



Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan



Prepared By:
Kim Jacobs, Civil Engineer & Resilience Planning Consultant



FEMA

August 7, 2024

Marc R. Pappas, Director
Rhode Island Emergency Management Agency
645 New London Avenue
Cranston, Rhode Island 02920

Director Pappas:

The U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) Region 1 Mitigation Division has approved the *Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan* effective **August 7, 2024** through **August 6, 2029** in accordance with the planning requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended; the National Flood Insurance Act of 1968, as amended; the National Dam Safety Program Act, as amended; and Title 44 Code of Federal Regulations (CFR) Part 201.

With this plan approval, the Town of Little Compton, RI is eligible to apply to the Rhode Island Emergency Management Agency for mitigation grants administered by FEMA. Requests for funding will be evaluated according to the eligibility requirements identified for each of these programs. A specific mitigation activity or project identified in this community's plan may not meet the eligibility requirements for FEMA funding; even eligible mitigation activities or projects are not automatically approved.

The plan must be updated and resubmitted to the FEMA Region 1 Mitigation Division for approval every five years to remain eligible for FEMA mitigation grant funding.

Thank you for your continued commitment and dedication to risk reduction demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please contact Alexis Meehan at (202) 394-6439 or Alexis.Meehan@fema.dhs.gov.

Sincerely,

CHRISTOPHER J MARKESICH Digitally signed by CHRISTOPHER J MARKESICH
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Floodplain Management and Insurance Acting Branch Chief | Mitigation Division | DHS, FEMA Region 1

cc: Melinda Hopkins, Planning Branch Chief, RIEMA
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Town of Little Compton Rhode Island

Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan



State Acknowledgements

The Town would like to thank the Rhode Island Emergency Management Agency for their continued support and mitigation planning resources. The guidance provided by the Rhode Island State Hazard Mitigation Committee is essential for implementing the strategy presented in this Plan.

The Honorable Daniel McKee, RI Governor

Marc R. Pappas, Director, Rhode Island Emergency Management Agency

Rae-Anne Culp, State Hazard Mitigation Officer, Rhode Island Emergency Management Agency

Melinda Hopkins, Planning Branch Chief, Rhode Island Emergency Management Agency

Adopted by Little Compton Town Council

May 9, 2024

Approved by FEMA

August 7, 2024

Local Acknowledgements

This Plan was made possible through the commitment of the Town of Little Compton Hazard Mitigation & Flood Management Plan (HM&FMP) Advisory Committee and leadership and support from the Little Compton Town Council. Further, as much of the Plan is built upon the good work of past plans, studies, and projects, the HM&FMP Advisory Committee would like to acknowledge those efforts and thank everyone involved in past initiatives, such as the 2018 Comprehensive Plan and 2020 Community Resilience Building Workshop.

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EXECUTIVE SUMMARY

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ASSESSMENT

Vulnerability Summary

MITIGATION STRATEGY

HM&FMP Goals

Action Plan

Plan Adoption & FEMA
Approval

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Executive Summary

In 1995 the Federal Emergency Management Agency (FEMA) enacted a National Mitigation Strategy, which promoted the partnership of government and the private sector to effectively “build” safer communities. The strategy encourages the identification of natural hazards that may affect individuals or communities and thereupon take action to permanently reduce or eliminate the associated risk (FEMA. National). The subsequent passage of the Disaster Mitigation Act (DMA) of 2000 provided the legal basis for FEMA to require natural hazard mitigation planning at both the State and local level as a condition of mitigation grant assistance (FEMA. Disaster). Pre-disaster planning and investment in preventative measures can minimize the economic and social disruption that can result from natural hazard events, significantly reduce the cost of post-disaster clean-up and recovery, and help post-disaster operations become more efficient.

Little Compton’s first Hazard Mitigation Plan (HMP) was developed in 2018. Since then, the Town has proactively collaborated with partners to reduce Little Compton’s vulnerabilities while reinforcing its strengths, and serving as a model for other communities throughout the region, particularly in terms of upgrading emergency management procedures and equipment, and conservation of vulnerable lands. While much progress has been made, the Town recognizes the continued need to increase hazard mitigation and adapt to a changing climate and its impacts – from extreme weather events to sea level rise.

The Town contracted with Civil Engineer & Resilience Planning Consultant Kim Jacobs to author of the Plan and function as technical advisor, and at their December 7, 2023 meeting, the Town Council authorized the formation of an Advisory Committee, comprised of Town staff, residents, local business owners, community lifelines, conservation organizations, and other stakeholders to provide input and help guide plan development (Town of Little Compton RI. *Town Council*, 14). The Advisory Committee, chaired by the Town’s Emergency Management Director, Richard G. Petrin, actively worked with the Town’s Consultant throughout the planning process, with the over-riding task of identifying natural hazards considered to pose the greatest threat to Little Compton and arriving at practical, meaningful, attainable, and cost-effective mitigation solutions to reduce both human and property losses should such hazards occur.

In recognition of the Town’s current and projected future vulnerability to flooding, the Town opted to intensify their focus on flood management within this HMP update. Further, as the Town is interested in participating in FEMA’s Community Rating System (CRS) program, it was determined advantageous to integrate CRS Activity 510 - Floodplain Management Planning in the update process. As such, this document was developed coordinating the DMA Planning Regulations and the CRS Activity 510 Planning Process into a single plan that meets the goals, intent, and requirements of each program. As discussed in **Section 2**, an integral part of the planning process was community and stakeholder engagement.

To ensure the community, local businesses, neighboring municipalities, community lifelines, and other stakeholders had the opportunity to provide input and feedback on the *Plan*, in addition to the six (6) publicized Advisory Committee meetings being open to the public, eleven (11) other outreach activities were held (**Appendix 2-2**), and emails/letters encouraging participation in the planning process and providing an opportunity for **pre-adoption review of the Draft Plan** were sent to 19 local government & school district groups and 74 stakeholders from various businesses, community lifelines, agencies, and organizations outside of Little Compton’s governmental structure (**Appendix 2-3**). It was keenly important to the Town to **engage the local business community as well as key community lifelines** in the planning process. Hence, **ALL** local businesses with storefronts in Town were included on the coordination list. In addition to the businesses, some of which provide fundamental community services, a number of other critical community lifelines were also included on the coordination list. Several of the community lifelines provide services to socially vulnerable populations. Public engagement is important as it ensures the *Plan* reflects community values and priorities, and builds a constituency educated in hazard mitigation and supportive of implementing activities and projects that will minimize community impacts and disruptions from natural hazards.

The integrated and community centric DMA and CRS planning process was highly successful, culminating in this document: ***Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan*** .

At the end of a three week public review period, the ***Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan*** was unanimously adopted by the Little Compton Town Council at the Public Hearing on May 9, 2024, with the acknowledgment that during the subsequent review/approval process by RIEMA/FEMA, any required revisions would be accepted as part of this approval. The *Plan* was subsequently reviewed by the Rhode Island Emergency Management Agency (RIEMA) and the Federal Emergency Management Agency (FEMA). **Neither Agency requested any revisions to the *Plan*. The *Plan* received FEMA Approval on August 7, 2024.**

Within this document, the title of the *Plan* is generally shortened to either the:
Hazard Mitigation & Flood Management Plan or HM&FMP

ASSESSMENT

As detailed in **Section 4**, the Advisory Committee discussed all of the natural hazards identified in the Rhode Island State Hazard Mitigation Plan (RI-SHMP) for possible inclusion in this *Plan*. Recognizing that the Town has limited fiscal and staffing resources, those hazards determined to pose little threat to the Town have not been considered herein. Using a priority ranking process, this *Plan* focuses on those hazards considered as having a greater likelihood of occurring or potentially having a greater impact on the community should they occur. These include: Flood-Related Hazards; Wind-Related Hazards; Winter-Related Hazards; Infectious Disease-Related Hazards (Vector-borne Diseases Transmitted by Ticks or Mosquitoes, Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses); and Other Hazards (Earthquake, Extreme Heat, Drought, Brush Fire). The *Plan* also addresses how climate change and sea level rise will exacerbate the risks from many of these hazards.

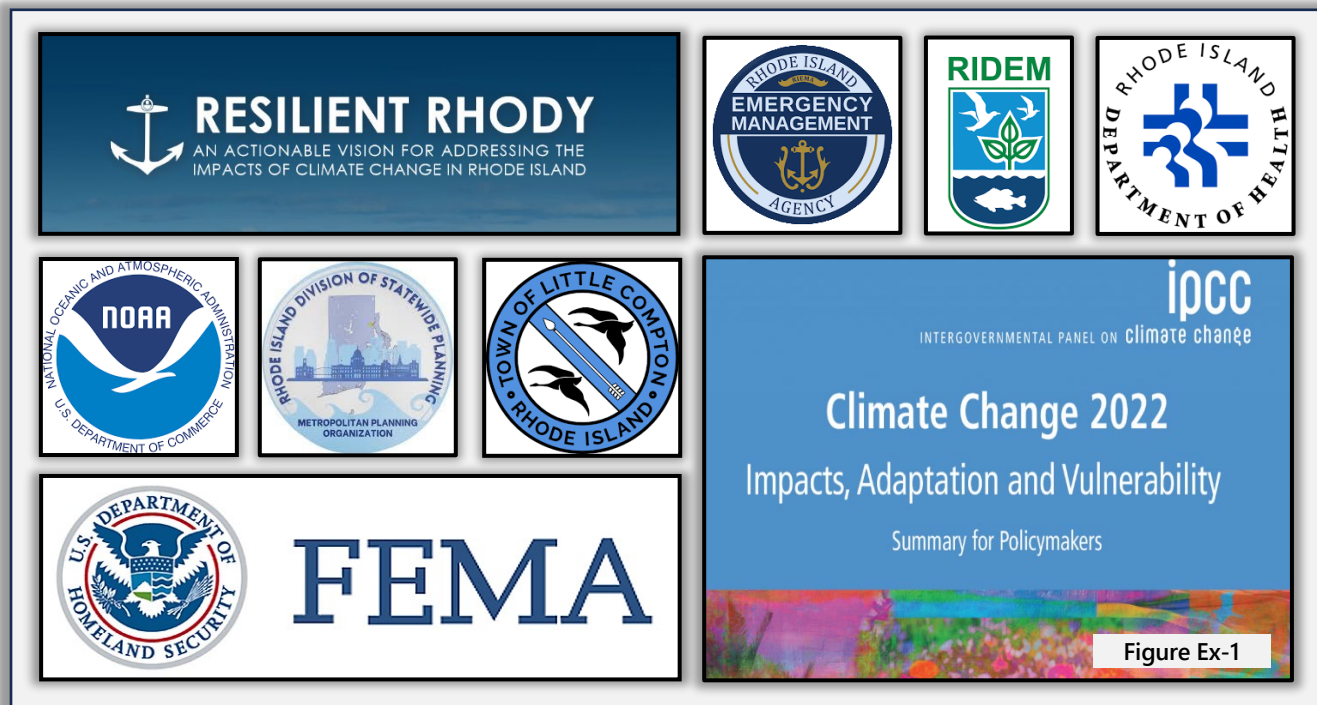
To determine how to mitigate these threats, it was first necessary to understand Little Compton's community profile (**Section 3**) and evaluate the Town's vulnerability to the various natural hazards (**Section 4**). A capability assessment (**Section 5**) to understand what measures the Town currently implements in terms of hazard mitigation was also undertaken. The assemblage of this information was used as a basis in determining goals and strategies to minimize long-term risks to the identified hazards (**Section 6**).

This *Plan*, which will supersede the Town's 2018 Local Hazard Mitigation Plan (HMP), pays tribute to and builds upon the good work that created that document. Portions of the 2018 HMP have been revised, eliminated, or restructured as deemed appropriate. A number of the Town's other key planning documents, as well as a multitude of technical reports, historical data, and other resources were also used in preparing this *Plan* (**Appendix 5-1**). Appreciation and gratitude are extended to all those associated with the resources used herein, including local knowledge from the Advisory Committee, community members, and other stakeholders.

Advances in the ability to predict the occurrence and effects of natural disasters, including model simulations and GIS data and mapping capabilities, provided the Town with significant updated and improved information. As such, new information and some new sections were added to this *Plan* to reflect the most current understanding of natural hazards that pose significant threats to Little Compton and how the Town can better prepare for these risks.

Vulnerability Summary

With an extensive southern coastline along the Rhode Island Sound, the Sakonnet River flowing along the western border, and significant low-lying areas, Little Compton is highly vulnerable to flood-related and wind-related natural hazards. The community's vulnerability will increase in the coming decades as climate change increases the potential for more frequent and intense rainfall events and sea level rise (SLR). As reflected in the *Plan*, climate change will also exacerbate a number of the other profiled hazards.



Climate Change Impacts

Little Compton is vulnerable to the following climate change impacts:

- ❖ More extreme precipitation events causing increased extent of flood damage to property and infrastructure and the potential for more riverine and flash flood events.
- ❖ Higher water tables resulting in subsurface issues such as wet basements.
- ❖ More coastal lands becoming susceptible to erosion due to increased intensity and frequency of storms.
- ❖ An increase in incidence of extreme high tide levels.
- ❖ Expediated sea level rise creating expanded areas of saltwater intrusion into aquifers contaminating water supplies.
- ❖ A net loss of coastal marshes that become inundated at a greater rate, resulting in a loss of salt marsh vegetation and an alteration of habitat types.
- ❖ More extreme high wind events creating greater vulnerability from increased storm surge levels along the coast; coastal erosion will create conditions that allow storm surge to impact further inland.
- ❖ Warmer air and water temperatures; shorter winters and longer summers; more frequent high heat days and heat waves.
- ❖ Longer periods of drought creating conditions for more frequent brush fires and water availability concerns.



Figure Ex-2
 Swells from Hurricane Lee break along South Shore Beach (September 2023)
 Photo Credit: Richard W. Dionne, Jr.

Flood-Related Hazards

- ❖ Flood waters can damage personal property and structures including mold contamination which can lead to indoor air quality problems; increase the water table resulting in subsurface issues such as wet basements; contaminate wells; impact stormwater and on-site wastewater treatment systems (OWTS); flood roadways create dangerous conditions for motorists; and create stagnant pools of water, which provide a breeding ground for mosquitoes.
- ❖ Floodwater can pick up pollutants like oils and salt from roadways, fertilizers and pesticides from lawns, effluent from failing septic systems, sediment, and debris as it makes its way down gradient. If sufficient polluted floodwater flows into a waterbody or inundates well water, it can harm wildlife and people, including potentially spreading waterborne diseases such as hepatitis A and cholera.
- ❖ FEMA's high risk flood zones, denoted as the Special Flood Hazard Area (SFHA), is comprised of the V and A Zones which have a 1% annual chance of flooding. The total assessed value for properties with any portion of the building footprint (or parcel boundary for vacant land) intersecting the SFHA represents approximately 10% of Little Compton's property tax base. **The Town has done an excellent job minimizing construction in the SFHA.** This is in part due to limited municipal services and through the efforts of the Little Compton Agricultural Conservancy Trust (LCACT) and other partners in protecting lands in these vulnerable areas. There are no buildings identified as critical facilities in the SFHA, with the exception of the historically significant Sakonnet Light House Station. **Further there are no repetitive loss (RL) or severe repetitive loss (SRL) properties in Little Compton.**
- ❖ Little Compton has several large freshwater waterbodies as well as numerous streams and brooks. Most of these do not represent a significant risk of riverine flooding for inland neighborhoods. In the village of Adamsville (located in the northeast of the Town), Mill Brook, the Westport River West Branch, and Gray's Mill Pond present a flood risk to nearby low-lying roadways and property, particularly along sections of Main Street, which is under RIDOT jurisdiction. In 2022, RIDOT implemented improvements to the Main Street culvert which seem to have helped mitigate stormwater flooding in the immediate area. In other parts of Town, flooding from stream overbanking and/or flash floods have historically impacted sections

of John Dyer Road, John Sisson Road, and Swamp Road, which are all Town-owned roads. In addition, there is potential inland shallow flooding risks (sheet flow, ponding) along low-lying sections of the following roads and adjacent property located in the SFHA: Town-owned roads - Amesbury Lane, Swamp Road, and William Sisson Road; State-owned roads - Main Street, Meeting House Lane, Pottersville Road, and Snell Road; Private roads - Quoquonset Lane, Rockbridge Drive, Rockbridge Road, and Whistler Point Road. The Advisory Committee assessed riverine and shallow flooding as being *Highly Likely* (greater than 90% annual probability) to occur in Little Compton.

- ❖ Eight of the ten dams in Little Compton have been identified by RIDEM as low hazard, meaning should they fail the probability of loss of life or significant property damage is low. The other two, the Watson Reservoir and Simmons Pond dams have higher RIDEM hazard ratings. The theoretical dam failure inundation area for the Watson Reservoir Dam (high hazard), “would likely cause loss of one or more human lives, given the presence of multiple residences located downstream of the dam and adjacent to the banks of the Pachet Brook (GZA. 485, 4). This theoretical dam failure inundation area is primarily located in Tiverton, RI. For the Simmons Pond Dam (significant hazard), the theoretical dam failure may cause extensive damage to the dirt access road located on top of the dam and likely overtop Amesbury Lane and the adjacent private drive, Pottersville Road, and Quicksand Pond Road. The residential areas upstream of Pottersville Road and Amesbury Lane that are close to Colebrook, may experience shallow flooding (GZA. 474, 2-4). The structural integrity of both of these higher classified dams is unclear. Although Rhode Island’s Rules and Regulations for Dam Safety (250-RICR-130-05-1) require annual inspections of High Hazard and Significant Hazard dams, the most recent visual inspection of the Watson Reservoir Dam appears to be 2019, and based on a notation in the 2013 Emergency Action Plan (EAP) for the Simmons Pond Dam, it was last inspected prior to 2012.
- ❖ With roughly 15 miles of shoreline, coastal flooding and coastal erosion are a continued threat, and were assessed by the Advisory Committee as *Highly Likely* (greater than 90% annual probability) to occur in Little Compton. The V and coastal A Zones includes low-lying portions along the southern and western shorelines, with the Sakonnet Point area being most impacted. The V Zone experiences coastal erosion, produced by wave action, which can be destructive, damaging natural and manmade structures, battering solid objects, and scouring sand from around foundations. As storms erode the shoreline, narrowing beaches, depleting dunes, and compromising coastal salt marshes, adjacent upland properties become more at-risk.
- ❖ There is potential coastal flooding risks along low-lying sections of the following roads and adjacent property located in the SFHA: Town-owned roads – John Sisson Road, Shaw Road, South Shore Road, and Town Way; State-owned roads - Sakonnet Point Road; Private roads - Baileys Ledge Road, Beach Drive, Beach Street, Bluff Head Road. California Road, Carey Lane, Francis Lane, Goodrich Lane, Kansas Road, Kempton Place, Little Pond Cove Road, Maryland Road, Milton Road, Minnesota Road, Montana Road, Nevada Road, Ohio Road, Oliver Lane, Pennsylvania Road, Pleasant View Drive, Point Street, Pond View Drive, Quaker Hill Farm Road, Reservation Road, Rhode Island Road, Round Pond Road, Taylor’s Lane North, Taylor’s Lane South, Tuniper Lane North, Tuniper Lane South, and Washington Road.
- ❖ The areas of Sakonnet Harbor, Round Pond, Indian Rock Acres, and the Town’s Northwest coastline could have access cut off due to inundation of low-lying roadways. Of particular concern is Round Pond Road, a private road near the south shore, which has periodically been flooded with up to two feet of water due to its proximity to Round Pond and the ocean.
- ❖ The Rhode Island Coastal Resources Management Council (CRMC) has adopted the NOAA SLR high curve projection for use in planning and coastal permitting. Based on NOAA’s 2022 “worst-case” high curve projection, Rhode Island could experience 1.6± feet of SLR by 2050, 4.2± feet of SLR by 2080, and 6.5± feet of SLR by 2100. Irrespective of the specific timeline, the potential impact from SLR on the Town cannot be understated.

- ❖ Future increases in relative sea level will intensify coastal flooding and may displace coastal populations; threaten transportation and other infrastructure including reducing the effectiveness of the Sakonnet Harbor breakwater, designed for historically lower water levels; contaminate water supplies through saltwater intrusion into aquifers; lead to the loss of public beach front; and have a deleterious impact on coastal wetlands, which are critical for flood control and habitat viability.



Figure Ex-3 Tree Downed by September 2021 Storm

Photo Credit: Chief Richard Petrin

Wind-Related Hazards

- ❖ High winds, can accompany various types of storms including thunderstorms, tornadoes, tropical cyclones (which include tropical depressions, tropical storms, and hurricanes), and Nor'easters. High winds can down trees and branches, and cause damage to structures, property, vehicles, and infrastructure including utility lines; cause bodily injury from flying debris or structures collapsing; may cause storm surge damage, particularly in the V flood zone; may exacerbate fire conditions by drying out ground cover, propelling fuel around the region, and increasing the ferocity of existing fires. In Little Compton the built environment along the western and southern shorelines, as well as in the Adamsville area influenced by the Westport River, are at higher risk to wind-related damage. The Advisory Committee assessed high winds as being *Highly Likely* (greater than 90% annual probability) to occur in Little Compton.
- ❖ Little Compton is dependent on above ground utilities. Damage to electrical or communication lines from high winds can cause a loss of electricity resulting in dangerous conditions, including no phone/internet service available for storm advisories and medical emergencies; loss of sanitary facilities and potable water; spoiled refrigerated food; and lack of heat, which if occurring in conjunction with freezing temperatures, can lead to dangerous health conditions and the potential for pipes to freeze and burst. Loss of power can also interrupt daily activities and cause business and school closings. Downed wires that are live are dangerous and if arcing have the potential to spark fires.
- ❖ Thunderstorms can produce lightning and hail. In general, buildings are more likely to be struck by lightning if they are located on high ground or if they have tall protrusions, such as steeples; electrical-based utilities are also vulnerable to direct lightning strike, and resulting damage has the potential to cause power outages for businesses, residents, and critical facilities. In Little Compton, over the years a number of house fires have been caused by lightning strikes. Historically hail has caused little structural damage in Little Compton, but depending on the growing season, could cause damage to crops & vegetation. The Advisory Committee assessed thunderstorms as being *Highly Likely* (greater than 90% annual probability) to occur in Little Compton.

- ❖ Although tornadoes are a rare occurrence in Rhode Island, a risk does exist, particularly during peak hurricane season (mid-August through October). The type, age, and standards to which a structure was constructed, play a role in its vulnerability to tornadoes. Wood-framed structures, which are common in Little Compton, are more vulnerable to damage by tornadoes than steel framed structures. There are also some mobile homes in Town which are vulnerable to tornado damage. Early warning tornado alerts, such as through CodeRED, can save lives.
- ❖ Based on historical frequency of occurrence and climate change projections, the Advisory Committee assessed a Tropical Cyclone (Tropical Depressions, Tropical Storms, and Hurricanes) as being *Likely* (between 50% and 89.9% annual probability) to occur in Little Compton. While high magnitude events, such as Category 4 or Category 5 hurricanes, are less likely to occur, this may change in the future. Climate change models from National Oceanic and Atmospheric Administration (NOAA), the Intergovernmental Panel on Climate Change (IPCC), and other sources, suggest there is a high probability of hurricanes becoming more intense, with stronger winds and heavier precipitation, through the 21st century.
- ❖ Major hurricanes pose a significant threat to sections of Town, particularly due to surge inundation. The most vulnerable areas to hurricane surge inundation are those along the Town's southern border which fronts on the Rhode Island Sound, and those along the Town's western border which fronts on the Sakonnet River. In terms of critical facilities, the Sakonnet Harbor and some evacuation route roadways along the coastline are impacted even by a Category 1 hurricane. The only buildings identified as critical facilities that are impacted are the Sakonnet Light House Station (impacted by a Category 1+ hurricane) and the Stone House Inn (impacted by a Category 4+ hurricane) both on the National Register of Historical Places.
- ❖ The Sakonnet Harbor has a breakwater to the west that supplies adequate protection throughout much of the year, but can fall short in the winter months when northwest winds prevail.

Winter-Related Hazards

- ❖ Although the geographical location of Little Compton to the water helps to reduce the impact of most winter related hazards, severe winter storms have and are expected to impact Little Compton in the future. The Advisory Committee assessed heavy snow as being *Highly Likely* (greater than 90% annual probability) to occur in Little Compton. Based on the National Centers for Environmental Information (NCEI) Storm Events Data, on an annual basis, approximately two to seven winter weather events of some significance will occur in any of Rhode Island's counties, and it is probable that one of those events will be a Nor'easter (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-187).
- ❖ Heavy snow and ice accumulation can weigh down and damage utility wires or cause trees/tree limbs to come down which may damage utility wires and block roadways. Damaged utility wires may lead to power loss resulting in dangerous conditions, including no phone/internet service available for storm advisories and medical emergencies; loss of sanitary facilities and potable water; spoiled refrigerated food; and lack of heat, which if occurring in conjunction with freezing temperatures, can lead to dangerous health conditions and the potential for pipes to freeze and burst. Loss of power can also interrupt daily activities and cause business and school closings. Downed wires that are live are dangerous and if arcing have the potential to spark fires.
- ❖ Several critical facilities have portions of their roof that are either flat or have a low pitch and may therefore be at greater risk of failure from heavy snow. These include the Brownell Library, Town Hall, Wilbur's General Store, and the Wilbur & McMahon School, all of which are part of the Little Compton Historic District.
- ❖ Flooding may occur after the rapid melting of a heavy snowfall.

- ❖ Snow, ice, and freezing temperatures may create treacherous walking and driving conditions; cause transportation delays; create transportation challenges for first responders or others who may need to be on the roads including those trying to access emergency shelters; impact access to homes and critical facilities such as hospitals, schools, and supermarkets; and damage vegetation and tree limbs.
- ❖ Based on historic climatic conditions and climate change predictions, the Advisory Committee assessed extreme cold as being *Likely* (between 50% and 89.9% annual probability) to occur in Little Compton. Exposure to extreme cold for an extended period can lead to health concerns including frost bite and hypothermia, which is of particular concern for infants and older adults; certain medications, medical conditions, or the consumption of alcohol can also make people more susceptible to the cold. Extreme cold may also increase the potential for house fires and carbon monoxide poisoning due to increased use of supplemental heating devices.
- ❖ Prolonged snow/ice cover and exposure to extreme cold may disrupt ecosystems and negatively impact outdoor domesticated animals and wildlife.

Figure Ex-4
Photo Credit:
RI Department of Health



Vector-borne Diseases Transmitted by Ticks or Mosquitoes

- ❖ Although mosquitoes will continue to be prevalent and the population may increase, the Advisory Committee assessed the risks of Eastern Equine Encephalitis and/or West Nile Virus as being *Unlikely* (less than 1% annual probability) to occur in Little Compton. However, with respect to risks associated with ticks, specifically Lyme disease, the Advisory Committee assessed the risk as *Highly Likely* (greater than 90% annual probability) to occur. It is anticipated that annually a number of Little Compton residents or visitors will be infected by Lyme disease, most likely at a rate similar to or exceeding the 2022 rate of 53 cases per year.
- ❖ As climate change shortens our winters, ticks and mosquitoes will extend their life cycle and ticks will expand their habitat range. The resulting impact may be more cases of vector-borne diseases in people from mosquito and tick bites.
- ❖ Little Compton residents living or engaging in outdoor activities in close proximity to areas more conducive to mosquito breeding (forested areas, and standing water along rivers, ponds, and wetlands) are at higher risk of being bitten. Similarly, Little Compton residents living or engaging in outdoor activities in close proximity to wooded and grassy areas where higher populations of ticks tend to be found are at greater risk of being bitten.
- ❖ If infected, elderly residents, children, and anyone with a weakened immune system may suffer more severe illness related to mosquito- and tick-borne diseases.

Figure Ex-5 Little Compton's CERT Team assisting with Covid-19 Clinics

Photo Credit: Chief Richard Petrin



November 2020



February 2021

Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses

- ❖ The Advisory Committee considers it *Highly Likely* (greater than 90% annual probability) that Little Compton will continue to experience some level of influenza and Coronavirus cases. For both of these viruses, following the CDC and RIDOH vaccination guidelines and suggestions for minimizing the spread of the diseases should have a positive impact on reducing incident rate and severity of infections.
- ❖ The CDC identifies those highest at risk of getting serious complications from flu as children younger than 5, but especially younger than 2 years old; adults 65 years or older; pregnant women; people with any chronic illness, especially heart, lung (including asthma), or kidney disease; and people with weak immune systems.
- ❖ The CDC has indicated that a number of factors increase a person's vulnerability to get severely ill from COVID-19, including age (greater risks for those over 50), weakened immune system, obesity, certain medical conditions (including chronic lung diseases, serious heart conditions, diabetes, and some neurologic conditions).
- ❖ A number of the critical facilities are considered places where sufficient people are in contact and therefore more vulnerable to the spread of Influenza or Coronavirus. Those facilities include the Little Compton Community Center, Little Peeps Montessori Naturskola, Wilbur & McMahon School, Public Safety Complex, Town Hall, Brownell Library, Little Compton Wellness Center, and Wilbur's General Store.

Earthquake

- ❖ The Advisory Committee assessed an earthquake as being *Unlikely* (less than 1% annual probability) to occur in Little Compton.
- ❖ If a significant earthquake occurred with an epicenter relatively close to Little Compton, all buildings may be at risk to some level of damage. However, as Little Compton complies with State Building Codes, it is unlikely that most structures would sustain much damage from a moderate earthquake occurring in Rhode Island or Massachusetts. There are some residential and commercial structures sporadically located throughout Little Compton that are of older masonry construction and may be more at risk for structural failure or failing debris which could put residents at higher risk of injury or death.

Extreme Heat

- ❖ According to the CDC, extreme heat is defined as a period of abnormally high temperature ($>10^{\circ}\text{F}$ above average regional temperatures) that lasts for several weeks (CDC. *Climate Change and Extreme Heat*). The Advisory Committee assessed extreme heat as being *Likely* (between 50% and 89.9% annual probability) to occur in Little Compton.
- ❖ As the annual number of high heat days (over 90°F) is expected to increase, extreme heat events remain a danger, particularly to sectors of the population more at risk, including infants and young children, seniors, low-income residents, people with chronic medical conditions, outdoor workers, pregnant women, and athletes ((RIDOH. *Extreme Heat*).
- ❖ Physical effects of heat can cause major health problems, dehydration, and may lead to death. As seniors may be more at risk from the impacts associated with extreme heat, critical facilities that serve this population should be cognizant of the health impacts associated with extreme heat and the potential benefit of having air conditioning available in some area of the facility. Critical facilities with targeted senior services include the Little Compton Community Center, Brownell Library, and the Little Compton Wellness Center.
- ❖ Increased energy demands, particularly related to AC usage, may cause power shortages/outages.



Figure Ex-6
Drought Impacting Local Farms
Skinny Dip Farm pictured
(August 2022)

Photo Credit:
Hannah Wolbach/Skinny Dip Farm

Drought

- ❖ The Advisory Committee assessed the probability of a long-term drought impacting Little Compton as *Potential* (between 1% and 49.9% annual probability).
- ❖ As all of Little Compton is reliant on wells, the community's vulnerability to drought is directly related to the viability of the Town's aquifers.
- ❖ Farms in Town, particularly those with high water demands, are vulnerable to impacts of drought.
- ❖ During droughts, dry soils may increase the number of airborne particles, such as pollen, which can irritate the airways and worsen chronic respiratory illnesses such as asthma; those suffering from asthma or other respiratory illnesses may be at higher risk.

Brush Fire

- ❖ In general Little Compton's overall humid climate puts the Town at a lower risk for brush fires. The probability of future events is further diminished as open air burning permits are required from the Fire Department and only issued when risk of brush/wildfires is low. Permits for fireworks are also required by the Fire Department and require fire detail supervision.
- ❖ Smoke particles from fire can cause adverse health effects in people, particularly those with respiratory and cardiovascular conditions.
- ❖ Brush fires can pose a risk to human life, particularly if it ignites nearby structures. Those who live near heavily forested areas of Little Compton are at higher risk.

Figure Ex-5 Little Compton Fire Department Fighting a Brush Fire (April 2023)

Photo Credit: Chief Richard Petrin



MITIGATION STRATEGY

The *Mitigation Strategy* is the culmination of the planning process. It provides the Town with the basis for action to reduce the risk to people and property from hazards and assists the Town in achieving compatible economic, environmental, and social objectives. The *Hazard Mitigation & Flood Management Plan (HM&FMP)* Advisory Committee used the assessment information to develop a broad-based mission statement, goals, policies, and actions which are intended to guide the Town's day-to-day operations and long-term approach to reduce the impacts of hazards and improve flood management.

It was important to the Town of Little Compton to develop a comprehensive and aggressive *Mitigation Strategy* that will lead to a safer and more sustainable community. The Town has and will continue to implement and institutionalize hazard mitigation and flood management through its human, legal, and fiscal resources; effective coordination and communication with the state, neighboring jurisdictions, stakeholders, community members, and across Town departments; and use of knowledge and tools to analyze and cope with hazard risks. The *Mitigation Strategy* includes a mix of mitigation and non-mitigation actions. Non-mitigation actions include activities that are emergency response or operational preparedness in nature.

HM&FMP Goals

The mitigation strategy *Goals* are the foundation behind the development of a comprehensive range of specific attainable mitigation actions for the Town. The 2018 HMP goals were reviewed for relevancy, and updated goals were developed based on the hazard profiles, vulnerability analysis, and capability assessment, as well as compatibility with the 2018 Comprehensive Plan.

Goal 1: Reduce natural hazard impacts to the **built environment**, including infrastructure, in order to safeguard essential services including efficient transportation and transmission of essential utilities, and to protect property including cultural and historic resources.

Goal 2: Continue acquisition and protection of open space land, and enhance the capability of the **natural environment** to improve Little Compton's resilience against impacts of natural hazards including flooding, storm surge, erosion, sea level rise (SLR), extreme heat, and drought, as well as to safeguard water quality.

Goal 3: Strengthen interdepartmental and stakeholder/partner efforts to identify and understand potential natural hazard risks in Little Compton, including the deleterious impacts from climate change and sea level rise, as well as corresponding mitigation and adaptation measures, and communicate this information to citizens and business owners through **public education and engagement**.

Goal 4: Establish conditions for improved **pre-disaster preparedness and post-disaster response and recovery**.

Action Plan

To comprehensively address the *2024 Goals*, the Advisory Committee reviewed an extensive array of possible actions (**Appendix 6-1**). The possible actions originated from various key local planning documents; the newly launched Town geographic information system (GIS); comments provided by community members, businesses, and other stakeholders in the 2024 HM&FMP Public Opinion Survey; relevant actions identified in other jurisdiction mitigation plans; and additional ideas identified by the Committee and other stakeholders. Through combining some of the possible actions and eliminating others, the Committee developed 13 actions to be considered for implementation by the Town during the five-year lifecycle of this *Plan*.

The mitigation *Action Plan* (**Section 6**) includes a mix of physical initiatives through capital improvement projects and programming, as well as passive initiatives through regulatory and policy measures. It was deemed essential to include actions focused on public education and awareness in order to encourage residents, property owners, and local businesses to recognize measures they can take to become more resilient to natural hazards. **All 13 actions have been deemed feasible, reflect updated priorities including response to climate change and accelerated sea level rise, and address the Town's current and projected future needs.**

The *Action Plan* is organized by *Goal* and includes a description of the action, along with other descriptors such as the lead authority, magnitude of cost, potential funding sources, timeframe, mitigation category (prevention, property protection, public education and awareness, natural resource protection, structural projects, and emergency services), hazards addressed, potential CRS crossover activities, and the STAPLEE priority ranking. The STAPLEE method (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) was the process the Advisory Committee used to prioritize the proposed actions (**Appendix 6-2**).

The actions will be implemented through the Town's personnel, legal, and fiscal resources; intergovernmental coordination and communication; academic resources and analysis tools; grant funding; and through the involvement of the Town's residents, business owners, conservation organizations, and institutional leaders. The Town also recognizes the need to work collaboratively across municipal lines, and with State and Federal agencies, to effectively address actions that will improve not only the Town, but the region, and, by extension, the State.



Plan Adoption and FEMA Approval

After the Advisory Committee determined the objectives of the *Plan* had been met, a *Public Review Draft* was made available to the public-at-large. The Committee established a 3-week review period culminating in a Public Hearing which was hosted by the Little Compton Town Council on May 9, 2024. The Public Review Period and Public Hearing were well advertised through a press release and two Public Hearing Legal Notices in the local newspaper, a notice posted on the Secretary of State website, Town website, and Project webpage, a hard copy of the notice posted in the Town Hall and Public Safety Complex, an item on the April Harbor Commission and Conservation Commission meeting agendas, and information posted at a kiosk at the public library. Additionally, the Town sent an email publicizing the *Draft Plan* and Public Hearing to the groups and organizations listed in **Appendix 2-3**, which includes the Little Compton Town Council, Town Boards and Commissions, local businesses, community lifelines, neighboring municipalities, and numerous other local, regional, and State stakeholders. Community members and other stakeholders were encouraged to provide input and feedback throughout the Public Review Period to the Emergency Management Director and/or at the Public Hearing. During the Public Review Period the Town did not receive any written comments from members of the community or other stakeholders.

At the Public Hearing, the Town's Consultant directed a PowerPoint presentation providing an overview of the planning process, community engagement, the hazards included, what is at risk, the Town's capabilities, the *Action Plan*, and *Plan* implementation. The presentation was followed by a public Q&A/comment session providing the public the opportunity to give input and feedback. No questions or comments were offered by the Town Council or members of the public.

It should be noted that the Advisory Committee made a concerted effort to **include the public throughout the planning process** and provided an opportunity for the community and other stakeholders to voice their concerns and potential mitigation measures through the Public Opinion Survey. As shown in Appendix 2-2 a great deal of public input was received as part of the Public Opinion Survey. **All input received was reviewed and considered when finalizing the Plan.** As shown in **Appendix 6-1** most of the actionable measures identified by community members or stakeholders in the Public Opinion Survey were integrated into the Action Plan (**Subsection 6.4**).

At the end of the Public Hearing (May 9, 2024), the Town Council voted unanimously to adopt the *HM&FMP*, with the acknowledgment that during the subsequent review/approval process by RIEMA/FEMA, any required revisions would be accepted by said adoption. The Town Council Resolution adopting the *HM&FMP* is included in **Appendix 7-1**. The Town worked diligently to produce a detailed plan with the intent of satisfying all DMA requirements, and therefore does not anticipate any substantial RIEMA/FEMA required revisions. However, if any substantial revisions are requested by RIEMA/FEMA, the Town Council may choose to re-adopt the *Plan* after said revisions are made. **(Note: No revisions were requested by RIEMA or FEMA).**

By adopting the *Plan*, the Town Council recognizes it as guidance for Town-wide natural hazard mitigation, enabling Little Compton to continue to work toward building a safer, disaster resilient, and sustainable community through the implementation and maintenance of mitigation actions.

On August 7, 2024, the *Plan* received approval from FEMA, which confirmed that the *HM&FMP* met all requirements. The FEMA approved/Town Council adopted *HM&FMP* makes Little Compton eligible for various FEMA grant programs.

The ***Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan*** will be maintained on the Town's website and replaces the Town's 2018 Local HMP.

Implementation and Plan Maintenance

The Town of Little Compton is committed to implement the *Action Plan* (**Section 6**) on an ongoing basis, as well as support a process by which the local government will integrate hazard mitigation planning into other departmental measures.

When creating this *Plan*, numerous local plans, policies, codes, and programs that guide development in Little Compton were consulted (**Section 5**). The Town intends to continue plan integration, ensuring that whenever appropriate, the mitigation strategies & principles, vulnerability information and mitigation actions outlined in the *HM&FMP*, will be incorporated into other Town planning mechanisms. Doing so will leverage activities that have co-benefits, reduce risk and increase resilience. **Appendix 5-1** includes plan integration considerations for key existing planning documents. Further integration will occur as land use plans & regulations, mutual aid agreements, and such, are updated or developed.

With respect to the *HM&FMP*, the Town considers it a **dynamic document**. To ensure it remains effective over the 5-year implementation period, the Advisory Committee will review it, at minimum, on an annual basis (preferably on a semi-annual basis), and as readily as possible following a natural disaster. These reviews will serve as opportunities to assess the progress and effectiveness of implemented mitigation measures, and to update the *Plan* as deemed appropriate to reflect items such as changes in the community, availability of funding and staffing resources, or an improved understanding of the Town's strengths and vulnerabilities.

For the *Plan* to remain relevant, continued community involvement throughout the implementation and maintenance process will be essential. Ongoing community engagement is an asset to the process as it continues the hazard risks discussion and builds support for mitigation activities. Throughout the 5-year implementation period, community members will be given the opportunity to affect the content and outcomes of the *HM&FMP* through outreach, public meetings, and community forums.

In addition to the annual reviews, the *Plan* will undergo a 5-year full update. The 5-year update will be completed in accordance with Disaster Mitigation Act requirements, in order to maintain eligibility for certain FEMA mitigation grant funding. To ensure that the revised plan will be approved within the 5-year cycle, it is proposed that the Town commence the update on the fourth anniversary of this *Plan's* adoption date.

The key to becoming more resilient to
natural hazards is:

1. Developing a good Mitigation Strategy
– and we've done that!
2. IMPLEMENTING the Mitigation Strategy
– the best time to start is now!

SECTION 1

Introduction

Subsections

- 1.1 PURPOSE AND MISSION
STATEMENT
- 1.2 ORGANIZATION OF THE
DOCUMENT

1 Introduction

The *Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan (HM&FMP)* is a critical planning document for the Town. With extensive coastline, the Sakonnet River flowing along the western border of the Town, and significant low-lying land within the Special Flood Hazard Area (SFHA), Little Compton is one of Rhode Island's most vulnerable communities to the impacts from natural hazards. For the purposes of this mitigation plan, a natural hazard is considered "an event or physical condition that has the potential to cause fatalities, injuries, property and infrastructure damage, agricultural loss, damage to the environment, interruption of business, or other types of harm or loss" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-1). The potential impacts from natural hazards range from minor short-term events such as street flooding and snowstorms, to catastrophic events, such as the Hurricane of 1938. Risks will continue to grow in the coming decades due to sea level rise and other anticipated deleterious effects of climate change. By planning ahead, Little Compton becomes pro-active rather than reactive, and can significantly reduce the damaging effects of future disasters, minimizing loss of life, injuries, destruction of property, infrastructure, and the environment, and economic and social disruption.

1.1 PURPOSE AND MISSION STATEMENT

The objective of this *Plan* is to guide hazard mitigation efforts by identifying natural hazards with a higher likelihood of occurring or potentially having a greater impact on the community should they occur; determining the vulnerability of the community to these hazards; and establishing clear goals and strategies that mitigate the risks. The Mission Statement, adopted by the HM&FMP Advisory Committee, forms the foundation upon which the *Mitigation Strategy* is built.

Mission Statement

The purpose of the *Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan (HM&FMP)* is to reduce Little Compton's vulnerability to natural hazards, including safeguarding against and facilitating recovery from the increasing threats from sea level rise and other deleterious climate change impacts, thereby fostering a safe, resilient community that preserves and enhances quality of life for all generations. By identifying areas and resources at risk to natural hazards and corresponding feasible, sustainable mitigation measures, for municipal and private implementation, the *HM&FMP* provides the foundation for an ongoing local mitigation program to reduce adverse impacts of natural hazards on Little Compton's people, critical facilities and services, built & natural environment, and economy.

As both inland and coastal flooding have historically been a problem for the Town of Little Compton, and climate change and sea level rise (SLR) models indicate flood-related hazards will continue to worsen in the future, the Advisory Committee chose to expand the FEMA required 5-year Hazard Mitigation Plan (HMP) update to include additional focus on flooding and flood management. The resulting *Hazard Mitigation & Flood Management Plan (HM&FMP)* was prepared pursuant to the requirements of the Federal Disaster Mitigation Act of 2000, integrates the 10-step planning process outlined in Community Rating System (CRS) Activity 510, and aligns with the State of Rhode Island's objectives for natural hazard mitigation included in the RI State Hazard Mitigation Plan (RI-SHMP).

The hazards addressed in this *Plan* include: Flood-Related Hazards; Wind-Related Hazards; Winter-Related Hazards; Infectious Disease-Related Hazards (Vector-borne Diseases Transmitted by Ticks or Mosquitoes, and Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses); and Other Hazards (Earthquake, Extreme Heat, Drought, Brush Fire). The *Plan* also addresses how climate change, including sea level rise, poses a significant threat to the community in terms of exacerbating many of the identified hazards.

1.2 ORGANIZATION OF THE DOCUMENT

This *Hazard Mitigation & Flood Management Plan (HM&FMP)* is organized as described below. As noted, the CRS Activity 510 planning process guided plan development. This process proved successful, encouraging community and stakeholder engagement, and the integration of key planning documents and other resources. The planning process led to a well-structured, community-centric *Plan* that addresses risk and vulnerability through a variety of hazard mitigation measures.

Executive Summary: provides an overview of the planning process and collaborative effort undertaken by the Town to create this document. The Executive Summary also provides a vulnerability summary, and delineates the goals, how the *Action Plan* was developed, and how *Plan* adoption, implementation, and maintenance will help ensure the *Plan* remains relevant and will provide effective guidance as Little Compton continues to build a safer, disaster resilient, and sustainable community.

Section 1 - Introduction: identifies the purpose and structure of the *Plan*. A brief summary of the information presented in each Section is provided.

Section 2 - Planning Process with Public Input: provides a description of the overall planning process and identifies the HM&FMP Advisory Committee members. As the Town intends to participate in the Community Rating System (CRS) program, the CRS Activity 510 planning process was used to guide plan development. As shown in Section 2, that process aligns with the Disaster Mitigation Act (DMA) of 2000 Hazard Mitigation Plan requirements. Section 2 also provides a discussion of public involvement, identifying how the community, neighboring jurisdictions, and other stakeholders were given the opportunity to provide input and feedback on the *Plan*. It further outlines the extensive plan integration effort undertaken as part of the planning process.

Section 3 – Community Profile: provides a glimpse of the history and character of the Town, as well as general information about the local government, geography, population, and demographics.



Figure 1-1 Goosewing Preserve
Photo Credit: Jodi Hilton | NY Times

Section 4 – Risk Assessment: comprises two key elements: Hazard Identification and Vulnerability Analysis. The Hazard Identification reviews and ranks the natural hazards that are likely to impact all or part of Little Compton. Ranking is used to determine which hazards have a higher likelihood of occurring or potentially may have a greater impact on the community should they occur. The hazards addressed in this *Plan* have been grouped into the following categories: **Flood-Related Hazards** (Inland Flooding including Dam Failure, Coastal Flooding including Storm Surge, Coastal Erosion); **Wind-Related Hazards** (High Winds, Thunderstorms including Lightning and Hail, Tornadoes, Tropical Cyclones including Tropical Depressions, Tropical Storms, and Hurricanes); **Winter-Related Hazards** (Heavy Snow, Ice, Extreme Cold); **Infectious Disease-Related Hazards** (Vector-borne Diseases Transmitted by Ticks or Mosquitoes, Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses); and **Other Hazards** (Earthquake, Extreme Heat, Drought, Brush Fire). A profile for each of these hazards is provided with the following information: description and extent (strength or magnitude of impact); location (geographic area affected); previous occurrences; climate change impacts; and probability of future events.

The Vulnerability Analysis considers how susceptible the community is to the various identified hazards. The analysis addresses what is at risk (built environment including public infrastructure, natural environment, local economy, and people) and what the impacts might be (structural and environmental damage, economic loss, inconvenience to residents, physical and emotional harm, and loss of life). The Vulnerability Analysis employed both a quantitative analysis (wherein data was available) and a qualitative analysis that relied on local knowledge and rational decision making.

Section 5 – Capability Assessment: provides an overview of what mitigation mechanisms are already in place. In other words, what policies, programs, regulations, authorities, personnel, funding, and other resources are available to the Town to accomplish mitigation and reduce long-term vulnerability. A Capability Assessment is an important step because understanding what is already in place and the effectiveness of those capabilities provides the opportunity to identify where additional measures or revisions to existing measures are needed.

Section 6 – Mitigation Strategy: is the culmination of the planning process, built upon the preceding Sections, particularly the findings from the Risk Assessment (Hazard Identification and Vulnerability Analysis), and Capability Assessment. **Section 6** includes a broad-based mission statement, goals, policies, and actions which are intended to guide both the Town's day-to-day operations and long-term approach to reduce the impacts of hazards and improve flood management.

The *Action Plan*, which will serve as a roadmap for the next 5-years, was developed by reviewing and prioritizing an array of possible actions. To comprehensively address the mitigation *Goals*, actions across a number of mitigation categories (prevention, property protection, public education & awareness, natural resource protection, structural projects, and emergency services) have been included in the *Action Plan*. As the Town has limited fiscal and staffing resources, the *Action Plan* places greater focus on mitigation measures for the higher ranked hazards.



Figure 1-2 (Image Credit: gapingvoid)

Section 7 – Plan Adoption, Implementation, and Maintenance: provides the *Plan* adoption process which represents community and local government support. In addition, by adopting the *Plan* the Town is eligible for FEMA Hazard Mitigation Assistance Grants and CRS credit points.

Section 7 also identifies a process for monitoring the overall progress of mitigation strategies and completed initiatives. The *Action Plan* includes descriptors for each mitigation action, such as lead authority and timeframe, which will aid implementation by providing a clear course for how the measure is to be incorporated into departmental and committee-based work plans and budgets.

To ensure continued momentum of *Plan* implementation, and ensure the *Plan* remains relevant, Section 7 stipulates an annual review process and a 5-year update. Structured maintenance of the *Plan* provides a defined opportunity to evaluate the effectiveness of implemented mitigation measures, address changing conditions, identify funding mechanisms, and facilitate integration of the *HM&FMP* into other Town planning documents and strategies.

Appendices: contain supporting documents.

- Appendix 2-1 CRS Credit for Activity 510
- Appendix 2-2 Outreach Activities
- Appendix 2-3 Coordination with Agencies & Organizations

- Appendix 4-1 Hazard Impacts & Risk Assessment
- Appendix 4-2 Maps
- Appendix 4-3 Critical Facilities Vulnerability Analysis

- Appendix 5-1 Planning & Regulatory Capabilities
- Appendix 5-2 Administrative & Technical Capabilities
- Appendix 5-3 Financial Capabilities

- Appendix 6-1 Possible Actions
- Appendix 6-2 STAPLEE Evaluation

- Appendix 7-1 Little Compton Town Council Resolution
- Appendix 7-2 Local Mitigation Plan Review Tool

SECTION 2

Planning Process with Public Input

Subsections

2.1 ORGANIZE

2.2.1 10-Step Planning Process

2.2.2 Local Government Involvement: Advisory Committee

2.2 PUBLIC INVOLVEMENT

2.2.1 Prior to HM&FMP Planning Process

2.2.1.1 Public Outreach Associated with the 2018 Comprehensive Plan

2.2.1.2 Public Outreach Associated with the MRP CRB Workshop

2.2.2 Throughout HM&FMP Planning Process

2.3 PLAN INTEGRATION AND COORDINATION

2.3.1 Plan Integration

2.3.1.1 CRS

2.3.1.2 2018 Local HMP

2.3.1.3 2018 Comprehensive Plan

2.3.1.4 2020 MRP CRB Workshop Summary of Findings

2.3.2 Coordination with Businesses, Agencies, and Organizations

2 Planning Process with Public Input

Hazard Mitigation Plan: The Town of Little Compton has successfully met the following requirements →
44 CFR Subsection D §201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

- 1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- 2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and
- 3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

44 CFR Subsection D §201.6(c)(1): The plan shall include the following:

- 1) Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

CRS - Flood Management Plan: The Town of Little Compton has successfully met the following Mitigation Strategy requirements based on the 10-step planning process for CRS Activity 510 →
Organize to Prepare the Plan (Step 1); Involve the Public (Step 2); and Coordinate (Step 3)

2.1 ORGANIZE

The Town of Little Compton is cognizant of the importance of updating and coordinating local planning initiatives. As the 2018 *Local Hazard Mitigation Plan* (HMP) was scheduled to be updated, and as a prevalent natural hazard facing the Little Compton is flooding, **the Town decided to expand the update process to effectively create a combined *Hazard Mitigation & Flood Management Plan (HM&FMP)*.**

CRS CREDIT:		
Mitigation Planning Element	CRS Planning Step	Max Pts
Phase I - Planning Process	1. Organize to Prepare the Plan	15

CRS Coordinator's Manual – Activity 510: Floodplain Management Planning

As the Town is interested in participating in FEMA's Community Rating System (CRS) Program, it was determined that the *Plan* should be created using the CRS Activity 510 planning process. This process allows the Town to maximize CRS credit for this *Plan* while meeting the Disaster Mitigation Act (DMA) 2000 Hazard Mitigation Plan requirements. This coordinated approach strengthened the planning process and led to a well-structured, community-centric plan that addresses risk and vulnerability through a variety of hazard mitigation measures. The Town contracted with Civil Engineer & Resilience Planning Consultant Kim Jacobs (KMJ-CE/RP) to draft the *Plan*, provide technical assistance to the Advisory Committee, facilitate meetings and outreach efforts, and coordinated plan review with RIEMA.

Planning is essential.

- Dwight D. Eisenhower

2.1.1 10-Step Planning Process

By implementing the CRS Activity 510 planning process outlined in **Table 2-1**, this *HM&FMP* meets DMA requirements while maximize CRS Activity 510 credit. An overview of the estimated CRS credit achieved by this *Plan* has been included in **Appendix 2-1**.

Table 2-1 shows the alignment of the DMA planning regulations to the 10-Step planning process. It should be noted that Steps 2 and 3 were implemented throughout the entire planning process.

Table 2-1 10-Step Planning Process & DMA Planning Regulations

CRS Activity 510 Planning Process	DMA Planning Regulations (44 CFR 201.6)
Phase I – Planning Process	
Step 1. Organize to Prepare the Plan	§201.6(c)(1)
Step 2. Involve the Public	§201.6(b)(1)
Step 3. Coordinate	§201.6(b)(2) & (3)
Phase II – Risk Assessment	
Step 4. Assess the Hazard	§201.6(c)(2)(i)
Step 5. Assess the Problem	§201.6(c)(2)(ii) & (iii)
Phase III – Mitigation Strategy	
Step 6. Set Goals	§201.6(c)(3)(i)
Step 7. Review Possible Activities	§201.6(c)(3)(ii)
Step 8. Draft an Action Plan	§201.6(c)(3)(iii)
Phase IV – Plan Maintenance	
Step 9. Adopt the Plan	§201.6(c)(5)
Step 10. Implement, Evaluate, and Revise the Plan	§201.6(c)(4)

2.1.2 Local Government Involvement: Advisory Committee

The 2018 Local Hazard Mitigation Plan (HMP) was Little Compton’s first mitigation plan. This HM&FMP constitutes the FEMA-required 5-year update. For this update, at their December 7, 2023 meeting, the Town Council authorized the formation of an Advisory Committee, comprised of Town staff, residents, local businesses, and other stakeholders to provide input and help guide plan development (Town of Little Compton RI. *Town Council*, 14). **The HM&FMP Advisory Committee members are listed in Table 2-2, with public representation comprising 50% of the membership. The Town’s Consultant for the HM&FMP served on the Committee throughout the planning process in an advisory capacity.**

The HM&FMP Advisory Committee met six (6) times throughout the development of this *Plan*, and their input and feedback were integral to its success. The date and key agenda items for each of the Advisory Committee meetings have been provided in **Table 2-4. As shown, the Advisory Committee was actively engaged in all aspects of plan development**, with emphasis on reviewing the impact of hazards on people and property; considering a variety of ways to reduce and prevent damage from flooding and other hazards; recommending appropriate and feasible measures to improve community resilience through implementation of mitigation actions; ranking both the hazards and the mitigation measures; engaging the public in the plan development process, and reviewing/editing *Plan* content. The Committee meetings were open to the public and publicized on the RI Secretary of State website, the Town website (calendar of events and HM&FMP Project webpage), and hard copies of the agenda were posted in the Town Hall and Public Safety Complex.

Table 2-2 HM&FMP Advisory Committee

Little Compton Town Staff <i>(or on a Town Board with Regulatory Authority)</i>	Members of the Public/Stakeholders
Advisory Committee Chair Richard G. Petrin, Fire Chief & Emergency Management Director; past President RI Association of Fire Chiefs	Abigail Brooks, President, Sakonnet Preservation Association; resident; business is located in the SFHA
Carol A. Wordell, CMC, Town Clerk; resident	Jason Burchard, Tree Warden; resident; local business owner
Denise M. Cosgrove, RICA, Tax Assessor, E911 Liaison, GIS Coordinator; resident	Nelson Cabot, Jr., Trustee, Little Compton Agricultural Conservancy Trust; resident; local business owner
George Duarte, Sr., Director of Public Works	Ben Gauthier, Harbor Commission Chair; resident
Dean Simmons, Building Inspector & Zoning Official, Floodplain Manager	Amy Mooney, Community Center Executive Director (<i>Senior Meals Site</i>); resident
A. Michael Steers, Planning Board Chair; Trustee, Little Compton Agricultural Conservancy Trust; resident; residence is located in the SFHA	Mike Rocha II, CERT Team Member; School Committee Member; resident
<i>Committee Facilitator and Technical Advisor Kim Jacobs, Civil Engineer & Resilience Planning Consultant</i>	

The Town Departments (including the Planning Board which has regulatory authority) represented on the Advisory Committee are responsible for implementing the majority of the *Plan's* recommendations and, as shown in **Table 2-3**, collectively have authority over all six categories of flood mitigation activities. Little Compton does not have a Planning Department, but the Planning Board has the authority to approve sub-divisions and surveys of property located within the jurisdiction of Little Compton, advises the Town Council on all matters concerning the growth and development of the Town, and matters related to zoning, land subdivision, and proposals for development. The Planning Board was the lead on the Town's Comprehensive Plan. The Chair of the Planning Board was an active member of the Advisory Committee and involved throughout the entire HM&FMP planning process.

Table 2-3 Town of Little Compton Department Responsibility

Department	Land Use and Comprehensive Planning	6 Categories of Flood Mitigation					
		Prevention	Property Protection	Public Education & Awareness	Natural Resource Protection	Structural Projects	Emergency Services Protection
Fire Department & Emergency Management		X	X	X	X	X	X
Building & Zoning	X	X	X	X	X	X	
Planning Board	X		X	X	X		
Public Works		X	X	X	X	X	X
Tax Assessor/GIS	X			X			
Town Clerk				X			

2.2 PUBLIC INVOLVEMENT

Public participation is a central component of the planning process which helps to provide critical information about the local occurrence of hazards, qualify past successful mitigation measures, and identify where additional work is needed to reduce the potential damages from hazard events. Public participation also builds understanding of the concept of hazard mitigation and climate change, therein helping to create a base of support for implementing *Plan* activities.

CRS CREDIT:



Mitigation Planning Element	CRS Planning Step	Max Pts
Phase I - Planning Process	2. Involve the Public	120

CRS Coordinator's Manual – Activity 510: Floodplain Management Planning

It is important to the Town of Little Compton that this *Plan* reflects the community's values and priorities. For that reason, the Town wanted an equal or greater public representation by members of the public on the Advisory Committee. Additionally, to engage the public-at-large, the Town conducted an extensive public outreach process that included the opportunity for residents, businesses, local boards and commissions, neighboring communities, academia, private and non-profit organizations, state agencies, and other interested stakeholders to attend and participate in public meetings, provide input through an online survey, and ask questions of or provide comments to the Advisory Committee Chair (Emergency Management Director/Fire Chief) about the *HM&FMP* as it was being drafted. All input received was appreciated and considered in finalizing this *Plan*.

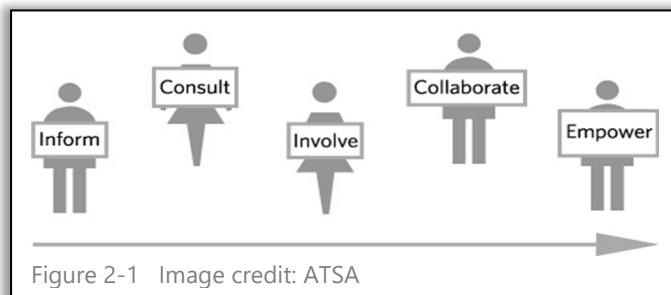


Figure 2-1 Image credit: ATSA

Following is an overview of public engagement that was essential to the development of the *Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan*.

2.2.1 Prior to HM&FMP Planning Process

It should be noted that even prior to the commencement of the *HM&FMP* planning process, several initiatives with highly successful public engagement took place; the outcomes of which have helped to shape this *Plan*. Two of those initiatives, the 2018 Comprehensive Plan and the 2020 Community Resilience Building Workshop, have been documented below.

2.2.1.1 Public Outreach Associated with the 2018 Comprehensive Plan

Little Compton's first Comprehensive Plan (CP) was approved by the Town Council in June 1994. The plan as presented in 1994 did not meet Statewide Planning Program requirements and subsequently underwent revisions in 2001 and 2003. The 2003 CP was the first plan both adopted by the Town Council and approved by the State. The CP was further updated in 2005, 2009, and most recently in 2018. The State currently requires updates every 10-years.

Little Compton's Planning Board led the effort to develop the 2018 Comprehensive Community Plan. Development of the CP embraced the *Rhode Island Comprehensive Planning and Land Use Act* goal of encouraging "the involvement of all citizens in the formulation, review, and adoption, or amendment of the comprehensive plan" (Rhode Island Comprehensive).

All Planning Board meetings discussing the CP development were advertised and open to the public and draft reviews were posted and made available as part of meeting information. The public and other stakeholders were encouraged to provide input and feedback. The Planning Board and Town Council held three joint Public Hearings associated with the 2018 Comprehensive Plan update. The first two (March 2, 2017 and March 9, 2017) were to gather public comments without taking any official votes for adoption. All comments secured through the public hearings were considered and incorporated as appropriate into the Draft Goals, Policies and Actions of the Town's Comprehensive Plan. The final public hearing was held February 15, 2018.

After the Public Hearing, the Comprehensive Plan was unanimously approved by the Planning Board, as amended by votes taken during the February 15, 2018 public hearing, and the Board referred the plan to the Town Council with a recommendation for adoption. The Town Council, based on the recommendation of the Planning Board, unanimously adopted the 2018 Comprehensive Plan. The 2018 Comprehensive Plan was subsequently incorporated into the Code of Ordinances as Chapter 1-6.

As will be further discussed in **Subsection 2.3**, the Town's CP was used extensively to inform and develop this *Plan*, including many of the action items.

2.2.1.2 Public Outreach Associated with the 2020 MRP CRB Workshop

In July 2020 the Town held a Community Resilience Building (CRB) Workshop, led by the Rhode Island Infrastructure Bank (RIIB) in partnership with The Nature Conservancy (TNC). The Workshop brought together Town staff and local, regional, and state stakeholders, in an effort to identify and prioritize steps to reduce risks and improve resilience within the Town and region. The Workshop provided a key opportunity to discuss and advance comprehensive community resilience planning and hazard mitigation efforts. An overview of the discussion and outcome from the Workshop is documented in the *CRB Workshop Summary of Findings Report*, which as further discussed in **Subsection 2.3**, was used extensively to inform and develop this *Plan*, including many of the action items.

2.2.2 Throughout HM&FMP Planning Process

A key element in the mitigation planning process is creating a plan that accurately reflects the community's values and priorities and promotes discussion among community members about creating a safer, more disaster-resilient community.

As previously indicated, the public was involved in the planning process from the onset, comprising 50% of the Advisory Committee membership. In addition, throughout the planning process, the public was given opportunities to be involved through outreach efforts that sought to deepen the public's understanding of hazard risks and encourage input on the development of resilient solutions. Community members and other stakeholders provided local knowledge of past hazard occurrences, described problem areas and issues of concern, helped identify community assets and mitigation alternatives, and provided ideas for continuing public involvement after *Plan* adoption. All input and feedback received was appreciated and taken into consideration in finalizing this *Plan*, including the *Action Plan*.

Successful Outreach

- ◆ Informs and educates about hazards and risks
- ◆ Invites interested parties to contribute their views and ideas for mitigation
- ◆ Identifies conflicts and incorporates different perspectives and priorities early in the process
- ◆ Provides data and information that improves overall quality and accuracy of the plan
- ◆ Ensures transparency and builds trust
- ◆ Maximizes opportunities for implementation through greater consensus and acceptance

Source: FEMA Local Mitigation Planning Handbook 2013, page 3-2

The Town engaged in a total of eleven (11) outreach activities which included an informational project webpage, several newspaper articles, social media posts on various platforms, informational posters, public opinion survey, public information meeting, stakeholder hosted public information session, the inclusion of the *HM&FMP* as an agenda item for the April Harbor Commission and Conservation Commission Board meetings, press release for the Public Review Period, 3-week Public Review Period commencing with disseminating the *Public Review Draft*, kiosk at the Public Library, and a Public Hearing. **As the most vulnerable population in Little Compton is the senior population (48.1% age 60 or older, and 35.9% age 65 or older), a special effort was made to include this population in the planning process. For example, as it was indicated that some seniors don't have or prefer not to use computers, hard copies of the survey were provided at the library and community center.**

An overview of the outreach activities has been included in **Table 2-4**. Additional information for each activity, including copies of the newspaper articles, results of the survey, and examples of the posters has been provided in **Appendix 2-2**. Just as public involvement throughout the planning process was a priority, after the Town Council adopts the *HM&FMP*, it is important to the Town that the public continue to be involved in the ensuing implementation and maintenance phase.

Because community and stakeholder engagement are important, the Advisory Committee meetings, Public Informational Meeting, and Public Hearing were publicized in the local newspaper, on the RI Secretary of State website, on the Town's website, and hard copies of the agenda were posted in the Town Hall and Public Safety Complex. In addition, emails highlighting the various outreach activities were sent to the 19 local government & school district groups, including the Little Compton Town Council and other Boards and Commissions, and 74 stakeholders from various businesses, community lifelines, agencies, and organizations outside of Little Compton's governmental structure, as listed in **Appendix 2-3**.

Table 2-4 Summary of Advisory Committee Meetings and Public Outreach

Event	Overview	Date
Advisory Committee Meeting #1	- The Committee members and Technical Advisor (TA) introduced themselves. - The TA presented a brief overview of the Disaster Mitigation Act, Community Rating System program, and the proposed structure and planning process for the HM&FMP. - The proposed meeting schedule was reviewed. - The Committee discussed the importance of engaging the public in the planning process and potential outreach activities. - The importance of Plan Integration was discussed and a list of local planning documents to be reviewed as part of developing the HM&FMP was identified. - The Committee reviewed the Major Disaster Declarations (Federal) and Emergency Disaster Declarations (State), and aggregate number of various hazard events/associated property damage in Newport County (generally between 1996-2018).	Dec 19, 2023 (9-10:30am)

Event	Overview	Date
Advisory Committee Meeting #1 <i>continued</i>	- The impacts of climate change were discussed with the recognition that for the foreseeable future, climate change (including SLR) will have a significant impact locally, nationally, and globally. In the Plan, climate change will be recognized as a present threat and an ongoing amplifier to some of the natural hazards. A discussion took place on what hazards are more likely to impact Little Compton and should/should not be included in the 2024 HM&FMP. - The TA identified Critical Asset categories and the Committee reviewed and modified the draft Critical Facilities list. - The Committee reviewed and modified the draft list of businesses, agencies, and organizations that the TA will coordinate with throughout the development of the HM&FMP - Public Comment: No one from the public attended.	
Outreach Activity #1	Project Webpage: A HM&FMP project webpage was created on the Town's website as a mechanism to provide the community and other stakeholders with information about the planning process and promote upcoming meetings and outreach activities. The webpage was maintained throughout the duration of the Project and updated on several occasions. At the beginning of the Public Review period, the <i>Public Review Draft</i> was posted on the project webpage. A link to the project webpage was also included on the Town's Emergency Management webpage.	Launched on Dec 20, 2023 (continued throughout the project)
Outreach Activity #2	Newspaper Articles: An article was published in the local newspaper, <i>The Sakonnet Times</i> , on December 21, 2023, informing the public about the project and encouraging the public to participate in the planning process, including the public opinion survey and Public Informational meeting. A news brief about the project and the opportunity for public input was published in <i>The Sakonnet Times</i> on January 11, 2024. A third article was published on April 4 (online edition) and April 11 (newsprint edition) informing the public that the <i>HM&FMP Public Review Draft</i> would be available for viewing and/or downloading from April 19 – May 9, 2024. The press release explained the purpose and content of the <i>DRAFT</i> and how to provide input and feedback to the EMA Director or at the Public Hearing, scheduled for May 9, 2024.	Dec 21, 2023 edition; Jan 11, 2024 edition; April 4, 2024 online edition & April 11, 2024 paper edition
Outreach Activity #3	Social Media Posts: Information about the project, public outreach activities, and other opportunities for the public to provide input and feedback was posted in various formats on various platforms. - Town Website: Little Compton News & Announcements and Emergency Management Webpage - Numerous organization's or personal Facebook pages, Instagram Accounts, Twitter Accounts, Newsletters, Webpages, and emails	Beginning Dec 20, 2023 (various posts throughout the project)
Outreach Activity #4	Informational Posters: Several styles of posters were created, with input from the Advisory Committee, to publicize the project and the various ways that the public could become involved. Approximately 26 posters were put up in Town buildings and around Town in high pedestrian traffic areas. The posters were also sent out to Town Departments, the school community via the School Superintendent, and various other individuals and groups.	Dec 20, 2023 – Jan 19, 2024
Outreach Activity #5	Public Opinion Survey: An integral element in hazard mitigation planning is broad public participation. Information provided by residents and stakeholders can illuminate local hazard concerns, gauge a community's awareness and preparedness for hazards, and inspire innovative solutions to reduce impacts of future hazard events. As online public opinion surveys are a highly accessible mechanism for gathering qualitative and quantitative data to inform the planning process, the Advisory Committee published an on-line survey hosted by SurveyMonkey.com. Hard copies of the survey were also available at the Community Center and Brownell Library (this was specifically done to target the senior population).	Dec 20, 2023 – Jan 19, 2024

Event	Overview	Date
Outreach Activity #5 <i>continued</i>	The survey was promoted through the Town’s website, newspaper articles, social media, and project posters. The survey was also publicized through emails sent to various groups including the 19 local government & school district groups and the 74 businesses, community lifelines, agencies, and organizations outside of Little Compton’s governmental structure listed in Appendix 2-3. The survey was accessible from December 20, 2023 – January 19, 2024 and had a total of 142 respondents. Survey results including the direct input in the comment section, were used by the Advisory Committee to help guide and focus mitigation planning efforts (Subsections 6.3.5 & 6.4 and Appendix 6-1) and an overview of the results has been included in Appendix 2-2.	
Outreach Activity #6	Public Information Meeting: A public informational meeting was hosted by the Little Compton Agricultural Conservancy Trust (LCACT) to inform the public about the Plan, promote discussion about creating a safer, more resilient community, and to obtain public input on the natural hazards, problems, and possible solutions for consideration and integration into the development of the <i>Plan</i>. Information publicizing the Meeting was included in Outreach Activities 1-4. The Town’s Project Consultant directed a PowerPoint presentation followed by an open public discussion/Q&A period. Six Trustees and sixteen others were present for the meeting. Several Trustees and members of the public asked questions general about the planning process and ongoing Public Opinion Survey. One member of the public (Randy Waterman) provided photos of the 12-18-2023 storm. An attendee (Vita Longo), subsequent to the meeting, provided photos of flooding on Oliver Lane. The Advisory Committee was apprised and narrative about the impact of the 12-18-2023 storm as well as photos from both attendees were included in Section 4.	Jan 3, 2024 (7pm) meeting notes
Advisory Committee Meeting #2	- The Committee voted to approve the meeting notes from the previous meeting (December 19, 2023). - The Committee reviewed the status of items from the previous meetings - various public outreach activities: project webpage is up; newspaper article was in the December 21, 2023 edition of <i>The Sakonnet Times</i>; information about the project and public input/feedback opportunities has been posted on various social media platforms; approximately 25 informational posters have been put up around town; the public opinion survey is live through January 19, 2024; and an email about the project was sent to the project coordination list. - A discussion took place on the elements included in a hazard profile, which is part of the Risk Assessment. The Committee discussed and modified the DRAFT hazard profiles associated with Wind-Related Hazards, Winter-Related Hazards, Infectious Diseases -Related Hazards, and Other Hazards (Earthquakes, Extreme Heat, Drought, Brush Fires). - A discussion took place on the elements included in the vulnerability analysis, which is part of the Risk Assessment. The vulnerability analysis will cover the following four asset groups: Built Environment & Infrastructure; Natural Environment; Local Economy; and People. - The Committee discussed hazard ranking and reviewed the scoring rubric. - Public Comment: No one from the public attended.	Jan 9, 2024 (9-10:30am)
Advisory Committee Meeting #3	- The Committee voted to approve the meeting notes from the previous meeting (January 9, 2024). - The Committee reviewed the status of items from the previous meetings - various public outreach activities: news brief was in the January 11, 2024 edition of <i>The Sakonnet Times</i> which publicized the project and provided a link to the survey; information about the project and public input/feedback opportunities has been posted on various social media platforms including on Facebook pages, twitter & Instagram accounts, websites, emails, and newsletters; and the public opinion survey closed on January 19, 2024 with 142 responses – the survey results will be used by the Committee and will be posted on the Project Webpage and included as an appendix to the HM&FMP.	Jan 23, 2024 (9-10:30am)

Event	Overview	Date
Advisory Committee Meeting #3 <i>continued</i>	- The Committee discussed and modified the DRAFT hazard profiles associated with Flood-Related Hazards. - The Committee received a copy of the DRAFT Vulnerability Tables prior to the meeting - suggested changes will be sent to the TA who will compile and report back to the Committee at the next meeting. - The majority of the meeting focused on the Committee completing the <i>Hazard Ranking Form</i> in order to prioritize the hazards potentially impacting Little Compton over the upcoming five-year period. Based on a scoring rubric the Committee ranked the hazards and determined the high, medium, and low risk categories. - Public Comment: 2 members of the public attended but had no comments.	
Advisory Committee Meeting #4	- The Committee voted to approve the meeting notes from the previous meeting (January 23, 2024). - The Committee reviewed the status of the following items from previous meetings: The public opinion survey results have been posted on the Project Webpage, and the survey comments with actionable suggestions will be reviewed by the Committee as possible action items; suggested changes to the Vulnerable tables from the Committee have been made; a draft of the Critical Facilities Vulnerability table was discussed. - A discussion on the Capability Assessment took place. Changes to the Planning & Regulatory Capabilities and Administrative & Technical Capabilities based on Committee input were made. A draft of the Financial Capabilities was discussed. A list of stakeholders augmenting the Town's conservation and resilience capabilities was reviewed and modified based on Committee input. - The Committee reviewed the status of the 2018 Actions and which of the non-completed ones remain relevant for the 2024 Action Plan. - A discussion on Mitigation Strategy took place. The Committee was encouraged to think about what they want the community to look like in the future in terms of resilience to flooding and other natural hazards. The Committee reviewed and provided input on the draft Mission Statement, Goals, and Policies – and changes were noted. - Discussion on development of the Action Plan took place. Initially the Committee will review an array of POSSIBLE ACTIONS, including those identified in key plan integration resources. The Committee began their review of possible actions, identifying those they feel strongly should be included in the 2024 Action Plan and those not to include for specified reasons. - The Committee reviewed and agreed to a modified schedule for meetings #5 and #6. - Due to time constraints an introduction to Prioritizing Actions (STAPLEE Evaluation) was not provided. - Public Comment: No one from the public attended.	Feb 20, 2024 (9-10:30am)
Advisory Committee Meeting #5	- The Committee voted to approve the meeting notes from the previous meeting (February 20, 2024). - The Committee discussed additional public outreach activities including: a possible second informational meeting; providing information regarding the HM&FMP as an agenda item for various upcoming Town Board & Commission meetings; press release in the Sakonnet Times; public hearing notice; disseminating the <i>Public Review Draft</i>; project kiosk at library; and a Public Hearing. In addition, an email publicizing the <i>Draft Plan</i> and Public Hearing will be sent to various groups and organizations including the Town Council and other Town Boards and Commissions, neighboring jurisdictions, and numerous other local, regional, and State stakeholders. - The majority of the meeting focused on the Committee's continued development of the Mitigation Strategy, including: reviewing/modifying the draft Mission Statement, Goals, Policies, and Actions; and discussing the prioritization of Actions using the STAPLEE evaluation process. - Public Comment: No public comments were made.	Mar 12, 2024 (9-10:30am)

Event	Overview	Date
Advisory Committee Meeting #6	- The Committee voted to approve the meeting notes from the previous meeting (March 12, 2024). - The Committee reviewed the status of items from previous meetings: upcoming public outreach activities were reviewed with no additions; and no additions were made to the draft Mission Statement, Goals, Policies, and Actions. - The majority of the meeting focused on reviewing and modifying, as deemed appropriate, the draft STAPLEE Evaluation. The STAPLEE evaluation has been provided as Appendix 6-2. - The TA reviewed the remaining plan development steps, including dissemination of the Public Review Draft, Public Hearing, modifying the document based on input and feedback from the community and stakeholders, and submitting the Final Draft to RIEMA who will then submit to FEMA for review/ approval. - The Committee entertained two motions –both were unanimously approved: Motion 1: The HM&FMP Advisory Committee directs the Town’s Project Consultant, Kim Jacobs, to finalize the Public Review DRAFT under the guidance and approval of the HM&FMP Advisory Committee Chair; and in conjunction with the HM&FMP Advisory Committee Chair, disseminate the Public Review DRAFT. Motion 2: The HM&FMP Advisory Committee directs the Town’s Project Consultant, Kim Jacobs, to assist the HM&FMP Advisory Committee Chair in coordinating a Public Hearing hosted by the Town Council at the end of the public review period; and at the Public Hearing, direct a Project presentation and public comment/Q&A session. - Public Comment: No one from the public attended.	April 2, 2024 (9-10:30am)
Outreach Activity #7	Stakeholder Hosted Public Information Session A public informational session, hosted by the Sakonnet Preservation Association, was held at the end of the planning process to obtain input and feedback on the <i>HM&FMP</i>. The Informational Session was publicized on the Town’s website in the News & Announcements section, calendar of events, and HM&FMP Project Webpage, as well as being sent to 1,115 subscribers through the Preservation Associations MailChimp service. At this meeting, the <i>Plan</i> and its findings and recommendations were explained and people were provided the opportunity to ask questions and provide comments for review, consideration, and potential modification of the <i>Plan</i>. General questions were asked about the <i>Plan</i>, but no comments or input were provided that was outside of the <i>Plan</i>’s existing narrative (i.e. no follow-up discussions regarding potential inclusion of input/comments was required).	April 10, 2024 (6:30pm)
Outreach Activity #8	Agenda Topic for Local Boards: The following Boards and Commissions included information about the <i>HM&FMP</i> Project and the upcoming Public Review Period/Public Hearing on their meeting agendas: Harbor Commission (April 11) and Conservation Commission (April 24).	HC - April 11, 2024; CC - April 24, 2024
Outreach Activity #9	Disseminate Public Review Draft (Public Review Period): The preliminary <i>HM&FMP-Administrative Draft</i> was developed and modified throughout the planning process with Advisory Committee, community, and stakeholder input and feedback incorporated into the document. At the Advisory Committee’s April 2, 2024 meeting, members were satisfied with all key elements of the <i>Plan</i> and authorized the Town’s Consultant to finalize the document (under the guidance and approval of the Committee Chair), and disseminate a <i>Public Review (PR) Draft</i>. The <i>PR Draft</i> was posted on the Town’s Project webpage on April 19, 2024, initiating a three-week public review period which allowed the community and stakeholders ample time to read, evaluate, and provide input and feedback on the <i>PR Draft</i> prior to or at the Public Hearing. The Public Review Period and Public Hearing were widely advertised, including a press release in <i>The Sakonnet Times</i>; information on the Town’s website and at the library kiosk; a notice posted at the	April 19 – May 9, 2024

Event	Overview	Date
Outreach Activity #9 <i>continued</i>	Town Hall and Public Safety Complex; an announcement at the Stakeholder Hosted Public Informational Session (April 10, 2024); information on the Harbor Commission and Conservation Commission April meeting agendas; and an email to the businesses, agencies, and organizations listed in Appendix 2-3. During the Public Review Period the Town did not receive any written comments from members of the community or other stakeholders.	
Outreach Activity #10	Kiosk at the Public Library: A kiosk was set up at the Brownell Library to publicize that the <i>PR Draft</i> was available to the public-at-large and encourage the community to provide input and feedback either prior to or at the Public Hearing.	April 22 – May 9, 2024
Outreach Activity #11	Public Hearing Notice and Public Hearing: The Public Review Period and Public Hearing were well advertised through a press release and two Public Hearing Legal Notices in the local newspaper; a notice posted on the Secretary of State website, Town website, and Project webpage; a hard copy of the notice posted in the Town Hall and Public Safety Complex; an item on the April Harbor Commission and Conservation Commission meeting agendas; and information posted at a kiosk at the public library. Additionally, the Town sent an email publicizing the <i>Draft Plan</i> and Public Hearing to the groups and organizations listed in Appendix 2-3, which includes the Little Compton Town Council, Town Boards and Commissions, local businesses, neighboring municipalities, and numerous other local, regional, and State stakeholders. At the end of the three-week Public Review Period, a Public Hearing was hosted by the Little Compton Town Council at their regularly scheduled May 9, 2024 meeting. At the beginning of the Public Hearing, the Town's Consultant directed a PowerPoint presentation providing an overview of the planning process, community engagement, the hazards included, what is at risk, the Town's capabilities, the <i>Action Plan</i>, and <i>Plan</i> implementation. The presentation was followed by a public Q&A/comment session providing the public the opportunity to give input and feedback. No questions or comments were offered by the Town Council or members of the public. It should be noted that the Advisory Committee made a concerted effort to include the public throughout the planning process and provided an opportunity for the community and other stakeholders to voice their concerns and potential mitigation measures through the Public Opinion Survey. As shown in Appendix 2-2 a great deal of public input was received as part of the Public Opinion Survey. All input received was reviewed and considered when finalizing the Plan. As shown in Appendix 6-1 most of the actionable measures identified by community members or stakeholders in the Public Opinion Survey were integrated into the Action Plan (Subsection 6.4). Town Council Adoption of HM&FMP: At the end of the Public Hearing, the Town Council voted unanimously to adopt the <i>HM&FMP</i>, with the acknowledgment that during the subsequent review/approval process by RIEMA/FEMA, any required revisions would be accepted by said adoption.	Public Hearing Notice: April 18 and May 2 edition May 9, 2024 (7:00pm)
RIEMA Review & FEMA Approval	Final Draft Plan Submitted to RIEMA/FEMA: Under the guidance of the <i>HM&FMP</i> Chair, the Town's Consultant finalized the <i>Plan</i> and submitted it to RIEMA for review. It was then forwarded by RIEMA to FEMA for review/approval. The Town received FEMA approval on August 7, 2024.	August 7, 2024

2.3 PLAN INTEGRATION AND COORDINATION

Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. Coordination with other community planning efforts and organizations is therefore paramount to the success of the *Plan*.

CRS CREDIT:		
Mitigation Planning Element	CRS Planning Step	Max Pts
Phase I - Planning Process	3. Coordinate	35

CRS Coordinator's Manual – Activity 510: Floodplain Management Planning

2.3.1 Plan Integration

For the purpose of developing a comprehensive and community-centric *HM&FMP*, numerous local plans, policies, codes, and programs that guide development in Little Compton were consulted in order to complement and build on past planning initiatives. As demonstrated in **Appendix 5-1**, a detailed review of Little Compton's existing studies, reports, and technical documents was undertaken to ensure that the community's needs, goals, and actions prioritized in those documents were recognized and incorporated, wherein appropriate, into the *HM&FMP*. This is specifically evidenced in **Appendix 6-1**, where actions and initiatives from many of these planning initiatives were compiled and subsequently reviewed by the *HM&FMP* Advisory Committee for possible inclusion in the *2024-2029 Action Plan*.

The planning documents and measures included in **Appendix 5-1 and 5-2**, supplemented by the knowledge and experiences of the *HM&FMP* Advisory Committee members, community, and other engaged stakeholders have successfully created a community-based hazard mitigation strategy.

A **References & Works Cited** section has been provided to recognize and pay tribute to the broad array of resources that were used in the development of this *Plan*. In addition to Little Compton's key planning documents, special recognition is made to the numerous FEMA, NOAA, RIEMA, and RI Statewide Planning resources relied upon for the development of this *Plan*. The *2024 HM&FMP* adheres to the guidelines outlined in the Disaster Mitigation Act of 2000; and FEMA's *Local Mitigation Planning Policy Guide (April 2023)*, *Local Mitigation Planning Handbook (May 2023)*, and *CRS Coordinators Manual (2017 and 2021 Addendum)*.

A brief overview of several of the key planning programs and documents integrated into the *HM&FMP* follows.

2.3.1.1 Community Rating System (CRS)

2.3.1.2 2018 Local Hazard Mitigation Plan (HMP)

2.2.1.3 2018 Comprehensive Plan (CP)

2.3.1.4 2020 MRP CRB Workshop Summary of Findings (SOF)

2.3.1.1 Community Rating System (CRS)

The Community Rating System (CRS) is a voluntary incentive program designed to encourage communities to engage in various community focused activities that promote a comprehensive approach to floodplain management beyond the minimum National Flood Insurance Program (NFIP) requirements. The CRS program emphasizes three goals: the reduction of flood losses, facilitating accurate insurance rating and promoting the awareness of flood insurance (RIEMA. *Flood*).

As the Town of Little Compton is interested participating in the CRS program, the Advisory Committee followed the 10-Step planning process used for FEMA's Community Rating System and Flood Mitigation Assistance programs. This process allows the Town to maximize CRS credit for this *Plan* while meeting the *Disaster Mitigation Act (DMA) 2000* Hazard Mitigation Plan requirements. A CRS activity credit checklist has been included in **Appendix 2-1**. It lists the 10 planning steps associated with CRS Activity 510 (Floodplain Management Planning) and references the section within this document that describes the completion of the step and the corresponding anticipated credit.

CRS uses a Class Rating System to determine flood insurance premium reductions for residents. CRS Classes are rated from 10 (lowest rating) to 1 (highest rating). **Table 2-5** shows the CRS credit points required for each Class and the corresponding premium reductions provided to those purchasing flood insurance through the National Flood Insurance Program (NFIP). As a community engages in additional mitigation activities, its residents become eligible for increased premium discounts (FEMA. *Community Rating*).

Table 2-5 CRS Credit Points, Classes and Premium Discounts (FEMA. *Community Rating*)

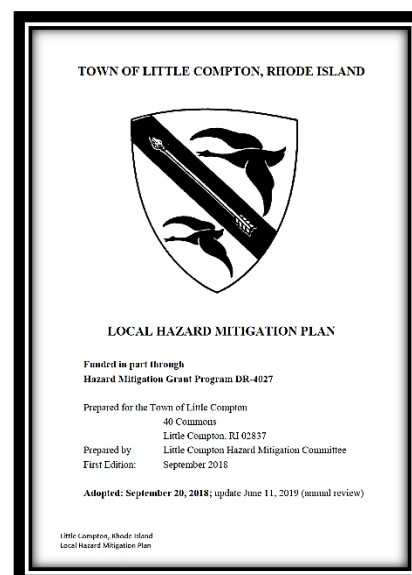
Note:
Premium
reductions
are subject
to change.

Credit Points	Class	Premium Reduction SFHA	Premium Reduction Non-SFHA
0 – 499	10	0	0
500 – 999	9	5%	5%
1,000 – 1,499	8	10%	5%
1,500 – 1,999	7	15%	5%
2,000 – 2,499	6	20%	10%
2,500 – 2,999	5	25%	10%
3,000 – 3,499	4	30%	10%
3,500 – 3,999	3	35%	10%
4,000 – 4,499	2	40%	10%
4,500+	1	45%	10%

2.3.1.2 2018 Local Hazard Mitigation Plan (HMP)

Little Compton adopted its Local Hazard Mitigation Plan in September 2018 to help organize future allocations of the Town's finite resources, determine what actions are feasible and appropriate to address local vulnerabilities, and to enhance community resilience.

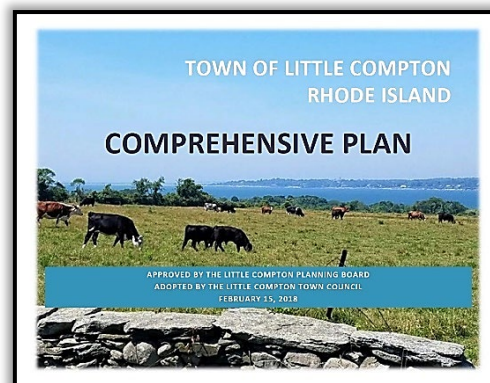
This *Plan* serves as the 5-year update to the Town's 2018 Local Hazard Mitigation Plan (HMP). Because flooding is a prevalent natural hazard facing the community and the Town is interested in participating in the CRS program, it was determined beneficial to expand the scope of the HMP update to include additional focus on floodplain management. As such, the document has been renamed the *Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan (HM&FMP)*. The *HM&FMP* has been guided by the planning process outlined in CRS Activity 510 and meets the Disaster Mitigation Act (DMA) 2000 Hazard Mitigation Plan requirements.



In developing this *Plan*, portions of the 2018 LHMP were restructured, eliminated, or revised. New sections were added in order to reflect the most current understanding of natural hazards that pose significant threats to Little Compton and how the Town has and can effectively continue to mitigate these threats. New actions or modifications to the 2018 actions were primarily the result of an extensive plan integration process (incorporating actions from the CP, SOF, and other plans) combined with HM&FMP Advisory Committee, community, and stakeholder input.

2.3.1.3 2018 Comprehensive Plan (CP)

A Comprehensive Plan (CP) is a tool to give guidance to future administrations on strategies to address increase development pressures, economic stability, open space and recreation issues, and public infrastructure. Little Compton's Planning Board led the effort to develop the 2018 Comprehensive Plan.



The planning efforts associated with the *2018 Local HMP* were coordinated with development of Little Compton's 2018 Comprehensive Plan to ensure that hazard mitigation strategies and principles, vulnerability information, and mitigation actions were integrated into the Comprehensive Plan update. In particular, this information was integrated into the CP's *Natural Hazards & Climate Change* element which describes critical issues, planning opportunities, and sets of goals, policies, and actions related to natural hazards, including the threat of sea level rise.

Similarly, to ensure alignment, the *Natural Hazard & Climate Change* element and other applicable elements in the CP were reviewed and integrated into this *HM&FMP*.

2.2.1.4 2020 MRP CRB Workshop Summary of Findings (SOF)

In July 2018 Governor Raimondo introduced the Resilient Rhody: Municipal Resilience Program (MRP), which outlined a comprehensive Climate Resilience Action Strategy for the State. Through the MRP program, the State is providing support to communities to engage in a municipal-driven process referred to as Community Resilience Building (CRB), which was developed by The Nature Conservancy (TNC). The Nature Conservancy has honed their highly successful CRB program for over a decade in an effort to respond to the need for communities and other organizations and enterprises to build resilience and adapt to the extreme weather and hazards resulting from climate change (TNC, 2).



In August 2020 the Town held a Community Resilience Building Workshop led by the Rhode Island Infrastructure Bank (RIIB) in partnership with The Nature Conservancy (TNC). The Workshop brought together roughly 35 community stakeholders and engaged professionals, in an effort to identify and prioritize steps to reduce natural hazard risks and improve resilience within the Town and region.

The Workshop Objectives included:

- "Define top local natural and climate-related hazards of concern;
- Identify existing and future strengths and vulnerabilities;
- Identify and prioritized actions for the Town of Little Compton;
- Identify opportunities to collaboratively advance actions to increase resilience" (TNC and RIIB, 2).

The 2018 HMP was used as a **KEY planning document** for the 2020 CRB Workshop. It was important to the Town that the hazard mitigation strategies and principles, vulnerability information, and mitigation actions were integrated into the discussions (and therefore the *Summary of Findings Report*) at the Workshop. Similarly, to ensure alignment, the *CRB Workshop Summary of Findings Report* was reviewed and integrated into this HM&FMP.

The Town of Little Compton appreciated the opportunity afforded to them by the Rhode Island Infrastructure Bank and The Nature Conservancy to engage in a CRB Workshop. The Workshop successfully helped to advance comprehensive community resilience planning and hazard mitigation efforts. An overview of the discussion and outcome from the Workshop was documented in the *Summary of Findings Report*; an important resource for the Town which has been integrated into the development of this *Plan*. A link to the report is available on the Town's website and activities from this report that were reviewed for possible inclusion in the *2024 Action Plan* are listed in **Appendix 6-1**.

2.3.2 Coordination with Businesses, Agencies, and Organizations

The HM&FMP Advisory Committee recognized that the planning process would be greatly enhanced by inviting local, regional, state, and federal agencies and organizations, as well as local community leaders, businesses, and community lifelines to participate in the process. Coordination with these key groups was initiated at the beginning of the planning process through an email (or through the mail if an email was not available) informing them of the development of the *Plan* and welcoming them to participate in meetings, the public opinion survey, and other outreach activities, and to provide information or opinions to inform the *Plan's* content. A link to the Project webpage was provided in order for stakeholders to remain informed throughout the development process.

It was important to the Town that all of the identified stakeholder groups, including those from which information was used in the development of the *Plan*, were provided an opportunity for **pre-adoption review of the Draft HM&FMP**. At the end of the development process, just prior to the public review period commencing, a link to the *Public Review Draft* and notification of the Public Hearing was sent to these groups by the Town's Project Consultant, encouraging them to review the *Draft Plan* and provide input and feedback.

As shown in **Appendix 2-3**, the Town coordinated with **19 local government boards & commissions**, including the Town Council, local departments and boards/commissions involved in hazard mitigation activities as well as those having authority to regulate development. The Town recognizes that collaboration among various sectors will ensure that mitigation capabilities continue to grow and build support for the implementation of a wide-range of mitigation activities. The Town also coordinated with **74 businesses, community lifelines, agencies, and organizations outside of Little Compton's governmental structure**. This group included state legislators, and representatives from conservation organizations, **neighboring municipalities**, various state offices, and other organizations with expertise related to hazard mitigation planning. In addition, it was keenly important to the Town to **engage the local business community** in the planning process. As Little Compton has a small commercial presence, **all local businesses with storefronts were included on the coordination list**. Further, the Town recognized the importance of including **community lifelines** in the plan development process. Lifelines are essential to enable the continuous operation of local government, businesses, and the community in general. A number of the local business provide fundamental services, such as BayCoast Bank, Bodington Plumbing & Heating, Madden Electric, Sakonnet Energy & Goulart Petroleum, and Wilbur's General Store. In addition, a number of other critical community lifelines were also included in the planning process: Rhode Island Energy, City of Newport Water Department, Little Compton Community Center, Little Compton Food Bank, and Stay at Home Inc. The last three lifelines provide services to socially vulnerable populations, including seniors and lower income residents.

