Town of Essex

Community Resilience Building Workshop
Summary of Findings
September 2019
Town of Essex
Community Resilience Building Workshop
Summary of Findings

Overview
The need for municipalities, academic institutions, regional planning organizations, states and federal agencies to increase resilience and adapt to extreme weather events and a changing climate is strikingly evident amongst the communities of the state of Connecticut. Recent events such as Tropical Storm Irene and Sandy have reinforced this urgency and compelled leading communities like the Town of Essex to proactively collaborate on planning and mitigating risks. Ultimately, this type of leadership is to be commended because it will reduce the vulnerability of municipal residents, infrastructure, and ecosystems and serve as a model for other communities in Connecticut, New England, and the Nation.

In the spring of 2019, the Town of Essex embarked on certification via Sustainable CT. As part of that certification, Sustainable CT and the Nature Conservancy provided the Town with a voluntary process to conduct an assessment of climate change impacts. In August 2019, a municipal-based core team organized a Community Resilience Building Workshop facilitated by the Nature Conservancy in partnership with Sustainable CT. The core directive of this effort was the engagement with and between community stakeholders to facilitate the assessment of climate vulnerabilities and the education, planning and ultimately implementation of priority adaptation actions for Essex.

The Community Resilience Building Workshop’s central objectives were to:

• Define top local natural and climate-related hazards of concern;
• Identify existing and future vulnerabilities and strengths;
• Develop prioritized actions for the Town of Essex;
• Identify opportunities to collaboratively advance actions to increase resilience.
For the Workshop, the Town of Essex employed a unique “anywhere at any scale”, community-driven process known as Community Resilience Building (CRB) (www.CommunityResilienceBuilding.org). The CRB’s Risk Matrix and various data and maps were integrated into the workshop process to provide both decision-support and risk visualization around shared values and priorities across Essex. Using this CRB process, rich with information, experience and dialogue, the participants produced findings which are outlined in this Summary of Findings report. The following report provides an overview of the top hazards, current concerns and challenges, current strengths, and proposed actions to improve Essex’s resilience to natural and climate-related hazards 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 additional stakeholders alike. The leadership displayed by the Town of Essex on community resilience building will benefit from the continuous and expanding participation of all those concerned.

**Summary of Findings**

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

During the CRB Workshop, community members were asked to identify the top hazards for the Town of Essex. The hazard of greatest concern to the participants was tidal flooding from the Connecticut River as concerns about increased flooding with accelerating sea level rise. The other hazards discussed included storms such as Nor ‘easters and winter storms that bring intense and sustained winds, snow and ice. In addition, extreme temperatures both cold snaps and heatwaves were identified as major concerns. These hazards have direct and increasing impacts on Essex’s residents and resources such as its neighborhoods, natural areas (river corridors, wetlands, watersheds, parks), roads, bridges, places of employment, residential drinking and wastewater systems, health care facilitates, social support service to vulnerable populations, and other critical infrastructure and community assets.
**Top Hazards and Areas of Concern for the Community**

**Top Hazards**
- Tidal Flooding (Current and with Sea Level Rise)
- Storms (Nor’easters and Winter Snow/Ice Storms)
- Extreme Temperatures (Cold Snaps and Heatwaves)

**Areas of Concern in Essex**

**Ecosystems:** Hazardous Trees (along transportation corridors and municipal-owned property), Gypsy Moth and Drought Stress on Trees across Municipality, Riparian Buffers, Stream Banks, Natural Storm Debris, Falls River, Beavers (flooding adjoining beaver dams), Viney Hill Brook, Thatch Bed Island (loss of area due to increased erosion), South Cove (siling in and lowering depth of harbor), Clean Vessel Act/Pump Outs of Vessels, No Public Swimming Areas, Mud River, Tidal Wetlands Upstream and Downstream of Essex on Connecticut River (i.e. Lords Cove, Meadows, etc.).

**Roads, Road Networks, Bridges:** Roads/Bridges crossing Falls River, North Main Street, Route 154, Walnut Street, Undersized Culverts, Bridge Abutment Encroachment, Route 9.

**Infrastructure:** Residential Septic Systems, Drinking Water Wells, Older Housing Stock (w/out AC), Gas Stations, Dams (six privately owned), Local Businesses (securing and maintaining over time), Essex Harbor, Bushy Hill Dam, Clark's Pond Dam, Mill Pond Dam, Ivoryton Pond Dam.

**Developments and Neighborhoods:** Downtown Village Area (economic center), Marina District, Residential Areas on Connecticut River north and south of Downtown Village Area, Residential Areas on Falls River in Ivoryton, Centerbrook Residential Area, Essex Meadows Senior Housing, Essex Court and Essex Place Affordable Housing.

