



# Jamestown Rhode Island



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## Municipal Resilience Program Community Resilience Building Workshop Summary of Findings July 2021



# Town of Jamestown, 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 Jamestown 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 Jamestown 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 June 2021, Jamestown's Core Team organized 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 Jamestown.

The Jamestown 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 Jamestown 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 Jamestown. The Jamestown Local Hazard Mitigation Plan (2017) and Comprehensive Plan (2015) 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 Jamestown’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 Jamestown on community resilience building will benefit from the continuous participation all those concerned.

## **Summary of Findings**

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

Prior to the CRB Workshop, the Jamestown Core Project Team identified the top hazards for the Town. The hazards of greatest concern included flooding (storm surge and other routine flooding around Town), hurricanes, and drought. Additional hazards mentioned and discussed during the CRB Workshop included locally severe winter storms (ice, wind, snow) and more intense and longer duration heat waves. These hazards have direct and increasing impacts on the infrastructure, residents, and environment including neighborhoods, natural areas (rivers, freshwater and coastal wetlands), drinking water sources, waterfront, roads, bridges, businesses and commerce, municipal facilities, school system, civic events, churches, social support services and other critical infrastructure and community assets within Jamestown.

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

## ***Top Hazards***

- Flooding (storm surge, routine/localized)
- Hurricanes
- Drought & Heat Waves
- Locally Severe Winter Storms (ice, wind, and/or snow)

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

**Infrastructure:** Public Works (highway garage), Jamestown Shores, Waterfront Properties (embankment failure due to erosion from high tides and storms), Wastewater Treatment Plant, South and North Pond Dams (Watson and Carr Ponds), Great Creek Wastewater Treatment Pump Station, Private Septic Systems, Drinking Water Wells, East Ferry, The Dumplings, Cell Coverage (north end of Island), Powerlines (north end of Island), Reservoirs (capacity - Phragmites), Electric Substation, Phone Substation (at Watson and Pemberton), Melrose Avenue School, RIDEM Division of Marine Fisheries Facility.

**Ecosystems/Waterways:** Coastal Embankments, Poor Soil Conditions (leaching capabilities, surface water runoff storage), Jamestown Brook, Great Creek, Mackerel Cove, East Ferry Beach, Aquifer (salt water intrusion), Sheffield Cove and Marsh, Potter's Cove, Fort Getty, Fox Hill Pond and Marsh, Hull Cove Swamp, Dutch and Gould Islands, Beavertail State Park, Carr Creek.

**Roads, Bridges, and Road Network:** North Road (at Great Creek), Beavertail Road (at causeway across Mackerel Cove), Maple Avenue (near West Ferry), Fox Run Drive, Conanicus Avenue, East Shore Road (at Toll Plaza), Fort Getty Road, Seaside Drive, State Highway 138E and 138W, Racquet Road, John C. Eldred Parkway, State Highway 138W On Ramp, Narragansett Avenue, Pell Bridge, Conanicut Bridge, Round Swamp Bridge.

**Vulnerable Populations:** Disabled and Special Needs Residents, Elderly, Residents within Jamestown's Urban Water District.

\*Information from workshop participants augmented via review of the Town of Jamestown's LHMP (2017) and Comprehensive Plan (2015). *See Appendix A for full list of mitigation/adaptation actions from the Town of Jamestown's LHMP.*

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

The Town of Jamestown has several concerns and faces multiple challenges related to the impacts of natural hazards and climate change. In recent years, Jamestown has experienced a series of highly disruptive and damaging weather events including:

- March Floods (March 2010)
- Tropical Storm Irene (August 2011)
- Nor'easters (January 2011, January-March 2015, March 2018, November 2020)
- Superstorm Sandy (October 2012)
- Nor'easter Nemo (February 2013)

Like most Rhode Island coastal communities the magnitude and intensity of these events and others across Rhode Island have increased awareness of natural hazards and climate change, while motivating communities like Jamestown to proactively and comprehensively improve their resilience. This series of extreme weather events highlights that the impacts from hazards are diverse: ranging from flooding of critical infrastructure, bridges, roads, and low-lying areas; localized flooding from stormwater runoff, increasingly higher tides, and heavy precipitation events; property damage, coastal erosion, potential dam, water, and sewer failure. Longer periods of elevated heat and associated drought further exacerbate existing water availability issues for residents and businesses. These hazards also impact vulnerable segments of the population including elderly, disabled, and/or disproportionately burdened residents, as well as the workforce and volunteer communities. The combination of these issues presents a challenge to preparedness and mitigation priorities and requires comprehensive, yet locally-tailored actions across Jamestown.

The workshop participants were generally in agreement that Jamestown is experiencing more intense and frequent storm events, heat waves, and precipitation events. Additionally, there was a general concern about the increasing challenges of being prepared for the worst-case scenarios (i.e. major disasters, storms, major hurricanes (Cat-3 or above)) throughout the year, but particularly in the fall/winter months due to more intense snow and ice storms coupled with colder weather. The impact of the current Covid-19 pandemic was raised several times by workshop participants as well.



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

As in any community, Jamestown is not uniformly vulnerable to hazards and climate change, and certain locations, assets, and populations have 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:**

- Topography of the Island is such that the Island can be split up in different segments within the southern and northern areas not able to get into the center of Town.
- Sea level rise resulting in more routine road flooding at two main high-risk places including North Road at Great Creek crossing and the Beavertail Road (causeway) at Mackerel Cove.
- Current flooding during high tides and during storms at East Ferry and Maple Avenue by West Ferry.
- Risks associated with loss of access or egress for resident and medical personnel/supplies, fuel, and food to and from Jamestown in the event both the Claiborne Pell/Newport Bridge and the Jamestown-Verrazzano Bridge (i.e. bridges currently close during high wind events).

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

- Cellular phone coverage gaps in north end of Island.
- Powerlines impacts causing outages in north end of Island during large storms.
- Continued migration of residents from landline phones to cell service all dependent on a single provider for the entire Island.
- Limitations with only one main electrical connection point for the Island.
- Cost of living including housing costs has impacted the availability of volunteers for services such as the Fire Department.
- Concerns about access to Island for critical backup support from nearby towns during disasters.
- Currently, only two ambulances for the entire Island.
- No hospital or other medical facilities on the Island other than one doctor's office.

#### **Housing/Buildings/Facilities:**

- Limited opportunities for creating more diverse and affordable housing stock even with affordable housing strategy in place.
- Increasingly expensive real estate prices resulting in limited opportunities for relocation of younger families and professionals.
- Small lot size and proximity of septic systems and drinking water wells in certain developments (Jamestown Shores) creates cross-contamination concerns.
- Wastewater treatment plant located in the flood zone.

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

### **Societal Concerns and Challenges**

#### **Vulnerable Populations:**

- Power outages are a concern for individuals dependent on electric medical devices such as oxygen.
- Growing elderly population (50% over 65, currently) that increasingly become isolated during extreme weather events making it challenging to get them food and supplies.

#### **Businesses:**

- Business community is vulnerable to natural disasters and major events.
- Limited parking for downtown businesses.

#### **Community Needs - Services:**

- Current challenges with adequate broadband access across the Island.
- Over dependence on a single, independently owned food store for the entire Island during extreme weather events.
- There are currently no pharmacies on the Island, which requires residents to secure prescriptions off Island in advance of a major event.

#### **Drinking Water:**

- Saltwater intrusion into groundwater impacting many private drinking water wells – especially during drought conditions.
- Limited quantity of public drinking water on the Island with decreasing reservoir capacity due to establishment of phragmites and only one public supply well to supplement existing quantities, if needed.
- Currently no drinking water interconnection with North Kingstown despite long standing emergency operation agreement between municipalities.
- No plan in place and approved by Rhode Island Department of Health for interconnection with North Kingstown for drinking water supply during crisis.
- Less than adequate water conservation efforts by residents to date (i.e. lawns).

### **Environmental Concerns and Challenges**

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

- Future flooding projections due to precipitation event of longer duration and higher intensity will present a challenge in rivers, streams, brooks, and wetland systems experiencing issues, currently (i.e. Trout Brook, North Branch - Park River).
- Poor soil conditions on Island result in significant stormwater runoff and limited leaching capabilities for privately owned and operated sewer systems.

## **Current Strengths and Assets**

Just as certain locations, assets, and populations in Jamestown stand out as particularly vulnerable to the effects of hazards and climate change, other features are notably assets for Jamestown's community 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 and sustainability building actions.

- Clearly, the responsive and committed engagement exhibited by leaderships, staff, volunteers, and residents is a very appreciated strength within and across Jamestown. Ongoing collaboration between municipal staff, committee/commission, volunteers, business community, faith-based organizations, NGOs, neighboring areas (Aquidneck Island), and various state-level organizations, among others, on priorities identified herein will help advance comprehensive, cost-effective, community resilience building actions.
- The Town has highly experienced staff with access to adequate resources for most emergency situations. The coordination amongst various departments including leadership, Public Works, Police, Fire, and Planning was cited as a highly valued community strength.
- Strong desire amongst residents to volunteer their expertise and knowledge of the Island at all levels (town council, commissions, etc.) to update/develop and operationalize plans to make Jamestown and more resilient and sustainable place.
- Consistent and informative internal communications system between multiple departments (i.e. Fire, Police, Public Works, Planning, Leadership, etc.).
- Relatively self-sufficient, local infrastructure system that does not rely too much on federal aid - except for the two major bridges serving the Island.
- Community members are accustomed to adapting to changes in conditions on the Island (i.e. water rationing during droughts, hurricane preparedness).
- True spirit of collaboration and willingness amongst municipal staff and residents to work together to prepare for and solve issue of concern including the implications of climate change.
- Various forms of community-wide communication/information systems get the word out quickly and effectively (i.e. Jamestown community facebook page).
- Close-knit community engaged with what goes on around the Island particularly when it comes the impacts of development on the community and the environment.



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

- The Town is increasingly preparing for climate change given the concern about current impacts from hazards and the threat of escalation—particularly from storms, flooding, and drought.
- Overall successful response to managing and responding to the Pandemic and vaccine rollout speaks highly of the communications and coordination possible within the Jamestown community.
- Passionate and environmentally supportive mindset in the community where nature-based solutions and ecosystems are respected as an asset worth protecting.
- Routine attention directed to maintaining foundational plans for the community that increasingly interconnect due to collaboration amongst staff and volunteers including Emergency Operations Plan (with an all-hazards approach), Hazard Mitigation Plan, Sustainability Plan (2020), and Comprehensive Plan.
- Strong sense of connection with Aquidneck Island due to the common circumstances and concerns shared amongst island communities in Rhode Island.
- Active and resourceful staff that are quick to mobilize in response to issues in a collaborative cross-department fashion.
- Tremendous support and participation from community members who want to help and stay engaged during emergencies.
- Productive relationship between Town leadership and business community.
- Emergency operation agreement in place with North Kingstown to supply drinking water in times of crisis but no interconnection, currently.



(Credit: christierealestate.com)

## **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 Jamestown's vulnerability to extreme weather events, sea level rise, flooding, drought, 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:

- **Infrastructure improvements** (i.e. electrical utility infrastructure reliability and access, dams, reservoir, road raising, stormwater management systems, low-impact and resilient development);
- **Drinking water supply** (i.e. facilities and supporting infrastructure, long-term comprehensive planning, communications/education, aquifer assessment, salt water intrusion, public/private wells interchange);
- **Quality of life improvements** (i.e. affordable housing, sustainability, workforce, volunteerism, green infrastructure, food security, connectivity, open space/recreation, senior care support);
- **Emergency management** (i.e. multiple plan coordination, communications, outreach, education, continuation of services, business recovery, sheltering, vulnerable populations).

