

North Hampton, NH  
Master Plan  
Coastal Hazards Chapter



King Tide, October 2019. Photo credit: Martha Lardent

Adopted XX, 2022

# Coastal Hazards Master Plan Chapter

Town of North Hampton, NH **DRAFT**

## Introduction

The Town of North Hampton (Town) and the Little Boar's Head Village District (LBH) in recent years have experience multiple storm and flooding events along the coast that have had direct impacts on roadways, infrastructure, public and private structures, recreational facilities, and natural resources. While North Hampton has always experienced the hazards of being a coastal community, there is growing awareness amongst residents and officials that the current and future impacts will be more significant. There is recognition amongst Town and LBH officials, staff and residents that specific coordinated efforts to deal with impacts of have been largely reactive instead of proactive.



*Plowing rocks on Route 1A after a coastal storm in November 1944. Source: North Hampton Historical Society*

The unique planning and zoning authority of the LBH coupled with the Town's authority and responsibilities means that any efforts to implement most coastal hazard mitigation and adaptation efforts must be done through a joint effort. The intent of this chapter, developed concurrently with the Little Boar's Head Village District was to increase the knowledge of coastal impacts and to develop a set of coordinated actions and goals that officials, staff and residents from both the Town and LBH can use to help mitigate impacts, better adapt to changes, and ultimately become a more resilient community.

This chapter was developed with the support from the following boards and departments within the Town and LBH, all of whom contributed volunteer participation, staff time, and extensive knowledge about North Hampton and Little Boar's Head:



*Broken walkway along the Route 1A shale piles after a coastal storm in March 2018. Photo credit: Rich Beauchesne.*

- North Hampton Select Board
- LBH Village District Commissioners
- North Hampton Planning Board
- Little Boar's Head Planning Board
- Conservation Commission
- Heritage Commission
- Town Administrator
- Emergency Management Director
- Fire Department
- Police Department
- Public Works Department
- Planning & Zoning Department
- Building Department

Additionally, multiple public information and input sessions were held between January 2020 and final adoption of the chapters by the North Hampton and Little Boar's Head Planning Boards.

## Vision

The residents of North Hampton seek to protect their community from the impacts of coastal hazards, climate change and sea-level rise to preserve and enhance the character, heritage, and natural resources within the Town. Planning of resources, funding and actions can address these issues in a way that minimizes losses to property, protects the environment, avoids unnecessary expenses, and allows for adaptation.

This can be accomplished by:

- Ensuring that the best available information, including continual feedback from residents, landowners and businesses is used for decisions. This information and feedback will help to ensure the best outcomes with an engaged and involved community.
- Acting early to reduce costs, maximize investment and increase resiliency.
- Determining the level of acceptable impacts and risks to minimize those impacts to residents, landowners, businesses, and for nature.
- Promoting actions that serve multiple benefits for the Town. The development of these actions must include engaging the community to enhance action development and to communicate benefits.
- Collaborate with Village District, neighboring municipalities, and regional, state and federal partners to use resources efficiently and maximize impact of actions.
- Being flexible as knowledge and conditions change and planning to revisit goals and actions often.
- Including everyone (residents, landowners, businesses, visitors, etc.) in meeting these goals through education, communication, and participation. Important in this endeavor is that all residents have a part to play, as an observer and a participant, and can take actions.

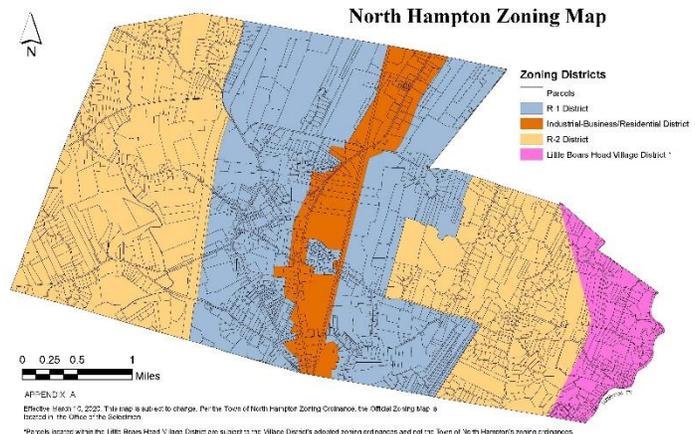


*Fish houses and Little River tidal culvert near North Hampton State Park during the King Tide, October 2019. Photo credit: Martha Lambert.*

## Background

North Hampton is a suburban and rural coastal community that lies in the heart of the seacoast of New Hampshire. The town encompasses 8,923 acres of land (approximately 14 square miles) and 55 acres of open water. North Hampton is predominantly drained by two main watersheds: the Winnicut River watershed that drains into the larger Great Bay-Piscataqua River watershed, and the coastal drainage to the Atlantic Ocean via the Little River, Philbrick's Pond, Berry's Brook and Bailey's Brook. North Hampton's land use pattern has largely been determined by its natural resources, which intern influenced its transportation and commerce development. Like many New England towns, North Hampton developed in the area adjacent to freshwater and coastal waterways, with major town facilities located near adjacent upland areas.

Within the boundaries of the Town of North Hampton, is the Little Boar's Head Village District (LBH). LBH was formed by an act of the NH Legislature in 1905 and encompasses the seaward extent of the town (depicted in pink on the North Hampton Zoning map to the right). LBH legally exists an independent political entity that has autonomous zoning authority and is responsible for the walkways and streetlights within the LBH boundaries. The Town of North Hampton continues to have responsibility for emergency service, education and health services, infrastructure oversight, and maintenance of local roadways within Little Boar's Head.



North Hampton Zoning Map (2020)

A key difference between the Town and LBH are that they maintain separate master plans and zoning ordinances as they have separate authority to enact zoning regulations. For example, North Hampton maintains participation in the National Flood Insurance Program (NFIP) administered by FEMA by having floodplain development regulations within North Hampton's Zoning Ordinance. In 2017, the Little Boars Head Village District became a participant in the NFIP as an independent political entity for zoning authority and adopted its own floodplain regulations. LBH's floodplain regulations are effectively identical to the Town's floodplain regulations.

While the Town and LBH have separate master plans and zoning regulations, many of the goals of both jurisdictions express similar intents to protect natural resources, preservation of community character, and ensure proper investment in community services and capital expenses. An overarching intent in this chapter, and within both the Town and LBH master plans, is to promote understanding of coastal hazards to encourage informed decisions by community members for better community resiliency.



