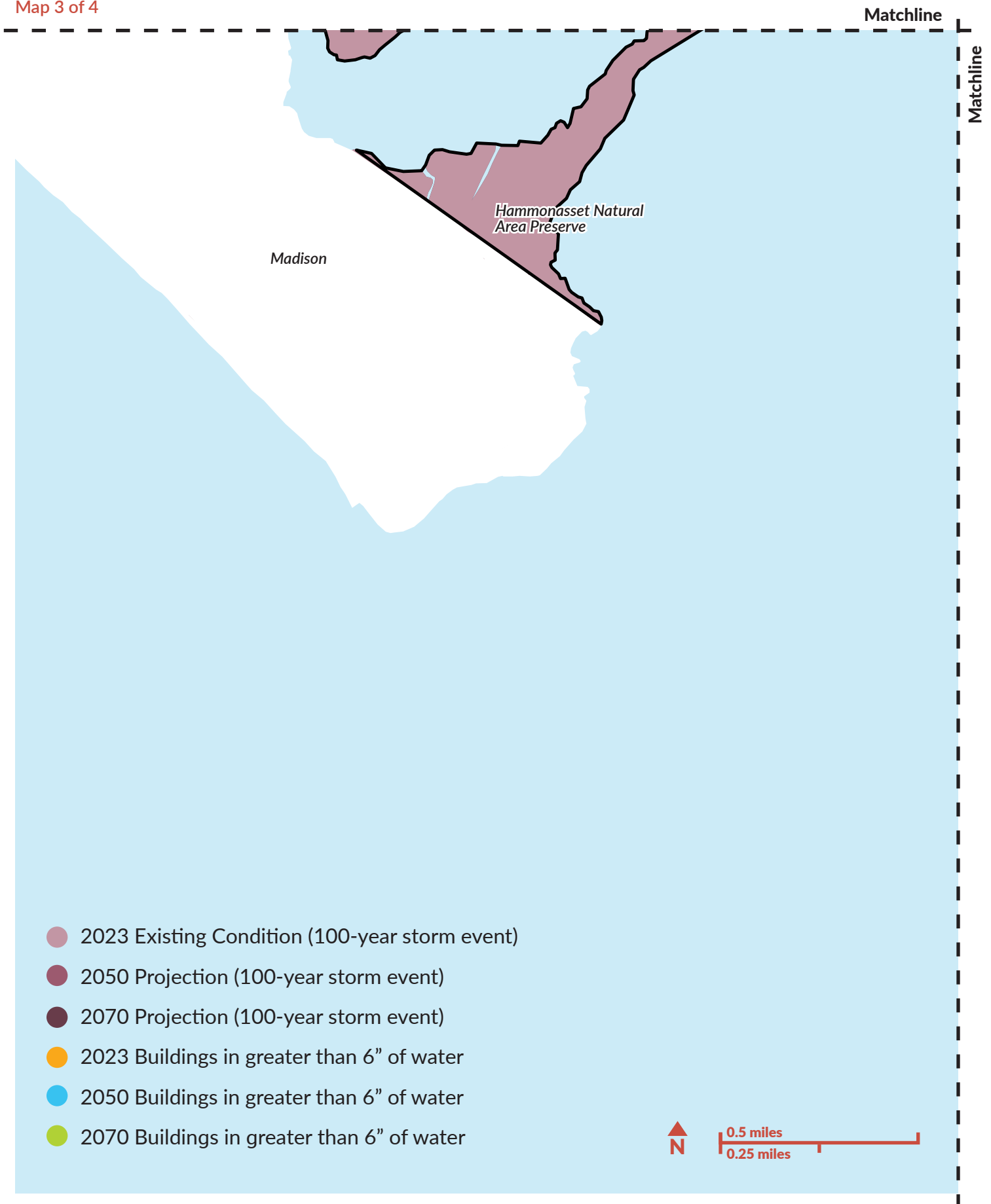
Clinton 100-Year Storm Scenario Map Enlargement

