



# North Kingstown



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## Municipal Resilience Program Community Resilience Building Process & Workshop Summary of Findings

August 2021



# **Town of North Kingstown, Rhode Island**

## **Community Resilience Building Workshop**

### ***Summary of Findings***

## **Overview**

The need for municipalities, regional planning organizations, corporations, states, and federal agencies to increase resilience to extreme weather events and a changing climate is strikingly evident amongst the communities across the state of Rhode Island. Recent events such as Tropical Storm Irene and Super Storm Sandy have reinforced this urgency and compelled leading communities like the Town of North Kingstown to proactively collaborate on planning and mitigating risks. Ultimately, this type of leadership is to be commended because it will reduce the vulnerability and reinforce the strengths of people, infrastructure, and ecosystems and serve as a model for other communities in Rhode Island, New England, and the Nation.

In the spring of 2021, the Town of North Kingstown embarked on certification within the state of Rhode Island's Municipal Resilience Program (MRP). As part of that certification, the Rhode Island Infrastructure Bank (RIIB) and the Nature Conservancy (TNC) provided the Town with a community-driven process to assess current hazard and climate change impacts and to surface projects, plans, and policies for improved resilience. In August 2021, North Kingstown's Core Team helped organize a Community Resilience Building Workshop facilitated by TNC in partnership with RIIB. The core directive of this effort was the engagement with and between community members to define strengths and vulnerabilities and the development of priority resilience actions for the Town of North Kingstown.

The North Kingstown Community Resilience Building Workshop's central objectives were to:

- Define top local, natural, and climate-related hazards of concern;
- Identify existing and future strengths and vulnerabilities;
- Identify and prioritize actions for the Town;
- Identify opportunities to collaboratively advance actions to increase resilience alongside residents and organizations from across the Town, and beyond.

The Town of North Kingstown employed a unique “anywhere at any scale”, community-driven process called Community Resilience Building (CRB) ([www.CommunityResilienceBuilding.org](http://www.CommunityResilienceBuilding.org)). The CRB’s tools, reports, other relevant planning documents, and local maps were integrated into the workshop process to provide both decision-support and visualization around shared issues and existing priorities across North Kingstown. The North Kingstown Local Hazard Mitigation Plan (2019) and Comprehensive Plan (2019) were particularly instructive. Using the CRB process, rich with information, experience, and dialogue, the participants produced the findings presented in this summary report including an overview of the top hazards, current concerns and challenges, existing strengths, and proposed actions to improve North Kingstown’s resilience to hazards and climate change today, and in the future.

The summary of findings transcribed in this report, like any that concern the evolving nature of risk assessment and associated action, are proffered for comments, corrections and updates from workshop attendees and other stakeholders alike. The leadership displayed by the Town of North Kingstown on community resilience building will benefit from the continuous participation of all those concerned.

## **Summary of Findings**

### **Top Hazards and Vulnerable Areas for the Community**

Prior to the CRB Workshop, the North Kingstown Core Team identified the top hazards for the Town. The hazards of greatest concern included coastal flooding due to increasing higher tides, storm surge associated with Nor’easters to hurricanes, and high winds from major storms and hurricanes. Additional hazards mentioned during the workshop included more intense heat waves as well as extreme cold events. These hazards have direct and increasing impacts on the infrastructure, environment, and residents of North Kingstown. These effects are seen in neighborhoods, natural areas (rivers, wetlands, parks), coastal areas, roads, bridges, businesses and commerce, public transportation, municipal facilities, school system, civic events, churches, social support services and other critical infrastructure and community assets within North Kingstown and adjoining municipalities.

# **Top Hazards and Areas of Concern for the Community**

## ***Top Hazards***

- Coastal Flooding (increasingly higher tides, sea level rise)
- Storm Surge (Nor'easters, hurricanes, etc.)
- High Winds (major storms, hurricanes)
- Extreme Temperatures (cold and heat waves/droughts)
- Riverine Flooding

***Areas of Concern in North Kingstown\**** - Several categories and locations were identified as being particularly vulnerable by workshop participants including:

**Infrastructure:** Above Ground Electrical Transmission Lines, Impervious Surfaces, Historic Properties & Older Buildings, Residential Unit Clusters on Coast, Private Septic Systems & Cesspools, Quonset Wastewater Treatment Facility, Pump Stations, Hunt River Dam, Pettaquamscutt Dam, Annaquatucket Dam, Community Center, Free Library, Water Mains, Pier One (Business Park), Town Hall, Town Hall Annex, Wickford Village Town Dock, Allen Harbor Marina, Highway Garage (West Main Street), Wickford Elementary School, Mobile Home Parks, Day Care Centers, Quonset State Airport.

**Ecosystems/Waterways:** Trees (downed during storms - Route 1A, Boston Neck Road), Hunt River, Beaches (Calf Pasture Point, Rome Point, Quonset), Coastline, Coastal Wetlands, Narrow River, Bissell Cove, The Hummocks, Cornelius Island, Mill Cove.

**Roads, Bridges, and Road Network:** Phillips Street, Main Street, Post Road, Road Segments - Wickford Village, Intersection (West Main Street & Brown Street), Brown Street Bridge, Brown Street Parking Lot (Wickford Village), Post Road - Essex Road & Camp Avenue Intersections, River Road, Walmsley Road, Route 1A, Loop Road.

**Neighborhood Areas:** Wickford Village, Hamilton, Mill Cove/Shore Acres, Mount View/Pojac Point, Quonset, Intrepid Drive, Popular Point, Hamilton/Bissell Cove, Plum Point/Plum Beach, Phillips/Loop Drive.

**Vulnerable Populations:** Elderly/Senior Citizens, Non-English Speakers, Residents with Special Needs, Disabled Residents, Local Business Owners, Veterans, Low-Income Residents, Working Poor, Long-term Renters.

\*Information from workshop participants augmented via review of the Town of North Kingstown's Local Hazard Mitigation Plan (2019) and Comprehensive Plan (2019). ***See Appendix A for full list of mitigation/adaptation actions from the Town of North Kingstown's LHMP.***

## **Current Concerns and Challenges Presented by Hazards**

The Town of North Kingstown has several concerns and faces multiple challenges related to the impacts of natural hazards and climate change. In recent years, North Kingstown has experienced a series of highly disruptive and damaging weather events including Tropical Storm Irene (August 2011), Tropical Storm Sandy, (October 2012), winter Nor'easter Nemo (February 2013), and other less impactful but more frequent events. Impacts from Irene included heavy, rain-induced, inland flooding and wind damage. Sandy caused extended coastal erosion and power outages across portions of North Kingstown. The winter storm Nemo dropped 19-20" of snow on the Town knocking out power and isolating residents and neighborhoods due to extended road closures. The magnitude and intensity of these events and others across Rhode Island have increased awareness of natural hazards and climate change, while motivating communities such as North Kingstown to proactively improve their resilience.

This series of extreme weather events highlights that the impacts from hazards are diverse, ranging from: coastal flooding of critical infrastructure, bridges, roads, and low-lying areas; localized flooding from stormwater runoff during intense storms and heavy precipitation events; and, property damage and utility outages from wind, snow, and ice. Longer periods of elevated heat, particularly in July and August, have raised concerns about vulnerable segments of the population including elderly, disabled, underserved, and disproportionately disadvantaged residents. The combination of these issues presents a challenge to preparedness and mitigation priorities and requires comprehensive, yet locally-specific actions across the Town.

The workshop participants were in agreement that North Kingstown is experiencing more intense and frequent storm events and heat waves. Additionally, there was a general concern about the increasing challenges of being prepared for the worst case scenarios (e.g. major storms, hurricanes (Cat-3 or above)) particularly in the fall/winter months when more intense storms coincide with colder weather. The impact of the current Covid-19 pandemic was raised by workshop participants as well.



(Credit: realator.com)



(Credit: North Kingstown)



(Credit: patch.com)

## ***Specific Categories of Concerns and Challenges***

As in any community, North Kingstown is not uniformly vulnerable to hazards and climate change, and certain locations, assets, and populations have been and will be affected to a greater degree than others. Workshop participants identified the following items as their community's key areas of concern and challenges across three broad categories - Infrastructure, Societal, and Environmental.

### **Infrastructure Concerns and Challenges**

#### **Roads, Bridges, and Road Networks:**

- Older, narrow road network with inadequate drainage in proximity to development which intensifies stormwater runoff volumes on adjoining roadway.
- Localized flooding due to inadequate drainage on Post Road at the intersections with Essex Road and Camp Avenue.

#### **Utilities:**

- Need to update water mains across Town.
- High cost of placing above ground electrical transmission lines underground.
- Electrical distribution lines that are currently above ground and vulnerable to high winds.

#### **Emergency Management and Preparedness:**

- Electrical utility and infrastructure susceptible to regular and extended outages puts residents at risk. Regular power outages also impact dissemination of critical information by the Town to residents.
- Residents are in need of emergency preparedness and shelter in place training.
- Police and Fire Department capacity is limited when trees are down after storms, due to the need for utility to confirm downed power lines are safe.
- Flooding of evacuation routes (e.g. Philips Street, Main Street, Brown Street) creating unsafe and/or impassable conditions.
- Flooding of local and state arterial roads cut off and isolate certain sections of Town.
- Power outages due to storms (e.g. Hurricane Henri) and high wind events that have noticeably increased in frequency and intensity recently.
- Concerns that if benchmark flood of 1938 occurred in 2021 it would devastate community due to lack of adequate resources to address unexpected or rare events.
- General fatigue amongst residents due to having to always prepare for routine and extended power outages as well as lack of awareness about shelter in place protocols and measures.
- Differing levels of emergency management resources and planning at the regional and state level resulting in uncertainty about amount of additional resources and capacity for communities like North Kingstown, among others, during disasters.

## ***Specific Categories of Concerns and Challenges***

### **Stormwater Management:**

- Lack of resources and capacity to routinely clean out storm drains across Town.

### **Societal Concerns and Challenges**

#### **Vulnerable Populations:**

- Power outages are concern for individuals dependent on electric medical devices such as oxygen.
- Extended amount of coastline with high levels of housing development in low lying areas.

#### **Development & Community Issues:**

- Sea level rise and/or routine coastal flooding impacts Wickford Village, economic engine and community hub of North Kingstown.
- High density of homes and residents along the coast in certain sections of Town (e.g. Hamilton, Shore Acres, Mount View).
- Concerns about impacts to historic properties in high-risk flood and sea level rise area and implications on historic fabric, property values, and tax base.
- Private septic systems increasingly exposed and compromised to rising water table due to increases in sea level.
- Aging housing stock in certain areas that require maintenance or improvements to accommodate amenities such as air conditioning.
- Concerns regarding elevating historic property to reduce flood and inundation risk that would block views and change the character of the streets and community.
- Impacts to Pier One (Business Park) due to storms and sea level rise which could affect shipping activity and job stability.
- Increasing frequency of basement flooding within older, stone foundation houses along the coast as well as more inland due to rising water tables and sea level rise.

#### **Community Service & Capacity:**

- Long term exposure of large portions of the overall infrastructure network (power lines, septic/wastewater treatment, roads/bridges, etc.) to flooding and wind, particularly in the Town's current economic centers (e.g. Wickford Village, etc.).
- Realization that required resiliency upgrades of larger systems in Town (such as drainage, transportation, and sewer/water) require support, technical expertise, and funding from state agencies to succeed.
- Need for robust communication with public and community participation in developing the capital improvement plan and subsequent investments.
- Resistance amongst residents to policies that increase regulations or potentially have an economic impact on the community.

## ***Specific Categories of Concerns and Challenges (cont'd)***

- Concerns about wastewater treatment facility and supporting infrastructure with rising sea level.
- Ongoing risk to dams due to increased pressure and force from more intense flood events particularly on the Hunt River, Pettaquamscutt Dam, and Annaquatucket Dam.
- Community Center and Library property located in areas that flood.
- Lack of enforcement of ordinances and laws designed to prevent tractor trailers above set weight (12 tons – 3 axle; 17 tons – 4 axle) going over Brown Street Bridge and through Wickford Village.

## **Environmental Concerns and Challenges**

### **Trees:**

- Increasing impacts on tree health from pests and pathogens resulting in a number of dead and damaged trees posing risks to power lines and blocking roads during emergencies.
- Loss of trees due to high winds (e.g. Hurricane Henri) and extended droughts that impact forested areas and tree canopy in neighborhoods.
- Tree trimming needed to reduce risk to power lines and resulting power outages as well as access and egress when downed across roadways (ex. Route 1A – between high school and Wickford Village).