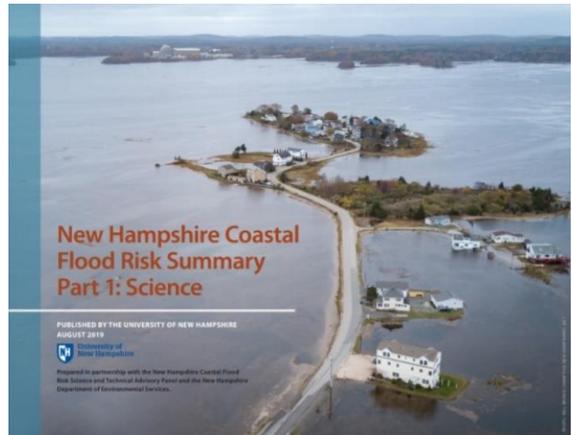
View of Ocean Boulevard in the vicinity of the Fish Houses at the height of the storm on February 7, 1978. Lydia Bottomley's Fish House has just floated onto the State highway, the ocean is flooding into the marsh.  
P 32. MEB 09 (photo by R.A. Southworth)

storm February 7, 1978. Source: North Hampton Historical Society

The following information is a summary of key state, regional and local planning documents and studies that address coastal hazards and topics. The body of information regarding the impacts of coastal hazards from climate change and sea level rise continues to grow and thus North Hampton and Little Boar's Head will need to consider updates to knowledge when making decisions on planning and projects efforts.

### New Hampshire Coastal Flood Risk Summary – Part 1: Science (2019)

In 2019, the NH Department of Environmental Services updated the 2014 Coastal Risk and Hazard Commission Science and Technical Advisory Panel Report with the publication of the [2019-2020 New Hampshire Coastal Flood Risk Summary](#), including “Part I: Science” and “Part II: Guidance for Using Scientific Projections.” Together, Part I and Part II of the New Hampshire Coastal Flood Risk Summary fulfill the requirements of RSA 483-B:22, that requires NHDES to update the 2014 Coastal Risk and Hazard Commission report every five years.

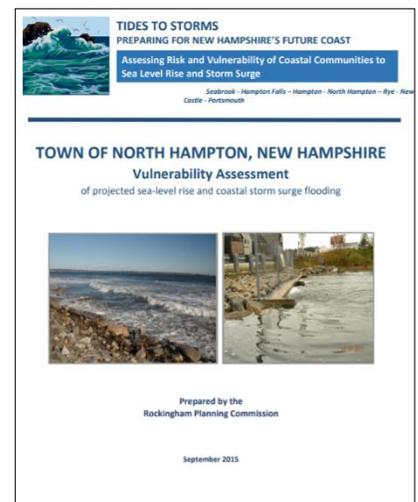


The New Hampshire Coastal Flood Risk Summary – Part 1: Science provides a synthesis of the state of the science relevant to coastal flood risks in New Hampshire. Key findings of the report related to projected sea-level rise, coastal storms, groundwater rise, precipitation changes and flooding include:

- Relative sea level in New Hampshire is rising and in coastal New Hampshire is projected to rise for centuries. The rate of ice mass loss from the Greenland and Antarctic ice sheets is accelerating, and land ice is now the primary contributor to sea-level rise.
- Inland and coastal impacts from storm surge in coastal New Hampshire will increase with sea-level rise
- Future storm surge increases as extreme storm intensity increases. And current 100-year return period storm surge estimates vary.
- Coastal groundwater levels will rise with sea-level rise, with the magnitude of groundwater rise decreasing with distance from the coast.

### TIDES TO STORMS: Assessing Risk and Vulnerability to Sea-level rise and Storm Surge (2015) – North Hampton, NH Vulnerability Assessment

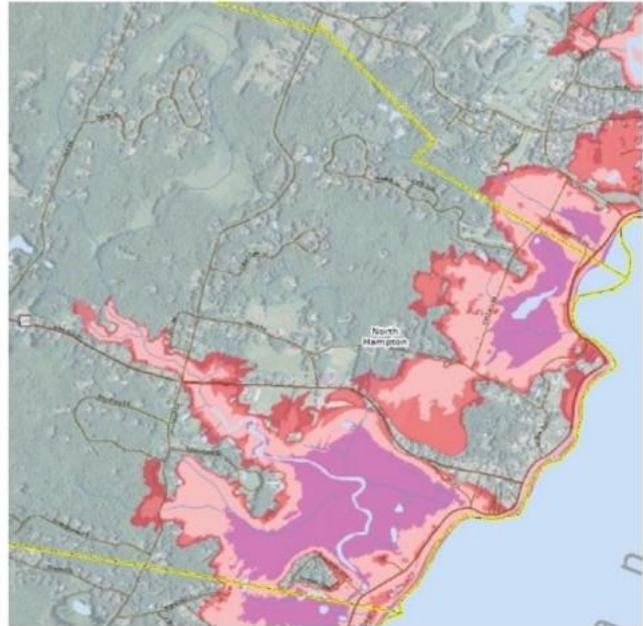
In 2015, Rockingham Planning Commission released TIDES TO STORMS: Assessing Risk and Vulnerability to Sea-level rise and Storm Surge, an assessment of vulnerable areas and infrastructure in coastal New Hampshire. Coastal municipalities were provided maps and an assessment of risks to roadways and supporting transportation infrastructure, critical facilities and infrastructure, and natural resources. [North Hampton’s Tides to Storms Vulnerability Assessment \(2015\)](#) included recommended actions that municipalities can take to help adapt and improve resiliency to changing conditions caused by storm surge and sea-level rise. The figure below depicts the identified areas of concern and the extent of areas potentially threatened by sea-level rise and storm surge in North Hampton.



Sea-Level Rise Scenarios 1.7 feet, 4.0 feet and 6.3 feet



Sea-Level Rise Scenarios 1.7 feet, 4.0 feet and 6.3 feet plus storm surge



Note: Storm surge is the area flooded by the 100-year/1% chance storm event.