The Coordination List was also cross referenced with those who were involved in the development of the 2018 Local Hazard Mitigation Plan, 2018 Comprehensive Plan, 2020 MRP Community Resilience Building Workshop, and on the Critical Facilities List, to ensure a broad spectrum of engagement in the planning process.

SECTION 3

Community Profile

Subsections

**3.1 WELCOME TO LITTLE
COMPTON**

3.2 GOVERNMENT

3.2.1 Municipal
Government

3.2.2 School Department

3.2.3 Budget

3.3 GEOGRAPHY

**3.3 POPULATION AND
DEMOGRAPHICS**

3 Community Profile

A brief community profile has been included in this Section which is augmented by community asset information in **Section 4** and the community capability assessment in **Section 5**. The planning area addressed in this Plan includes all lands within the geographical boundaries of the Town of Little Compton, Rhode Island.

3.1 WELCOME TO LITTLE COMPTON

Little Compton, located in Newport County, Rhode Island, is a quiet, picturesque, rural New England seaside town. It was incorporated in 1682 by Plymouth Colony in the Commonwealth of Massachusetts and named Little Compton (Wikipedia. *Little*). In 1746, after a long boundary dispute between the colonies of Rhode Island and Massachusetts, Little Compton, along with Tiverton, Bristol, Barrington, and Cumberland were annexed to Rhode Island by Royal Decree (Wikipedia. *Tiverton*). As documented in Little Compton Historic Society's research, *A History of the Sakonnet People*, prior to European settlement, Little Compton was the traditional homeland of Native Americans. The Sakonnet People (variations include Sagkonate, Seconit, and Seaconnet) lived in what is now referred to as western Little Compton and the Coxits lived in the Adamsville area (O'Toole, slide 5).

Little Compton is fortunate to have a few 17th-century structures still standing, and many others which date from the 18th and 19th century (Town of Little Compton RI. Website, History). There are quite a few properties and areas within the Town that have the qualities necessary for inclusion on the National Register of Historic Places. Currently the Town boasts six historic sites and one historic district on the National Register (Town of Little Compton RI. *Comprehensive*, 39). The six historic sites are the Stone House Inn, Sakonnet Light Station, Rhode Island Red Monument, Wilbor House, William Whalley Homestead, and Friends Meetinghouse and Cemetery. There are also numerous other historical cemeteries throughout the Town, many of them on private property (Town of Little Compton RI. *Local*, 4,51). The entire Town commons is a National Register historic district, and is the only town common in Rhode Island. "Land for the common was designated in August of 1677 and has been used ever since as both a religious and civic center for social activities in the town" (Wikipedia. *Little*).



There are three villages located in Little Compton, Adamsville, Pottersville, and Sakonnet. Adamsville is situated in the northeast corner of Little Compton and is home to Gray's General Store (built in 1788), the Rhode Island Red Monument (built in 1925), and the Spite Tower (constructed circa 1905) (Wikipedia. *Adamsville*). Pottersville is a sparsely settled hamlet located south of Adamsville, and the Sakonnet neighborhood consists of the area located within and surrounding Sakonnet Point in the southwest corner of Town. Sakonnet Point features several beaches, the Stone House Inn (built in 1854), Sakonnet Golf Club, Sakonnet Yacht Club, and the Sakonnet Point Club (Wikipedia. *Little*).

In part due to its remote location, but perhaps more by choice, the Town has remained a low-density residential and farming community which actively promotes land conservation. Unlike many similar seaside communities, Little Compton's population has not experienced significant growth. Over the past two hundred thirty years, the population has slightly more than doubled, going from a population of 1,542 in 1790 to 3,616 people in 2020 (Wikipedia. *Little*). The Town only has few storefront commercial businesses, but does support a large number of self-proprietor businesses operated out of residential homes. (Town of Little Compton RI. *Local*, 4).



Figure 3-2 Agricultural Land in Little Compton

Photo Credits: Wishing Stone Farm (barn on hill); White Rock Farm (cattle); Carolyn's Sakonnet Vineyard (landscape by Ellen Hassett | TCLF); Wilbour-Nelson Farm (landscape/tractor by Bart Brownell | EastBayRI); Bee Baa Farm (sheep)

"Little Compton has a rich history in the fishing and farming trades which continues to this day" (Town of Little Compton RI. *Local*, 4). This has been shaped by the Town's natural features, which include extensive southern shoreline along the Rhode Island Sound and western shoreline along the Sakonnet River and harbor, coastal ponds and inland waterways, as well as expansive woodland and agrarian land.



Figure 3-3 Wind Driven Waves

Photo Credit: Ron Pownall, Getty Images

While the Town's inland and coastal water features are integral to the character of Little Compton, and embraced by residents and visitors, the adjacent low-lying lands are vulnerable to flooding, coastal erosion, sea level rise, and wind damage. While risks from these hazards are not new, the intensity and frequency of occurrence due to climate change, exacerbates resiliency concerns. To ensure public health and safety and environmental resiliency, on an ongoing basis the Town needs to balance development, especially in areas with higher risks to natural hazards, with the active protection of the Town's natural resources. In addition, to the extent possible, the Town needs to implement natural hazard mitigation strategies, such as those identified in **Section 6**.

3.2 GOVERNMENT

The State of Rhode Island has 39 municipalities which are grouped into 5 counties. The Town of Little Compton is part of Newport County along with Jamestown, Middletown, Newport, Portsmouth, and Tiverton. While neighboring communities work cooperatively with one another, Rhode Island counties do not have governmental structure. Instead, local governance is provided by each of the eight cities and thirty-one towns.

3.2.1 Municipal Government

The Town of Little Compton operates under a Home Rule Charter, adopted November 8, 1994 and ratified by the Rhode Island General Assembly in May 1995 (RIDMF. *Town*, 24). The Charter provides the overall structure of the government, including the form of government (Town Council-Town Meeting), legislative body (Town Council), which officials are elected and which are appointed by the legislative body, procedures for adopting a Town Budget, and various other provisions (RIDMF. *Municipal*, 41). Once a local government is established, it is in the position to create municipal code for the community's governance. Municipal code refers to the collection of local laws (also known as ordinances, bylaws, measures, regulations, etc.) that are passed by a local governing body. As long as a community's laws do not conflict with the laws of the State, they carry the full force and effect of law (Library of Congress. Intro).

Little Compton's Charter provides for the election of a five-member Town Council, Town Clerk, Town Moderator, and five-member School Committee, all elected at large for two year terms. As indicated, the Town Council is the legislative body. Upon installation after a general election, at the first meeting the Council will elect a President and Vice President. Generally, the Town Council meets the first Thursday after the first Monday of each month, and two weeks later on Thursday, at 7pm. The Town Council is responsible for the overall management of the Town, including enacting local legislation; making decisions related to the Town's property, affairs, and government; adopting new ordinances; preparing the annual municipal budget (*the School Committee prepares the School Budget*); and the appointment of a number of administrative positions, including: Building/Zoning Official, Director of Public Works, Director of Social Services, Finance Director/Treasurer/Tax Collector, Fire Chief, Harbor Master, Local Emergency Management Director, Police Chief, Probate Judge, Solicitor, Tax Assessor, Town Administrator, and Town Sergeant; as well as appointments to Local Boards & Commissions. The Town Administrator is responsible for assisting the Town Council, at their direction, in the discharge of the Council's executive and administrative responsibilities.



Figure 3-4 Town Hall Photo Credit: Wikipedia | Beyond My Ken

"The Town has a tradition and desire to remain a community with limited municipal services. There is no public sewer, public water, or public curbside trash pickup available in the Town and there are no current plans to make those services available. Water supply and wastewater disposal are provided by individual wells and onsite wastewater treatment systems (OWTS). Residents dispose of waste and recycling at the transfer station or hire private vendors to provide curbside pick-up" (Town of Little Compton RI. *Comprehensive*, 86). That being said, the Town remains committed to providing "quality facilities and responsive government services in order to maintain a high quality of life for its residents" (Town of Little Compton RI. *Comprehensive*, 86).

Town employees, across all departments, work hard to meet the needs of the community and to maintain a quality of life that residents have come to expect. As municipal staffing is limited, the Town relies on active volunteer boards to assist in meeting the community's current and future needs. The volunteer participation on the Town's numerous boards and commissions speaks to the community's pride in its heritage and aspiration for the future. A list of Town Boards and Commissions is provided below. Notification of board meetings are posted on the Town website's Calendar of Events. An overview of the key Town departments and boards/commissions engaged in hazard mitigation is provided in **Appendix 5-2**.

Town Boards and Commissions

- | | | |
|----------------------------------|---|--------------------------|
| ◇ Agricultural Conservancy Trust | ◇ Conservation Commission | ◇ LC Housing Trust |
| ◇ Beach Commission | ◇ Harbor Commission | ◇ Planning Board |
| ◇ Board of Canvassers | ◇ Hazard Mitigation & Flood Management Advisory Committee | ◇ Recreation Committee |
| ◇ Budget Committee | ◇ LC Free Public Library | ◇ Zoning Board of Review |

3.2.2 School Department

The stated mission of Little Compton School Department (LCSD) is "to develop a comprehensive educational community with high academic standards that challenge all students to love learning and to become skilled communicators and critical thinkers who are respectful, motivated, responsible, and self-confident contributors to their community and their world" (LCSD).



Figure 3-5
Wilbur & McMahon
School (Photo
Credit: LCSD)

There is only one public school in Town, the Wilbur & McMahon School, located at 28 Commons, which serves PreK through eighth grade students. The current configuration of the school, renovated in 2013-2014, joins the historic Wilbur school (originally constructed in 1929) with the McMahon School (originally constructed in 1973). Attendance is free for Little Compton residents and there are some tuition slots available for students from other communities in southcoast RI and MA . According to the School Department, as of February 2024 the enrollment was 214 students, of which 196 (92±%) are Little Compton residents.

The Little Compton School Committee is composed of five members of the community who are elected at large for staggered four-year terms at the regular biennial elections. Committee meetings are open to the public and generally take place on the second Wednesday of the month at 7pm. The School Committee directs the general administration of the School Department. They determine and control all policies, appoint a Superintendent as the District's chief administrative agent, and review and approve the annual school budget. In addition, as there is not a public high school in Town, the School Committee facilitates the contractual agreement with the Town of Portsmouth which allows Little Compton residents in grades 9-12 to attend Portsmouth High School on a tuition basis.

3.2.3 Budget

The annual Town budget runs from July 1 to June 30, and serves as the foundation for financial planning and control. Entities under the jurisdiction of the Town Council, including Town officials, departments, boards, and committees, need to submit budget requests for the ensuing fiscal year to the Town Administrator prior to January 31st. This information is then organized by the Town Clerk and submitted to the Budget Committee by March 1. Based on the submitted requests, the Budget Committee with assistance from the Town Administrator will assemble a preliminary recommended budget, with input from the sponsor of each appropriation request and the Town Council. The Budget Committee, with the Town Council in attendance, will hold a Public Hearing on its preliminary recommended budget. After changes (if any) to the preliminary budget based on Public Hearing input, the Budget Committee will finalize their Budget Report. In order for the community to be better informed at the Financial Town Meeting, the Budget Report is then mailed to each voter in the Town. All registered voters in Town may vote on the proposed annual budget at the Financial Town Meeting which generally takes place in May (Town of Little Compton RI. *The Code*, Article 5-Section 502-504).

Maintaining a resilient local economy is important to enable providing high quality municipal services, including protecting against natural hazard risks. According to the Town's Certified Budget, for the fiscal year FY2022-23, the total operating budget was \$16,226,971, of which \$8,089,495 is attributed to the municipal side, and \$8,137,476 to the School District (Town of Little Compton RI. *2022 Report*, 15). As part of the budget process, each year the Town adopts a 5-year Capital Improvement Program identifying projects that should be undertaken during the upcoming 5 years. This long-range planning process is essential in addressing the future development and growth of the Town. The Town has continually funded its capital requirements aggressively and, to limit borrowing requests, maintains a pay as you go funding for most of its capital needs. Occasionally, such as in FY2023, the Town had a Bond issue for renovating the Town Hall, new DPW building, and new school parking lot.

3.3 GEOGRAPHY

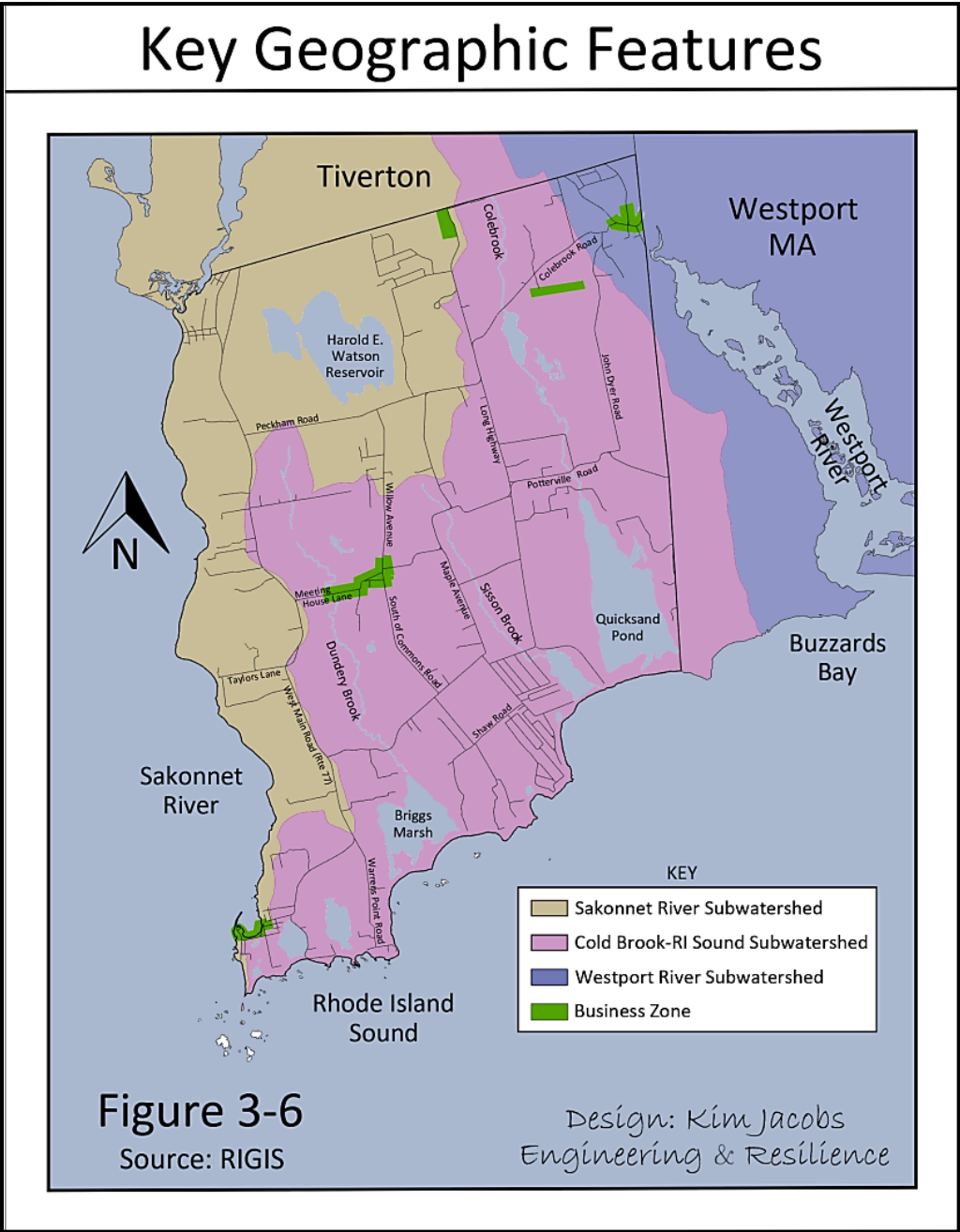
Little Compton is a coastal community located in the southeast corner of Rhode Island. It is approximately 35 miles from downtown Providence, RI and 70 miles from downtown Boston, MA to the Commons area of Little Compton. The Town is bordered by the Sakonnet River to the west and the Rhode Island Sound (Atlantic Ocean) to the south. Adjacent communities include the Town of Tiverton, RI to the north, and the Town of Westport, MA to the east.

The Town covers approximately 28.9 square miles (18,496 acres), with water accounting for approximately 27.8 percent, which is roughly 8.0 square miles (5,120 acres) (Wikipedia. *Little*). No location in Little Compton is more than 2.5± miles from coastal waters. Along with its extensive meandering coastline, other defining features of Little Compton's landscape are single family residences on large lots interspersed with forested areas, wetlands, bountiful stone walls, and sprawling farms. In recent years, Little Compton, along with Tiverton, RI, Westport, MA, and Dartmouth MA have been unofficially designated as the Farm Coast. These four communities are the only remaining predominate coastal farming communities in Southern New England (Wikipedia. *South*). "Large areas of agricultural lands are located throughout the Town, primarily west of Long Highway. Active farms range in size and complexity, including small family farms to a large commercial vineyard" (Town of Little Compton RI. *Local*, 3).

Little Compton is home to three HUC-12 subwatersheds: Sakonnet River, Cold Brook-Rhode Island Sound (*locally Cold Brook is known as Colebrook*), and Westport River. Only a small section of the Town in the northeast is within the Westport River subwatershed. This watershed includes the Village of Adamsville which is one of the Town's five business districts, and includes a small café and marketplace, a liquor store, and U.S. Post Office. One of the larger streams in this area is the West Branch of the Westport River which feeds into Gray's Mill Pond. Most of Gray's Mill Pond is in Little Compton, but the outlet of the pond with the Adamsville Dam spillway is in Westport, MA.

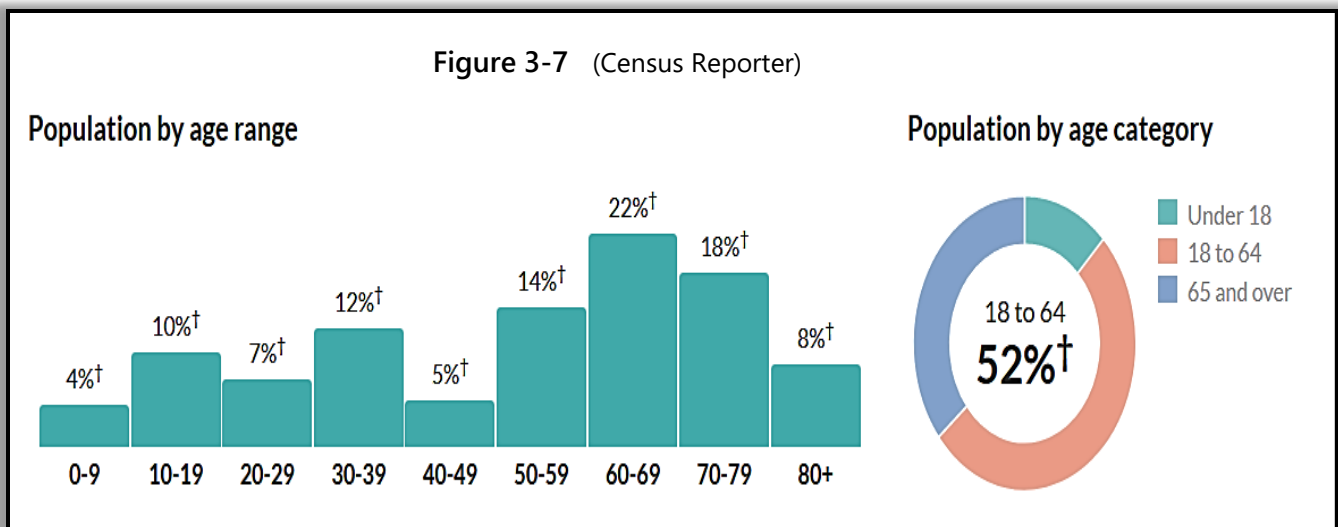
The Cold Brook-Rhode Island Sound subwatershed encompasses the largest portion of Little Compton. There are numerous streams throughout this subwatershed, most notably Colebrook, Sission Brook, and Dundery Brook. Freshwater ponds are dotted throughout the landscape, with Simmons Pond being the largest. This area also contains all of the Town's coastal ponds. This subwatershed drains into the Rhode Island Sound along the Town's scenic southern shoreline which is comprised of sandy and rocky barrier beaches. The Villages of Pottersville and Sakonnet are within this subwatershed, as are the business districts for the Transfer Station on Amy Hart Path, a portion of the business district along the Sakonnet Harbor, and the Commons area business district. Within the Common's business district are a number of small private businesses, churches, a bank, and the U.S. Post Office. The Commons, considered the heart of the community, is also the center of Town government, with the Town Hall, Public Safety Complex, and Wilbur & McMahon School in the vicinity.

The Sakonnet River subwatershed along the western portion of Town, includes the Harold E. Watson Reservoir, along with the Pachet Brook, Almy Creek, and other small streams. This subwatershed drains into the Sakonnet River which is actually a tidal strait that flows for approximately 14 miles between Mount Hope Bay and the Rhode Island Sound (USDA|NRCS, 1). It includes the business district along Long Highway adjacent to the northern border of the Town, as well as most of the business district along the Sakonnet Harbor.



3.4 POPULATION AND DEMOGRAPHICS

According to the U.S. Census Bureau, Little Compton had a population of 3492 in 2010 and 3616 in 2020, which represents a growth of 3.6% (124 people). The American Community Survey (ACS) five-year estimates (2018-2022) indicate that the population of Little Compton is nearly equal between females (50.6%) and males (49.4%), with 13.9% age 19 or younger, **48.1% age 60 or older, and 35.9% age 65 or older**. Comparatively, the population of those 65 or older in Newport County is 25.4%, and for the State of Rhode Island is 17.9%. The median age for Little Compton is 59.3± (US Census Bureau. *Little*, Population and People). "Little Compton has one of the highest percentages of residents over the age of 65 in Rhode Island which adds to the challenge of mitigating hazard risks. There are no elderly housing units in Little Compton which results in pockets of elderly dispersed throughout town that could become stranded due to natural hazards" (Town of Little Compton RI. *Local*, 2, 3). **As such, the Advisory Committee made the effort to include community lifelines that service the senior population and modified several of the outreach activities to better accommodate this population.**

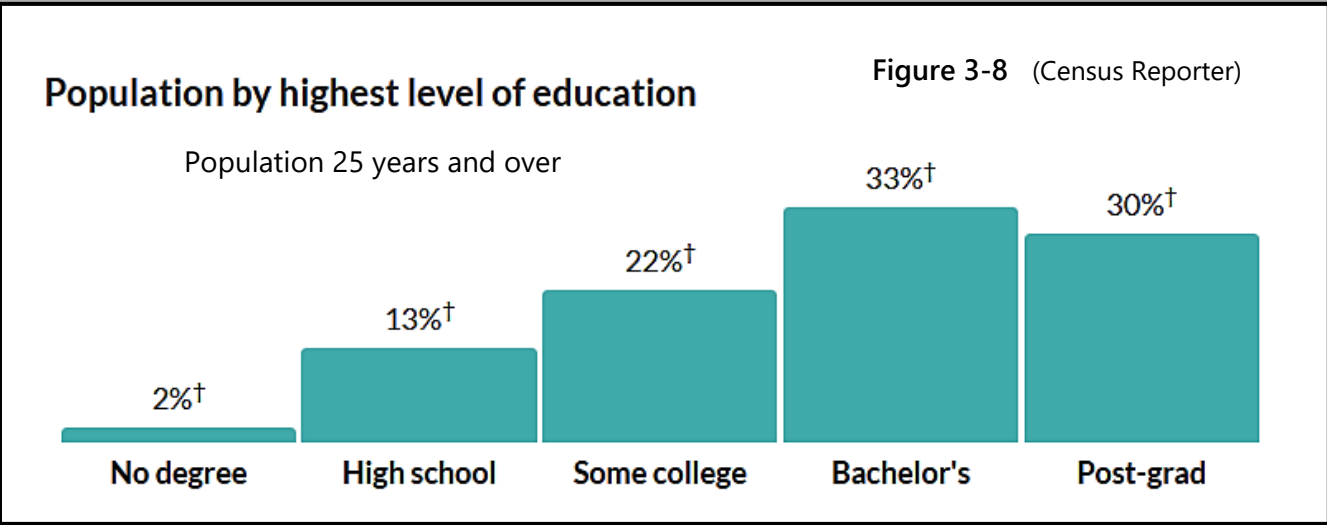


In terms of race and ethnicity, the 2020 Census for Little Compton identifies 94.61±% of the residents as White, 3.82±% two or more races, 0.72±% some other race, 0.47±% Asian, 0.22±% Black or African American, 0.11±% American Indian or Alaska Native, and 0.06±% Native Hawaiian and Other Pacific Islander. Of Little Compton's population, 1.80±% identified as Hispanic or Latino (US Census Bureau. *Little*, Race and Ethnicity).

Development in Little Compton is highly homogeneous. Based on the 2022 ACS 5-year estimates, approximately 97.5% of the 2,506 housing units in Town are single family dwellings. The remainder are a mix of 2 units (0.4±%), 3 or 4 units (0.3±%), and mobile homes (1.7±%) (US Census Bureau. *Little*, Housing). In terms of housing, the shorefront areas are somewhat more diverse than the inland areas, ranging from high density cottages near Briggs Beach and South Shore Beach, to large acreage residential estates along West Main Road.

Of the 2,506 housing units, only 60.1±% are identified as occupied (US Census Bureau. *Little*, Housing). It is important to note that most of the units characterized by the U.S. Census Bureau as vacant may be vacation homes, occupied by owners for specific time periods (such as summer) and/or for specific events (such as weekends and holidays). This community characteristic causes the Town's population to roughly double during the summer season (May through August). Of the housing units occupied (1560 units), the majority (87.5±%) are owner occupied, with the remaining 12.5±% occupied by renters. Almost half (46.4±%) of Little Compton's homes were built before 1960, with 24.7±% built before 1940 (US Census Bureau. *Little*, Housing). Some of these older homes may not have been updated to meet current building codes, which creates concern in terms of hazard risks, particularly for high wind and heavy snow events.

According to the 2022 ACS 5-year estimates, the median household income is estimated as \$136,389 for Little Compton, \$93,334 for Newport County, and \$81,370 for Rhode Island. The poverty rate is 1.9±% compared to 6.2±% for Newport County (US Census Bureau. *Little*, Income and Poverty). Based on the 2022 ACS 1-year estimates, the poverty rate for the State of Rhode Island is 10.8±% (US Census Bureau. *Rhode*, Income and Poverty). The Town of Little Compton is a highly educated community with 62.8±% of the population 25 years and over having a Bachelor's Degree or higher, and 29.6±% having a Graduate or professional degree (US Census Bureau. *Little*, Education).



Little Compton’s population has not experienced, nor is expected to experience in the relative near future, significant growth. As shown in **Table 3-1**, from 1990 to 2020 the population had fluctuations of increases and decreases, with an overall increase during those three decades of 8.3±%. During those decades Rhode Island saw an overall increase in population of 9.4±%. Rhode Island Division of Statewide Planning (RIDSP) extrapolated mathematically from historic trends to project the future population of cities and towns through 2040. Projections for Little Compton and the State are shown in the table. Comparing the projected 2040 population to the 2020 census population, it is estimated that Little Compton’s population will decrease by 3.9±%.

Table 3-1 Population Trend and Projections

Jurisdiction	Actual Based on U.S. Census (Wikipedia. <i>Little</i>)				Projected Based on RIDSP (RIDSP. <i>Technical Paper 162</i> , 16, 17)			
	1990	2000	2010	2020	2025	2030	2035	2040
Rhode Island	1,003,464	1,048,319	1,052,567	1,097,379	1,061,796	1,070,677	1,073,799	1,070,104
Little Compton	3,339	3,593	3,492	3,616	3,493	3,507	3,503	3,475

SECTION 4

Risk Assessment

Subsections

4.1 CLIMATE CHANGE - SLR

- 4.1.1 Climate Change
- 4.1.2 Sea Level Rise (SLR)

4.2 HAZARD IDENTIFICATION

- 4.2.1 Disaster Declaration History
- 4.2.2 Hazard Priority Ranking

4.3 HAZARD PROFILES

- 4.3.1 Flood-Related Hazards
 - 4.3.1.1 Inland Flooding (Riverine Flooding, Shallow Flooding, and Dam Failure)
 - 4.3.1.2 Coastal Flooding including Storm Surge
 - 4.3.1.3 Coastal Erosion
- 4.3.2 Wind-Related Hazards
 - 4.3.2.1 High Winds
 - 4.3.2.2 Thunderstorms including Lightning and Hail
 - 4.3.2.3 Tornadoes
 - 4.3.2.4 Tropical Cyclones (Tropical Depressions, Tropical Storms, and Hurricanes)
- 4.3.3 Winter-Related Hazards
- 4.3.4 Infectious Disease-Related Hazards
 - 4.3.4.1 Vector-borne Diseases Transmitted by Ticks or Mosquitoes

- 4.3.4.2 Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses

4.3.5 Other Hazards

- 4.3.5.1 Earthquake
- 4.3.5.2 Extreme Heat
- 4.3.5.3 Drought
- 4.3.5.4 Brush Fire

4.4 VULNERABILITY ANALYSIS

- 4.4.1 Critical Facilities
- 4.4.2 Built Environment and Infrastructure
 - 4.4.2.1 FEMA Flood Zones
 - 4.4.2.2 Flooding, Storm Surge, and Sea Level Rise
- 4.4.3 Natural Environment
 - 4.4.3.1 Conservation Land
 - 4.4.3.2 Freshwater & Saltwater Resources and their Floodplains
- 4.4.4 Local Economy
 - 4.4.4.1 Flood-Related Hazards
- 4.4.5 People
- 4.4.6 Future Development Trends
 - 4.4.6.1 Development Over the Past 5-Years
 - 4.4.6.2 Future Land Use
 - 4.4.6.3 Future Development
 - 4.4.6.4 Town's Ability to Expand and Improve Capabilities

4 Risk Assessment

Hazard Mitigation Plan: The Town of Little Compton has successfully met the following requirement → 44 CFR Subsection D §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

CRS - Flood Management Plan: The Town of Little Compton has successfully met the following Mitigation Strategy requirements based on the 10-step planning process for CRS Activity 510 → Assess the Hazard (Step 4); and Assess the Problem (Step 5)

This *Risk Assessment* evaluates the potential impacts of hazards to the people, economy, and built and natural environments of Little Compton, creating a basis for the Mitigation Strategy. As described in FEMA's Local Hazard Mitigation Planning Handbook and illustrated in **Figure 4-1**, the degree of risk can be measured by the overlap between hazards and community assets; the larger the overlap the greater the risk.

This Risk Assessment presented in this Section is organized as follows, with the goal of identifying this overlap:

4.1 Climate Change - Sea Level Rise:

Recognizes how climate change and sea level rise may exacerbate natural hazards

4.2 Hazard Identification:

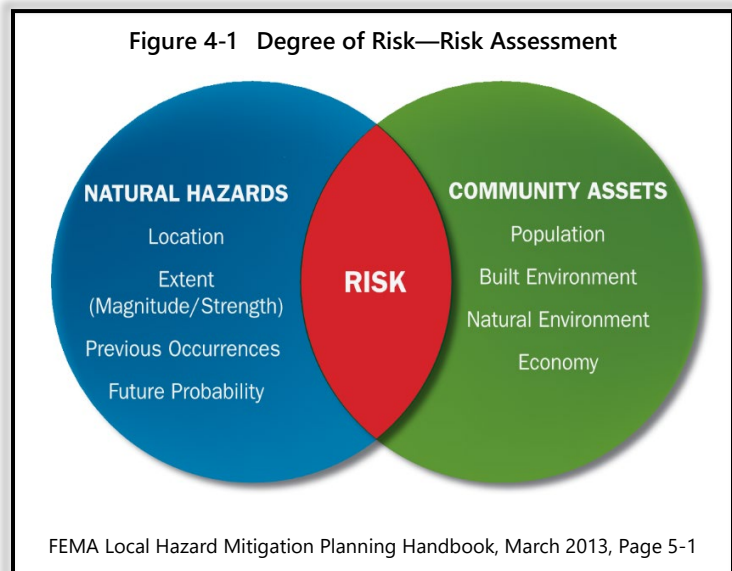
Identifies the hazards with the highest likelihood of negatively impacting Little Compton

4.3 Hazard Profiles:

Describes the potential threat of each identified hazard and provides an overview of previous occurrences and the likelihood of future occurrences

4.4 Vulnerability Analysis:

Identifies community assets and analyzes the potential impact the identified hazards might have on them



During the Risk Assessment process, natural hazards were identified, profiled, and analyzed using best practices. In support of this process, data and documentation from numerous resources including the following were reviewed: Town of Little Compton's 2018 Local Hazard Mitigation Plan, 2018 Comprehensive Plan, and 2020 CRB Workshop Summary of Findings; 2019 Rhode Island State Hazard Mitigation Plan (RI-SHMP); hazard mitigation plans from adjacent and similar communities; information from FEMA, EPA, NASA, CDC, RIEMA, RIDSP, RIDEM, RIDOH, CRMC, URI-Coastal Institute, URI-Climate Change Collaborative, and IPPC; information from the National Oceanic and Atmospheric Administration (NOAA) including the National Climatic Data Center (NCDC) and the National Weather Service (NWS); and other relevant articles, documents, and websites on natural hazards. A complete list of the plan integration and references used in developing Little Compton's *Hazard Mitigation & Flood Management Plan* (HM) is provided in **Appendix 5-1** and the **References and Works Cited**.

4.1 CLIMATE CHANGE – SEA LEVEL RISE

A key change reflected in this updated Plan is more comprehensively addressing climate change including sea level rise (SLR). For the foreseeable future, climate change will have a significant impact locally, nationally, and globally. In this *Hazard Mitigation & Flood Management Plan (HM&FMP)*, climate change is recognized as a present threat and ongoing amplifier to the identified natural hazards. As such, each hazard profile in **Subsection 4.3** addresses associated climate change impacts. That information will assist the Advisory Committee in determining an action strategy that will help to reduce or mitigate existing and future impacts.

This Section will provide a general overview of climate change including sea level rise projections.

4.1.1 Climate Change

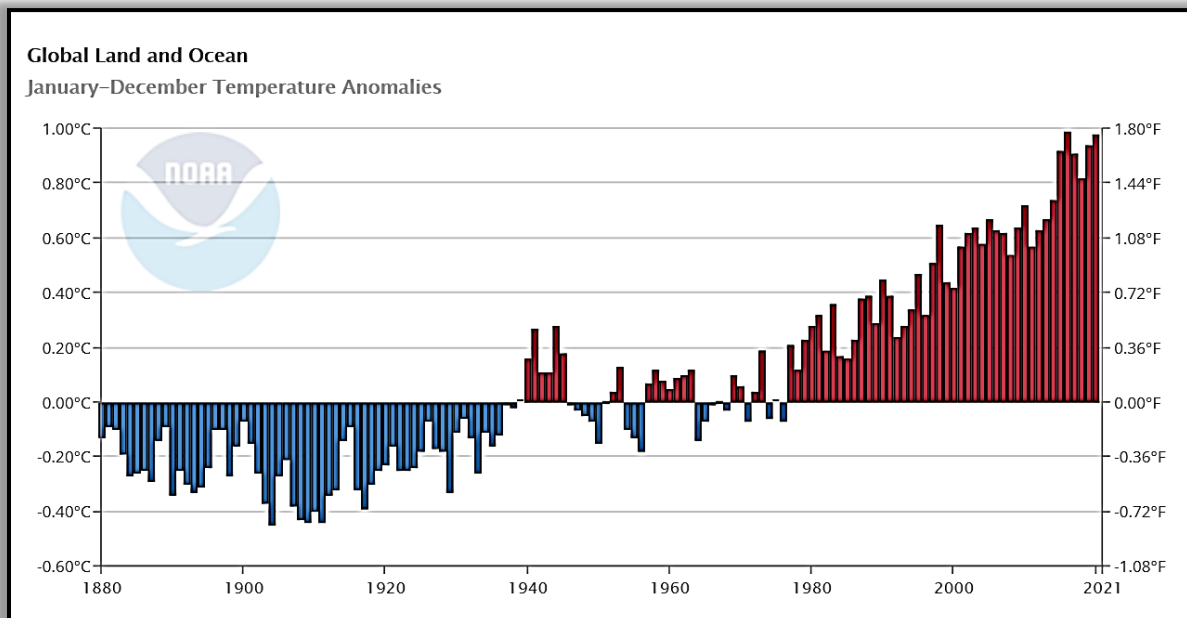
What is meant by Climate Change?

As pointed out by National Geographic, “Climate is sometimes mistaken for weather. But climate is different from weather because it is measured over a long period of time, whereas weather can change from day to day, or from year to year. The climate of an area includes seasonal temperature and rainfall averages, and wind patterns. Different places have different climates... Climate change is the long-term alteration of temperature and typical weather patterns in a place” (National Geographic. *Climate*).

Over geologic time, the earth has warmed and cooled periodically. This slow-paced change in climate may be attributed to natural internal processes or external forces such as modulations of the solar cycles, volcanic eruptions, or persistent anthropogenic changes in the composition of the atmosphere or land use (IPCC. *Annex I*).

In contrast, over the past century the rapid warming of the earth is cause for concern (**Figure 4-2**). Across every region of the Earth’s climate system, scientists are observing changes. According to the 2021 Intergovernmental Panel on Climate Change (IPCC) Report, “Many of the changes observed in the climate are unprecedented in thousands, if not hundreds of thousands of years, and some of the changes already set in motion—such as continued sea level rise—are irreversible over hundreds to thousands of years” (IPCC. *Climate Change widespread*).

Figure 4-2 Global Temperatures are Rising (NOAA/NCEI)



Data gathered by NASA and NOAA indicate that the planet's average surface temperature has risen about 2.0 degrees Fahrenheit since the late 19th century, with **most of the warming happening over the past four decades**. NASA Goddard Institute for Space Studies Director, Gavin Schmidt, stated that, "Despite colder than average temperatures in any one part of the world, temperatures over the planet as a whole continue the rapid warming trend we've seen over the last 40 years" (NASA|NOAA. *Long-term warming*).

The rapid warming of the earth has been largely driven by the accumulation of human-caused pollutants in the atmosphere. These pollutants, known as greenhouse gases, include carbon dioxide, methane, nitrous oxide, water vapor, and synthetic fluorinated gases. Normally the sunlight and solar radiation that bounces off the earth's surface would escape into space, but the accumulation of these pollutants, which can last for years to centuries in the atmosphere, trap the heat inside the earth's atmosphere and cause the planet to get hotter. The impact of these heat-trapping pollutants in the atmosphere, creating global warming and influencing rapid climate change, is called the greenhouse effect (NRDC. *Global Warming*).

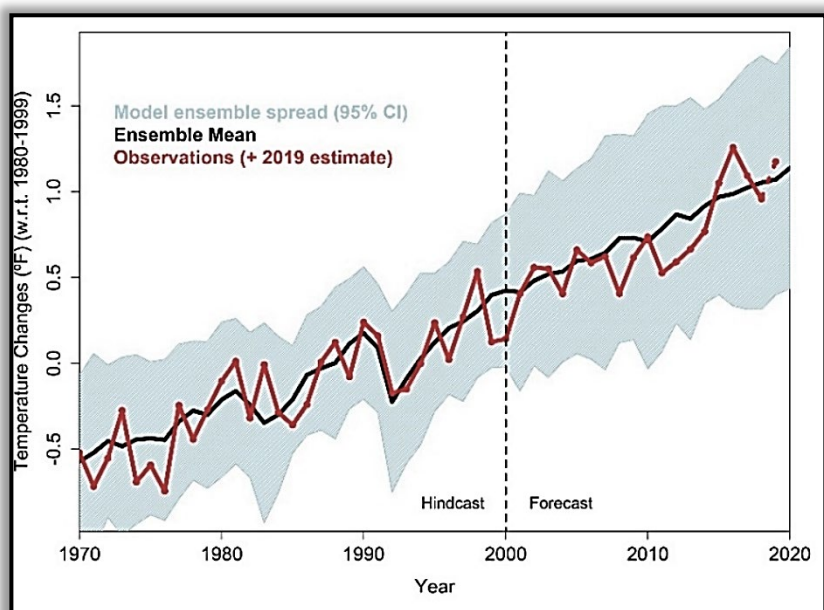
How is Climate Change predicted?

Scientists use climate models, which are complex mathematical computer simulations, to recreate the Earth's past and current climate or predict future climate trends. The foundation of the models requires an accurate representation of the Earth's atmosphere, sun, oceans, ice, and land surface. By solving the relevant mathematical equations, climate models can calculate properties such as atmospheric temperature, pressure, wind, and humidity. Because global warming has widespread effects, global temperature trends are among the most significant predictions.

As climate models are based on physics and the best understanding of the Earth's system, and are verified against real world observations, scientists are confident that climate models accurately represent our climate system. To this point, the University of California, Berkely, conducted a systematic evaluation of the performance of 17 climate models from 1970 to 2007 to determine how reliable they have been. The study looked at how accurately the models predicted temperature changes. The results, depicted in **Figure 4-3**, show that most of the past climate model projections closely matched observations. As public confidence in climate projections is critical, a recognition that even the less sophisticated climate models of 15 plus years ago produced reasonably accurate future temperature trends, should bolster public confidence in climate change predictions (Buis, Alan. *Study Confirms*).

Figure 4-3 Forecast Evaluation for Models Run in 2004 (Buis, Alan. *Study Confirms*)

Models that were used in the IPCC 4th Assessment Report can be evaluated by comparing their approximately 20-year predictions with what actually happened. In this figure, the multi-model ensemble and the average of all the models are plotted alongside the NASA Goddard Institute for Space Studies Surface Temperature Index (GISTEMP). Climate drivers were known for the 'hindcast' period (before 2000) and forecast for the period beyond. The temperatures are plotted with respect to a 1980-1999 baseline. (Credit: Gavin Schmidt)



What are some global impacts of Climate Change?

The impacts of a rapidly changing climate are already present. No longer viewed as a future possibility, the effects of climate change, including sea level rise (SLR), are scientifically recognized as exacerbating the impact of other natural hazards.

According to the 2021 IPCC Report, climate change “is not just about temperature. Climate change is bringing multiple different changes in different regions – which will all increase with further warming. These include changes to wetness and dryness, to winds, snow and ice, coastal areas and oceans.

For example:

- Climate change is intensifying the water cycle. This brings more intense rainfall and associated flooding, as well as more intense drought in many regions.
- Climate change is affecting rainfall patterns. In high latitudes, precipitation is likely to increase, while it is projected to decrease over large parts of the subtropics. Changes to monsoon precipitation are expected, which will vary by region.
- Coastal areas will see continued sea level rise throughout the 21st century, contributing to more frequent and severe coastal flooding in low-lying areas and coastal erosion. Extreme sea level events that previously occurred once in 100 years could happen every year by the end of this century.
- Further warming will amplify permafrost thawing, and the loss of seasonal snow cover, melting of glaciers and ice sheets, and loss of summer Arctic Sea ice.
- Changes to the ocean, including warming, more frequent marine heatwaves, ocean acidification, and reduced oxygen levels have been clearly linked to human influence. These changes affect both ocean ecosystems and the people that rely on them, and they will continue throughout at least the rest of this century.
- For cities, some aspects of climate change may be amplified, including heat (since urban areas are usually warmer than their surroundings), flooding from heavy precipitation events and sea level rise in coastal cities” (IPCC. *Climate Change widespread*).

Science is still discovering the breadth and scope of climate change impacts. As recognized by NOAA, it is a complex issue wherein, “The impacts of climate change on different sectors of society are interrelated. Drought can harm food production and human health. Flooding can lead to disease spread and damages to ecosystems and infrastructure. Human health issues can increase mortality, impact food availability, and limit worker productivity... [Further] long-standing socioeconomic inequities can make underserved groups, who often have the highest exposure to hazards and the fewest resources to respond, more vulnerable” (NOAA. *Climate change impacts*).

Intergovernmental Panel on Climate Change (IPCC)

The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations responsible for advancing knowledge on human-induced climate change. It was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), and later endorsed by the United Nations General Assembly. The IPCC is comprised of 195 member states; headquartered in Geneva Switzerland; and has issued 6 Climate Change Assessment Reports.

First Assessment Report (1990)

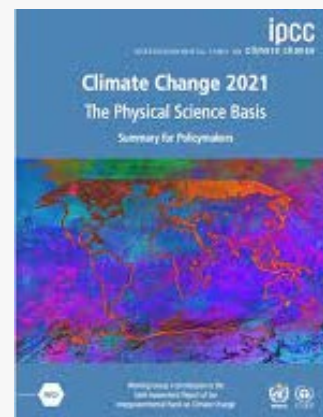
Second Assessment Report (1995)

Third Assessment Report (2001)

Fourth Assessment Report (2007)

Fifth Assessment Report (2014)

Sixth Assessment Report (2021)



Wikipedia. *Intergovernmental*

What are some local impacts of Climate Change?

According to an article by the URI Climate Change Collaborative, "In New England, temperatures are expected to increase by a few degrees by the end of the century. While summers may be 3°F to 7°F warmer, winters will likely be 5°F to 8°F warmer. Likewise, we will continue to see a shift in the seasons. Summer weather potentially will persist longer and with more days over 100°F. Winters will be warmer with more rain and less snow. Wet days will be wetter but droughts will be more frequent. The average annual temperature of Narragansett Bay has warmed approximately 3.6°F (with winters even greater) since the 1960s, and the Bay is expected to continue warming throughout the century. Rates of sea level rise have been increasing as well" (URI Climate Change Collaborative. *Climate*).

According to CRMC, potential effects of climate change and sea level rise include increased vulnerability to storm surges, risk to infrastructure, higher water tables, more extreme high tides, worsening coastal erosion and net loss of coastal marshes.

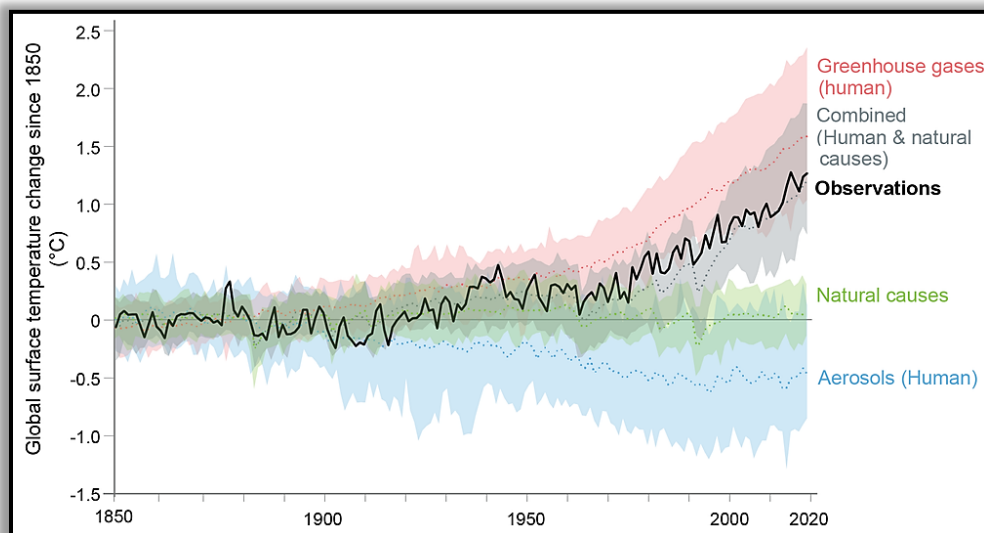
In general, Rhode Island communities may experience the following climate change impacts:

- Warmer air and water temperatures; shorter winters and longer summers; more frequent high heat days and heat waves
- Longer periods of drought creating conditions for more frequent brush fires and water availability concerns
- More extreme precipitation events causing increased extent of flood damage to property and infrastructure and the potential for more riverine and flash flood events
- More extreme high wind events creating greater vulnerability from increased storm surge levels along the coast; coastal erosion will create conditions that allow storm surge to impact further inland
- Higher water tables resulting in subsurface issues such as wet basements
- An increase in incidence of extreme high tide levels
- Expediated sea level rise creating expanded areas of saltwater intrusion into aquifers contaminating water supplies
- More coastal lands becoming susceptible to erosion due to increased intensity and frequency of storms
- A net loss of coastal marshes that become inundated at a greater rate, resulting in a loss of salt marsh vegetation and an alteration of habitat types

What can be done to slow Climate Change?

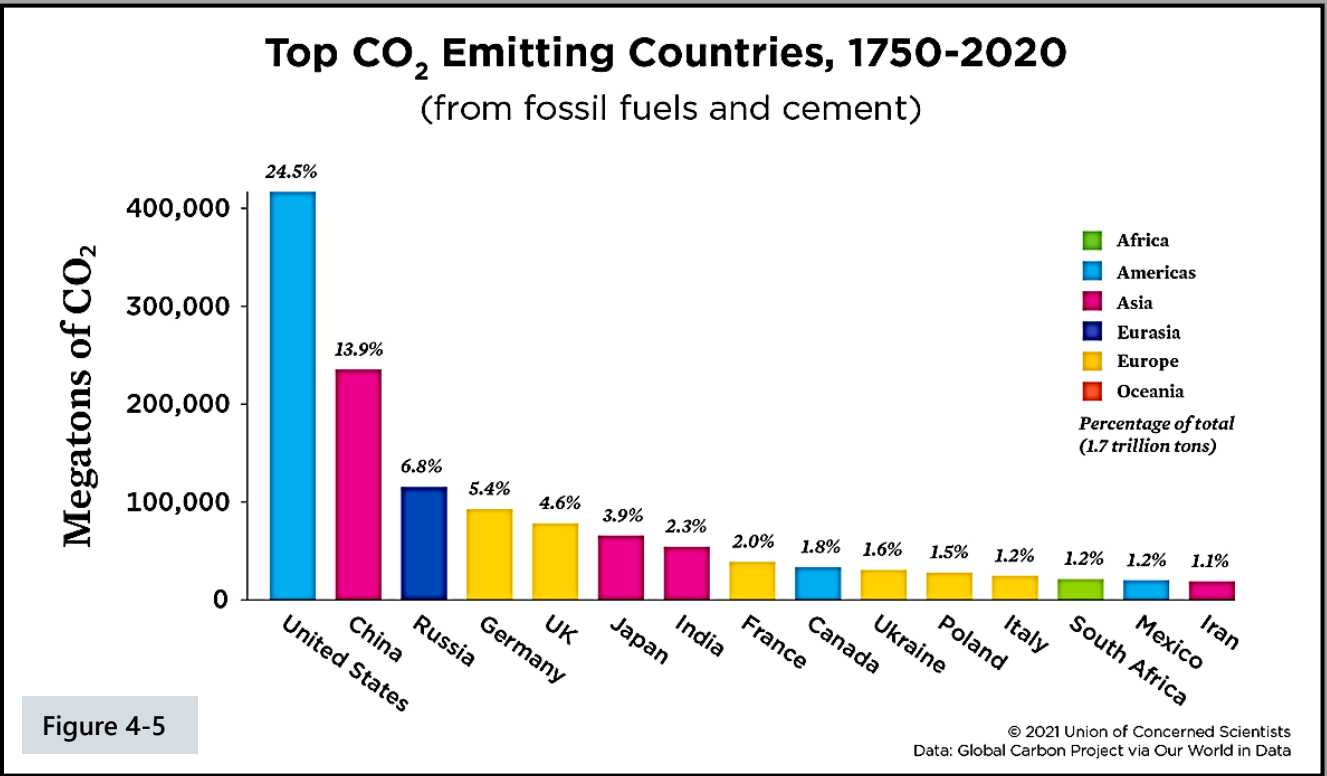
As stated on NASA's Global Climate Change website, "A consensus on climate change and its human cause exists... Multiple studies published in peer-reviewed scientific journals show that **97 percent or more** of actively publishing climate scientists agree: Climate-warming trends over the past century are extremely likely due to human activities. In addition, most of the leading scientific organizations worldwide have issued public statements endorsing this position" (NASA. *Scientific Consensus*).

Figure 4-4 How do we know humans are causing climate change? (IPCC)

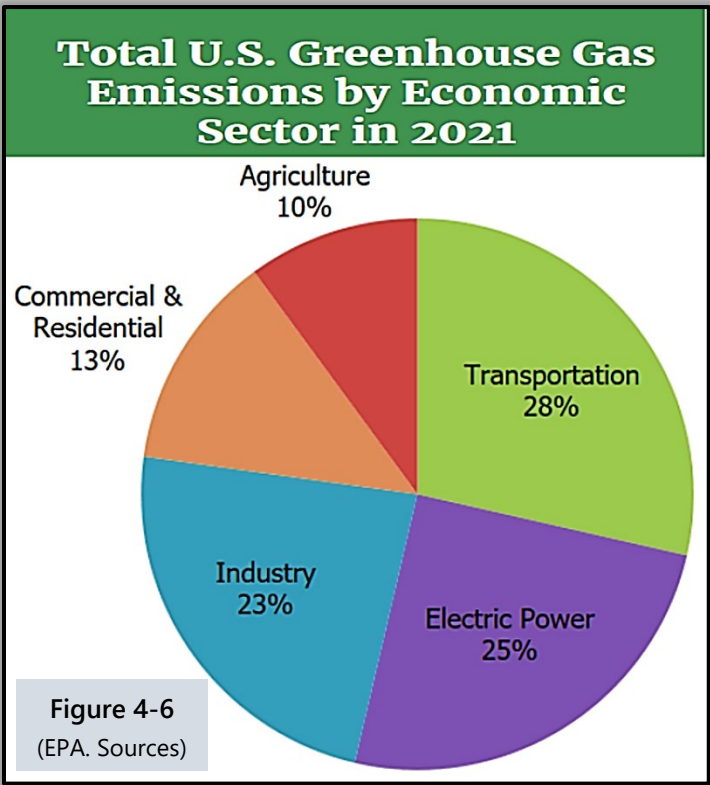


As depicted in **Figure 4-4**, from IPCC's Sixth Assessment Report, rapid climate change is primarily caused by humans producing large amounts of greenhouse gas emissions (Kopp, Robert).

Scientists around the world are engaged in climate change because it is a global problem. Studies by the Union of Concerned Scientists show that, “Cumulative carbon dioxide emissions are the dominant driver of climate change. These began rising during the Industrial Revolution (especially after 1850)—which means richer countries like the United States, which made an early transition to a heavily fossil fuel-based economic system, have an outsized role in contributing to the climate impacts we see around the world today. Both in terms of cumulative emissions, and current per capita emissions, richer countries rank high” (Union of Concerned Scientist). The top CO₂ emitting countries for the period 1750-2020 are shown in **Figure 4-5**.



The primary human action contributing to climate change is the burning of fossil fuels, like natural gas, oil, and coal, which produce large quantities of carbon dioxide, sulfur oxides, nitrogen oxides, and fine particulates consisting primarily of soot and ash. In addition to burning fossil fuels, other actions such as deforestation and livestock farming also contribute to the greenhouse effect. With respect to the United States CO₂ emissions, the EPA tracks total U.S. emissions on an annual basis. As shown in **Figure 4-6**, in 2021 the country's largest source of carbon pollution was in the transportation sector, closely followed by electric power and industry.



The EPA has provided the following overview of the primary sources of greenhouse gas emissions in the United States for 2020 (EPA. *Sources*):

- **Transportation** (28% of 2021 greenhouse gas emissions) – The transportation sector generates the largest share of greenhouse gas emissions. Greenhouse gas emissions from transportation primarily come from burning fossil fuel for our cars, trucks, ships, trains, and planes. Over 94% of the fuel used for transportation is petroleum based, which includes primarily gasoline and diesel.
- **Electricity production** (25% of 2021 greenhouse gas emissions) – Electric power generates the second largest share of greenhouse gas emissions and includes emissions from electricity production used by other end use sectors (e.g. industry). 79% of our electricity comes from burning fossil fuels, mostly coal and natural gas.
- **Industry** (23% of 2021 greenhouse gas emissions) – Greenhouse gas emissions from industry primarily come from burning fossil fuels for energy, as well as greenhouse gas emissions from certain chemical reactions necessary to produce goods from raw materials.
- **Commercial and Residential** (13% of 2021 greenhouse gas emissions) – Greenhouse gas emissions from the commercial and residential sector include fossil fuels burned for heat, lighting and the use of gases for refrigeration and cooling in businesses and homes, and non-building specific emissions such as the handling of waste.
- **Agriculture** (10% of 2021 greenhouse gas emissions) – Greenhouse gas emissions from agriculture come from livestock such as cows, agricultural soils, and rice production.

Understanding what is contributing to the greenhouse effect provides an opportunity to take proactive measures. “According to the World Economic Forum’s Global Risks Report 2021, **the failure to mitigate and adapt to climate change is ‘the most impactful’ risk facing communities worldwide** - ahead of even weapons of mass destruction and water crises. Blame its cascading effects: As climate change transforms global ecosystems, it affects everything from the places we live to the water we drink to the air we breathe” (Denchak).

The good news is that there is a general understanding of the key steps that need to be taken to curb global climate change. Many of these steps were outlined in the 2015 Paris Agreement which is a “legally binding international treaty on climate change” (United Nations). The goal of the Agreement is to limit global warming to below 2 degrees Celsius, compared to pre-industrial levels (United Nations). Although announced by President Trump in June 2017, the U.S. did not formally withdraw from the Paris Agreement until November 2020 (McGrath). The withdrawal was short-lived as President Biden rejoined the Paris Agreement on his first day in office (January 20, 2021) with membership becoming official on February 19, 2021 (US Secretary).

Although there is a general global understanding of what needs to be done, as noted by the Natural Resources Defense Council (NRDC), “The not-so-good news is that we’re not working fast enough. To avoid the worst impacts of climate change, scientists tell us that we need to reduce global carbon emissions by as much as 40 percent by 2030. For that to happen, the global community must take immediate, concrete steps: to decarbonize electricity generation by equitably transitioning from fossil fuel-based production to renewable energy sources like wind and solar; to electrify our cars and trucks; and to maximize energy efficiency in our buildings, appliances, and industries” (NRDC. *Global Warming*).

The State of Rhode Island is committed to move toward carbon neutrality, a state of net-zero carbon dioxide emissions. On January 17, 2020 Governor Raimondo signed an Executive Order mandating the State to move toward 100% renewable energy by 2030 – which at the time was the most ambitious ten-year renewable energy target of any state in the nation (Clarcq). The Town of Little Compton is reviewing associated changes which may support State goals, while accommodating necessary conditions for farming and fishing, which are important occupations in Town.

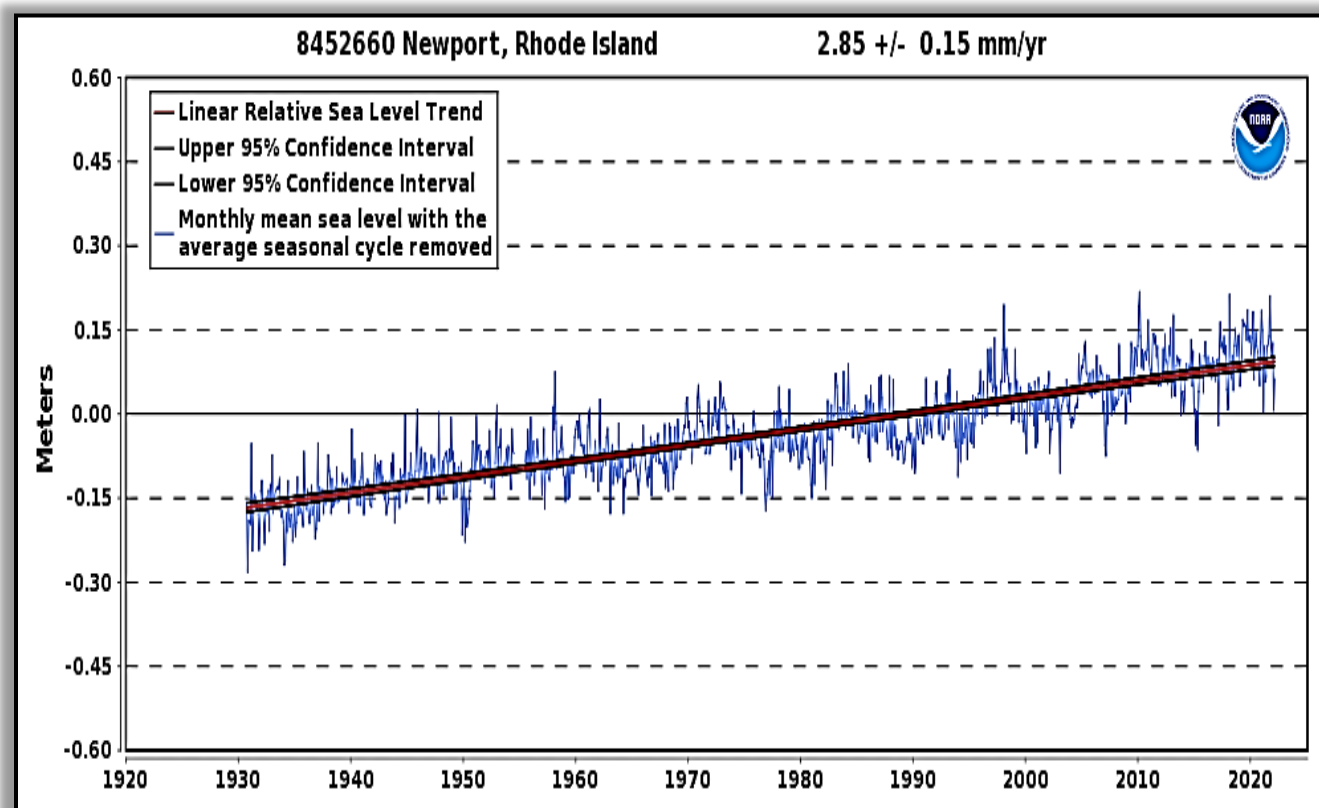
4.1.2 Sea Level Rise (SLR)

Greenhouse gas emissions released to the atmosphere increase surface warming, which in turn, warms ocean waters and accelerates the melting of glacial ice. Both the melting of land ice and the expansion of warm seawater increase the overall Global Mean Sea Level (GMSL). Although the rate of sea level rise is accelerating, it is not expected to be globally uniform, due to a number of factors including prevailing winds and powerful ocean currents (CRMC. *Sea Level and Climate*).

As the average water level of the oceans rise, previously dry land will be permanently inundated. Findings suggest that for about 2000 years prior to the 20th century, there was little change in the global average sea level. During the 20th century the rate of change accelerated with global sea level rise averaging 0.06 inches per year from 1880 to 2013 and roughly twice as fast (0.12 to 0.14 inches per year) from 2013 onward (EPA. *Climate Change Indicators: Sea Level*).

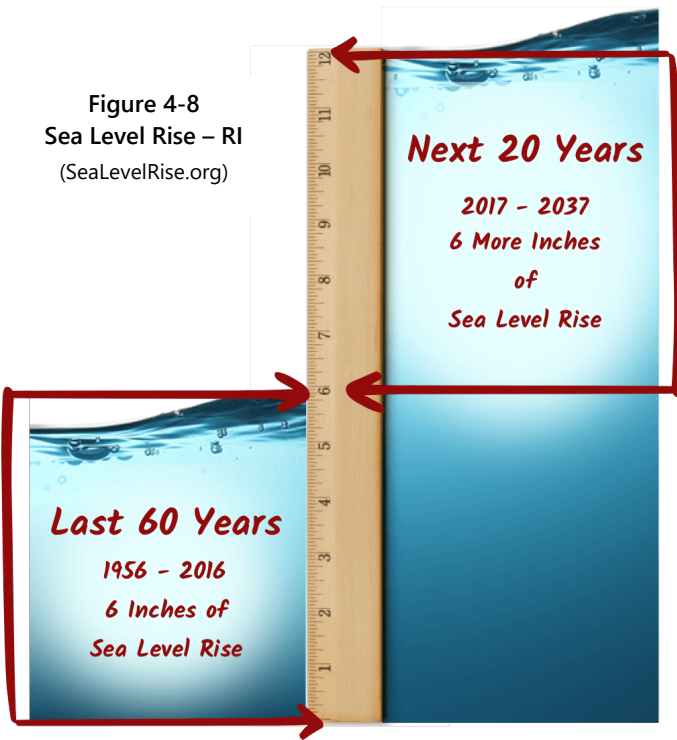
Since the 1930s, NOAA has maintained two stations in Rhode Island, one in Newport and the other in Providence, that measure sea level rise. Based on recordings from the Newport Tide Gauge (**Figure 4-7**), sea levels have risen over 10 inches since 1930 (CRMC. *Shoreline Change SAMP*, 2-3). Because greenhouse gas emissions continue to increase, it is expected that this trend will accelerate in the coming decades.

Figure 4-7 Relative Sea Level Trend
8452660 Newport, Rhode Island (NOAA. *Tides*)



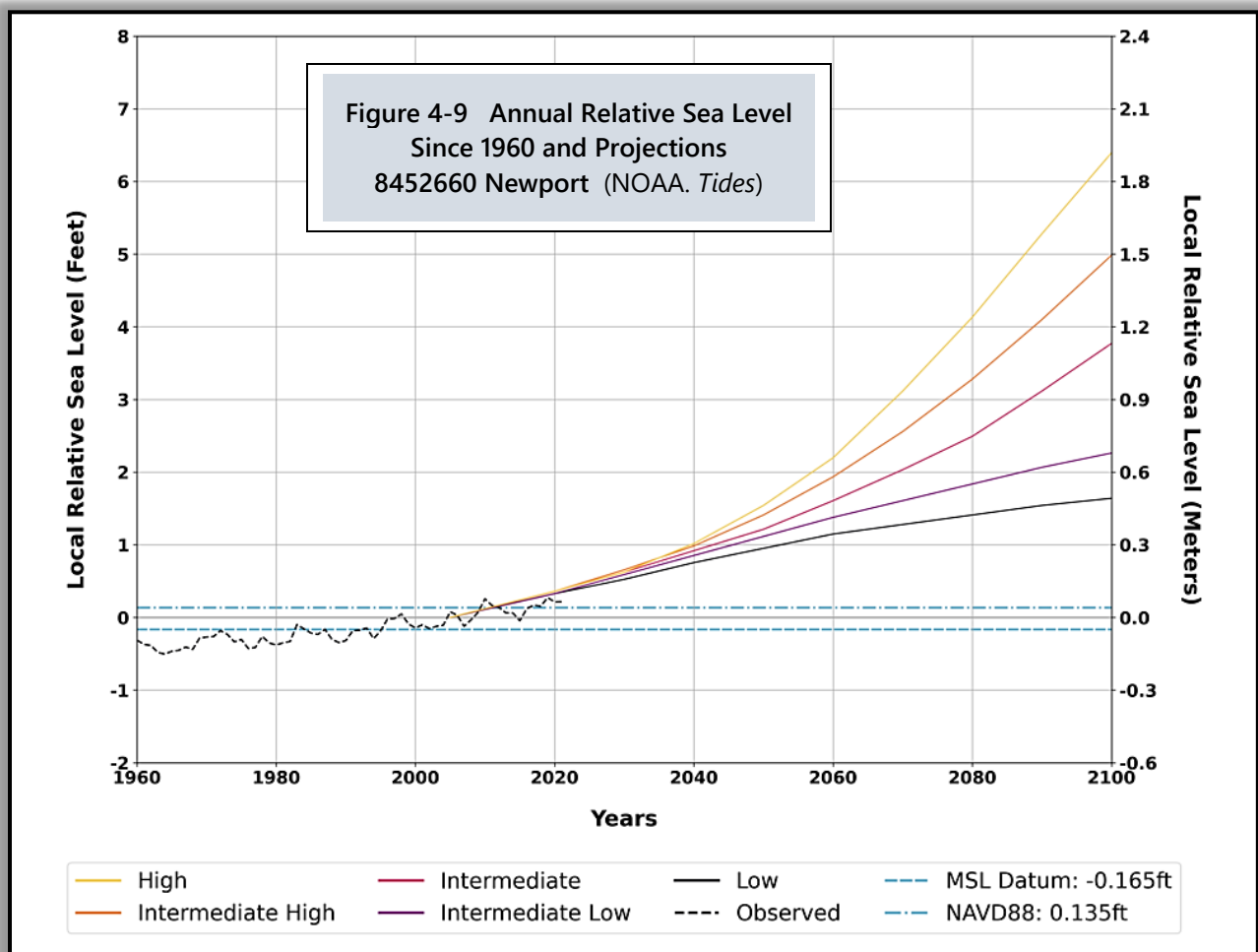
The relative sea level trend is 2.85 millimeters/year with a 95% confidence interval of +/- 0.15 mm/year based on monthly mean sea level data from 1930 to 2021 which is equivalent to a change of 0.94 feet in 100 years.

Figure 4-8
Sea Level Rise – RI
(SeaLevelRise.org)



In the last decade, the speed at which Rhode Island sea level is rising has increased, and is now rising by as much as 1 inch every 8 years. As illustrated in **Figure 4-8**, it took around 60 years for the sea level to rise approximately 6 inches. Scientists forecast that in the 20-year period from 2017-2037, the sea will rise by another 6 inches (SeaLevelRise.org. *The Future*).

According to NOAA, sea levels in the Northeast Region will rise significantly faster than the global average. The annual relative sea level since 1960 is shown in **Figure 4-9**, as well as NOAA's most recent best through worst case regional SLR projections up to 2100.



In February 2022 NOAA released their **Sea Level Rise Technical Report** which updates their 2017 SLR projections and provides additional information on tide, wind, and storm-driven extreme water levels affecting current and future coastal flood risk. The 2022 SLR Technical Report “provides the most up-to-date sea level rise projections for all U.S. states and territories by decade for the next 100 years and beyond, based on a combination of tide gauge and satellite observations and all the model ensembles from the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). NOAA’s 2022 SLR Technical Report projects sea levels along the coastline will rise an additional 10-12 inches by 2050 with specific amounts varying regionally, mainly due to land height changes” (NOAA. *U.S. coastline*).

The Rhode Island Coastal Resources Management Council (CRMC) adopted NOAA’s “worst-case” high curve projection to guide planning in Rhode Island (CRMC. *Shoreline Change SAMP*, 2-5). As shown in **Table 4-1**, the current worst-case sea level rise projections for Rhode Island based on the 2022 NOAA high curve, are lower than projected in 2017. Although this is welcome news, the projected levels remain a threat to Rhode Island’s coastline. As noted by CRMC, “While the 2022 NOAA high curve projections appear to have decreased for 2050, there is far more certainty with these future sea level rise projections based on multiple lines of evidence, and the CRMC and RI must remain vigilant in its planning for coastal adaption and resiliency” (CRMC. *Statement*).

Table 4-1 Sea Level Rise Projections for Rhode Island

NOAA Worst-case projections for Rhode Island based on high curve	2030	2050	2080	2100
2022 SLR Projections	0.71 feet	1.60 feet	4.19 feet	6.47 feet
2017 SLR Projections	1.67 feet	3.25 feet	6.69 feet	9.60 feet

CRMC. *Shoreline Change SAMP*, 2-5; NASA. *Interagency*

The impacts of SLR are already being experienced through:

- increased frequency of low-level inundation
- exacerbated flood elevations during storm events
- increased rates of coastal erosion
- increased saltwater intrusion into groundwater
- a net loss of coastal marshes

The impact of sea level rise is extensive and must be considered in long-term land use, development, and critical infrastructure planning. The RI Emergency Management Agency’s (RIEMA) Risk Assessment states that, “Sea level rise will result in wide scale systematic changes in the terrestrial and marine environments. **Future increases in relative sea level will displace coastal populations, threaten infrastructure, intensify coastal flooding and ultimately lead to the loss of recreation areas, public space, and coastal wetlands.** Coastal infrastructure will become increasingly susceptible to complications from rising sea levels, as the upward trend continues. Residential and commercial structures, roads, and bridges will be more prone to flooding. SLR will also reduce the effectiveness and integrity of existing seawalls and revetments, designed for historically lower water levels. Higher sea levels will result in changes in surface water and groundwater characteristics. Salt intrusion into aquifers will contaminate drinking water supplies and higher water tables will compromise wastewater treatment systems in the coastal zone” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-174 & 3-175).

4.2 HAZARD IDENTIFICATION

In accordance with the planning guidelines outlined in Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000), this *Plan* addresses only **natural hazards**, and does not consider man-made hazards (e.g., structural fires, hazardous materials, chemical spills, or weapons of mass destruction). The Rhode Island State Hazard Mitigation Plan (RI-SHMP) defines a natural hazard as “an event or physical condition that has the potential to cause fatalities, injuries, property and infrastructure damage, agricultural loss, damage to the environment, interruption of business, or other types of harm or loss” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-1).

CRS CREDIT:		
Mitigation Planning Element	CRS Planning Step	Max Pts
Phase II – Risk Assessment	4. Assess the Hazard	35

CRS Coordinator's Manual – Activity 510: Floodplain Management Planning

In an effort to determine what natural hazards should be addressed in this *Plan* the Advisory Committee reviewed the hazards included in the Town's 2018 Local Hazard Mitigation Plan, the 2019 Rhode Island State Hazard Mitigation Plan (RI-SHMP), plans from neighboring communities, and documentation/research from various sources related to previous hazards that have impacted Little Compton. An overview of RI disaster declarations from the 1950's forward, which were reviewed as part of the hazard identification process, has been included in **Table 4-2**.

The Committee also discussed the group of hazards identified by the State as not having a high risk to Rhode Island. Due to Little Compton's topography and subsurface conditions, the Advisory Committee concurred with the State's assessment and determined that the Town's **exposure to the following hazards was unlikely**, and will therefore not be addressed in this update: *Avalanches, Expansive Soils, Land Subsidence, Landslides, Volcanoes, and Tsunamis*.

As Town resources are limited, it is important that staff time and funding be devoted to hazards with a higher likelihood of occurring or potentially having a greater impact on the community. While there is always the possibility for an unexpected natural hazard to occur, it should be recognized that the intent of this *Plan* is to understand what natural hazards have a higher probability of impacting Little Compton over the ensuing 5-year period. **The Advisory Committee determined that in addition to the hazards addressed in the Town's 2018 HMP, the following hazards should also be considered: Hail, Earthquake, Extreme Heat, Drought, Brush Fire, Vector-borne Diseases Transmitted by Ticks or Mosquitoes, and Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses.** Effectively, the Town will address all of the natural hazards identified by the State of Rhode Island in their most current Hazard Mitigation Plan.

The hazards that are addressed in this *Plan* have been grouped into the following categories:

4.3.1 Flood-Related Hazards (Inland Flooding including Dam Failure, Coastal Flooding including Storm Surge, Coastal Erosion)

4.3.2 Wind-Related Hazards (High Winds, Thunderstorms including Lightning and Hail, Tornadoes, Tropical Cyclones - Tropical Depressions, Tropical Storms, and Hurricanes)

4.3.3 Winter-Related Hazards (Heavy Snow, Ice, Extreme Cold)

4.3.4 Infectious Disease-Related Hazards (Vector-borne Diseases Transmitted by Ticks or Mosquitoes, Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses)

4.3.5 Other Hazards (Earthquake, Extreme Heat, Drought, Brush Fire)

4.2.1 Disaster Declaration History

To assist in identifying the likelihood and potential severity of future hazards, the Advisory Committee reviewed past events that triggered a State or Federal Disaster Declaration for Rhode Island. Disaster declarations are issued when the severity of an event overwhelms and exhausts a local government's or state government's resources. A summary of Federal and State Disaster Declarations for Rhode Island is shown in **Table 4-2**. The majority of the emergency declarations and major disaster declarations were issued as the result of hurricanes and winter weather-related events. The first five events listed, occurred after the 2018 Local Hazard Mitigation Plan update.

Table 4-2 Disaster and Emergency Declarations in Rhode Island, 1954 – 2022

Disaster Number	Declaration Type *	Declaration Date	Description	Individual Assistance Total	Public Assistance Total	Hazard Mitigation Grant Program Total
4653	DR	5/12/2022	Severe Winter Storm and Snowstorm	N/A	\$8,901,805	N/A
3563	EM	8/21/2021	Hurricane Henri	Not currently available		
4505	DR	3/30/2020	Covid-19 Pandemic	\$11,376,854	\$763,834,531	\$973,890
3440	EM	3/13/2020	Covid-19 Pandemic	Not currently available		
3515	EM	3/13/2020	Narragansett Indian Tribe Covid-19 Pandemic	Not currently available		
4212	DR	4/3/2015	Severe Winter Storm Juno and Snowstorm	N/A	\$8,897,067	N/A
4107	DR	3/22/2013	Severe Winter Storm and Snowstorm	N/A	\$7,929,498	N/A
4089	DR	11/3/2012	Hurricane Sandy	\$421,341	\$8,629,001	N/A
3355	EM	10/29/2012	Hurricane Sandy	N/A	N/A	N/A
4027	DR	9/3/2011	Tropical Storm Irene	N/A	\$8,341,293	N/A
3334	EM	8/27/2011	Hurricane Irene	N/A	N/A	N/A
3311	EM	3/30/2010	Severe Storms and Flooding	N/A	N/A	N/A
1894	DR	3/29/2010	Severe Storms and Flooding	\$37,157,116	\$24,263,849	N/A
1704	DR	5/25/2007	Severe Storms and Island/Coastal Flooding	N/A	\$592,557	N/A
3255	EM	9/19/2005	Hurricane Katrina Evacuation	N/A	\$1,110,010	N/A
3203	EM	2/17/2005	Record Snow	N/A	\$6,273,609	N/A
3182	EM	3/27/2003	Snowstorm	N/A	\$2,002,984	N/A
3123	EM	11/19/1996	Major Water Main Break	N/A	\$1,539,100	N/A
1091	DR	1/24/1996	Blizzard	N/A	N/A	N/A
3102	EM	3/16/1993	Blizzards, High Winds, and Record Snowfall	N/A	\$167,897	N/A
3094	EM	9/16/1992	Water Contamination	N/A	\$1,994,343	N/A
913	DR	8/26/1991	Hurricane Bob	N/A	N/A	N/A
748	DR	10/15/1985	Hurricane Gloria	N/A	N/A	N/A
548	DR	2/16/1978	Snow, Ice	N/A	N/A	N/A
3058	DR	2/7/1978	Blizzards and Snowstorms	N/A	N/A	N/A
39	DR	8/20/1955	Hurricane, Flood	N/A	N/A	N/A
23	DR	9/2/1954	Hurricane	N/A	N/A	N/A

FEMA Declared Disaster Website

Note: DR = Major Disaster Declaration; EM = Emergency Disaster Declaration

In support of the Risk Assessment process, **Table 4-3** was created from NOAA's National Centers for Environmental Information (NCEI) Storm Events Data for Newport County as provided in the RI-SHMP. Over the past several decades, wind/hurricanes, winter storms, thunderstorms, and flooding have been the most prevalent disasters faced by Newport County. While the total property damages are believed to be underrepresented due to unreported or difficult to quantify losses, it is clear that damages associated with flooding are the most extensive (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-12 & 3-13).

Table 4-3 Overview of Hazard Events and Related Property Damage in Newport County, Rhode Island

Hazard	Flood	Hurricane	Wind	Tornado	Winter Storm	Drought	Extreme Cold	Extreme Heat	Thunder-storm
<i>Years of Record</i>	1996-2018	1996-2018	1955-2018	1950-2018	1996-2018	1996-2018	1996-2018	1996-2018	1955-2018
Total Number of Events	20	1	90	0	56	5	2	2	56
Total Reported Property Damages	\$6,635,000	\$20,000	\$497,100	---	\$291,000	---	---	---	\$104,000
Total Annualized Reported Damages	\$288,478	\$870	\$7,767	---	\$12,652	---	---	---	\$1,625

RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-12 & 3-13

NOAA's National Centers for Environmental Information (NCEI) Storm Events Data for Newport County



Figure 4-10 Hurricane Carol Hits Rhode Island (1954)

Photo Credit: Rhode Island Historical Society

4.2.2 Hazard Priority Ranking

Little Compton is one of Rhode Island's coastal communities, bounded on the south by the Atlantic Ocean and on the west by the Sakonnet River. Although the warmth from the ocean and river may reduce the severity of certain natural hazards, the Town's land characteristics, including extensive low-lying property, make it subject to a range of natural hazards that have the potential to adversely affect public health and safety.

To assist the HM&FMP Advisory Committee in analyzing each hazard and then comparing and prioritizing the hazards in terms of their potential impact on the Town, a standard methodology was used. The methodology was based on three semi-quantitative factors (probability of occurrence, likely range of impact, and likely magnitude of impact). The Advisory Committee utilized a number of resources to help them assess the hazards. These included a review of the Disaster and Emergency Declarations for Rhode Island, review of the hazard profiles, input from the community via the HM&FMP Public Opinion Survey, the 2019 RI State Hazard Mitigation Plan (Newport County), 2018 Little Compton Local Hazard Mitigation Plan, 2018 Little Compton Comprehensive Plan, and from personal experience.

In the Committee's risk summary (**Table 4-4**) each of the three semi-quantitative factors were given equal weight when calculated to determine the overall numeric ranking. The full ranking and criteria have been provided in **Appendix 4-1**. The narrative included in **Appendix 4-1** explains the methodology of scoring the vulnerability for the profiled hazards and creating the overall ranking. This exercise assisted the Advisory Committee in determining if any hazards should be excluded from further consideration and which ones should be more heavily weighted in terms of the Town's mitigation strategy. The hazards ranked the highest by the Committee were: High Winds; Tropical Cyclone (Tropical Depression, Tropical Storm & Hurricane); Heavy Snow & Ice; Coastal Flooding including Storm Surge; Extreme Heat; Inland Flooding; Thunderstorm including Lightning and Hail; and Extreme Cold.

Some of the key information used in profiling the hazards came from the resources listed below. The specific documents or websites used can be found in the **References and Works Cited Section**.

FLOOD-RELATED HAZARDS

- Climate Central
- Coastal Resources Management Council (CRMC)
- Environmental Protection Agency (EPA)
- Federal Emergency Management Agency (FEMA) – including FEMA Flood Insurance Rate Maps (FIRMs), National Flood Insurance Program (NFIP), and repetitive loss/severe repetitive loss (RL/SRL) properties
- Intergovernmental Panel on Climate Change (IPCC)
- National Geographic
- National Oceanic and Atmospheric Administration (NOAA) – including NOAA|NCEI Storm Events Database
- Review of historical Federal and State disaster Declarations
- Rhode Island Climate Change Collaborative
- Rhode Island Department of Environmental Management (RIDEM)
- Rhode Island Division of Statewide Planning (RIDSP)
- Rhode Island Emergency Management Agency (RIEMA) – RI-SHMP
- Rhode Island Geographic Information System (RIGIS) – GIS Data
- United States Army Corps of Engineers (USACE) National Inventory of Dams database

WIND-RELATED HAZARDS

- American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures
- Intergovernmental Panel on Climate Change (IPCC)
- National Geographic
- National Oceanic and Atmospheric Administration (NOAA) – including National Weather Service (NWS), NOAA National Hurricane Center (NHC), NOAA Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model, and NOAA|NCEI Storm Events Database
- Review of historical Federal and State disaster Declarations
- Rhode Island Emergency Management Agency (RIEMA) – RI-SHMP
- Rhode Island Geographic Information System (RIGIS) – GIS Data

WINTER STORM-RELATED HAZARDS

- American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures
- Intergovernmental Panel on Climate Change (IPCC)
- National Oceanic and Atmospheric Administration (NOAA) – including National Weather Service (NWS) snowfall data, and NOAA|NCEI Storm Events Database
- Review of historical Federal and State disaster Declarations
- Rhode Island Emergency Management Agency (RIEMA) – RI-SHMP

INFECTIOUS DISEASE-RELATED HAZARDS

- Centers for Disease Control and Prevention (CDC)
- Environmental Protection Agency (EPA)
- Review of historical Federal and State disaster Declarations
- Rhode Island Department of Environmental Management (RIDEM)
- Rhode Island Department of Health (RIDOH)
- Rhode Island Emergency Management Agency (RIEMA) – RI-SHMP
- World Health Organization (WHO)

OTHER HAZARDS

- American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures
- Climate Central
- Intergovernmental Panel on Climate Change (IPCC)
- National Aeronautics and Space Administration (NASA)
- National Oceanic and Atmospheric Administration (NOAA) – including National Weather Service (NWS) average annual rainfall data (drought conditions), and NOAA|NCEI Storm Events Database
- Review of historical Federal and State disaster Declarations
- Rhode Island Department of Health (RIDOH)
- Rhode Island Emergency Management Agency (RIEMA) – RI-SHMP
- United States Department of Agriculture Natural Resources Conservation Service (USDA)
- United States Geological Survey (USGS)

Table 4-4 Risk Summary: Overview

Hazard	Overall Ranking	Risk Category
High Winds	3.08	High
Tropical Cyclone (Tropical Depression, Tropical Storm & Hurricane)	2.92	
Heavy Snow & Ice	2.92	
Coastal Flooding including Storm Surge	2.75	
Extreme Heat	2.58	
Inland Flooding	2.50	
Thunderstorm including Lightning and Hail	2.50	
Extreme Cold	2.50	
Coastal Erosion	2.42	Medium
Vector-borne Diseases Transmitted by Ticks or Mosquitoes	2.42	
Drought	2.25	
Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses	2.17	
Brush Fire	1.75	
Dam Failure	1.33	Low
Tornado	1.17	
Earthquake	1.08	

4.3 HAZARD PROFILES

Hazard Mitigation Plan: The Town of Little Compton has successfully met the following requirement →
44 CFR Subsection D §201.6(c)(2)(i): [The risk assessment shall include] A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

As indicated in **Table 4-4**, based on Committee input, the lowest ranked hazards were determined to be Dam Failure, Tornado, and Earthquake. Although these hazards are not currently considered a significant threat to Little Compton, it was determined prudent to maintain their inclusion in this document. As our climate is rapidly changing, some of these hazards may become more significant in future years. That being said, in terms of the Town's ensuing 5-year mitigation strategy, those three hazards will have a lower standing.

The identified hazards are profiled in the following subsections:



4.3.1 Flood-Related Hazards (Inland Flooding including Dam Failure, Coastal Flooding including Storm Surge, Coastal Erosion)



4.3.2 Wind-Related Hazards (High Winds, Thunderstorms including Lightning and Hail, Tornadoes, Tropical Cyclones - Tropical Depressions, Tropical Storms, and Hurricanes)



4.3.3 Winter-Related Hazards (Heavy Snow, Ice, Extreme Cold)



4.3.4 Infectious Disease-Related Hazards (Vector-borne Diseases Transmitted by Ticks or Mosquitoes, Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses)



4.3.5 Other Hazards (Earthquake, Extreme Heat, Drought, Brush Fire)

Each profile includes a description and extent (strength or magnitude of impact); is locally defined (geographic areas affected); identifies previous occurrences; addresses climate change impacts; and discusses the probability of future events. With respect to probability of future events, this Plan will adopt the following probability rating assessment used in the State of Rhode Island Hazard Mitigation Plan (RISAMP):

Highly Likely: Greater than 90% annual probability

Likely: Between 50% and 89.9% annual probability

Potential: Between 1% and 49.9% annual probability

Unlikely: Less than 1% annual probability



FLOOD-RELATED HAZARDS

4.3.1 Flood-Related Hazards

Flooding, the accumulation of a substantial amount of water in areas that are typically dry, generally results from heavy rainfall, storm surges, and melting snow. FEMA defines a flood as:

- “A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from: overflow of inland or tidal waters; unusual and rapid accumulation or runoff of surface waters from any source; or a mudflow; or
- The collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above” (FEMA. *Glossary*).

The RI Geographic Information System (RIGIS) has made available FEMA’s Digital Flood Insurance Rate Map (D-FIRM) database for the State, which the Town has used in developing this *Plan*. The Flood Insurance Rate Maps show FEMA designated flood zones according to varying levels of flood risk. The base floodplain, also called the **Special Flood Hazard Area (SFHA)** is considered the highest risk area and is comprised of the A and V zones. **Zone A**, or the 100-year floodplain, identifies areas with a one percent or greater chance of flooding in any given year. **Zone V**, the Velocity Zone, identifies coastal areas with a one percent or greater chance of flooding in any given year plus the additional hazard of storm-induced waves, or velocity action. Both the A and V Zones have a 26% chance of flooding over the life of a 30-year mortgage (FEMA. *Unit 3*, 3-4 & 3-5).

Due to its coastal location and numerous inland water bodies, Little Compton is vulnerable to flooding and coastal erosion from storm events and storm surge. There are 14 flood insurance rate maps (FIRMs or D-FIRMs for the digital version) that encompass Little Compton. **The most recent flood maps, which were adopted by the Town, were used for the Flood Zone mapping and analysis in this Plan.** Seven of the panels have an effective date of 9/4/2013, and the other seven panels were updated as of 7/6/2021. Links for the FIRM panels has been included in **Appendix 5-1**.

The **high risk flood zone** is commonly referred to as the 100-year floodplain or the Special Flood Hazard Area (SFHA). The 100-year floodplain includes the V and A flood zones. There are different designations for the V and A zones based on the data collected. In Little Compton the designations include Zones VE, A, and AE. The first letter (V or A) represents the flood zone, and the second letter, if denoted, identifies additional flood data. The computed elevation to which floodwater is anticipated to rise during the base flood is the **Base Flood Elevation (BFE)**. If the second letter is an E (e.g. VE or AE), it denotes that base flood elevations have been provided in that area.

In Little Compton the **moderate risk flood zone** is designated as the X shaded or 500-year floodplain or 0.2% annual chance flood zone. Although often referred to as the 500-year floodplain, it actually encompasses the area from the limits of the 100-year (1% annual chance) floodplain up to and including the 500-year floodplain (0.2% annual chance) (FEMA. *Unit 3*, 3-29).

The flood hazard mapping depicted in **Figure 4-11**, serves as the basis for NFIP regulations and flood insurance requirements. Based on a simple overlay of the RIGIS Town of Little Compton municipal boundary with the FEMA D-FIRM layers (without removing water features from either layer), produces a rough calculation of 18 percent of Little Compton is within the Special Flood Hazard Area (the 100-year floodplain): approximately 9.1 percent within Zone VE and 8.9 percent within Zones A/AE. **Figure 4-11** is also included at a larger scale in **Appendix 4-2**.

"Floodplains, by their very nature, are the low, flat, periodically flooded lands adjacent to rivers, lakes, and oceans, and are subject to geomorphic (land-shaping) and hydrologic (water flow) processes. It is only during and after major flood events that the connections between a river and its floodplain become more apparent. These areas form a complex physical and biological system that not only supports a variety of natural resources, but also provides natural flood and erosion control" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-112).

The location of flood events generally varies based on the type of flooding. In this Section, flood-hazards will be discussed in terms of the following three categories:

- 4.3.1.1 Inland Flooding (Riverine Flooding, Shallow Flooding, and Dam Failure)**
- 4.3.1.2 Coastal Flooding including Storm Surge**
- 4.3.1.3 Coastal Erosion**

Flooding

According to FEMA, between 2010 and 2018 the annual cost of flood damage in the United States was approximately \$17 billion and was four times more than was recorded in the 1980s (FEMA. TESTIMONY, 5)

FEMA Flood Insurance Rate Map Zone Definitions

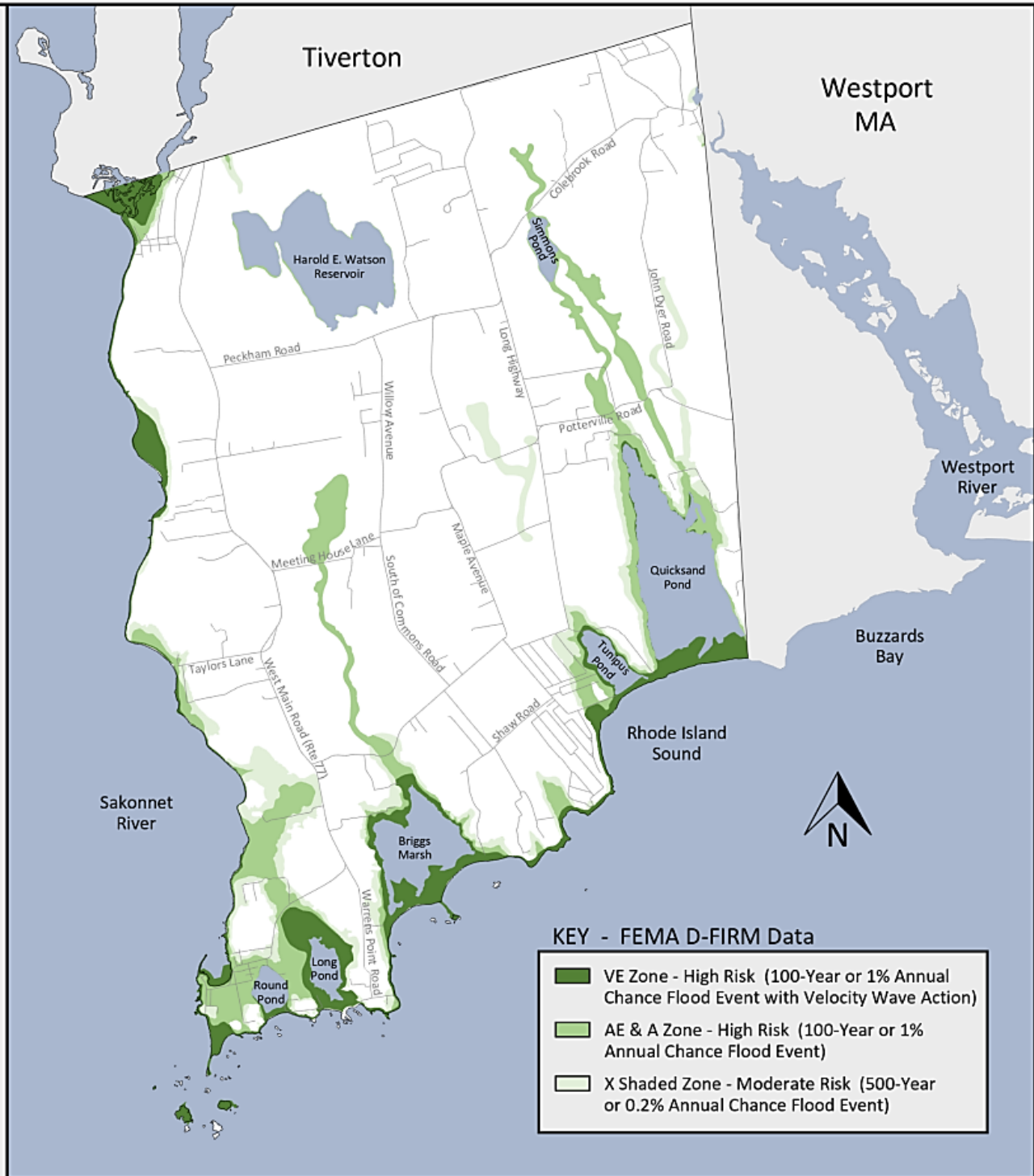
High Risk: Zone V (1% annual chance): Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplain that has additional hazards associated with storm waves. Mandatory flood insurance purchase requirements apply. For areas within the V Zone where detailed hydraulic analyses has been performed and Base Flood Elevations (BFEs) identified, it is classified as VE replacing the old format V1-V30.