**Vulnerable Populations:** Homebound/Isolated Elderly (rapidly aging population), Developmentally Disabled, Non-English Speaking, Low Income, Volunteers (decline over time), Fixed Income Retirees, Homeless Population, Tourists.

*Information above from workshop participants as well as from the Essex NHMP Update (2014).*
**Current Concerns and Challenges Presented by Hazards**

The Town of Essex has several concerns and faces multiple challenges related to the impacts of natural hazards and climate change. In recent years, Essex 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 impactful events in the last eight years. Impacts from Irene included heavy rain-induced riverine and tidal flooding and wind damage. Sandy caused extended power outages across portions of Essex. Winter snow storms drop excessive snow on the Town knocking out power and isolating residents and neighborhoods. The magnitude and intensity of these events and others across Connecticut has increased awareness of natural hazards and climatic change, while motivating communities like Essex to comprehensively improve resilience.

This series of extreme weather events highlights that for Essex the impacts from hazards are diverse; they range from limited riverine and tidal flooding of roads and low-lying areas near rivers and wetlands during intense storms and heavy precipitation events to property damage from trees, wind, snow, and ice. Longer periods of elevated heat, particularly in July and August, and cold snaps have raised concerns about vulnerable segments of the population including the elderly and disabled. The combination of these issues presents a challenge to preparedness, response and mitigation priorities and requires comprehensive yet tailored actions for particular locations and/or areas across Essex.

The workshop participants were generally in agreement that Essex is experiencing more intense and frequent storm events, heat waves, and tidal flooding. The impacts have affected the daily activities of most residents. Additionally, there was a general concern about the challenges of being prepared with contingency plans for worst case scenarios during different times of the year (i.e. major disasters, storms, major hurricanes (Cat-3 or above)) particularly in the fall/winter due to more intense storms.
**Specific Categories of Concerns and Challenges**

As in any community, Essex is not uniformly vulnerable to hazards and climate change, and certain locations, resources, 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 concerns and challenges across three categories - Infrastructure, Societal, and Environmental.

**Infrastructure Concerns and Challenges**

**Roads, Road Networks, Bridges:**
- Routine and major flooding of road networks adjacent to tidally and precipitation influenced waterways in select areas of municipality.
- Parking issues and congestion in Village.

**Wastewater:**
- Chronic flooding of septic systems in select areas and neighborhoods subjected to flooding and seasonal high ground water levels (February - April).
- Unknown common septic systems in Village shared between businesses and residents.
- Concerns regarding upstream combined-sewer overflow systems.

**Emergency Management and Preparedness:**
- Major hurricane creating unmanageable challenges for current response and recovery staff, resources, and facilities within municipality.
- Need for more business continuity and recovery planning for major events.
- Concerns regarding declines in volunteers for critical services.

**Housing:**
- Isolation of homes when road network is compromised for extended periods.

**Societal Concerns and Challenges**

**Vulnerable Populations:**
- Isolated pockets of residents who live in more rural parts of community.
- Older housing stock including homes without air conditioning.
- Implications on disproportionately disadvantaged populations (i.e. elderly, working poor, fixed income, etc.) due to flooding, winter storms, and heat waves.
Specific Categories of Concerns and Challenges (cont’d)

Societal Concerns and Challenges

Vulnerable Populations:
- Need to improve emergency communications and update information on special needs residents that require additional support during and after major events.
- Need for long-term residents to educate and support new residents on preparedness.
- Growing mobility issues given rapidly aging population.
- Limited availability of and access to proximate, larger grocery stores.

Power:
- Power outages to residential homes and business particularly during the winter months increasing isolation.
- Lack of generators amongst the five gas stations in municipality.

Environmental Concerns and Challenges

River, Watersheds, Aquifers:
- Principal drinking water source provided by two well heads susceptible to surface water flooding and subsequent contamination.

Trees and Forest:
- Increasing impacts to tree health from pests and pathogens resulting in dead and standing trees which pose risk to power lines, people, and property if not managed.

Connecticut River:
- Erosion of Thatch Bed Island and silting in of South Cove and Harbor.
- Long term viability of tidal wetlands upstream and downstream of municipality that store flood water and absorb storm surge currently and as sea level rise accelerates.
Current Strengths and Assets

Because of the recent experiences with extreme weather, the Town of Essex is well acquainted with existing and shared strengths. Reinforcing best practices and enhancing available assets will generate greater benefits to the Town and adjoining communities through increased resiliency to more frequent and intense storms, as well as to long term impacts from increases in flooding, temperatures, precipitation.

