2018 Hazard Mitigation Plan Update

Town of Coventry, Rhode Island

PREPARED FOR

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ADOPTED FEBRUARY 2018

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TOWN OF COVENTRY
RESOLUTION
OF THE
TOWN COUNCIL

No. 08-18-4920

A RESOLUTION BY THE TOWN COUNCIL OF THE TOWN OF COVENTRY, AUTHORIZING THE ADOPTION OF THE 2018 HAZARD MITIGATION PLAN.

WHEREAS, the town of Coventry recognizes the threat of natural hazards present to people and property within our community and the opportunity to align our programs to the 2014–2018 FEMA Strategic Plan and whole community approach to resiliency; and

WHEREAS, the Coventry Emergency Management Team in conjunction with the consultant VHB has prepared a multi-hazard mitigation plan known as the 2018 Hazard Mitigation Plan; and

WHEREAS, the 2018 Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property Coventry from impacts of future hazards and disasters; and

WHEREAS, adoption by the Town Council demonstrates their commitment to hazard mitigation and achieving goals outlined in the Town of Coventry 2018 Hazard Mitigation Plan.

NOW THEREFORE BE IT HEREBY RESOLVED that the Town Council of The Town of Coventry authorizes accepts and adopts the 2018 Town of Coventry Hazard Mitigation Plan.

PASSED AND ADOPTED THIS 12TH day of February, 2018.

APPROVED: Glen Shibley
Town Council President
Glen Shibley

ATTEST: Deborah A. Lavoie
Deborah A. Lavoie, Deputy

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Executive Summary

This Hazard Mitigation Plan (HMP), a product of the Coventry Hazard Mitigation Plan Committee (CHMPC), puts forth short-term and long-term actions which will reduce the actual or potential loss of life or property from hazardous events. It has been approved by the Coventry Town Council, the Rhode Island Emergency Management Agency, and the Federal Emergency Management Agency in accordance with the Disaster Mitigation Act of 2000.

The CHMPC's overview of past natural hazard occurrences verifies that the Town is vulnerable to diverse events including high winds, flooding, and ice storms. The discussion in this plan puts the likelihood of these events into historical perspective and recognizes that although the probability of lightning and extreme temperatures may be higher; the intensity and potential impacts from less likely events such as hurricanes may be far greater.

To address risks and vulnerabilities the 2018HMP put forth a clear mission, a distinct set of goals and 18 specific mitigation actions. The Town's hazard mitigation mission is to protect and enhance the quality of life, property and resources by identifying areas at risk and implementing appropriate mitigation actions. The specific goals include protecting the lives and property of the Town of Coventry's residents, protecting the Town of Coventry's critical facilities and infrastructure, and protect the town's cultural, historical, natural, and economic resources. Each of the subsequent mitigation actions for achieving these goals summarizes specific problems and possible solutions, details the primary tasks to be undertaken, identifies an appropriate lead and anticipated funding sources.

Adoption of this mitigation strategy increases Coventry's eligibility for future federal hazard mitigation grants.

1

Introduction

Plan Purpose

The purpose of The Hazard Mitigation Plan is to set forth guidelines of short-term and long-term actions, which will reduce the actual or potential loss of life or property from hazardous events such as high winds, dam failure, flooding, hurricanes and nor'easters, ice storms, snow storms, hail, lightning, brushfires, drought, extreme temperatures, tornadoes and earthquakes. In addition to the input from the committee, this plan was constructed using input from the general public that responded to requests for information throughout the process. This plan serves as guidance to help the Town reduce their losses and vulnerabilities related to natural hazards.

Hazard Mitigation and Benefits

Hazard mitigation planning consists of a series of actions taken to identify specific areas that are vulnerable to natural and human-caused hazards within a town, and seek to permanently reduce or eliminate the long-term risk to human life and property. It coordinates available resources and identifies community policies, actions, and tools for implementation that will reduce risk and the potential for future losses town-wide. The process of natural hazard mitigation planning sets clear goals, identifies appropriate actions, and produces an effective mitigation strategy that can be updated and revised to keep the plan current. In short, 'it's where we were, where we are and where we're going' in terms of hazard mitigation.

States and communities across the country are slowly but increasingly realizing that simply responding to natural disasters without addressing ways to minimize their potential effect is no longer an adequate role for government. Striving to prevent unnecessary damage from natural disasters through proactive planning that characterizes the hazard, assesses the community's vulnerability, and designs appropriate land-use policies and building code requirements is a more effective and fiscally sound approach to achieving public safety goals related to natural hazards.

In the past, federal legislation has provided funding for disaster relief, recovery, and some hazard mitigation planning. The Disaster Mitigation Act of 2000 (DMA 2000) is the latest federal legislation to improve this planning process. It reinforces the importance of natural hazard mitigation planning and establishes a pre-disaster hazard mitigation program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP) or other annual funding opportunities. Section 322 of the Act specifically addresses mitigation planning at the state and municipal levels of government. It identifies new requirements that allow HMGP funds to be used for planning activities. As a result of this Act, states and communities must now have a FEMA approved natural hazard mitigation plan in place prior to receiving post-disaster HMGP funds. In the event of a natural disaster; municipalities that do not have an approved natural hazard mitigation plan will not be eligible to receive post-disaster HMGP funding.

The purpose of this Plan is to recommend actions and policies for the Town of Coventry to minimize social and economic loss and hardships resulting from natural hazards. These hardships include the loss of life, destruction of property, damage to critical infrastructure and critical facilities, loss/interruption of jobs, loss/damage to businesses, and loss/damage to significant historical structures. Hazardous events that affect Coventry include severe weather, hurricanes, brushfires, floods, and earthquakes. To protect present and future structures, infrastructure and assets and to minimize social and economic hardships, the Town of Coventry implements the following general actions and policies:

- Revisions to the Town's Comprehensive Plan.
- Incorporation of hazard mitigation into the site plan review process.
- State and local building code review.
- Public education/outreach.
- Post-disaster recovery opportunities/strategies.

The Town of Coventry also recognizes the important benefits associated with hazard mitigation, its interaction with municipal land use and infrastructure planning, and the need for a comprehensive planning approach, which accommodates these interdependencies. Coventry's Comprehensive Community Plan (2000)[1] addresses natural and cultural resources, land use, housing, services and facilities, traffic circulation, open space, economic development, and future development trends.

[1] Plan update underway as of December 2017

While the entire Hazard Mitigation Plan will not be formally incorporated into the Comprehensive Plan updates, certain, applicable mitigation actions will be incorporated during the update process. The Town recognizes coordination between the Hazard Mitigation Plan and the Comprehensive Plan to be of benefit because it will ensure a unified planning approach into the future and ensure that risk reduction remains a critical element of municipal planning. This is also in alignment with current goals of Rhode Island Statewide Planning which requires a natural hazards component to be included in the Comprehensive Plan.[2]

A second benefit of hazard mitigation allows for a careful selection of risk reduction actions through an enhanced collaborative network of stakeholders whose interests might be affected by hazard losses. Working side by side with this broad range of stakeholders can forge partnerships that pool skills, expertise, and experience to achieve a common goal. Proceeding in this manner will help the Town ensure that the most appropriate and equitable mitigation projects are undertaken.

A third benefit of hazard mitigation would be endorsing a proactive planning approach focused on sustainability, whereby the Town of Coventry could minimize the social and economic hardships that have resulted from the occurrence of previous natural disasters. These social and economic hardships include: the loss of life, destruction of property, interruption of jobs, damage to businesses, and the loss of historically significant structures and facilities. This proactive planning approach would look for ways to combine policies, programs, and design solutions to bring about multiple objectives and seek to address and integrate social and environmental concerns. Linking sustainability and loss reduction to other goals can provide a framework within the state and local governments that will bring the comprehensive planning process full circle.

Lastly, the participation in a hazard mitigation planning process will establish funding priorities. The formal adoption and implementation of this Plan will allow the Town of Coventry and its residents to become more involved in several programs offered by the Federal Emergency Management Agency (FEMA) including: the Community Rating System Program (CRS); the Pre-Disaster Flood Mitigation Assistance Program (PDM); Flood Mitigation Assistance (FMA); and the Hazard Mitigation Grant Program (HMGP). Money spent today on preventative measures can significantly reduce the cost of post-disaster cleanup tomorrow.

Goals

The Town of Coventry has established the following mission statement:

"Preserve and enhance the quality of life, property, and resources by identifying areas at risk from natural hazards and implementing prioritized hazard mitigation strategies

[2] Rhode Island Statewide Planning, *Rhode Island Comprehensive Planning Standards Manual, Section 12. Planning For Natural Hazards and Climate Change*. January 14, 2016.

designed to protect Coventry's population, infrastructure, historical, cultural, natural and economic resources".

The Town of Coventry has established the following mitigation goals:

- Implement actions which protect the lives and property of the Town of Coventry's residents.
- Implement actions which protect the Town of Coventry's critical facilities and infrastructure.
- Implement actions which protect the Town of Coventry's cultural, historical, natural and economic resources.

Background

Map 1 Rhode Island

The Town of Coventry, in Kent County Rhode Island is located approximately 15 miles southwest from Providence, the State's Capital City. It is bounded on the north partly by the Town of Scituate, partly by the Town of Foster, and partly by the City of Cranston; on the east by the Town of West Warwick; on the south partly by the Town of West Greenwich and partly by the Town of East Greenwich; and on the west by the State of Connecticut.

Coventry has a population of 35,041 (2010 Census). Its land area of 64.8 square miles is the largest in the state. It is located approximately 15 miles southwest of Providence.

This Plan is an update of the prior hazard mitigation plan which was approved by FEMA in September 2010. Since then, the Town of Coventry has been awarded $16,000 in federal funding to update their Hazard Mitigation Plan.

History

Originally part of Warwick, Coventry was incorporated in 1741 after an increase in population, settlement to the west, and geographic isolation from the town center. With the Industrial Revolution, a number of mills were constructed along the Pawtuxet River leading to the creation of a series of dams along the river. Tiogue Lake, the Flat River Reservoir and other mill ponds were created to power mills that required the steady employment of large numbers of people. Standardized housing

and company-built stores and schools can still be seen in many of the village centers.[3]

After the decline of the textile industry in the late 1800s, there was a short-lived period of light manufacturing before the completion of Route 3, Route 117, and Interstate 95 brought parts of Coventry within reasonable commuting distance to the Providence Metro area. Although there is no centralized commercial area, development growth has occurred around the mill ponds and in the eastern part of town.

Cotton Mill in Coventry, RI. Circa early 1800s. Source: RI Secretary of State

Demographics

Coventry can be divided into three distinct population sub-areas: the rural, the suburban and the old mill villages. The suburban and old mill areas in eastern Coventry contain approximately 20% of the Town's land mass with 71% of the Town's population. The rural area of central and western Coventry contains approximately 80% of the land and 29% of the population. [4]

Of the 35,014 people in Coventry (98% white), 15% are age 65 or older. The median income is $51,987. In 2010, 5.2% of the population was below the poverty line (total family income is less than weighted thresholds measured by U.S. Census Bureau).

3 Coventry Comprehensive Community Plan, June 19, 2000.

4 Coventry Comprehensive Community Plan, June 19, 2000.

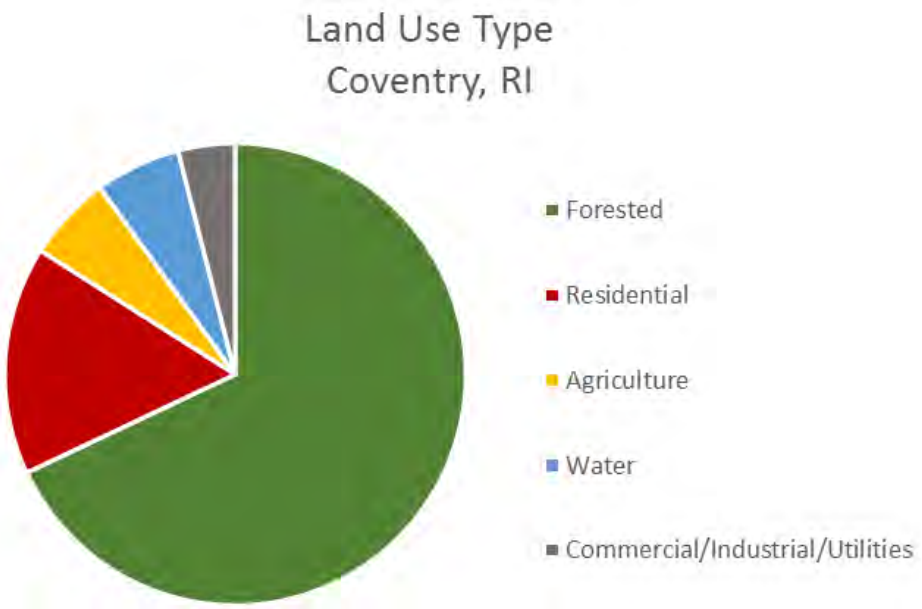
Government

The Town of Coventry is governed by an elected Town Council with five (5) members, elected every two years. Day to day operation of the town is delegated to an appointed Town Manager who reports to the Town Council.

Land Use Patterns

The total area of Coventry approximately 68% forested, 16% residential, 6% agriculture, 6% water, and 4% commercial/industrial/utilities. Most of the forested regions are located west of Route 102. That area is anticipated to include more solar development in these regions. The major body of water in town is the Pawtuxet River which flows generally east and west through the town. It is also a tributary for a number of reservoirs which are controlled by a series of dams.

Figure 1 Land Use Type – Coventry, RI



There is no centralized core or commercial district in Coventry. Development has been focused in the eastern part of the town. The eastern area of Coventry (east of Big River/Hill Farm Road) is a mix of residential land use, commercial areas, forests, and freshwater lakes and ponds. There are two strip-mall styled commercial areas (both along Tiogue Avenue) that have been built without landscape aesthetics. The central and western parts of town are mainly forested or agricultural, with a network of low density residential areas along the main roads. Water and wetlands are present throughout.

There are a few areas in Coventry that have the potential to contaminate surrounding land and water. During the March 2010 floods, an area along Industrial Drive at Flat River Road was inundated. Nearby businesses in this industrial area include an automotive supplier, car mechanic, self-storage, furniture store, and medical device manufacturer. The 8-acre Picillo Farm, once part of a larger pig farm,

has been classified as an EPA Superfund site for storage of improperly disposed hazardous waste and liquid bulk chemicals.[5] The site is continually undergoing soil remediation. The asphalt plant on 75 Airport Road is open and remains a potential contaminator. The Coventry Municipal Landfill on Arnold Road and Arkwright Inc. dumpsite are closed but remain in the EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database.[6] Sites on this list have the potential for releasing hazardous substances into the environment.

Table 1 Land Use

Land Use Type[7]	2003/2004 Acres	2011 Acres	% Change
Residential	17.8	20	+ 12%
Commercial/Industrial	38.6	37.8	- 2%
Forested	12.9	8.2	- 36%
Agriculture/Pasture	43.9	41.30	- 6%

Public Safety

Law enforcement and protection of persons and property is provided by the Police Department's 57 sworn officers supported by 17 professional employees. The Police Department operates a twenty-four-hour patrol. Average response time to an emergency dispatched call is approximately four minutes throughout town. The Town's Emergency Operations Center (EOC) in the Town Hall Annex, 1675 Flat River Road serves as the center for preparation and response to a natural or human-caused disaster. Through the use of grant funding, its computer and communication capabilities have been enhanced. The Police Chief currently serves as the Emergency Management Director, appointed by the Town Manager and supported by the Deputy Emergency Management Director and Emergency Management Assistant.

The four (4) Coventry fire districts (Coventry/Anthony, Central Coventry, Hopkins Hill, and Western Coventry) provide first response to major disasters. Firefighters are trained in various matters which include search and rescue, EMT services, and firefighting. The Hopkins Hill Fire Department is equipped with a mobile mass chemical decontamination team.

The Hopkins Hill Fire Chief currently serves as the Deputy Emergency Management Director appointed by the Town Manager.

Coventry High School serves as the primary local emergency shelter. As of September 2017, a new sheltering plan is being drafted by the Emergency Management Assistant that will include Summit Station 2 at 1110 Victory Highway as an alternate shelter facility.

5 EPA website: www.epa.gov/superfund/picillo.

6 RIDEM Landfill Closer Program Sites in RI http://www.dem.ri.gov/programs/benviron/waste/pdf/lfclosrs.pdf

7 RIGIS Land Use Data from 2003/2004 and 2011 (most recent).

The Town's Community Emergency Response Team (CERT) volunteers are trained in disaster preparedness for hazards that may impact their area.

Roads and Bridges

There are approximately 250 miles of streets and highways in Coventry. The major roads include Route 102 running north and south, Route 117 running east and west, and Route 3 in the southeast sector of the Town which provides access to Interstate Route 95. Improved roadway capacity will be necessary for economic expansion into undeveloped areas. Access to Interstate 95 is currently available from Hopkins Hill, and Route 102.

Utilities

There is currently only a very limited wastewater collection and treatment system existing in Coventry. A portion of the eastern sector of the Town is serviced by an infrastructure which includes public water, drainage, and sewers. The western sector of the Town is still primarily rural.

As of May 2016, 97% of the residents in Coventry rely on onsite wastewater treatment systems (OWTS).[8] Flood events and resulting saturation of soils have caused the failure of many septic systems & cesspools. Failures of these systems result in contamination of groundwater; exposure of dug/shallow or overburden wells to contamination; lack of bath/shower water; and a need for potable water sources.

For the other 3%, the Town is a member of the West Warwick Regional Wastewater Treatment Facility (WWTF). Wastewater and septage are transported to the regional facility through a series of force mains, gravity main lines, interceptors and pump stations. The Town has a reserve capacity of 2.25 million gallons per day (mgd) average daily flow in the WWTF. Public sewers have been expanded in the vicinity of Tiogue Lake. In addition to public sewers, there is a private sewer line in Town. The Woodland Manor Pumping Station & Force Main flows easterly from a housing complex on Nooseneck Hill Road, along Route 3 (connecting certain businesses) to the WWFT. It has a capacity of 200,000 gallons per day (gpd) and currently treats approximately 100,000 gallons of wastewater per day.

The public sewer pump stations are located on Sandy Bottom Road, Industrial Drive, Woodland Manor, and Arnold Road.

There are two (2) wellhead protection areas identified by the Rhode Island Department of Environmental Management (RIDEM) for public water supply in the town. These are designated as the Spring Lake Wellhead protection area and the Mishnock Well Field protection area. These areas have been recognized as critical resource areas. The identification of potential sources of groundwater contamination due to commercial or industrial uses is a component of hazard

8 Facilities Plan Update, Town of Coventry, Rhode Island. March 2016, Weston & Sampson.

mitigation. In Coventry, potential sources of contamination include hazardous materials stored improperly, and sediment and oil/petrochemicals in road runoff.

Forest and Open Space

There are approximately 21,796 acres of forested areas in Coventry (RIGIS Land Cover database). Most of the forested land and open space is located in central and western Coventry. State holdings and Audubon Society holdings in these areas present an opportunity for conservation and open space preservation.

Water Resources

The Town of Coventry is traversed by rivers, brooks and streams. There are 20 lakes and ponds covering a total of 1,600 acres. These waters provide essential habitat and many support fishing and swimming criteria. Water bodies of significance include:

- 8.5 miles of the South Branch of the Pawtuxet River.
- Flat River Reservoir sub-watershed: Flat River Reservoir, also known as Johnson's Pond, Quidnick Reservoir and Stump Pond, among other small reservoirs and tributary streams
- Tiogue Lake
- Big River
- Mishnock-Big River Groundwater Reservoir and recharge area: identified for potential supply of future and existing water supply systems with large quantities of groundwater.

Cultural and Historic Resources

Many historic resources in Coventry are threatened by insufficient identification, protection, documentation, and education of the public about proper preservation measures.[9]

The South Main Street Historic District (residential) and the Rice City National Register Historic District (rural) include:

- 11 mid-nineteenth century houses
- 9 late 1700s/early 1800s houses
- 27 architecturally historically important buildings
- 2 archeological sites
- 14 family cemeteries
- 1 state management park area (Nicholas Farm Management Area)
- 1 abandoned and overgrown 18th century dirt road

[9] Coventry Comprehensive Community Plan June 19, 2000.

Other structures of historic significance include the Nathanael Greene Homestead, Waterman Tavern, and the Paine House.

Development Trends Since the 2010 Plan

There have been few changes in commercial development in the past 7 years. Additional buildings have been built in already commercial areas along Tiogue Avenue and near the Centre of New England. The industrial zones have also experienced little change, with minor build out along Reservoir Road. In Western Coventry, 10 wind turbines have been built in areas that were already agriculturally zoned.

Most residential growth is centered in the eastern and central parts of the town. Since 2010, two large subdivisions have been developed. The Oaks, located off Teakwood Drive is a 75-lot subdivision that is currently under development as of June 2017. Pine Ridge is a 69-lot subdivision off Clark Mill Street and Arbor Drive is also under development.

The historic Anthony Mill and Concordia buildings have been converted into apartments. Both buildings suffered extensive damage during the March 2010 Floods.

Potential Future Development

The Town of Coventry is planning for a future that includes renewable energy installations which capitalize on solar and wind resources. The Town Planning Department is currently is working to incorporate the nuances of the renewable energy sector contributions to comprehensive sustainable growth. In addition to permitting large solar arrays, the Town is also considering installing solar panels on town buildings and has installed an electric charging station at Town Hall.

The Washington Secondary Bike Path, which runs from Cranston to Coventry is the state's longest continuous bike path (19 miles). This recreational greenway is scheduled to be extended to the Connecticut border.

Table 2 Demographic Changes

	2010	2015 (Estimate)	% Change
Housing Units	14,082	14,850	+ 5%
Population	35,014	34,981	-.09%

2

Planning Process

Overview

The Town of Coventry initiated the hazard mitigation planning effort on January 24, 2016 at the recommendation of the Coventry Emergency Management Director. This planning effort was partially funded by a Pre-Disaster Mitigation grant awarded by the Federal Emergency Management Agency (FEMA) to the Town of Coventry. This Hazard Mitigation Plan Update is the result of a dedicated group of individuals working for eight (8) months identifying the risk from natural hazards and proposing ways to improve Coventry's resiliency. Not only will this effort result in a series of actions to better protect the town, but this adopted plan will qualify the Town to apply for additional pre-disaster grant funding from FEMA.

Coventry Hazard Mitigation Plan Committee

This Hazard Mitigation Plan (HMP) is a product of the Coventry Hazard Mitigation Plan Committee (CHMPC). Committee members include:

- Colonel John MacDonald, Emergency Management Director
- Chief Frank Brown, Hopkins Hill and Central Coventry Fire District*
- Ray Laprad, Emergency Management Assistant
- Abby Pimental, Parks & Recreation*
- Denise Cummiskey, Parks & Recreation
- Dennis Skorski, Police Department*

- Lee Bessette, Police Department*
- Mike Broggi, Police Department
- Frederick Heise, Police Department
- Gary Miller, Police Department
- Bev Gammell, Police Department
- Peter Zalabowski, Police Department
- Robert Mann, Fire Department*
- Peter Lamb, Fire Department (left in Spring 2017)
- Jim Cady, Western Coventry Fire District*
- Mark Robitaille, Safety & training Compliance Officer*
- Bob Joyal, Engineering Department*
- Graham Waters, Town Manager*
- Jason Martin, School Department*
- Chuck Smith, Public Works*
- Kevin McGee, Public Works*
- Matthew Sarcione, Planning (left in Spring 2017)
- Therese Stafford, Business Department*

*denotes Coventry resident

In order to minimize meeting fatigue, the CHMP Committee was created from the existing Emergency Management committee which met once a month. During the planning process, additional stakeholders were invited to the Emergency Management meeting to participate in the hazard mitigation portion.

The Planning Process

This 2018 HMP is the result of a 7-step process that was initiated in November 2016 with the establishment of the CHMPC by invitation from the Town Emergency Management Director. One month prior, in October 2016, the Town Council approved the consulting firm VHB to assist with this planning effort.

Step two started the plan development process and included the first meeting of the CHMPC on November 15, 2016. The CHMPC met regularly during the Emergency Management monthly meeting at the Town Annex.

The Town's previously adopted plan was dated 2010. At the first meeting, the consultant lead the team through an exercise of re-ranking the identified hazards and discussing if there were new ones to consider. At this initial meeting, the team also reviewed a set of questions to be included in an online public survey. The purpose of the survey was to capture the local residents' perception of natural hazards.

The link to the survey was widely distributed on social media and on the Town's website. Over 980 people participated! See Appendix D for survey results.

Step three began with the CHMPC meeting on January 24, 2017. After reviewing the hazards of concerns and survey results, the CHMPC identified critical infrastructure and community assets within the town. Seven areas of vulnerability were identified: flood prone drainage systems, fresh water, electrical facilities, dams, populations, businesses, and recreational facilities. During discussions, the group decided that although important for the function of the Town, the following were not identified as being particularly vulnerable:

- Bridges – In good condition, not a vulnerability.
- Wastewater – 98% of wastewater is treated onsite. No current vulnerable structures. All system pumps are out of the floodway and have generators.
- Critical Response Facilities – None are particularly vulnerable to the magnitude of hazards expected.
- Mobile Home Parks – None are particularly vulnerable to the magnitude of hazards expected.
- Schools – They have early warning and evacuation procedures. No current vulnerabilities.
- Historic Sites – None are particularly vulnerable to the magnitude of hazards expected.
- Communication Towers- They may be vulnerable to high winds but the Town has a strong backup system in place should there be a loss of the equipment.

During this early phase, the Town's consultant reviewed the existing Comprehensive Plan, local ordinances, StormReady plan, and gathered information on current infrastructure projects going on within the Town.

Current town capabilities were discussed at the meeting on February 28, 2017. Many different departments, committees, and programs already engage in activities that help the town become more resilient to a variety of hazards. It is important to highlight these capabilities and show how they support the Town's hazard mitigation efforts.

Step four was creating an updated list of mitigation actions to reduce the impact to the identified vulnerable areas. On March 28, 2017, the CHMPC reviewed the mitigation items that were proposed in the 2010 plan. Status updates were given for all the previous actions. The incomplete actions that were still important were rolled into the list of actions for this 2018 plan update.

Step five was completed at the April 25, 2017 meeting where the group brainstormed additional mitigation actions they wanted to include. During this meeting, the group decided that not all critical infrastructure needs a mitigation action within the lifespan of this plan (5 years). Included in this step was proposing new actions, establishing action timelines, costs, and identifying responsible parties.

Step six focused on the prioritization of the mitigation actions. On May 23, 2017, the CHMPC met as a group to prioritize their proposed actions and confirm additional

action details. After this meeting the consultant finished the draft of the plan for committee review.

Step seven furthered the public input and review process with the Coventry Planning Commission, Town Council, and the general public for review and comment. The plan was posted on the Town's website, Facebook, and was made available at Town Hall and Library for public review. The Hazard Mitigation Plan was also emailed to Emergency Management Directors in the neighboring towns of Foster, Scituate, Cranston, West Warwick, East Greenwich, West Greenwich, and Sterling, CT for their review and comments. No comments were received. At the Town Council meeting on August 21, and in subsequent meetings with Council members, there were a variety of suggested typographic edits, content clarification requests, and suggestions for improving the plan. All comments were taken into consideration and questions answered. The Council members supported the Team's efforts to improve the accuracy and understanding of the plan content.

Table 3 provides a summary of the Committee's meeting dates and the activities that they conducted:

Table 3 Committee Meetings

Date	Meeting Summary
10/18/2016	Town Council approved hiring VHB to assist with plan update
11/15/2016	Kick off meeting with new consultant, VHB. CHMPC discussed the plan purpose and hazards of concern. Reviewed survey questions.
01/02/2017	Hazards Survey posted online
01/24/2017	The CHMPC reviewed the hazards of concern and listed critical infrastructure and community assets
02/28/2017	Review of community assets and discussion of current capabilities.
03/28/2017	Discussed the status/need for actions from the 2010 plan.
04/25/2017	Brainstormed new mitigation actions
05/23/2017	Finalized mitigation actions and discussed prioritization
05/31/2017	Draft plan sent to CHMPC for review
07/6/2017	Draft of 2018 HMP posted for public comment and promoted through social media and on the Town's website.
07/6/2017	2018 HMP was emailed to neighboring Emergency Management Directors for review.
08/21/2017	2018 HMP was presented to Town Council and public
09/15/2017	Town's consultant made document changes as per public comments and final edits.
10/06/2017	Sent to RIEMA for review.
12/28/2017	Comments received from RIEMA. Edits made to draft plan by Town's consultant under the guidance of the Coventry Planning Director
01/02/2018	Sent to FEMA for review
01/26/2018	Plan received Approval Pending Adoption status from FEMA
02/12/2018	Plan approved and adopted by Town Council

Public Input

This hazard mitigation plan benefits from various distinct types of public input strategies that were utilized by the CHMPC during the drafting process and prior to its adoption by the Town Council. Public input for the Coventry hazard mitigation plan was primarily collected through a public survey, public meetings and an invitation to comment.

Early in the planning process, the CHMPC promoted and distributed a "Hazard Perceptions" survey online. The purpose of the anonymous survey was to hear from residents the hazards and neighborhoods they are most concerned about. Over 980 individuals participated in the survey. Hazards of significant concern included: snow/blizzards, hurricanes/tropical storms, street flooding, and high winds. The survey also provided the CHMPC with a list of problematic areas that are susceptible

to flooding. The CHMPC used the input from the survey to focus their mitigation planning efforts.

The 2018 CHMPC included town residents. The CHMPC's roles focused on reviewing the content of the risk assessment matrix to ensure proper classification of problems and estimates of potential impacts; formulation of mitigation actions and sequencing of primary tasks; and identification of feasible implementation methods and schedules. Their comments were incorporated into the final 2018 hazard mitigation plan.

Another public input strategy involved consulting with local business owners who may be especially vulnerable. Representatives from Rhodes Technologies were encouraged to share their concerns regarding hazard mitigation in Coventry. Rhodes Technologies, and Clariant and Boston Scientific all have hazardous chemicals on site that could be released during a natural disaster. Most if not all have tested and exercised Emergency Action Plans.

Prior to public release of the 2018 HMP, the CHMPC drafted the plan through a series of committee meetings. While these meetings did not rise to the level of public hearings and were not advertised, they were open to the public. Local interest groups and businesses did occasionally attend when invited.

Another public input strategy was geared toward the general public as opposed to specific stakeholders. During the draft review portion of the plan development, an electronic copy of the draft 2018 HMP was posted to the Town's website. The public was informed of both the webpage posting and the public hearing. See **Appendix C**. They were encouraged to review the document, comment on the HMP and attend the meeting. Notice of the public hearing was also posted as an agenda item on the Town's website in accordance with state law. On August 21, 2107, the Town Council was introduced to the HMP as part of their regular public meeting. At the Town Council meeting, there were a few questions about the content and planning process but additional constructive comments were given during subsequent meetings with particular Council members. There were no further comments from the general public.

Review and comments from the Federal Emergency Management Agency and the Rhode Island Emergency Management Agency were also incorporated prior to adoption by the Town Council.

Before the CHMPC began meeting regularly, the Town was working on updating their Comprehensive Plan which includes discussions on floodplains, resource protection districts, and development trends. The Coventry Comprehensive Plan Update went out for bid in May 2017. Members of the CHMPC will be involved in the Comprehensive Plan update and will be incorporating elements of this document into the other plan.

3

Natural Hazards

Hazards of Concern

The Rhode Island 2016 Hazard Identification and Risk Assessment and 2010 Coventry Hazard Mitigation Plan were used as a starting point for identifying hazards that pose the largest threat to the Town. The following table summarizes the hazards identified by the Coventry Hazard Mitigation Plan Committee.

Table 4 Hazards Identified by the Coventry Hazard Mitigation Plan Committee

Natural Hazards Identified by the State	Identified by the CHMP Committee
Severe Winter Weather	
Ice Storm	✓
Snow	✓
Flood	
Riverine	✓
Coastal	-
Flash	-
Urban	✓
High Wind	✓
Extreme Heat	✓
Hurricane and Tropical Storms	
Nor'easter	✓

Natural Hazards Identified by the State	Identified by the CHMP Committee
Storm Surge	-
Extreme Cold	✓
Thunderstorm	
Hail	✓
Lightning	✓
Dam Failure	✓
Fire	
Urban	-
Wildfire	✓
Sea Level Rise	-
Epidemic	-
Drought	✓
Earthquake	✓
Tornado	✓
Human-Caused Hazards	
Cyber Security	✓
Chemical Incident	✓
Terrorism	-
Biological Incident	-
Radiological Incident	-
Civil Unrest	-
Technological Hazards	
Infrastructure Failure	-

This plan will focus primarily on the natural hazards.