Map 2 of 4



Clinton 100-Year Storm Scenario Map Enlargement

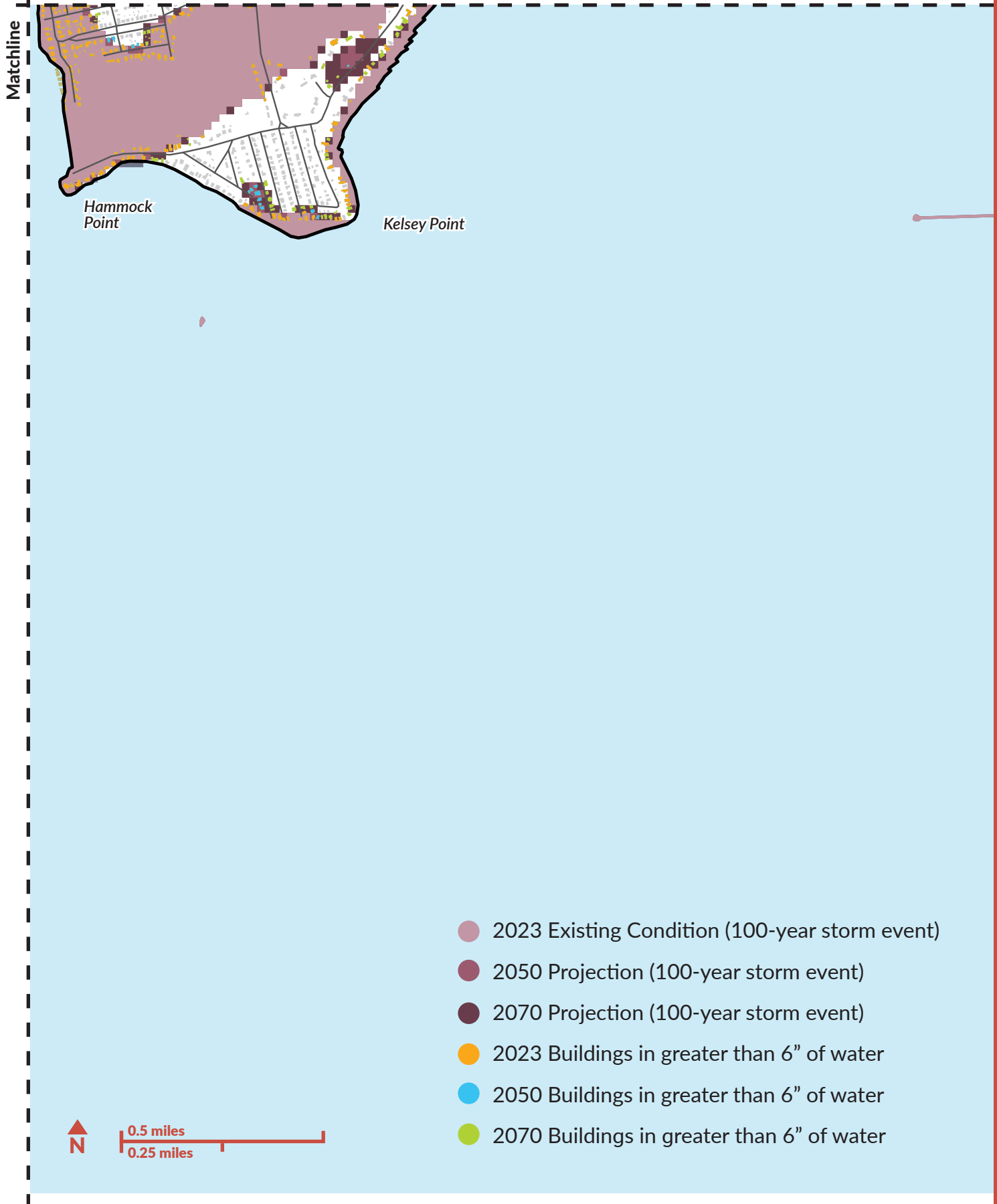
Map 3 of 4



Clinton 100-Year Storm Scenario Map Enlargement

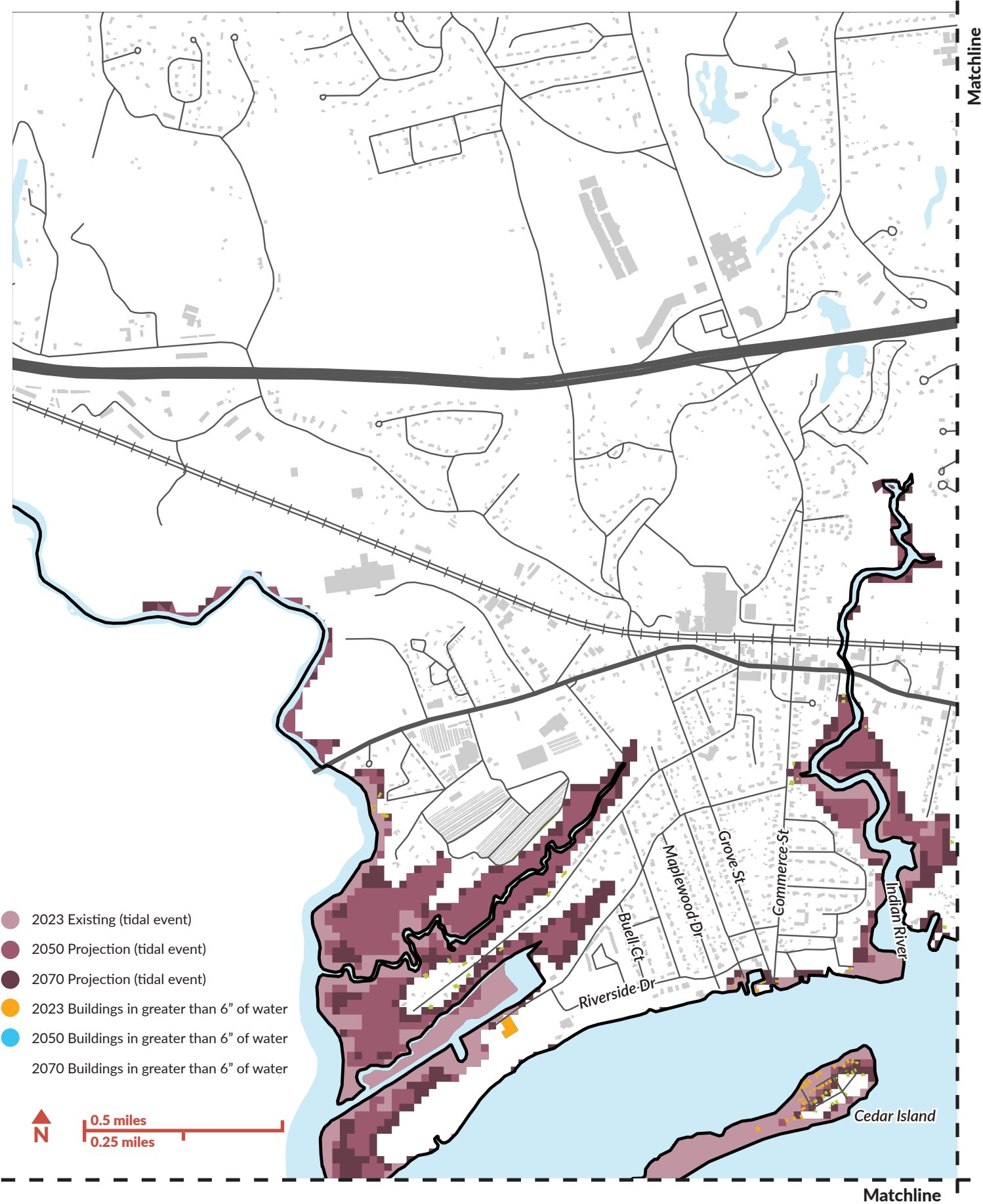
Map 4 of 4

Matchline



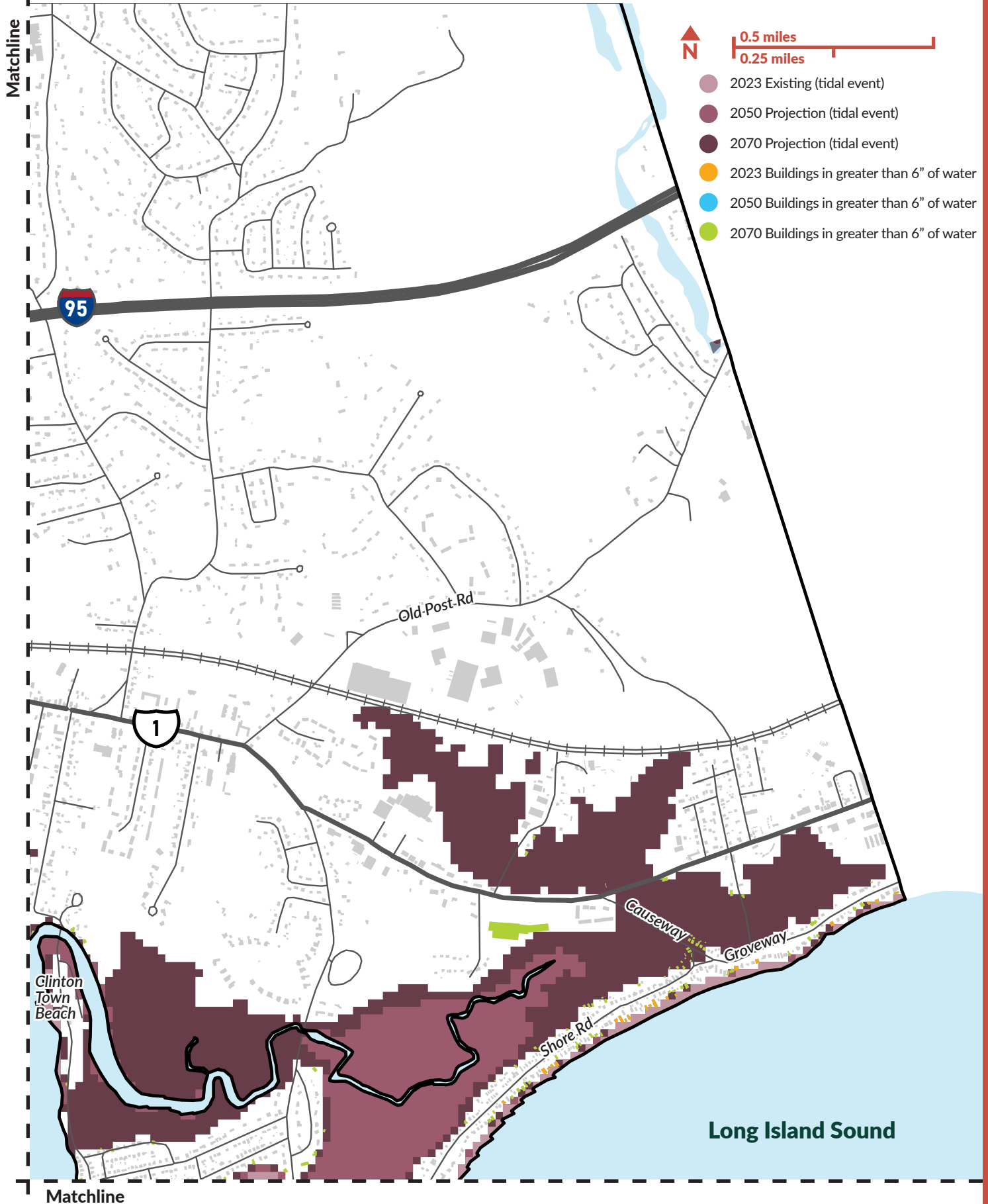
Clinton Tidal Scenario Map Enlargement

Map 1 of 4



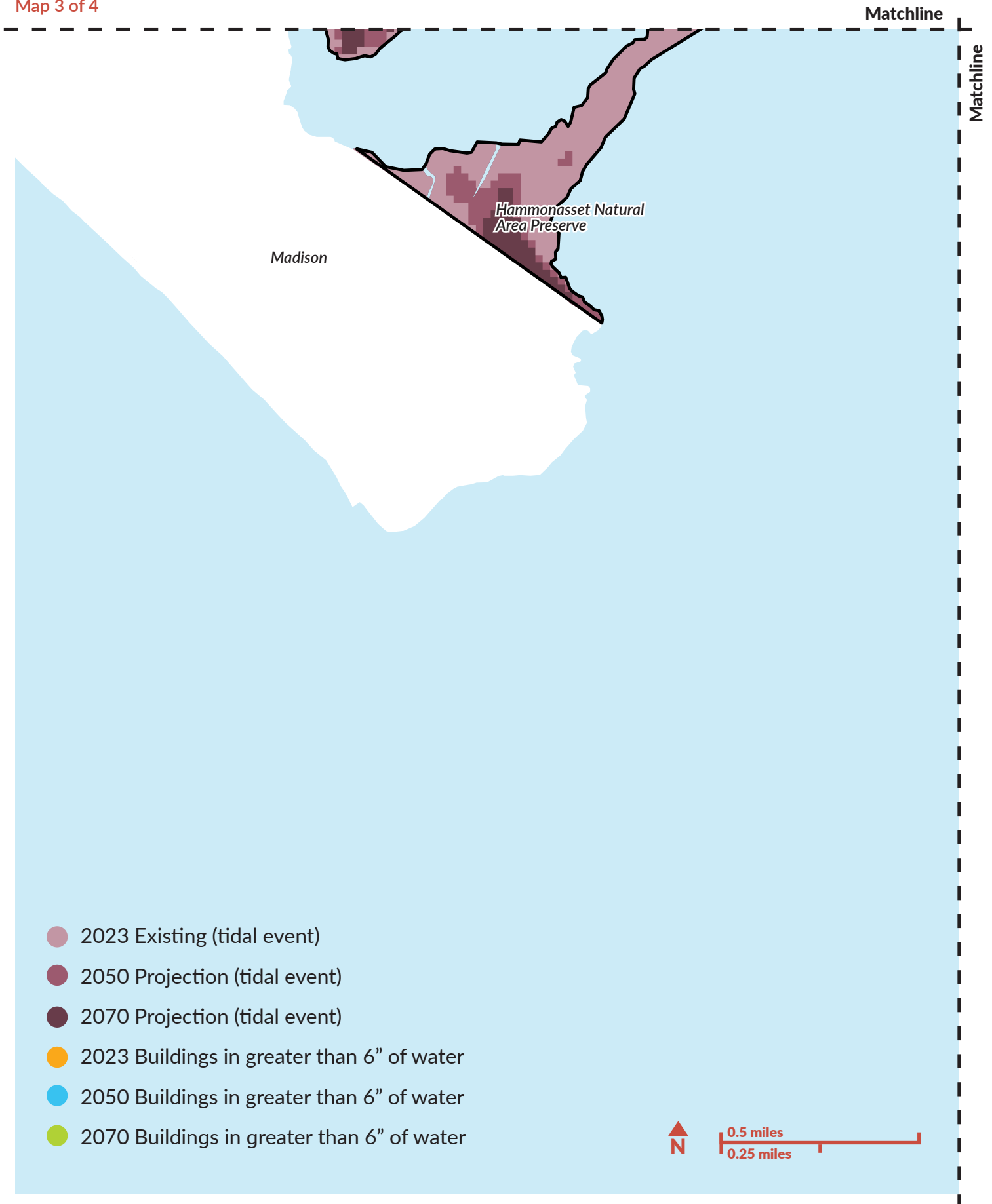
Clinton Tidal Scenario Map Enlargement