• Clearly, the responsive and committed leadership exhibited by officials and staff is a very appreciated strength within the Town of Essex. Ongoing collaboration between the Town, adjoining municipalities (mutual aid agreements), Lower Connecticut River Valley Council of Governments, DEMS Region 2, business community, faith-based organization, Visiting Nurse Association, and NGOs among others on the priorities identified below will help to advance comprehensive, cost-effective approaches to community resilience building.

• The Town has solid, highly experienced, staff with a desire to maintain adequate resources for most emergency situations. The coordination amongst various departments including leadership, Police, Fire, and EMS was cited as an ongoing, and highly valued community strength despite the need to maintain a flow of volunteers over time (i.e. multi-town Community Emergency Response Team).

• Relatively intact tidal wetland systems upstream and downstream of municipality couple with forested watersheds and robust rivers and wetland systems which provide flood storage, enhance public amenities for recreation and gathering, and increase ecological function and biodiversity.

• Network of support facilities to provide sheltering, food, heating/cooling, and charging options for residents regionally in addition to ongoing food pantries.

• Robust harbor facilities, moorings, and base of operations for pump out boats.

• Self-reliant and resilient residents that look out for one another and pride themselves on preparedness.

• Per MS4, mapping and prioritization of 1,200 catchment basins completed with immediate needs addressed and long-term plan for additional needs in place.

• Committed engagement via Health Department that identifies and maintains services for residents in need (i.e. SAFER Essex).

• Attractiveness and desirability of downtown village area and surrounds for tourist that are critically important to the economic vitality of municipality.
Top Recommendations to Improve Resilience

A common thread throughout the workshop discussions was the recognition that Essex needs to be better prepared through longer term community-based, contingency planning across all areas of concern. This need and additional core highlights surfaced by the Workshop participants are addressed below across Infrastructure, Societal, and Environmental categories.

Infrastructure

- Continue to conduct routine and regular upgrades, retrofits, and replacements to the 1200 catchment basins per the existing capital improvement and maintenance plans. Ensure that future precipitation scenarios are factored into future upgrades.
- Explore the costs and benefits of community septic systems or sewer infrastructure to select areas of the municipality via discussions between Planning Department, Economic Development Commission, Health Department, Board of Trade, and Ivoryton Alliance.
- Identify areas across municipality where Low Impact Development (LID) practices along with installation of green stormwater infrastructure could help to minimize localized flooding and improve water quality in adjoining waterbodies.
- Continue to monitor the status of large dams upstream from municipality and update periodically the footprint of downstream flooding due to catastrophic failure.
- Explore the potential options to alleviate traffic congestion for Main Street given current conditions and limitations.
- Advance a comprehensive culvert and bridge upgrade, retrofit, or replacement assessment and implementation plan over next 10-15 years designed for future, more extreme precipitation events.
- Look to replace Old Deep River Road Bridge with incorporation of increase intensity and frequency of precipitation-driven flooding event in associated water course.
- Consider the costs and benefits of installing microgrid(s) and burying power lines in high risk areas.
- Look to incorporate green stormwater infrastructure installation where appropriate into upgrades to storm drains, paving, and general maintenance road. Integrate green stormwater options into Capital Improvement Plan budgets.
Community Resilience Building Workshop Recommendations

Societal

- Continue to seek ways to improve the townwide promotion of personal safety and responsibility in response to major events as well as a neighbor-helping-neighbor approach to preparedness.
- Include in the Town’s Welcome materials for new residents information about how to sign up for Reverse 911 systems.
- Ensure wide distribution of sign-up sheets and info cards for Reverse 911 to residents via realtors, churches, laundry mat, library, and other places where people congregate.
- Consider securing paid language translation services to help assist non-English speakers and look to expand Reverse 911 to provide additional languages.
- Explore educational programming for senior residents with an emphasis on risk reduction and preparedness at the household and community scale.
- Look to increase outreach and engagement with business community to help increase the level and depth of disaster continuity planning via the Board of Trade and Ivoryton Alliance.
- With a rapidly aging population, look to coordinate and increase transportation options to enhance mobility of seniors including access to larger grocery stores.