During the beginning phases of the planning process, the Hazard Mitigation Planning Committee participated in an exercise that captured the frequency of various hazards, their potential damage extent, and their impacts (i.e. to populations, infrastructure, natural environment, etc.). The StormReady EOP Annex A was also reviewed for consistency. The following scales were used during the analysis:

Frequency
Highly likely: near 100% probability within the next year;
Likely: between 10% and 100% probability within the next year or at least one chance in next 10 years;
Possible: between 1% and 10% probability within the next year or at least one chance in next 100 years;
Unlikely: less than 1% probability in next 100 years

Damage Extent
Low: some local property damage not town wide, minor injuries/ loss of life
Medium: 50% of property could be damaged and possible injuries/ loss of life
High: major town wide property damage, injuries and loss of life

Level of Concern/Risk Rank
Developed by the CHMPC to rank the various hazards based on frequency and damage potential.
Low - Not expected to occur with any frequency, damages will be limited.
Medium - Will occur within the next 10 years but the Town has resources to reduce risks.
High - Expected to occur within the next 5 years, and is a major concern for the Town.

Based on a combination of frequency, damage extent and impacts, the team assigned each hazard a Level of Concern. Table 5 summarizes the hazards of concern for the Town of Coventry, ranked from a high concern to low concern

Table 5 Hazards Ranked

Hazard	Level of Concern/Risk Rank
High Winds	Medium/High
Dam Failure	Varies- Could be high
Flooding (Riverine)	Medium
Hurricane	Medium
Nor'easter	Medium
Ice Storm	Medium
Snow Storm	Medium/Low
Flooding (Street)	Low
Hail	Low
Lightning	Low
Brushfire	Low
Drought	Low
Extreme Heat and Cold	Low
Tornadoes	Low
Earthquake	Low
Power Plant Failure: Dominion Millstone Power Station in CT, and Pilgrim Nuclear Generating Station in MA (offline but still has hazardous components)	Low

Hazard	Level of Concern/Risk Rank
Cybersecurity	Medium
Hazardous Materials	Low

The above human-caused hazards were discussed as a concern for the Coventry Hazard Mitigation Plan Committee. Mitigating these hazards requires a highly facility-specific approach not explored in depth in this plan. However, including them in this plan was important for the Committee to explore all the hazards that they are concerned about.

The following sub-sections are organized by the level of risk as identified in the table above.

High Winds

Description

Wind is the movement of air caused by a difference in pressure from one place to another. Local wind systems are created by the immediate geographic features in a given area such as mountains, valleys, or large bodies of water. National climatic events such as high gale winds, tropical storms, thunderstorms, Nor'easters, hurricanes, and low-pressure systems produce wind events in Rhode Island. Wind effects can include blowing debris, interruptions in elevated power and communications utilities, and intensification of the effects of other hazards related to winter weather and severe storms. In 2015 Rhode Island experienced localized damaging winds from a microburst. According to the National Weather Service, a microburst occurs when the core of a developed thunderstorm suddenly sinks, hits the ground, and spreads out in all directions. The highest winds occur where the microburst first hits the ground.

The Beaufort Wind Scale is a 17-level scale used to describe wind speed and observed wind conditions at sea and on land. A wind classification of 0 has wind speeds of less than 1 mile per hour and are considered calm. On the other end, a classification of 10 with wind speeds reaching 63 miles per hour will blow down trees and cause considerable damage.

Public property damage from high wind event in Coventry.

Private property damage from high wind event in Coventry.

Figure 2 Beaufort Wind Chart

Beaufort Wind Chart – Estimating Winds Speeds

Beaufort Number	MPH Range	MPH Average	Terminology	Description
0	0	0	Calm	Calm. Smoke rises vertically.
1	1-3	2	Light air	Wind motion visible in smoke.
2	4-7	6	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	11	Gentle breeze	Leaves and smaller twigs in constant motion.
4	13-18	15	Moderate breeze	Dust and loose paper is raised. Small branches begin to move.
5	19-24	22	Fresh breeze	Smaller trees sway.
6	25-31	27	Strong breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult.
7	32-38	35	Near gale	Whole trees in motion. Some difficulty when walking into the wind.
8	39-46	42	Gale	Twigs broken from trees. Cars veer on road.
9	47-54	50	Severe gale	Light structure damage.
10	55-63	60	Storm	Trees uprooted. Considerable structural damage.
11	64-73	70	Violent storm	Widespread structural damage.
12	74-95	90	Hurricane	Considerable and widespread damage to structures.

Location

Wind events are expected throughout the year in Coventry.

Probability of Future Occurrence

Highly likely.

Extent

Wind speeds in neighboring Providence are indicative of Coventry (more local data unavailable). "With an average wind speed of 9.3 MPH, Providence is a windy city, 1.00 MPH higher than the national average. The average wind speed in Providence is

about the same as the State average. The windiest season in Providence is spring, with spring wind speeds reaching 10.27 MPH on average, 1.17 MPH higher than in the rest of the U.S..[10]

Impact

Strong wind gusts of 40 miles per hour (Beaufort Scale of 8) can blow twigs and small branches from trees. Occasional gusts and sustained winds at this speed (and above) are of concern to the Town. Damages from wind events range from power outages, property damage to vehicles and buildings and fallen trees/limbs. Wind events in Coventry have resulted primarily in power outages and downed tree limbs with minimal property damage. It is important that the Town of Coventry maintain their public tree trimming program which reduces the likelihood of fallen trees/limbs from disrupting transportation routes and/or taking down power lines.

Climate Change Impacts

Wind speeds are expected to decrease. "Oceanographers at the University of Rhode Island have analyzed long-term data from several anemometers in southern New England and found that average wind speeds have declined by about 15 percent at inland sites while speeds have remained steady at an offshore site."[11]

History[12]

Coventry experiences high wind events annually.

Table 6 History of High Wind Events in Coventry

Date	Magnitude (kts)	Comments
12/17/00	50	Countless reports of downed trees, limbs and power lines.
07/23/02	50	Severe thunderstorms downed trees in Coventry.
09/11/02	50	Wind speeds measured as high as 50 mph. Many trees were reported downed in Coventry near the Scituate line.
11/13/03	50	In Rhode Island, peak wind gusts of 50 to 60 mph brought down trees and power lines.
05/25/05	50	Late season Nor'easter brought strong winds and heavy rains, some gust as high as 60 mph.
08/05/05	50	These severe winds caused downed wires, limbs, and trees.
09/29/05	58	Wind gusts between 40 and 60 mph downed trees and wires.
10/25/05	58	Strong coastal storm (remnants of Wilma) brought rain and damaging winds to the area.
01/18/06	58	Two large trees were blown down in Coventry.
08/20/06	50	Winds brought down wires on Union Street in Coventry.

10 WeatherDB https://wind-speed.weatherdb.com/l/206/Providence-Rhode-Island accessed 3/3/2017.

11 University of Rhode Island, 2012. Wind speeds in southern New Englad declining inland, remaining steady on coast: Climate change, urbanization among possible causes. https://www.sciencedaily.com/releases/2012/12/121205091044.htm.

12 NOAA Storm Event Database and Coventry 2010 Hazard Mitigation Plan.

Date	Magnitude (kts)	Comments
12/01/06	50	Trees and wires were blown down on Old Summit Road and on Route 117 in Coventry.
03/08/08	66	High winds took down trees.
06/06/08	34	Tropical Storm Hanna resulted in 5 inches of rain and strong winds.
07/31/09	50	High winds took down a tree on Hopkins Hollow Road.
12/03/09	38	Strong low pressure moving through New York State coupled with a vigorous low level jet resulted in periods of damaging wind across Southern New England. Rain and occasional thunder also occurred. The Automated Surface Observing System at T.F. Green Airport (KPVD) recorded sustained winds of 44 mph and gusts to 56 mph.
01/25/10	50	Unseasonably warm temperatures moved into southern New England ahead of a cold front which allowed for excellent atmospheric mixing. This resulted in strong to damaging winds across much of eastern Massachusetts and Rhode Island. Many trees were downed in Coventry.
06/05/10	50	A wave of low pressure moving along a stationary front in place across Southern New England produced showers and thunderstorms across much of the region. Multiple trees and utility poles were downed in the Greene section of Coventry.
11/08/10	36	Low pressure tracked across Cape Cod bringing cold, windswept rain to Southern New England. The Automated Surface Observing System at T.F. Green State Airport in Warwick, RI (KPVD) recorded sustained wind speeds of 41 mph. No damage was reported.
02/25/11	35	An area of low pressure deepened through the interior Mid-Atlantic Region early on February 25th slowly moving to the northeast and reinvigorating off the immediate shoreline of New England and into the Gulf of Maine before retreating further northeast into Nova Scotia. Heavy snows impacted interior New England during the onset of the storm, while high winds developed across the eastern shoreline as the storm deepened as the storm continued to move northeast. The Automated Surface Observing Station at T.F. Green State Airport (KPVD) recorded sustained wind speeds of 40 mph. No damage was reported.
12/22/11	37	A warm front moved through Southern New England resulting in increased moisture and lift. This produced thunderstorms across the area, including northern Connecticut, Rhode Island, and the coastal waters. The Automated Surface Observing Station at T.F. Green Airport in Warwick, RI recorded sustained wind speeds of 43 mph and gusts to 60 mph. No damage was reported.
06/22/12	50	Trees and wires on Waterman Hill Road were downed by thunderstorm winds causing $15,000 in damages. Trees and wires on Mohawk Street, Shady Valley Road, New Dam Road, East Shore Drive, and Windsor Park Drive were downed by thunderstorm winds resulting in $40,000 in damages.
08/10/12	40	Southerly winds drew tropical moisture over the area, resulting in very heavy rain in showers and thunderstorms that developed. In addition, strong winds in the upper levels and 30-40 knots of deep layer shear resulted in wind damage with the strongest of these storms. A large limb on Cove Road was downed onto a house, damaging the roof.
01/31/2013	45	Wind gusts up to 52 mph reported in Coventry.

Date	Magnitude (kts)	Comments
10/22/14	50	Low pressure moving up the east coast brought a soaking rain and strong winds to much of southern New England. In addition, both downed leaves from the storm and naturally fallen leaves from before the storm clogged storm drains which resulted in street flooding. A tree was downed onto Division Road in nearby East Greenwich.
08/04/15	50	Severe storms (later identified as a microbust) caused significant wind damage across Rhode Island resulting in widespread power outages, knocking down a significant amount of trees, and causing massive traffic delays. Wind gusts were estimated to be between 60 to 80 mph, with T.F. Green Airport reporting a wind gust of 67 mph. In fact, these storms caused more power outages (121,000 customers without power) than Hurricane Sandy (107,000)! Some of the hardest hit areas were nearby Cranston and Charlestown, RI. Downed trees were reported in Coventry.
07/23/16	50	Trees and wires on Route 116, Station Street, and Knotty Oak Shores Road were downed by thunderstorm winds.
08/12/16	50	A tree and wires on Lewis Farm Road were downed by thunderstorm winds.

Dam Failure

Description

Dams are classified as high hazard, significant hazard or low hazard. The classification is not based on whether a dam is deemed safe or unsafe. As of 2016, there are 96 high hazard dams, 81 significant hazard dams and 490 low hazard dams in the state. Each dam's hazard classification determines the frequency of inspection. The higher the classification, the more frequently the inspection is conducted.

A *High Hazard* dam is one whose failure or misoperation will result in a probable loss of human life.

A *Significant Hazard* dam is one whose failure or misoperation results in no probable loss of human life but may cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare.

A *Low Hazard* dam is one whose failure or misoperation results in no probable loss of human life and low economic losses.

As part of each RIDEM inspection, the major components of the dam are subjectively rated as good, fair or poor. The major components are the embankment, the spillway and the low-level outlet. Good means the dam meets the minimum U.S. Army Corps of Engineers (USACOE) guidelines. Fair means the dam has one or more components that require maintenance. Poor means a component of a dam has deteriorated beyond maintenance and is in need of repair.

Flood events call into question the structural integrity of dams that would affect Coventry. In addition to the threat of flooding downstream during a dam breach, the Town is also concerned about the dam gate systems. It is suspected that most

of the antiquated dam gates may not open properly to let off water, thereby flooding the areas behind the dam.

In 2016 the Department of Environmental Management (DEM) identified 61 dams in the Town of Coventry. Six (6) of the 61 dams are classified as high hazard dams and six (6) dams are identified as significant hazard dams. The remainder are considered low hazard. The dam on Route 118 at the Quidnick Reservoir is undergoing repairs. Repairs have recently been completed to the Tiogue dam spillway.

The following summaries set forth the conditions of the twelve dams that are classified as significant or high hazard dams.

Location

Arnold Pond Dam #561 (**high hazard**)
Black Rock Reservoir #185 (**high hazard**)
Centre of New England #1, #645 (significant hazard)
Coventry Reservoir #176 (**high hazard**)
Flat River Reservoir Dam #167 (**high hazard**)
Harris Pond #157 (significant hazard)
Hopkins Farm Pond #498 (significant hazard
Middle Pond Dam #187 (significant hazard)
Mill Pond Dam #152 (significant hazard)
Pearce Pond #371 (**high hazard**)
Quidnick Pond Upper Dam #175 (significant hazard)
Tiogue Lake Dam #177 (**high hazard**)
Upper Pond Dam #186 (significant hazard)

See Appendix A for the locations of the various dams in Coventry.

Probability of Future Occurrence

Likely to Possible.

Extent

All three dam hazard classifications are represented in Coventry. The extent of a failure would vary. The Coventry Hazard Mitigation Plan Committee has identified failure as a break in the dam, sending water downstream, or faulty gates which if not opened will cause flooding behind the dam.

Impact

The Coventry Hazard Mitigation Plan Committee recognizes that a dam failure is not a natural hazard in itself but several of the hazards listed in the hazard list could bring dam failure upon the Town of Coventry. Severe winter storms, flooding, and a hurricane could all bring enough rain and or snowfall to cause a dam failure. The age of these dams also pose a risk to the structural integrity of these dams. A failure of the antiquated gates could cause considerable loss to lives, property and economy.

Climate Change Impacts

Heavier, more frequent precipitation events may cause more riverine flooding , which can stress the dams in Coventry.

History

According to Coventry DPW staff, in the late 1980s the wooden (low hazard) dam at Rope Walk Pond failed. There was no major damage or injury.

Flooding (Riverine and Urban/Street)

Description

According to the Rhode Island 2014 Hazard Mitigation Plan Update, "Flooding is a localized hazard that is generally the result of excessive precipitation. Flooding is the most commonly occurring natural hazard, due to the widespread geographical distribution of river valleys and coastal areas, and the attraction of human settlements to these areas. Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss."

"A flood, which can be slow or fast rising but generally develops over a period of days, is defined by the National Flood Insurance Program (NFIP) as:

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

Severe storms with heavy rain can generate flash floods which strike and end quickly. Flash flooding isn't limited to streams and rivers but also streets.

Flooding due to runoff occurs when water runs over the land's surface impervious surfaces (paved areas, building subdivisions, and highways). Two major environmental modifications are primarily responsible for drastically altering the rain fall-runoff relationship.

1. Making the land surface impervious by covering it with pavement and construction work.
2. Installing storm sewer systems that collect urban runoff rapidly discharging large volumes of water into stream networks and/or freshwater wetland system

Location

Floodplains (Special Flood Hazard Areas, or SFHAs) in Coventry include "A" and "AE" zones. "A" zones are areas that would be inundated by the 1% annual chance flood.

"The A Zone is that portion of the SFHA that is not subject to high velocity wave action during the base flood and is not designated as Zone V due to primary frontal dune considerations. The source of flooding in an A Zone can be a stream or river that overflows its banks; a lake; or coastal storm surge accompanied by wave heights and wave run-up depths less than 3 feet."[13] "AE" zones area zones depicted using specific elevation data. The Coventry Community Resources Map in Appendix E shows where the SFHAs are located.

The Town's proximity to the Pawtuxet River and its tributaries makes it vulnerable to flooding and the effects of precipitation storms. The Pawcatuck and Pawtuxet Basins largely comprise the watersheds which surround Coventry and West Greenwich. The Pawtuxet Basin directly impacts the residents of Coventry. The Pawtuxet River is 11 miles in length and drains a watershed of approximately 231 square miles in area. Overall, the watershed contains 64 ponds (named & unnamed), 93 brooks, 7 tributary rivers and 18 dams. Most notably, it consists of the North Branch Pawtuxet River and the South Branch Pawtuxet River. The North Branch is located in the northerly Harris section of the Town. It flows easterly from near the Cranston/ Scituate border in the vicinity of the Arkwright Bridge into the Phenix section of West Warwick; the South Branch is located in central Coventry and flows in an easterly direction from western Coventry parallel to Flat River Road to West Warwick in the vicinity of Pulaski Street. The confluence of the branches is at Riverpoint in West Warwick.

During the March 2010 flood events, specific areas which were affected included:

- Parker Street & Harding Street were inundated with flood waters from the Pawtuxet River; some residents were subject to mandatory evacuation with flood waters reaching 5' in the homes.
- Osprey Drive, Kingfisher Drive & Eagle Drive were impassable and homes experienced flooding from the reservoir.
- Club House Road was impassable by flood waters from Flat River Reservoir.
- Isle of Capri Drive homeowners experienced flooded basements and waters to the first floor level.
- Phillips Hill Road at its intersection with Route 117 was flooded and impassable.
- Station Street and Route 117 area was impassable due to flooding.
- Jefferson Drive at its intersection with Tiogue Avenue was flooded and impassable.

Historic Coventry mill building downstream of damaged bridge and dam. April 2010. Source: FEMA

[13] "CRS Credit for Coastal A Zone Regulations." http://training.fema.gov/EMIWeb/CRS/

- Laurel Avenue bridge abutment was undermined and rendered unsafe for passage.
- Maple Valley Road was washed out at two areas.
- Franklin Road, Hammett Road and Fish Hill Road were flooded and washed out.
- Nelson Capwell Road was flooded and washed out during the rain events.

Probability of Future Occurrence

Street flooding is highly likely. Riverine flooding is possible. Due to climatic changes it is quite possible that the Town may experience similar flooding events on a more frequent basis.

Extent

Localized flooding can be expected to occur on an annual basis. The flood event which occurred in March 2010 was approximately a 250 year event.

Impact

Heavy rains, quick thaws and precipitation, and hurricanes accompanied by heavy winds and rain make the Town vulnerable to personal, property and environmental damage occasioned by flooding.

Flood prone areas and/or areas of concern are:

- Areas east of Lewis Farm Road;
- Areas east of Station Street;
- Flooding or dam failure could have a significant negative impact on two (2) private chemical facilities (Boston Scientific and Rhodes Technologies), and Pasteryak Asphalt at 75 Airport Road which border the Pawtuxet River;
- Centre of New England (residential and commercial development);
- Route 116; and
- 1,075 mobile homes in the town.

Vulnerable structures include dams, residential homes, mobile home parks, water supply substations, facilities storing hazardous materials, historic buildings, sewer pump stations and electric substations.

Riverine flooding in a residential neighborhood of Coventry.

The Warwick and West Warwick Wastewater Regional Treatment Facilities which abut the Pawtuxet River were rendered inoperable during the peak flooding. Both treatment

facilities are permitted for treatment of wastes at a tertiary level. For a period of time following the flooding events, the West Warwick Regional Treatment Facility was able to treat wastes first at a primary level then at a secondary level and eventually at a tertiary level. As a result of flooding of these plants, sewers were unable to handle discharges from residences and businesses causing, at times, backflows of wastes and effluent flows into the rivers and streams.

The Town of Coventry also participates in the National Flood Insurance Program (NFIP). There are currently 217 NFIP policies in effect covering $58,968,800 in property value (35 properties in A1-30 and AE Zones, 11 in the A Zone, 171 in the X Zone). There have been 59 claims made since 1978, which paid out $1,281,242 to policyholders. Currently there are 6 residential properties (16 claims) and 0 non-residential Repetitive Loss properties in the Town of Coventry. A Repetitive Loss property is defined as an insurable building for which two or more claims of more than $1,000 were paid out by the NFIP within a 10-year period.[14]

Climate Change Impacts

Heavier, more frequent precipitation events may cause more riverine flooding and flash flooding events in Coventry.

History

On March 15 & 16, 2010, the Pawtuxet River reached a new record high flood level. The river crested at 15.2'

On March 29 & 30, 2010 an additional 6-10" of rainfall across southern New England caused the Pawtuxet River to exceed the previous flood levels of March 15 & 16, 2010. The river crested at 20.8' in the morning hours of March 31st. This resulted in the worst flooding in the area in over 200 years. In addition to financial losses occasioned by the flooding, the State and Town experienced deleterious environmental impacts.

During the March flood events, the North Branch of the river flooded the Harris fire station of Central Coventry Fire District; the South Branch of the river rendered the Laurel Street Bridge impassable and caused its' failure.

Table 7 History of Flooding in Coventry Since 2000[15]

Date	Damage (reported)	Comments
9/15/2005	$25,000	2-5 inches of rain fell from this flash flood event; and most of the rain fell within a three hour period.

[14] Conversation with RIEMA NFIP staff on 10/24/2016.

[15] NOAA National Centers for Environmental Information, Storm Event Database. https://www.ncdc.noaa.gov/stormevents/

Date	Damage (reported)	Comments
10/15/2005	$200,000	Between 2.5 and 4.5" of rain. Local roads to include Hammet Road, Isle of Capri Road, Industrial Drive and portions of Hope Furnace Road were closed due to flooding of the Pawtuxet River, its tributaries and Johnson's Pond. Nearly 200 individuals were evacuated by public safety personnel.
10/28/2006	$4,000	2-4 inches of rain. Significant urban flooding was reported in Coventry. Washington Street was closed with two feet of water on the roadway. The heavy rainfall also resulted in minor flooding on the Pawtuxet River.
4/16/2007	$25,000	3-5 inches of rain from a slow moving coastal storm. Minor to moderate flooding affected the Blackstone and Pawtuxet Rivers. Tributaries to Johnson Pond came out of their banks and flooded several nearby homes.
7/30/2007	$0	Water rose to car doors. Vehicles were stuck along Route 3 and Arnold Road.
2/13/2008	$20,000	2-4 inches of rain coupled with snow and ice resulted in 18 inches of water on Route 116 & 117. Tiogue Avenue was impassable with several cars underwater.
7/23/2008	$90,000	Flash floods flooded or washed out several roads in Coventry. Some streets including Arnold Road experienced 3-4' of flooding. Vehicles were stuck along Sandy Bottom Road and Hopkins Hill Road.
12/12/2008	$2,000	3-5 inches of rain. Route 117 was flooded with two feet of water. Small stream flooding inundated a portion of Maple Valley Road. Turkey Meadow Brook overflowed its banks flooding Meadow Road.
7/1/2009	$0	Flash flood resulted in 2' of water at intersection of Route 116 & Route 117 causing them to be impassable. The intersection of Newell Court and Main Street was flooded up to car bumpers.
3/15 - 16/2010	$1.3 M	Pawtuxet River reached record high level when it crested at 15.2'. Johnson Pond in Coventry rose out of its banks, flooding several homes and pushing docks inland. Fifteen to twenty streets in Coventry were washed out or damaged. Localized street flooding and washouts including Flat River Road, Maple Valley Rd., Osprey Dr., Hammet Rd., Kingfisher Rd., Franklin Rd., Isle of Capri Rd.
3/29-3/31/2010	$25.65 M	Pawtuxet River exceeded prior high record levels cresting at 20.8'. Force of water measured at 5000 cfs was 2x the prior record. Localized street flooding throughout eastern portion of Town. Flat River Rd. experienced road flooding & embankment washout; multiple culverts were damaged; damage exacerbated by poor drainage. Susan Bowden Rd. experienced washout and channeling of storm water. Sandy Bottom Rd. and eastern portions of Tiogue Ave. were flooded and businesses were closed for several days following flooding event. Laurel Ave. bridge severely damaged by flood waters causing it to be inoperable and subsequently dismantled & replaced. A large portion of Concordia Mill building was damaged and swept downstream by flood waters. A more complete listing of State and Town roads is attached as an Annex. Wastewater Treatment Plant was flooded and rendered inoperable causing backup of wastewaters. Numerous cesspools & septic systems failed. Basement of police station which secures prisoners was flooded.
9/8/2011	$0	Two inches of rain in hour and a half with 6 inches of total rainfall for the event resulted in flooding of rivers streams and roads including Route 117.
6/22/2012	$0	Cold front moving through hot humid southern New England produced thunderstorms resulted in flash flooding Rts 116 & 117 were flooded and impassable. Tiogue Ave, Sandy Bottom Road and the intersection of Rts 3 (Tiogue) & 33 (Arnold Rd.) were closed due to flooding.

Date	Damage (reported)	Comments
9/1/2013	$100,000	3-4 inches of heavy rain fell across Coventry, RI resulting in substantial flash flooding. Route 117 was flooded at several points, including near Route 116 under the railroad trestle, near South Main, near Paine Memorial Field and at the intersection of Industrial Drive. Many cars became stuck in flood waters along Route 117. The area near 1070 Tiogue Avenue was flooded and impassable. The intersection of Hopkins Hill Road and Tiogue Avenue was flooded with four cars stuck in the flood waters. The intersection of Laurel Avenue and Washington Street was flooded and impassable. Hopkins Hill Road was closed due to flooding between South Main Street and Route 3.
9/2/2013	$150,000	Second day of heavy rain. Route 102 flooded with up to a foot of water, numerous roads flooded with one to two feet of water, including Route 117, Hopkins Hill and Sandy Bottom Roads, and Laurel and Tiogue Avenues, with cars stuck in flood waters on all of those roads. Hopkins Hill Road, Sandy Bottom Road, and Route 33 (Arnold Road) were later closed. Route 116 (Knotty Oak Road) was washed out at Gervais Street.
10/22/2014	$0	Low pressure moving up the east coast brought a soaking rain and strong winds to much of southern New England. In addition, both downed leaves from the storm and naturally fallen leaves from before the storm clogged storm drains which resulted in street flooding. Laurel Ave & Washington St. and intersection of Rt 117 Industrial Drive were close due to flooding.
5/31/2015	$0	Flooding and pockets of flash flooding. Lansdowne Road near Miantonomo Drive was closed due to flooding.
6/21/2016	$0	Walker Lane was flooded and impassable.
7/22/2016	$0	Main Street closed due to flooding.

Hurricanes (Tropical Cyclones)

Description

Tropical cyclones, a general term for tropical storms and hurricanes, are low pressure systems that usually form over the tropics. These storms are referred to as "cyclones" due to their rotation. Tropical cyclones are among the most powerful and destructive meteorological systems on earth. Their destructive phenomena include very high winds, heavy rain, lightning, tornadoes, and storm surge. As tropical storms move inland, they can cause severe flooding, downed trees and power lines, and structural damage (Rhode Island State Hazard Mitigation Plan 2014).

There are three categories of tropical cyclones:

1. Tropical Depression: maximum sustained surface wind speed is less than 39 mph
2. Tropical Storm: maximum sustained surface wind speed from 39-73 mph
3. Hurricane: maximum sustained surface wind speed exceeds 73 mph

Once a tropical cyclone no longer has tropical characteristics it is classified as an extratropical system (Rhode Island State Hazard Mitigation Plan 2014).

Most Atlantic tropical cyclones begin as atmospheric "easterly waves" that propagate off the coast of Africa and cross the tropical North Atlantic and Caribbean Sea. When a storm starts to move toward the north, it begins to leave the area where the easterly trade winds prevail and enters the temperate latitudes where the westerly winds dominate. This situation produces the eastward curving pattern of most tropical storms that pass through the Mid-Atlantic region. When the westerly steering winds are strong, it is easier to predict where a hurricane will go. When the steering winds become weak, the storm follows an erratic path that makes forecasting very difficult (Rhode Island State Hazard Mitigation Plan 2014).

Hurricanes are categorized according to the Saffir/Simpson scale (Table 8) with ratings determined by wind speed and central barometric pressure. Hurricane categories range from one (1) through five (5), with Category 5 being the strongest (winds greater than 155 mph). A hurricane watch is issued when hurricane conditions could occur within the next 36 hours. A hurricane warning indicates that sustained winds of at least 74 mph are expected within 24 hours or sooner (Rhode Island State Hazard Mitigation Plan 2014).

The Saffir-Simpson scale below is based primarily on wind speeds and includes estimates of barometric pressure and storm surge associated with each of the five categories. It is used to give an estimate of the potential property damage and flooding expected along the coast from a hurricane landfall."

Table 8 Saffir/Simpson Hurricane Wind Scale[16]

Wind Speed	Typical Effects
Category 1 – Weak 74-95 MPH (64-82kt)	Minimal Damage: Damage is primarily to shrubbery, trees, foliage, and unanchored mobile homes. No real damage occurs in building structures. Some damage is done to poorly constructed signs.
Category 2 – Moderate 96-110 MPH (83-95kt)	Moderate Damage: Considerable damage is done to shrubbery and tree foliage; some trees are blown down. Major structural damage occurs to exposed mobile homes. Extensive damage occurs to poorly constructed signs. Some damage is done to roofing materials, windows, and doors; no major damage occurs to the building integrity of structures.
Category 3– Strong 111-130 MPH (96-113kt)	Extensive damage: Foliage torn from trees and shrubbery; large trees blown down. Practically all poorly constructed signs are blown down. Some damage to roofing materials of buildings occurs, with some window and door damage. Some structural damage occurs to small buildings, residences and utility buildings. Mobile homes are destroyed. There is a minor amount of failure of curtain walls (in framed buildings).

16 Source: National Weather Service, National Hurricane Center

Wind Speed	Typical Effects
Category 4 – Very Strong 131-155 MPH (114-135kt)	Extreme Damage: Shrubs and trees are blown down; all signs are down. Extensive roofing material and window and door damage occurs. Complete failure of roofs on many small residences occurs, and there is complete destruction of mobile homes. Some curtain walls experience failure.
Category 5 – Devastating Greater than 155 MPH (135kt)	Catastrophic Damage: Shrubs and trees are blown down; all signs are down. Considerable damage to roofs of buildings. Very severe and extensive window and door damage occurs. Complete failure of roof structures occurs on many residences and industrial buildings, and extensive shattering of glass in windows and doors occurs. Some complete buildings fail. Small buildings are overturned or blown away. Complete destruction of mobile homes occurs.

Storm surge is the abnormal rise in water level caused by the wind and pressure forces of a hurricane or nor'easter (Rhode Island State Hazard Mitigation Plan 2014). Nationally, storm surge flooding has caused billions of dollars in damage and hundreds of deaths. Given today's ever-increasing population densities in coastal states, the need for information about the potential for flooding from storm surge

Local damage after Hurricane Irene. August 2011.

has become even more important. Further discussion on storm surge is not included in this plan, due to Coventry's inland location over 5 miles from Greenwich Bay.

Location

The Town's close proximity to the Atlantic Ocean renders it particularly susceptible to hurricanes and the resulting loss of human life and property.

Probability of Future Occurrence

Likely.

Extent

Hurricanes that likely make it up to Rhode Island are usually weak (Category 1) or downgraded tropical systems. The wind speeds may be less but the storms can still bring a lot of rain.

Impact

Coventry is an inland community; most damage would be from downed power lines, downed trees, and damage to mobile homes or older structures.

Climate Change Impacts

Increasing air and water temperatures will lead to stronger hurricanes along the Atlantic Ocean. It is uncertain if changing climatic conditions will affect the storm tracks, allowing for more storms to head towards Rhode Island. Coventry should expect stronger hurricanes, but not necessarily more frequent hurricanes.

History

The unforeseen Great New England Hurricane of 1938 is the most catastrophic weather event in Rhode Island and history. The event occurred slightly before high tide and brought with it winds upward of 120 mph. A tidal surge inundated the city of Providence with over 10' of water.

Coventry suffered loss of power and damage to houses and buildings. In western Coventry, the dam had to be raised at Roaring Brook in Hopkins Hollow to float logs and trees that came down in the storm.

A Category 1 hurricane struck Rhode Island in August 1954 (Carol). The hurricane resulted in house and tree damage around Coventry.

In October 1991, Hurricane Bob hit Rhode Island as a Category 2 storm. The hurricane damaged business and homes as well as took down numerous trees and utility lines in Coventry.