High Risk: Zone A (1% annual chance): Zone A is the flood insurance rate zone that corresponds to the 100-year floodplain that is determined in the Flood Insurance Study (FIS) by approximate methods. Mandatory flood insurance purchase requirements apply. For areas within the A Zone where detailed hydraulic analyses has been performed and Base Flood Elevations (BFEs) identified, it is classified as AE replacing the old format A1-30. There are four additional A zone designations: AH indicating shallow flooding with BFEs identified; AO indicating sheet flow, ponding, or shallow flooding with base flood depths (feet above ground) provided; A99 indicating an area to be protected from base flood by levees or Federal Flood Protection Systems under construction; and AR indicating a base floodplain that resulted from the decertification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection.

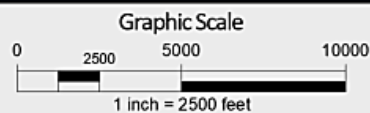
Moderate Risk: Zone X (shaded) (from less than 1% to 0.2% annual chance): Zone X (shaded) is the flood insurance rate zone that is considered moderate risk. Flood Zone X (shaded) indicates the area from the limits of the 100-year floodplain up to and including the 500-year floodplain (0.2% annual chance). As this zone encompasses up to the 0.2% annual chance, it is generally referred to as the 500-year floodplain. The Zone X (shaded) is determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs (base flood elevations) or depths are shown within this zone.

Low Risk: Zone X (unshaded) (less than 0.2% annual chance): Zone X (unshaded) is the flood insurance rate zone that is considered low risk. Flood Zone X (unshaded) is the area outside of (higher in elevation than) the 500-year flood level.

FEMA Flood Zones



This map is not the product of a Professional Land Survey. It was created for the Town of Little Compton for general reference, informational, planning or guidance use, and is not a legally authorized source as to location of natural or manmade features. Proper interpretation of this map may require the assistance of appropriate professional services. The Town of Little Compton makes no warranty, express or implied, related to the spatial accuracy, reliability, completeness, or currentness of this map.



May 2024

Source: RIGIS

Figure 4-11

Kim Jacobs, Civil Engineer &
Resilience Planning Consultant



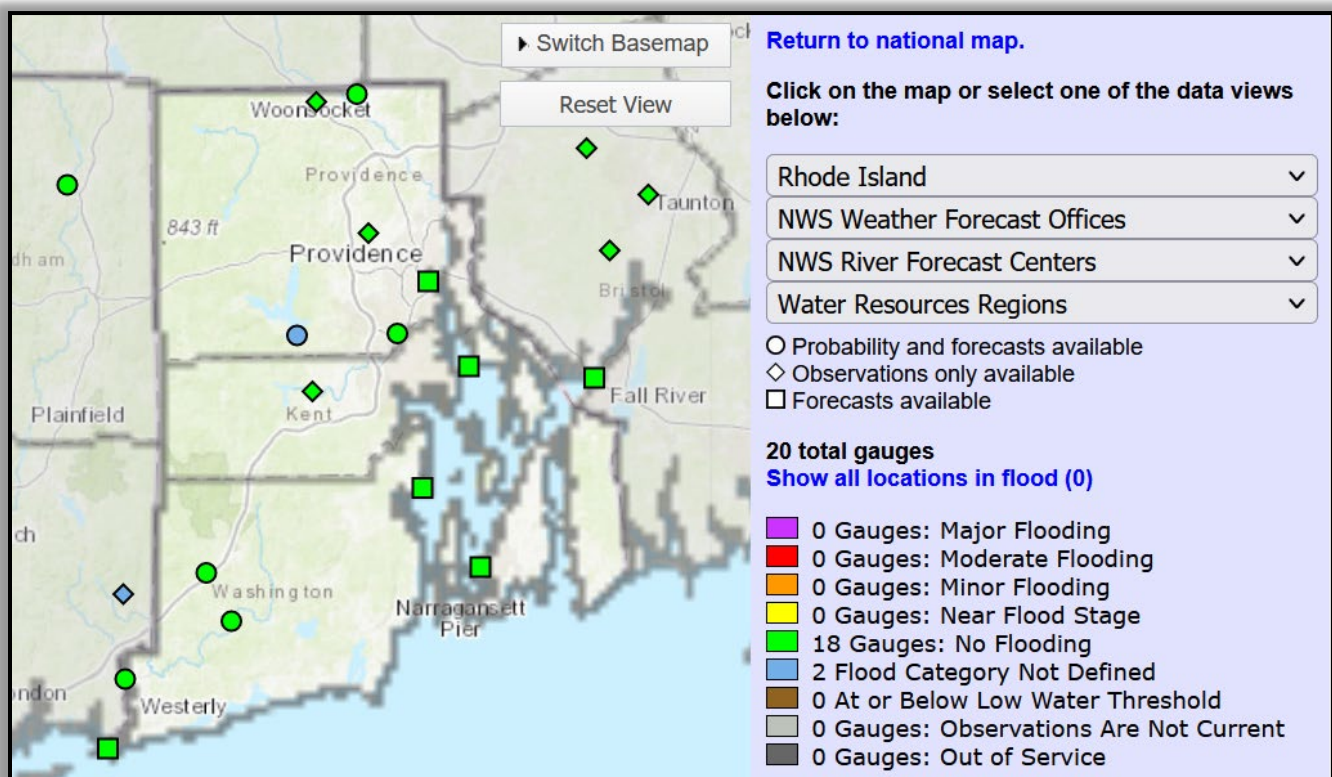
4.3.1.1 Inland Flooding (Riverine Flooding, Shallow Flooding, and Dam Failure)

Description and Extent

"Inland flooding can occur when the volume of water on land exceeds the capacity of natural and built drainage systems" (mass.gov). While there is no universally accepted scale for measuring flooding, some inland flooding may be measured by stream gauges, installed in bodies of water located near populated areas, designed to determine the risk of flooding. The most commonly used stream gauge is the Automated Local Evaluation in Real-Time (ALERT) which continuously sends water level data through a satellite or phone telemetry. The United States Geological Survey (USGS) installs, operates, and collects stream gauge data from thousands of sites around the country. **Figure 4-12** shows the location of National Weather Service (NWS) flood gauges in and near Rhode Island. The data is sent to and analyzed by the NWS River and Flood program who is responsible for issuing flood warnings to local, state, and federal decision-makers. It is then up to the decision-makers what action should be taken (Restoration Master).

As Little Compton's creeks and streams are part of small basins, which have smaller flood storage capacity, significant flood events may occur without sufficient warning time to prepare. Streams and small rivers are also susceptible to flooding from more localized weather systems that may cause intense rainfall over only a small area. Significant inland flooding can cause extensive damage to structures and personal property; disrupt potable water, stormwater, and sewer system operations; and flooded roadways can cause dangerous conditions for motorists. Additionally, flood water can carry debris, toxic material, or contaminants spreading pollution which can negatively impact ecosystems. Inundated structures that aren't addressed quickly, may also provide an opportunity for mold contamination. Further, standing water following a flooding event can provide a conducive environment for breeding mosquitos.

Figure 4-12 Rhode Island: NWS Observed Gauge Map (NOAA|NWS)



**The types of flooding that present a risk within inland (non-coastal) areas
in Little Compton include:
riverine flooding, shallow flooding, and dam failure.**

❖ **Riverine Flooding (overbank flooding, flash floods)**

Riverine flooding is defined as flooding that occurs along a channel. It is a function of precipitation levels and water runoff volumes within the stream or river. Riverine flooding occurs periodically and is typically a by-product of coastal storms, but can also occur during late winter and early spring due to melting snow and ice, or seasonal precipitation. If an increase in the volume of water within a channel flows over the river or stream bank (also referred to as overbank flooding) it will result in partial or complete inundation of the adjacent floodplain. Flood conditions can be exacerbated if channels are constricted due to large amounts of debris, such as fallen trees, or ice. Floodplains are low-lying lands adjacent to rivers, lakes, and oceans that are periodically flooded. The connections between a waterway and its floodplain becomes more apparent after major flood events (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-112). Maintaining floodplains helps to provide natural flood and erosion control. In addition, floodplains support a variety of natural resources and function as a natural filtering system for groundwater recharge (FEMA. *Unit 1*, 1-7).

Flash floods occur with little warning, move quickly, and can carry a huge amount of debris. They have the power to tear out trees, and destroy buildings and bridges. Flash floods are primarily caused by severe storms that drop significant rainfall over a short period of time. Steep slopes and narrow stream valleys increase a community's vulnerability to flash floods and resultant damage, as do areas with poor drainage. The construction of impervious surfaces such as asphalt roads, parking lots, driveways, sidewalks, and expansive roofs, accelerates the potential for flash flooding because these surfaces do not allow natural absorption by open ground. As a result, storm drains are often overwhelmed, and water rushes to low spots such as basements and underpasses. Flash floods can also be caused by a dam or levee failure or the release of ice-jam flooding (FEMA. *Unit 1*, 1-8).

❖ **Shallow Flooding (sheet flow, ponding)**

"Shallow flooding occurs in flat areas where a lack of channels means water cannot drain away easily" (FEMA. *Unit 1*, 1-11). Urbanization exacerbates the accumulation of floodwater due to increased impervious surfaces, and is of particular concern in areas that have a high groundwater table, where development has occurred within floodplains, or with marginal urban drainage systems. Often urban drainage systems, which include swales, ditches, storm sewers, retention ponds, and other facilities constructed to store or carry runoff to a receiving waterbody, are insufficient in size or due to lack of maintenance to accommodate heavy rainfall. Two categories of shallow flooding are:

- ◇ **Sheet flow** – A lack or insufficiency of defined channels creates conditions where floodwater spreads over a large area at a roughly uniform depth.
- ◇ **Ponding** – This condition occurs when stormwater runoff collects in depressions and cannot drain out; the water remains until it infiltrates into the soil, evaporates or is pumped out (FEMA. *Unit 1*, 1-11 & 1-12). (This does not include stormwater retention ponds specifically designed to collect stormwater and retain the water until it infiltrates into the soil; typically, within a matter of hours).

❖ **Dam Failure (Special Flood Hazard)**

"Dams have been an important part of Rhode Island's water infrastructure for centuries. In addition to the historic economic benefits provided by dams, they are used for flood control, water supply, power generation, recreation, and for mitigating the impact of increased runoff typically caused by land use changes associated with property development" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-48).

NOAA defines a dam as “any artificial barrier that diverts or impounds water” and dam failure as a “catastrophic event characterized by the sudden, rapid, and uncontrolled release of impounded water” (NWS. *National Weather Service Glossary*). The RI-SHMP indicates that the most common cause of dam failure is overtopping which can occur due to prolonged periods of rainfall and flooding. “Overtopping occurs when a dam’s spillway capacity is exceeded and portions of the dam that are not designed to convey flow begin to pass water, erode away, and ultimately fail. Other causes of dam failure include design flaws, foundation failure, internal soil erosion, inadequate maintenance, or mis-operation. Complete failure occurs if internal erosion or overtopping results in a complete structural breach, releasing a high-velocity wall of debris-laden water that rushes downstream, damaging or destroying everything in its path” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-46).

Weather conditions will impact extent. During high precipitation and flooding events, the potential for overtopping or breaches has a higher probability and may exacerbate the impact. A dam breach unrelated to a precipitation event may have an overall lesser impact; however the population will likely receive less warning which could create more life threatening situations. Dam failures can create the most damaging flash flood events because generally there is little or no warning time, limiting the opportunity to prepare and evacuate (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-46, 3-48).

Inventoried dams in Rhode Island are classified by size and hazard rating by the Rhode Island Department of Environmental Management (RIDEM). “The size classification provides a relative description of small, medium, or large dams, based on the storage capacity and height of the impounded water. The hazard classification relates to the probable consequences of failure or mis-operation of the dam; however, it does not relate to the current condition or the likelihood of failure of the dam” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-46). The dam hazard classifications defined by RIDEM (RIDEM. *2022 Annual Report*, 4), are as follows:

- **Low Hazard:** Failure or mis-operation will not likely result in loss of human life or cause major economic loss.
- **Significant Hazard:** Failure or mis-operation will likely not result in loss of human life, but will cause major economic loss, disruption of lifeline facilities, or impact other concerns detrimental to the public’s health, safety, or welfare.
- **High Hazard:** Failure or mis-operation will result in a probable loss of human life.

“According to the Federal Guidelines for Dam Safety, two (2) factors influence the severity of a dam failure: the amount of water impounded and the density, type, and value of development and infrastructure located downstream. The magnitude and severity of dam failures may also be assessed in terms of damage, including loss of life and injury, damage to infrastructure, loss of services or utilities, debris, and economic damage” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-48).

The Rhode Island Department of Environmental Management’s 2022 Annual Dam Safety Report, identifies eleven dams in Little Compton: eight are classified as Low Hazard; two are classified as Significant Hazard, and one is classified as High Hazard (RIDEM. *2022 Annual Report, Attachment 13*). **Table 4-5** provides a list of these dams.

Location

❖ **Riverine Flooding (overbank flooding, flash floods)**

Riverine flooding is more likely to result from an event with a slower speed of onset that causes stream and creek banks to overtop. In Little Compton this is generally the result of tropical storms, but it can also occur during late winter due to melting snow, ice, and persistent spring rain. Areas bordering rivers may also be affected by large discharges caused by heavy rainfall over upstream areas (FEMA. *Unit 1*, 1-7).

Little Compton has several large freshwater waterbodies as well as numerous streams and brooks. Most of these do not represent a significant risk of riverine flooding for inland neighborhoods. In the village of Adamsville (located in the northeast of the Town), Mill Brook, the Westport River West Branch, and Gray's Mill Pond present a flood risk to nearby low-lying roadways and property, particularly along sections of Main Street, which is under RIDOT jurisdiction. Flooding from stream overbanking and/or flash floods have historically impacted sections of John Dyer Road, John Sisson Road, and Swamp Road, which are all Town-owned roads.

Flooding from the Pachet Brook and Watson Reservoir currently pose little threat as the majority of the surrounding area is open space and farmland. Similarly, the southerly running Colebrook to Simmons Mill Management Area (Simmons Pond/Swamp) to Quicksand Pond is predominately surrounded by open space and farmland, as is most of the land adjacent to the southerly running Dunderly Brook corridor which is a tributary of Briggs Marsh.

Riverine flooding can be exacerbated by constriction of river waters, particularly if large amounts of ice or debris pile up behind low-lying bridge decks or narrow bridge spans. However, while many roads in Little Compton have culverts to allow free-flow of waterways, there are no roadway bridges in Town. That being said, it is critical to conduct regular maintenance on culverts to ensure they do not get blocked with debris. In Wilbour Woods there is a small bridge which the Town is currently reconstructing to handle emergency vehicles for the purpose of public safety at the recreational complex and to access the pond for fire suppression.

❖ **Shallow Flooding (sheet flow, ponding)**

New development is subject to the State and Town's stormwater regulations, requiring bioretention basins, swales, dry wells, and/or other measures to capture and treat stormwater from streets, rooftops, and other impervious surfaces. However, as development in many areas of Town predate such requirements, a significant amount of stormwater runoff flows overland, some of which is handled by roadside ditches and some catch basins along State roadways.

During high precipitation events, runoff in excess of that managed by stormwater controls may accumulate in low-lying areas, such as floodplains, particularly the 100-year floodplain. As depicted in **Figure 4-11**, besides the floodplain along the Sakonnet River and the coastline, Little Compton has several inland areas within the 100-year floodplain which predominately align with the waterbodies described above. Most of the low-lying inland area adjacent the floodplain is not developed. **Some portion of the following inland roads and adjacent property are located within the SFHA (V or A flood zones):**

Town-Owned Roads	State-Owned Roads	Private Roads
• Amesbury Lane • Swamp Road • William Sisson Road	• Main Street • Meeting House Lane • Pottersville Road • Snell Road	• Quoquonset Lane • Rockbridge Drive • Rockbridge Road • Whistler Point Road

In addition, some portion of the following inland roads and adjacent property that are not located in the SFHA are also subject to flooding during significant precipitation events: south end of Town-owned John Dyer Road, and sections of State-owned East Main Road, Main Street, and Crandall Road.

Large amounts of impervious surfaces increase runoff amounts and decrease the lag time between the onset of rainfall and stream flooding. Man-made channels and incorrectly sized culverts may also constrict stream flow and increase flow velocities (FEMA. *Unit 1*, 1-7). Little Compton has minimal areas that meet that criteria. The **Business Zone** in Town is limited to the Adamsville area, north end of Long Highway, and the transfer station and cellular telephone tower complex off Amy Hart Path in the north; the Commons area in the center of Town; and the southwestern area of Sakonnet Point Road. Stormwater runoff in these areas can be problematic as portions of the storm drainage system is not adequate to handle significant precipitation events.

❖ **Dam Failure (Special Flood Hazard)**

According to the *2022 Annual Report to the Governor on the Activities of the Dam Safety Program*, there are eleven dams in Little Compton: one is classified as High Hazard; two are classified as Significant Hazard; and the other eight are classified as Low Hazard. However, as of March 4, 2024, RIDEM has indicated that because the Adamsville Dam spillway is located in Westport, Massachusetts and the failure inundation area will only impact property in Massachusetts, this Significant Hazard dam has been removed from Little Compton's list.

The following table was compiled based on information from the 2022 Annual Report supplemented by the technical references listed in the table, and by Advisory Committee and public input.

Table 4-5 Little Compton Dams (RIDEM. *2022 Annual Report*; Advisory Committee and public input)

Hazard Class	State ID	Dam Name	River/ Stream	Owner	Technical References
High Failure or mis-operation will result in a probable loss of human life.	485	Harold E Watson Reservoir <i>Functions as the City of Newport's storage reservoir (Total storage capacity 1,755± million gallons)</i>	Pachet Brook	City of Newport, Department of Utilities and Water Division	Watson, Harold E. Reservoir Inundation Study (2002) Watson, Harold E. Reservoir Dam-Visual Inspection/Evaluation Report (2013) Watson Reservoir Dam-Visual Inspection/ Evaluation Report (2019)
Significant Failure or mis-operation will likely not result in loss of human life, but will cause major economic loss, disruption of lifeline facilities, or impact other concerns detrimental to the public's health, safety, or welfare.	474	Simmons Pond	Colebrook	RIDEM	Simmons Pond Dam Inundation Study (2007) Dam Emergency Action Plan – Simmons Pond Dam (2014)
Low Failure or mis-operation will not likely result in loss of human life or cause major economic loss.	609	Simmons Pond #2	Colebrook	RIDEM	
	610	Simmons Pond #3	Colebrook	RIDEM	
	611	Simmons Pond #4	Colebrook	RIDEM	
	612	Simmons Pond #5	Colebrook	RIDEM	
	613	Simmons Pond #6	Colebrook	RIDEM	
	614	Simmons Pond #7	Colebrook	RIDEM	
	483	Sherer Pond	Unnamed Stream	Joseph Sherer	
	747	Sakonnet Golf Course Watering Hole	Long Pond Tributary	Sakonnet Golf Club	

Potential Impact from Dam Failure of High and Significant Hazard Dams:

As set forth in Rhode Island General Laws, Chapters 46-18 and 46-19, a dam owner has the responsibility for the safe operation of their dam, and is liable for the consequences of accidents or failures of the dam. As the condition of a dam is evolutionary in nature, dams should be inspected annual and monitored regularly including during high precipitation or seismic events. Emergency Action Plans (EPAs) should also be on file with RIEMA for all High and Significant Hazard Dams. EPAs are designed to notify the appropriate public officials of possible, impending, or actual failure of the dam in time to take remedial action to safeguard people and property. The Town is in the process of completing an EAP for the Watson Reservoir Dam and RIDEM is in the process of updating the Simmons Pond Dam EAP.

Harold E. Watson Reservoir Dam (High Hazard)

The Harold E. Watson Reservoir Dam was built in 1960 for the purpose of impounding water to augment the City of Newport's water supply. It is currently owned by the City of Newport, Department of Utilities and Water Division. The dam consists of a zoned earthen embankment that impounds water along the Pachet Brook. The Pachet Brook flows through the Town of Little Compton into Almy Creek in Tiverton, and eventually discharges to the Sakonnet River. Approximately 0.67 miles downstream of the dam the outflow channel passes under West Main Road (Route 77). The normal pool storage capacity is 4,910± acre-feet and the top of dam capacity is 7,860± acre-feet (GZA. 485, 1, 2).

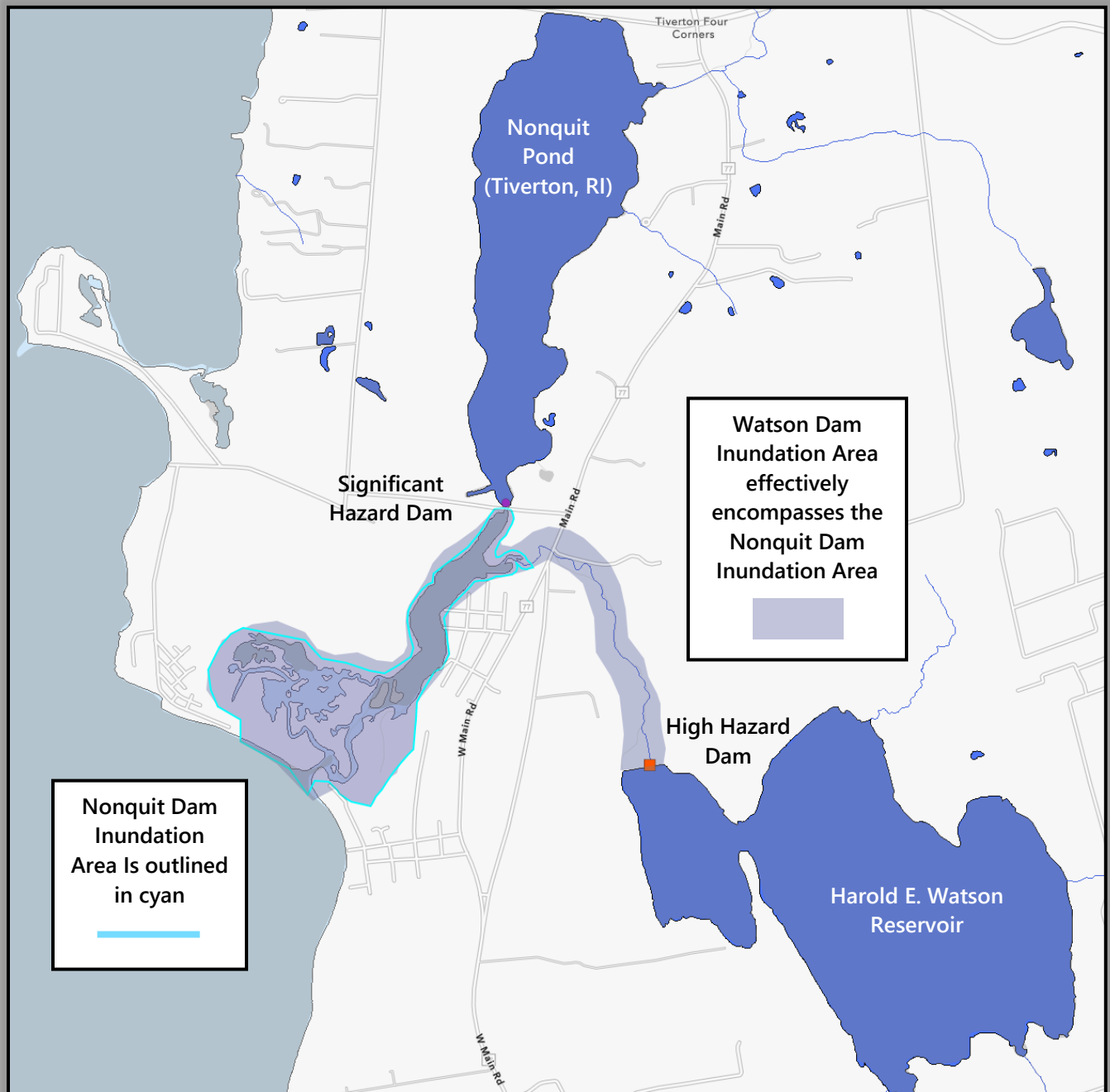
In 2002, to assist in evaluating the extent of flooding due to a theoretical dam failure, GZA performed a limited hydraulic analysis using the National Weather Service (NWS) Simplified Dam Break (SMPDBK) model. Based on the modeled scenario, the extent of flooding includes the woodlands along the Pachet Brook; residences near Pachet Brook along West Main Road (Route 77) and Brookside Drive in Tiverton; and the low lying wetlands at the mouth of Almy Creek. The downstream residential development adjacent to the Almy Creek, are likely high enough out of the floodplain that they will not be impacted by a dam break (GZA. 485, 3, 4). "A potential dam failure of Harold E. Watson Reservoir Dam would likely cause loss of one or more human lives, given the presence of multiple residences located downstream of the dam and adjacent to the banks of the Pachet Brook. Additionally, an Algonquin gas transmission line immediately downstream of the dam is vulnerable in the event of a hypothetical dam break" (GZA. 485, 4). The failure inundation areas have been depicted in **Figure 4-14** for the Watson Dam, and the Nonquit Dam which is located in Tiverton Rhode Island.

In October 2019 Pare Corporation conducted an assessment of the Watson Reservoir Dam based on available data and visual inspections. The general findings were that the Dam was "in *fair condition* with remnant stumps from recent clearing activity, toe drains requiring maintenance, areas of concrete deterioration, and other dam safety concerns" (Pare, 4). According to RIDEM, the dam rating of *Fair* is defined as a component that requires maintenance. The specific concerns were outlined in greater detail in the Report, as were recommendations for additional studies, maintenance, and repairs.

Figure 4-13
Watson
Reservoir Dam
(Pare. Cover)



Figure 4-14 Watson Reservoir Dam & Nonquit Dam (Tiverton, RI) Failure Inundation Areas
(Modified from RI Dam Safety ArcGIS)



Simmons Pond Dam (Significant Hazard)

The Simmons Pond Dam was built in 1778 for the purpose of recreation. It is currently owned by RIDEM. The dam consists of an earthen embankment structure with a drop inlet spillway that impounds water along Colebrook in the Town of Little Compton. Approximately 0.7 miles downstream of the dam, Colebrook flows through a small culvert under Amesbury Lane. Roughly 1.4 miles downstream Colebrook flows into Quicksand Pond which is tidal. The normal pool storage capacity is $61 \pm$ acre-feet and the top of dam capacity is $90 \pm$ acre-feet (GZA. 474, 1, 2).

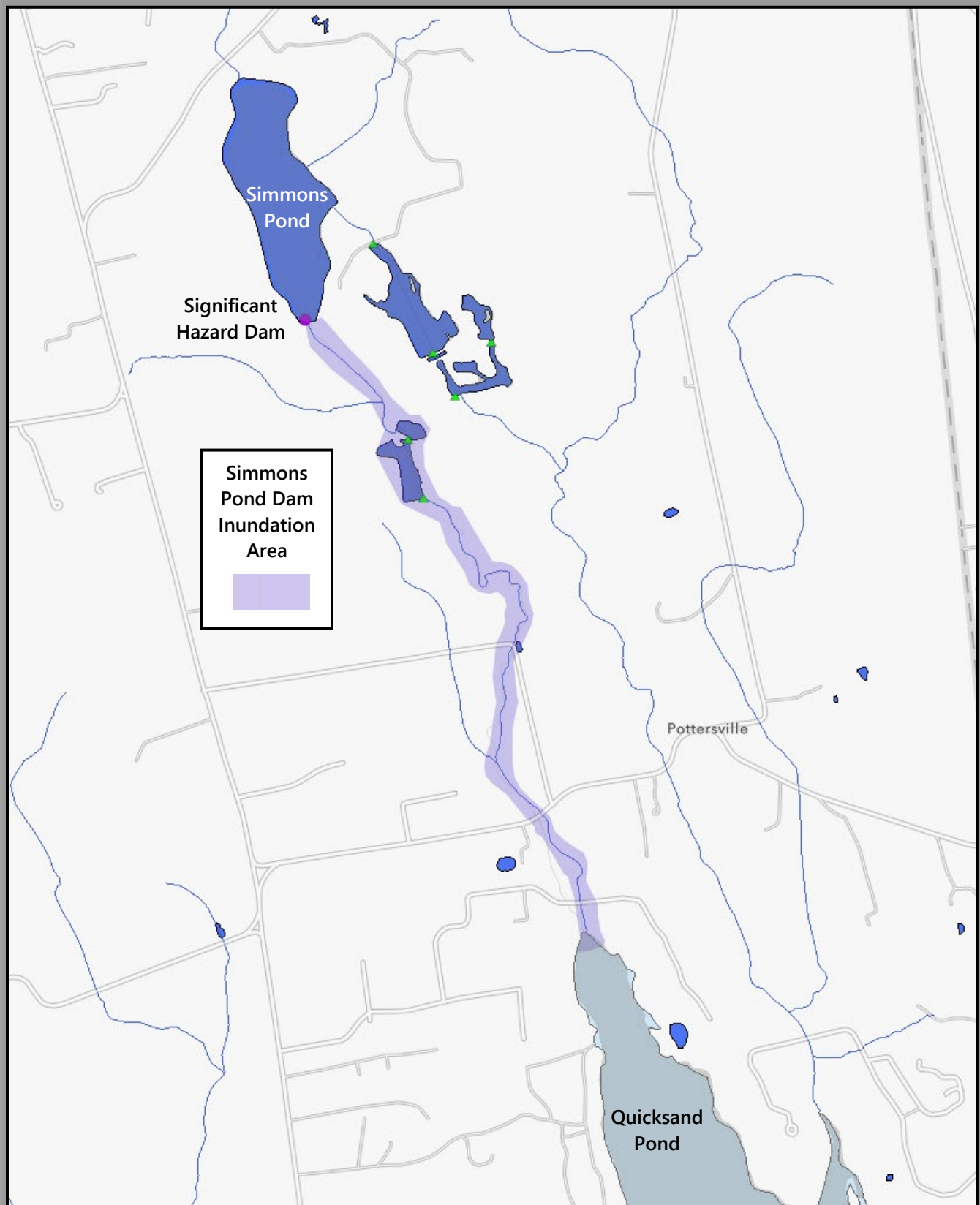
In 2007, to assist in evaluating the extent of flooding due to a theoretical dam failure, GZA performed a limited hydraulic analysis using the National Weather Service (NWS) Simplified Dam Break (SMPDBK) model. Based on the modeled scenario, flooding would pass along Colebrook and dissipate after entering Quicksand Pond. Dam failure may cause extensive damage to the dirt access road located on top of the dam and likely overtop Amesbury Lane and the adjacent private drive, Pottersville Road, and Quicksand Pond Road. The residential areas upstream of Pottersville Road and Amesbury Lane that are close to Colebrook, may experience shallow flooding. There are a total of seven dams associated with Simmons Pond. Failure of Simmons Pond Dam would likely result in overtopping two of the small dams, Simmons Dam #6 (613) and Simmons Dam #7 (614), which are located approximately 0.33 and 0.45 miles downstream, respectively, of Simmons Pond Dam (GZA. 474, 2-4). The failure inundation area has been depicted in **Figure 4-16** for the Simmons Pond Dam.

In 2014 EA Engineering, Science, and Technology completed a Dam Emergency Action Plan (EAP) for the – Simmons Pond Dam. The EAP contains notification procedures to safeguard people and properties along Colebrook in the event of a failure of Simmons Pond Dam. A list of nine property owners in Little Compton that should be notified in the event of a dam breach is included in the EAP (EA Engineering, Appendix G). In the 2022 Annual Dam Report, it notes that vegetation prohibited inspection and that no progress was made in addressing the inoperable low level outlet (RIDEM. 2022, 20).

Figure 4-15 Simmons Pond Dam (GZA. 474, 13)



Figure 4-16 Simmons Pond Dam Failure Inundation Area
(Modified from RI Dam Safety ArcGIS)



Previous Occurrences

❖ **Riverine and Shallow Flooding (overbank flooding, flash floods, sheet flow, ponding)**

As shown in **Table 4-6**, which was created from the NOAA|NCEI Storm Events Database, Little Compton regularly experiences precipitation events that result in localized flooding. Some of these flood events are considered **urban flooding** which refers to inundation of land or property in a built environment. "Urban flooding occurs when water flows into an urban area faster than it can be absorbed into the soil, conveyed in a stormwater system, or stored in a lake or reservoir. Increased development in the floodplain can increase the frequency of urban flooding because of the increase in pavement and therefore decrease in soil area for water to absorb into" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-113).

Along certain low-lying roadways, storm management is inadequate during high precipitation events resulting in roadway flooding. These roadways, some of which are Town-owned, and others that are State-owned or private, have been identified above in the **Location** subsection.

The Village of Adamsville, located in the northeast area of Little Compton, has a higher degree of impervious surface and has on a number of occasions experienced riverine and sheet flow flooding during high precipitation events. The Westport River West Branch has at times flooded over the roadway and into Gray's Mill Pond and adjoining properties. Mill Brook has also previously caused nuisance flooding, with the flood water generally receding in a day or two after the storm has passed. In 2022, RIDOT implemented improvements to the Main Street culvert which seem to have helped mitigate stormwater flooding in the immediate area.

In March of 2010, Rhode Island encountered the worst flooding in its recorded history on a number of the State's largest rivers. The damage from the 2010 flooding across Rhode Island resulted in a Presidential Major Disaster Declaration for the State; with property damage for Newport County estimated at \$3,520,000 (NOAA|NCEI. *Storm Events*). During the 2010 precipitation events, several lower lying areas in Little Compton flooded causing roadway blockage and damage as well as home and property damage. Several homes experienced basement flooding due to stormwater runoff, requiring the Fire Department to pump out the water. While the 2010 flooding was exceptional, according to the Fire Chief, over the past five years the Fire Department responded to 9 request to pump water from basements and about 35 water evacuations.

Although less frequent, flash floods have occurred in Little Compton on several occasions, including in 1997 and associated with the spring 2010 precipitation events. In August 1997 showers and thunderstorms produced intense rainfall amounts with a total of 5.4 inches reported in Little Compton. In March 2010, in the northeastern section of Town flash flooding occurred "where the Westport River west branch flowed over Adamsville Road into Gray's Mill Pond and Round Pond Road and other roadways throughout town known to be collectors of water during heavier rains quickly flooded and blocked traffic. Most roadways cleared enough for traffic flow within hours of the initial event" (Town of Little Compton RI. *Local*, 41).

As shown in **Figure 4-17**, high precipitation events, especially occurring in tandem, can cause ponds and streams, such as that at The Ponderosa property to overbank.

❖ **Dam Failure (Special Flood Hazard)**

Since 1889, Rhode Island has experienced 111 dam incidents (e.g. embankment erosion, vegetative growth, structural deterioration, inflow flood-hydrologic event); seven of which resulted in some degree of breach failure (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-49). Although there are no records of dam breach having occurred in Little Compton, the historic spring flooding in 2010 did cause several Rhode Island dams to overtop their embankments, and dams in Hopkinton, Exeter, and South Kingstown did breach (Benson).

More recently, a small earthen dam in Richmond, Rhode Island failed during the December 19, 2023 storm. The dam, located on The Nature Conservancy's property at the Beaver River Preserve was built in the 1800s and likely powered a downstream grist mill. The estimated 2 million gallons of water broke through part of the dam inundating the riverbed and flooding two roads downstream of Beaver River. Fortunately the failure caused minimal damage (Cronin).



Figure 4-17 Flooding at The Ponderosa

Photo Credits: Abigail Brooks

The precipitation event beginning on January 9, 2024, dropped 3 to 4 inches of rain across Rhode Island, melting much of the 2 to 8 inches of snow accumulation (Landeck). This produced significant flooding in various low-lying areas throughout Little Compton. According to the President of the Sakonnet Preservation Association, The Ponderosa property on the north side of Meeting House Lane was flooded. The pond on the property overflowed its embankment, possibly due to the culverts under Meeting House Lane being clogged with debris and sediment, and flooded the parking area as well as portions of the access drive and meadow across the entire southern edge of the pond to the western boundary.

Table 4-6 Flood, Flash Flood, Heavy Rain Events – Newport County 1996-January 9, 2024

(NOAA|NCEI. *Storm Events Database*; and for the January 9, 2024 entry the Providence Journal)

Begin Date	Key Event Information (no deaths or injuries reported for any of these events)	Property Damage Estimate
Refer to list in next column	Note: the following dates have been identified on the NCEI database as heavy rain events but are NOT listed as flood events. This does not necessarily mean that local flooding didn't occur, but rather that it was not recorded as part of this database. 09/18/1996; 10/08/1996; 10/20/1996; 12/07/1996; 08/29/1997; 11/01/1997; 02/18/1998; 02/23/1998; 03/08/1998; 04/01/1998; 05/09/1998; 06/13/1998; 09/22/1998; 10/08/1998; 01/03/1999; 05/23/1999; 09/10/1999; 09/16/1999; 03/11/2000; 11/10/2000; 03/30/2001; 09/22/2002; 03/29/2003; 04/11/2003	-----
08/29/1997	Event: Flash Flood General Description: A redeveloping area of showers and thunderstorms produced intense rainfall amounts of three to nearly five and one-half inches in one to three hours in parts of Washington and Newport Counties. In Middletown, Bailey Brook rose out of its banks and flooded a section of Forest Avenue. In Newport, the rainfall total was 3.73 inches and 2.29 inches of rain fell in one hour. A total of 5.40 inches of rain was reported in Little Compton.	-----
02/18/1998	Event: Flash Flood General Description: Strong northeast winds gusting to 30 to 40 mph occurred across the south portion of Narragansett Bay and along the south coast from Little Compton to Westerly. Rainfall totals for this storm were in the range from 2.0 to 3.5 inches during a 12-hour period. In Little Compton, a lightning bolt struck in the center of town resulting in an estimated 5 to 10 thousand dollars damage to a house. In Tiverton, fire crews pumped out many basements.	-----
06/07/2006	Event: Flood General Description: A late season coastal storm brought heavy rain to Rhode Island, which resulted in widespread flooding in Providence County as well as near Narragansett Bay. Storm total rainfall averaged 2 to 4 inches.	10K

Begin Date	Key Event Information (no deaths or injuries reported for any of these events)	Property Damage Estimate
03/02/2007	Event: Flood General Description: Snow quickly changed to heavy rain as the storm reached Rhode Island, when milder air was drawn into the region. Rainfall totals of 2 to 3 inches caused widespread urban and small stream flooding. Several roads were closed due to flooding in Portsmouth, Newport, and Little Compton.	5K
03/08/2008	Event: Flood General Description: A powerful low pressure system tracked through eastern New York spreading heavy rain and strong winds across Southern New England. Heavy rain coinciding with spring snowmelt contributed to river flooding, especially along the Connecticut River. In addition, rainfall totals of two to three inches resulted in areal flooding across much of the region. In coastal areas, high astronomical tides combined with rough seas and storm surge to produce minor coastal flooding.	10K
07/01/2009	Event: Flood General Description: A stationary front stretched from Hartford, Connecticut across northern Rhode Island to southeast Massachusetts combined with an upper level disturbance to produce showers and thunderstorms across southern New England.	30K
03/30/2010	Event: Flood General Description: A low pressure system sat just south of Long Island for two days, bringing heavy rain to much of Southern New England during that time. A persistent southerly low level jet brought very moist air into the area, which resulted in high rainfall rates. This event followed a heavy rainfall and record flooding event in mid-March as well as a second lesser rain event about a week prior. Rivers across much of Massachusetts and Rhode Island were still high from those events. All of these factors led to a second record rainfall and flooding event. In hardest hit Rhode Island, two day rainfall totals ranged from five to ten inches. River and areal flooding resulted in millions of dollars of damage across Rhode Island, with numerous homes, businesses, and people affected. A portion of Interstate 95 was closed for two days after the Pawtuxet River inundated the highway with up to three feet of water, and Amtrak service through the state were suspended for several days because portions of the tracks were under up to 2 ft of water. The Governor's office estimated that tens of thousands of properties were impacted by the flooding and about 4,000 workers were affected when the businesses they worked in were closed during and after the flooding. Numerous schools and many businesses, as well as the state government were closed for at least a day because of the flooding. President Obama issued a federal disaster declaration, encompassing both the mid-March storm and this storm, for the entire state of Rhode Island.	3.52M
07/28/2012	Event: Flash Flood General Description: Several areas of low pressure traveled along a stationary front stalled across Southern New England producing showers and a few thunderstorms. This resulted in very heavy rain falling in these showers and thunderstorms. Many locations received up to two to three inches in less than an hour. This resulted in flash flooding, particularly in more urban areas.	5K
08/15/2012	Event: Flood General Description: Showers and thunderstorms developed in a warm, moist atmosphere. Cold air aloft contributed to an unstable environment resulting in severe thunderstorms.	-----
06/07/2013	Event: Flood General Description: The remnants of Tropical Storm Andrea tracked across southeastern Massachusetts bringing heavy rain (3-5 inches) to much of southern New England. This resulted in significant urban flooding, particularly across eastern Massachusetts and Rhode Island, as well as river and small stream flooding. It also contributed to record high rainfall across the area for the month of June.	15K
07/16/2014	Event: Flash Flood General Description: Showers and thunderstorms developed during the morning as a slow moving frontal boundary crossed southern New England. A tropical airmass was in place which led to torrential rainfall and flash flooding.	5K

Begin Date	Key Event Information (no deaths or injuries reported for any of these events)	Property Damage Estimate
07/14/2020	Event: Flood/Flash Flood General Description: A negatively tilted trough with cold air aloft moved into southern New England, producing severe thunderstorms and localized flooding during the afternoon.	20K
09/02/2021	Event: Flash Flood General Description: On Sept. 1, Tropical Depression Ida tracked northeastward from the central Appalachians and arrived in southern New England late in the day as a remnant low. The low moved rather swiftly across southern New England, reaching the coastal waters east of MA by 7 AM EDT on Sept. 2. Heavy rain of 4.0 to more than 8.0 inches fell across Rhode Island, with the most intense rain falling from the evening on the 1st to the early morning on the 2nd. In Portsmouth, a CoCoRAHS observer recorded 8.32 inches of rain for the event. There was widespread street flooding and some flash flooding in Rhode Island.	54K
01/09/2024 <i>Not yet on the NOAA/NCEI Database</i>	Event: Flood General Description: As reported by the Providence Journal, the storm dropped 3 to 4 inches of rain across Rhode Island – adding to the 2 to 8-inch snowfall occurring several days earlier. Much of the snowfall melted in the rain, adding at least another inch of water to the total amount of water draining toward the rivers (Landeck).	-----

Climate Change Impacts

In their 2017 Climate Science Special Report, the U.S. Global Change Research Program states that, “Changes in the characteristics of extreme events are particularly important for human safety, infrastructure, agriculture, water quality and quantity, and natural ecosystems. Heavy rainfall is increasing in intensity and frequency across the United States and globally and is expected to continue to increase. The largest observed changes in the United States have occurred in the Northeast” (USGCRP, Executive Summary).

As reported by Climate Central, “More than 70% of the planet’s surface is water, and as the world warms, more water evaporates from oceans, lakes, and soils. Every 1°F rise also allows the atmosphere to hold 4% more water vapor” (Climate Central. *POURING*). Climate warming, predicted to increase the intensity and frequency of storm events, translates to increases in flooding. The problem will be exacerbated as winters become wetter saturating the ground prior to heavier rainfall periods. Increased construction within floodplains, destroying these natural protective systems, will also yield greater risks from flooding. Curbing humanity’s greenhouse gas emissions would limit the increase in downpours. Scenarios modeled in the 2017 Climate Science Special Report suggest that, “If greenhouse emissions continue unchecked, the frequency of a once-in-five-years rain event could increase two-to-threefold by late century” (Climate Central. *POURING*).

In addition to the increased frequency and intensity of precipitation events, climate change impacts also include global warming-driven sea level rise. The combination of these effects exacerbates the risk to low lying coastal flood zones, discussed in the next subsection.

Figure 4-18 “Shows the percent increases in the amount of precipitation falling in daily events that exceed the 99th percentile of all non-zero precipitation days (top 1 percent of all daily precipitation events) from 1958 to 2016 for each region of the United States. The number in each black circle is the percent change over the entire period (1958–2016)” (US Climate Resilience Toolkit).

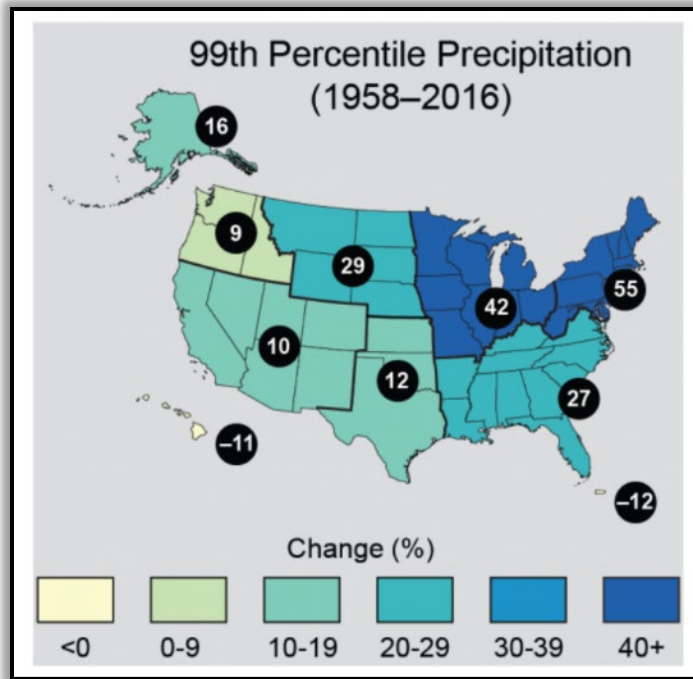


Figure 4-18
Observed Change in
Heavy Precipitation
(US Climate Resilience
Toolkit)

Probability of Future Events

❖ **Riverine and Shallow Flooding (overbank flooding, flash floods, sheet flow, ponding)**

According to FEMA's reoccurrence assessment, areas within the Special Flood Hazard Area (100-year floodplain), as identified on **Figure 4-11**, have a 1% chance of being flooded in any given year. Based on previous occurrences and climate change projections, the RI-SHMP has assessed flooding as **Highly Likely** to occur in Newport County with a greater than 90% annual probability (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-122). The Advisory Committee concurs that this is a reasonable assessment for Little Compton.

❖ **Dam Failure (Special Flood Hazard)**

While eight of the ten dams in Little Compton have been identified by RIDEM as low hazard, meaning should they fail the probability of loss of life or significant property damage is low, the structural integrity of the other two dams which have higher RIDEM hazard ratings, is unclear.

Although Rhode Island's Rules and Regulations for Dam Safety (250-RICR-130-05-1) require annual inspections of High Hazard and Significant Hazard dams, the **Harold E Watson Reservoir Dam (hazard class high)** appears to have been most recently visually inspected in 2019, and based on a notation in the 2013 Emergency Action Plan (EAP) for the **Simmons Pond Dam (hazard class significant)**, it was last inspected prior to 2012.

Without a clear understanding of the structural condition of the dams, it is difficult to address the probability of failure. The probability increases with increased major flood events, and decreases with preventative measures, such as routine inspection, maintenance, repair, and proper operation.

The RI-SHMP, has assessed dam failure for Newport County as having the **Potential** to occur with between 1% and 49.9% annual probability (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-52). While the Advisory Committee feels this is a reasonable assessment for Little Compton, the Committee also recognizes the importance of RIDEM inspecting the one high and two significant classified dams in order to better assess their potential for failure.



4.3.1.2 Coastal Flooding including Storm Surge

Description and Extent

Coastal flooding occurs when surges of waves inundate the shores of bays, tidally influenced rivers, streams, and inlets. These conditions are produced by tropical cyclones (tropical storms and hurricanes) during the summer and fall as well as Nor'easters during the fall, winter, and spring (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-113). **Storm surge is being addressed in this and the following subsections due to the resultant hazard of coastal flooding and coastal erosion. Additional information about the winds associated with Tropical Cyclones and Nor'easters that cause storm surge, will be addressed in Subsection 4.3.2.**

Storm Surge:

According to the National Hurricane Center, storm surge is an abnormal rise of coastal water generated by a storm, over and above the predicted astronomical tides. The rise in water level occurs primarily due to winds pushing water toward the shore (NOAA/NHC. *Storm Surge*). More specifically, "Winds blowing over a water surface generate horizontal surface currents flowing in the general direction of the wind. These surface currents in turn create subsurface currents that, depending on the intensity and forward speed of the hurricane or Nor'easter, may extend from one (1) to several hundred feet below the surface. If these currents are in the onshore direction, water begins to pile up as it is impeded by the shoaling (shallow) continental shelf causing the water surface to rise. This dome of water will increase shoreward until it reaches a maximum height at the shoreline or at some distance inland" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-219).

In Rhode Island, storm surge heights have been observed from a few feet higher than normal tides during Nor'easters to more than 10 feet during hurricanes. "The counterclockwise rotation of the hurricane's wind field in combination with the forward motion of the hurricane, typically causes the highest surge levels to occur to the right of the hurricane's forward track. This phenomenon has been observed in regions where the shoreline is typical straight, not fragmented by large inlets and bays, and when a hurricane travels generally perpendicular to the shore. In Little Compton, the increased wind stress from the rotational wind field has a large effect on the level of surge. The contribution to surge generation from the forward motion of the storm can be greater than the contribution made by an increase in hurricane intensity" (Town of Little Compton RI. *Local*, 18). As Little Compton's shoreline faces south, storms passing to the west raise the highest storm surges along the Town's coastline.

The magnitude of storm surge within a coastal basin is governed by the meteorological parameters of the storm event and the physical characteristics of the basin. Rather than characterize the extent of storm surge itself, it is more functional to characterize the extent of the event causing the surge. As outlined in the RI-SHMP (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-219), the meteorological aspects of storm surge include:

- Hurricane size – measured by the radius of the maximum winds (measured from the center of the hurricane to the location of the highest wind speeds within the storm; this radius may vary from as little as 4 miles to as much as 50 miles)
- Hurricane intensity – measured by sea level pressure and maximum surface wind speeds at the storm center
- Hurricane path, or forward track of the storm
- Hurricane forward speed

Storm surge may push sea water up coastal rivers and inlets, blocking the downstream flow of inland runoff; inundate large swaths of developed and forested land with saltwater or freshwater; damage coastal habitats; damage natural and manmade structures; erode beach material; carry debris out to sea; strand residents in flooded areas and hamper rescue efforts by cutting off escape routes; and pose a serious threat of death by drowning (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-113).

When storm surge coincides with normal high tide or higher king tides, coastal flooding can be exacerbated. In the future, as sea levels continue to rise, the inundation area subject to coastal flooding and storm surge will continue to move inland.

NOAA tracks coastal flooding from tide gauges, such as the ones in Newport and Providence, Rhode Island, which continuously measure water levels. Based on Google Maps, as the crow flies, the Newport tide gauge located near Coasters Harbor Island is approximately 7.5 miles northwest of Sakonnet Point. The data collected measures the height of the tides, tracks long-term local relative sea level rise (SLR), and is used to detect coastal floods. Warnings of coastal storms usually occur several days before impact allowing areas vulnerable to storm surge to prepare and evacuate if necessary. It is important to note that as the Newport tide gauge is located well within the harbor, the dynamics of storm surge combined with astronomical tides will be different from the dynamics observed at Sakonnet point.

High Tide Flooding:

High tides may cause *nuisance* coastal flooding. “Tides are long-period waves that roll around the planet as the ocean is ‘pulled’ back and forth by the gravitational pull of the moon and the sun as these bodies interact with the Earth in their monthly and yearly orbits” (NOAA. *What*). “Unlike a 24-hour solar day, a lunar day lasts 24 hours and 50 minutes. This occurs because the moon revolves around the Earth in the same direction that the Earth is rotating on its axis. Therefore, it takes the Earth an extra 50 minutes to ‘catch up’ to the moon. Since the Earth rotates through two tidal ‘bulges’ every lunar day, we experience two high and two low tides every 24 hours and 50 minutes. High tides occur 12 hours and 25 minutes apart, taking six hours and 12.5 minutes for the water at the shore to go from high to low, and then from low to high” (NOAA. *Tides and Water*).

According to Bryan Oakley, professor of environmental geoscience at Eastern Connecticut State University, sea level isn’t the same every day, with spring tides a foot or two above an average high tide, and king tides even higher (Sherman). “King tides occur during a perigean (when Moon is closest to Earth) spring tide (full and new moon); in other words, a full or new moon must co-occur when the Moon is closest to Earth in its elliptical orbit. Due to their astronomical nature, king tides are regular and predictable events, reoccurring multiple times a year” (North Carolina).

“During extremely high tides, the sea literally spills onto land in some locations, inundating low-lying areas with seawater until high tide has passed. Because this flooding causes public inconveniences such as road closures and overwhelmed storm drains, the events were initially called nuisance flooding. To help people understand the cause of these events, they are now referred to as high-tide floods. Over longer periods, chronic flooding can strain city budgets and compromise infrastructure. As global sea level rises, so will the frequency and depth of high-tide flooding” (US Climate Resilience Toolkit. *High-Tide*).

Location

Coastal flooding is a particular concern to Little Compton because of its extensive southern and western shoreline and because some of the coastal areas of Town are more densely populated. There are only a few elevated shoreline areas along the Sakonnet River roughly between Reservation Road and Old Bull Lane, between Taylors Lane and Indian Hill Road, and from a little south of Patten Drive to Town Way.

Figure 4-19 Tropical storm waves roll into Little Compton near Warren’s Point (March 2017)

Photo Credit: Rhody Beat

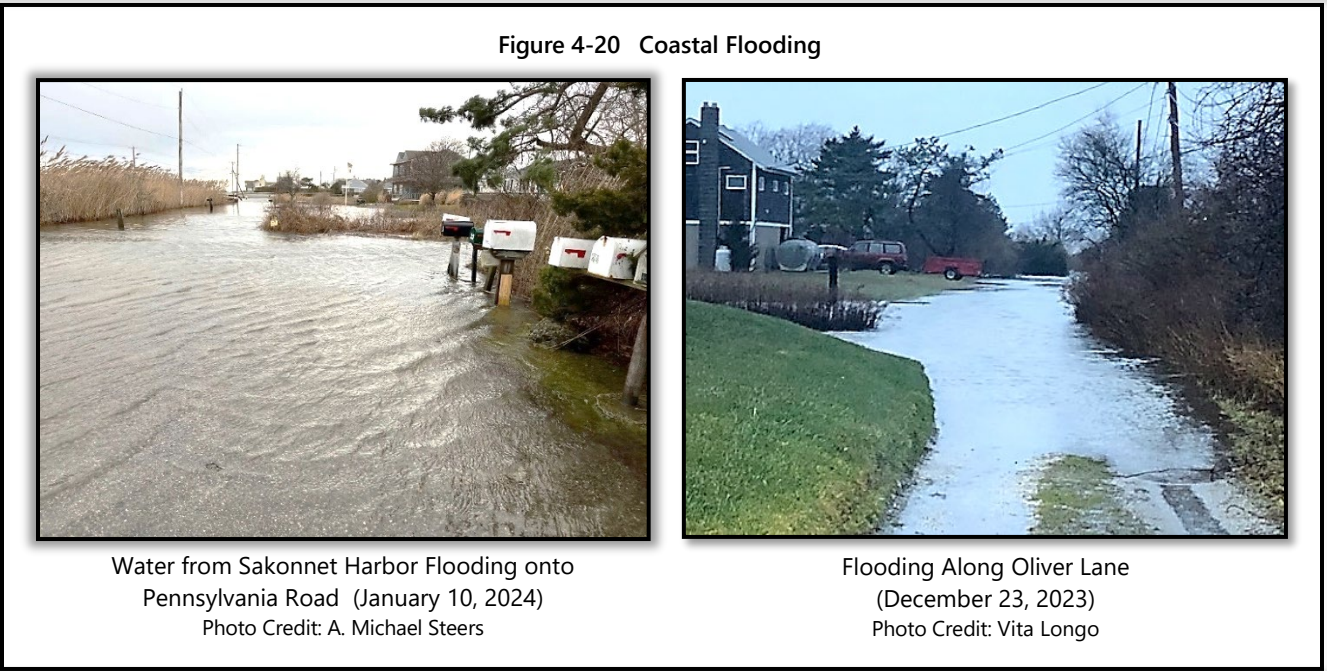


During high precipitation and/or high wind events (due to storm surge), low-lying coastal property is exposed to the threat of coastal flooding. **Some portion of the following coastal roads and adjacent property are located within the SFHA (V or A flood zones):**

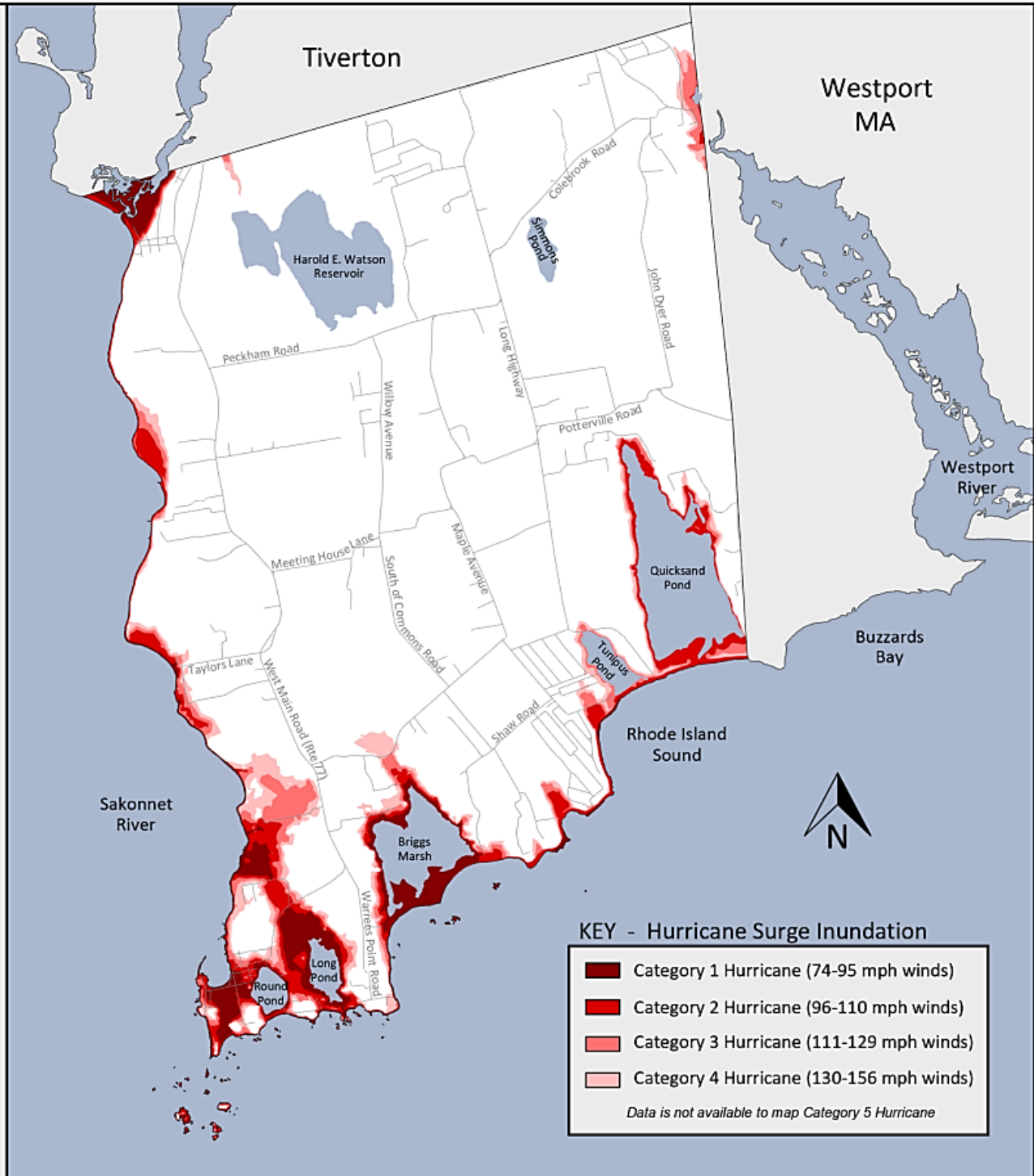
Town-Owned Roads	State-Owned Roads	Private Roads			
John Sisson Road	Sakonnet Point Road	Bailey's Ledge Rd	Kansas Road	Ohio Road	Rhode Island Rd
Shaw Road		Beach Drive	Kempton Place	Oliver Lane	Round Pond Rd
South Shore Road		Beach Street	Little Pond Cove Rd	Pennsylvania Road	Taylor's Lane N
Town Way		Bluff Head Road	Maryland Road	Pleasant View Drive	Taylor's Lane S
		California Road	Milton Road	Point Street	Tuniper Lane N
		Carey Lane	Minnesota Road	Pond View Drive	Tuniper Lane S
		Francis Lane	Montana Road	Quaker Hill Farm Rd	Washington Rd
		Goodrich Lane	Nevada Road	Reservation Road	

The areas most susceptible to storm surge are those in the Velocity Zone (**Figure 4-11**) and those impacted by a Category 1 or higher hurricane. **Figure 4-21** depicts the areas of Little Compton susceptible to storm surge from Category 1-4 hurricanes and has been included at a larger scale in **Appendix 4-2**. Data is not available to map Category 5 hurricane inundation. Storm surge heights in Little Compton have ranged from a few feet higher than normal tides during Nor'easters to substantial heights during hurricanes. For the Great New England Hurricane of 1938, the Newport tide gauge recorded storm surge of 9.46 feet above MHHW (NOAA. *Tides & Currents*).

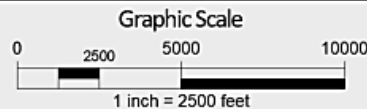
Along certain low-lying roadways, storm management is inadequate during high precipitation events resulting in roadway flooding. **However, many of the roadways which have flood issues are private and therefore not under the Town's jurisdiction.** For example, as shown in **Figure 4-20**, water from the Sakonnet Harbor often floods sections of Pennsylvania Road (private), sometimes blocking access. Another example is in the area of Oliver Lane (private) which is often inundated, sometimes to the extent that access is blocked due to the combined impact of stormwater runoff along Town Way and Almy Creek overbanking. Almy Creek is located in the northwestern section of Town and flows into the tidally influenced Sakonnet River. Winter precipitation events can cause sections of Town Way and Oliver Lane to freeze over making vehicle passage dangerous, if not impossible. The Town is in the process of implementing improvements, including stormwater management, to Town Way which is a Town-owned road.



Hurricane Surge Inundation Areas



This map is not the product of a Professional Land Survey. It was created for the Town of Little Compton for general reference, informational, planning or guidance use, and is not a legally authorized source as to location of natural or manmade features. Proper interpretation of this map may require the assistance of appropriate professional services. The Town of Little Compton makes no warranty, express or implied, related to the spatial accuracy, reliability, completeness, or currentness of this map.



May 2024

Source: RIGIS

Figure 4-21

Kim Jacobs, Civil Engineer & Resilience Planning Consultant

Previous Occurrences

As shown in **Table 4-7**, which was created from the NOAA|NCEI Storm Events Database, incidents of coastal flooding since 1996 include both minor and significant coastal flooding. Superstorm Sandy, a hybrid storm with both tropical and extra-tropical characteristics, hit Rhode Island in October 2012. Coastal flooding from the storm caused damage to Little Compton's beaches and some adjacent roadways. South Shore Beach was reduced to cobble and rocks after Superstorm Sandy washed most of the sand away, and a portion of Round Pond Road was submerged and damaged due to a blocked culvert (NOAA|NCEI. *Storm Events Database*). Sections of Washington Road were also flooded during the storm event.

The impacts associated with coastal flooding and storm surge are further identified in **Table 4-13**, which lists tropical depressions/storms and hurricanes that have impacted the region. Little Compton experiences the greatest extent of coastal flooding from storm surge associated with high wind and hurricane events. The two hurricanes with the largest storm surge in Rhode Island were the Hurricane of 1938 (15 feet) and Hurricane Carol of 1954 (14 feet). Both of these resulted in widespread destruction in Little Compton.

The areas of Town most vulnerable to storm surge are the western and southern coastlines. The southern coastline is on the Rhode Island Sound which opens into the Atlantic Ocean. The western shoreline is along the Sakonnet River which is a tidal strait that flows approximately 14 miles between Mount Hope Bay and the Rhode Island Sound (New England). Round Pond Road, a private road near the south shore, has periodically been flooded with up to two feet of water due to its proximity to Round Pond and the ocean. During severe storms, South Shore Beach has come close to breaching into Tunipus Pond. On various occasions, properties within the Velocity Zone (**Figure 4-11**) have been known to experience storm-induced wave action and coastal flooding. "There are a few areas in the Town that could have access cut off due to inundation of low-lying roadways. These areas include Sakonnet Harbor, Round Pond, Indian Rock Acres, and the Town's Northwest coastline. Historically Round Pond has been the only area that has had access cut off due to flooding, while the other locations have had nominal flooding which did not block access for any significant period of time" (Town of Little Compton RI. *Comprehensive*, 111).

Coastal flooding can also occur as a result of snow melt from significant winter storms, such as those identified in **Table 4-15**.

Figure 4-22 Storm Surge Impacts from December 18, 2023 Event



Staircase washed up on LCACT Ratcliff Property
(Oliver Lane) Photo Credit: Randy Waterman



Sakonnet Point Breakwater Storm Damage
Photo Credit: Chris Brady

Table 4-7 Coastal Flooding Events - Newport County 1996-January 9, 2024

(NOAA|NCEI. *Storm Events Database*; and for the January 9, 2024 entry the Providence Journal)

Begin Date	Key Event Information (no deaths or injuries reported for any of these events)	Property Damage Estimate
01/10/1997	Event: Coastal Flood General Description: A combination of a new-moon high tide and southeast winds that became southwest and gusted to 40 to 50 mph resulted in a storm tidal surge which reached 2 to 4 feet on Narragansett and Mount Hope Bays. In Newport, where high tide occurred at 8:21 AM, two and one-half feet of water was reported on streets and there was basement flooding. In Tiverton and Portsmouth, the tide covered parts of several roads and parking lots. Overall, the flooding was considered minor and there was no structural damage or road washouts.	-----
10/28/2006	Event: Coastal Flood General Description: Low pressure intensified as it tracked from the mid-Atlantic states to New England. This system brought damaging winds to much of central and southern Rhode Island, where trained spotters and amateur radio operators reported many downed trees and power lines. Wind gusts were estimated near 60 mph on Block Island. About 10,200 customers were left without power throughout the state, as reported by the media.	5K
04/15/2007	Event: Coastal Flood General Description: An unusually strong and slow moving coastal storm for mid-April tracked to western Long Island Sound on April 16th before weakening slowly and drifting offshore. This storm brought a variety of impacts, including damaging winds in excess of 60 mph, widespread river and stream flooding, and significant coastal flooding through several high tide cycles. East to northeast winds gusted as high as 60 mph. There were widespread reports of downed trees, large branches, and power lines, especially in southern Rhode Island and as far inland as Providence. Rainfall totals of 3 to 5 inches, combined with wet antecedent conditions, resulted in widespread river and stream flooding, as well as significant flooding of urban areas. The highest rainfall total reported was 5.00 inches in Little Compton. Minor to moderate coastal flooding occurred along the coastline of Rhode Island through several high tide cycles, due to the combination of strong onshore winds, high seas, and astronomically high tides.	30K
09/03/2010	Event: Coastal Flood General Description: Tropical Storm Earl made its closest pass to Southern New England the morning of September 4th, passing 98 miles to the southeast of Nantucket Island. High surf induced by Earl resulted in minor coastal flooding in Newport, RI and Nantucket, MA.	-----
10/29/2012	Event: Coastal Flood General Description: Superstorm Sandy, a hybrid storm with both tropical and extra-tropical characteristics, brought high winds and coastal flooding to southern New England. Easterly winds gusted to 55 to 65 mph along the eastern Massachusetts coast and along the I-95 corridor in southeast Massachusetts and Rhode Island; and 70 to 80 mph along the southeast Massachusetts and Rhode Island coasts. In general, moderate coastal flooding occurred along the Massachusetts coastline, and major coastal flooding impacted the Rhode Island coastline. The storm surge was generally 2.5 to 4.5 feet along the east coast of Massachusetts, but peaked late Monday afternoon in between high tide cycles. Seas built to between 20 and 25 feet Monday afternoon and evening just off the Massachusetts east coast. Along the south coast, the storm surge was 4 to 6 feet and seas from 30 to a little over 35 feet were observed in the outer coastal waters. The very large waves on top of the storm surge caused destructive coastal flooding along stretches of the Rhode Island exposed south coast. In Southern New England, Rhode Island was hardest hit. A peak wind gust of 86 mph occurred in Westerly, and nearly the entire Rhode Island shoreline experienced moderate to major coastal flooding. Numerous power outages occurred with winds gusting to 60 mph over the interior and to 80+ mph along the south coast. Major coastal flooding struck the Rhode Island ocean exposed south coast during the Monday evening high tide. This storm tide, especially destructive across shorelines in Westerly, Charlestown, South Kingstown, Narragansett, and Block Island, rivaled the impact from Hurricane Bob in 1991.	3M

Begin Date	Key Event Information (no deaths or injuries reported for any of these events)	Property Damage Estimate
10/29/2012 <i>continued</i>	While Newport County's beaches didn't experience the same devastation as Washington County's, Superstorm Sandy affected the coastline there as well. South Shore Beach in Little Compton was reduced to cobble and rocks after Sandy washed most, if not all the sand away. Round Pond Road was damaged as a result of a blockage in the culvert that runs under it connecting the pond to Sakonnet Harbor. While the blockage was cleared, at one point the roadway was submerged.	
08/13/2014	Event: Coastal Flood General Description: An area of low pressure over New York City lifted northeast across Southern New England. This worked together with a warm humid airmass to produce heavy downpours.	-----
12/23/2022	Event: Coastal Flood General Description: The storm produced damaging southeast to south winds across much of southern New England and minor to moderate coastal flooding the east and south coasts. Two to 3.5 inches of rain fell across much of RI and interior MA.	2K
12/18/2023	Event: Coastal Flood General Description: A strong storm system moved up the Atlantic coast bringing strong southerly winds and coastal flooding to southern New England. This was a very impactful storm flooding roads, closing schools, knocking out power to 300,000 across MA, cancelling flights, and killing one man in southern New England.	-----
01/09/2024 <i>Not yet on the NOAA/NCEI Database</i>	Event: Coastal Flood General Description: As reported by the Providence Journal, the storm dropped 3 to 4 inches of rain across Rhode Island – adding to the 2 to 8-inch snowfall occurring several days earlier. Much of the snowfall melted in the rain,, adding at least another inch of water to the total amount of water draining toward the rivers (Landeck).	-----

High Tide Flooding along Little Compton Coastline:

Little Compton has some low-lying coastal areas which regularly experience high-tide flooding. These include sections adjacent Sakonnet Harbor as well as the northern section of Oliver Lane which floods predominately due to overtopping of Almy Creek. During king tides, waves easily breach the Tunipus cut at South Shore Beach allowing coastal water into Tunipus Pond.



Figure 4-23 King Tide Flooding Tunipus cut at South Shore Beach (Nov 6, 2021)

Photo Credit: MyCoastRI – Zachary Miller

Repetitive Loss:

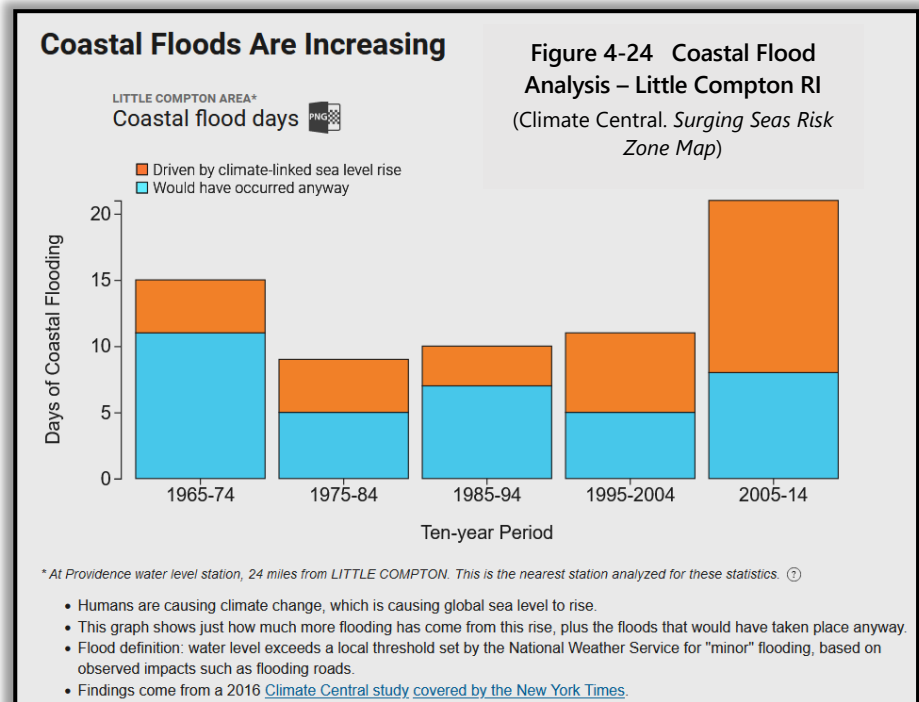
As of February 19, 2024, the National Flood Insurance Program (NFIP) does not list any Repetitive Loss (RL) or Severe Repetitive Loss (SRL) properties in Little Compton. This suggests the Town has successfully implemented a pragmatic construction strategy within higher flood risk areas. A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. Additional information on FEMA Flood Zones, Repetitive and Severe Repetitive Loss Properties, and the National Flood Insurance Program is provided in **Subsection 4.4.2.1**.

Climate Change Impacts

As discussed in **Subsection 4.1.2**, the level of the sea is rising. The Newport Tide Gauge has documented that the relative local sea level has risen over 10 inches since 1930 (CRMC. *Shoreline Change SAMP*, 2-3). Because greenhouse gas emissions continue to increase, it is expected that this trend will accelerate in the coming decades. In **Figure 4-24**, Climate Central highlights the increasing trend of coastal flooding being driven by climate-linked sea level rise.

The EPA recognizes that, "Climate change threatens coastal areas, which are already stressed by human activity, pollution, invasive species, and storms" (EPA. *Climate Impacts*). Sea level rise will impact development along the coast and could erode and inundate coastal ecosystems and eliminate wetlands. As the sea level rises, high tide flooding will become more destructive. "Coastal areas are also vulnerable to increases in the intensity of storm surge and heavy precipitation. Storm surges flood low-lying areas, damage property, disrupt transportation systems, destroy habitat, and threaten human health and safety" (EPA. *Climate Impacts on Coastal Areas*). Additional general information associated with the impacts of sea level rise (SLR) is provided in **Subsection 4.1.2**.

"According to the National Climate Assessment, coastal flooding in the northeast has increased due to a rise in sea level of around one foot since 1900. And in the future, if we continue to emit greenhouse gases, **global sea levels** are expected to rise one to four feet by 2100. Specifically in the coastal Northeast, due to the natural sinking of land, sea levels are likely to rise even **higher** than the global average. A sea level rise of two feet would more than triple the frequency of coastal flooding across the Northeast, without any change in storms" (Di Liberto).



Probability of Future Events

Flooding is the most prevalent and frequent natural hazard that impacts Rhode Island. As a low-lying community with roughly 15 miles of shoreline, coastal flooding is highly probable and may have serious consequences for the Town of Little Compton. The RI-SHMP has assessed coastal flooding as **Highly Likely** (greater than 90% annual probability) to occur in Newport County (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-122) and the Advisory Committee concurs with this assessment for Little Compton.

Climate change and sea level rise will further exacerbate the impacts from flooding. Long term, even in the absence of a storm event, the projected rise in sea level alone would have a dramatic impact on the base flood elevations in Little Compton. As sea levels continue to rise, the inundation area subject to coastal flooding and storm surge will continue to move inland. If currently undeveloped coastal land, including wetlands, along the shoreline remain undeveloped, it will help minimize the effects of localized flooding until SLR engulfs the land.

As a low-lying community with 6.7± miles of southern shoreline and 8.2± miles of western shoreline, coastal flooding is highly probable and may have serious consequences for the Town of Little Compton.



4.3.1.3 Coastal Erosion

Description and Extent

“Coastal erosion is the process by which local sea level rise, strong wave action, and coastal flooding wear down or carry away rocks, soils, and/or sands along the coast. All coastlines are affected by storms and other natural events that cause erosion; the combination of storm surge at high tide with additional effects from strong waves—conditions commonly associated with landfalling tropical storms—creates the most damaging conditions. The extent and severity of the problem is worsening with global sea level rise, but it differs in different parts of the country, so there is no one-size-fits-all solution” (US Climate Resilience Toolkit. *Coastal*). In addition to the natural processes that cause coastal erosion, human influences, such as development or manmade structures along the shoreline, impedes the natural dynamic coastal system and increases erosion.

While measurable coastal erosion may occur during a storm event, for planning purposes the extent is assessed over extended periods of time. Comparing aerial photographs provides insight into coastal erosion trends. According to the State Coastal Council, the average coastal erosion rate is 1.9 feet per year in Rhode Island (CRMC. *Shoreline Change SAMP Volume I*, 2-14). Extreme high tides, or king tides, occur several times a year, inundating low-lying shoreline areas and threaten to worsen erosion if coupled with wave energy produced by storms.

In 2018 the State adopted the RI Shoreline Change Special Area Management Plan (Beach SAMP) which is an outstanding tool to plan for climate change, including coastal erosion, increased storm events, and flooding from sea level rise. In addition to STORMTOOLS, an online mapping tool that shows storm surge and sea level rise scenarios for the entire Rhode Island coastline, the SAMP also provides shoreline change maps showing the extent of coastal erosion over time. Little Compton is composed of barrier beaches which tend to be dynamic, losing sand at times and then regaining it through natural processes. The links to access the shoreline change maps for Little Compton have been included in this subsection under **Previous Occurrences**.

In addition to providing habitat for marine and terrestrial organisms and supporting recreation and tourism, a wide, healthy sand beach provides protection against the effects of storm surge, coastal flooding, and high surf impacts. A report prepared for FEMA by the Heinz Center in 2000, stated that “Over the next 60 years, erosion may claim one out of four houses within 500 feet of the U.S. shoreline” (Heinz Center, 150). Sea walls, dunes, coastal bluffs, and other natural features that dissipate/ absorb wave energy and provide protection for the structures behind them are increasingly being impacted by coastal erosion. If these protective coastal features fail, the property damage from storms and rising seas may significantly increase.

Location

All of Little Compton's shoreline, is susceptible to the impacts of coastal erosion. While storm surges can cause abrupt changes, many areas are also being continually impacted by the regular movement of the tides. Little Compton's barrier beaches along the Rhode Island Sound encompass roughly 2.4 miles and include (Olsen, 90):

- Sakonnet to Warren's Point Barriers (Watchhouse Pond Beach, Long Pond Beach, and Tappen's Beach)
- Briggs Marsh Barrier (Briggs Beach)
- Ship Pond Cove Barrier (Ship Pond Cove)
- South Shore Barriers (Round Pond Meadow Beach, Tunipus Pond Beach, and Quicksand Beach)

In addition, the Sakonnet Harbor beach, at the mouth of the Sakonnet River is also a barrier beach.

Little Compton's shoreline is dotted with residential development, both large lot estates and smaller, high density cottage type development. Coastal ponds, beaches, and rocky shores are interspersed with the development. New development is prohibited on moderately developed barrier beaches, which include Tunipus Pond Beach and Watch House Pond Beach, unless an exception is permitted by CRMC. The Town intends to maintain undeveloped barrier beaches as conservation areas with no future development permitted (Town of Little Compton RI. *Comprehensive*, 14).

Due to coastal erosion coupled with sea level rise, the coastline will continue to move inland. As the coast moves inland, coastal salt marshes that have nowhere to migrate will be lost. In addition, as barrier beaches shrink, upland residential properties become more vulnerable to flooding. Additional information on the vulnerability of marshes has been provided in **Subsection 4.4.3**.

Previous Occurrences

Over time, storm events including hurricanes, Nor'easters and severe winter weather, coupled with sea level rise, has caused erosion along Little Compton' shoreline. Coastal erosion has narrowed beaches; compromised coastal salt marshes; and undermined road beds, public infrastructure, and coastal homes.

In May 2021, EcoRI news highlighted how coastal erosion is shrinking Rhode Island's shoreline, drowning essential ecosystems and putting vital infrastructure at risk. "Surge from these large storms, and from smaller but more frequent and intense weather events, washes away dunes and damages salt marshes. This wave energy, steadily growing stronger by warming waters and a warming atmosphere, pound a coastline saturated and weakened by more frequent heavy rains, which have, according to CRMC, increased by 71 percent in New England since 1958, causing bluffs, like those at Crescent Park in East Providence and Town Landing in Little Compton, to collapse" (Carini).

**Figure 4-25 Erosion
Along the Bluffs at
Town Landing**

Photo Credit: Frank Carini
| EcoRI News



According to a member of the Harbor Commission, the combined effects of erosion of surrounding sand and gravel filled lots, storm surge, and seabed circulation patterns, results in a need for periodic dredging of the Sakonnet Harbor to maintain navigable channels. Increasing storm intensity also complicates mooring system maintenance. Currently the Town code requires annual mooring system inspections, whereas the Coastal Resources Management Council (CRMC) mandates a biannual inspection interval for the State.

The CRMC has documented shoreline change and average erosion rates for coastal areas throughout Rhode Island. Although coastal erosion does not occur linearly over time, the maps depict an average annual historic rate of change. This rate of change is recognized solely as a planning tool and used to guide CRMC regulatory decisions related to coastal activities, including setbacks from coastal features.

The Shoreline Change Maps produced by CRMC, documenting the erosion from 1939 to 2003 in the following nine areas of Little Compton, are provided below:

- Little_Compton_Briggs_Beach
- Little_Compton_Briggs_Point
- Little_Compton_Brown_Point
- Little_Compton_Church_Cove
- Little_Compton_Church_Point
- Little_Compton_North_Brown_Point
- Little_Compton_Sakonnet_Point
- Little_Compton_South_Shore_Beach
- Little_Compton_Warren_Point

Based on CRMC's Shoreline Change Maps, most of Little Compton's coastline has experienced at least some, and in many areas significant, erosion during the documented period from 1939 to 2003. "Studies of shoreline change in Rhode Island have documented an average annualized rate of shoreline change of 0.57 meters/year (1.9 feet/year)" (CRMC. *Shoreline Change SAMP Volume I*, 2-14). A couple areas in Little Compton exceed Rhode Island's average annualized rate of shoreline change. Some of the most significant coastal erosion in Town has occurred in the vicinity of Briggs Beach. The highest rate identified in this area is about 850 feet east of Briggs Marsh with an average erosion rate of 3.2 feet/year during the 64-year data period or a total erosion of roughly 207 feet. Warren's Point (roughly 200 feet west of Warren's Point Beach Club building) has seen a total of 158 feet of erosion or an average annualized rate of 2.5 feet/year. Between 1939 to 2003, a number of other areas have experienced beachfront loss of up to 100 feet or an average annualized rate of 1.6 feet/year. These include Brown Point shoreline (roughly between Brown Point Lane and Sherer Cove); Sakonnet Point (both at the tip of Sakonnet Point and south of Round Pond); and South Shore Beach (south of Quicksand Pond).

Climate Change Impacts

Climate change is expected to continue intensifying storms and produce rising sea levels. "Coastal erosion is expected to increase due to the increase in storm intensity and associated flooding. The IPCC (2017) found that coastal and low-lying areas have been experiencing increased erosion, and will continue to do so, due to sea level rise, in North America and throughout the world. Erosion has been noted to be of particular concern in the northeastern U.S. In their study of climate change impacts in the Northeastern U.S., Horton et al. (2014) noted that increased rates of coastal erosion are likely to compromise aging coastal infrastructure, including transportation, communications, and energy infrastructure" (CRMC. *Shoreline Change SAMP*, 2-13 & 2-14).

To assist communities to predict the potential impact to Rhode Island shorelines, CRMC, in partnership with the University of Rhode Island, developed the Shoreline Change Special Area Management Plan (Beach SAMP). As recognized in the SAMP, "In Rhode Island, coastal erosion is of particular concern because it is characterized by a storm-driven coastline... Studies of shoreline change in Rhode Island have documented an average annualized

rate of shoreline change of 0.57 meters/year (1.9 feet/year), though these annualized rates should be used with caution because coastal erosion is not a gradual process, but rather the result of abrupt changes due to storms" (CRMC. *Shoreline Change SAMP*, 2-14). CRMC further indicates that, "Scientists' understanding of coastal erosion and other coastal processes is rapidly evolving, particularly with regard to how processes are changing due to changing climate trends and what may happen in the future" (CRMC. *Shoreline Change SAMP Volume I*, 2-14).

Probability of Future Events

The probability of coastal erosion is considered **Highly Likely** (greater than 90% annual probability) and will be accelerated with sea level rise and more frequent and intense storm events.

It should be noted that FEMA's post hazard event management practices indicate that reconstruction or repair funding for coastal protection structures will only be made available where the damage can be directly attributed to the storm event. Therefore, in order to receive this funding, the Town must maintain records of maintenance and repair activities that demonstrate the status of each structure. The Town's aerial imagery will be beneficial in qualifying future storm damage claims.



WIND-RELATED HAZARDS

4.3.2 Wind-Related Hazards

Wind is the natural movement of air caused by a difference in pressure from one place to another. Local wind systems are created by the immediate geographic features in a given area, such as mountains, valleys, or large bodies of water. Wind effects can include blowing debris, interruptions in elevated power and communications utilities, and intensification of the effects of other hazards related to winter weather and severe storms (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-134). In this Section, wind-related hazards will be discussed in terms of the following four categories:

4.3.2.1 High Winds

4.3.2.2 Thunderstorms including Lightning and Hail

4.3.2.3 Tornadoes

4.3.2.4 Tropical Cyclones (Tropical Depressions, Tropical Storms, and Hurricanes)



4.3.2.1 High Winds

Description and Extent

The wind is air moving from an area of high pressure to an area of low pressure. As identified below, there are several types of damaging winds, and high winds can accompany various types of storms including thunderstorms, tropical cyclones (which includes tropical depressions, tropical storms, and hurricanes), and Nor'easters. Thunderstorms and tropical cyclones are discussed in **Subsections 4.3.2.2 and 4.3.2.4**, respectively, and Nor'easters are addressed in **Subsection 4.3.3 Winter-Related Hazards**.

Types of Damaging Winds (NOAA|NSSL. *Severe Weather 101 - Damaging Winds*)

- **Straight-line wind:** is a term used to define any thunderstorm wind that is not associated with rotation, and is used mainly to differentiate from tornadic winds.
- **Downdraft:** is a small-scale column of air that rapidly sinks toward the ground.
- **Macroburst:** is an outward burst of strong winds at or near the surface with horizontal dimensions larger than 4 km (2.5 mi) and occurs when a strong downdraft reaches the surface. To visualize this process, imagine the way water comes out of a faucet and hits the bottom of a sink. The column of water is the downdraft and the outward spray at the bottom of the sink is the macroburst. Macroburst winds may begin over a smaller area and then spread out over a wider area, sometimes producing damage similar to a tornado. Although usually associated with thunderstorms, macrobursts can occur with showers too weak to produce thunder.

- **Microburst:** is a small concentrated downburst that produces an outward burst of strong winds at or near the surface. Microbursts are small — less than 4 km across — and short-lived, lasting only 5 to 10 minutes, with maximum windspeeds sometimes exceeding 100 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.

Table 4-8 Beaufort Wind Scale (NOAA)

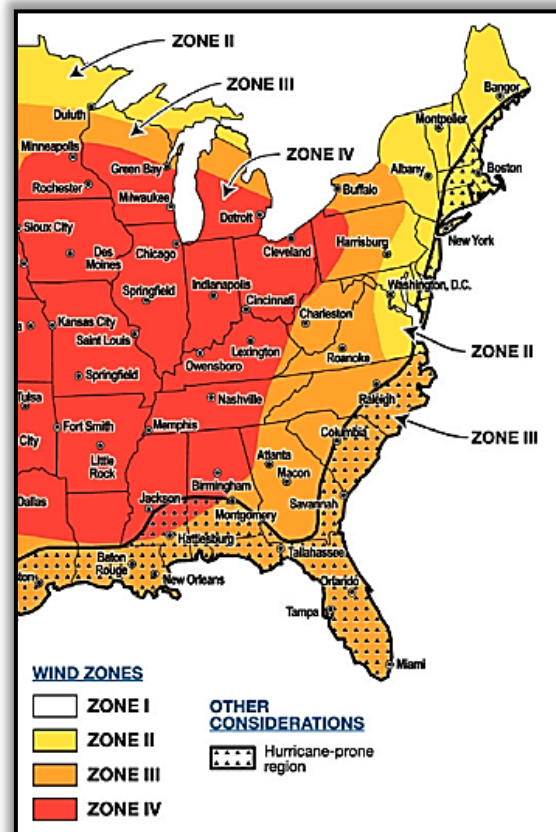
Beaufort Number	Wind Speed (mph)	Description
0	< 1	Calm
1	1-3	Light Air
2	4-7	Light Breeze
3	8-12	Gentle Breeze
4	13-18	Moderate Breeze
5	19-24	Fresh Breeze
6	25-31	Strong Breeze
7	32-38	Moderate Gale
8	39-46	Fresh Gale
9	47-54	Strong Gale
10	55-63	Whole Gale
11	64-72	Storm
12	> 73	Hurricane Force

Although anemometers, which measure wind speed and wind pressure, can be found at almost all weather stations, the Beaufort Wind Scale (**Table 4-8**), created in 1805, is still used today as a standardized scale for characterizing observed wind conditions.

Figure 4-26 Wind Zone Map (FEMA)

FEMA has produced a Wind Zone Map (**Figure 4-26**) based on historic tornado and hurricane data, that depicts maximum wind speeds and is applicable in designing structures to withstand these forces. Rhode Island is included in Wind Zone II which identifies the maximum speed for the design of safe rooms (160 mph).

High winds can cause damage to structures, property, vehicles, utility lines, vegetation, and the shoreline, as well as bodily injury from flying debris or structures collapsing. Loss of power and internet/telephone cable can disrupt daily routines and businesses, spoil refrigerated food, and result in lack of heat, which can lead to dangerous health conditions and the potential for pipes to freeze and burst if occurring in conjunction with freezing temperatures. Additionally, high winds may exacerbate fire conditions by drying out the ground cover, propelling fuel around the region, and increasing the ferocity of existing fires.



Location

All of Rhode Island is at risk from high speed winds, however, "Washington and Newport counties, near the Narragansett Bay, are within highest wind speed area due to the direct proximity to the coast (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-134).

The wind zone designation for Little Compton is 110 mph. Little Compton enforces the RI State Building Code, which currently requires new buildings in Little Compton be designed to withstand wind speeds of 140 mph (Category 4 hurricane). As opposed to higher risk structures such as high rise buildings and towers, most of Little Compton's development is comprised of single family dwellings no more than 30 feet in height. However, there are some residential and commercial structures sporadically located throughout Little Compton that are of older construction and may be more susceptible to damage from high winds.

Due to the character of Little Compton one of the most vulnerable factors is tree limb damage. Properties and heavily treed roadways with above ground utilities, especially those in proximity to the coast, such as South Shore Beach, Round Pond, and Briggs Marsh, are exposed to greater risk from wind events.

Previous Occurrence

As shown in **Table 4-9**, Newport County has experienced a number of High and Strong wind events as defined by NOAA's Storm Events Database. However, most of the damaging wind events that occur in Little Compton are associated with one of the wind-related hazard categories (tornadoes, tropical storms, hurricanes, or Nor'easters) discussed in following subsections.

Figure 4-27
Trees Downed by
August 2021 Storm

Photo Credit:
Chief Richard Petrin



Table 4-9 High and Strong Wind Events - Newport County 1996-2023
(NOAA|NCEI. *Storm Events Database*)

Type	Number of Events	Number of Events with Property Damage	Property Damage Estimate
High Wind	46	19	\$489,100
Strong Wind	60	15	\$65,300

Climate Change Impacts

In November 2019, *Scientific American* published an article titled *The World's Winds Are Speeding Up*. It discussed the recent findings from a study published in the *Nature Climate Change* journal. For several decades, starting in the 1970s, global winds had been decreasing. The study found that, "winds across much of North America, Europe and Asia have been growing faster since about 2010. In less than a decade, the global average wind speed has increased from about 7 mph to about 7.4 mph. Using models to investigate the factors that influence the behavior of global winds, the researchers found that big climate patterns - which affect temperatures in certain parts of the world - have a major influence on wind speeds" (Harvey). While it is widely agreed that temperatures all over the Earth are steadily rising as a result of human-caused climate change, the study speculates that within that larger, long-term warming pattern, there will be natural cycles - which could last decades at a time - that osculate between warmer and cooler periods. The shifting between these cycles may trigger shifts from slower to faster wind speeds. Continued research is needed to determine how the overall warming trend from climate change will impact long-term wind speeds (Harvey).

Probability of Future Events

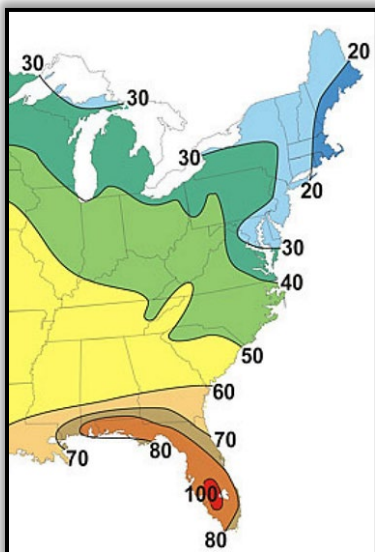
The RI-SHMP has assessed high winds as **Highly Likely** (greater than 90% annual probability) to occur in Newport County (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-140), and the Advisory Committee concurs with this assessment for Little Compton.