Environmental

- Continue to address dead and standing tree concerns along critical transportation corridors and right of ways to proactively minimize power outages and access issues during and after major events.
- Explore options to establish a public swimming area to help reduce the impacts of heatwaves on residents and their families.
- Identify ecological restoration and funding options to help maintain Thatch Bed Island as a natural buffer to critical harbor and waterfront facilities and infrastructure. In addition, seek ways to increase ecological resilience of riparian corridors.
CRB Workshop Participants: Department/Organization
Town of Essex - First Selectmens Office
Town of Essex - Harbor Management
Town of Essex - Emergency Management
Town of Essex - Administration Office
Town of Essex - Planning
Town of Essex - Economic Development
Town of Essex - Parks and Recreation
Town of Essex - Public Works Department
Town of Essex - Sustainable Essex
Town of Essex - Residents
Lower Connecticut River Valley Council of Governments

CRB Workshop Project Team: Organization and Role

**Essex Core Team**
Stacy Abbott - Town of Essex - Sustainable Essex
Mackenzie Pias - Sustainable CT

**Workshop Facilitation Team**
The Nature Conservancy – Adam Whelchel, Ph.D. (Lead Facilitator)
Institute of Sustainable Energy - Jessica LeClair (Support Lead)
Institute of Sustainable Energy - Torin Radicioni (Scribe)
Sustainable CT Fellows - Mackenzie Pias (Scribe)

**Recommended Citation**

**Acknowledgements**
Special thanks to the Town of Essex Selectmen, staff, and community members for their willingness to embrace this process in hopes of a more resilient future for Essex. Thank you to Sustainable CT for providing refreshments and food. Finally, thanks to the scribes that recorded the workshop dialogue.

This project was made possible in part through the generous contribution of the Workshop team by The Nature Conservancy and Sustainable CT to conduct Essex's Community Resilience Building Workshop in close partnership with the Town’s Core Team.
Appendix

Base Map
Essex Natural Hazard Mitigation Plan (2014)
Comprehensive Mitigation Actions
(Table 22)
Prepared by
Lower Connecticut River Council of Governments
### Comprehensive Mitigation Action Items

<table>
<thead>
<tr>
<th>Natural Hazards</th>
<th>Schedule</th>
<th>Responsible Party**</th>
<th>Status</th>
<th>Cost</th>
<th>Possible Funding Source**</th>
<th>Weighted STAPLE Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding</td>
<td>A. Daily</td>
<td>ZC, WPC, PC</td>
<td>New</td>
<td>$</td>
<td>OP</td>
<td>1 1 0 0 1 1 1 5</td>
</tr>
<tr>
<td>Drought and Hunger</td>
<td>D. Monthly</td>
<td>BWF, BOB</td>
<td>Occurs</td>
<td>$</td>
<td>OP</td>
<td>1 1 0 1 1 1 1 6</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>C. Annually</td>
<td>PC, LDU</td>
<td>In Place, storm water infrastructure cleaning, etc.</td>
<td>$</td>
<td>OP</td>
<td>1 1 1 1 1 1 1 7</td>
</tr>
<tr>
<td>Extreme Heat</td>
<td>D. 2015-2017</td>
<td>BOB, BOF, BOF</td>
<td>No Plan exists to date.</td>
<td>$</td>
<td>OP</td>
<td>1 1 0 0 1 1 1 1 5</td>
</tr>
<tr>
<td>High Wind and Tornado</td>
<td>E. 2018-2027</td>
<td>BOB, BOF, BOF, BOF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Local Plans and Regulations

- **Amend Flood Ordinances**: Consider adding an “enforcement” – an additional insight above the flood level – to add a greater margin of safety. In the case of nonresidential structures, the insurance rates do not go down until a structure is flood proofed at least one (1) foot above the EFE.

- **Benefit-Cost Analysis**: Evaluate opportunities for public funding of mitigation projects on private property where public benefits exceed the cost for RL properties or for properties otherwise eligible for buy-out.

- **Best Management Practices**: Continue to see best management practices (SMPs) as described in the Connecticut DEEP Storm water Management Guidelines on a site-by-site basis as advised by a professional engineer.

- **Business Recovery Plan**: Develop business recovery plan cooperatively with other region towns and districts to distribute to businesses.

- **Capital Improvement Program**: Use Capital Improvement Program (CIP) to set aside funds for infrastructure improvements to reduce loss of life and property damage during natural hazard (NH) events.

- **Conservation Planning**: Educate the public about how the town uses planning, regulation, and incentives to mitigate NHs via LID, aquifer recharge, stormwater buffer, green gardens, open stormwater, house numbering, etc.

- **Design Standards**: Continue to implement State Building/Fire Code and local Flood Code for construction that minimizes loss of life and property damage due to NHs.

- **Immobile Evacuees**: Review annually the program to evacuate persons without means of transport, including evacuation and house numbering.

- **Flood Zone Study algae**: Update flood zone study for the town to incorporate changed conditions and within the flood plain.