### **Open Space, Watersheds, Waterways, and Coastline:**

- Lack of coherent strategy to secure conservation easements in current and future flood zones to help reduce risks to ecosystems and structures.
- Flash flooding events due to high levels of impervious surface within the Hunt River watershed.
- Changing coastal environment with climate change that will alter the landscape and increase exposure to disasters.
- Reduction in current availability and level of coastal access due to changing coastal dynamics including beaches at Calf Pasture Point and Rome Point.
- Water quality concerns within waterbodies and Bay from compromised septic systems due to rising water table and sea level rise.
- Flooding along Narrow River at River Road and Walmsley Road which results in contributions of sediment into Narrow River from two adjoining gravel roads.
- Depreciation and/or loss of natural resources such as wetlands and beach/dunes with the capacity to act as natural buffer to storm surge from coastal storms in North Kingstown and across the Narragansett Bay.

## **Current Strengths and Assets**

Just as certain locations, assets, and populations in North Kingstown stand out as particularly vulnerable to the effects of hazards and climate change, other features are notably assets for North Kingstown's resilience building. Workshop participants identified the following items as their community's key strengths and expressed interest in using them as the core of future resilience building actions.

- Clearly, the responsive and committed engagement exhibited by leadership, staff, and residents is a very appreciated strength within and across North Kingstown. On-going collaboration between municipal staff, boards/commissions, volunteers, business community, faith-based organizations, non-profit organizations, regional planning entities, adjoining municipalities, and various state-level organizations, among others, on priorities identified herein will help advance comprehensive, cost-effective, community resilience building actions.
- High level of emergency response capacity during response and recovery operations by Fire, Police, and Public Works Departments during and after major disasters.
- The central geographic location with multi-modal transportation options that improve the access/egress to and from North Kingstown is a strength for resource provisioning to shelters and evacuation of residents.
- Willingness of residents to work with leadership and staff to plan for and implement modest resiliency measures that can help to minimize the adverse effects of climate change.
- Solid knowledge base among residents about municipal processes and operations which speaks to the good communications from Town Council, Boards, Commissions, and Departments.
- Volunteer organizations/community partnerships are an outstanding asset.
- Stability of tax base lends to good municipal management and fiscal responsibility, which aids the Town in responding to flood and hazards.
- Strong checks and balances within municipal regulations and ordinances that provide needed oversight on stormwater management and takes future development into consideration.
- Post-2010 flooding event, the Water Department held a series of workshops, which led to positive changes and greater resilience in the municipal water supply.

## **Current Strengths and Assets (cont'd)**

- Stable and effective Planning Department that provides solid disaster plans which make it possible for a strong top-down management approach during major events.
- Integration and coordination across Comprehensive Plan (2019) and Hazard Mitigation Plan (2019) on natural hazard projections, vulnerabilities, and actions.
- Common focus within principal municipal planning documents on floodplains with housing and other structures along side the prioritization of floodplain protection with restricted development via public education and engagement with residents.
- Water infrastructure has been designed to capitalize on the lower risk landscapes and locations with less risk in the western portions of Town versus eastern.
- North Kingstown is enrolled in FEMA's Community Rating System with regular public education about overall risk to the community as well as household risk reduction measures for residents.
- Relatively large amount of public coastal access points.
- Long standing productive partnership and projects with University of Rhode Island's Coastal Resource Center.
- The wastewater treatment facility owned by North Kingstown has been floodproofed and hardened to prevent impacts from floods.
- Robust stormwater management program based on RIDEM's stormwater guidance manual with a stormwater specialist on staff to work with homeowners associations, homeowners, and other stakeholders help alleviate drainage issues.
- Subdivision regulations that require utilities to be run underground for all new development which helps to reduce risk to above ground utility infrastructure.
- Town Boards and Commissions largely supportive and advocates for resiliency planning and project efforts and are aware of activities such as CRMC applications, among other steps.
- Increasing willingness of the Town to advance larger development projects such as the Quonset area.
- Current projects that are increasing the resilience of the community including a shoreline adaption project on Roger Williams Drive and relatively high level of conservation and preservation of land that are keeping properties vulnerable to flooding from being developed.

## **Current Strengths and Assets (cont'd)**

- Strong commitment through historic development to continue and perpetuate adaptation projects such as the municipal parking lot in Wickford.
- Previous and ongoing investments in Town facilities including recreational sports fields and spaces that are multi-purpose to accommodate other events such as art festivals.
- Further investments including routine and proactive building of children's playgrounds that attract families with kids to community.
- High level of clean, affordable, and reliable supply of drinking water for residents.
- The presence of Wickford with serves as the pulse of North Kingstown and provides resources and historical significance.
- Proactive road and bridge network upgrades/repairs such as the restructuring of the Brown Street Bridge and Boston Neck Road Bridge.



(Credit: North Kingstown)

## **Recommendations to Improve Resilience**

A common theme among workshop participants was the need to continue community-based planning efforts focused on developing adaptive measures to reduce North Kingstown's vulnerability to extreme weather, climate change and other common concerns raised. To that end, the workshop participants reached agreement on several priority topics requiring more immediate and/or ongoing attention including:

- **Long-term Vision and Growth** (i.e. development/redevelopment, conservation, transportation, commerce/economic growth, diverse demographics, volunteerism, open space protection, affordability);
- **Infrastructure Improvements** (i.e. wastewater treatment systems and facilities, stormwater management systems, impervious cover, low-impact development, utility infrastructure reliability, nature-based solutions (living shorelines), roads);
- **Resilient Community Support** (i.e. affordable/accessible housing, sustainability, green infrastructure, tree management, business and residential recovery, community support);
- **Emergency Management** (i.e. communications, outreach, education, continuation of services, coordinating and exercise plans, sheltering facilities/centers)

In direct response, the workshop participants developed the following priority and other action list. Mitigation actions from the North Kingstown's Local Hazard Mitigation Plan (2019) are provided in Appendix A for cross reference. In addition, actions previously identified in the North Kingstown's Comprehensive Plan (2019) were reviewed for consistency with input from workshop participants.

### **Priority Actions**

- Develop and conduct a public information campaign for residents and business owners regarding tree-cutting and trimming needs and associated activities particularly in high-canopy areas of Town.
- Assess, examine, and identify the specific road segments that have the greatest consequences for impacting evacuation and access of residents and resources in the short and long-term in collaboration with RIDOT.

## Priority Actions (cont'd)

- Secure a dedicated community center that could double as an emergency shelter for North Kingstown.
- Conduct a public health and safety communications campaign from community-based emergency management geared towards residents ranging from children and young family to elderly residents with the primary focus on circulating emergency preparedness checklists, shelter in place guidelines, and information on individual emergency management steps (i.e. who goes where at what time to shelters).
- Work to improve the dialogue with the utility companies providing services within North Kingstown in hopes of proactively identifying and solving issues more effectively and efficiently rather than waiting until times of crises.
- Develop educational awareness event for K-12 students and adults that explains the municipal systems including roads, stormwater, and water/sewer and the functions of various departments in Town such as planning, engineering, and public works in hopes of building appreciation for services provided to residents.
- Increase redundancy and resilience at pump station and the wastewater treatment facility via back up pumps and other measures as determined via a specific needs assessment including the Quonset Point Wastewater Treatment Facility, Mark Drive Pump Station, and Wickford Point Pump Station.
- Look to secure funding to offset costs of providing access to existing sewer lines in additional sections of the community (i.e. Wickford Village).
- Develop and implement a comprehensive tree management plan which both addresses tree maintenance, particularly along power lines to prevent outages, and tree canopy expansion in more developed areas.
- Conduct a review of current tree ordinances and street design standards to assess whether updates to setbacks and/or allowable trimming measure are needed.



(Credit: North Kingstown)



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## **Priority Actions (cont'd)**

- Continue to explore needs and opportunities related to long-term solutions such as placing electrical power lines underground in high-risk areas.
- Conduct outreach related to stormwater management for residents.
- Maintain and support the dam that controls riverine flooding along the Hunt River.
- Mitigate risks from hazards through infrastructure updates and large-scale projects in collaboration with state and federal agencies and departments.
- Conduct full analysis of current evacuation route and flooding scenarios and location that lead to unsafe or impassable conditions for residents with an eye to identifying alternative routes where feasible. For example, Earle Drive, Loop Drive and the intersection of Brown Street, Main Street and West Main Street.

## **Other Actions**

- Incorporate resulting resilience actions from CRB workshop into future updates of Comprehensive Plan and Hazard Mitigation Plan.
- Seek out areas where impervious surfaces can be removed and/or replaced with green stormwater infrastructure and open space to increase localized filtration in hopes of reducing flash flooding. Refer to the Shoreline Adaptation Inventory and Design program including the end of road retrofit at Roger Williams Drive.
- Initiate a community dialogue to explore potential approaches and available options for an equitable and actionable plan to help manage the long-term implications of coastal flooding and sea level rise on historic properties across North Kingstown.
- Public education to convince residents and business owners that they need to evacuate when North Kingstown has storms of larger magnitude.
- Look to increase awareness amongst residents about National Grid's tree trimming activities within their jurisdiction.
- Implement the design completed for the Wickford Waterfront Improvement Project and reevaluate condition and long-term improvements to the Wickford Village sea wall (raising 4-5') which is currently threatened by rising seas, routine high tides, and/or storm surge.

## **Other Actions (cont'd)**

- Draft regulatory framework to allow for updates to historic properties to mitigate and adapt for resilience. Updates to regulations and policies for historic buildings should be done in partnership with the State Historic Commission and be updated in ways that have minimal impacts on the community and build on lessons learned elsewhere (e.g. Keeping History Above Water program).
- Conduct further research on how the coastal zone in North Kingstown will change with climate change to identify areas with projected increased exposure.
- Establish a greater understanding of the “pipeline” for additional funding sources to move the bigger, capital-intensive resiliency projects forward.
- Examine the location and extent of septic system vulnerabilities due to rising water tables.
- Look to draft additional regulations and policies to limit the risk to septic systems going forward, if possible and feasible.
- Develop financial assistance program for historic property retrofits that improve resilience.
- Continue to identify and prioritize the protection and conservation management of open space areas within existing and future floodplains as to reduce risk to structures and enhance the recreational quality and livability of North Kingstown.
- Expand the use of “Stormtools” for all new building permit application and the use to the tool to increase public education about risks to development from a changing climate.
- Integrate low-impact design standards, including green stormwater infrastructure, further into the planning and permitting process for new development and redevelopment projects.
- Educate local landowners and residents on how to work towards better preserving and restoring natural shoreline buffer to storm surge and sea level rise versus clearing properties right down to the water’s edge.
- Address flooding to one of the most critical road segments at the intersection of Phillips Street and Loop Road by initiating engineering analysis to develop a safe and resilient design.

## **Other Actions (cont'd)**

- Explore developing a disaster relief program for small local businesses.
- Continue conversations with RIDOT to install bike lanes and bring share-ride bikes to key areas such as Wickford Village, public transit areas, and train station in hopes of increasing multi-modal transportation options for residents and visitors.
- Continue to pre-deploy repair, maintenance, and response vehicles (i.e. backhoes, etc.) in advance of major events to ensure quicker response and recovery operations such as removing downed trees that restrict egress and access to vulnerable neighborhoods and areas around Town.
- Secure grant and implement a hardening project for a bike path to allow emergency response access to an area of Town that is typically difficult to reach in a timely manner.
- Look to foster and strengthen peer-to-peer or neighbor-helping-neighbor approaches to emergency management preparedness effort in Town.
- Increase coordination and alignment between municipality and utilities related to capital improvement projects to prevent disruption in transportation corridor and needless repetitive excavation and closure (e.g. Brown Street – Town and DPUC).
- Conduct an available resource and equipment inventory and cross-department project list development in advance of anticipated large-scale federal infrastructure funding to ensure readiness for inclusion in proposals.
- Identify areas that are both more vulnerable to hazards and also offer value as open space for ecological as well as adaptation for people and property and seek various forms of preservation including transfer of development rights and property acquisition.
- Conduct a quantitative assessment via survey the number of hours and days of power outages by residents, neighborhoods, municipality, and businesses across North Kingstown during various storm events to provide data back to the utility and state entities.
- Determine the feasibility of reconnecting Cornelius Island with mainland via manipulation and elevation.
- Increase outreach to landlords to help weatherize and winterize rental properties and promote energy efficient appliances.