In direct response, the workshop participants developed the following priority and other action list. Mitigation/adaptation actions from the Jamestown LHMP (2017) are provided in Appendix A for cross reference. In addition, actions previously identified in the Jamestown Comprehensive Plan (2015) were reviewed for consistency with input from workshop participants.

### **Priority Actions**

- Expand emergency services on the Island by increasing size of emergency vehicle fleet, full-time personnel, medical treatment facilities, and increase support and resources for volunteer personnel (insurance, affordable housing, etc.).
- Accelerate support amongst residents for the completion of fire station annex.
- Assess existing critical infrastructure and facilities vulnerability to sea level rise and flooding and develop a plan based on assessment to mitigate failure.

## Priority Actions (cont'd)

- Coordinate bridge contingency failure plans in local Emergency Management Service plan and integrate into comprehensive plan for total bridge failure scenario including mechanisms to reconnect (ferries, barges) to enable distribution of emergency responders and services, shelters, and food supplies.
- Address vulnerability of causeway and mitigate dune washout at Mackerel Cove in the long term (vs. dune rebuilding every 2-4 years) via coordination with DOT to raise roadway and/or harden causeway and to explore overflow designs which would allow water to move to Sheffield Cove and back again (elevate east and west ends of road; permeable or hardened middle section, etc.).
- Expand funding and implement plans for affordable and workforce housing.
- Develop and implement a comprehensive water conservation and management plan that integrates public and private water concerns, uses, and resiliency.
- Develop plan to mitigate vulnerability of water treatment plant and pumphouses located in the flood zone to sea level rise and flooding including raising or relocating critical infrastructure (particularly at Great Creek with additional pump stations).
- Look to locate and establish additional supplementary drinking water wells across the Island to help augment current supply reservoirs (currently 1 of 3 wells functioning as 2 used to maintain lagoons).
- Preserve potable water by coordinating actions to remediate phragmites at the supply reservoirs (which improves water quality and capacity), address poor dam structural integrity, expand easements and reduce high impact development.
- Explore potential for the creation of regulatory tools to mandate private well use is in accordance with an integrated comprehensive water management plan (emergency and otherwise).



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(Credit: jamestownrentals.com)

## Priority Actions (cont'd)

- Develop and implement a comprehensive plan for broadband/cell service coverage across Jamestown (particularly in the North End) that includes determining the potential location of additional cell tower in the North End and take steps needed to address environmental and infrastructure concerns and requirements at chosen location as well as coordination with additional broadband/cell service providers and vendors.
- Address short and long term vulnerability of North Road Bridge at Great Creek by advancing the following actions:
  - Take immediate steps to improve the resiliency of the bridge and roadway at Great Creek to address short term sea level rise scenarios and withstand high tides and storm surges for the next 10-15 years.;
  - Collaborate with DOT (and State Transportation Improvement Program) to replace the bridge at Great Creek and raise it and roadway above long-term sea level rise scenarios;
  - Coordinate both phases with complementary actions regarding proximate water treatment plant, pumphouse, marshland conservation, and efforts to preserve the natural hydrodynamics of the creek.
- Assess the extent of private well use and issues including reduced water yields and increased salinity levels from salt water intrusion and establish a volunteer system to report ongoing issues.
- Develop an action plan for emergency scenarios to extend supply lines and public water outside Jamestown's Urban Water District to other residents in need.
- Revisit and strengthen former collaboration with North Kingstown regarding emergency/crisis drinking water supply support and explore expansion to non-emergency conditions.
- Remediate infill development and substandard use of restricted lots (e.g. Jamestown Shores conversion from summer cottages to year-round and multi-home lots) and assess extent of lots which violate zoning restrictions.
- Mandate capture of surface runoff during construction (e.g. Fox Run Drive).

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

- Conduct comprehensive update to zoning limits through the lens of water scarcity and water supply in coordination with updates to Comprehensive Plan (e.g. impervious surfaces and high ground water overlay district restrictions, soil type restrictions, high water table subfloor construction restriction, etc.).
- Support comprehensive water conservation and management plan through public education on drinking water fragility for both public water and private well users.
- Raise awareness (particularly with private well users) regarding Urban Water District use requirements and restrictions and the interconnectedness of private well use and public water resources and fragility.
- Hazardous waste education, training, community events, and services/sites for waste removal to help minimize discharge straight into waterways.

## **Other Actions**

- Identify areas for salt marsh advancement to assist with protection from sea level rise.
- Increase protection and conservation of freshwater wetlands on the Island.
- Expand coastal resilience efforts including embankment maintenance and implement nature-based solution alternatives in impacted areas.
- Increase local food production to bolster on-Island food supply generally and in event of isolation during crisis events.
- Incentivize and facilitate zero-waste/waste-minimizing strategies to reduce financial burden of waste collection.
- Address the needs of aging population through resources, services, and programming for seniors to support “aging-in-place” given lack of homecare agencies and skilled-care providers currently positioned in Jamestown.
- Look to restrict lawn installment particularly associated with large private residences and fertilizer use in areas with poor leaching capability for septic systems and increased stormwater run-off characteristics.

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

- Establish and enforce zoning limits and restrictions that protect coastal buffers and limit impervious surfaces for new development and redevelopment.
- Explore potential size limits on single family homes.
- Establish an authorizing ordinance or regulation that requires surface runoff capture on construction sites.
- Develop and retain staff capacity (in planning and otherwise through full time staff additions and/or partnerships) to apply broadly for and manage grant funding (federal and otherwise), particularly for long-term projects which support climate resilience and these priority actions.
- Design and administer an island-wide survey to define parameters of private well concerns amongst residents.
- Look to remedy the lack of a pharmacy on the Island.
- Conduct community education and preparedness, at the individual, neighborhood, and community levels and determine where service providers can be integrated into a novel neighborhood-based network-building initiative for Jamestown.

## **Town of Jamestown Plans Reviewed:**

Jamestown Comprehensive Community Plan (2014 (update in progress))

Jamestown Natural Hazard Mitigation Plan (2017)

Zoning 82-314 High Groundwater Table/Impervious Layer Overlay District Restrictions (2007)

The Town Of Jamestown Emergency Operations Plan (dev. 1992; updated 2012)

The Harbor Management Plan (dev 1994, updated 2014)

Dam Emergency Action Plan (2014)

## **Further Resources (Sea Level Rise and Water) Consulted:**

Clean Water Infrastructure Replacement Plan (2019)

Sea Level Affecting Marshes Model (SLAMM) Jamestown Map Series

Jamestown Socioeconomics of Sea Level Rise Coastal Factsheet

Coastal Sea Level Rise and Storm Surge: Transportation Fact sheet

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

Town of Jamestown - Office of the Town Administrator

Town of Jamestown - Town Council

Town of Jamestown - Planning Department

Town of Jamestown - Police Department

Town of Jamestown - Public Works Department

Town of Jamestown - Parks & Recreation Department

Town of Jamestown - Building & Zoning Department

Town of Jamestown - Conservation Commission

Town of Jamestown - Harbor Management Commission

Town of Jamestown - Planning Commission

Town of Jamestown - Chamber of Commerce

Town of Jamestown - Residents

Clean Ocean Access

## **Jamestown Core Project Team**

Lisa Bryer - Town Planner, Town of Jamestown

Chief Ed Mello - Police Chief, Town of Jamestown

Jean Lambert - Town Engineer, Town of Jamestown

## **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/Scribe)

URI Coastal Resource Center - Pam Rubinoff (Small Group Facilitator)

Audubon Society of Rhode Island - Meg Kerr (Small Group Facilitator)

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

Rhode Island Infrastructure Bank - Kim Koriath (Scribe)

The Nature Conservancy - Jasmine Li (Scribe)

Rhode Island Infrastructure Bank - Kellie King (Scribe)

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# **Appendix A**

## **Town of Jamestown Local Hazard Mitigation Plan (2017)**

### **Mitigation Actions, Priorities, and Timeframes & Action Tables**

# Mitigation Actions, Priorities, and Timeframes

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## 5.2.3.1 Planning and Regulation Actions

**Action 1:** Future Proposed Development- Medium Priority

**Description:** Map vulnerable areas and critical facilities for future proposed residential and commercial development.

**Responsible Department:** Planning Department with assistance of GIS

**Time Frame:** Near-term, Re-evaluate as development occurs

**Resources Available:** Town annual budget, Jamestown Natural Hazard Mitigation Plan

**Cost:** Staff time

**Action 2:** Update Stormwater Mitigation Plan Requirements - Medium Priority

**Description:** Jamestown has a Stormwater Mitigation Plan as required by RIDEM and required Annual Reports are submitted. The town is consistently meeting the maintenance of town drainage systems as required by our general permit issued by RIDEM. This program needs annual review to insure we are meeting our general permit requirements.

**Responsible Department:** Public Works Department

**Time Frame:** Medium-term

**Resources Available:** Town annual budget- Capital budget

**Action 3:** Review the Harbor Management Plan and the Emergency Operations Plan for Town of Jamestown - Medium Priority

**Description:** It is important to review and revise these plans to ensure the adequacy of emergency operations. Revisions should be proposed as

necessary to meet adequacy. A schedule for review and revision should be devised. Also, training and education of key personnel needs conducted so all responsibilities are outlined and known.

**Responsible Department:** Harbor Management Commission and Jamestown Emergency Management Director

**Time Frame:** Near-term

**Resources Available:** Town annual budget,

**Cost:** Staff time

## Mitigation Actions, Priorities, and Timeframes

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### 5.2.3.2 Property Protection, Structural Projects and Maintenance

**Action 4:** North Pond Dam- High Priority

**Description:** An in depth engineering evaluation is scheduled for 2013-14 to assess the dam structure. It is anticipated that structural repairs will be needed. Repairs are anticipated to be budgeted within the 5 year capital infrastructure replacement plan.

**Responsible Department:** Public Works

**Time Frame:** Medium-term

**Resources Available:** FEMA Grant, Town Annual Budget

**Cost Estimate:** \$250,000

**Action 5:** Reduce Vulnerability to Utility and Communication Lines - High Priority

**Description:** Continue to implement the Tree Damage Mitigation Program to trim trees adjacent to utility lines to avoid power outages and therefore, maintain communication systems during and after hurricanes, thunderstorms, ice storms, and windstorms. National Grid complete "trimmed" the island in 2012 as part of their vegetation management planning. The town will continue to provide emergency tree and limb emergency removal and essential clean up after storm events per the Debris Management Plan as noted below.

**Responsible Department:** Department of Public Works will coordinate with National Grid to defray local costs

**Time Frame:** Near-term

**Resources Available:** National Grid, Town annual budget

**Action 6:** Develop Debris Management Plan- High Priority

**Description:** Fallen debris and tree limb resulting from thunderstorms, hurricanes, ice storms, and windstorms collect under bridges, dams and block storm culverts. Prompt removal and proper siting of this material decreases potential of road and property flooding. A comprehensive tree-

## Mitigation Actions, Priorities, and Timeframes

trimming plan will minimize potential impacts in addition to decreasing the costs of cleanup.

**Responsible Department:** Public Works Department

**Time Frame:** Near-term

**Resources Available:** Town annual budget

**Action 7:** Infrastructure Improvements - High Priority

**Description:** Evaluate existing condition of bridges concerning their foundation, structure, and drainage properties. Retrofit and repair as needed.

**Responsible Department:** RIDOT

**Time Frame:** Long-term

**Resources Available:** State funding, RI Transportation Improvement Program

**Cost:** Approximately \$2.5 million has been identified in the 2013-2016 TIP for RIDOT projects in Jamestown.

**Action 8:** Road Hazard Assessment- High Priority

**Description:** Evaluate town and state roads that are at risk for impact due to storm events/sea level rise and determine capital budget implications or other funding sources. These include at a minimum North Road at the Creek, Beavertail Road at Mackerel Cove, East Shore Road at Potter Cove, and southern Bay View Drive near Bryer Beach.