#### Essex, CT

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Provider</th>
<th>Cost</th>
<th>Total</th>
<th>Risk</th>
<th>Mitigation</th>
<th>Sensitivity</th>
<th>Completeness</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Management Plan</td>
<td>EME, Tree Warden</td>
<td>$$</td>
<td>1 1 1 1 1 0 1 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grants Identify and apply for grants to fund infrastructure improvements and other mitigation tasks identified in this plan.</td>
<td>BOF, BOF, LDU</td>
<td>$$</td>
<td>1 1 0 1 1 1 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Use Regulation</td>
<td>PC, LDU, LDU</td>
<td>$$</td>
<td>0 1 0 0 1 1 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landlord Incentives</td>
<td>BOF, LDU</td>
<td>$$</td>
<td>1 1 0 1 1 1 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Social Resources</td>
<td>BOF, LDU</td>
<td>$$</td>
<td>1 1 0 1 1 1 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimal runoff from development</td>
<td>ZC, LDU</td>
<td>$$</td>
<td>0 1 0 0 1 1 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Owner Participation Promotion owner participation in mitigation efforts to protect their own properties.</td>
<td>LDU, BOF</td>
<td>$$</td>
<td>0 1 0 0 1 1 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible Open Space Criteria</td>
<td>LDU, BOF</td>
<td>$$</td>
<td>1 1 1 1 1 1 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post Disruption School Arrangements</td>
<td>LDU, BOF</td>
<td>$$</td>
<td>0 1 0 0 1 1 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential Financial Impact of Probable Events</td>
<td>LDU</td>
<td>$</td>
<td>1 1 0 0 1 0 1 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Property Funds</td>
<td>BOF, BOF</td>
<td>$$</td>
<td>1 1 0 0 1 1 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Transit Funding</td>
<td>BOF, BOF</td>
<td>$</td>
<td>1 1 1 1 1 1 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

*Figure 22: Comprehensive Mitigation Action Items*
## Essex, CT

### Recovery & Reconstruction Plan
Develop a post-disaster recovery and reconstruction plan to re-establish infrastructure and public services, etc. damaged or destroyed by any NE event, including establishment of a "Ready Day" fund in case Federal assistance is insufficient or delayed.

| Recovery & Reconstruction Plan | BOS, EMD, UDO, PW | D | New | $ | OP | 1 1 1 1 1 1 1 |

### Regulations
Strengthen existing subdivision regulations to either optimally prevent road or house construction within floodplains, or alternatively raise structures above BFE.

| Regulations | MC, BO, ZC, UDO | D | Current regulations do not allow new structures in these areas. | $ | OP | 1 1 1 1 1 1 1 1 |

### Zoning Map Audit
The town should conduct a comprehensive audit of the zoning map to consider the changes made to either improve and ensure that the new market zoning is not encroached upon by areas that are at high risk from natural disasters.

| Zoning Map Audit | ZC, UDO | C | Zoning Map is evaluated yearly. | $ | OP | 1 1 0 0 1 1 1 1 1|

### Structure and Infrastructure Projects

| Structure and Infrastructure Projects | BO, UDO | D | GIS was used for this plan update. | $ | OP | 1 0 0 1 1 1 1 1 5 |

### Electronic Records Preservation
Design databases for records keeping. Create a back-up of existing electronic records, including geographic information system (GIS) data.

| Electronic Records Preservation | BO, BOF | D | Several backups are in place. | $ | OP | 1 0 0 1 1 1 1 1 5 |

### Firefighting Infrastructure Analysis
Evaluate existing firefighting infrastructure to identify needs for improvement to cover gaps in availability.

| Firefighting Infrastructure Analysis | Fire Dept | D | New | $ | OP | 1 1 1 1 1 1 1 1 1 7 |

### GIS Database
Establish a comprehensive GIS database to better identify and assess areas, structures and populations potentially affected by natural disasters. Those data will provide the town with information necessary to assess natural hazard risks and develop plans to mitigate risks to people and property.

| GIS Database | BO, BOF, UDO | D | Regular updates, RiverGIS is currently mapping the entire region. | $ | OP | 1 1 1 1 1 1 1 1 1 7 |

### Municipal Buildings Capable of Being Shelters
Future investment in municipal structures should include funding for new construction or renovation that will assure the structure is compliant with the standards for use as a shelter, to the extent possible.

| Municipal Buildings Capable of Being Shelters | BO, BOF, BO | E | New | $ | OP | 1 1 1 1 1 1 1 1 1 6 |

---

### Oblique Imagery
Over the next five (5) years obtain oblique imagery to allow for assessment of such factors as extent of fire damage, compliance with building standards, identification of shoreline hardening and shoreline erosion and accretion.