## **CRB Workshop Participants: Department/Organization**

State Senate Representation - District 36 - North Kingstown & Narragansett  
Town of North Kingstown - Town Council  
Town of North Kingstown - Office of the Town Manager  
Town of North Kingstown - Public Works Department  
Town of North Kingstown - Planning Department  
Town of North Kingstown - Harbor Master  
Town of North Kingstown - Fire Department  
Town of North Kingstown - Police Department  
Town of North Kingstown - Engineering Department  
Town of North Kingstown - Water Department  
Town of North Kingstown - Code Enforcement Department  
Town of North Kingstown - Economic Development Advisory Board  
Town of North Kingstown - Planning Commission  
Town of North Kingstown - Wickford Advisory Committee  
Land Conservancy of North Kingstown  
University of Rhode Island - Coastal Resources Center  
Quonset Development Corporation

## **North Kingstown Core Project Team**

Nicole LaFontaine - Planning Department, Town of North Kingstown

Becky Lamond - Planning Department, Town of North Kingstown

Joe Donohoe - Planning Department, Town of North Kingstown

## **Online CRB Workshop Facilitation Team**

Rhode Island Infrastructure Bank - Shaun O'Rourke (MVP Program Lead)

The Nature Conservancy - Adam Whelchel (Lead Facilitator)

The Nature Conservancy - Sue AnderBois (Lead Coordinator/Small Group Facilitator)

The Nature Conservancy - Samantha Lash (IT Management/Scribe)

The Nature Conservancy - Drew Goldsman (Small Group Facilitator)

Narragansett Bay Research Reserve - Caitlin Chaffee (Small Group Facilitator)

Rhode Island Infrastructure Bank - Kim Korioth (Scribe/MRP Program Support)

Rhode Island Infrastructure Bank - Kellie King (Scribe)

The Nature Conservancy - Sharon Gold (Scribe)

URI Coastal Resource Center - Rosemarie Fusco (Scribe)

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# **Appendix A**

## **Town of North Kingstown Local Hazard Mitigation Plan (2019)**

### **Mitigation Strategies and Actions**

<b>Table 13: Hazard Mitigation Updated Goals &amp; Actions</b>	
<b>Goal 1</b> Reduce risks and increase resilience from natural hazards in North Kingstown.	
<p><b>Action 1.1:</b> Open Space Acquisition of lands within SFHA areas with a priority on the protection of open space landward of sensitive features to help create a buffer to storm surge drainage and erosion.</p> <p><b>Priority:</b> High</p> <p><b>Lead Departments:</b> Department of Planning and Development</p> <p><b>Partnerships:</b> North Kingstown Land Conservancy, Narrow River Land Trust, Town Council, Conservation Commission, and RIDEM, CRMC Coastal and Estuary Habitat Restoration Program/Trust</p> <p><b>Time Frame:</b> Long Term</p> <p><b>Benefit:</b> Future Planning Mitigation, Public safety</p> <p><b>Cost:</b></p> <p><b>Status:</b> Continued and enhanced action from 2005 Plan</p>	
<p><b>Action 1.2:</b> Continue to enforce Building Code Compliance for land uses and structures in SFHA and those prone to other potential hazards to residents in accordance with updated legislation, ordinances and State Building Code requirements as part of the building permitting process to reduce risk to structures and facilities.</p> <p><b>Priority:</b> High</p> <p><b>Lead Departments:</b> Building Department</p> <p><b>Time Frame:</b> Long Term</p> <p><b>Benefit:</b> Future Mitigation Planning, Public Safety &amp; Property Protection</p> <p><b>Cost:</b> Part of Permit Review Process, Cost will vary depending on the action needs (elevation of structures outside of BFE)</p> <p><b>Status:</b> Continued and enhanced action from 2005 Plan</p>	
<p><b>Action 1.3:</b> Educate and promote awareness to homeowners of the benefit of elevating or otherwise storm-proofing coastal structures to reduce losses and protect public health, safety and welfare through mailings and through the Town's website.</p> <p><b>Priority:</b> High</p> <p><b>Lead Departments:</b> Planning Department &amp; Building Department</p> <p><b>Time Frame:</b> short term</p> <p><b>Benefit:</b> Future Mitigation Planning, Public Safety &amp; Property Protection</p> <p><b>Cost:</b> \$1,000 per year in flyers in addition to staff time to update website data</p> <p><b>Status:</b> Continued and enhanced goal from previous plan.</p>	
<p><b>Action 1.4:</b> Identify the "design life" of critical facilities at the time of construction and maintain data to allow for clear planning horizons to be defined for the development of phasing plans for implementation and prioritizing funding from federal and state grants and through the municipal CIP by utilizing the STORMTOOLS mapping program to reduce future risk.</p> <p><b>Priority:</b> High</p> <p><b>Lead Departments:</b> Building Department &amp; DPW</p> <p><b>Time Frame:</b> Long Term</p> <p><b>Benefit:</b> Future Mitigation Planning, Public Safety and Property Protection</p> <p><b>Cost:</b> staff time and expenses</p> <p><b>Status:</b> New Action</p>	

**Action 1.5:** Create policy to direct development away from areas subject to erosion and flooding from gale-force winds, storm surge and sea level rise.

**Priority:** High

**Lead Departments:** Planning Department, Building Department & DPW

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning

**Cost:** Staff time, Consultant fees

**Status:** New action

**Action 1.6:** The town should utilize the municipal web site and direct mailings as outreach to North Kingstown's Historic District (HD) property owners and residents in Wickford located within the SFHA to educate and assist these homeowners with the long term management of their property to balance the preservation of the structure's historic integrity with protection of the property from future flood damage.

**Priority:** High

**Lead Departments:** Planning Department, Building Department & DPW

**Time Frame:** short term

**Benefit:** Future Mitigation Planning

**Cost:** \$1,000 in staff time and mailings

**Status:** New action

**Action 1.7:** Complete database updates of: 1) building permits and elevation certificates issues within the SFHA 2) parcels within the HDC, the SFHA and projected sea level rise areas 3) open space parcels and public parks to help identify trends and patterns and to protect assets in the town.

**Priority:** Medium

**Lead Departments:** Planning Department, Building Department & DPW

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning

**Cost:** Staff time, Consultant fees , requires adequate GIS updates

**Status:** Continued and expanded action

**Action 1.8:** Plan and Raise awareness via the municipal web site and CodeRED for the Safe Evacuation of Tourist, Residents & Business Owners during Hazard Events.

**Priority:** Medium

**Lead Departments:** Department of Public Works & Planning Dept.

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning

**Cost:** Staff time, Consultant fees

**Status:** Continued and consolidated action

## **Goal 2** Ensure public safety from natural hazards.

**Action 2.1:** Complete an assessment of municipal structures located in SFHA that are utilized by vulnerable populations.

**Priority:** Medium

**Lead Departments:** Building Dept. & Planning Dept.

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning, Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued and consolidated action

**Action 2.2:** Provide information via direct mailings to schools and day-care facilities located in the flood zone in order to educate children and day care providers on natural hazard preparedness to raise awareness and improve response.

**Priority:** High

**Lead Departments:** Planning Department, Police Department, Schools and Day-Care Centers

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning, Public Safety

**Cost:** Staff time

**Status:** Continued and merged action from previous plan

**Goal 3:** Maintain emergency services during an event.

**Action 3.1:** Identify all evacuation routes serving coastal hazard areas that will be inundated with future sea level rise scenarios. Identify strategies for upgrades to the segments identified for evacuation routes. Publish and make these available to educate and raise awareness to those citizens impacted.

**Priority:** High

**Lead Departments:** Planning Department, Police Department, Schools and Day-Care Centers

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning, Public safety

**Cost:** Staff time

**Status:** Continued and merged action from previous plan

**Action 3.2:** Continue to maintain viable evacuation routes through the implementation of the Town's Tree Maintenance Plan which prioritizes maintaining those trees running along evacuation routes and roads offering single access to coastal and flood prone neighborhoods and encourage routine inspections for trees that are a potential storm threat.

**Priority:** High

**Lead Departments:** Department of Public Works

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning & Public Safety

**Cost:** Staff time

**Status:** Continued and merged action from previous plan

**Action 3.3:** Coordinate Evacuation Plans with Neighboring Towns to ensure each Town's evacuation routes are compatible.

**Priority:** Medium

**Lead Departments:** Department of Public Works & Police Department

**Time Frame:** Long Term

**Benefit:** Future Public safety

**Cost:** Staff time, Consultant fees

**Status:** Continued action

**Action 3.4:** Evaluate shelter sites (existing and potential) on an annual basis.

**Priority:** Medium

**Lead Departments:** Department of Public Works

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning, Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued and merged action from previous plan

**Action 3.6:** The Town will research feasibility of a recovery and reconstruction ordinance that will expedite re-building after a natural hazard event.

**Priority:** High

**Lead Departments:** Building Dept. & Planning/Zoning Dept.

**Time Frame:** Long Term

**Benefit:** Future Property Protection

**Cost:** Staff time, Consultant fees

**Status:** Continued and enhanced action

**Goal 4** Retrofit hazard prone facilities.

**Action 4.1:** Maintain a database with record of flood impacts on municipal properties and structures to better plan for improvements and protect the town's assets.

**Priority:** Medium

**Lead Departments:** Building Depart. & Planning Depart.

**Time Frame:** Long Term

**Benefit:** Future property protection

**Cost:** Staff time, Consultant fees

**Status:** Continued and Updated Action.

**Action 4.2:** Retrofit municipal structures in SFHA .

**Priority:** Medium

**Lead Departments:** Department of Public Works, Building Dept. & Planning Dept.

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning, Property Protection & Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued and Updated Action.

**Action 4.3:** Develop a cooperative strategy for municipal officials/facilities.

**Priority:** Medium

**Lead Departments:** Building Dept. & Department of Public Works

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning

**Cost:** Staff time, Consultant fees

**Status:** Continued and Updated Action.

**Goal 5** Reduce the vulnerability of the town's **infrastructure and utilities, cultural resources and recreational resources** to natural hazards.

**Action 5.1:** Evaluate new technologies promoting "green infrastructure" solutions that are available and could be applied to increase stormwater infiltration upstream and reduce runoff.

**Priority:** Medium

**Lead Departments:** Department of Public Works, Planning Dept. & Building Dept.

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning

**Cost:** Staff time, Consultant fees

**Status:** Continued and Updated Action.

**Action 5.2:** Promote OWTS upgrades in accordance with the Cesspool Phase-out Act, 2007 through potential grants and determine feasibility of sewerizing neighborhoods and commercial centers in SFHA with storm surge and sea level rise impacts.

**Priority:** High

**Lead Departments:** DEM, Department of Public Works, Planning Dpt. & Building Dpt.

**Time Frame:** Long Term

**Benefit:** Future Mitigation Planning

**Cost:** Staff time, Consultant fees

**Status:** Continued and Updated Action.

**Action 5.3:** Continue to monitor, update and evaluate town owned and private dams in accordance with Emergency Action Plan (EAP) with a view to implementing preventative actions in the event of a dam failure. This should be reviewed with an update occurring annually.

**Priority:** High

**Lead Departments:** Department of Public Works, RIDEM, Water Department

**Time Frame:** Long Term

**Benefit:** Future Public Safety, Mitigation Planning

**Cost:** Staff time, Consultant fees

**Status:** Continued and Updated Action.

**Action 5.4:** Inspect municipally owned bridges and work with the RIDOT via the State Transportation Improvement Program to inspect state-owned bridges for structural integrity to determine their individual vulnerability to damage in a hazard event. Records will be maintained to allow for the prioritization of funds for bridges which may have been to be retrofitted to prevent failure.

**Priority:** Medium

**Lead Departments:** Department of Public Works, RIDOT

**Time Frame:** Long Term

**Benefit:** Future Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued Action

**Action 5.5:** Create an emergency response plan in the event of bridge collapse. Hussey Bridge, Brown Street Bridge, Babbit Farm Bridge over Cocumscussoc Brook and the Hamilton Mill Bridge on Boston Neck.

**Priority:** Medium

**Lead Departments:** Department of Public Works, RIDOT

**Time Frame:** Long Term

**Benefit:** Future Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued Action

**Action 5.6:** Continue to Protect the Town Water Supply from contamination and drought through the increased monitoring and review of activities allowed in Groundwater Overlay Areas and through the Purchase of Development Rights (PDR) and Transfer of Development Rights (TDR) to direct development outside of the GW Overlay zones.

**Priority:** High

**Lead Departments:** Water Department, Department of Public Works, RIDOT

**Time Frame:** Long Term

**Benefit:** Future Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued Action

**Action 5.7:** Move utility lines underground for public safety by prioritizing lines in coastal areas and requiring that all utilities for new residential development to be installed underground.

**Priority:** Medium

**Lead Departments:** Department of Public Works, RIDOT

**Time Frame:** Long Term

**Benefit:** Future Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued Action

**Action 5.8** Retrofitting flood prone homes located within the Historic District . and other historical buildings and structures in town As ownership changes over time, properties will be upgraded to meet flood standards. Historic homeowners should be directed to resources that will assist them in a self-inspection of their properties to determine how vulnerable their structures are to storm damage.

**Priority:** Medium

**Lead Departments:** Planning Department & Building Department

**Time Frame:** Long Term

**Benefit:** Mitigation Planning & Property protection

**Cost:** Staff time

**Status:** Continued Action

**Action 5.9** Continue to implement the Storm Preparedness Plan to mitigate the effect of storms on boats, marina, infrastructure and docks and by preparing harbor and shoreline areas for storm events.