4.3.2.2 Thunderstorms including Lightning and Hail

Description and Extent

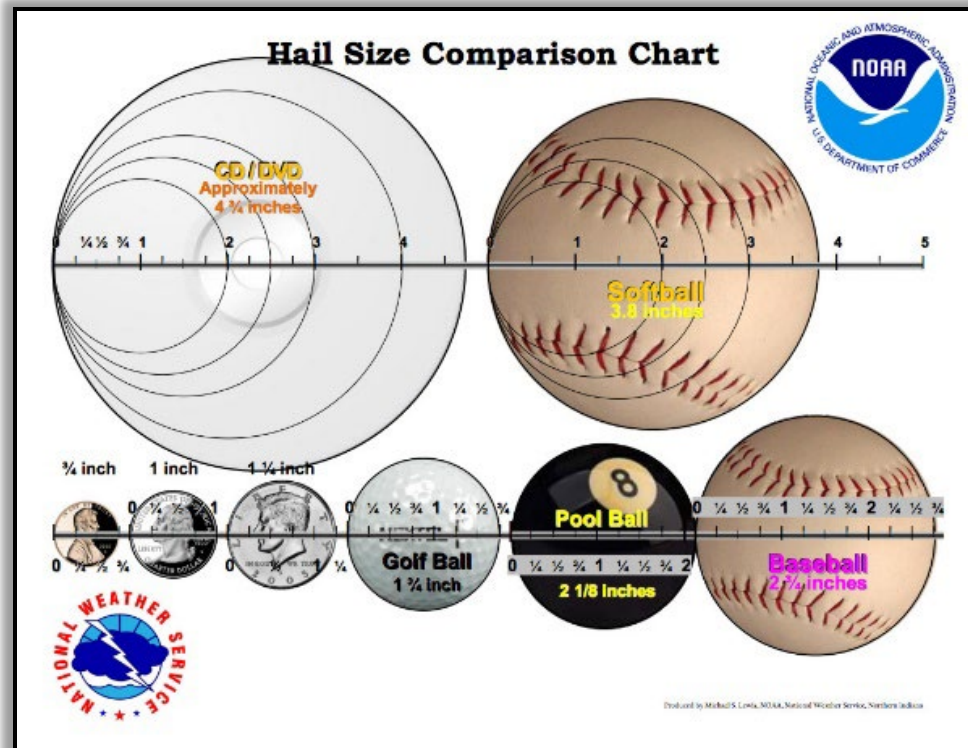
"Thunderstorms typically develop in the warmer months of spring, summer, and fall, but they can occur at any time of the year over most of the United States. There are three basic ingredients needed for thunderstorm development: moisture, an unstable atmosphere, and some way to start the atmosphere moving" (NOAA|NWS. *Understanding*). Thunderstorms "have the potential to produce lightning, hail, tornadoes, powerful straight-line winds, and heavy rains that produce flash flooding" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-199).



A warning is issued if a thunderstorm is classified as severe - having destructive winds exceeding 58 mph, hail at least one (1) inch in diameter, or a tornado. However, as thunderstorms can form within 30 minutes, the opportunity for warnings to be issued and heeded is limited. As illustrated in **Figure 4-28**, on average 20 thunderstorms occur annually in Rhode Island. However, according to NOAA, only about 10% of thunderstorms are categorized as severe (NOAA|NWS. *Introduction to Thunderstorms*).

Figure 4-28 Average Annual Number of Thunderstorms (NOAA|NWS)

Figure 4-29
Hail Size
Comparison Chart
(NOAA|NWS)



Hail

"Hail is formed in towering cumulonimbus clouds (thunderheads) when strong updrafts carry water droplets to a height at which they freeze. Eventually, these ice particles become too heavy for the updraft to hold up, and they fall to the ground at speeds of up to 120 mph. Hail falls along paths called swaths, which can vary from a few square acres to up to 10 miles wide and 100 miles long" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-199). Hail primarily occurs during the summer months in Rhode Island and has the potential to damage cars and buildings, as well as devastate farm fields during the growing season. The National Weather Service (NWS) classifies hail by diameter size (5 mm diameter or greater) and relates it to everyday objects as shown in **Figure 4-29**.

Lightning

All thunderstorms produce lightning, which causes the thunderous noise. Lightning can strike from any part of the storm, as far as 10 miles away from the rainfall area, or strike after the storm has passed. "Lightning is a giant spark of electricity in the atmosphere between clouds, the air, or the ground. In the early stages of development, air acts as an insulator between the positive and negative charges in the cloud and between the cloud and the ground. When the opposite charges build up enough, this insulating capacity of the air breaks down and there is a rapid discharge of electricity that we know as lightning. The flash of lightning temporarily equalizes the charged regions in the atmosphere until the opposite charges build up again. Lightning can occur between opposite charges within the thunderstorm cloud (intra-cloud lightning) or between opposite charges in the cloud and on the ground (cloud-to-ground lightning)" (NOAA|NSSL. *Severe Weather 101 – Lightning*). Higher lightning flash density indicates a more severe lightning hazard event.

Lightning events are difficult to assess in terms of extent as there is no universally accepted standard for measuring the strength or magnitude. Rather, lightning events are generally measured by the damage they produce. Lightning injures hundreds of people in the U.S. annually, with strike victims often suffering from long-term weakness and fatigue, muscle spasms, chronic pain, sleep disorders, memory loss, and depression. Lightning strikes can also ignite urban and wildland fires (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-199).

Location

Although Rhode Island has a low incidence of lightning-related fatalities and damages, all areas of Little Compton are vulnerable to severe thunderstorm. In addition, over the years a number of house fires caused by lightning strikes have occurred.

Due to the character of Little Compton one of the most vulnerable factors is tree limb damage. Properties and heavily treed roadways with above ground utilities, especially those in proximity to the coast, such as South Shore Beach, Round Pond, and Briggs Marsh, are exposed to greater risk from thunderstorm events.

Previous Occurrences

As depicted in **Figure 4-28**, Rhode Island experiences approximately 20 thunderstorms a year. According to NOAA, only about 10% of thunderstorms that occur are categorized as severe (NOAA|NWS. *Introduction to Thunderstorms*). The reported severe thunderstorm events (including hail and lightning) for Newport County from 1996 to 2022 has been included in **Table 4-10**. None of the reported events resulted in injury or death (NOAA|NCEI. *Storm Events Database*). The most recent reported thunderstorm event occurred in Little Compton on November 13, 2021, where “police reported a tree down on Peckham Road and another tree down on Amesbury Lane” (NOAA|NCEI. *Storm Events Database*). In 1995, a private residence off of West Main Road was struck by lightning during a severe thunderstorm. The interior electrical wiring was severely damaged requiring the home be gutted and rewired (Town of Little Compton. *Local*, 30).

Table 4-10 Hail, Lightning, and Thunderstorm Events - Newport County 1996-2023
(NOAA|NCEI. *Storm Events Database*)

Type	Number of Events	Number of Events with Property Damage	Property Damage Estimate
Hail	8	0	---
Lightning	8	7	\$78,000
Thunderstorm Wind	13	8	\$91,500

Climate Change Impacts

Based on a recent article in *Inside Climate News*, “Climate change is making the air warmer, which allows it to hold more moisture, and both of those factors can boost the chance of thunderstorms. One major study from 2014 estimated that, if warming continues at its current pace, the number of lightning strikes in the U.S. could increase by as much as 50 percent by the end of the century, with each additional 1 degree Celsius of warming generating about 12 percent more strikes” (Tigue). In addition to increasing the potential for lightning, global warming also exacerbates drought conditions. This combined result could lead to an increase in lightning strikes igniting wildland/brush fires (Tigue).

Climate change is creating dynamic shifts in weather. A study published in *Geophysical Research Letters* in June 2022 assessed how increasing greenhouse gas concentrations may modify regional climates and influence regional thunderstorm activity. The study concluded that by the end of the century southern Plains states will be getting fewer intense storms, with the East and Northeast getting more. Climate models are increasingly more accurate and being down-scaled to take into consideration regional data. One simulation from this study projects that the Northeast could see more than two weeks of thunderstorm-rich days, with the east coast states getting three to nine more days of storms. This potential shifting thunderstorm trend has ramifications for the eastern states, but is perhaps more dire for the Plains states. The mid-west relies on frequent thunderstorms as a vital water source for crops, many of which are staples for the country (Borunda).

Probability of Future Events

Based on the RI-SHMP, in a given year Rhode Island is **Highly Likely** (greater than 90% annual probability) to experience up to 5 thunderstorm wind events, three hail events, and two lightning events (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-204). The Advisory Committee concurs that it is **Highly Likely** that Little Compton will annually experience at least one thunderstorm.

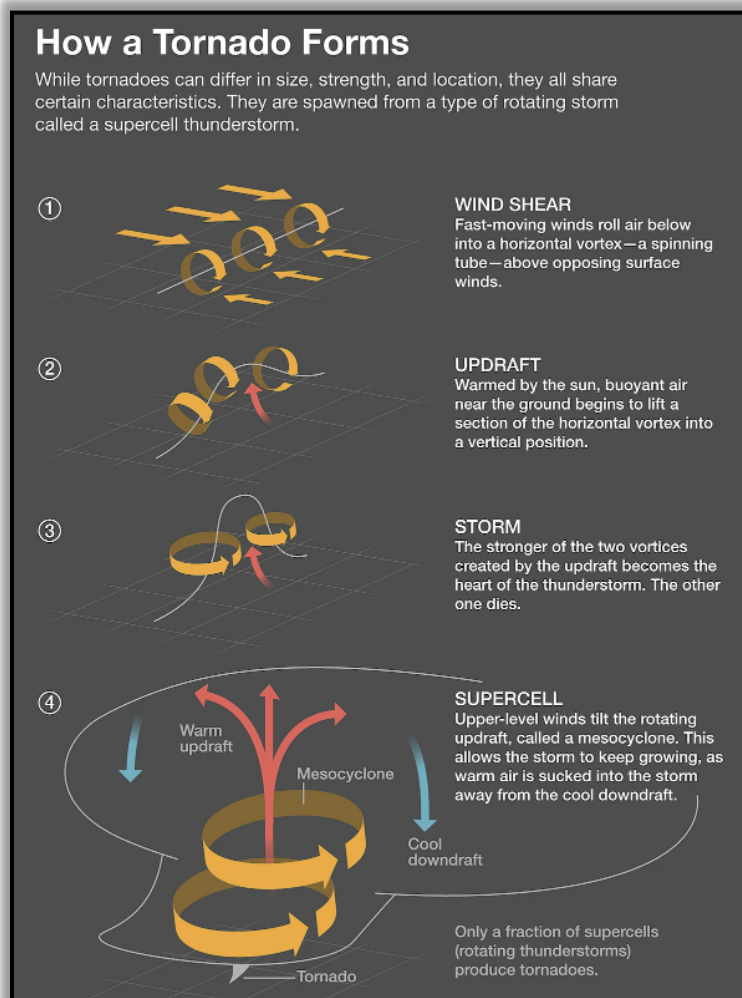


4.3.2.3 Tornadoes

Description and Extent

According to NOAA, “Exactly how and why tornadoes form is not completely understood” (NOAA. *Tornadoes*). However, as illustrated in **Figure 4-30**, scientists do know that tornadoes develop from thunderstorms when cold air overrides a layer of warm air, causing the warm air to rise rapidly. They are vertical funnels of violently rotating air extending between a cloud and the surface of the earth. Wind speeds can reach up to 250 mph and create damage paths in excess of one mile wide and 50 miles long. Most tornadoes move southwest to northeast, but tornadoes have been known to move in any direction (National Geographic. *Tornadoes*).

Figure 4-30 How a Tornado Forms (National Geographic)



NOAA has observed that the tornado season nationally lasts from March to August, with peak tornado activity normally occurring in April, May, and June. Historically, the highest concentrations of tornadoes have been in the Central U.S. and portions of the Gulf Coast states (NOAA|NSSL. *Severe Weather 101 – Tornadoes*).

“Tornadoes can appear as a traditional funnel shape, or in a slender rope-like form. Some have a churning, smoky look to them, while others contain “multiple vortices”—small, individual tornadoes rotating around a common center. Others may be nearly invisible, with swirling dust or debris at ground level as the only indication of the tornado’s presence” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-209).

NOAA|NWS Storm Prediction Center issues tornado and severe thunderstorm watches. A tornado watch does not indicate an imminent tornado; rather, a tornado watch is an advisory for citizens to be alert and prepared to go to safe shelter should a tornado develop or if a tornado warning is issued.

Local National Weather Service offices are responsible for issuing tornado warnings. Tornado warnings indicate that a tornado has been spotted, or that Doppler radar detects a thunderstorm circulation capable of spawning a tornado (NOAA. *Severe Weather Definitions*).

The Fujita scale is used to characterize tornadoes based on the damage they produce and relating that damage to the fastest quarter-mile wind at the height of a damaged structure. The 2007 Enhanced Fujita Scale, shown in **Table 4-11**, improves upon the original scale by including more damage indicators, taking into account construction quality and variability, and providing a more definitive correlation between damage and wind speed (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-210).

Table 4-11 Fujita Scale and Enhanced Fujita Scale (RI-SHMP)

Fujita Scale			Enhanced Fujita Scale	
F Number	Fastest ¼ mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85
1	73-112	79-117	1	86-110
2	113-157	118-161	2	111-135
3	158-207	162-209	3	136-165
4	208-260	210-261	4	166-200
5	261-318	262-317	5	Over 200

Tornadoes can be devastatingly destructive to everything in their path, including homes, property, and infrastructure, particularly overhead electrical utilities and communications. In addition to lost revenues, downed power lines present a threat to personal safety. Further, downed wires and lightning strikes have been known to spark fires. A structure’s tornado vulnerability is based in large part on building construction and standards. In general, mobile homes and wood-framed structures are more vulnerable to damage from a tornado than steel framed structures. Other factors, such as location and condition/maintenance of trees, also play a significant role in determining vulnerability.

As tornadoes can have a wide path, a significant section of Little Compton could experience damage should a tornado track in the community. However, as the extent of a tornado generally lessens as it draws closer to the coastline where cooler air temperatures usually resides, it is probable that should a tornado touch down in Little Compton the extent of damage would be on the lower end.

Location

The area of the U.S. with the highest tornado activity is in the central part of the states between Texas and North Dakota, informally known as Tornado Alley. Though Rhode Island is not an area that is highly susceptible to tornadoes, it is possible for one to occur anywhere in the region. All areas of Little Compton are considered equally exposed to a tornado.

Little Compton enforces the RI State Building Code, which currently requires new buildings in Little Compton be designed to withstand wind speeds of 140 mph (Category 4 hurricane). This requirement is considered effective in preserving structures from less severe categories of tornadoes and all but the most severe microbursts. There are some residential and commercial structures sporadically located throughout Little Compton that are of older construction and may be more susceptible to damage from a tornado.

Previous Occurrences

New England does not frequently suffer destruction from tornadoes, with the region's most serious tornado event occurring in Worcester Massachusetts on July 9, 1953. In that event, 90 people were killed and 1,300 injured. A tornado is reported in southern New England, on average, once every two to three years (NASA - Earth).

Based on NOAA|NCEI Storm Events Database, between 1978 and 2023, fourteen tornadoes have impacted Rhode Island; two resulting in 3 people being injured; and eleven resulting in property damages totaling 4.99± million dollars. None of these tornadoes were located in Little Compton, and only one occurred in Newport County. On October 2, 2019, a southward cold front pushed through the region into warm, moist air mass, which formed an isolated EF-0 tornado in Portsmouth, Rhode Island, that lasted for approximately one minute. Damage was minimal consisting of a few uprooted trees, broken tree limbs, and a bowed out garage wall due to the wind entering the garage through an open door. The total property damage was estimated as \$5,000 (NOAA|NCEI. *Storm Events Database*).

However, in October 2018, a thunderstorm moved through the area which fueled several separate water spouts over the Rhode Island and Massachusetts waters, including one off the shores of Little Compton (**Figure 4-31**) (Searles).



Figure 4-31
Water Spout off
Little Compton
Coast (October
23, 2018)
Photo Credit:
Sally Jane Gavin

Climate Change Impacts

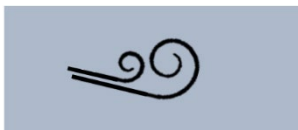
According to the Center for Climate and Energy Solutions (C2ES), "The link between tornadoes and climate change is currently unclear. Current data on tornadoes is inconsistent because measuring the presence of tornadoes relies on eyewitness accounts and aftermath damage assessments rather than quantifiable data. Additionally, it is difficult to identify long-term trends in tornado records, which only date back to the 1950s in the U.S." (C2ES).

Tornadoes). Additionally, tornadoes are considered too geographically small to be accurately modeled. That being said, multiple studies do suggest that, “the conditions that produce the most severe thunderstorms from which tornadoes may form are more likely as the world warms” (C2ES. *Tornadoes*).

Probability of Future Events

Although tornadoes are a rare occurrence in Rhode Island, a risk does exist, particularly during peak hurricane season (mid-August through October). The RI-SHMP indicates that based on NOAA|NCEI Storm Events Database, “As a whole, Rhode Island has less than 1% probability of a tornado incident occurring in a given year” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-213). The Advisory Committee concurs that it is **Unlikely** (less than 1% annual probability) that a tornado will occur in Little Compton.

NOAA’s Storm Prediction Center constantly monitors changing weather conditions and is able to provide short-term tornado predictions, but unfortunately, there is no long-term forecasting system that can accurately predict the likelihood of a tornado event. Because of predictive limitations, and because Rhode Island residents do not expect severe tornadoes and may be ill-prepared to respond to such an event, it is important for the community to be signed up for CodeRED Emergency notifications, which are administered by the Town of Little Compton. Broadcasting tornado warnings through an extensive communication network is currently the best means for mitigating tornado hazards.



4.3.2.4 Tropical Cyclones (Tropical Depressions/Storms and Hurricanes)

Description and Extent

“Tropical cyclones, a general term for tropical storms and hurricanes, are low pressure systems that usually form over the tropics. These storms are referred to as ‘cyclones’ due to their rotation. Tropical cyclones rotate counterclockwise and are among the most powerful and destructive meteorological systems on earth. Their destructive features include very high winds, heavy rain, lightning, tornadoes, and storm surge. As tropical storms move inland, they can cause severe flooding, downed trees and power lines, and structural damage” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-218).

“There are three (3) categories of tropical cyclones:

- **Tropical Depression:** maximum sustained surface wind speed is less than 39 mph
- **Tropical Storm:** maximum sustained surface wind speed from 39-73 mph
- **Hurricane:** maximum sustained surface wind speed exceeds 73 mph

Most Atlantic tropical cyclones begin as atmospheric easterly waves that propagate off the coast of Africa and cross the tropical North Atlantic Ocean and Caribbean Sea. When a storm starts to move toward the north, it leaves the area where the easterly trade winds prevail and enters the temperate latitudes where the westerly winds dominate. This produces the eastward curving pattern of most tropical cyclones that pass through the Mid-Atlantic region. When the westerly steering winds are strong, it is easier to predict where a hurricane will go. When the steering winds become weak, the storm follows an erratic path that makes forecasting very difficult” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-218).

According to NOAA, the Atlantic hurricane season runs from June 1 to November 30, with the peak between mid-August and late October (NOAA|NHC. *Tropical*). Hurricanes are categorized according to the Saffir-Simpson Scale depicted in **Table 4-12**, with ratings determined by wind speed and central barometric pressure. Hurricane categories reflect damage potential, which helps to provide public officials and the public-at-large with an understanding of the potential flooding and wind damages an impending storm may inflict. The categories range from one (1) through five (5), with Category 5 being the strongest (winds greater than 157 mph) (NOAA|NHC. *Saffir-Simpson*).

A hurricane watch is issued when hurricane conditions could occur within the next 48 hours. A hurricane warning indicates that sustained winds of at least 74 mph are expected within 36 hours or less. The reliability of predicting the path of hurricanes and wind speed has helped allow communities to better prepare for these storms, which lessens the amount of damage to people and property (NOAA|NHC. *NHC Issuance*).

Although the Saffir-Simpson Scale is widely accepted, because storm surge is a complex interaction between storm meteorology, storm track, and the topography of the impacted shoreline, “there is no statistical relationship between the Saffir-Simpson classification of a tropical storm and the resulting storm surge (Young). This is an important distinction because lower category hurricanes may end up causing an unexpected level of destruction due to associated storm surge, as was the case in 2018 when Hurricane Florence was downgraded from a Category 4 to a Category 1 hurricane. Meteorologists warned that the flood and surge potential were still major threats, but many Carolinians chose not to evacuate after Florence was downgraded, resulting in trapping and stranding tens of thousands of people (Young).

Table 4-12 Saffir-Simpson Scale of Hurricane Intensity (NOAA|NHC)

Wind Speed	Type of Damage Due to Hurricane Winds
Category One Hurricane (Weak)	
74-95 MPH (64-82kt)	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category Two Hurricane (Moderate)	
96-110 MPH (83-95kt)	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category Three Hurricane (Strong)	
111-129 MPH (96-112kt)	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category Four Hurricane (Very Strong)	
130-156 MPH (113-136kt)	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category Five Hurricane (Devastating)	
Greater than 157 MPH (137kt)	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Hurricanes can damage structures, property, and infrastructure, as well as disrupt transportation routes and pose threats to public safety. While strong winds from hurricanes can pose a threat to life and property, the greatest threat posed by hurricanes in Rhode Island is generally heavy rainfall and flooding caused by storm surge. As discussed in **Subsection 4.3.1.2**, wind and pressure forces of a tropical storm, hurricane, or Nor'easter moving across water can create an abnormal rise in water level known as storm surge. With respect to hurricane related storm surge, the magnitude of the storm surge within a coastal basin "is governed by both the meteorological parameters of the hurricane and the physical characteristics of the basin" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-219). The meteorological aspects include:

- **Hurricane size** measured by the radius of maximum winds (Measured from the center of the hurricane to the location of the highest wind speeds within the storm. This radius may vary from as little as 4 miles to as much as 50 miles)
- **Hurricane intensity** measured by sea level pressure and maximum surface wind speeds at the storm center
- **Hurricane path** or forward track of the storm
- **Hurricane forward speed**

When coupled with normal tides, storm surge can raise the mean water level 15 feet or more and cause substantial property damage and risk of injury and death. Hurricanes also have the potential to cause coastal erosion. As storms erode the shoreline, they put adjacent properties at greater risk. A home constructed in the V-zone may be destroyed as the beach erodes and the barrier or headland is washed over by high water in a storm.

Location

The RI-SHMP indicates that Rhode Island is particularly vulnerable to tropical cyclones (tropical depressions, tropical storms, and hurricanes) due to its geographic location and features (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-219)

Little Compton's coastal location and areas of low elevation, makes it particularly susceptible to hurricanes. Southern New England's geography in relation to the Atlantic seaboard is a key reason. "Historically, most hurricanes which have struck the New England region recurved northward on tracks which paralleled the eastern seaboard maintaining a slight north-northeast track direction. The fact that Little Compton geographically projects easterly into the Atlantic and has southern exposed shorelines, places it in direct line of any storm which tracks in this manner" (Town of Little Compton RI. *Local*, 23). Narragansett Bay's configuration also exhibits a funneling effect on tidal surges as they flood the East and West Passages and the Sakonnet River, which affects the western shoreline of Little Compton (Town of Little Compton RI. *Local*, 24).

Although the trend is for hurricanes to lose their strength after passing the outer banks of Cape Hatteras, North Carolina, they also tend to pick up forward speed. This forward acceleration may intensify the surge flooding, wave effects, and wind speeds. Hence although the hurricane may be downgraded, the impacts on the New England region may be heightened (Town of Little Compton RI. *Local*, 23). "This means that for some locations, depending on the meteorology of the storm, the affects from a Category 2 hurricane traveling at 60 MPH might be worse than that from a Category 4 hurricane moving at 20 MPH" (Town of Little Compton RI. *Local*, 23).

Hurricane surge values for Category 1 through 4 hurricanes were developed by the National Hurricane Center using the SLOSH (Sea Lake and Overland Surge from Hurricanes) Model. The U.S. Army Corps of Engineers, New England District created a Hurricane Surge Inundation Areas (Worst Case) for Rhode Island GIS layer (2009) to assist emergency management officials in hurricane preparedness and operations. This GIS data was used to produce **Figure 4-16 (provided in Subsection 4.3.1.2)** which depicts Hurricane Surge Inundation areas for Little Compton.

Under modeled scenarios, even Category 1 and 2 hurricanes can produce storm surges that inundate the Town's southern coastline, as well as portions of the Town's western boundary along the Sakonnet River. The storm surge from Category 3 and 4 hurricanes reaches farther inland around Quicksand Pond, Tunipus Pond, and Briggs Marsh, as well as the area between Sakonnet Point Road and Bailey's Ledge Road, and in the vicinity of Reservation Road. In the northern section of Town, the inland area east and south of Crandall Road is also impacted from storm surge produced by a Category 3 or 4 hurricane.

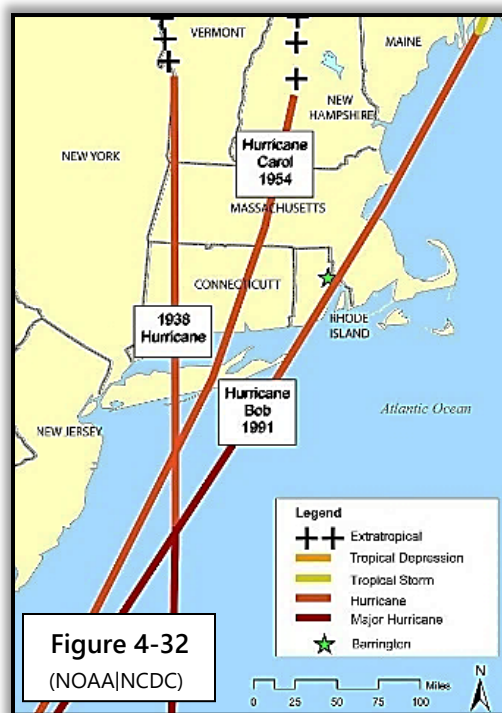
Although Little Compton enforces the RI State Building Code, which currently requires new buildings in Little Compton be designed to withstand wind speeds of 140 mph (Category 04 hurricane), there are some residential and commercial structures sporadically located throughout Little Compton that are of older construction and may be more susceptible to damage from a tropical storm or hurricane.

Previous Occurrences

"Rhode Island has experienced tropical depressions, tropical storms, and hurricanes ranging from Category 1 to Category 3. Hurricanes can have potentially devastating effects on Rhode Island. Hurricane wind damage can be costly, but storm surge is by far the most destructive force acting on the Rhode Island coast" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-223).

As shown in **Table 4-13**, since 1938, there are thirteen documented tropical cyclones that have significantly impacted Rhode Island. An additional fourteenth entry, Tropical storm/depression Hermine (September 5, 2016), was included as it impacted Rhode Island's southwestern shoreline.

Figure 4-32, Hurricane Paths of Significant New England Hurricanes: 1938, 1954, 1991 - illustrates the hurricane paths for three Category 3 hurricanes that directly impacted Rhode Island, causing millions of dollars in damage and hundreds of deaths.



Impacts on Little Compton from three historic hurricanes:

Great New England Hurricane of 1938

In Rhode Island, The Great New England Hurricane of 1938, first hit landfall in Westerly. The gale winds and storm surge destroyed much of Westerly's coastline including the Napatree Point, Watch Hill, and Misquamicut areas. The storm continued up Narragansett Bay and the Sakonnet River, leaving devastation in its wake. The Newport tide gauge recorded storm surge of 9.46 feet above MHHW on September 21, 1938 (NOAA. *Tides & Currents*).

In Little Compton, Sakonnet Point which is located at the southern tip of the Town, took the brunt of the storm (**Figure 4-33**). As outlined in the *Sakonnet Point Perspectives*, "No event caused more irreversible changes to the landscape, culture, and economy of Sakonnet Point than the unnamed hurricane of September 21, 1938. The storm, which caused cataclysmic damage and as many as 600 deaths throughout New England, was all the more disastrous because of the lack of early warning systems" (Garman, 91). The narrative documents tales from Gus Bounakes, a fisherman who lived through the 1938 hurricane, to Fred Torphy. Mr. Bounakes told him, "I looked down toward the south... further south than the lighthouse, maybe a mile or two... The sea just rose up. It looked like the whole horizon had risen and was coming toward the land... We really didn't think we would survive it" (Garman, 92).

The Sakonnet Lighthouse went into operation in 1884. The first principal keeper was William Durfee who was appointed in 1921 and would hold the position for 20 years. Mr. Durfee's wrote the following in his account of the 1938 Hurricane: "By three o'clock the wind blew a gale and the sea began to go higher and higher. Pounding with such a force that it smashed up all the boats and by four o'clock we had lost part of our rain shed, one oil tank, a boat landing, also smashing in the engine room and flooding the engines and putting the fog signal out of commission... At five-thirty I went into the tower to light up. While there, we took what was called a tidal wave. There were seas that went by that completely buried the tower. The first sea that came along was the one that caused the most damage. That one broke seven plates out of our upper deck, which is fifty-six feet from the average high water. That sea, when it hit the tower, sounded like a cannon" (Garman, 92,93). The Providence Journal reported that, "'Sakonnet Point bore the brunt of the blow, the tidal wave leaving the breakwater clean of buildings and practically leveling the cove... More than 100 persons were made homeless, and about 45 buildings, including stores, dine and dance places, and homes, and fishing shanties destroyed" (Garman, 95).



Figure 4-33
1938 Hurricane Damage
Photo Credit: Little
Compton Historical Society
(LCHS) Collection

Hurricane Carol - 1954

On August 31, 1954, Hurricane Carol pummeled the southern Rhode Island coast at the astronomical high tide. The Newport tide gauge recorded storm surge of 6.76 feet above MHHW during the hurricane (NOAA. *Tides & Currents*). In Little Compton, Sakonnet Point once again took the brunt of the storm. Hurricane Carol's damage to the Sakonnet Point Lighthouse ended her commissioned days, as the Coast Guard elected to abandon the lighthouse. As an important historical feature in the community, the lighthouse is currently maintained by The Friends of Sakonnet Point Lighthouse (The Friends).

Hurricane Sandy - 2012

Hurricane Sandy (October 2012) is the most recent hurricane to strike Little Compton and much of the East Coast. Although Sandy had been downgraded to a Tropical Storm by the time it reached Rhode Island, many parts of the State still experienced considerable damage and approximately 122,000 people in Rhode Island were without power, some for as long as five days. In Westerly, Hurricane Sandy flooded historic Watch Hill village, destroyed many of the sand dunes along Misquamicut Beach, and caused extensive property damage to a number of residences and businesses along Atlantic Avenue. Rhode Island sought and received a federal emergency declaration which provided \$39.4 million in support from federal disaster relief programs (VHB, 33). Little Compton experienced significant damage to its town beach. The event nearly caused a breach of the barrier area between South Shore Beach and Quicksand Pond which is fed by the ocean during tidal flows. Had this happened, much more significant beach damage would have occurred (Town of Little Compton RI. *Local*, 44).

Table 4-13 Significant Tropical Cyclones Affecting Rhode Island Since 1938

Name/Date	Category	Wind Speed (mph)	Damage to RI
Great New England Hurricane - 1938 (Sept 21, 1938)	Hurricane: 3	Sustained to 91, gusts to 121	The Rhode Island coastline experienced widespread damage estimated at \$100 million and 262 people lost their lives; at the USGS gauge in Westerly the tide was recorded as 15 feet above mean sea level; and virtually all of the state was without power – with 10% of electric customers without power for 12 days.
Great Atlantic Hurricane - 1944 (Sept 14-15, 1944)	Hurricane: 3	Sustained to 49, gusts to 90	Affected Rhode Island and southeastern Massachusetts; \$2 million in property damage with 701 homes and businesses destroyed and over 12,000 damaged; fortunately no fatalities reported.
Carol (August 31, 1954)	Hurricane: 3	Sustained to 100, gusts to >125	Coastal communities were hit hard; downtown Providence had 13 feet of flooding; storm surge in upper bay was 14 feet; New England experienced \$200 million in damages and 19 fatalities; in Providence, wind speeds of 90 mph and gusts up to 115 mph were recorded; and most of Rhode Island was without power with some customers not regaining power for 7 days.
Edna (Sept 11, 1954)	Hurricane: 3	Sustained to 95, gusts 110	Inland flooding; rivers rose several feet above flood stage; and electrical power was knocked out in several areas.
Diane (August 17-20, 1955)	Tropical Storm	Gusty winds 25-45	Damage to power lines was high, and at one point 82% of Rhode Island's homes were without electricity; ample warning permitted people to return home from school and work early, and as a result, only two (2) lives were lost; and property damage amounted to \$170 million, most resulting from torrential rains, which caused serious river flooding.
Donna (Sept 12, 1960)	Hurricane: 2	Sustained to 95, gusts 130	Moderate storm surge; extensive beach erosion; and wind damage to trees and utility poles causing major power outages.
Esther (Sept 20-21, and 25, 1961)	Hurricane: 3	Strong gales 35-50	Heavy shore damage at Sakonnet Point in Little Compton and Misquamicut in Westerly.
Gloria (Sept 27, 1985)	Hurricane: 2	Sustained to 81, gusts 100	Minor coastal flooding and erosion; scattered power outages; and New England experienced \$19.8 million in damages and 2 fatalities.
Bob (August 19, 1991)	Hurricane: 2	Sustained to 100, gusts >105	Storm surge of 5 to 8 feet; extensive beach erosion; wind damage to trees and utility poles; 60% of Southeastern New England residents lost power; and Southern New England experienced \$1.5 billion in damages and 18 fatalities.
Irene (August 27, 2011)	Tropical Storm	Sustained to 44, gusts up to 71	Irene knocked down trees and power lines, leaving up to half of Rhode Island residents without power; storm surge (2-4 feet) in Narragansett Bay caused some coastal damage; majority of damage was caused by wind - an amateur radio operator recorded gusts to 57 mph on their home weather station in Little Compton.
Sandy (October 29, 2012)	Hurricane: 1	60-80+ gusts	Significant damage all along the coast; beaches along Westerly, including Misquamicut, were devastated; more than 122,000 people lost power; roughly \$40 million in support from disaster relief programs helped Rhode Island recover.
Hermine (September 5, 2016)	Tropical Storm/ Depression	Sustained 39-44	Hermine was a hurricane as she made landfall in Florida, then weakened to a tropical storm and finally a tropical depression as she moved off the coast of North Carolina and meandered along southern New England; Hermine had minimal impact in most of RI, but because trees were still fully leaved, the higher gusts did down some branches and trees.
Isaías (August 4, 2020)	Tropical Storm	Gusts to 58	Tropical Storm Isaías caused widespread wind damage from Virginia through parts of New England; in Tiverton, wind gust to 58 mph were reported; no reports of damage were received from Newport County, but it is likely that isolated tree or power line damage occurred; statewide property damages were estimated at \$32.1K.
Henri (August 22, 2021)	Tropical Storm	60-70 gusts	Tropical Storm Henri made landfall in southwest RI and then moved slowly northwestward across northern CT where it weakened; the worst flash flooding occurred in northeast CT, and Henri spawned three tornadoes and a waterspout in MA; there was significant damage and widespread power outages; property damages across Rhode Island was estimated at \$1.82 million; according to RIEMA, approximately 60 homes were damaged in Newport County; a tree was reported down on West Bay Road in Little Compton and multiple trees and wires were reported down in Tiverton. According to Little Compton's EMA Director, during this event the South Shore Beach parking lot sustained considerable damage, 21 streets were closed to traffic because of debris, and the tree warden chipped about 74 yards of wood and brush.

RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-224 through 3-226; NOAA|NCEI. *Storm Events Database*, and Vallee, David

Climate Change Impacts

“There is a strong consensus in the tropical cyclone climate community that the incidence of high-category events will increase, and that storms will precipitate more” (Berardelli). An increase in the rainfall rates and destructive potential of future tropical cyclones is consistent with NOAA’s findings. According to NOAA, due to wind intensity, 85% of all damage from hurricanes come from Category 3, 4, and 5 storms. Coupled with rising sea levels, these more intense hurricanes will amplify impacts to coastal communities (Knutson). The Intergovernmental Panel on Climate Change (IPCC) has also created long-term global climate models that indicate the probability of hurricanes becoming more intense, with stronger winds and heavier precipitation, through the 21st century.

Probability of Future Events

Based on historical frequency of occurrence, the RI-SHMP assesses all of Rhode Island as **Likely** (between 50% and 89.9% annual probability), of experiencing a hurricane (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-228). The Advisory Committee concurs that this is a reasonable assessment for Little Compton.

While high magnitude events, such as Category 4 or Category 5 hurricanes, are less likely to occur, this may change in the future. Climate change models from NOAA, the IPCC, and other sources, suggest there is a high probability of hurricanes becoming more intense, with stronger winds and heavier precipitation, through the 21st century.

As the impacts can be devastating, it is important for the Town to continue to enforce RI State Building Codes, educate the community about steps they can take to become more resilient to hurricanes and other high wind storm events, and remain apprised of improvements in forecasting and understanding the impact from hurricanes.



WINTER-RELATED HAZARDS

4.3.3 Winter-Related Hazards

The winter-related hazards of heavy snow, ice, and extreme cold, detailed in this Section, can occur in combination or independently. A winter weather event typically occurs during the climatological winter season between October 15 and April 15.

Description and Extent

❖ **Heavy Snow**

"A heavy snow is generally defined as having more than nine (9) inches of accumulation in less than 24 hours. Heavy snow can bring a community to a standstill by inhibiting transportation, knocking down trees and utility lines, and causing structural collapse in buildings and infrastructure not designed to withstand the weight of the snow. Repair and snow removal costs can be significant and surpass annual municipal salt and snow removal budgets, often before the end of the season" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-183).

According to the National Severe Storms Laboratory (NOAA|NSSL. *Severe Weather 101 – Winter Weather*) key winter weather alerts include:

- **Blizzard Warning:** Issued when winds of 35 mph or greater are combined with blowing and drifting snow with visibilities of 1/4 mile or less. Seek indoor shelter immediately and stay indoors until the severe conditions end.
- **Winter Storm Warning:** Issued when a combination of hazardous winter weather in the form of heavy snow, heavy freezing rain, or heavy sleet is imminent or occurring. Winter Storm Warnings are usually issued 12 to 24 hours before the event is expected to begin.
- **Winter Storm Watch:** Issued 12-48 hours in advance of the onset of severe winter conditions. The watch may or may not be upgraded to a winter storm warning, depending on how the weather system moves or how it is developing.

In the northeastern United States, the term Nor'easter is used to describe storm events that have northeasterly winds that blow in from the ocean. A Nor'easter, is an extratropical cyclone, meaning that it no longer has tropical characteristics. Nor'easters exhibit a counter-clockwise wind circulation around a low-pressure center and pick up strength from cold air in the atmosphere. Nor'easters are a common winter occurrence in New England and often result in flooding, and wave/erosion-induced damage to structures and natural resources. The erosion of coastal features (such as beaches, dunes, and coastal bluffs) commonly results in greater potential for future storm damage to shoreline development. The amount of coastal erosion caused by Nor'easters depends on the intensity and the duration of the storm, the tidal phase at the time of the storm, the path of the storm, and the time interval between storms (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-218).

The storm radius of a Nor'easter, traveling up the eastern United States coast, is often as large as 1,000 miles, and the horizontal storm speed is generally around 25 miles per hour (mph). Sustained wind speeds of 10-40 mph are common during a Nor'easter, with short term wind speeds gusting up to 70 mph. Unlike hurricanes and tropical storms, Nor'easters can sit off shore, wreaking damage for days (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-218). Although these storms occur between October and April, they are most severe in the winter when the difference in temperature between the converging cold polar air and warmer air over the Atlantic Ocean is the greatest (NOAA|NHS. *What is*).

While the winds from Nor'easters are not as powerful as hurricane winds, their wind gusts can approach hurricane force, which means Nor'easters also have the potential to tear off roofs and topple structures. If a Nor'easter hits the coast as a blizzard, the ensuing snowfall can collapse weak roofs, as well. Nor'easter winds have the potential to produce significant storm surges, and as prolonged events can often continue through multiple high tides. The amount of damage resulting from a strong hurricane is often more severe than a Nor'easter, but historically, Little Compton has suffered more overall damage from Nor'easters because of the greater frequency in which they occur.

Other than characterizing a winter storm as an ice storm, snow squall, or blizzard, there is no universally accepted scale to measure them. However, the Northeast Snowfall Impact Scale (NESIS), developed by the National Weather Service (NWS), is commonly used to characterize and rank significant Northeast snowstorms with 10 inches or greater accumulation. The NESIS index is unique in that in addition to meteorological measurements, it uses population information that provides a framework for the storm's societal impacts, particularly in terms of transportation and economic impact. **Table 4-14** provides the NESIS values which are a function of the area affected, the amount of snow, and the number of people living in the path of the storm, as well as a descriptive adjective related to hazard impact (NOAA|NCDC. *The Northeast*).

Table 4-14 NESIS Index (NOAA|NCDC)

Category	NESIS Value	Description
1	1—2.49	Notable
2	2.5—3.99	Significant
3	4—5.99	Major
4	6—9.99	Crippling
5	10+	Extreme

❖ **Ice Storm**

The term ice storm is used to describe the weather phenomena involving rain or snow being converted to ice with accumulations that create hazardous conditions on the ground. Ice storm warnings are issued for one-half inch or greater accretion of freezing rain (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-183). Even small accumulations of ice can create hazards for motorists and pedestrians. Heavy accumulations of ice can bring down trees and utility poles resulting in disruptions to electrical power and internet communication.

❖ **Extreme Cold**

What is considered an excessively cold temperature varies according to the normal climate of a region. Extreme cold for Rhode Island is characterized by temperatures well below zero degrees Fahrenheit for an extended period of time. This event may coincide with winter storms, occur after a storm, or occur without storm activity at all (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-88). Extreme cold can lead to hypothermia and frostbite, which are both serious medical conditions. Infants and seniors are more susceptible to extreme cold. If extreme cold conditions are combined with low/no snow cover, the cold can better penetrate downward through the ground and potentially create problems for underground infrastructure as well. When utilities are affected and heaters do not work, water and septic system pipes can freeze and even rupture (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-92).

Rather than simply the outside temperature, extreme cold is typically measured in terms of the NWS Wind Chill Temperature (WCT) index shown in **Figure 4-34**. The index attempts to quantify the cooling effect of wind with the actual outside air temperature to provide a more realistic representation of how cold people and animals feel, based on the rate of heat loss from exposed skin (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-88).

"A wind chill index of -5°F indicates that the effects of wind and temperature on exposed flesh are the same as if the air temperature alone were five (5) degrees below zero (0), even though the actual temperature may be much higher. The NWS issues a wind chill advisory when wind chill temperatures are potentially hazardous and a wind chill warning when the situation can be life-threatening" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-88).

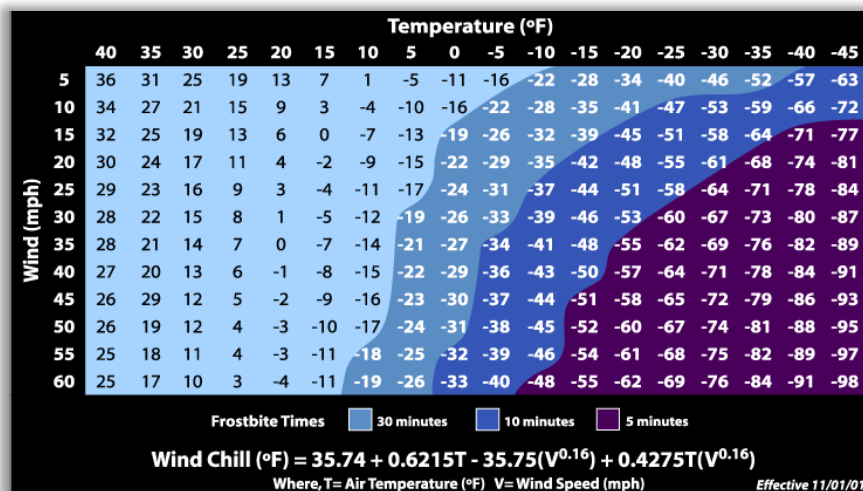


Figure 4-34 Wind Chill Index Chart (NOAA/NWS)

Location

Little Compton's coastal location makes it somewhat less prone to heavy snowfall than inland communities, but virtually any area of Town could be impacted by a severe winter storm. All areas of Little Compton are considered exposed to winter-related hazards, with the shoreline areas more vulnerable to Nor'easter wind gusts and associated flooding. Town Way, located near the Sakonnet River in the northwestern area of Town, has a history of stormwater run-off damaging the roadway. In the winter freezing runoff can cause vehicular safety issues in this area. The following roads are known to have icing issues: Commons, John Dyer Road (north and south ends), Long Highway (north end), Main Street, Public Safety Complex, Town Way, and Willow Avenue (north end). There are some residential and commercial structures sporadically located throughout Little Compton that are of older construction and may be more susceptible to roof collapse due to heavy snow loads.

Previous Occurrences

Winter storms are a regular occurrence in Little Compton, with snowfall ranging from a few inches to blizzard conditions, including sustained winds or frequent gusts of 35 mph or greater. These storms can create hazardous and disruptive conditions due to broken tree limbs, loss of power, school closings, business/civic service interruption, dangerous driving conditions with reduced visibility to less than a quarter mile, coastal erosion, and flooding conditions when the snow melts.

Figure 4-35 Blizzard of 1978 - Providence, RI



Photo Credit: Providence Journal

Figure 4-36 January 2015 Blizzard



Photo Credit: Carol Wordell

As shown in **Table 4-15**, the frequency of winter storms in Newport County has varied over the past several decades. Based on information obtained from NOAA|NCEI Storm Events Database, between 1996 and 2022 there have been 47 events categorized as either blizzard, winter storm, or heavy snow. Only seven of the events caused property damage, with a cumulative total of approximately \$291,000. Many of the events did, however, result in traffic difficulties or school and commercial closings.

Over the past 100 years, the most significant Nor'easter to impact Rhode Island was the Blizzard of 1978 (**Figure 4-35**), with parts of the State receiving up to 4 feet. Wind speeds exceeded 60mph and downed power lines across the State. The heavy snow stranded more than 10,000 people on roadways throughout Rhode Island. Regrettably, 232 injuries and 26 deaths resulted from the storm, and damages totaled more than \$15 million (Strauss).

As shown in **Figure 4-36**, a recent blizzard occurred in January 2022, with Rhode Island experiencing "the most single-day snowfall in recent memory. Warren saw the highest snow accumulation in the state, breaking two feet with 24.6 inches. Tiverton was not far behind, with 22 inches of snow recorded. Everywhere in the state saw at least a foot of snowfall, according to the latest report from the National Weather Service" (Nunes).

In February 2013 Winter Storm Nemo, a powerful Nor'easter, bore down on the State. Most of Rhode Island received between 24 to 30 inches of snow, and isolated thunderstorms were common across the entire region during the height of the storm. The Providence Journal reported that almost 170 people sought treatment for storm-related heart attacks, falls, and other injuries (NOAA|NCEI. *Storm Events Database*). Governor Lincoln Chafee declared a state of emergency in Rhode Island and enacted a statewide travel ban that lasted nearly 24 hours (Rapoza). National Grid estimated more than 180,000 customers lost power, with most of Bristol and Newport Counties in the dark. Due to the severity of the winter storm, a Major Disaster Declaration (DR-4107) was declared. Rhode Island received \$1 million in reimbursements from the Federal Emergency Management System (FEMA) for snow removal costs from the storm (Cicilline).

Another significant nor'easter, Winter Storm Juno, occurred in January 2015. The blizzard inundated Rhode Island with roughly 16 inches of snow, produced strong winds with gusts of 50 to 65 mph, caused several fatalities, and caused approximately \$8.4 million in damages statewide. The Governor declared a statewide travel ban beginning at midnight on January 27 and continuing through 8 pm on January 28, 2015. President Obama issued a Presidential Major Disaster Declaration (DR-4212) for the State, allowing federal assistance for emergency work and repairs to facilities damaged by the storm (NOAA|NCEI. *Storm Events Database*).

Table 4-15 Significant Winter Storms for Newport County 1996-2023 (NOAA|NCEI. *Storm Events Database*)

Begin Date	Category	Description (statewide snow totals unless specified otherwise)	Damages
1/7/1996	Heavy Snow	Blizzard of 1996; 12-24 inches	School and commercial closings; transportation difficulties
2/2/1996	Heavy Snow	6-8 inches	Transportation difficulties
3/2/1996	Heavy Snow	6-11 inches	Numerous automobile accidents
3/31/1997	Heavy Snow	Up to 15 inches; 60-70mph winds along the coast; a peak gust to 71 mph from the northeast was recorded in Little Compton	Heavy wet snow; widespread power outages; transportation difficulties
4/1/1997	Heavy Snow	Near blizzard conditions; 30 inches northern RI; 4 inches along the coast	Heavy wet snow; downed trees and power lines; power outages; school closings; approximately \$100,000 in property damage
2/25/1999	Heavy Snow	Up to 15 inches in northern RI	School closings; transportation difficulties
3/15/1999	Heavy Snow	7-12 inches	School and commercial closings; transportation difficulties
1/20/2001	Heavy Snow	Up to 8 inches	Minor accidents

Begin Date	Category	Description (statewide snow totals unless specified otherwise)	Damages
3/26/2001	Heavy Snow	5-7 inches	
1/19/2002	Heavy Snow	Up to 7 inches	
12/5/2002	Heavy Snow	2- 7 inches	
2/7/2003	Winter Storm	6-12 inches	Minor automobile accidents
2/17/2003	Winter Storm	23 inches in Burrillville, less for most of the State	Occurred during school vacation so only minor transportation disruption
3/6/2003	Winter Storm	6-10 inches	Minor transportation disruption; approximately \$25,000 in property damage
12/5/2003	Winter Storm	Major storm; strong winds; 10-20 inches	Major transportation disruption; two deaths indirectly attributed to the storm
12/26/2004	Winter Storm	Powerful storm; strong winds - 50mph along south coast; 6-10 inches; 9 inches in Little Compton	Treacherous driving conditions
1/22/2005	Winter Storm	Major storm; near blizzard conditions; 60mph wind gusts; 15-25 inches most areas; 27 inches Little Compton	Coastal flooding; treacherous driving conditions
2/24/2005	Heavy Snow	5-8 inches most areas; 10 inches along south coast and in Little Compton	
3/1/2005	Winter Storm	Heavy snow; gusty winds; 4-8 inches; 9 inches in Little Compton	
2/12/2006	Winter Storm	Nor'easter; blizzard-like conditions; 9-14 inches	approximately \$10,000 in property damage
12/19/2008	Heavy Snow	9-11 inches in Newport County	Downed trees; approximately \$4,000 in property damage
12/19/2009	Blizzard	18-20 inches	Treacherous driving conditions; school and commercial closings; flights cancelled
2/10/2010	Winter Storm	5-8 inches in Newport County	Downed trees and power lines
12/26/2010	Winter Storm	Strong winds; near blizzard conditions; 6-10 inches in Newport County	
1/12/2011	Winter Storm	Portions of the State received 24 inches over 24 hours; 6-10 inches in Newport County	
1/26/2011	Heavy Snow	5-7 inches in Newport County	
1/21/2012	Heavy Snow	8-12 inches along the coast	
12/29/2012	Heavy Snow	5-8 inches in Newport County	
2/8/2013	Blizzard	Blizzard of 2013 – Winter Storm Nemo; strong winds – gusts up to 68mph; wet snow; up to 30 inches	Downed trees and power lines; power outages; 170 people reported to have sought treatment at RI Lifespan Hospitals for storm-related injuries
1/2/2014	Heavy Snow	Bitter temperatures; strong winds; 7-9 inches in Newport County	
1/21/2014	Heavy Snow	strong winds; 5-8 inches in Newport County	
2/15/2014	Heavy Snow	Strong winds; 6-8 inches in Newport County	
1/26/2015	Blizzard	Blizzard conditions; gusty winds; limited visibility; 16-19 inches in Newport County	President Obama issued a federal disaster declaration; RI Governor declared a statewide travel ban; school and commercial closings; flights cancelled; several fatalities occurred as a result of the storm; approximately \$50,000 in property damage
2/14/2015	Heavy Snow	Near blizzard conditions; 9-10 inches in Newport County	Coastal flooding
3/5/2015	Heavy Snow	8-11 inches in Newport County	

Begin Date	Category	Description (statewide snow totals unless specified otherwise)	Damages
1/23/2016	Heavy Snow	High winds; 4-9 inches in Newport County	
2/5/2016	Heavy Snow	2-8 inches in Newport County	Heavy wet snow; downed tree limbs
1/7/2017	Winter Storm	8-14 inches in Newport County	
2/9/2017	Winter Storm	9-12 inches in Newport County	
3/10/2017	Winter Storm	5-6 inches	
1/4/2018	Winter Storm	Heavy snow and damaging winds; near blizzard conditions; 12-15 inches in Newport County	
1/30/2018	Winter Storm	5-8 inches in Newport County	
3/13/2018	Blizzard	64mph wind gusts; 9-14 inches in Newport County; up to 24 inches in northern RI	tree and wires were down on Queen Awashunk's Trail in Little Compton; approximately \$2,000 in property damage
12/16/2020	Heavy Snow	wind gusts 45-50mph; 6-14 inches; 8 inches in Little Compton	
2/7/2021	Heavy Snow	4-7 inches in Newport County; 6 inches in Little Compton	
1/28/2022	Blizzard	wind gusts 50-65mph; blizzard conditions in some areas; 10-26 inches	
2/3/2023	**Extreme Cold Event	A major Arctic cold front blasted through southern New England followed by a few rounds of strong and locally damaging wind gusts. Temperatures plunged to 10 to 20 below zero with wind chill indices 30 to 40 below zero across southern New England. . In Rhode Island more than 2,700 customers were without power. There were numerous instances of burst pipes due to the cold across the region, including a burst pipe in the home of one of the Advisory Committee members which caused basement flooding	
2/27/2023	Heavy Snow	4-6.5 inches in Newport County; 6.2 inches in Little Compton	

** This event was not listed in the NOAA|NCEI Storm Events Database for Newport County, however the Advisory Committee recommended including it as it was impactful for Little Compton.

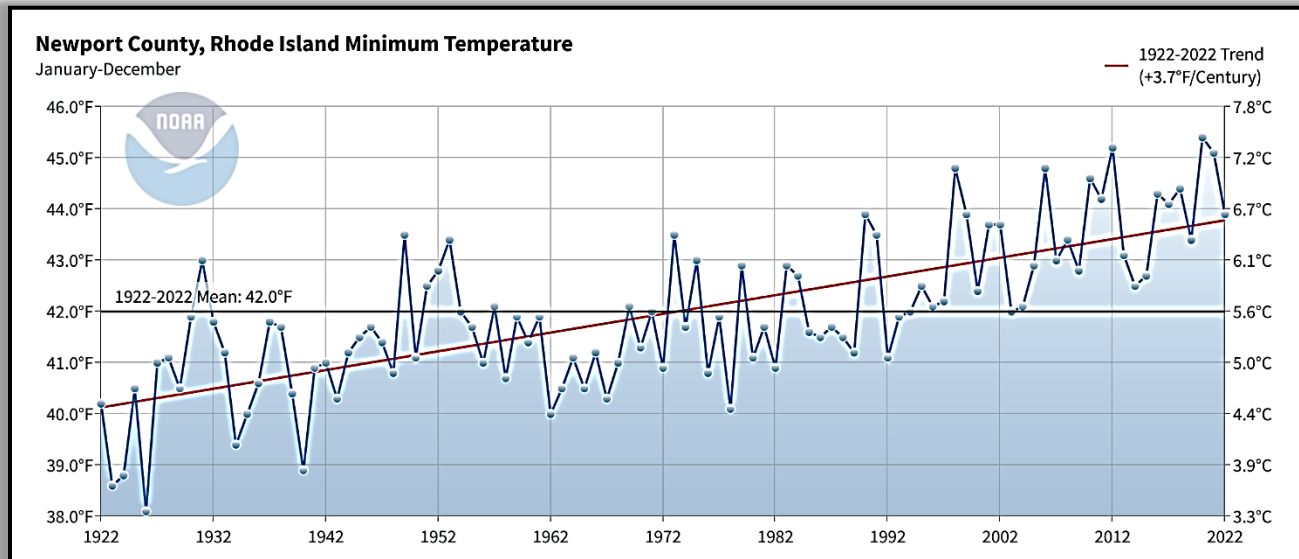
Climate Change Impacts

The number and strength of storms during colder months have increased in the Northern Hemisphere since 1950; however, the total amount of snowfall averaged across the Northern Hemisphere is in decline due to global warming (Di Liberto). In the northern and eastern U.S. in particular, extremely heavy snowstorms have increased in frequency over the last century (Di Liberto).

As illustrated in **Figure 4-37** (NOAA|NCEI. *Climate at a Glance*), temperatures in Newport County have been steadily climbing since the 1920s. A decrease in extreme cold days has been documented and is expected to continue. For example, prior to 1980, Rhode Island experienced at least 120 days a year with temperatures at or below freezing. This has not occurred since 2000 (Vallee and Giuliano).

More research and better predictive models are needed to determine if, despite a decline in total snowfall, the winter storms that Rhode Island and other areas experience will become more intense. Further, some studies that have been done suggest that although the total amount of snowfall may be decreasing, the overall precipitation rate is increasing. Coupled with sea level rise, more precipitation is problematic in terms of flooding hazards (Di Liberto).

Figure 4-37 Newport County Annual Minimum Temperature 1922-2022 (NOAA|NCEI)



Probability of Future Events

Winter weather events for the Town, as in most of the northeast, can be described as unpredictable. Days with below freezing temperatures may be followed by days with mild temperatures in the 40s or 50s. Based on history and climatic conditions, the RI-SHMP states that it is **Likely** (between 50% and 89.9% annual probability) of extreme cold affecting Rhode Island. However, it is likely that the extreme cold temperatures will only occur for short periods of time (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-89, 3-90). The Advisory Committee concurs with this assessment of extreme cold for Little Compton.

As shown in **Table 4-15**, winter storms regularly occur in Rhode Island. Based on the NCEI data, on an annual basis, approximately two to seven winter weather events of some significance will occur in any of Rhode Island's counties. It is probable that one of these events will be a Nor'easter. As such, the RI-SHMP assesses it as **Highly Likely** (greater than 90% annual probability) that a winter weather event will occur in Newport County (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-187) and the Advisory Committee concurs with this assessment for Little Compton.

INFECTIOUS DISEASE-RELATED HAZARDS



4.3.4 Infectious Disease-Related Hazards

Profiles for the following natural hazards have been included in this Section.

4.3.4.1 Vector-borne Diseases Transmitted by Ticks or Mosquitoes

4.3.4.2 Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses



4.3.4.1 Vector-Borne Diseases Transmitted by Ticks or Mosquitoes

Description and Extent

Vector-borne diseases are infections transmitted to humans and other animals by blood-feeding arthropods, such as mosquitoes and ticks.

❖ **Mosquitoes**

Mosquitoes are carriers (vectors) for many diseases. There are 46 mosquito species in Rhode Island, including the species that carry West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE) (RIDEM. *About Mosquitoes*). Female mosquitoes have a mouthpart made to pierce skin and siphon off blood, which is required to complete their egg production cycle. As the mosquito fills itself with blood, it injects saliva into the host's skin. If disease-causing organisms are present in the blood from one of the mosquito's victims, those organisms could then be injected into other victims' bloodstreams when the mosquito feeds again. Mosquitoes can spread disease from animal to animal, animal to man, and from person to person in this manner (Mayo Clinic. *Mosquito Bites*).

➤ **West Nile Virus (WNV)**

West Nile virus (WNV) is the leading cause of mosquito-borne disease in the continental United States, with 970 known human infections in 2022. Only one human case was reported in Rhode Island in 2022 (CDC. *West Nile Virus*). "It is most commonly spread to people by the bite of an infected mosquito. Cases of WNV occur during mosquito season, which starts in the summer and continues through fall. There are no vaccines to prevent or medications to treat WNV in people. Fortunately, most people infected with WNV do not feel sick. About 1 in 5 people who are infected develop a fever and other symptoms. About 1 out of 150 infected people develop a serious, sometimes fatal, illness. You can reduce your risk of WNV by using insect repellent and wearing long-sleeved shirts and long pants to prevent mosquito bites" (CDC. *West Nile Virus*).

➤ **Eastern Equine Encephalitis (EEE) Virus**

The EEE virus is rare, but the impacts of infection can be deadly. Nearly 30 percent of the people that contract the disease die. EEE can cause brain infections including meningitis and encephalitis, and many survivors have ongoing neurologic problems. The CDC indicates that there are no preventative vaccines or medical treatments for EEE. Between 2011 and 2020 there were a total of 110 reported cases in the U.S., with a higher than average mortality rate of 43 percent. Three of the cases occurred in Rhode Island - all in 2019 (CDC. *Eastern Equine Encephalitis*).

❖ **Ticks**

Another type of blood-feeding arthropod, the tick, is also common in North America, and can spread disease in the same manner. According to RIDOH, “Ticks feed on small wild rodents, deer, pets, and humans. When a tick becomes infected and continues to feed on various hosts, the bacteria, virus, or parasite can be transmitted. Ticks that are located in the brush and on tall grasses come into contact with humans as we pass through these environments” (RIDOH. *Tick*). Not every tick is a carrier, but if you are bitten by an infected tick, the disease may be transmitted to you.

“Lyme disease, Anaplasmosis, and Babesiosis are the most frequently reported tick-borne diseases in Rhode Island” (RIDOH. *Tick*). In 2016, Rhode Island had their first case of Powassan virus, which is currently not treatable. Although the risk of being bitten is greater in the spring and summer when the nymphs are feeding, you may find ticks any time the temperature is above freezing (RIDOH. *Tick*). “If you have become infected, symptoms can present themselves between a few days and a few months later, or may not appear at all. The type and severity of symptoms vary with the specific disease, but there are some common symptoms, which include tiredness, body/muscle aches, joint pain, fever, rash, stiff neck, and facial paralysis. Early diagnosis is helpful in successfully treating tick-borne diseases, so it is important to contact your healthcare provider if you are experiencing symptoms” (RIDOH. *Tick*).

➤ **Lyme Disease**

According to the EPA, Lyme disease is the most common vector-borne disease in the U.S. and is prevalent in Rhode Island which had the nation’s fifth-highest rate of cases in 2018 (RI.gov Press Releases). The CDC has determined that, generally, for the Lyme disease bacterium to be transmitted, the tick (most often a nymph, or immature tick) must be attached for 36 to 48 hours. Of those infected, about 70 percent develop a rash at the bite site, which sometimes resembles a “bull’s eye.” If left untreated, other symptoms may occur involving the skin, eyes, heart, nervous system, brain, or joints, some of which may be permanent. Early detection is important in the treatment of Lyme disease (CDC. *Lyme Disease*).

➤ **Anaplasmosis**

Anaplasmosis is caused by the bacterium *Anaplasma phagocytophilum* and spread to people primarily from the blacklegged tick and western blacklegged tick. Symptoms include fever, headache, chills, and muscle aches (CDC. *Anaplasmosis*).

➤ **Babesiosis**

Most people won’t experience symptoms if infected with babesiosis (red blood cell parasite), but some may have fatigue, fever, malaise, jaundice, and anemia. A more severe and prolonged illness or possibly death may occur for those elderly or immunocompromised (RIDOH. *Babesiosis*).

Monitoring Mosquitoes and Ticks

Both the Rhode Island Department of Health (RIDOH) and the University of Rhode Island (URI) have programs that monitor the extent of mosquito and tick populations and/or disease incidents. From June through October, RIDOH’s Arboviral Surveillance program monitors the epidemiology, incidence, and geographic distribution of West Nile Virus, Eastern Equine Encephalitis Virus, and other arboviruses in Rhode Island for early detection and prevention of any human transmission (RIDOH. *Arboviral Surveillance*).

The State requires health care providers to report positive tick-borne laboratory results to RIDOH. The Department of Health then monitors and analyzes the tick-borne disease data to detect potential increases in disease and to identify opportunities for outreach (RIDOH. *Tick*). The University of Rhode Island Tick Encounter Resource Center has set up a program called *TickSpotter* to help keep track of tick activity across North America. The program has an app that allows participants to take a photo of the tick they found, use the *Tick Identification Guide* to correctly identify the tick, and then submit the information. The submissions help to monitor tick population trends and tickborne disease risk (URI. *Tick Encounter*).

Location

Although ticks can be found in urban areas and along coastlines, higher populations tend to be found in wooded and grassy areas where the creatures they feed on live and roam, including deer, rabbits, birds, lizards, squirrels, mice, and other rodents. Typically, ticks climb to the top of a grass blade or the tips of a bush or branch and wait for potential prey to pass by. They latch onto the fur, hair, or clothing of their prey by extending their hooked front legs. Once on their host they tend to climb upward before attaching and feeding (IGeneX).

Mosquitoes breed in standing water which can be found along the river, creek, and pond areas as well as in swimming pools, birdbaths, ditches, and just about any outdoor vessels that can hold even a small amount of water. As such, conditions conducive for breeding can be found Town-wide. That being said, higher concentrations of mosquitoes will be found in forested and wetland areas. Based on RIGIS datasets (2020 statewide land cover and 1993 wetlands), Little Compton has approximately 3,704 acres (25.7%) of upland forest and 2,924 acres (20.3%) of wetlands (Mosaic Land Management).

The Town's coastal wetlands include salt marshes and freshwater or brackish wetlands contiguous to salt marshes. There are numerous coastal ponds along the southern shore, many of which are surrounded by estuarine emergent wetlands, typically salt marshes. Little Compton's coastal ponds include Quicksand Pond, Tunipus Pond, Little Pond, Briggs Marsh, Long Pond, Round Pond, and Watch House Pond (Town of Little Compton RI. *Comprehensive*, 17). The dominant type of inland wetland within the Town is forested wetland, also known as forested swamp. Shrub wetlands or shrub swamps are the second most common (Town of Little Compton RI. *Comprehensive*, 19).

There are three major freshwater stream systems flowing from north to south: Adamsville Brook, Colebrook, and Dunderly Brook. Adamsville Brook (also locally referred to as Mill Brook) traverses along the east side of Crandall Road, flowing into Gray's Mill Pond in Westport, MA and then into the West Branch of the Westport River. The wetlands associated with Adamsville Brook are forested wetlands. Colebrook, which originates in Tiverton, flows southerly into Simmons Pond and a series of manmade ponds, after which it is renamed West Brook and flows to Quicksand Pond. Dunderly Brook originates south of Peckham Road and flows southward eventually flowing into Town-owned Wilbour Woods on the north side of Swamp Road, and then into Briggs Marsh. Both the Colebrook and Dunderly Brook freshwater systems includes forested wetlands, shrub swamps, and wet meadows (Town of Little Compton RI. *Comprehensive*, 16). There are also two other north to south running stream corridors that are less well-defined. An unnamed perennial stream originates in the wetland area between South of Commons and Maple Avenue and flows south under Brownell Road and subsequently Shaw Road, eventually draining into Little Pond (also locally referred to as Ship Cove Pond) at the shoreline. Sisson Brook and another unnamed stream commence just north of Snell Road and meander southward through forested wetlands and shrub swamps to terminate in Tunipus Pond.

There are numerous scenic hiking trails within these areas that provide outdoor enjoyment to residents and visitors. The more educated the population is on how to minimize the risks of mosquito and tick bites, the lower the incident rate.

Previous Occurrences

According to the CDC, in 2019 the United States saw a large increase in the total number of Eastern Equine Encephalitis cases (38) and deaths (19). Three cases were found in Rhode Island, but none of those resulted in death (CDC. *Eastern Equine Encephalitis*). The CDC reports a low incidence of West Nile Virus in Rhode Island over the past two decades (15 cases from 1999 to 2018) (CDC. *West Nile Virus*).

As illustrated in **Figure 4-38**, the incidence of Lyme disease in the United States has significantly increased over the past two decades. Cases documented by the CDC have nearly doubled between 1991 and 2018 and recent estimates suggest that approximately 300,000 people may get Lyme disease each year in the United States (EPA. *Climate Change Indicators*). In 2020, Rhode Island had 839 cases of Lyme disease – 77 cases per 100,000 people, almost 10x the national average of 7.95 cases per 100,000 (EPA. *Climate Change Indicators in the United*).

According to RIDOH, the “Reported cases of Lyme remained stable from 2017-2021, however reported cases increased by over 230% in 2022 with much of this significant increase attributed to the Council of State and Territorial Epidemiologists (CSTE) case definition change for Lyme disease. In 2022, Rhode Island had 2,326 cases of Lyme disease, with an incidence rate of 212 cases per 100,000 people. The 5-year mean rate for Lyme disease for 2017-2021, reporting years before the CSTE case definition change, was 92 per 100,000 people. According to RIDOH, in 2022 Little Compton had 53 cases of Lyme which corresponds to a rate of 1,466 per 100,000 residents (RIDOH. *Tickborne Disease Data*).

Figure 4-38 Reported Lyme Disease Cases in 1996 and 2018 (adapted from CDC)

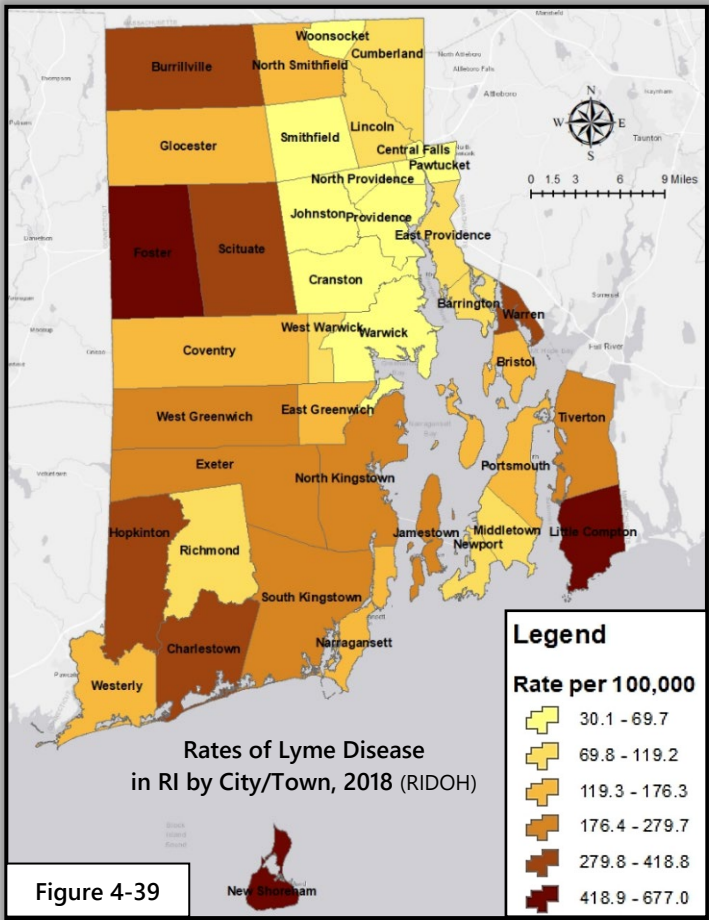
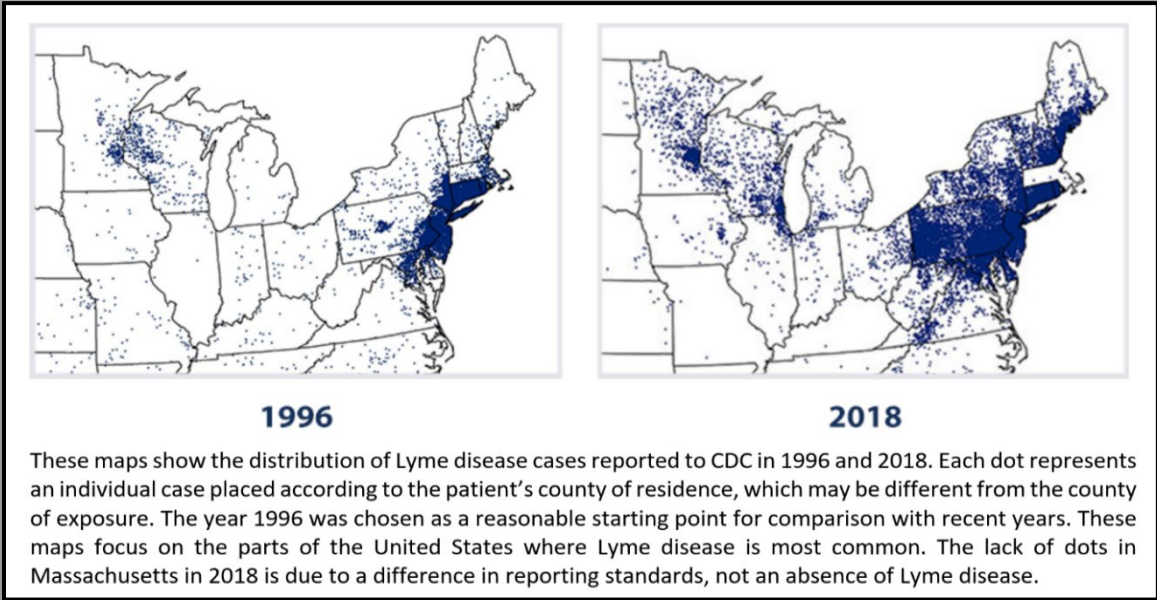


Figure 4-39 shows the 2018 rates of Lyme Disease in RI. As shown, Little Compton has one of the highest incident rates in the State (RIDOH. *Lyme Disease Surveillance*, 20).

Climate Change Impacts

Climate change is expected to cause heavier precipitation, longer warm seasons, and warmer winters. These changing temperature and precipitation patterns could make conditions more hospitable for mosquitos and ticks, thereby increasing life cycle and geographic spread, which may increase disease transmission rates (RIDOH. *Mosquitoes*).

“Both the infectious agent (protozoa, bacteria, viruses, etc.) and the associated vector organism (mosquito or tick) are very small and devoid of thermostatic mechanisms. Their temperature and fluid levels are therefore determined directly by the local climate. Hence, there is a limited range of climatic conditions - the climate envelope - within which each infective or vector species can survive and reproduce. It is particularly notable that the incubation time of a vector-borne infective agent within its vector organism is typically very sensitive to changes in temperature, usually displaying an exponential relationship. Other climatic sensitivities for the agent, vector, and host include level of precipitation, sea level elevation, wind and duration of sunlight” (Patz, 104).

Probability of Future Events

Although mosquitoes will continue to be prevalent and the population may increase, based on past occurrences the Advisory Committee assesses the risks of Eastern Equine Encephalitis and/or West Nile Virus occurring in Little Compton as **Unlikely** (less than 1% annual probability).

With respect to risks associated with ticks, specifically Lyme disease, the Advisory Committee assesses the risk as **Highly Likely** (greater than 90% annual probability) that a number of Little Compton residents or visitors will be infected by Lyme disease, most likely at a rate similar to or exceeding the 2022 rate of 53 cases per year. Due to the vast open space in Town ideal for tick habitat, the Advisory Committee notes that the local trends associated with the risks of tick-borne diseases will probably continue to track or exceed the State trends.



4.3.4.2 Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses

Description and Extent

The terms epidemic and pandemic are used to describe the degree at which a disease is spreading. An epidemic is an outbreak of a disease that occurs in a community, geographical area, or several countries which spreads quickly and affects many people at the same time. An epidemic becomes a pandemic when it spreads over several countries or continents, usually affecting a large percent of the population in a country or around the world. A pandemic often creates social disruption and economic loss with a lengthy response and recovery period. Many diseases throughout the history of the world have been pandemic (Rochester Regional).

Global, federal, state, and local agencies closely monitor diseases that have the potential to cause outbreaks and work to develop strategies to contain their spread, including medical countermeasures such as antibiotics and antiviral medications (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-157).

❖ **Influenza (Flu)**

According to the RIDOH, “Flu is a contagious respiratory illness caused by viruses. People get sick from seasonal flu viruses every year. Flu can cause illness ranging from mild to severe. In some cases, flu can lead to hospitalization and even death. Most people who get the flu will have a fever and cough or sore throat. They may also have a runny or stuffy nose, body aches, a headache, chills, fatigue, vomiting, or diarrhea” (RIDOH. *Flu*).

Epidemics of influenza typically occur during the winter months. The CDC estimates that annually in the United States, between 2010 and 2020, the flu resulted in between 9-41 million illnesses, 140,000-710,000 hospitalizations, and 12,000-52,000 deaths (CDC. *Disease Burden*). Although rates of infection are highest among children, rates of serious illness and death are highest among persons aged 65 and over and those with serious underlying health conditions (Harper, Scott).

A 2018 Centers for Disease Control and Prevention (CDC) study suggests, “that on average, about 8% of the U.S. population gets sick from flu each season, with a range of between 3% and 11%, depending on the season” (CDC. *Seasonal Influenza*). To prevent contracting seasonal flu people can take precautions such as regularly washing their hands and avoiding people who are sick, but the best way to prevent the flu is to get vaccinated every year. The effectiveness of a vaccine to protect a person from the flu depends on several factors including the match between the flu virus strain in the community and the vaccine strain, and the characteristics of the person being vaccinated (such as their age and health) and their body’s ability to use the vaccine to fend off the virus (CDC. *Seasonal Influenza*).

An influenza pandemic is a global outbreak of a new strain of the *Influenza A Virus* that has been transmitted to humans from another animal species. Species that are thought to be important in the emergence of new human strains are pigs, chickens, and ducks. Because the virus is new to humans, very few people will have immunity and an effective vaccine might not be widely available. The new strain can therefore spread rapidly infecting a large number of people (CDC. *Seasonal Influenza*).

❖ **Coronavirus Disease 2019 (COVID-19)**

According to the RIDOH, “Coronavirus Disease 2019 (COVID-19) is a virus strain that has only spread in people since December 2019” (RIDOH. *Covid-19 Information*). On March 11, 2020 the Coronavirus Disease was declared a pandemic by the World Health Organization (WHO) and on March 13, 2020 the United States declared the outbreak a national emergency (CDC. *New ICD*).

Symptoms of COVID-19 range in severity and may include fever or chills, cough, shortness of breath or difficulty breathing, muscle or body aches, sore throat, headache, nausea or vomiting, diarrhea, runny or stuffy nose, fatigue, and loss of taste or smell. RIDOH recommends that anyone with COVID-19 symptoms, or exposed to someone with symptoms or who tested positive, should be tested. Prior to receiving test results, individuals should try to isolate from those who are not sick. Anyone diagnosed with COVID-19 should isolate until they are well and test negative (RIDOH. *Covid-19 Information*). To prevent infection with COVID-19, the CDC recommends frequent handwashing with soap and warm water; coughing and sneezing into your elbow or a tissue; avoid touching mouth, nose, and eyes; and if you are sick, stay at home.

The CDC established a National Notifiable Diseases Surveillance System that enables states and other jurisdictions to share infectious and non-infectious disease-related data. Data for both Influenzas and Coronaviruses are collected through this system. Reporting is mandated by state laws and should follow uniform reporting criteria. The CDC has a Pandemic Severity Index (PSI) to assess the potential magnitude of the impact and resulting Community Mitigation Strategies to help guide the states and jurisdictions (CDC. *Pandemic Influenza*).

As outlined in the RI-SHMP (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-157, 3-158) the extent of an infectious disease’s impact depends on a number of factors including:

- The disease’s virulence, transmissibility, and pathogenesis
- Individuals’ vulnerability factors, such as underlying medical conditions, malnutrition, behavior, and pregnancy
- Immunization prevalence
- Quality and availability of healthcare services
- Availability and accessibility of medical countermeasures that protect against and treat the disease
- Modes of transmission
- Environmental conditions, including temperature and rainfall

Figure 4-40 Coronavirus (CDC. Photo ID #23313)

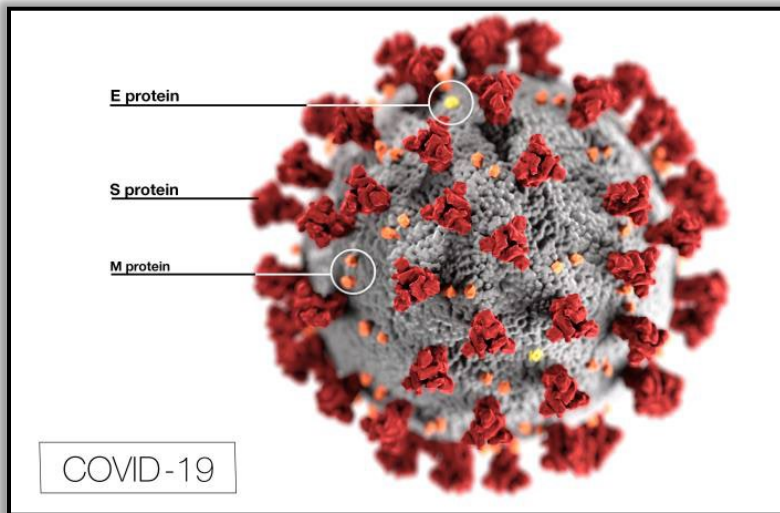


Photo Credit: Alissa Eckert, MSMI; Dan Higgins, MAMS

Figure 4-40, "created at the Centers for Disease Control and Prevention (CDC), reveals ultrastructural morphology exhibited by coronaviruses. Note the spikes that adorn the outer surface of the virus, which impart the look of a corona surrounding the virion, when viewed electron microscopically. In this view, the protein particles E, S, and M, also located on the outer surface of the particle, have all been labeled as well. A novel coronavirus, named Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2), was identified as the cause of an outbreak of respiratory illness first detected in Wuhan, China in 2019. The illness caused by this virus has been named coronavirus disease 2019 (COVID-19).

Location

Factors like high population density, where people are in routine close contact with one another, can aid transmission of infectious diseases (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-157). Overall, the Town of Little Compton has a low population density which is favorable in terms of minimizing the spread of communicable diseases. Areas of potentially higher risk in Town include schools, day care facilities, churches, the Little Compton Community Center, Little Compton Food Bank, Little Compton Wellness Center, and other places where people are in close contact and/or where people more vulnerable to communicable diseases may congregate. However, as COVID-19 is a highly contagious communicable disease, the entire Town is considered at risk.

Previous Occurrences

❖ *Influenza (Flu)*

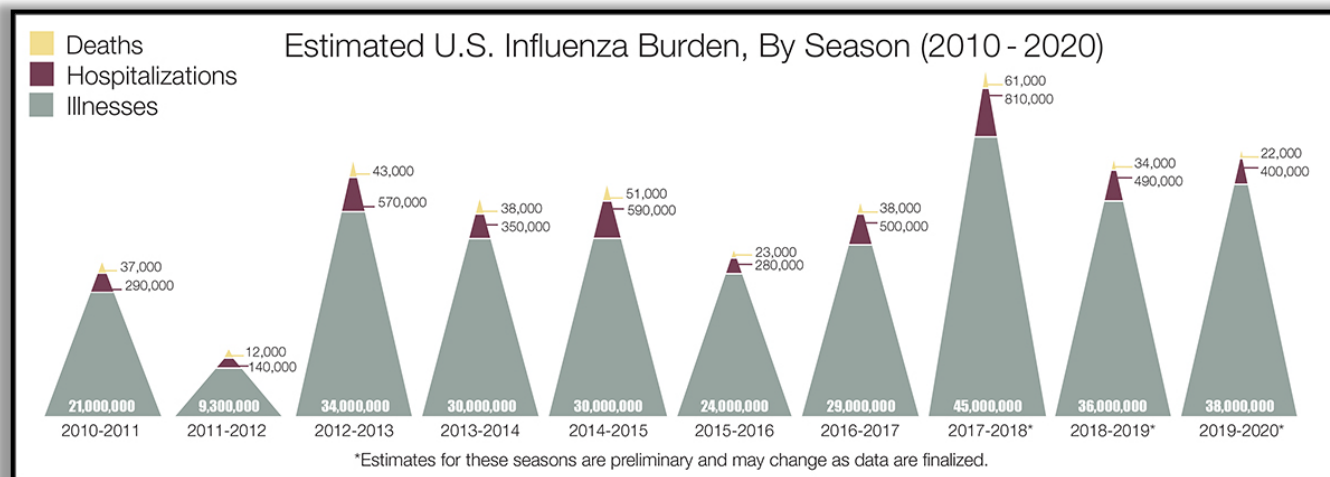
Due to public awareness, vaccines, and past immunity, it is rare that the flu season becomes epidemic or pandemic. There have however been four influenza pandemics in the 20th century (CDC. *Pandemic Influenza*):

- Spanish flu - H1N1 virus (1918-1920)
- Asian flu - H2N2 virus (1957-1958)
- Hong Kong flu - H3N2 virus (1968-1969)
- 2009 flu pandemic - H1N1pdm09 virus (2009-2010)

Cases of influenza are common every year in Rhode Island and across the United States. Generally mid-September through mid-May is considered the flu season, peaking between December and February. As illustrated in **Figure 4-41**, over the past decade, the worst flu season was 2017-2018, when 61,000 people nationwide died from the flu. During the 2018-2019 flu season, the CDC estimates the U.S. experienced approximately 34,000 deaths and during the 2019-2020 flu season, approximately 22,000 deaths (CDC. *Seasonal Influenza*).

Interestingly, during the 2020-2021 flu season, which coincided with the COVID-19 pandemic, the U.S. experienced extremely low flu numbers. According to Scientific American, “the drop-off in flu numbers following COVID’s arrival was swift and global. Since then, cases have stayed remarkably low. ‘There’s just no flu circulating,’ says Greg Poland, who has studied the disease at the Mayo Clinic for decades. The U.S. saw about 700 deaths from influenza during the 2020–2021 season” (Peek).

Figure 4-41 (CDC. *Seasonal Influenza*)

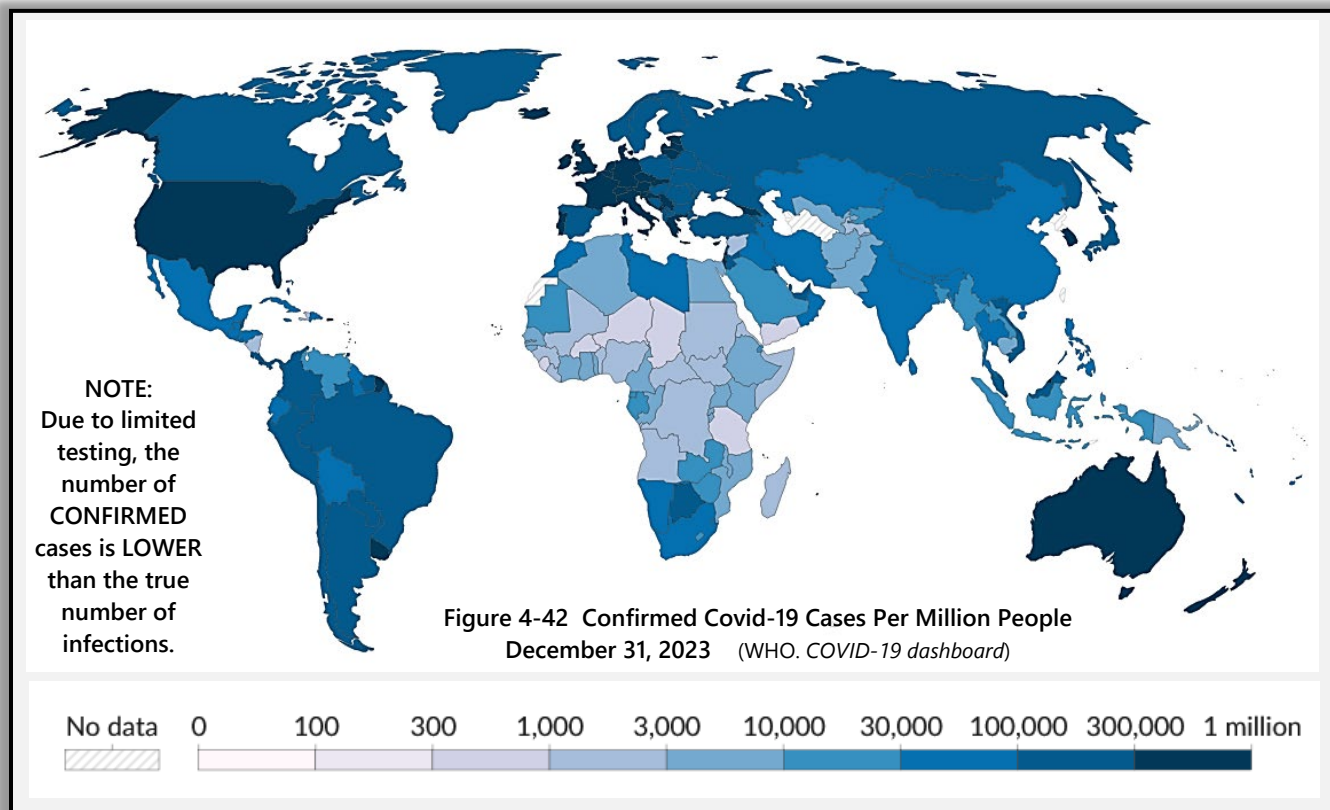


With respect to Rhode Island, the 2019-2020 Flu Season (October 6, 2019 - May, 22, 2020) was a moderately severe season with 948 hospitalizations for influenza, resulting in 20 deaths. This was lower than during the 2018-2019 season which reported a total of 1,032 hospitalizations and 39 deaths. According to RIDOH’s Influenza Surveillance Report for the 2020-2021 Flu Season (September 27, 2020 - May 22, 2021), Rhode Island paralleled the national trend with unprecedented low levels of influenza. Of the 12 positive influenza tests, only 2 were hospitalized, and there were no deaths. These numbers may be skewed however, because there is so much overlap in the symptoms of COVID-19 and influenza, that people may have assumed they were experiencing COVID-19 and did not get tested for influenza. Conversely, the extensive mask wearing and heightened hand hygiene practices to protect against COVID-19 may have also protected against influenza (RIDOH. *Influenza Surveillance*).

RIDOH data indicates that the 2021-2022 Flu Season was mild, with 301 influenza-associated hospitalizations and 3 influenza-associated deaths between October 3, 2021 and May 28, 2022 (RIDOH. *Surveillance*, 2). The CDC has indicated that in some areas of the country, the seasonal influenza viruses have continued to circulate into June 2022, creating a remarkably prolonged influenza season (Austin). As of the end of November 2022, Rhode Island topped the list as the state with the highest flu vaccine rate (66.1%); 14.7% points higher than the national rate (Stacker).

❖ **Coronavirus Disease 2019 (COVID-19)**

In 2007, WHO reported that since 1970 over 40 infectious diseases had been discovered (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-160). Hence, it is not surprising that at some point a new infectious disease will create an epidemic or pandemic. This is what appears to have happened with the 2019 Coronavirus Disease (COVID-19), which according to RIDOH, “is a virus strain that has only spread in people since December 2019” (RIDOH. *Covid-19 Information*). As depicted in **Figure 4-42**, the Coronavirus spread rapidly, creating a worldwide pandemic (WHO. *COVID-19 dashboard*).



Worldwide:

Globally, as of December 24, 2023, there have been 773,119,173 COVID-19 cases, including 6,990,067 deaths, reported to WHO. The first COVID-19 vaccine product was introduced on July 22, 2020. As of November 26, 2023, approximately sixty-seven percent (67%) of the world's total population had been vaccinated with a complete primary series of a COVID-19 vaccine (WHO. COVID-19 dashboard).

"The World Health Organization ended the global emergency status for COVID-19 on Friday [May 5, 2023], more than three years after its original declaration, and said countries should now manage the virus that killed more than 6.9 million people along with other infectious diseases... The COVID death rate has slowed from a peak of more than 100,000 people per week in January 2021 to just over 3,500 in the week to April 24, 2023, according to WHO data, reflecting widespread vaccination, availability of better treatments and a level of population immunity from prior infections" (Rigby).

United States:

In United States, between January 20, 2020 (first confirmed case in U.S.) and December 24, 2023 there have been 103,436,829 COVID-19 cases, including 1,144,877 deaths, reported to WHO. Between the U.S. vaccination start date of December 14, 2020 and November 26, 2023, approximately seventy percent of the total population (70% or 230,637,348 people) in the U.S. were vaccinated with a complete primary series of a COVID-19 vaccine (WHO. COVID-19 dashboard).

Based on current COVID-19 trends, the U.S. Department of Health and Human Services (HHS) ended the federal Public Health Emergency for COVID-19 as of May 11, 2023. The CDC stated, "The United States has mobilized and sustained a historic response to the COVID-19 pandemic. As a nation, we now find ourselves at a different point in the pandemic – with more tools and resources than ever before to better protect ourselves and our communities" (CDC. End). As of May 11, 2023 the CDC stopped collecting certain types of Covid-19 related data (CDC. End).

Rhode Island:

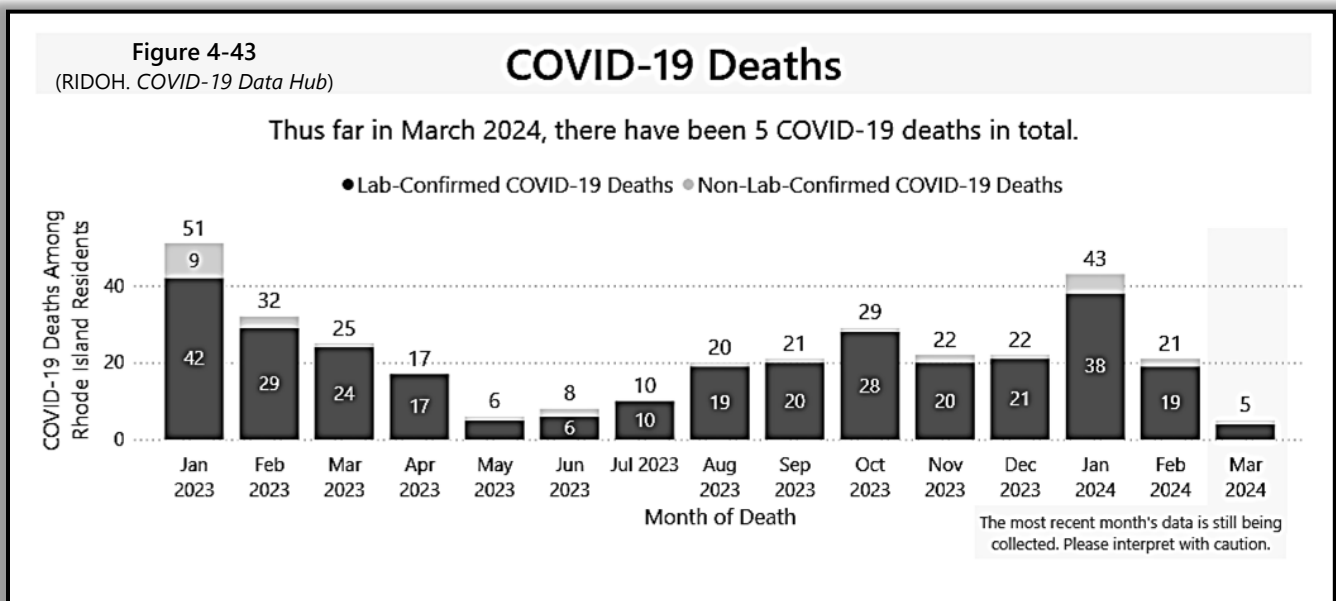
On July 1, 2021, just over eighteen months after the first confirmed case in U.S. (January 20, 2020), Rhode Island became the fifth state to reach 70% of adults fully vaccinated against COVID-19 (Taylor). As of August 10, 2023, RIDOH stopped updating some statewide Covid-19 data. Some of the data that has continued to be updated is provided in **Table 4-16**.