North Hampton’s Tides to Storms Vulnerability Assessment (Rockingham Planning Commission, 2015)

The sea-level rise projections used in the Tides to Storms study are based on a study completed in 2011 by Wake et al., but are similar to report issued by the NH Coastal Risks and Hazards Commission’s Science and Technical Advisory Panel in 2014. Key findings for the Town of North Hampton and Little Boars Head Village District are reported in the table below based on evaluation of the 1.7 feet intermediate-low, 4.0 feet intermediate, and 6.3 feet highest sea-level rise projections at the year 2100 and these sea-level rise projections with the 100-year storm surge.

Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
Infrastructure (# of sites)	1	7	9	10	15	16
Critical Facilities (# of sites)	1	2	2	2	4	7
Roadways (miles)	0.0	0.7	1.3	1.3	2.6	3.3
Upland (acres)	67.8	135.3	215.9	193.5	283.9	358.6
Freshwater Wetlands (acres)	32.5	49.4	71.5	61.9	84.2	95.5
Tidal Wetlands (acres)	18.1	21.3	21.9	22.1	22.1	22.2
Conserved and Public Lands (acres)	8.8	14.8	19.3	19.1	28.4	37.6
100-year floodplain (acres)	69.5	69.5	69.5	69.5	69.5	69.5
500-year floodplain (acres)	135.7	135.7	135.7	135.7	135.7	135.7

Notes: Storm surge is the area flooded by the 100-year/1% chance storm event. Upland refers to land above mean higher high water (highest tidal extent) and excluding wetlands. 500-year floodplain impacts were calculated based on flooding beyond the extent of the 100-year floodplain impacts.

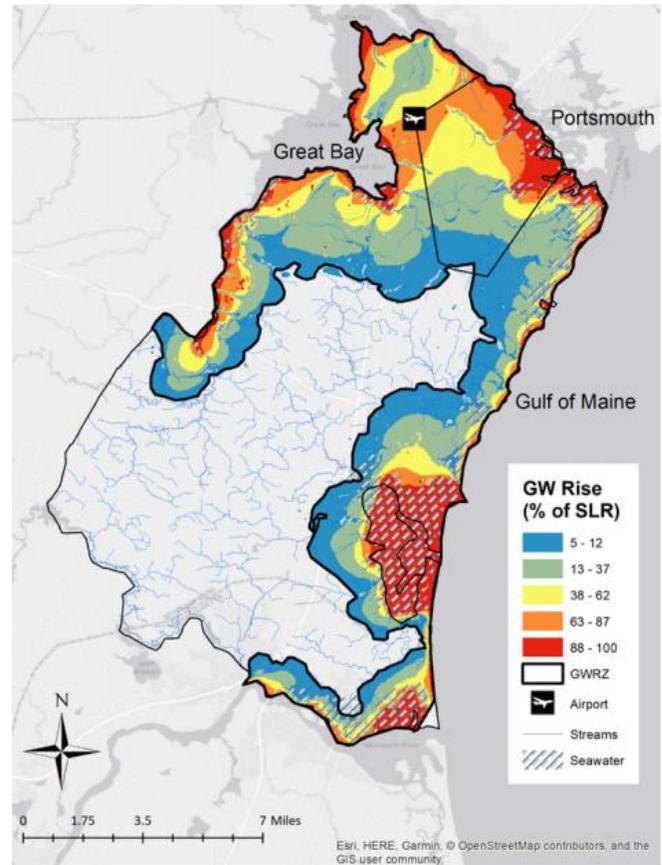
### Groundwater Resource Impacts

Climate change in New England is forecast to include more frequent and intense precipitation events, with a slight decrease to little change in total precipitation, and increasing temperatures. The effects of this potential future climate change on the Seacoast hydrologic system would likely include reduced base flows and fresh ground-water discharges to tidal areas and lowered ground-water levels. The effects of these climate changes by 2025 were estimated to be greater than the potential effects of increased water demands. The analyses indicated that there are potential issues of concern for future use of water resources in the Seacoast region. The models developed and demonstrated in this investigation can provide water-resource managers and planners tools with which to assess future water resources in this region. The findings regarding the effects of increasing water demand and potential climate change on ground-water availability may be transferrable to other regions of the nation with similar hydrogeologic and climatic characteristics. (Assessment of Ground-Water Resources in the Seacoast Region of New Hampshire, 2001. US Geological Survey)

The 2019 [New Hampshire Coastal Flood Risk Summary, Part I: Science](#) considered several impacts of climate change, but specifically looked at the impact of sea-level rise on groundwater levels as saltwater displaces fresh groundwater resources. The conclusion is that coastal groundwater levels will rise with increase sea-level rise.

Within North Hampton groundwater rise and saltwater intrusion have the potential to impact several topics include:

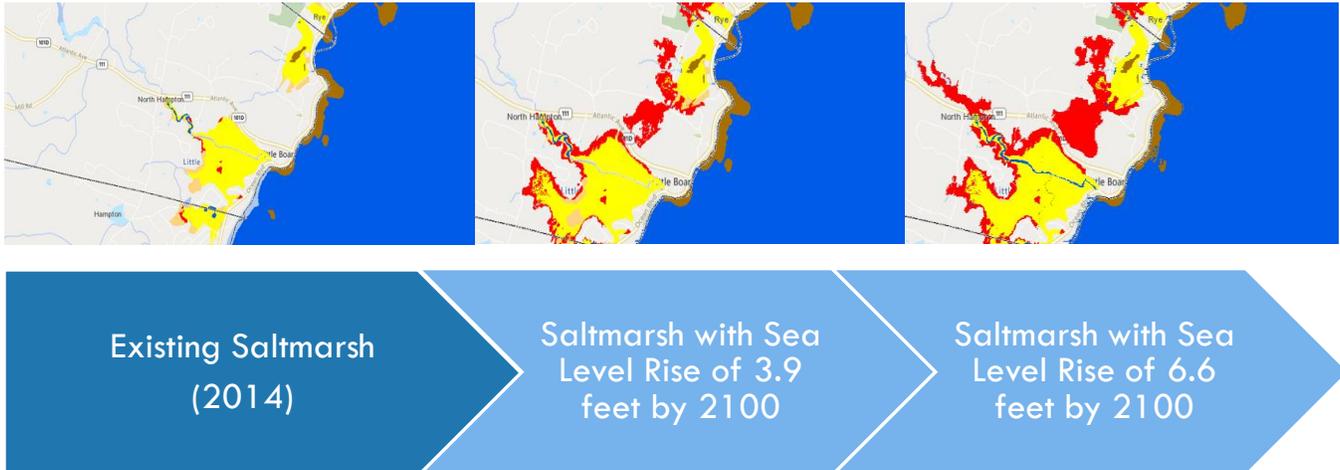
- **Drinking water resources:** The eastern portion of North Hampton and all of Little Boar's Head are serviced by drinking water wells from the Aquarian Water Company, with most of their wells located in the northwest corner of North Hampton and south of Mill Road near the Hampton border. Additional wells are located within the town of Hampton. The wells located in Hampton and those located near Mill Road are projected to be the most susceptible to impacts from groundwater rise.
- **Septic systems:** North Hampton relies entirely upon on-site septic systems for wastewater disposal. As groundwater rises septic systems become increasingly at risk for failure if they have insufficient separation between groundwater levels and the bottom of the septic system. A recent evaluation of septic system risk in North Hampton conducted by Rockingham Planning Commission for the Conservation Commission found that 229 developed parcels within North Hampton and Little Boar's Head are already at risk for impacts due to their location within existing flood zones.
- **Road impacts:** Coastal roads are susceptible to damage from groundwater rise as the water movement impacts the base materials of the roadway (NH Coastal Flood Risk Summary, 2019). These impacts are in addition to the damage caused by flooding and storm surge that coastal roads are increasingly subject to. (See Seacoast Transportation Corridor Vulnerability Assessment section on page 12 for additional detail.)