**Priority:** Medium

**Lead Departments:** Harbor Commission

**Time Frame:** Long Term

**Benefit:** Future Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued Action

**Action 5.10** Maintain town beaches and work with CRMC to re-nourish local beaches to help prevent erosion and protect coastal properties. The Town should also research the possibility of establishment of new beaches.

**Priority:** Medium

**Lead Departments:** Department of Public Works, CRMS & Planning Department

**Time Frame:** Long Term

**Benefit:** Future Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued Action

**Action 5.11** Perform actions to provide adequate access to forested parcels and a local source of water.

**Priority:** Medium

**Lead Departments:** Department of Public Works, Planning Department, Fire Dept., Water Dept.

**Time Frame:** Long Term

**Benefit:** Future Public Safety and forest protection

**Cost:** Staff time, Consultant fees

**Status:** Continued Action

#### **Goal 6:** Maintain essential services at Quonset Point.

**Action 6.1** Work with the Quonset Development Corporation to ensure new and existing development at Quonset Point meets State Building Code requirements.

**Priority:** Medium

**Lead Departments:** State Building Official

**Time Frame:** Long Term

**Benefit:** Future Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued & Merged Action

**Action 6.2:** Coordinate closely with RI Airport Corporation and the Army National Guard through the master planning process to assess the need for improvements at Quonset airport to prevent or mitigate flood damage from coastal storms.

**Priority:** Medium

**Lead Departments:** Department of Public Works, RIDOT

**Time Frame:** Long Term

**Benefit:** Future Public Safety

**Cost:** Staff time, Consultant fees

**Status:** Continued Action

**Action 6.3:** Actively involve flood prone businesses in Quonset Point involved in the outreach process to inform of natural hazards, primarily hurricanes and protection of their property and employees.

**Priority:** Medium

**Lead Departments:** Department of Public Works, RIDOT

**Time Frame:** Long Term

**Benefit:** Future Public Safety, Mitigation Planning, Protection of Property

**Cost:** Staff time, Consultant fees

**Status:** Continued Action

**Goal 7:** Improve CRS classification.

**Action 7.1:** Update CRS application and earn s class 7 rating.

**Priority:** Medium

**Lead Departments:** Planning Dept, Building Official, Department of Public Works

**Time Frame:** Long Term

**Benefit:** Future Public Safety

**Cost:** Staff time, Consultant fees

**Status:** New Action

**Goal 8:** Increase **resilience** towards coastal hazards and climate change.

**Action 8.1** Inform citizens and business owners of impacts from storm surges and rising sea levels through the municipal web site, local information sessions and dissemination of information at the town hall, libraries and chamber of commerce.

**Priority:** Medium

**Lead Departments:** Planning Dept., URICRC & RISG, RIDOT, Building Dept. & DPW

**Time Frame:** Long Term

**Benefit:** Future Public Safety, Mitigation Planning and Property Protection

**Cost:** Staff time, Consultant fees

**Status:** New Action

**Action 8.2:** Implement recommendations based on the findings of the climate adaptation strategies at local level to help North Kingstown make informed decisions and build an increased resilience to coastal hazards and climate change.

**Priority:** Medium

**Lead Departments:** Planning Department

**Time Frame:** Long Term

**Benefit:** Mitigation Planning

**Cost:** Staff time, Consultant fees

**Status:** New Action

**Action 8.3:** Implement projects using the TIP and CIP funds.

**Priority:** Medium

**Lead Departments:** Planning Department

**Time Frame:** Long Term

**Benefit:** Future Public Safety & Mitigation Planning

**Cost:** Staff time, Consultant fees

**Status:** New Action

**Action 8.4:** Continue to coordinate with state agencies and educational institutions to identify new or innovative strategies that have been successfully implemented in other location to address emerging problems.

**Priority:** Medium

**Lead Departments:** Planning Department, Building Department

**Time Frame:** Long Term

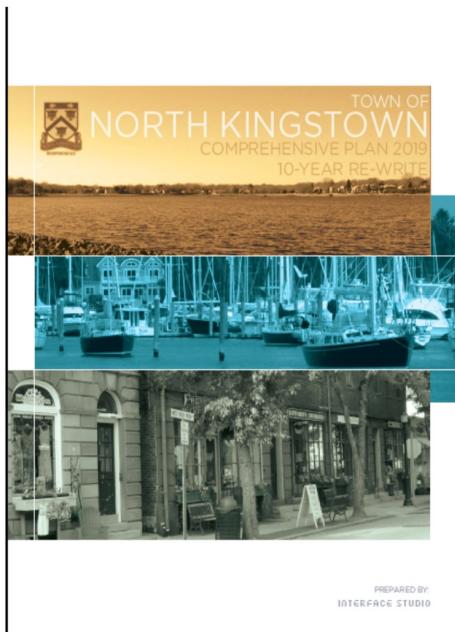
**Benefit:** Future Public Safety

**Cost:** Staff time, Consultant fees

**Status:** New Action

# Appendix B

## North Kingstown Map Resource Packet\* Used During Workshop



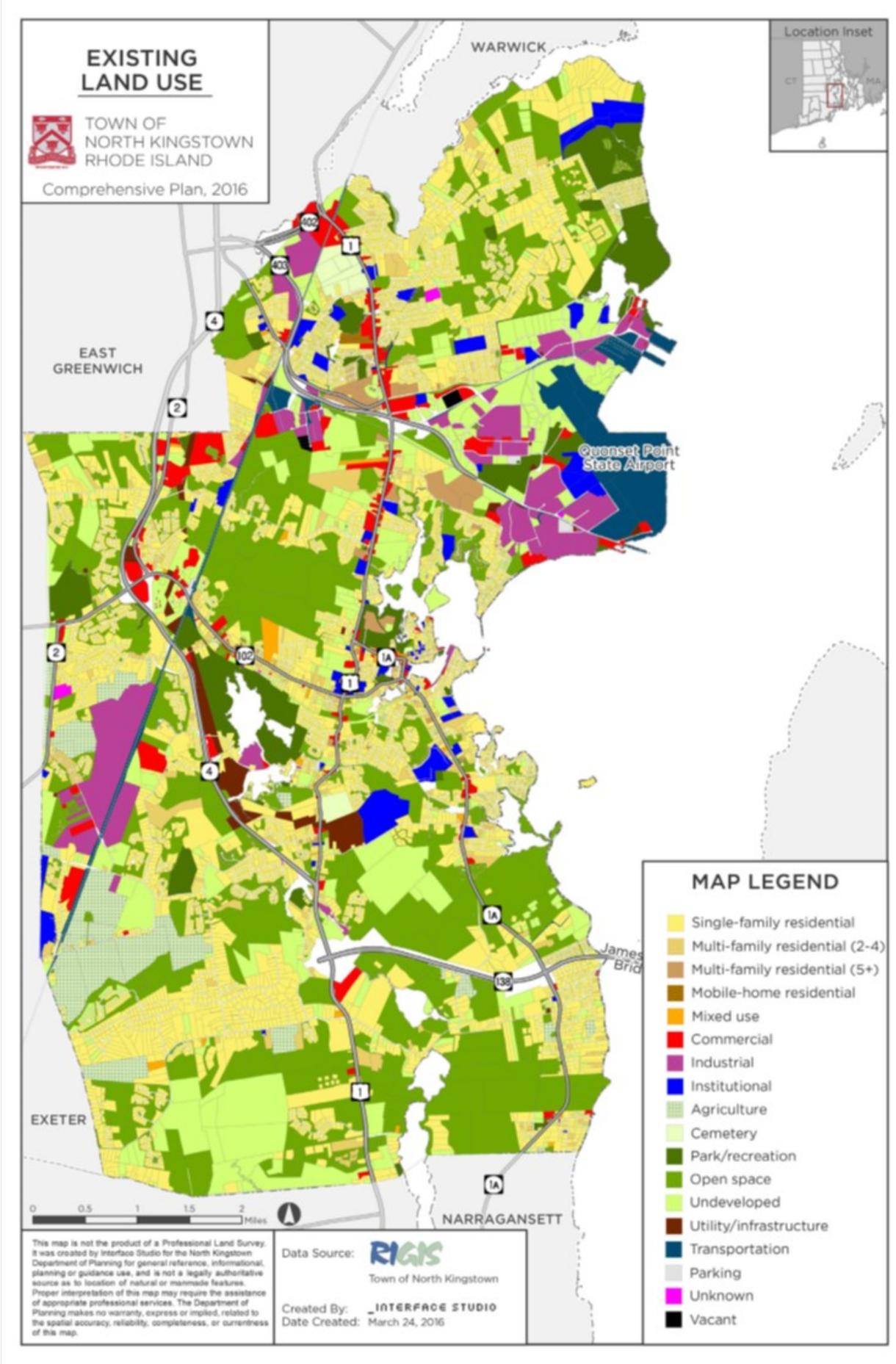
**Strategy for Reducing Risks  
From Natural Hazards in  
North Kingstown, Rhode Island**