In 2011, Hurricane Irene hit Coventry as a tropical storm. Despite the relatively low wind speeds, sustained winds over a 6 to 12-hour long duration resulted in widespread tree damage and resulted in power outages to roughly half a million customers throughout the state. Numerous trees, poles, and wires were downed throughout Coventry. Wind gusts of 52 knots were observed locally. Collective effects throughout Massachusetts and Rhode Island resulted in 1 fatality, no injuries, and $127.3 million in property damage (NOAA).

In October 2012, Hurricane Sandy severely impacted coastal Rhode Island as it came ashore with Tropical Storm strength winds. Peak wind speeds in Coventry were 63-68 mph. Being inland, Coventry was spared the storm surge but suffered minor damage throughout the town due to high winds and rain. There were widespread power outages and a backlog of requests for downed tree removal which restricted access to roads and private property.

Nor'easter

Description

A strong low pressure system along the Mid-Atlantic and New England can form over land or over coastal waters. The storm radius is often as large as 1,000 miles, and the horizontal storm speed is about 25 miles per hour, traveling up the eastern United States coast. Sustained wind speeds of 10-40 MPH are common during a nor'easter, with short term wind speeds gusting up to 70 MPH. Typically a winter weather event, Nor'easters are known to produce heavy snow, rain and heavy waves along the coast. Unlike hurricanes and tropical storms, nor'easters can sit off shore, wreaking damage for days.

Also called East Coast Winter Storms, Nor'easters are characterized by:

- A closed circulation.
- Located within the quadrilateral bounded at 45N by 65W and 70W, and at 30N by 85W and 75W.
- Show a general movement from the south-southwest to the north-northeast.
- Contain winds greater than 23 mph.
- The above conditions must persist for at least a 12-hour period[17].

The magnitude or severity of a severe winter storm or Nor'easter depends on several factors including a region's climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, and time of occurrence during the day (e.g., weekday versus weekend) and time of season.

The extent of a severe winter storm (including Nor'easters that produce snow) can be classified by meteorological measurements and by evaluating its combined impacts. For measuring wind effects, the Beaufort Wind Scale is a system that relates wind speed to observed conditions at sea or on land. (See Table 8). The snow impact of a Nor'easter can be measured using NOAA's Regional Snowfall Index (See Section 3.1.7 Snow Storm).

17 Hersher, et al. An East Coast Winter Storm Climatology. Northeast Regional Climate Center, Cornell University, Ithaca, NY, 2001.

Location

The Town's close proximity to the Atlantic Ocean renders it particularly susceptible to Nor'easters and the resulting loss of human life and property.

Probability of Future Occurrence

Likely.

Extent

On average, Coventry experiences or is threatened by a Nor'easter every couple of years.

Impact

Coventry is an inland community; most damage would be from downed power lines, downed trees, and damage to mobile homes or older structures. The Blizzard of 1978 was the largest Nor'easter on record. Many people were without heat, food, and electricity for over a week.

Climate Change Impacts

Similar to hurricanes, changes in air and water temperatures will lead to stronger Nor'easters along the Atlantic Ocean. Coventry should expect stronger Nor'easters, but not necessarily more frequent storms.

History

Table 9 Nor'easter History[18]

Date	Comments
02/10/1969	Up to 20 inches of snow in parts of Rhode Island
02/06/1978	Catastrophic snow storm in Southern New England. 3' of snow reported in Providence.
02/11/1994	Major Nor'easter. School closed by noon, business and highway travel disrupted.
02/23/1998	Second Nor'easter to affect region in less than one week brought heavy rainfall and strong winds. 2" of rain fell in Coventry
05/25/2005	Late season Nor'easter brought strong winds and heavy rains, some gusts as high as 60 Mph.
02/12/2006	Heavy snow (9.4 inches at T.F. Green) and windy conditions
10/29/2011	A rare and historic October Nor'easter brought very heavy snow to portions of southern New England on Saturday October 29. Low pressure tracked northeast from the North Carolina coast Saturday morning, rapidly strengthening as it passed well south of Nantucket Saturday evening. As the storm intensified, colder air

[18] Coventry 2010 Hazard Mitigation Plan and National Wester Service

	from aloft was drawn into New England resulting in heavy snow in the interior. 2-3 inches of snow fell across eastern Kent County.
01/26/2015	An Alberta clipper that turned into a strong Nor'easter brought heavy snow and strong winds to the region. About a foot and a half of snow fell across western Kent County.
02/08/2015	Long duration snow storm that dumped 5 inches of snow in western Kent County.
01/21/2016	Strong wind and snow. -8 inches of snow in western Kent County
03/14/2017	Heavy wet snow followed by plunging temps hampered roads. 9 inches of snow were reported in Coventry.

Ice Storm

Ice Storm. Source: NOAA.

Description

An ice storm occurs when moisture falls and freezes immediately upon impact. The term ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Freezing rain most commonly occurs in a narrow band within a winter storm that is also producing heavy amounts of snow and sleet in other locations. If extreme cold conditions are combined with low or no snow cover, the cold can better penetrate downward through the ground and potentially create problems for underground infrastructure, as well. When utilities are affected and heating systems are compromised or do not work, water and sewer pipes can freeze and even rupture.

Location

All of Coventry is susceptible to ice storms.

Probability of Future Occurrence

Likely.

Extent

Ice storms can be a devastating winter weather phenomena and are often the cause of automobile accidents, power and communication system outages, personal injury, and death. Moreover, they can hinder the delivery of emergency services needed in response to these catastrophes and endanger the responders. Ice storms accompanied by wind gusts cause the most damage.

The Sperry–Piltz Ice Accumulation (SPIA) Index is a scale for rating ice storm intensity, based on the expected storm size, ice accumulation, and damages on

structures, especially exposed overhead utility systems. The SPIA Index uses forecast information to rate an upcoming ice storm's impact from 0 (little impact) to 5 (catastrophic damage to exposed utility systems).

Coventry expects at least a level 1- isolated or localized utility interruptions every year due to ice.

Figure 3 SPIA Index

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised-October, 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	> 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

Impact

The Coventry Hazard Mitigation Plan Committee is most concerned about ice taking down trees throughout the heavily forested town. Falling trees have taken out power lines, damaged buildings, and essentially shut down the town. Without power, many residents are unable to operate their wells for drinking water. Icy roads can also cause dangerous driving conditions.

Climate Change Impacts

Warming temperatures will mean less snowfall but if there is enough moisture in the atmosphere, it may fall as freezing rain, coating everything in ice. Coventry may expect more ice events.

History

Due to the unique weather in New England, ice storms are usually part of larger snow events. The winter storm event that crippled the state in February 1978

included a FEMA disaster declaration for snow and ice. Subsequent storms have included ice warnings when there are rapidly warming and cooling temperatures. Rhode Island was spared the brunt of the 2008 ice storm which affected more than a million people across New England, and New York.

Snow Storm

Description

The majority of Rhode Island lies outside the heavy snow and ice regions of the northeast. Due to its maritime climate, Rhode Island generally experiences cooler summers and warmer winters than inland areas. However, snow does occur and can be more than an inconvenience and cause extensive damage. The two major threats from heavy snow are stranded populations and snow loading on rooftops. Additionally, loss of power could mean loss of heat and loss of well operation for many residents.

Coventry, RI. Blizzard of 2015.

Winter storms vary in size and strength and can be accompanied by strong winds that create blizzard conditions and dangerous wind chill. There are three categories of winter storms. A blizzard is the most dangerous of the winter storms. It consists of low temperatures, heavy snowfall, and winds of at least 35 miles per hour. A heavy snow storm is one which drops four or more inches of snow in a twelve-hour period.

Location

All of Coventry is susceptible to ice storms. Roads and trees will be the most affected.

Probability of Future Occurrence

Highly Likely.

Extent

The Regional Snowfall Index (RSI) is a scale that uses the area of snowfall, the amount of snowfall, and the number of affected people to rank high-impact storms.[19]

19 NOAA Regional Snowfall Index https://www.ncdc.noaa.gov/snow-and-ice/rsi/

On average, Coventry receives 27.9 inches of snow throughout the year. The record single day snowfall is 23 inches on February 14, 1899. The average winter temperature in Coventry is 41.7 Fahrenheit.[20]

NOAA's RSI Scale

CATEGORY	RSI VALUE	DESCRIPTION
1	1–3	Notable
2	3–6	Significant
3	6–10	Major
4	10–18	Crippling
5	18.0+	Extreme

Impact

Heavy snow can strand motorists, and cause damage to private and public buildings,. During a heavy snow storm, the Town may activate their shelters for people without power. Although expected to occur more frequently, snow is expected to have a less crippling effect on the Town than an ice storm.

Climate Change Impacts

Warming temperatures will mean less moisture falls as snowfall. Rising temperatures will melt snow earlier in the spring. Coventry may experience fewer yet heavier snow events.

History

Coventry has been subjected to annual snowstorms. The Great Blizzard of 1978 blanketed Coventry with over 30 inches of snow and closed businesses for several days.

Table 10 History of Significant Snow Events in Coventry[21]

Date	Inches	Comments
02/18/2000	6-8	Dozens of accidents reported, many due to excessive speed.
12/30/2000	6-9	6" in Coventry; no damage reported.
01/20/2001	6-8	6" in Coventry. Minor accidents reported throughout state, few power outages.
03/05/2001	6-12	More than 12" across Kent County, substantial power outages.
11/27/2002	4-8	8" in Western Coventry though storm occurred the day before Thanksgiving, travel was not notably interrupted.
12/05/2002	5-7	Coventry received 7" of snow. Some parts of the state only received 2" from this snow event.

20 https://snowfall.weatherdb.com/l/5842/Coventry-Rhode-Island.

21 NOAA National Centers for Environmental Information, Storm Event Database https://www.ncdc.noaa.gov/stormevents/

Date	Inches	Comments
02/07/2003	6-12	Western Coventry received 11" while eastern Coventry received around 7".
02/17/2003	12-24	15" were reported in Coventry.
03/06/2003	6-10	8" reported in Coventry.
12/05/2003	10-20	15-19" reported in Coventry. Transportation was greatly disrupted during this storm.
01/27/2004	6-10	9" reported in Coventry.
12/26/2004	6-10	8" in Coventry There were dozens of car accidents state wide due to slick roads and poor visibility. High gusts of wind reported.
01/22/2005	15-25	18" in Coventry gusting wind as high as 60mph creating blizzard condition making travel impossible during the height of the storm.
02/24/2005	5-8	8" in Coventry.
03/01/2005	4-9	8" in Coventry.
03/23/2005	4-8	6" in Coventry.
12/09/2005	2-12	12" reported in Western Coventry much less in the Eastern side of Town. Storm created wind and icy condition causing many traffic accidents and downed trees and wires.
02/12/2006	9-16	Storm created blizzard conditions with high winds and heavy snowfall.
03/16/2007	4-7	Snowfall turned into sleet, freezing rain and then rain.
12/13/2007	12	Snow fell at rates up to 2 inches an hour for 8 to 10 hour period. Many motorists were affected as early dismissals from work and school just before snow began created rush hour like conditions which limited the snowplows ability to plow.
12/19/2008	8-12	Snow started early afternoon and intensified quickly.
12/31/2008	5-7	In addition to the snow this storm brought with it very cold temperatures and strong winds.
01/18/2009	6-7	No major disruptions caused by snow.
03/01/2009	7-12	Storm caused many car accidents and flight cancellations.
12/20/2009	18-20	Weekend storm. Transportation very difficult during the storm.
02/11/2010	5-8	Strong winds accompanied the storm across this area, resulting in numerous downed trees and power lines, knocking out power to many. 5-8 inches of snow fell across western Kent County.
12/26/2010	6-12	A strengthening winter storm passed southeast of Nantucket and brought heavy snow and strong winds to much of Rhode Island, resulting in near blizzard conditions at times. Snowfall totals of 8 to 12 inches were observed in eastern Kent County. Sustained winds of 40 mph with gusts as high as 54 mph were also reported, leading to near blizzard conditions at times.
02/1/2011	6	A total of 6 inches of snow fell across Eastern Kent County over the two-day period, with upwards of a tenth of an inch of ice accumulation for isolated locations falling during the morning period on the 2nd.
10/29/2011	2-3	A rare and historic October Nor'easter brought very heavy snow to portions of southern New England on Saturday October 29. Low pressure tracked northeast from the North Carolina coast Saturday morning, rapidly strengthening as it passed well south of Nantucket Saturday evening. As the storm intensified, colder air from aloft was drawn into

Date	Inches	Comments
		New England resulting in heavy snow in the interior. 2-3 inches of snow fell across eastern Kent County.
01/19/2012	3-4	Amateur Radio operators reported 3 to 4 inches of snow on the ground.
02/24/2012	2-3	An upper level disturbance moving across New England brought a period of snow to portions of Connecticut and Rhode Island. Two to three inches of snow fell across western Kent County
02/29/2012	3-4	Several waves of low pressure moved south of southern New England. Three to four inches of snow fell across eastern Kent County.
02/17/2013	3-4	Three to four inches of snow fell across coastal Kent County.
03/18/2013	2-5	Two to five inches of snow fell across Kent County.
01/26/2015	12-18	The Blizzard of January 2015 produced very strong winds late Monday into Tuesday near the Massachusetts and Rhode Island coasts where gusts of 50 to 65 mph were common. The Governor of Rhode Island declared a state-wide travel ban beginning at midnight on January 27th and continuing through 8 pm. Blizzard conditions occurred at nearby T.F. Green Airport from approximately 6 am to 9 am. Outside this time frame, near blizzard conditions occurred with gusty winds and limited visibilities. Approximately a foot and a half of snow fell across western Kent County.
01/23/2016	7-8	With bare trees, there was remarkably little damage associated with winds that gusted near hurricane force at times.
02/5/2016	1 – 9	Mix of heavy rain and snow brought down trees on Flat River Road and Page Drive.
02/8/2016	8 – 9	Heavy snow and gusty winds.
04/4/2016	6 – 7	Early April snowstorm.
01/7/2017	6 – 10	Snow and wind event
02/09/2017	12 to 14	Strong winds and heavy snow event. 12-14 inches of snow in western Kent County.
03/14/2017	9	A major winter storm brought snow and strong damaging winds.

Hail

Description

Hail is formed in towering cumulonimbus clouds (thunderheads) when strong updrafts carry water droplets to a height at which they freeze. Eventually, these ice particles become too heavy for the updraft to hold up and they fall to the ground at speeds of up to 120 MPH. Hail falls along paths called swaths which can vary from a few square acres to up to 10 miles wide and 100 miles long. Hail larger than 0.75 inch in diameter can cause damage to both property and crops and some storms produce hail over two inches in diameter. Hail causes about $1 billion in damages annually in the U.S. (Rhode Island State Hazard Mitigation Plan 2014).

Table 11 Hail Size

Hail Diameter	Size Description
1/4"	Pea Size
1/2"	Mothball Size
3/4"	Penny Size
7/8"	Nickel Size
1" (Severe Criteria)	Quarter Size
1 1/4"	Half Dollar Size
1 1/2"	Walnut or Ping Pong Ball Size
1 3/4"	Golf Ball Size
2"	Hen Egg Size
2 1/2"	Tennis Ball Size
2 3/4"	Baseball Size
3"	Teacup Size
4"	Grapefruit Size
4 1/2"	Softball Size

Location

All of Coventry is susceptible to hail.

Probability of Future Occurrence

Possible.

Extent

The hail in Coventry is usually 1 inch or smaller.

Impact

Structure vulnerability to hail is determined mainly by construction and exposure. Metal siding and roofing is better able to withstand the damages of a hailstorm than many other materials although it may also be damaged by denting. Exposed windows and vehicles are also susceptible to damage. Crops are extremely susceptible to hailstorm damage, as even the smallest hail stones can rip apart unsheltered vegetation.

Human vulnerability is largely determined by the availability and reception of early warnings for the approach of severe storms, and by the availability of nearby shelter.

The Town and residents are increasing their reliance on solar power. Solar panels designed around international standards are built to withstand hailstones traveling at 50 mph. For reference, a 0.40" hailstone (between a pea and mothball size) can

only travel up to 20 mph. Because panels are mounted on an angle, they only receive a glancing blow from hail.[22]

Climate Change Impacts

There is uncertainty about the effects of climate change on hail storms in Coventry. It is likely that the changes in weather patterns may bring more severe hail events.

History

Table 12 History of Hail in Coventry

Date	Size	Comments
6/22/1997	1″	Quarter sized hail spotted in Coventry.
8/16/2000	¾″	Dime sized hail in Coventry.
6/19/2002	¾″	Isolated thunderstorm produced dime sized hail in Coventry near Johnson's Pond.
7/2/2004	1″	Quarter sized hail in Coventry during severe thunderstorm.
6/22/2005	¾″	Penny sized hail in Coventry.
7/23/2008	1″	Penny to quarter size hail fell in a swath from Coventry to West Warwick.
6/22/2012	1″	Nickel to quarter sized hail in Coventry.

Source: National Climate Data Center (2016)

Lightning/Thunderstorms

Description

Thunderstorms are formed when the right atmospheric conditions combine to provide moisture, lift, and warm unstable air that can rise rapidly. Thunderstorms occur any time of the day and in all months of the year, but are most common during summer afternoons and evenings and in conjunction with frontal boundaries. The National Weather Service (NWS) classifies a thunderstorm as severe if it produces hail at least one inch in diameter, winds of 58 MPH or greater, or a tornado. About 10 percent of the estimated 100,000 annual thunderstorms that occur nationwide are considered severe. Thunderstorms affect a smaller area compared with winter storms or hurricanes, but they can be dangerous and destructive for a number of reasons. Storms can form in less than 30 minutes, giving very little warning; they have the potential to produce lightning, hail, tornadoes, powerful straight-line winds, and heavy rains that produce flash flooding.

All thunderstorms contain lightning. Thunderstorms can occur singly, in clusters, or in lines; therefore, it is possible for several thunderstorms to affect one location in

[22] Renewable Energy Corporation. https://www.renewableenergysolar.net/blog/solar-panels-and-hail-can-my-solar-panels-withstand-a-hail-storm/

the course of a few hours. Thunderstorms usually bring heavy rains (which can cause flash floods), strong winds, hail, lightning, and tornadoes. Lightning is caused by the attraction between positive and negative charges in the atmosphere, resulting in the buildup and discharge of electrical energy. Lightning is one of the most underrated severe weather hazards, yet ranks as the second-leading weather killer in the United States. "Hundreds of people across the nation are injured annually by lightning, most commonly when they are moving to a safe place but have waited too long to seek shelter. Lightning strike victims often suffer long-term effects such as memory loss, sleep disorders, weakness and fatigue, chronic pain, depression and muscle spasms. Lightning has the potential to start both house fires and wildfires. Lightning causes an average of 55-60 fatalities, 400 injuries, and over $1 billion in insured losses annually nationwide." Lightning often strikes as far as 10 miles away from any rainfall.

Location

All of Coventry is susceptible to lightning

Probability of Future Occurrence

Likely.

Extent

There is no universally accepted standard for measuring the strength or magnitude of a lightning storm. Similar to modern tornado characterizations, lightning events are often measured by the damage they produce. Building construction, location, and nearby trees or other tall structures will have a large impact on how vulnerable an individual facility is to a lightning strike. A rough estimate of a structure's likelihood of being struck by lightning can be calculated using the structure's ground surface area, height, and striking distance between the downward-moving tip of the stepped leader (negatively charged channel jumping from cloud to earth) and the object. In general, buildings are more likely to be struck by lightning if they are located on high ground or if they have tall protrusions such as steeples or poles which the stepped leader can jump to.

Impact

Swimming, boating, and fishing are particularly dangerous during periods of frequent lightning strikes which can also cause power outages, down trees, and spark fires. Individuals who immediately seek shelter in a sturdy building or metal-roofed vehicle are much safer than those who remain outdoors. Early warnings of severe storms are also vital for aircraft flying through the area.

Lightning can strike buildings and accessory structures, often causing structure fires. Electrical and communications utilities are also vulnerable to direct lightning strikes. Damage to these lines has the potential to cause power and communication outages for businesses, residencies, and critical facilities. Lightning may impact solar arrays and wind turbines.

Climate Change Impacts

Changing weather patterns may lead to more severe thunder and lightning storms.

History

There has been no reported loss of human life in Coventry in the past 50 years due to lightning.

Table 13 History of Lightning Strikes in Coventry

Date	Type	Comments
06/24/2008	Lightning Strike	Lighting struck house on West Log Bridge Road, setting it on fire. $10,000 in damage.
08/05/2009	Lightning Strike	Nine people taking shelter under a tree at Foster Memorial Park were injured when lightning struck nearby. Five of the injured refused medical treatment, the other four individuals were transported to a nearby hospital. There were only minor injuries.
07/24/2010	Lightning Strike	Lightning strikes produced damage in parts of central and southern Rhode Island. Lightning ignited a house fire on Jennifer Lane.
10/20/2012	Lightning Strike	A warm front with a developing triple point and occlusion resulted in heavy rain and a few embedded thunderstorms. Two houses were set on fire by lightning, both were deemed uninhabitable.

Source: National Climate Data Center (2016)

Brushfire

Description

Brushfires (smaller versions of wildfires) are fueled by natural cover, including native and non-native species of trees, brush and grasses, and crops along with weather conditions and topography. While available fuel, topography, and weather provide the conditions that allow wildfires to spread, most wildfires are caused by people through criminal or accidental misuse of fire.

Brushfire in nearby Hopkinton, RI. April 2009. Source: Ashaway Volunteer Fire Association.

Brushfires pose serious threats to human safety and property in rural and suburban areas. They can destroy crops, timber resources, recreation areas, and habitat for wildlife. Wildfires are commonly perceived as hazards in the western part of the country; however, wildfires are a growing problem in the wildland/urban interface of the eastern United States, including Rhode Island.

Brushfires are dependent upon the quantity and quality of available fuels. Fuel quantity is the mass per unit area. Fuel quality is determined by a number of factors, including fuel density, chemistry, and arrangement. Arrangement influences the availability of oxygen. Another important aspect of fuel quality is the total surface exposed to heat and air. Fuels with large area-to-volume ratios, such as grasses, leaves, bark and twigs, are easily ignited when dry.

Climatic and meteorological conditions that influence wildfires include solar insulation, atmospheric humidity, and precipitation, all of which determine the moisture content of wood and leaf litter. Dry spells, heat, low humidity, and wind increase the susceptibility of vegetation to fire. In Rhode Island, common factors leading to large fires include short-term drought, humidity below 20%, and fuel type.

Various natural and human agents can be responsible for igniting wildfires. Natural agents include lightning, sparks generated by rocks rolling down a slope, friction produced by branches rubbing together in the wind, and spontaneous combustion.

Human-caused wildfires are typically worse than those caused by natural agents. Arson and accidental fires usually start along roads, trails, streams, or at dwellings that are generally on lower slopes or bottoms of hills and valleys. Nurtured by updrafts, these fires can spread quickly uphill. Arson fires are often set deliberately at times when factors such as wind, temperature, and dryness contribute to the fires' spread.

Location

The forested Western part of Coventry is susceptible to fire.

Probability of Future Occurrence

Likely during the spring.

Extent

Roughly 2-3 acres are burned in the spring; less than 1 acre burns in the fall.

Impact

Individual buildings may be more or less vulnerable to damage from wildfire based on factors such as the clear distance around the structure and the structure's construction materials. Wildfire primarily impacts timber and forest ecosystems, although the threat to nearby buildings is always present.

Climate Change Impacts

Changes in precipitation patterns may shorten the dry periods that produce ideal conditions for brushfires. However, periods of drought may be more intense, increasing the fire hazard during the summer.

History

According to the 2010 Hazard Mitigation Plan, Coventry has experienced 2 substantial brushfires in the past 175 years. A catastrophic fire in the summer of 1942 burned close to 10,000 acres in the Western Coventry District between Hopkins Hollow Road and Victory Highway.[23] No further information was recalled by the CHMPC.

Drought

Description

Drought in nearby Connecticut.
Source: Bob Luckey Jr./ Hearst Connecticut Media

Drought is characterized as a continuous period of time in which rainfall is significantly below the norm for a particular area over a multi-year period. The American Meteorology Society defines drought as a period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance. Drought differs from other natural hazards in that they occur suddenly. Rather, a drought evolves over months or even years and, while causing very little structural damage, can have profound economic, environmental, and social impacts.

There are four different ways that a drought can be defined:

1. Meteorological – A measure of departure of precipitation from normal. Due to climatic differences, what is considered a drought in one location may not be a drought in another location.
2. Agricultural – refers to a situation when the amount of moisture in the soil no longer meets the needs of a particular crop.
3. Hydrological- occurs when surface and subsurface water supplies are below normal.
4. Socioeconomic- refers to the situation that occurs when physical water shortage begins to effect people.

Characteristics and impacts of drought differ in many ways, so it is difficult to quantify drought. An existing index called the Palmer Drought Severity Index (PDSI) that used temperature and precipitation levels to determine dryness, measuring a departure from the normal rainfall in a given area. The PDSI uses temperature and precipitation levels to determine dryness. The advantage of the PDSI is that it is standardized to local climate, so it can be applied to any part of the country to

[23] Personal communication with Skip Mays of Western Coventry

demonstrate relative drought or rainfall conditions. A monthly PDSI value below -2.0 indicates moderate drought, and a value below -3.0 indicates severe drought.

Table 14 Drought Severity [24]

Severity	PDSI Index Value	Drought Level	Possible Impacts
Exceptional Drought	-5 or less	Emergency	Widespread crop/pasture losses, shortages of water creating water emergencies
Extreme Drought	-4 to -4.9	Warning	Major crop/pasture losses, widespread water shortages or restrictions
Severe Drought	-3 to -3.9	Watch	Crop or pasture losses likely, water shortages common, water restrictions imposed
Moderate Drought	-2 to -2.9	Advisory	Some damage to crops/pastures, developing water shortages, voluntary water-use restrictions requested
Mild Drought/ Abnormally Dry	-1 to -1.9	Normal	Short term dryness slowing planting or crop growth
Incipient Dry Spell	-0.9 or less	-	-

Rhode Island, as with most states within the United States, uses both the Palmer Drought Severity Index (PDSI) and the Crop Moisture Index (CMI) as indices for a drought occurrence. The CMI (a derivative of the PDSI) provides information on the short-term or current status of purely agricultural drought or moisture surplus. The PDSI is most effective for determining long-term drought conditions, while the CMI is effective at helping determine short-term drought.

The RI Drought Steering Committee assigns drought levels for the seven designated drought regions in the state, based on hydrological indices such as precipitation, groundwater, stream flow, and the PDI, as well as on local supply indices such as static groundwater levels and reservoir levels. The Normal, Advisory, and Watch levels are issued statewide. The Warning and Emergency levels are issued on a regional basis and consider local conditions, source of water supply, and water storage capacity issues.

Location

According to the Rhode Island Water Resources Board the potential for a drought exists every eleven years in Rhode Island. Although temporary drought conditions may occasionally exist in Rhode Island, long term drought conditions are not indicative of this temperate region. Due to geographic location, Coventry may experience occasional drought conditions.

24 http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx

Probability of Future Occurrence

Likely.

Extent

According to the National Weather Service Rhode Island receives on average 39" to 54" of rain annually. Even though the state receives more rain annually than the average for the United States (29.53 inches), Rhode Island does experience extended periods of dry weather. Some level of meteorological drought, while not frequent, does occur in Coventry every couple of years.

Impact

The main impact of meteorological drought is periods of very high fire danger. In addition, small pond levels are reduced, thereby impacting private wells. An estimated one quarter to one third of Coventry residents are on wells which may be affected by long periods of low water. Coventry has the capacity to enact a plan to distribute drinking water.

Drought conditions have been known to trigger the rapid increase of the gypsy moth populations in the region. The extended period of dry weather (specifically in May and June) slows the fungus that usually keeps the gypsy moth caterpillars at bay. Denuded trees can have cascading effects on the local ecosystem.

Climate Change Impacts

Changes in precipitation patterns may increase the water tables, however, periods of drought may be more intense.

History

Extended droughts are rare in Rhode Island with a record of six major droughts (those lasting for more than one year) since 1929. The longest and most severe drought occurred in 1963-67 and affected most of the northeast. Water shortages affected most communities in Rhode Island and several municipal-supply wells were drilled to augment declining public supplies. [25]

Table 15 History of Droughts that Have Affected Coventry[26]

Date	Area Affected	Remarks
1930-31	Statewide	Stream flow of 70% normal.
1941-45	Statewide	Stream flow of 70% normal in Blackstone and Pawtuxet Rivers.
1949-50	Statewide	Stream flow of 70% normal.
1963-67	Statewide	Water restrictions/well replacements common.

25 USGS Floods and Droughts https://md.water.usgs.gov/publications/wsp-2375/ri/

26 National Climate Data Center (2016).

Date	Area Affected	Remarks
1980-81	Statewide	Groundwater deficient in eastern part of state. Considerable crop damage.
1987-88	Southern part of the State	$25 million crop damage.
1998-99	Statewide	Spring through summer the State experienced 75% of normal flow.
2012	Statewide	January –April 2012. Meteorological drought due to precipitation levels one half of normal.
2016	Statewide	Drought Advisory

Extreme Temperatures

Description

Extreme cold may accompany winter storms, be left in their wake, or can occur without storm activity. Extreme cold can lead to hypothermia and frostbite, which are both serious medical conditions. The definition of an excessively cold temperature varies according to the normal climate of a region. In areas unaccustomed to winter weather, near freezing temperatures are considered "extreme cold." In Rhode Island, extreme cold usually involves temperatures below zero degrees Fahrenheit (Rhode Island State Hazard Mitigation Plan 2014).

The wind chill index attempts to quantify the cooling effect of wind with the actual outside air temperature to determine a wind chill temperature that represents how cold people and animals feel, based on the rate of heat loss from exposed skin. A wind chill index of -5 indicates that the effects of wind and temperature on exposed flesh are the same as if the air temperature alone were five (5) degrees below zero (0), even though the actual temperature could be much higher. The NWS issues a wind chill advisory when wind chill temperatures are potentially hazardous and a wind chill warning when the situation can be life-threatening (Rhode Island State Hazard Mitigation Plan 2014).

The National Weather Service issues **extreme (or excessive) heat** warnings when the maximum expected heat index is expected to be 105° F or higher for at least 2 consecutive days and night time air temperatures are not expected to fall below 75 °. In the northeast, these criteria is generally modified to a heat index of 92° or higher for 2 consecutive days.

Location

An extreme heat or cold event would be a regional issue affecting Coventry and significant portions of Southern New England. Extreme temperatures could have a serious impact on private and public structures, as well as the general population throughout Coventry. The elderly and those who work outside are most at risk to extreme temperatures are

Probability of Future Occurrence

Likely.

Extent

In 2011, T.F. Green Airport reported heat indexes of 105 to 106 over an eight-hour period.

Wind chills of 32 below zero were reported at T.F. Green Airport in 2016.

Impact

Personal exposure to dangerous heat conditions may lead to heat cramps, heat exhaustion, and heat stroke. These are especially important to monitor in children, and vulnerable populations that are not able to move to cooler conditions. Extreme cold conditions may occur during, after, or without any connection to a winter storm. Exposure to extreme cold can lead to hypothermia and frostbite.

Climate Change Impacts

Coventry should anticipate more frequent occurrences of extreme heat during the summer.

History

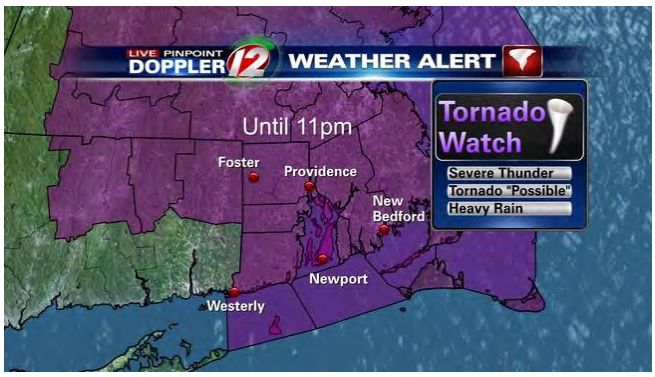
Extreme temperatures are recorded by NOAA and are the most accurate recording of weather in and around Coventry. The following table summarizes extreme temperature events within Kent County. TF Green Airport, located about 7 miles northeast of Coventry is the nearest recording station.