**Responsible Department:** Public Works Department and Planning Department

**Time Frame:** Long-term

**Resources Available:** RI Transportation Improvement Program.

**Cost:** \$50,000

### Public Information, Outreach and Incentive Programs

**Action 9:** Public Education and Outreach- High Priority

a.) **Description:** Develop and make preparedness and response material available concerning evacuation routes, emergency shelters, and maps of risks and critical facilities of Jamestown. Jamestown introduced the Code Red Calling System which notifies residents via phone of an impending emergency with 72 hour notice. Distribute material concerning proper building practices and how to retrofit structures against future damage.

**Responsible Department:** Jamestown Emergency Management Director, Police and Fire Departments and Building Inspector.

**Time Frame:** Near-term, Re-evaluate every 3 years

**Resources Available:** Jamestown Natural Hazard Mitigation Plan

**Cost:** Staff time.

## Mitigation Actions, Priorities, and Timeframes

b.) **Description:** Organize and conduct training program for town officials, employees, boards, and commissions regarding hazard mitigation, including flood mitigation, and actions/responsibilities during a natural disaster.

**Responsible Department:** Natural Hazard Mitigation Committee  
Chair

**Time Frame:** Medium-term; Every 3 years

**Resources Available:** Town annual budget

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### Emergency Services (Protection of critical facilities)

**Action 10:** Inflow and Infiltration of Sewer System-Medium Priority

**Description:** One major problem with the existing sewer lines is the infiltration of groundwater into the lines. The infiltration reduces the amount of the system's treatment capacity. During heavy rainstorms, up to 1-million gallons per day infiltrates the sewer lines. Additionally, the connection of gutter drains and sump pumps to the sewer lines causes a further reduction in the treatment capacity of the system. The infiltration has been aggressively reduced by door to door searches during the upgrading of water meters and by smoke testing. The town should continue to mitigate this problem.

**Responsible Department:** Public Works Dept.

**Time Frame:** Medium-term

**Resources Available:** Town annual budget

**Cost:** Staff time

**Action 11:** Water Treatment Facility- Low Priority

**Description:** The access to the Water Treatment Facility is within a flood zone. There are opportunities to access the plant other ways. This should be pursued as a short-term project. The current plant is out of harms way due to the raising of the new plant above the flood zone. The long term, low priority project involves planning for a new plant at a higher elevation. This will be necessary as sea level rises due to climate change. This may require acquiring another property for this purpose. The planning for this project should be considered in the next decade.

**Responsible Department:** Town Administration/Town Council/Public Works Dept.

**Time Frame:** Long-term

**Resources Available:** CDBG, Town annual budget

**Cost:** \$2 million

# Mitigation Actions, Priorities, and Timeframes

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## 5.2.3.4 Post-disaster Opportunities

**Action 12:** Replenish Beach with Sand Overwash - High Priority

**Description:** Sand overwash will be cleared off the streets and temporarily stored on the beach parking lots until the debris can be separated and the sand can be returned to the beaches.

**Responsible Department:** Planning, Public Works, Police, and Fire

**Time Frame:** Post Disaster

**Resources Available:** Public Works Department Assets, FEMA Public Assistance Funds

**Cost:** TBD

**Action 13:** Continue Agreement with North Kingstown for purchase of Potable Water - High Priority

**Description:** The Town of Jamestown has had the need to purchase water from the Town of North Kingstown in the 1990's. The hose went across the old Jamestown Bridge. When that bridge was demolished, the town purchased a reel hose for this purpose. It has yet to be used for lack of need. The town should maintain and test regularly the emergency hose and reels so that they are ready if needed. In addition, the town should keep the agreement current with the Town of North Kingstown.

**Responsible Department:** Town Administrator/Public Works Dept.

**Time Frame:** Near-term

**Resources Available:** Town annual budget

Jamestown Mitigation Action Table

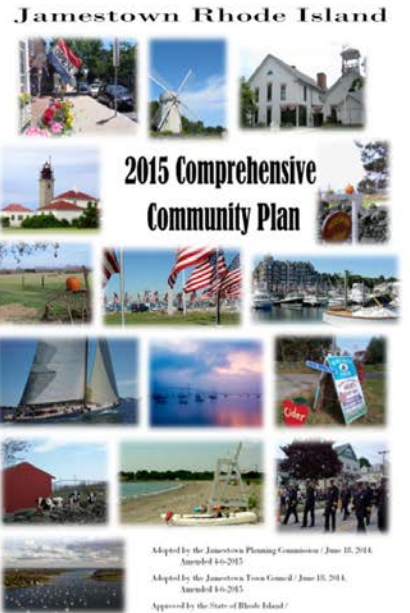
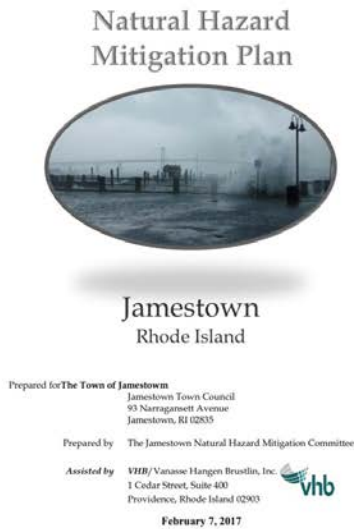
ACTION #	PRIORITY	POTENTIAL PROGRAM	DESCRIPTION OF STRATEGY	AFFECTED LOCATION	TYPE OF ACTIVITY	RELATED GOAL(S)	FUNDING SOURCES	TIMEFRAME	RESPONSIBLE DEPARTMENT
						Objectives			
1	Medium	Future Proposed Development	Map vulnerable areas and critical facilities for future proposed residential and commercial development	Town-wide	Planning and Regulations	1,4	Town Annual Budget, Staff Time	Near-term	Planning Department
						1,3,5			
2	Medium	Update Stormwater Mitigation Plan Requirements	Update of stormwater mitigation plan	Town-wide	Planning and Regulations	1,2,3,4	Town Annual Budget	Medium-term	Public Works Department
						1,4,5			
3	Medium	Review the Harbor Management Plan and the Emergency Operations Plan after every storm or every three years	It is important to review and revise these plans to ensure the adequacy of emergency operations. Revisions should be proposed as necessary to meet adequacy	Town-wide	Planning and Regulations	1,2,3,4	Town Annual Budget, Staff Time	Medium-term	Harbor Management Commission and Emergency Management Director
						1			
4	High	North Pond Dam	Perform structural repairs to prevent catastrophic failure	Downstream (North Road)	Property Protection, Structural Projects and Maintenance	1,2	FEMA Grant Town Annual Budget \$250,000	Medium-term	Public Works Department
						1,4			
5	High	Reduce vulnerability to utility and communication lines	Tree Damage Mitigation Program to trim trees adjacent to utility lines to avoid power outages and therefore, maintain communication systems during and after hurricanes, thunderstorms, ice storms, and windstorms.	Town-wide	Property Protection, Structural Projects and Maintenance	2,4	National Grid Town Annual Budget	Near-term	Public Works Department National Grid
						4,7			
6	High	Develop Debris Management Plan	Develop plan for prompt removal and proper siting of fallen debris and tree limbs which decreases potential of road and property blockage.	Town-wide	Property Protection, Structural Projects and Maintenance	1,2,3,4	Town Annual Budget FEMA Grant	Near-term	Public Works Department
						7			

Jamestown Mitigation Action Table

ACTION #	PRIORITY	POTENTIAL PROGRAM	DESCRIPTION OF STRATEGY	AFFECTED LOCATION	TYPE OF ACTIVITY	RELATED GOAL(S)	FUNDING SOURCES	TIMEFRAME	RESPONSIBLE DEPARTMENT
						Objectives			
7	High	Infrastructure Improvements	Evaluate existing condition of bridges concerning their foundation, structure, and drainage properties. Retrofit and repair as needed	Town-wide	Property Protection, Structural Projects and Maintenance	2,4	TIP \$2.5 million	Medium-term	RIDOT
						1,4			
8	High	Local Road Hazard Assessment	Evaluate town roads that are at risk for impact due to storm events/sea level rise and determine capital budget implications or other funding sources	Town-wide	Property Protection, Structural Projects and Maintenance	1,2,4	RIDOT \$50,000	Medium-term	Public Works Department Planning Department
						1,4			
9a	High	Public Education and Outreach	Develop and make preparedness and response material available concerning evacuation routes, emergency shelters, and maps of risks and critical facilities of Jamestown	Town-wide	Public Information, Outreach and Incentive Programs	1,2,3,4	Town Annual Budget	Near-term	Emergency Management Director, Police and Fire Departments and Building Inspector
9b	High	Public Education and Outreach	Organize and conduct training program for town officials, employees, boards, and commissions regarding hazard mitigation, including flood mitigation, and actions/responsibilities during a natural disaster	Town-wide	Public Information, Outreach and Incentive Programs	1,2,3,4	Town Annual Budget	Medium-term	Natural Hazard Mitigation Committee Chair
						2,4,6			
10	Medium	Inflow and Infiltration of Sewer System	Program to mitigate the infiltration of groundwater into the sewer lines	Town-wide	Emergency Services (Protection of critical facilities)	1,2,4	Sewer Annual Budget	Medium-term	Public Works Department
						4,5			
11	Low	Water Treatment Facility	The long term, low priority project involves planning for a new access and infrastructure to service the existing Water Treatment Facility	Town-wide	Emergency Services (Protection of critical facilities)	1,2,4	CDBG, Town Annual Budget \$2 million	Long-term	Town Administration Town Council Public Works Department
						1,4			
12	Medium	Shoreline Protection and Retrofit	Develop shoreline sea level rise resilience plan which involves shoreline protection strategies	Town-wide	Planning and Regulation	1,4	FEMA PA Town Annual Budget	Medium-term	Planning, Public Works, Police, and Fire
						1,2			
13	High	Continue Agreement for purchase of Potable Water	The Town should maintain and test regularly the emergency hose and reels so that they are ready if needed. The Town should keep the agreement current with the Town of North Kingstown.	Town-wide	Public Information, Outreach and Incentive Programs	2,4	Water Annual Budget	Near-term	Town Administrator Public Works Department
						4			

# Appendix B

## Jamestown Map Resource Packet\* Used During Workshop



\*Gathered from Jamestown's Local HMP (2017) & Comprehensive Plan (2015)