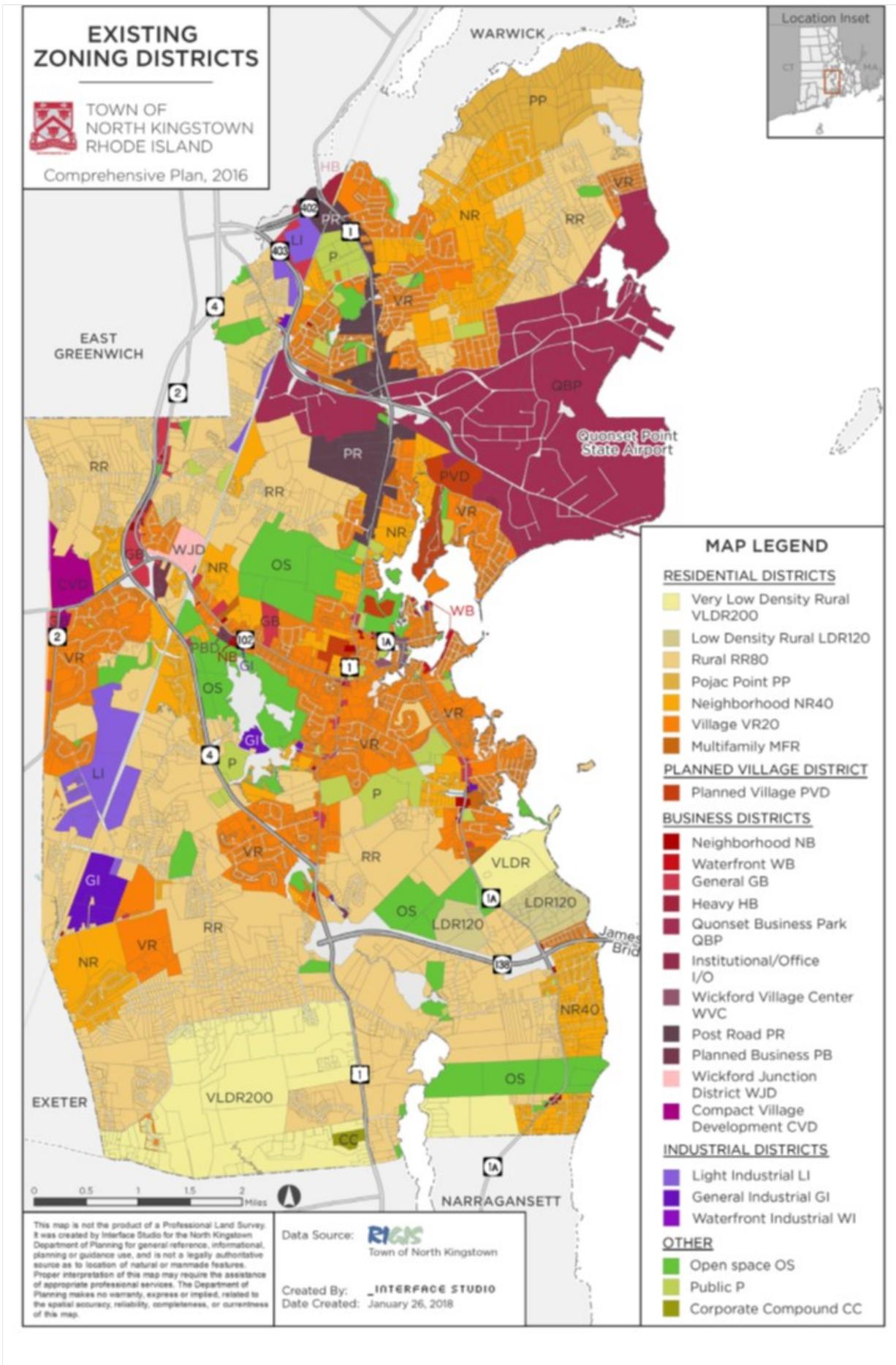
A Multi-Hazard Mitigation Strategy 2019

5-Year Update

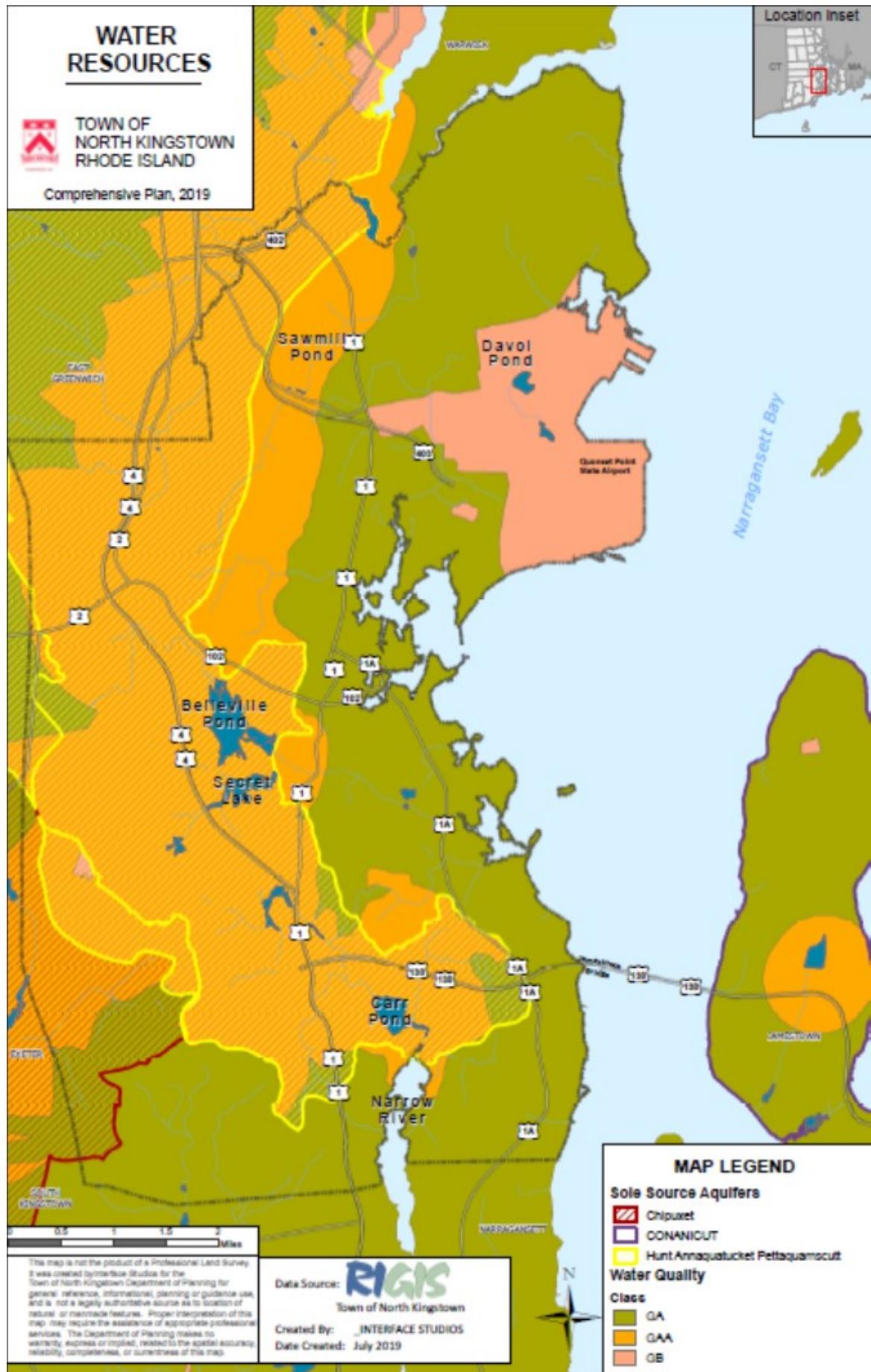


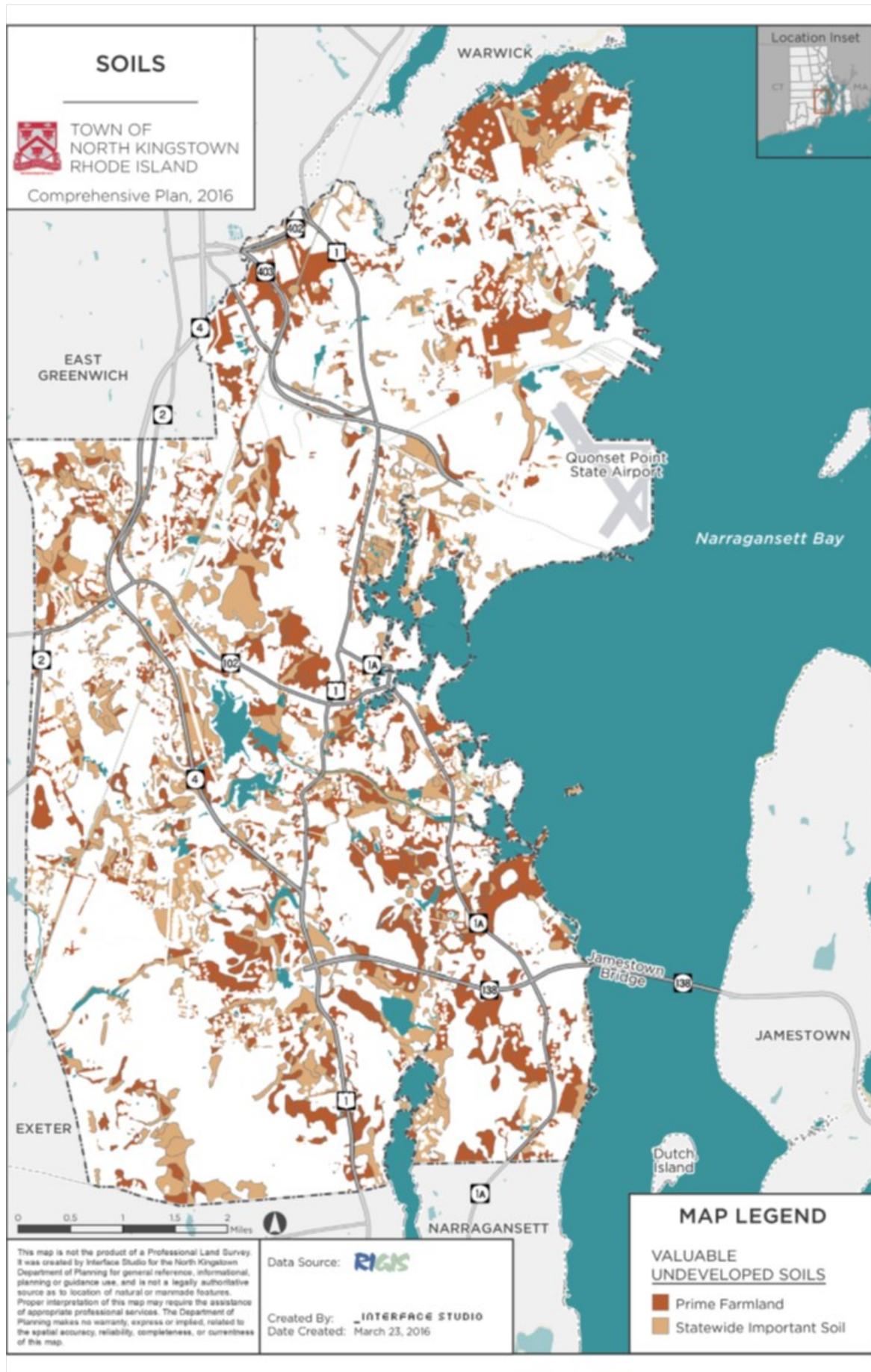
\*Gathered from North Kingstown's Local HMP (2019) & Comprehensive Plan (2019)