Table 16 History of Extreme Temperatures near Coventry, RI[27]

Date	Temperature (F)	Remarks
05/09/2000	91	3rd day in a row of high temps exceeding 90 degrees at nearby TF Green airport. Earliest heatwave on record since 1904.
05/03/2001	91	At nearby T.F. Green airport.
05/04/2001	92	3rd day of temperatures reaching 90 degrees or higher, making it the NEW earliest heat wave on record in greater Providence.
05/12/2001	90	At nearby T.F. Green airport.
07/06/2010	Heat Index 105-106	At nearby T.F. Green airport.
07/22/2011	Heat index 105-106	At nearby T.F. Green airport.
02/16/2015	Wind chills - 26 below zero	At nearby T..F Green airport.
02/14/2016	Wind chills - 32 below zero	At nearby T.F. Green airport.

Tornadoes

Description



A tornado is a violent windstorm with a twisting, funnel-shaped cloud. They are often spawned by thunderstorms or hurricanes. Tornadoes are produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornado season is generally March through August, although tornadoes can occur at any time of year. Over 80 percent of all tornadoes strike between noon and midnight. During an average year, about 1,000 tornadoes are reported across the United States, resulting in 80 deaths and over 1,500 injuries. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of one-mile-wide and 50 miles long.

Tornadoes are categorized according to the damage they produce using the Fujita Scale (F-scale). Below is the Enhanced Fujita (EF) Scale and the Old Fujita (F) Scale. An F0 tornado causes the least amount of damage, while an F5 tornado causes the most amount of damage. Relatively speaking, the size of a tornado is not

27 NOAA National Centers for Environmental Information, Storm Events Database. https://www.ncdc.noaa.gov/stormevents/

necessarily an indication of its intensity. On August, 7th, 1986, a rare outbreak of seven tornadoes occurred in New England. One such tornado, rated F2 on the Enhanced Fujita Scale, carved its way through Cranston, RI, and Providence, RI, causing twenty injuries and $2,500,000 in damages. Table 18 highlights more tornado events that have affected, Rhode Island.

Table 17 Enhanced Fujita Scale

Enhanced Fujita Scale		Damage Scale
EF Number	3 Second Gust (MPH)	
0	65-85	**Light damage.** Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
1	86-110	**Moderate damage.** Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
2	111-135	**Considerable damage.** Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
3	136-165	**Severe damage.** Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
4	166-200	**Devastating damage.** Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
5	Over 200	**Incredible damage**. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

Probability of Future Occurrence

Unlikely. Tornadoes rarely occur in this region.

Location

The hazard mitigation planning committee recognizes that the risk of tornadoes is low for the State of Rhode Island and Town of Coventry but with the recent changing weather patterns and touchdowns of tornadoes, it would be unjust not to consider them a possible hazard.

Extent

All of Coventry is susceptible to tornadoes.

Impact

Tornadoes could cause significant damage to structures, trees and utility lines. Flying debris could cause injuries to residents. Mobile homes are generally more vulnerable to damage than steel framed structures. The town has 1,053 mobile or manufactured homes within its borders, these properties are more susceptible to the threat of a tornado.

Climate Change Impacts

It is uncertain how climate change may affect tornado outbreaks in Coventry.

History

Table 18 Recent Tornado Events in Rhode Island[28]

Date	F-Scale	Injuries	Damage	Location
8/16/2000	-	0	$0	Providence County
8/7/2004	-	0	$0	Kent County
7/23/2008	1	0	$47,987	Bristol County
8/10/2012	-	0	$50,000	Washington County

Earthquake

Description

An earthquake (also known as a quake, tremor or temblor) is the result of a sudden release of energy in the Earth's crust that creates seismic waves. The seismicity or seismic activity of an area refers to the frequency, type and size of earthquakes experienced over a period of time. Earthquakes are measured with a seismometer. The size or magnitude is recorded on a device known as a seismograph. Earthquakes with a magnitude 3 or lower are mostly imperceptible (too low to recognize) and magnitude 7 earthquakes cause serious damage over large areas.

Although earthquakes are not considered to be a major problem in the Northeast United States, they are more prevalent than one might expect. Table 20 presents historical seismic activity for Rhode Island. It highlights the earthquake epicenter, the Richter magnitude at the epicenter, and the Mercalli Intensity Level. Richter magnitudes are technical quantitatively based calculations that measure the amplitude of the largest seismic wave recorded. Richter magnitudes are based on a logarithmic scale and are commonly scaled from 1 to 8. See Figure 4: Richter Scale. The higher the magnitude on the Richter Scale, the more severe the earthquake. Mercalli intensity levels are based on qualitative criteria that use the observations of the people who have experienced the earthquake to estimate the intensity level.

28 Rhode Island Emergency Management Agency (RIEMA), Rhode Island 2014 Hazard Mitigation Plan Update. There have been no reported tornadoes in Coventry.

The Mercalli scale ranges from I to XII. The higher the intensity level on the scale, the closer the person is to the epicenter.

Figure 4: Richter Scale

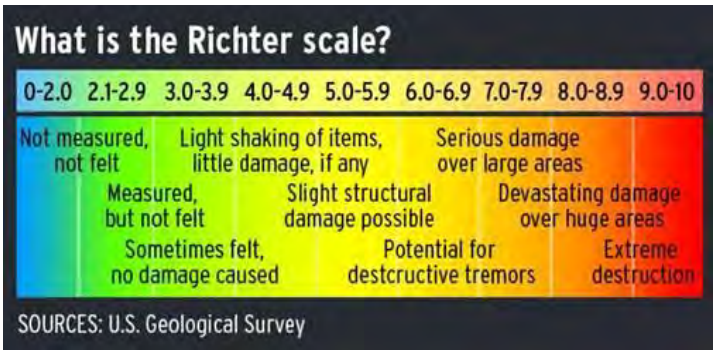


Table 19 Mercalli Scale

Modified Mercalli Intensity	Description of Intensity Level
I	Not felt except by a very few under especially favorable circumstances.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motorcars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level distorted. Objects thrown into the air.

Despite the low probability of a high impact earthquake, physical characteristics in Rhode Island may increase earthquake vulnerability:

- Hard Rock: Due to the geological makeup of New England's base rock, seismic energy is conducted on a greater scale (four (4)-10 times that of an equivalent Richter magnitude earthquake in California).
- Soft Soil: Many coastal regions of New England are made up of soft soils. These soils can magnify an earthquake as much as two times.
- Structures: The New England region, being one (1) of the first settled areas of the United States, has an abundance of older, unreinforced masonry structures that are inherently brittle and very vulnerable to seismic forces.
- Low Public Awareness of Vulnerability: Little public recognition of earthquake threat, and no established system of educating or informing the public of the threat or how to prepare for or respond during an earthquake. Therefore, higher losses will occur here than in other regions of the country.

Location

Rhode Island is located in the North Atlantic tectonic plate and is in a region of historically low seismicity. Only three (3) or four (4) earthquakes of Modified Mercalli Intensity Scale (MMI) V or greater have been centered in Rhode Island, including the 1951 South Kingstown earthquake of magnitude 4.6 on the Richter scale. The Town of Coventry is about 17 miles northeast of South Kingstown.

Probability of Future Occurrence

Unlikely. Damaging earthquakes do not normally occur in this region. Seismologists have estimated that there is about a 50% probability of a very damaging magnitude 5.0 earthquake occurring anywhere in New England, in a 50-year period[29].

Extent

Rhode Island is located in an area of "moderate" seismicity and "high" risk. Seismic risk applies to the seismic hazard, location demographics, and regional economics to the vulnerabilities of the structure or lifeline on the site. However, based on past occurrences, current geologic makeup and future climate changes, the Town of Coventry is not anticipating any disturbances higher than a Class IV intensity.

Impact

The committee recognizes that the potential for an earthquake to strike the Town of Coventry is low but the hazard could afflict town wide damage, causing; power outages, building collapses, water main breaks, dam failures, gas leaks, fires and injuries or deaths. Buildings that are most at risk from earthquakes are the old masonry buildings and large structures such as those in the Historic Districts.

29 RI Hazard Identification and Risk Assessment, 2016.

Climate Change Impacts

It is uncertain how climate change will affect earthquakes in Coventry.

History

No major earthquakes have happened in Coventry but the resulting damage it could produce makes it a threat.

Table 20 Historic Seismic Activity in/near Rhode Island[30]

Date	Epicenter	Epicenter Magnitude	Mercalli Intensity Level
10/16/1963	Coastal MA	4.5	Caused some cracked plaster (MMI V) at Chepachet, Rhode Island.
6/14/1973	Western Maine	unknown	The intensities in Rhode Island were IV at Charlestown and I-III at Bristol, East Providence, Harmony, and Providence.
03/11/76	Near Newport, RI	3.5	Intensity level VI shock effects felt throughout Southern New England. This earthquake has the distinction of being the largest earthquake to originate in Rhode Island.
04/20/02	Plattsburgh, NY	5.2	Intensity level II to III shock effects felt throughout Rhode Island.
03/11/08	Central Connecticut	2.9	No data reported for Rhode Island
6/23/10	Ontario-Quebec	5.0	Felt throughout Rhode Island.
2011	Rhode Island	0.9	Felt locally.
2012	Rhode Island	1	Felt locally.
2013	Kingston, RI	Unknown	Felt locally.
1/12/15	Wauregan, CT	3.3	Felt locally in RI, but maybe not in Coventry.
7/22/15	East Providence, RI	2.3	Felt locally in RI, but maybe not in Coventry.

Climate Change

Changing climate patterns globally and in Rhode Island will worsen the effects of natural hazards and affect future planning and mitigation efforts. Long-term climate change is likely to cause the following impacts in Coventry:

- Heavier, more frequent precipitation events, which may cause more riverine flooding and flash flooding events.
- Longer periods of drought which may affect water availability and increase the threat for wildfires.
- Increasing air and water temperatures.
- More frequent high heat days and heat waves.

30 United States Geologic Survey http//neic.usgs.gov/neis/states/rhode_island/rhode_island_history.html and Earthquake Hazards Program "Did You Feel It" Archives.

How rapidly these changes will be felt is debatable but there is certainty within the state that municipalities need to be prepared. The Town of Coventry is working to become more adaptable/resilient to the changing conditions.

Through the exercise of creating this plan, the Town of Coventry is exploring ways to reduce their long and short term risks to a variety of hazards. Fortunately, being an inland community, Coventry does not have to be concerned about storm surge and erosion but being in a coastal state, any storm that comes up the eastern seaboard will likely impact the town which is located about 6 miles from the shore. As climate conditions intensify, the CHMPC is prepared to update this plan accordingly.

4

Risk Assessment

Facilities Inventory

The first step in the assessment process was to create the inventory of facilities of special concern to the Town. The CHMPC identified the following as community assets:

- Flood Prone Drainage Systems
- Bridges
- Wastewater facilities
- Water facilities
- Electrical and Communication facilities (including wind and solar)
- Dams
- Critical municipal hazard response facilities
- Populations
- Businesses
- Schools
- Recreational Facilities
- Historic resources

During the review of these assets, the CHMPC came to the conclusion that not all of these are so vulnerable they require a mitigation action within the next 5 years. As

infrastructure ages, and climate conditions change, the CHMPC will update this plan accordingly.

These most vulnerable assets are identified in the Community Assets Matrix, Section 4.8.

Hazard Mitigation Mapping

The Town's GIS database, including parcel data, orthophotography and FEMA flood zone information (as of October 2015), were utilized to complete the assessment. The use of this system allowed the CHMPC to estimate potential fiscal and population impacts for individual parcels (see Sections 4.3 and 4.4 for results).

The final output of this exercise is the Town of Coventry Resources map (Appendix A). The focus of the maps is not to duplicate all of the spatial information generated through the inventorying process but rather to present the location of the identified risks as they relate to the Town's response facilities.

Fiscal Impact Analysis

The Town of Coventry's parcel data and FEMA's 1% annual chance floodplain data were utilized to generate estimates of potential fiscal impacts from natural hazard events such as flooding. The information utilized from the tax assessor's database and GIS included the improvement values, land usage, and unit counts. The analysis showed that Coventry is comprised of 39,745 acres of land, with 232 acres (<0.6%) in the regulatory floodplain. These 232 acres are mainly located along Buck's Horn Brook west of Route 102, and to the east along the Pawtucket River and associated water bodies.

HAZUS-MH was used to further understand the potential risk from a large hurricane. HAZUS-MH[31] is a software tool that contains models for estimating potential losses from earthquakes, floods, and hurricanes. For the purpose of this plan, a scenario was run that captures the town's risk from hurricane damage. The table below summarizes some of the potential damages should Hurricane Carol (Category 1) hit today. The hurricane scenario model uses the same path as the hurricane which tracked west of Coventry.

In 1954 Hurricane Carol (peak gusts at 89 mph) tore through Southern New England, causing extensive damage throughout Rhode Island. If this same storm were to strike again today, it would cause over $50 million dollars in total economic losses (property damage and business interruption loss). About 120 buildings are expected to be at least moderately damaged. An estimated 1 of the 120 buildings would be totally destroyed.[32]

31 HAZUS modeling conducted by VHB on 4/17/2017 using HAZUS-MH 2.2.

32 HAZUS-MH: Hurricane Event Report, run 4/17/2017.

HAZUS Qualitative Damage Description
No Damage or Very Minor Damage Little or no visible damage from the outside. No broken windows, or failed roof deck. Minimal loss of roof over, with no or very limited water penetration.
Minor Damage Maximum of one broken window, door or garage door. Moderate roof cover loss that can be covered to prevent additional water entering the building. Marks or dents on walls requiring painting or patching for repair.
Moderate Damage Major roof cover damage, moderate window breakage. Minor roof sheathing failure. Some resulting damage to interior of building from water
Severe Damage Major window damage or roof sheathing loss. Major roof cover loss. Extensive damage to interior from water.
Destruction Complete roof failure and/or, failure of wall frame. Loss of more than 50% of roof sheathing.

Table 21 HAZUS-MH Scenarios for Coventry, RI

1954 Hurricane Carol Scenario (Category 1)

POTENTIAL DAMAGE	AMOUNT
Debris generated	36,990 tons
Buildings destroyed	1
Buildings at least moderately damaged	125
Displaced households	27
Essential Facility Damage (fire, police, schools)	<1 day loss
Residential Property (capital stock)	$49 million
Business interruptions	$1.6 million

Figure 5 Hurricane Carol Path

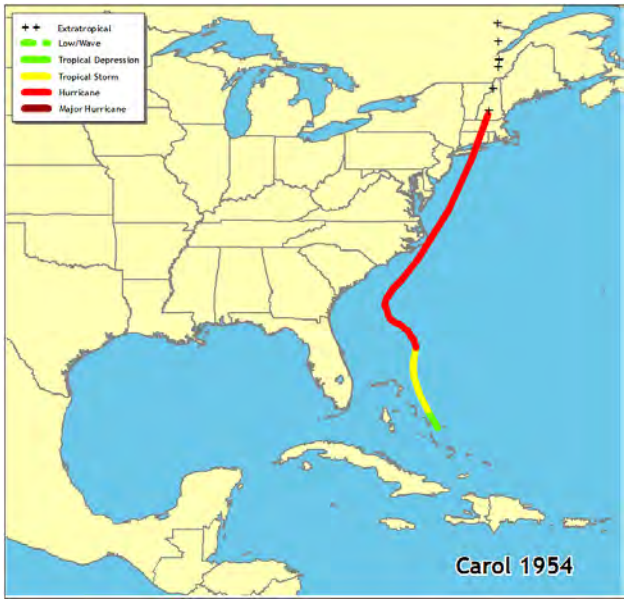


Table 22 displays potential damage estimates of property values of parcels that are located wholly or partially within the Town's Special Flood Hazard Area (SFHA, or regulatory floodplain). The parcel information, using the best available data, provides the number of parcels in the SFHA, and values of the buildings on each property. Land value was not considered for this exercise. The values provided are an estimate considering some properties are located in more than one sub-watershed. This percentage was calculated in order to assist with identifying which areas are at greater risk. According to Table 22, the town wide total potential building damages for these floodplain areas are about $9,896,300. The watershed with the most parcels in the SFHA is the Headwaters of the South Branch Pawtuxet River. Of the 3,620 parcels in that region, 106 have buildings in the SFHA.

The most expensive residential building in the SFHA is in the South Branch of the Pawtuxet River Watershed and has estimated building value of just less than $500,000.

Approximately 75% of Coventry's revenue is generated from property tax. Should any of the properties forming the tax base be destroyed by a hazardous event, a causal effect would be property owners whose parcels remain intact would carry an increased financial burden with regards to property taxes. It is an important course of action for the Town to protect both lives and property from natural disasters. However, as Coventry's population grows, the burden of protecting lives and property grows.

Using data from the RI Geographic Information System (RIGIS) and information from the Coventry Tax Assessor, the following table summarizes the value of the properties that are located within the Special Flood Hazard Areas.

Table 22 Property Vulnerability from Flooding

Watershed	# Parcels in SFHA w buildings	Residential	Commercial	Public	TOTAL
South Branch Pawtuxet River	38	$ 3,244,500.00	$ 926,500.00	$ -	**$ 4,171,000.00**
North Branch Pawtuxet River	2	$ 64,500.00	$ -	$ 209,900.00	**$ 274,400.00**
Moosup	18	$ 2,370,400.00	$ -	$ -	**$ 2,370,400.00**
Headwaters of South Branch Pawtuxet	106	$ 3,080,500.00	$ -	$ -	**$ 3,080,500.00**
TOTAL	**164**	**$ 8,759,900.00**	**$ 926,500.00**	**$ 209,900.00**	**$ 9,896,300.00**

Built Environment

According to HAZUS-MH, Coventry has an estimated 13,000 buildings with a total replacement value (excluding contents) of $3.9 billion. Approximately 93% of which are associated with residential housing.[33]

The CHMPC has identified critical infrastructure listed in the Community Asset Matrix (Table 23). The list includes: flood prone drainage systems, Fresh Water Resources, Electrical Facilities, Dams, Special Populations, Businesses, and Recreational Facilities. All of these important community resources have the potential to be affected by a natural or manmade hazard. The magnitude of the losses would be dependent upon the type, location, and extent of each unique hazard.

The town's zoning laws help dictate future development while maintaining Coventry's rural character. Continued enforcement of Rhode Island State building codes and new regulations as required will lessen potential damage caused by a natural hazard event. The codes adopted by the Town of Coventry range from building codes and design standards, to zoning regulations.

Some of the developed parts of Coventry are particularly susceptible to flooding. The base flood is an event that has a 1% chance of occurring annually and is the storm event used to identify the flood zones which impact zoning and building requirements throughout the Town. Further, Coventry has 1,075 mobile homes- one of the largest concentrations of mobile homes in the state. These mobile homes are often located in areas that flood and are not able to withstand high winds and extreme weather events.

While temporary street flooding is generally a nuisance, the CHMPC is most concerned about the effects of strong winds on their built environment. Wind vulnerability to structures can be controlled in part by building and construction standards. Wind can also bring down trees, power, and communication lines, reducing access to the transportation network and leaving residents without power.

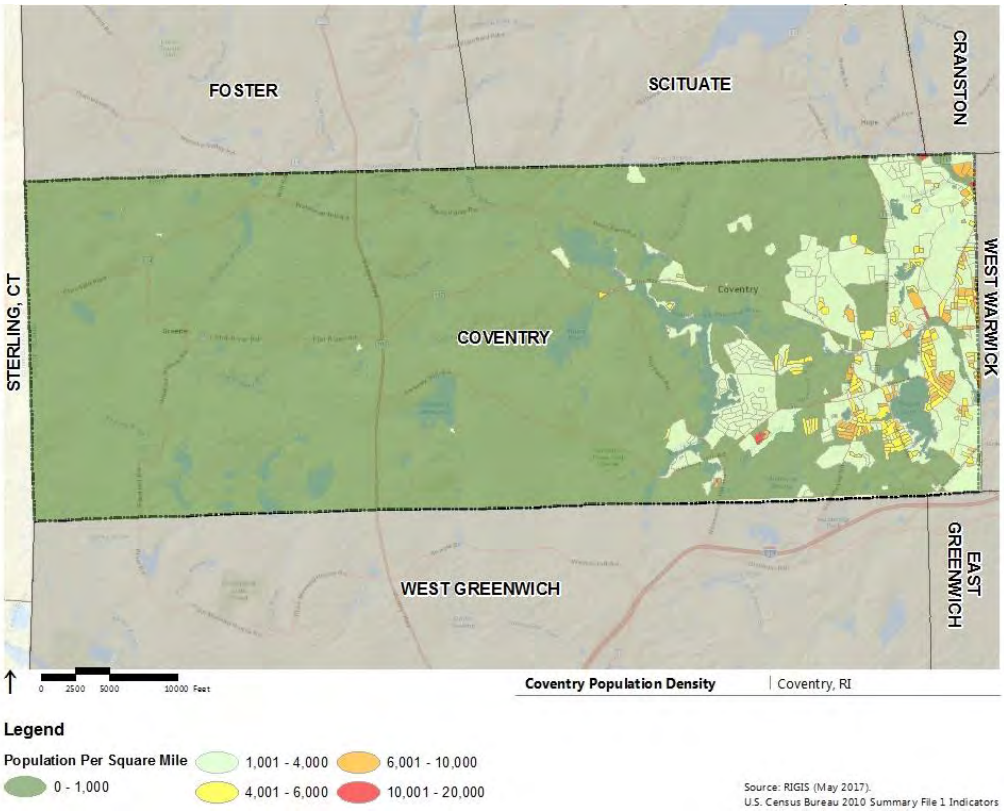
33 HAZUS-MH: Hurricane Event Report, run 4/17/2017. 2010 Census data and 2010 dollars.

The Town's requirement for new subdivisions to bury electrical wires does protect from power outages.

Population Impact Analysis

Of primary concern during a hazard event is protecting the health and safety of Coventry residents. In addition to knowing the total population, it's also important to estimate how many people would be impacted by loss of service or need to evacuate. According to the 2015 US Census, there are 14,850 housing units in Coventry supporting a population estimate of 35,041. The population is not spread evenly throughout the town.

Map 2 Population Density



Using the 2014 Tax Assessor's Database, the Rhode Island GIS e911 structure file, and the Town's GIS, it was determined that there are total of 167 non-accessory structures within Town's base flood zones (6 are commercial, 2 are public, and 159 are residential buildings). In addition to the transportation network that would be crippled by floodwaters, some residents' homes could be flooded.

In addition to private wells, which serve most of the population, there is public water service available east of Town Hall offices at 1670 Flat River Road. This water service is provided by Kent County Water Authority. Drought conditions can quickly have wide-spread impacts to residents who rely on available groundwater for drinking, bathing, agriculture, farming, and fire-fighting.

The Coventry businesses that store hazardous materials have multiple safe guards to limit the risk of exposure. However, since there is some inherent risk of storing these chemicals, first responders will want to be trained on emergency response to specific chemical spills to contain the contaminants and protect the public.

There is no current estimate on the number of visitors to any of Coventry recreation facilities. However, during the summer months, the ballfields are particularly popular. Fortunately, there is usually some advance warning for lightning and wildfires, allowing visitors to seek shelter; provided they heed the warnings.

Natural Environment

Coventry possesses an extensive network of surface water resources comprised of rivers, lakes, ponds, brooks and streams, with over 20 lakes and ponds accounting for over 1,600 acres. These bodies of water are basic elements to the Town's character, provide wildlife habitat, afford recreational opportunities and are component parts of a broader regional ecological system. The eastern two thirds of Coventry are located within the Pawtuxet River Basin, with the western section of Coventry falling within the Thames River Basin. There are 4 sub-basins: South Branch of the Pawtuxet River, North Branch of the Pawtuxet River, Moosup, and Headwaters of the South Branch of the Pawtuxet River.

Coventry's wetlands are a vital component in the community's ecological system providing a buffer for groundwater recharge areas, serving in a retention capacity alleviating flooding and providing a habitat for much of the Town's wildlife. The local wetlands are evenly distributed throughout the town following drainage patterns, along streams, brooks, and surface water bodies.[34]

The largest amount of open space preservation in the State is located in Coventry due to State and private organization purchases. With ever expanding development activity, there is potential for negative impact on these sensitive habitats.

Vulnerability of Future Structures

Since the 2010 hazard mitigation plan, Coventry has experienced slow growth. Western Coventry remains the most rural third, Eastern Coventry being more densely populated, and Central Coventry being the transition between the two extremes.

According to the Comprehensive Plan, the Town seeks to "(A) maintain Coventry's diversity by preserving Coventry's rural character in western and central Coventry and preserving the historic mill character and neighborhoods of eastern Coventry, and (B) expand and enhance the character of the commercial areas in Coventry."

There is enough land available to meet Coventry's near-future development needs for both residential and non-residential structures. An estimated 90% of the town is

[34] Coventry Comprehensive Community Plan, June 19, 2000.

zoned for residential uses. Future growth will likely be centered along expansions of water and sewer services areas in the central part of the town. Coventry is looking to expand their solar and wind capabilities which will change the land use patterns but it is uncertain how it will affect vulnerability. Relying on alternative energy sources may increase resiliency for residents but the structures themselves may be at risk to damage from high winds or other events.

Coventry's vulnerability to natural hazards is not expected to change dramatically over the next five years due to increased development. Enforcement of current building codes will ensure that development will be stronger and more resilient than some of the older structures in Coventry.

Community Assets Matrix

Table 23 Critical Infrastructure/Community Assets Matrix

At Risk	Location	Hazard/Problem	Problem	Mitigation Benefits	Proposed Actions
Flood Prone Drainage Systems	• Laurel Ave. at Washington • Bridge trestle at Main St. (Between Route 116/Knotty Oak Rd. and Route 33/Sandy Bottom Road) • Knotty Oak • Maple Valley • Industrial Drive • Tiogue Ave. between Hopkins Hill Rd. and Jefferson Drive.	Inadequate drainage Flooding Drivers not knowing risk	Flooding of local roads limit access and may strand residents and hinder rescue or evacuation efforts.	Drainage, road access, reducing infrastructure loss.	Action 1-9, and 16-17
Water	Point driven wells at Johnson Pond Private wells in Western Coventry Water used for agriculture and farming	Drought	Low water supply hinders fire suppression as well as private drinking water. Could increase risk of widespread wildfire, and affect human health.	Additional ways to draw water for fire suppression.	Action 10
Electrical / Communication Facilities	Electric distribution substations: St. Vincent DePaul Street @ Washington Street, Indian Trail @ Flat River Road, and 990 Tiogue Ave. Various communication towers, repeaters, and receivers. (See page 77.)	Riverine flooding High wind	Flooding near substation could reduce access during an emergency. High winds could disrupt the system.	Improved resiliency.	None in the scope of this plan update.

At Risk	Location	Hazard/Problem	Problem	Mitigation Benefits	Proposed Actions
Dams	Arnold Pond Dam #561 (**high hazard**) Black Rock Reservoir #185 (**high hazard**) Centre of New England #1, #645 (significant hazard) Coventry Reservoir #176 (**high hazard**) Flat River Reservoir Dam #167 (**high hazard**) Harris Pond #157 (significant hazard) Hopkins Farm Pond #498 (significant hazard Middle Pond Dam #187 (significant hazard) Mill Pond Dam #152 (significant hazard) Pearce Pond #371 (**high hazard**) Quidnick Pond Upper Dam #175(significant hazard) Tiogue Lake Dam #177 (**high hazard**) Upper Pond Dam #186 (significant hazard)	Flooding. Dam failure (failing to open causing flooding upstream and a break in the dam, causing flooding downstream).	Dam failure could lead to damaged roads, flooded homes and businesses, and economic loss.	Structural preservation preventing catastrophic flooding, reducing property loss and protecting public health, safety, and welfare.	Action 11
Populations	Group Homes • 51 Laurel Ave • 18 Reddington St • Marie Drive • 110 Casey Lane • Station Street • Hopkins Hill Rd • Flat River • Groden Center • St. Vincent DePaul St. • Alpine Nursing Home • Woodland Manor Assisted Living • Summer Villa, no staff, no EAP, need better communication. • Centre of New England • Woodpecker Hill Nursing Home • Riverview next to Arkwright	Any hazard that requires evacuation. All hazards.	Special needs populations that may need assistance during hazard events.	Care facilities for welfare improvement of special needs populations.	Action 12-13

At Risk	Location	Hazard/Problem	Problem	Mitigation Benefits	Proposed Actions
Businesses	• Boston Scientific- medical (Industrial Drive)- radiation • Suburban Propane (2030 Flat River Road) • Rhodes Technologies- manufacture active ingredients • Arkwright- located adjacent to the Pawtuxet River • BioSci • Pasteryak Asphalt at 75 Airport Road	Hazardous material spill from any hazard.		Protection of nearby natural resources. Improve protection of public health and safety.	Action 14
Recreation Facilities	Over 35 local parks, fields, and access points within town.	Wildfire. Lightning.	These facilities provide residents of Coventry places to go for recreational and leisure activity. The occurrence of a natural hazard event creates a threat of property damage and natural systems.	Preservation of recreational facilities and reducing risk to residents.	Action 15

5

Programmatic Capabilities

Purpose

This capability assessment examines the existing studies, plans, programs, and policies that have incorporated hazard mitigation and other pro-active tools into the Town system. The purpose of the capability assessment is to highlight successes, identify shortcomings, and to lay the groundwork for possible improvement. Coventry recognizes that the inclusion of mitigation initiatives not only benefits the community by reducing human suffering, damages and the costs of recovery, but also helps build and maintain the sustainability and economic health of the Town. Section 5.2 details the Town's existing relevant plans, programs, and policies that were reviewed during the drafting of this plan.

Primary Plans, Regulations, and Departments

Coventry Comprehensive Plan

The Coventry Comprehensive Community Plan was adopted on August 14, 1992, revised in 1999, and most recently in 2000. The Town of Coventry's Comprehensive Community Plan defines the existing land use, cultural and natural resources, traffic circulation and social and economic conditions within the Town and then outlines the visions, goals and objectives for sustainable growth and development.

Planning department is currently updating the Comprehensive Plan as of May, 2017.

Subdivision and Land Development Regulations

The Coventry Land Development and Subdivision Regulations protect existing natural and built environments and mitigate the significant negative impacts of proposed development on those environments. The regulations also guide land development with an emphasis on siting subdivision improvements so as to allow for the maximum preservation of existing natural features. Further, each subdivision shall be consistent with the requirements of the Coventry Comprehensive Community Plan and/or shall satisfactorily address the issues where there may be inconsistencies. The Planning Commission may modify these requirements if the change is reasonable and within the general purposes and intents of these regulations.

These regulations require developers submit soil erosion & sediment control plans, surface & subsurface storm drainage structures that conform to State standards, designation of flood zone, soils maps, approvals from RIDEM respecting alteration of wetlands, and approvals from Rhode Island Department of Transportation. Further, the regulations do not allow for development in the Special Flood Hazard Area without appropriate permitting procedures. New subdivision developments are required to have utility lines buried to maintain service during high wind events.

Zoning Ordinance

Among other things, the Zoning Ordinance of the Town of Coventry aims to provide guidance for orderly growth and development which recognizes natural land characteristics, values and considers the unique and valuable natural resources and features in town. The Zoning ordinance supports the preservation and promotion of agricultural production, forest, silviculture (growing and cultivating of trees), aquaculture, timber resources, and open space. The Town of Coventry will amend its Zoning Ordinance to be in conformance with the Comprehensive Plan within eighteen (18) months of plan adoption in accordance with the General Laws of Rhode Island, section 45-22.2-5(A)(4). Overall, the zoning ordinance needs to be reviewed and updated to reflect the current goals of the Town.

Emergency Operations Plan (EOP)

Plan for procedures during an emergency. The Comprehensive Emergency Management Plan and the Coventry Emergency Operations Plan need to be integrated into a single document. The Emergency Management Assistant is currently updating this as of May 2017.

Hurricane Operations Plan

The Hurricane Operations Plan is targeted at avoiding losses caused by strong wind events. The Plan identifies and graphically displays emergency evacuation routes and directs those in danger to specific shelters. In addition, the “reverse 911” system

can isolate, identify and notify those individuals in harm's way in anticipation of a natural disaster. The 2005 Hurricane Operations Plan was updated in 2010. Included in this updated Hurricane Plan is mitigation strategy pre-landfall for all of the campgrounds, mobile home parks, rivers and streams as well as "how, when and where" the Town's shelter operations will occur. Evacuation routes and mitigation recommendations for the residents have been included in the plan. This will be an Annex to the EOP. Currently being developed by the Emergency Management Assistant as of May 2017.