Map 2 of 4



Clinton Tidal Scenario Map Enlargement

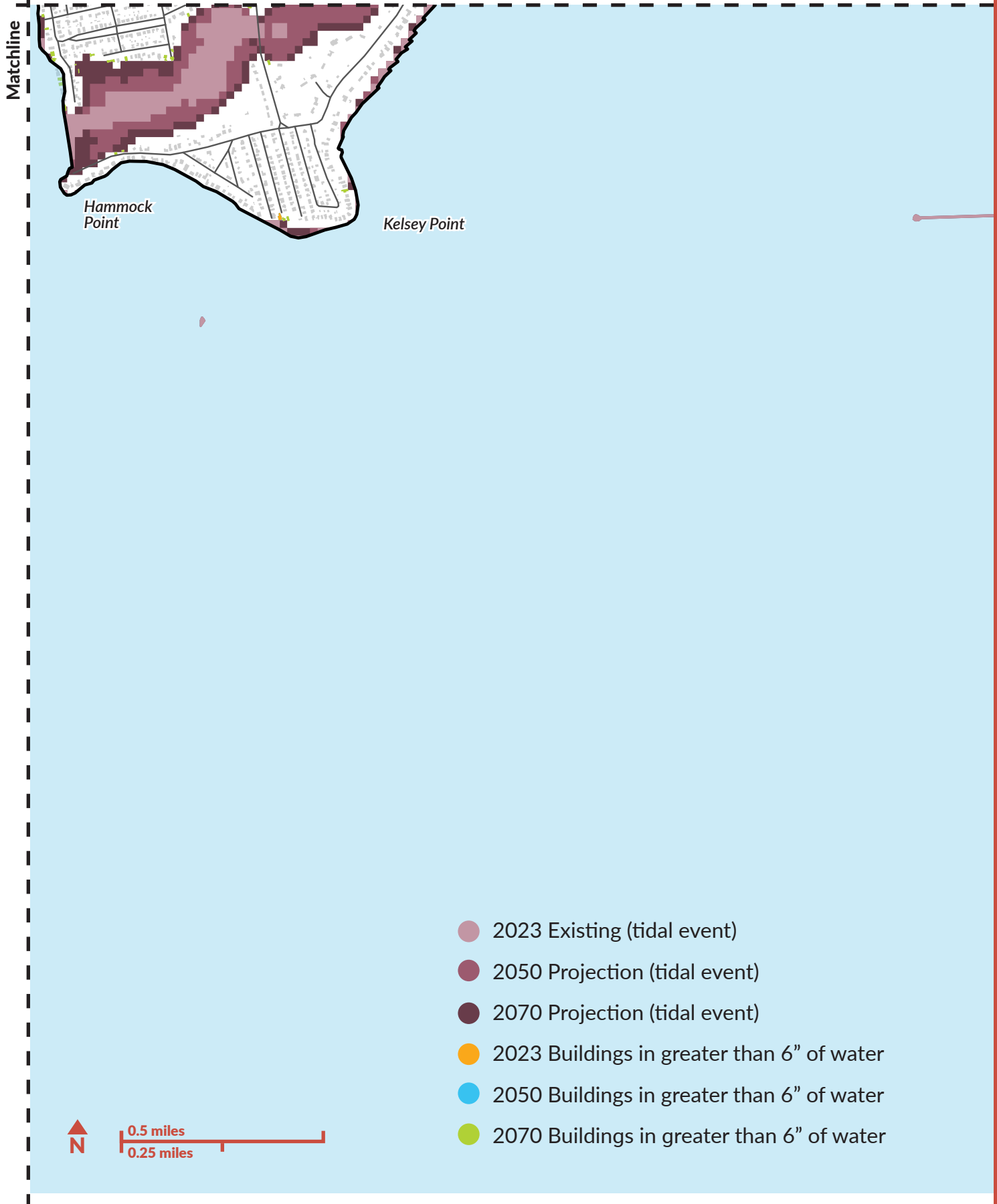
Map 3 of 4



Clinton Tidal Scenario Map Enlargement

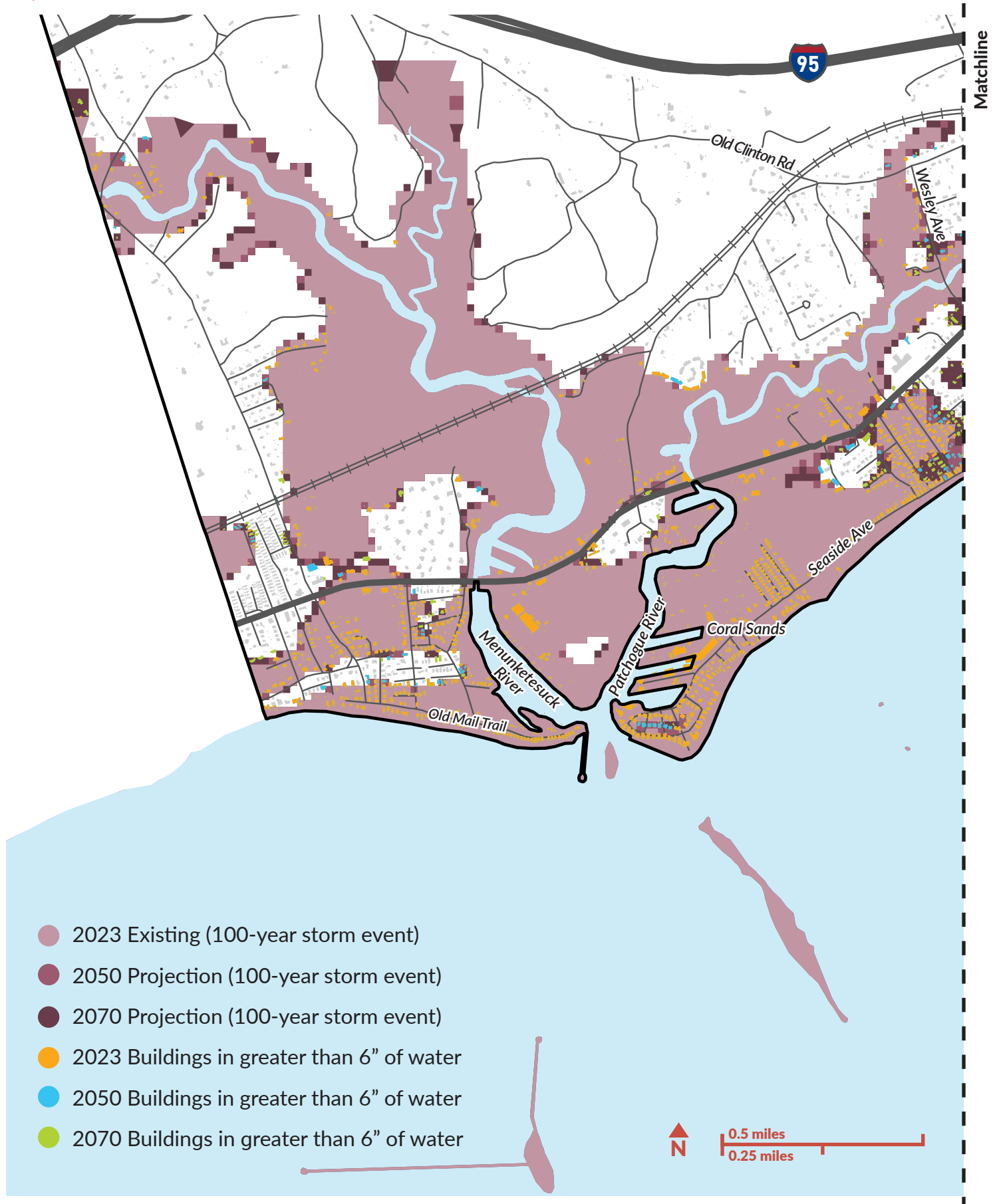
Map 4 of 4

Matchline



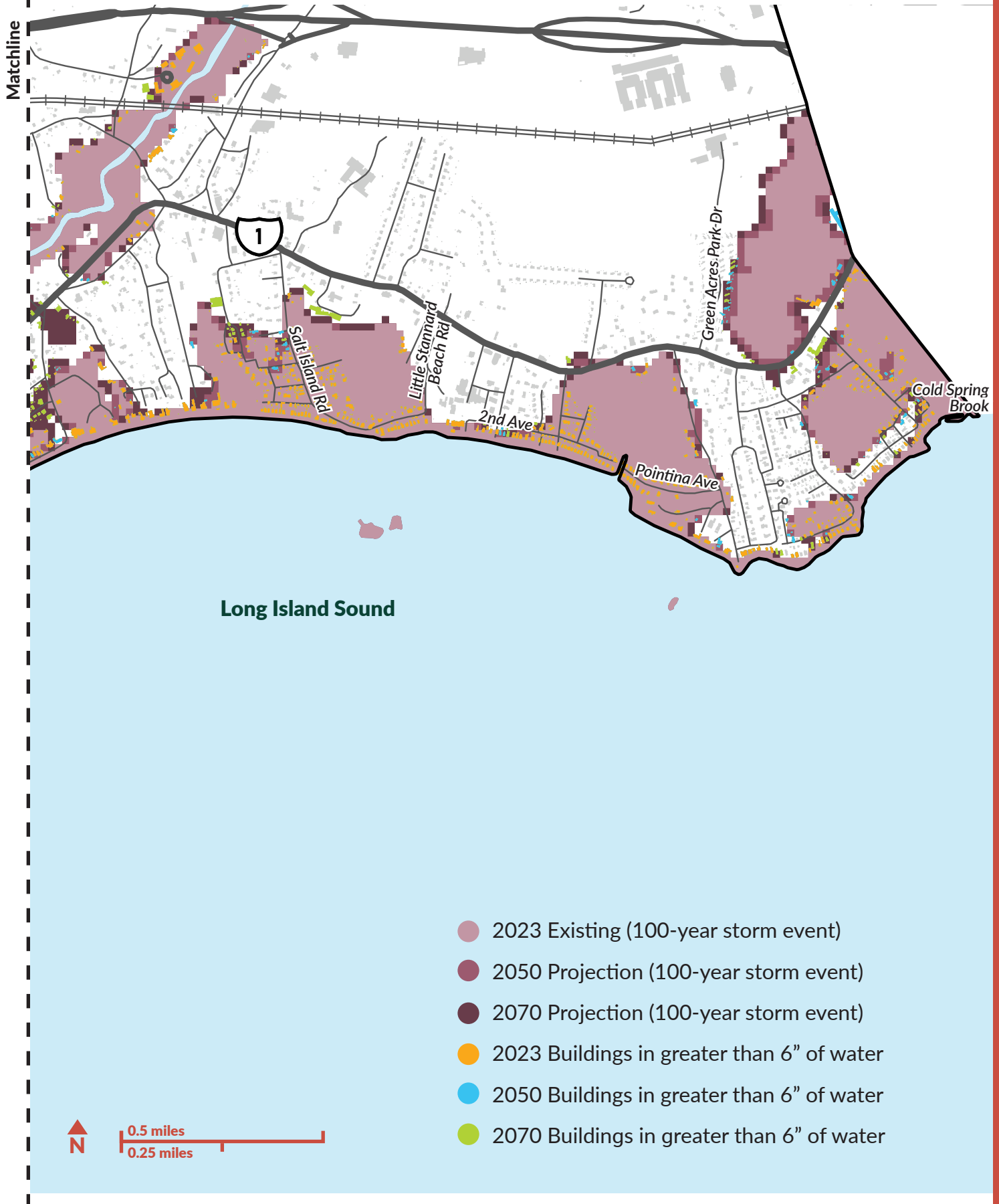
Westbrook 100-Year Storm Scenario Map Enlargement

Map 1 of 2



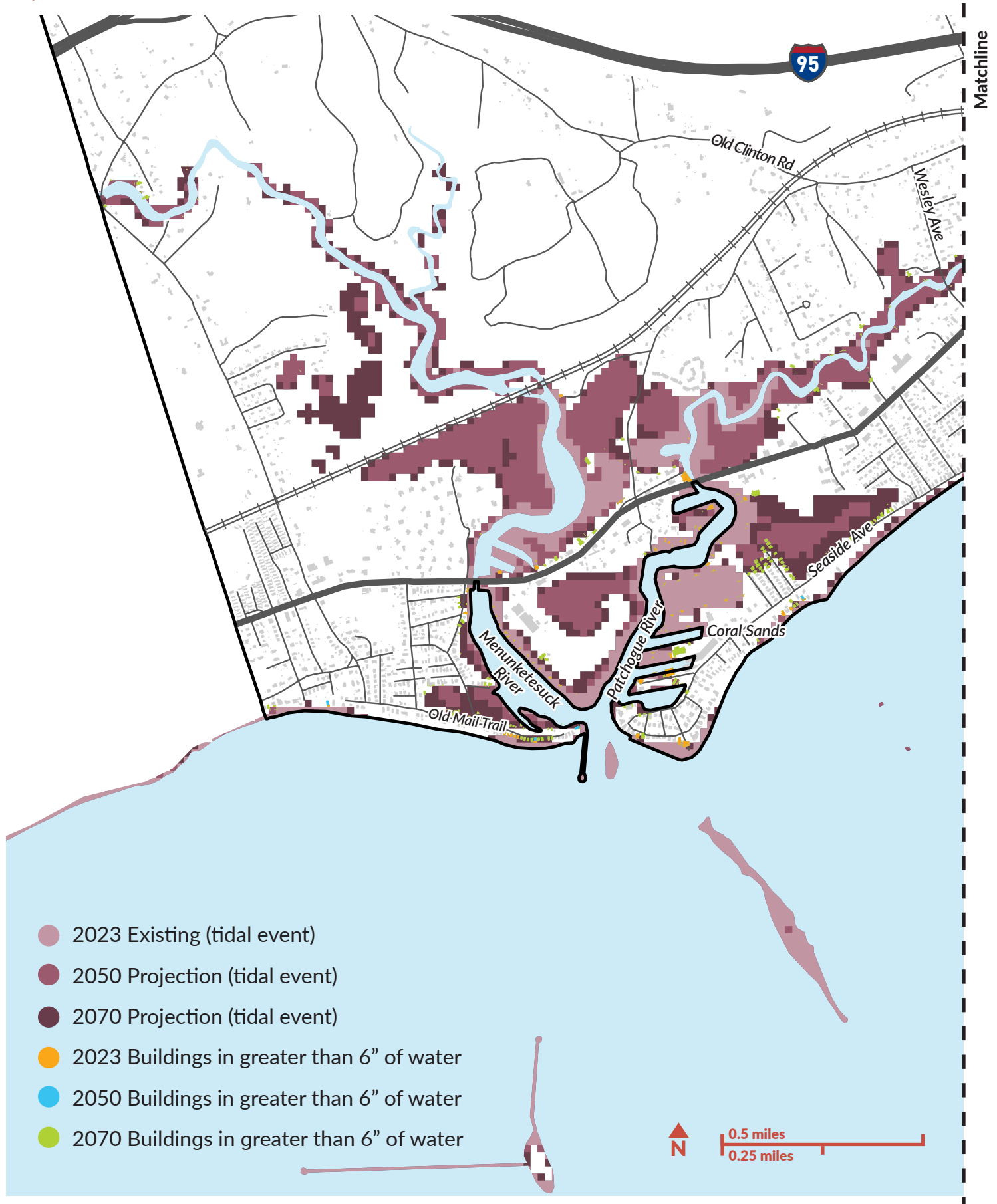
Westbrook 100-Year Storm Scenario Map Enlargement

