The Nature Conservancy
Protecting nature. Preserving life.™

GBRC
Greater Bridgeport Regional Council

Ned Gerard October 30, 2012

Town of Stratford

Hazards and Community Resilience Workshop

Summary of Findings


The Nature Conservancy
Protecting nature. Preserving life.™


GBRC
Greater Bridgeport
Regional Council

Town of Stratford
Hazards and Community Resilience Workshop
Summary of Finding

Overview

The need for municipalities, regional planning organizations, and state and federal agencies to increase resilience to extreme weather events and mounting natural hazards is strikingly evident along the coast of Connecticut. Recent events such as Tropical Storm Irene, Storm Sandy, and winter nor'easter Nemo have reinforced this urgency and compelled leading communities like the Town of Stratford to proactively plan and mitigate risk through a comprehensive community-driven process. Ultimately, this type of leadership is to be commended because it will help to reduce the exposure of citizens, infrastructure and ecosystems in this municipality and serve as a model for communities across Connecticut, New England and the Nation.

As part of an effort to update municipal and regional Natural Hazard Mitigation Plans for the greater Bridgeport area, the Town of Stratford has partnered with the Greater Bridgeport Regional Council and The Nature Conservancy. The partnership has focused on increasing awareness of risks associated with natural hazards and assessing the strengths and vulnerabilities within the Town and across the region. This initiative was actualized through a series of initial presentations, public meetings and outreach to build community willingness followed by a Hazards and Community Resilience Workshop in October of 2013. The core directive of this effort has been to foster discussion between community stakeholders and decision makers and to facilitate the education, planning and implementation of priority adaptation and mitigation actions. The Workshops had several central objectives including:

- Define extreme weather and local natural and climate-related hazards;
- Identify existing and future vulnerabilities & strengths;
- Develop and prioritize actions for the Town and broader stakeholder network;
- Identify opportunities for the community to advance actions to reduce risk and increase resilience.

The Town of Stratford Hazards and Community Resilience Workshop utilized the National Oceanic and Atmospheric Administration Coastal Services Center's "Roadmap for Adapting too Coastal Risk" as the conceptual frame coupled with a decision-support process and risk visualization tools provided by The Nature Conservancy's Risk Matrix and Coastal Resilience Tool (www.coastalresilience.org). Through this workshop process, rich with information, experience, and dialogue, the participants produced recommendations which are outlined in this summary of findings. The following report provides an overview of the top hazards, current concerns and challenges, current strengths and assets, and recommendations to improve the resilience to natural hazards today and in the future for the Town of Stratford.

The summary of finding 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 additional stakeholders alike. The leadership on hazards and resilience demonstrated by the Town will benefit from the continuous and expanding participation of all those vested in the future of this community.

Workshop Summary of Findings

Top Hazards and Vulnerable Areas for the Town of Stratford:

During the Hazards and Community Resilience Workshop (October 2013), participants from the Town were asked to identify the top hazards for their community. Coastal flooding and inland/riverine flooding were listed as top hazards along with winter storms (both ice and snow) and associated wind events. In addition, there was mention of extreme heat and cold events as a secondary hazard during the Workshop. The participants unanimously agreed that recent extreme weather events have had direct impacts on community services, neighborhoods, businesses, natural areas (streams, wetlands, floodplains, and parks), roads and critical infrastructure across the Town of Stratford.

Top Hazards and Vulnerable Areas for Town of Stratford

Top Hazards for Stratford

Coastal Flooding

Inland and Riverine Flooding

Winter Storms (Ice and Heavy Snow)

Wind associated with extreme weather events

Vulnerable Areas in Stratford

Neighborhoods: Multiple locations across Town; Stratford Housing Authority; South of Stratford Avenue, South End, and Lordship.

Power lines: Multiple locations across Town.

Roads/Viaducts: West Broad Street, Bruce Avenue, King Street, East Main Street, Main Street, Surf Avenue in South End, Stratford Avenue, Lordship Boulevard, and Lower Main Street.

Dams: Beaver Dam, Brewster Pond Dam, Pecks Mill Pond Dam, Cooks Pond Dam.

Waste Water Treatment Plant: Birdseye Facility and pump stations (6-7 of 16 currently vulnerable).

Ecosystems: Long Beach/Pleasure Beach and adjoining tidal marsh complex (Stewart B. McKinney Wildlife Refuge), Short Beach, Russian Beach, Roosevelt Forest, Booth Memorial Park, Far Mill River, Wooster Park, Bruce Brook, Long Brook, Tanner Brook, Wooster Pond, Park Boulevard Bluffs.

Facilities: Lordship Elementary, Birdseye Complex (Alpha School), Police Station, Animal Shelter, Gas Stations, Stratford High School Ball Fields, Buildings South of Stratford Avenue, Bunnell High School, Baldwin Senior Center.

© TNC

Ned Gerard

Current Concerns and Challenges Presented by Natural Hazards:

The Town of Stratford has multiple concerns and challenges related to impacts from natural hazards. Recently, the Town has experienced a series of highly impactful events ranging from Tropical Storm Irene (August, 2011) and Storm Sandy (October, 2012) to winter nor'easter Nemo (February, 2013). Irene brought heavy-rain induced inland flooding and wind damage. Sandy brought extensive flooding and wind damage. Nemo dropped more than 3 feet of snow. The combined magnitude of each of these events within a very short time frame (August 2011 – February 2013) has resulted in greater awareness and engagement directed at comprehensively reducing risk and improving resilience within the community as well as in the larger context of greater Bridgeport area, Fairfield County and the state of Connecticut.

As expressed in the Workshop by the participants, the principal concerns and challenges for the Town of Stratford include:

- Vulnerability of Waste Water Treatment facility and pump stations to flooding and impacts on water quality caused by overwhelming the system's capacity during and after major precipitation events.

- Position of Stratford Housing Authority units (500+) in high hazard, flood-prone areas.

- Exposure of socially vulnerable population in flood-prone areas (South End).

- Routine flooding of railroad viaducts that bifurcate transportation and business corridors from north to south.

- Lack of adequate flood-proofing measures for businesses (Lordship Commercial Enterprise District, Main Enterprises, South of Stratford Avenue).

- Detrimental impacts to natural areas, habitat (tidal marsh, floodplains) and public amenities (Long Beach/Pleasure Beach, Short Beach, Russian Beach, Parks) that currently provide defenses against storm surge and inland and riverine flooding.

Current Concerns and Challenges cont...