Table 4-16 COVID-19 Cases, Hospitalizations, and Deaths (RIDOH. *COVID-19 Data Hub*)

March 2020 through March 14, 2024			As of March 14, 2024
Jurisdiction	Total hospitalizations	Total deaths	Total population who have received the 2023-24 COVID-19 Vaccine
Rhode Island	18,827	2167	182,014 (17.2%)
Little Compton	5	<5	946 (27.1%)

Non-residents of Rhode Island are excluded from the data

Although the federal Public Health Emergency has ended, the “likelihood of COVID-19 disappearing any time soon is very low. In fact, scientists expect that the virus will eventually become endemic—causing seasonal illnesses each year” (URMC). As demonstrated in **Figure 4-43**, as deaths from Coronavirus continue, there remains the need to protect public health in the form of vaccines and other health measures.



It is normal and expected for variants of viruses to occur, and there are currently a number of variants of the virus SARS-CoV-2 that causes the COVID-19 disease (RIDOH. *COVID-19 Variants*). According to RIDOH, as of August 2022, “nearly all COVID-19 cases in Rhode Island are caused by the Omicron variant. Omicron is highly contagious and spreads more easily than the original virus that causes COVID-19 and the Delta variant” (RIDOH. *COVID-19 Variants*). In November 2022 the CDC reported that the Omicron variant (BQ.1) and a new subvariant (BQ.1.1) constituted nearly half of cases nationwide. The subvariant may pose a greater threat to immunocompromised people, but for the majority of fully vaccinated people, it should not be a serious health threat.

In September 2023, Yale Medicine reported that “Omicron and its subvariants have ranked as the predominant SARS-CoV-2 strains in the U.S. for almost two years now. While the original Omicron strain (BA.1) is no longer circulating, Omicron subvariants are now driving most of the country’s SARS-CoV-2 infections. In 2023, a new Omicron strain called EG.5 (nicknamed “Eris”) is the dominant strain in the U.S., and experts are monitoring another new strain called BA.2.86 (nicknamed “Pirola”)” (Katella).

“Numerous variants of the virus that causes COVID-19 are being tracked in the United States and globally. CDC is working with public health officials to monitor the spread of all variants and provide an estimate of how common they are in the nation and at the regional level ” (CDC. *COVID-19 Variants*).

A great number of studies are being conducted to determine how well antibodies fare against emerging variants. While the outcomes vary, some findings suggest antibody immunity against new variants are lower than scientists prefer. This suggests that to minimize breakthrough cases, vaccine companies will need to continue to modify vaccines to better combat emerging variants. According to Dr. Dan Barouch, director of the Center for Virology and Vaccine Research at Beth Israel Deaconess Medical Center (Cross), “The current vaccines are likely not going to provide substantial and sustained protection against infection, even with boosters... but these vaccines will likely still provide substantial protection against severe disease, and that is the most important goal of vaccines” (Cross).

Climate Change Impacts

Researchers warn that the sudden weather changes associated with climate change, could fuel future flu epidemics (Preidt). Zhaohua Wu, from Florida State University’s Department of Earth, Ocean and Atmospheric Science, explains, “The historical flu data from different parts of the world showed that the spread of flu epidemic has been more closely tied to rapid weather variability, implying that the lapsed human immune system in winter caused by rapidly changing weather makes a person more susceptible to flu virus” (Preidt).

Probability of Future Events

The Advisory Committee considers it **Highly Likely** (greater than 90% annual probability) that Little Compton will continue to experience some level of influenza and Coronavirus cases. For both of these viruses, following the CDC and RIDOH vaccination guidelines and suggestions for minimizing the spread of the diseases should have a positive impact on reducing incident rate and severity of infections.



OTHER HAZARDS



4.3.5 Other Hazards

Profiles for the following natural hazards have been included in this Section.

4.3.5.1 Earthquake

4.3.5.2 Extreme Heat

4.3.5.3 Drought

4.3.5.4 Brush Fire



4.3.5.1 Earthquake

Description and Extent

According to the U.S. Geological Society (USGS), an earthquake is the vibration (rapid shaking of the earth's surface in both horizontal and vertical directions) of the ground, produced by the sudden release of slowly accumulated energy. This energy can be generated by a sudden dislocation of segments of the crust, volcanic eruptions, or manmade explosions. The sudden dislocation of segments of the crust generally produces the most destructive quakes. Earthquakes tend to occur along faults which are fractures between two blocks of rock, known as tectonic plates. More specifically, tectonic plates are massive, irregularly shaped slabs of rock within the lithosphere, the rigid outermost shell of a planet, and are continually slowly moving because of convection in the mantle. When plates come in contact, the force of their movement against one another will cause deformation or strain on the rocks, building up potential energy. If the stress becomes too great, the weaker segments of rocks may suddenly snap, releasing large amounts of energy. This energy, in the form of seismic waves travels outwardly, in all directions, from its origin, commonly referred to as the focus or hypocenter. The location on the Earth's surface directly above the focus is called the epicenter and usually sustains the greatest damage in an earthquake event (Shedlock).

The depth to the center of the earth's core is approximately 3,960 miles. Earthquakes originate in relatively shallow parts of the earth's interior, generally the crust and upper mantle. Shallow earthquakes have focal depths from the surface to about 43.5 miles; intermediate earthquakes range from greater than 43.5 to about 186 miles; and deep earthquakes range from greater than 186 miles and may reach depths of more than 435 miles below the earth's surface (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-72).

As discussed in the RI-SHMP, the severity of an earthquake can be expressed in terms of magnitude and intensity. Magnitude is a measure of earthquake size based on the amount of seismic energy released at the hypocenter of the earthquake which is recorded on uniformly calibrated seismographs. It is represented by a single, instrumentally determined Richter Magnitude Scale value. The magnitude of an earthquake is not used to express damage and therefore remains unchanged with distance from the earthquake (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-74). Earthquakes with a magnitude of 2.0 or less on the Richter Scale are generally not felt by people, only recognized by local seismographs, and considered micro earthquakes. Around the world, hundreds of these events occur daily. Earthquakes with a magnitude of at least 4.5 are strong enough to be recorded by sensitive seismographs worldwide. Great earthquakes which have a magnitude of at least 8.0 occur about once a year. The largest earthquake ever recorded was in Chile in 1960 with a magnitude of 9.5 (IRIS).

The intensity of an earthquake is based on observation of the damage impact of an earthquake and therefore changes based on location; generally decreasing with distance from the epicenter. The intensity considers the effects of the ground shaking on people, manmade structures, and natural features. “Although numerous intensity scales have been developed over the last several hundred years to evaluate the effects of earthquakes, the one currently used in the United States is the MMI Scale (Modified Mercalli Scale). This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. It does not have a mathematical basis; instead it is an arbitrary ranking based on observed effects” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-74).

Table 4-17 relates the Modified Mercalli Intensity (MMI) scale to the Richter Scale. The MMI scale is used to evaluate the observed effects of earthquakes. The level of intensity ranges from imperceptible shaking (I) to catastrophic destruction (XII).

Table 4-17 Intensity and Effects of Earthquakes defined by the Richter and Modified Mercalli Intensity (MMI) Scales (adapted from USGS)

Richter Magnitude Scale	MMI Rating	MMI Description
1.0 - 2.9	I Instrumental	Not felt except by a very few under especially favorable conditions.
3.0 - 3.9	II Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
	III Slight	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck.
4.0 - 4.9	IV Moderate	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors, disturbed; walls make cracking sound. Sensation like truck striking building. Standing vehicles rocked noticeably.
	V Rather Strong	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0 - 5.9	VI Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
	VII Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6.0 - 6.9	VIII Destructive	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
	IX Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7.0 and higher	X Intense	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
	XI Extreme	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
	XII Catastrophic	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Earthquakes can affect large areas, cause extensive damage to property, result in loss of life and injury to many people, and disrupt the social and economic functioning of the affected area. Most property damage and earthquake-related deaths are caused by the failure and collapse of buildings, bridges, and other structures due to the amplitude and duration of the ground vibrations. Ground movement can also cause flooding, dam failure, failure in above ground utilities, and rupture underground utilities which can result in various secondary hazards including flash floods, fires, and landslides. A shallow marine earthquake event that displaces the seafloor has the potential to trigger a tsunami (immense sea waves) which provides an additional risk to coastal areas.

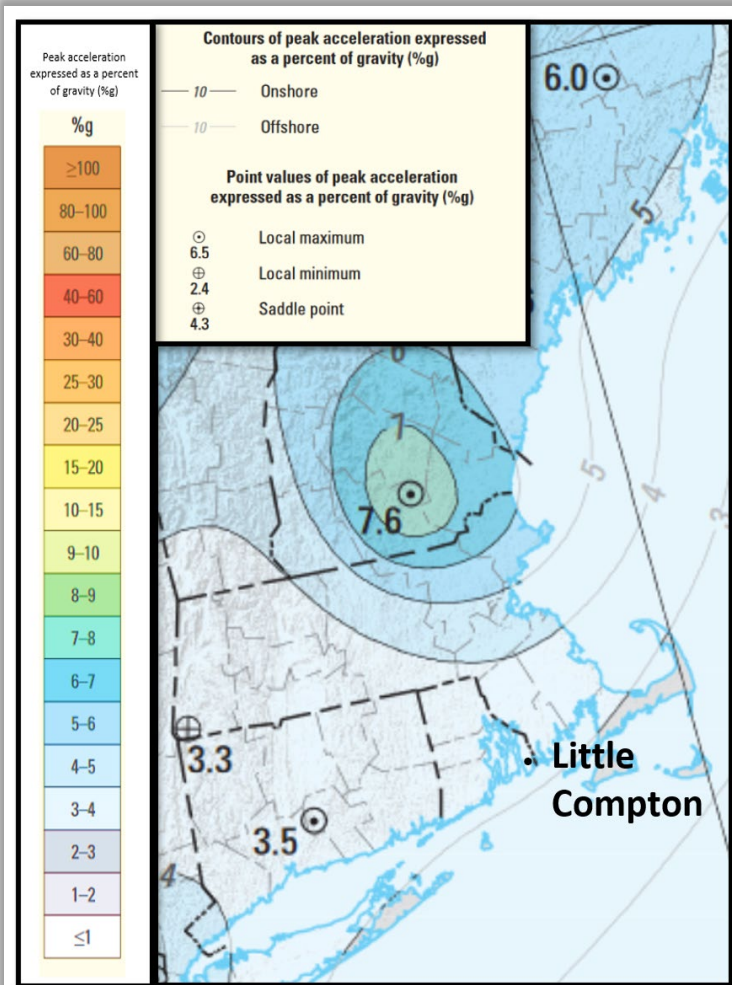
Location

Rhode Island is on the North Atlantic tectonic plate and there are no significant geologic fault lines in Rhode Island or New England. The USGS Earthquake Hazards Program identifies the State of Rhode Island as a low seismic risk area. This is illustrated in the USGS 2014 Seismic Hazard Map (**Figure 4-44**) showing Little Compton in an area on the lower end of the scale for potential peak acceleration (i.e. how hard the earth shakes at a given geographic point) of a potential earthquake.

Earthquakes occur infrequently in Rhode Island and surrounding New England, but historically earthquakes originating in other states have been felt in various parts of Rhode Island. "For example, the area off Cape Ann, Massachusetts, has had several Modified Mercalli Intensity (MMI) VIII or greater events within the past 300 years. An earthquake of that location and intensity has the possibility to cause damage to structures in Rhode Island not designed to withstand seismic loadings" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-73).

Figure 4-44
Seismic-Hazard Map:
Peak Horizontal Acceleration with 10%
Probability of Exceedance in 50 Years
(adapted from USGS)

Because the impact from an earthquake can be experienced hundreds of miles from the epicenter, all areas of Town are considered vulnerable to some degree. Should an earthquake strike or its effects be felt in Little Compton, people may experience shaking. Damage in structures that are up to current building codes is expected to be minimal. However, old masonry structures that do not meet current earthquake codes could potentially be at higher risk of damage or collapse. There are some residential and commercial structures sporadically located throughout the Town that are of older construction and may be more susceptible to earthquakes.



Previous Occurrences

Between 1678 and 2016, the New England region experienced 2,030 felt earthquakes. During that time, 34 were centered in Rhode Island, with the first occurring on August 25, 1776 (NESEC. *Rhode*). "Of these felt earthquakes, only one caused some slight damage. That event took place at 12:20 pm on June 10, 1951 and had a magnitude of 4.6. The earthquake was centered a few miles south of Westerly, RI, and it was felt across Connecticut, Rhode Island and the south coast of Massachusetts to Cape Cod. Some dishes were knocked from shelves and plaster was reported cracked in a few buildings in Newport, RI. Many people in Westerly, RI were so frightened by the shaking that they ran from their homes. Residents jammed the telephones lines following the earthquake in their attempts to find out what had happened" (NESEC. *Rhode*).

Rhode Island has experienced minor impacts from a number of earthquakes with epicenters outside of the State. On August 23, 2011 a 5.8 magnitude earthquake struck Virginia and was felt up and down the Eastern seaboard, including Rhode Island (NPR). On January 12, 2015 a 3.3 magnitude quake occurred with an epicenter in Wauregan, Connecticut (a village in the northwestern corner of Plainville). Effects of the quake were predominately felt along the border in the Plainfield CT and Foster RI area. In November 2020 there was a small 3.6 magnitude earthquake felt by many in Southern New England. The epicenter was in Buzzards Bay, MA (MVTimes). More recently, on May 14 & 15, 2022, three small earthquakes hit off of the coast of Rhode Island along the fault line near the Narragansett Pier. The first had a magnitude of 2.2, followed about 17 hours later by a 2.5 magnitude aftershock and then a 2.2 magnitude aftershock roughly 4 and a half hours later (Boston.com).

Climate Change Impacts

According to an article from NASA's Jet Propulsion Laboratory, "most earthquakes occur far beneath Earth's surface, well beyond the influence of surface temperatures and conditions" (Buis, Alan. *Can*). That being said, scientist have determined some relationships between climate change and earthquakes. The amount of stress on a fault can trigger or inhibit earthquakes. "The largest climate variable that could change fault stress loads is surface water in the form of rain and snow" (Buis, Alan. *Can*). Scientist have found a correlation between surface water and microseismicity (small earth tremors with magnitudes less than zero – which humans can't feel), but as yet have not been able to apply it to a quake of any size that people can feel (Buis, Alan. *Can*).

Research has shown that "changes in stress loads on Earth's crust from periods of drought can, in fact, be significant. Similarly, pumping of groundwater from underground aquifers by humans, which is exacerbated during times of drought, has also been shown to impact patterns of stress loads by 'unweighting' Earth's crust" (Buis, Alan. *Can*). While such stresses on a fault may be small compared to the normal buildup of stress from tectonic processes, it could potentially hasten the onset of an earthquake (Buis, Alan. *Can*).

"Another climate-related phenomenon that's believed to have connections to tectonic processes is glaciation. The retreat of a glacier can reduce stress loads on Earth's crust underneath, impacting the movement of subsurface magma. The rapid movement of glaciers has also been shown to cause what are known as glacial earthquakes. Glacial earthquakes in Greenland peak in frequency in the summer months and have been steadily increasing over time, possibly in response to global warming" (Buis, Alan. *Can*).

Probability of Future Events

The RI-SHMP indicates that there is a **Potential** (between 1% and 49.9% annual probability) of an earthquake occurring in Newport County, and should one occur the probable impact to structures and facilities would be limited and to people negligible (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-81). For Little Compton, the Advisory Committee downgrades the State's assessment to **Unlikely** (less than 1% annual probability).



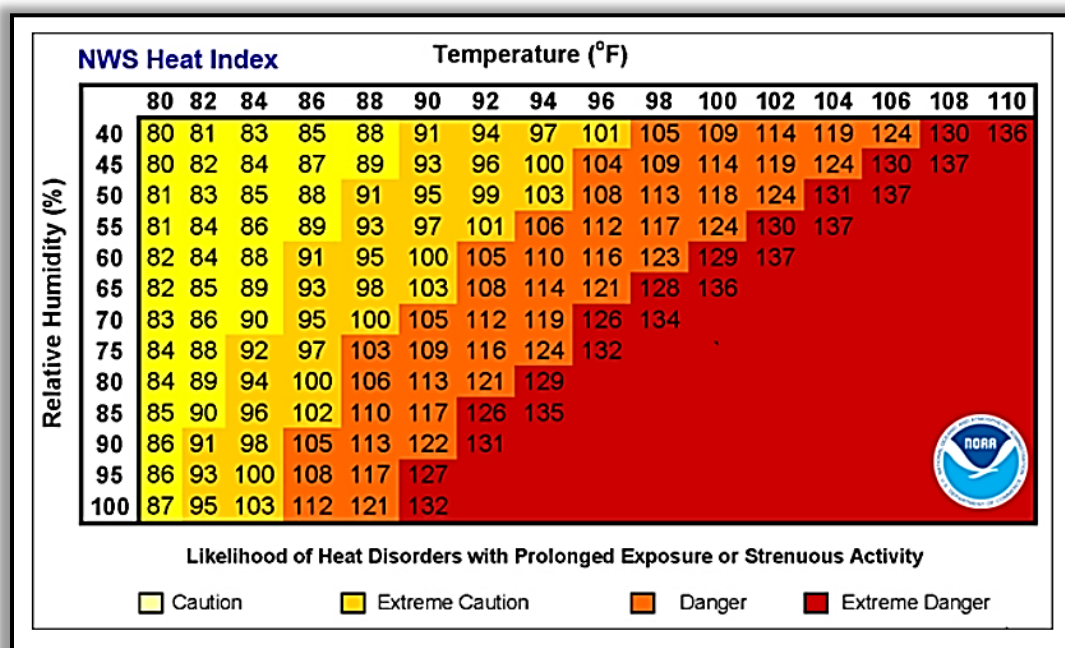
4.3.5.2 Extreme Heat

Description and Extent

According to the CDC, extreme heat is defined as a period of abnormally high temperature ($> 10^{\circ}\text{F}$ above average regional temperatures) that lasts for several weeks. Humid or muggy conditions occur when a "dome" of high pressure, humid air remains near the ground. The increased water vapor in the air traps solar radiation near the surface of the earth, which raises temperatures. Humidity prevents the evaporation of sweat and the associated cooling effects on the human body (CDC. *Climate Change and Extreme Heat*).

The RI-SHMP identifies a heat wave occurring if the outside temperature goes above 90 degrees Fahrenheit for three or more consecutive days. The NOAA|NWS Heat Index Program is used to alert the public of hazardous heat/humidity conditions. The Heat Index (HI), shown in **Figure 4-45**, is a measure of how hot it actually feels from the combined effect of humidity and temperature (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-94). In Rhode Island, a heat advisory is issued when the heat index value is expected to reach 100 to 104 degrees for any amount of time, or between 95 to 99 degrees for 2 consecutive days (NOAA|NWS. *National Weather Service is Lowering*).

Figure 4-45 Heat Index (NOAA|NWS. *Heat Forecast Tools*)



Extreme heat events "are the leading cause of extreme weather-related deaths in the United States" (RIDOH. *Extreme Heat*). According to the CDC, "Despite the fact that all heat-related deaths and illnesses are preventable, each year an average of about 658 people succumb to extreme heat" (CDC. *Heat-Related*, 1).

Heat-related illness (hyperthermia) results from exposure to extreme heat over a period of time, taxing the human body beyond its ability to properly cool. Normally body heat is removed through the evaporation of sweat. However, if the humidity is high, sweat does not evaporate as quickly. If the body is unable to shed heat, the temperature of the body's inner core begins to rise and heat-related illness may develop. Exposure to excessive heat can also exacerbate many preexisting conditions, including heart and respiratory disease (CDC. *Heat-Related*, 1).

Negative effects of extreme heat include but are not limited to:

- Heat-related illnesses such as sunburn, fatigue, heat cramps, heat exhaustion, and heat stroke
- Health concerns created by stagnant atmospheric conditions trapping pollutants
- Excessively dry and hot conditions can provoke dust storms resulting in low visibility and respiratory problems
- Power shortages/outages caused by increased energy demands
- Increased demand on health care facilities by individuals suffering from various heat related health effects
- Disruption of commerce as a result of increased energy demand
- Disruption of municipal services as a result of decreased human productivity or increased energy demand
- Damage to structures and infrastructure (such as asphalt) due to softening

Urban Heat Island Effect

An urban heat island effect occurs when natural land cover is replaced by dense concentrations of buildings and pavement that absorb and retain heat, and radiate it back into the surrounding air. In July, 2020, an urban heat watch study was conducted by CAPA Strategies, to evaluate the effect of heat islands in Providence, East Providence, Pawtucket, and Central Falls, Rhode Island. The study found that temperatures in developed areas with lots of buildings, concrete, and asphalt “can be 13 degrees higher than in neighborhoods with more vegetation and fewer buildings. What’s more, paved roads and parking lots slowly release that trapped heat overnight, so the evening hours aren’t as cool as they otherwise would be” (Kuffner, Alex. *How hot is it?*).

Location

All areas of Little Compton are considered susceptible to extreme heat. As Little Compton is a rural community, there does not exist an area with a dense concentration of buildings and pavement that might produce an urban heat island effect.

Previous Occurrences

“Temperatures in Rhode Island have risen almost 4°F since the beginning of the 20th century. The number of hot days has been above the long-term average since the 1990s with the greatest number occurring during the most recent 6-year period of 2015–2020. The greatest number of warm nights also occurred during the 2015–2020 period” (NOAA|NCEI. *State*). As depicted in **Figure 4-46**, the number of extreme heat days has risen in Rhode Island over the last several decades from 52.6 to 71. A study by Brown University linked temperature rises above 80 degrees to Rhode Islanders being more likely to end up in the hospital or die (News from Brown). The overall warming trend in Newport County Rhode Island is further illustrated in **Figure 4-47**.

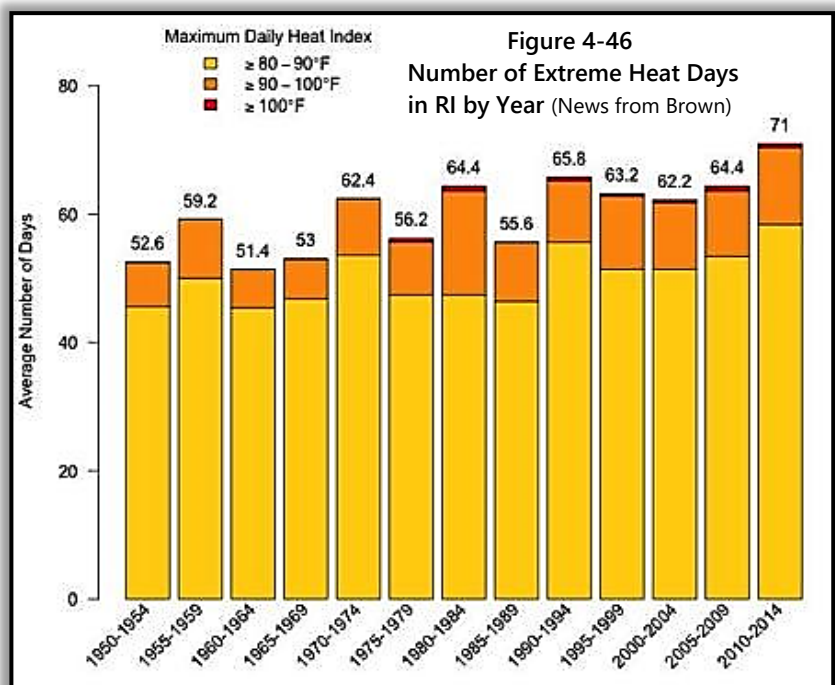
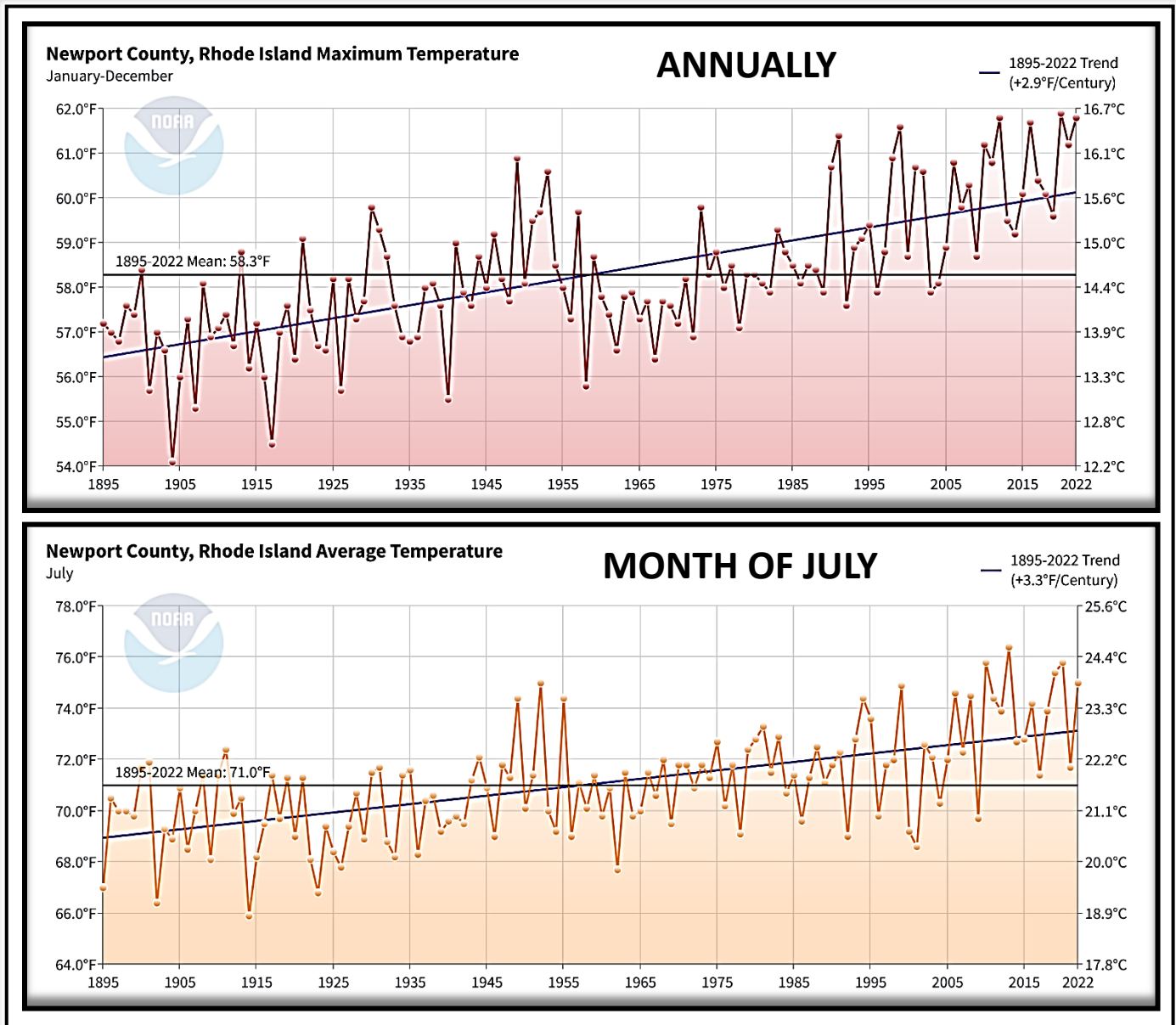


Figure 4-47 Temperature Trends from 1895-2022 in Newport County Rhode Island
(NOAA|NCEI. *Climate at a Glance*)



Climate Change Impacts

"Temperatures in Rhode Island have risen almost 4°F since the beginning of the 20th century" (NOAA|NCEI. *State*). NOAA's 2022 State Climate Summary for Rhode Island further states, "The number of hot days has been above average since the mid-1990s. The highest number of such days occurred in the most recent 6-year period (2015–2020), with an average of 14 hot days occurring each year" (NOAA|NCEI. *State*). RIDOH predicts that over the ensuing 80 years, the number of days over 90°F is expected to increase significantly due to climate change (RIDOH. *Extreme Heat*).

According to Climate Change RI (Climate Change RI. *Impacts on Rhode Island*):

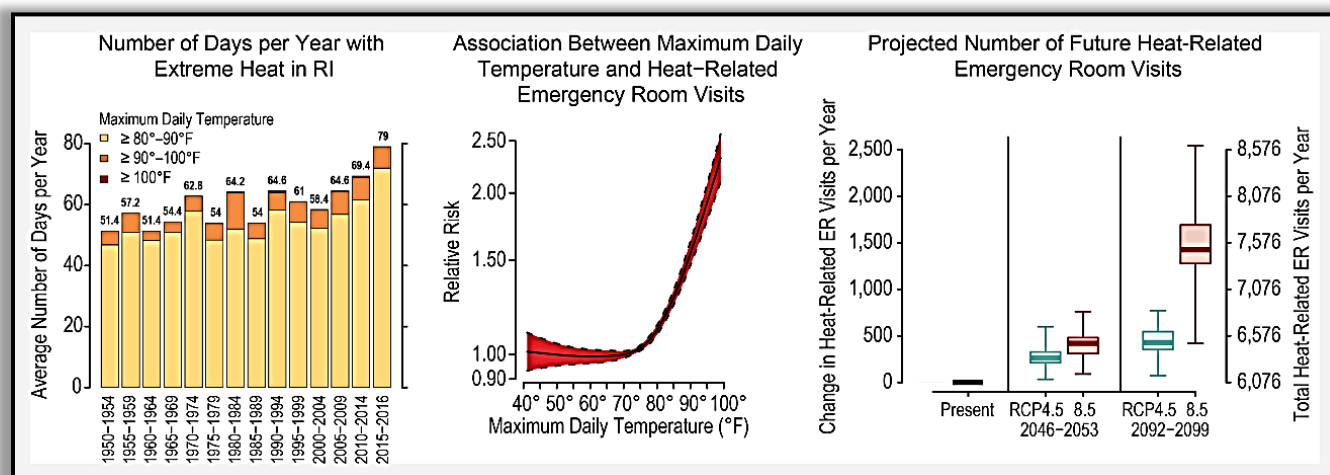
- The long-term warming trend continued in 2019 with the Earth having its second warmest year on record; making the 2010s the hottest decade on record.
- The water in Narragansett Bay is getting warmer. The surface temperature of the Bay has increased 2.5–2.9°F (from 1960–2010). Wintertime water temperatures are warming most rapidly.

As recognized by the U.S. Global Change Research Program *Climate Science Special Report*, climate-related weather extremes are expected to continue over climate timescales. “This assessment concludes, based on extensive evidence, that it is extremely likely that human activities, especially emissions of greenhouse gases, are the dominant cause of the observed warming since the mid-20th century. For the warming over the last century, there is no convincing alternative explanation supported by the extent of the observational evidence” (Wuebbles, Executive Summary).

According to the Fourth National Climate Assessment, “Moderate and extreme heat events already pose a health risk today, and climate change could increase this risk” (US Global Change Research Program. *Fourth National Climate Assessment – Chapter 18-Section 4*). **Figure 4-48** shows the maximum daily temperature in Rhode Island, which has been increasing over the last 60 summers, resulting in three more weeks of health-threatening hot weather compared to the 1950s (left); incidence rate of heat-related ER visits which rose sharply as maximum daily temperatures climbed above 80°F (middle); and the observed and projected impacts of excess heat on emergency room visits in Rhode Island, based on climate change predictions (right). Under the higher modeled climate change scenario, the study projects that Rhode Islanders could experience an additional 400 (6.8% more) heat-related ER visits each year by 2050 (US Global Change Research Program. *Fourth National Climate Assessment – Chapter 18-Figure 18.11*).

Figure 4-48 Observed and Projected Impacts of Excess Heat on Emergency Room Visits in Rhode Island

(US Global Change Research Program. *Fourth National Climate Assessment – Chapter 18-Figure 18.11*)



Probability of Future Events

“Regardless of any trends indicating heat related deaths are declining, extreme heat events remain a danger. Specific high-risk groups of the population typically experience a disproportionate number of health impacts from extreme heat conditions. In addition, the number of days over 90°F is projected to continue to grow. Climate change studies estimate that by 2070, Rhode Island could have up to 50 days over 90°F per year” (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-97).

In the near future, the RI-SHMP assesses it as **Likely** (between 50% and 89.9% annual probability) that **extreme heat** will occur in Newport County (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-99). According to the CDC, extreme heat is defined as a period of abnormally high temperature (>10° F above average regional temperatures) that lasts for several weeks (CDC. *Climate Change and Extreme Heat*). The Advisory Committee concurs with this assessment for Little Compton.



4.3.5.3 Drought

Description and Extent

Drought is a natural climatic condition which occurs in virtually all climates, the consequence of a natural reduction in the amount of precipitation experienced over a period of time. According to NOAA, lack of precipitation for a few weeks or months can create a short-term drought. Long-term droughts occur when the atmospheric circulation pattern creates a precipitation deficit for several months to several years. High temperatures, prolonged winds, and low relative humidity can exacerbate the severity of drought (NOAA|NIDIS).

The National Drought Mitigation Center classifies droughts as follows (NDMC):

- **Agricultural drought:** related to agricultural impacts from lack of precipitation, reduced ground water levels, and dry soils
- **Hydrological drought:** related to the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (stream flow, reservoir and lake levels, ground water)
- **Meteorological drought:** refers to a reduction in the normal rainfall for a given geographic area; it is area-specific, as the average rainfall can vary greatly in different areas
- **Socioeconomic drought:** measures the impact that the statements above have on people/businesses

Table 4-18 Palmer Drought Severity Index (NDMC)

Severity	Index Value
Extreme Drought	-4 or less
Severe Drought	-3.0 to -3.99
Moderate Drought	-2.0 to -2.99
Mild Drought	-1.0 to -1.99
Incipient Dry Spell	-0.5 to -0.99

NOAA's National Climate Data Center (NCDC) recognizes that, "The wide variety of disciplines affected by drought, its diverse geographical and temporal distribution, and the many scales drought operates on make it difficult to develop both a definition to describe drought and an index to measure it" (NOAA|NCEI. *Measuring Drought*). Of the various quantitative measures of drought, the Palmer Z index is widely used to measure short-term (monthly) drought, and the Palmer Drought Severity Index (PDSI) (shown in **Table 4-18**) is used to measure the duration and intensity of long-term drought. Long-term drought is cumulative and the PDSI uses temperature and precipitation levels to determine dryness as compared to normal rainfall patterns for a particular locale (NOAA|NCEI. *Measuring Drought*).

Precipitation in Rhode Island averages about 45 inches per year (NOAA|NCEI. *State Climate Summaries*). This amount of precipitation generally ensures a plentiful water supply for Little Compton's daily requirements, which are dominated by potable water and agricultural needs. However, long-term drought conditions, may threaten groundwater availability.

Little Compton does not have a municipal water system. Rather, the entire Town relies on individual wells for all water supply needs. In terms of the health, safety, and welfare of residents, surface and groundwater resources, which feed the individual wells, are therefore of paramount concern in the Town, as well as for the City of Newport which depends, in part, upon the Watson Reservoir for its drinking water supply. The vast majority of the Town is underlain by till aquifer, a type of glacial sediment which has a lower water yield than most other soil types found in the State. A few small areas of Town have a stratified drift underlay producing a higher water yield. When water tables are high, generally in the winter and spring, water levels in till are commonly within 5 to 10 feet of land surface. During dry periods of summer and fall, till may become unsaturated, and is therefore considered an unreliable source to meet domestic water needs. While there remain some older homes in Town that have shallow wells in till, most new homes feature wells drilled into the underlying bedrock (Town of Little Compton RI. *Comprehensive*, 11 and 12).

"Current drought conditions in Rhode Island and the nation are tracked by the U.S. Drought Monitor, a partnership between the University of Nebraska-Lincoln and various federal and state agencies and other experts. The Rhode Island Water Resources Board works with the National Weather Service and the U.S. Geological Survey to assess and report monthly water conditions (precipitation, PDI [Palmer Drought Index], groundwater and surface water). Graphic and text summaries of current and projected drought conditions are updated on a weekly basis and are available through the Drought Monitor website" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-63). Based on this information, the RIWRB issues notices to the State regarding drought conditions.

Location

The entire Town is reliant on wells, and all areas are considered susceptible to drought conditions. There are a number of hand dug shallow wells located sporadically throughout the Town that are of greater concern during drought conditions, even during short-term droughts.

For four summers, beginning in 2019, Little Compton's Conservation Commission has conducted a study to determine if the Town has enough water. The study, which included roughly 160 residences (approximately 10% of households, geographically distributed throughout the Town), showed that overall water quality is good in Little Compton, but the supply is heavily reliant on precipitation levels. Without large reserves of freshwater held in aquifers, Total Dissolved Solids (TDS - such as salt, septic waste, and fertilizer) levels were readily impacted by precipitation levels. Lower precipitation yielded higher TDS readings, i.e. poorer quality water. Homes along the coastline are more vulnerable to salt water intrusion during periods of low precipitation (Town of Little Compton RI. *"Do We*, 1-4).

Previous Occurrences

Droughts, while not frequent in Rhode Island, do occur. Rhode Island does experience extended periods of dry weather generally in the late spring and the first half of summer, during which crops and lawns may require irrigation. "Though short-term droughts may not have a significant impact on the state's public water systems, no water system will be immune to periods of long-term drought" (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-65).

According to the *RI Water 2030* plan, there have been just six historical drought events since 1929. The last long-term drought in the state was in the early to mid-1960s. This drought lasted for three summers (1965-1967) and included long periods of below normal precipitation during the winter, spring, and summer months. Historically, Rhode Island's driest year on record is 1965, with less than 26 inches of rainfall (RIDSP. *RI Water 2030*).

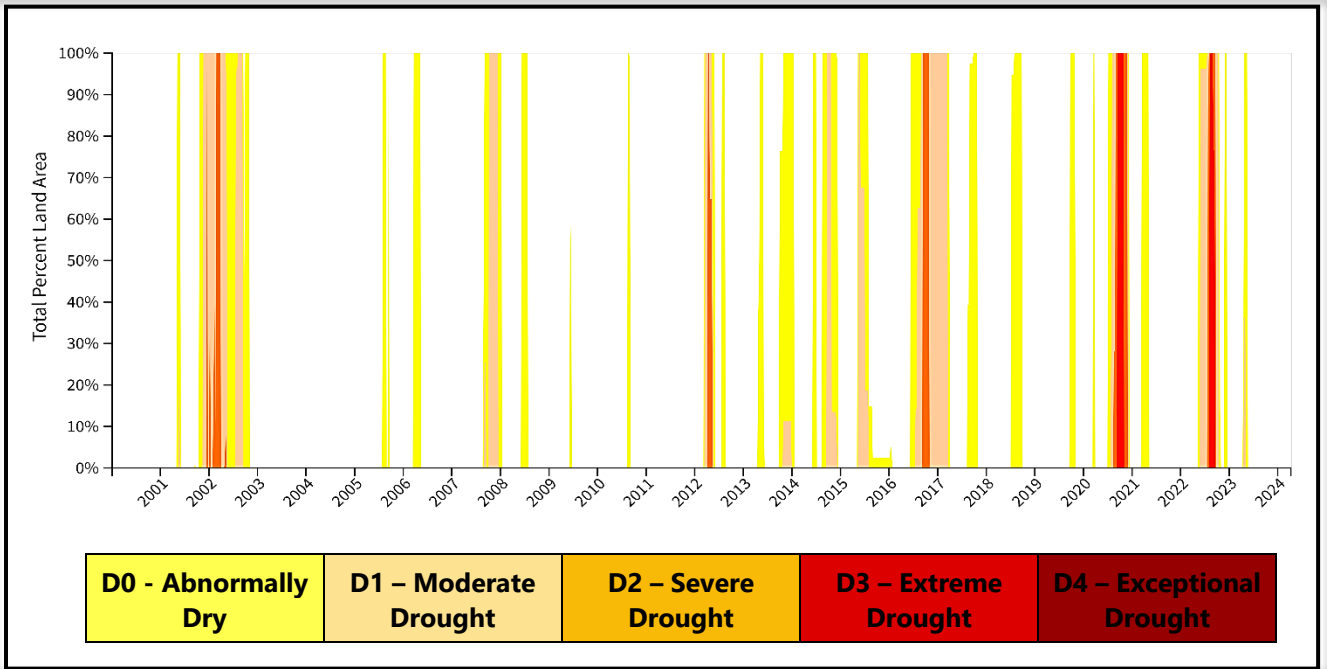
More recently, Little Compton, Tiverton, and Westport, MA experienced drought conditions in the fall of 2016, sharply limiting the availability of water for fire suppression and, in some cases, for drinking. "'It's going to take a lot of rain to fill the ponds up,' said Little Compton Fire Chief Rick Petrin, who said the 12 pond locations he normally uses to obtain firefighting water have dwindled to two. We're in dire need of water. Unless we get substantial rain, we're in trouble,' he said. One Little Compton source estimated that the wells serving around 20 families have dried up" (Dalglish). For public health and safety concerns, the Town of Little Compton provides drinking water to residents whose wells have gone dry.

In August of 2022, according to Ken Ayars, Chief of the Division of Agriculture and Forest Environment at RIDEM, a "'sharp, relatively short but extremely significant drought'" (Ashfaq) disrupted food production in Rhode Island prompting the U.S. Department of Agriculture to declare all of Rhode Island a natural disaster area. Ayars indicated that the primary impact of the drought was on farmers who generally rely on shallow water systems for crop production, making them particularly vulnerable to dry periods. Hannah Wolbach, co-founder of Skinny Dip Farm in Little Compton, Rhode Island and Westport, Massachusetts, noted that "'The drought made for lower yields of many of our crops last summer... We were able to irrigate some of our crops, but setting up and running irrigation

takes a lot of time and labor and energy” (Ashfaq). After the drought disaster status was declared, RIDEM officials were responsible for coordinating state and federal relief efforts to support to affected farms (Ashfaq).

The National Integrated Drought Information System provides historical, current, and near future anticipated drought conditions for counties throughout the United States. **Figure 4-49** depicts the intensity of drought in Newport County from 2000 to April 2024. The graph is a product of NOAA, USDA, and the National Drought Mitigation Center based on the best available data and input from local observers (NOAA|NIDIS. *National*).

Figure 4-49 Historical Drought Conditions (2000-April 2024) for Newport County, RI (NOAA|NIDIS)



Climate Change Impacts

There are a number of ways climate change may contribute to worsening drought conditions. For example, the Center for Climate and Energy Solutions indicates that “Warmer temperatures can enhance evaporation from soil, making periods with low precipitation drier than they would be in cooler conditions” (C2ES. *Drought*).

Although most precipitation models predict an increasing trend in overall precipitation for Rhode Island, they further suggest that simultaneous warming trends and less frequent but more intense precipitation events favor an increase in short-term (one to three month) drought intensity (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-62, 3-63).

The 2022 drought “raised broader concerns over the impact of climate change on future farming in Rhode Island” (Ashfaq). Kenneth Kunkel, NOAA affiliate and research professor at North Carolina State University stated “We expect global warming to continue and temperatures in the Northeast to increase over time... With higher temperatures, soils dry out faster. The Northeast has moved into an era of much more frequent very warm summers. The effects of dry periods will likely become more severe faster” (Ashfaq).

In response to climate change impacts on food production, in 2021 the United States Department of Agriculture (USDA) updated their “Action Plan for Climate Adaptation and Resilience that describes how USDA will integrate climate adaptation into its mission, programs, and operations” (USDA|FSA). In 2022, the Farm Service Agency (FSA) created a Climate Change Adaptation Plan “that identifies and prioritizes climate vulnerabilities and actions to integrate climate change into its programs, operations and decision-making” (USDA|FSA).

Probability of Future Events

The last major drought in Rhode Island was more than 50 years ago, and based on future precipitation projections, the RI-SHMP assesses a long-term drought in Rhode Island as **Unlikely** (Less than 1% annual probability) (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-68). Based on local experience, the Advisory Committee assessed the probability of a long-term drought impacting Little Compton as **Potential** (between 1% and 49.9% annual probability).



4.3.5.4 Brush Fire

Description and Extent

The U.S. Forest Service has established the National Fire Danger Rating System (NFDRS) to determine the daily risk to fire experienced by different regions of the country. The system uses mathematical formulas including wind speed and fuel type to determine a fire index. As shown in **Table 4-19**, the updated 2016 version (NFDRS 2016) is simpler than previous versions and has a 5 color-coded system to help the public understand fire potential (USFS|USFS. *Understanding*).

Rhode Island Department of Environmental Management (RIDEM) Division of Forest Management is responsible for predicting the risk of fires igniting in the State. Forewarning of dangerous fire conditions aids firefighters and can result in reducing the severity of a fire thereby mitigating risks to life and property (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-105). In 2020, RIDEM updated their *Forest Action Plan* which provides communities key information on how to prepare, respond, educate, and fund fire-related protection programs.

Brush Fire versus Wildland Fire

According to the Fire Department, in Little Compton, fires ignited by lightning are infrequent and when occurring, are generally limited to small (less than 0.5 acre) brush fires. The USDA Forest Service defines a brush fire as a fire burning in vegetation that is predominantly shrubs, brush, and scrub growth. Wildland fires are generally associated with thousands of acres of trees burning, whereas brush fires tend to be smaller, more manageable, and generally confined to the understory (National Park Service).

Weather conditions and topography impact fires fueled by natural cover, including native and non-native species of trees, brush and grasses, and crops. Fuel quantity and quality impact the extent of a brush or wildland fire. Climatic and meteorological conditions that influence the moisture content of wood and leaf litter, thereby impacting brush or wildland fires, include solar insolation, atmospheric humidity, and precipitation. Dry spells, heat, wind, and low humidity increase vegetative susceptibility to fire. Favorable fire conditions arise from extended periods of hot, dry weather and accumulated vegetation. Peak fire season in Rhode Island is typically between mid-March and mid-May when dry windy weather can occur increasing the potential for fires (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-102, 3-105).

Larger brush fires and wildland fires can disrupt and endanger wildlife and ecosystems, destroy crops and timber resources, impact above ground utility lines affecting power, internet, and phone service, and if they reach the built environment can damage structures and other property and pose a threat to human safety.

Table 4-19 National Fire Danger Rating System (NFDRS 2016)

Color Code	Rating	Description
	LOW	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
	MODERATE	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
	HIGH	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
	VERY HIGH	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
	EXTREME	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

Location

The coastal town of Little Compton has large areas of open space, including beaches, wetlands, and other unimproved land. As of December 2022, based on RIGIS datasets (2020 statewide land cover and 1993 wetlands) and locally maintained conservation lands dataset, Little Compton had approximately 2,342 acres (16.3%) agricultural land and 4,086 acres (28.4%) conservation land. Some of the agricultural land (1,003± acres) is conserved and therefore is also represented in the conservation land total (Mosaic Land Management).

Under the right conditions, including during a drought, the threat of brush fires increase. Brush fires that occur in more remote, harder to access areas of Town pose a greater risk of spreading as they may go unnoticed for longer and/or take longer to access by fire protection services. The Town keeps the trails in the Wilbour Woods area maintained and volunteers keep the trails in the Simmons Mill Pond area maintained which allows access for emergency vehicles.

Other areas of Town where dry conditions could provide fuel for a brush fire (such as the old growth of phragmites) include the coastal grasslands of Almy Creek, Meeting House Lane, Round Pond, Sakonnet Point, South Shore Beach, and Warren's Point. If not controlled quickly, brush fires in these areas could threaten nearby structures.

As water from Ponderosa Pond's outflow stream is unreliable, fire suppression capabilities in the Commons area is of high concern to the Town. Hence, it is critical that vegetation is maintained in this area to minimize fire potential.

Previous Occurrences

Wildfires are not common in Rhode Island, but there have been a few significant ones. The most devastating was the Coventry Fire in April 1942, which consumed over 24,000 acres of forest and injured approximately 180 people. Another substantial wildfire occurred in Exeter in 1951, which consumed roughly 7,400 acres and caused a fatality (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-106).

As previously indicated, brush fires tend to occur during the spring and summer months when dormant brush, dead twigs, and small branches provide a good fuel source. Although less common, they can occur during the summer and fall, particularly during drought conditions. Early spring 2021 saw a number of days where the fire danger was high. By March 15, 2021, twenty-six brush fires had occurred (albeit mostly small) across the State (Vallee, Jason).

According to the Fire Department, although occasional brush fires occur, they are generally the result of permitted or illicit open air burning that were not managed correctly. Fires ignited by a natural cause (e.g. lightning) are infrequent, but do occur. Due to improved fire prevention and firefighting efforts, brushfires are generally extinguished quickly, with no significant impact.

Climate Change Impacts

Wildland and brush fire risk depends on a number of factors, including temperature, soil moisture, and the presence of potential fuel (tree, shrubs, etc.). These factors have direct or indirect ties to climate variability and climate change. Changes in climate that create warmer, drier conditions increase the fire season and help fires spread making them harder to put out.

Probability of Future Events

In general Little Compton's overall humid climate does not favor brush fires. The probability of future events is further diminished as open air burning permits are required from the Fire Department and only issued when risk of wildfires is low. Permits for fireworks are also required by the Fire Department and require fire detail supervision.

The RI-SHMP assesses the occurrence of a natural fire hazard in Newport County to be **Likely** (between 50% and 89.9% annual probability) (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-108), and the Advisory Committee concurs with this assessment for Little Compton.

Although brush and wildland fires occur infrequently, it is important that the community not become indifferent to the risks from fire hazards. It is therefore important to continue to educate the community about fire risks, in particular those who live in heavily forested areas of Little Compton.

4.4 VULNERABILITY ANALYSIS

Hazard Mitigation Plan: The Town of Little Compton has successfully met the following requirement →

44 CFR Subsection D §201.6(c)(2)(ii): [The risk assessment shall include] a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:

- (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;
- (B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; and
- (C) Provide a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

With Little Compton's hazards identified and profiled (**Subsections 4.1-4.3**), the Advisory Committee conducted a *Vulnerability Analysis* to describe the impact that each identified hazard might have on the Town. The term vulnerability indicates what is likely to be damaged by a particular hazard and how severe that damage could be. The *Vulnerability Analysis*, in conjunction with the *Capability Assessment* (**Section 5**), was used in developing the *Mitigation Strategy* and *Action Plan* (**Section 6**).

CRS CREDIT:		
Mitigation Planning Element	CRS Planning Step	Max Pts
Phase II – Risk Assessment	5. Assess the Problem	52

CRS Coordinator's Manual – Activity 510: Floodplain Management Planning

The *Vulnerability Analysis* used the process described in the FEMA publication *Understanding Your Risks - Identifying Hazards and Estimating Losses* as a guideline for the analysis. In assessing the Town's vulnerability to the identified hazards, the Advisory Committee considered what community assets are at risk (built environment including public infrastructure, natural environment, local economy, and people) and what the impacts might be (structural and environmental damage, economic loss, inconvenience to residents, physical and emotional harm, and loss of life). The Advisory Committee also identified a list of critical facilities to be assessed. The *Vulnerability Analysis* presented in this Section is organized as follows:

4.4.1 Critical Facilities

4.4.2 Built Environment and Infrastructure

4.4.3 Natural Environment

4.4.4 Local Economy

4.4.5 People

4.4.6 Future Development Trends

Two distinct methodologies were used in the *Vulnerability Analysis*. The first consists of a quantitative analysis that relies upon best available data and technology, while the second approach consists of a somewhat qualitative analysis that relies on local knowledge and rational decision making. For hazards that do not have the data to support quantitative analysis, vulnerability is discussed in more general qualitative terms.

CRITICAL FACILITIES

4.4.1 Critical Facilities

Although the Town as a whole is considered in the overall *Vulnerability Analysis*, it is important to identify critical facilities that, if adversely affected by a hazard event, may result in more severe consequences to public health and safety or interrupt essential services and operations for the community. In addition, as Little Compton highly values its historical resources, the Advisory Committee elected to include structures listed on the National Register of Historic Places. Little Compton's Critical Facilities have been classified into five categories:

- Schools/Day Care/Early Learning/ Special Population Centers
- Government/Emergency Centers
- Institutional/Commercial
- National Register of Historic Places
- Infrastructure/Transportation

A *Vulnerability Analysis* was conducted to determine the potential susceptibility of each critical facility to the profiled hazards. A summary of the analysis in tabular format has been provided in **Appendix 4-3**, and discussed in the narrative of **Subsections 4.4.2-4.4.5**. A list of the critical facilities is included in **Table 4-20**, and their locations depicted in **Figure 4-51** (a larger scale of this map is included in **Appendix 4-2**).



Figure 4-50 Historic Buildings on School House Lane

From left to right: Sakonnet Lodge (1840), Little Compton Community Center (1904), Schoolhouse (1850), and Town Hall (1880)

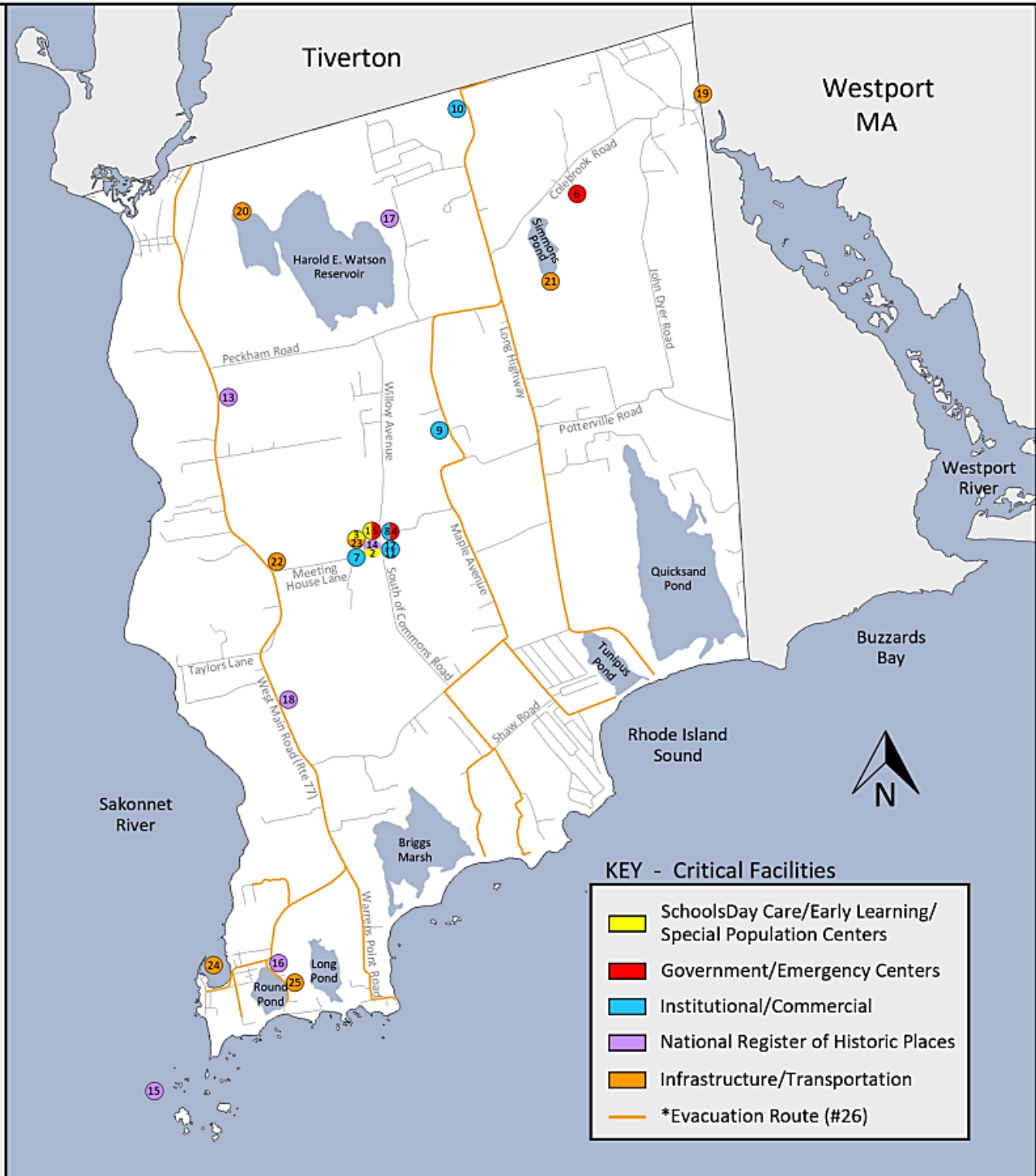
Photo Credit: Wikipedia | Beyond My Ken

Table 4-20 Critical Facilities with Map Number Identification

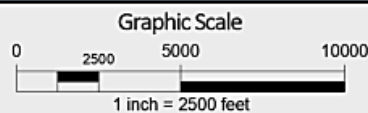
Schools/Day Care/Early Learning/ Special Population Centers	Government/ Emergency Centers	Institutional/ Commercial	National Register of Historic Places	Infrastructure/ Transportation
1 Little Compton Community Center (non-profit) 34 Commons	4 Public Safety Complex (public) 60 Simmons Road	7 BayCoast Bank (private) 2 Meeting House Lane	13 Friends Meeting House & Cemetery (LCHS) 234 West Main Road	19 Dam: Adamsville Dam (Gray's Grist Mill Inc.) <i>Please refer to the note below</i>
2 Little Peeps Montessori Naturskola (private) 4 Commons	5 Town Hall (public) 40 Commons	8 Brownell Library (building private; content public) 44 Commons	14 Little Compton Common Historic District	20 Dam: Harold E. Watson Reservoir Dam (City of Newport)
3 Wilbur & McMahon School (public) 28 Commons	6 Transfer Station (public) 122 Amy Hart Path	9 Little Compton Wellness Center (private) & Food Bank (non-profit) 115 East Main Road	15 Sakonnet Light House Station (non-profit) South of Little Compton on Little Cormorant Rock	21 Simmons Pond Dam (RIDEM)
		10 Sakonnet Energy & Goulart Petroleum (private) 43 Long Hwy	16 Stone House Inn (David Sisson House) (private) 120A Sakonnet Road	22 Verizon Substation (private) 81 Meeting House Lane
		11 US Postal Service (federal) 4 S of Commons	17 William Whalley Homestead (private) 33 Burchard Avenue	23 Wastewater Treatment Facility for municipal buildings (public) 28 Commons
		12 Wilbur's General Store (private) 50 Commons	18 Wilbor House (Little Compton Historical Society) (LCHS) 548 West Main Road	24 Sakonnet Harbor (public)
				25 Roadway: Round Pond Road (private)
Roadway: Evacuation Route consists of portions of the following roads: Town-owned Roads: Brownell Road, Grange Avenue, John Sission Road, Long Highway, Long Pasture Road, Maple Avenue, Shaw Road, South Shore Road, Warren's Point Road State-owned Roads: East Main Road, Long Highway (small section between Peckham & Colebrook Roads, Peckham Road, Sakonnet Point Road, West Main Road Private Roads: Atlantic Drive, Bailey's Ledge Road, Grinnell Road, Quaker Hill Farm Road, Round Pond Road, South Lake Road, Washington Road				26 Roadway: Evacuation Route (which includes portions of Town-owned, State-owned, and private roads)

Please Note: On March 4, 2024, RIDEM indicated that because the Adamsville Dam spillway is located in Westport, Massachusetts and the failure inundation area will only impact property in Massachusetts, this Significant Hazard dam has been removed from Little Compton's list. The Adamsville Dam is remaining on this Critical Facilities list only as a reference.

Critical Facilities



This map is not the product of a Professional Land Survey. It was created for the Town of Little Compton for general reference, informational, planning or guidance use, and is not a legally authorized source as to location of natural or manmade features. Proper interpretation of this map may require the assistance of appropriate professional services. The Town of Little Compton makes no warranty, express or implied, related to the spatial accuracy, reliability, completeness, or currentness of this map.



May 2024

Source: RIGIS

Figure 4-51

Kim Jacobs, Civil Engineer & Resilience Planning Consultant

BUILT ENVIRONMENT AND INFRASTRUCTURE

4.4.2 Built Environment and Infrastructure

Little Compton's built environment, including public infrastructure, is an important resource. Due to its coastal location and extensive low-lying land, the primary hazards that will impact the built environment, are inland flooding, coastal flooding, and coastal erosion caused by rain and snow events, as well as storm surge and wind damage from hurricanes or other high wind events. These hazards will be exacerbated by climate change including sea level rise. Many developed areas within Little Compton pre-date zoning ordinances or are not up to current building codes. This presents unique challenges to hazard mitigation. It must be recognized that there are many older buildings in flood- and wind-prone areas that would benefit from current regulations, but unless the owners are proposing changes or modifications that require local permit approvals, they most likely will not be retrofitted to the new standards. In addition to the items identified in **Table 4-21**, the vulnerability to Little Compton's built environment/infrastructure will be further explored in the following subsections: **4.4.2.1 FEMA Flood Zones** and **4.4.2.2 Flooding, Storm Surge, and Sea Level Rise**.

Table 4-21 Built Environment and Infrastructure Vulnerability

Hazard Group	Vulnerability (<i>What is at Risk</i>)
 Flood-Related Hazards (Inland Flooding/Dam Failure; Coastal Flooding/Storm Surge; Coastal Erosion)	• Significant flooding can lead to extensive damage to structures and personal property; disrupt potable water, stormwater, and sewer system operations; flood roadways creating dangerous conditions for motorists; and increase the water table resulting in subsurface issues such as wet basements. Standing water can lead to basal failures in live as well as dead trees. More failures leads to falling limbs and felled trees which may cause traffic disruptions. The most affected roads are Amesbury Lane, Colebrook Road, John Dyer Road, Long Highway, and Swamp Road. • Properties, structures, and infrastructure in the SFHA (V and A/AE Flood Zones) are at highest risk to the impacts from flooding. As shown on Figure 4-52, the SFHA includes: ◇ Potential inland flooding risks along sections of the following roads and adjacent property located in the SFHA: Town-owned roads - Amesbury Lane, Swamp Road, and William Sisson Road; State-owned roads - Main Street, Meeting House Lane, Pottersville Road, and Snell Road; Private roads - Quoquonset Lane, Rockbridge Drive, Rockbridge Road, and Whistler Point Road ◇ Potential coastal flooding risks along sections of the following roads and adjacent property located in the SFHA: Town-owned roads – John Sisson Road, Shaw Road, South Shore Road, and Town Way; State-owned roads - Sakonnet Point Road; Private roads - Baileys Ledge Road, Beach Drive, Beach Street, Bluff Head Road. California Road, Carey Lane, Francis Lane, Goodrich Lane, Kansas Road, Kempton Place, Little Pond Cove Road, Maryland Road, Milton Road, Minnesota Road, Montana Road, Nevada Road, Ohio Road, Oliver Lane, Pennsylvania Road, Pleasant View Drive, Point Street, Pond View Drive, Quaker Hill Farm Road, Reservation Road, Rhode Island Road, Round Pond Road, Taylor's Lane North, Taylor's Lane South, Tuniper Lane North, Tuniper Lane South, and Washington Road

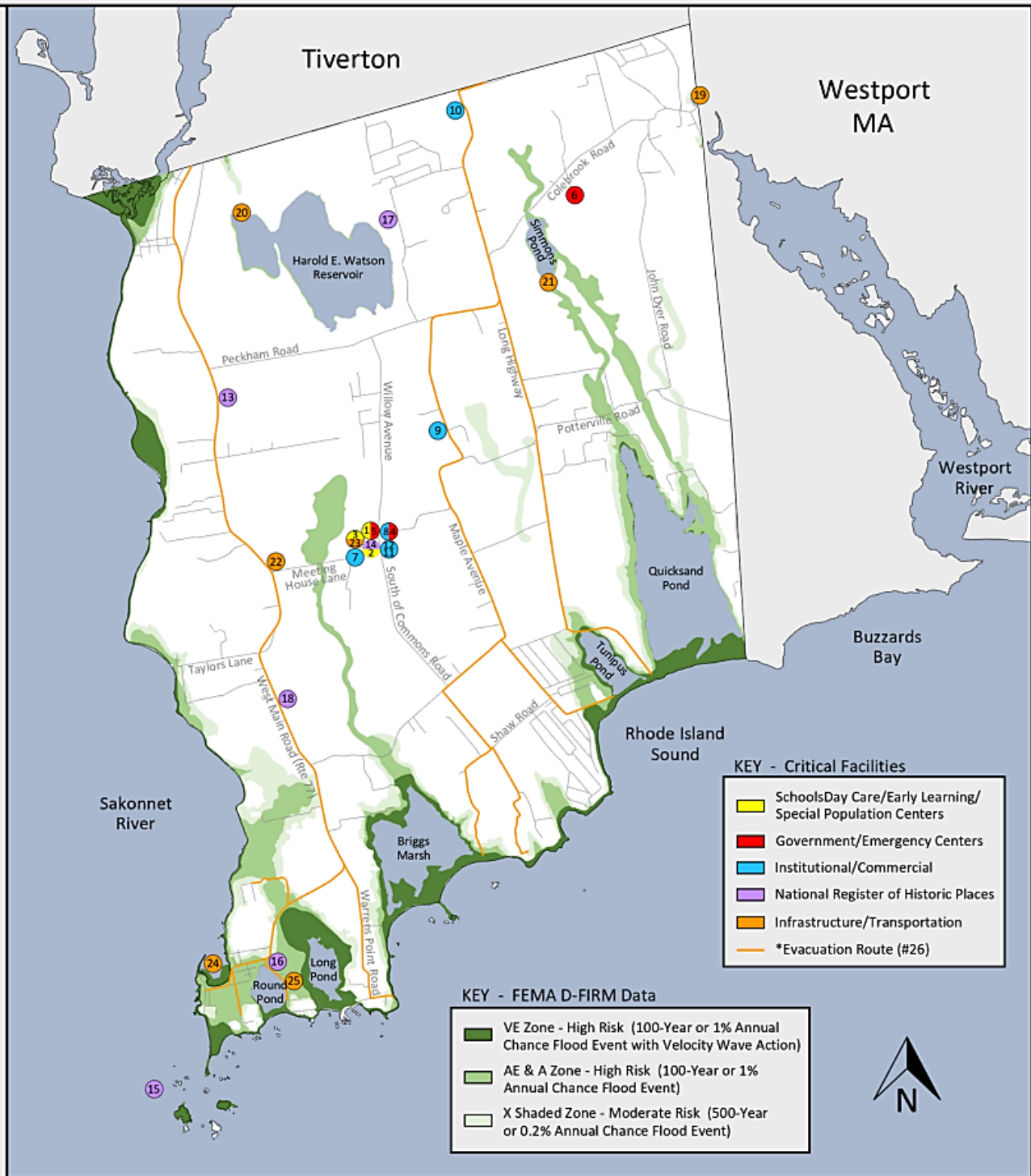
Hazard Group	Vulnerability (<i>What is at Risk</i>)
Flood-Related Hazards <i>continued</i>	• Low-lying areas along the coast are at higher risk to storm surge and coastal erosion; located in the southeast corner of Rhode Island along the Rhode Island Sound (Atlantic Ocean), Little Compton experiences high storm surge elevations; when coupled with normal tides, storm surge can raise the mean water level 10 feet or more; coastal erosion produced by wave action can become very destructive, damaging natural and manmade structures, battering solid objects, and scouring sand from around foundations; as storms erode the shoreline, they put adjacent upland properties at greater risk. Coastal erosion has been documented by CRMC in the following locations: Briggs Beach, Briggs Point, Brown Point, Church Cove, Church Point, North Brown Point, Sakonnet Point, South Shore Beach, and Warren's Point. • Hurricanes: Little Compton's coastal location and areas of low elevation, makes it particularly susceptible to hurricanes. As shown on Figure 4-54, under modeled scenarios, even Category 1 and 2 hurricanes can produce storm surges that inundate the Town's southern coastline, as well as portions of the Town's western boundary along the Sakonnet River. The storm surge from Category 3 and 4 hurricanes reaches farther inland around Quicksand Pond, Tunipus Pond, and Briggs Marsh, as well as the area between Sakonnet Point Road and Bailey's Ledge Road, and in the vicinity of Reservation Road. In the northern section of Town, the inland area east and south of Crandall Road is also impacted from storm surge produced by a Category 3 or 4 hurricane. • Future increases in relative sea level will: intensify coastal flooding and may inundate structures therein displacing coastal populations; threaten roadway and other infrastructure designed for historically lower water levels; and contaminate water supplies through saltwater intrusion into aquifers. • Refer to Subsections 4.4.2.1 and 4.4.2.2 for additional flood-related vulnerabilities, including the vulnerability of critical facilities.
 Wind-Related Hazards (High Winds – Thunderstorms/ Lightning/Hail; Tornadoes; Tropical Cyclones)	• High winds, including those associated with tropical cyclones (tropical depressions, tropical storms, and hurricanes), tornadoes, and thunderstorms can cause damage to structures, property, vehicles, and infrastructure including utility lines. Downed wires that are live have the potential to spark fires; damaged utility wires may lead to power loss which could disrupt critical infrastructure, technology, and communications, as well as create public safety issues such as loss of household heat which could then cause water and sewer pipes to freeze and even rupture. • In Little Compton the built environment along the western and southern shorelines, as well as in the Adamsville area influenced by the Westport River, are at higher risk to wind-related damage. NOTE: The impacts from wind-driven storm surge have been addressed above in the Flood-Related Hazards section. • The type, age, and standards to which a structure was constructed, play a role in its vulnerability to high wind events. Little Compton enforces RI State Building Code, which currently requires residential and commercial structures in Little Compton be designed to ultimate wind speeds of 140 mph (Category 4 hurricane); in general, structures found in Little Compton include wood-framed structures and some mobile-homes, both of which are more vulnerable to damage from wind during significant events; in addition, some residential and commercial structures sporadically located throughout Little Compton that are of older construction and/or not well-maintained, may be more susceptible to damage from high winds.

Hazard Group	Vulnerability (<i>What is at Risk</i>)
Wind-Related Hazards <i>continued</i>	• Sakonnet Harbor has a breakwater to the west that supplies adequate protection throughout much of the year, but can fall short in the winter months when northwest winds prevail. • Lightning: In general, buildings are more likely to be struck by lightning if they are located on high ground or if they have tall protrusions, such as steeples; electrical-based utilities, including the wireless communication towers located at 122 Amy Hart Path, are also vulnerable to direct lightning strike and damage to them has the potential to cause power outages for businesses, residents, and critical facilities. • Hail: Structure vulnerability to hail is determined mainly by construction and exposure; metal siding and roofing is better able to stand up to the damages of a hailstorm; exposed windows are also susceptible to damage. • Tornadoes: The type, age, and standards to which a structure was constructed, play a role in its vulnerability to tornadoes; in general, concrete, brick and steel-framed structures tend to fare better in tornadoes than older, wood-framed structures. Wood-framed structures are common in Little Compton and are more vulnerable to damage by tornadoes than steel framed structures. There are also some mobile homes which are also more vulnerable to tornado damage. • Due to the character of Little Compton one of the most vulnerable factors is tree limb damage. Properties and heavily treed roadways with above ground utilities, especially those in proximity to the coast, such as South Shore Beach, Round Pond, and Briggs Marsh, are exposed to greater risk from wind events. Downed trees and branches during wind-events are anticipated to create some travel disruption and hazards to automobiles and their passengers, as well as occasionally damage structures or electrical utilities and communications lines. According to the tree warden, the potential for tree limb damage is worse than he has experienced in his 24 years doing tree work in Little Compton. Several factors have created weakening tree health including a warmer and damper climate trend which led to many fungal and bacterial diseases; a winter moth infestation over the past eight years which wiped out or weakened many native oaks, maples, black cherry, and others species; a new American Beach tree disease caused by a foliar nematode; and two significant droughts about two years apart. All of these factors have led to more die back along Town road shoulders and private property. The tree warden explained that, "As rot sets in at cankers and unions it creates weak spots that after saturation lose rigidity and potentially fail. Combining this with any wind event would obviously compound the damage." • Damaged electrical utilities or communications lines can pose threats to public safety, including inability to access emergency services or use medical equipment. Little Compton has two (2) main power lines feeding the Town from Tiverton (one along West Main Road and the other along Crandall/Colebrook Roads). The Town currently houses a commercial wireless communications tower and a public safety wireless communications tower on municipal land. Both towers, but specifically the public safety tower (which hosts various entities, including the State radio network, RISCON), are critical to communications during and after hazard events. Downed wires that are live have the potential to spark fires. • Refer to Subsections 4.4.2.2 for additional wind-related vulnerabilities, including the vulnerability of critical facilities.

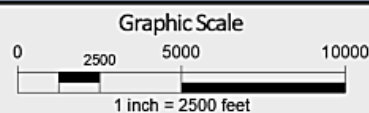
Hazard Group	Vulnerability (<i>What is at Risk</i>)
Winter-Related Hazards (Heavy Snow; Ice; Extreme Cold)	• The geographical location of Little Compton to the ocean helps to reduce the impact of most of winter related hazards. However, over the years, severe winter storms have impacted Little Compton. • Snow and ice can impact access to homes and critical facilities such as hospitals, schools, and supermarkets. • The geographical location of Little Compton to the ocean helps to reduce the impact of most of winter related hazards. However, over the years, severe winter storms have impacted Little Compton. • Snow, ice, and freezing temperatures may create treacherous driving conditions, cause transportation delays, and create transportation challenges for first responders or others who may need to be on the roads. The following roads are known to have icing issues: Commons, John Dyer Road (north and south ends), Long Highway (north end), Main Street, Public Safety Complex, Town Way, and Willow Avenue (north end). • If extreme cold conditions are combined with low/no snow cover, the cold can better penetrate downward through the ground and potentially create problems for underground infrastructure. • Heavy snow and ice accumulation can weigh down and damage utility wires; downed wires that are live have the potential to spark fires; damaged utility wires may lead to power loss which could disrupt critical infrastructure, technology, and communications, as well as create public safety issues such as loss of household heat which could then cause water and sewer pipes to freeze and even rupture. • Heavy snow and ice accumulation can weigh down and damage trees. This may result in falling limbs and felled trees which may cause traffic disruptions. As the health of many trees in Town has been compromised due to several factors, trees with weak unions may more easily succumb to the weight of snow and ice accumulation. • Walking on roads/ sidewalks can be dangerous if not properly cleared of snow and ice. • There are some residential and commercial structures sporadically located throughout Little Compton that are of older construction and/or have flat roofs and may be more susceptible to roof collapse due to heavy snow loads. Little Compton's only public school has a flat roof over the gymnasium, which has been susceptible to heavy snow fall buildup in the past. Several local farms have barn roof types that have a limited pitch which also cause the need to watch closely for snow buildup. • Nor'easters: Nor'easters cause varying amounts of coastal erosion depending on the intensity and the duration of the storm, tidal phase at the time of the storm, and frequency of storms. Back to back storms do not allow time for the beaches and dunes to recover sand that has been transported offshore. The erosion of coastal features commonly results in greater potential for damage to adjacent built environment. It is common for Little Compton's South Shore Beach to experience coastal erosion from Nor'easters. • A quick thaw after a heavy snow can cause substantial flooding, especially along small streams and in developed areas. • Critical Facilities: Several critical facilities have portions of their roof that are either flat or have a low pitch and may therefore be at greater risk of failure from heavy snow. These include the Brownell Library, Town Hall, Wilbur's General Store, and the Wilbur & McMahon School, all of which are part of the Little Compton Historic District.

Hazard Group	Vulnerability (<i>What is at Risk</i>)
 Infectious Disease-Related Hazards	Mosquitoes & Ticks - The tick and mosquito populations are not expected to have an impact on Little Compton's built environment & infrastructure. Influenza Viruses or Coronaviruses - The influenza viruses or coronaviruses are not expected to have an impact on Little Compton's built environment & infrastructure.
 Other Hazards (Earthquake; Extreme Heat; Drought; Brush Fire)	Earthquakes - If a significant earthquake occurred with an epicenter relatively close to Little Compton, all buildings may be at risk to some level of damage. - As Little Compton complies with State Building Codes, it is unlikely that most structures would sustain much damage from a moderate earthquake occurring in Rhode Island; there may be some residential and commercial structures sporadically located throughout the Town that are of older construction and may be at higher risk of damage or collapse due to an earthquake. Critical Facilities: Although an earthquake of significance is considered a low probability for Little Compton, should one occur, depending on the magnitude and epicenter, all critical facilities structures are vulnerable to some level of damage. Extreme Heat - Although extreme heat can cause pavement to soften and expand (creating rutting and potholes), as heat waves in the near future are expected to be of short duration, the impact to Little Compton is expected to be minimal. - Increased energy demands, particularly related to air conditioning usage, may cause power shortages/outages. Drought - Wells are generally more vulnerable to drought conditions than municipal water systems. As the entirety of the Town relies on private wells, and the Fire Department relies on several small ponds to supply hydrants for fire suppression, a long-term drought may result in public health and safety concerns. However, as climate change models predict more precipitation for the Northeast, the probability of a long-term drought over the next five-years is considered as Potential (between 1% and 49.9% annual probability). Brush Fires - In general, brush fires are not expected to have an appreciable impact on Little Compton's built environment & infrastructure. Although the Town does have a fair number of homes with wood shake roofs which tend to ignite relatively easy. - If not contained quickly, brush fires in areas with a lot of old growth of phragmites could threaten nearby structures; these areas include the coastal grasslands of Almy Creek, Meeting House Lane, Round Pond, Sakonnet Point, South Shore Beach, and Warren's Point.

FEMA Flood Zones with Critical Facilities Overlay



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May 2024

Source: RIGIS

Figure 4-52

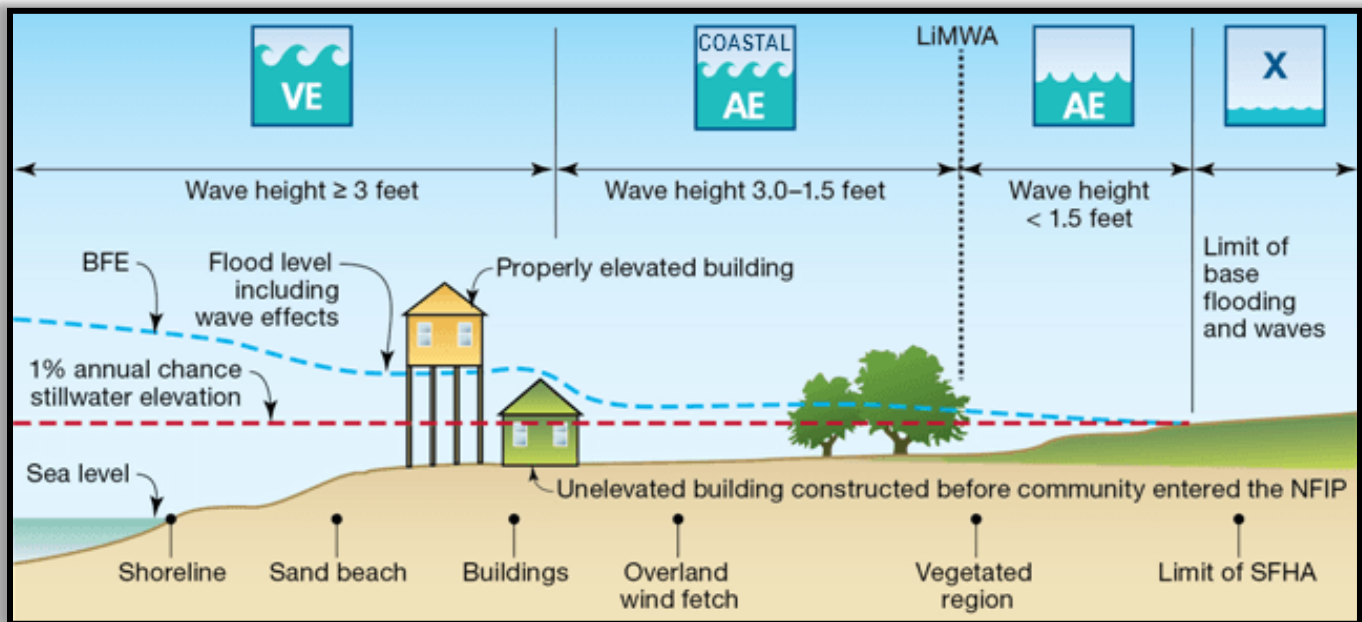
Kim Jacobs, Civil Engineer & Resilience Planning Consultant

4.4.2.1 FEMA Flood Zones

FEMA's Federal Insurance and Mitigation Administration (FIMA) manages, among other things, the National Flood Insurance Program (NFIP). In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the Nation's floodplains. Mapping flood hazards creates broad-based awareness of this issue and provides the data needed for floodplain management programs and to actuarially rate new construction for flood insurance. The Flood Insurance Rate Map (FIRM) is the legal document for determining flood zone location and may be viewed at Little Compton's Town Hall or on the Town's website.

Figure 4-53 depicts FEMA's coastal flood hazard mapping, which "is the process where the overland wave modeling results are assimilated with the topography data to delineate the boundary of the Special Flood Hazard Area (SFHA) for the 1% annual chance stillwater elevation (100-year conditions), along with mapping the location and extent of Zones VE, AE, and X" (FEMA Region III). The stillwater elevation indicates how high floodwaters could rise during a flood event due to storm surge, tides, wave setup, or other factors. The higher the stillwater elevation, the farther inland the impacts of flooding will be felt (FEMA. *Coastal*, 2).

Figure 4-53 Typical Shoreline - Coastal Flood Hazard Mapping (FEMA Region III)



A map of the Town depicting the Flood Zones and location of critical facilities is provided as **Figure 4-52** (refer to **Table 4-20** for the critical facilities map numbers; a larger scale of this map is included in **Appendix 4-2**). A summary of the total assessed value for each flood zone and the critical facilities in the SFHA follows:

High Risk: VE Zone (1% annual chance of flooding with additional hazards associated with wave action)

The analysis summarized in **Table 4-22** shows that the total assessed value for properties with any portion of the building footprint (or parcel boundary for vacant land) intersecting the VE Zone is \$78,267,000 (approximately 2.8% of tax base).

Critical Facilities: The Sakonnet Light House Station (South of Little Compton on Little Cormorant Rock), a National Register of Historic Places site; Sakonnet Harbor; Round Pond Road (private roadway); and portions of the Evacuation Route including small sections of **Town-owned Roads:** John Sission Road, Shaw Road, South Shore Road; **State-owned Roads:** Sakonnet Point Road; **Private Roads:** Atlantic Drive, Round Pond Road.

High Risk: AE/A Zone (1% annual chance of flooding)

The analysis summarized in **Table 4-22** shows that the total assessed value for properties with any portion of the building footprint (or parcel boundary for vacant land) intersecting the AE or A Zone is \$199,135,696 (approximately 7.1% of tax base).

Critical Facilities: The Harold E. Watson Reservoir Dam (owned by the City of Newport); Simmons Pond Dam (owned by RIDEM); and portions of the Evacuation Route including small sections of **Town-owned Roads:** John Sission Road, Shaw Road, South Shore Road; **State-owned Roads:** Sakonnet Point Road; **Private Roads:** Bailey's Ledge Road, Round Pond Road, Washington Road.

Moderate Risk: X shaded (0.2% annual chance of flooding)

The analysis summarized in **Table 4-22** shows that the total assessed value for properties with any portion of the building footprint (or parcel boundary for vacant land) intersecting the X-shaded Zone is \$198,489,300 (approximately 7.0% of tax base).

Critical Facilities: Stone House Inn (120A Sakonnet Point Road); Adamsville Dam (*no longer on Little Compton's dam list as the spillway is in MA as is the failure inundation area*); and portions of the Evacuation Route including small sections of **Town-owned Roads:** John Sission Road, Shaw Road; **State-owned Roads:** Sakonnet Point Road; **Private Roads:** Atlantic Drive, Bailey's Ledge Road, Quaker Hill Farm Road.

Flood Zone Analysis

The outcome of a GIS flood zone analysis is summarized in **Table 4-22**. The analysis was conducted for the entire Town to approximate the assessed valuation of properties in the various flood zones as of December 19, 2023.

General Methodology

Table 4-22 - Parcel Vulnerability Based on Flood Zones, was created using December 19, 2023 data from CAI Technologies who manage the Town's online Geographic Information System (GIS). Based on the parcel layer data provided, the assessed value for the entire Town of Little Compton as of December 19, 2023, was \$2,819,883,576, with the Primary Buildings assessed at \$1,200,593,000 and the Land assessed at \$1,573,290,023.

Recognizing that sea level rise will continue to move the floodplain designations inland, the flood zone for a parcel was determined using the spatial intersection of the FEMA Digital FIRM GIS layers and either the building footprint(s) within a parcel, or for vacant land, the parcel boundary. The assessed values associated with the parcels, which is based on Computer Assisted Mass Appraisal (CAMA) data that CAI uploads from the Tax Assessor's Office, was used to create **Table 4-22**.

A property's flood zone was categorized based on the **highest risk flood zone** any portion of a building footprint (or parcel boundary for vacant land) touched. Hence, for example, if even a small portion of the building footprint was in the VE flood zone, the entire assessed valuation for that parcel was attributed to the VE zone in **Table 4-22**. The only exception was for parcels associated with the *Seasonal and Waterfront Land with Improvements* Categories. For these two categories, if numerous buildings were associated with a single parcel, the analysis was refined by obtaining each individual primary building assessment from the Tax Assessor's Office and then attributing said building assessments to the respective flood zone.

Analysis Limitations: In addition to the full assessment being attributed to the higher risk flood zone, other analysis limitations include that both the building footprints and CAMA parcel boundary data are not precise (they are not the product of a professional land surveyor).

The outcome of the analysis should therefore be used only for general planning or guidance purposes. Specifically, it provides a basis of understanding of the tax base that may be at risk from flooding.

Table 4-22 Parcel Vulnerability Based on Flood Zones
(Little Compton Tax Assessor Data 12-18-2023/Town GIS/RIGIS)

HIGH RISK: Velocity Flood Zone (VE) – 1% Annual Chance with additional hazards associated with wave action				
Land Use		Assessed Value (\$)		
		Primary Building(s)	Land	Total
RESIDENTIAL	Single-Family Residential	\$3,507,000	\$8,135,900	\$11,702,600
	Two Family Residential	-----	-----	-----
	Mobile Home	-----	-----	-----
	Ocean Front Residential	\$3,899,000	\$12,070,800	\$16,094,700
	Residential Waterfront based on Square Footage	\$4,087,600	\$8,519,400	\$12,764,300
	Residential with Multiple Buildings	-----	-----	-----
	Residential Waterfront with Multiple Buildings/ Seasonal	\$10,153,500	\$19,058,100	\$29,453,200
COMMERCIAL	Large Businesses with Out-Buildings	\$1,791,100	\$2,206,300	\$4,202,700
	Combination Property (Commercial & Residential)	\$285,400	\$1,117,600	\$1,407,100
	Waterfront Land with Improvements	\$23,500	\$2,401,400	\$2,424,900
VACANT	Residential Vacant Land	-----	-----	-----
	Commercial Vacant Land	\$0	\$147,700	\$161,200
OTHER	Charitable Waterfront	\$0	\$6,300	\$56,300
	Open Space Commercial Waterfront	-----	-----	-----
	Open Space with Building(s)	-----	-----	-----
	Conservation Easement	-----	-----	-----
Subtotal: Velocity Zone (VE)		\$23,747,100	\$53,663,500	\$78,267,000

Note: In addition to the Primary Building(s) and Land, the Total Assessment also includes outbuildings and other improvements.

HIGH RISK: 100-Year Flood Zone (AE & A) – 1% Annual Chance

Land Use		Assessed Value (\$)		
		Primary Building(s)	Land	Total
RESIDENTIAL	Single-Family Residential	\$25,750,500	\$51,696,796	\$78,419,696
	Two Family Residential	\$637,000	\$782,800	\$1,431,500
	Mobile Home	-----	-----	-----
	Ocean Front Residential	\$8,448,900	\$26,733,300	\$35,376,600
	Residential Waterfront based on Square Footage	\$4,255,200	\$14,910,900	\$19,370,900
	Residential with Multiple Buildings	\$8,789,600	\$17,306,300	\$26,340,900
	Residential Waterfront with Multiple Buildings/ Seasonal	\$9,818,600	\$24,828,300	\$34,921,600
COMMERCIAL	Large Businesses with Out-Buildings	\$440,300	\$933,300	\$1,412,000
	Combination Property (Commercial & Residential)	-----	-----	-----
	Waterfront Land with Improvements	\$808,200	\$0	\$808,200
VACANT	Residential Vacant Land	\$0	\$227,900	\$227,900
	Commercial Vacant Land	\$0	\$322,400	\$322,400
OTHER	Charitable Waterfront	-----	-----	-----
	Open Space Commercial Waterfront	-----	-----	-----
	Open Space with Building(s)	-----	-----	-----
	Conservation Easement	\$0	\$499,500	\$504,000
Subtotal: 100-Year Zone (AE & A)		\$58,948,300	\$138,241,496	\$199,135,696

Note: In addition to the Primary Building(s) and Land, the Total Assessment also includes outbuildings and other improvements.

**MODERATE RISK: 500-Year Flood Zone (X shaded) –
0.2% Annual Chance**

Land Use		Assessed Value (\$)		
		Primary Building(s)	Land	Total
RESIDENTIAL	Single-Family Residential	\$24,145,600	\$46,278,300	\$71,228,100
	Two Family Residential	-----	-----	-----
	Mobile Home	\$42,600	\$137,900	\$183,400
	Ocean Front Residential	\$9,870,900	\$32,279,600	\$42,391,600
	Residential Waterfront based on Square Footage	\$5,071,200	\$15,683,100	\$20,896,200
	Residential with Multiple Buildings	\$2,627,500	\$6,317,800	\$8,971,500
	Residential Waterfront with Multiple Buildings/ Seasonal	\$8,962,000	\$18,922,900	\$28,201,000
COMMERCIAL	Large Businesses with Out-Buildings	\$5,374,200	\$11,486,300	\$17,411,900
	Combination Property (Commercial & Residential)	-----	-----	-----
	Waterfront Land with Improvements	\$156,700	\$3,409,900	\$3,818,600
VACANT	Residential Vacant Land	\$0	\$73,800	\$73,800
	Commercial Vacant Land	-----	-----	-----
OTHER	Charitable Waterfront	-----	-----	-----
	Open Space Commercial Waterfront	\$25,200	\$2,974,800	\$3,175,100
	Open Space with Building(s)	\$805,100	\$1,325,800	\$2,138,100
	Conservation Easement	-----	-----	-----
Subtotal: 500-Year Zone (X-Shaded)		\$57,081,000	\$138,890,200	\$198,489,300

Note: In addition to the Primary Building(s) and Land, the Total Assessment also includes outbuildings and other improvements.

Flood Insurance Analysis

FEMA's Mitigation Division manages the National Flood Insurance Program (NFIP) which was established by the *National Flood Insurance Act of 1968*, with the intent of reducing the need for post-disaster federal aid by offering flood insurance and providing mitigation incentives to properties that have significant flood risks. Legislation associated with the NFIP has undergone a number of changes over the years including that set forth in the *Flood Insurance Protection Act of 1973*, *Flood Insurance Reform Act of 2004*, *Biggert-Waters Flood Insurance Reform Act of 2012*, and *Homeowner Flood Insurance Affordability Act of 2014* (FEMA. 50 Years).

Flood insurance through the NFIP is available to residents in communities that comply with the minimum NFIP floodplain management requirements for reducing flood damage. Participating NFIP communities must adopt Flood Insurance Rate Maps (FIRMS), FEMA's Flood Insurance Study (FIS) for the community, and a FEMA compliant floodplain management ordinance that regulates activity in the community's floodplains. The Town of Little Compton (CID 440035) has been a participant in the NFIP program since July 19, 1974 (FEMA. *Community Status*). Little Compton's participation in NFIP, through the adoption and enforcement of floodplain management ordinances, provides Little Compton residences and businesses the opportunity to obtain their flood insurance through that program. Communities that participate in NFIP currently have the opportunity to participate in the Community Rating System (CRS) program. CRS is a voluntary incentive program that will allow the Town to receive credit points for flood management activities beyond the minimum NFIP requirements. The credits translate to insurance premium discounts (from 5-45%) for NFIP insurance policy holders in the community. **Per Town Ordinance § 14-5.9 Special Flood Hazard Areas, the Town of Little Compton will continue to comply with NFIP requirements (Appendix 5-1) and intends in the near future to participate in the CRS program.**

Most homeowners' insurance policies do not cover flooding. As a condition of a mortgage from a lender that is federally regulated, flood insurance is required (either through NFIP or a private insurer) for buildings located in the Special Flood Hazard Area (comprised of the V and A Flood Zones). Those without federally backed mortgages or outside of the SFHA are also able to purchase flood insurance through NFIP (or private insurers) to protect their home and/or content from physical losses caused by a flood. Policyholders pay premiums that are based on the level of flood risk at an identified location in the community. To accurately identify the risk, FEMA produces Flood Insurance Rate Maps (FIRMS) that show areas subject to flooding. The flood risk information presented on the FIRMS is based on historic, hydrologic, and hydraulic data, as well as on open-space conditions, flood-control works, and development.

The 100-year flood is a regulatory standard used by federal agencies, states, and NFIP-participating communities to administer and enforce floodplain management programs and is also used nationwide by the NFIP as the basis for insurance requirements. The precipitation from a 100-year flood is expected to inundate the area designated as the 100-year floodplain or the Special Flood Hazard Area (SFHA). Statistically, there is a 1 percent chance of a 100-year flood occurring in any given year – which translates to a 26 percent chance over a 30-year mortgage period.

The NFIP maintains flood insurance data for active policies and past claims. This data is a valuable resource for analyzing the impact of flood hazards. As shown in **Table 4-23 & 4-24**, according to FEMA, as of February 19, 2024, Little Compton had 95 active policies with a total coverage of over \$30 million. Of the active policies, 88 are residential, 7 are non-residential, 1 is the V zone, and 27 are in the A/AE Zone. The Town does not have access to data related to those who purchase flood insurance through the private sector. Hence, the total number of properties with flood insurance in Little Compton may be higher.

Based on information provided from FEMA Region I, from May 9, 1975 to February 19, 2024, there have been 32 NFIP claims, of which 25 were paid with a net total payment of \$301,972 (**Table 4-25**). As this information only represents claims associated with flood damage for those insured through the NFIP, and does not take into consideration losses caused by flooding for those privately insured or those uninsured, the actual flood damage that has occurred to buildings and contents in Little Compton over the past 49± years is expected to be higher.

It should further be noted that there are no Town-owned buildings located in the SFHA.