**MAP 11**  
**TOPOGRAPHY**

**TOWN OF JAMESTOWN**  
**RHODE ISLAND**  
Comprehensive Plan, 2014

**Map Legend**

-  Roads
-  Highways
-  Streams
-  Waterbodies

**CONTOURS (Ft)**

-  50
-  60
-  80
-  100
-  120

**Boundaries**

-  Jamestown
-  RI Municipal

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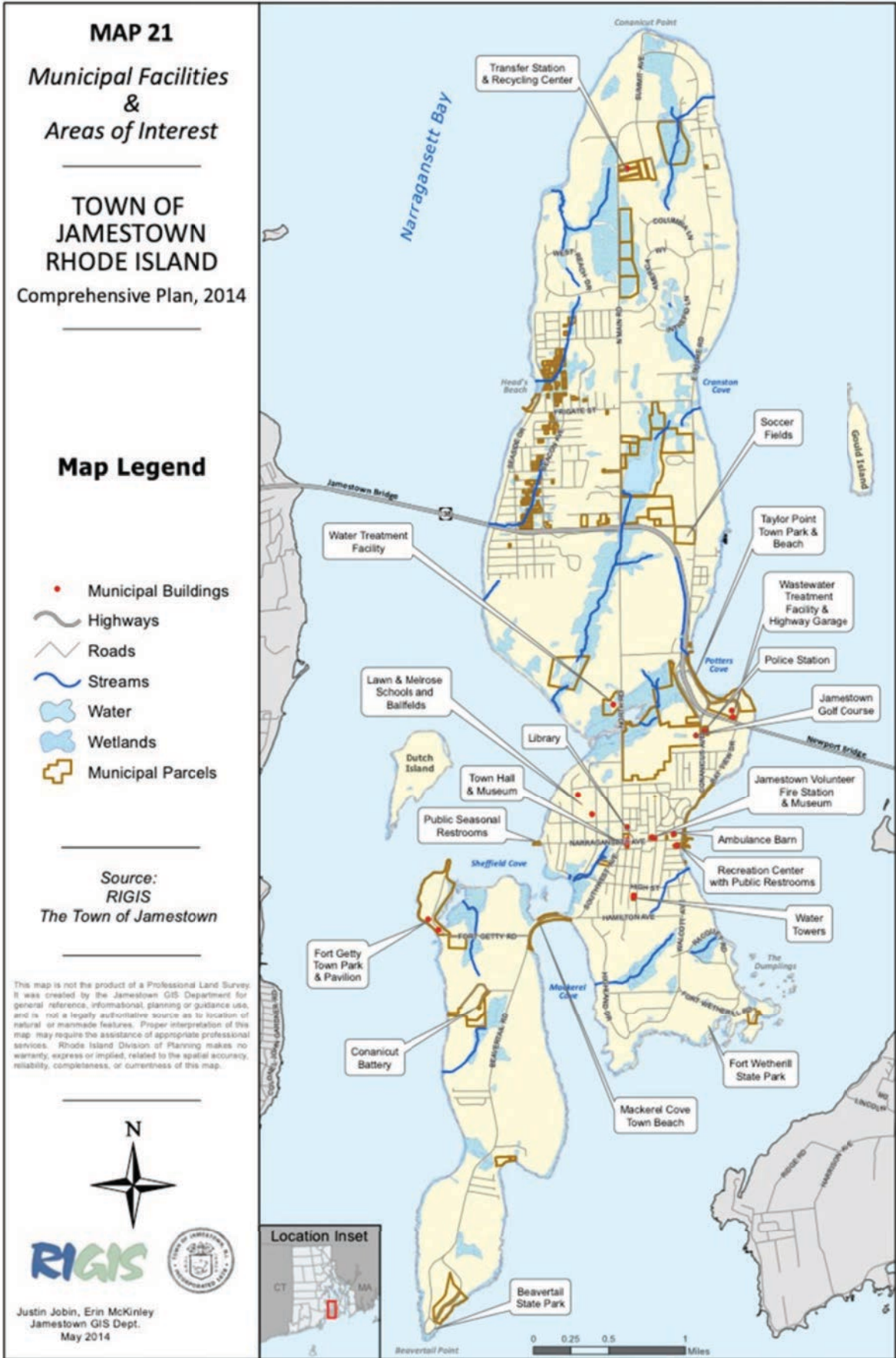


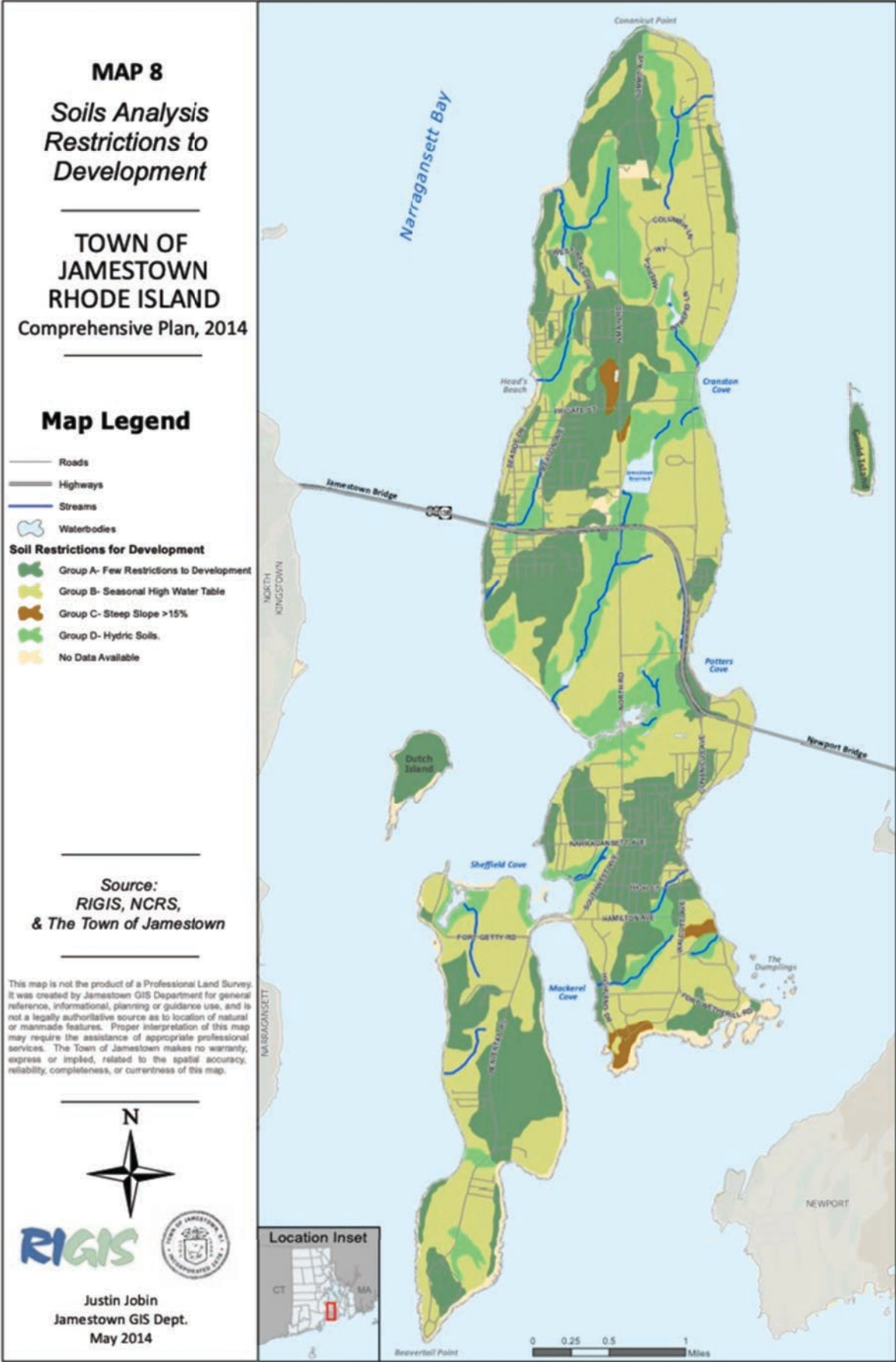
**RIGIS**

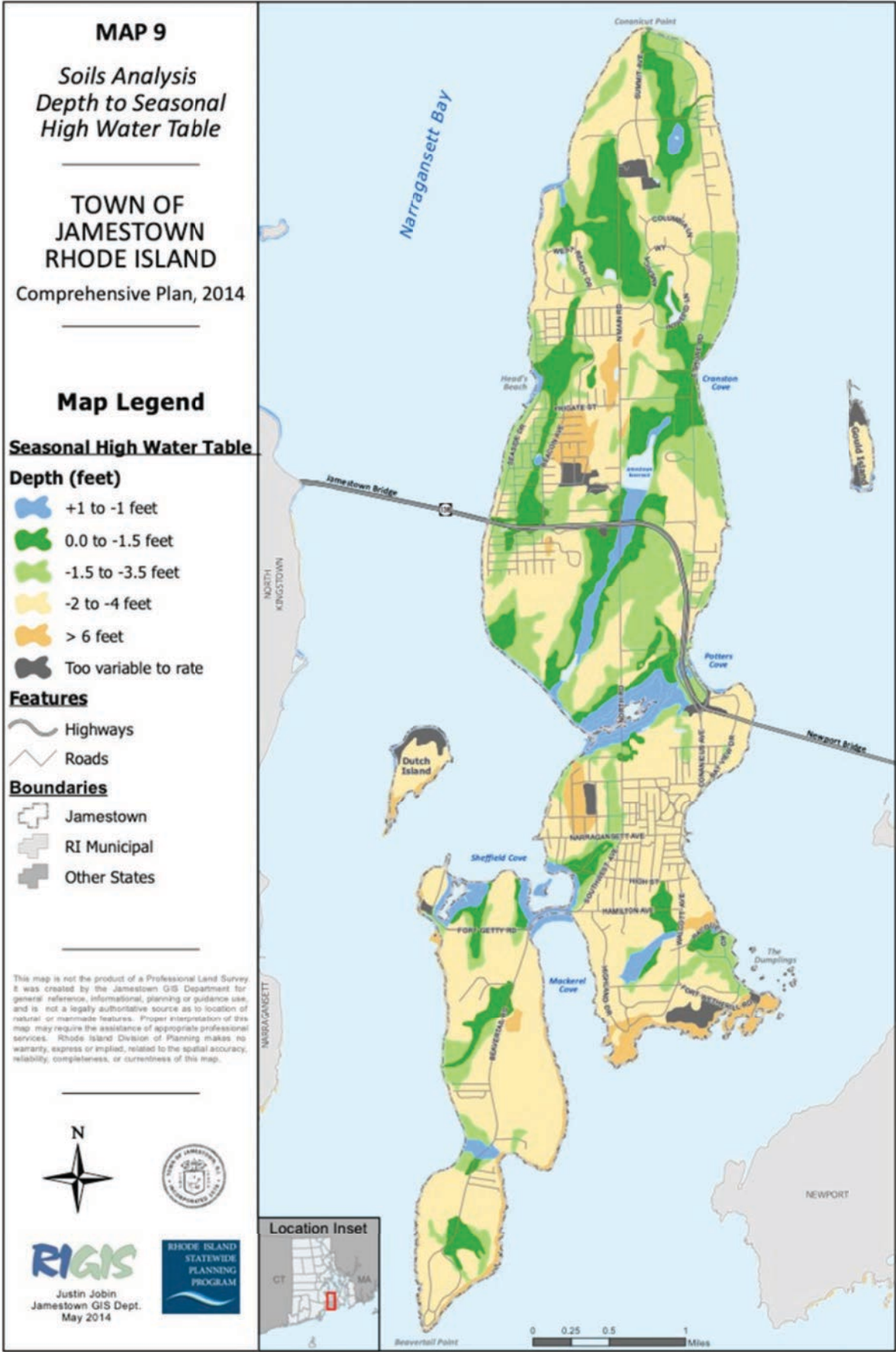


Justin Jobin  
Jamestown GIS Dept.  
May 2014









**MAP 3**  
**Existing Land Use**

**TOWN OF JAMESTOWN**  
**RHODE ISLAND**  
 Comprehensive Plan, 2014

**Map Legend**

**Features**

- Highways
- ~ Roads

**Boundaries**

- Jamestown
- RI Municipal

**Landuse 2011 \***

- Beaches
- Low Density Residential
- Medium Low Density Residential
- Medium Density Residential
- Medium High Density Residential
- High Density Residential
- Commercial
- Mixed Use
- Institutional
- Transportation & Utilities
- Cemeteries
- Developed Recreation
- Agricultural
- Undeveloped
- Rock Outcrops
- Water
- Wetland

**Protected Lands**

- Protected Lands \*\*

\* Data obtained from RI Statewide Planning

\*\* Local & State Conservation Lands obtained from RIGIS

(May Contain developed land that is partially preserved by easement or deed restriction)