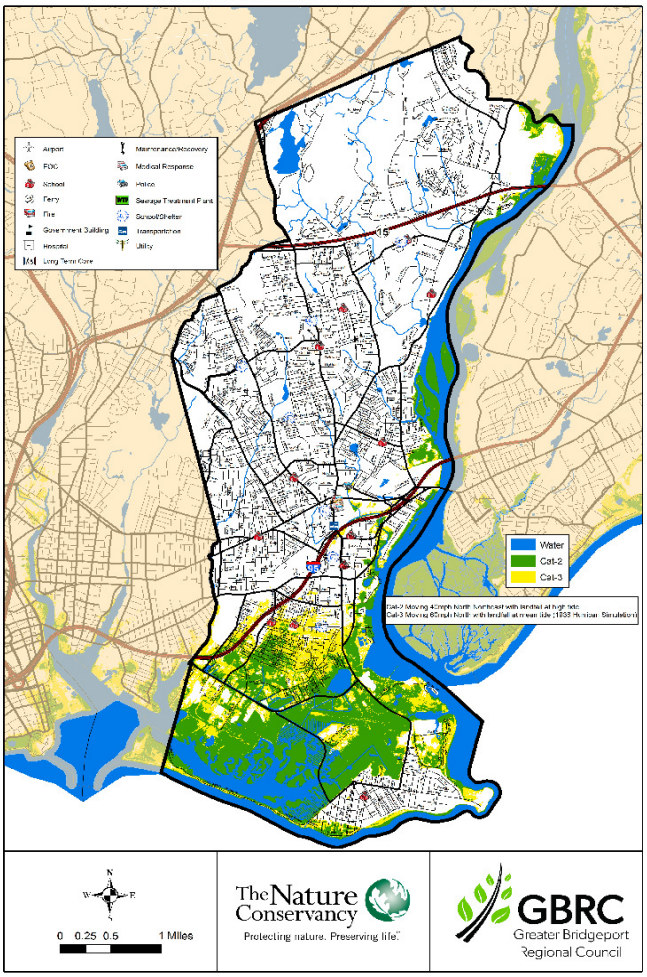
- Possibilities of catastrophic failure of dams during extreme weather events and resulting impacts to downstream properties and infrastructure.

- Mobilization of hazardous materials from contaminated sites and associated businesses due to flooding and storm surge.

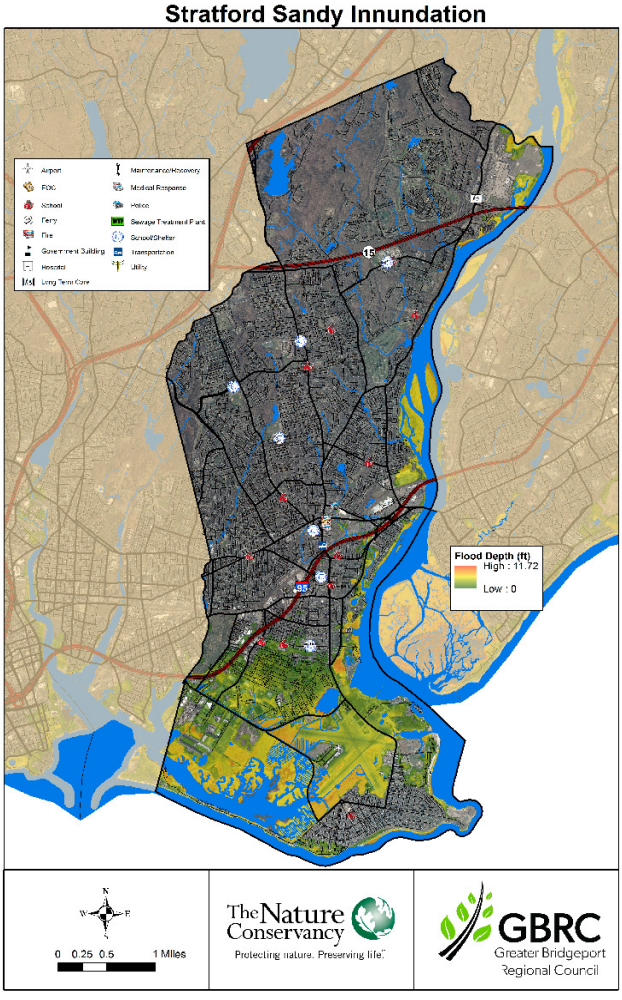
- Downed trees and power lines resulting in wide-spread power outages.

- Vulnerability of certain critical sheltering and senior center facilities to flooding.

Stratford Hurricane Inundation



Stratford Sandy Innundation



Current Strengths and Assets in Town of Stratford:

Given the experiences with extreme weather events in the last several years, the Town of Stratford has clearly identified and reinforced the existing strengths and assets within the community. Expanding further upon these community benefits will ultimately improve the resilience of the Town to future extreme weather events.

- Well trained and practiced emergency management systems and teams with proven capacity to respond effectively given all the recent events (Police, Fire, EOC, Parks and Recreation, etc...). The Code Red reverse 911 system allows emergency management officials to inform residents before, during, and after an event. Responsive and committed leadership by the elected officials is a very much appreciated strength in the Town.

- Expanding regional web-based and mapping services provided by Greater Bridgeport Regional Council to facilitate natural hazard preparedness and mitigation opportunities (i.e., FEMA's CRS enrollment).

- Effective shelter and services provided by the Town, businesses and other private entities during recent events.

- Tidal wetlands, beaches, floodplains, reservoirs/ponds, and parks and open space that provide capacity to store floodwaters and deflect wave energy that would otherwise increase the impact and cost of natural hazards across the Town.

- A strong sense of community has aided in recovery following recent events and has helped to reinforce an urgency to prepare and mitigation risk going forward.

- In previous events, the Town has anticipated needs and has had resources in place prior to the storms. This has improved the response and recovery time and scope of localized efforts following disasters.

Top Recommendations to Improve Stratford's Resilience to Hazards:

The following are recommendation generated by the Workshop participants organized from the highest to lowest priority for the Town of Stratford.

Highest Priority

- Railroad Viaducts: Complete the West Broad Street renovation project and assess feasibility of other locations in need (Bruce Avenue, King Street, East Main). Explore additional options such as utilizing green infrastructure to reduce drainage "upstream" from viaducts (catchment basins, swales, stormwater gardens, etc...).

- Waste Water Treatment Plant: Conduct investigation to examine implications of various flooding scenarios on facility and identify appropriate and feasible responses (raise berm). In addition, strive to reduce inflows from stormwater runoff by flood proofing manhole covers.

- For the 16 pump stations, assess and scope feasibility of hardening facilities; particularly for the 6-7 pump stations currently subjected to flooding. The system should be tested to assess the foreseeable impacts due to the temporary loss of multiple pump stations. Alternative sites should be explored to accommodate relocation of vulnerable stations longer term.

- Ensure that the Durham Bus Company has updated contingency plan and notification process to ensure buses are relocated from current depot prior to major flooding events.

- Assess vulnerability due to exposure of high pressure gas main in Pecks Mill Pond area to extreme weather events and ongoing erosion due to tidal action (main gas line for Bridgeport).