Table 4-23 Little Compton Properties with NFIP Flood Insurance Per Flood Zone (FEMA Data: 2-19-2024)

Community	VE-Zone	A/AE-Zone	X-Zone/Other	Number of Policies in Force	Total Premiums	Coverage Total \$
Little Compton	1	27	67	95	\$74,124	\$30,055,000

Table 4-24 Little Compton NFIP Insurance Summary by Occupation Type (FEMA Data: 2-19-2024)

Occupancy Type	Policies in Force	Annual Premium Total	Total Coverage in Force
Residential	88	\$63,075	\$27,728,000
Non-Residential	7	\$11,049	\$2,327,000
Total	95	\$74,124	\$30,055,000

Table 4-25 Little Compton NFIP Claim Overview (FEMA Data: from 5-9-1975 to 2-19-2024)

Flood Zone	VE-Zone	A/AE-Zone	X-Zone	Other	All
Claims CWP	15	3	2	5	25
Open Claims	0	0	0	0	0
Claims CWOP	6	1	0	0	7
Net Building Payments	\$165,543.34	\$22,932.17	\$12,199.33	\$79,577.62	\$280,252.46
Net Contents Payments	\$14,376.04	\$0.00	\$243.98	\$7,100.00	\$21,720.02
Net Total Payments	\$179,919.38	\$22,932.17	\$12,443.31	\$86,677.62	\$301,972.48
Average Net Payment (Open & CWP)	\$11,994.63	\$7,644.06	\$6,221.66	\$17,335.52	\$12,079.00
Number of Records	21	4	2	5	32

Note: CWP = Closed With Payment; CWOP = Closed Without Payment

Repetitive Loss Properties

FEMA has no recorded repetitive loss (RL) or severe repetitive loss (SRL) properties in Little Compton. However, for reference, the National Flood Insurance Program currently defines properties that have had more than one flood insurance claim as follows:

- ❖ **Repetitive Loss:** Any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling 10-year period, since 1978 (claims made within 10 days of each other are counted as one claim). A repetitive loss property may or may not be currently insured by the NFIP (FEMA. Repetitive Loss Structure).
- ❖ **Severe Repetitive Loss:** Any NFIP-insured single-family or multi-family residential building that has incurred flood-related damage for which four or more separate claims payments have been made, with the amount of each claim (including building and contents payments) exceeding \$5,000; or for which at least two separate claim payments (building payments only) have been made, with the cumulative amount exceeding the market value of the building. In both instances, at least two of the claims must be within any rolling 10-year period, since 1978, and claims made within 10 days of each other are counted as one claim (FEMA. *Appendix I: Severe*).

Coastal Barrier Resources Act

"In 1982, the United States adopted the Coastal Barrier Resources Act (CBRA) to establish the John H. Chafee Coastal Barrier Resources System (CBRS). The CBRS is comprised of several coastal areas along the Atlantic (including the Gulf of Mexico and the Caribbean Sea) and Great Lakes shorelines of the United States - designated in the CBRS as units - which buffer inland areas from storm surge and heavy winds and often support significant bio-diversity. While private development is allowed in CBRS units, federal expenditures and federal financial assistance for developments are prohibited. This means, among other restrictions, a structure built in a CBRS unit is ineligible for flood insurance and cannot receive funds from the Federal Emergency Management Agency (FEMA) for elevation, rehabilitation, or reconstruction" (Town of Westerly RI. *Comprehensive*, 247). Maps identifying the Coastal Barrier Resources System Units in the Town of Little Compton are available through the following links:

CBRS - Little Compton Ponds Unit D01, Tunipus Pond Unit D01P (10-24-1990)

CBRS - Brown Point Unit RI-01, Fogland Marsh Unit D02 (10-15-1992)

4.4.2.2 Flooding, Storm Surge, and Sea Level Rise

Following is an overview of the impact on the built environment (buildings, transportation system, and utilities) from flooding and storm surge coupled with projected sea level rise.

Hurricane Storm Surge

Little Compton, located along Rhode Island Sound, has in the past experienced high surge elevations associated with hurricanes. High winds push the water toward the shore creating storm surge. As shown in **Figure 4-54**, the most vulnerable areas to hurricane surge inundation are those along the Town's southern border which fronts on the Rhode Island Sound, and those along the Town's western border which fronts on the Sakonnet River.

A detailed list of Little Compton's critical facilities vulnerable to various hazards, including storm surge inundation, has been included as **Appendix 4.3**. Following is an overview of the critical structures determined vulnerable to hurricane surge inundation. These properties are also identified on **Figure 4-54** (refer to **Table 4-20** for the critical facilities map numbers; a larger scale of this map is included in **Appendix 4-2**). *Please note that GIS data to map the storm surge impact from a category 5 hurricane is not available for Rhode Island.*

Critical Facilities at risk from a Category 1 (or higher) Hurricane

The Sakonnet Light House Station (on Little Cormorant Rock), a National Register of Historic Places site; Sakonnet Harbor; Round Pond Road (private roadway); and portions of the Evacuation Route including small sections of **State-owned Roads**: Sakonnet Point Road; **Private Roads**: Round Pond Road, Washington Road.

Critical Facilities at risk from a Category 2 (or higher) Hurricane

Adamsville Dam (*no longer on Little Compton's dam list as the spillway is in MA as is the failure inundation area*); and portions of the Evacuation Route including small sections of **Town-owned Roads**: Shaw Road; **State-owned Roads**: Sakonnet Point Road; **Private Roads**: Bailey's Ledge Road, Round Pond Road, Washington Road.

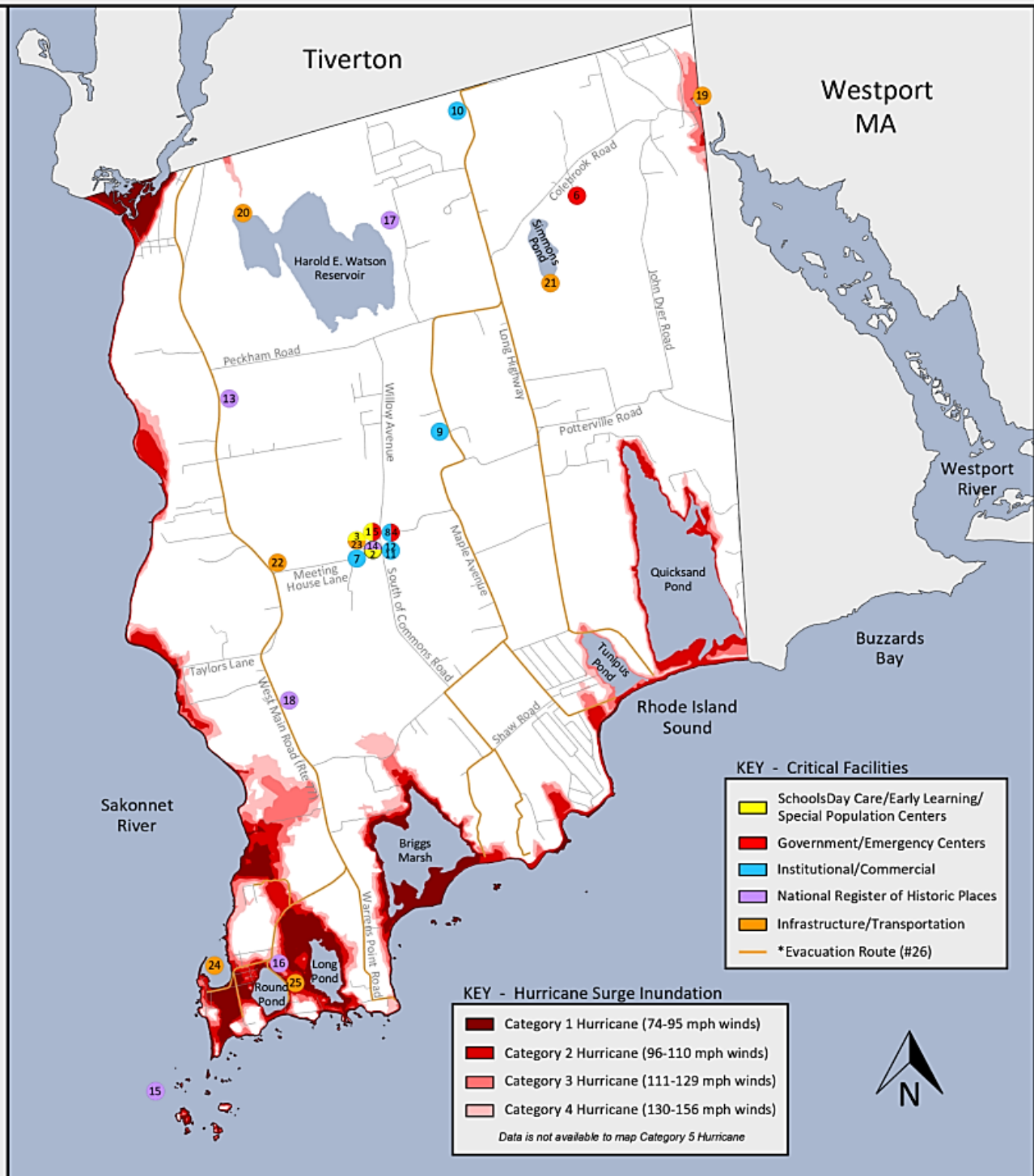
Critical Facilities at risk from a Category 3 (or higher) Hurricane

Portions of the Evacuation Route including small sections of **Town-owned Roads**: John Sission Road, Shaw Road, South Shore Road; **State-owned Roads**: Sakonnet Point Road; **Private Roads**: Bailey's Ledge Road, Round Pond Road, Washington Road.

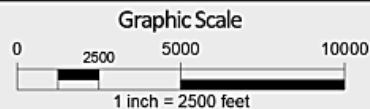
Critical Facilities at risk from a Category 4 (or higher) Hurricane

Stone House Inn (120A Sakonnet Point Road), a National Register of Historic Places site; and portions of the Evacuation Route including small sections of **Town-owned Roads**: John Sission Road, Shaw Road, South Shore Road; **State-owned Roads**: Sakonnet Point Road; **Private Roads**: Atlantic Drive, Bailey's Ledge Road.

Hurricane Surge Inundation Areas with Critical Facilities Overlay



This map is not the product of a Professional Land Survey. It was created for the Town of Little Compton for general reference, informational, planning or guidance use, and is not a legally authorized source as to location of natural or manmade features. Proper interpretation of this map may require the assistance of appropriate professional services. The Town of Little Compton makes no warranty, express or implied, related to the spatial accuracy, reliability, completeness, or currentness of this map.



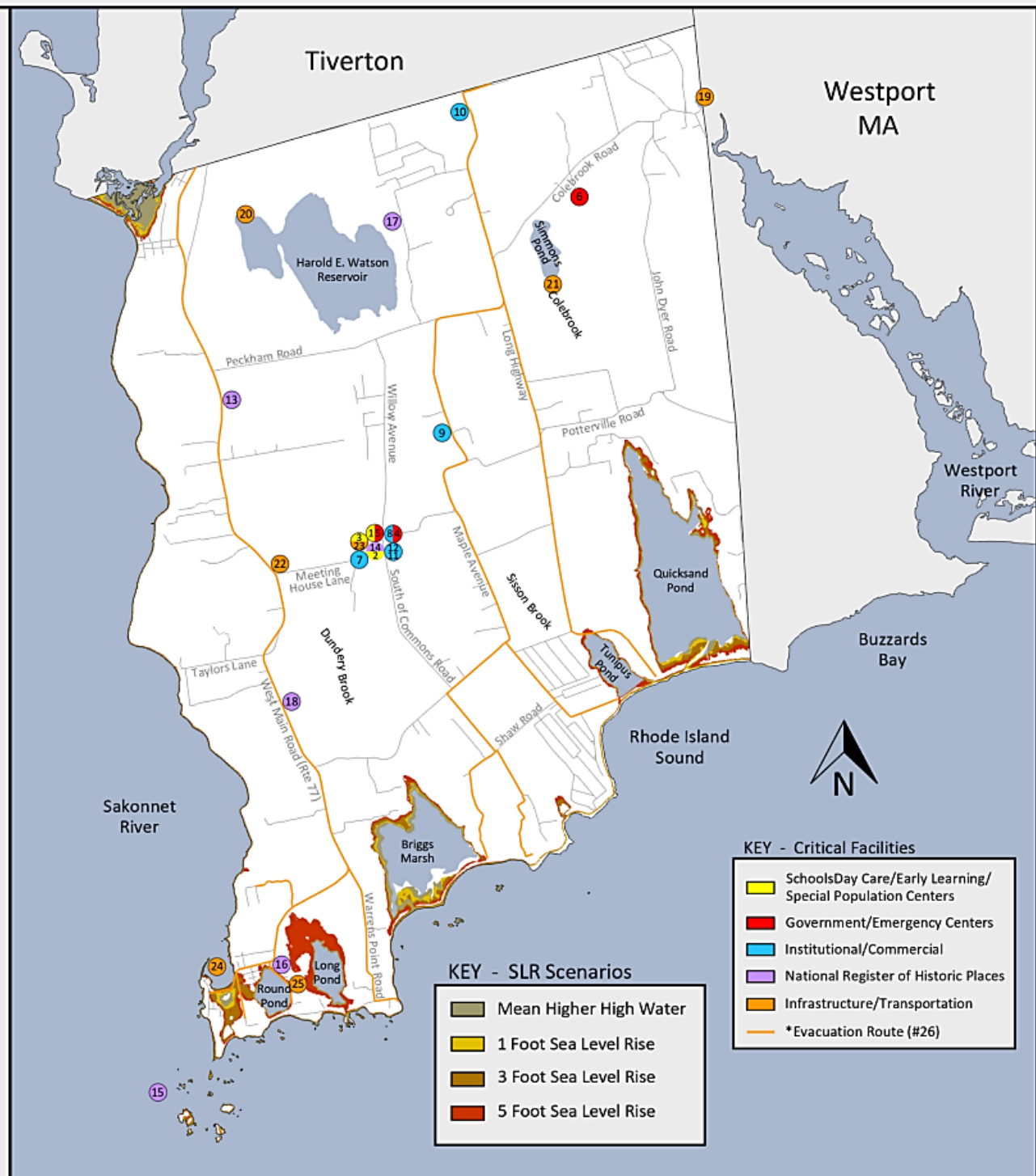
May 2024

Source: RIGIS

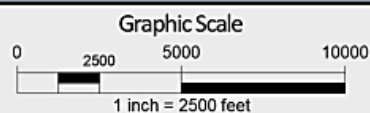
Figure 4-54

Kim Jacobs, Civil Engineer & Resilience Planning Consultant

Sea Level Rise Inundation Areas with Critical Facilities Overlay



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May 2024

Source: RIGIS

Figure 4-55

Kim Jacobs, Civil Engineer & Resilience Planning Consultant

Sea Level Rise

If, as projected by climate scientists, the frequency and intensity of storms continue to increase in the near future, buildings and infrastructure in Little Compton's low-lying areas along the Rhode Island Sound and along the tidally influenced Sakonnet River, may be subjected to greater risk of flood and wind damage.

A key consequence of climate change is sea level rise (SLR). With an extensive coastline, SLR will expand the higher risk flood zones inland, thereby impacting more of Little Compton's properties, and amplifying the effects of storm surge. Coastal erosion and encroachment resulting from rising seas increase Little Compton's exposure to cascading damages.

The CRMC warns that the threat of sea level rise will grow significantly in the coming decades and has adopted NOAA's "worst-case" high curve projection to guide planning in Rhode Island (**Table 4-26**). **Figure 4-55** shows the locations of critical facilities overlaid with the current Mean High-Water level and projected 1, 3, and 5-foot SLR scenarios (refer to **Table 4-20** for the critical facilities map numbers; a larger scale of this map is included in **Appendix 4-2**).

Table 4-26 Sea Level Rise Projections for Rhode Island (NASA. *Interagency*)

NOAA 2022 SLR Scenarios	2030	2050	2080	2100
Worst-case projections based on high curve	0.71 feet	1.60 feet	4.19 feet	6.47 feet

Transportation System Analysis

The Department of Public Works in conjunction with the Town Council, implements programs for the rehabilitation and maintenance of local roads which support the community's transportation network. In the event of a natural disaster, Little Compton must coordinate response and recovery efforts with the bordering towns of Tiverton, RI and Westport, MA, with a particular focus on maintaining critical road and bridge transportation links.

ROADWAYS: The road network in the Town is comprised of state, local, and private roads.

LOCAL ROADS

Listed in **Table 4-27** are the approximately 20.2 miles of local roadways that the Little Compton Department of Public Works manages, with the top priority being safety. The Town's transportation management goals include installing BMPs (best management practices) to treat and manage stormwater runoff where appropriate, coordinating roadway improvements with utility companies' roadwork, and implementing a pavement management program (Town of Little Compton RI. *Comprehensive*, 102).

Table 4-27 Town-Owned Roads (20.2 Miles Total)

Road Name	Miles	Road Name	Miles
Amesbury Lane	0.8	Old Stone Church Road	0.6
Brownell Road	0.5	RI Avenue and Bluff Head Avenue	0.3
Burchard Avenue	1.0	Shaw Road	0.8
Dump Right-of-Way	0.2	South Shore Road	1.1
Grange Avenue	0.6	Swamp Road	1.3
John Dyer Road	2.1	Taylor's Lane	0.4
John Sisson Road	0.4	Tompkins Lane	0.5
Long Highway	4.2	Town Way	0.3
Long Pasture Road	0.5	Warren's Point Road	0.8
Maple Avenue	1.0	William Sisson Road	0.6
Old Main Road (Windmill Hill)	0.8	Willow Avenue	1.4

STATE ROADS

Figure 4-56 identifies the State-maintained roads in Little Compton. "Access to the Town is principally provided by State roads from the north (Tiverton, RI) and from the East (Westport, MA). West Main Road (Route 77) enters the Town in the north western corner and runs the length of the Town terminating at Sakonnet Harbor. Stone Church Road (Route 179) and Crandall Road (Route 81) converge in the Adamsville Village area. Other State roadways in the Town include Meeting House Lane, Peckham Road, Cole Brook Road, East Main Road, Snell Road, Mullin Hill Road, and South of Commons Road" (Town of Little Compton RI. *Comprehensive*, 101). **Table 4-28** lists the roughly 18.9 miles of roadway within Little Compton that the Rhode Island Department of Transportation manages.

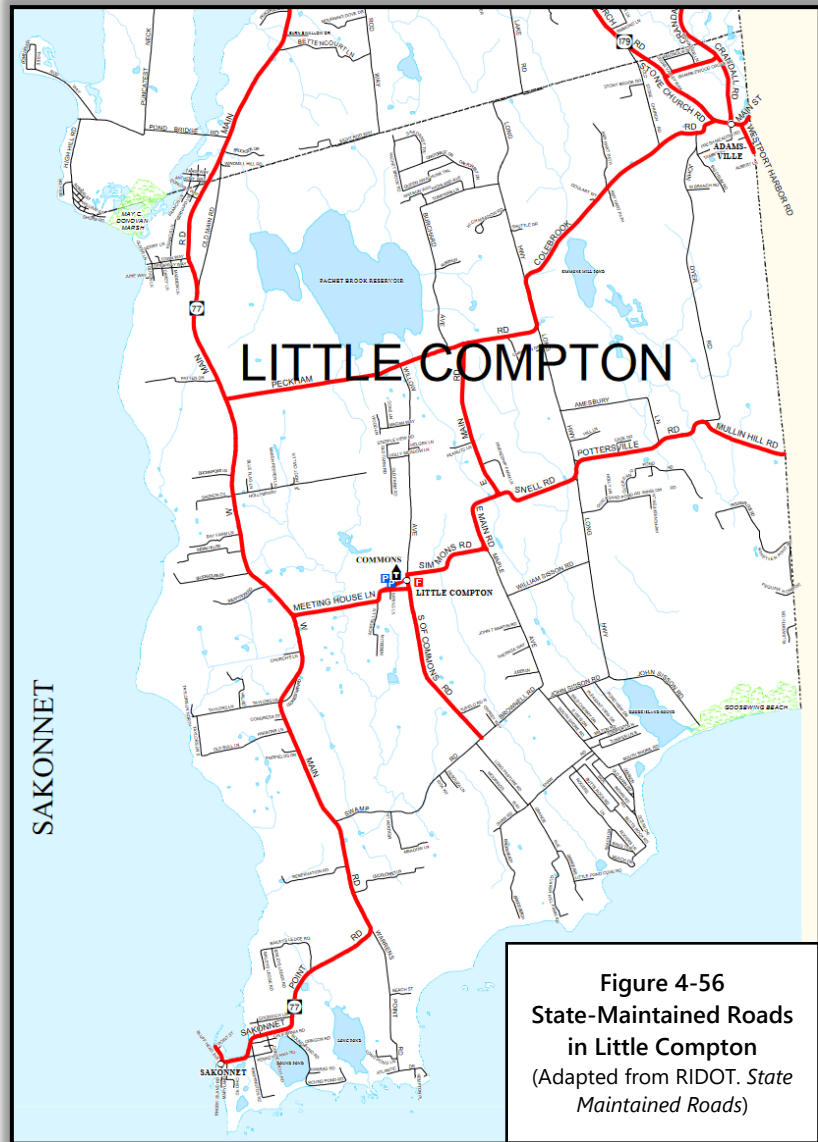


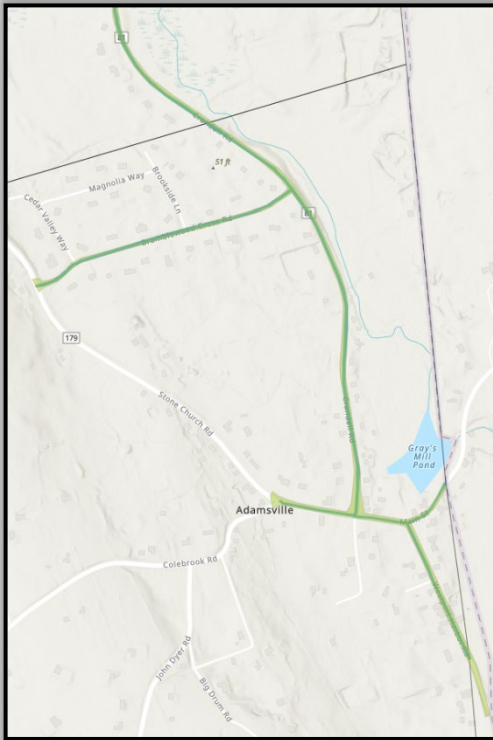
Table 4-28 State-Owned Roads (18.9 Miles Total)

Road Name	Miles
Colebrook Road	1.8
Crandall Road	0.6
East Main Road	1.6
Harbor Road (Main St to State Line)	0.2
Long Highway (between Peckham & Colebrook Roads)	0.3
Main Street	0.3
Meeting House Lane & Commons	0.6

Road Name	Miles
Peckham Road	2.1
Pottersville Road & Mullin Hill Road	1.6
Sakonnet Point Road	1.4
Simmons Road	0.6
Snell Road	0.6
South of Commons Road	1.1
Stone Church Road	0.6
West Main Road	5.5

The Rhode Island State Transportation Improvement Program (STIP) FFY 2022-2031 is a list of transportation projects the State intends to implement using United States Department of Transportation (USDOT) funds. The State adopt a new STIP at a minimum of every four (4) years. The current STIP (adopted by the State Planning Council on September 9, 2021), covers the required four-year revenue constrained time period of Federal Fiscal Years FFY 2022-2025, with additional information included for FFY 2026-2031. A project's inclusion in the STIP is a critical step, but it does not represent an obligation to fund (RIDSP. *State Transportation*). **Figure 4-57** shows the two projects currently on the STIP.

Figure 4-57 Little Compton STIP Projects (RIDSP, FFY2022-2031 STIP)



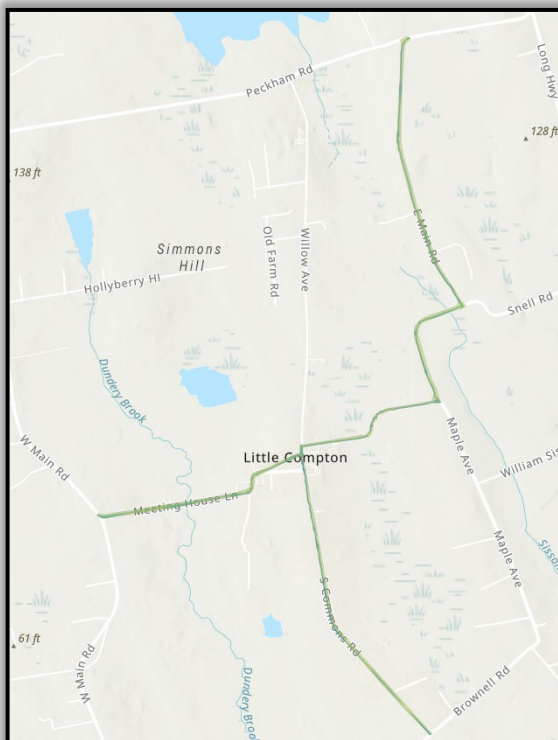
STIP ID: 1351

STIP Program: Pavement

Project Name: Little Compton Commons Repaving - Meeting House Ln. (RI-77 to Commons), S Commons Rd. (Brownell Rd. to Commons), Simmons Rd. (Commons to Maple Ave.), E Main Rd. (Simmons Rd. to Peckham Rd.)

Project Description: This line item involves reclaim and mill and overlay of roads surrounding the Little Compton Commons, including Meeting House Lane, South Commons Road, Simmons Road, and East Main Road. Improvements to pedestrian access, stormwater drainage, and traffic safety may be included. This project includes elements of TIPID 1352 and 1354, which were bundled into this project in Amendment 6. This project will be coordinated with TIPID 1402 and 1404.

Anticipated First and Last Year of Funding: 2022 - 2031



STIP ID: 1403

STIP Program: Pavement

Project Name: RI-81 Crandall Road and East Road Resurfacing

Project Description: This line item involves reclaiming of East Road in Tiverton and Adamsville Main Street in Little Compton. Bramblewood Cross Road and RI-81 from East Rd. to Main St. will also be resurfaced. Mill and overlay, wheelchair ramp improvements. This line item may require additional funding beyond 2031.

Anticipated First and Last Year of Funding: 2028 - 2031

PUBLIC TRANSPORTATION

The Rhode Island Public Transit Authority (RIPTA) provides public transportation service for the State. However, currently RIPTA does not offer any bus transportation nor FlexService van transportation to or from Little Compton. “A Park-n-Ride Lot located at the intersection of Fish Road and Route 24 in Tiverton provides the closest access point to Rhode Island Public Transit Authority (RIPTA) bus service. The Park-n-Ride offers free parking and a bus stop along Route 60 that travels to both Newport and Providence” (Town of Little Compton RI. *Comprehensive*, 103).

The Rhode Island Office of Healthy Aging does provide curb-to-curb transportation for older adults (60+) to various community services such as to and from medical appointments, adult day care, and meal sites. These services are intended for individuals without any other means/access to transportation. The Ride Program provides paratransit services to those protected under the Americans with Disabilities Act (ADA) and Medicaid recipients. This service requires advance reservations. The Town of Little Compton has a free senior van service for Little Compton residents age 60 and older to Little Compton grocery stores, banks, Community Center, Library, and other personal needs not covered by the State Ride program.

“Commuter Resources Rhode Island offers free carpool programs, such as NuRide, to Rhode Island residents who want to reduce their carbon footprint. Participation is free and includes benefits such as reduced parking in Downtown Providence” (Town of Little Compton RI. *Comprehensive*, 103). As very limited public transportation options exist, Little Compton is largely dependent on the use of private vehicles.

SEA LEVEL RISE IMPACT ON ROADS

Maintaining roadway viability is critical to Little Compton. Statewide Planning reports that, “Sea level rise presents a major challenge to Rhode Island’s transportation infrastructure, both via daily tidal flooding of coastal assets and making storm surge events more severe” (RIDSP. *Technical Paper 167*, 4). Unlike storm surge or flooding, sea level rise is a long-term, permanent trend with implications for coastal transportation infrastructure. To assist municipalities in preparing for sea level rise and storm surge in their local planning efforts, Statewide Planning utilized STORMTOOLS, developed by the Coastal Resources Management Council (CRMC) in collaboration with the University of Rhode Island (URI), to identify the transportation assets at risk of damage/disruption from SLR and storm surge. Although there are some inherent limitations in the modeled scenarios (compounding impacts from erosion, riverine flooding, and such), the findings provide municipalities valuable information regarding the effects SLR and storm surge will have on their local transportation infrastructure. This analysis illuminates the need to design with respect to future climate change impacts based on the life expectancy of the transportation asset (road- 30 years, bridge-50 years).

According to Statewide Planning’s SLR analysis, with 7 feet of SLR, Little Compton can expect approximately 2 miles of roadway to be inundated, ranking it the 17th most vulnerable municipality to sea level rise in the state of Rhode Island. Based on Statewide Planning’s analysis, the top ten road assets in Little Compton vulnerable to SLR are shown in **Table 4-29**, with Sakonnet Point Road, Round Pond Road, and Washington Road the three most vulnerable to SLR. Six of these roads are part of the Army Corps of Engineers (USACE) Hurricane Evacuation Route (RIDSP. *Little Compton*, 2).

The USACE Hurricane Evacuation Route Maps were provided to Rhode Island’s 21 coastal communities in 2013 as a product of the Army Corps Hurricane Evacuation Study. The maps depict evacuation zones that are recommended to be evacuated during potential worst-case Hurricane Surge Inundation. Portions of Little Compton’s Evacuation Route are in low-lying areas, particularly in the southwestern portion of the Town, and may become inundated with flood waters. In the event of an emergency, waterfront residents who ignore evacuation warnings could easily be cut off from escape due to roadway inundation.

Table 4-29 Top 10 Road Assets in Little Compton Vulnerable to Sea Level Rise (SLR)

(adapted from RIDSP. Little Compton, 2)

Town Rank	Road Name (jurisdiction)	Length of Roadway Impact from SLR (LF)					Evacuation Route	Functional Classification
		1 Ft SLR	3 Ft SLR	5 Ft SLR	7 Ft SLR	Total Impact		
1	Sakonnet Point Road (RIDOT)	0	315	1,139	165	1,619	Yes	Major Collector
2	Round Pond Road (private)	0	1,517	457	283	2,257	Yes	Local
3	Washington Road (private)	0	601	224	327	1,151	Yes	Local
4	Oliver Lane (private)	0	376	114	76	566	No	Local
5	Maryland Road (private)	0	303	79	82	464	No	Local
6	Pennsylvania Road (private)	0	519	409	20	948	No	Local
7	John Sisson Road (LC)	0	0	341	241	582	Yes	Local
8	Shaw Road (LC)	0	0	0	57	57	Yes	Local
9	South Shore Road (LC)	0	0	6	92	98	Yes	Minor Collector
10	Bluff Head Avenue (private)	0	0	82	146	228	No	Local

Additionally, Statewide Planning looked at the impact of 100-year storm surge events on roadways. As shown in **Table 4-30**, the analysis considered no SLR through 7 feet of SLR. According to Statewide Planning's analysis, Little Compton can expect roughly 8 miles of roadway to be inundated if a 100-year storm event occurs in conjunction with 7 feet of SLR. Under this analysis, Little Compton is ranked as the 17th most vulnerable municipality in the State (RIDSP. *Little Compton*, 3).

Table 4-30 Top 10 Road Assets in Little Compton Vulnerable to 100-Year Storm Surge Events

(adapted from RIDSP. Little Compton, 3)

Town Rank	Road Name	Length of Roadway Impact from SLR (LF)						Evacuation Route	Functional Classification
		No SLR	1 Ft SLR	3 Ft SLR	5 Ft SLR	7 Ft SLR	Total Impact		
1	Sakonnet Point Road (RIDOT)	3,439	467	302	309	571	5,088	Yes	Major Collector
2	South Shore Road (LC)	760	154	353	63	42	1,373	Yes	Minor Collector
3	Round Pond Road (private)	3,142	86	123	85	99	3,535	Yes	Local
4	Bluff Head Avenue (private)	616	0	0	0	0	616	No	Local
5	California Road (private)	921	0	0	0	0	921	No	Local
6	Nevada Road (private)	320	0	0	0	0	320	No	Local
7	Oregon Road (private)	263	0	0	0	0	263	No	Local
8	Pennsylvania Road (private)	948	0	0	0	0	948	No	Local
9	Point Street (private)	161	0	0	0	0	161	No	Local
10	South Shore Road (LC)	379	0	0	0	0	379	No	Local

BRIDGES: An inaccessible or collapsed bridge can have major implications, including preventing emergency vehicles from reaching their destinations, creating difficulties in obtaining important lifeline supplies such as food and medicine reaching the community, disrupting residents from access to/from their homes, work, or other destinations, and a general loss of productivity. **In terms of vulnerability, Little Compton is fortunate to not have any bridges as part of its transportation network.**

BOAT ACCESS: “Sakonnet Harbor, originally known as Church Cove, provides boat access to the Town. It is a small-boat harbor on the northerly side of Sakonnet Point near the entrance to the Sakonnet River and is mostly used by recreational watercraft and fishing boats. There is no ferry service to or from Sakonnet Harbor. The harbor is protected by an 800 foot breakwater. Initial work in the harbor by the US Army Corps of Engineers was completed in 1908 and involved constructing a 400-foot-long breakwater extending northerly from the western side of the harbor, and removing a ledge near the wharf to a depth of eight feet. In 1957, the Corps constructed a 400-foot-long extension to the breakwater and dredged the harbor to a depth of eight feet. The total area dredged was about 13 acres” (Town of Little Compton RI. *Comprehensive*, 103). As the frequency and intensity of storms are anticipated to increase, and the level of the seas are projected to rise, there is concerns over how Sakonnet Harbor will fare from the impacts of sea level rise, coupled with wave action.

“In an effort to enhance the level of protection of the community’s mooring field and other infrastructure assets within the harbor, the Town would like to identify natural or structural solutions to provide northerly wave attenuation for Sakonnet Harbor. A wave attenuation feasibility study could be conducted in order to explore solutions, investigate impacts, identify permitting requirements and estimate cost versus benefits related to such a project for Sakonnet Harbor” (Town of Little Compton RI. *Comprehensive*, 113).

Dam Analysis

Eight of the ten dams in Little Compton have been identified by RIDEM as low hazard, meaning should they fail the probability of loss of life or significant property damage is low. The other two, the Watson Reservoir and Simmons Pond dams have higher RIDEM hazard ratings. The theoretical dam failure inundation area for the Watson Reservoir Dam (high hazard) is primarily located in Tiverton, RI. “A potential dam failure of Harold E. Watson Reservoir Dam would likely cause loss of one or more human lives, given the presence of multiple residences located downstream of the dam and adjacent to the banks of the Pachet Brook. Additionally, an Algonquin gas transmission line immediately downstream of the dam is vulnerable in the event of a hypothetical dam break” (GZA. 485, 4). The theoretical dam failure of the Simmons Pond Dam may cause extensive damage to the dirt access road located on top of the dam and likely overtop Amesbury Lane and the adjacent private drive, Pottersville Road, and Quicksand Pond Road. The residential areas upstream of Pottersville Road and Amesbury Lane that are close to Colebrook, may experience shallow flooding (GZA. 474, 2-4). The structural integrity of both of these higher classified dams is unclear. Although Rhode Island’s Rules and Regulations for Dam Safety (250-RICR-130-05-1) require annual inspections of High Hazard and Significant Hazard dams, the Harold E Watson Reservoir Dam appears to have been most recently visually inspected in 2019, and based on a notation in the 2013 Emergency Action Plan (EAP) for the Simmons Pond Dam, it was last inspected prior to 2012.

Public Utilities Analysis

Public utilities keep communities running effectively. Following is an overview of the public utilities that service the Town of Little Compton.

❖ Drinking Water

Little Compton does not have public drinking water system. All properties are serviced by individual private wells. Wells may be vulnerable to high floodwater which can deposit mud or sediment in the wells or cause structural damage if the floodwater is carrying with it large pieces of debris. Wells may also be more vulnerable to drought conditions.

❖ **Stormwater Management**

Little Compton has a limited amount of stormwater infrastructure. Most of the stormwater management along roads under the jurisdiction of the Town is in the form of open channels with vegetative cover, detention basins, and retention basins/ponds. Some of the roads under the jurisdiction of the State have stormwater catch basins and associated piping to outfalls. There are a number of culverts throughout the Town which carry stream flow under roadways. It is important that culverts are sized appropriately for high precipitation events.

Stormwater infrastructure can be damaged from high volume rainfall events due to high flow velocity causing erosion or from floodwater carrying debris and sedimentation which can clog culverts, open channels, storm drains, pipes, and outfalls. An important measure that needs to be implemented with more regularity is cleaning debris and sedimentation from the stormwater channels and culverts to ensure they are functioning properly. In addition to flooding, prolonged presence of saltwater can damage stormwater infrastructure. Coastal erosion can also expose stormwater infrastructure along the shoreline which may lead to damage.

Historically, Little Compton has had few commercial or residential developments. Currently there is only one small development with four single family residential units anticipated in the ensuing five-years. The Town does enforce the *RI Stormwater Design and Installation Standards Manual* which regulates stormwater runoff from most new developments. These stormwater regulations seek to ensure that new private infrastructure is sized appropriately and will operate effectively.

❖ **Wastewater Management**

Little Compton does not have a public sewer system. All developed properties, with the exception of the Town's municipal buildings on the Commons, are serviced by individual Onsite Wastewater Treatment Systems (OWTS), formerly referred to as Individual Sewage Disposal System (ISDS). The four municipal buildings on the Commons (Wilbur & McMahon School, Odd Fellows Hall, Little Compton Community Center, and the Town Hall) are serviced by a single Wastewater Treatment Facility located at 28 Commons.

To effectively treat septic tank effluent before it reaches groundwater, OWTS drainfields require a minimum of 4 ft separation distance between the infiltrative surface and the groundwater table. Some older systems may no longer have adequate separation distance and, it may become increasingly more difficult to achieve adequate separation distance in new systems. The problem is expected to worsen in the future due to climate change related increases in frequency and magnitude of precipitation events, and rising sea levels. OWTSs not functioning optimally may contribute to the degradation of coastal aquifers and estuaries through nutrient and pathogen loading (Cox, 1-4).

Systems that are old or not properly maintained can lead to the failure of an OWTS, creating a potential health and environmental threat, including contaminating surface and groundwater, thereby potentially impacting drinking water supplies. The Town is in the process of developing an Onsite Wastewater Management Plan (OWMP) designed to meet local needs. Once the Town's OWMP is approved by RIDEM, Little Compton will be eligible to apply to the Community Septic System Loan Program (CSSLP). CSSLP funds are used by participating jurisdictions to provide interest-free loans to homeowners to cover the costs associated with septic system repairs and upgrades.

❖ **Solid Waste Management**

Little Compton owns and operates a solid waste Transfer Station located just off Colebrook Road at 122 Amy Hart Path. The facility is overseen by the Department of Public Works. Residents can obtain a household trash permit, in the form of a vehicle sticker, from the Town Clerk to utilize the transfer station. There are additional fees for construction debris and appliances. If residents prefer, they can contract for curbside pickup with a licensed private hauler.

As recycling is mandatory in the State of Rhode Island, the Transfer Station is set up to accept recyclable materials in varied collection containers. Rhode Island Resource Recovery has recommended the Town consider a Pay-As-

You-Throw program, in order to meet the State's mandated 35% recycling rate and 50% diversion rate. Solid waste which is not recycled is compacted and transported to the RI Resource and Recovery Corporation (RIRRC) facility in Johnston, Rhode Island where it is landfilled.

Yard waste dropped off at transfer station is composted and used by local farmers and residents. The Town also offers composting bins at a reduced cost to residents.

❖ **Electric and Natural Gas**

On February 23, 2022 the Pennsylvania-based PPL Corporation received approval from the Rhode Island Division of Public Utilities and Carriers to acquire The Narragansett Electric Company from National Grid USA. PPL is based in Allentown, Pennsylvania, and provides electricity and natural gas to approximately 2.5 million customers in the U.S. (PPL). After the acquisition, PPL changed the name from National Grid to Rhode Island Energy. Little Compton's electric service is provided by Rhode Island Energy, who also owns and maintains the Town's utility poles and electric lines. Little Compton is not serviced by gas, although the Algonquin Gas Main comes through Town (underground) and crosses the river to serve Aquidneck Island.

"The electric grid is one of the most critical infrastructure systems for modern life, but it is also one of the most vulnerable" (Korbatov, 3). Little Compton receives electricity through two main power lines from Tiverton, one along West Main Road and the other along Crandall/Colebrook Roads. "The vast majority of the Town has electricity served through above ground electrical lines with only a few developments that have opted to secure their electrical lines underground. Future planning would be best served to consider offering incentives to have underground utilities which have been proven to reduce power outages in certain hazard risk events such as wind related events" (Town of Little Compton RI. *Local Hazard*, 64).

Above-ground utilities can be impaired by strong winds, as well as by heavy snow and ice associated with winter storms. In 2015, the U.S. insurance industry identified an annual financial loss from power outages caused by flooding, hurricanes, and extreme temperatures to be in the range of 20–55 billion dollars (Korbatov, 3). In addition to lost revenues, power outages can impact the Town's ability to manage emergencies and keep residents safe. From 2019 through 2023, the Town of Little Compton experienced 31 power outages.

❖ **Communication Network**

"Little Compton continues to explore opportunities to improve essential services and critical facilities. Periodic review of backup procedures and redundant equipment is conducted to ensure adequate communications coverage during any disaster event. The Little Compton Fire Department headquarters and main dispatch center is located at 60 Simmons Rd in Little Compton. The fire department and RIEMA regularly performs maintenance and upgrades the equipment when necessary" (Town of Little Compton RI. *Local*, 65).

In regards to communications systems, the fire department has two repeaters and two receivers and the entire radio system is narrow band compliant. Both the Fire and Police Departments use the 800 MHz RI Statewide Communications Network (RISCON) digital system, located in the Public Safety Complex dispatch center, as their primary operating system. That system has a generator for a backup power source. For redundancy, in the event of RISCON failure, the Fire Department uses a 400MHz radio system. A separate UHF radio for inter-operability is also located in the dispatch center (Town of Little Compton RI. *Local*, 65, 66).

On the Town-owned Transfer Station site (located just off Colebrook Road at 122 Amy Hart Path) a small area (less than 10,000 square feet) houses both a commercial wireless communications tower and a public safety wireless communications tower (Town of Little Compton RI. *Local*, 24). Both towers, but specifically the public safety tower (which hosts various entities, including the State radio network, RISCON), are critical to communications leading up to, during, and after natural hazard events. Human vulnerability may be impacted due to power outages or downed communication lines which can pose threats to public safety, including inability to access emergency services and early warnings for the approach of severe storms, as well as use of medical equipment. At the site, in the outside secured area, there are two backup generators; one owned by the Town and the other by Verizon.

NATURAL ENVIRONMENT

4.4.3 Natural Environment

Little Compton's natural features are important resources, providing potable water for the Town, serving as habitat for wildlife, providing passive recreational opportunities for the public, and enhancing the scenic characteristics of the community. **The natural environment also plays an important role in reducing natural hazard impacts and increasing the community's resilience to climate change.** For example, vegetated buffers along streams and rivers help absorb and hold excess water, thereby reducing flooding; coastal marshes offer shoreline protection and help reduce the impacts of storms, including erosion, by acting as a physical barrier and reducing wind and wave energy; freshwater wetlands and coastal marshes help absorb flood waters, effectively buffering upland development; vegetated land cover reduces erosion and helps to reduce flooding and its subsequent impacts; vegetated land cover intercepts and absorbs water replenishing groundwater resources and guarding against drought; trees and other vegetation aid in mitigating the effects of heat-related hazards by shading areas and reducing surface temperatures; and trees and other vegetation, as well as wetlands, sequester carbon helping mitigate the greenhouse effect (EPA. *EnviroAtlas*).

Due to its coastal location and significant low-lying land, the primary hazards that will impact the natural environment are flooding and coastal erosion from rain and snow events, and storm surge from hurricanes and other high wind events. These hazards will be exacerbated by sea level rise. In addition to the vulnerabilities identified in **Table 4-31**, risks to the natural environment will be further explored in subsections **4.4.3.1 Conservation Land** and **4.4.3.2 Freshwater & Saltwater Resources and their Floodplains**.

Table 4-31 Natural Environment Vulnerability

Hazard Group	Vulnerability (<i>What is at Risk</i>)
 Flood-Related Hazards (Inland Flooding including Dam Failure; Coastal Flooding including Storm Surge; Coastal Erosion)	• The natural environment within Little Compton's low-lying land areas is vulnerable to flood-related hazards. • Flood waters can carry toxic material or contaminants spreading pollution which can negatively impact ecosystems and contaminate well sources. • Standing water following a flooding event can provide a conducive environment for breeding mosquitos. • With a substantial southern and western coastline (15± miles), Little Compton is highly susceptible to impacts from coastal flooding exacerbated by wind-driven storm surge. • High precipitation events and storm surge can cause coastal erosion which may narrow beaches and compromise coastal salt marshes; coastal erosion has been documented by CRMC in the following locations: Briggs Beach, Briggs Point, Brown Point, Church Cove, Church Point, North Brown Point, Sakonnet Point, South Shore Beach, and Warren's Point. • Due to increased intensity and frequency of storms, more coastal lands will be susceptible to erosion; eroded beach material and debris may be carried out to sea. Future increases in relative sea level will lead to changes in surface water and groundwater characteristics; salt intrusion into aquifers will contaminate well water supplies; coastal wetlands, which are critical for flood control and habitat viability, will become inundated causing a loss of salt marsh vegetation and an alteration of habitat types; wide-scale systematic changes in the terrestrial and marine environments may result; the loss of recreation areas and public space (RIEMA. <i>State of Rhode Island Hazard Mitigation Plan</i>, 3-175). • Refer to Subsections 4.4.3.1 & 4.4.3.2 for additional flood-related vulnerabilities.

Hazard Group	Vulnerability (<i>What is at Risk</i>)
 Wind-Related Hazards (High Winds; Thunderstorms including Lightning & Hail; Tornadoes; Tropical Cyclones)	• As discussed above under flood hazards, for Little Compton, the most significant impact to the natural environment from high winds is storm surge damage to shoreline ecosystems. • High winds may fell trees or tree limbs disrupting wildlife habitats. Tree damage may also compromise the health and longevity of a tree. • High winds may exacerbate fire conditions by drying out the ground cover, propelling fuel around the region, and increasing the ferocity of exiting fires; lightning associated with thunderstorms have been known to spark fires. • High winds and hail can cause damage to vegetation. • Tornadoes can kill or disrupt wildlife if their habitat is impacted. • Refer to Subsections 4.4.3.1 & 4.4.3.2 for additional wind-related vulnerabilities.
 Winter-Related Hazards (Heavy Snow; Ice; Extreme Cold)	• Heavy snow and/or ice accumulation can weigh down and damage vegetation and tree limbs. • Prolonged snow/ice cover and exposure to extreme cold may disrupt ecosystems and negatively impact outdoor domesticated animals and wildlife. • Flooding may occur after the rapid melting of a heavy snowfall.
 Infectious Disease-Related Hazards	Mosquitoes or Ticks • As climate change shortens our winters, ticks and mosquitoes will extend their life cycle and ticks will expand their habitat range. ◦ In the short term, the tick and mosquito population are not expected to have an appreciable impact on Little Compton's natural environment. ◦ Long-term, if the tick and mosquito population continue to increase, it may alter the health of local ecosystems. Influenza Viruses or Coronaviruses • The influenza viruses or coronaviruses are not expected to have an impact on Little Compton's natural environment.
 Other Hazards (Earthquakes; Extreme Heat; Drought; Brush Fires)	Earthquake • If an earthquake occurred in the region, it is not expected to have an appreciable impact on Little Compton's natural environment. Extreme Heat • Over the long term, extreme heat trends may alter the life cycle of plants and animals and could create a cascading effect to the surrounding environment (Columbia). • Sporadic periods of extreme heat may deplete food and water resources for local wildlife, and may stress or damage plants including agricultural crops. • Extreme heat and drought can increase water temperature in coastal ponds, leading to fish kills, rise in bacteria levels, and disease. Drought • Sporadic periods of short-term drought may stress plants and deplete food and water resources for local wildlife; there is a relatively large portion of Town in agricultural use which is more at risk to short-term droughts.

Hazard Group	Vulnerability (<i>What is at Risk</i>)
 Other Hazards <i>continued</i>	• Long-term drought conditions are associated with insect infestations, plant disease, loss of biodiversity, wind erosion of soil, degrading water quality, and decrease in levels of water produced by natural aquifers (NOAA NIDIS. <i>Drought</i>); however as climate change models predict more precipitation for the Northeast, the probability of a long-term drought in the near future is considered low for Little Compton. • Extreme heat and drought can increase water temperature in coastal ponds, leading to fish kills, rise in bacteria levels, and disease. Brush Fire • Brush fires that occur in more remote, harder to access areas pose a greater risk of spreading as they may go unnoticed for longer and/or take longer to access by fire protection services – these areas include portions of the Wilbour Woods, Simmons Mill Pond, and Almy Creek areas.

4.4.3.1 Conservation Land

Over the years, the Town and dedicated partners have made substantial efforts in land conservation. In 1985, legislation was enacted allowing the Town to create the Little Compton Agricultural Conservancy Trust (LCACT) to preserve agricultural property, open space, and other undeveloped natural areas. The LCACT is financed through a transfer tax assessment, currently 4% of the purchase price of real property in excess of \$300,000 (Town of Little Compton RI. *Comprehensive*, 32).



As shown in **Figure 4-58**, conservation land is scattered throughout the Town. One of the largest open space areas is the 400± acre State owned Simmons Mill Management Area (SMMA) located in the northeastern part of Town. SMMA is dominated by forest cover and freshwater wetlands and hosts miles of well-marked trails (Town of Little Compton RI. *Comprehensive*, 32). In addition to SMMA, many other conservation holdings, such as Bumble Bee Preserve (The Nature Conservancy), Haffenreffer Wildlife Refuge (Audubon Society), The Ponderosa (Sakonnet Preservation Association), and Wilbour Woods (Town of Little Compton), are valuable recreational assets.

Table 4-32 provides the total municipal and conservation acreage in Little Compton. The municipal acreage was derived from the RIGIS 1997 Municipal Boundaries dataset and includes inland water, and the conservation acreage through a locally maintained conservation lands dataset. As of December 2022, the conservation acreage was approximately 4,086 acres or 28.4% of the Town's total land area (Mosaic Land Management). As depicted in **Figure 4-58**, conservation land is held by various public and private entities including the Town of Little Compton, Little Compton Agricultural Conservancy Trust, City of Newport, State of Rhode Island, Natural Resources Conservation Services, RI Resources Management Council, Audubon Society of Rhode Island, The Nature Conservancy, and the Sakonnet Preservation Association which, founded in 1972, has the distinction of being the first private, non-profit community land trust in Rhode Island.

Further, as of April 2024, there were **157 parcels** in Town, totaling over **2393 acres**, that are included in the State's Farm, Forest and Open Space Program (FFOS). Approximately **2323 acres** of the FFOS properties are designated as farms. Agriculture is important to the local economy, historically and culturally intertwined into the fabric of the Town, and as highlighted below, plays an important role in hazard mitigation. It is therefore important that as farmland becomes idle, the Town's Agricultural Conservancy Trust, or other conservation groups, consider conservation of the land through purchase, donation, or acquisition of development rights. As shown in **Table 4-33**, based on RIGIS 2020 statewide land cover and 1993 wetlands datasets, there is approximately 2,342 acres of agricultural land in Little Compton, approximately 43% of which is permanently protected (Mosaic Land Management).

In addition to being integral to the character of the community and providing scenic and recreational enjoyment, Little Compton's open space also aids in mitigating the impacts of natural hazards. The following types of open space contribute to resilience against natural hazards impacts (EPA. *EnviroAtlas*):

- *Undeveloped property in floodplains*: preserves the ability for that land to act as flood storage, effectively buffering upland development; helps filter pollutants and nutrients before flood waters reach rivers and streams
- *Coastal marshes*: offer shoreline protection and help reduce the impacts of storms, including erosion, by acting as a physical barrier and reducing wind and wave energy;
- *Freshwater wetlands*: provide flood storage capacity and water quality treatment; sequester carbon, helping mitigate the greenhouse effect and combat climate change;
- *Coastal dunes and barrier beaches*: reduce erosion and the effects of storm surge on coastal areas further inland;
- *Vegetated land cover*: intercepts and absorbs water, replenishing groundwater resources and guarding against drought while also reducing flooding; reduces erosion and its subsequent impacts; mitigates the effects of heat-related hazards by shading areas and reducing surface temperatures; sequesters carbon, helping mitigate the greenhouse effect and combat climate change.

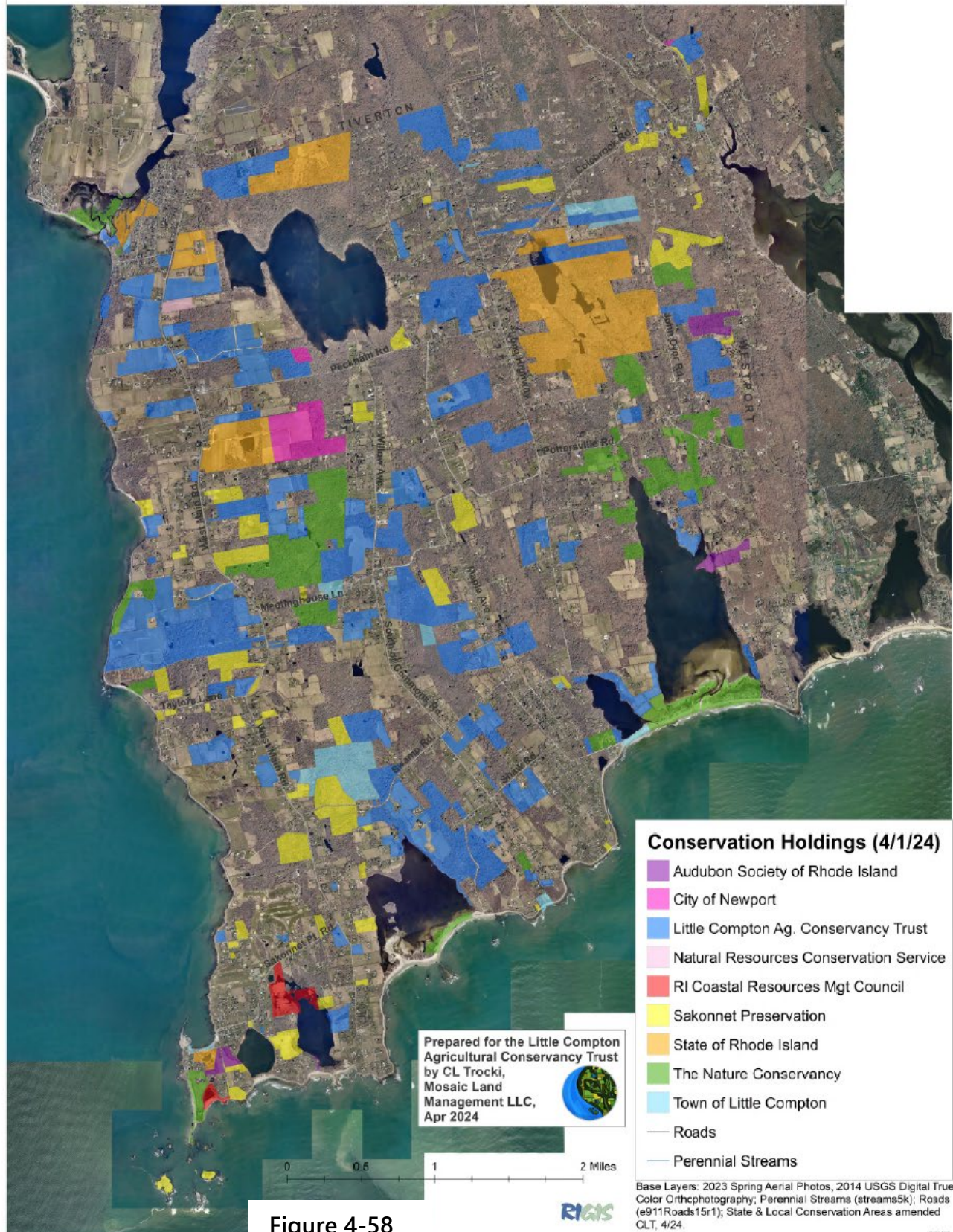
Table 4-32 Little Compton Total Municipal & Conservation Land (Mosaic Land Management)

Owner	Acreage	Percentage
Municipal Acreage	14,396	100.0%
Conservation Land	4,086	28.4%

Table 4-33 Little Compton Land Cover (Mosaic Land Management)

Owner	Acreage	Percentage
Agricultural Land	2,342	16.3%
Beaches and Shoreline	200	1.4%
Brushland	172	1.2%
Commercial and Services	64	0.4%
Forest Land	3,704	25.7%
Forested Swamp/ Forested Wetlands/ Wooded Swamps	2,380	16.5%
Freshwater Marsh/ Shrub Wetland/ Scrub Swamp/ Shrub Swamp	395	2.7%
Institutional	12	0.1%
Private Recreation and Open Space	133	0.9%
Public Recreation Space	11	0.1%
Residential	2,741	19.0%
Residential Field	835	5.8%
Salt/Brackish Marsh	149	1.0%
Transportation, Communication and Utilities	13	0.1%
Water	1,244	8.6%

Little Compton Conservation Lands, April 2024



4.4.3.2 Freshwater & Saltwater Resources and their Floodplains

As shown in **Figures 4-59 and 4-60**, there are three HUC Level 12 subwatersheds in Little Compton: **Sakonnet River**, **Cold Brook-Rhode Island Sound** (*locally Cold Brook is known as Colebrook*), and **Westport River**. The USGS created a nationwide system of delineating watersheds based on surface hydrologic features. The system initially divided the country into 22 regions which each have a 2-digit hydrologic unit code (HUC). Within each region, five additional subdivisions are made: subregions (4-digit HUC), basins (6-digit HUC), subbasins (8-digit HUC), watersheds (10-digit HUC), and subwatersheds (12-digit HUC). The code is hierarchical with each progressing subdivision retaining the previous HUC code as a prefix (USGS. NAS). The following information and links are from USGS (USGS. Science).

Sakonnet River Subwatershed

The Sakonnet River Subwatershed "drains approximately 56 square miles [144.72 km²] and lies within the broader Narraganset Bay Basin. The Sakonnet River is a tidal strait located in the middle of the watershed, which flows for 14 miles between Mount Hope Bay and Rhode Island Sound. The western coastline of the watershed drains eastern portions of Aquidneck Island" (USDA|NRCS, 1).

- [010900040910 Sakonnet River Subwatershed](#)
- Area in Acres = 35760.97
- Area in kilometers² = 144.72
- States: RI
- [Additional Information for HUC12 010900040910](#)
- [3D Model of 010900040910 Sakonnet River Subwatershed](#)

Cold Brook-Rhode Island Sound Subwatershed (*locally Cold Brook is known as Colebrook*)

The Cold Brook-Rhode Island Sound Subwatershed is located almost entirely in Little Compton, with small sections in Tiverton, RI and Westport, MA. It is a relatively small subwatershed encompassing approximately 19.6 square miles (50.72km²) in area.

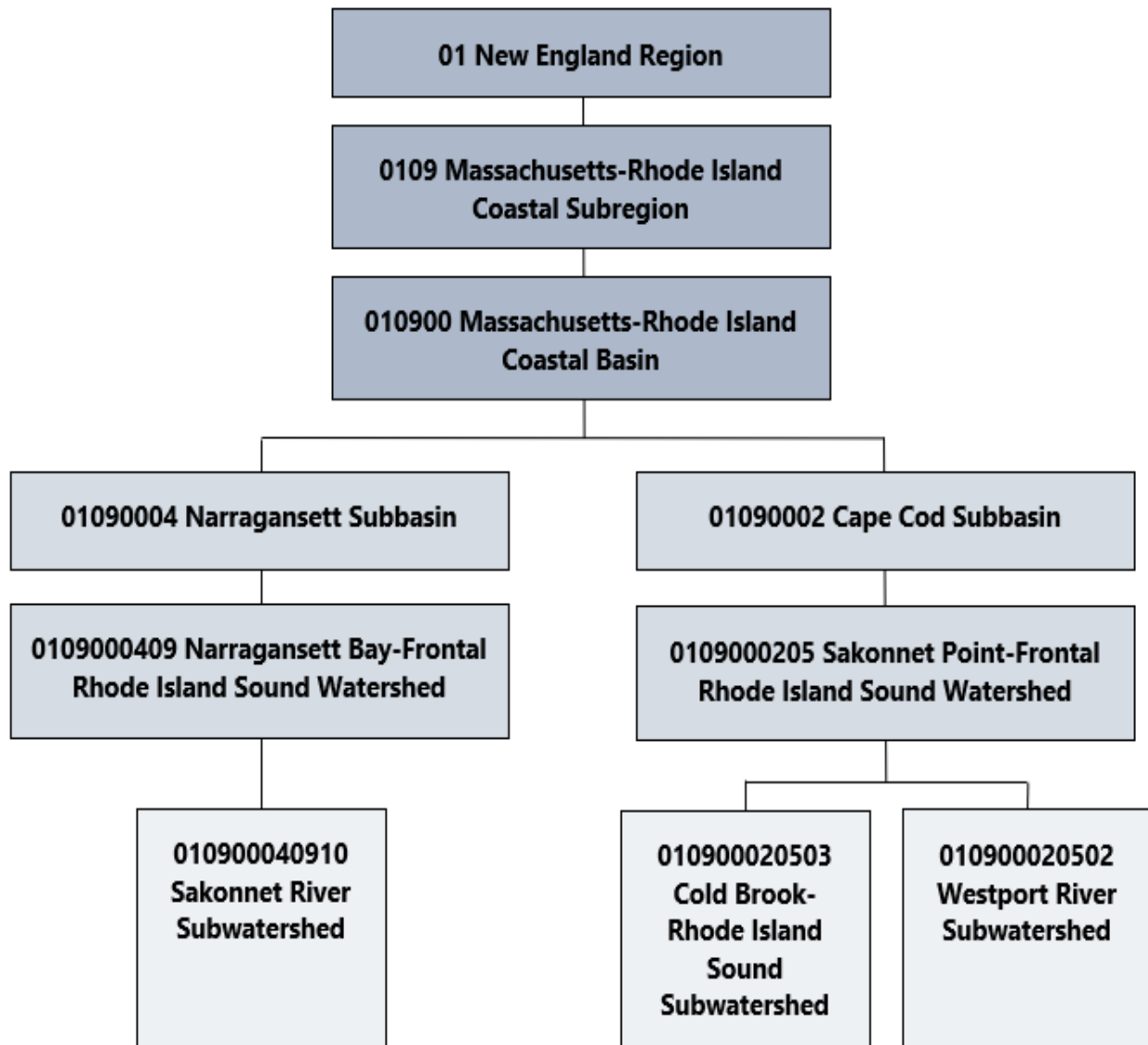
- [010900020503 Cold Brook-Rhode Island Sound Subwatershed](#)
- Area in Acres = 12534.29
- Area in kilometers² = 50.72
- States: MA,RI
- [Additional Information for HUC12 010900020503](#)
- [3D Model of 010900020503 Cold Brook-Rhode Island Sound Subwatershed](#)

Westport River Subwatershed

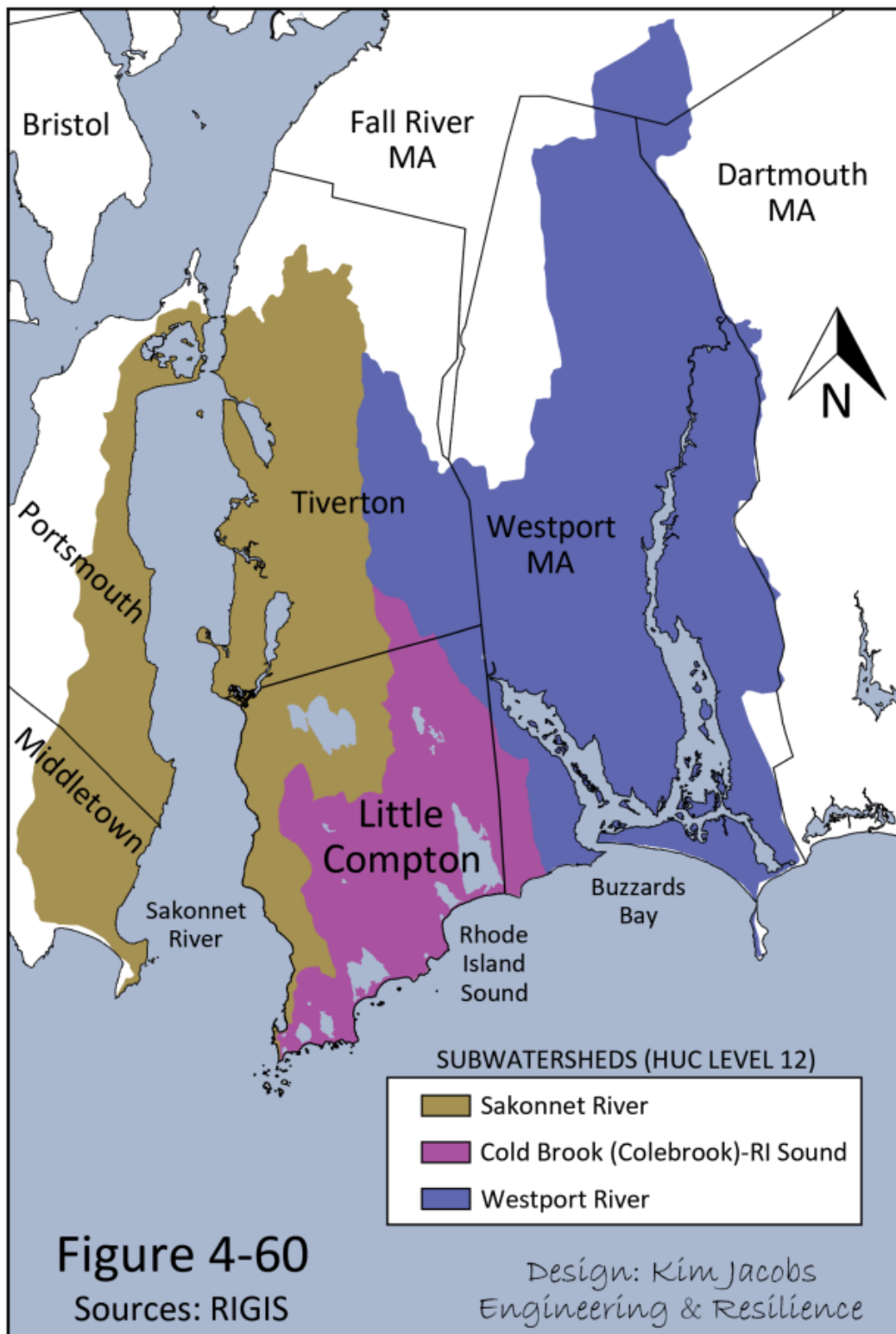
The Westport River Subwatershed is located in southeastern Massachusetts and a portion of Rhode Island. It is approximately 84 square miles in area and "is a tidal embayment with marine waters entering from Buzzard's Bay and freshwater entering through several stream inflows and direct groundwater discharge" (MACD, i)

- [010900020502 Westport River Subwatershed](#)
- Area in Acres = 36094.27
- Area in kilometers² = 146.07
- States: MA,RI
- [Additional Information for HUC12 010900020502](#)
- [3D Model of 010900020502 Westport River Subwatershed](#)

Figure 4-59 Little Compton Watershed Hierarchy

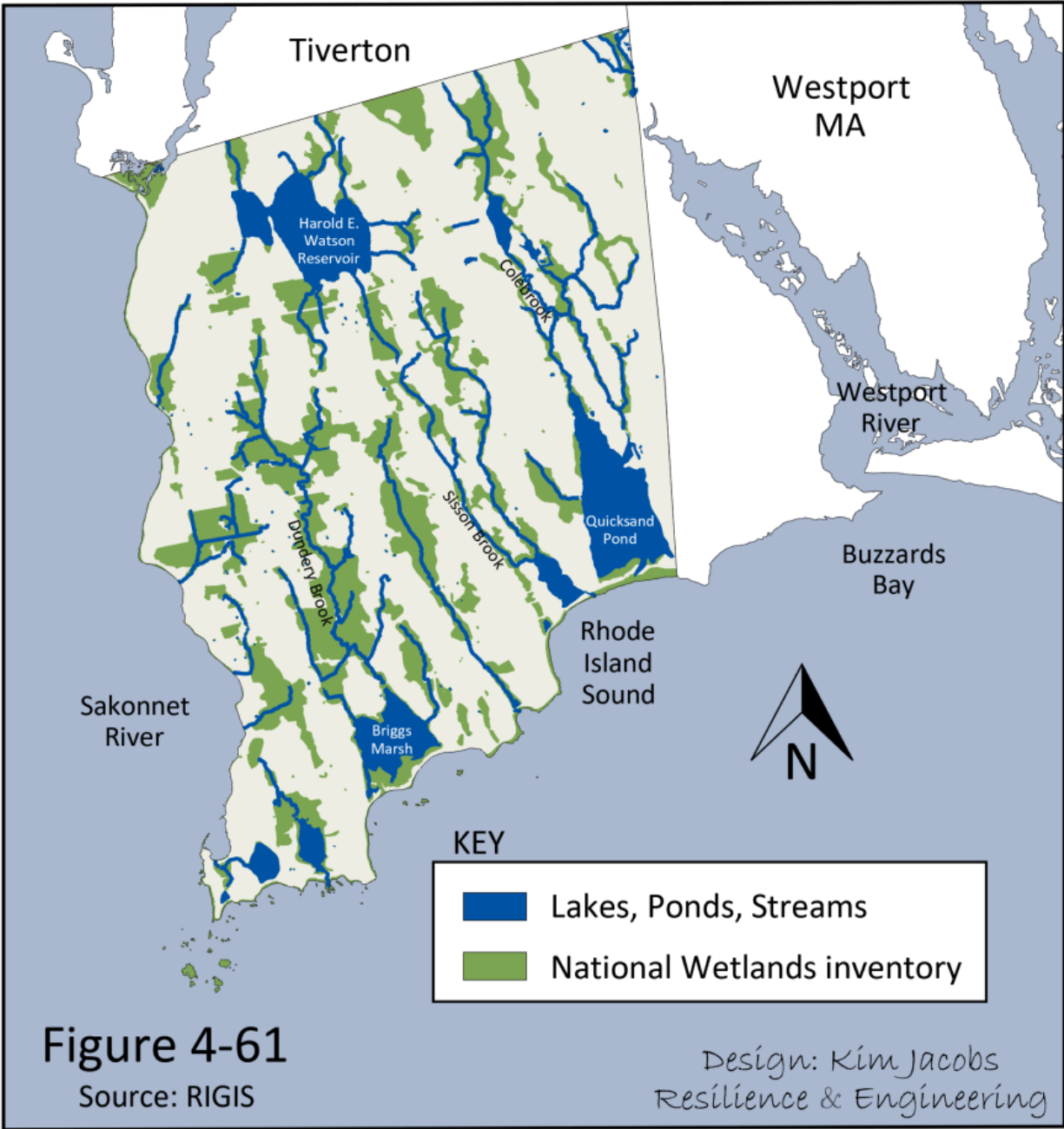


Little Compton Subwatersheds



As evidenced in **Figure 4-61**, Little Compton has an abundance of freshwater and saltwater resources. In addition to providing scenic beauty, Little Compton’s aquatic resources help control flooding, erosion and pollution; provide valuable fish, plant, and wildlife habitats; offer year-round active and passive recreation; and accommodate fin and shell fishing. The Town’s character is intertwined with these important resources and it is essential to understand how natural hazards, exacerbated by climate change including sea level rise, will impact these resources.

Freshwater & Saltwater Resources



Freshwater Resources

The Town's freshwater resources include streams, freshwater ponds, the Watson Reservoir, freshwater wetlands, and groundwater. "These resources are critical to the future functioning of the Town in terms of providing a continued safe drinking water supply, flood storage capacity, wildlife habitat, as well as secondary benefits such as recreation and scenic enjoyment" (Town of Little Compton RI. *Comprehensive*, 11).

Streams & Freshwater Ponds: There are numerous small streams in Little Compton including Adamsville Brook, Almy Creek, Colebrook, Dunderbury Brook, Pachet Brook, Sisson Brook, and the West Branch of the Westport River which runs through the northeastern corner of Town. There are also numerous small natural and manmade ponds including Gray's Mill Pond, Simmons Pond, Bumble Bee Pond, and Ponderosa Pond. "These water bodies serve as part of the Town's natural drainage system, channeling overland runoff into wetlands, ponds, the Sakonnet River, and Rhode Island Sound. Maintaining adequate vegetated buffers is critical the protecting water and habitat quality" (Town of Little Compton RI. *Comprehensive*, 17).

The floodplains associated with Little Compton's freshwater and saltwater resources are an important community asset. Floodplains, by their very nature, are the low, flat, periodically flooded lands adjacent to rivers, streams, ponds, lakes, and oceans, and are subject to geomorphic (land-shaping) and hydrologic (water flow) processes. It is only during and after major flood events that the connections between a river and its floodplain become more apparent. These areas form a complex physical and biological system that not only supports a variety of natural resources, but also aid hazard mitigation in a number of ways (RIEMA. *State of Rhode Island Hazard Mitigation Plan*, 3-111). More information on floodplains is provided in the **Freshwater Wetlands & Floodplains** narrative (page 4-132).

Harold E. Watson Reservoir: The Watson Reservoir is a 375 acre reservoir located in the northwestern area of Town. The reservoir and 300 watershed acres surrounding the reservoir, are owned by the City of Newport as part of its potable water supply system. In an effort to maintain the water quality of the reservoir, it is anticipated that Newport's watershed acreage will remain undeveloped. As the host community for this resource, there are steps Little Compton can take to minimize the impact on the reservoir's water quality. These include sanding rather than salting Peckham Road and Willow Avenue when required, and maintaining vegetated buffers around Pachet Brook and other tributary streams. These actions will also improve groundwater quality (Town of Little Compton RI. *Comprehensive*, 13).

Groundwater: "Groundwater is essentially held in common ownership by the residents of the Town, and is the Town's most important resource in terms of the health, safety and welfare of all residents" (Town of Little Compton RI. *Comprehensive*, 11). All residents and businesses in Little Compton use private wells for domestic water needs. Due to the Town's sole reliance on groundwater, it is critical that the relative quantity of groundwater must be understood and groundwater must be protected against contamination.

In 2019 the Conservation Commission in collaboration with URI researchers, launched a multi-year study to understand the quantity of freshwater available in Little Compton. Their 2022 Report presents findings from the first three-years of the study. During those three years, water samples were collected from approximately 150 wells ($\pm 10\%$ of Little Compton's households) geographically distributed throughout the Town. The samples were tested for dissolved solids (Town of Little Compton RI. *Do We*, 1-3).

The concentration of Total Dissolved Solids (TDS) in a water sample is a measure of the total amount of inorganic and organic substances dissolved in water that are small enough to pass through a 2-micrometer sieve. Some natural sources of dissolved solids in groundwater include bedrock, soil, leaves, plankton, and salt deposits. Some non-natural sources include contaminants on roads and other imperious surfaces that may be picked up by stormwater runoff, fertilizers and pesticides used in agriculture or for residential lawns, sewage, and piping or hardware used to convey the water (Benham, 1).

Comparing the three years of TDS levels from samples collected as part of the Conservation Commission study, suggests a correlation between precipitation and TDS levels: greater precipitation lowers TDS levels; and precipitation has a measurably quick impact on TDS levels. For Little Compton, the correlation between precipitation and TDS levels in well water may primarily be due to dilution and salt water intrusion. During periods of low precipitation there is less water to dilute dissolved solids. For wells in closer proximity to the coast, salt water intrusion into the fissures and cracks in the bedrock that feeds freshwater to wells may occur during periods of low precipitation and under drought conditions (Town of Little Compton RI. *Do We*, 1-3).

The study notes that if Little Compton “had large reserves of freshwater held in aquifers below us, then we would expect that it would take annual precipitation longer to effect TDS changes in our drinking water. The fact that precipitation levels so quickly affect TDS readings is [an] indication that our freshwater resources, particularly near the coast, are finite in nature. It hints at our vulnerability to drought and, in coastal locations, to saltwater intrusion that will be exacerbated by sea level rise” (Town of Little Compton RI. *Do We*, 4). In 2018 students from URI’s Department of Landscape Architecture conducted a *Coastal Resiliency Study* of the Town. **Figure 4-62**, is from their findings and designates various concerns including potential saltwater intrusion along the southern shoreline in the vicinity of Chase Point.

The HM&FMP Advisory Committee commends the research being conducted by the Conservation Commission in collaboration with URI, and supports continued evaluation of the quantity of the Town’s groundwater. Future assessments may also delve further into the quality of groundwater throughout the Town.

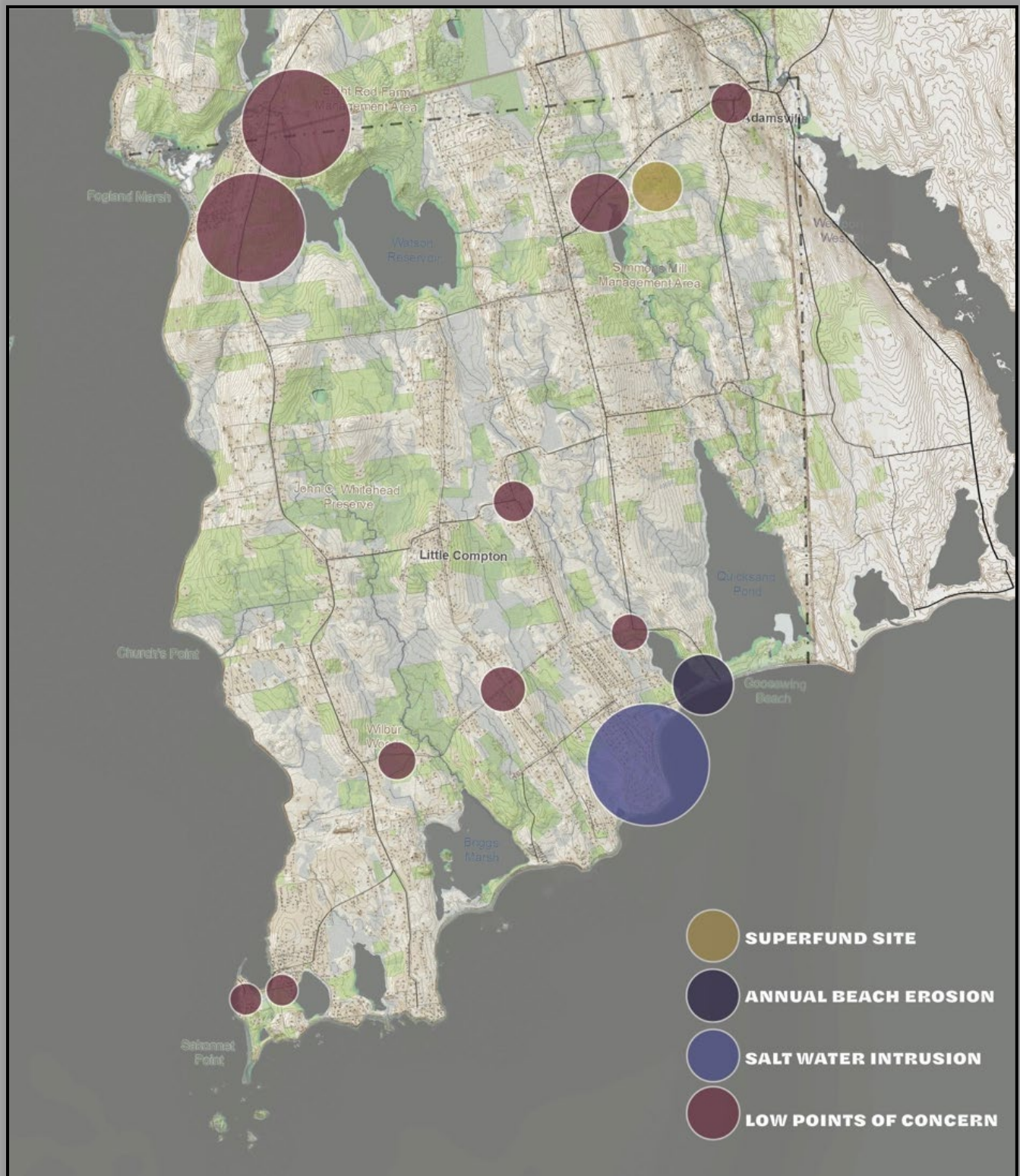
The fact that the samples tested thus far indicate that greater precipitation correlates with lower TDS levels, could suggest that the rural nature of Little Compton which has no major industrial or commercial development, has less potential ground contaminants for surface water runoff/flood water to carry. If a correct ascertain – this is good news.

However, from a **hazard mitigation perspective**, it is important to differentiate between TDS levels and safe drinking water. While high TDS levels may signal water quality concerns, it is not correct to assume that lower TDS levels necessarily constitute a safe drinking water source. The measure of Total Dissolved Solids is used as a general indicator of drinking water quality, but the test does **not differentiate** between the types of dissolved solids. As a TDS test is not a specific measure of any one contaminant, it may be imprudent to suggest that lower TDS levels - especially occurring after a high precipitation event with substantial stormwater runoff/flooding - are indicative of an unpolluted well. (Benham, 1). This may be especially true in connection with shallow wells, often connected to older homes. Since shallow wells penetrate into aquifers that are near the ground surface, they are more susceptible than deeper wells to rainfall and surface water runoff contamination as well as leachate from onsite wastewater treatment systems (OWTS). As shallow wells draw water from closer to the surface, the natural process of soil media filtering and absorbing pollutants carried by stormwater is more limited.

While the Safe Drinking Water Act (SDWA) protects the quality of drinking water from public water systems, private well owners are responsible for delivering safe drinking water to their households. **As such, it remains advisable that any well that may have been contaminated by surface water runoff/floodwater or other causes, should take precautions such as those recommended by RIDOH Keep Your Well Water Safe in an Emergency, or EPA’s What to Do After a Flood – Well Safety.**

Protection of Little Compton’s groundwater quality is essential. RIDEM previously identified the Town Transfer Station, the State salt storage site, and leaking underground fuel storage tanks as point sources (*coming from a specific source*) of pollution. These should be mitigated to the extent possible. In addition there are a number of potential non-point sources (*coming from disperse activities*) of pollution that can impact groundwater quality as well as threaten habitats. These include fertilizers and pesticides used in agriculture or for residential lawns, stormwater runoff from roads and other impervious surfaces, leaking underground storage tanks not identified by or registered with RIDEM, and of perhaps greatest concern is leachate contamination from failing onsite wastewater treatment systems (OWTS) throughout the Town (Town of Little Compton RI. *Comprehensive*, 12).

Figure 4-62 Little Compton Coastal Resiliency Study Findings Map
(URI Department of Landscape Architecture, slide 32)



Freshwater Wetlands & Floodplains: At the Federal, State, and local levels, there is legislation to protect and regulate the use of wetlands and floodplains because of the many important functions they perform. There are a variety of definitions of wetlands, but for the purpose of CFR 44, **FEMA defines wetlands** as “those areas which are inundated or saturated by surface or ground water with a frequency sufficient to support, or that under normal hydrologic conditions does or would support, a prevalence of vegetation or aquatic life typically adapted for life in saturated or seasonally saturated soil conditions” (Code of Federal Regulations-44 CFR 9). **FEMA defines floodplains** as “any land area susceptible to being inundated by floodwaters from any source” (FEMA. *Glossary*). Basically, floodplains are the land adjacent to wetlands or water bodies which may be periodically covered by flood water.

The Town of Little Compton recognizes these benefits and has and will continue to protect these resources, support development trends that do not hinder the important ecological services they provide, and integrate wetland and floodplain management efforts with other community goals and objectives. Some of the benefits of freshwater and coastal wetlands and their floodplains are listed below.

Benefits of Freshwater and Coastal Wetlands and their Floodplains

Wetlands and floodplains:

- Provide flood storage area, reducing storm damage to upland property and structures
- Control stormwater runoff flow rate, reducing erosion
- Act as natural sediment traps, limiting the amount of sedimentation from surface water runoff that might otherwise negatively impact other ecosystems
- Filter runoff pollution and excess nutrients, helping to maintain and enhance water quality
- Recharge groundwater to preserve water supplies
- Maintain surface water flow during dry periods
- Provide natural coastal barriers to stabilize shorelines, dissipate waves, and protect upland areas from storm surge, flooding, and erosion
- Produce nutrients for organisms that form the base of the food web
- Provide fish and wildlife habitat and contribute to biodiversity
- Support large and diverse populations of plants
- Store carbon within their plant communities and soil, helping to moderate the effects of climate change
- Support commercial fishery, aquaculture, agriculture, and forestry
- Provide recreational opportunities (fishing, bird watching, hiking, etc.)
- Provide educational and scientific research opportunities
- Add aesthetic scenic value to the natural environment

As described above, wetlands and floodplains provide an array of ecoservices, many of which assist in mitigating the impacts from natural hazards. These include providing flood storage area, reducing erosion, recharging groundwater to preserve water supplies and offset drought conditions, and maintaining surface water flow during dry periods. It is therefore critical to safeguard the Town’s wetlands. A key mechanism to protecting wetlands is enforcing regulatory standards for wetland setbacks from dwellings and septic systems. As depicted in **Figure 4-64**, at the State level RIDEM regulates freshwater wetlands and CRMC coastal wetlands. **The Town of Little Compton should evaluate how the recently implemented RIDEM Freshwater Wetlands rules, which took effect July 1, 2022 impact the Town, as there has been speculation the regulations may reduce future setbacks and buffers in Little Compton.**

Freshwater wetlands are areas that are flooded or that have water at or near the surface for part of most growing seasons and commonly occur between uplands and water bodies, but may stand alone surrounded by upland. Forested wetlands, dominated by the presence of 20 feet or taller woody vegetation, are the most abundant freshwater wetland type in the Town of Little Compton and within the State. They are commonly referred to as wooded swamps and most often vegetated with broad-leaved deciduous trees, including red maples, gum, oak, holly, and mountain laurel. Some wooded swamps in Town also have notable coniferous vegetation (Town of Little Compton RI. *Comprehensive*, 19). Based on RIGIS 2020 statewide land cover and 1993 wetlands datasets, there is approximately 2380 acres of forested wetlands (wooded swamps) throughout the Town (Mosaic Land Management). The second most common freshwater wetland in Little Compton is shrub wetland or scrub/shrub swamp. Scrub/shrub swamps are dominated by shrubs such as buttonbush, sweetgale, pussy willow, blueberry, swamp azalea, and winterberries, as well as tree saplings less than 20 feet tall. The largest scrub swamp in Town is located west of West Main Road and south of the Meeting House Lane intersection (Town of Little Compton RI. *Comprehensive*, 19). Based on RIGIS 2020 statewide land cover and 1993 wetlands datasets, there is approximately 395 acres of shrub wetland (scrub/shrub swamp) throughout the Town (Mosaic Land Management).

Figure 4-63 Freshwater Resources in Little Compton



Dundery Brook Trail

Photo Credit: John Kostrzewa | The Providence Journal



Dundery Brook Trail

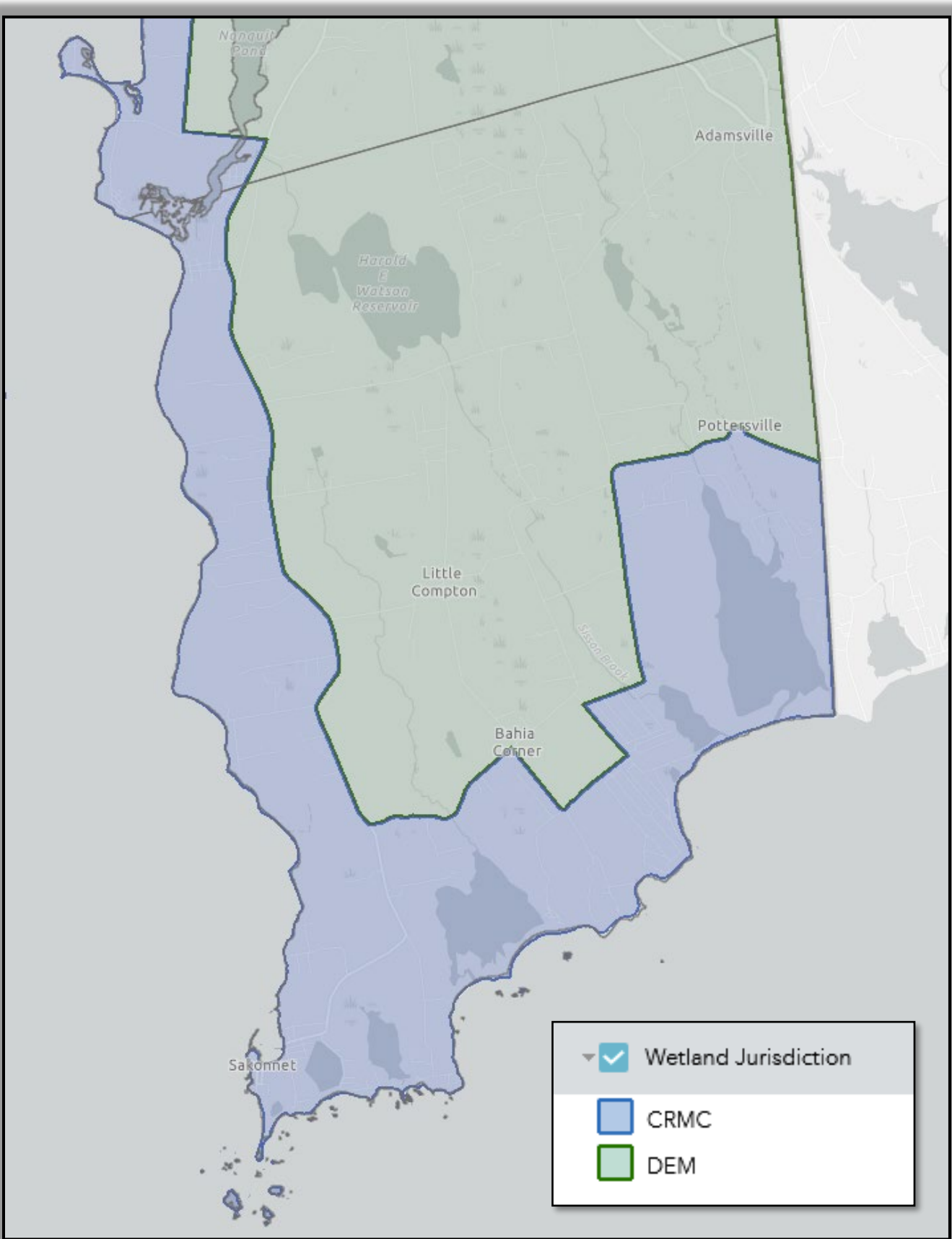
Photo Credit: The Nature Conservancy

While periodic flooding can have positive impacts on ecosystems, including rejuvenating floodplain vegetation and recharging groundwater supplies in aquifers, it can also have negative impacts on waterbodies. Floodwater can cause erosion and carry with it pollutants like oils and salt from roadways, fertilizers and pesticides from lawns and agricultural lands, effluent from failing septic systems, industrial chemicals, sediment, and debris as it makes its way down gradient. If sufficient polluted floodwater flows into a waterbody or inundates well water, it can harm wildlife or contaminate drinking water.

Flooding, which is expected to increase due to climate change impacts, as well as leaking septic systems, may have played a role in the degraded water quality in several of Little Compton's water bodies. According to RIDEM's 2022 Impaired Waters Report, Adamsville Brook and tributaries, Colebrook and tributaries, tributaries east of Colebrook, and Dundery Brook are listed as impaired due to enterococcus; Pachet Brook is listed as impaired due to enterococcus and fecal coliform; and Round Pond and tributaries to Watson Reservoir are listed as impaired due to total phosphorus (RIDEM. *State*, 15, 17, 20, 21, 70).

While the impact of Sea Level Rise is generally connected to loss of coastal wetlands, freshwater wetlands can also be impacted. The **SLAMM Summary Report** (further discussed on page 4-136) estimates the freshwater wetland losses under specified sea level rise scenarios. With 1 foot of SLR, 12.1± acres of freshwater wetlands will be lost; with 3 feet of SLR, 23.1± acres; and with 5 feet of SLR, 47± acres (CRMC. *Summary*, 16).

Figure 4-64 Rhode Island Freshwater & Coastal Wetland Jurisdiction
(adapted from RIDEM Environmental Resource Map)



Saltwater Resources

The Town's saltwater resources include the Atlantic Ocean coastal waters (Rhode Island Sound) which delineates the Town's southern border and the Sakonnet River which delineates the Town's western border, coastal ponds, and coastal wetlands.

Coastal Waters: "The entire shoreline of the Town has been defined by RIDEM as marine/estuarine unconsolidated shore" (Town of Little Compton RI. *Comprehensive*, 17). The Rhode Island Coastal Resources Management Council (CRMC) regulates coastal features and has produced Water Type Classification Maps for the State. Each type of coastal water has an associated list of permissible activities. All other activities for a particular classification are prohibited unless an assent is granted by CRMC. Most of the Little Compton's shoreline and coastal ponds are classified as Type 1 (conservation areas). Sakonnet Harbor has two classifications, Type 2 (Low Intensity Use) and Type 5 (Recreational and Commercial Harbors).

Sakonnet River: The Sakonnet River which delineates the western border of Town is technically a "tidal strait that flows approximately 14 miles between Mount Hope Bay and the Rhode Island Sound" (New England).

Sakonnet Harbor: Sakonnet Harbor is owned and managed by the Town of Little Compton. The harbor "is located on the Southeastern most tip of Rhode Island bordered by the Sakonnet River to the west, Rhode Island sound to the south and has remained virtually unchanged for many years. With a relatively small but thriving commercial fishing fleet comprised of lobster boats, gillnetters, and trap fisherman, Sakonnet Point looks and feels like the quintessential New England harbor" (Town of Little Compton RI. *Website*. Harbor Master). Sakonnet Harbor "is one of the most valuable natural, cultural, recreational, and economic resources of the Town... The southern shore of the harbor consists of a federally protected bather beach and, behind it, a natural tidal wetland owned by the state and management by RIDEM as a wildlife refuge. The western side is composed largely of commercial fishing and pleasure boating docking facilities; the eastern side consists of the Sakonnet Yacht Club and numerous private residences... While commercial fishing is the primary winter activity, it continues at a high level throughout the year. In warm weather, recreational boating also reaches its peak" (Town of Little Compton RI. *Comprehensive*, 14,15).

The harbor "has a breakwater to the west that supplies adequate protection throughout much of the year, but can fall short in the winter months when northwest winds prevail" (Town of Little Compton RI. *Website*. Harbor Master). The Town is interested in working with the US Army Corps of Engineers to improve the resilience of the breakwater.

Beaches: Little Compton has extensive beach areas with over 43 acres of combined public and private beaches. There are several types of beach facilities in Little Compton: **Town-owned beaches open to the general public** (Town Beach also known as South Shore Beach and adjacent Goosewing Beach); **open only to Town residents** (Lloyd's Beach); **neighborhood only beaches** (Tappens Beach, Little Pond Cove, and Philippi Beach); and **open to dues paying members** (Briggs' Beach and Warren's Point Beach) (Town of Little Compton RI. *Comprehensive*, 29).