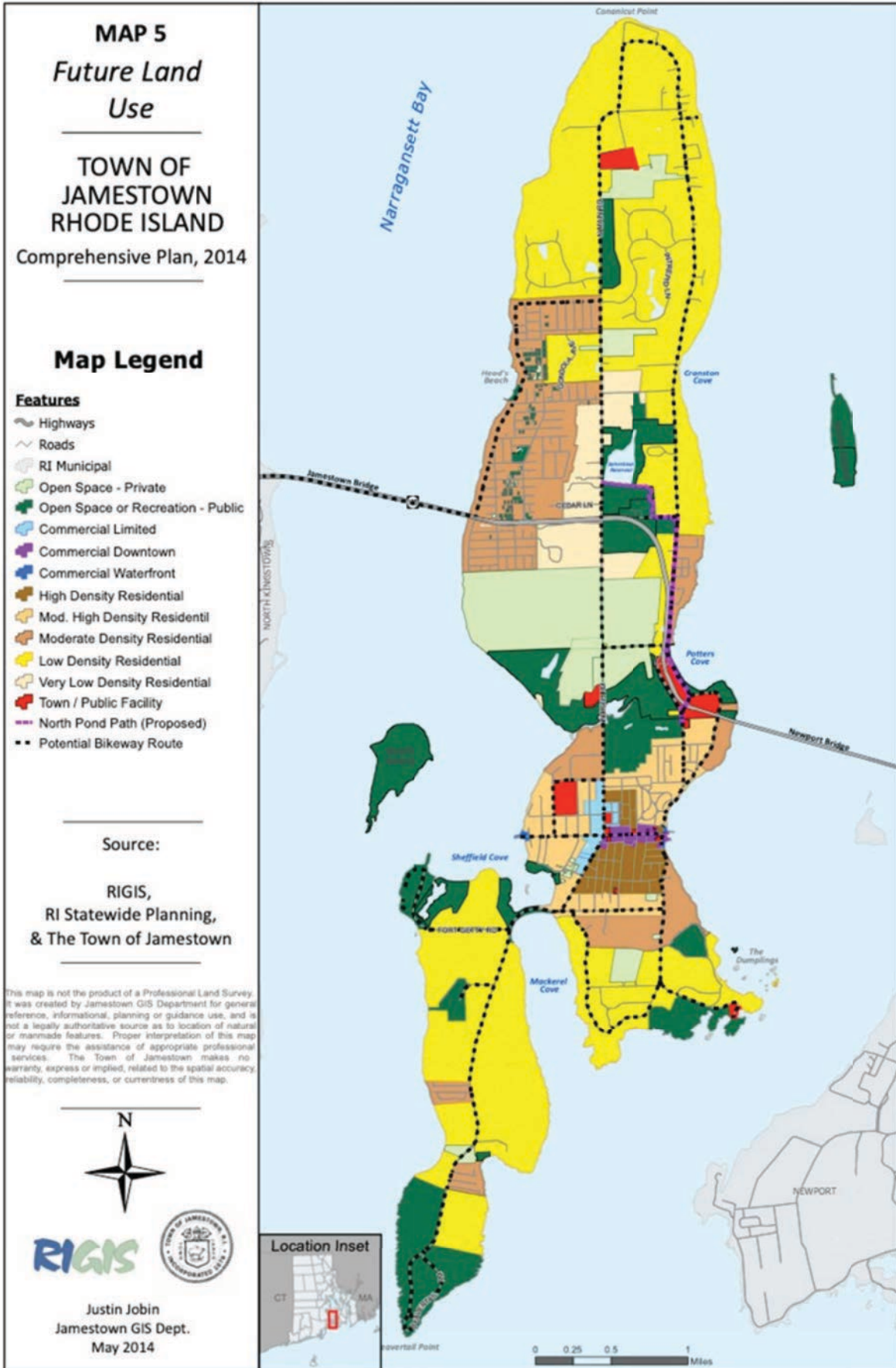
Source:  
 RIGIS

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 Jamestown GIS Dept.  
 May 2014





**MAP 16**  
**Cultural, Historic,**  
**& Scenic Areas**

**TOWN OF**  
**JAMESTOWN**  
**RHODE ISLAND**  
 Comprehensive Plan, 2014

**Map Legend**

- Roads
- Highways
- Water
- Streams
- Historic Sites**
  - National Historic Structures & Sites
  - State Recommended Historic Structures & Sites
- Historic Districts and Scenic Landscapes**
  - National Historic Districts
  - State Recommended Historic Districts
  - Scenic Landscapes

**Source:**  
 RIGIS  
 The Town of Jamestown  
 RI Hist Preservation Commission  
 "Historical & Architectural  
 Resources of Jamestown, RI"

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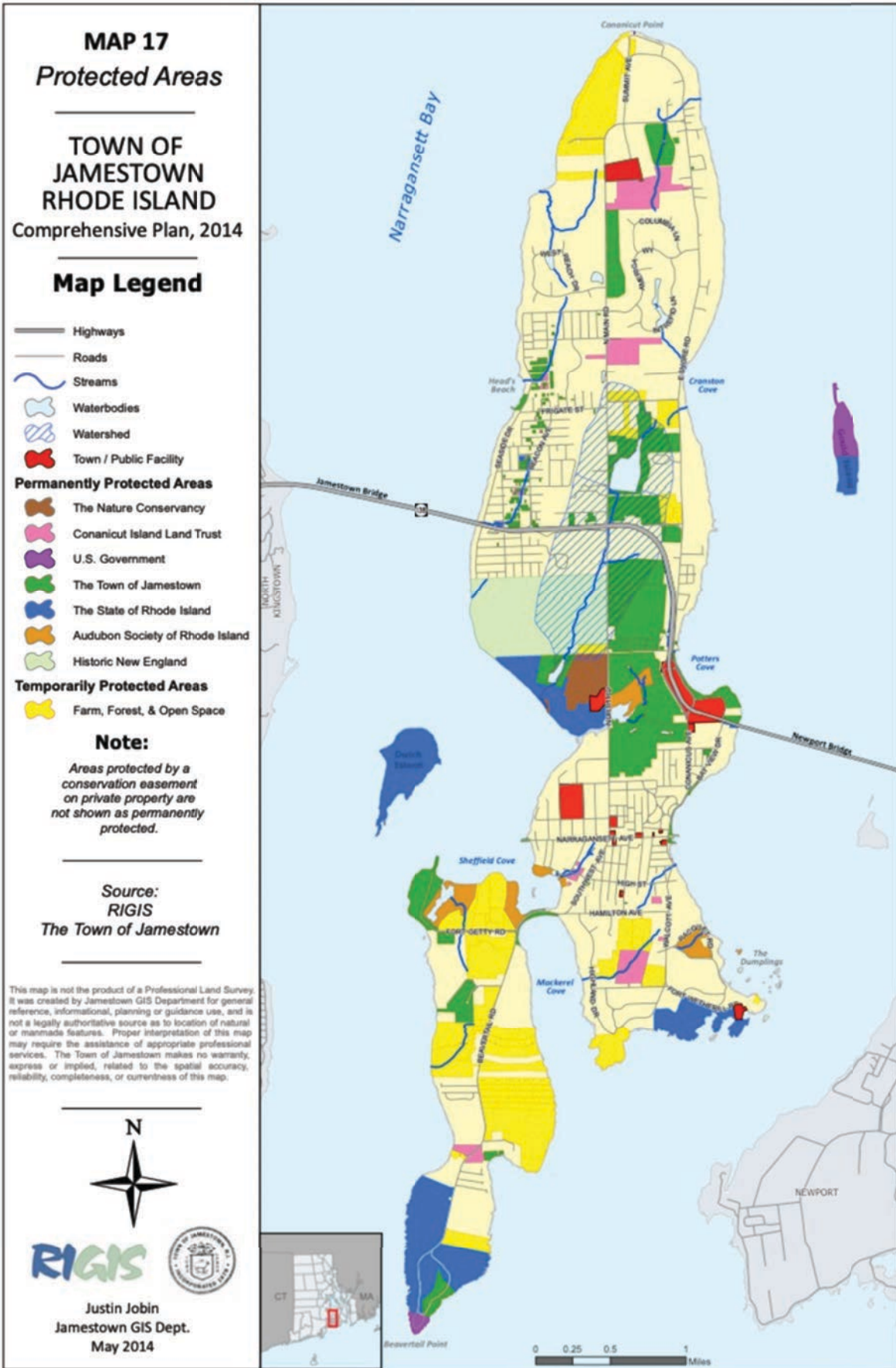


**RIGIS**



Justin Jobin  
 Jamestown GIS Dept.  
 May 2014







**MAP 4**  
**Existing Zoning**

**TOWN OF JAMESTOWN**  
**RHODE ISLAND**  
Comprehensive Plan, 2014

**Map Legend**

- Streams
- Highways
- Roads
- Water
- SSD

**Zoning Districts**

- OS-I
- OS-II
- CL
- CD
- CW
- DC
- R-8
- R-20
- R-40
- RR-80
- RR-200
- P
- Jamestown

**Source:**  
**RIGIS**  
**The Town of Jamestown**

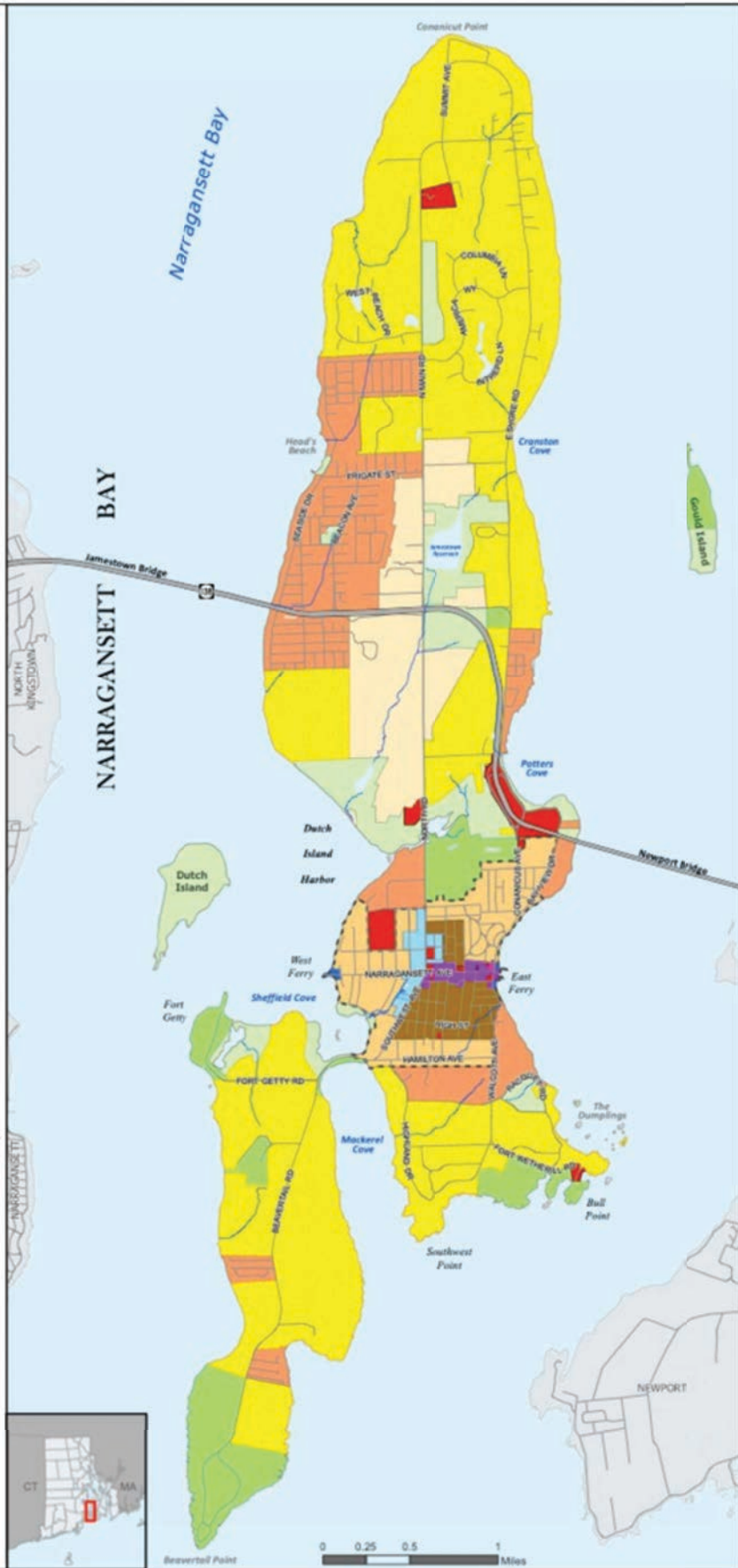
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Justin Jobin  
Jamestown GIS Dept.  
May 2014