- For critical transportation routes throughout Town, update evacuation plans with maps depicting loss of access/egress during peak events (Cat-3). These updated plans should utilize "peak event" maps to trigger notification of voluntary and mandatory evacuation orders.

Top Recommendations cont...

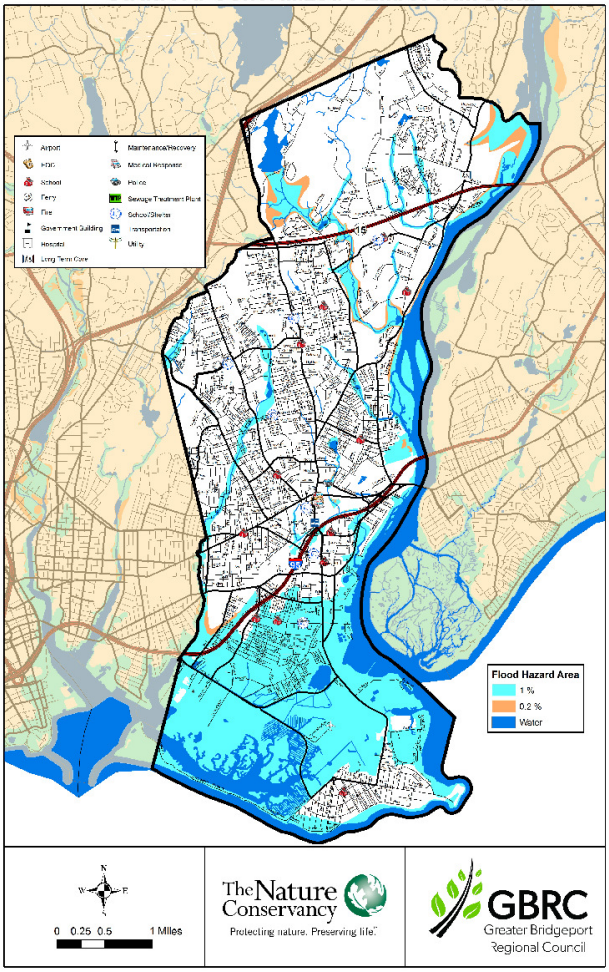
Highest Priority

- Work with United Illuminating to harden utilities by burying priority, high-risk power lines across Town.

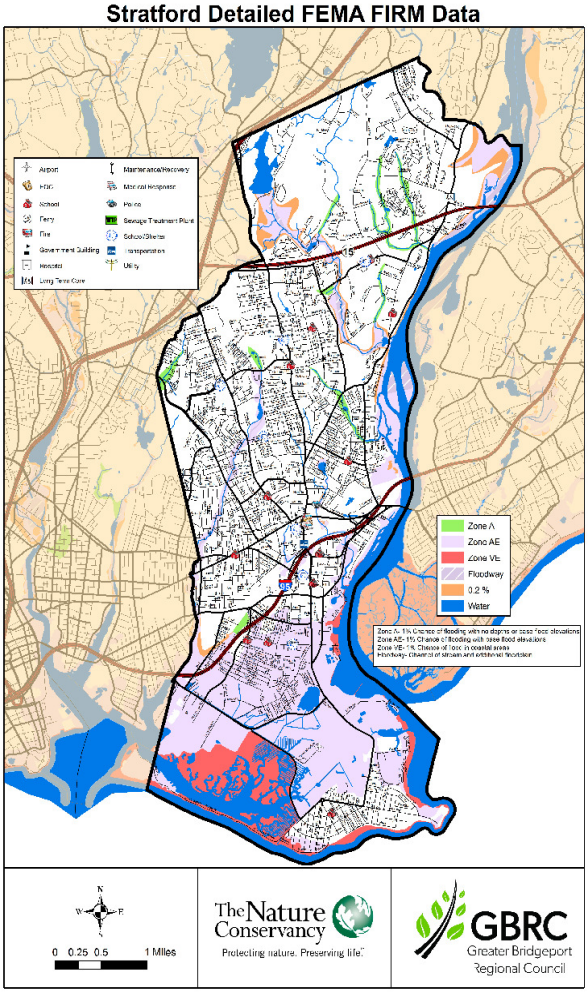
- The Stratford Housing Authority should conduct a feasibility study of power supply needs via generators for the 500+ housing units dispersed across multiple neighborhoods with many units in current flood zones.

- For buildings south of Stratford Avenue (municipal buildings, private residents, community buildings), coordinated flood proofing improvement should be organized including raising equipment and generators well above flood levels and installing projectile proof windows to reduce health and safety concerns to employees, residents and customers.

Stratford Generalized FEMA FIRM Data



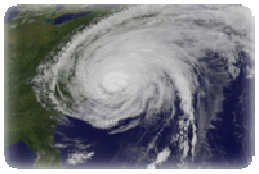
Stratford Detailed FEMA FIRM Data



Top Recommendations cont...

Highest Priority

- For the South End, reassess existing and future risks to employment growth areas identified in Stratford Plan of Conservation and Development. Plan should consider all costs of redeveloping land in vulnerable areas and consider less vulnerable areas where feasible. Where unfeasible, buildings should be elevated in accord with modified building codes that would reduce flood risk to residents and structures in at-risk locations such as the South End.



NWS

- For the Bunnell High School and Baldwin Senior Center sheltering facilities there is a need to secure generators.

- Support and identify funding to provide generators to enable gas pumping at priority gas stations during storm events that cause power outages.

- Ensure that private contractor equipment is relocated to secure flood proofed location prior to events; areas of concern include along Surf Avenue, Barnum Avenue, Bow Avenue, Greenfield Avenue and Albright Avenue.

- Encourage private entities such as restaurants throughout town to acquire and install back-up generators to increase food preparation and ice availability for residents during power outages.

- Privately owned property requires cooperation to ensure planting and stabilization of contaminated land to prevent mobilization during flooding events - Raymark Waste - Ferry Creek/Lockwood Avenue.

- Need to improve coordination with Town and utility crews in response to disasters. Utilities need to increase the commitment and availability of "make safe" crews.

Top Recommendations cont...

Highest Priority

- For Norway Maples there is a clear need to conduct assessment of age and distribution to inform removal and trimming efforts that will reduce risk to life and property. Look to benefit from urban tree inventory being conducted within the greater Bridgeport region.

- Assess the impacts of hazards on natural areas (Roosevelt Forest, Booth Memorial Park, Far Mill River, Wooster Park, etc...) and identify ways to enhance natural defensive/protective features for additional flood protection and wave attenuation longer term across the entire Town.

- For Long Beach/Pleasure Beach assess the impacts on adjoining National Wildlife refuge and built structures (roads, commercial/industrial, residential, airport) from breach of barrier island during future extreme weather events. Look to conduct a cost/benefit analysis of beach restoration/replenishment over time.