Extent of Groundwater rise as a percent of sea-level rise. Source: New Hampshire Coastal Flood Risk Summary, Part I: Science (NHDES 2019).

### Coastal Wetlands

In 2015, the N.H. Fish & Game used a modeling tool - [Sea Level Affecting Marshes Model \(SLAMM\)](#) - to project where saltmarsh may persist or migrate inland based on changes in sea level. Currently, salt marsh lie within North Hampton is located predominantly within the Little River Marsh and Philbricks Pond; however, at the 3.9 feet sea level rise by 2100 scenario there is potential for marsh to form inland further up the Little River and Chapel Brook, and at the 6.6 feet scenario there is potential for marsh migration further inland as far as the Mill Pond Dam.



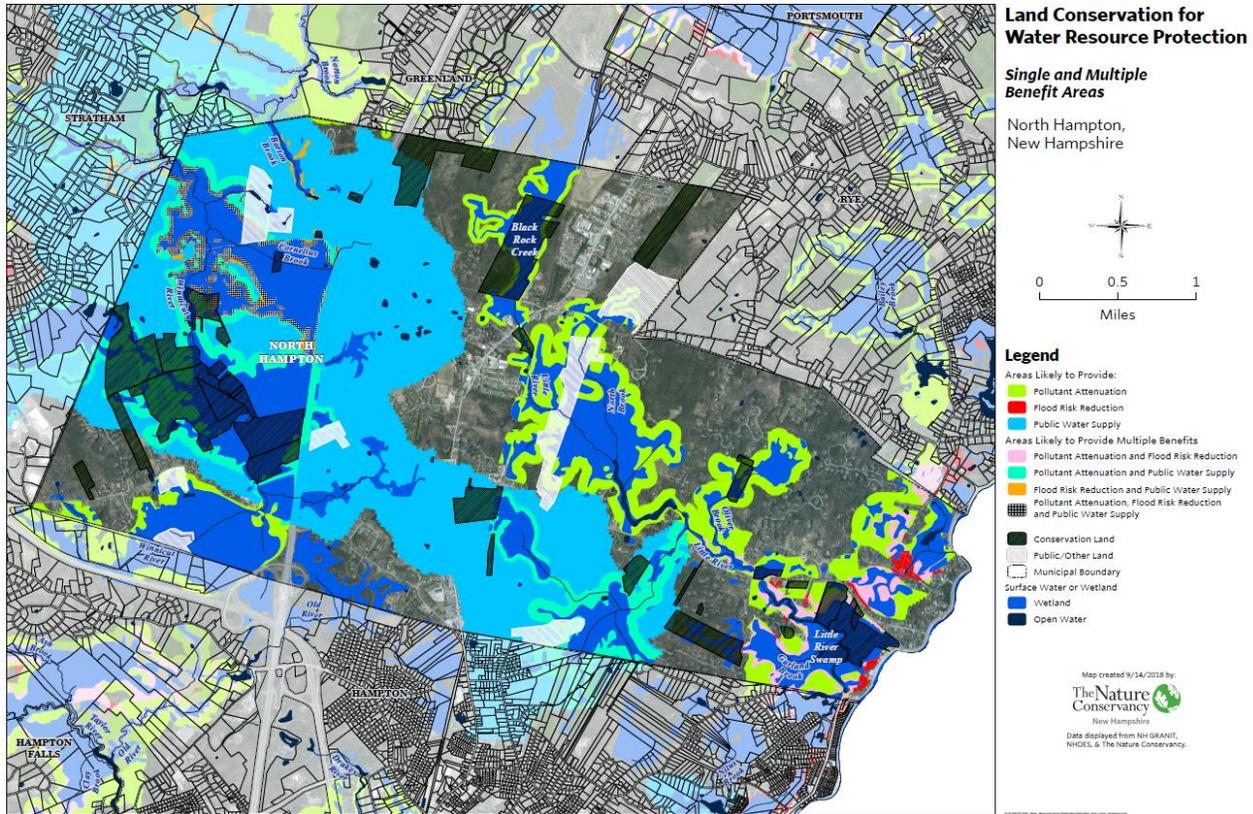
Rising sea levels are considered a threat to salt marsh habitats, but if not blocked by development or infrastructure marshes have the ability to migrate inland in many cases. The benefit of allowing inland marsh migration is twofold: allowing the inland migration helps to preserve the unique marsh habitat and allows the marsh to continue to provide natural services such as flood retention, water filtration, and reduction in erosion caused by wave action.



*Philbrick Pond restoration site walk. Source: North Hampton Conservation Commission*

### Coastal Water Resources Protection & Land Conservation

In 2016, The Nature Conservancy created a supplement to *The Land Conservation Plan for New Hampshire's Coastal Waters* (TNC, 2005) to identify land conservation opportunity areas that provide the greatest benefits to protect coastal water resources. Decline in water quality and land development are linked as increased development increases pollution and flood risks, while the loss of natural areas decreases the capacity of natural ecosystem services (water purification, flood water retention, and groundwater recharge). When combined with the effects of climate change, the effects of development on water quality are amplified.