StormReady Community

Coventry is a StormReady community, having demonstrated necessary communication and safety procedures needed to save lives and property before and during a storm event. There is an existing notification network, and weather radios and lightning detection devices are distributed throughout town. The Town has adopted Standard Operating Procedures to provide guidance in preparing for and dealing with the effects of hazardous weather conditions. If the Coventry EMA Director is unable to be reached, responders are encouraged to monitor weather activity through RIEMA's WebEOC, National Weather Service Alerts, and Code Red. The Rhode Island State Police provide National Weather Service Alerts over the Openfox Messenger Service.

National Flood Insurance Program (NFIP)

The Town of Coventry is an active and compliant member of the National Flood Insurance Program since 1978. As such, Coventry residents are able to purchase flood insurance to protect their property against flood losses. The Town of Coventry has adopted the most recent (October 2015) Flood Insurance Rate Maps (FIRM) and Flood Insurance Study (FIS). The Town has designated the Town Engineer as the NFIP Coordinator to manage the program. They are available to assist residents with flood insurance rate map questions and coordinate with the State Floodplain Manager during Community Assisted Visits (CAV). The Town will continue to improve public outreach through direct mailings, the municipal website and social media regarding flood hazard risk, flood insurance, and mitigation.

Departments

Emergency Management

The Emergency Management committee meets at least monthly to develop plans and seek funding for response and recovery to local emergencies and hazards. As a result of the Committee's actions grants have been secured for upgrade of communication facilities, public safety equipment and training. Training events have included preparation & response to natural hazards such as hurricanes, dam breeches and flooding. The Town's volunteer CERT team is trained in disaster preparedness for hazards that may impact their area. They learn basic disaster

response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. The purpose of CERT is to assist others in the community following a disaster when professional responders are not immediately available to help.

In the event of an emergency, the EM Department can utilize Code Red, a reverse 911 notification system to alert residents. As of May 2017 there are an estimated 13,000 unique phone numbers on the call list, 1,000 numbers that receive text messages, and a couple hundred registered email addresses. The EM department is also responsible for operation of the Emergency Operations Center during events and organizing points of distribution for necessary commodities such as water. Local heating and cooling centers will be available as per the discretion of the emergency management team.

The EMA Director, the Deputy EMA Director and the Emergency Management Assistant shall continue to upgrade the emergency preparation and response activities. The Coventry Community Emergency Response Team (CERT) has about 9 members who have been trained in disaster preparedness for hazards that may affect their town.

Planning and Development Department

The Department serves many functions related to the physical development of the community. The Planning Department utilizes the Comprehensive Community Plan, the Subdivision and Land Development Regulations and the Zoning Ordinance to administrate and shepherd land use in the Town of Coventry. The department is continuously developing initiatives and making recommendations related to the Town of Coventry's managed growth and preservation of quality of life.

Geographic Information Systems, and Information Technology/Communications

Coventry began implementing its Geographic Information System (GIS) in 1998, and currently hosts an online viewer with multiple unique layers. The Town also has an Information Technology/Communications department which maintains the Town's website and general messaging.

The Town of Coventry holds more than 12 FCC Radio Authorization licenses for use in Public Safety Communications. In addition, the Town has resources available in the Amateur Radio Community where individuals are licensed by the FCC to operate equipment at an amateur radio station to engage in two-way personal communications with other amateur operators on radio frequencies assigned to the amateur radio service.

The Coventry Police Department has the ability to operate on Public Safety bands-VHF/800MHz as well as Amateur Radio 2 meter. The Department has both mobile and hand-held radios in all the above bands to insure operability during all events.

The Coventry EMA also has the ability to operate on Public Safety bands- VHF/UHF/800MHz. The Department has both mobile and hand held radios in all the above bands to insure operability during all events.

The EMA sponsors an AMC (Amateur Radio Club) KC1CUE with about 20 members. They maintain amateur radios in the EOC with 2 mobile radio go-kits to work outside of the building if needed. The Coventry EMA is in the process of forming a relationship with Rhode Island ARES (Amateur Radio Emergency Service) whose mission is to develop and maintain an appropriately trained pool of Amateur radio operators who are available and qualified to provide situational awareness, auxiliary, public service, health and welfare and emergency communications support to any incident response agency requiring those services and to the people of RI in times of need.

Communication equipment is located throughout the Town.

- Communication Towers/Repeaters
    - 570 Read School House Rd. (Police and Fire)
    - 210 Piggy Ln. (Ri13844-a) (Police and EMA)
    - Waterman Hill Rd. (Police and Fire)
    - 1075 Main St.
    - 1111 Main Street (Fire)
    - 40 Reservoir Rd.
    - 1675 Flat River Road (Amateur Radio)
- Police Department Receivers
    - 571 Washington St.
    - 40 Reservoir Rd.
    - 546 Main St.
- Cell Towers (privately owned)
    - 210 Piggy Ln. (Ri13844-a)
    - Provident Place (Ri13843-a)
    - 40 Reservoir Rd. (4pr0671c)
    - 12 La Casa Dr. (4pr0672b)
    - Arnold Rd. Exit off Rt. 95
    - 50 Wood St.

Public Works

The Department of Public Works consists of the following divisions: Engineering, Building Inspector, Roads and Bridges, Snow Removal, Building Maintenance, Sanitation, Sanitary Sewer, Cemetery Maintenance, and Vehicle Maintenance. The department is responsible for the engineering, maintenance and construction of roads and bridges along with storm water systems, traffic and street signs, winter storm operations and sanitation services. The Public Works Department also engages in precautionary tree trimming to reduce damage during a wind or ice storm.

The Coventry Department of Public Works is a member of the Rhode Island Public Works Association. Through this involvement, employees have access to high quality training and educational opportunities and participate in a forum for an exchange of information within the public works community.

The Building Inspector's office works with the Engineering Division in issuing new building permits, Minimum Housing, ISDS compliance, subdivision and other regulation compliance, provides review of plans, and inspects construction.

The Building/Facilities Division is responsible for the upkeep and general maintenance of all municipal buildings and grounds, with the exception of those belonging to the School Department or Parks and Recreation.

There is currently no formalized snow removal and ice management plan which prioritizes road clearing during a major snow storm.

Dam 186, Upper Pond Dam, is owned by the Town of Coventry and is involved in a consent agreement. A contract was awarded in September 2017 to begin dam repairs in Fall 2017. Dam repairs are expected to be substantially completed by the end of 2017.[35]

Police Department

The Coventry Police Department consists of 57 sworn officers supported by 17 professional staff employees. The department provides law enforcement services to a population of approximately 36,000 residents who reside within 64 square miles. A new public safety building was approved by voters in 2016. The new facility will house a new EOC and a new dispatch center for fire and police.

The Town is expanding their Code Red Emergency Notification System capabilities. As of July 2017, they are able to use it for non-emergencies where the dissemination of timely community information is important.

Fire Departments

Coventry has 5 stations within 4 fire districts departments available to respond to emergencies. The Central Coventry fire department has 30 sworn officers, and 6 administrators. The Western Coventry fire district has 2 full time employees, up to 12 volunteers, and 7-8 civilian staff. The Hopkins Hill fire department has 8 full time employees, up to 4 administrators, and several volunteers. The Anthony fire district has 9 full time employees and 1 administrator. Fire dispatch is managed by the Hopkins Hill Fire District chief.

Parks and Recreation

The Coventry Parks & Recreation department manages the local conservation areas, beach, and waterfront sites, as well as the sports fields. Every sports league and

[35] As per a conversation with Coventry DPW Director on 9/27/17.

umpire that uses the fields is trained in lightning detection and safety. StormReady weather radios and lightning detectors are used at every Parks & Recreation sponsored event. Parks and Recreation are also available to staff assist with disaster response.

Coventry School Department

The School Department has a system in place to ensure the timely and safe removal of snow from school roofs and access areas, thus preventing structural damage and protecting human safety. The State has invested in capital improvements in schools in Coventry. Each school has their own Emergency Management plan to guide actions during an event. There is also a District School Safety and Security Committee that addresses active shooter training and exercises. The combination of these elements strengthens the Town's ability to respond to and recover from a disaster.

Town Council & Town Manager

The 5-member Town Council appoints the Town Manager who is the chief administrative officer of the Town. The Town Manager is responsible to the Town Council for the administration of all town affairs.

The Town Council approves local hazard mitigation plans and zoning ordinances.

Conservation Commission

The Conservation Commission consists of 5 Coventry residents appointed by the Town Manager. The Conservation Commission shall act in an advisory capacity to the Town Council and the Town Manager, and its purpose is to promote and develop the natural resources, to protect the watershed resources, and to preserve natural aesthetic areas within the Town.

Planning Commission

The 9-member Commission shall act in an advisory capacity to the director of planning and development, the Town Manager and the Town Council, in all matters concerning the physical growth and development of the Town as such growth and development affects the general health, safety and welfare of the inhabitants of the Town. The Planning Commission has encouraged developers to utilize residential cluster developments rather than conventional subdivision techniques. Cluster developments reduce the amount of impervious surface of roadways and provide more open space. The Planning Department, Planning Commission, and Building official have engaged in regulatory implementation measures targeted towards mitigating the potential impacts of natural disasters.

Coventry Land Trust

The Coventry Town Council in conjunction with the Rhode Island Legislature established the Coventry Land Trust in February of 1999. Many communities have created Land Trusts to preserve and protect open space and the Coventry Land Trust is the town's vehicle to promote preservation of Coventry's rural, rustic and historic character that defines the town. Members of the Land Trust are volunteers appointed by the Town Council who share the goal of preserving and protecting the Town's precious lands for future generations.

The Land Trust strives to preserve open space, protect wetlands, water bodies, ground and surface water resources, farm lands, historical or cultural places of interest, scenic views, unusual, exceptional or exemplary natural habitats. Land Trust held properties hopefully will provide opportunities for research and education on natural resources. Land Trust properties, unless restricted, are open to the public for passive recreation.

Sheltering

Coventry High School can shelter up to 2,000 individuals but has never been utilized to that level. During Hurricane Irene in 2011, only a dozen people came to the shelter. Most went to West Warwick. As of September 2017, a new sheltering plan is being drafted by the Emergency Management Assistant that will include Summit Station 2 at 1110 Victory Highway as an alternate shelter facility. The new Human Resources and Police Complex will also serve as a shelter. If necessary, the library and Senior Center are available during the day as a heating or cooling centers.

State Programs

Rhode Island State Building Code

All municipalities within the State of Rhode Island share a single building code (RIGL 23-27.3-100 et. al.). The Code itself (which incorporates the International Building Code) was last amended in 2012 and provides comprehensive construction requirements designed to mitigate the impacts from natural hazards, such as high wind events. The Code is enforced by the Coventry Building Department and provides an additional layer of regulatory control to those discussed above.

Rhode Island State Fire Code Regulations

Coventry has adopted the RI Fire Safety Codes to safeguard life and property from the hazards of fire and explosives in accordance with safe practice. The Code is enforced by the Coventry Fire Departments and provides reasonable minimum requirements for fire prevention and protection.

Rhode Island State Dam Safety Program

The Town of Coventry has 5 high hazard and 8 significant hazard dams and participates in the State Dam Safety Program. The Program was created to facilitate the enforcement of the primary dam inspection laws Rhode Island General Law (RIGL) 46-19, Inspection of Dams and Reservoirs). RIGL 46-19 states that dam owners are responsible for the safe operation, maintenance, repair, and rehabilitation of a dam, which are the essential elements in preventing dam failure; furthermore, dam owners are liable for the consequences of accidents or failures of their dams. According to the State of Rhode Island 2016 Dam Safety Program Report, the following have been identified as program limitations: unclear ownership of numerous high hazard dams, construction of buildings within inundation areas below dams, lack of funding to repair of remove privately owned dams, inadequate spillway capacities and engineering analyses, lack of Emergency Action Plans across the state, inadequate staffing, increase in rainstorm intensities. Of the 13 high and significant hazard dams in Coventry, all have Emergency Action Plans on file.

Rhode Island DEM Wetland Regulations

The Rhode Island Department of Environmental Management is responsible for regulating alterations of the freshwater wetlands throughout the State. Since many floodplains are also wetlands, appropriately managing these resources help maintain proper floodplain function. These regulations ensure that actions in this plan which will alter the physical landscape will not do so at the expense of wetlands.

6

Mitigation Actions

Mission Statement

Minimize the loss of life, property, cultural and environmental resources from natural disasters and to better develop programs to educate the public on issues related to hazard mitigation while bolstering communications between local officials and RIEMA.

Mitigation Goals

Through these mitigation goals, the Coventry Hazard Mitigation Plan Committee aims to:

- Promote projects & programs which minimize losses associated with natural and manmade hazards.
- Improve communication amongst public agencies.
- Increase public understanding and support for hazard mitigation.
- Enhance communications to residents and business owners- engagement opportunities.
- Improve readiness.

Status of Actions Proposed in 2010

Coventry's Hazard Mitigation Plan 2010 Update proposed a mitigation strategy with actions that covered all the hazards of concern. Details for each action were not

provided to the level that would be helpful today. The table below summarizes the status of previous actions.

Table 24 Status of 2010 Actions

Action	Status	Reason why it is not complete (if applicable)	Other comments
Develop Dam EAPs	Ongoing	✓	The Town has a continued responsibility for the functionality and safety of the dams, regardless of owner.
Dam inspection	In progress Ongoing capability	✓	
Review of inundation maps and FIRM maps	Ongoing capability	✓	
Stockpile sandbags and gravel at DPW, publish on website preceding an event	Completed	✓	
Update Zoning Ordinance and Subdivision & Land Development Regulations to reflect prohibition of land development in SFHA	Not completed	Unknown	To be revisited in 2018 plan.
Encourage Low Impact Development, cluster development	In Progress	✓	Cluster development regulations were added to the Subdivision & Land Development regulations in 2013.
Home acquisition/relocation downstream of Washington Bridge	Not done	Shift in priority to acquisition on Isle of Capri.	Will reconsider after flood event.
New and larger box culverts at Johnson Blvd, York Dr., Twin Lakes Ave, Lydia St & King St	Not done	Inadequate funding.	Shift to educate residents about temporary flooding in 2018 plan.
Catch basin and a "Vortex" drainage system at Rawlinson Dr., Mohawk St, Mead St & Seneca St.	Completed	✓	
Box culvert on westerly side of Club House Road	Completed	✓	
Engineering study for Jefferson Dr./Tiogue Ave.	Not done	RI Department of Transportation project.	Coordinate with RIDOT for 2018 plan
Culverts and channel at Industrial Dr./Flat River Road	Not done	Inadequate funding.	To be revisited in 2018 plan
Box culvert at Maple Valley Rd.	Completed	✓	

Action	Status	Reason why it is not complete (if applicable)	Other comments
Culvert at Franklin Rd. and Hammet Rd.	Hammet completed	✓ Inadequate funding for Franklin Rd.	Franklin Rd. culvert to be revisited in 2018 plan.
Box culvert at Sisson Rd.	Not completed	Inadequate funding	
Detention basin at Maple Street	Completed	✓	
Detention basin at Ginger Trail	Completed	✓	
Culvert at Nelson Capwell Road	Not completed.	Inadequate funding	Install in conjunction with Sisson Rd. box culvert.
Inspection and improvements of outfalls	Ongoing	✓	
Expansion of sewers	Ongoing	✓	East Shore Drive is being sewered now.
Flat River Reservoir	Completed	✓	
Quidnick Upper	Unknown	Private dam, no town jurisdiction	
Anthony (Mill Pond)	Unknown	Private dam, no town jurisdiction	Owned by mill.
Washington Upper	Unknown	Private dam, no town jurisdiction	
Harris Pond	Unknown	Private dam, no town jurisdiction	
Arkwright	Unknown	Private dam, no town jurisdiction	Arkwright mill.
Tiogue Lake	Complete	✓	New culvert and spillway across from Benny's
Increase the number of dry hydrants and cisterns in the rural area of town	Complete. Ongoing expansion.	✓	Currently there are 3 dry hydrants Over the next 3-5 years, would like 4 more.
Buy a storm tracking device	Complete	✓	Town was given 4 handheld storm trackers via StormReady.
Develop fire lanes in the forested areas of western and central Coventry along Trestle Trail.	Not complete	RIDEM responsibility	
Fire education	Ongoing	✓	
Offer lightning safety class	Not complete	Not a priority	Could be part of larger HazMit public education library

Action	Status	Reason why it is not complete (if applicable)	Other comments
Wind info for homeowners	Not complete	Not a priority	Could be part of larger HazMit public education library
Use of CDBG funds to bring low income homes up to code	Ongoing	✓	Funds have been given to recipients for septic system updating and for other structural repairs; program remains ongoing
Implement evacuation procedures for mobile home residents	Not complete	No longer a priority. Evacuations are voluntary	
Establish pet safe areas near shelters	Complete	✓	Completed by Animal Control Officer
Inspections for low-income mobile home owners	Ongoing	✓	Only when an applicant is requesting CDBG funds.
Purchase illuminated weather advisory signs	Complete	✓	
Winter brochures or info on Town website	Not complete	Not a priority	Could be part of larger HazMit public education library
Coordination with the State of Rhode Island's Water Resources Board and Kent County Water Authority	Ongoing	✓	Two Town members on Water Board.
Public information material made available about drought	Not complete	Not a priority	Could be part of larger HazMit public education library
Adopt Aquifer Protection District by ordinance based upon wellhead protection areas.	Not complete	Funding not prioritized.	
Subdivision regulations to limit density of development	Ongoing	✓	
Periodic inventory of potential contamination sources within the wellhead protection areas should be conducted.	Not complete	Funding not prioritized.	
Designate safe places in public buildings	Not complete		Could be part of larger HazMit public education library
Develop tornado plans	Not complete	Not a priority	
Provide a NOAA radio in public safety complexes and EOC	Complete	✓	

Action	Status	Reason why it is not complete (if applicable)	Other comments
Identify measures to evacuate and accommodate people w special needs	Complete	✓	Promote Special Needs Registry
Tornado Public Education	Not complete	Not a priority	Could be part of larger HazMit public education library
Earthquake Public Education	Not complete	Not a priority	Could be part of larger HazMit public education library
Retrofitting and strengthening roof structures of high school (shelter), Town Hall Annex, and Human Services facilities (shelter).	In progress	✓	
Repairs to Tiogue Land Dam and Flat River Reservoir Dam and their spillways	Complete	✓	

Mitigation Actions

The Coventry Hazard Mitigation Plan Committee decided to propose actions that addressed certain vulnerabilities that were identified earlier in the planning process. See Chapter 4.

The text following the table below summarizes the specific problem and proposed possible solution, details the primary tasks to be undertaken, identifies an appropriate lead and anticipates financing options. Each action was given a priority ranking of low, medium, or high as determined by the Committee. The Committee understands that implementation of many of these proposed actions require the Town to secure external funding.

There are necessary planning elements that need to be completed before additional mitigation actions can be considered. The Committee has identified a range of actions below, some of which are planning. However, there is a mitigation action identified for each vulnerable area where applicable.

Priority Level

- High: Reduces the greatest risks, is important to accomplish first
- Medium: May need other actions to be completed first
- Low: Less of an impact on safety and property

Time Frame (from date of plan adoption)

- Short Term: within 1-3 years
- Medium Term: within 3-5 years
- Long Term: greater than 5 years

Flood Prone Drainage Systems

Through this planning process, the Committee identified two types of street flooding issues. One is nuisance flooding in which streets are temporarily flooded during a heavy rain event but then quickly drain. The Committee has decided that educating residents and drivers about these hazards is the best way to protect life and property. The second type of street flooding is when the water does not drain quickly, indicating an inadequate drainage system. The following proposed actions address improvements to these areas that could benefit from structural enhancements.

- **Action 1** – Install larger culverts at bridge trestle at Main St. (Between Route 116/Knotty Oak Rd. and Route 33/Sandy Bottom Road).

  Mitigation Action Type: Property Protection and Structural Projects
  Priority: Low
  Lead: RIDOT
  Support: Coventry DPW
  Financing Options: FEMA Pre-Disaster Mitigation, FEMA Flood Mitigation Assistance, RI DEM, RIDOT
  Cost Estimate: $500,000
  Time Frame: Long Term
  Benefit: Reduce street flooding at the corner of Sandy Bottom Road and Main Street during a heavy rain event.

- **Action 2** – Install additional culverts along Maple Valley Road

  Mitigation Action Type: Property Protection and Structural Projects
  Priority: Low
  Lead: Coventry DPW
  Support: RIDOT
  Financing Options: FEMA Pre-Disaster Mitigation, FEMA Flood Mitigation Assistance, RI DEM, RIDOT
  Cost Estimate: $500,000
  Time Frame: Medium Term
  Benefit: Reduce street flooding along Maple Valley road during a heavy rain event

- **Action 3** – Improve drainage with larger collection system along Knotty Oak Road/Route 116. Repaved 2015 but drainage did not improve. Area slow to drain during the floods in 2010.

  Mitigation Action Type: Property Protection and Structural Projects
  Priority: Low
  Lead: RIDOT
  Support: Coventry DPW
  Financing Options: FEMA Pre-Disaster Mitigation, FEMA Flood Mitigation Assistance, RI DEM, RIDOT
  Cost Estimate: Unknown. $500,000
  Time Frame: Long Term
  Benefit: Reduce street flooding at Knotty Oak during a heavy rain event.

- **Action 4** – Install culvert at Franklin Road south of Maple Valley Road.

  Mitigation Action Type: Property Protection and Structural Projects
  Priority: Low
  Lead: Coventry DPW
  Support: RIDOT
  Financing Options: FEMA Pre-Disaster Mitigation, FEMA Flood Mitigation Assistance, RI DEM, RIDOT
  Cost Estimate: $250,000
  Time Frame: Medium Term
  Benefit: Reduce street flooding at Franklin Road near Flat River during a heavy rain event.

- **Action 5** – Install culvert at Sisson Road near Sisson Pond.

  Mitigation Action Type: Property Protection and Structural Projects
  Priority: Low
  Lead: Coventry DPW
  Support: RIDOT
  Financing Options: FEMA Pre-Disaster Mitigation, FEMA Flood Mitigation Assistance, RI DEM, RIDOT
  Cost Estimate: $250,000
  Time Frame: Medium Term
  Benefit: Reduce street flooding at Sisson Road during a heavy rain event.

- **Action 6** – Install culvert at Nelson Capwell Road near Warwick Brook.

  Mitigation Action Type: Property Protection and Structural Projects
  Priority: Low
  Lead: Coventry DPW
  Support: RIDOT
  Financing Options: FEMA Pre-Disaster Mitigation, FEMA Flood Mitigation Assistance, RI DEM, RIDOT
  Cost Estimate: $250,000
  Time Frame: Medium Term
  Benefit: Reduce street flooding along Nelson Capwell Road during a heavy rain event.

- **Action 7** – Install culverts and a channel on Industrial Drive at Flat River Road

  Mitigation Action Type: Property Protection and Structural Projects
  Priority: Low
  Lead: Coventry DPW
  Support: State
  Financing Options: FEMA Pre-Disaster Mitigation, FEMA Flood Mitigation Assistance, RI DEM, RIDOT
  Cost Estimate: $1.2 million
  Time Frame: Long Term
  Benefit: Reduce street flooding along Industrial Drive during a heavy rain event and eliminate choke point at trestle.

- **Action 8 (Step 1)** – Perform an engineering study for Tiogue Avenue (state owned) from Hopkins Hill Road to Jefferson Drive.

  Mitigation Action Type: Planning
  Priority: Low
  Lead: RIDOT
  Support: Coventry DPW
  Financing Options: Coventry DPW budget
  Cost Estimate: $45,000
  Time Frame: Medium Term
  Benefit: To better inform drainage infrastructure improvements

- **Action 8 (Step 2)** – Install a larger drainage pipe along Tiogue Avenue (state owned) from Hopkins Hill Road to Jefferson Drive.

  Mitigation Action Type: Property Protection and Structural Project
  Priority: Low
  Lead: RIDOT
  Support: Coventry DPW
  Financing Options: RIDOT
  Cost Estimate: $150,000 (depending on the results of the engineering study)
  Time Frame: Long Term
  Benefit: Reduce street flooding at Saint John and Paul's Church and Jiffy Lube during a heavy rain event

- **Action 9** – Update Zoning Ordinance and Subdivision & Land Development Regulations to reflect prohibition of land development in SFHA.

  Mitigation Action Type: Prevention and Natural resource protection
  Priority: Low
  Lead: Coventry Zoning Department
  Support: Coventry Planning Department
  Financing Options: Coventry Zoning budget
  Cost Estimate: staff time
  Time Frame: Medium Term
  Benefit: Consistency, encouraging development outside of the more hazardous floodway.

Water

During extended drought conditions, the Town is most concerned about the fresh water wells used by most residents, as well as water available for fire suppression.

- **Action 10** – Add 4 more dry hydrants in the rural areas of town.

  Mitigation Action Type: Property Protection and Structural Project
  Priority: Low
  Lead: Coventry Fire Department Chief Brown
  Support: RIDEM
  Financing Options: RIDEM dry hydrant grants
  Cost Estimate: $2,000 to $6,000 per location
  Time Frame: Medium Term

Benefit: Improve availability of water for firefighting

Electrical Facilities

The electrical distribution substation at St. Vincent DePaul Street and Washington Street floods. The site is located less than 400 feet from the South Branch of the Pawtuxet River (elevation). Temporary flooding has not caused any disruption in service. The site and equipment is owned by Narragansett Electric.

Dams

The Town of Coventry is currently undergoing efforts to develop dam Emergency Action Plans (EAPs) as well as regular inspections. If dam conditions change or if the natural or built environments change, the Committee may propose additional hazard mitigation actions. Coventry has no jurisdiction over the private and state-owned dams and can only suggest improvements. Prior projects have built up dam resiliency throughout the town.

› **Action 11** – Inventory the operating systems of the dams. Most have antique gates that may not effectively open if necessary.

Mitigation Action Type: Planning
Priority: Low
Lead: Coventry EMA Assistant and DPW staff
Support: none
Financing Options: Emergency Management and DPW budget
Cost Estimate: Staff time
Time Frame: Short term
Benefit: Defective gate systems could be recommended for replacement by the owner. This would lead to better protection of residents both upstream and downstream of the dam.

As a note, private owners recently spent $100,000 to replace the antique gates at Tiogue dam. These projects are large undertakings.

Populations

The Group Homes, and Assisted Living complexes are not managed by the Town. However, the following actions are proposed to improve pre-and post-disaster communication among the owners, residents, and local responders.

› **Action 12** – Review copies of the Group Home Emergency Action Plans which should be on file with the Department of Health.

Mitigation Action Type: Planning
Priority: Low
Lead: Coventry EMA Assistant and Fire Chief
Support: None
Financing Options: Emergency Management and Fire Department budget
Cost Estimate: Staff time

Time Frame: Short term
Benefit: Improve ability of the first responders to assist should there be a need for a mass evacuation or other emergency.

- **Action 13** – Coordinate with RI Department of Health to encourage Summer Villa (Assisted Living) to develop an Emergency Action Plan.

  Mitigation Action Type:
  Priority: Medium
  Lead: Coventry EMA Assistant and Fire Chief
  Support: RIDOH and Coventry Human Services
  Financing Options: Emergency Management and Fire Department budget
  Cost Estimate: Staff time
  Time Frame: Short term
  Benefit: Improve ability of the first responders to assist should there be a need for a mass evacuation or other emergency. Especially since Summer Villa has no overnight staff.

Businesses

Several businesses within Coventry store hazardous materials on-site.

- **Action 14** – Review and educate local response team on the Emergency Action Plans for Boston Scientific, Suburban Propane, Rhodes Technologies, BioSci, and Pasteryak Asphalt

  Mitigation Action Type: Planning
  Priority: Low
  Lead: Coventry EMA Assistant and Fire Chief
  Support: LEPC4
  Financing Options: Emergency Management and Fire Department budget
  Cost Estimate: staff time
  Time Frame: Short term
  Benefit: Improve ability of the first responders to assist should there be a need for a mass evacuation or other emergency.

Recreation Facilities

There are over 35 local parks, fields, and access points within the town. See Appendix B.

- **Action 15** – Create a Forest Management Plan which includes an inventory and map of the natural resources on the land, objectives for the land, a defined schedule of activities that will help meet the Town/State goals while protecting the health of the forest.

  Mitigation Action Type: Natural Resource Protection
  Priority: Low
  Lead: Parks and Recreation Department
  Support: RIDEM

Financing Options: Natural Resource Conservation Service (NRCS) RI, RI DEM Division of Forest Environment, USDA Forest Service, Northeastern Area State & Private Forestry.
Cost Estimate: $25,000
Time Frame: Medium term
Benefit: Reduce the risk of widespread and dangerous forest fires.

Residents

The Committee agreed that Coventry residents could benefit from education to reduce their risk from hazards that are not an everyday occurrence.

- **Action 16**- Create an online hazards education public library which houses informational material on extreme temperatures, drought, wildfires, tornadoes, earthquakes, and lightning.

  Mitigation Action Type: Prevention
  Priority: Medium
  Lead: Coventry EMA Assistant
  Support: None
  Financing Options: Emergency Management budget
  Cost Estimate: Staff time
  Time Frame: Short term
  Benefit: Smarter citizens make smarter choices

- **Action 17**- Distribute messaging on road closures due to temporary flooding. Run a public service campaign about temporary street flooding and the danger of trying to drive through water.

  Mitigation Action Type: Prevention
  Priority: Low/Medium
  Lead: Coventry Police Department
  Support: Coventry EMA Assistant, Coventry DPW
  Financing Options: Police Department budget
  Cost Estimate: Staff time
  Time Frame: Short term
  Benefit: Smarter citizens make smarter choices

7

Implementation and Adoption

Prioritization of Mitigation Actions

Having identified a range of appropriate mitigation actions the Coventry Hazard Mitigation Committee set about prioritizing them for implementation. THMC had an informed roundtable discussion on 5/23/17 about the prioritization of each action. They ranked each as "high", "medium", and "low". See Table 25 below. It is understood that these ranks may change and will be re-considered when the plan is updated.

The following were considered when ranking the actions:

- Protecting human health and safety
- Reducing damages
- Economic feasibility
- Current Town needs
- Environmental impact

High Priority: Greatest beneficial impact

Medium Priority: May need other actions to be completed first

Low Priority: Less of an impact on safety and property

Table 25 Priority of Mitigation Actions

High	(none)
Medium	Summer Villa EAP
	Public hazards library
	Road closure messaging
Low	Larger culverts at bridge trestle at Main St.
	Additional culverts along Maple Valley Road
	Larger collection system along Knott Oak Road/Route 116
	Culvert at Franklin Road
	Culvert at Sisson Road
	Culvert at Nelson Capwell Road
	Culvert and channel on Industrial Drive
	Engineering study for Tiogue Ave.
	Larger collection system along Tiogue Ave.
	Update Zoning Ordinance
	Install additional dry hydrants
	Dam flood gate inventory
	Review group home EAPs
	Hazardous chemical training
	Forest Management Plan

Implementing the Plan

The Town of Coventry and the Coventry Hazard Mitigation Plan Committee realize that successful hazard mitigation is an ongoing process that requires implementation, evaluation, and updates to this plan. The Town also understands the importance of integrating appropriate sections of the plan into the Town's Comprehensive Plan, Emergency Operations Plan, and site plan review process. It is intended that this plan and the ongoing efforts of the CHMPC will preserve and enhance the quality of life, property, and resources for the Town of Coventry.

Adoption of this mitigation strategy increases Coventry's eligibility for federal hazard mitigation grants. These grants originate from FEMA's Pre-Disaster Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM) and post-disaster Hazard Mitigation Grant (HMGP) Programs. (Refer to Appendix B for further information.)

Monitoring

The CHMPC, under the leadership of the Town's Emergency Management Assistant, will meet annually (or more frequently if necessary), to monitor and evaluate the actions contained in the plan. At each meeting, the committee members will discuss the actions assigned to them to ensure continual progress with mitigation efforts. The status of each mitigation action will be documented and minutes recorded for the record. The CHMPC will also continue to re-evaluate membership on the

committee to ensure effective engagement of the appropriate parties. New members may be invited to serve on the CHMPC as priorities shift.

Evaluation

At the annual meetings, the CHMPC will evaluate both the actions and the planning process. The CHMPC will base its evaluation on whether or not the actions have met the following criteria: increased public awareness/education, reduction in hazard damage, actions being implemented in the designated time frames, and actions staying within the cost estimate. The committee will document and report its findings to the Planning Board and Town Council. The CHMPC will involve the public in the action evaluation process by holding an annual advertised public meeting in order to review the evaluation and solicit input.