**MAP 7**  
**Land Use 2025:**  
**RI Land Use**  
**Policies and Plan**

**TOWN OF**  
**JAMESTOWN**  
**RHODE ISLAND**  
 Comprehensive Plan, 2014

**Map Legend**

-  Highways
-  Roads
-  Streams
-  Urban Services Boundary
-  Town Facility
- Land Use 2025**
-  Sewered Urban Developed
-  Urban Development
-  Non-urban Developed
-  Reserve
-  Conservation/Limited
-  Prime Farmland
-  Major Parks & Open Space
-  Water Bodies

**Source:**  
 RIGIS, RI Statewide Planning  
 "Land Use 2025: Rhode Island  
 State Land Use Policies and Plan"  
 & The Town of Jamestown

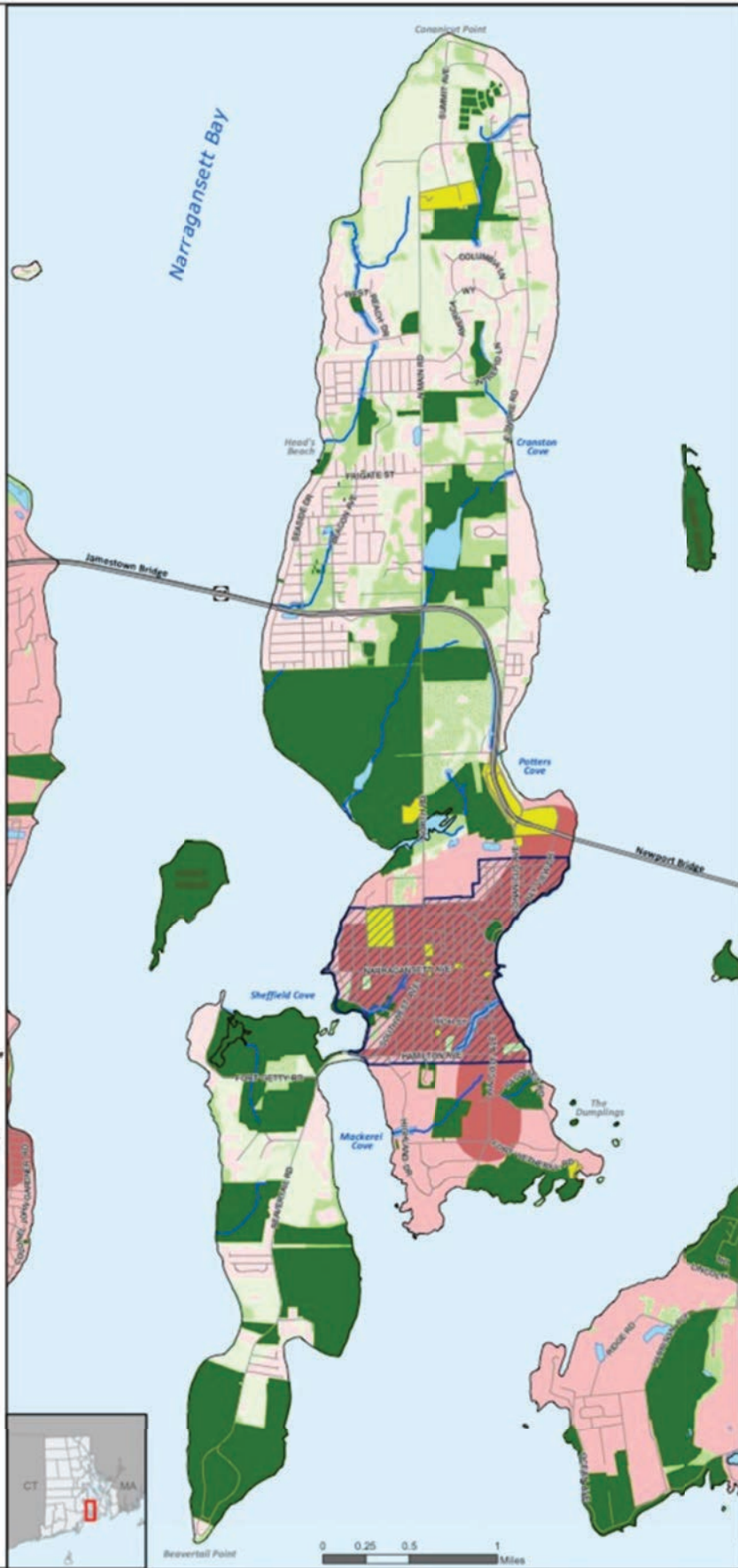
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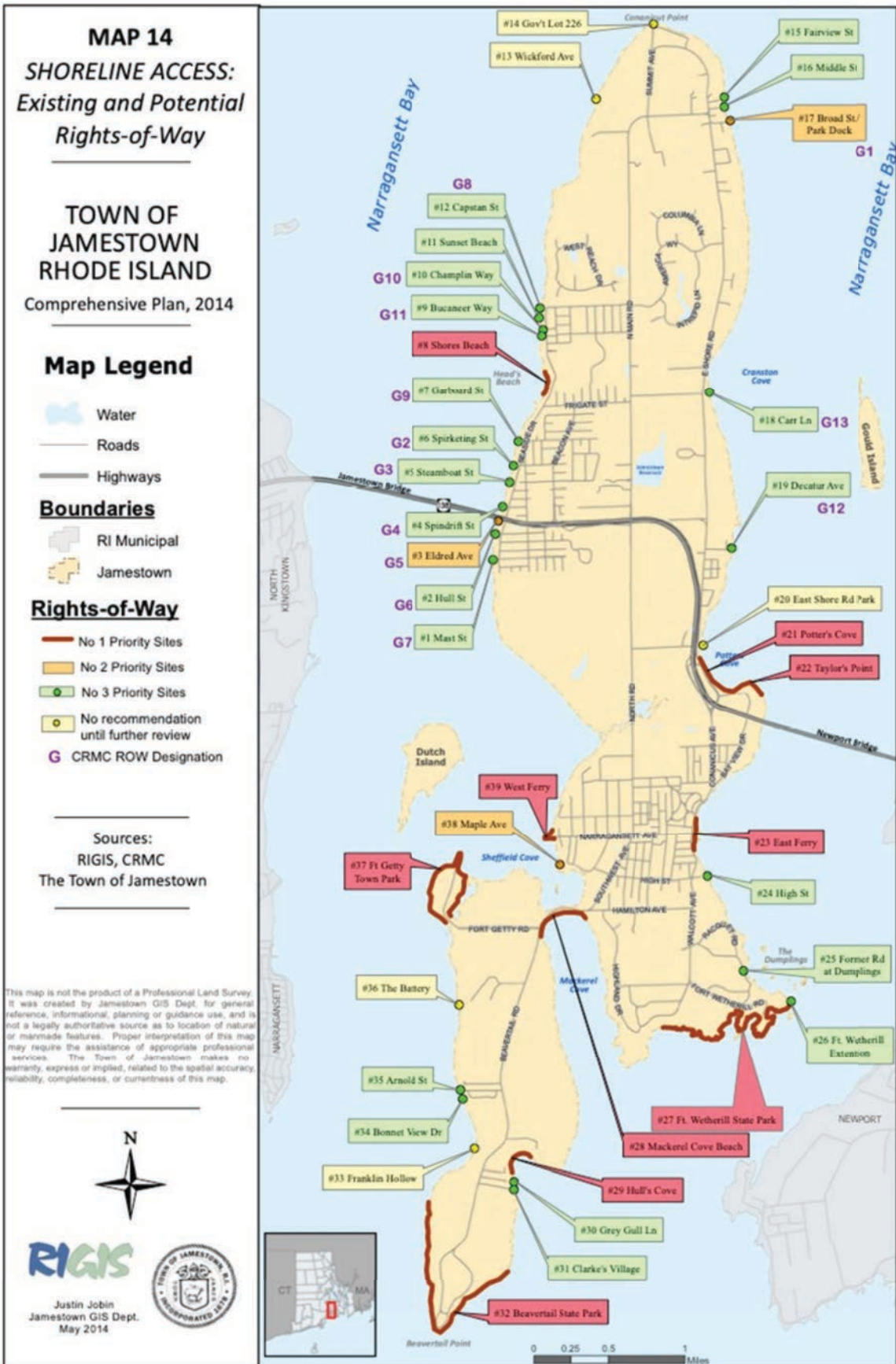


**RIGIS**



Justin Jobin  
 Jamestown GIS Dept.  
 May 2014





**MAP 15**  
**CRMC**  
**Water Designations**

**TOWN OF JAMESTOWN**  
**RHODE ISLAND**  
 Comprehensive Plan, 2014

**Map Legend**


**Features**

-  Highways
-  Roads
-  Streams
-  Waterbodies

**Boundaries**

-  Jamestown
-  RI Municipal

**CRMC Water Designation**

-  Type 1: Conservation Area
-  Type 2: Low Intensity Use
-  Type 3: High Intensity Boating
-  Type 4: Multipurpose
-  Type 6: Industrial & Commercial