Moderate Priority

- Main Enterprises and Lordship Boulevard District: Need for businesses to find solutions to minimize impact to facilities and improve business continuity after major events including the addition of back-up generators.

- Critical sheltering facility requires improved access up Birdseye Avenue during flooding events to enhance operations and access to facility.

- Dams: Need to assess current condition, potential impacts in the event of a catastrophic failure and review previous inundation contingency plans (Beaver Dam, Brewster Pond Dam, Pecks Mill Pond Dam, Cooks Pond Dam).

- Assess feasibility of elevating Main Street - from 5 1/2' to 7'.

- At the Police Station, relocate technical equipment to upper floors, raise parking area and reevaluate communication tower(s) design to withstand high winds.

Top Recommendations cont...

Moderate Priority

- Consider integrating Animal Shelter into improvements at WWTP by extending protective berm to encompass Shelter.

- Stratford High School Ball Fields: Evaluate ways to use location to increase protection of downtown area from flooding events.

- South End (Senior Housing, Housing Authority): Advance voluntary buy-out programs for repetitive loss properties and other at-risk properties.

- Short Beach: Coordinate with federal agencies to conduct a cost/benefit analysis for Short Beach replenishment over time and look to define Short Beach as an Engineered Beach.

- Russian Beach: Assess the ongoing and long-term impacts from natural hazards towards developing a sustainable course of action.

Lowest Priority

- Birdseye Boat Docks and Ramp: Assess approaches to maintain functionality of facilities under flooded conditions and ensure continued use during disasters.

- Need to clearly define roles of CERT teams to minimize response functions of emergency services - fire department.

Giny Fullam

Workshop Participants: Departments, Organizations and Other Entities

Office of the Mayor
Stratford Health Department
Stratford Department of Community Services
Stratford Highway Department
Stratford Recreation Department
Stratford Building Official
Stratford Information and Technology
Stratford Fire Department
Stratford Building Maintenance Department
Stratford Economic Development Department
Stratford Conservation Department
Stratford Operation Coordinator
Stratford Planning and Zoning Department
Stratford Department of Public Works
Stratford Engineering Department
Stratford Emergency Medical Services

Workshop Project Team: Organizations and Principal Contacts

The Nature Conservancy – Adam Whelchel, Ph.D. (Project Lead) awhelchel@tnc.org

Greater Bridgeport Regional Council — Brian Bidolli (GBRC Contact) bbidolli@gbrct.org

Acknowledgement:

Special thanks are deserved for the Town of Stratford and their willingness to embrace this process and provide the facilities to convene.

This effort was made possible through partial funding by the Horizon Foundation, Anne S. Richardson Fund and the McCance Foundation Trust.

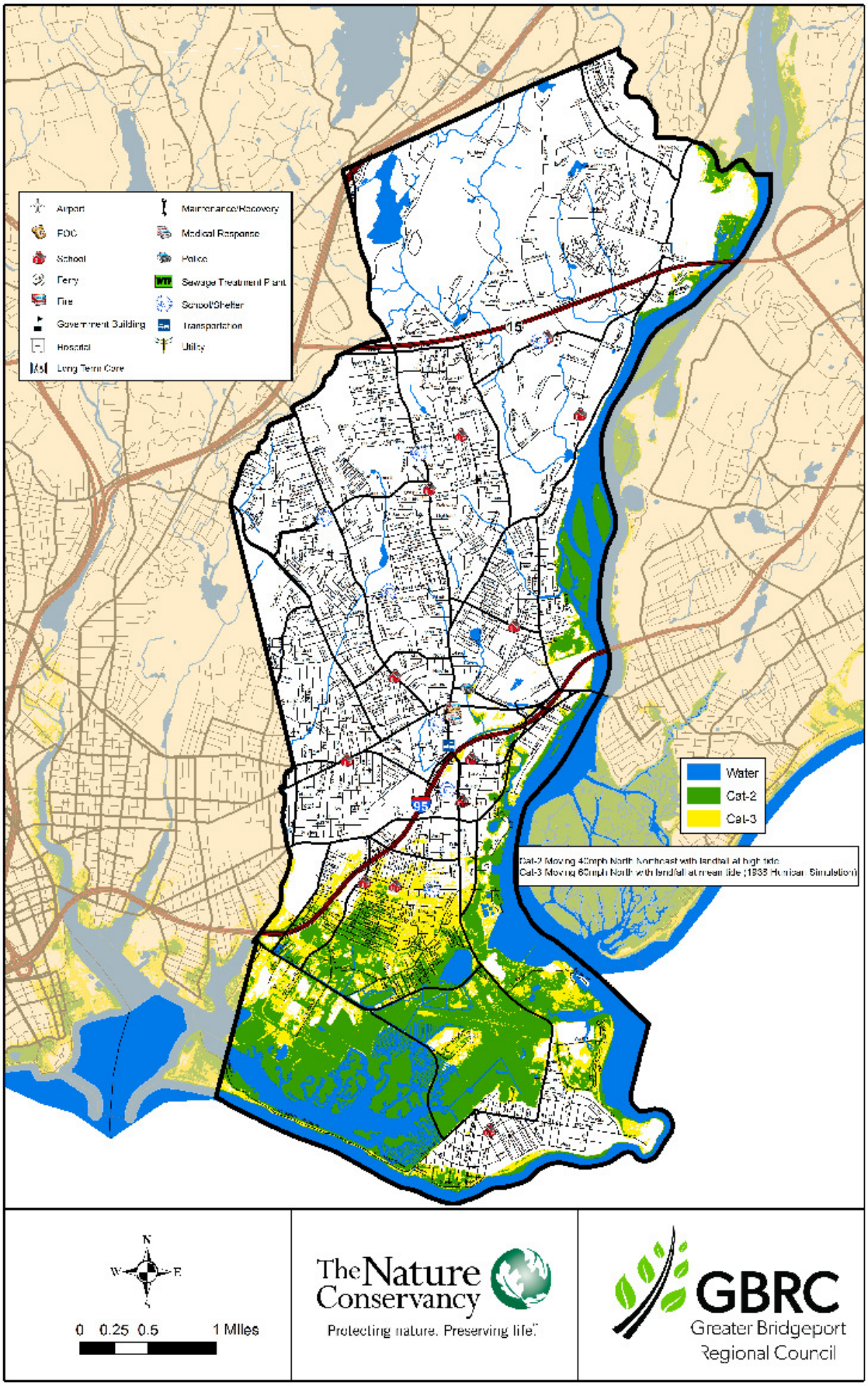
Recommended Citation

Town of Stratford Hazards and Community Resilience Workshop Summary of Findings. The Nature Conservancy and Greater Bridgeport Regional Council. October 2013.