During the annual evaluation process, the plan will be promoted online, in the local library, at Town Hall, and the Senior Center for public review. Comments and suggestions can be sent directly to the Emergency Management Assistant or brought up at the advertised public meeting.

Revisions

Recognizing that this is a living document, the CHMPC will make changes to it after each annual revision or a disaster, as conditions warrant. These revisions will also reflect changes to priorities and funding strategies that may have been implemented.

A full revision of the plan will commence a year in advance of the current plan expiration date in order to ensure the Town always has an approved plan. The update will be completed every five years and will incorporate a formalized process for prioritizing actions and weighing the cost/benefit of such actions. All updates or revisions to the plan will be submitted to the RIEMA. The Town Council will involve the public in the plan revision process by holding an annual advertised public meeting to present recommended revisions and solicit input. Revised plans will also be sent to the neighboring communities for comment.

All future meetings will again be open to the public and it is the hope of the CHMPC Committee that once the public education and outreach actions begin, public involvement in the Plan will increase and will be reflected in future revisions. The CHMPC will involve the public in the annual meeting by posting it on the website, in the local library, and in the local newspaper to encourage involvement.

Adoption

After each evaluation cycle (every 5 years), the Coventry hazard mitigation plan will be presented to and adopted by the Town Council. The associated ordinance documentation will be kept as part of this plan.

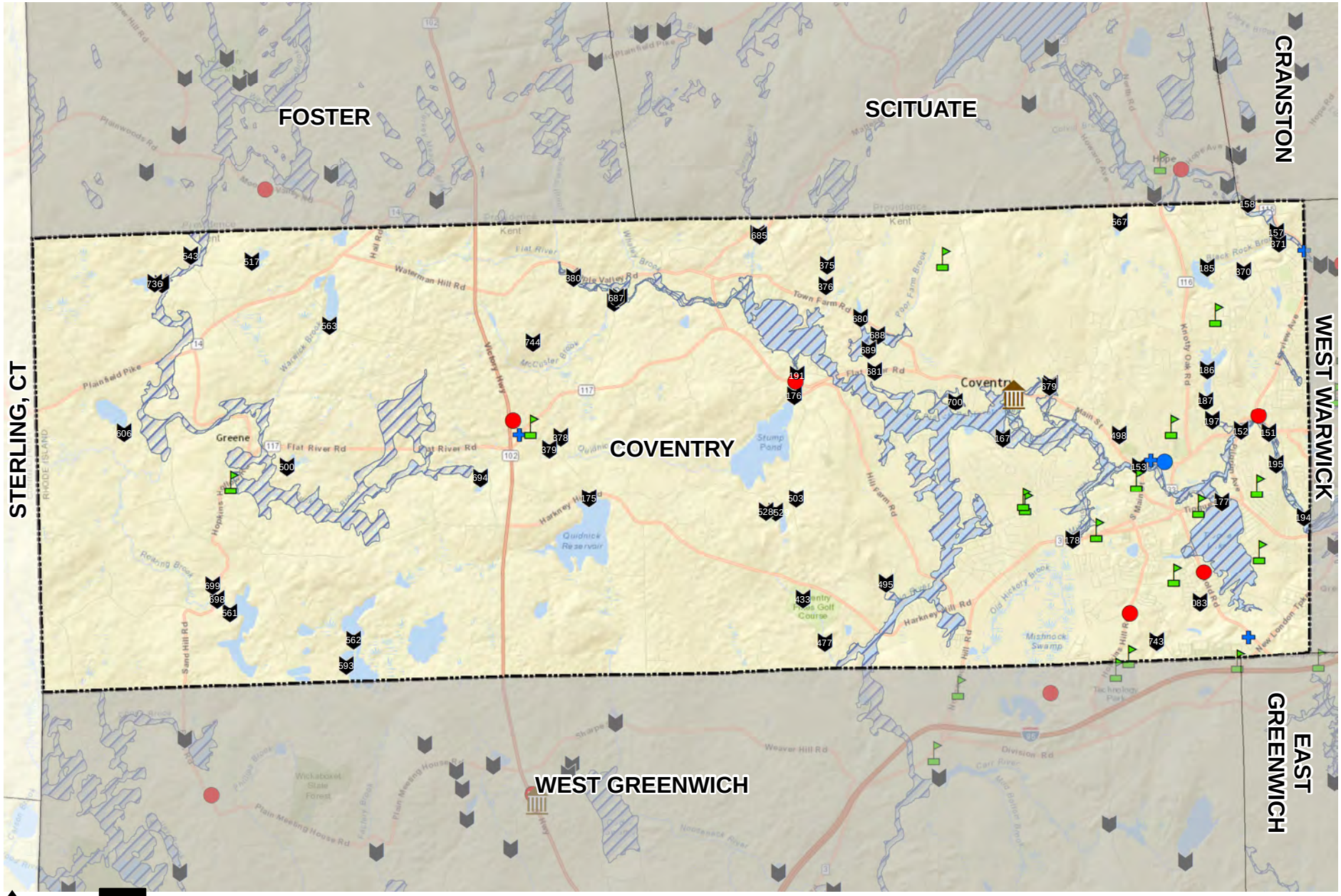
Appendices

A. Resources Map which will include dams
B. List of Recreation Department Resources
C. Public Notices
D. Hazards Survey
E. Resources

Appendix A

Coventry Resource Map

June 16, 2017



0 2500 5000 10000 Feet

Coventry Community Resources | Coventry, RI

Legend

- Dams
- Town Hall
- Schools
- Fire Stations
- Police Stations
- EMS Facilities
- Dams
- Special Flood Hazard Area
- Town Line

Source: RIGIS (May 2017)

Appendix B

Town Parks and Recreation Facilities

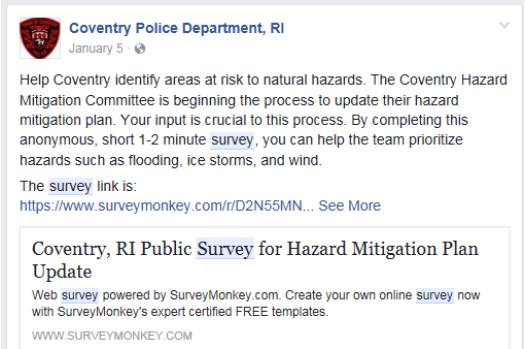
Park	Location	Acres
Alan Shawn Feinstein Middle School- Fields	15 Foster Dr.	1
Anthony Mill Workers House (1800 House)	Located on Route 117 near the Anthony Mill Apartments.	0.39
Anthony Village Green- AMVETS Memorial Park	Across from Anthony Mill Apartments	0.34
Arnold Road Veteran's Memorial	Arnold Rd.	0.25
Breezy Lake/ Green Acres Beach	Off Knotty Oak Rd.- down White Rock Rd.	8.84
Briar Point Beach Area	At the end of Briar Point Ave. Off of Arnold Road	7.48
Carbuncle Pond	Owned by DEM	106
Central Coventry Park	275 Provident Place	28.4
Colonial Acres Park	Jefferson Drive	2.27
Coventry Focal Point	Corner of Tiogue Ave and Sandy Bottom Road- 763 Tiogue Ave	0.5
Coventry Greenway	Park and access: On Town Farm Rd. and Station St.	49.9
Coventry Teen Center	668 Washington St.	0.2
Fish Hill Field	130 Fish Hill Rd.- Owned by DEM- P&R takes care of one field	38
Foster Memorial Park	177 Station St.	100.6
Francis Sherman Park	140 Old Flat River Rd.	2.1
Hall Conservation Area	Phillips Hill Rd.	
Harkney Hill Baseball Field	Corner of Phillips Hill Rd. and Harkney Hill Rd.- Owned by DEM	99
Harris Playground	Howard Ave.	1.3
Herbert F. Paine Memorial Park	1277 Main St.	15.4
Highwood Playground	Ginger Trail off Station St.	.60 net
Hope Meadows	Route 117- near Whipple Ct.- Owned by Land Trust	5.85
Hopkins Hill Rest Area	Hopkins Hill Rd, approx. 1/4 a mile from Tiogue Ave. 123 Hopkins Hill Road	<1.00
Hunters Crossing (John Giblin Memorial Park)	54 Hunters Crossing Drive	10.38
Maple Root Baptist Church Cemetery	Intersection of Hill Farm and Harkney Hill Road- Owned by the Church	3.2
Merrill S. Whipple Conservation Area	Route 117 behind Merrill Motors. Main St.	28.5
Pawtxet River Access/ Sandy Acres	100 Sandy Bottom Road	17.8
Quidnick Field	195 MacArthur Blv.	3.5
Ravenwood Recreation Area	Raven Blvd off of Route 102	19.1
Rice Field	21 Knotty Oak Rd	8.8
Stump Pond Access	Hall Conservation Area off Phillips Hill	<1.00
Tiogue Ave Veteran's Memorial	Corner of Arnold Rd. and Tiogue Ave- Maintained by Knights of Columbus	0.25
Tiogue Boat Ramp	Tiogue Lake across from Benny's 446 Tiogue Ave	<1.00
Town Hall Annex	1675-91 Flat River Rd.	5
Trestle Park	Located off Fairview Ave- Maintained by Veterans	<1.00
Walker Farm Preserve	Beginning of Walker Lane behind Town Hall Annex- Not maintained by P&R	19.32
Wood Street Field	60 Wood St. Behind Coventry Senior Center	1.4
Zeke's Bridge Boat Ramp on Johnson's Pond	472 Harkney Hill Road- Bridge owned by DEM	<1.00

As of 6/16/2017 as per the Town of Coventry's website.

Appendix C

Public Notices

FACEBOOK 1/5/2017



Coventry Police Department, RI
January 5 ·

Help Coventry identify areas at risk to natural hazards. The Coventry Hazard Mitigation Committee is beginning the process to update their hazard mitigation plan. Your input is crucial to this process. By completing this anonymous, short 1-2 minute survey, you can help the team prioritize hazards such as flooding, ice storms, and wind.

The survey link is:
https://www.surveymonkey.com/r/D2N55MN... See More

Coventry, RI Public Survey for Hazard Mitigation Plan Update

Web survey powered by SurveyMonkey.com. Create your own online survey now with SurveyMonkey's expert certified FREE templates.

WWW.SURVEYMONKEY.COM

Public Notice for Review

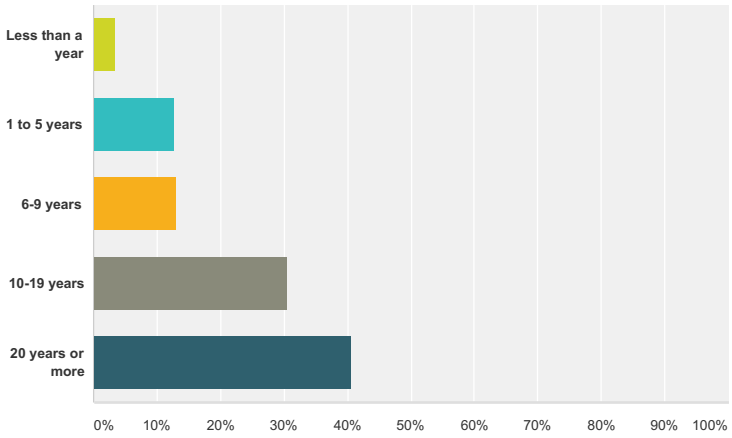
Town Council Announcement

Appendix D

Public Survey

Q1 How long have you lived in Coventry, Rhode Island?

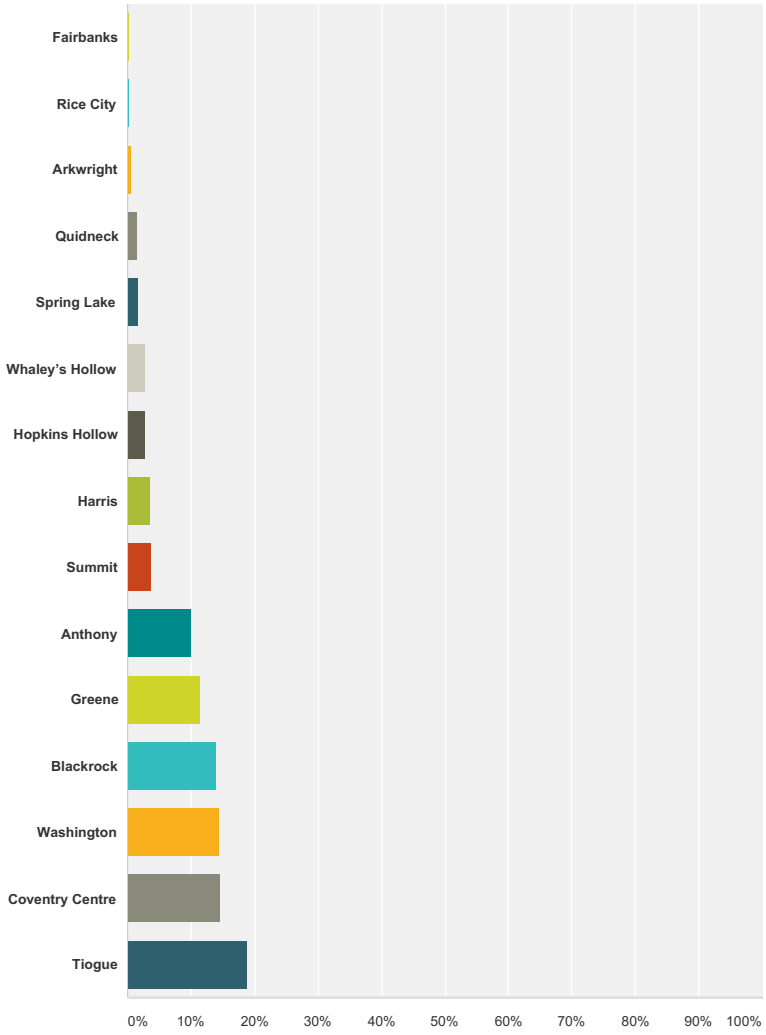
Answered: 988 Skipped: 5



Answer Choices	Responses	
Less than a year	**3.24%**	32
1 to 5 years	**12.65%**	125
6-9 years	**12.96%**	128
10-19 years	**30.57%**	302
20 years or more	**40.59%**	401
Total		**988**

Q2 What neighborhood do you live in?

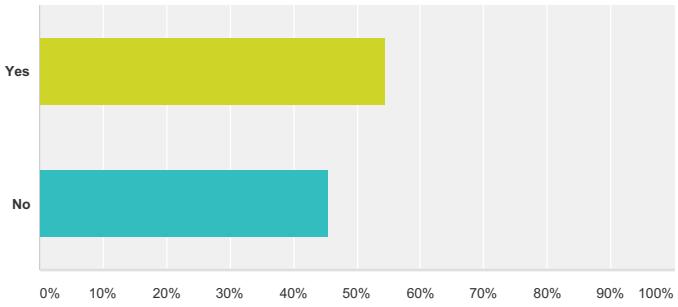
Answered: 925 Skipped: 68



Answer Choices	Responses	
Fairbanks	**0.11%**	1
Rice City	**0.22%**	2
Arkwright	**0.65%**	6
Quidneck	**1.41%**	13
Spring Lake	**1.62%**	15
Whaley's Hollow	**2.70%**	25
Hopkins Hollow	**2.81%**	26
Harris	**3.46%**	32
Summit	**3.68%**	34
Anthony	**10.05%**	93
Greene	**11.57%**	107
Blackrock	**13.95%**	129
Washington	**14.49%**	134
Coventry Centre	**14.59%**	135
Tiogue	**18.70%**	173
Total		**925**

Q3 Have you ever experienced or been impacted by a natural disaster in Coventry?

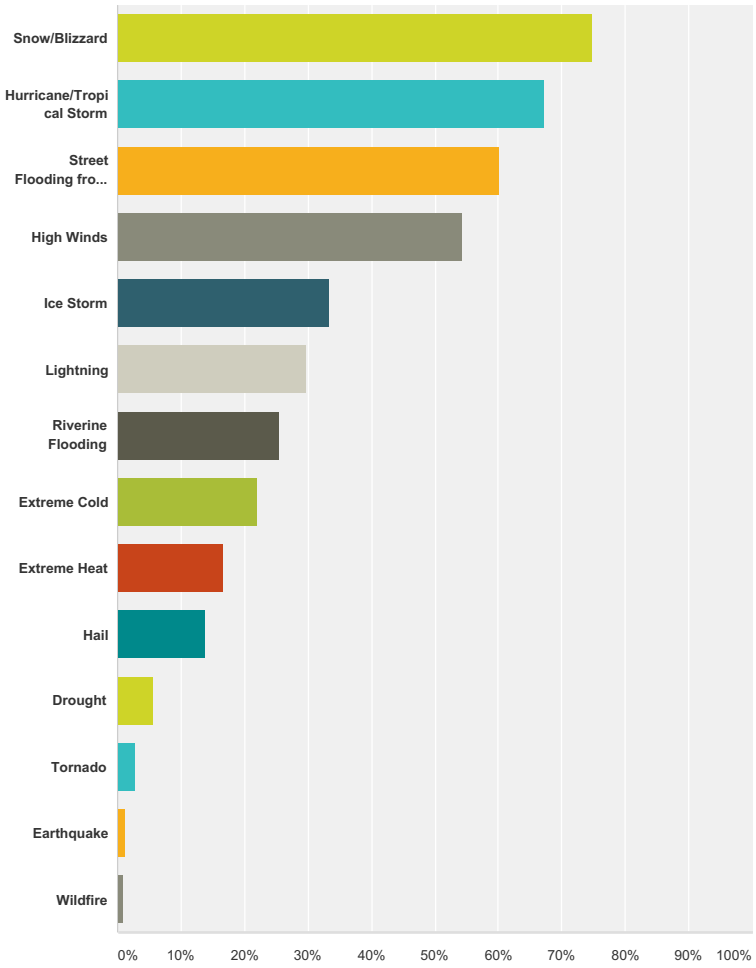
Answered: 991 Skipped: 2



Answer Choices	Responses	
Yes	**54.39%**	539
No	**45.61%**	452
Total		**991**

Q4 If yes, what types of disasters? Check all that apply.

Answered: 491 Skipped: 502



Answer Choices	Responses	
Snow/Blizzard	**74.75%**	367
Hurricane/Tropical Storm	**67.21%**	330
Street Flooding from Heavy Rain	**60.08%**	295
High Winds	**54.38%**	267
Ice Storm	**33.40%**	164
Lightning	**29.74%**	146
Riverine Flooding	**25.46%**	125
Extreme Cold	**22.00%**	108
Extreme Heat	**16.70%**	82
Hail	**13.85%**	68
Drought	**5.70%**	28
Tornado	**2.65%**	13
Earthquake	**1.22%**	6
Wildfire	**0.81%**	4
Total Respondents: 491		

Q5 When was the last time you experienced a natural disaster in Coventry?

Answered: 404 Skipped: 589

#	Responses	Date
1	Last year	1/18/2017 5:29 AM
2	Wind storm a year ago took out trees in our yard that flattened our shed/barn.	1/17/2017 9:06 PM
3	It's been a couple of years at least.....and, honestly, I wouldn't call any of them "disaster" except the 100 year flooding.	1/17/2017 8:45 PM
4	A couple years ago severe wind, lighting.	1/15/2017 10:17 AM
5	3 years ago	1/13/2017 2:48 PM
6	2015	1/13/2017 12:28 AM
7	irene	1/12/2017 8:04 AM
8	2014	1/11/2017 11:05 PM
9	Rhode Island flooding 2010	1/11/2017 9:14 PM
10	Microburst in August 2015	1/11/2017 7:23 PM
11	March 2010 when Johnson's pond flooded	1/11/2017 5:44 PM
12	Blizzards two years ago	1/11/2017 1:53 PM
13	floods about 4-5 years ago	1/11/2017 10:15 AM
14	2010 floods	1/10/2017 2:45 PM
15	Seven yrs.	1/10/2017 12:55 PM
16	Every major rainfall	1/10/2017 10:16 AM
17	Hurricane Andrea?	1/10/2017 8:04 AM
18	Micro burst couple years ago	1/10/2017 7:01 AM
19	Winter 2014-2015	1/9/2017 3:11 PM
20	Last hurricane 2 years ago	1/9/2017 2:55 PM
21	2011	1/9/2017 1:26 PM
22	Flood a couple of years back	1/9/2017 12:29 PM
23	don't know	1/9/2017 10:09 AM
24	2010	1/9/2017 9:55 AM
25	2010	1/9/2017 9:21 AM
26	2010	1/9/2017 8:56 AM
27	I think it was the windy snow storm that left us without power for almost a week.	1/9/2017 8:34 AM
28	Blizzard 2 years ago.	1/9/2017 8:07 AM
29	Flood of 2008	1/8/2017 10:23 PM
30	1 year ago	1/8/2017 10:08 PM
31	Flood in 2010.	1/8/2017 9:54 PM
32	1day ago	1/8/2017 9:40 PM
33	6 yrs	1/8/2017 9:28 PM
34	2015	1/8/2017 9:00 PM
35	early 2016	1/8/2017 8:20 PM
36	2011 hurricane Irene	1/8/2017 8:15 PM
37	3 years	1/8/2017 5:58 PM
38	last year	1/8/2017 5:11 PM
39	Not sure	1/8/2017 4:12 PM
40	Snow storm 2016	1/8/2017 11:56 AM
41	Yesterday	1/8/2017 10:32 AM
42	2011, hurricane Irene	1/8/2017 8:37 AM
43	Flooding due to heavy rain around 2012 bridges damages and closed	1/8/2017 8:29 AM
44	The hurricane in August 2011 when we had no power for a week. There have been other events since then, but I don't think they rise to the level of a disaster.	1/8/2017 7:42 AM
45	2009 Flooding	1/8/2017 6:20 AM
46	There is a snow storm going on currently.	1/7/2017 11:35 PM
47	2012 - Sandy	1/7/2017 10:44 PM
48	The March Floods	1/7/2017 9:41 PM
49	Today	1/7/2017 8:19 PM

50	Flooding I believe it was 2010	1/7/2017 7:26 PM
51	2010	1/7/2017 6:40 PM
52	March 2010	1/7/2017 6:29 PM
53	The downburst/tornado that ran through the state. Maybe 2015??	1/7/2017 5:33 PM
54	2013	1/7/2017 5:13 PM
55	I think it was the flooding in 2008 and whatever blizzard we had last	1/7/2017 5:11 PM
56	2011	1/7/2017 4:10 PM
57	2-3 years	1/7/2017 4:00 PM
58	last winter..big storm..power out for 3 days	1/7/2017 1:52 PM
59	7-2015	1/7/2017 12:42 PM
60	hurricane Sandy	1/7/2017 11:32 AM
61	January 2015	1/7/2017 11:04 AM
62	There is a blizzard today! Haha	1/7/2017 10:46 AM
63	Last year	1/7/2017 10:19 AM
64	Not sure of the dates for all of them but the floods in 2010 (?) was probably on the the worst.	1/7/2017 9:10 AM
65	the last hurricane and the flooding in 2011	1/7/2017 9:02 AM
66	Yearly	1/7/2017 9:02 AM
67	The flooding several years ago	1/7/2017 8:50 AM
68	Nemo in 2013	1/7/2017 8:48 AM
69	The big 100 year flood	1/7/2017 8:22 AM
70	2013	1/7/2017 8:04 AM
71	2013	1/7/2017 7:42 AM
72	Flood of 2010	1/7/2017 7:23 AM
73	2013	1/7/2017 7:16 AM
74	2015	1/7/2017 6:38 AM
75	2016	1/7/2017 3:08 AM
76	2007	1/7/2017 2:17 AM
77	Blizzard last year	1/7/2017 1:25 AM
78	Microburst 2016	1/7/2017 12:24 AM
79	Last year	1/6/2017 11:57 PM
80	great flood of 2010	1/6/2017 11:39 PM
81	Polar vortex I believe.	1/6/2017 11:03 PM
82	Flooding 2010	1/6/2017 10:50 PM
83	2010 floods	1/6/2017 10:45 PM
84	The last major one was the flood in 2010.	1/6/2017 10:09 PM
85	in the last 3 years	1/6/2017 10:05 PM
86	The last natural disater was summer of last year	1/6/2017 9:59 PM
87	A few years ago with the major flood and hurricane Sandy	1/6/2017 9:40 PM
88	Flood 2010	1/6/2017 9:26 PM
89	2 years ago during the winter with excess snow	1/6/2017 9:16 PM
90	During the flood	1/6/2017 9:02 PM
91	Never	1/6/2017 8:55 PM
92	2010 Floods	1/6/2017 8:51 PM
93	1year ago	1/6/2017 8:45 PM
94	Hurricane Sandy	1/6/2017 8:36 PM
95	Several years...maybe 10?	1/6/2017 8:36 PM
96	2014	1/6/2017 8:35 PM
97	April 2010	1/6/2017 8:11 PM
98	August 2015 Macroburst	1/6/2017 8:08 PM
99	Hurricane Irene	1/6/2017 8:06 PM
100	2010	1/6/2017 7:47 PM
101	100 year flood	1/6/2017 7:20 PM
102	It was in 2010	1/6/2017 7:20 PM
103	Winter 2016	1/6/2017 6:54 PM
104	2014	1/6/2017 6:31 PM
105	Aug. 2015	1/6/2017 6:23 PM

106	Last year	1/6/2017 6:20 PM
107	2010	1/6/2017 6:17 PM
108	2012	1/6/2017 6:14 PM
109	2 years ago	1/6/2017 6:12 PM
110	Floods of 2010	1/6/2017 6:09 PM
111	9 years ago	1/6/2017 6:07 PM
112	Flood 4 years ago or about	1/6/2017 5:54 PM
113	can't remember	1/6/2017 5:49 PM
114	3 years?	1/6/2017 5:46 PM
115	The flood.	1/6/2017 5:40 PM
116	2010	1/6/2017 5:30 PM
117	2010	1/6/2017 5:27 PM
118	I think the last one was the April flooding about 5/6 years ago	1/6/2017 5:19 PM
119	100 year flood, Not sure of date, maybe 2008	1/6/2017 5:16 PM
120	2016	1/6/2017 5:09 PM
121	5 years ago	1/6/2017 5:05 PM
122	1 1/2 years ago	1/6/2017 4:50 PM
123	Last year	1/6/2017 4:43 PM
124	Every winter	1/6/2017 4:42 PM
125	2010 my house was flooded	1/6/2017 4:40 PM
126	A few years ago when hurricane sandy hit	1/6/2017 4:37 PM
127	Flood of March 2010	1/6/2017 4:30 PM
128	Last year I believe	1/6/2017 4:18 PM
129	2010 floods	1/6/2017 4:13 PM
130	2 years ago	1/6/2017 4:10 PM
131	Couple years ago?	1/6/2017 4:09 PM
132	2014	1/6/2017 4:07 PM
133	Flood 2016	1/6/2017 4:04 PM
134	2012??	1/6/2017 4:01 PM
135	Last year ... wind felt like a freight train coming through. A tree fell onto our home.	1/6/2017 4:00 PM
136	Over the past few years we have had flooding in our neighborhood	1/6/2017 3:57 PM
137	Hurricane sandy	1/6/2017 3:44 PM
138	Last winter	1/6/2017 3:42 PM
139	Forgot. At least 4 years ago	1/6/2017 3:34 PM
140	Years ago	1/6/2017 3:28 PM
141	Last year	1/6/2017 3:27 PM
142	Last year, 2016, winter, bad snow, heavy and strong, and a tree fell on the power lines, knocking out entry and exit to my road and power for days.	1/6/2017 3:18 PM
143	Summer of 2015... high winds, tornado like storm.	1/6/2017 3:09 PM
144	The floods in 2010 is the one that comes to mind.	1/6/2017 3:05 PM
145	2years ago	1/6/2017 3:03 PM
146	The hundred year flood	1/6/2017 2:59 PM
147	2010	1/6/2017 2:56 PM
148	2 years ago.	1/6/2017 2:54 PM
149	Microbursts in August 2015	1/6/2017 2:44 PM
150	2015	1/6/2017 2:43 PM
151	2015	1/6/2017 2:43 PM
152	Last year property damage	1/6/2017 2:38 PM
153	1980's hurricane gloria	1/6/2017 2:37 PM
154	?? I forget...was high winds	1/6/2017 2:35 PM
155	dont know	1/6/2017 2:31 PM
156	Floods of 2010 I think was the year	1/6/2017 2:29 PM
157	Years ago. Very long power outage.	1/6/2017 2:27 PM
158	Summer of 2015-microburst winds took down many trees and power lines	1/6/2017 2:25 PM
159	Microburst 8/2015	1/6/2017 2:22 PM
160	4 years ago	1/6/2017 2:19 PM

161	Early summer 2016	1/6/2017 2:19 PM
162	3 years ago	1/6/2017 2:18 PM
163	Flood of 2010 or 11	1/6/2017 2:16 PM
164	2010	1/6/2017 2:15 PM
165	Truly flooding in 2010 and microstorms from 2014/2015	1/6/2017 2:11 PM
166	Winter 2015	1/6/2017 2:10 PM
167	Don't remember	1/6/2017 2:09 PM
168	Winter 2013/14	1/6/2017 2:09 PM
169	2016	1/6/2017 2:07 PM
170	2009 floods	1/6/2017 2:06 PM
171	Last year	1/6/2017 2:06 PM
172	winter 2015	1/6/2017 2:04 PM
173	2010	1/6/2017 1:59 PM
174	5 years	1/6/2017 1:58 PM
175	When all of Rhode island had flooding issues.	1/6/2017 1:57 PM
176	last winter	1/6/2017 1:56 PM
177	? the year	1/6/2017 1:50 PM
178	August of 2015 with very high winds.	1/6/2017 1:48 PM
179	Flooding March 2010	1/6/2017 1:45 PM
180	Hurricane	1/6/2017 1:43 PM
181	The 100 year flood.	1/6/2017 1:41 PM
182	2004? 2005. Tropical storm that hit late August	1/6/2017 1:41 PM
183	About 5 years ago	1/6/2017 1:39 PM
184	2015	1/6/2017 1:34 PM
185	Hurricane (lost power for days)	1/6/2017 1:32 PM
186	Floods 2010	1/6/2017 1:29 PM
187	The Blizzard	1/6/2017 1:27 PM
188	Summers 2011	1/6/2017 1:27 PM
189	Spring 2015 - micro burst	1/6/2017 1:27 PM
190	6 months ago	1/6/2017 1:26 PM
191	3 weeks ago	1/6/2017 1:25 PM
192	2 years ago	1/6/2017 1:20 PM
193	Flood of 2010	1/6/2017 1:20 PM
194	2016 Snow	1/6/2017 1:15 PM
195	winter 2015 / superstorm sandy	1/6/2017 1:15 PM
196	Flood of 2010	1/6/2017 1:15 PM
197	2010	1/6/2017 1:13 PM
198	Probably the last hurricane when we lost power for a week. I think that was 2011?	1/6/2017 1:12 PM
199	Hurricane few years back. We lost power in our area for 7days	1/6/2017 1:12 PM
200	2015	1/6/2017 1:11 PM
201	7or 8 years maybe	1/6/2017 1:08 PM
202	AUG 2015	1/6/2017 1:07 PM
203	2011	1/6/2017 1:07 PM
204	flood in 2016 and blizzard of 2015	1/6/2017 1:07 PM
205	About 8 years ago	1/6/2017 1:06 PM
206	The hurricane in 2011	1/6/2017 1:05 PM
207	4yrs	1/6/2017 1:01 PM
208	2010	1/6/2017 12:58 PM
209	2013 or 14?	1/6/2017 12:56 PM
210	Snow about 2 years ago	1/6/2017 12:56 PM
211	2010	1/6/2017 12:55 PM
212	last time there was a hurricane	1/6/2017 12:55 PM
213	April floods	1/6/2017 12:53 PM
214	2015	1/6/2017 12:52 PM
215	Hurricane bob and sandy	1/6/2017 12:51 PM
216	Blizzard of 1978	1/6/2017 12:49 PM