| Oblique Imagery | BO, BOF | D | New | $ | OP | 1 1 0 1 1 1 0 1 5 |

### Paper Records Preservation
Convert all paper records maintained by the municipality to an electronic format, consistent with any State recommendations, to ensure their survival. Establish protocols for paper records going forward.

| Paper Records Preservation | BO, BOF | D | Parent records are converted as needed. | $ | OP | 1 1 0 1 1 1 0 1 5 |

### Pet Sheltering
Participate in regional program for pet sheltering during hazard events.

| Pet Sheltering | BO, EM | D | DEMs Region 2 is in planning stages Regionwide. | $ | OP | 1 1 0 1 1 1 1 1 6 |

### Public Works Garage & Transfer Station Generator
Install a generator for back-up power.

| Public Works Garage & Transfer Station Generator | BOF, BO | D | New | $ | OP | 1 1 1 1 1 1 1 1 6 |

### Risk Reduction
Develop a strategy and funding program to elevate or relocate structures or improve property values or acquire RL properties that request a "buy-out"

| Risk Reduction | BO, BOF, BO | A | New | $ | OP | 1 1 1 1 1 1 1 1 6 |

### RL and SRL Properties
Encourage property owners of repetitive loss properties to obtain assistance for hazard mitigation funding from DEEP/EMER for elevation of structures and repairs where applicable.

| RL and SRL Properties | BO, UDO, BO | A | New | $ | OP | 1 1 1 1 1 1 1 1 6 |

### Road Evaluation
Evaluate to develop plans and improve for emergency access and evacuation.

| Road Evaluation | PW, BOF, BO | D | New | $ | OP | 1 1 1 1 1 1 1 1 6 |

### Road Reconstruction
Develop a priority list for road and bridge reconstruction and conversations for roads which experience frequent flooding or are integral to evacuation in areas such as Post Street, Falls River Drive, and others.

| Road Reconstruction | PW, F | D | Priority list is on file at PW. Projects are carried out as funding is available. | $ | OP | 1 1 1 1 1 1 1 1 1 6 |

### Storm Water Infrastructure Inventory
Implement mapping and monitoring of catch basins, storm water outlets and related infrastructure.

| Storm Water Infrastructure Inventory | PW | D | Inventory is on file at PW, but not mapped. | $ | OP | 1 1 1 1 1 1 1 1 1 6 |

### Storm Water Infrastructure Maintenance
Provide for annual maintenance of storm water infrastructure, including catch basin basics.

| Storm Water Infrastructure Maintenance | PW | D | Cleaned yearly or as needed | $ | OP | 1 1 1 1 1 1 1 1 1 6 |

### Structural Reports
Continue to require structural engineering reports for expansion or alteration of buildings within the floodplains.

| Structural Reports | BO | A | Required | $ | OP | 1 1 1 1 1 1 1 1 1 6 |

### Telecommunications Tower Generators (Private)
Evaluate whether generators are needed for back-up power at telecommunications facilities.

| Telecommunications Tower Generators (Private) | Private | D | New | $ | OP | 1 1 1 1 1 1 1 1 1 6 |

### Underground Utilities
Require underground utilities for new development, require retrofitting during redevelopment of existing sites to bury utilities where appropriate to mitigate NH.

| Underground Utilities | BO, BOF, BO, UDO | D | New | $ | OP | 1 1 1 1 1 1 1 1 1 6 |
### Natural Systems Protection

| Assist Property Owners with Buyouts | Develop strategy and program for flood prone property owners who request a buyout | X | X | X | X | BOS, BOF, LUO | E | New | $ | FEMA, ILP, NDRG | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 |

### Before Flood Event - Flood Mitigation Programs

| Dredge | Excavation and dredging to remove sediment and improve water flow | X | X | X | BOS, LUO | D | Information is available, few properties eligible | $ | HMP, PCU, RFC, SRL | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 4 |

### Flood Mitigation

| Stormwater Management | Continue to use best management practices (BMPs) as described in the Cranedeed DEEP storm water management guidelines on a site-by-site basis as advised by a professional engineer | X | X | X | X | X | LUO, BOF, CC | D | New | $ | OP, HMP, OP, O | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 3 |

| Water Conservation | Recommendations for future land use patterns including recharging into existing aquifers, including site design to encourage water conservation through such techniques as, strict regulation of vegetative buffers for streams and river contours, rain gardens for site drainage, and prohibition of septic systems alteration | X | X | X | LUO, BOF | D | Currently included in zoning and subdivision regulations | $ | OP, HMP, O | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |

### Tree Hazard Mitigation Program

| Implement a tree hazard management program to encourage appropriate planting practices to minimize future storm damage to buildings, utilities and streets | X | X | X | X | PW A | C | Tree hazard mitigation program to encourage appropriate planting practices to minimize future storm damage to buildings, utilities and streets | $ | OP, I | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 5 |

---

### Education and Awareness Programs

| Circulate Existing Literature | Literature is available | X | X | X | X | X | BOS, BOF | C | Literature is available | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 5 |

| Drought Education | Coordinate with Connecticut Water Company on public education and public service announcements during droughts | X | X | X | BOF, BOF | D | New | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 5 |

| Educate About Risks Where People Live | Educate residents at high risk due to geographical or social attributes about the risks present in the areas that they live | X | X | X | X | X | LUO | C | New | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 5 |

| Hotline | Publicize emergency "hotline" phone number or website for public information and volunteer support | X | X | X | X | X | BOS | C | Essex Website has extension information | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

| Incident Notification System | Text public participation through public workshops to develop methods for notification of hazard events and emergencies | X | X | X | X | X | X | X | X | BOS, LUO | D | Reverse 911 System in place | $ | OP, I | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

| Information | Publish materials on additional hazards and encourage additional information | X | X | X | X | X | X | X | BOS, LUO | D | Newsletter and e-mails go out throughout the year | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

| Interpretation in Shelters | Request information regarding the need for non-english language speakers during natural disasters from the District 4 School administrator, and coordinate a shared shelter for safe night shelter, and emergency operations | X | X | X | X | X | X | X | X | EMG D | New | $ | OP, I | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

| Natural Hazard Training | Continue to train and educate emergency responders about mitigating risks | X | X | X | X | X | X | X | X | LUO | C | New | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

| Outreach | Promote volunteer participation in mitigation efforts to protect their property | X | X | X | X | X | X | X | X | BOF | C | New | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

| Pet Sheltering | Disseminate hurricane preparedness information including pet sheltering plans | X | X | X | X | X | X | X | X | EMG | C | Information available on Town Website | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

| Preparedness Webpage | Create a page on the town website with NHI preparedness information, including hazard areas, evacuation routes, emergency shelters, and information on how to prepare for hurricanes | X | X | X | X | X | X | X | X | EMG D | Town website has ext  | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

| Projective Paradigm | Provide pamphlets and refer to web-based information for property owners for hazards listed in this document and options for obtaining additional information, structural alterations to protect against various hazard damage, and emergency procedures for families during a hazard | X | X | X | X | X | X | X | X | LUG, PC | D | Extensive information is available on Town website | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

| Public Participation | Continual public participation through public workshops and surveys to develop methods for notification of emergencies | X | X | X | X | X | X | X | X | EMG, PC | C | Occurs annually | $ | OP, I | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

| Recovery Webpage | Post on town website information about recovery assistance following hurricane events | X | X | X | X | X | X | X | X | BOS | C | New | $ | HMP, PCU | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |
### Reverse 911
Consider establishing reverse 911 alert system or similar alert system.

|                | X | X | X | X | X | BOS, EMD | D          | Complete, Forebridge System | $5 | CP | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

### Schools
Visit schools and educate children about the risks of floods, hurricanes, and other natural hazards and how to prepare for them.

|                | X | X | X | X | X | X | BOS | C          | Emergency Personnel visit schools annually. | $ | HMIFG, PDM | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |

### Social–Demographic Impacts
Seek grant funding for developing more detailed data to assist in the social–demographic estimation of how Essex will be affected by natural hazards.

|                | X | X | X | X | X | X | BOS, LUCO | D          | New | $ | CP | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |

### Tenant Notification
Develop a mechanism for tenants to register for disaster notifications.

|                | X | X | X | X | X | LUCO | C          | New | $ | HMIFG, PDM | 3 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |

### Webpage
Update town webpage with the section on Hazard Preparedness for the public. Include maps of evacuation routes, storm surge areas, and shelters. Include options for mitigation for residential structures and business recovery and provide links to FEMA, NOAA, State OREM and River COG websites for additional information.

|                | X | X | X | X | X | X | BOS | C          | Continual updating of Town website | $ | HMIFG, PDM | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 6 |

### Wildfire Education
Educate the public on potential hazard of wildfire caused by campfires or open burning.

|                | X | Fire Dept | C          | Information is available on Town and DEEP websites. | $ | HMIFG, PDM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 |