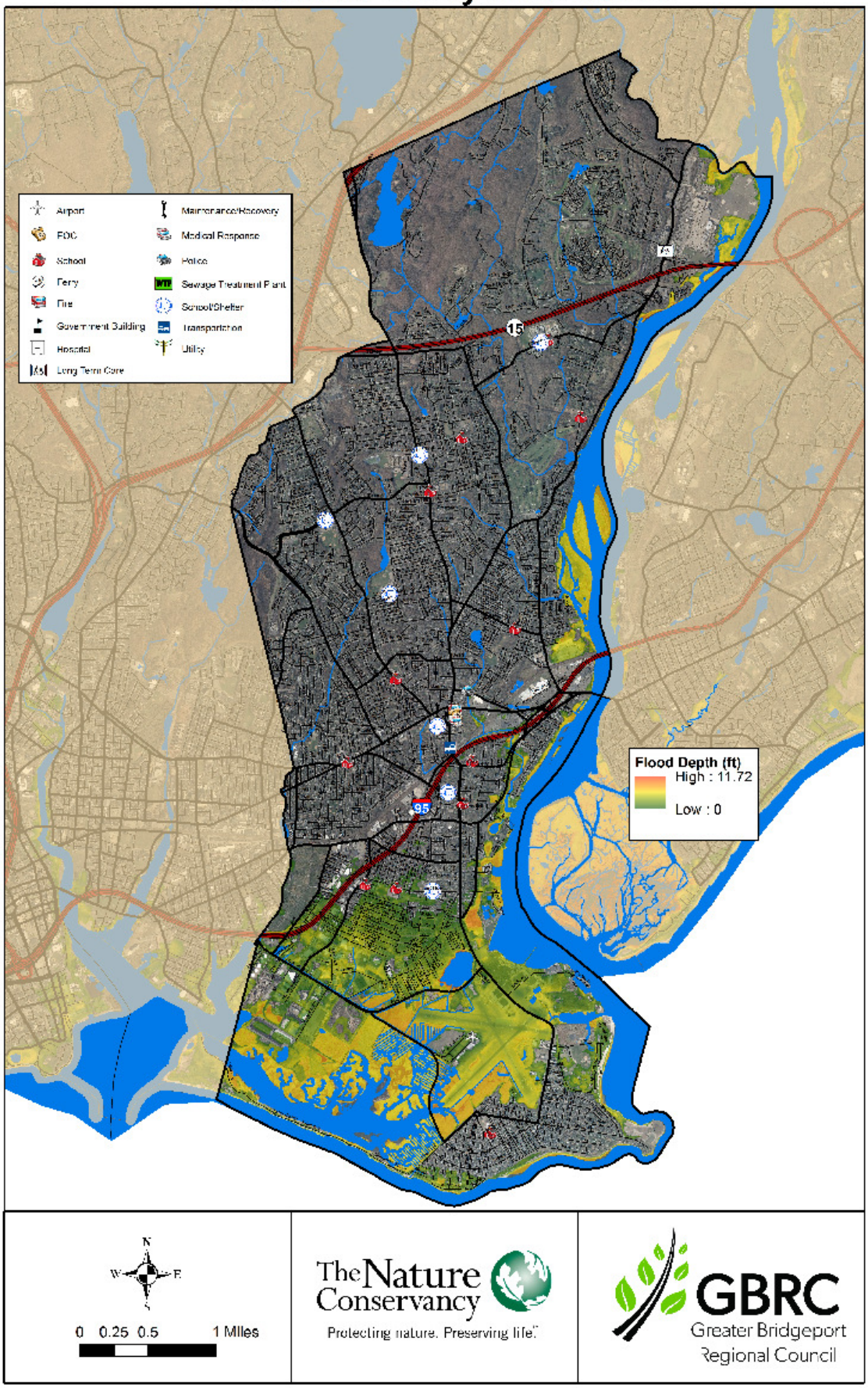
Appendix

Maps of Stratford Used During Workshop

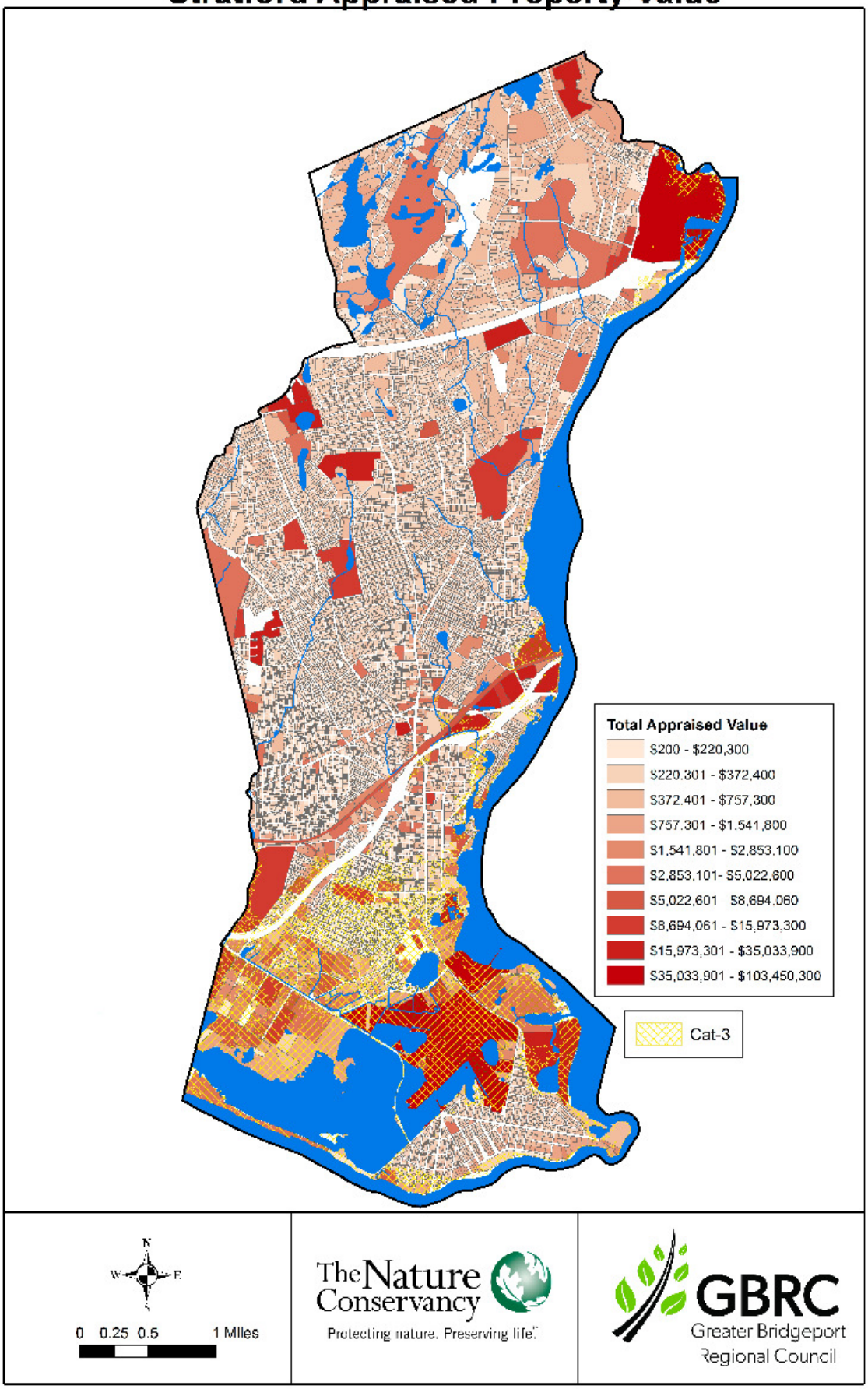
Stratford Hurricane Inundation