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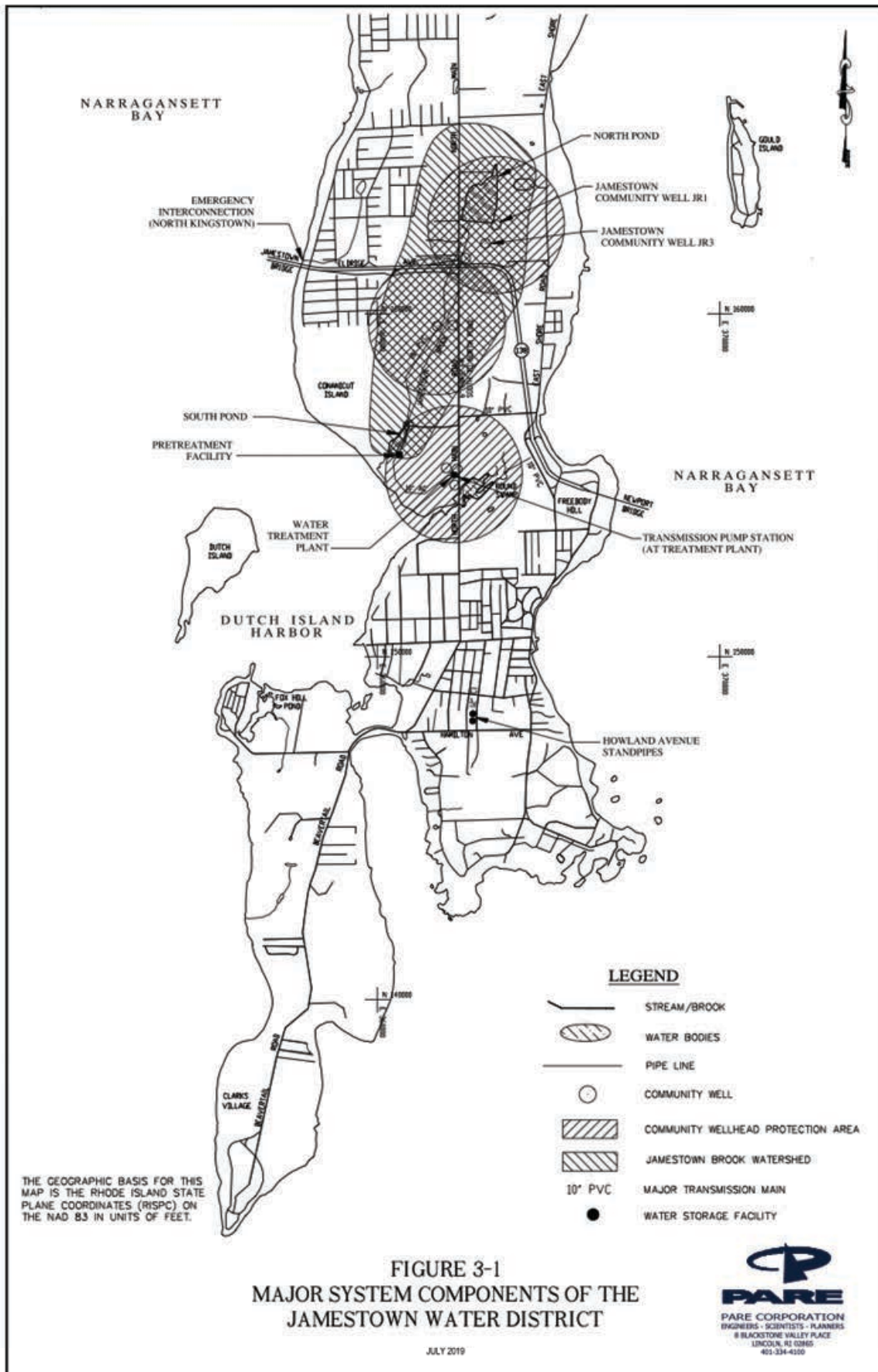


**RIGIS**



Justin Jobin, Erin McKinley  
 Jamestown GIS Dept.  
 May 2014





# MAP 22

## Public Water and Sewer Service Area

### TOWN OF JAMESTOWN RHODE ISLAND

Comprehensive Plan, 2014

#### Map Legend

##### Features

Highways

Roads

##### Boundaries

Jamestown

RI Municipal

Streams

Other States

Sewer Pump Stations

Rural Water District

Urban Water and Sewer District

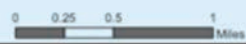
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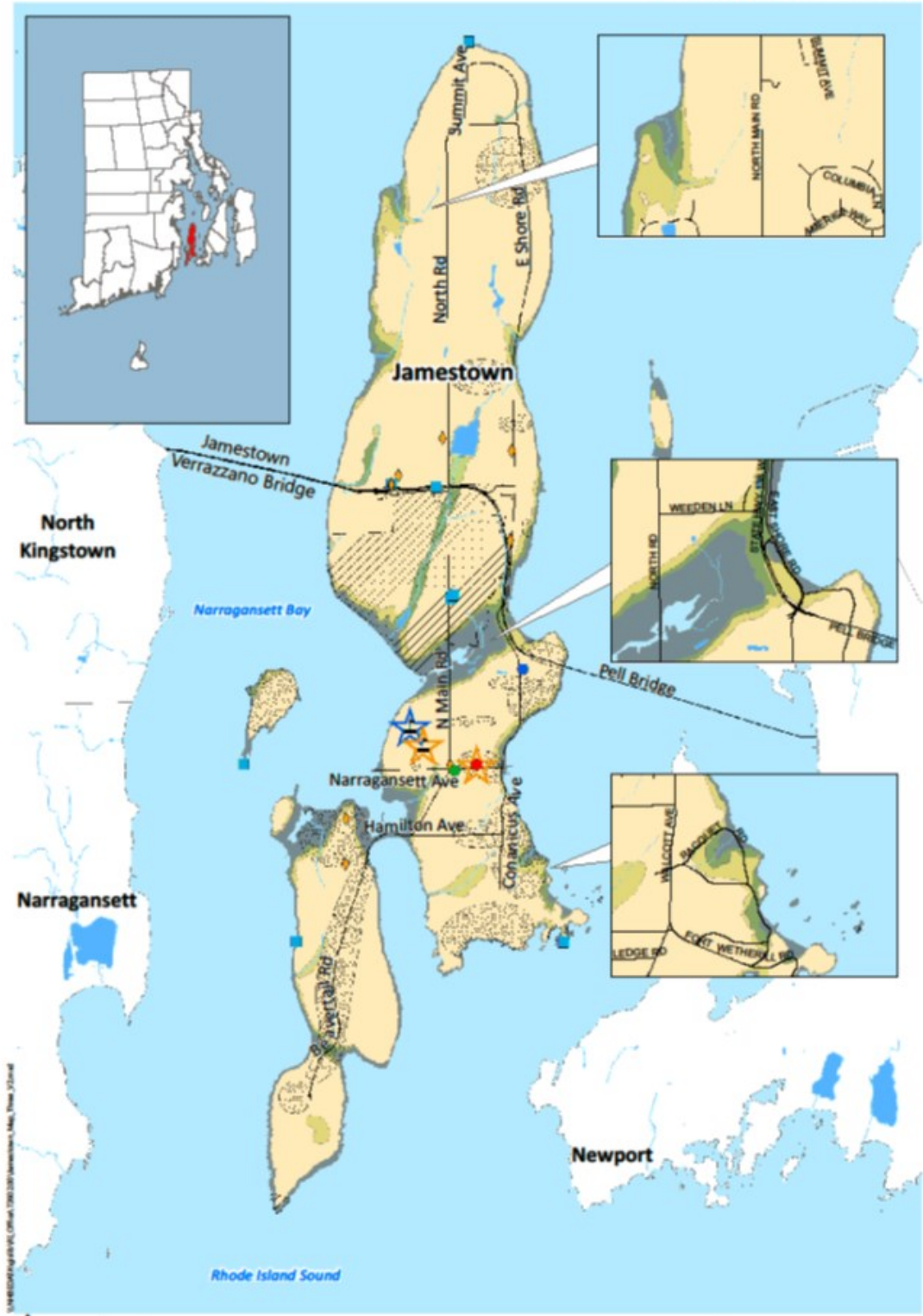


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Justin Jobin  
Jamestown GIS Dept.  
May 2014





**Town of Jamestown's Natural Hazard Mitigation Plan | Jamestown, Rhode Island**

<ul style="list-style-type: none"> <li>★ Primary Emergency Shelter</li> <li>★ Secondary Emergency Shelter</li> <li>● Town Hall</li> <li>● Fire Department</li> <li>● Police Department</li> <li>● School</li> <li>● Historic Cemetery</li> <li>■ Historic Site</li> </ul>	<ul style="list-style-type: none"> <li>■ Historic Candidate Site</li> <li>■ Historic District</li> <li>■ VE</li> <li>■ AE</li> <li>■ A</li> <li>■ 0.2 % Chance Annual Flood Hazard Area</li> <li>■ Minimal Flood Hazard Area</li> </ul>
---	---


**FEMA Flood Hazard Designation Areas**

July 2016

Source: RGS, 2015, Statewide Digital Flood Insurance Rate Map Database; DFRM\_Statewide15, Rhode Island Geographic Information System Data Distribution System, URL: <http://www.vhb.uri.edu/igis>, Environmental Data Center, University of Rhode Island, Kingston, Rhode Island

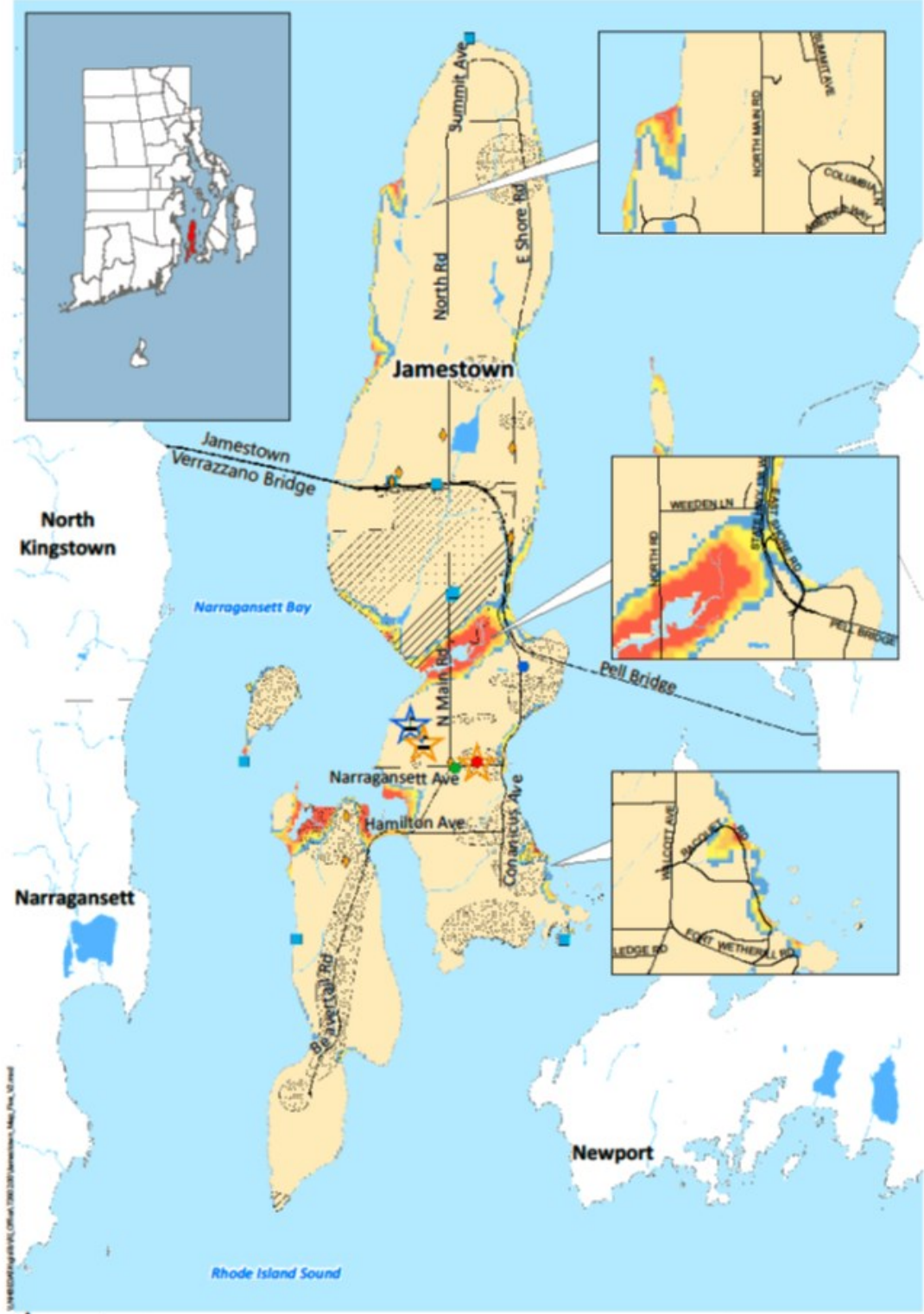


**Town of Jamestown's Natural Hazard Mitigation Plan | Jamestown, Rhode Island**

<ul style="list-style-type: none"> <li>★ Primary Emergency Shelter</li> <li>☆ Secondary Emergency Shelter</li> <li>● Town Hall</li> <li>● Fire Department</li> <li>● Police Department</li> <li>● School</li> </ul>	<ul style="list-style-type: none"> <li>100 Year Base Flood Level</li> <li>Base Flood Level Plus 1' Sea Level Rise</li> <li>Base Flood Level Plus 2' Sea Level Rise</li> <li>Base Flood Level Plus 3' Sea Level Rise</li> <li>Base Flood Level Plus 5' Sea Level Rise</li> <li>Area not affected</li> </ul>	<p><b>100-Year Base Flood Elevation with Projected Sea Level Rise</b></p> <p>July 2016</p> 
---	--	--