Other beach and rocky shore areas have been classified by CRMC as undeveloped barrier beaches or moderately developed barrier beaches. These designations limit the extent and type of new development permissible. Undeveloped barrier beaches, which includes Long Pond Beach, Round Pond Meadow, High Hill Marsh Bather (eastern portion), Briggs Beach, Round Pond Beach, Ship Pond Cove, and Quicksand Pond Beach, are intended to remain as conservation areas, with no future development permitted. New development is also prohibited on moderately developed barrier beaches. Permissible and prohibited activities for barrier beach classifications are detailed in CRMC's CRMP Red Book. Moderately developed barrier beaches include Sakonnet Harbor Beach (eastern portion), Tunipus Pond Beach, and Watch House Pond Beach.

Coastal Wetlands & Ponds: The coastal waters feed coastal wetlands which include salt marshes and brackish marshes, as well as ponds or other open water within coastal wetlands. Salt marshes are flooded and drained by salt water brought in by the tides. The ground has a marshy consistency because it is composed of deep muddy sediment and decomposing plant matter known as peat. Based on RIGIS 2020 statewide land cover and 1993 wetlands datasets, there is roughly 149 acres (1.0%) of salt/brackish marsh in Town (Mosaic Land Management). As previously identified, these areas support ecosystem services including providing flood storage area.

The Town's coastal ponds include Quicksand Pond, Tunipus Pond, Little Pond, Briggs Marsh, Long Pond, Round Pond, and Watch House Pond. The largest, Quicksand Pond has both a Significant Natural Communities and Rare Species Habitat designation (Town of Little Compton RI. *Comprehensive*, 17).

Figure 4-65 Saltwater Resources in Little Compton



South Shore Beach's stretch of sand accommodates both RVs and shorebirds like sanderlings
Photo Credit: Jodi Hilton | The New York



Goosewing Beach from a drone, with Quicksand Pond on the right and Tunipus Pond in the background
Photo Credit: Will_y_theweatherguy473737

Storm Surge & Sea Level Rise Impacts

Storm Surge: Hurricanes and other high wind events that produce storm surge can transport sand and debris from the oceanside of the barrier beach into nearby ponds. In addition to depleting the barrier dunes separating the coastal ponds from the ocean, the shoals (sandbars) that are created can impact the existing ecosystem. The areas of Town most vulnerable to storm surge are the western and southern coastlines. Round Pond Road, a private road near the south shore, has periodically been flooded with up to two feet of water due to its proximity to the pond and ocean. During severe storms, South Shore Beach has come close to breaching into Tunipus Pond. On various occasions, properties within the Velocity Zone (**Figure 4-52**) have been known to experience storm-induced wave action and coastal flooding. "There are a few areas in the Town that could have access cut off due to inundation of low-lying roadways. These areas include Sakonnet Harbor, Round Pond, Indian Rock Acres, and the Town's Northwest coastline" (Town of Little Compton RI. *Comprehensive*, 111).

The coastal area is subject to heavy surf and is in a storm surge warning area during hurricanes. According to Advisory Committee and other stakeholders, extreme weather has created a drastic reduction in the size of the parking area at South Shore Beach and the beach front is effectively a rocky shore. The Town annually imports sand which inevitably ends up in the parking area and adjacent pond due to high wind storms such as the one that occurred on December 18, 2023. Further, Briggs Beach has lost almost 200 feet of frontage due to erosion and Lloyd's Beach is gradually disappearing. Although the Warren's Point Association has worked to restore the dunes at Warren's Point, annual degradation continues. Watch House Pond, which is owned by The Nature Conservancy, is being allowed to adapt to climate change pressures.

Sea Level Rise: As the sea level rises, increasing deleterious impacts on the Natural Environment will occur, including loss of salt marshes and other important habitat, increased damage and erosion to inland areas due to loss of salt marshes acting as a natural barrier, shifts in species diversity affecting commercial and recreational fishing industries, and a reduction in freshwater resources due to brackish infiltration.

In March 2015, CRMC and its partners developed Sea Level Affecting Marshes Model (SLAMM) Maps for the coastal wetlands throughout Rhode Island. "The purpose of these SLAMM maps is to show how coastal wetlands will likely transition and migrate onto adjacent upland areas under projected sea level rise scenarios of 1, 3 and 5 feet in the coming decades. These maps are intended to support state and local community planning efforts and to help decision makers prepare for and adapt to future coastal wetland conditions despite the inherent uncertainties associated with future rates of sea level rise" (CRMC. *Sea Level Affecting*, 1). According to the technical findings from the SLAMM Project, "Coastal wetlands, especially tidal marshes, are one of the most susceptible ecosystems to climate change and in particular accelerated sea level rise. A considerable percentage of coastal wetlands may be permanently lost by the end of this century unless upland areas directly abutting coastal wetlands are protected or otherwise set aside for the purpose of providing wetland migration in response to sea level rise" (CRMC. *The Rhode*, Executive Summary).

As sea levels rise, marshes may be established in some adjacent upland areas, which may effectively produce a net gain in coastal marshes in some locations. However, this upland encroachment will replace the ecoservice currently provided in that area. Wetlands abutting developed areas will not have room to migrate inland and will be lost in the future unless such development is removed. "The Town will identify affected upland areas that will likely be future coastal wetlands, and then use the information to develop and implement adaptive management strategies to protect and conserve these abutting upland areas and restore degraded wetlands" (Town of Little Compton RI. *Comprehensive*, 114).

Ten (10) SLAMM Map Panels were created for Little Compton. Each Panel has four maps showing the initial wetland condition, followed by sea level rise scenarios of 1-, 3-, and 5-feet. The SLAMM maps were developed using a digital wetlands coverage derived from the 2010 National Wetlands Inventory for Rhode Island. The elevation data used in the model was developed from the 2011 USGS LIDAR elevation dataset (CRMC. *Sea Level Affecting*, 1). All 40 SLAMM Maps prepared for Little Compton can be accessed via the following link: [Little Compton SLAMM Maps](#)

The SLAMM Summary Report estimates that with 1 foot of SLR, 24.8± acres of Little Compton's salt marsh will be lost; with 3 feet of SLR, 72.5± acres; and with 5 feet of SLR, 96.2± acres (CRMC. *Summary*, 12).

LOCAL ECONOMY

4.4.4 Local Economy

Based on the Report of the Budget Committee for the 2023 Town Financial Meeting, the economic condition of the Town of Little Compton is strong in terms of municipal finances, with a AAA credit rating (Town of Little Compton RI. *2023 Report*, 3). A credit rating of AAA is the highest assigned to any debt issuer, and signals a high level of credit-worthiness with the strongest capacity to repay investors. This is important because if the Town needs to borrow money, it can do so at the most favorable rate (Gad).

Maintaining a resilient local economy is important to enable providing high quality municipal services, including protecting against natural hazard risks. According to the Town's Certified Budget for fiscal year FY2022-23, the total operating budget was \$16,226,971, of which \$8,089,495 is attributed to the municipal side, and \$8,137,476 to the School District (Town of Little Compton RI. *2022 Report*, 15). As part of the budget process, each year the Town adopts a 5-year Capital Improvement Program (CIP) identifying projects that should be undertaken during the upcoming 5 years. This long-range planning process is essential in addressing the future development and growth of the Town. The Town has continually funded its capital requirements aggressively and, to limit borrowing requests, maintains a pay-as-you-go funding for most of its capital needs. Occasionally, such as in FY2023, the Town had a Bond issue for renovating the Town Hall, new DPW building, and new school parking lot.

Little Compton is primarily a rural residential & farming community. According to the Finance Director, property taxes finance 82± percent of the government activities, supplemented by state funding and charges for local services such as Town Hall functions (permits, transfer station stickers, document requests), public safety fines/fees, and beach receipts. Taxes are firmly reliant on residential property which accounted for 79±% of the total tax roll in FY 2022-23. Most of the 2,506 housing units in Town are single family dwellings (97.5±%), with a smattering of 2 unit dwellings, 3 or 4 unit dwellings, and mobile homes (US Census Bureau. *Little*, Housing).

Little Compton has a very small commercial tax base. According to the Finance Director, over the past five years, the commercial base has increased by roughly 10%. However, as recognized in the Comprehensive Plan, it is the current intent of the residents to maintain a quiet rural community. "As a result, the Town does not significantly invest in economic development activities or actively recruit new businesses to relocate to the Town" (Town of Little Compton RI. *Comprehensive*, 73). Over the years the Town has implemented land use policies that prioritize the protection of the natural environment, such as two acre minimum lot sizes, minimal commercially zoned land, and no industrial zoned land. To further curb economic growth, the Town has no public water or sewer systems, no hospitals or full scale grocery markets, and is geographically remote from highway access.

The commercial development which does exist in Town is largely limited to three areas, the Commons, the Village of Adamsville, and Sakonnet Point. "The Commons is the activity center of the Town, serving as the seat of government and as a gathering place for residents and visitors. A few retail and service businesses are located in the Commons. Adamsville is more a residential village, with a few stores serving the local and visiting population" (Town of Little Compton RI. *Local*, 48). Sakonnet Point, located at the southwestern tip of Little Compton, is exposed to the brutality of the sea, creating ongoing challenges for commercial and residential development. While relatively few, there are some commercial establishments, including the Sakonnet Golf Club, Stone House Inn, Sakonnet Yacht Club, Sakonnet Point Club, and the Sakonnet Point Marina Club. The Yacht Club, Point Club, and Point Marina Club have evacuation plans which are implemented when a hurricane is declared. The Sakonnet Harbor "provides some facilities for commercial fishing activities and recreational boating, but is limited in capacity. While recreational fishing, clamming and lobstering have been part of the lives of many Little Compton residents, fishing was never a predominant or typical livelihood for residents" (Town of Little Compton RI. *Local*, 48).

Figure 4-66 Little Compton's Annual Community Dinner on the Commons

Hundreds of friends and neighbors gathered to celebrate community



Photo Credit: Top Photos - Julie Furtado | EastBayRI; Bottom Left - Community Dinner Website;
Bottom Right - Julie Furtado | EastBayRI

Because Little Compton is located in the southeast corner of Rhode Island, its local economy is closely linked to both Rhode Island and southwestern Massachusetts. According to the RI Department of Labor and Training, based on the 2011-2015 American Community Survey data, 37.9% of Little Compton residents (16 years and over) work in Little Compton, 32.5% work in other Rhode Island communities, 23.8% work in Massachusetts, 0.5% work in Connecticut, and 5.2% work in other states/countries. While an updated commuting patterns report has not been issued, this data is provided merely to emphasize that the local economy of Little Compton is strongly linked to other Rhode Island communities (primarily Portsmouth, Tiverton, Providence, and Newport), as well as some Massachusetts communities (primarily Fall River and Westport) (RIDLT, *RI Commuting*, 21).

"Residents who work within the Town have historically relied on farming, small service/retail businesses, and home-based trades/occupations for their livelihoods. In more recent years, the community has attracted a larger seasonal population, resulting in the growth of numerous small businesses serving the needs of summer residents" (Town of Little Compton RI. *Local*, 47). Between 2006 and 2015, some employment statistics within the Town have changed substantially. There has been significant increases in the agriculture, forestry, fishing & hunting industry (90% increase) and professional and technical services (63% increase), as well as significant decreases in real estate (78% decrease), health care & social assistance (56% decrease), and accommodation & food services (42% decrease) (Town of Little Compton RI. *Comprehensive*, 75). **Table 4-34** is a breakdown of how Little Compton's residents are employed based on the American Community Survey 5-Year Estimates (2018-2022). As shown, a high percentage of Little Compton residents are employed in educational services, health care & social assistance.

Table 4-34 Little Compton Employment for Population 16 Years and Over
(US Census Bureau. 2018-2022)

Type of Employment	Percent of LC workers 16+ years
Educational services, and health care and social assistance	27.6%
Professional, scientific, and management, and administrative and waste management services	16.4%
Construction	9.4%
Finance and insurance, and real estate and rental and leasing	9.0%
Arts, entertainment, and recreation, and accommodation and food services	7.9%
Retail trade	5.9%
Transportation and warehousing, and utilities	4.7%
Information	4.5%
Manufacturing	4.0%
Public administration	3.5%
Agriculture, forestry, fishing and hunting, and mining	3.3%
Other services, except public administration	2.9%
Wholesale trade	1.0%

Between December 2022 and December 2023, the average seasonally unadjusted unemployment rate was 2.7% in Little Compton compared to 3.2% State-wide in the same 12-month period (RIDLT. *Local*). The Town of Little Compton is a significant local employer. The approved FY2022-23 Town budget provided for 47 full-time equivalent (FTE) positions on the municipal side and 48 FTE positions for the School Department, as well as for part-time seasonal employment to support parks and recreation activities, beaches, and other summer programs.

The impact from most of the natural hazards profiled is not anticipated to have a long-term economic effect on the Town. Two of the profiled hazards, heavy and sustained precipitation events, which are expected to worsen in the future due to climate change and sea level rise, and Coronavirus-19, may have more substantial economic consequences for Little Compton than the other profiled natural hazards. In addition to the items identified in **Table 4-35**, the vulnerability to Little Compton's local economy will be further explored in the following subsection:

4.4.4.1 Flood-Related Hazards.

Table 4-35 Local Economy Vulnerability

Hazard Group	Vulnerability (<i>What is at Risk</i>)
 Flood-Related Hazards (Inland Flooding including Dam Failure; Coastal Flooding including Storm Surge; Coastal Erosion)	• In Little Compton, a group at higher risk from flooding are those residing in the Special Flood Hazard Area (SFHA) comprised of the VE, AE, or A Flood Zones; flood damage to homes or businesses may present an economic challenge for the owners/renters. • If residences and businesses are destroyed as a result of flooding, the corresponding decrease in the tax base would need to be shouldered by the remaining property owners. • The higher concentration of impervious surface due to building size and large parking areas makes commercial properties more susceptible to flooding and snow hazards. The most significant commercial development is in the Town's Business Zone which is limited to the Adamsville area, north end of Long Highway, and the transfer station off Amy Hart Path in the north; the Commons area in the center of Town; and the southwestern area of Sakonnet Point Road. • Refer to Subsections 4.4.4.1 for additional flood-related vulnerabilities.
 Wind-Related Hazards (High Winds; Thunderstorms including Lightning & Hail; Tornadoes; Tropical Cyclones)	• The Town may recognize an increase in municipal spending related to downed tree removal. • A study conducted in 2010 by Montclair State University suggests that individuals with lower incomes may not have the financial resources to maintain trees on their property, putting them at higher risks for tree-related damage associated with high wind events (Prioleau). • Although generally short-term, due to damage from wind-events, individuals may experience lost revenues from business closures, inability to get to work, or inability to provide services. • In general, power outage disruptions in Little Compton are expected to be short-term and have minimal impact on the local economy. However, the loss of electric power due to damaged power lines can interrupt businesses. Disruptions that continue for days, weeks, or longer can impact the normal operation of businesses and even result in closures which would decrease revenues to proprietors, loss of wages to employees, and reduce state and local tax revenues.
 Winter-Related Hazards (Heavy Snow; Ice; Extreme Cold)	• The Town may recognize an increase in municipal spending related to snow plowing and road surface treatments. • Although generally short-term, individuals may experience lost revenues due to business closures, inability to get to work, or inability to provide services. • In general, power outage disruptions in Little Compton are expected to be short-term and have minimal impact on the local economy. However, the loss of electric power due to damaged power lines can interrupt businesses. Disruptions that continue for days, weeks, or longer can impact the normal operation of businesses and even result in closures which would decrease revenues to proprietors, loss of wages to employees, and reduce state and local tax revenues.

Hazard Group	Vulnerability (<i>What is at Risk</i>)
 Infectious Disease-Related Hazards (Vector-borne Diseases Transmitted by Ticks or Mosquitoes; Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses)	Mosquitoes & Ticks - Influenza viruses are not expected to have an appreciable impact on Little Compton's local economy. Influenza Viruses or Coronaviruses - Influenza viruses are not expected to have an appreciable impact on Little Compton's local economy. - During periods throughout the Covid-19 Pandemic, many indoor activities and events considered high risk of spreading the disease were cancelled leading to loss of revenue for the venue. - It is difficult to assess how Coronavirus-19 may impact Little Compton's economy over the upcoming 5-year period. As related to Town finances, during the period from March 2020 through fiscal year 2022, the pandemic caused some additional burden including staff related sick leave, and PPE and cleaning supply expenses (some of which was reimbursed through FEMA). - Due to the pandemic, Little Compton (as was true Nationwide) experienced an increase in unemployment rate. The unemployment rate in 2020 was xxx%; although the rate decreased to xxx% in 2021, that is still higher than the preceding non-pandemic years of 2017 (xxx%), 2018 (xxx%), or 2019 (xxx%) (RIDLT. <i>Local</i>).
 Other Hazards (Earthquakes; Extreme Heat; Drought; Brush Fires) continued	Earthquake - Earthquakes are not expected to have an appreciable impact on Little Compton's local economy. Extreme Heat - Although residents may recognize higher energy bills due to increased energy use, primarily associated with air conditioning, extreme heat is not expected to have an appreciable impact on Little Compton's local economy. - The Community Center and Brownell Library both have shade structures for summer programs and senior lunches, however additional sunshades on recreational fields or the Commons may be beneficial to provide protection from the sun. Drought - Droughts are not expected to have an appreciable impact on Little Compton's local economy. - Droughts may impact crop yields and watering costs for local farmers. This could result in financial burdens for farmers and increased prices for local goods. Brush Fires - Brush fires are not expected to have an appreciable impact on Little Compton's local economy. However, downed wires resulting from wind or winter weather, and lightning strikes, have been known to spark fires.

4.4.4.1 Flood-Related Hazards

As climate change exacerbates seasonal flooding, and SLR permanently changes the landscape, properties in FEMA's Special Flood Hazard Area (SFHA) are at high risk. Recognizing that sea level rise will continue to move the floodplain designations inland, a property's flood zone was categorized based on the highest risk flood zone any portion of a building footprint (or parcel boundary for vacant land) touched. Hence, for example, if even a small portion of the building footprint was in the VE flood zone, the entire assessed valuation for that parcel was attributed to the VE zone. The only exception was for parcels associated with the *Seasonal* and *Waterfront Land with Improvements* Categories. For these two categories, if numerous buildings were associated with a single parcel, the analysis was refined by obtaining each individual primary building assessment from the Tax Assessor's Office and then attributing said building assessments to the respective flood zone. As summarized in **Table 4-36**, approximately 9.9% of the tax base is derived from properties that are fully or partially in the Special Flood Hazard Area (the VE, AE, or A Zones).

Table 4-36 Property Vulnerability Based on FEMA Flood Zones
(Little Compton Tax Assessor Data 12-18-2023/Town GIS/RIGIS)

Land Use	Special Flood Hazard Area (SFHA)	
	V Zone Total Value	AE & A Zone Total Value
Residential	\$70,014,800	\$195,861,196
Commercial	\$8,034,700	\$2,220,200
Vacant	\$161,200	\$550,300
Other	\$56,300	\$504,000
TOTAL	\$78,267,000 (approximately 2.8% of tax base)	\$199,135,696 (approximately 7.1% of tax base)

Based on NOAA's 2022 high-curve, sea level rise in Rhode Island could be 1.60 feet by 2050 (NASA. *Interagency*). Unlike flooding related to a precipitation event, where the floodwater eventually recedes, sea level rise is a permanent feature. As existing landmass is permanently inundated, structures in those environs may become uninhabitable. If SLR continues as currently projected, displacement of those residents living at the most vulnerable properties will occur and the corresponding **decrease in the tax base resulting from property abandonment would need to be shouldered by the remaining property owners or the tax base correspondingly expanded within the upland areas of Town.**

"The US Army Corps of Engineers (USACE) Breakwater protects Sakonnet Harbor from storm surge. Typically boats moored in the harbor have been removed to dryland storage prior to arrival of significant storms. Wind damage and storm surge did severely impacted the harbor during the 1938, 1944 and 1954 hurricanes, which in part supported the argument that extending the breakwater would help protect property in and immediately around the harbor. The breakwater project was modified in 1957 when the Corps constructed a 400-foot-long extension to the breakwater and dredged the harbor to a depth of eight feet. The extension has offered better protection for the harbor and vessels within the harbor. Financial data specific to the harbor is not easily extracted for losses during these events although it is clear from the photographic data found in the Little Compton Historical Society records that the damage was extensive. Storms documented after the 1957 modification seem to support the reduction in loss and ultimately cost losses" (Town of Little Compton RI. *Local*, 48). **However, as sea level is predicted to rise and the frequency and intensity of storms are predicted to increase due to climate change, the Town is currently discussing with USACE additional breakwater improvements to further protect the harbor.**

PEOPLE

4.4.5 People

The Town's *Emergency Operations Plan* (EOP) addresses the planned response to extraordinary emergency situations, including those related to natural disasters. The EOP is a preparedness document that outlines the concepts and methods for dealing with potential large-scale disasters while continuing to provide day-to-day essential services. The EOP provides procedures for warning and evacuation of residents and visitors should it become necessary. In the event of such an emergency, coordination and cooperation of Town, State, and Federal agencies will be essential.

It is important to know the number of people that are considered to be at a higher risk in a natural hazard event in order to plan for their needs and safety. According to the 2020 Census, the population of Little Compton is 3,616. The American Community Survey (ACS) five-year estimates (2018-2022) indicate that of the 2,506 housing units in Town, approximately 946 (38%) are vacant (US Census Bureau. *Little*, Housing). Most of the units identified as vacant are vacation homes, occupied by owners for specific time periods (such as summer) and/or for specific events (such as weekends and holidays). This community characteristic causes the Town's population to increase to roughly 7,000 people during the summer season (May through August). A population that roughly doubles in the summer, puts additional strain and challenges on local emergency management.

The American Community Survey (ACS) five-year estimates (2018-2022) indicate that 13.9% of Little Compton's population are age 19 or younger, 48.1% age 60 or older, and 35.9% age 65 or older. Comparatively, the population of those 65 or older in Newport County is 25.4%, and for the State of Rhode Island is 17.9%. (US Census Bureau. *Little*, Population and People). As there are no senior or assisted living facilities in Little Compton, older residents are dispersed throughout Town which adds to the challenge of mitigating hazard risks. While it is important that all community members be encouraged to sign up for the Code Red Emergency Notification System and the Rhode Island Special Needs Emergency Registry (RISNER), it is critical the Town continues making a concerted effort to inform seniors in the community of these two important emergency management programs. The Rhode Island Special Needs Emergency Registry is overseen by the RI Department of Health, and provides a reliable system for the identification of Rhode Islanders who may require special assistance (due to special healthcare needs, chronic conditions, disabilities, etc.) during emergencies (RIDOH. *Special*). RISNER provides first responders the tools to reach out and prepare before the natural hazard arrives, which is highly beneficial especially in the case of evacuation orders. A link to both Code Red and RISNER can be accessed through the [Town's Emergency Management webpage](#).

The majority of participants in the Public Opinion Survey (123 out of 142 – or 87%) indicated that either they or someone in their household had been negatively impacted by a natural disaster while living or doing business in the Town of Little Compton. Most people were impacted by Wind-Related Hazards (73%) and Winter-Related Hazards (62%). Just under half of those responding were impacted by Influenza/Coronaviruses (47%) and diseases transmitted by Ticks/Mosquitoes (43%), and roughly a third were impacted by Drought (39%) and Coastal Flooding/Coastal Erosion (32%).

An often-overlooked impact of a natural hazard is emotional and physical stress. Stress can affect residents if they have witnessed people hurt or their home or belongings destroyed; are forced to evacuate their home; have personal finances compromised; are subject to an extended period without electric power or with a shortage of supplies and necessities; and/or are not receiving effective communication regarding the hazard event. To help offset these impacts, the Town recognizes the continued need to bring emergency preparedness and response awareness to the community and to provide or support the additional services required as the result of a disaster.

The items addressed on the previous page, as well as the vulnerabilities identified in **Table 4-37**, represent risks to people from the identified hazards.

Table 4-37 Human Vulnerability

Hazard Group	Vulnerability (<i>What is at Risk</i>)
Flood-Related Hazards (Inland Flooding including Dam Failure; Coastal Flooding including Storm Surge; Coastal Erosion)	- Human vulnerability is based on: the availability, reception, and understanding of early warnings issued by the NWS for significant precipitation and flood-related events; heeding the advice of local officials; personal emergency preparedness; and access to substantial shelter and a means and desire to evacuate if so ordered. Table 4-38 provides a list of weather watch, warnings, and advisories issued by the NWS and links to their definitions. - Flooding events increase the chance of spreading waterborne diseases, such as hepatitis A and cholera; the health risks to residents impacted may be significant during and after a flood event; at higher risk are those residing in the SFHA, and in areas subject to hurricane surge inundation. - Water intrusion into buildings can result in mold contamination, leading to indoor air quality problems; populations living in damp indoor environments experience increased prevalence of asthma and other upper and lower respiratory tract symptoms (CDC. <i>Precipitation</i>). - Receding floodwaters can create stagnant pools of water, which provide the perfect breeding ground for mosquitoes (<i>refer below to the Infectious Disease-Related information for the potential effects of mosquitoes on humans</i>). - Significant flooding can lead to extensive damage to structures and personal property which can cause emotional stress to those impacted. - Injuries may occur due to flooded roadways creating dangerous conditions for motorists. - Based on data from Climate Central's Surging Seas Risk Finder (Climate Central. Surging): ➤ The number of people in Little Compton who live on land below 3 feet above sea level is approximately 16. The localized projection based on the intermediate sea level rise scenario in the NOAA Technical Report for the 2018 U.S. National Climate Assessment points to a 100% risk of at least one flood over 3 feet taking place between today and 2050 in the Little Compton area. ➤ The number of people in Little Compton who live on land below 5 feet above sea level is approximately 37. The localized intermediate sea level rise scenario points to a 79% risk of at least one flood over 5 feet taking place between today and 2050. ➤ The number of people in Little Compton who live on land below 7 feet is approximately 62. The localized intermediate sea level rise scenario points to a 15% risk of at least one flood over 7 feet taking place between today and 2050. - Escape routes may be cut off due to flooding, stranding residents in flooded areas, hampering rescue efforts, limiting access to health/emergency facilities, and hampering life support services; those at higher risk include seniors, those with mobility issues, and those located in the SFHA. Historically community members residing in the areas surrounding Sakonnet Harbor and Round Pond, Indian Rock Acres adjacent Tunipus Pond, and the Northwest coastline of Town are more vulnerable to flood hazards. The Round Pond neighborhood has been the only area that has had access cut off due to flooding for any significant period of time. - Low lying coastline neighborhoods are asked to voluntarily evacuate when a storm demonstrates a level of threat to those areas exposed to storm surge. A few neighborhoods at Sakonnet Point, Round Pond, and along the western coastline are notified if weather conditions warrant an evacuation. The most likely area to be asked to evacuate is the Round Pond neighborhood as it only has a single egress and is very low lying.

Hazard Group	Vulnerability (<i>What is at Risk</i>)
Wind-Related Hazards (High Winds; Thunderstorms including Lightning & Hail; Tornadoes; Tropical Cyclones)	- Human vulnerability is based on: the availability, reception, and understanding of early warnings issued by the NWS for significant wind-related events including hurricanes and tornadoes; heeding the advice of local officials; personal emergency preparedness; and access to substantial shelter and a means and desire to evacuate if so ordered. Table 4-38 provides a list of weather watch, warnings, and advisories issued by the NWS and links to their definitions. - Little Compton residents and businesses in close proximity to the shoreline are generally at higher risk to the impacts from high wind events. - High wind events, particularly hurricanes, that cause a loss of electricity can result in dangerous conditions including no phone/internet service available for storm advisories and medical emergencies; spoiled refrigerated food; lack of heat, which, if occurring in conjunction with freezing temperatures can lead to dangerous health conditions and the potential for pipes to freeze and burst; loss of sanitary facilities and potable water. - If downed power lines are arcing they present a threat to personal safety. - High winds can cause bodily injury from flying debris or structures collapsing; debris can block roadways preventing emergency access or a means to evacuate. - Over the years, building codes have improved the structural integrity of buildings, taking into account the impact of high winds and other factors; those residing in older homes that have not been renovated to meet current building standards may be at higher risk to wind-related damage which could put residents at higher risk of injury or death. - The availability, reception, and understanding of early warnings tornado alerts and access to a substantial shelter will impact vulnerability. Once warned of an impending tornado hazard, seeking shelter indoors on the lowest floor of a substantial building away from windows is recommended as the best protection against bodily harm. - Swimming, boating, and fishing are particularly dangerous during periods of frequent lightning strikes, which can also cause power outages, topple trees, and spark fires. Individuals who immediately seek shelter in a sturdy building or metal roofed vehicle are much safer than those who remain outdoors. Early warnings of severe storms are also vital for aircraft flying through the area.
Winter-Related Hazards (Heavy Snow; Ice; Extreme Cold)	- Human vulnerability is based on: the availability, reception, and understanding of early warnings issued by the NWS for impending significant winter weather events; heeding the advice of local officials; personal emergency preparedness; and access to substantial shelter and a means and desire to evacuate if so ordered. Table 4-38 provides a list of weather watch, warnings, and advisories issued by the NWS and links to their definitions. - Heavy snow and ice events that cause a loss of electricity can result in dangerous conditions including no phone/internet service available for storm advisories and medical emergencies; lack of heat during extended cold periods can lead to dangerous health conditions and the potential for pipes to freeze and burst. Little Compton Building Official's records shows that a larger number of local residents are installing backup generators due to the increasing number of winter events where power has been lost for a number of days. - Snow, ice, hail, and freezing temperatures may create treacherous driving conditions, cause transportation delays, and create transportation challenges for first responders or others who may need to be on the roads, including those trying to access emergency shelters. - Heavy snow may cause school and business closures. - Overexertion while shoveling snow may lead to dangerous health conditions including strokes or heart attacks. - Ice can create dangerous walking conditions – seniors or others who may be less stable are at more risk of falling and injuring themselves.

Hazard Group	Vulnerability (<i>What is at Risk</i>)
Winter-Related Hazards <i>continued</i>	• Snow and ice events can cause downed trees and limbs which can damage power lines and block transportation routes. Both pedestrians and vehicles are at risk. • Exposure to extreme cold for an extended period can lead to health concerns including frost bite and hypothermia (of particular concern for infants/seniors); certain medications, medical conditions, or the consumption of alcohol can also make people more susceptible to the cold. • Extreme cold may increase the potential for house fires and carbon monoxide poisoning due to increased use of supplemental heating devices. • Pets may be affected by severe winter weather, especially those that are kept outdoors. • There are some residential and commercial structures sporadically located throughout Little Compton that are of older construction and may be more susceptible to roof collapse due to heavy snow loads which could put residents at higher risk of injury or death. • Critical Facilities: Several critical facilities have portions of their roof that are either flat or have a low pitch and may therefore be at greater risk of failure from heavy snow. These include the Brownell Library, Town Hall, Wilbur's General Store, and the Wilbur & McMahon School, all of which are part of the Little Compton Historic District. People can be injured if the roof partially or fully collapses.
Infectious Disease-Related Hazards (Vector-borne Diseases Transmitted by Ticks or Mosquitoes; Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses)	Mosquitoes & Ticks • Increased tick and mosquito populations resulting from climate change may lead to more vector-borne diseases in people. • The CDC states that everyone is at risk from mosquito bites (CDC. <i>Mosquito</i>); Little Compton residents living or engaging in outdoor activities in close proximity to areas more conducive to mosquito breeding (forested areas, and standing water along rivers, ponds, and wetlands) are at higher risk of being bitten. Similarly, Little Compton residents living or engaging in outdoor activities in close proximity to wooded and grassy areas where higher populations of ticks tend to be found are at greater risk of being bitten. • As mosquitoes lay eggs in standing water, conditions conducive for breeding can be found town-wide; residents who minimize standing water on their properties (including in outdoor vessels, etc.) will lessen the mosquito population in the vicinity of their homes. • Pets can be potential hosts for ticks, putting their owners at potentially greater risk. • If infected, elderly residents, children, and anyone with a weakened immune system may suffer more severe illness related to mosquito- and tick-borne diseases. • Higher populations of ticks tend to be found in wooded and grassy areas where the creatures they feed on live and roam. Typically, ticks climb to the top of a grass blade or the tips of a bush or branch and wait for potential prey to pass by. Higher concentrations of mosquitoes will be found in forested and wetland areas. Several of the Town's natural resources may provide environmental conditions more favorable for tick and mosquito populations, including Simmons Mill Management Area and Wilbour Woods. People frequenting these types of environments increase their opportunity to be bitten and infected. Signage at these locations educating the community to use appropriate repellants and check for ticks after outdoor activities may help to decrease mosquito or tick related diseases. Influenza (Flu) • The CDC identifies those highest at risk of getting serious complications from flu as children younger than 5, but especially younger than 2 years old; adults 65 years or older; pregnant women; people with any chronic illness, especially heart, lung (including asthma), or kidney disease; and people with weak immune systems (CDC. <i>Seasonal Influenza</i>).

Hazard Group	Vulnerability (<i>What is at Risk</i>)
Infectious Disease-Related Hazards <i>continued</i>	Influenza (Flu) - <i>continued</i> • Critical Facilities: A number of the critical facilities are considered places where sufficient people are in contact and therefore more vulnerable to the spread of Influenza or Coronavirus; those facilities include the Little Compton Community Center, Little Peeps Montessori Naturskola, Wilbur & McMahon School, Public Safety Complex, Town Hall, Brownell Library, Little Compton Wellness Center, and Wilbur's General Store. Coronavirus Disease 2019 (COVID-19) • The CDC has indicated that there are many factors that increase a person's vulnerability to get severely ill from COVID-19. The following list - adapted from the CDC. <i>COVID-19 Risks</i>, CDC. <i>Press Release</i>, and CDC. <i>People</i> - identifies severity risk increases: ○ people in their 50s and further increases for people in their 60s, 70s, and 80s; people 85 and older are the most likely to get very sick; ○ people with chronic lung diseases, including COPD (chronic obstructive pulmonary disease), asthma (moderate-to-severe), interstitial lung disease, cystic fibrosis, and pulmonary hypertension; ○ people who have certain underlying medical conditions, including Chronic kidney disease; ○ Obesity (BMI of 30 or higher), immunocompromised state (weakened immune system) from solid organ transplant; and ○ Serious heart conditions, such as heart failure, coronary artery disease, or cardiomyopathies, Sickle cell disease, Type 2 diabetes, asthma, high blood pressure, neurologic conditions such as dementia, cerebrovascular disease such as stroke, pregnancy. • Systemic health and social inequities may increase the risk of getting sick and dying from COVID-19 among certain racial and ethnic minority groups and people with disabilities. Factors affecting health equity include (CDC. <i>Health Equity</i>): ○ Discrimination: can lead to chronic and toxic stress, and shapes social and economic factors that increase risk for COVID-19; ○ Healthcare access and use: multiple barriers to accessing health care, for example lack of insurance, transportation, child care, or the ability to take time off of work may increase risk for COVID-19; ○ Occupation: work in essential settings (healthcare facilities, farms, factories, grocery stores, public transportation, etc.) can lead to more chances of COVID-19 exposure; ○ Educational, income, and wealth gaps: less access to high-quality education may limit job opportunities that minimize exposure to COVID-19; and ○ Housing: living in crowded conditions can make it very difficult to isolate when you are or may be sick with COVID-19. • It should be recognized that the more underlying medical conditions or systemic health and social inequities a person is subject to, the higher their overall risk to COVID-19. • A number of factors associated with the COVID-19 Pandemic, including uncertainty, social isolation, closures/disruption to work and school has created significant emotional stress for many. • Critical Facilities: A number of the critical facilities are considered places where sufficient people are in contact and therefore more vulnerable to the spread of Influenza or Coronavirus; those facilities include the Little Compton Community Center, Little Peeps Montessori Naturskola, Wilbur & McMahon School, Public Safety Complex, Town Hall, Brownell Library, Little Compton Wellness Center, and Wilbur's General Store.

Hazard Group	Vulnerability (<i>What is at Risk</i>)
Other Hazards (Earthquakes; Extreme Heat; Drought; Brush Fires)	Earthquakes • People who are socially isolated or less mobile may be at greater risk. • There are some residential and commercial structures sporadically located throughout Little Compton that are of older masonry construction and may be more at risk for structural failure or failing debris which could put residents at higher risk of injury or death. • Critical Facilities: Although an earthquake of significance is considered a low probability for Little Compton, should one occur, depending on the magnitude and epicenter, all critical facilities structures are vulnerable to some level of damage. People can be injured due to collapsing buildings or falling debris. Extreme Heat • Physical effects of heat can cause major health problems, dehydration, and may lead to death. • Certain populations are particularly sensitive to extreme heat for various reasons including health conditions such as cardiac or breathing problems, living and working conditions, mobility, and limited financial resources. RIDOH lists the following populations at risk to extreme heat (RIDOH. <i>Extreme Heat</i>): ○ Infants and young children ○ People with chronic, long-term medical conditions ○ Disabled ○ Outdoor workers ○ People who use certain medications/illegal drugs ○ Low-income residents ○ People who are overweight/obese ○ Pregnant women ○ Athletes ○ People who are socially isolated • Some of the Town's natural resources have limited shaded areas and therefore visiting those areas on hot days may put them at higher risk to the impacts of extreme heat. • Critical Facilities: Senior populations may be more at risk from the impacts associated with extreme heat. As such, critical facilities that serve this population should be cognizant of the health impacts associated with extreme heat and the potential benefit of having air conditioning available in some area of the facility. Critical facilities with targeted senior services include the Little Compton Community Center, Brownell Library, and the Little Compton Wellness Center. Drought • As all of Little Compton is reliant on wells, the community's vulnerability to drought is directly related to the viability of the Town's aquifers. • Water rationing may be necessary and impact sanitary conditions. • During droughts, dry soils may increase the number of airborne particles, such as pollen, which can irritate the airways and worsen chronic respiratory illnesses such as asthma; those suffering from asthma or other respiratory illnesses may be at higher risk. • Farms in Town, particularly those with high water demands, are vulnerable to impacts of drought.

Hazard Group	Vulnerability (<i>What is at Risk</i>)
 Other Hazards continued	Brush Fire - Human vulnerability is based on the availability, reception, and understanding of early warnings issued by the NWS for impending fire weather events; heeding the advice of local officials; and personal emergency preparedness. Table 4-38 provides a list of weather watch, warnings, and advisories issued by the NWS and links to their definitions. - Smoke particles from fire can cause adverse health effects in people, particularly those with respiratory and cardiovascular conditions. - Brush fires can pose a risk to human life, particularly if it ignites nearby structures. Those who live near heavily forested areas of Little Compton are at higher risk.

Table 4-38 provides a list of weather watch, warnings, and advisories issued by the NWS and links to their definitions.

Table 4-38 Definitions of Weather Watch, Warnings and Advisories (adapted from NOAA|NWS. *Watch*)

Hazardous Weather Outlook		Fire Weather Fire Weather Watch Red Flag Warning	
Winter Weather/Cold Weather Winter Storm Watch Blizzard Warning Winter Storm Warning Ice Storm Warning Winter Weather Advisory Freeze Watch Freeze Warning Frost Advisory Wind Chill Advisory Wind Chill Warning	Fog/Wind /Severe Weather Dense Fog Advisory High Wind Watch High Wind Warning Wind Advisory Severe Thunderstorm Watch Severe Thunderstorm Warning Tornado Watch Tornado Warning Extreme Wind Warning	Flooding Coastal Flood Watch Coastal Flood Warning Coastal Flood Advisory Flood Watch Flash Flood Warning Flood Warning River Flood Watch River Flood Warning	
Marine Small Craft Advisory Gale Warning Storm Warning Hurricane Force Wind Warning Special Marine Warning	Excessive Heat Excessive Heat Watch Excessive Heat Warning Heat Advisory	Tropical Tropical Storm Watch Tropical Storm Warning Hurricane Watch Hurricane Warning	

FUTURE DEVELOPMENT TRENDS

4.4.6 Future Development Trends

Little Compton is a coastal community located in the southeast corner of Rhode Island, bordered on the west by the tidally influenced Sakonnet River and on the south by Rhode Island Sound. Little Compton is primarily a rural community comprised essentially of single family dwellings interspersed with agricultural and conservation land and a small but important smattering of businesses. In terms of housing, approximately 97.5% of the 2,506 housing units in Town are single family dwellings (US Census Bureau. *Little*, Housing). The shorefront areas are somewhat more diverse than the inland areas, ranging from high density cottages near Briggs Beach and South Shore Beach, to large acreage residential estates along West Main Road.

The Business District is comprised of five small independent business zones dispersed throughout Town which allow existing and proposed limited business and commercial development. No industrial development is permitted in Town. The business zones include the areas in the vicinity of the village centers of Adamsville, the Commons/Meeting House Lane, and Sakonnet Point, as well as the business district adjacent to the northern border of Town along Long Highway, and the business district for the Transfer Station off Amy Hart Path. The Adamsville and Commons business zones support light retail and office uses. The Commons business zone also includes government, institutional, and recreational uses. The Sakonnet Point business zone is primarily marine-related businesses, a restaurant, and residential uses (Town of Little Compton RI. *Comprehensive*, 121, 122).

4.4.6.1 Development Over the Past 5-Years

Key development over the past five years is listed in **Table 4-39**. As demonstrated, very little development occurs in Little Compton. **Neither of the development efforts initiated or completed since the previous hazard mitigation plan (2018) have had an appreciable impact on the Town's vulnerability.**

Table 4-39 Development Post the 2018 LHMP (2018-2024)

Project	Location	Number and Type of Units	SFHA/ Hurricane Surge Inundation Area	Completion Date
Hinter Way	Hinter Way (which is a new private road off Amy Hart Path)	4 residential single family units	No	2023
Hawk's Nest Ridge	Hawk's Nest Ridge & Port West Lane (which are new private roads off Brayton Point Road - Plat 35, Lots 2-3, 3-1, 4-1, 5-1)	4 residential single family units	No	Houses have been constructed on 2 lots; the other 2 remain vacant

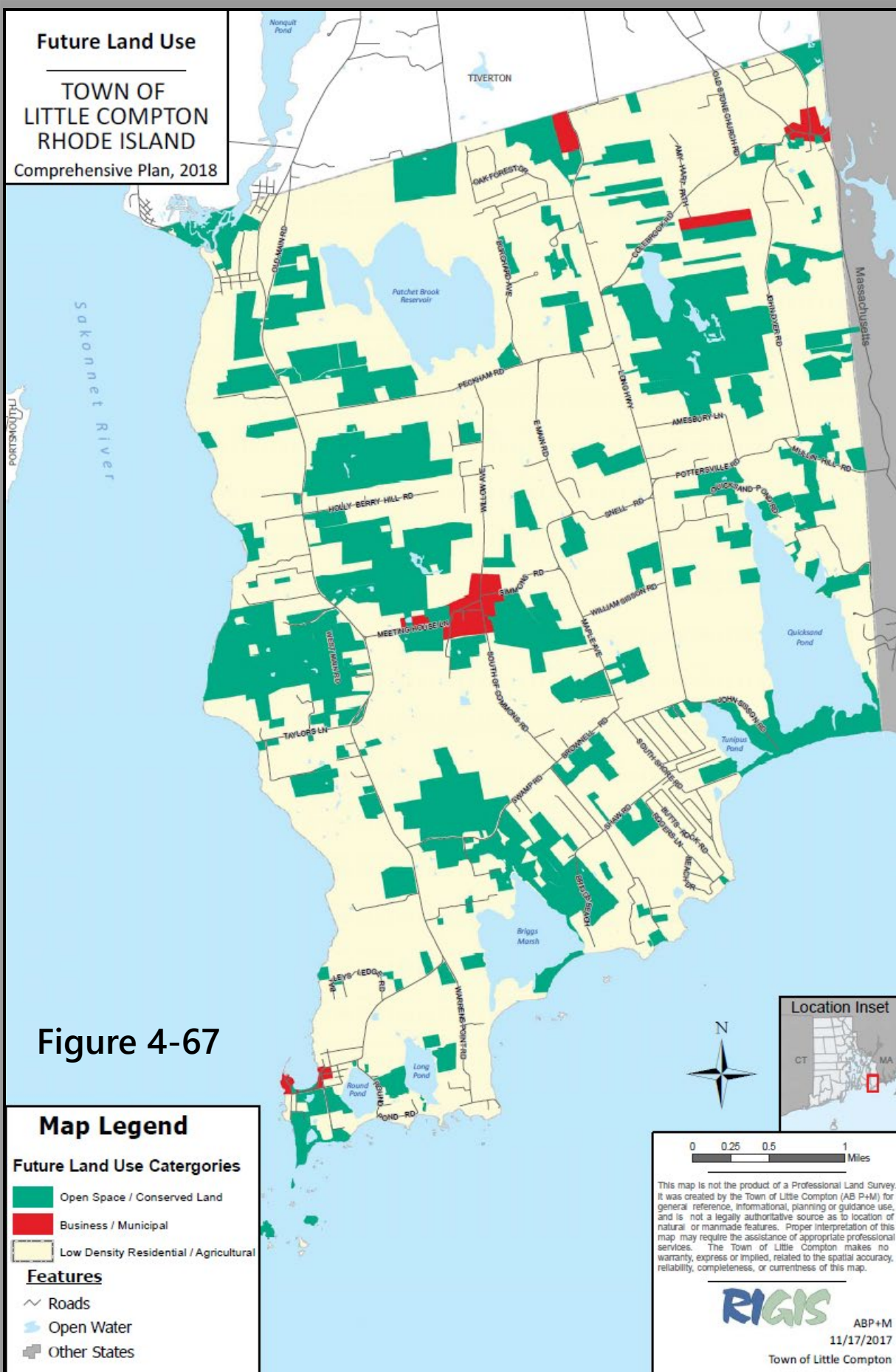


Figure 4-67

4.4.6.2 Future Land Use

Little Compton's total municipal acreage including inland water, as derived from the RIGIS 1997 Municipal Boundaries dataset, is approximately 14,396 acres (Mosaic Land Management). A **Future Land Use Map**, consistent with existing zoning, was created as part of the 2018 Comprehensive Plan. "The Future Land Use Map is a policy statement directing municipal decision-makers as to what types of land uses are desired in each area of Town and setting a vision for future growth over the next 20-years. **The Future Land Use Map serves as the underpinning for local zoning regulations that legally regulate development in the community**" (Town of Little Compton RI. *Comprehensive*, 122).

The recommended future land uses "were determined based upon the Town's historic development pattern, the natural characteristics of the land, the transportation network, the availability of services and facilities, and the need to protect water quality, environmental quality, and the scenic quality of the community" (Town of Little Compton RI. *Comprehensive*, 122). As shown in **Figure 4-67** (Town of Little Compton RI. *Comprehensive*, 153), the recommended future land uses are limited to three categories: low density residential/agricultural; open space/conserved land; and business/municipal. The first two land use categories fall under the Town's zoned Residence District and the latter category under the zoned Business District.

Residence (R) District: "Over 90% of the Town's land area is within the Residence District. These lands are considered suitable for residential, agricultural and related development" (Town of Little Compton RI. *Comprehensive*, 121). In an effort to minimize development and accommodate safe and adequate water supply and OWTS, residential building lots are required to be a minimum of two acres. With the majority of the Town in the Residence District, a homogeneous development pattern of single family units on 2+ acre lots interspersed with large acreage farm and conservation lands is prevalent throughout the Town. Within the Residence District, there is an allowance by right or in some instances by special use permit to operate small scale home businesses.

Business (B) District: Little Compton's Business District comprises less than 10% of the Town's land area. "There is no minimum lot size requirement in the Business District but lots must be able to accommodate the required off-street parking and loading area, safe and adequate water supply and OWTS" (Town of Little Compton RI. *Comprehensive*, 121). There is no current focus on expanding the Business District.

4.4.6.3 Future Development

Strong resident sentiment has historically persevered in maintaining the unique rural character of Little Compton, with minimal development especially compared to other New England coastal communities (Town of Little Compton RI. *Comprehensive*, 45, 121). This sentiment is interwoven into the Town's 2018 Comprehensive Plan which maintains the intent to limit Town services, including providing no public water or sewer, thereby curbing the financial viability of developing large tracts of land. Local land use regulations and ordinances also curb unregulated development within flood hazard areas, as do Federal and State regulations restricting land use in wetlands or near waterways. In addition, the preservation of open space has a long and impressive history in Little Compton. As of December 2022, the conservation acreage was approximately 28.4% of the Town's total land area (Mosaic Land Management).

By minimizing development and protecting the water quality, environmental quality, and the scenic quality of the community through zoning regulations and conservation practices, the Town has intrinsically helped to mitigate natural hazard risks. Although "the Town does not significantly invest in economic development activities or actively recruit new businesses to relocate to the Town" (Town of Little Compton RI. *Comprehensive*, 73), has in place zoning regulations to help control development, and there is ongoing acquisition of open space by public and private organizations thereby reducing the land available for future development, **there are always development pressures.**

Much of the development pressure in Little Compton is “associated with the rise in demand of second/seasonal homes, corporations purchasing local businesses to profit from the Town’s unique qualities, and the approval of building a casino in the neighboring Town of Tiverton” (Town of Little Compton RI. *Comprehensive*, 45). Additional pressure is being exerted from residents interested in constructing multiple accessory units on existing residential lots. **As the Town will have an opportunity to produce an updated Comprehensive Plan in 2028**, which will be the program that will guide future land-use and physical development in Little Compton through 2038, it is important for the Town to determine how best to balance development pressure with measures that will continue to assist in mitigating natural hazards and creating a safe and resilient community.

As shown in **Table 4-40**, there is only one development effort thus far identified for the ensuing five-year period, and it is anticipated that few, if any others, will be implemented. **The identified project, a four unit affordable housing project, is being facilitated by the Little Compton Housing Trust, and is located outside of the SFHA and hurricane surge inundation zones and will not have an appreciable impact on the Town’s vulnerability.** Any new developments must comply with current floodplain regulations, State building codes, and stormwater standards, and therefore will not increase Town’s vulnerability to natural hazards. Little Compton’s Emergency Management Director, in collaboration with the Town Council and HM&FMP Advisory Committee will monitor development trends and determine any resulting changes in vulnerabilities that natural hazards will present.

Table 4-40 Potential Development Over the Next 5-Years (2024-2029)

Project	Location	Number and Type of Units	SFHA/Hurricane Surge Inundation Area	Anticipated Completion Date
Little Compton Housing Trust	Off Old Harbor Road	4 residential single family units – qualify as affordable housing	No	Start in 2024

4.4.6.4 Town’s Ability to Expand and Improve Capabilities

As further discussed in **Section 5**, the Town of Little Compton has numerous ongoing capabilities (authorities, policies, programs, and resources). In an effort to further mitigate the impacts of natural hazards, the Town intends to expand on and improve many of their capabilities including the following which relate to future development:

Building Official

The Town’s Building Official implements and enforces the State Building Code ensuring new structures or those substantially renovated are compliant. To ensure that no violations exist, mandatory, progressive, on-site inspections are made while work is in progress. The capability of the Building Official is continually expanded through ongoing education on the current NFIP policies and ordinances, floodplain management practices, and professional engagement with the Association of State Floodplain Managers, Rhode Island Emergency Management Agency (RIEMA), and the State Building Commissioner’s Department. The Building Official is also working toward becoming a certified floodplain manager.

Improved Floodplain Drainage

In compliance with the RI Nonpoint Source Pollution (RINPS) Management Plan and the RI Pollutant Discharge Elimination System (RIPDES) regulations, the Town of Little Compton has an ongoing effort to improve stormwater drainage infrastructure in flood prone areas. Both riverine and coastal flooding can be relieved through a well-

designed and maintained drainage system that efficiently retains, detains, or directs the flow of stormwater to points where the impacts of flooding will be minimized. As identified in the Action Plan (**Section 6**), the following actions include implementing drainage projects to improve stormwater management.

- **Action 2024 G1-A:** Complete steps to enroll in FEMA's Community Rating System (CRS) Program and support related activities in an effort to improve the Town's floodplain programs and correspondingly reduce the cost of flood insurance through the National Flood Insurance Program (NFIP) for Little Compton property owners.
- **Action 2024 G1-B:** Assess, monitor, maintain, and implement improvements to public roadways and associated drainage infrastructure (including culverts) to mitigate flooding, and incorporate resilient designs to ensure, wherein feasible, continued service during natural hazard events.
- **Action 2024 G2-C:** Expand green infrastructure stormwater management practices throughout the natural environment through monitoring, maintenance, and implementing new or retrofitting existing stormwater measures, and strengthen the Town's maintenance and management of public trees.

Regulations and Ordinances

The Town has enacted regulatory restrictions designed to reduce the potential impacts of flooding to property by limiting development in and around wetlands and flood-prone areas. As identified in the Action Plan (**Section 6**), the following action includes reviewing and potentially amending the Zoning Ordinance (including **§ 14-5.9 Special Flood Hazard Areas** which ensures the Town is in compliance with NFIP requirements) and/or Land Development and Subdivision Regulations, to improve resilience to natural hazards. An excellent resource available for Little Compton is *Subdivision Design in Flood Hazard Areas*, produced jointly by FEMA and the American Planning Association. This publication discusses site-specific measures to minimize flood damage and preserve natural functions of floodplains, including coastal high hazard areas and low lying areas near rivers.

- Action 2024 G1-C: Review and as deemed locally practical, amend the Zoning Ordinance and Subdivision Regulations to:
 - a. ensure appropriate resiliency and environmental protection is incorporated in new private and public development and redevelopment, especially in vulnerable areas including special flood hazard areas, coastal erosion zones, areas subject to sea level rise, and sensitive natural habitats.
 - b. enhance green infrastructure approaches, including Low-Impact Development (LID) requirements (practices that can be employed at the site-level to control stormwater and strive to replicate the pre-development hydrology of the site), particularly in areas vulnerable to natural hazards.

Management of Open Space

The Town recognizes the importance of managing conservation lands held in public and private ownership. In 1985, through enabling legislation the Town established the Little Compton Agricultural Conservancy Trust (LCACT) to preserve agricultural property, open space, and other undeveloped natural areas through purchase of development rights or land in fee simple. The LCACT is financed through a transfer tax assessment, currently 4% of the purchase price of real property in excess of \$300,000 (Town of Little Compton RI. *Comprehensive*, 32). As of December 2022, based on a locally maintained conservation lands dataset, Little Compton has approximately 4,086 acres or 28.4% of the Town's total land area (Mosaic Land Management).

While great achievements have been made to protect important natural resource areas, the Town is cognizant that climate change, including the threat of SLR, makes it imperative to preserve low-lying areas adjoining the ocean, salt ponds, Sakonnet River, and key inland waterways. These conservation efforts reduce the potential for development in flood prone areas subject to the adverse effects of hurricanes, coastal storms, and riverine flooding.

As identified in the *Action Plan* (**Section 6**), the Town, primarily through the LCACT, intends to continue working with the State and conservation organizations such as the Sakonnet Preservation Association, The Nature Conservancy, and the Audubon Society of Rhode Island, to protect open space and restore degraded wetlands and shorelines in critical areas, which helps reduce the risk of damages from flooding events.

- Action 2024 G2-B: Coordinate with the Little Compton Agricultural Conservation Trust (LCACT), Sakonnet Preservation Association (SPA), The Nature Conservancy (TNC), and other conservation organizations, State and Federal agencies, and local property owners in the maintenance, restoration, acquisition, and protection of open space, especially wetlands, flood hazard areas, coastal migration areas, and other natural resource areas (ex. agricultural land), to improve resiliency.

SECTION 5

Capability Assessment

Subsections

5.1 CAPABILITY INVENTORY

5.1.1 Planning and
Regulatory Capabilities

5.1.2 Administrative and
Technical Capabilities

5.1.3 Financial Capabilities

5.1.4 Key Local Mitigation
Measures Related to Profiled
Hazards

5.2 PARTNERSHIPS AND PUBLIC OUTREACH

5.3 ASSESSMENT OF 2018 HAZARD MITIGATION ACTION PLAN

5 Capability Assessment

The Town of Little Compton has the capacity to implement and institutionalize hazard mitigation through its personnel, legal, and fiscal resources; intergovernmental coordination and communication; and academic and analysis tools. In addition, Little Compton is fortunate to have a community base - residents, business owners, organizations, and institutional leaders - that support hazard mitigation and other critical issues important to the Town's future. A collaborative and engaged local governance and community are necessary to ensure Little Compton's preparedness for natural hazards.

In **Section 4**, the planning process identified the natural hazards posing a threat to Little Compton and described the vulnerability of the Town to those risks. In this Section, the *Capability Assessment* provides the opportunity to evaluate what mitigation mechanisms are already in place. In other words, what policies, programs, regulations, authorities, personnel, funding, and other resources are available to the Town to aid in natural hazard mitigation and reduce long-term vulnerability.

The *Capability Assessment* is an important step because understanding what is already in place and the effectiveness of those capabilities provides the opportunity to identify where additional measures or revisions to existing measures are needed. The Town has the capacity to expand and improve certain capabilities through measures included in the *Action Plan*; through the passage and enforcement of additional codes and regulations; by integrating mitigation measures into other Town planning documents and programs; and by continually increasing community and stakeholder engagement, including expanding those involved in the HM&FMP Advisory Committee to reflect growth and change in the community.

The *Capability Assessment* is structured in part as an inventory of existing mitigation capabilities, which may help decrease the community's hazard risk and/or impact the way pre- and post-hazard events are handled. In addition to the inventory, the *Capability Assessment* includes an overview of the Town's partnerships with various agencies and organizations that support hazard mitigation; public outreach efforts; and the status of the 2018 Hazard Mitigation Action Plan. This information has been provided in the following subsections:

5.1 Capability Inventory

5.2 Partnerships and Public Outreach

5.3 Assessment of 2018 Hazard Mitigation Action Plan

5.1 CAPABILITY INVENTORY

The Capability Inventory identifies existing mitigation capabilities that in some way contribute to or inform the hazard mitigation process in the Town of Little Compton. The inventory includes Local, Regional, State, and Federal measures and has been organized into three categories. Although a number of the capabilities overlap between the planning/regulatory and administrative/technical categories, each capability has been included in only one of those categories.

Planning and Regulatory
Capabilities

Administrative and
Technical Capabilities

Financial
Capabilities

As evidenced by the citations throughout the *HM&FMP*, relevant information from a significant number of the resources included in the Capability Inventory have been incorporated into the *Plan*. Integrating this information was critical to reflect updated Town priorities. Familiarization with the Town's existing capabilities helped to shape the mitigation goals and strategy. As documented in the *Action Plan*, a number of *Mitigation Actions*, are taken directly from or build on the good work and priorities identified in other Town planning documents. Some of the proposed mitigation actions were identified to fill gaps within the Town's existing protection matrix in an effort to make the community more resilient.

Over the ensuing five year period, the Town intends and has the ability to further expand on and improve existing policies and programs. This is evidenced in **Appendices 5-1 through 5-3**, as well as in **Subsections 6.4 and 4.4.6**. Key examples of Little Compton's ability to improve its capabilities over the upcoming 5-year period include:

- ❖ The Town Council will work to strengthen their understanding of hazard mitigation, the beneficial uses of floodplains, and applicable State or national policies and programs (such as ASFPM's No Adverse Impact Initiative) that will aid in natural hazard mitigation and reduce long-term vulnerability
- ❖ The Emergency Management Director intends to expand emergency management drills and exercises, and continue to strengthen the CERT program
- ❖ Emergency Management Director will work to strengthen the coordination between themselves, the Building Official, and the Planning Board in order to leverage assets/resources to strengthen the effectiveness of hazard mitigation.
- ❖ The Emergency Management Director will continue to have periodic reviews of backup procedures and redundant equipment to ensure adequate communications coverage during any disaster event
- ❖ Apply for a grant to assist in the purchase of a generator for the Community Center which can then function as an emergency heating & cooling center
- ❖ Further integrate hazard mitigation into future Comprehensive Plan updates
- ❖ Integrate hazard mitigation into other planning initiatives
- ❖ Increase coordination and engagement with the local business community, neighboring jurisdictions, and other stakeholders
- ❖ Expand community outreach activities and public participation in hazard mitigation related activities
- ❖ Improve and expand the Town's Website – including additional information on flood risks and preparedness
- ❖ Improve and expand the Town's GIS – including a stormwater drainage layer
- ❖ Create a Debris Management Plan
- ❖ Participate in the CRS program
- ❖ Require the Building Official to become a Certified Floodplain Manager
- ❖ Review and strengthen existing codes and regulations associated with hazard mitigation
- ❖ Planning Board to undertake a Low Impact Development (LID) Municipal Self-Assessment
- ❖ Little Compton will continue to explore opportunities to improve essential services and critical facilities
- ❖ As many natural hazard risks are related to the location and geography of private property, or related to an individual's actions/responses before, during, and after events, the Town will endeavor to increase public education and outreach programs associated with hazard mitigation

5.1.1 Planning and Regulatory Capabilities

As discussed in **Section 2**, an extensive plan integration was undertaken which examined Local, Regional, State, and Federal plans, policies, ordinances, regulations, and programs that support hazard mitigation and flood management goals in the Town of Little Compton.

CRS CREDIT:		
Mitigation Planning Element	CRS Planning Step	Max Pts
Phase III –Mitigation Strategy	7. Review Possible Activities (a & b)	10

CRS Coordinator's Manual – Activity 510: Floodplain Management Planning

While there is always room for improvement, the Town is proud of the efforts made to enact regulatory restrictions and undertake studies and activities which have laid the foundation for the mitigation strategy included herein. As part of plan integration, and in accordance with CRS Activity 510 Planning Process - Step 7, the Town reviewed preventive activities including zoning, stormwater management regulations, building codes, subdivision ordinances, and the preservation of wetlands and open space. With respect to floodplain management, how to reduce future flood losses and if the Town should adopt or revise these planning tools to better meet current or future conditions was considered. **Table 5-1** lists the *Planning and Regulatory Capabilities* and includes a hyperlink where available.

The assessment of these capabilities, including key discussion points and *HM&FMP* integration considerations, has been included in **Appendix 5-1**. In the Appendix, the section related to local capabilities also includes a **Level of Effectiveness rating to assist in determining limitations of the existing data and which measures should continue to be supported or enhanced**. Capabilities with a low or moderate rating were further reviewed to determine if the measure should be updated or if the 2018 Comprehensive Plan or other measure effectively incorporates that capability. Further, since the Town is interested in participating in the Community Rating System (CRS) program, it has been noted if a particular capability, or aspect thereof, may qualify for CRS credit.

Table 5-1 List of Planning and Regulatory Capabilities (Refer to Appendix 5-1 for Assessment Details)

LOCAL (the capabilities have been listed in alphabetical order)
Comprehensive Plan (2018)
Emergency Operations Plan (2012)
Flood Insurance Rate Maps for Little Compton, Rhode Island
Geographic Information System (GIS)
Harbor Management Plan – Sakonnet Harbor (2010)
Hazard Mitigation & Flood Management Plan (2024) *** THIS DOCUMENT ***
Little Compton Water Quality and Aquatic Habitat Management Plan (2022-Draft)
Local Hazard Mitigation Plan (2018; updated 2019)
MRP Community Resilience Building Workshop Summary of Findings (2020)
The Code of the Town of Little Compton RI: Chapter 7-1.1 Conformity with State Building Code Required Rhode Island General Law, Chapter 23-27.3 State Building Code
The Code of the Town of Little Compton RI: Chapter 8-2 Drainage onto Town Roads and Highways; The Code of the Town of Little Compton RI: Chapter 12-Drainage
The Code of the Town of Little Compton RI: Chapter 8-3 Outdoor Burning of Rubbish and Other Waste Products
The Code of the Town of Little Compton RI: Chapter 14 Zoning
The Code of the Town of Little Compton RI: Appendix C Subdivision Regulations
Watson Reservoir Watershed Plan (2021)

REGIONAL/STATE (the capabilities have been listed in alphabetical order)

Association of State Floodplain Managers (ASFPM)

Coastal Resources Management Council (CRMC)

Narragansett Bay National Estuarine Research Reserve (NBNERR)

Resilient Rhode Island Act

Resilient Rhody: Municipal Resilience Program

Rhode Island Building Codes

Rhode Island Department of Administration (RIDOA) - Rhode Island Division of Statewide Planning (RIDSP)

Rhode Island Department of Environmental Management (RIDEM)

Rhode Island Department of Health (RIDOH)

Rhode Island Department of Public Safety (RIDPS)

Rhode Island Department of Transportation (RIDOT)

Rhode Island Emergency Management Agency (RIEMA)

Rhode Island Energy - PPL Corporation (formerly National Grid/Narragansett Electric)

Rhode Island Flood Mitigation Association (RIFMA)

Rhode Island Geographic information System (RIGIS)

Rhode Island Office of Energy Resources (RIOER)

Rhode Island Sea Grant

FEDERAL (the capabilities have been listed in alphabetical order)

Americans with Disabilities Act Guide for Small Towns

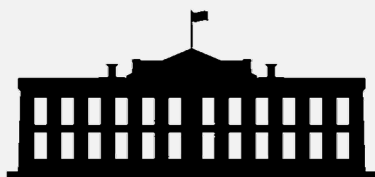
Clean Water Act

Federal Disaster Mitigation (some key Acts)

Federal Emergency Management Agency (FEMA)

National Oceanic and Atmospheric Administration (NOAA)

*Working Together to build a safer
and more climate resilient community*



State of RI



Little Compton



Federal Govt.

and numerous other partners and stakeholders

5.1.2 Administrative and Technical Capabilities

The *Administrative and Technical Capabilities* include policies, standard operating procedures, public services, trainings, and tools that can be used for mitigation planning and to implement specific mitigation actions. At the local level, it encapsulates the skills and expertise of the Town of Little Compton staff in terms of their ability to effectively undertake hazard mitigation planning and implementation, and the coordination of associated resources. **Table 5-2** provides a list of the *Administrative and Technical Capabilities* that were reviewed at the Local, Regional, State, and Federal level. The full assessment has been provided in **Appendix 5-2**. Where applicable, the capability measure includes a hyperlink.

Table 5-2 List of Administrative and Technical Capabilities (Refer to Appendix 5-2 for Assessment details)

LOCAL (the capabilities have been listed in alphabetical order)
Boards & Commissions
Brownell Library
Coordination with Area Schools, Colleges, and Universities
Coordination with Neighboring Municipalities
Drills, Exercises, and CERT Program
Emergency Shelter
Evacuation Zones and Routes
Little Compton Community Center
Little Compton Public Schools
Map Information Services
Medical Facilities and Services
Senior Citizen Services
Town Administration and Departments
Town Communication (Website and Facebook)
Warning and Notification Systems
REGIONAL/STATE (the capabilities have been listed in alphabetical order)
American Red Cross – Rhode Island Chapter
New England States Emergency Consortium (NESEC)
Providence Stormwater Innovation Center
Rhode Island Association of Conservation Districts (RIACD)
Save The Bay
StormSmart Coasts Rhode Island
The Nature Conservancy
University of New Hampshire Stormwater Center (UNHSC)
University of Rhode Island (URI)
FEDERAL (the capabilities have been listed in alphabetical order)
National Flood Insurance
National Warning and Alert Systems
Nationwide Programmatic Environmental Documents
Pandemic and All-Hazards Preparedness Act (PAHPA)
Voluntary Organizations Active in Disasters (VOAD)

5.1.3 Financial Capabilities

Funding of mitigation projects can at times cause delays in the implementation of the necessary action. Little Compton, like most communities, rely on tax revenues with occasional grant funding to supplement a project. The Advisory Committee intentionally included a broad spectrum of mitigation actions (**Subsection 6.4**) in order to provide opportunities for smaller, low-budget projects to be implemented through the operating budget, as well as larger projects whose implementation may require Capital Improvement Program (CIP) funding and/or grant funding. With respect to grant funding, the Town - across all municipal departments - will consider and pursue applicable Local, Regional, State, and Federal grant opportunities to assist in implementing hazard mitigation programs. The *Financial Capabilities* identified in **Table 5-3** represent potential funding sources the Town has access to, has used in the past, or may be eligible to use in the future for hazard mitigation measures. The full assessment of the financial capabilities has been provided in **Appendix 5-3**. A number of the recent hazard mitigation related grants awarded to Little Compton have been listed in **Table 5-4**.

Table 5-3 List of Financial Capabilities (Refer to Appendix 5-3 for Assessment details)

LOCAL (the capabilities have been listed in alphabetical order)
Community Organizations
Disaster Relief Funds
Town Operating Budget & Capital Improvement Program (CIP)
Mutual Aid Agreements for Public Safety Personnel and Equipment
REGIONAL/STATE (the capabilities have been listed in alphabetical order)
Eastern Rhode Island Conservation District (ERICD)
Narragansett Bay Estuary Program (NBEP)
Preserve Rhode Island
Rhode Island Coastal Resources Management Council (CRMC)
Rhode Island Commerce
Rhode Island Department of Environmental Management (RIDEM)
Rhode Island Department of Health (RIDOH)
Rhode Island Department of Transportation (RIDOT)
Rhode Island Division of Statewide Planning (RIDSP)
Rhode Island Emergency Management Agency (RIEMA)
Rhode Island Foundation
Rhode Island Infrastructure Bank (RIIB) – MRP Action Grant
Rhode Island Public Utilities Commission
Southern New England Program (SNEP)
University of Rhode Island (URI) Cooperative Extension
Volunteer Organizations
FEDERAL (the capabilities have been listed in alphabetical order)
American Rescue Plan Act (ARPA)
Department of Commerce – U.S. Economic Development Administration (EDA)
Department of Homeland Security Grant Program (HSGP)
Federal Emergency Management Agency (FEMA)
National Fish and Wildlife Foundation (NFWF)
National Oceanic and Atmospheric Administration (NOAA)
U.S. Army Corps of Engineers (USACE)

U.S. Department of Agriculture Natural Resources Conservation Service (USDA NRCS)
U.S. Department of Housing and Urban Development (USHUD)
U.S. Economic Development Administration
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service



Table 5-4 List of Recent Hazard Mitigation Related Grants Awarded to Little Compton
(Refer to **Appendix 5-3** for additional details)

Project Description	Year Award/ Project Status	Award Amount
Overflow Sewer Grant (<i>Taylor's Lane</i>)	2023- <i>Not Started</i>	\$247,100
Hazard Mitigation Plan Update	2023 - <i>In Progress</i>	\$45,000
Stormwater Management (<i>South Shore Beach Parking Area; Town Way area; and John Dyer Road area</i>)	2022 - <i>In Progress</i>	\$164,000
Winter Storm Kenan (DR 4653)	2022 - <i>Completed</i>	\$13,836
American Rescue Plan Act of 2021 (ARPA)	2021 - <i>In Progress</i>	\$1,038,401
Protective Measures (Disaster #4505)	2021 - <i>Completed</i>	\$1,605
Coronavirus Relief Fund (CARES Act)	2020 - <i>In Progress</i>	\$91,322
Assistance to Firefighters	2018 - <i>Completed</i>	\$97,428
Upgrade Essential Fire Department Equipment	2017 - <i>Completed</i>	\$211,364
Volunteer Fire Assistance Grant (<i>For items such as: backpack blowers for fire brush truck; installation of dry hydrants</i>)	Annually - <i>Completed</i>	\$1,000 (varies – matching up to \$2,000)
Meds Program	Annual Collectible based on completing RIDOH designated exercises/tasks	\$19,980 (total over past several years)

5.1.4 Key Local Mitigation Measures Related to Profiled Hazards

In **Section 4**, the Advisory Committee identified and profiled those hazards thought to have a higher likelihood of occurring or potentially having a greater impact on the Town should they occur. **Table 5-5** relates key local capabilities to each of the profiled hazards. The Town will continue to expand and improve these capabilities.

Table 5-5 Key Local Mitigation Measures Related to Profiled Hazards

Hazard	Existing Mitigation Measure	Hazard	Existing Mitigation Measure
All Hazards Identified in HM&FM Plan	CodeRED™ Communications Equipment Comprehensive Plan Emergency Operations Plan Emergency Power Generators Hazard Mitigation & Flood Management Plan (<i>this document</i>) Local Emergency Management conducts trainings/exercises Monthly department head meetings where emergency management related items are discussed as necessary MOUs with neighboring Town's of Tiverton RI & Westport MA Professionalism, Expertise, and Dedication of Town Staff Town Website Upgraded emergency management equipment	Wind-Related	Evacuation Plan Local Emergency & Warming Shelters MOUs with local contractors for debris removal Regional Red Cross Certified Shelter RIEMA – Hurricane Preparedness link on Town Website State Building Codes Tree Maintenance Program
		Winter-Related	Evacuation Plan Local Emergency & Warming Shelters MOUs with local contractors for snow removal Regional Red Cross Certified Shelter Roadway Treatments Snow Removal
Flood-Related	Dam Safety Regulations Evacuation Plan Floodplain Regulations Harbor Management Plan Implementing Structural and Non-Structural Projects Little Compton GIS Local Emer. Cooling & Warming Shelters MOUs with local contractors for debris removal National Flood Insurance Program Participation Regional Red Cross Certified Shelter RIPDES Small MS4 Permit Regulations RIEMA - Flood Safety & NFIP information on Town Website RI STORMTOOLS Roadway Treatments Site Plan Review for Stormwater and Erosion Control State Building Codes Storm Drainage & Catch Basin Maintenance on State Roads (RIDOT) Street Sweeping on State Roads (RIDOT) Subdivision Regulations Wetlands and Open Space Acquisition Zoning Ordinance	Vector-borne Diseases Transmitted by Ticks & Mosquitoes	RIDOH - Mosquitoes & Ticks Booklet on Town Website
		Contagious Respiratory Illness Caused by Influenza Viruses or Coronavirus	Covid-19 Home Testing Kits made available to public during pandemic Town Covid-19 Testing - in vehicle at Public Safety Complex and onsite at Wilbur & McMahon School Public Safety Complex acted as collection & distribution center for local food bank Town Website: Information on Covid-19
		Earthquake	Evacuation Plan Local Emergency Shelters Regional Red Cross Certified Shelter State Building Codes
		Extreme Heat, Drought, Brush Fires	Local Emergency Cooling Shelters Local Fire Safety Education Program Permits Required for Outdoor Fires on Public Land & Brush Fires on Private Land State Fire Building Code Tree Maintenance and Replacement Program Water Use Restriction

5.2 PARTNERSHIPS AND PUBLIC OUTREACH

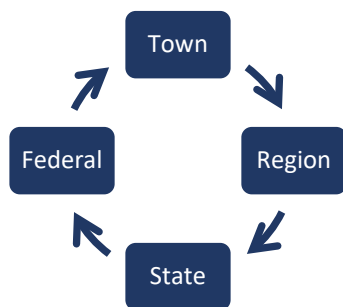
The Town of Little Compton recognizes the benefit of coordinating and working collaboratively with an array of partners. The list in **Appendix 2-3**, identifies 19 local government & school district groups, as well as 74 businesses, agencies, and organizations outside of Little Compton's governmental structure, that were invited to be part of the *HM&FMP* planning process. The Town has established partnerships with many of those agencies and organizations.

As identified in **Appendices 5-1, 5-2, and 5-3**, many of these partners have helped to enhance Town projects and community outreach through their expertise, resources, and funding support. As evidenced through the **References and Work Cited** documentation, resources from many of the partners have been used throughout this *Plan*.

This *HM&FMP* is a prime example of the integral nature of these partnerships. Stakeholders from the Little Compton Agricultural Conservancy Trust, Sakonnet Preservation Association, Little Compton Community Center, and the local CERT Team are serving on the Advisory Committee.

As part of the *Capability Assessment*, it was determined that it would be beneficial for the Town to continue to build upon existing partnerships to ensure the Town remains current with respect to hazard risks and mitigation. Throughout the *Action Plan*, the Advisory Committee recognized the benefit of partnerships and informational connections.

The Town is particularly grateful of the partnership with the Rhode Island Emergency Management Agency (RIEMA) and the Federal Emergency Management Agency (FEMA) for their knowledgeable staff; databases; tools to perform local risk assessments and other analysis; resources to support development of mitigation strategies; grant funding opportunities; and for their vast collection of public outreach materials, including those that promote flood risk awareness and flood insurance.



Additionally, over the years the Town has worked closely with a number of other resilience and conservation focused organizations, including the Audubon Society of Rhode Island, Buzzards Bay Coalition, Coastal Resources Management Council, Eastern Rhode Island Conservation District, RI Department of Environmental Management, Sakonnet Preservation Association, The Nature Conservancy, and U.S. Army Corps of Engineers. Examples of efforts undertaken include:

- The flood-prone area at the bottom of Town Way is being modified to account for, and to retain and/or redistribute, stormwater.
- The handling of stormwater at the southern end of John Dyer Road is being improved in conjunction with scheduled road repair.
- The Town's Agricultural Conservancy Trust has been proactive in conserving contiguous wetland areas within the Town.

Partnering with government agencies and other organizations to plan and carry out emergency preparedness, emergency response, and hazard mitigation activities has been a successful strategy that the Town will endeavor to expand in the coming years. In particular the Town recognizes the benefit of expanding the role of stakeholder partners in public outreach. As evidenced in the *Action Plan* (**Section 6**), several of the action items fall into the **Public Education & Awareness Category**. The Town will look for opportunities to involve their partners in community outreach activities that promote a safer, more disaster resilient community. Successful outreach programs provide accurate data and information that serves to make citizens better prepared for potential hazard

events. Public outreach and education also builds an understanding of the concept of hazard mitigation and climate change, therein helping to create a base of support for implementing *Plan* activities.

Within the Town administrative structure, two ongoing outreach and educational programming efforts that support hazard awareness and reinforce individual pro-active hazard mitigation measures include:

Information on the Town Website

The Town Clerk, in conjunction with Town Departments, maintains and updates the Town website. Throughout the COVID-19 pandemic, the Town regularly provided updates to the community via the Town website. The Town continues to use the website to provide information, as needed, on weather related or other Town events.

A critical tool administered by Little Compton Emergency Management is the CodeRED™ Emergency Notification System. This system facilitates more rapid citizen notification and warning in advance of or during a disaster.

As part of the *Capability Assessment*, it was determined that it would be beneficial for the Town to continue to improve the scope and breadth of hazard mitigation/ emergency preparedness awareness. In the *Action Plan*, the Advisory Committee prioritized the need for expanded public education and outreach efforts through information on the Town website, workshops, presentations, and other mechanisms (refer to **Subsection 6.4 – 2024 Actions G3-A & B**).

A number of Town webpages provide information, such as the following, related to hazard mitigation:

- CodeRed Emergency Notification Signup
- COVID-19 Resources
- Elderly Affairs
- Emergency Management
- HM&FMP Project
- Hurricane Evacuation Information
- Lifeline Resources General
- Lifeline Resources for Seniors
- Power Outages
- Rhode Island Special Needs Emergency Registry (RISNER)
- RIDOH Emergency Preparedness Publications
- RIEMA Emergency Preparedness Publications
- Town Documents (Comprehensive Plan, Hazard Mitigation Plan, MRP CRB Workshop Summary of Findings, etc.)

As part of the *Capability Assessment*, it was determined that it would be beneficial for the Town to continue to build their GIS capability and provide additional valuable information to the community through this visual mapping tool. In the *Action Plan*, the Advisory Committee prioritized the need for enhancing the Town’s GIS capabilities (refer to **Subsection 6.4 – 2024 Action G3-C**).

Information on the Town GIS Web Viewer

The Town’s on-line *GIS Web Viewer* provides Town departments and the public easy access to Little Compton’s ArcGIS mapping which includes FEMA flood hazard areas and hurricane surge inundation areas. Providing this information allows users (residents, potential home buyers, insurance agencies, lenders, Town staff, etc.) to understand how a particular property or area of the Town may be impacted by flooding.

Over the ensuing five-year period the Town intends to improve and expand its GIS capabilities.

5.3 ASSESSMENT OF 2018 HAZARD MITIGATION ACTION PLAN

Throughout the life-cycle of the 2018 LHMP, the mitigation actions were tracked and assessed by the Town. In accordance with 44 CFR § 201.6 and CRS Activity 510 Planning Process - Step 7, the Advisory Committee conducted a review of the 2018 Mitigation Actions to determine their status and relevance for inclusion in this update. **Of the thirteen Actions, four have been completed (Actions #1, #4, #6, and #11), one has had no action (Action #12), and the rest are ongoing or in-progress.** As evidenced in **Table 5-6**, the Town has been **PROACTIVE** and made progress on almost all of these actions. After reviewing the work accomplished and what remains to be done, it was determined that **all of the non-completed actions remain relevant and compatible with the updated Goals and Policies, and have therefore been carried over to the 2024 Action Plan.** Although these actions have been carried over to the *2024-2029 Action Plan*, most have been modified to account for work accomplished and/or plan integration of actions and measures from other resources. For cross-referencing, **Appendix 6-1** identifies where the 2018 actions have been incorporated into the *2024 Action Plan*.

Table 5-6 Overview of Actions included in 2018 LHMP

2018 LHMP Action Item	Status
Action #1: Plan Review Develop a plan to handle evacuation of RV's and other items located at South Shore Beach, determine if Round Meadows has an evacuation plan Responsible Departments: Beach Commission, Town Council, Police Chief	Status: Complete - The Town Council in conjunction with the Beach Commission makes the determination to close the beach. The entrance to the beach will be closed off and a notice posted that the beach is closed. - Evacuation notices are issued by the Town Council President in consultation with the Police Chief. The Police Chief will alert the Chair of the Beach Commission that an evacuation notice has been issued. The Beach Commission has a plan in place to notify their contact at Round Meadows Campground (125 South Shore Road) when an evacuation is necessary. Once notified, it is then the responsibility of the Campground property owners to notify the RV owners that an evacuation order has been issued. To date this process has worked efficiently.
Action #2: Develop Debris Management Plan Creation of a Debris Management Plan for inclusion in the town's EOP Responsible Departments: Tree Warden & DPW Director	Status: In Progress The Tree Warden in conjunction with the EMA Director are in the process of developing a Debris Management Plan.
Action #3: MOU City of Newport Educate residents downstream of Dam and secure MOU with the City of Newport to assure the City has a Dam Mitigation Plan Responsible Departments: Fire Department	Status: In Progress The Town is in the process of creating an Emergency Action Plan (EAP) for the Watson Reservoir Dam (RI Dam #485, Constructed 1960). The Watson Reservoir in Little Compton has a capacity of 1,677 Million Gallons, which is approximately 40% Newport Water Division's (NWD) available supply.

2018 LHMP Action Item	Status
Action #4: Public Education Develop public outreach information on emergency preparedness and evacuation routes Responsible Departments: Hazard Mitigation Committee	Status: Complete Links to emergency preparedness information and a map showing the evacuation routes is available on both the Town's Emergency Management webpage and the HM&FMP Project webpage. Handouts (hard copies) of this information is available through the Town Clerks office.
Action #5: Code Development Continued development of town code, local plans and regulations that influence the way land and buildings are developed and built for enforcing ordinances and regulations; new step to review existing language for potential improvement Responsible Departments: Council and Planning Board	Status: On-going As a consequence of changes to zoning regulations voted by the State legislature, the Town reviewed and modified its Zoning Ordinance to accommodate increased density requirements without sacrificing drinking water quality. The following Zoning Amendments were made between 2018 and February 2024: <u>§ 14-3.1 Compliance with Regulations</u> e. Use Regulations - Amended 7-11-2019 <u>§ 14-5.14 Solar Energy Systems</u> - Added 7-11-2019 <u>§ 14-9.11 Adoption, Amendment and Administration of Zoning Chapter</u> c. Notice and Hearing Requirements - Amended 9-5-2019 <u>§ 14-9.13 Publication and Availability of Zoning Chapter</u> - Amended 9-5-2019 <u>§ 14-5.9 Special Flood Hazard Areas</u> a. Applicability - Amended 3-16-2020; 7-9-2020; 5-20-2021 c. Notification of Watercourse Alteration - Amended 4-30-2020 <u>§ 14-1.4 Zoning Districts and Zoning Map</u> b. Zoning Map - Amended 2-4-2021 <u>§ 14-2.7 Land Nonconforming by Area</u> - Amended 12-7-2023 <u>§ 14-5.5 Accessory Uses - Dwelling Units</u> - removed 12-7-2023; added 2-22-2024 <u>§ 14-9.1 Enforcement</u> - Amended 12-7-2023 <u>§ 14-5.11 General Performance Standards For All Uses</u> j. Stormwater Mitigation Plan - Added 8-25-2022 <u>§ 14-9.5 Special Use Permit</u> - Amended 12-7-2023 <u>§ 14-9.6 Variance</u> - Amended 12-7-2023

2018 LHMP Action Item	Status
Action #6: Long Pasture & Swamp Roadway drainage repair Determine mitigation action relating to roadway drainage problem and implement Responsible Departments: DPW	Status: Complete • In 2021 the culvert under Swamp Road was replaced with a larger diameter pipe; and swales and cape cod berms were added along portions of Long Pasture Road.
Action #7: Town Way drainage repair Determine mitigation action relating to roadway drainage problem and implement Responsible Departments: DPW	Status: In Progress • Plans to mitigate the drainage along Town Way have been approved by CRMC and funding has been included in the 2024 Little Compton Municipal Roadway Plan for Action.
Action #8: Wetland preservation Purchase development rights or land in fee simple for wetlands and open space; improvement action to continue to protect and preserve; LCACT monthly reviews potential purchases and secures by deed once sufficient funding is available Responsible Departments: LC Agricultural Conservancy Trust	Status: On-going • The LCACT is continuing to purchase property for the purpose of open space and preservation. Between January 21, 2019 and February 6, 2024, a total of 373.82 acres of land was purchased by or donated to the LCACT. • The Sakonnet Preservation Association has been actively conserving wetland properties since 1972, accepting them by purchase or donation and considers their protection a high priority. Approximately 260 acres, which represents 55% of the organization's total holdings, are predominantly or entirely wetlands.
Action #9: John Sisson Roadway drainage repair Determine mitigation action relating to roadway drainage problem and implement Responsible Departments: DPW	Status: In Progress • Funding to mitigate the drainage along John Sisson Road has been included in the 2024 Little Compton Municipal Roadway Plan for Action.
Action #10: John Dyer Roadway drainage repair Determine mitigation action relating to roadway drainage problem and implement Responsible Departments: DPW	Status: In Progress • Funding to mitigate the drainage along John Dyer Road has been included in the 2024 Little Compton Municipal Roadway Plan for Action.

2018 LHMP Action Item	Status
Action #11: Main Street Adamsville/Harbor Roadway drainage repair Determine mitigation action relating to roadway drainage problem and implement Responsible Departments: DPW	Status: Complete • In 2023 RIDOT undertook roadwork in this area which included drainage improvements. • The Town will monitor the improvements to see if drainage issues have been corrected.
Action #12: Public Education Develop public outreach program to educate on floodplain management, local regulations, and hazard resistant designs and materials Responsible Departments: Building Official	Status: No Action • No formal outreach program has been enacted.
Action #13: CRS qualification Review the NFIP Community Rating System eligibility requirements and develop a set of achievable activities to qualify and participate in the NFIP CRS Responsible Departments: Building Official	Status: In Progress • The Town has not yet applied to the CRS Program, but intends to apply in 2024. • The <i>HM&FMP</i> (this Plan) is being developed with respect to CRS Activity 510 which will provide CRS credit to the Town and help them achieve a CRS 9 rating once the Town has formally applied to the program.

SECTION 6

Mitigation Strategy

Subsections

6.1 MISSION STATEMENT

6.2 GOALS

6.3 DEVELOPMENT OF
ACTION PLAN

6.3.1 Review Possible
Activities/Actions

6.3.2 Choose & Develop
Possible Actions

6.3.3 Prioritize Actions -
STAPLEE Evaluation

6.3.4 Actions Supporting
CRS Program

6.3.5 Action Descriptors

6.4 ACTION PLAN (2024-
2029)

6 Mitigation Strategy

Hazard Mitigation Plan: The Town of Little Compton has successfully met the following requirement → 44 CFR Subsection D §201.6(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

CRS - Flood Management Plan: The Town of Little Compton has successfully met the following Mitigation Strategy requirements based on the 10-step planning process for CRS Activity 510 → Set Goals (Step 6); Review Possible Activities (Step 7); and Draft an Action Plan (Step 8)

The *Mitigation Strategy* is the culmination of the mitigation planning process. It provides the Town with the basis for action to reduce the risk to people and property from natural hazards and assists the Town in achieving compatible economic, environmental, and social objectives. The *Mitigation Strategy* stems from the comprehensive planning process used in creating this document, and the findings of the *Risk Assessment*, *Vulnerability Analysis*, and *Capability Assessment*.

The *Hazard Mitigation & Flood Management Plan (HM&FMP)* Advisory Committee used the information outlined in the previous Sections to update and create a broad-based mission statement, goals, and actions which are intended to guide the Town's day-to-day operations and long-term approach to reduce the impacts of hazards and improve flood management. This updated strategy builds upon the extensive mitigation, climate adaptation, and flood management work the Town of Little Compton has previously implemented and will serve as a roadmap for the next 5 years.

FEMA's Mitigation Strategy is comprised of the three main components represented in **Figure 6-1** and described below:

- ❖ **Goals** – General guidelines explaining what the plan proposes to achieve. These are usually broad statements with long-term applicability that provide the framework for achieving the intent of the mission statement.
- ❖ **Actions** – Specific projects for achieving the goals.
- ❖ **Action Plan** – A plan for implementing the actions. The Action Plan establishes priorities, assigns responsible parties, defines the type of action, and provides a magnitude of cost, potential funding sources, and an estimated timeframe for completion.

It was important to the Town of Little Compton to develop a comprehensive and aggressive *Mitigation Strategy* that will lead to a safer and more sustainable community. The Town has and will continue to implement and institutionalize hazard mitigation and flood management through its human, legal, and fiscal resources; effective coordination and communication with the state, neighboring jurisdictions, stakeholders, community members, and across Town departments; and use of knowledge and tools to analyze and cope with hazard risks.

As the Town has undertaken to develop a combined hazard mitigation and flood management plan, the *Mitigation Strategy* includes a mix of mitigation and non-mitigation actions. Non-mitigation actions include measures that are emergency response or operational preparedness in nature.

Figure 6-1 Mitigation Strategy Components



FEMA Local Hazard Mitigation Planning Handbook, Page 6-1

6.1 MISSION STATEMENT

The Town of Little Compton is striving to become a disaster resilient community and achieve sustainable development by mitigating hazard impacts before disaster strikes and by restricting infringement on sensitive lands. The following *Mission Statement* forms the foundation upon which the *Mitigation Strategy* is built.

Mission Statement

The purpose of the *Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan (HM&FMP)* is to reduce Little Compton’s vulnerability to natural hazards, including safeguarding against and facilitating recovery from the increasing threats from sea level rise and other deleterious climate change impacts, thereby fostering a safe, resilient community that preserves and enhances quality of life for all generations. By identifying areas and resources at risk to natural hazards and corresponding feasible, sustainable mitigation measures, for municipal and private implementation, the *HM&FMP* provides the foundation for an ongoing local mitigation program to reduce adverse impacts of natural hazards on Little Compton’s people, critical facilities and services, built & natural environment, and economy.

6.2 GOALS

DMA Requirement §201.6(c)(3)(i):
The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

CRS CREDIT:		
Mitigation Planning Element	CRS Planning Step	Max Pts
Phase III –Mitigation Strategy	6. Set Goals	2

CRS Coordinator’s Manual – Activity 510: Floodplain Management Planning

The *Mitigation Strategy* consists of a coordinated set of goals for mitigating natural hazard impacts to people, the built and natural environments, and the local economy by integrating policy and action across functional areas. This includes strengthening interdepartmental and stakeholder/partner efforts to identify and understand potential natural hazard risks and communicating this information to citizens and business owners through public education and engagement. It also includes establishing conditions for improved pre-disaster preparedness and post-disaster response and recovery.

As discussed in **Subsection 2.3**, the Town of Little Compton recognizes the benefit of plan integration. The Advisory Committee was therefore cognizant that the *HM&FMP* goals be consistent with and complement the goals and objectives of the Town’s 2018 Comprehensive Plan and other planning efforts (**Appendix 5-1** has a list of local planning documents reviewed as part of the *HM&FMP* planning process).

In an effort to effectively review the 2018 HMP goals for relevancy, and, as appropriate, modify or add new goals, the Advisory Committee envisioned what they would want the community to look like in the future in terms of resilience to flooding and other natural hazards. The Committee recognizes the Town’s commitment to becoming a safer, more resilient community, through the implementation of mitigation programs and policies, and to achieving sustainable development by striving to mitigate hazard impacts before disasters strike. The following goals were developed to support future natural hazard mitigation and flood management efforts,

2024 HM&FMP Goals

Goal 1: Reduce natural hazard impacts to the **built environment**, including infrastructure, in order to safeguard essential services including efficient transportation and transmission of essential utilities, and to protect property including cultural and historic resources.

Goal 2: Continue acquisition and protection of open space land, and enhance the capability of the **natural environment** to improve Little Compton’s resilience against impacts of natural hazards including flooding, storm surge, erosion, sea level rise (SLR), extreme heat, and drought, as well as to safeguard water quality.

Goal 3: Strengthen interdepartmental and stakeholder/partner efforts to identify and understand potential natural hazard risks in Little Compton, including the deleterious impacts from climate change and sea level rise, as well as corresponding mitigation and adaptation measures, and communicate this information to citizens and business owners through **public education and engagement**.

Goal 4: Establish conditions for improved **pre-disaster preparedness and post-disaster response and recovery**.

6.3 DEVELOPMENT OF ACTION PLAN

The Advisory Committee considered a wide-range of mitigation and non-mitigation actions to incorporate into the *2024 Action Plan*.

DMA Requirement §201.6(c)(3)(ii):

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction’s participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

CRS CREDIT:



Mitigation Planning Element	CRS Planning Step	Max Pts
Phase III –Mitigation Strategy	7. Review Possible Activities (c-g)	25

CRS Coordinator’s Manual – Activity 510: Floodplain Management Planning

6.3.1 Review Possible Activities/Actions

As discussed in **Section 5**, the Town reviewed possible preventive activities, such as zoning, building codes, and subdivision ordinances, as well as the status of the actions included in the Town’s 2018 HMP for potential inclusion in the updated *Action Plan*. To further support CRS Activity 510 Planning Process - Step 7, a large array of additional possible activities was also reviewed.

The broad-based list of possible activities was generated from Advisory Committee input, public engagement via the Public Opinion Survey, and through key planning documents. The list of possible mitigation and non-mitigation activities compiled from the documents and Public Opinion Survey is included in **Appendix 6-1**. The possible activities were reviewed based on the following criteria:

- supports the 2024 *HM&FMP* Goals
- supports the 2018 Comprehensive Plan Natural Hazard & Climate Change goal & policies
- potential funding capability
- staff and implementation capability
- supports CRS program
- mitigation category
- activity previously completed or no longer a priority

In the Public Opinion Survey (**Appendix 2-2**), when asked to rank level of concern regarding specific natural hazards, most people were extremely concerned about Coastal Flooding & Coastal Erosion (49.6%), Wind-Related Hazards (46.5%), and Vector Borne Diseases Transmitted by Ticks or Mosquitoes (42.3%). With respect to the weighted score, the top five hazards of concern based on the Public Opinion Survey, were: Coastal Flooding/Erosion, Wind-Related, Vector-Borne Diseases (Ticks/ Mosquitoes), Winter-Related, and Inland Flooding.