217	2016	1/6/2017 12:49 PM
218	Flooding in 2010 and Hurricane Sandy	1/6/2017 12:47 PM
219	2015??	1/6/2017 12:44 PM
220	2 years	1/6/2017 12:37 PM
221	Street Flooding some time in October	1/6/2017 12:35 PM
222	Flooding of river, tiogue lake on route 3	1/6/2017 12:35 PM
223	Last extreme rain storm, water table is high in WC. wind cut out power and water table caused water in the basement.	1/6/2017 12:35 PM
224	2011	1/6/2017 12:34 PM
225	2014, winter	1/6/2017 12:32 PM
226	Fall 2016, high winds	1/6/2017 12:32 PM
227	4 years	1/6/2017 12:31 PM
228	Hurricane Irene	1/6/2017 12:30 PM
229	5 + years ago	1/6/2017 12:30 PM
230	March 30, 2010 - The Great Flood of 2010	1/6/2017 12:30 PM
231	2016 Summer Heatwave lost electricity	1/6/2017 12:29 PM
232	2010	1/6/2017 12:29 PM
233	2016	1/6/2017 12:28 PM
234	2 years ago	1/6/2017 12:28 PM
235	2015	1/6/2017 12:28 PM
236	2014?	1/6/2017 12:27 PM
237	2010	1/6/2017 12:25 PM
238	Winds 2015	1/6/2017 12:25 PM
239	About 4 years ago hurricane, we lost power in Greene for 10 days. We had no running water due to well.	1/6/2017 12:25 PM
240	Four years ago with the blizzard in which we lost power for about a week.	1/6/2017 12:24 PM
241	last blizzard	1/6/2017 12:23 PM
242	Flood of 2010	1/6/2017 12:23 PM
243	Don't remember	1/6/2017 12:22 PM
244	Flooding in 2010	1/6/2017 12:21 PM
245	2012	1/6/2017 12:20 PM
246	Last winter	1/6/2017 12:19 PM
247	5 years ago	1/6/2017 12:18 PM
248	2015/16 Blizzard	1/6/2017 12:16 PM
249	2 to 5 years ago	1/6/2017 12:15 PM
250	2012	1/6/2017 12:14 PM
251	can't remember	1/6/2017 12:13 PM
252	December 2016 (street flooding)	1/6/2017 12:13 PM
253	April 1st flood, not sure of year(within last 5 years)	1/6/2017 12:13 PM
254	About 4 years ago.....wind storm blew siding off of house.	1/6/2017 12:13 PM
255	The big flood in 2009 (I think that was the year) we lost our entire finished basement.	1/6/2017 12:12 PM
256	2010...2011?	1/6/2017 12:12 PM
257	2010	1/6/2017 12:10 PM
258	2010	1/6/2017 12:10 PM
259	the flooding	1/6/2017 12:09 PM
260	High winds/rain in fall 2015 knocking a tree down.	1/6/2017 12:09 PM
261	2010	1/6/2017 12:08 PM
262	4 years	1/6/2017 12:08 PM
263	ice dams 2015, downdraft wind shear 2014, flooding 2010.	1/6/2017 12:08 PM
264	2010	1/6/2017 12:07 PM
265	2010 flood and the hurricane sandy	1/6/2017 12:07 PM
266	Hurricane Sandy 2012, blizzard of 2013.	1/6/2017 12:07 PM
267	August 2015.	1/6/2017 12:06 PM
268	This fall	1/6/2017 12:06 PM
269	Within last year I think	1/6/2017 12:05 PM
270	Micro burst a year and a half a ago - trees down / no power etc.	1/6/2017 12:05 PM
271	4 years ago?	1/6/2017 12:01 PM
272	2011	1/6/2017 12:01 PM

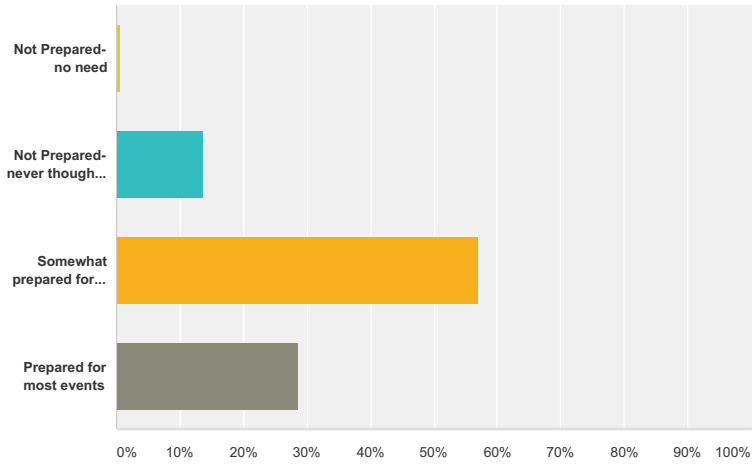
273	Thankfully we have not been impacted since the 100 year flood	1/6/2017 12:01 PM
274	6 years ago	1/6/2017 12:01 PM
275	Aug 2015	1/6/2017 12:00 PM
276	2016	1/6/2017 12:00 PM
277	Last winter	1/6/2017 11:59 AM
278	Winter of 2015	1/6/2017 11:59 AM
279	5 years ago?	1/6/2017 11:58 AM
280	When Hurricane Floyd came through	1/6/2017 11:58 AM
281	The hurricane that put the Laurel Ave bridge out of commission for a few years.	1/6/2017 11:57 AM
282	2014	1/6/2017 11:56 AM
283	Approximately 8 years ago	1/6/2017 11:56 AM
284	Drought summer of 2016	1/6/2017 11:56 AM
285	2011 hurricane	1/6/2017 11:56 AM
286	?	1/6/2017 11:56 AM
287	Winter of 2015- winds broke house siding.	1/6/2017 11:55 AM
288	3 years	1/6/2017 11:55 AM
289	Hurricane sandy	1/6/2017 11:55 AM
290	2013 Flooding, 2014 Extreme Cold	1/6/2017 11:55 AM
291	Flood of 2010	1/6/2017 11:54 AM
292	last tropical storm - 3yrs ago?	1/6/2017 11:54 AM
293	June 2011	1/6/2017 11:54 AM
294	Aug. 2015	1/6/2017 11:53 AM
295	2010	1/6/2017 11:53 AM
296	during the 100 year flood. basement flooded 2-3 inches of water	1/6/2017 11:53 AM
297	2 years ago with ice from extreme cold	1/6/2017 11:53 AM
298	2010	1/6/2017 11:52 AM
299	3/2010	1/6/2017 11:52 AM
300	Few years ago..No power for a week	1/6/2017 11:52 AM
301	Approximately 7-10 years ago	1/6/2017 11:52 AM
302	2015	1/6/2017 11:51 AM
303	2 years ago ice dams caused damage	1/6/2017 11:51 AM
304	August 2015	1/6/2017 11:50 AM
305	4 years ago	1/6/2017 11:49 AM
306	The last time probably the last Tropical Storm. It has been a while.	1/6/2017 11:49 AM
307	the year of the flood	1/6/2017 11:48 AM
308	Blizzard last year, Hurricane Irene	1/6/2017 11:48 AM
309	2013	1/6/2017 11:48 AM
310	2 years ago	1/6/2017 11:47 AM
311	few years back high winds brought a tree down on our street and blocked the only way in and out of our part of the street	1/6/2017 11:46 AM
312	Loss of Power and tree on house in Micro burst	1/6/2017 11:46 AM
313	when the Hurricane came through	1/6/2017 11:46 AM
314	unsure	1/6/2017 11:45 AM
315	few years ago - blizzard	1/6/2017 11:44 AM
316	3/2012 (I believe) It was the flooding in the state that the concodia building collapsed and our neighborhood was evacuated as a precaution.	1/6/2017 11:43 AM
317	2011	1/6/2017 11:43 AM
318	Hurricane Sandy	1/6/2017 11:43 AM
319	hurricane irene	1/6/2017 11:43 AM
320	Closest would prob be 2016 with heavy snowfall amounts. Other than that it was the storm around Halloween in 2014-2015?	1/6/2017 11:43 AM
321	Microburst storm last year	1/6/2017 11:42 AM
322	Irene? did last year's blizzrad in feb have a name? not sure	1/6/2017 11:40 AM
323	2013	1/6/2017 10:42 AM
324	2010 flooding	1/6/2017 9:53 AM
325	2010 flooding	1/6/2017 9:35 AM

326	Forgot, but we had so much rain it started entering our home in the basement. It flooded my basement with 3-4 inches of ground water.	1/6/2017 9:28 AM
327	2016 micro burst	1/6/2017 9:16 AM
328	1 year	1/6/2017 8:15 AM
329	Year ago February. Snow and ice storm.	1/6/2017 8:03 AM
330	Hurricane sandy and blizzard of 2014	1/6/2017 7:39 AM
331	2010 rain event	1/6/2017 7:03 AM
332	2015	1/6/2017 6:24 AM
333	6 years ago	1/6/2017 4:04 AM
334	Floods of 2008	1/6/2017 12:44 AM
335	Winter of 2016	1/6/2017 12:43 AM
336	2010	1/5/2017 11:06 PM
337	August 4, 2015	1/5/2017 11:01 PM
338	Superstorm sandy	1/5/2017 10:48 PM
339	The last blizzard or hurricane.	1/5/2017 10:44 PM
340	2009	1/5/2017 10:19 PM
341	During hurricane Sandy	1/5/2017 10:18 PM
342	Last winter I think there was a blizzard	1/5/2017 10:18 PM
343	2010 march floods	1/5/2017 10:12 PM
344	When all of RI flooded That spring 7? years ago.	1/5/2017 9:42 PM
345	Flooding	1/5/2017 9:39 PM
346	Summer 2015	1/5/2017 9:29 PM
347	August 2015	1/5/2017 9:23 PM
348	Ice/ frigid temps. Winter 2015	1/5/2017 9:16 PM
349	2010 flooding Johnsons Pond	1/5/2017 9:08 PM
350	It was a semi natural when Kent Count Water repaved the roads after the new water line where put in they did not replace the berms as required and our home was flooded and the town had to correct the problem	1/5/2017 8:56 PM
351	2010	1/5/2017 8:31 PM
352	Summer 2015	1/5/2017 8:28 PM
353	2012	1/5/2017 8:21 PM
354	2014	1/5/2017 8:19 PM
355	Extreme cold last winter	1/5/2017 8:18 PM
356	Hurricane Irene	1/5/2017 8:13 PM
357	2015	1/5/2017 8:11 PM
358	The "10,000 year flood". We live at the bottom of a hill (old mishnock hwy). We had to pump our basement for 3 months.	1/5/2017 8:07 PM
359	March 2010	1/5/2017 8:05 PM
360	2013	1/5/2017 8:03 PM
361	Heavy snow and roof damage 2 years ago	1/5/2017 7:59 PM
362	A few years ago	1/5/2017 7:53 PM
363	Over the summer with the microbursts, also our roads get flooded a lot	1/5/2017 7:51 PM
364	Last year	1/5/2017 7:50 PM
365	August 2015	1/5/2017 7:48 PM
366	4 yrs ago	1/5/2017 7:45 PM
367	2013 house hit by lightening	1/5/2017 7:24 PM
368	Two years ago	1/5/2017 7:18 PM
369	2009 Flooding	1/5/2017 7:15 PM
370	2014	1/5/2017 7:04 PM
371	10 years	1/5/2017 6:55 PM
372	2 years ago	1/5/2017 6:47 PM
373	All were when I was young maybe 20 +yrs ago	1/5/2017 6:30 PM
374	The flooding at time we lived in town and had to be evacuated	1/5/2017 6:20 PM
375	Couple of years	1/5/2017 6:16 PM
376	2013	1/5/2017 5:51 PM
377	August 2015	1/5/2017 5:48 PM
378	2 or 3 years ago	1/5/2017 5:32 PM
379	3 months ago	1/5/2017 5:30 PM

380	Hurricane Irene	1/5/2017 5:30 PM
381	Flood of 2010	1/5/2017 5:18 PM
382	The rains in 2010. Springtime	1/5/2017 4:54 PM
383	We had a microburst take out several trees two years ago.	1/5/2017 3:57 PM
384	2009	1/5/2017 3:51 PM
385	2010	1/5/2017 3:49 PM
386	Hurricane Sandy and Irene 2011 and 2012?	1/5/2017 3:40 PM
387	some time ago	1/5/2017 3:39 PM
388	Hurricane sandy	1/5/2017 3:30 PM
389	August, 2015	1/5/2017 3:26 PM
390	Winter 2015	1/5/2017 3:26 PM
391	Hurricane Sandy and the associated flooding	1/5/2017 3:20 PM
392	January 2016.	1/5/2017 3:05 PM
393	A few years ago during the "100 year flood". Wind storm this past fall.	1/5/2017 2:59 PM
394	3 years ago, hurricane and live in mobile home so we had to evacuate.....or some did and others did not	1/5/2017 2:56 PM
395	A few years ago when we had the flooding.	1/5/2017 2:51 PM
396	Can't recall specifically.	1/5/2017 2:42 PM
397	Hurricane 5-6 years ago	1/5/2017 2:41 PM
398	Flooded and lost my entire finished basement in 2013.	1/5/2017 2:40 PM
399	August 2015	1/5/2017 2:38 PM
400	Winter Storm Nemo	1/5/2017 2:08 PM
401	Last winter- snow/ice/wind ripped electrical wire off of our home	1/5/2017 2:03 PM
402	August 2015 severe thunderstorm (macro burst)	1/5/2017 2:01 PM
403	2 years ago	1/5/2017 1:33 PM
404	100 year flood	1/5/2017 1:11 PM

Q6 How prepared do you feel that you and your household/business are for the probably impacts of natural hazards?

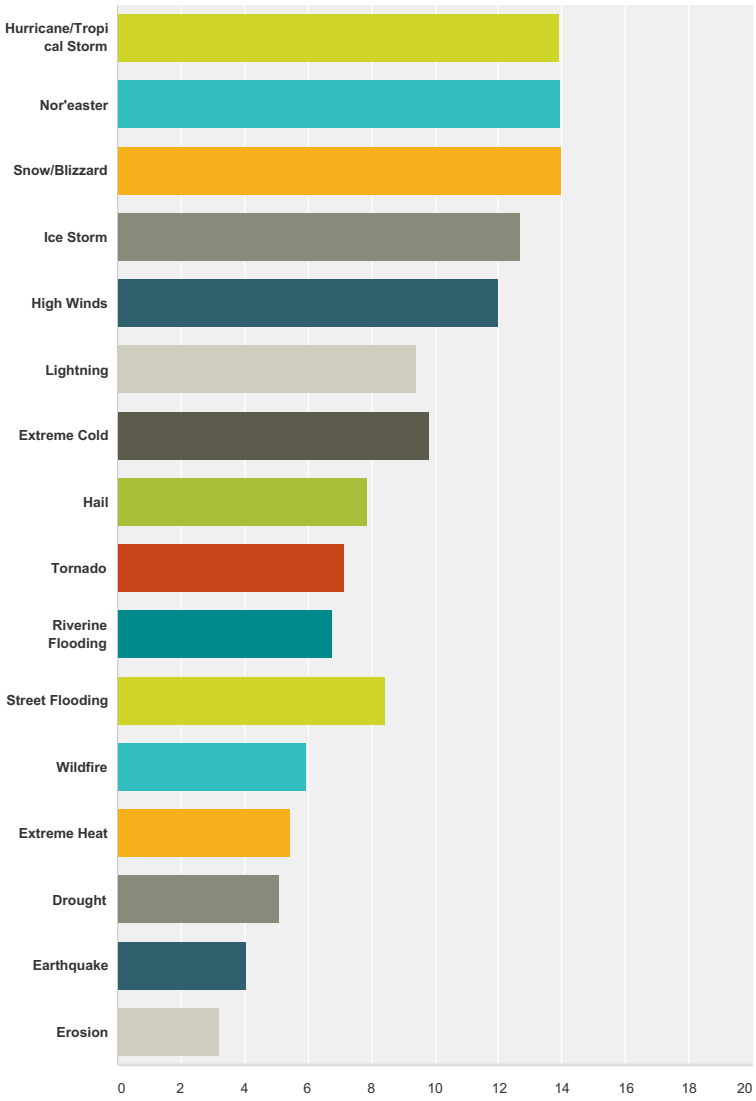
Answered: 930 Skipped: 63



Answer Choices	Responses	
Not Prepared- no need	**0.65%**	6
Not Prepared- never thought about it	**13.66%**	127
Somewhat prepared for some events	**57.10%**	531
Prepared for most events	**28.60%**	266
Total		**930**

Q7 Click and drag the each hazard so that the one that you are most concerned about is in the #1 spot at the top.

Answered: 697 Skipped: 296

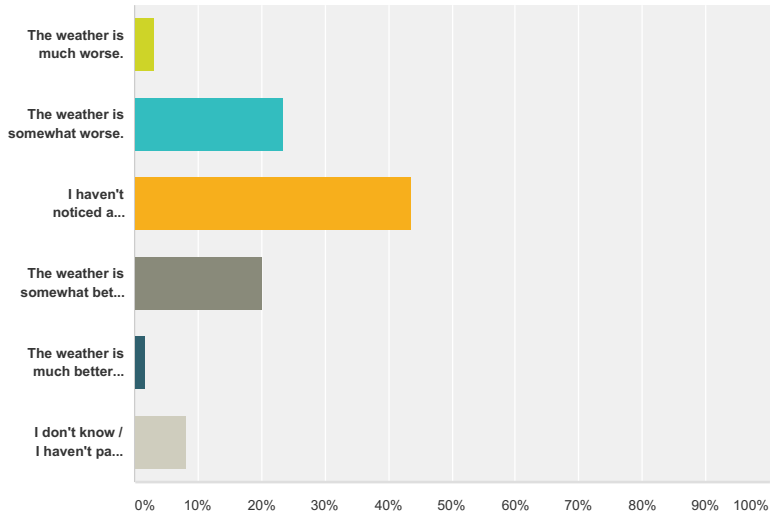


	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Score
Hurricane/Tropical Storm	37.58% 230	16.67% 102	13.24% 81	11.93% 73	8.17% 50	3.27% 20	2.94% 18	1.47% 9	0.82% 5	1.31% 8	0.33% 2	0.65% 4	0.33% 2	0.16% 1	0.16% 1	0.98% 6	612	13.92
Nor'easter	20.31% 119	30.89% 181	21.84% 128	11.43% 67	6.31% 37	2.90% 17	0.85% 5	1.37% 8	1.19% 7	1.19% 7	0.17% 1	0.51% 3	0.34% 2	0.17% 1	0.17% 1	0.34% 2	586	13.95
Snow/Blizzard	22.02% 135	26.59% 163	25.12% 154	11.58% 71	5.22% 32	3.10% 19	1.79% 11	1.47% 9	1.14% 7	0.33% 2	0.49% 3	0.00% 0	0.49% 3	0.33% 2	0.33% 2	0.00% 0	613	13.99
Ice Storm	9.17% 52	8.64% 49	17.81% 101	27.34% 155	16.23% 92	8.11% 46	4.76% 27	3.00% 17	0.88% 5	1.23% 7	0.88% 5	0.88% 5	0.71% 4	0.00% 0	0.18% 1	0.18% 1	567	12.68
High Winds	4.78% 27	8.67% 49	9.56% 54	16.28% 92	28.14% 159	14.87% 84	6.37% 36	3.36% 19	2.48% 14	2.48% 14	0.35% 2	0.88% 5	1.06% 6	0.53% 3	0.00% 0	0.18% 1	565	11.97
Lightning	0.40% 2	1.61% 8	2.41% 12	3.82% 19	5.02% 25	26.51% 132	21.29% 106	11.65% 58	8.03% 40	5.02% 25	4.02% 20	2.61% 13	2.01% 10	1.41% 7	1.81% 9	2.41% 12	498	9.38
Extreme Cold	2.00% 10	1.60% 8	3.61% 18	6.61% 33	7.82% 39	13.23% 66	24.45% 122	16.43% 82	9.02% 45	6.61% 33	3.21% 16	1.80% 9	1.20% 6	1.20% 6	0.60% 3	0.60% 3	499	9.81
Hail	0.00% 0	0.00% 0	0.42% 2	1.04% 5	2.08% 10	4.79% 23	7.92% 38	26.25% 126	23.75% 114	11.46% 55	8.13% 39	5.42% 26	2.92% 14	2.50% 12	2.50% 12	0.83% 4	480	7.84
Tornado	5.69% 28	3.46% 17	3.46% 17	2.03% 10	1.83% 9	2.44% 12	2.64% 13	5.08% 25	16.67% 82	13.01% 64	7.32% 36	6.91% 34	6.71% 33	6.91% 34	9.55% 47	6.30% 31	492	7.14

Riverine Flooding	**2.06%** 10	**1.44%** 7	**1.44%** 7	**2.27%** 11	**2.89%** 14	**3.51%** 17	**3.92%** 19	**5.98%** 29	**4.95%** 24	**24.33%** 118	**15.26%** 74	**7.84%** 38	**7.84%** 38	**6.60%** 32	**5.57%** 27	**4.12%** 20	485	6.78
Street Flooding	**6.20%** 32	**2.71%** 14	**3.29%** 17	**5.04%** 26	**5.81%** 30	**5.62%** 29	**7.56%** 39	**5.81%** 30	**7.17%** 37	**9.88%** 51	**20.16%** 104	**10.08%** 52	**5.23%** 27	**2.52%** 13	**1.55%** 8	**1.36%** 7	516	8.42
Wildfire	**2.88%** 14	**2.26%** 11	**1.03%** 5	**0.82%** 4	**2.88%** 14	**2.47%** 12	**4.12%** 20	**2.88%** 14	**3.50%** 17	**3.70%** 18	**8.44%** 41	**31.28%** 152	**12.76%** 62	**9.67%** 47	**6.17%** 30	**5.14%** 25	486	5.92
Extreme Heat	**0.00%** 0	**0.21%** 1	**0.83%** 4	**0.63%** 3	**1.46%** 7	**1.25%** 6	**3.33%** 16	**4.58%** 22	**7.29%** 35	**7.50%** 36	**13.54%** 65	**9.79%** 47	**31.87%** 153	**10.42%** 50	**5.00%** 24	**2.29%** 11	480	5.41
Drought	**0.21%** 1	**1.66%** 8	**0.62%** 3	**1.04%** 5	**1.86%** 9	**3.11%** 15	**2.28%** 11	**4.55%** 22	**4.76%** 23	**5.18%** 25	**7.25%** 35	**10.56%** 51	**10.77%** 52	**34.78%** 168	**9.11%** 44	**2.28%** 11	483	5.09
Earthquake	**2.25%** 11	**3.28%** 16	**1.64%** 8	**1.02%** 5	**1.64%** 8	**1.64%** 8	**1.02%** 5	**1.43%** 7	**2.87%** 14	**2.05%** 10	**2.25%** 11	**3.28%** 16	**5.12%** 25	**11.48%** 56	**41.80%** 204	**17.21%** 84	488	4.05
Erosion	**1.22%** 6	**1.02%** 5	**1.02%** 5	**0.81%** 4	**0.41%** 2	**1.02%** 5	**1.63%** 8	**3.25%** 16	**2.24%** 11	**2.64%** 13	**3.46%** 17	**3.66%** 18	**7.11%** 35	**7.93%** 39	**11.59%** 57	**51.02%** 251	492	3.23

Q8 Looking back over the past 5 years, which statement about Coventry weather do you believe to be true?

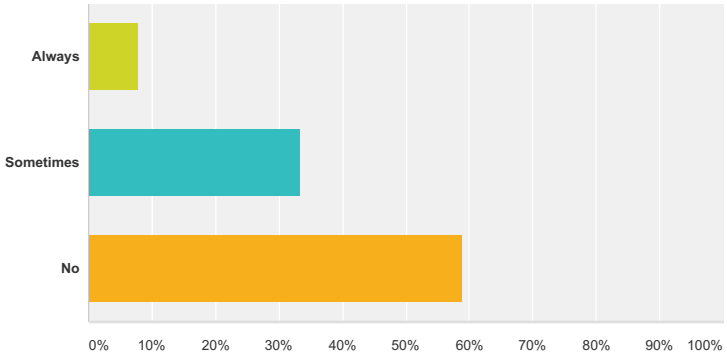
Answered: 765 Skipped: 228



Answer Choices	Responses	
The weather is much worse.	**3.14%**	24
The weather is somewhat worse.	**23.40%**	179
I haven't noticed a difference.	**43.66%**	334
The weather is somewhat better than usual (fewer storms)	**20.13%**	154
The weather is much better than usual.	**1.57%**	12
I don't know / I haven't paid attention.	**8.10%**	62
Total		**765**

Q9 Does your street flood when it rains?

Answered: 773 Skipped: 220



Answer Choices	Responses	
Always	**7.63%**	59
Sometimes	**33.51%**	259
No	**58.86%**	455
Total		**773**

Q10 If yes, please provide the street name and nearest cross street. Or tell us of a place you know that floods.

Answered: 221 Skipped: 772

#	Responses	Date
1	Fish Hill Road and Twin Brook Lane	1/17/2017 9:15 PM
2	Corner of Rosemary & Johnson Boulevard due to clogged drains...no big deal...not a natural flooding	1/16/2017 4:19 PM
3	Washington st across from waterfall	1/16/2017 8:45 AM
4	Boston street, last winter due too so much rain boston street became a sheet of ice.	1/15/2017 10:19 AM
5	Nooseneck across from Cumberland Farms at the entrance to Wood Estates.	1/13/2017 7:42 AM
6	Eastgate and Clubhouse	1/11/2017 9:24 PM
7	Osprey/Kingfisher	1/11/2017 5:51 PM
8	The water flows down 117 from the westward segment, carrying sand and depositing it on the corner. Very large puddle form in front of the fire station (anex?). The deposited sediment is a hazard especially for motor cycles. We have seen several riders drop their bikes on the corner because of this. We have gone out there, stopped traffic, and swept the corner on multiple occasions.	1/10/2017 10:17 AM
9	Flat River Road /Town Hall area floods and also near the entrance of the dog pound	1/10/2017 8:11 AM
10	Shady Valley	1/9/2017 9:55 AM
11	West Lake Drive	1/9/2017 8:59 AM
12	Cynthia Drive	1/9/2017 8:27 AM
13	Acres of Pine Rd.	1/8/2017 10:14 PM
14	Red Barn Court Hunters Crossing	1/8/2017 7:20 PM
15	Maple st	1/8/2017 7:19 PM
16	Johnson Blvd	1/8/2017 6:33 PM
17	cady and south main st	1/8/2017 6:03 PM
18	hunters crossing/ rte 116	1/8/2017 5:15 PM
19	Coventry Drive	1/8/2017 4:18 PM
20	Johnson boulevard.	1/8/2017 8:45 AM
21	Colvintown road and station street	1/8/2017 8:28 AM
22	Hope Furnace Road near Ben Brown, but that might be Scituate	1/8/2017 7:47 AM
23	Victory highway	1/7/2017 6:45 PM
24	Nicole/Old Mishnock Hwy	1/7/2017 6:33 PM
25	In front of silverlake pizza, over by benny's, sandy bottom road	1/7/2017 5:39 PM
26	Fairview ave and read ave	1/7/2017 5:16 PM
27	Hunters zing and red barn court. When the drain is clogged	1/7/2017 5:16 PM
28	Sandy bottom	1/7/2017 5:09 PM
29	Teakwood Drive West	1/7/2017 3:09 PM
30	Town Farm Rd	1/7/2017 11:12 AM
31	Under the bridge on 117. crossroad sandybottom or 116	1/7/2017 11:06 AM
32	We actually have more trouble with washout than flooding (but that wasn't a choice). We live on a dirt road.	1/7/2017 9:13 AM
33	Regis St & Clifton It floods mostly because the storm drains are covered with debris. Also the area on Hopkins Hill at Regis and Clifton floods and backs up into the neighborhood	1/7/2017 8:57 AM
34	Black Walnut Drive & Hill Street	1/7/2017 8:30 AM
35	Flooding only when drain grates are all covered with leaves...otherwise it's a hill that cannot really flood, Walker Lane	1/7/2017 8:30 AM
36	Near library	1/7/2017 8:07 AM
37	hammet road -- between flat river and maple valley	1/7/2017 7:27 AM
38	Greene street and laurel	1/7/2017 2:41 AM
39	Flat River Road @ Indian Trail	1/7/2017 2:20 AM
40	Laurel and Washington / Washington under the bridge near Sandy bottom rd	1/7/2017 1:24 AM
41	Maple Vally Rd, the two bridges flood with enough rain	1/6/2017 10:03 PM
42	Nooseneck Hill Rd and Leisure Way	1/6/2017 9:55 PM
43	Kingswood drive. In front of 12 kingswood drive the drainage is awful.	1/6/2017 9:02 PM
44	Mile Road and Matteson	1/6/2017 8:59 PM
45	Wisteria Drive	1/6/2017 8:39 PM
46	Cynthia Drive,Alvaro Road	1/6/2017 8:16 PM

47	blackrock near congdon	1/6/2017 8:15 PM
48	Knotty Oak and long pond rd	1/6/2017 8:05 PM
49	Princeton and laurel	1/6/2017 7:50 PM
50	Various places throughout Colvintown road from Hope Furnace south.	1/6/2017 7:25 PM
51	Sisson and 102	1/6/2017 7:15 PM
52	Twin Brook Lane off of FishHill Road	1/6/2017 6:35 PM
53	washington and edward	1/6/2017 6:20 PM
54	Viola Street - towards the first cul-de-sac. I live at #13 and the town never cleans out the drainage in front of me. A good rainstorm causes a standing pool that is 40 feet wide and covers half the street.	1/6/2017 6:17 PM
55	Shady valley road	1/6/2017 5:59 PM
56	the storm drain at the parking lot entrance to Colonial Arces playfield	1/6/2017 5:54 PM
57	Old North Rd and Deerfield	1/6/2017 5:37 PM
58	Lloyd drive and alvero	1/6/2017 5:29 PM
59	Isle of Capri... we are on the pond.the street behind us is Lakehurst	1/6/2017 5:24 PM
60	Whitehead rd.	1/6/2017 5:11 PM
61	intersection of Old Main St & Colvintown	1/6/2017 4:58 PM
62	Sugar Maple Dr	1/6/2017 4:55 PM
63	Blackrock	1/6/2017 4:51 PM
64	6800 flat river rd	1/6/2017 4:45 PM
65	Wood St	1/6/2017 4:44 PM
66	Whitehead Rd	1/6/2017 4:41 PM
67	Twin Brook lane off fish hill	1/6/2017 4:40 PM
68	Corner of South main and Sunapee Ct	1/6/2017 4:37 PM
69	New London Turnpike/Rejane	1/6/2017 4:34 PM
70	Knotty oak	1/6/2017 4:23 PM
71	Fairview/MacArthur	1/6/2017 4:23 PM
72	117 between Shell and Family dollar.	1/6/2017 4:11 PM
73	Circlewood Dr.	1/6/2017 4:09 PM
74	Hope Furnace Road, Rte 117 (between Town Hall & intersection with Sandy Bottom Road)	1/6/2017 4:07 PM
75	Arnold and Tiogue intersection. If we have a flash flood, rain builds up there. Two years ago 2 cars were stuck half way under water.	1/6/2017 3:59 PM
76	Howard ave	1/6/2017 3:58 PM
77	Westwood estates Floods happen throughout the park	1/6/2017 3:56 PM
78	117	1/6/2017 3:47 PM
79	Lowell - off South Main	1/6/2017 3:28 PM
80	In the cul-de-sac of Thompson Drive, off of Leuba Rd.	1/6/2017 3:20 PM
81	Boston st	1/6/2017 3:03 PM
82	Perry Hill Road, just past Fen Way. Road fills about half way across when rains and in winter it freezes over. Very dangerous when we need to bring our trash out.	1/6/2017 3:02 PM
83	My road doesn't flood, I can't go back and change my answer. Sorry!	1/6/2017 2:54 PM
84	Washington St	1/6/2017 2:53 PM
85	Rt102 and Rt117	1/6/2017 2:50 PM
86	Myra rd	1/6/2017 2:48 PM
87	Coventry Dr/hopkins hill rd	1/6/2017 2:38 PM
88	Larchmont Drive cross road is Oak St off Pune which is directly off Arnold	1/6/2017 2:37 PM
89	Hazard Knight	1/6/2017 2:31 PM
90	Pioneer Rd at Hill Street	1/6/2017 2:27 PM
91	Leuba Rd Area and 117	1/6/2017 2:14 PM
92	Pembroke	1/6/2017 2:13 PM
93	Centennial and Laforge	1/6/2017 2:12 PM
94	Pembroke and Princeton	1/6/2017 2:10 PM
95	Wood estates, near hillfarm,	1/6/2017 2:10 PM
96	Matteson Rd near Autumn Ridge Rd	1/6/2017 2:08 PM
97	Wisteria dr	1/6/2017 2:06 PM
98	Bates ave and Washington Street	1/6/2017 1:53 PM
99	R	1/6/2017 1:53 PM
100	Adams at Jefferson	1/6/2017 1:43 PM