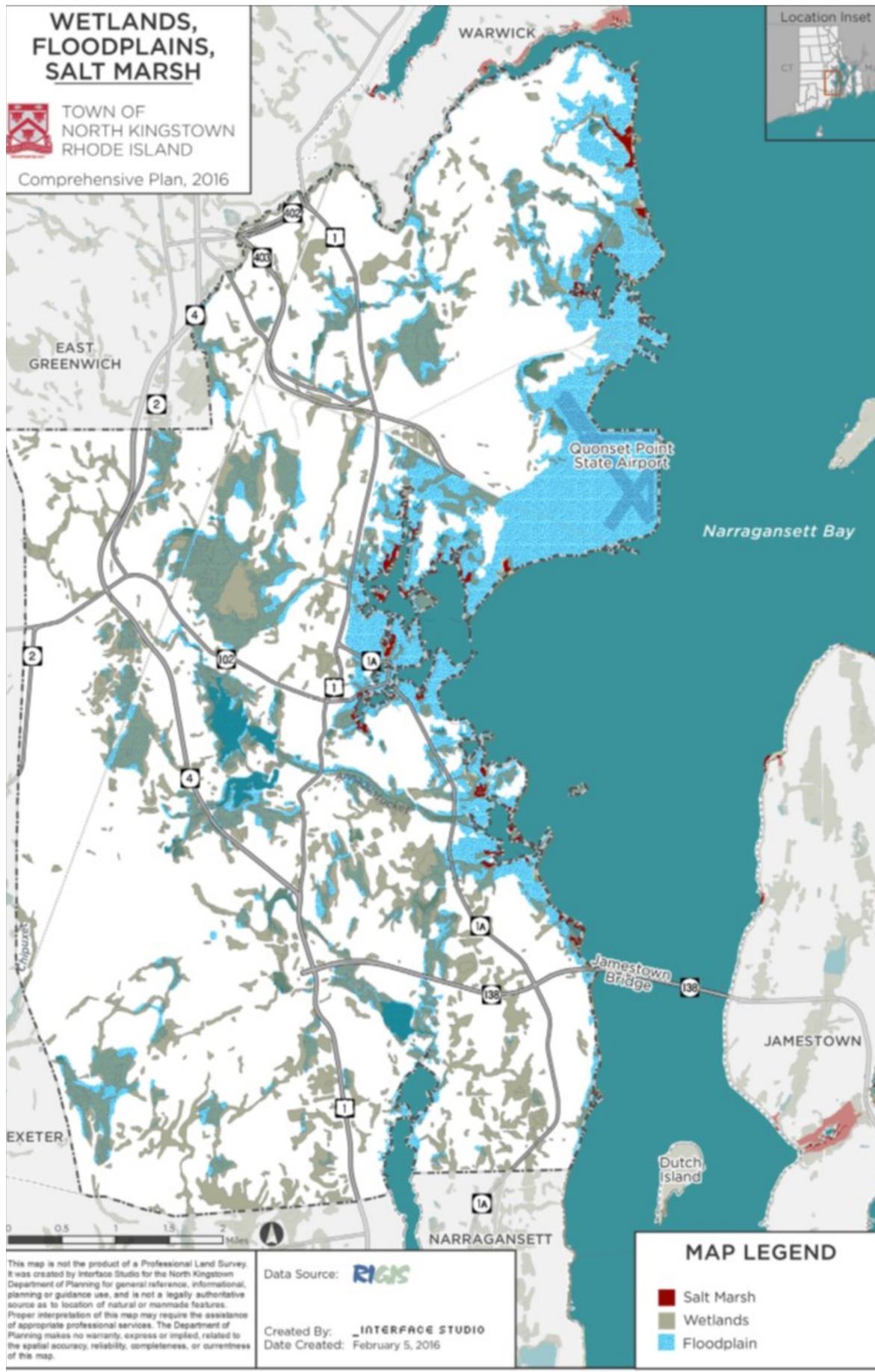


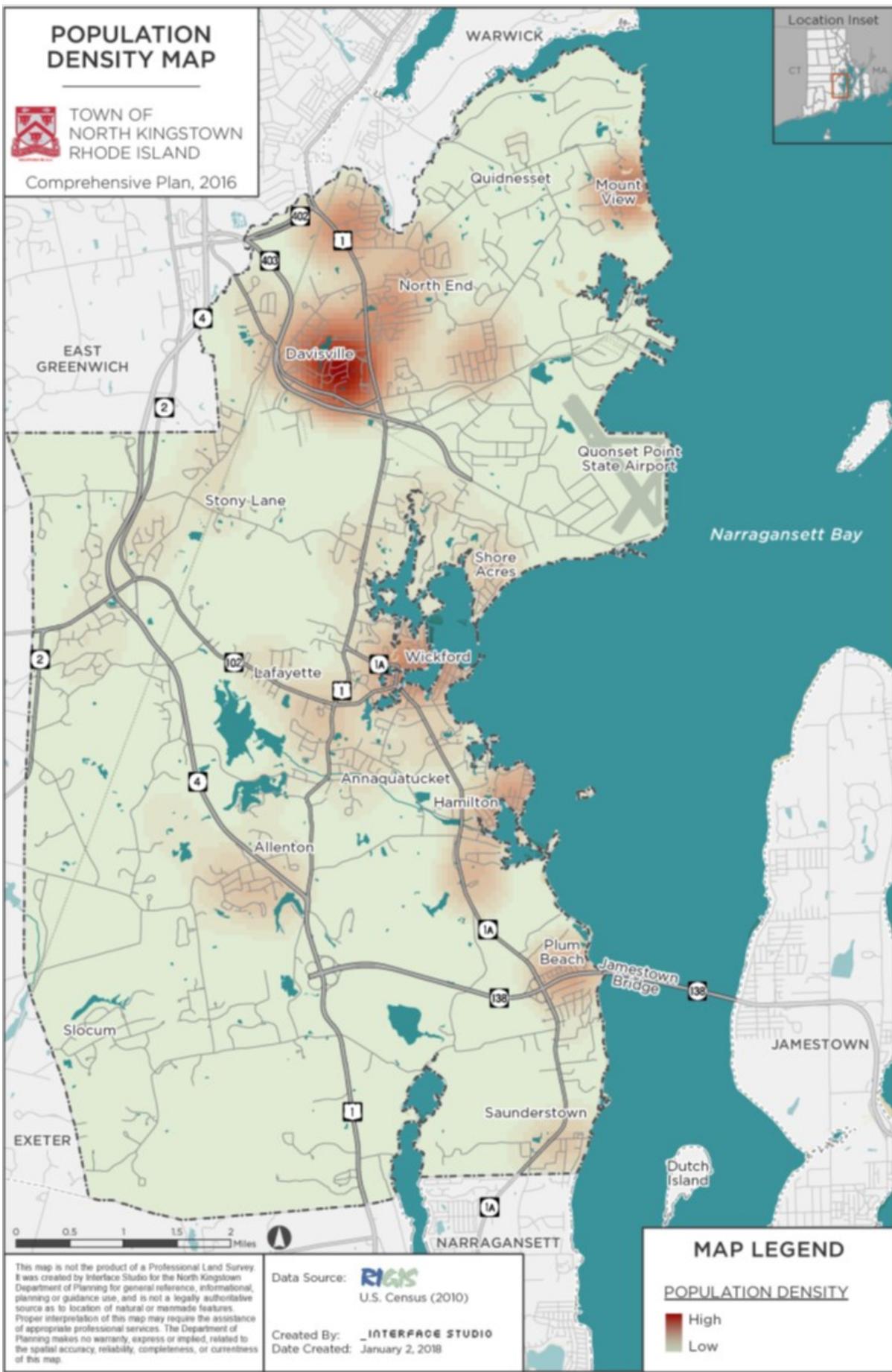












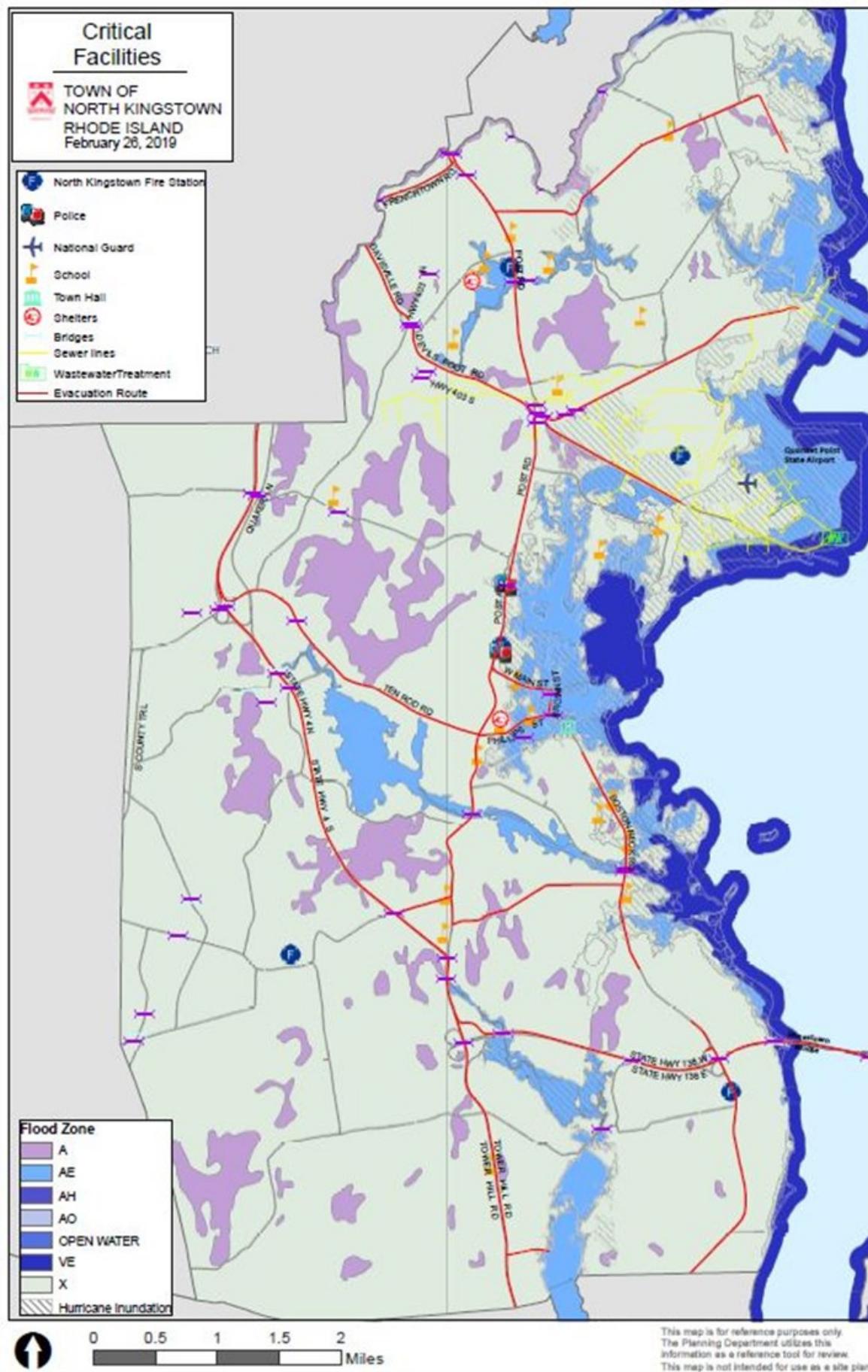
## CONSERVATION AREAS



TOWN OF  
NORTH KINGSTOWN  
RHODE ISLAND

Comprehensive Plan, 2016



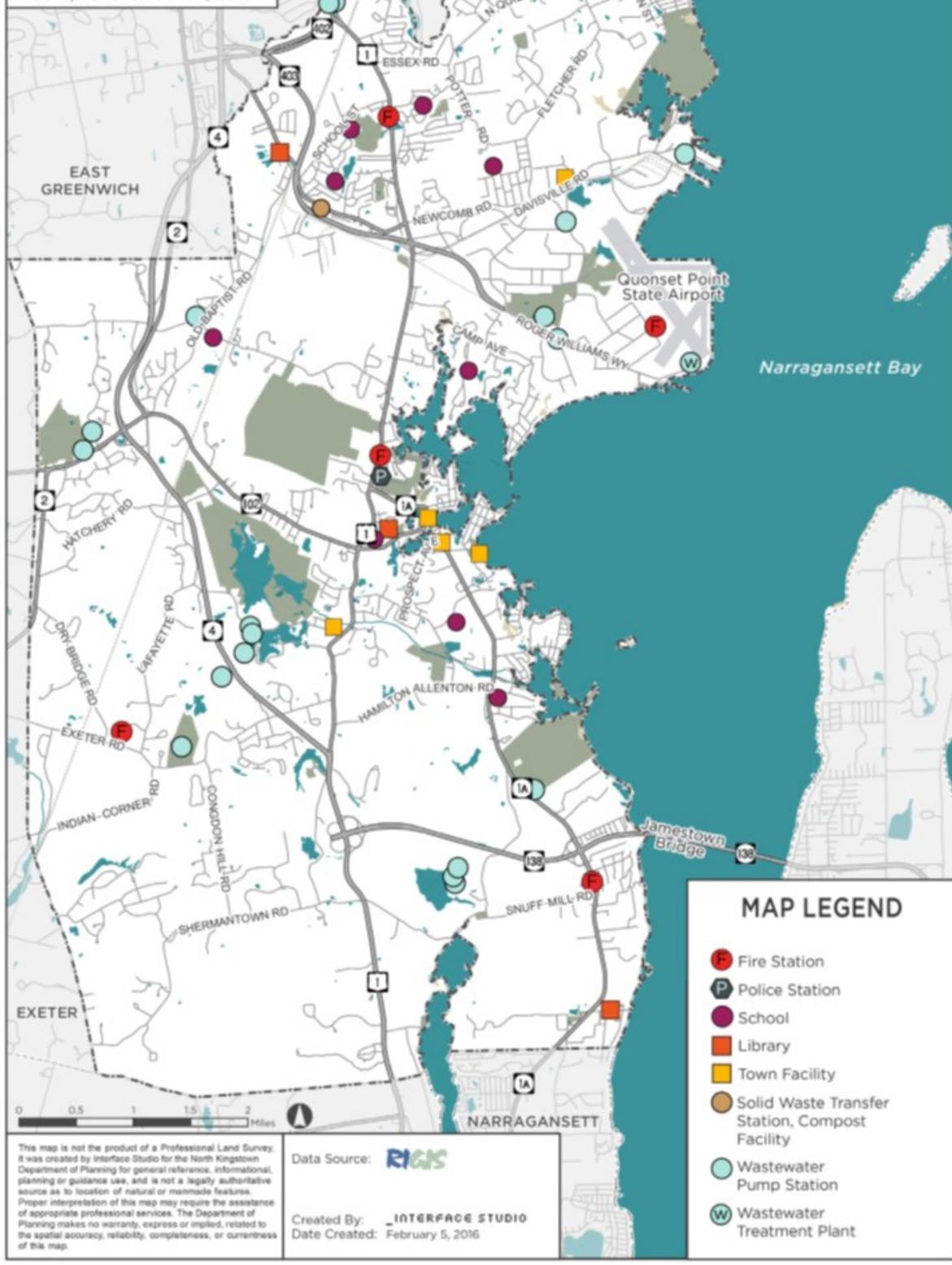


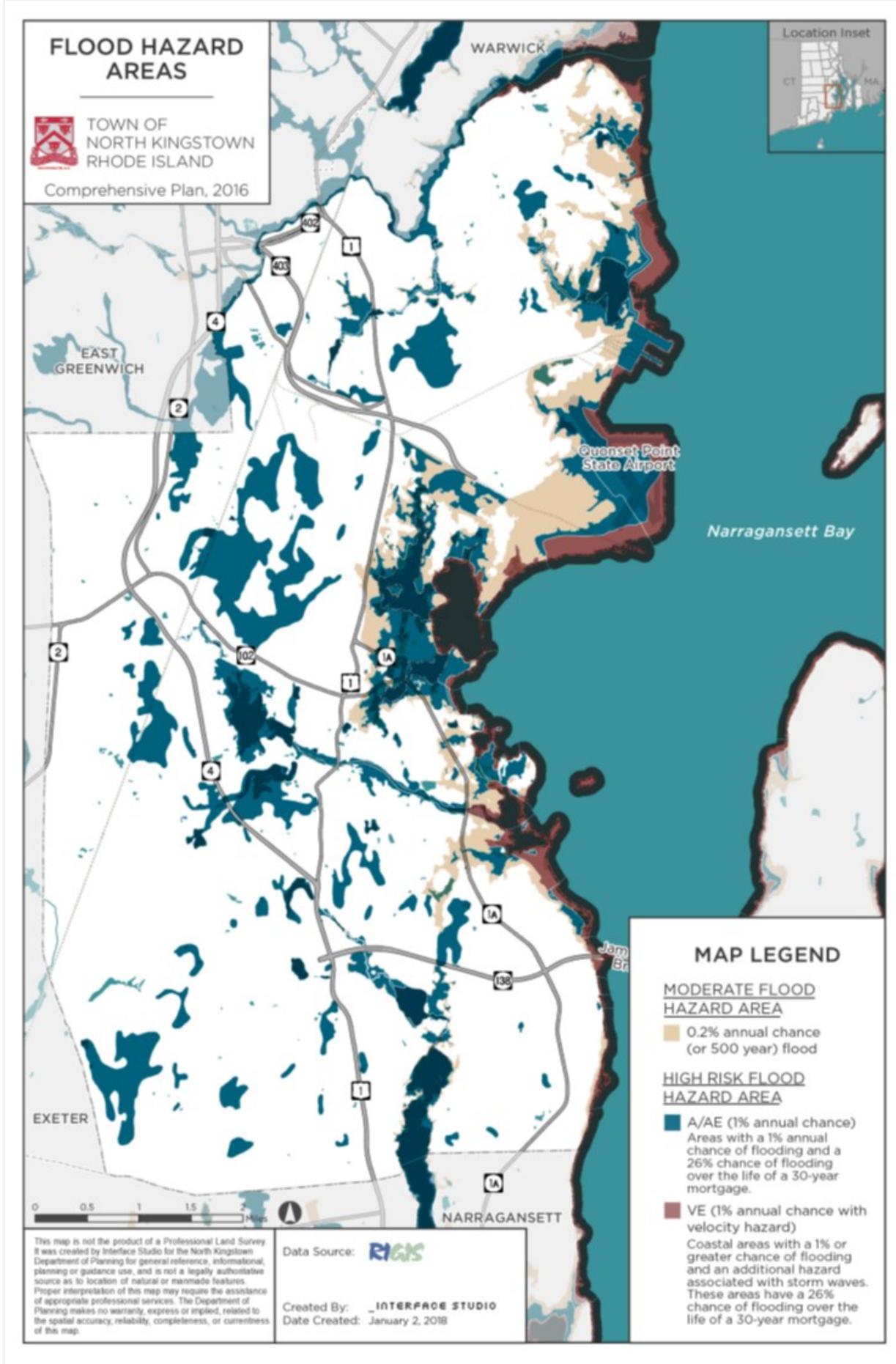
## PUBLIC INFRASTRUCTURE



TOWN OF  
NORTH KINGSTOWN  
RHODE ISLAND

Comprehensive Plan, 2016





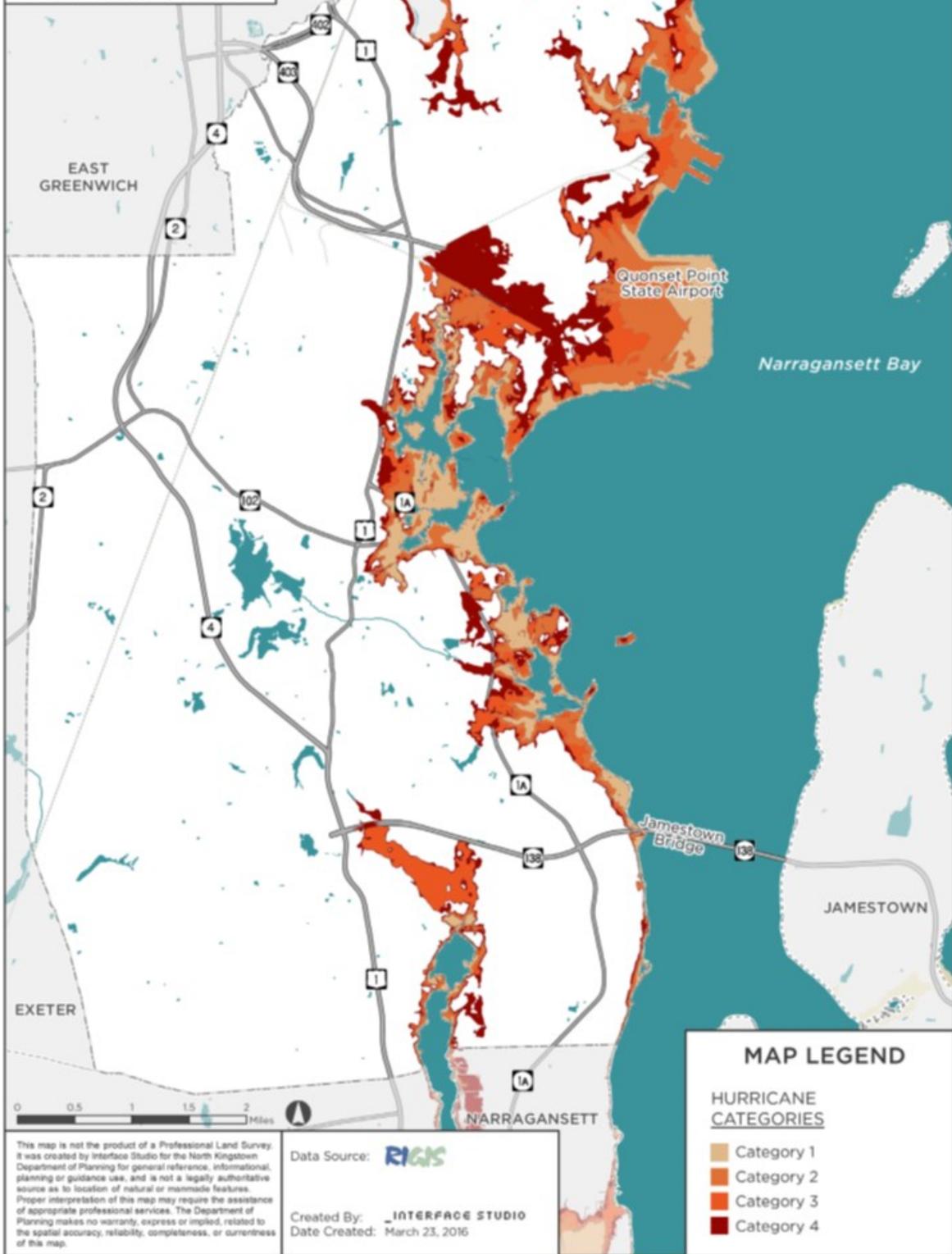
## WORST HURRICANE SCENARIO



TOWN OF  