Land Conservation for Water Resource Protection – Single and Multiple Benefit Areas. Source: The Nature Conservancy (2017).

### New Hampshire Seacoast Transportation Corridor Vulnerability Assessment (Expected March 2022)

Coastal storms and flooding already threaten state and local transportation infrastructure in New Hampshire’s seacoast. These risks are expected to increase with sea-level rise, causing potential daily inundation of some transportation assets within the next 80 years. Sea-level rise and other climate change impacts will need to be considered as municipalities and NHDOT maintain or replace aging existing transportation assets and design and construct new systems. Route 1A, Route 1, and I-95—the primary roadways running from North/South—the primary evacuation routes running East/West along NH’s coast—are all vulnerable to sea-level rise and sea-level rise induced groundwater rise in certain areas. Route 1A—a road that runs immediately adjacent to the Atlantic Coast and within Little Boar’s Head Village District.

The findings of the Tides to Storms (2015) report noted previously, found that 43% of the 18 miles that make up Route 1A will be inundated twice daily by 2100 under a high sea-level rise scenario of 6.6 feet. This flooding will significantly impact transportation networks and their derived services, including the 18,000 drivers that use the road every day in peak summer season. Route 1 and I-95 are situated further



Areas of impacted roadways in North Hampton under projected sea-level rise scenarios. Source: Rockingham Planning Commission.

inland and are fortunately less vulnerable to flooding; however, they are vulnerable to sea-level rise along specific road segments, see higher traffic volumes than Route 1A, and are expected to absorb additional traffic burden in the event parts of Route 1A are closed.

The goal of the [Seacoast Transportation Corridor Vulnerability Assessment](#) is to enhance regional coordination in New Hampshire for transportation networks vulnerable to sea-level rise and other coastal hazards in order to maximize information sharing, identify opportunities to fill data gaps, and develop shared understanding of options for future transportation planning. The final report, expected in March 2022 will include a set of recommendations begin addressing impacts to the region’s roadways and future transportation network needs.

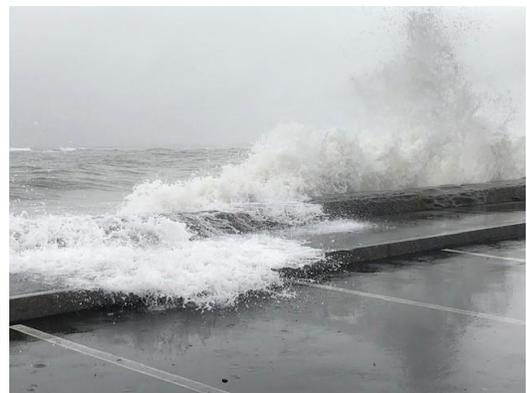
Within North Hampton and Little Boar’s Head there are only a few locations directly impacted with projected sea-level rise. These include low areas along Route 1A near North Hampton State Beach and Bass Beach. However, several state and local roadways will see increased traffic as routes within Hampton and Rye become cut off and force alternate routes. For example, at with 1.7 feet of sea-level rise, Route 111 is expected to see a ten percent increase in traffic as a significant east-west route for the coast.

Town	Site	Map number	SLR Impact level
Hampton/North Hampton	Ocean Blvd	14	4’
Hampton	Cusack Road	15	1.7’
Hampton	High Street	16	1’
Hampton	Winnacunnet Rd/Ocean Blvd	17	4’
Hampton	NH 101/Church St/Highland Ave/Brown Ave	18	1’
Rye	NH 1A/ Locke Road	13	4’

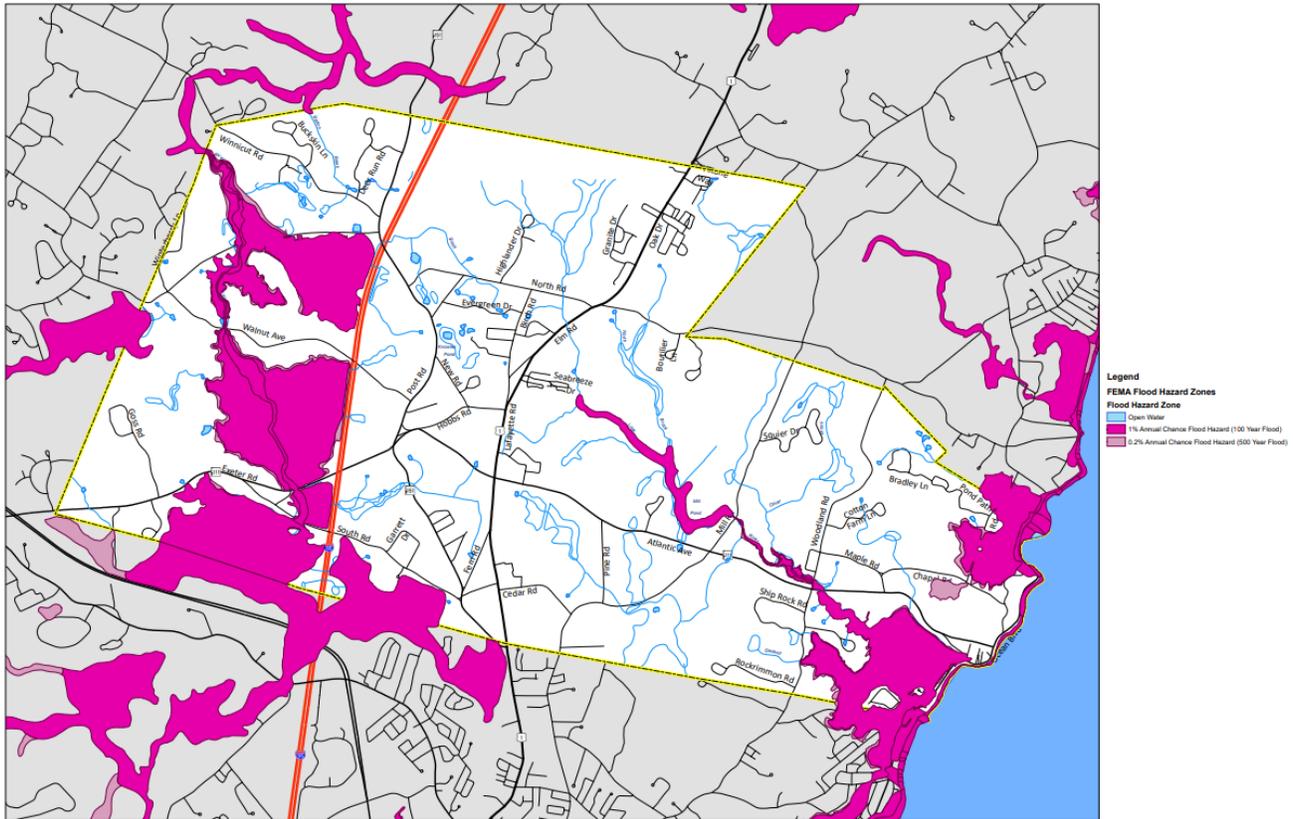
### North Hampton Natural Hazard Mitigation Plan (2018)