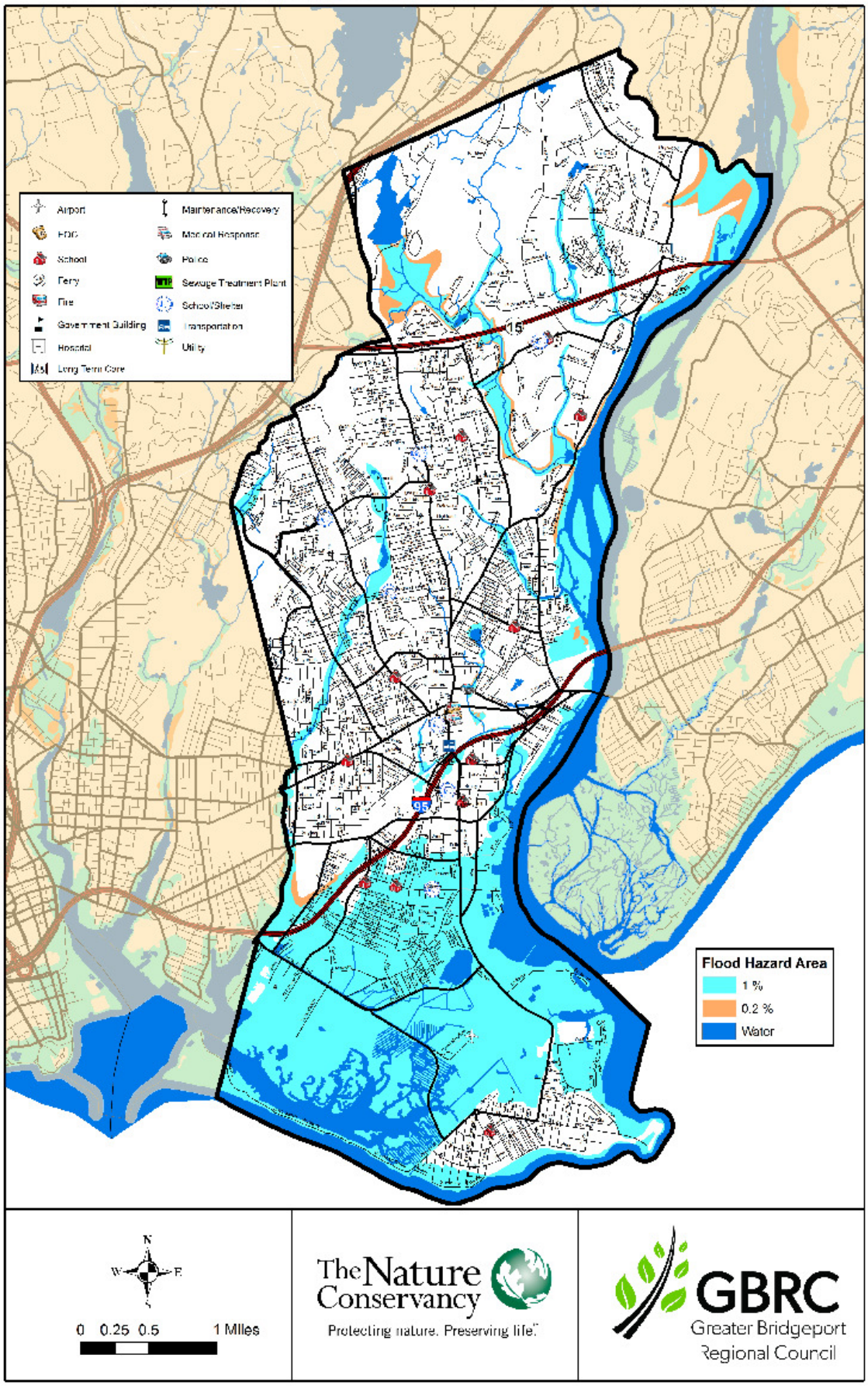
Stratford Sandy Innundation



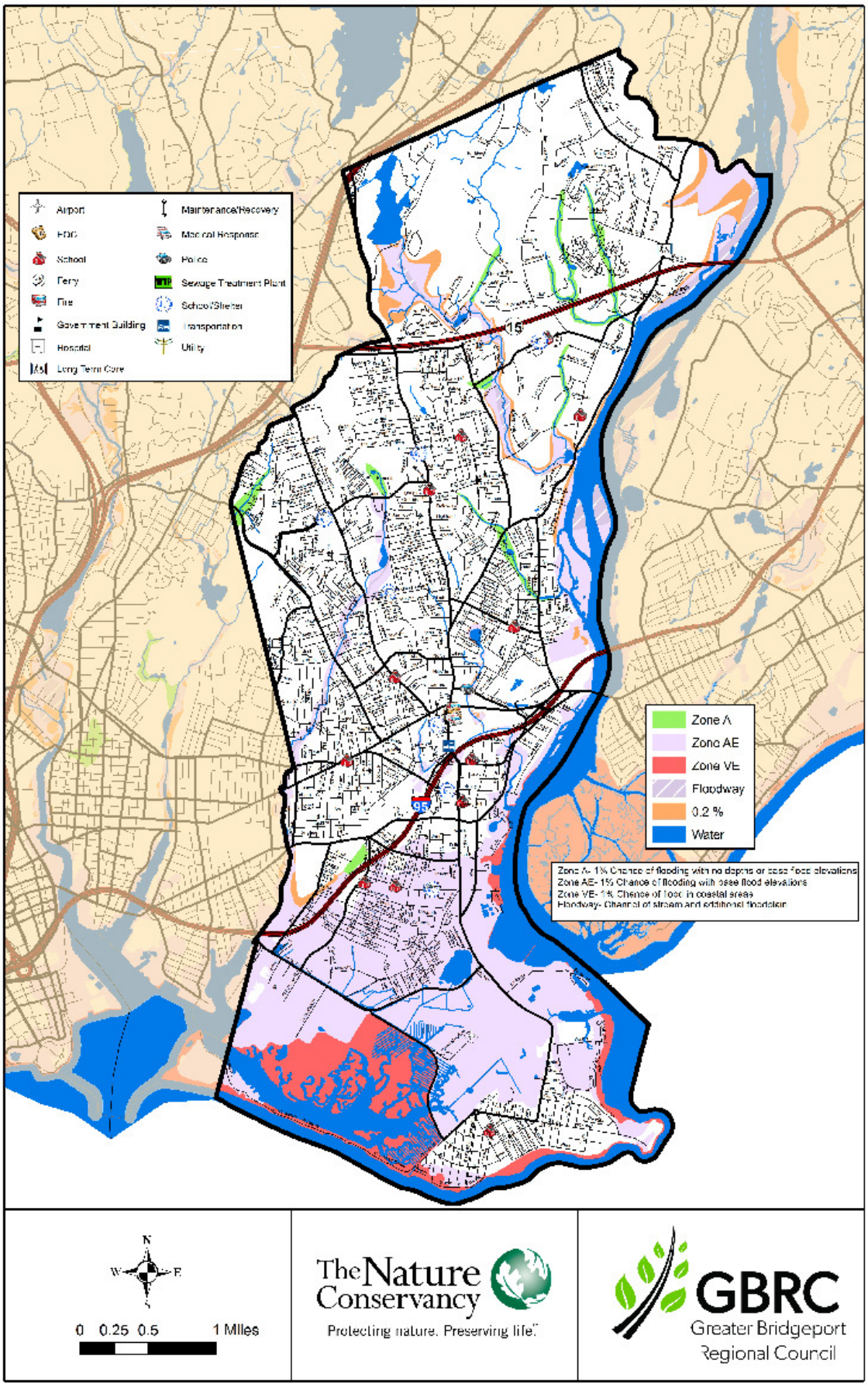
Stratford Appraised Property Value



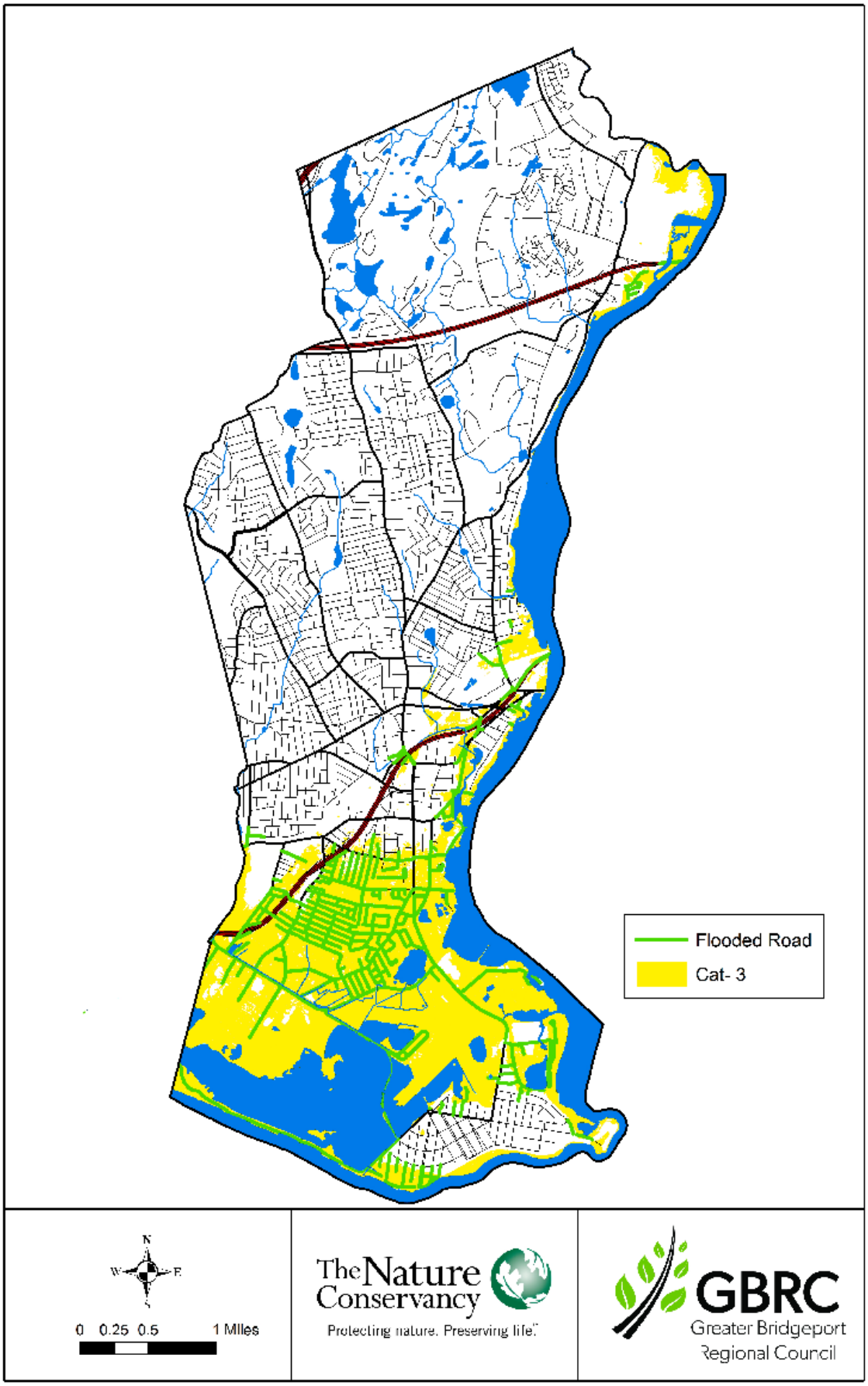