NORTH KINGSTOWN  
RHODE ISLAND

Comprehensive Plan, 2016

Location Inset



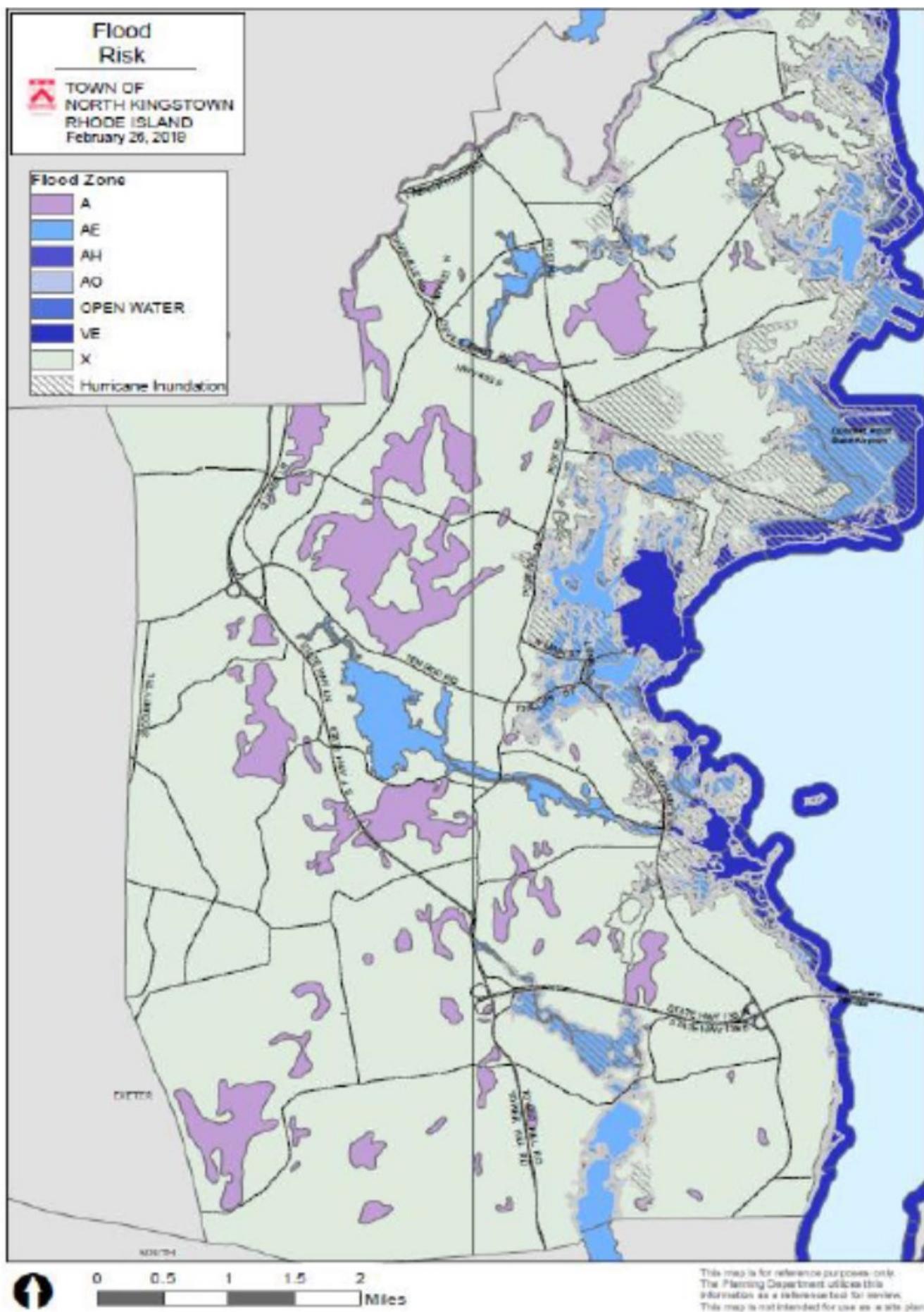
## Flood Risk



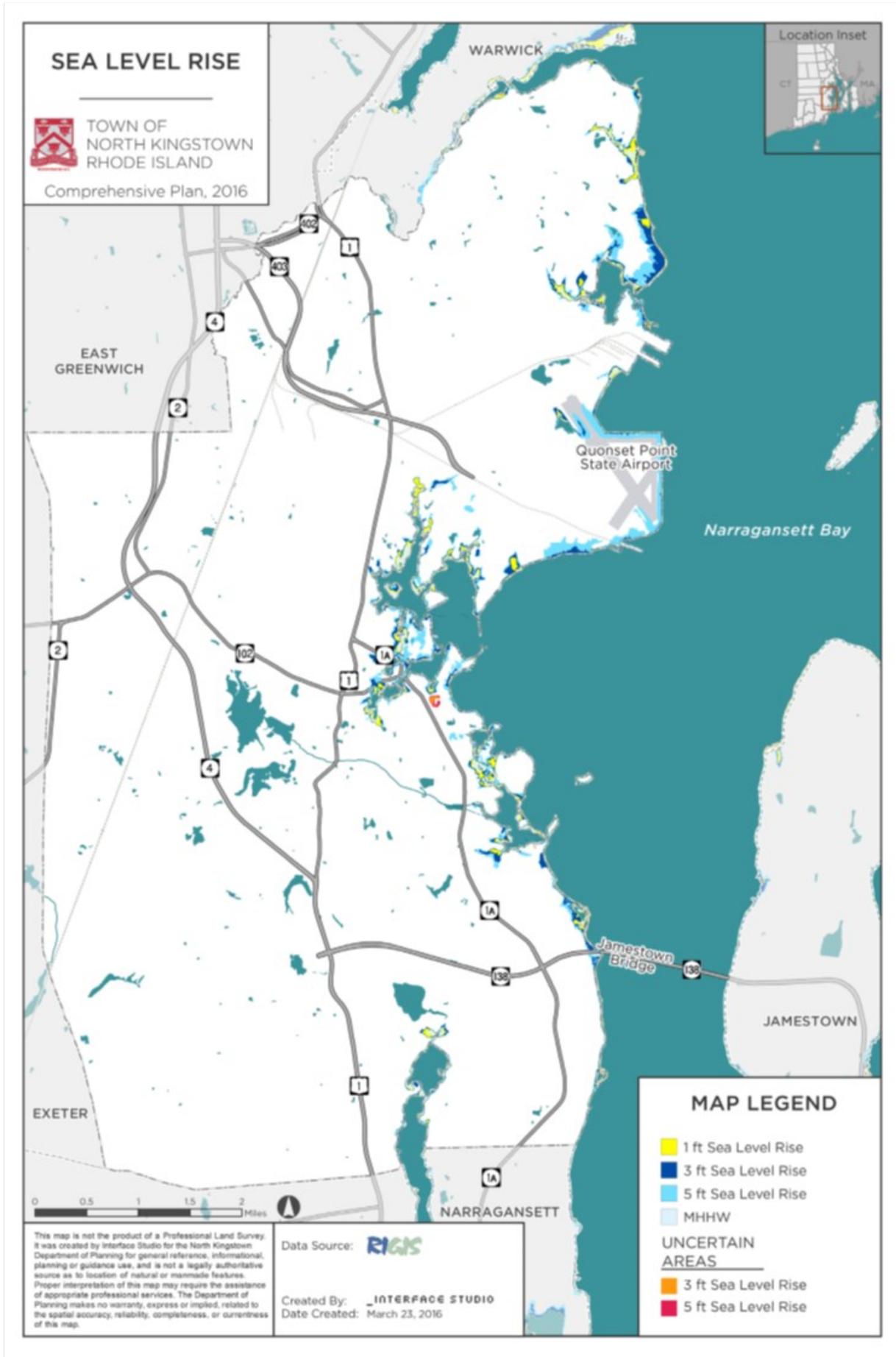
TOWN OF  
NORTH KINGSTOWN  
RHODE ISLAND  
February 26, 2018

### Flood Zone

- A
- AE
- AH
- AO
- OPEN WATER
- VE
- X
- Hurricane Inundation



This map is for reference purposes only.  
The Planning Department utilizes this information as a reference tool for review.  
This map is not intended for use as a site plan.