Map 2 of 2



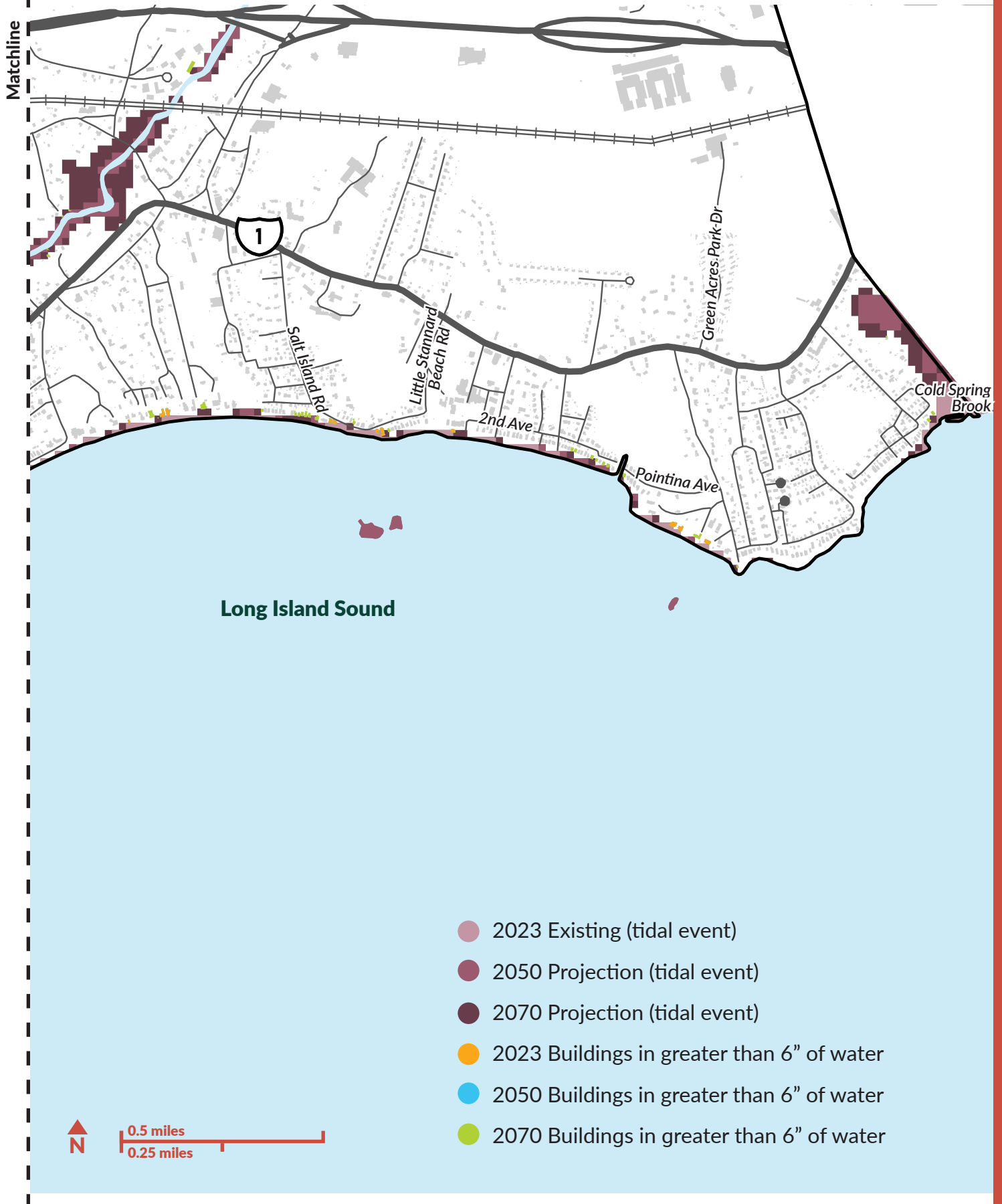
Westbrook Tidal Scenario Map Enlargement

Map 1 of 2



Westbrook Tidal Scenario Map Enlargement

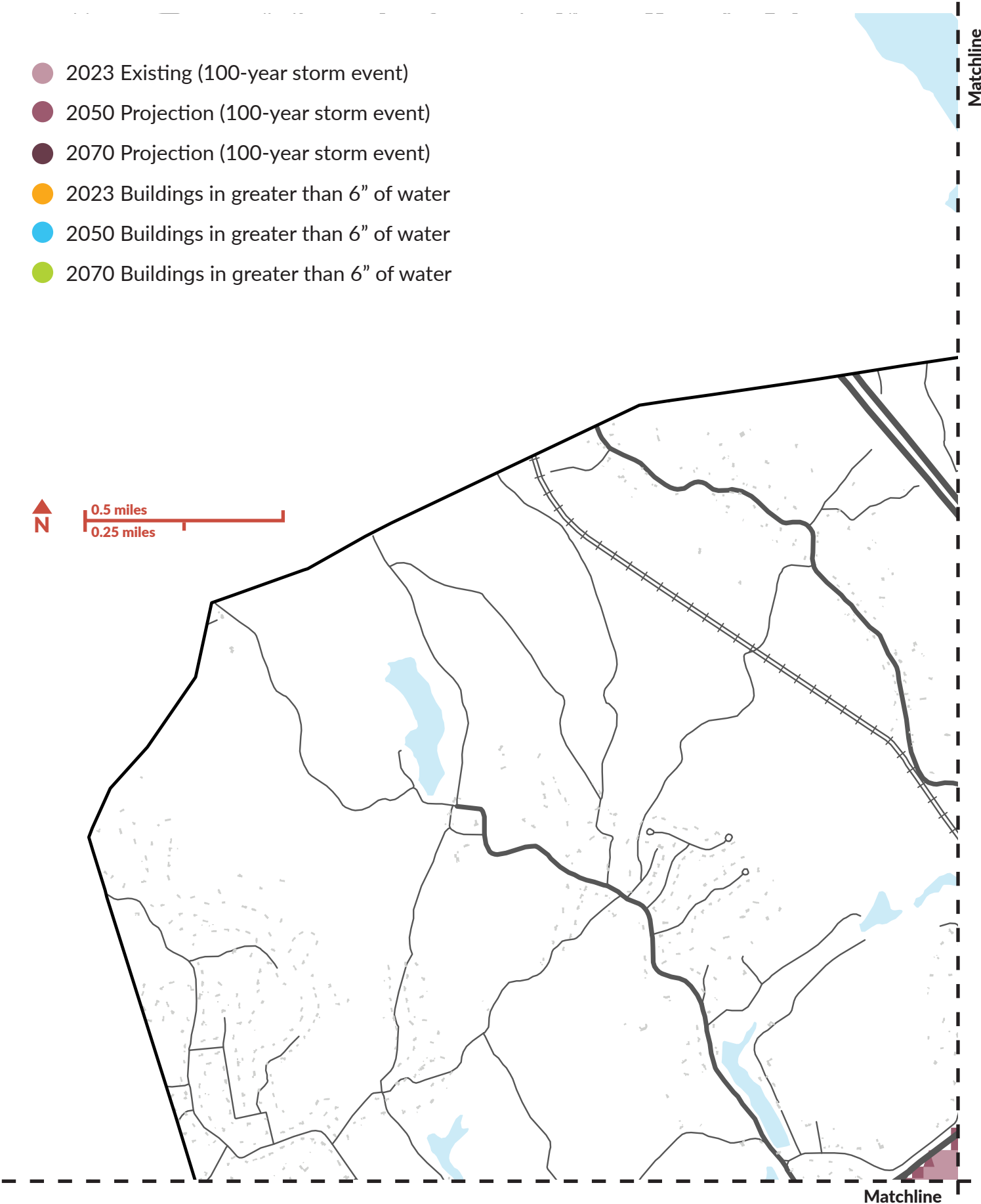
Map 2 of 2



Old Saybrook & Fenwick 100-Year Storm Scenario Map Enlargement

Map 1 of 4

- 2023 Existing (100-year storm event)
- 2050 Projection (100-year storm event)
- 2070 Projection (100-year storm event)
- 2023 Buildings in greater than 6" of water
- 2050 Buildings in greater than 6" of water
- 2070 Buildings in greater than 6" of water