**Responsible Party Code**
- BOS: Building Official
- BOE: Board of Education
- BOF: Board of Finance
- BOS: Board of Selectmen
- EMD: Emergency Management Director
- HRC: Harbor Management Commission
- LUCO: Land Use Office
- PC: Planning Commission
- PW: Public Works
- ZC: Zoning Commission
- ZEO: Zoning Enforcement Official

**Funding Source Code**
- BOE: Board of Education
- CP: Capital Improvement Plan
- FEMA: Flood Mitigation Assistance
- HMIFG: Hazard Mitigation Grant Program
- OP: Other Program
- PEM: Pre-Disaster Mitigation
- RFC: Repetitive Flood Claim
- RFP: Regional Transportation Program
- SHL: Severe Repetitive Loss
- STIP: State Transportation Improvement Project

**Notes:**
1. Many Action Items include more than one responsible party; however, the first party listed is the primary.
2. Estimated Costs are defined as: $ = $0 to $50,000; $5 = $50,001 to $100,000; $55 = Over $100,000.
Resources and Maps

Used During

Workshop
Essex, Connecticut
Natural Hazards
Mitigation Plan Update, 2014

Prepared for
Essex Planning Commission

Adopted by
Town of Essex, Connecticut
June 4, 2014

Prepared by
Lower Connecticut River Valley Council of Governments
145 Dennison Road
Essex, CT 06426
www.rivercog.org
Map 1: Essex and surrounding towns.

This map depicts Essex among surrounding towns. The map also shows Essex's relationship to the Connecticut River as well as major roads.
Map 2: Zoning Districts

This map depicts the relationships among Essex's Zoning Districts.

Source: Essex GIS (4/2013)
Map 3: Future Land Use. This map depicts the future land use throughout the town of Essex based on current Land Use and Zoning Regulations.

Source: Essex POCD, 2005
Map 5: **Natural Diversity** Area locations include State and Federally listed species and significant natural communities. Information on listed species is collected and compiled by the Natural Diversity Data Base (NDDB) from a number of data sources. Exact locations of species have been buffered to produce the general locations. Exact locations of species and communities occur somewhere in the shaded areas, not necessarily in the center.

Source: DEEP
Map 6: Essex Open Space
This map shows designated open space throughout Essex, both lands owned by the Essex Land Trust and lands owned by other entities designated as open space.
Source: Essex Land Trust (4/2013)
Map 7: **Special Flood Hazard Area** surrounding Essex Village Center.

This map shows the flood zone that runs through Essex’s economic center. Visible is the extent of the downtown property that lies within the flood zone. This map is based on the latest FIRM, adopted August 28, 2008.
Hazard Legend
1. Bushy Hill Dam – Private Owner in Deep River
2. Clarks’ Pond Dam – Private Owner
3. Residential Area – Density w/in flood plain
4. Commercial Flooding – Density w/in flood plain
5. Ivoryton Pond Dam – Private Owner
6. Dam Maintenance
7. Mill Pond Dam – Private Owner
8. Centerbrook Commercial and Residential Flooding
9. Flooding Under Route 9
10. Dam Maintenance - Private
11. Dam Maintenance - Private
12. Residential Area – Storm Surge and River Flooding
13. Residential Area – Storm Surge and River Flooding
14. Residential Area – Storm Surge and River Flooding
15. Residential Area – Storm Surge and River Flooding
16. Marina District – Storm Surge and River Flooding
17. Village Commercial and Residential Flooding

Map 8: Infrastructure Hazard Areas

This map depicts areas that are prone to nuisance and storm flooding, as well as other hazards, throughout town. Areas are based on a review completed by the Town for the 2006 NHMP.
Map 9: **Flood Zones** in Essex.

This map depicts flood zones through Essex. Much of the flood zone occurs along the Connecticut River with a length along the Falls River (north) and the Mud River (south).

*Source: Essex GIS (4/2013) Based on August 28, 2008 FIRM*
This map depicts the locations of dams and flood zones in Essex and indicates their hazard potential classification. Note that the Bushy Hill Dam, the only High Hazard Dam is located in neighboring Deep River, though water flowing over the dam proceeds into Essex, approximately 350 feet downstream.

Source: Essex GIS (4/2013)
Map 11: **Hurricane Inundation** in the Northeastern part of town. Visible is the extent of the Falls River that would be affected by a Category 4 Hurricane.

Source: Essex GIS (4/2013)
Map 12: **Hurricane Inundation** in the Southeastern Portion of Essex.

Source: Essex GIS (4/2013)
Open Space in Essex amounts to approximately 1,100 acres or 16% of the Town’s surface area. The Essex Land Trust owns or manages 900 acres with the remainder held by the Town of Essex and The Nature Conservancy.