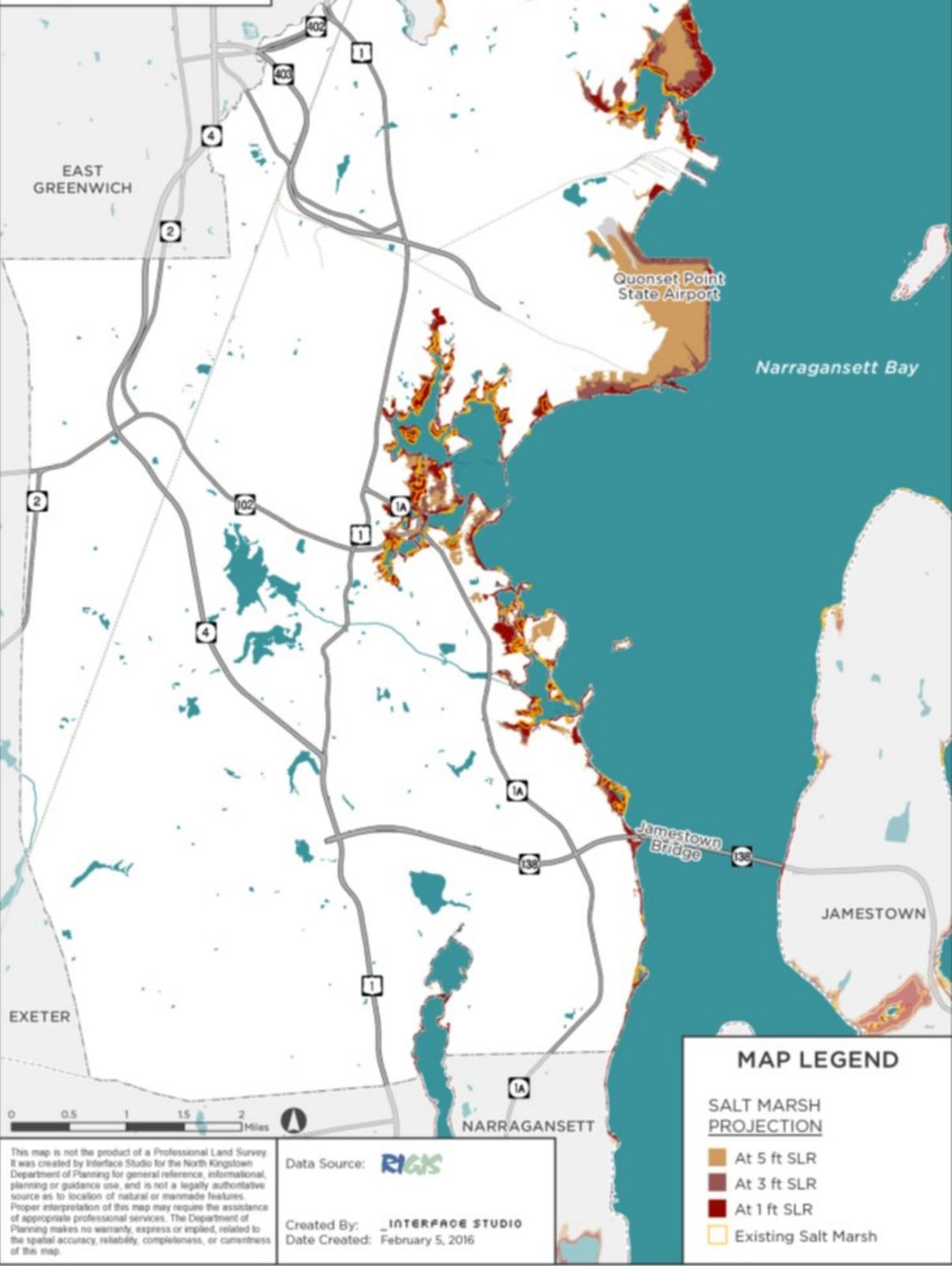


## PROJECTED SEA LEVEL RISE IMPACT ON SALT MARSH



TOWN OF  
NORTH KINGSTOWN  
RHODE ISLAND  
Comprehensive Plan, 2016

Location Inset

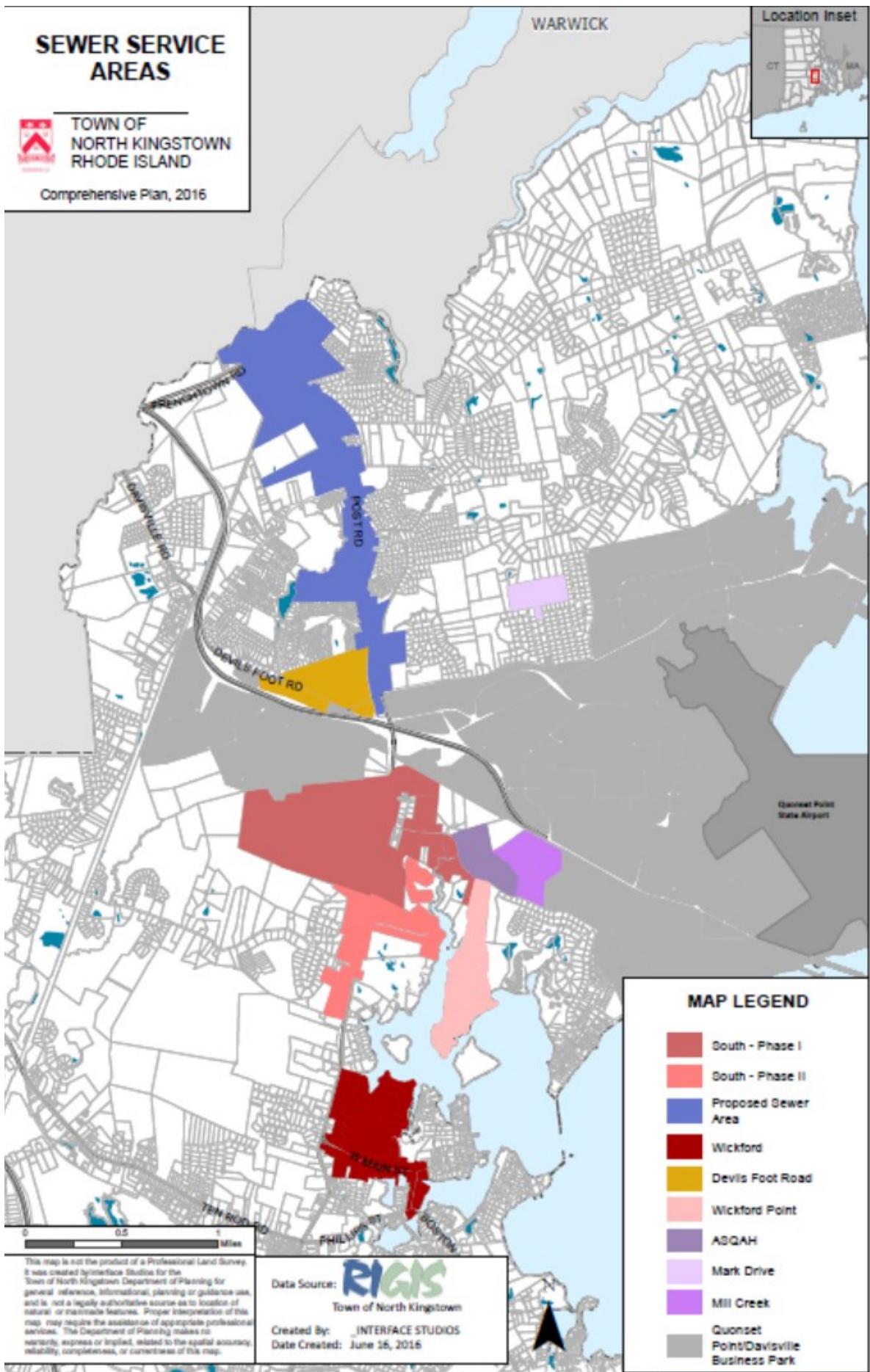


## SEWER SERVICE AREAS



TOWN OF  
NORTH KINGSTOWN  
RHODE ISLAND

Comprehensive Plan, 2016

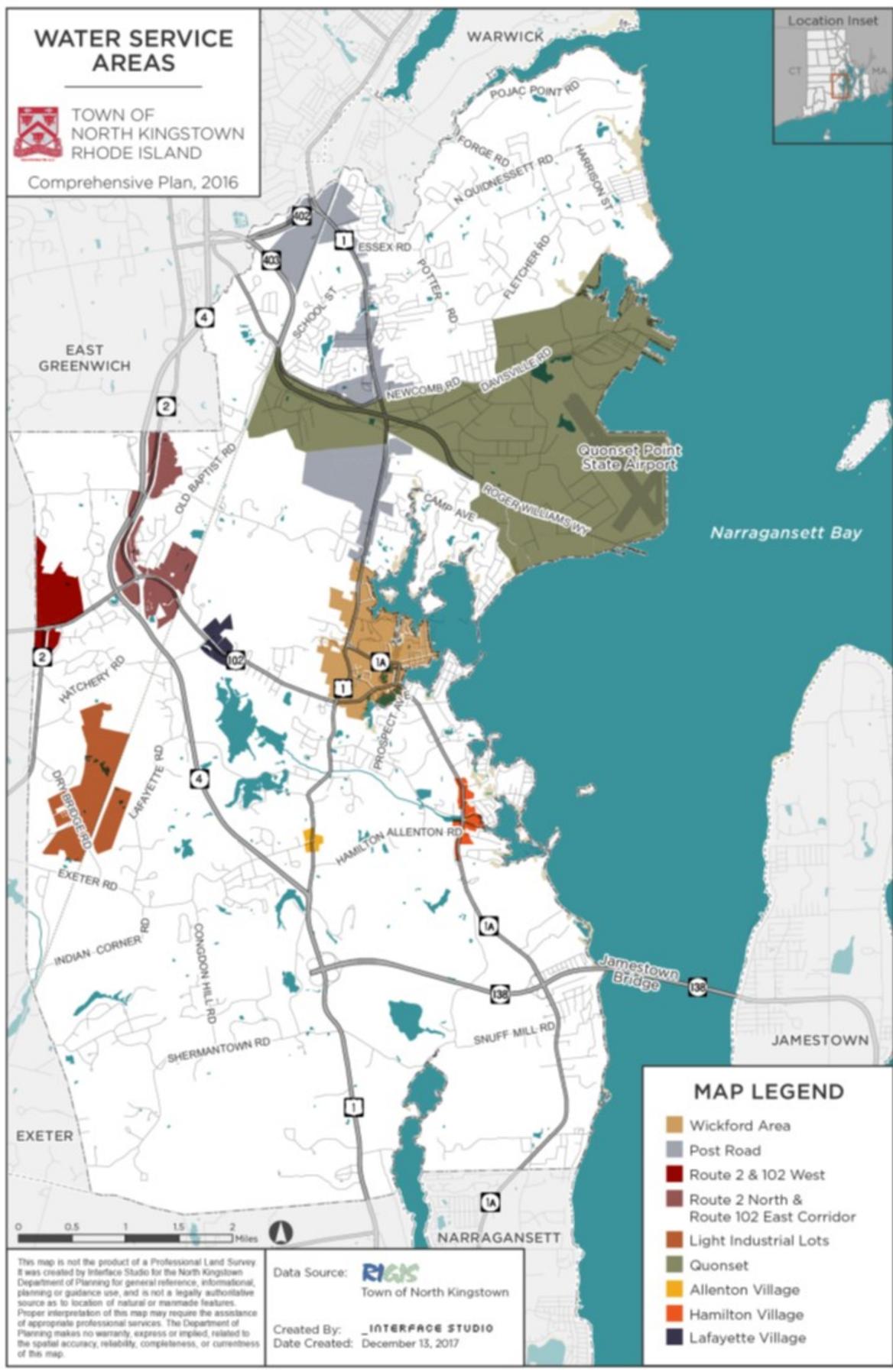


## WATER SERVICE AREAS



TOWN OF  
NORTH KINGSTOWN  
RHODE ISLAND

Comprehensive Plan, 2016





[www.CommunityResilienceBuilding.org](http://www.CommunityResilienceBuilding.org)