Old Saybrook & Fenwick 100-Year Storm Scenario Map Enlargement

Map 2 of 4

Matchline

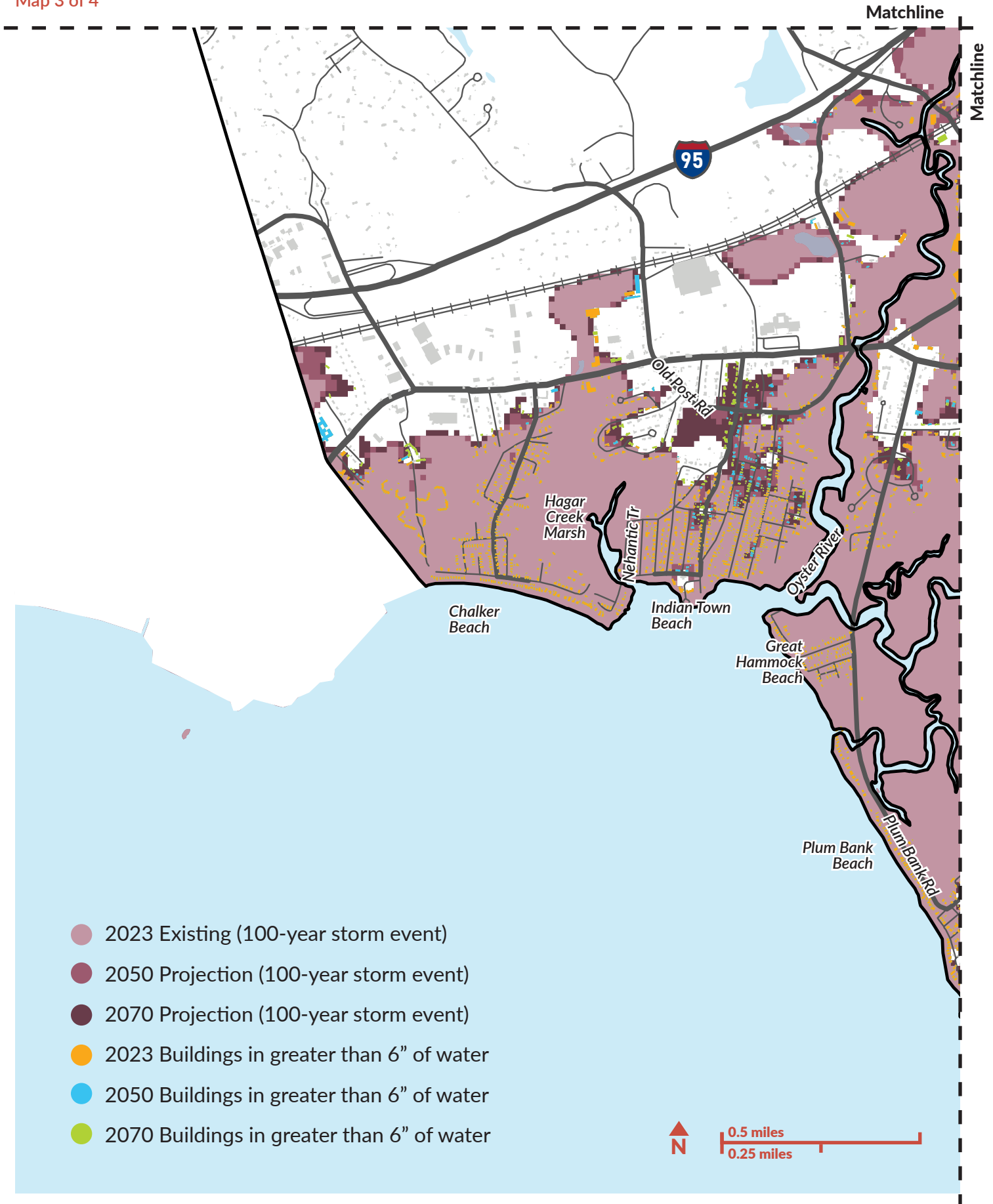


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Matchline

Old Saybrook & Fenwick 100-Year Storm Scenario Map Enlargement

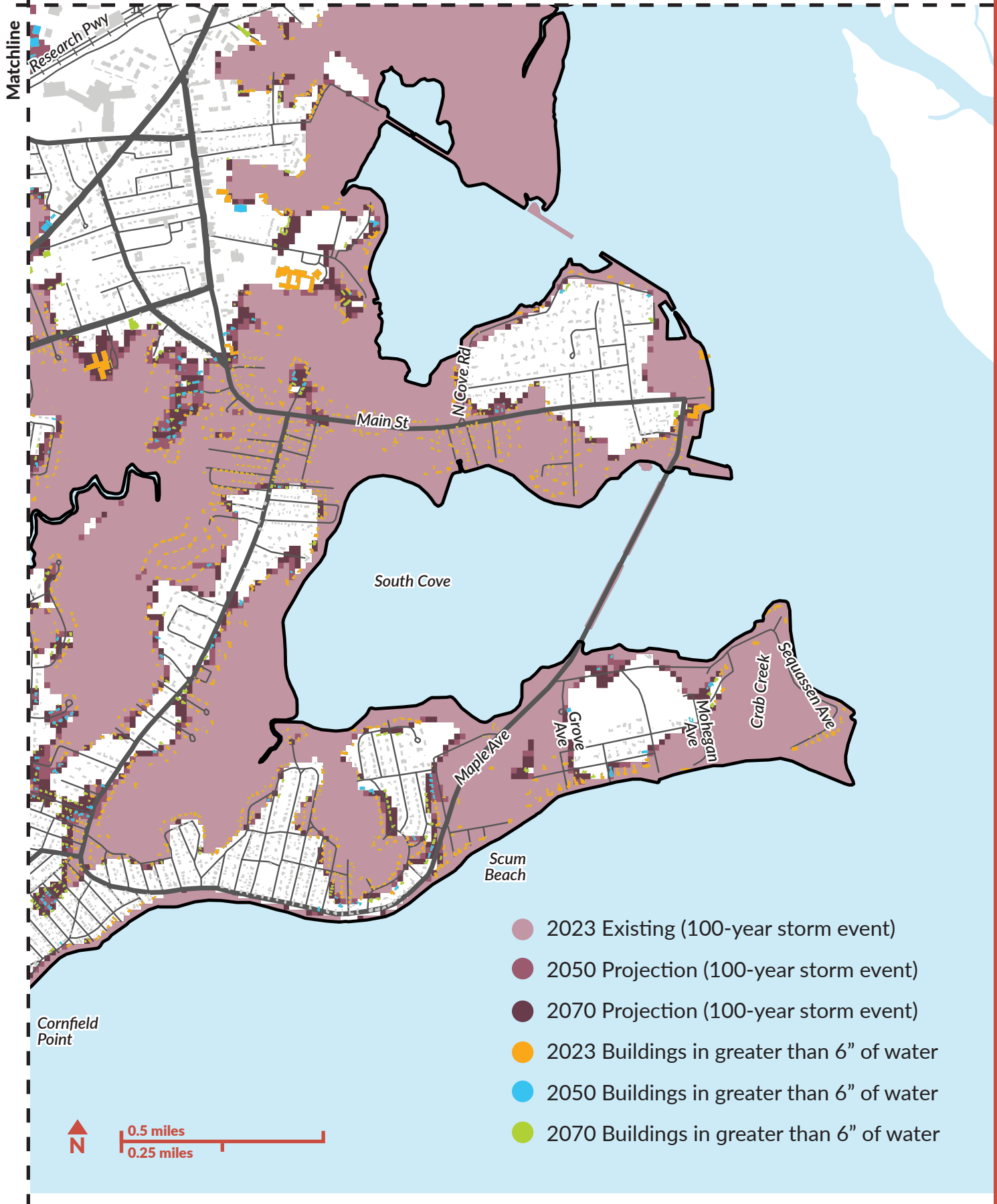
Map 3 of 4



Old Saybrook & Fenwick 100-Year Storm Scenario Map Enlargement

Map 4 of 4

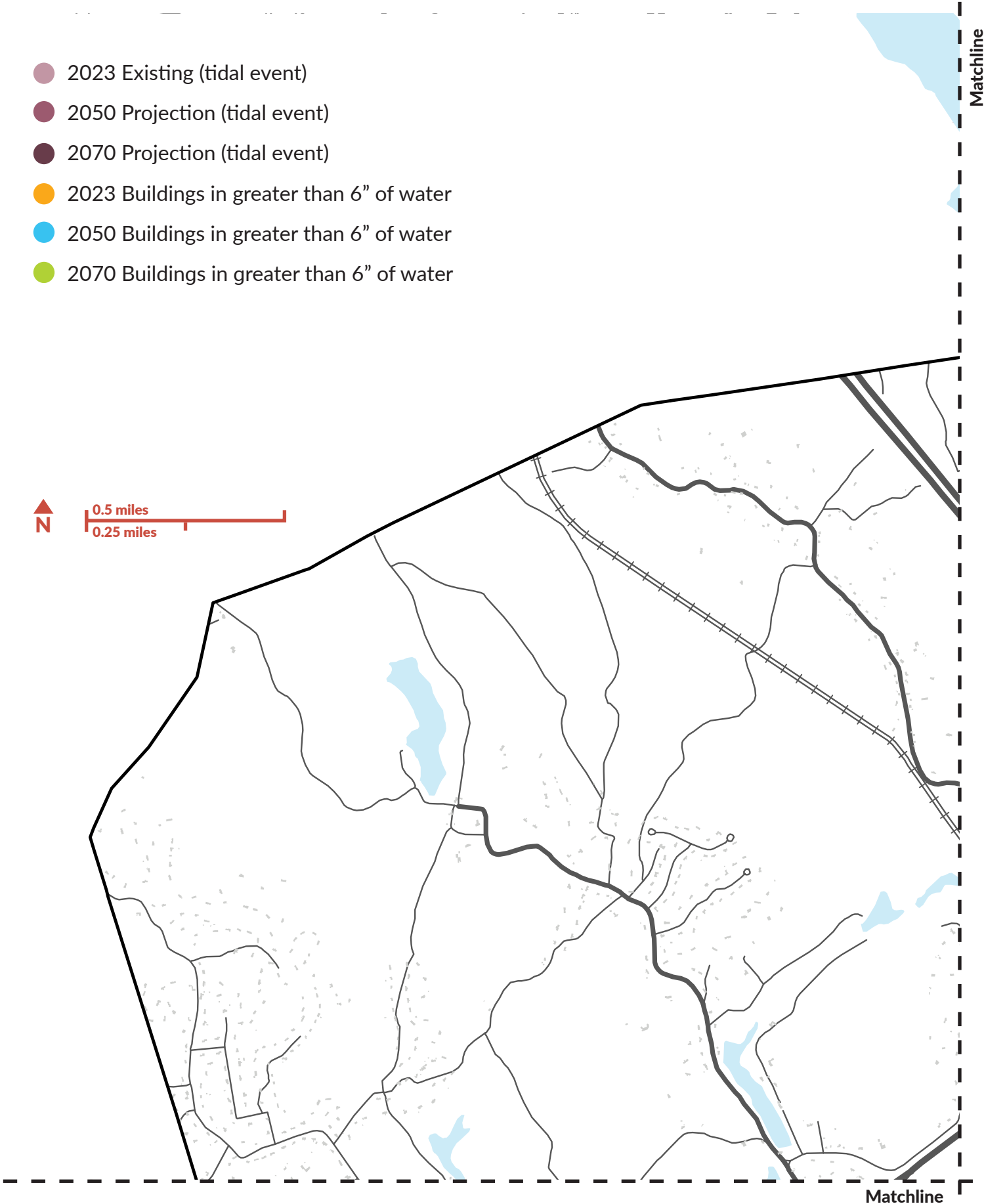
Matchline



Old Saybrook & Fenwick Tidal Scenario Map Enlargement

Map 1 of 4

- 2023 Existing (tidal event)
- 2050 Projection (tidal event)
- 2070 Projection (tidal event)
- 2023 Buildings in greater than 6" of water
- 2050 Buildings in greater than 6" of water
- 2070 Buildings in greater than 6" of water