The Advisory Committee used the results of the Public Opinion Survey as one of the resources in developing their *Risk Assessment* (**Subsection 4.2.2**). The Committee's *Risk Assessment* identified the following natural hazards as the most prevalent threats to the Town of Little Compton: High Winds, Tropical Cyclone (Tropical Depression, Tropical Storm & Hurricane), Heavy Snow & Ice, Coastal Flooding including Storm Surge, Extreme Heat, Inland Flooding, Thunderstorm including Lightning and Hail, and Extreme Cold.

To mitigate the potential impacts from natural hazards, particularly those identified as a greater risk to Little Compton or the region, the Advisory Committee performed a systematic review of a broad spectrum of possible activities, including actions from all six of the categories below. As documented in **Appendix 6-1**, under consideration were measures that would reduce flood and other natural hazard damage to buildings and infrastructure through preservation of open space, revisions to zoning and subdivision ordinances, and implementation of green infrastructure and structural projects. Outreach actions to promote awareness and encourage the private sector to take preventative action to mitigate risks associated with flooding and other hazards were also reviewed, as were actions associated with emergency services and capacity building within the municipal government.

Action Categories:

- **Prevention:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built, or otherwise assist in reducing the impacts of a natural hazard. These actions include public activities to reduce hazard losses such as planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection:** Actions that involve the modification of existing buildings or infrastructure to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, flood proofing, storm shutters, shatter resistant glass, **as well as implementing or improving green/natural infrastructure.**
- **Public Education & Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the potential risks from hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, also preserve, supplement and restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, tree planting and maintenance, and wetland restoration and preservation.

- **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include storm water controls (e.g., culverts), floodwalls, seawalls, retaining walls, and safe rooms.
- **Emergency Services:** Actions that will protect or enhance emergency services before, during, and immediately after an occurrence. Examples of these actions include protection of critical facilities, emergency response infrastructure, and protection of or improvements to warning system capability.

6.3.2 Choose & Develop Possible Actions

Due to budgetary and other constraints it would be impossible over the ensuing 5-year period to implement all of the possible activities/actions the Committee reviewed. As such, it was necessary to scale back the possible actions based on a number of parameters including: if the action is expected to substantially reduce the impact of one or more of the hazards identified in the *Risk Assessment*; compatibility in terms of the Town's vulnerabilities and capabilities; compatibility with other community programs and objectives; if the action supported one or more of the *Mitigation Goals*; continued compliance with the NFIP; possible crossover CRS activity; if the action could realistically be implemented based on staff time; and potential funded sources.

The possible actions which originated from other Town planning documents (refer to the list below) or from the 2024 Public Opinion Survey, have been included in **Appendix 6-1**, and for cross-referencing have been identified as either being included or not in the *2024 Action Plan*. **It should be noted that the specification "included" refers to the general intent of the reviewed action (i.e. the wording may vary or some particular aspects may not be included – however, the action in some form is essentially represented).** Similar actions from various sources were combined and rewritten for inclusion in the *2024 Action Plan*.

Key Planning Documents:

- Local Hazard Mitigation Plan (2018; updated June 2019)
- Comprehensive Plan (2018)
- Little Compton MRP Community Resilience Building (CRB) Workshop Summary of Findings (2020)
- Little Compton Water Quality and Aquatic Habitat Management Plan (2022-Draft)
- Watson Reservoir Watershed Plan (2021)
- Rhode Island State Hazard Mitigation Plan (2019)
- Conservation Commission Study: "Do We Have Enough Water in Little Compton" (2022)
- Emergency Operations Plan (2012)
- Harbor Management Plan – Sakonnet Harbor (2010)
- Geographic Information System (GIS)
- HM&FMP Public Opinion Survey (2024) - *Outreach Activity #5*

Actions

After thoroughly vetting an extensive array of possible activities, a total of 13 actions were developed by the Advisory Committee. As outlined in the following subsection, these actions underwent a STAPLEE prioritization evaluation.

6.3.3 Prioritize Actions - STAPLEE Evaluation

In accordance with the *Disaster Mitigation Act 2000 (DMA)*, the Advisory Committee undertook a process to prioritize actions in order to assist in creating an implementation guideline for mitigating natural hazard risks. Each of the actions reviewed received a priority score based upon a general set of criteria common to public administration officials and planners, known as STAPLEE. The acronym stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental.

The STAPLEE method includes a general benefit-cost review as part of prioritizing actions. The Committee considered the probable benefits that would result from an action versus a general magnitude of cost. This review was done based on experience and judgment but is not considered a full benefit-cost analysis. When seeking funding assistance or inclusion in the capital improvement program (CIP), a more detailed analysis may need to be conducted. A description of the **criterion and the full STAPLEE evaluation** can be found in **Appendix 6-2**.

All 13 actions, even those with lower STAPLEE rankings, have been included in the *Action Plan*. It was determined that actions receiving lower rankings should be included as they are still relevant to achieving the overall goals of the *HM&FMP*, and over the *Plan's* lifecycle circumstances may change to improve their ranking (e.g., political/social support is bolstered, grant funding opportunities arise, etc.). In the *Action Plan*, to recognize the higher prioritized actions, the numeric listing under each goal is from highest to lowest STAPLEE ranking.

6.3.4 Actions Supporting Community Rating System (CRS) Program

The most common and the most destructive natural disaster in the United States is flooding, the damage from which is not covered under a standard homeowner's policy. In 1968, to protect lives and property and to reduce the financial burden of providing disaster assistance, Congress created the National Flood Insurance Program (NFIP) which is administered by the Federal Emergency Management Agency (FEMA). The NFIP offers flood insurance to communities that comply with minimum standards for floodplain management. All Rhode Island municipalities, including the Town of Little Compton, currently comply with the minimum standards, allowing residents to purchase federal flood insurance through the NFIP.

As discussed in **Subsection 2.3**, beyond the minimum NFIP requirements, communities can choose to participate in a voluntary incentive program known as the Community Rating System (CRS), to further improve flood mitigation and achieve discounts on NFIP flood insurance premiums for property owners. A community's CRS classification is based on credit points earned for its activities. Any combination of activities that reduce flood losses through better mapping, regulations, public information, flood damage reduction, and flood warning and preparedness programs can be implemented. The discounts on flood insurance premiums range from 5% (rate class 9) up to 45% (rate class 1). It has been shown that CRS incentives have encouraged communities to broaden mitigation programs and keep them going even during periods of budgetary challenges (FEMA. *National Flood*).



As previously indicated, the Town of Little Compton is committed to continued compliance with the NFIP and is also interested in participating in the CRS program. To improve flood management throughout the Town and to bolster entrance into the CRS program, Little Compton chose to integrate CRS Activity 510 (Floodplain Management Planning) into their Hazard Mitigation planning process therein creating a *Hazard Mitigation & Flood Management Plan*. Throughout this document both HMP and CRS requirements have been noted.

In the *Action Plan*, **cross-over actions** that could potentially garner CRS credit, depending on how they are implemented and documented, have been identified.

NFIP: Participation in the National Flood Insurance Program (NFIP) is voluntary and is based on a community's agreement to adopt and enforce, at a minimum, the Federal standards for building within a Special Flood Hazard Area (SFHA). In exchange, the Federal Government makes flood insurance available as a financial protection against flood losses.

In compliance with NFIP Requirements, per Town Ordinance § 14-5.9 Special Flood Hazard Areas, (Appendix 5-1) the Town of Little Compton:

- Adopts the latest effective Flood Insurance Rate Maps (FIRMs)
- Assists in the preparation and revision of floodplain maps
- Issues or denies floodplain development/building permits
- Inspects all development to assure compliance with the local floodplain management regulations
- Maintains records of floodplain development
- Assists residents in obtaining information on flood hazards, floodplain map data, flood insurance, and proper construction measures

6.3.5 Action Descriptors

The *Action Plan* includes the following descriptors:

- **Action Number and Description.** The description is a brief overview of the action. The Action Number has been assigned based on the STAPLEE priority ranking (from highest to lowest) under each Goal.

For example:

2024 Action G1-A represents the highest prioritized action associated with Goal 1

2024 Action G2-B represents the second highest prioritized action associated with Goal 2

If two or more actions received the same priority score, they have been arbitrarily listed one after the other.

- **Lead & Support.** The lead(s) identified is the proposed authority responsible for overseeing implementation of an action. **It is likely that most actions will require interdepartmental and stakeholder support.** In **Table 6-1**, the anticipated lead(s) has been listed first with some potential supporting partners listed alphabetically in parentheses.

Acronyms describing leads and supporting partners:

◇ BBNEP: Buzzards Bay National Estuary Program	◇ PSIC: Providence Stormwater Innovation Center
◇ BC: Beach Commission	◇ RIDOH: RI Department of Health
◇ BO: Building Official	◇ RIDOT: RI Department of Transportation
◇ CC: Conservation Commission	◇ RIEMA: RI Environmental Management Agency
◇ CERT: Community Emergency Response Team	◇ SPA: Sakonnet Preservation Association
◇ CRMC: Coastal Resources Management Center	◇ TC: Town Council
◇ DPW: Department of Public Works	◇ TCL: Town Clerk
◇ EMD: Emergency Management Director	◇ TFD: Town Finance Director
◇ ERICD: Eastern RI Conservation District	◇ TNC: The Nature Conservancy
◇ FD: Fire Department	◇ TreeC: Tree Committee
◇ HC: Harbor Commission	◇ TreeW: Tree Warden
◇ LCACT: LC Agricultural Conservancy Trust	◇ TXA: Tax Assessor
◇ LCHT: Little Compton Housing Trust	◇ URI-CI: URI Coastal Institute
◇ PB: Planning Board	◇ USACE: United States Army Corps of Engineers
◇ PD: Police Department	◇ WRWA: Westport River Watershed Alliance

- **Cost & Funding Source.** The magnitude of cost is a generalized estimate based on Advisory Committee, departmental, or stakeholder experience with similar initiatives. It is recognized that some degree of municipal staff time will be necessary for the successful implementation of all actions. Hence, staff time is represented within each category. As funding is often an obstacle to implementing mitigation actions, preliminary funding sources have been identified in **Table 6-1**. Refer to **Appendix 5-3** for information about specific grants identified as a possible funding opportunity,

Costs are categorized as follows:

- ◇ Minimal (\$): less than \$50,000
- ◇ Moderate (\$\$): between \$50,000 - \$100,000
- ◇ Significant (\$\$\$): over \$100,000

- **Timeframe & Kickoff.** The timeframe was based on a combination of factors including STAPLEE priority, complexity of the action, and the current phase of the action (e.g., conceptual, preliminary design, final design). For non-ongoing actions, the kickoff indicates in which year of this five-year *Plan* the action is proposed to commence.

Timeframe	Kickoff
◇ Ongoing: in place and expected to continue	◇ Begin in year X: where X = the year in the Plan's lifecycle (2024-2029) when the action is proposed to commence
◇ Short-term: less than 2-years	
◇ Medium-term: between 2 and 4-years	
◇ Long-term: over 4-years	

- **Priority Ranking & CRS Activity.** The priority ranking was determined by the Advisory Committee through the STAPLEE evaluation (**Appendix 6-2**). The STAPLEE numeric ranking is provided for each action and the actions have been listed in order of ranking under each Goal. As the Town is interested in participating in the Community Rating System (CRS) program, cross-over actions that could **potentially garner CRS credit, depending on how they are implemented and documented**, have been identified.

- **Action Category.** In developing the *Action Plan*, the Advisory Committee sought to include a wide-range of actions to comprehensively address the established hazard mitigation *Goals*. The following categories, described in **Subsection 6.3.1**, were used:

- | | |
|--------------------------------|-------------------------------|
| ◇ Prevention | ◇ Natural Resource Protection |
| ◇ Property Protection | ◇ Structural Projects |
| ◇ Public Education & Awareness | ◇ Emergency Services |

- **Hazard Addressed.** Which hazard(s) a particular action addresses has been recorded in **Table 6-1**. The *Action Plan* has at least one action for each of the hazard categories identified in **Subsection 4.2** and listed below:

- ◇ Flood-Related
- ◇ Wind-Related
- ◇ Winter-Related
- ◇ Infectious Disease-Related:
 - ◆ Vector-borne Diseases Transmitted by Ticks or Mosquitoes
 - ◆ Contagious Respiratory Illness Caused by Influenza Viruses or Coronaviruses
- ◇ Other:
 - ◆ Earthquake
 - ◆ Extreme Heat
 - ◆ Drought
 - ◆ Brush Fire

- **Reference.** Actions from the following planning documents were considered for inclusion in the *2024 Action Plan*. The *Action Plan* identifies which of the following sources reference the measure. Often more than once source is referenced because similar actions from various documents were grouped together and rewritten as single actions in the *2024 Action Plan*. A more detailed crossover assessment has been included in **Appendix 6.1**.

- ◇ 2018 LHMP: Local Hazard Mitigation Plan (2018; updated June 2019)
- ◇ 2018 CP: Comprehensive Plan (2018)
- ◇ 2020 SOF: LC MRP Community Resilience Building (CRB) Workshop Summary of Findings (2020)
- ◇ 2022 CCS: Conservation Commission Study "Do We Have Enough Water in Little Compton" (2022)
- ◇ 2022 WQAHP: Little Compton Water Quality and Aquatic Habitat Management Plan (2022-Draft)
- ◇ 2021 WR WP: Watson Reservoir Watershed Plan (2021)
- ◇ 2019 RI-SHMP: Rhode Island State Hazard Mitigation Plan (2019)
- ◇ 2012 EOP: Emergency Operations Plan (2012)
- ◇ 2010 HMP-SH: Harbor Management Plan – Sakonnet Harbor (2010)
- ◇ GIS: Geographic Information System (GIS)
- ◇ 2024 POS: HM&FMP Public Opinion Survey (2024) - Outreach Activity #5

6.4 ACTION PLAN (2024-2029)

All of the chosen *Actions* support the *Mission Statement* and *Goals*. They reflect updated priorities, including response to climate change and accelerated sea level rise, and address the Town's current and projected future needs. The *Action Plan* is organized by *Goal* and includes a description of the action, along with other descriptors including the STAPLEE priority ranking, which may assist the Town as a guideline for implementation.

The priority ranking, timeframe, and kickoff for each action is provided as a guide and recognized as flexible due to staff and funding availability. It is also recognized that the identified lead for an action may shift from one party to another, or become a shared responsibility. To augment local funding, the Town should aggressively pursue grants to support these actions.

CRS CREDIT:		
Mitigation Planning Elements	CRS Planning Steps	Max Pts
Phase III –Mitigation Strategy	8. Draft an Action Plan	60

CRS Coordinator's Manual – Activity 510: Floodplain Management Planning

DMA Requirement

§201.6(c)(3)(iii):

The mitigation strategy section shall include an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

In addition to the acronyms identified in **Subsection 6.3.5**, the following acronyms are provided as reference for the *Action Plan*:

BMP: Best Management Practice
 CIP: Capital Improvement Program
 CRS: Community Rating System
 CSSLP: Community Septic System Loan Program
 DMP: Debris Management Plan
 EMA: Emergency Management Agency
 EOP: Emergency Operations Plan
 EPA: Environmental Protection Agency
 FEMA: Federal Emergency Management Agency
 GIS: Geographic Information System
 HWM: High-Water Mark
 LID: Low-Impact Development

NFIP: National Flood Insurance Program
 OWMP: Onsite Wastewater Management Plan
 OWTS: Onsite Wastewater Treatment System
 RIDEM: RI Department of Environmental Management
 RISNER: Rhode Island Special Needs Emergency Registry
 ROW: Right-of-Way
 SFHA: Special Flood Hazard Area
 SLAMM: Sea Level Affecting Marshes Model
 SLR: Sea Level Rise
 USDA|NCRS: United States Department of Agriculture
 Natural Resources Conservation Service
 USFWS: United States Fish and Wildlife Service

Natural Hazard Mitigation Action Plan

The *HM&FMP* Advisory Committee chose to develop an **AMBITIOUS Action Plan** that sought to **INTEGRATE** actions and initiatives identified in nine key local planning documents; the newly launched Town geographic information system (GIS); comments provided by community members, businesses, and other stakeholders in the 2024 *HM&FMP* Public Opinion Survey; relevant actions identified in other jurisdiction mitigation plans; and additional ideas identified by the Committee and other stakeholders.

By intentionally being broad-based and inclusive, the Committee recognizes that the potential work associated with the Action Plan will realistically span beyond the five-year *Plan* life-cycle. The Committee also recognizes that budgetary, staffing, and other constraints will also impact the amount of mitigation-related work implemented by the Town over the next five-years. **However, by including a broad spectrum of actions, the Advisory Committee is providing opportunities for smaller, low-budget projects to be implemented as staff time permits, as well as leveraging opportunities to implement larger projects based on the availability of grant funding.**

Table 6-1 Town of Little Compton 2024-2029 Action Plan

Goal 1: Reduce natural hazard impacts to the built environment, including infrastructure, in order to safeguard essential services including efficient transportation and transmission of essential utilities, and to protect property including cultural and historic resources. Policy 1.1: Continue to incorporate hazard resilience for property development and land use into zoning ordinances and other regulatory provisions in an effort to reduce exposure to natural hazards. Policy 1.2: Reduce the impact of development within the floodplain and other vulnerable areas, and anticipate the potential future need for structural elevations or retreat from coastal shorelines. Policy 1.3: Maintain and improve critical infrastructure durability.						
Action 2024 G1-A: Complete steps to enroll in FEMA's Community Rating System (CRS) Program and support related activities in an effort to improve the Town's floodplain programs and correspondingly reduce the cost of flood insurance through the National Flood Insurance Program (NFIP) for Little Compton property owners.						
Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
BO (TC)	Minimal \$ Funding: Operating Budget	Short-term Begin in 2024	Ranking Score 21 CRS Activity Enroll in Program	Prevention	Flood-Related	2018 LHMP; 2018 CP

Action 2024 G1-B: Assess, monitor, maintain, and implement improvements to public roadways and associated drainage infrastructure (including culverts) to mitigate flooding, and incorporate resilient designs to ensure, wherein feasible, continued service during natural hazard events. The biggest threat to continued service of roadways during natural hazard events is flooding. As such, management of stormwater along public roads and rights-of-way (ROWs) is the primary focus of this action. Through implementing green infrastructure measures, to the extent feasible, this action will also serve to increase groundwater recharge and improve groundwater quality. For culvert replacements, perform site-specific data collection, geotechnical evaluation, hydrologic and hydraulic evaluation, and structure type evaluation to support design, and as required, replace downstream culverts first. On State roadways, this action requires coordination with the Rhode Island Department of Transportation (RIDOT), and on roadways in the vicinity of coastal features and waters, this action requires coordination with the Coastal Resources Management Council (CRMC). Resources: RI Stormwater Solutions; Inventory of LID projects in RI.

To prepare for potential sea level rise (SLR) inundation, the Town should undertake a comprehensive study of those sections of roadway that may be subject to SLR, in an effort to identify opportunities for realignment or redesign.

Potential projects include:

- Develop and implement a comprehensive annual stormwater maintenance program for Town-owned roads.
- Sections of Town-owned public roads that are subject to repetitive flooding and require stormwater management improvements either upgradient or adjacent to the roadway include:
 - Burchard Avenue (Bioretention, page 58)
 - John Sisson Road
 - Long Pasture Road
 - South Shore Road
 - Swamp Road
 - Town Way
 - John Dyer Road (Consider engaging the Buzzards Bay National Estuary Program (BBNEP) and Westport River Watershed Alliance (WRWA) in discussions on mitigating stormwater flooding from the junction of John Dyer Road/Colebrook Road and continuing roughly 1,000 feet south)
- Consider implementing end-of-road retrofit projects and municipal parking area retrofit projects, which may include pavement removal and green infrastructure, to manage runoff and erosion. Due to high-water table or other site limitations, stormwater management for some of these sites may prove technically or economically impractical and the Town should instead/in-conjunction consider upgradient control measures such as tree trench BMPs (stormwater management measures). Potential sites include:
 - South Shore Beach parking area
- Consider upgradient stormwater control BMPs, as well increasing culvert sizes under the following roads to improve flood resilience:
 - Meeting House Lane (RIDOT)
 - Pottersville Road (RIDOT)
 - William Sisson Road
- For sections of public roads under RI Department of Transportation (RIDOT) jurisdiction that are subject to repetitive flooding or future SLR inundation, work with the State to include these roads as part of the State Transportation Improvement Program (STIP), and on the STIP identify the need for roadway drainage improvements and possible sectional redesign and/or realignment. These roads include:
 - East Main Road (Linear Bioretention, page 57)
 - Main Street (Adamsville)
 - Meeting House Lane
 - Peckham Road Linear (Bioretention, page 55)
 - Sakonnet Point Road
 - Simmons Road
 - West Main Road (Linear Bioretention, page 60)

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
TC (CRMC, DPW, EMD, PSIC, RIDOT)	Significant \$\$\$ Funding: CIP; RIDOT-STIP; Grants (MRP Action Grant, RIDEM-OSCAR & Climate Resilient Fund, NBEP, FEMA-BRIC)	Long-term Begin in 2024	Ranking Score 14 CRS Activity 540	Property Protection; Natural Resource Protection; Structural Projects	Flood-Related	2018 LHMP; 2018 CP; 2020 SOF; 2021 WRWP; 2024 POS

Action 2024 G1-C: Review and as deemed locally practical, amend the Zoning Ordinance and Subdivision Regulations to:

- a. **ensure appropriate resiliency and environmental protection is incorporated in new private and public development and redevelopment, especially in vulnerable areas including special flood hazard areas, coastal erosion zones, areas subject to sea level rise, and sensitive natural habitats.** This action is intended to revise existing ordinances and create new ordinances, with consideration for climate change and natural hazards in land use planning. Guidance and potential incorporation of documents from state and federal environmental agencies such as the Coastal Resources Management Council (CRMC), Rhode Island Department of Environmental Management (RIDEM), Federal Emergency Management Agency (FEMA), and United States Fish and Wildlife Service (USFWS) into local regulations is also intended with this action. The Town will:
- help ensure compliance with the National Flood Insurance Program (NFIP) requirements by disallowing variances from flood regulations for new construction located within the Special Flood Hazard Area (SFHA) and ensure 50%+ renovations comply with current standards.
 - conduct a build-out analysis (assessment of future development capacity) to assist in determining the necessity for subdivision and/or zoning regulation amendments. Resources: New Shoreham Comprehensive Plan Build-Out Analysis; Statewide Planning - Land Use Standards
 - after conducting a build out analysis, consider the merits of an ordinance requiring new developments to have underground utilities.
 - comprehensively study existing and future land use in coastal areas most vulnerable to sea level rise, storm surge, and coastal erosion, and, through robust public engagement (including local stakeholders such as conservation agencies, non-profit organizations, and the business community), evaluate strategies to manage development and mitigate risks. Consideration may be given toward creating a Coastal Pond Overlay District to recognize and protect the sensitive nature of the coastal environment and to coordinate with CRMC policies and regulations.
 - conduct a review of the new RIDEM freshwater wetland regulations (effective July 1, 2022) to determine if additional freshwater wetland protections are warranted in Little Compton.
 - investigate the feasibility of establishing a stormwater utility district as a stable source of funding for stormwater management needs.
- b. **enhance green infrastructure approaches, including Low-Impact Development (LID) requirements (practices that can be employed at the site-level to control stormwater and strive to replicate the pre-development hydrology of the site), particularly in areas vulnerable to natural hazards.** The Town will complete RIDEM's LID Municipal Self-Assessment and use EPA's Revising Local Codes to Facilitate Low Impact Development and/or other guidance to assist in reviewing LID measures (such as incorporation of vegetation and trees, reduction in impervious surface, porous pavement, tree trench BMPs, raingardens, and biofiltration) to treat and reduce stormwater runoff, especially in coastal areas and floodplains, and to reduce solar heat conduction and wind velocities. *Note: Best Management Practice (BMP) means a practice, or combination of practices, that is determined to be an effective and practicable means of preventing or reducing the amount of pollution generated by nonpoint sources (coming from disperse activities) to a level compatible with water quality goals.*

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
PB, TC (BO)	Minimal \$ Funding: Operating Budget; Grants (RIDSP-Technical Assistance Program)	Short-term Begin in 2025	Ranking Score 12 CRS Activity 420, 430, 450	Prevention	Flood-Related; Wind-Related; Winter-Related; Extreme Heat	2018 LHMP; 2018 CP; 2020 SOF; 2022 WQAHMP; 2021 WRWP; 2024 POS

Action 2024 G1-D: In conjunction with the U.S. Army Corps of Engineers (USACE) and other partners, investigate measures to mitigate the impact of storm surge and wave action in the area of Sakonnet Harbor, including those in the 1980 Army Corps proposal. Concepts may include a riprap breakwater, a natural reef such as oyster beds, and a chain of moored floating wave attenuators. In February 2024 the USACE visited the Sakonnet Harbor to survey damage from two recent winter storms and prepare to restore the breakwater to as-built condition. USACE engineers indicated any further growth of the breakwater for better future protection would require much larger boulders and a shallower outward slope to both dissipate wave energy and break up wave coherence. The need for this would have to compete with many other requests for USACE investment. The Harbor Commission will be seeking external support to develop the argument for improvements, beginning with establishing capability for new local wind and wave observations. For northerly protection, a variety of options will be examined once the ocean dynamics are better understood. Concepts to be evaluated may include a riprap breakwater, a natural reef such as oyster beds, and a chain of moored floating wave attenuators. These efforts would require coordination with the USACE and CRMC. Resources: Sakonnet Harbor 1981 Project Report; Brooklyn Wave Attenuation; Kittery, ME Wave Attenuation Feasibility Study.

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
HC, TC, EMD (CRMC, USACE)	Significant \$\$\$ Funding: Harbor Management Fund; Grants (MRP Action Grant)	Long-term Begin in 2024	Ranking Score 10	Natural Resource Protection; Structural Projects	Flood-Related; Wind-Related; Winter-Related	2018 CP; 2020 SOF; 2024 POS

Goal 2: Continue acquisition and protection of open space land, and enhance the capability of the **natural environment** to improve Little Compton's resilience against impacts of natural hazards including flooding, storm surge, erosion, sea level rise (SLR), extreme heat, and drought, as well as to safeguard water quality.

Policy 2.1: Identify and sustainably protect and manage open space areas that are vulnerable to natural hazards and SLR.

Policy 2.2: Preserve existing tree canopy and maintain public trees for their value as green infrastructure and their ability to mitigate natural hazards such as flooding, erosion, and extreme heat.

Policy 2.3: Protect the Sakonnet Harbor area, including property and natural resources, from impacts of natural hazards and SLR.

Action 2024 G2-A: Prioritize and implement shoreline stabilization and adaptation projects. Work with LC Agricultural Conservation Trust (LCACT), and other stakeholders, to increase the resiliency of the Town to climate change and sea level rise impacts, including reducing upland property damage through shoreline stabilization and adaptation projects. To the extent practical, implement green infrastructure (including planting trees and other vegetation in living shoreline projects, and replacing invasive species with native species) on Town-owned/LCACT property. Resources: SLAMM Maps; BI Harbors Sea Level Rise Study.

Potential projects include:

- Identify lands that can accommodate salt marsh migration in response to sea level rise, and work with stakeholders to prioritize preservation of these lands.
- Explore longer-term options for maintaining Town-owned public beach/shoreline access facilities.

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
TC, PB (BC, CC, CRMC, ERICD, LCACT, SPA, TNC)	Moderate \$\$ to Significant \$\$\$ Funding: Operating Budget; CIP; Grants (MRP Action Grant, RIDEM-OSCAR & Climate Resilient Fund, NFWF-NCR, NBEP, FEMA-BRIC, CRMC-CEHRPTF)	Long-term Begin in 2026	Ranking Score 19	Property Protection; Natural Resource Protection; Structural Projects	Flood-Related; Wind-Related; Winter-Related	2018 CP; 2020 SOF; 2022 WQAHMP; 2021 WRWP; 2024 POS

Action 2024 G2-B: Coordinate with the Little Compton Agricultural Conservation Trust (LCACT), Sakonnet Preservation Association (SPA), The Nature Conservancy (TNC), and other conservation organizations, State and Federal agencies, and local property owners in the maintenance, restoration, acquisition, and protection of open space, especially wetlands, flood hazard areas, coastal migration areas, and other natural resource areas (ex. agricultural land), to improve resiliency. This Action supports beach ecosystem preservation and landward migration of coastal habitats, such as estuarine beaches and dunes, salt marshes, and coastal forests, as these features must be allowed to migrate in response to sea level rise in order to continue to provide some level of natural storm protection.

a. Existing Conservation Holdings: Maintenance & Restoration

Continue to maintain a detailed inventory and map of all conserved lands in Little Compton and periodically update map layers posted on the Town's GIS.

- On Town/LCACT owned or managed conservation lands, identify and implement maintenance and/or restoration projects. Restoration projects to improve resilience and enhance wildlife habitat may include revegetation, beach nourishment, and removal of invasive species/replacement with native species.
- Promote (via presentations, articles, or other social media platforms) maintenance and/or restoration projects on conserved lands to highlight environmental and resilience benefits.

b. Potential Future Conservation Holdings: Acquisition & Protection

To aid in determining which properties not currently protected will enhance resilience, continue development and maintenance of a plan and priority map for the future preservation of key parcels.

- In addition to potential key parcels for conservation consideration, the priority map may also identify potential "green corridors" to connect conserved parcels, as well as natural features such as floodplains, wetlands and watercourses, barrier beaches, coastal ponds, forest, and agricultural land.
- The map should depict sea level inundation predictions to help conservation organizations prioritize future coastal adaptation/landward migration areas.
- The plan for preservation will identify potential funding to permanently protect these areas, such as through LCACT, and RIDEM Open Space Acquisition grants. In addition, other mechanisms such as conservation easements and zoning amendments should be explored. Resource: [Putting Smart Growth to Work in Rural Communities](#).
- The map should be shared with the Little Compton Housing Trust (LCHT) in order to explore cooperative acquisitions that meet the dual goals of land conservation and affordable housing development. Resource: [Vermont Housing and Conservation Board – Examples of Dual Goal Projects](#).
- The LCACT or Conservation Commission (CC) should explore participating in the Half-Earth project.

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
LCACT (CC, LCHT, SPA, TNC)	Minimal \$ to Significant \$\$\$ Funding: LCACT Tax; Grants (RIDEM-Section 319 & Local Open Space Grant)	Ongoing	Ranking Score 17 CRS Activity 420	Prevention; Public Education & Awareness; Natural Resource Protection	Flood-Related; Wind-Related; Winter-Related; Extreme Heat; Drought; Brush Fire	2018 LHMP; 2018 CP; 2020 SOF; 2022 WQAHMP; 2021 WRWP; 2024 POS

Action 2024 G2-C: Expand green infrastructure stormwater management practices throughout the natural environment through monitoring, maintenance, and implementing new or retrofitting existing stormwater measures, and strengthen the Town's maintenance and management of public trees. The primary intent of this Action is to mitigate the impact of flooding on property, structures, and infrastructure; increase groundwater recharge and improve groundwater quality; and mitigate risks from falling trees/limbs.

- a. Improve flood storage capacity by increasing frequency of maintenance on stormwater BMPs (stormwater management measures), and cleaning out waterways and drainage areas to help increase conveyance and minimize localized flooding from stormwater runoff.
- b. Retrofit or implement green infrastructure (such as stormwater infiltration areas, tree and vegetation plantings, rain gardens, tree trench BMPs) on Town-owned property and rights-of-way (ROWs) to mitigate stormwater flooding and/or improve flood storage capacity. Care should be taken to improve stormwater retention in new designs or improvements to existing parks and public building grounds, including reducing the amount of hardscape or replacing hardscape with permeable materials.

Potential projects include:

- The outflow stream from The Ponderosa's pond is a vital source of water for fire suppression in the area of the Commons. Currently, invasive phragmites and insufficient culvert capacity under Meeting House Lane are restricting flow, causing siltation, and effectively diminishing the water depth of the pond. Additionally, undersized culvert capacity is causing flooding during storm events, risking damage to adjacent commercial structures, and flooding sections of Meeting House Lane. The Town will work with the Sakonnet Preservation Association (SPA), the owner and manager of this public use property, and support grant funding opportunities to design and implement improvements that will, amongst other benefits, increase the quantity and reliability of water available for fire suppression while also addressing storm-related flooding risks.
 - Consider implementing green infrastructure stormwater management measures at Town recreation fields.
 - On Town property, or working with interested land owners, identify beneficial riparian buffer improvements along key streams and brooks.
- c. Strengthen Town maintenance and management of public trees to mitigate hazards such as stormwater flooding, erosion, and extreme heat, and to reduce risk to people or property from falling trees/limbs. This action may include increasing the Tree Warden budget to accelerate tree maintenance (including stump removal along road shoulders, which are difficult to see yet may cause similar vehicular damage to hitting a tree), encouraging RI Energy to further maintain trees along power lines, planting new native tree species (preferably with high carbon sequestering rates) on Town property and ROWs (*right tree/right place*), and identifying locations where trees should not be planted. The Town will consider pursuing a RIDEM Urban & Community Forestry Grant to create a Tree Inventory with the ultimate goal of developing an ongoing five-year urban forestry plan for all Town-owned property. The Tree Inventory, coordinated by the Tree Committee and/or Tree Warden, will utilize community volunteers to collect data.

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
TC, PB, CC (for <i>The Ponderosa</i> – SPA, EMD) (DPW, EMD, LCACT, SPA, TNC, TreeW, TreeC)	Minimal \$ to Moderate \$\$ Funding: Operating Budget; CIP; Grants (MRP Action Grant, RIDEM-OSCAR & Climate Resilient Fund & Urban/Community Forestry Grant, NBEP, FEMA-BRIC)	Ongoing	Ranking Score 14 CRS Activity 540	Property Protection; Natural Resource Protection	Flood-Related; Wind-Related; Winter-Related; Extreme Heat; Drought	2018 CP; 2020 SOF; 2022 WQAHMP; 2021 WRWP; 2024 POS

Goal 3: Strengthen interdepartmental and stakeholder/partner efforts to identify and understand potential natural hazard risks in Little Compton, including the deleterious impacts from climate change and sea level rise, as well as corresponding mitigation and adaptation measures, and communicate this information to citizens and business owners through **public education and engagement**.

Policy 3.1: Educate the public on the concept of community resilience, including steps individuals, families, and businesses can take to better protect themselves and their property from the impacts of natural hazards, and measures that will reduce contributions to climate change, which is a threat multiplier for natural hazards.

Policy 3.2: Educate the public on the value of open space, permeable surfaces, wetlands, and trees to mitigate hazards such as flooding, erosion, extreme heat, and drought.

Policy 3.3: Include hazard mitigation review as part of all development projects.

Policy 3.4: Educate residents on the importance of maintaining properly functioning onsite wastewater treatment systems (OWTS) and the potential of obtaining low-interest loans through the Community Septic System Loan Program (CSSLP), in order to reduce the threat of sewage contaminating wells, local water resources, and the environment in general.

Action 2024 G3-A: Conduct community outreach and engagement to increase awareness of and improve emergency preparedness/response to impacts from all profiled hazards. This action includes education related to risks and preparedness associated with flooding, coastal erosion, dam failure, high winds, thunderstorms, lightning, tornadoes, hurricanes, winter weather, tick- or mosquito-borne diseases, influenza or coronavirus, earthquakes, extreme heat, drought, and brush fires; as well as information on climate change. The intent of the action is to educate and engage the community through implementing various types of programs which may include presentations, workshops, demonstrations, posting information at Town facilities and on the Town website, information in the school newsletter, articles in the Sakonnet Times or other social media platforms, and direct mailings. Target audiences include the general public, property owners in higher-risk hazard areas, seniors, students, local businesses, elected officials/decision-makers, and local boards/commissions. To increase effectiveness of programs, engage stakeholders such as the Community Emergency Response Team (CERT), Conservation Commission (CC), Coastal Resources Management Council (CRMC), Eastern RI Conservation District (ERICD), LC Agricultural Conservancy Trust (LCACT), Providence Stormwater Innovation Center (PSIC), RI Emergency Management Agency (RIEMA), RI Department of Health (RIDOH), Sakonnet Preservation Association (SPA), The Nature Conservancy (TNC), and the URI Coastal Institute (URI-CI) to participate/lead outreach activities.

Potential Programs include:

- Strengthen interdepartmental efforts to identify and understand potential natural hazard risks in Little Compton through implementation of *HM&FMP* actions, participation in the annual *HM&FMP* assessment, and by Including hazard mitigation review as part of all development projects.
- Publicize signing up for the CodeRED Emergency Notification System to receive communication prior to, during, and after natural hazard events that threaten to or impact the Town and publicize enrolling in the Rhode Island Special Needs Emergency Registry (RISNER).
- Publicize the local hurricane evacuation routes and protocol, and facilities, such as shelters and warming centers, available to the public in times of power outages, loss of heat, and other secondary impacts resulting from natural hazards.
- Post alerts on the Town website about impacts from impending/occurring natural hazards.
- Update the Town's Emergency Management webpage to provide a link to the *HM&FMP* and other natural hazard related information.
- Publicize general emergency preparedness steps residents and businesses can take to be better prepared in the event of a natural disaster (such as RIDOH's My Emergency Plan Workbook or RIEMA's Disaster Supply Kit Checklist), as well as actions to take for a home or business that may help mitigate the impacts of specific natural hazards.
- Provide copies at the Brownell Library of FEMA, RIDOH, and other publications on how to mitigate risks from/prepare for/recover from all natural hazards profiled in the *HM&FMP*. Include links to these publications on the Town's website.
- Consider establishing a non-emergency communication system for email and/or texting to alert those interested that information on resilience-related matters has, for example, been posted on the Town's website or that an event will be taking place.
- Create Wi-Fi hot spots in all business zones.

- Educate residents downstream of dams on potential risks due to breach or failure.
- Publicize maps identifying Little Compton's Special Flood Hazard Area (SFHA), hurricane inundation areas, and sea level rise projections, as well as various web-based tools for determining a property's flood zone and risks to flooding from 100-year storm events and various sea level rise scenarios.
- Conduct a workshop open to the general public, but also targeted at property owners in higher-risk hazard areas, on adaptive strategies for flood- and wind-related hazards. Topics may include steps to take before/during/after a flood event, flood insurance, upgrading property to meet current building code requirements to protect against flood and wind damage, hazard resistant designs and materials, minimizing impermeable surfaces, and FEMA opportunities to elevate structures in the SFHA. The Northeast States Emergency Consortium is a good resource on how to protect your home & property and plan for specific hazards events.
- Distribute information on flood prone areas and flood insurance to local real estate agencies, which can be passed on to potential purchasers.
- Develop and implement a High-Water Mark (HWM) and roadway signage program consistent with NFIP's HWM initiative, to increase public awareness of flooding risk and potential future high tide levels from sea level rise. Signage could include a Coastal Cradle to support photo documentation of shoreline change over time. Photos could be publicized on MyCoast RI or other sites.
- Conduct a workshop to teach residents the basics of fire safety including proper use of fire extinguishers, window ladders, advantageous locations of smoke detectors, etc. and also publicize the information on the Town's website. In addition, educate regarding the benefits of clearing brush from property to minimize fuel in the event of a brush fire (encourage composting cleared brush).
- Conduct a workshop on how to correctly plant and maintain native tree species and the overall benefit of trees and vegetation with respect to flooding, heat index, and carbon sequestering. Also discuss the importance of removing invasive plant species and replacing with native species.
- Conduct a workshop to promote the benefit of shade structures on public property to protect from extreme heat, and determine potential location, types, and configuration of shade structures to be installed.
- Conduct outreach regarding public health risks and steps to protect from extreme heat, winter weather, vector-borne diseases transmitted by ticks or mosquitoes, and influenza or coronavirus.
- Encourage all Department Heads, Town Council members, and Chairs of local boards/commissions to complete the PREP-RI training modules, which focus on increasing the capacity of decision-makers to enhance local resilience to the impacts of natural hazards and climate change.
- Develop a publicly accessible online tracking program (ex. ArcGIS StoryMap) identifying the Town's hazard mitigation and climate adaptation projects so the public, Town Council, and other boards/commissions are aware of progress that has been made and future plans toward enhancing resilience of residences, businesses, infrastructure, and ecosystems.
- Publicize the *HM&FMP* annual evaluation report, including submitting the report to the Town Council, releasing the report to the media, and making the report available to local boards/commissions and the public-at-large.

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
EMD, CERT (BO, CC, CRMC, ERICD, FD, LCACT, PSIC, RIEMA, RIDOH, SPA, TCL, TNC, TreeC TreeW, URI-CI)	Minimal \$ Funding: Operating Budget; Grants (MRP Action Grant, SNEP-Technical Assistance Network, ERICD Technical Assistance)	Long-term Begin in 2024	Ranking Score 24 CRS Activity 330, 340, 350, 440	Property Protection; Public Education & Awareness; Structural Projects	All Profiled Hazards	2018 LHMP; 2018 CP; 2020 SOF; 2022 WQAHMP; 2021 WRWP; 2024 POS

Action 2024 G3-B: Conduct community outreach and engagement to increase awareness of and promote residents and businesses to take actions that will improve the quantity and quality of groundwater. The intent of the action is to educate and engage the community through implementing various types of programs which may include presentations, workshops, demonstrations, posting information at Town facilities and on the Town website, articles in the Sakonnet Times or other social media platforms, and direct mailings. Target audiences include the general public, property owners with shallow or poor producing wells, property owners with older onsite wastewater treatment systems (OWTS), students, local businesses, elected officials/decision-makers, and local boards/commissions. To increase effectiveness of programs, engage stakeholders such as the Conservation Commission (CC), Eastern RI Conservation District (ERICD), LC Agricultural Conservancy Trust (LCACT), Providence Stormwater Innovation Center (PSIC), Sakonnet Preservation Association (SPA), The Nature Conservancy (TNC), and the URI Coastal Institute (URI-CI) to participate/lead outreach activities.

Potential Programs include:

- Communicate through various mechanisms what measures community members can take to improve the quantity and quality of the Town's groundwater, including:
 - supporting town-wide preservation of wetlands and open space
 - supporting town-wide implementation of green infrastructure
 - minimizing the use of chemical fertilizer, pesticides, and deicing solution
 - properly disposing of all waste, including pet waste and household hazardous waste
 - encouraging residents to test their wells as often as pollution risk demands
 - minimizing water use during periods of drought
 - maintaining/testing septic systems to ensure they are not leaking
 - implementing green infrastructure on their property, such as rain gardens, planting/maintaining native trees and vegetation, replacing sections of mowed lawn area with wildflower gardens, and improving/restoring riparian buffers along streams
- Enlist the help of community members and other stakeholders, such as the ERICD, to restore vegetated buffers around streams, and to implement green infrastructure BMPs (stormwater management measures) on conservation land.
- Develop a drought management plan including identification of indicator wells across Town to provide early warning of insufficient water levels, and establish a resource plan for households in need of portable water, which might include a municipal cistern or other local drawing place for emergency potable water.
- Elevate the importance of forests and trees, and create a list of native tree species that will be more resilient to climate change and have higher carbon sequestering rates. Make the list available to residents and use when developing public projects.
- Implement a program to offer rain barrels to residents (such as those sponsored by ERICD), and provide information on water conservation and water quality.
- Work with partners, such as ERICD, to provide guidance and tools for farmers (including small part-time farmers) regarding identification of non-point source pollution (coming from disperse activities), where and what type of BMPs (stormwater management measures) to implement (nutrient management, fencing livestock out of streams and wetlands, planting cover crops, etc.), and available educational and funding resources, such as through USDA/NRCS, and RIDEM (Clean Water Act – Section 319).
- Create an ad-hoc committee to review and implement the onsite wastewater management plan (OWMP) that Weston & Sampson are contracted to develop (refer to 12-7-2023 Town Council minutes). Under State law the Town of Little Compton has the authority to establish a local management program to encourage or require septic system maintenance. Program elements may include passing an ordinance requiring system inspections, educating homeowners on good practices for system maintenance, or specifying more stringent treatment requirements in environmentally sensitive areas. Once the Town's OWMP is approved by RIDEM, Little Compton will be eligible to apply to the Community Septic System Loan Program (CSSLP). CSSLP funds are used by participating jurisdictions to provide interest-free loans to homeowners to cover the costs associated with septic system repairs and upgrades. The ad-hoc committee should consider working with RIDEM, as well as reaching out to communities with existing OWMPs to determine successful methods of implementing the program.

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
CC (BO, EMD, ERICD, LCACT, PB, PSIC, SPA, TC, TCL, TNC, TreeW, TXA URI-CI)	Minimal \$ Funding: Operating Budget; Grants (MRP Action Grant, RIDEM-Section 319, SNEP-Technical Assistance Network, ERICD Technical Assistance, URI Cooperative Extension Technical Assistance)	Long-term Begin in 2024	Ranking Score 24	Preservation; Property Protection; Public Education & Awareness; Natural Resource Protection	Flood-Related; Drought	2018 CP; 2020 SOF; 2022 CCS; 2022 WQAHMP; 2021 WRWP; 2024 POS

Action 2024 G3-C: Continue to enhance GIS capabilities.

Improve Geographic Information Systems (GIS) capabilities through increased training to Town personnel and through adding to the geodatabase to support emergency management and DPW activities, planning, grant development, property tax revaluations, and community use.

Potential New GIS Layers:

- stormwater drainage system including outfall discharges to surface waters and contributing drainage areas
- stormwater catchment areas
- pond location for immersing fire suppression water pumps
- public trees along road ROWs
- elevation certificates
- wells (or a subset of wells that are known to go dry first as a mechanism to gage groundwater level)
- onsite wastewater treatment systems (OWTS)
- evacuation routes
- benchmarks
- coastal erosion data
- future flood vulnerabilities (projected 100-year storm and SLR scenarios)
- location of major flood events to identify patterns of flooding
- public access to waterways

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
TXA (BO, CC, EMD, TreeC, TreeW, TC)	Minimal \$ to Moderate \$\$ Funding: Operating Budget; Grants-depending on layer (MRP Action Grant, NBEP)	Medium-term Begin in 2024	Ranking Score 20 CRS Activity 310, 440	Public Education & Awareness; Emergency Services	Flood-Related; Wind-Related; Winter-Related	2020 SOF; 2022 WQAHMP; 2021 WRWP; GIS

Goal 4: Establish conditions for improved **pre-disaster preparedness and post-disaster response and recovery.**

Policy 4.1: Support coordinated municipal preparedness, response, and recovery efforts to all natural hazard disasters.

Policy 4.2: Provide guidance and references to residents and businesses on natural hazard disaster recovery assistance.

Action 2024 G4-A: Continue to improve emergency response and recovery coordination amongst community facilities and services, and members of the public, through an emergency services network and citizens emergency response team (CERT). Create direct connections between the critical service organizations and the public to help get resources to those in need quicker during and after natural disasters. Continue to utilize and update municipal communications strategy to get important information out to residents, including expanding Code Red and the Special Needs Registry. Consider mechanisms to strengthen the reliability of the communications network, particularly to reduce impacts from wind-related communication interruptions. Resource: Sustainable NJ Municipal Communications Strategy Action Guidance.

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
EMD, TC (BO, DPW, FD, PD, RIDOH, RIEMA, TCL, TFD)	Minimal \$ Funding: Operating Budget; Grants (RIEMA-EMPG)	Ongoing	Ranking Score 19 CRS Activity 610	Public Education & Awareness; Emergency Services	All Profiled Hazards	2018 CP; 2020 SOF; 2024 POS

Action 2024 G4-B: Continue to improve the Town's capacity for pre-natural disaster preparedness and post disaster response, and recovery.

Potential Capacity Building Activities:

- Develop a database and strategy of grant funding options and collaborate both interdepartmentally and with partners to obtain grant funding to support hazard mitigation projects, especially those identified within this *HM&FMP*.
- Consider establishing a part-time or contractual position to assist with resilience grant funding and implementation of resilience-related projects and initiatives.
- Update the Town's *Emergency Operations Plan (EOP)* in accordance with *FEMA's 2021 Comprehensive Preparedness Guide*.
- As identified in the EOP, to ensure local readiness, from time to time, conduct an exercise (simulated emergency) in order to provide practical controlled emergency operations experience to those who have direction and control responsibilities.
- Develop a *Debris Management Plan (DMP)* for inclusion in the Town's EOP. A DMP is essential for handling the impact of fallen debris and tree limbs as a result of wind events, thunderstorms, ice storms, blizzards, or other natural hazards.
- Develop an *Emergency Action Plan (EAP)* for Watson Dam for inclusion in the Town's EOP.
- Update the Town's *Harbor Management Plan* in accordance with *CRMCs Guidelines for the Development of Municipal Harbor Management Plans*. The update should be in accordance with the Town's *2018 Comprehensive Plan* and this document (*HM&FMP*), and should address future SLR projections as adopted by CRMC.
- Continue to improve Town staffing capacity through training & support on natural hazard preparedness, response, and recovery.
- Support the Building Official in obtaining a floodplain manager certification in order to improve coordination and implementation of stormwater management activities, including those associated with the NFIP and CRS programs.
- Continue to meet the National requirements for the Fire Department, and identify and secure funding for training and equipment needed for the Fire Department and/or Harbormaster.
- Install a back-up generator at the Community Center.

- Evaluate and maintain sources of water for fire suppression across Town, and assess options to improve fire suppression capabilities in the Commons area, and install a dry hydrant in the area of Tunipus Pond.
- Add a high water vehicle able to navigate flooded areas to the Police and Fire Department fleet.
- Review current emergency evacuation plans and identify emergency transportation challenges, ensuring transportation is considered for residents with mobility limitations as identified in the Rhode Island Special Needs Emergency Registry (RISNER).
- Establish a Resilience & Energy Committee to develop a town-wide Energy & Climate Action Plan that supports measures outlined in the 2018 Comprehensive Plan and other key local planning documents.

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
EMD, TC (BO, DPW, FD, PD, TCL, TreeW)	Minimal \$ Funding: Operating Budget; Grants (MRP Action Grant, RIEMA-EMPG)	Ongoing	Ranking Score 18 CRS Activity 610	Emergency Services	All Profiled Hazards	2018 LHMP; 2020 SOF; 2012 EOP; 2010 HMP-SH; 2024 POS

Action 2024 G4-C: Implement policies and programs to reduce the impacts of infectious diseases, specifically tick- or mosquito-borne, and influenza or coronavirus. This action includes reviewing and updating the Town's policies and programs for controlling the mosquito and tick populations, and preventing the spread of influenzas and coronaviruses. Infectious disease programming will primarily be focused on public education, but should also include procedures for dealing with outbreaks. The Town will consider installing tick- and mosquito-borne disease warning signs at high risk Town properties and encourage local conservation groups to take similar action.

Lead & Support	Cost & Funding Source	Time-frame & Kickoff	Priority Ranking & CRS Activity	Action Category	Hazard Addressed	Reference
EMD, TC (FD, RIDOH, TCL, TFD)	Minimal \$ Funding: Operating Budget; Grants (RIEMA-EMPG)	Ongoing	Ranking Score 13	Prevention; Public Education & Awareness; Emergency Services	Infectious Disease-Related	2020 SOF; 2024 POS

SECTION 7

Plan Adoption, Implementation, and Maintenance

Subsections

7.1 ADOPT THE PLAN

7.2 IMPLEMENT AND MAINTAIN THE PLAN

7.2.1 Implement the Plan

7.2.1.1 Incorporate the
Plan into Existing
Planning Mechanisms

7.2.2 Evaluate and Revise the Plan

7.2.2.1 Continued
Public Involvement

7.2.2.2 Funding
Opportunities

7.2.3 5-Year Plan Update

7 Plan Adoption, Implementation, and Maintenance

Hazard Mitigation Plan: The Town of Little Compton has successfully met the following requirements →
44 CFR Subsection D §201.6(c)(4): [The plan shall include] a plan maintenance process.

44 CFR Subsection D §201.6(c)(5): [The plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan.

CRS - Flood Management Plan: The Town of Little Compton has successfully met the following Mitigation Strategy requirements based on the 10-step planning process for CRS Activity 510 → Adopt the Plan (Step 9); and Implement, Evaluate, Revise (Step 10)

The Town of Little Compton has completed a lengthy community-based process to update their 2018 Hazard Mitigation Plan and expand it to encompass flood management planning in accordance with CRS Activity 510. In doing so, the HM&FMP Advisory Committee has sought to embrace all aspects of the process and create a broad-based *Action Plan* including prevention, property & natural resource protection, structural projects, public education & awareness, and emergency service protection activities. As has been demonstrated through the inclusion of the Code of Federal Regulations (CFR) Local Mitigation Plan requirements throughout this document, and further demonstrated through the use of FEMA's Local Mitigation Plan Review Tool (**Appendix 7.2**), the *Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan* meets all 44 CFR §201.6 requirements.

The Town of Little Compton and the HM&FMP Advisory Committee are committed to the implementation of this *Plan* and recognize that successful hazard mitigation is an ongoing process that requires:

- ❖ endorsement and support from Town Officials and the community
- ❖ a strategy for monitoring, evaluating, and updating the *Plan*
- ❖ incorporating the mitigation goals and activities into other local planning mechanisms
- ❖ continued public participation

**Figure 7-1 Tree Collapses on Power Lines
(February 2022)**

Photo Credit: Chief Richard Petrin



**Figure 7-2 Flooding Along Oliver Lane
(December 23, 2022)**

Photo Credit: Vita Longo

7.1 ADOPT THE PLAN

The *HM&FMP* went through an extensive iterative process before formal adoption by the Little Compton Town Council. Throughout the development of the Plan, the Advisory Committee followed FEMA’s CRS floodplain management 10-step planning process, which aligns with Disaster Mitigation Act (DMA) 2000 requirements. The CRS planning process was beneficial as it helped to ensure that the opportunity for public input and feedback occurred throughout the process.

CRS CREDIT:			
Mitigation Planning Elements	CRS Planning Steps	Max Pts	
Phase IV – Plan Maintenance	9. Adopt the Plan	2	

CRS Coordinator’s Manual – Activity 510: Floodplain Management Planning

As documented in Section 2, during the development of the *Plan*, the Advisory Committee met numerous times to provide input, feedback, and guidance on the document. Once satisfied that all provisions had been successfully met, the Advisory Committee authorized the Town’s Consultant, Kim Jacobs, to finalize the *DRAFT Plan* and disseminate it for public review. The public review period occurred from April 19 - May 9, 2024. During this 3-week public review period, the Town posted the *Public Review DRAFT* on the Town’s website, and a hard copy was made available for viewing at the Little Compton Clerk’s Office in the Town Hall.

In order to further public participation in the process, the Public Review Period and Public Hearing were widely advertised. Publicity included a press release in *The Sakonnet Times*, information on the Town’s website, an informational kiosk at Brownell Library, a notice posted at the Town Hall and Public Safety Complex, an announcement at the Stakeholder Hosted Public Informational Session (April 10, 2024), information on the Harbor Commission and Conservation Commission April meeting agendas, two Public Hearing legal notices in *The Sakonnet Times*, and a notice of the Public Hearing posted on the Secretary of State website, Town website calendar, *HM&FMP* Project Webpage, and in the Town Hall and Public Safety Complex. Additionally, the Town sent an email publicizing the *Draft Plan* and Public Hearing to the groups and organizations listed in **Appendix 2-3**, which includes the Town Council and other Town boards and commissions, local businesses, neighboring jurisdictions, and numerous other local, regional, and State stakeholders.

During the Public Review Period the Town did not receive any written comments from members of the community or other stakeholders. At the end of the Public Review Period, on May 9, 2024, a **Public Hearing** was hosted by the Little Compton Town Council. At the beginning of the Public Hearing, the Town’s Consultant gave a brief project presentation providing an overview of the planning process, community engagement, the hazards included, what is at risk, the Town’s capabilities, the *Action Plan*, and *Plan* implementation. The presentation was followed by a public Q&A/comment period. No questions or comments were offered by the Town Council or members of the public.

Town Council Adoption of HM&FMP:

After the public comment period, the Town Council voted unanimously to adopt the *HM&FMP*, with the acknowledgment that during the subsequent review/approval process by RIEMA/FEMA, any required revisions would be accepted by said adoption. The Town Council Resolution adopting the *Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan* is included in **Appendix 7-1**.

FEMA Approval of HM&FMP:

On August 7, 2024, the *Plan* received approval from FEMA, which confirmed that the *HM&FMP* met all requirements (**Appendix 7-2**). The FEMA Approved and Town Council adopted *Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan* will be maintained on the Town’s website and replaces the Town’s 2018 Local HMP.

7.2 IMPLEMENT AND MAINTAIN THE PLAN

DMA Requirement §201.6(c)(4)(i):

[The plan maintenance process shall include] a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

CRS CREDIT:

Mitigation Planning Elements	CRS Planning Steps	Max Pts
Phase IV – Plan Maintenance	10. Implement, Evaluate, Revise	26

CRS Coordinator’s Manual – Activity 510: Floodplain Management Planning

The success of the *HM&FMP* lies in the ability to effectively implement the mitigation actions, and regularly evaluate and revise the *Plan* for continued relevancy. In doing so, Little Compton will continue building a resilient community - one in which critical lifeline systems, including roads, utilities, infrastructure, and other support facilities, will function in the midst of natural hazards, helping to ensure the safety of the community.

7.2.1 Implement the Plan

Implementation of the mitigation activities will be more successful if they are incorporated into the day-to-day functions and priorities of Little Compton’s government. A number of action descriptors were included in the *Action Plan* (**Table 6-1**), which will aid implementation. For each mitigation action, the descriptors provide a clear course for the actions to be incorporated into departmental and committee-based work plans and budgets.

Over the ensuing 5-years, the 2024-2029 *Action Plan* outlines a substantial amount of mitigation measures the Town could implement. The timeframe for each action is provided as a guide and recognized as flexible due to staff and funding availability. It is also recognized that the identified lead for an action may shift from one party to another, or become a shared responsibility.

7.2.1.1 Incorporate the Plan into Existing Planning Mechanisms

State regulations require that hazard mitigation be addressed within Comprehensive Plans (CP). The Town of Little Compton’s 2018 Comprehensive Plan contains a Natural Hazards & Climate Change Element. It is the intent of the Town to further integrate hazard mitigation into all applicable elements as the CP is updated. Incorporating pertinent aspects of the *HM&FMP* throughout the CP will strengthen the Town’s position to implement hazard mitigation as it will carry the full legal weight and authority of the Comprehensive Plan.

DMA Requirement §201.6(c)(4)(ii):

[The plan maintenance process shall include] a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

In addition to the Comprehensive Plan, the mitigation strategies & principles, vulnerability information and mitigation actions outlined in the *HM&FMP*, will be incorporated, where appropriate, into other Town planning mechanisms. Doing so will leverage activities that have co-benefits, reduce risk and increase resilience. **Appendix 5-1** includes plan integration considerations for key existing planning documents. Further integration will occur as land use plans & regulations, mutual aid agreements, and such, are updated or developed.

7.2.2 Evaluate and Revise the Plan

As directed by FEMA, “To be useful, planning must be ongoing and plans must be dynamic. Therefore, the community must have an evaluation and update process” (FEMA. *National Flood*, 510-25).

Success of Little Compton’s *Hazard Mitigation & Flood Management Plan* will be measured by the degree to which actions are sustainably implemented and the *Plan* is maintained. At the Town Council’s regular meeting on December 7, 2023, the Council voted unanimously to create an Advisory Committee to assist and oversee the development of the Hazard Mitigation & Flood Management Plan (Town of Little Compton RI. *Town Council*, 14). The HM&FMP Advisory Committee is comprised of six Town staff members and six members of the public. **The Advisory Committee, or its successor committee with a similar membership, be charged with monitoring and evaluating implementation of the *Plan*.** Doing so will maintain public representation in the implementation and evaluation process and will afford the Town more CRS credit points for Activity 510-Step 10.

The Little Compton Emergency Management Director (EMD) will serve as the *Hazard Mitigation & Flood Management Plan* lead, reviewing actions on an ongoing basis and coordinating the annual HM&FMP Evaluation Meetings. Should the Advisory Committee choose to convene on a semi-annual or quarterly basis, additional CRS credit points can be achieved. **At a minimum, the Town will conduct an annual review which is key to ensuring the *Plan* reflects current information and continues to meet the needs of the Town. The annual meeting will be held in October to align with Little Compton’s annual municipal budget process** in order to identify where capital improvement funding will be required. All meetings will be publicly noticed in accordance with Town and State open meeting laws and the public will be encouraged to attend and participate.

The Rhode Island Emergency Management Agency (RIEMA) has issued a State requirement (Element H) related to plan evaluation, which the Town of Little Compton will comply with. While RIEMA encourages jurisdictions to meet twice a year to discuss mitigation goal progress, they are requiring for annual meetings wherein: RIEMA is invited, the meeting minutes are sent to RIEMA within 30 days after the meeting, and the meeting is open to the public and posted in several places to promote community awareness and encourage public engagement. In addition RIEMA is requiring certain local stakeholders (wherein applicable to the particular municipality) participate in the annual meeting: Mayor or Town Administrator, Emergency Manager, Director of DPW, Fire Chief, Police Chief, Planning Department, Finance Department, Floodplain Manager, and Building Official. With respect to Little Compton, most of these positions are represented on the HM&FMP Advisory Committee (**Section 2**). Currently, Little Compton’s Building Official functions as the Floodplain Manager, and the Town does not have a Planning Department. **To ensure compliance with RIEMA’s Element H, in addition to the Town staff already designated as part of the HM&FMP Advisory Committee, the Town Administrator, Police Chief, and Finance Department will be invited to participate in the annual evaluation meetings.**

During the annual review, an assessment of progress on each of the goals and activities in the *Plan* will be discussed and documented in an Evaluation Report. Recommendations will be made concerning the various aspects of *Plan* implementation, including timeframes for completion of activities, funding and staffing resources, responsible entities, stakeholder engagement, coordination efforts, and priority standings of activities. Some activities that are found to be unachievable may be removed from the *Plan* and activities addressing problems unforeseen during plan development may be added. Implementation successes, hurdles, and lessons learned will also be identified. Further, the Committee will consider whether there have been any changes to the nature, magnitude, or type of risks, and whether the goals remain current and appropriate. The meeting also provides an opportunity to discuss new recommendations or findings from other planning initiatives, policy changes, studies, research, etc. that may influence plan implementation. As Little Compton intends to participate in the CRS program, upon becoming a CRS community, the annual Evaluation Report needs to be submitted to the Town Council, released to the media, made available to the public, and submitted with the annual CRS recertification.

The Committee will also convene within a month after a natural disaster to discuss the effectiveness of implemented actions, and if deemed appropriate, revise the *Plan* to reflect lessons learned from Town officials and community members based on their experiences during and after the hazard event.

7.2.2.1 Continued Public Involvement

For the *Plan* to be effective and relevant over time, continued community involvement throughout the implementation and maintenance process will be essential. Ongoing community engagement continues the hazard risks discussion and builds support for mitigation activities. Community members will be given the opportunity to affect the content and outcomes of the *HM&FMP* through outreach, public meetings, and community forums. Little Compton residents, local and regional stakeholders, neighboring community members, and the public-at-large will be encouraged to participate in the process through advertised meetings and events.

DMA Requirement

§201.6(c)(4)(iii):

[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

The annual *Plan* Evaluation Meetings, which will provide updates and findings on the progress and implementation of the *Plan*, will be open to the public. The annual progress of the *Plan* will be reported to the Town Council and posted on the HM&FMP Project webpage. The public can also stay involved through the use of the [Town's website](#), where updates to the *Plan* as well as other hazard mitigation information is posted.

7.2.2.2 Funding Opportunities

An array of funding can be used to finance improvements that mitigate hazards. The Town of Little Compton can budget for larger mitigation projects in its Capital Improvement Program (CIP) or finance improvements locally through bond issues. Various grants, including the Rhode Island Infrastructure Bank (RIIB) Sewer Overflow and Stormwater Reuse Municipal Grant Program, FEMA Hazard Mitigation Grant Program, RIIB Municipal Resilience Program (MRP) Action Grant, American Rescue Plan Act, Coronavirus Relief Fund (CARES Act), FEMA Assistance to Firefighters, and RIDEM Volunteer Fire Assistance Grant have assisted the Town over the past five years in funding projects associated with natural hazard mitigation and community resilience, and may be utilized in the future. A list of recent hazard mitigation related grants awarded to the Town has been included in **Appendix 5-3**. Rhode Island State Department of Transportation (RIDOT) projects may address stormwater runoff and flood management on roadways under State jurisdiction. Further, local college programs, and other organizations, may be able to donate resources to help plan, communicate risks, or implement mitigation activities.



Figure 7-4 FEMA Grant Programs

Image credit: FEMA

Adoption of this *Plan* by the Little Compton Town Council will also assist the Town in maintaining eligibility and enhancing application priority for certain federal and State grants utilized for mitigation efforts. FEMA prioritizes municipalities that have completed a risk assessment and established mitigation projects with detailed information on the timeline, cost, and municipal department responsible for completing the project. FEMA grant opportunities for mitigation activities include FEMA's Flood Mitigation Assistance (FMA) Grant Program, Pre-Disaster Mitigation (PDM) Grant Program, Building Resilient Infrastructure & Communities (BRIC), and post-disaster Hazard Mitigation Grant Program (HMGP). Additional information on grant opportunities has been provided in **Appendix 5-3**.

7.2.3 5-Year Plan Update

The *Town of Little Compton 2024 Hazard Mitigation & Flood Management Plan* is a **dynamic document** and, as discussed in **Subsection 7.2.2**, over the 5-year implementation period there will be an ongoing plan maintenance schedule. Additionally, as required by FEMA, in accordance with 44 CFR §201.6(d)(3), to maintain eligibility for mitigation project grant funding, the plan needs to undergo a **full update every 5-years** to reflect changes in development, progress in local mitigation efforts, changes in priorities, and updated science-based data and tools on hazard tracking, climate change, etc. To ensure that the revised plan will be approved within the 5-year cycle, it is proposed that the Town commence the update on the fourth anniversary of the *Plan* adoption date.

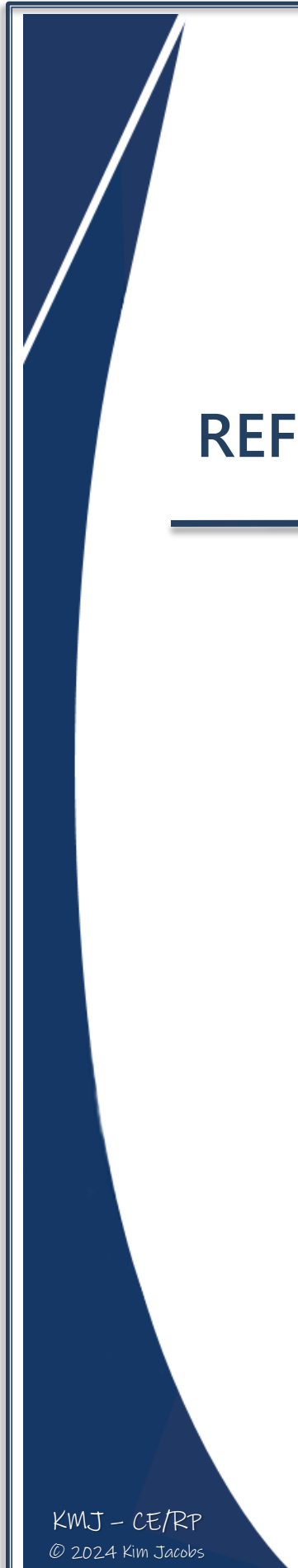
The HM&FMP Advisory Committee, with the Emergency Management Director as Chair, will be responsible for overseeing the 5-year update. All relevant Town departments, boards, agencies, and other stakeholders will be engaged in the process.

In general, the 5-year update will follow the process implemented for the development of this document. The process will include Advisory Committee meetings (open to the public) to update the community profile; review and modify hazard profiles and potential impacts to the Town, vulnerable assets, changes in development, community capabilities, and mitigation goals; update the status of mitigation actions included in the 2024 HM&FMP; identify lessons learned based on the effectiveness of the 2024 HM&FMP; and identify new mitigation actions.

As the Town appreciates the emphasis placed on **public participation** in CRS Activity 510, the 5-year update will follow the CRS Activity 510 - 10 Step Planning Process. Similar to this update, an extensive public outreach program will be implemented and public comments will be solicited throughout the planning process.

To financially support the 5-year plan update process, the Town should consider applying for FEMA BRIC or other applicable funding during the third year of the plans' life-cycle.





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ACRONYMS

Acronyms

ACS - American Community Survey
ADA - Americans with Disabilities Act
ARPA - American Rescue Plan Act of 2021
ASCE - American Society of Civil Engineers
ASFPM - Association of State Floodplain Managers

BCC – Building Code Commission
Beach SAMP - Rhode Island Shoreline Change Special Area
Management Plan
BFE - Base Flood Elevation
BMP - Best Management Practice
BRIC - Building Resilient Infrastructure & Communities

CBRA - Coastal Barrier Resources Act
CDBG - Community Development Block Grant
CDC - Centers for Disease Control and Prevention
CEHRPTF - Coastal and Estuary Habitat Restoration
Program and Trust Fund
CERI – Coastal Environmental Risk Index
CERT - Community Emergency Response Team
CFR - Code of Federal Regulations
CHA – Coastal Hazard Application
CIP- Capital Improvement Program
COVID-19 - Coronavirus Disease 2019
CP - Comprehensive Plan
CRB - Community Resilience Building
CRMC - Coastal Resources Management Council
CRS - Community Rating System
CSSLP - Community Septic System Loan Program
CSTE - Council of State and Territorial Epidemiologists
CWSRF - Clean Water State Revolving Fund

DMA - Disaster Mitigation Act
DMP - Debris Management Plan

EAP - Emergency Action Plan
EAS – Emergency Alert System
EC4 – Executive Climate Change Coordinating Council
EDA - US Economic Development Administration
EEE - Eastern Equine Encephalitis
EMA - Emergency Management Agency

EMD - Emergency Management Director
EOP - Emergency Operations Plan
EPA - Environmental Protection Agency
EQIP – Environmental Quality Incentives Program
ERICD - Eastern Rhode Island Conservation District

FEMA - Federal Emergency Management Agency
FFOS - Farm, Forest and Open Space Program
FIMA - Federal Insurance and Mitigation Administration
FIRM - Flood Insurance Rate Map
FIS - Flood Insurance Study
FMA - Flood Mitigation Assistance
FSA - Farm Service Agency
FTE - Full-Time Equivalent

GIS - Geographic Information System
GMSL - Global Mean Sea Level

HHS - Health and Human Services
HM&FMP - Hazard Mitigation & Flood Management Plan
HMGP - Hazard Mitigation Grant Program
HMP - Hazard Mitigation Plan
HSGP - Department of Homeland Security Grant Program
HWM - High-Water Mark

IBC – International Building Code
ICC – International Code Council
IPCC - Intergovernmental Panel on Climate Change
ISDS - Individual Sewage Disposal System

LCACT - Little Compton Agricultural Conservancy Trust
LCCC – Little Compton Community Center
LCSD - Little Compton School Department
LCWC – Little Compton Wellness Center
LID - Low-Impact Development

MMI - Modified Mercalli Intensity
MPO – Metropolitan Planning Organization
MRP - Municipal Resilience Program
MSC – Map Service Center

NASA - National Aeronautics and Space Administration
 NAWAS – National Warning System
 NBEP - Narragansett Bay Estuary Program
 NBNERR - Narragansett Bay National Estuarine Research Reserve
 NCDC - National Climatic Data Center
 NCEI - National Centers for Environmental Information
 NEPA - National Environmental Policy Act
 NESEC - New England States Emergency Consortium
 NFDRS - National Fire Danger Rating System
 NFIP - National Flood Insurance Program
 NFWF - National Fish and Wildlife Foundation
 NHC - National Hurricane Center
 NOAA - National Oceanic and Atmospheric Association
 NRDC - Natural Resources Defense Council
 NRICD – Northern RI Conservation District
 NWS - National Weather Service

 OSCAR - Ocean State Climate Adaptation and Resilience
 OWMP - Onsite Wastewater Management Plan
 OWTS - On-site Wastewater Treatment System

 PAHPA - Pandemic and All-Hazards Preparedness Act
 PDM - Pre-Disaster Mitigation
 PDSI - Palmer Drought Severity Index
 PR - Public Review
 PSI - Pandemic Severity Index

 RIACD - Rhode Island Association of Conservation Districts
 RIDEM - Rhode Island Department of Environmental Management
 RIDOA - Rhode Island Department of Administration
 RIDOH - Rhode Island Department of Health
 RIDOT - Rhode Island Department of Transportation
 RIDPS - Rhode Island Department of Public Safety
 RIDSP - Rhode Island Division of Statewide Planning
 RIEMA - Rhode Island Emergency Management Agency
 RIFMA - Rhode Island Flood Mitigation Association
 RIGIS - Rhode Island Geographic Information System
 RIIB - Rhode Island Infrastructure Bank
 RIOER - Rhode Island Office of Energy Resources
 RIPTA - Rhode Island Public Transit Authority
 RISCO - Rhode Island Statewide Communications Network

RI-SHMP - Rhode Island State Hazard Mitigation Plan
 RISNER - Rhode Island Special Needs Emergency Registry
 RL - Repetitive Loss
 ROW - Right-of-Way

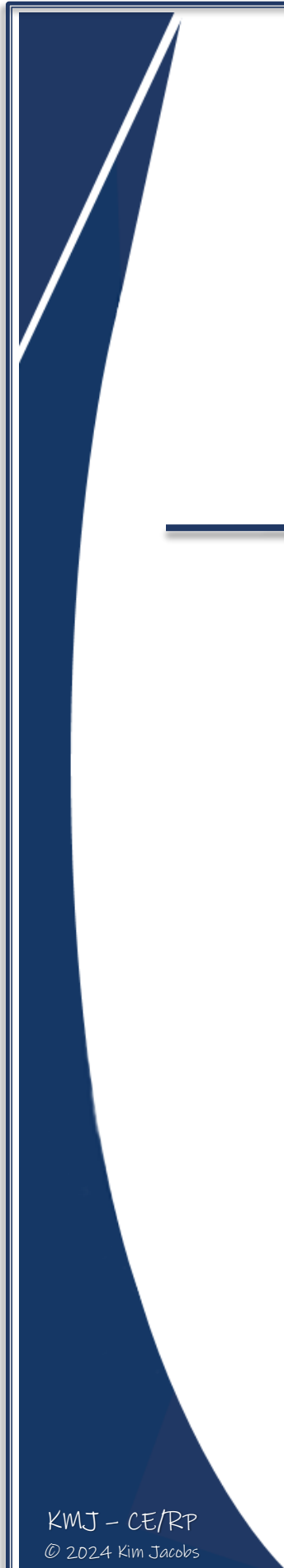
 SDWA - Safe Drinking Water Act
 SFHA - Special Flood Hazard Area
 SHSP - State Homeland Security Program
 SLAMM - Sea Level Affecting Marshes Model
 SLOSH - Sea, Lake, and Overland Surges from Hurricanes
 SLR - Sea Level Rise
 SMMA - Simmons Mill Management Area
 SMPDBK - Simplified Dam Break
 SNEP - Southern New England Program
 SOF - Summary of Findings
 SPA - Preservation Association
 SRICD - Southern RI Conservation District
 SRL - Severe Repetitive Loss
 STAPLEE - Social, Technical, Administrative, Political, Legal, Economic, and Environmental
 STIP - State Transportation Improvement Program

 TA - Technical Advisor
 TDS - Total Dissolved Solids
 TNC - The Nature Conservancy

 UNHSC - University of New Hampshire Stormwater Center
 URI - University of Rhode Island
 USACE – United States Army Corps of Engineers
 USDA|NRCS – United States Department of Agriculture Natural Resources Conservation Service
 USFWS - United States Fish and Wildlife Service
 USGS - United States Geological Survey
 USHUD - US Department of Housing and Urban Development

 VOA - Voluntary Organizations Active in Disasters

 WCT - Wind Chill Temperature
 WHIP – Wildlife Habitat Incentives Program
 WHO - World Health Organization
 WNV - West Nile Virus



GLOSSARY

Glossary

Action Plan – A sequence of steps to achieve specific goals, including identification of responsible parties, resources required, and a timeline.

American Community Survey – The framework by which the Census Bureau collects and publishes demographic, social, housing, and economic data.

Base Flood Depth (BFD) – The depth shown on the Flood Insurance Rate Map (FIRM) for Zone AO that indicates the depth of water above highest adjacent grade resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.

Base Flood Elevation (BFE) – The computed elevation to which floodwater is anticipated to rise during the base flood. BFEs are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles. The BFE is the regulatory requirement for the elevation or floodproofing of structures. The relationship between the BFE and a structure's elevation determines the flood insurance premium.

Beaufort Scale – Created in 1805, a scale still used today as a standardized scale for characterizing wind.

Berm – A geomorphologic feature usually located at mid-beach and characterized by a sharp break in slope, separating the flatter backshore from the seaward-sloping foreshore.

Brush Fire – A fire burning in vegetation that is predominantly shrubs, brush, and scrub growth. Peak fire season in Rhode Island is typically between mid-March and mid-May when dry windy weather can occur increasing the potential for fires.

Building Code – The Rhode Island State Building Code.

Built Environment – Manmade surroundings including buildings, infrastructure, parks, lawns, etc.

Climate – An area's typical or average weather.

Climate Change – A change in the typical or average weather of a region or city. This could be a change in a region's average annual rainfall, for example. Or it could be a change in a city's average temperature for a given month or season. Climate change is also a change in Earth's overall climate. This could be a change in Earth's average temperature, for example. Or it could be a change in Earth's typical precipitation patterns.

Coastal Barrier – A naturally occurring island, sandbar or other strip of land, including coastal mainland, that protects the coast from severe wave wash.

Coastal Erosion – The process of the gradual wearing away of land masses along the coast.

Coastal Flooding – Inundation of areas along the coast resulting from storm surge, wave action.

Coastal High Hazard Areas – Special Flood Hazard Areas (SFHAs) along the coasts that have additional hazards due to wind and wave action. These areas are identified on Flood Insurance Rate Maps (FIRMs) as zones V, V1-V30 and VE.

Coastal Resources Management Council (CRMC) – The Coastal Resources Management Council is a State of Rhode Island management agency with regulatory functions. Its primary responsibility is for the preservation, protection, development and where possible the restoration of the coastal areas of the state via the implementation of its integrated and comprehensive coastal management plans and the issuance of permits for work with the coastal zone of the state.

Code of Federal Regulations (CFR) – The Code of Federal Regulations (CFR) is the codification of the general and permanent rules and regulations published in the Federal Register by the executive departments and agencies of the federal government.

Community Assets – The people, structures, facilities, and systems that have value to the community.

Community Rating System (CRS) – A voluntary program developed by FEMA to provide incentives for NFIP compliant communities who want to implement extra measures to provide protection from flooding.

Comprehensive Community Plan – A municipal-level plan written in accordance with requirements of the Rhode Island Comprehensive Planning and Land Use Regulation Act.

Coronavirus Disease 2019 (COVID-19) – is a virus strain that has only spread in people since December 2019. On March 11, 2020 the Coronavirus Disease was declared a pandemic by the World Health Organization and on March 13, 2020 the United States declared the outbreak a national emergency.

Critical Facilities – A structure or other improvement that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired.

Drought – A natural climatic condition which occurs in virtually all climates, the consequence of a natural reduction in the amount of precipitation experienced over a long period of time, usually a season or more in length. High temperatures, prolonged winds, and low relative humidity can exacerbate the severity of drought.

Earthquake – A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the earth's tectonic plates.

Elevated Building – A building that has no basement and that has its lowest elevated floor raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns. Solid (perimeter) foundations walls are not an acceptable means of elevating buildings in V and VE zones.

Erosion – The collapse, undermining or subsidence of land along the shore of a lake or other body of water. Erosion is a covered peril if it is caused by waves or currents of water exceeding their cyclical levels which result in flooding.

Extent – The strength or magnitude of the hazard. Extent can be described in a combination of ways depending on the hazard.

Farm, Forest, and Open Space Program – A tax incentive program that helps to achieve open space protection, but does not provide permanent protection. The program is intended to encourage property owners to manage their land for forestry, agriculture, and open space. Property owners enter into an agreement with the Town to keep their properties undeveloped for at least 15 years in exchange for lower property tax assessments.

Federal Emergency Management Agency (FEMA) – An agency within the U.S. Department of Homeland Security charged with responding to Presidentially-declared disasters.

Flash Flood – A flood that occurs when excessive water fills normally dry creeks or river beds along with currently flowing creeks and rivers, causing rapid rises of water in a short amount of time. They can happen with little or no warning.

Flood – A general and temporary condition of partial or complete inundation of normally dry land areas from: the overflow of inland or tidal waters; the unusual and rapid accumulation of runoff of surface water from any source.

Flood Insurance Rate Map (FIRM) – Official map of a community on which FEMA has delineated the Special Flood Hazard Areas (SFHAs), the Base Flood Elevations (BFEs) and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a Digital Flood Insurance Rate Map (DFIRM).

Floodplain – Any land area susceptible to being inundated by floodwaters from any source.

Floodplain Management – The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to, emergency preparedness plans, flood-control works and floodplain management regulations.

Floodproofing – Any combination of structural and nonstructural additions, changes or adjustments to structures, which reduce or eliminate risk of flood damage to real estate or improved real property, water and sanitation facilities or structures with their contents.

Flood Zone A (1% annual chance): Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Mandatory flood insurance purchase requirements apply. For areas within the A Zone where detailed hydraulic analyses has been performed and Base Flood Elevations (BFEs) identified, additional classifications (VE, V1-V30) are made.

Flood Zone V (1% annual chance): Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Mandatory flood insurance purchase requirements apply. For areas within the V Zone where detailed hydraulic analyses has been performed and Base Flood Elevations (BFEs) identified, additional classifications (AE, AH, AO, AR, A1-A30, A99) are made.

Flood Zone X (0.2% annual chance): Zone X is the flood insurance rate zone that corresponds to the 500-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs (base flood elevations) or depths are shown within this zone.

Foundation Walls – Masonry walls, poured concrete walls or precast concrete walls, regardless of height, that extend above grade and support the weight of a building.

Freeboard (FEMA Definition for Flood Zones) – An additional amount of height above the Base Flood Elevation (BFE) used as a factor of safety (e.g., 2 feet above the Base Flood) in determining the level at which a structure's lowest floor must be elevated or floodproofed to be in accordance with state or community floodplain management regulations.

Freeboard (bridge clearance) – The space between the bottom of a bridge's structure and the surface of the water underneath the bridge.

Freshwater Wetlands (Per RIDEM) – areas that are flooded or that have water at or near the surface for part of most growing seasons. They commonly occur between uplands and water bodies; however, many freshwater wetlands stand alone and are surrounded by upland. Freshwater wetlands are widespread throughout Rhode Island. Swamps, marshes, bogs, ponds, rivers, and streams are considered wetlands in Rhode Island as are other smaller areas and certain adjacent areas known as perimeter wetlands, riverbank wetlands, and floodplain.

Fujita Scale – An intensity scale which rates tornadoes with numeric values from F0 to F5 based on tornado wind speed and damage sustained. An F0 rating indicates light damage such as broken tree limbs or signs, while an F5 rating indicates incredible damage was sustained.

Geographic Information System (GIS) – A computer system that analyzes and displays geographically referenced information. It uses data that is attached to a unique location.

Greenhouse Gas Emissions – Gases that trap heat in the atmosphere, including carbon dioxide and methane.

Hazard – A natural or man-made source or cause of harm or difficulty.

Hazard Identification – The process of identifying hazards that threaten an area.

Hazard Mitigation – Sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Hazard Mitigation Plan – A plan, written to comply with FEMA requirements, that identifies local policies and actions that can be implemented over the long term to reduce risk and future losses from hazards. These mitigation policies and actions are identified based on an assessment of hazards, vulnerabilities, and risks and the participation of a wide range of stakeholders and the public in the planning process.

Hazard Profiles – Profiles of each identified hazard.

Hurricane – A tropical cyclone in which the maximum sustained surface wind is 74 mph or more. The term hurricane is used for Northern Hemisphere tropical cyclones east of the International Dateline to the Greenwich Meridian. (The term typhoon is used for Pacific tropical cyclones north of the Equator west of the International Dateline).

Hydrology – The science of dealing with the waters of the earth. A flood discharge is developed by a hydrologic study.

Impact – The effect of a hazard on the community and its assets.

Inland Flooding – Flooding that presents a risk within inland (non-coastal) areas, including riverine flooding and shallow flooding.

Inundation – The total water level that occurs on normally dry ground as a result of the storm tide, and is expressed in terms of height of water, in feet, above ground level.

Letter of Map Amendment (LOMA) – An amendment to the currently effective FEMA map which establishes that a property is not located in a Special Flood Hazard Area (SFHA). A LOMA is issued only by FEMA.

Letter of Map Revision (LOMR) – An official amendment to the currently effective FEMA map. It is issued by FEMA and changes flood zones, delineations and elevations.

Location – The geographic areas within the planning area that are affected by the hazard, such as a floodplain.

Lowest Floor Elevation (LFE) – The measured distance of a building's lowest floor above the National Geodetic Vertical Datum (NGVD) or other datum specified on the FIRM for that location.

Magnitude – A measure of the strength of a hazard event. The magnitude (also referred to as severity) of a given hazard is usually determined using technical measures specific to a hazard.

Mean Higher High Water (MHHW) – There are two high tides in each day, and one of those two is always higher than the other. The higher of the two high tide lines is called “Higher High Water.” The National Oceanic Observatory Administration defines the MHHW as the average of the Higher High Water readings in a location over a 19 year period.

Mission Statement – A statement that drives the process and describes in a short, simple statement the intended outcome.

Mitigation – An effort to reduce the impact or loss from an incident.

Mitigation Strategy – The heart of the mitigation plan is the mitigation strategy, which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy describes how the community will accomplish the overall purpose, or mission, of the planning process.

Modified Mercalli Intensity (MMI) Scale – An intensity scale created to evaluate the effects of earthquakes, the MMI is the one currently used in the United States. Developed in 1931 by seismologists this scale is composed of increasing levels of intensity that range from imperceptible shaking to catastrophic destruction. Each level is designated by Roman numerals. It does not have a mathematical basis; instead it is an arbitrary ranking based on observed effects.

National Centers for Environmental Administration Information – Formerly the National Climatic Data Center, a division of the National Oceanic and Atmospheric Administration responsible for “preserving, monitoring, assessing, and providing public access to the Nation’s treasure of climate and historical weather data and information.”

National Flood Insurance Program (NFIP) – A program that makes federally-backed flood insurance available in those states and communities that agree to adopt and enforce flood-plain management ordinances to reduce future flood damage.

National Geodetic Vertical Datum (NGVD) of 1929 – National standard reference datum for elevations, formerly referred to as Mean Sea Level (MSL) of 1929. NGVD 1929 may be used as the reference datum on some Flood Insurance Rate Maps (FIRMs).

National Weather Service – A component of NOAA that provides weather, water, and climate data, forecasts and warnings for the protection of life and property and enhancement of the national economy.

Natural Disaster – A natural hazard event, such as a flood or tornado, which results in widespread destruction of property or caused injury and/or death.

Natural Environment – Natural systems with limited human influence. Examples: freshwater wetlands, coastal marshes, woodlands.

Natural Grade – The grade unaffected by construction techniques such as fill, landscaping or berming.

Natural Hazard – An unexpected or uncontrollable natural event of unusual magnitude that threatens the activities of people or people themselves.

Nor’easter – A storm along the East Coast of North America, so called because the winds over the coastal area are typically from the northeast. These storms may occur at any time of year but are most frequent and most violent between September and April.

North American Vertical Datum (NAVD) of 1988 – The vertical control datum established for vertical control surveying in the United States of America based upon the General Adjustment of the North American Datum of 1988. It replaces the National Geodetic Vertical Datum (NGVD) of 1929.

Repetitive Loss Structure – Any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling 10-year period, since 1978 (claims made within 10 days of each other are counted as one claim). A repetitive loss property may or may not be currently insured by the NFIP (FEMA. Repetitive Loss Structure).

Resilience – The ability of systems, infrastructures, government, business, communities and individuals to resist, tolerate, absorb, recover from, prepare for, or adapt to an adverse occurrence that causes harm, destruction or loss.

Return Period – The return period of a storm is a shorthand way for experts and policy makers to standardize and discuss the strength of a theoretical storm event. It is also an expression of the characteristics of that theoretical storm, and an educated guess as to how often such a storm could occur.

Richter Scale – The Richter magnitude scale, developed in 1935 by Charles F. Richter, is a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes.

Risk – The potential for an unwanted outcome resulting from an incident, event, or occurrence, as determined by its likelihood and the associated consequences.

Risk Assessment – A product or process that collects information and assigns values to risks for the purpose of informing priorities, developing or comparing courses of action, and informing decision making.

Riverine Flooding – Surface water runoff introduced into streams and rivers exceeds the capacity of the natural or constructed channels to accommodate the flow; as a result, water overflows the stream banks, spilling out into adjacent low-lying areas.

Save the Bay – A Providence-based nonprofit organization whose mission is to “protect and improve Narragansett Bay.”

Sea, Lake and Overland Surges from Hurricanes

(SLOSH) Model – A computerized numerical model developed by the National Weather Service (NWS) to estimate storm surge heights resulting from historical, hypothetical, or predicted hurricanes by taking into account the atmospheric pressure, size, forward speed, and track data. These parameters are used to create a model of the wind field which drives the storm surge. The SLOSH model consists of a set of physics equations which are applied to a specific locale's shoreline, incorporating the unique bay and river configurations, water depths, bridges, roads, levees, and other physical features.

Sea Level Rise – The upward trend in average sea level height.

Severe Repetitive Loss: Any NFIP-insured single-family or multi-family residential building that has incurred flood-related damage for which four or more separate claims payments have been made, with the amount of each claim (including building and contents payments) exceeding \$5,000; or for which at least two separate claims payments (building payments only) have been made, with the cumulative amount exceeding the market value of the building. In both instances, at least two of the claims must be within any rolling 10-year period, since 1978, and claims made within 10 days of each other are counted as one claim.

Shallow Flooding – For purposes of the National Flood Insurance Program (NFIP), shallow flooding is defined as that with a depth limited to 3.0 feet or less where no defined channel exists.

Shear Walls – Walls used for structural support but not structurally joined or enclosed at the ends (except by breakaway walls). Shear walls are parallel or nearly parallel, to the flow of the water and can be used in any flood zone.

Sheet Flow Hazard. A type of flood hazard with flooding depths of 1 to 3 feet that occurs in areas of sloping land. The sheet flow hazard is represented by the zone designation AO on the FIRM.

Special Flood Hazard Area (SFHA) – The shaded area on the Flood Insurance Rate Map (FIRM) which identifies an area that has a one percent chance of being flooded in any given year (100-year floodplain). The FIRM identifies these shaded areas as FIRM Zones A, AO, AH, A1 -A30, AE, A99, V, V1 -30, and VE.

Shelter – A place of refuge that provides life-sustaining services in a congregate facility for individuals who have been displaced by an emergency or a disaster.

State Hazard Mitigation Plan (SHMP) – A Plan that provides comprehensive guidance for hazard mitigation in the State of Rhode Island.

Storm Surge – The abnormal rise of water generated by a storm, over and above the normal astronomical tide, and is expressed in terms of height above predicted or expected tide levels. Since storm surge represents the deviation from normal tide levels, it is not referenced to a vertical or tidal datum.

Tornado – A violently rotating column of air extending ground-ward.

Tropical Cyclone – A generic term for a cyclonic, low-pressure system over tropical or sub-tropical waters.

Tropical Storm – A tropical cyclone with maximum sustained winds greater than 39 miles per hour and less than 74 miles per hour.

Variance – A grant of relief by a participating community from the terms of its floodplain management regulations.

Vector-borne diseases – Infections transmitted to humans and other animals by blood-feeding arthropods, such as mosquitoes and ticks.

Vertical Datum – A base elevation used as a reference from which to measure heights (or depths).

Vulnerability – Characteristics of community assets that make them susceptible to damage from a given hazard.

Vulnerability Analysis – An analysis of the risk of hazards impacting community assets.

Wildfire – A wildfire is an unplanned, unwanted fire burning in a natural area, such as a forest, grassland, or prairie. Wildfires can damage natural resources, destroy homes, and threaten the safety of the public and the firefighters who protect forests and communities.

Wildland Urban Interface (WUI) Zone – As building development expands into natural areas, homes and business may be situated in or near areas susceptible to wildfires.

Wind Chill Index – Wind chill index is an attempt to quantify the cooling effect of wind with the actual outside air temperature to determine a wind chill temperature that represents how cold people and animals feel, based on the rate of heat loss from exposed skin.

Zoning Ordinance – Regulations that define how property can be used within zones as mapped on a Zoning Map. Regulations specify how property may be used and establish dimensional requirements including lot size, building placement, bulk (or density) and the height of structures.

Glossary Sources

Centers for Disease Control and Prevention (CDC)

<https://www.cdc.gov/>

Coastal Resources Management Council (CRMC)

<http://www.crmc.ri.gov/aboutcrmc.html>

Federal Emergency Management Agency (FEMA)

<https://www.fema.gov/about/glossary>

https://www.fema.gov/pdf/nfip/manual201205/content/22_definitions.pdf

https://www.fema.gov/sites/default/files/2020-05/fim_appendix-i-severe-repetitive-loss-properties_apr2020.pdf

https://www.fema.gov/sites/default/files/2020-06/fema-local-mitigation-planning-handbook_03-2013.pdf

National Oceanic and Atmospheric Administration (NOAA)

<https://forecast.weather.gov/glossary.php?>

<http://www.nhc.noaa.gov/aboutgloss.shtml>

http://www.nhc.noaa.gov/news/20130806_pa_defineSurge.pdf

<https://www.weather.gov/safety/winter-noreaster>

National Park Service (NPS)

<https://www.fs.fed.us/nwacfire/home/terminology.html>

RI Department of Environmental Management (RIDEM)

<http://www.dem.ri.gov/programs/benviron/water/wetlands/pdfs/scoop.pdf>

Save the Bay (STB)

<https://www.savebay.org/>

Statewide Planning (RI Dept. of Administration)

http://www.planning.ri.gov/documents/sea_level/2016/TP167.pdf

United States Geological Survey (USGS)

<http://earthquake.usgs.gov/>

<https://www.usgs.gov/faqs/what-geographic-information-system-gis>

<https://www.usgs.gov/programs/earthquake-hazards/modified-mercalli-intensity-scale>

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