The [North Hampton Hazard Mitigation Plan](#) was prepared by participants from the Town of North Hampton Hazard Mitigation Planning Committee (including Little Boars Head Village District) under the guidance of Section 44 CFR 201.6 and Federal Emergency Management Agency requirements. The Plan serves as a strategic planning tool for use by the Town of North Hampton in its efforts to identify and mitigate the future impacts of natural and/or man-made hazard events. The Plan references several hazards related to coastal hazards, specifically flooding, high wind events, and severe storms as causing high impacts in North Hampton.

Specifically called out are the impacts of climate change and sea-level rise related to many of the natural hazards that already occur, specifically to flooding through coastal storms and storm surge due to increase precipitation and rising sea-level. The extent and potential losses of these hazards is just beginning to be calculated. However, the extent of potential flood losses within the 100 and 500 year floodplains are estimated between \$2.1 and \$53.7 million depending on the level of flooding.



North Hampton State Park, March 2018 storm. Photo credit: Margaret Schoenberger



North Hampton FEMA adopted flood zones. Source: FEMA, map by RPC.

The primary actions contained within the North Hampton's Natural Hazard Mitigation Plan that directly address coastal hazards include:

- Development of a coastal hazards master plan chapter.
- Incorporate the findings and recommendations of the NH Coastal Risks and Hazards Commission's report *Preparing New Hampshire for Projected Storm Surge, Sea-Level Rise, and Extreme Precipitation* into town planning documents.
- Identifying projects included in the North Hampton Capital Improvement Program (CIP) as being part of the Hazard Mitigation Plan.
- Coordination between the Town and Little Boar's Head to ensure compliance of floodplain regulations with the National Flood Insurance Program (NFIP).
- Maintaining culvert maintenance program (ongoing) and replacement of culverts known to have flooding (deferred due to funding).
- Continued protection of aquifer, drinking water, and wetland resources through land use regulations, including coordination between the Town and Little Boar's Head.
- Invest in joining the Community Rating System (CRS) to reduce flood insurance cost and reduce future flood risk. (Little Boar's Head is specifically identified to consider joining the CRS.)

### Philbrick Pond Salt Marsh Restoration

In 2006, during the “Mother’s Day” flood event Philbrick Pond flooded due to flow limitations and resulted in flood impacts that isolation of more than 40 homes for more than three days from vehicular traffic, including ambulance and fire vehicles. An existing berm and two culverts limit flow into and out of the marsh during normal tidal cycles, and limit flood levels in the marsh during storm surge conditions. In 2018, the Town of North Hampton obtained a grant through NOAA and NH Department of Environmental Services to evaluate design alternatives and develop a conceptual design for the replacement of the trolley berm culvert at Philbrick Pond salt marsh, accounting for sea-level rise in their evaluation and design alternatives.

One of the primary recommendations for the restoration of Philbrick Pond was the need to consider sea level rise implications on the marsh and the infrastructure. “In the long run, both the Town of North Hampton and the NH DOT will need to carefully consider the impacts on infrastructure of sea level rise in other North Hampton drainage basins. Assessment of the adequacy of seawalls and “shale piles” will be required on the part of NHDOT, and raising road grades in other locations will likely require consideration both by NH DOT and the Town.” (CMA Engineers, 2018)

The Town of North Hampton is currently continuing work with NHDOT, NHDES and property owners adjacent to the two tidal culverts to address design feasibility to improve the drainage and tidal restrictions that negatively impact Philbrick Pond and increase hazards for adjacent homes and infrastructure.

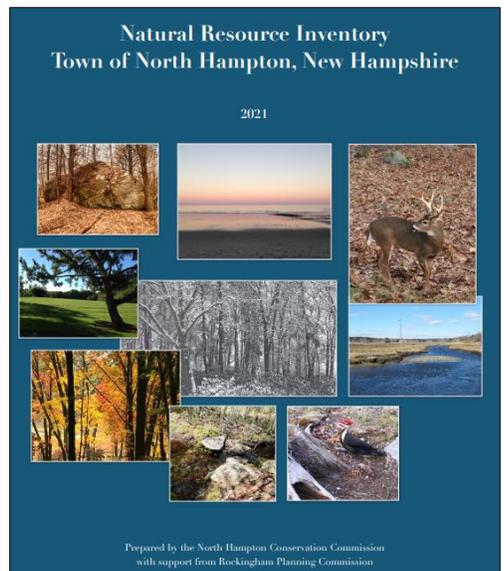
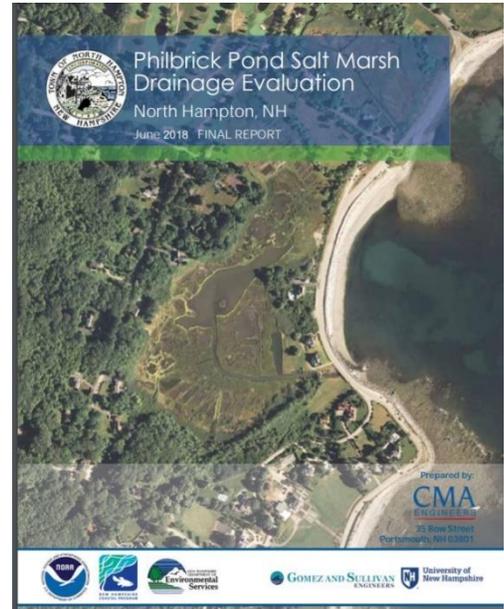
### North Hampton Natural Resource Inventory (2021)

The North Hampton Conservation Commission finalized the update to the town’s [Natural Resource Inventory](#) (NRI) in 2021 with assistance from Rockingham Planning Commission and UNH Cooperative Extension. NRI’s are intended to provide an inventory, description and commonly maps of the natural resource found within a community; North Hampton’s NRI encompasses the entire town, including Little Boar’s Head Village District.