Old Saybrook & Fenwick Tidal Scenario Map Enlargement

Map 2 of 4

Matchline

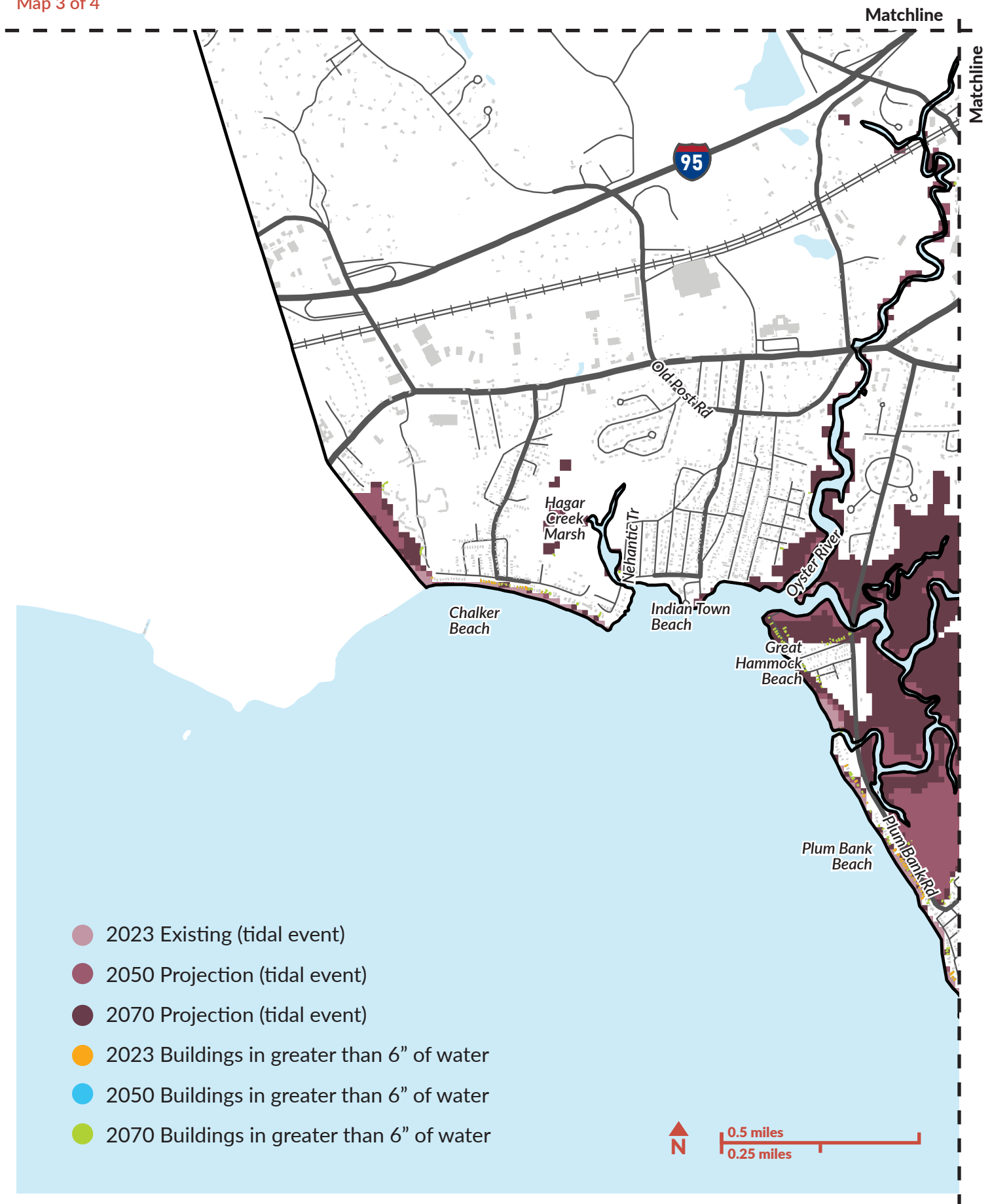


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Matchline

Old Saybrook & Fenwick Tidal Scenario Map Enlargement

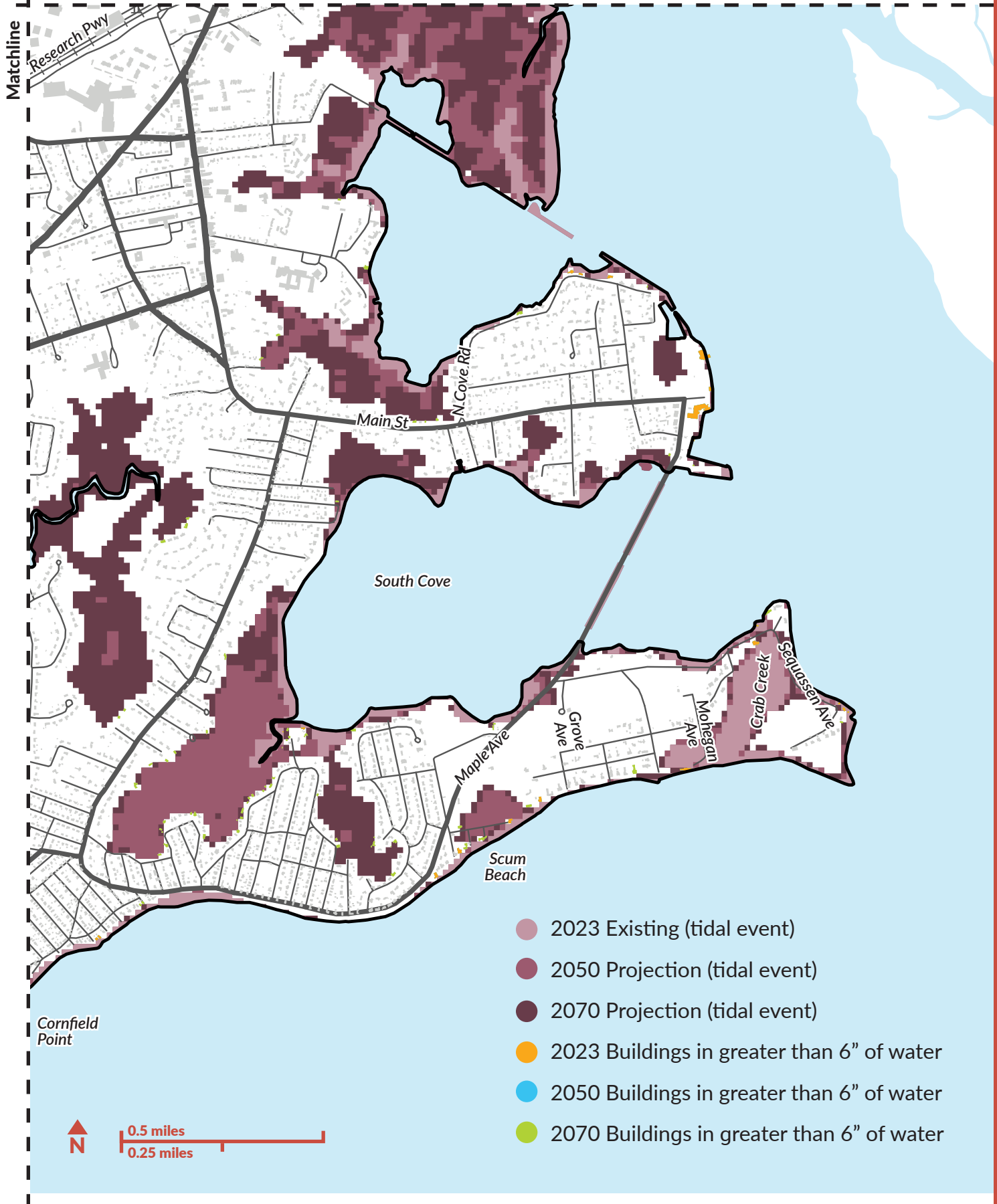
Map 3 of 4



Old Saybrook & Fenwick Tidal Scenario Map Enlargement

Map 4 of 4

Matchline



Appendix C

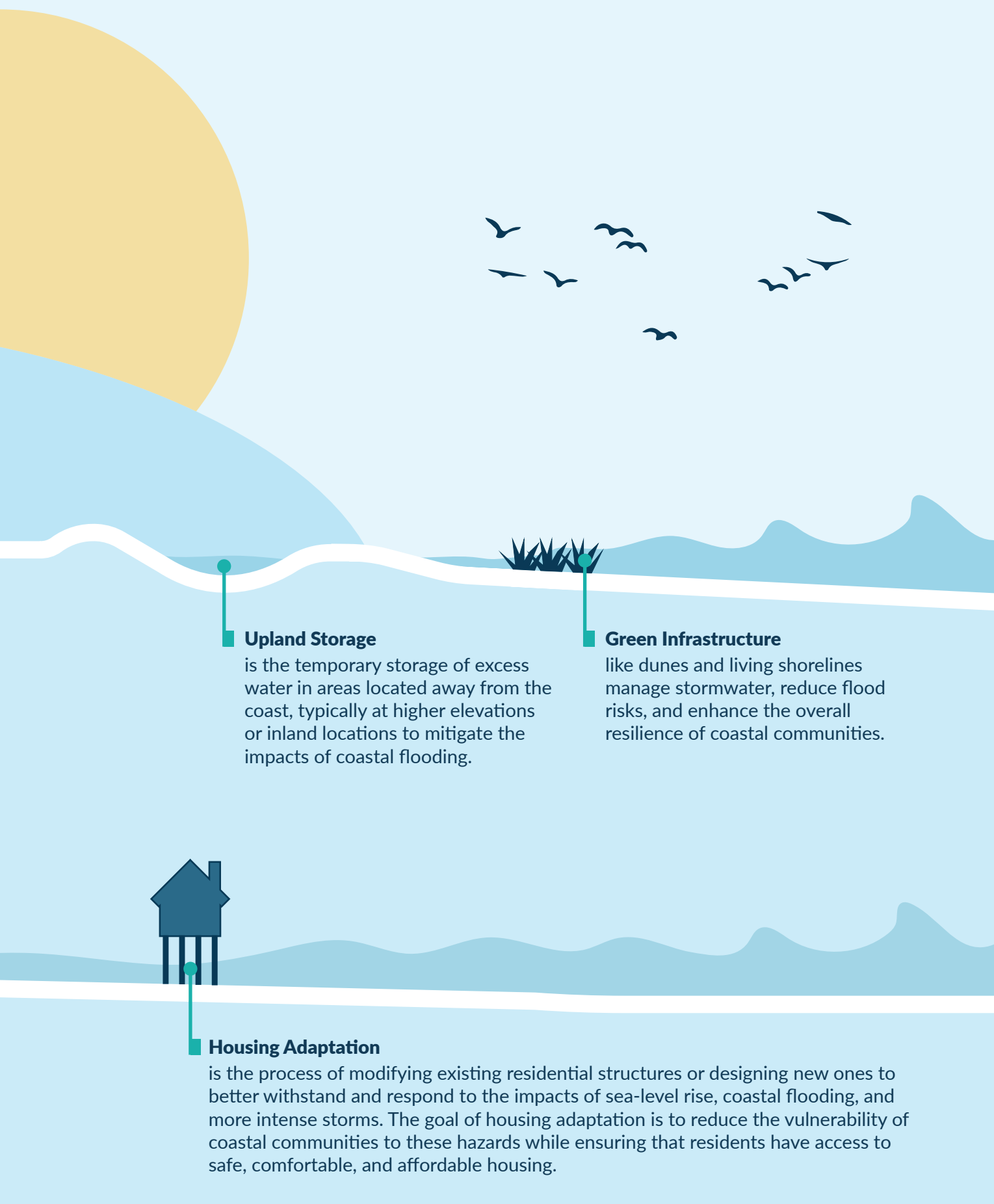
Coastal Resiliency Examples From Other Locations

The upcoming section presents case studies showcasing climate resilience and adaptation strategies relevant to Clinton, Westbrook, Old Saybrook, and Fenwick. The case studies explore various topics, such as nature-based and structural solutions, open space preservation, forward-thinking land use policies, managed retreat, and other pertinent approaches.

Project Title		Project Focus	Location
1	Resilient Edgemere Community Plan	<ul style="list-style-type: none">▪ Managed Retreat▪ Nature-Based Solutions▪ Open Space Preservation	Queens, NY
2	Flood Mitigation Analysis and Design	<ul style="list-style-type: none">▪ Open Space Preservation▪ Innovative Land Use Policies▪ Funding Strategies▪ Capital Projects	Schenectdy,NY
3	Restoration of Intertidal Habitat at Stratford Point	<ul style="list-style-type: none">▪ Nature-Based Solutions▪ Environmental Restoration Measures	Stratford, CT
4	Village Creek Salt Marsh Restoration Demonstration	<ul style="list-style-type: none">▪ Nature-Based Solutions▪ Environmental Restoration Measures▪ Open Spave Preservation	Norwalk, CT
5	South Bank Street - Water Street Project	<ul style="list-style-type: none">▪ Innovative Land Use Policies▪ Capital Projects`	New London, CT
6	Road Flooding in Coastal Connecticut	<ul style="list-style-type: none">▪ Funding Strategies▪ Capital Projects	Branford, CT Guilford, CT
7	Coastal Wastewater Management Plan	<ul style="list-style-type: none">▪ Funding Strategies▪ Capital Projects	Old Lyme, CT

Adaptation Options



**Upland Storage**

is the temporary storage of excess water in areas located away from the coast, typically at higher elevations or inland locations to mitigate the impacts of coastal flooding.

Green Infrastructure

like dunes and living shorelines manage stormwater, reduce flood risks, and enhance the overall resilience of coastal communities.

Housing Adaptation

is the process of modifying existing residential structures or designing new ones to better withstand and respond to the impacts of sea-level rise, coastal flooding, and more intense storms. The goal of housing adaptation is to reduce the vulnerability of coastal communities to these hazards while ensuring that residents have access to safe, comfortable, and affordable housing.

Resilient Edgemere Community Plan

This project focuses on:



Managed Retreat



Nature-Based
Solutions



Open Space
Preservation

Location: Queens, New York City

Year of Project: 2015

Project Description:

After Hurricane Sandy caused severe damage in the low-lying Edgemere neighborhood of Queens, New York City initiated the Resilient Edgemere Community Planning Initiative. This community-driven process, involving city agencies, residents, elected officials, and local organizations, led to the development of the Resilient Edgemere Community Plan. The plan outlines a long-term vision for a more resilient neighborhood, including a “land swap” pilot project that provided buyout and relocation assistance to residents in high-risk areas.

Through this project, eligible residents could exchange their damaged homes for newly built, elevated homes on safer ground. The damaged properties would be demolished and maintained as open space, enhancing flood resilience and potentially serving as recreational amenities. The plan’s 18-month public engagement process placed residents at the center of a transparent planning process, recognizing their unique understanding of their community. Resilient Edgemere demonstrates how local governments can help transition residents away from vulnerable areas while building community resilience and maintaining cohesion and local tax bases.

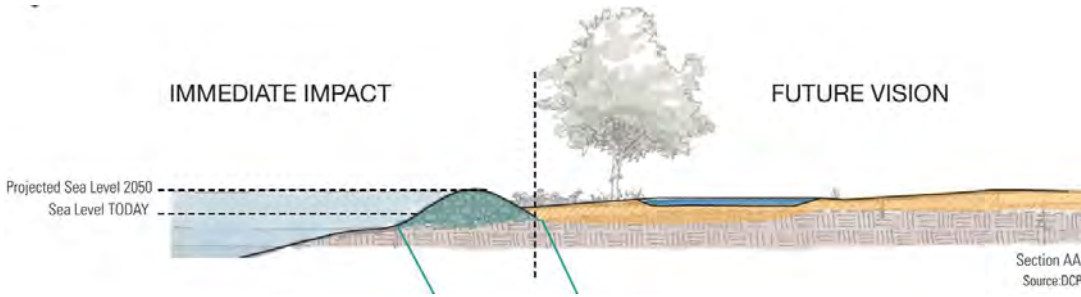
Funding:

Funding for the Resilient Edgemere planning process and buyouts through the Build It Back program in the aftermath of Hurricane Sandy came from the city’s Community Development Block Grant – Disaster Recovery grant. The Resilient Edgemere Community Plan also identifies potential funding sources for additional projects, such as FEMA and other public entities like the U.S. Army Corps of Engineers, U.S. Department of Transportation, and National Park Service, as well as private entities. However, securing funding for individual projects will require going through a public approval process or the city obtaining outside funding before implementation can begin.