Stratford Generalized FEMA FIRM Data



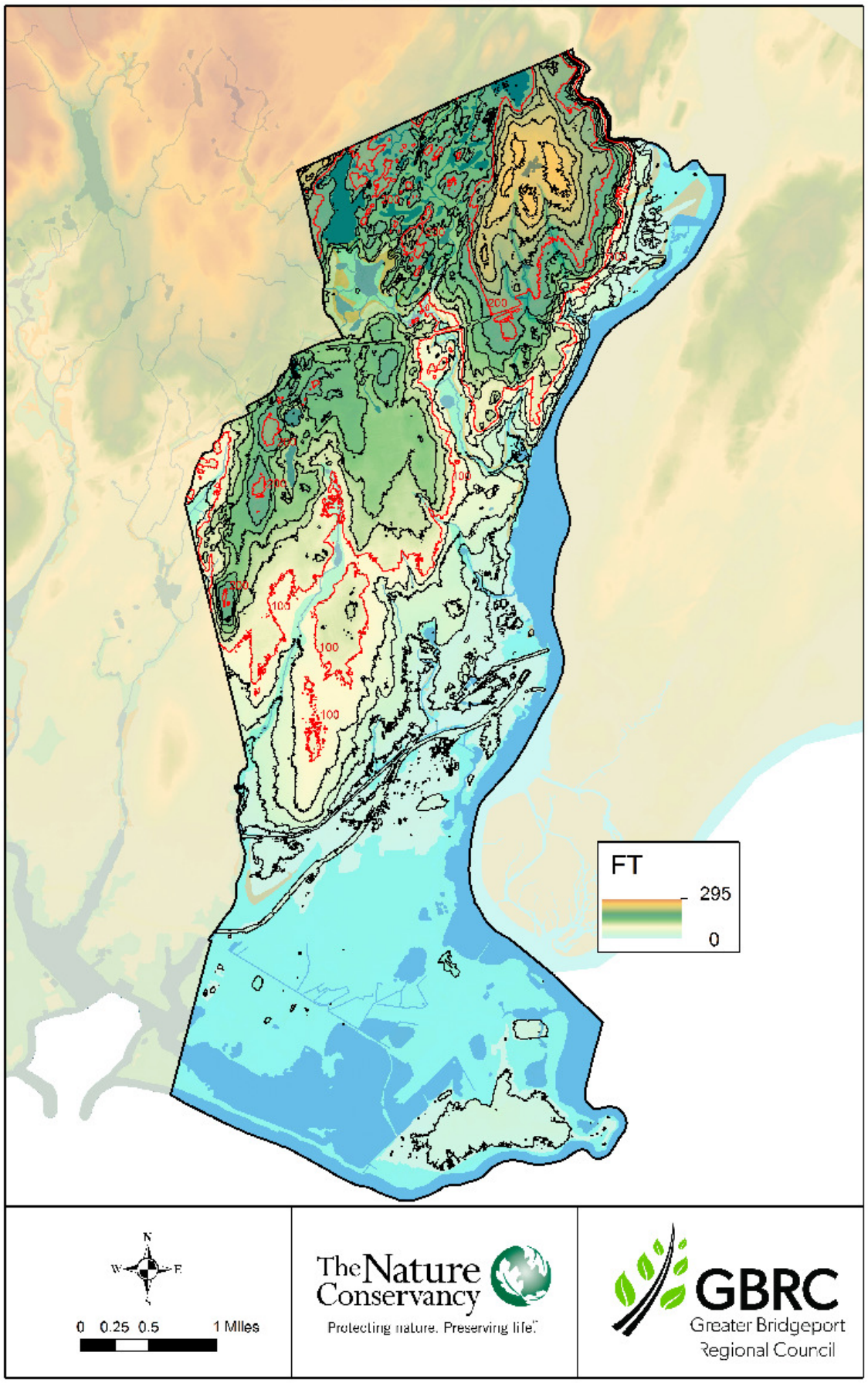
Stratford Detailed FEMA FIRM Data



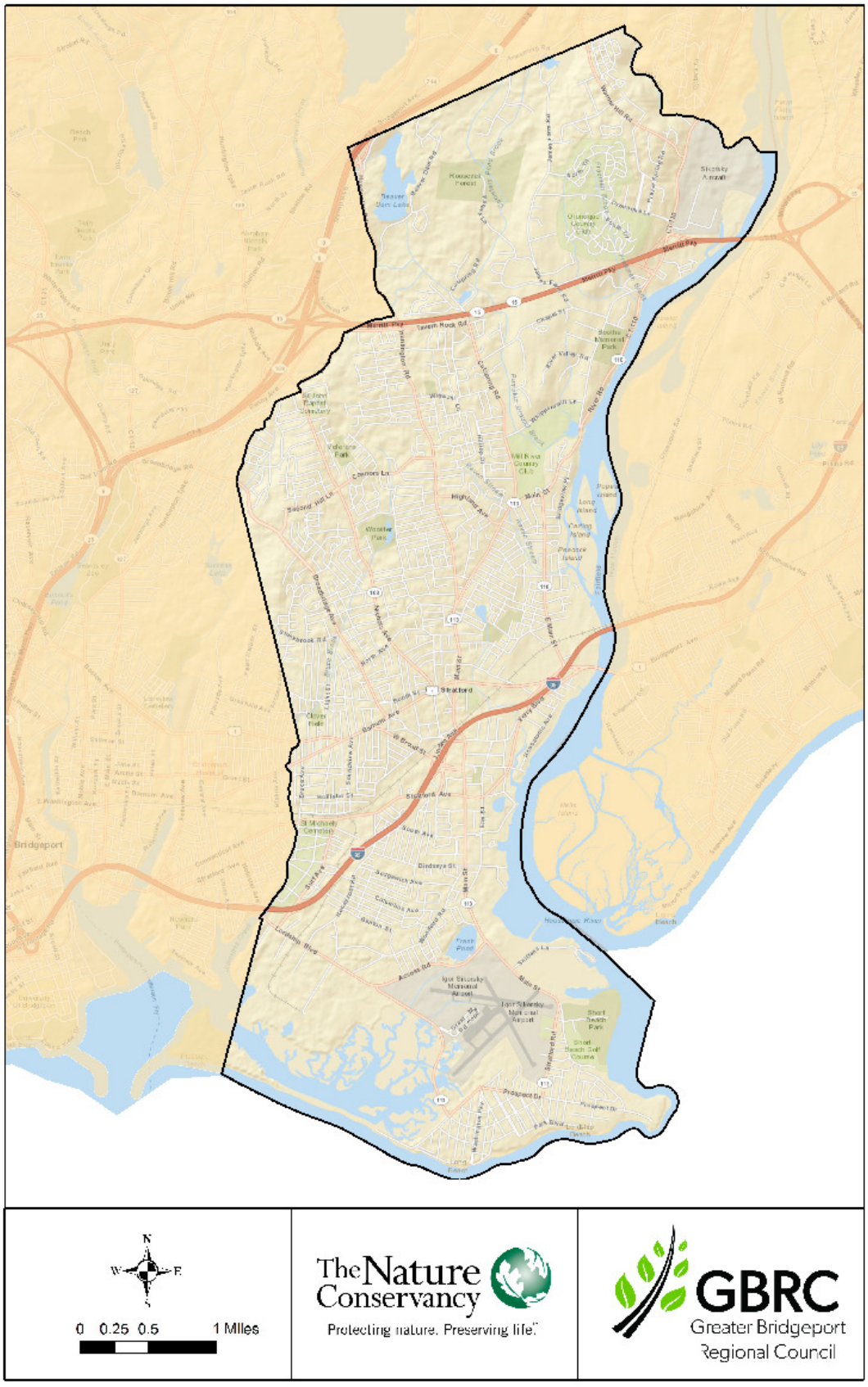
Stratford Flooded Roads



Stratford Elevation



Stratford Basemap




The Nature Conservancy
Protecting nature. Preserving life.™


GBRC
Greater Bridgeport
Regional Council