Several of the topics and references included in this chapter are included within the NRI with additional detail and maps.

The primary findings and recommendations contained within the North Hampton’s Natural Resource Inventory that are associated with coastal **hazards include:**

- **Groundwater:** Incorporate sea level rise into groundwater planning efforts. Adopt recommendations for the siting of drinking water wells and septic system design, placement, and maintenance.
- **Land Conservation:** Partner with land conservation organizations and surrounding municipalities in the region to protect critical areas identified in the Land Conservation Plan for New Hampshire’s Coastal Watersheds.
- **Buffer Protection:** Promote protection of wetland, shoreline and riparian habitats for multiple benefits, including wildlife.



- **Habitat Protection:** Use available climate change and sea-level rise data, tools and resources to learn more about the impacts of climate change on natural resources, and use them to prioritize areas for wildlife protection and inform adaptive management planning, habitat, water quality protection, and flood storage.
- **Surface Water:** Adopt buffers and setbacks that adequately separate development and infrastructure from tidal wetlands, freshwater wetlands and surface waters to sustain flood storage capacity, and allow for inland migration of tidal marsh systems and conversion of freshwater systems to tidal systems to accommodate projected changes in sea-levels. Incentives to further protect wetlands may include applying increased buffers and setbacks as mitigation for wetlands impacts from development.
- **Land Conservation:** Land conservation offers the greatest opportunities to provide for adaptation to the effects of sea-level rise and coastal storm flooding and climate change impacts:
  - Identify lands in high risk areas to purchase for the purpose of removing development and infrastructure and restoring the land to a natural condition. This is a way to gradually retreat from areas highly susceptible to coastal flooding.
  - Adopt a targeted scoring framework or incorporate new scoring criteria into existing land conservation prioritization efforts that consider climate adaptation benefits when evaluating land for purchase. • Identify and inventory lands where protection of tidal and freshwater wetlands would provide tangible benefits to protect against flooding, and restoration opportunities to remove barriers to tidal function and marsh and migration.
- **Shoreline Protection:** Maintaining natural shorelines is an effective way to preserve the functions of shoreline systems (marshes, dunes, estuaries) in providing valuable services including flood storage, recreational areas, and commercial harvesting of fish and shellfish.
  - Provide information to property owners about living shorelines and the importance of retaining the functions of natural shorelines, and implementing landscaping best practices.
  - Implement living shorelines projects on town lands to demonstrate best practices, and the benefits and effectiveness of living shorelines approaches

## Coastal Hazards Chapter Goals & Actions

The following section includes the goals and actions developed to help ensure that coastal hazards are addressed by North Hampton using the best available information, to meet the desires expressed by residents, and are consistent with the overall Master Plan.

### Goal 1 - Communicate Information and Actions with Public

All work associated with coastal hazards resiliency needs to include communication and engagement with the public. Outreach should be done with a variety of different tools and platforms to maximize accessibility. Information about general coastal hazards should be routinely communicated, but specific effort should be made to ensure that the public understands potential impacts, resiliency options and actions being proposed on specific planning or project efforts. This communication is key in development of public support for regulatory changes and investments in resiliency actions.

#### Actions:

1. Use existing Town outreach tools to promote the findings, goals and actions of the Coastal Hazards Master Plan Chapters. These tools should include the weekly electronic newsletter, emergency services social media accounts, community outreach channels, promotion through local cable access channel, and discussion at municipal meetings.
2. Communicate actions identified within the existing North Hampton Natural Hazard Mitigation Plan, and subsequent updates, that address impacts associated with climate change and coastal hazards, including flooding, drought, extreme temperatures, and storm events.
3. When updates are made to the Coastal Hazards Master Plan Chapter due to changes in information or priorities, the process should include seeking input from the community. If actions require coordination with departments, boards, or community stakeholders, ensure that their input is sought.
4. Communicate the recommendations found within the Natural Resource Inventory to promote overall health of natural resources in North Hampton with emphasis on how those recommendations provide multiple benefits for community resiliency to climate change.
5. Coordinate with emergency services to provide information about what residents and businesses should do to prepare for hazardous weather events, what to do during weather events, and resources available for mitigation and recovery.
6. Communicate when high tide or storm events are expected to better prepare residents and businesses that may be impacted by closed roadways, flooded areas, potential property impacts, and disruption of services.
7. Develop a work plan for outreach efforts that includes information about existing outreach materials and resources. This effort may require the establishment of an ad hoc work group that includes representatives from Town and Village committees, municipal staff, and community members.

### Goal 2 - Understand Impacts on Town and Little Boar's Head Owned Properties and Align Investments

Evaluate the impact of coastal hazards on Town owned facilities, infrastructure, and properties to determine potential mitigation opportunities, adaptation strategies, and risk level for near and long-term investments.

#### Actions:

1. Add criteria to the Capital Improvement Program to evaluate the risk level to capital expenses association with coastal flood risk potential. The [NH Coastal Flood Risk Summary: Part 2 Guidance for Using Scientific Projections](#) can be used to evaluate potential capital investments.
2. Assess the capacity of existing town-owned stormwater infrastructure to handle precipitation events and susceptibility to flooding from storms. If infrastructure is found to be under capacity or inadequate, structures should be prioritized for upgrades.

3. Prioritize retrofits of culverts identified in the 2018 North Hampton Natural Hazard Mitigation Plan as susceptible to flooding, particularly those culverts and stream crossings that may cut off access to specific areas.
4. Use the findings of the Seacoast Transportation Corridor Vulnerability Assessment to identify the town-owned roadways that may see impacts from increase traffic over time if existing roadways become unusable for periods of time or indefinitely due to sea-level rise or storm surge. The town-owned roadways may require more frequent maintenance or upgrades due to increased usage.
5. When conducting maintenance or repair on local roads ensure that roadways are being upgraded using the most up to date materials and techniques that account for impacts from climate change and sea-level rise. Research in roadway construction techniques is currently in the early phases in New Hampshire. Design criteria for new roadways being developed should be incorporated into land use regulations under Goal 4.
6. Identify opportunities to conserve land, particularly lands that serve multiple ecological and community, benefits through Town investments, including seeking out available grants, loans, and partnerships to leverage funding.