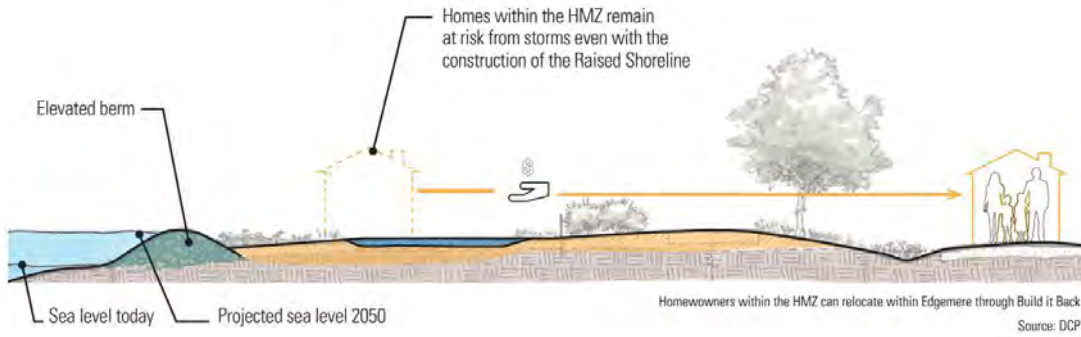
Considerations and Lessons Learned:

The Resilient Edgemere Community Plan demonstrates how planners and decision makers can effectively collaborate with communities to develop a shared vision for building resilience. The planning process empowered residents to contribute to aligning multiple objectives, programs, and projects with a long-term vision. Resilient Edgemere also exemplifies local retreat strategies that help people transition from high-risk flood areas to safer locations within their neighborhood, minimizing the economic, social, and psychological costs of relocation. Furthermore, the plan aligns resiliency planning and disaster recovery with New York City’s broader affordable housing and climate adaptation goals.

Source: N.Y. City Department of Housing Preservation & Development, Resilient Edgemere Community plan 21 (2017)



← Raised Shoreline



← Managed Retreat



← Short- and long-term visions for the Edgemere neighborhood



Flood Mitigation Analysis and Design

This project focuses on:



Open Space
Preservation



Innovative Land
Use Policies



Funding
Strategies



Capital
Projects

Location: Stockade, Schenectady, NY

Year of Project: 2019

Project Description:

A portion of the historic neighborhood of Schenectady, New York, located in a low-lying area along the Mohawk River, has been consistently subjected to flooding, including the devastating effects of 2011's Hurricane Irene along with nuisance flooding caused by ice jams on the river. The City's preliminary study found that 75 homes in the area were particularly vulnerable to flooding. To build a comprehensive assessment of the study area's parcels, the City conducted surveys with a combination of drones and ground observation, built 3D models of each structure, and developed a hydrological model.

After fully assessing the study area and mitigation options, the City engaged the community. Together, they assessed whether to "Keep the Water Out," by building a levy, or "Let the Water In," by elevating housing, raising streets or building new ones, or conducting a managed retreat. After considering the options, most residents supported managed retreat which saved their homes but relocated them out of the floodplain.

Funding:

FEMA awarded the City \$1.2 million through the Hazard Mitigation Grant Program to conduct Phase One of the project, which included an existing conditions analysis, evaluation of alternatives, and preferred alternative recommendations. At the outset of the first phase, FEMA had set aside another \$7.5 million for Phase Two construction, but it is anticipated that the preferred alternative will cost more than the set aside.

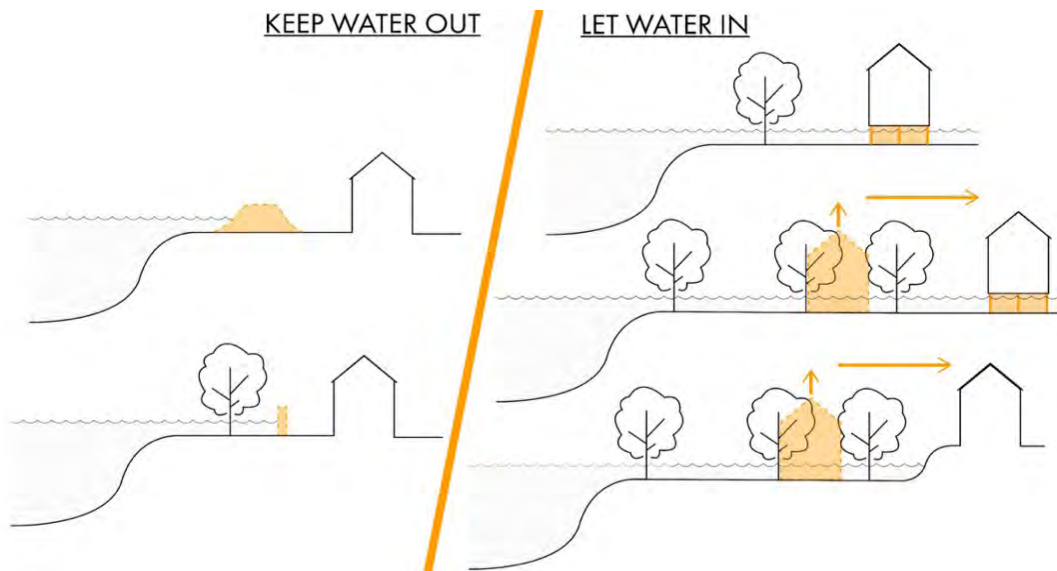
Considerations and Lessons Learned:

Community members prioritized long-term resilience and neighborhood fabric preservation over historic architecture, with river views and park access ranked lowest. However, there's a disconnect between these stated preferences and the public's support for managed retreat over levees/walls. While respondents opposed barriers that would impact low-priority river views and park quality, only about 30 people provided feedback—a small fraction of the 62 homeowners whose unanimous cooperation is required for managed retreat. Furthermore, not all respondents were property owners, and managed retreat wasn't universally ranked as the preferred option among those who responded.

Source: The City of Schenectady, Flood Mitigation Analysis and Design in the Historic Stockade Neighborhood (2018)



- ← The City's public process aimed to have participation from all homeowners in the project area



- ← The City laid out all of the complex options for flood mitigation in a simple graphic, based on two larger themes.



- ← Managed retreat concept

Restoration of Intertidal Habitat at Stratford Point

This project focuses on:



Nature-Based
Solutions



Environmental
Restoration Measures

Location: Stratford, Connecticut

Year of Project: 2015

Project Description:

The National Fish and Wildlife Fund conducted a living shoreline pilot program utilizing Reef Balls - concrete structures designed to mitigate wave action, facilitate enhanced ecosystem growth, and build up sediments. The project was followed by a five-year study of the installation's success. Partners from Sacred Heart University (grantee,) DuPont, AECOM, Connecticut Audubon Society, and National Audubon Connecticut, and more helped with the installation and study..

CTDEEP's Office of Long Island Sound programs was engaged early on to build buy-in, the permitting agency, and provide feedback. The project collaboration team has assisted in the maintenance of the installation, providing educational opportunities to local students, and measuring the impact of the outcomes. Due to the success of the project, NFWF has provided continued funding to expand the project in the year since implementation.

Funding:

Funding for the project was provided by a grant from National Fish and Wildlife Fund to Sacred Heart University.

Considerations and Lessons Learned:

This project is an example of how with the proper coalition building, a small investment in a novel idea can evolve into a best practice, capable of being replicated in further communities in Long Island Sound. Only one year after the installation of 64 Reef Balls, up to 15 cm of sediment was accreted inland of the reefs, wave impact was reduced by 30%, and the installations were found to serve as a habitat for oysters, barnacles, algae, sponges, clams, snails, and crabs.

Source: National Fish and Wildlife Foundation, Restoration of Inter-tidal Habitat at Stratford Point (CT) Final Programmatic Report (2016)



← Installation of Reef Balls



← Reef Balls after installation, during high tide



← Volunteers planting aquatic grasses to aid with erosion control

Village Creek Salt Marsh Restoration Demonstration

This project focuses on:



Nature-Based
Solutions



Environmental
Restoration Measures



Open Space
Preservation

Location: Norwalk, Connecticut

Year of Project: 2017

Project Description:

Village Creek empties into Long Island Sound through a diminished salt marsh surrounded by commercial, industrial, and residential uses. Much of the original footprint of the marsh has been lost, severely limiting the ecosystem's ability to absorb storm surge and protect the surrounding properties. Property loss around the marsh was occurring on an annual basis.

In 2016, NFWF and UCONN CIRCA provided funds to Norwalk Land Trust to conduct a study of how to rehabilitate the salt marsh. This included a survey of land and water conditions, testing and characterization of salt marsh soils, conceptual design options, and a baseline for site monitoring.

The study established two major activities to restore the coastal protection function properties of the salt marsh. First, after a vegetation study, it was found that it would be beneficial to restore three species of seagrass, *S. patens*, *D. spicata*, *I. frutescens* at the highest ranges of their preferred elevations. Second, the study found that it would be not only feasible, but beneficial to use sediments dredged from the Village Creek Channel to restore the salt marsh. This was recommended to be done via the process of "thin layer enhancement" every 6-10 years.

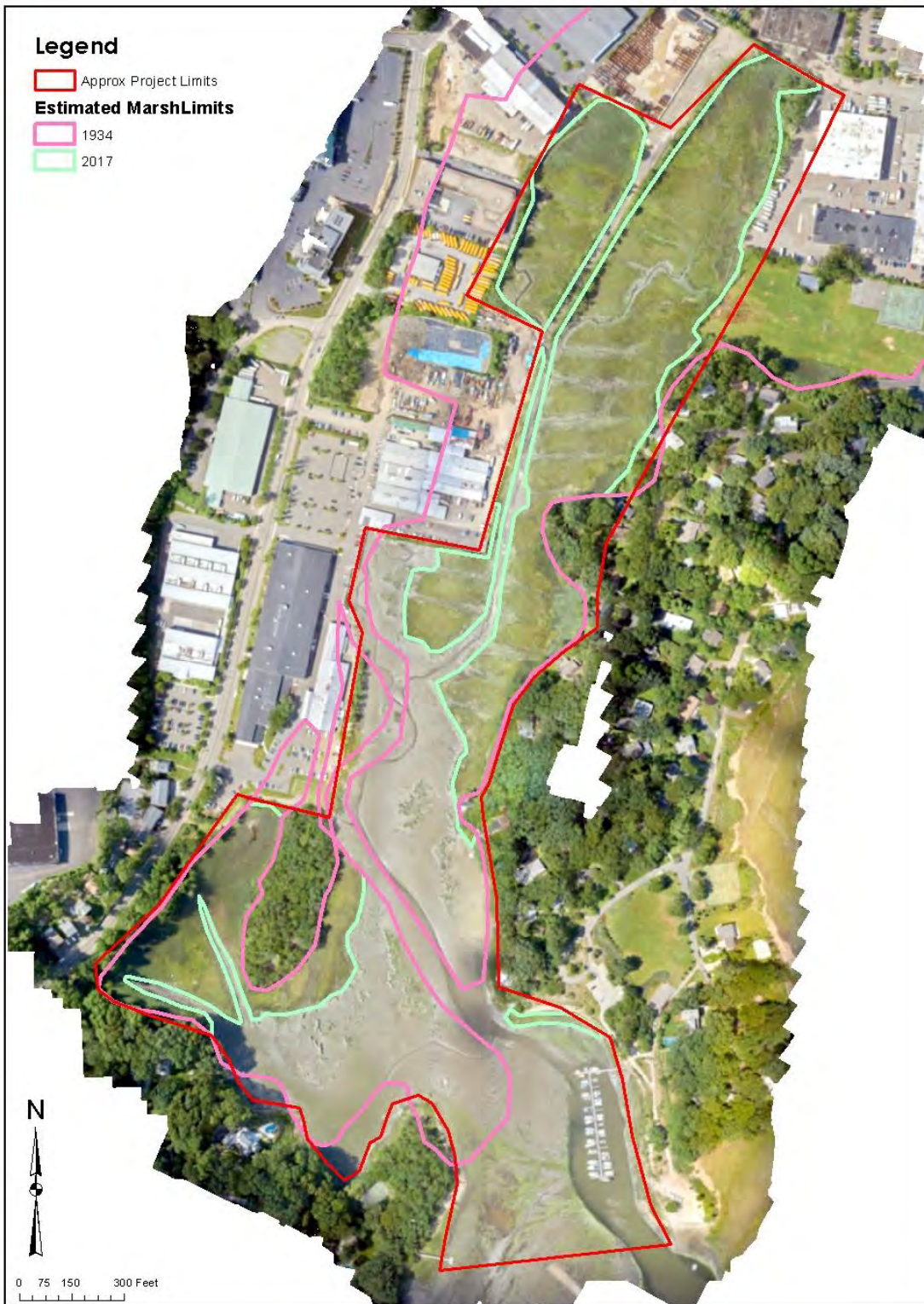
Funding:

An initial grant for \$20,000 from the National Fish and Wildlife Fund was supplemented by \$5,000 from the UCONN CIRCA program. The project was estimated to cost \$40,000 in total, but final budget was just under \$29,000.