Source: STORMTOOLS 2015. Developed by URI Coastal Resources Center Rhode Island. See Grant <http://www.beachamp.org/resources/stormtools/>





**Town of Jamestown's Natural Hazard Mitigation Plan | Jamestown, Rhode Island**

**Category 2 Hurricane Storm Surge Inundation**

July 2016

Source: National Hurricane Center (NHC) NHC\_SeamlessGDSH\_Category2 Storm Surge Unit and web mapping services generated by the NOAA Office for Coastal Management (OCM). [http://files.noaa.gov/OCM/CBMagnRFLR/Usnglyphic/services/NHC\\_SeamlessGDSH\\_Category2MapServer](http://files.noaa.gov/OCM/CBMagnRFLR/Usnglyphic/services/NHC_SeamlessGDSH_Category2MapServer)

★ Primary Emergency Shelter	⬜ Historic Candidate Site
★ Secondary Emergency Shelter	⬜ Historic District
● Town Hall	■ Up to 3 feet above ground
● Fire Department	■ Greater than 3 feet above ground
● Police Department	■ Greater than 6 feet above ground
⚎ School	■ Greater than 9 feet above ground
⬜ Historic Cemetery	■ Area not affected
■ Historic Site	



**Town of Jamestown's Natural Hazard Mitigation Plan | Jamestown, Rhode Island**

**Jamestown Hurricane Evacuation Zones**

July 2016


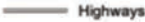






Source: GIS, 2014. Hurricane Evacuation Areas, wva/area05. Rhode Island Geographic Information System Data Distribution System, URL: <http://www.rigis.state.ri.us/>. Environmental Data Center, University of Rhode Island, Kingston, RI. Based on data set developed by US Army Corps of Engineers, 2008.

<ul style="list-style-type: none"> <li>★ Primary Emergency Shelter</li> <li>★ Secondary Emergency Shelter</li> <li>● Town Hall</li> <li>● Fire Department</li> <li>● Police Department</li> <li>● School</li> </ul>	<ul style="list-style-type: none"> <li>Zone A: Evacuate prior to a category 1 or 2 hurricane</li> <li>Zone B: Evacuate prior to a category 3 or 4 hurricane</li> <li>Area not affected</li> </ul>
---	---

**MAP 12**  
**Hydrologically Sensitive Areas**

**TOWN OF JAMESTOWN**  
**RHODE ISLAND**  
 Comprehensive Plan, 2014

**Map Legend**

-  Roads
-  Highways
-  Streams
-  Waterbodies
-  A & AE Zone\*
-  V - Zone\*\*
-  Town Water Supply Watershed
-  Wetlands

\*A & AE Zone: Area within a Special Flood Hazard Area, landward of a V Zone or landward of an open coast without mapped V Zones.

\*\*V - Zone: An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources.

**Source:**

**RIGIS**  
 The Town of Jamestown  
 FEMA FIRM Hazard  
 Data for 2010

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**RIGIS**



Justin Jobin  
 Jamestown GIS Dept.  
 May 2014



# MAP 13 Projected Sea Level Rise

## TOWN OF JAMESTOWN RHODE ISLAND

Comprehensive Plan, 2014



### Legend

- Roads
- Mean Higher High Water (MHHW)
- MHHW plus 1' SLR
- MHHW plus 3' SLR
- MHHW plus 1' SLR and 3' Surge
- MHHW plus 5' SLR
- Hurricane of 1938 Surge Level

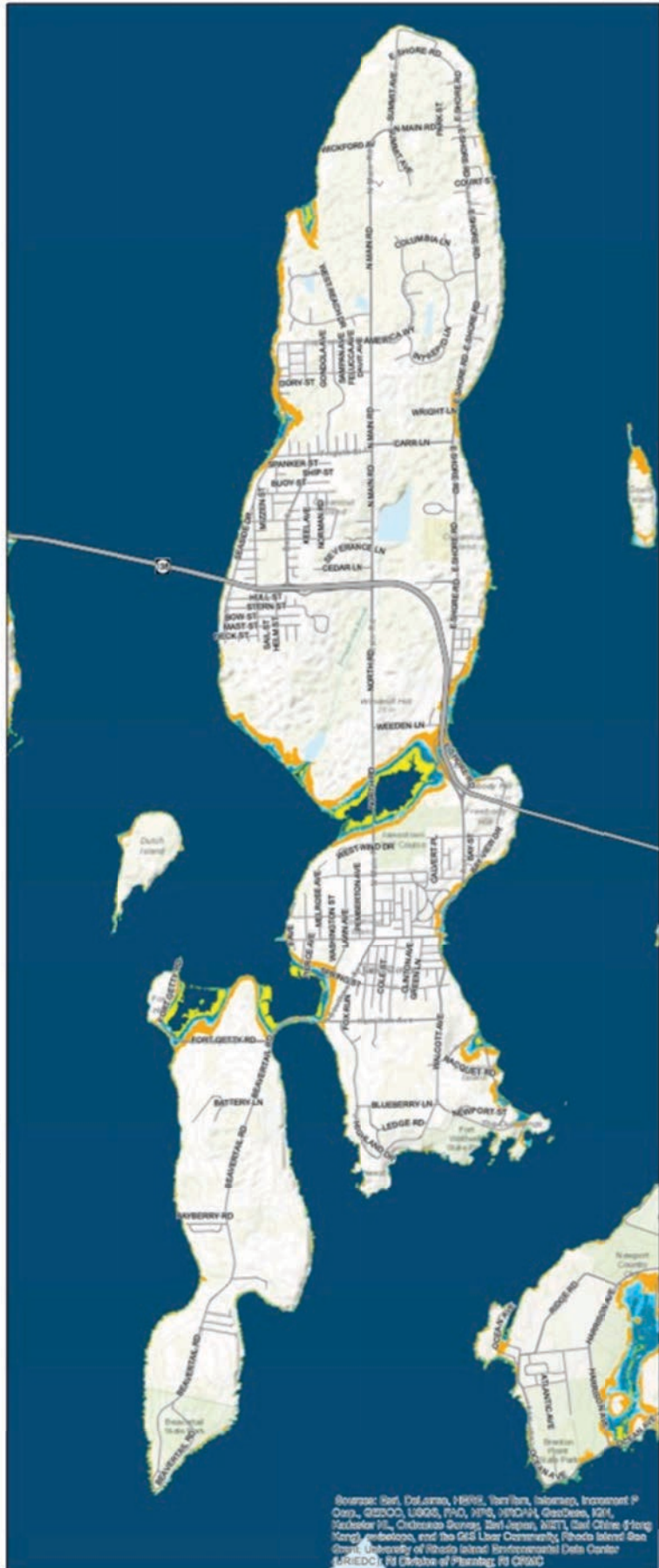
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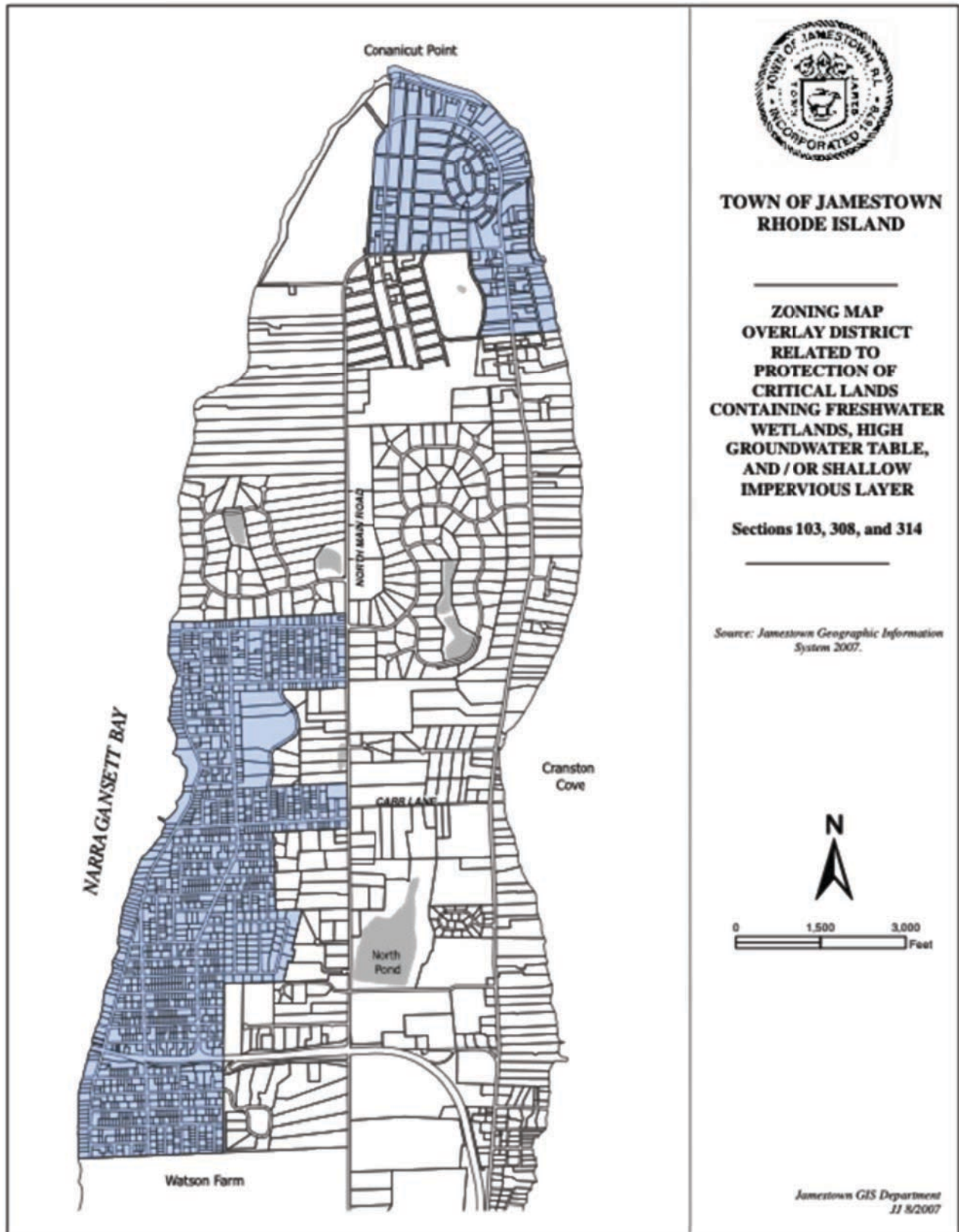
### Location Inset



Justin Jobin  
Jamestown, RI GIS Dept  
May 2014



Source: Ref. Data, MHHW, Surveys, Intermap, Increment P Corp., GEBCO, LIGGS, PND, NPS, NRO-H, GeoData, IGN, Tucker III, Chickasaw Survey, Earl J. Jones, MITI, and Office of Long Range Planning, and the GIS User Community, Rhode Island State Dept. University of Rhode Island, Environmental Data Center (RIEDC), RI Division of Planning, RI CRWD





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