### **Goal 3 - Understand Impacts and Identify Actions that Residents and Businesses Can Take**

Identify opportunities residents, property-owners and businesses can take on their own properties to mitigate climate change and sea-level rise impacts. Educating individuals about how their actions help the community is necessary. Encouraging individual actions can also spur a greater willingness for investment for Town and Village District resiliency actions.

#### **Actions:**

1. Promote the regular inspections and maintenance of septic systems through outreach efforts to ensure that the long-term health of coastal water quality.
2. Develop outreach materials to the owners of the fish houses to ensure that septic holding tanks are installed, properly maintained, are regularly pumped and have working alarms to indicate full tanks.
3. Develop outreach materials and hold workshops to promote the restoration or maintenance of shoreland buffer areas on private property. This outreach should be promoted through channels identified in Goal 1.
4. Identify historical resources and properties that are susceptible to impacts from coastal hazards and target outreach towards those property owners about adaptations they can make to help protect their own property and help protect a key aspect of the community's character.
5. Encourage reduction of stormwater runoff from private property through voluntary actions by residents and businesses.
6. Identify opportunities to distribute information to residents and businesses as identified in the work plan developed under Goal 1, Action 7.

### **Goal 4 - Consider Modifications to Land Use Regulations to Minimize Impacts**

Incorporate the latest science and information on climate change and sea-level rise impacts into land use regulations and modify when necessary to minimize impacts on natural resources and property. Land use regulations should set standards that match the acceptable level of risk of potential impacts and should be evaluated routinely. Land use regulations should be coordinated between the Town and the Village District.

#### **Actions:**

1. Adopt standards in floodplain regulations to require all new development and redevelopment to be elevated two feet above the base flood elevation. Two feet of additional elevation will ensure that structures are protected from flooding based on the highest sea-level rise projection of 2 feet by 2050.
2. Adopt in the Town's and Village District's respective zoning ordinance a Coastal Flood Hazard Overlay District that includes performance-based standards that protect against flood impacts from sea-level rise and coastal storm surge. Establish the overlay district boundaries based on current flood hazard areas on

FEMA Flood Insurance Rate Maps and projected future high risk flood areas using the [NH Coastal Flood Risk Summary: Part 2 Guidance for Using Scientific Projections](#) as a guide for risk tolerance.

3. Continue to promote protection of groundwater resource by limiting uses that pose potential contamination risks.
4. Continue to promote the limiting of impervious surfaces to reduce stormwater runoff through stormwater management standards and consider upgrades to design standards to accommodate climate change impacts.
5. Minimize disturbance of shoreland areas by encouraging the maintenance of natural vegetative buffers within 100 feet of waterways and wetland areas, particularly in areas identified for tidal wetland migration as sea-levels rise using the Sea-Level Marsh Migration Model (SLAMM).
6. When available, incorporate the latest information on roadway construction techniques and material to ensure that new roadways are constructed to withstand projected coastal hazard impacts.
7. Consider land use regulations or amendments that further incentivize restoration of wetlands that have been degraded or filled in overtime to help restore their ecological functions, including those that mitigate impacts from climate change and sea-level rise.

### **Goal 5 - Ensure Existing Municipal Efforts, Projects and Activities That Incorporate Coastal Hazards Considerations are Communicated and Coordinated.**

Many existing efforts undertaken by the Town and Little Boars Head, various municipal boards and commissions, and community groups individually consider the impacts associated with climate change and sea level rise. However, if these efforts are not coordinated they can reduce the impact of the overall investment or project. Increasing communication between Town and Village, various local boards and commissions, and community groups can lead to reduce duplicative efforts and maximize the effectiveness of actions.

#### **Actions:**

1. Use the North Hampton Natural Resources Inventory (NRI) to identify properties for conservation to help mitigate impacts from climate change such as flooding, storm surge, and salt-marsh migration. Protection for areas identified in the NRI and the NH Coastal Land Conservation for Water Resources (The Nature Conservancy, 2016) that serve multiple benefits should be prioritized.
2. Identify the susceptibility of groundwater resources to groundwater rise and saltwater intrusion in North Hampton. The purpose will be to aid in identifying impacts to drinking water sources, impacts to septic system, infrastructure, and historic resources. The outputs of this investigation can inform the need to make modifications to regulations for the siting requirements of wells, criteria for septic systems, or roadways design, and the vulnerability of historic resources and structures.
3. Consider participation in FEMA's Community Rating System (CRS) program as identified in the 2018 North Hampton Hazard Mitigation Plan to reduce flood insurance rate costs by implementation climate adaptation strategies that include planning and policy, regulatory, non-regulatory, and community outreach and engagement activities.

### **Goal 6 - Consult with Local, Regional and State Partners on Coordinate on Coastal Resiliency Efforts**

**North Hampton:** The Town should consider working with neighboring communities, regional partners, and state agencies on planning efforts and specific project when feasible to evaluate ways to improve resiliency. Municipally initiated projects should not adversely impact neighboring communities or the region. When the goals of North Hampton residents are consistent with those of neighboring communities, regional partners, or state agencies collaboration should be encouraged.

#### **Actions**

1. Identify existing projects proposed by NH Department of Transportation to identify new projects associated with state roads and infrastructure occurring in North Hampton that may be impacted by coastal hazards and advocate for project design that incorporate impacts from sea level rise and climate change.

2. Continue to work with NH Department of Environmental Services to identify opportunities to improve tidal culverts and marshes, such as ongoing efforts at Philbrick's Pond, to improve wetland health and remove tidal restrictions that exacerbate storm surge flooding
3. Work with the NH State Parks to evaluate the impacts to the North Hampton State Beach from coastal storms, the impact of sea-level rise to cut off access to the beach area, and the impacts from changes to tidal flow.
4. Continue to work with regional and state partners to identify sources of water pollution impacting the Little River and Winnicut River Watershed Management Plans to ensure long-term health of wetland and water resources within North Hampton.