Considerations and Lessons Learned:

A modest investment in environmental restoration research can guide improvements to routine waterway maintenance procedures. While state and federal agencies typically focus on navigability during coastal waterway maintenance, collaboration with town officials who understand local flooding challenges presents opportunities to enhance flood protection. At Village Creek Salt Marsh, dredged sediment—available every 6-10 years—can be repurposed for marsh stabilization rather than open water disposal. This approach, combined with new vegetation, offers long-term cost savings through reduced property damage, making the modified maintenance process economically advantageous.

Source: National Fish and Wildlife Foundation, Restoration of Inter-tidal Habitat at Stratford Point (CT) Final Programmatic Report (2016)



← Project area satellite view, showing the extent of the salt marsh in 1934 (pink) versus current extent as of 2017 (light green)

South Bank Street - Water Street Project

This project focuses on:



*Innovative Land
Use Policies*



*Capital
Projects*

Location: New London, Connecticut

Year of Project: 2018

Project Description:

South Bank Street and Water Street lie along the waterfront in New London's business district. The City of New London and UCONN's Community Research and Design Collaborative partnered on a climate action plan for the year 2100, designed to mitigate the effects of sea level rise and spur economic growth in the study area.

The public was presented with conceptual options for mitigating flood damage to the corridor with the following three design principles: do not place walls higher than 6' in close proximity to the user so as to cause a claustrophobic feeling, maintain sense of place by keeping street-level uses in buildings, and keep streets as memorable pathways and connections.

Design concept 1 combined a berm in the riverfront park with floodgates that bookended the park. Design concept 2 raised South Water Street three feet, with a three foot glass wall atop the elevated plane. Design concept 3 called for the back of buildings facing South Water Street to be backfilled three feet to create a berm integrated with the buildings.

Considerations and Lessons Learned:

This project explored conceptual design alternatives for building resilient infrastructure which can be applied to denser shoreline neighborhoods. The public overwhelmingly chose the option to raise the street and provide a glass flood wall. Though there were no cost estimates conducted for each alternative, this option could turn out to be the most expensive of the three options. As more and more communities try to mitigate flooding in low-lying neighborhoods, funding for projects will be in high demand. Town officials should be prepared for tough conversations with the public on the feasibility of floodproofing projects.

Source: UCONN CIRCA, Bank Street-South Water Street Project Final Report (2018)



← Flooding projection by UCONN CIRCA

- structures affected by flooding
- Limit of 100-year flood event
- Limit of 100-year flood event plus one foot
- Limit of 100 year flood event plus 20 inches



← Conceptual location of glass floodwall and building floodproofing

- Glass Floodwall
- Waterproof Treatment

Road Flooding in Coastal Connecticut

This project focuses on:



Funding
Strategies



Capital
Projects

Location: Branford and Guilford, Connecticut

Year of Project: 2017

Project Description:

Like most Connecticut coastal communities, Branford and Guilford have raised roads that traverse through salt marshes. These roads are critical infrastructure and can sometimes be the only egress for residents to reach higher ground during storms.

In 2017, UCONN CIRCA developed an approach to estimate the frequency of flooding at six flood problem sites on State Route 146 for the Towns of Branford and Guilford and SCRCOG. The study assessed the flow of water to the flooding areas back to Long Island Sound and the man-made infrastructure controlling it, if any, to determine how different amounts of sea level rise will affect the flooding issues. For example, the study identified that a low-lying area around a railroad underpass on Sachems Head Road (Rt 146) in Guilford, which is dependent on the downstream berm on Daniel's Avenue, will likely flood on a yearly basis if sea level rise increases 8 inches, causing flood waters to more easily and frequently overtake the berm.

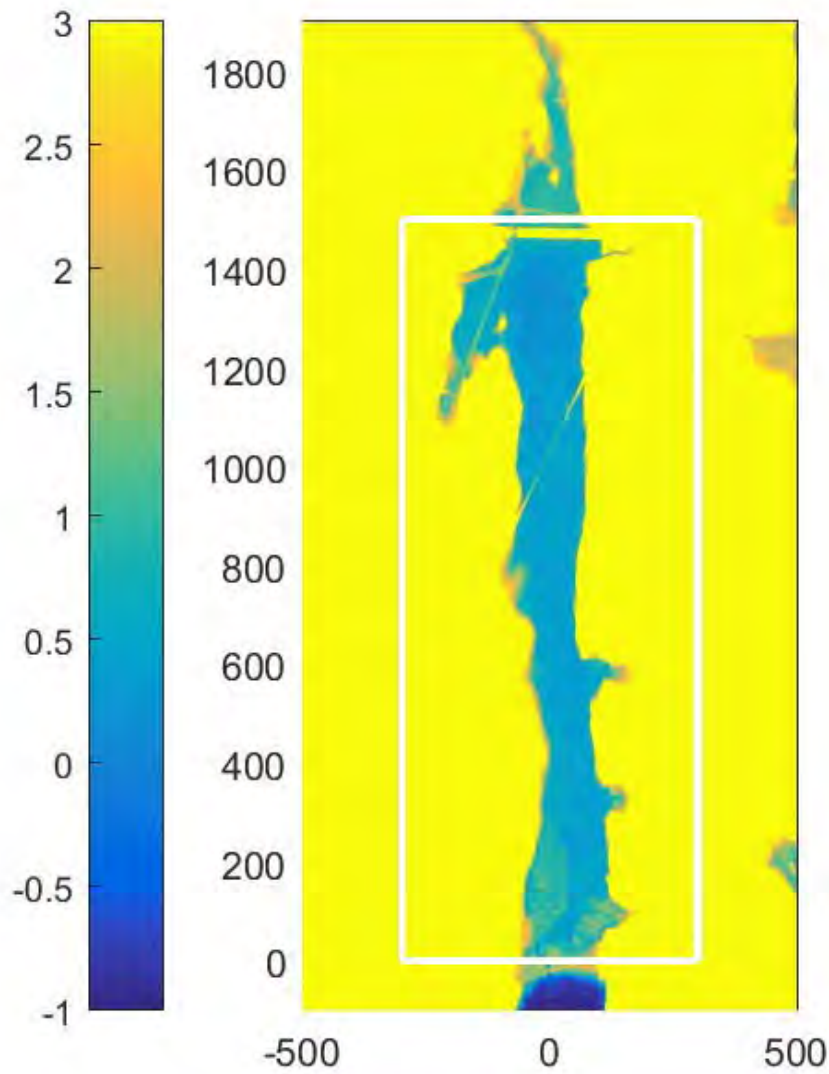
The study uses this data to produce suggestions for projects to remediate the road flooding. For the example above, the study suggested that either raising Daniel's Avenue a minimum of 8 inches or Sachems Head Road 16 inches will help mitigate the flooding, but admitted that neither would be substantial enough to fully eliminate the flood issue.

Considerations and Lessons Learned:

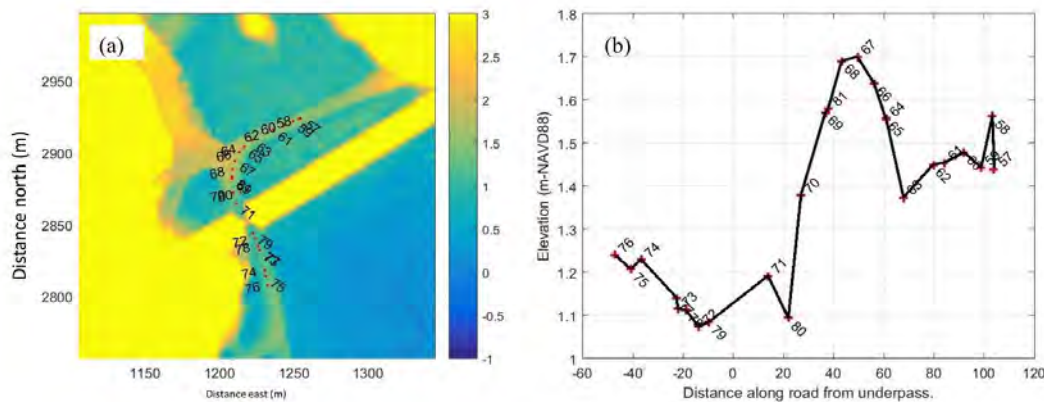
Many roads in the Four Shore region are subject to nuisance flooding, but when and where they will flood remains unpredictable without proper data. If Towns had access to flood model data, they will be able to give emergency crews and residents prior warning of closures before storms.

The data-driven approach of this study benefits project design, as it ensures to the best possible extent that expected outcomes meet actual outcomes. This also is favorable in the development of grant applications, giving prospective projects a leg up over other applications with less supporting data.

Source: UCONN CIRCA, Road Flooding in Coastal Connecticut: Final Report to South Central Regional Council of Governments (2017)



← Bathymetry and elevation (meters relative to NAVD88) of the salt marsh between Sachems Head Road and Daniel's Avenue.



Appendix D

Abbreviations

Abbreviations

AADT: Annual Average Daily Traffic

ACS: American Community Survey

ALICE: Asset Limited, Income Constrained, Employed

BFE: Base Flood Elevation

CEDS: Comprehensive Economic Development Strategy

CDBG-DR: Community Development Block Grant-Disaster Recovery

CDC: Centers for Disease Control and Prevention

CGS: Connecticut General Statutes

CHHA: Coastal High Hazard Area

CIF: Community Investment Fund

CIRCA: Connecticut Institute for Resilience and Climate Adaptation

CLEAR: Center for Land Use and Educational Research

CRCOG: Capital Region Council of Governments

CRS: Community Rating System

CTDOT: Connecticut Department of Transportation

CT DEEP: Connecticut Department of Energy and Environmental Protection

CTECO: Connecticut Environmental Conditions Online

DFE: Design Flood Elevation

EAP: Emergency Action Plan

EJA: Environmental Justice Area

EPA: U.S. Environmental Protection Agency

FEMA: Federal Emergency Management Agency

FIRM: Flood Insurance Rate Map

FLOW: Delft3D-FLOW Flexible Mesh

HUD: United States Department of Housing and Urban Development

IPCC: Intergovernmental Panel on Climate Change

IWWA: Inland Wetland and Watercourse Act

LCRV COG: Lower Connecticut River Valley Council of Governments

LF: Linear Feet

LIMWA: Limit of Moderate Wave Action

LISCIF: Long Island Sound Community Impact Fund

LISFF: Long Island Sound Futures Fund

LOTICIP: Local Transportation Capital Improvement Program

MHW: Mean High Water

MHHW: Mean Higher High Water

MLW: Mean Low Water

MLLW: Mean Lower Low Water

MTL: Mean Tide Level

MSL: Mean Sea Level

NACCS: North Atlantic Coast Comprehensive Study

NAD83/11: North American Datum of 1983, 2011

NAVD88: North American Vertical Datum of 1988

NFIP: National Flood Insurance Program

NFWF: National Fish and Wildlife Foundation

NOAA: National Oceanic and Atmospheric Administration

NPS: National Parks Service

NWI: National Wetland Inventory

QCEW: Quarterly Census Of Employment And Wages

Rte.: Route

RVT: River Valley Transit

SCRCOG: South Central Regional Council of Governments

SF: Square Feet

SFHA: Special Flood Hazard Area

SLR: Sea Level Rise

SVI: Social Vulnerability Index

SWAN: Simulating Waves Nearshore

TIF: Tax Increment Financing

TNC: The Nature Conservancy

UConn: University of Connecticut

USACE: United States Army Corps of Engineers

USGS: United States Geological Survey

WAVE: Delft3D-WAVE

3DEP: 3D Elevation Program

2-D: Two-dimensional