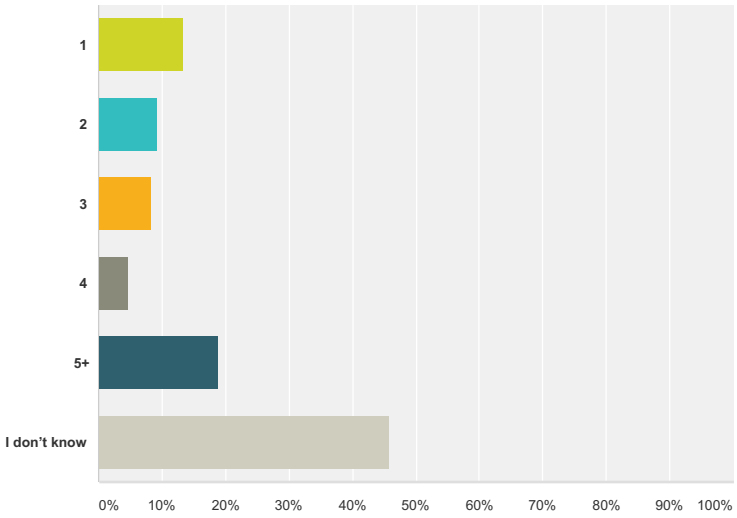
101	Viola St. Coventry	1/6/2017 1:41 PM
102	Allison ave	1/6/2017 1:27 PM
103	Pilgrim Avenue AND Matteson Avenue	1/6/2017 1:17 PM
104	Gibson hill rd	1/6/2017 1:16 PM
105	Water table rises so the basement floods	1/6/2017 1:12 PM
106	Pembroke lane	1/6/2017 1:10 PM
107	I live on Sugarmaple Dr. going down the hill where it intersects with Wood Cove pools at the intersection especially when snow is melting	1/6/2017 1:09 PM
108	Twin Brook and Harkney Hill	1/6/2017 1:08 PM
109	Tiogue	1/6/2017 1:07 PM
110	Under the bridge that has the Coventry sign on 117 near 116 intersection usually floods. Also the bottom of hill on Howard St where there is a small bridge next to the mill, just before Mumford St on right.	1/6/2017 1:02 PM
111	Town Farm Road/Poor Farm Road	1/6/2017 1:02 PM
112	Lewis Farm Rd	1/6/2017 1:00 PM
113	Sheltra Ave across the road were the river crosses the street	1/6/2017 12:56 PM
114	Reservoir road	1/6/2017 12:55 PM
115	Shady Valley Road	1/6/2017 12:53 PM
116	Old Flat River Road	1/6/2017 12:50 PM
117	Wood Cove/Wisteria	1/6/2017 12:49 PM
118	Pembroke Lane does not flood but there is a tremendous about of run off from Tiogue Ave.	1/6/2017 12:49 PM
119	Washington Street and laurel ave.	1/6/2017 12:47 PM
120	Washington st. And laurel ave.	1/6/2017 12:42 PM
121	Route 102. my house is lower than the street.	1/6/2017 12:39 PM
122	Maple Valley Road where the stream from Parker Woodlands runs under the road	1/6/2017 12:39 PM
123	red maple/plum tree . drains get clogged often.	1/6/2017 12:38 PM
124	bottom of station street	1/6/2017 12:38 PM
125	intersection of Lorraine and Hopkins Hill rd	1/6/2017 12:36 PM
126	Station st & hunters crossing	1/6/2017 12:33 PM
127	Carrsvtrail a couple of low points particularly at bottom of hill near 526	1/6/2017 12:33 PM
128	Rose Bud	1/6/2017 12:32 PM
129	Weaver Hill Rd and harkney hill	1/6/2017 12:31 PM
130	Anthony Mills Apartments	1/6/2017 12:29 PM
131	South Main & Sunapee. Drains cleaned twice in 6 years	1/6/2017 12:27 PM
132	Sunset/acorn	1/6/2017 12:25 PM
133	Bottom of Nichole and Old Mishnock Hwy when the single drain is clogged by debris.	1/6/2017 12:25 PM
134	Princeton and Wesleyan	1/6/2017 12:24 PM
135	Gibson hill and jenks	1/6/2017 12:22 PM
136	F	1/6/2017 12:21 PM
137	Niblick Circle; condo association in Station street	1/6/2017 12:20 PM
138	Hopkins court. Culda sac basin does not support water that rushed down the hill. I think it needs to be re paved and pitched	1/6/2017 12:19 PM
139	Sophias' Way (Cross Street - Windsor Park Drive)	1/6/2017 12:16 PM
140	Capwell Ave off 117	1/6/2017 12:16 PM
141	Colvintown & Sweetwater	1/6/2017 12:15 PM
142	Fish Hill Rd. and Twin Brook Lane	1/6/2017 12:12 PM
143	with the Arkwright Bridge closed, I have to travel from Hill Street to Howard Ave. bottom of the hill at Howard Ave floods/large puddle. Also on Main street near the fire station turning onto Wakefield Street.	1/6/2017 12:11 PM
144	Sheltra Ave and Washington st	1/6/2017 12:11 PM
145	Maple Valley Road, over the stream (after Pig Hill Road if Pig Hill is on your right).	1/6/2017 12:10 PM
146	Hill Street and South Pond	1/6/2017 12:10 PM
147	Larchmont, Pine	1/6/2017 12:09 PM
148	nooseneck at reservoir rd	1/6/2017 12:09 PM
149	Blackrock & Hornbeam intersection	1/6/2017 12:08 PM
150	Reservoir Rd	1/6/2017 12:08 PM
151	Cove & Johnson	1/6/2017 12:07 PM
152	Reervoir Rd. infront of 98/99... due to drainage	1/6/2017 12:03 PM
153	245 Whitehead Road. At the bike path and the where new house is being built	1/6/2017 12:03 PM

154	Town Farm Road	1/6/2017 12:02 PM
155	Island Dr, near bridge	1/6/2017 12:02 PM
156	All of Greene	1/6/2017 12:00 PM
157	Shady Valley Road	1/6/2017 12:00 PM
158	Oakhaven	1/6/2017 12:00 PM
159	End of Centennial St. The drain is in the road and leaves, and others items come down the hill and block the drain.	1/6/2017 12:00 PM
160	tiogue ave, arnold road	1/6/2017 12:00 PM
161	Laurel Ave and 117	1/6/2017 11:59 AM
162	Knotty Oak Rd. Bottom of hill between Gervais St. and Sandy Lane. Near Cumberland Farms	1/6/2017 11:59 AM
163	Clifton Ave and Marion St	1/6/2017 11:58 AM
164	white rock and spring valley	1/6/2017 11:57 AM
165	Rt. 117, under bike path trestle at Knotty Oak Cemetary	1/6/2017 11:57 AM
166	Jennifer & Tioque	1/6/2017 11:57 AM
167	Lydia Road at Vera Road. I live at the top of Lydia	1/6/2017 11:57 AM
168	Howard Ave, between Alexis St and Hill St	1/6/2017 11:56 AM
169	Flooding in basement. Red Oak Drive toward dead end. It's happened to me a few times since living Coventry. When it rains over two inches I need to worry.	1/6/2017 11:52 AM
170	WE live on a private dirt road that gets a lot of water but does not fully flood	1/6/2017 11:52 AM
171	Weeks Hill/ Campwest wood	1/6/2017 11:50 AM
172	Down of Fairview avenue floods	1/6/2017 11:46 AM
173	Hope furnace rd	1/6/2017 11:46 AM
174	Hill Farm Rd	1/6/2017 11:46 AM
175	Shady Valley	1/6/2017 11:46 AM
176	3 Dawley Street off Tiogue Ave. The water comes down Tiogue and rushes down Dawley Street. We have a berm but it does not eliminate the issue	1/6/2017 11:45 AM
177	Circlewood Dr.	1/6/2017 11:44 AM
178	Town hall area	1/6/2017 11:21 AM
179	#415 Shady Valley Rd near the lake	1/6/2017 10:55 AM
180	Murray/Irene	1/6/2017 9:59 AM
181	main street & station street	1/6/2017 9:21 AM
182	More driveway erosion into street than flooding.	1/6/2017 8:05 AM
183	Station street north of Maple street	1/6/2017 4:20 AM
184	Johnson Blvd and Ledo Street. Street flooding has gotten better with dredging of pond down the street	1/6/2017 12:49 AM
185	End parts on hopkins hill heading towards tiogue ave	1/5/2017 10:52 PM
186	Leuba Rd	1/5/2017 10:22 PM
187	Metro Drive	1/5/2017 10:21 PM
188	The dead end on Canyon dr. Does when it rains hard. The water from the hills all wash down there.	1/5/2017 9:41 PM
189	Lionel Ave	1/5/2017 9:29 PM
190	Hammet Road	1/5/2017 9:20 PM
191	Indian trail number 50	1/5/2017 9:13 PM
192	Larch off Arnold Rd	1/5/2017 8:31 PM
193	Washington @ knotty oak	1/5/2017 8:20 PM
194	117/116	1/5/2017 8:16 PM
195	Nichole lane & old mishnock hwy	1/5/2017 8:09 PM
196	Flat River and Franklin Rd	1/5/2017 8:06 PM
197	Tiogue at bennys	1/5/2017 8:05 PM
198	Linda Dr. and Grace Ave.	1/5/2017 8:05 PM
199	Flat river rd	1/5/2017 7:57 PM
200	My street flooded numerous times in front of my previous residence (Windsor park drive). I called the town and they did nothing but provide a useless berm in front of my driveway. The road was redone for new water lines and was slopped towards my property only to fill up my driveway with 3 inches of water.	1/5/2017 7:57 PM
201	Chandler estates - Daniel drive - chandler	1/5/2017 7:53 PM
202	Brown/lucille....water runs down from hillside street and pools in my front yard which then floods my basement	1/5/2017 7:51 PM
203	Laforge / Viola	1/5/2017 7:19 PM
204	Hopkins Hill at Coventry Dr area	1/5/2017 6:59 PM
205	Coventry Drive and Audrey Court	1/5/2017 6:30 PM
206	Red Maple Road and Jack Pine	1/5/2017 5:35 PM

207	Arnold road @ Tiogue ave.	1/5/2017 5:24 PM
208	Alexis Street off of Howard Ave. Sometimes floods in areas within the cul-de-sac but not much. Down at the bottom of Howard Ave it floods a lot where the abandoned buildings are.	1/5/2017 4:42 PM
209	Victory Highway. We are hoping with the new storm drains from the resurfacing of the road will eliminate flooding. Water would cascade down the road vs the drainage ditch.	1/5/2017 4:29 PM
210	Hopkins Court - the end of the court almost always floods when it rains.	1/5/2017 4:27 PM
211	My street doesn't flood, but 116 very near to Marie Dr does and so does Stewart Lane at 116.	1/5/2017 4:05 PM
212	Airport Road and Milton Lane	1/5/2017 4:03 PM
213	Old north road	1/5/2017 3:45 PM
214	Rawlinson Dr - directly in front of our house (40). The drain floods in heavy rains and it impacts our driveway (I would be concerned about car access in an emergency evacuation situation - or even just the damage to our vehicles/driveway/ yard)	1/5/2017 3:33 PM
215	Off Highwood, and Station Street 269 to 271.	1/5/2017 3:10 PM
216	i had pavers put a higher spot at the beginning of my driveway to stop the street run off from going down my down inclined driveway. Ramblewood Estates	1/5/2017 3:00 PM
217	Blackrock at Hornbeck and sandlewood and hickory.	1/5/2017 2:45 PM
218	Colvintown Road, cross road Hunters Crossing toward Hope Furnance	1/5/2017 2:35 PM
219	Washington street	1/5/2017 2:32 PM
220	Hill Farm Rd in several locations	1/5/2017 2:12 PM
221	station , main	1/4/2017 7:20 AM

Q11 How many times has that street flooded in the last 12 months?

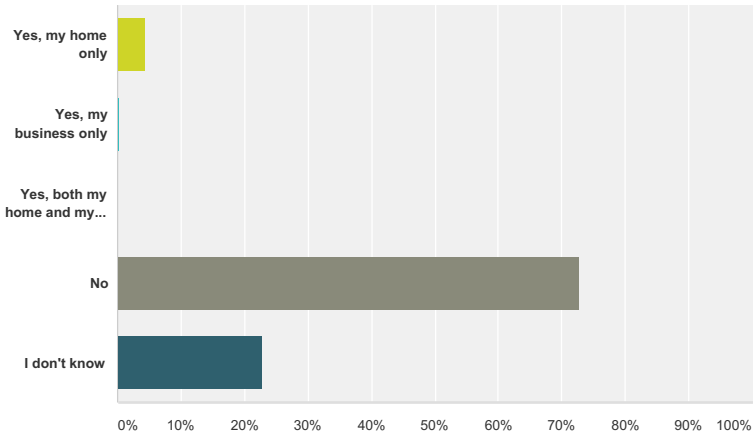
Answered: 286 Skipped: 707



Answer Choices	Responses	
1	13.29%	38
2	9.09%	26
3	8.39%	24
4	4.55%	13
5+	18.88%	54
I don't know	45.80%	131
Total		**286**

Q12 Is your home/business located in a floodplain?

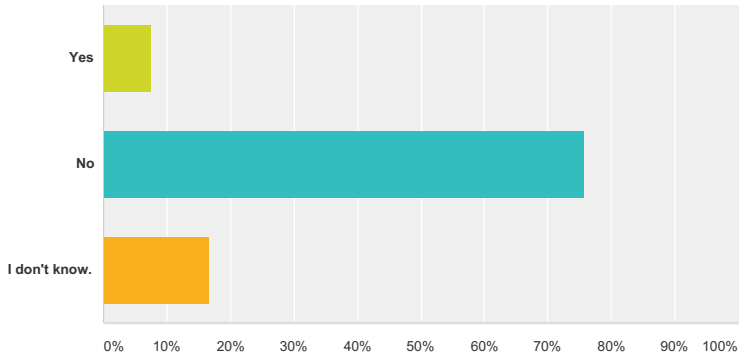
Answered: 721 Skipped: 272



Answer Choices	Responses	
Yes, my home only	**4.30%**	31
Yes, my business only	**0.28%**	2
Yes, both my home and my business	**0.00%**	0
No	**72.68%**	524
I don't know	**22.75%**	164
Total		**721**

Q13 Do you currently have flood insurance on your house?

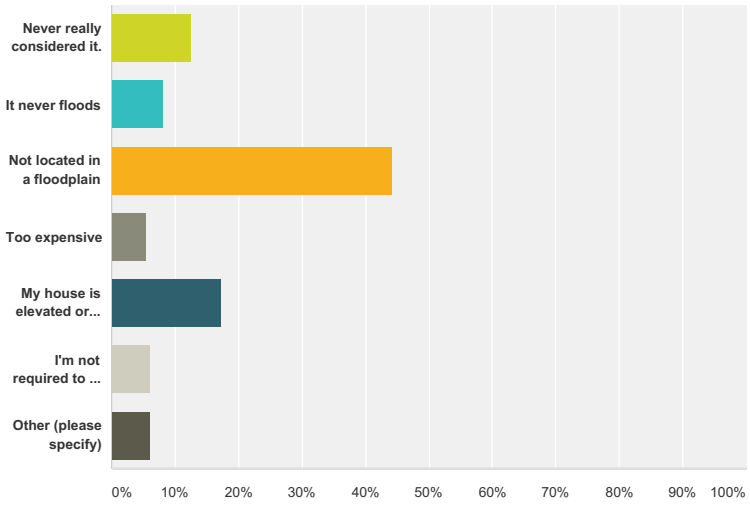
Answered: 720 Skipped: 273



Answer Choices	Responses	
Yes	**7.50%**	54
No	**75.69%**	545
I don't know.	**16.81%**	121
Total		**720**

Q14 If you don't have flood insurance, please indicate why.

Answered: 523 Skipped: 470



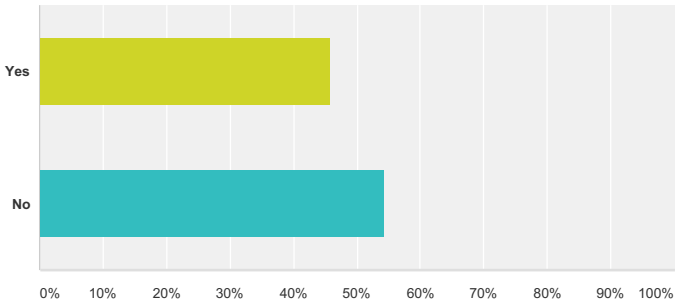
Answer Choices	Responses	
Never really considered it.	**12.62%**	66
It never floods	**8.22%**	43
Not located in a floodplain	**44.17%**	231
Too expensive	**5.35%**	28
My house is elevated or otherwise protected	**17.40%**	91
I'm not required to do so (I don't have a federally backed mortgage)	**6.12%**	32
Other (please specify)	**6.12%**	32
Total		**523**

#	Other (please specify)	Date
1	I have never experienced any water in my residence since I've been in it (16 years)	1/16/2017 4:20 PM
2	I rent	1/16/2017 8:45 AM
3	Live on a hill	1/11/2017 11:10 PM
4	Top of one of the highest points in Coventry. Never had a drop of wetness in basement even during the 100 year flood a few years ago. The elevation of the land was important to us when we bought the house 16 years ago.	1/9/2017 12:27 PM
5	I was denied flood insurance when I applied	1/9/2017 8:28 AM
6	I rent	1/7/2017 11:40 PM
7	rent	1/7/2017 7:37 PM
8	We are on a hill at the highest point in neighborhood	1/7/2017 8:50 AM
9	We had it for two years after the big 100 year flood, but we are not in a flood plain, on a hill, have a walk out, we bought out of fear but could have much better grading, grading points some water towards house	1/7/2017 8:37 AM
10	rent	1/6/2017 8:15 PM
11	We are just outside the flood zone	1/6/2017 5:25 PM
12	I am on high ground	1/6/2017 5:12 PM
13	Don't own	1/6/2017 4:44 PM
14	I rent my house	1/6/2017 4:42 PM
15	Only flooded once	1/6/2017 4:23 PM
16	Have an elevated mobile home and it's quite expensive	1/6/2017 3:57 PM
17	I rent	1/6/2017 3:04 PM
18	Rent the house	1/6/2017 1:53 PM
19	i rent	1/6/2017 1:15 PM
20	Don't believe to be in floodplain	1/6/2017 12:34 PM
21	dwelling is not close to the road, long driveway, wooded lot	1/6/2017 12:16 PM
22	Not located in floodplain but during 2010 had significant flooding from groundwater	1/6/2017 12:12 PM

23	Renter	1/6/2017 12:03 PM
24	Rent don't own a home	1/6/2017 12:00 PM
25	I am an insurance agent and don't believe I need the coverage	1/6/2017 11:59 AM
26	I rent	1/6/2017 11:58 AM
27	Per my insurance company i am in a high water table and it is not offered	1/6/2017 11:45 AM
28	Fixed income, not part of my budget with rising health care costs..	1/6/2017 10:01 AM
29	J	1/5/2017 11:07 PM
30	We are not in a flood plain and we are in a hill	1/5/2017 10:16 PM
31	Renter	1/5/2017 6:50 PM
32	Have elevation certificate and LOMA out of floodzone	1/5/2017 5:05 PM

Q15 Have you taken any actions to make your home, business or neighborhood more resistant to natural hazards?

Answered: 710 Skipped: 283



Answer Choices	Responses	
Yes	**45.63%**	324
No	**54.37%**	386
Total		**710**

Q16 If yes, please explain.

Answered: 208 Skipped: 785

#	Responses	Date
1	We keep trees and bushes trimmed, pruning when needed.	1/17/2017 8:55 PM
2	French drains	1/13/2017 2:50 PM
3	Bought generator, installed sump pump	1/11/2017 9:30 PM
4	Better weather resistent exterior	1/11/2017 7:31 PM
5	Just prepare before an event. For snow, get gas and make sure things outdoors are ready. For wind, bring in anything that could become a hazard.	1/11/2017 1:59 PM
6	drainage, securing fencing, etc	1/11/2017 10:20 AM
7	Using rain barrels for water collection	1/11/2017 7:40 AM
8	French drain in basement	1/10/2017 1:00 PM
9	We installed drainage pipes and landscaped to divert runoff away from the house.	1/10/2017 10:26 AM
10	gutter guards, compressor for power outages and window seals for drafts	1/10/2017 8:14 AM
11	new roof with ice and water shield	1/9/2017 10:46 PM
12	Weather stripping. Generator.	1/9/2017 2:53 PM
13	We have cleared the trees around the house back 50 ft and taken down most of the trees in the front near power lines. We have 2 generators and a wood stove as backup and water stored. We have a backhoe and a tractor to plow and move debris.	1/9/2017 12:27 PM
14	purchased generator	1/9/2017 9:00 AM
15	Proactive common sense	1/9/2017 8:51 AM
16	Sealed basement, purchased generator,	1/9/2017 8:39 AM
17	sump pumps, drainage system enhancements	1/9/2017 8:30 AM
18	Put in provisions for a house generator.	1/9/2017 8:13 AM
19	new roof and gutters	1/8/2017 10:26 PM
20	More drainage	1/8/2017 9:27 PM
21	new roof, generator, back-up heaters	1/8/2017 8:27 PM
22	French drains	1/8/2017 7:22 PM
23	sump pump and generator for power outages	1/8/2017 7:10 PM
24	taking down trees	1/8/2017 6:26 PM
25	new gutters	1/8/2017 11:49 AM
26	Installed Generator.	1/8/2017 8:50 AM
27	we have a generator connected to the house now	1/8/2017 7:48 AM
28	Generator w/transfer switch, installed sump pumps	1/8/2017 6:26 AM
29	French Drains	1/7/2017 10:46 PM
30	French Drain	1/7/2017 6:37 PM
31	Be aware	1/7/2017 5:10 PM
32	sump pump in basement	1/7/2017 1:47 PM
33	slope grade away from house	1/7/2017 1:41 PM
34	Re-did driveway so that water flowing down the hill does not flow directly into our driveway.	1/7/2017 11:49 AM
35	Installed French drains and sub pump after last flood	1/7/2017 11:37 AM
36	Tree cutting	1/7/2017 11:08 AM
37	Water Batteries Flashlights Wood stove	1/7/2017 10:50 AM
38	Removed large trees over hanging house. Landscaped so water drains away from foundation. Installed generator.	1/7/2017 10:44 AM
39	Bottled water Non perishable food	1/7/2017 10:27 AM
40	Whole house generator	1/7/2017 10:13 AM
41	installed a generator	1/7/2017 9:56 AM
42	Reinforce gutters and have clear area. This was as a result of a hurricane/tropical storm Sandy.	1/7/2017 9:51 AM
43	redirecting water away from house and barn, keeping trees trimmed	1/7/2017 9:17 AM
44	Always checking outside and inside before a storm.	1/7/2017 9:11 AM
45	We keep the drains cleared	1/7/2017 9:11 AM
46	window and door replacement and structure reinforcement for chance of wind damage.. cut down trees etc.	1/7/2017 9:11 AM
47	New gutters, downspouts, windows, draining	1/7/2017 8:54 AM
48	Sump pump	1/7/2017 8:41 AM
49	Our grounding rod is deeper in the ground. Gutters are cleaned regularly.	1/7/2017 7:55 AM

50	Installed sump pump	1/7/2017 7:49 AM
51	installed generator	1/7/2017 7:30 AM
52	Portable generator, sump pump, precautions for loss of water	1/7/2017 7:28 AM
53	Cut down diseased and large trees close to house. Purchased a generator. Secured windows.	1/7/2017 4:56 AM
54	Try to keep trees healthy and trimmed as much as possible	1/7/2017 1:42 AM
55	drain around foundtion	1/7/2017 12:27 AM
56	Changed grade of land outside bssement	1/6/2017 10:59 PM
57	Installed generator switch, maintain wood stove for alternative heat, trimmed large trees and limbs too close to the house	1/6/2017 10:53 PM
58	attic insulation (ice dams from melting snow), pellet stove (for cold weather power outages), generator (for power outages), septic backflow preventer (for extreme rain), trees removed and pruned (for wind events)	1/6/2017 10:13 PM
59	Invested in generators, machines to plow, increased wood stockpiles	1/6/2017 10:06 PM
60	New Windows and doors	1/6/2017 9:46 PM
61	Retaining wall	1/6/2017 9:30 PM
62	French drains, tiled basement,	1/6/2017 9:22 PM
63	Cut trees away from home, insulated well, wood stove installed.	1/6/2017 9:03 PM
64	Sump Pump built in.	1/6/2017 8:56 PM
65	Removed trees	1/6/2017 8:39 PM
66	Treework	1/6/2017 8:37 PM
67	Cut trees,adding soil,adding stone	1/6/2017 8:20 PM
68	New roof with ice water shield	1/6/2017 8:13 PM
69	Removed trees from yard	1/6/2017 8:08 PM
70	French drains and sump pump	1/6/2017 7:53 PM
71	Sump pump in basement for flooding, pitching natural flow away from the house	1/6/2017 7:29 PM
72	Had the town put in a berm to change the water direction down the street.Paid for drains and a huge French drain in our driveway.	1/6/2017 6:39 PM
73	Improved roof drainage and aggressively look for low-lying tree limbs and other hazards.	1/6/2017 6:19 PM
74	Battery. Canyon cor garage Generator ready for outage	1/6/2017 6:17 PM
75	erosion control/plantings/site drainage	1/6/2017 6:00 PM
76	secured items, disaster plan, home maintenance	1/6/2017 5:58 PM
77	I have reinforced my foundation seams.	1/6/2017 5:45 PM
78	metal roof, cut down trees, made a fire break	1/6/2017 5:43 PM
79	When our house was renovated we had hurricane precautions added to the roof structure. We have also had a retaining wall put in the back yard to help with erosion.	1/6/2017 5:28 PM
80	Cut back trees, move thing away from the house that could damage it. Have good drainage around house	1/6/2017 5:26 PM
81	Tree clearing,trimming	1/6/2017 5:15 PM
82	new windows in basement, landscaping	1/6/2017 5:10 PM
83	Removable of trees that could be hazards to house. Generator circuit wired in by licensed electrician. Family preparedness plan.	1/6/2017 5:03 PM
84	Cut down trees and fixed erosion	1/6/2017 4:47 PM
85	We have a stand by generator powered by propane. We have French drains in our basement. We own a tractor for plowing we own a chain saw.	1/6/2017 4:45 PM
86	Sub pump	1/6/2017 4:44 PM
87	Pest inspection and spraying regularly, storm rated windows, hi rated insulation	1/6/2017 4:41 PM
88	New roof, generator	1/6/2017 4:25 PM
89	Sump pump was installed after the floods	1/6/2017 4:24 PM
90	Elevated everything in basement and sealed things	1/6/2017 4:20 PM
91	We have had some rather large trees removed from our property to prevent damage to our home and that of our neighbors.	1/6/2017 4:18 PM
92	Replaced all windows and keep house maintained.	1/6/2017 4:12 PM
93	Put away out door items. Have water, gas and batteries on hand. Wood brought to easiest attainable area, as well as shovels. Rock salt on hand. Chain saw ready for tree down on something important (barns sheds ext).	1/6/2017 3:52 PM
94	Had trees that were weakened by storms cut down.	1/6/2017 3:22 PM
95	New roof for no leaking, tree worked on so loose branches don't fall in high winds, got a generator	1/6/2017 3:14 PM
96	Trimming trees, new gutterso	1/6/2017 3:08 PM
97	Sump pumps	1/6/2017 3:00 PM
98	basement waterproofing system	1/6/2017 2:56 PM
99	Cut down trees close to the house. installed better drains	1/6/2017 2:43 PM
100	Generator	1/6/2017 2:36 PM

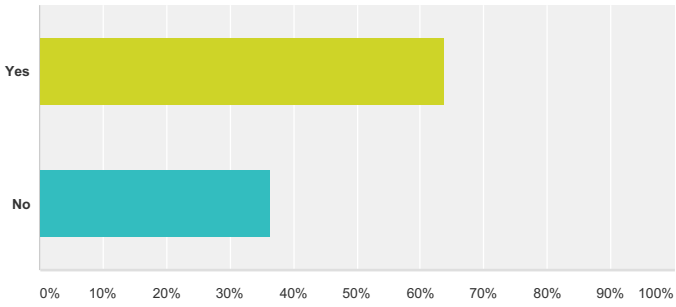
101	Trees that were on our property have been removed and generator	1/6/2017 2:28 PM
102	Removed some trees	1/6/2017 2:27 PM
103	Sandbags in window wells for basement. We also have a generator for loss of power.	1/6/2017 2:18 PM
104	Make sure that exterior items are tethered to support (table, grill, etc) as we are in high wind area. We clean off grates located at bottom of driveway so rain water doesn't back up into neighbors home.	1/6/2017 2:16 PM
105	Installed whole house generator. fixed grading and erosion issues to drain water away from house. Removed weak/ dangerous trees.	1/6/2017 2:06 PM
106	Install sump pump in basement	1/6/2017 1:57 PM
107	We have eliminated a few trees in the immediate area surrounding my residence in case of any high winds, hurricanes, etc.	1/6/2017 1:53 PM
108	Cut down trees, sealed basement because of flooding	1/6/2017 1:50 PM
109	Keeping trees trimmed.	1/6/2017 1:47 PM
110	Removed trees that could fall and damage home	1/6/2017 1:46 PM
111	Watch weather and stay ahead of storm prep	1/6/2017 1:45 PM
112	generator, underground power lines in my neighborhood	1/6/2017 1:37 PM
113	We have removed dead trees and limbed up those hanging over the house.	1/6/2017 1:35 PM
114	Sub pump French drains generator	1/6/2017 1:31 PM
115	Remove 10 trees	1/6/2017 1:31 PM
116	Everything in home updated	1/6/2017 1:29 PM
117	We waterproofed our basement after the flood although our basement only got a little water through the bulkhead.	1/6/2017 1:24 PM
118	Drainage, generator	1/6/2017 1:19 PM
119	Flashlights, fireplace set up in case of winter power outages	1/6/2017 1:18 PM
120	Fixed are roof and gutters	1/6/2017 1:16 PM
121	Purchased a permanent generator	1/6/2017 1:15 PM
122	Clearing drains, trimming trees, new roofing, new windows, new gutters	1/6/2017 1:13 PM
123	Removed trees	1/6/2017 1:10 PM
124	purchased a generator	1/6/2017 1:09 PM
125	Trimmed overhanging tree branches and cut down old trees that are hazards in storms, clean gutters, have gutter extenders, and maintain home properly (roof, windows) to resist bad weather, etc.	1/6/2017 1:08 PM
126	cut back trees, ensure drains are away form house	1/6/2017 1:05 PM
127	replaced roof/shingles w/ hurricane/high wind nails	1/6/2017 1:03 PM
128	We have French drains along outside 3 sides of our house	1/6/2017 1:02 PM
129	Removed numerous trees/limbs in yard to prevent damage from high winds. Installed new roof shingles to prevent flooding damage from melting snow & heavy rains.	1/6/2017 1:01 PM
130	Drainage around basement	1/6/2017 12:57 PM
131	French drains, directed gutter runoff,	1/6/2017 12:48 PM
132	cut some pine trees down. Bought a generator/wood stove.	1/6/2017 12:41 PM
133	We put in a lightning rod, regraded the hill behind out house, and fixed a roofing issue. We also made the fireplace usable in case we need to heat with it.	1/6/2017 12:40 PM
134	generator	1/6/2017 12:39 PM
135	Drain for basement	1/6/2017 12:38 PM
136	Drains in basement from flooding and purchased generator to run well	1/6/2017 12:37 PM
137	Sup pump. Landscaping /generator	1/6/2017 12:34 PM
138	Cut down trees near house. Wired generator to house	1/6/2017 12:33 PM
139	Put away items could be moved by wind, limbed trees, insulation is in home,	1/6/2017 12:33 PM
140	generator for the well water	1/6/2017 12:32 PM
141	Generator, drainage improvements, branch trimming.	1/6/2017 12:27 PM
142	Maintenance	1/6/2017 12:26 PM
143	Generator	1/6/2017 12:24 PM
144	We have other means of heat lighting cookng	1/6/2017 12:20 PM
145	Purchased a generator for power loss.	1/6/2017 12:20 PM
146	tree cutting, yard kept clean of leaves and debris	1/6/2017 12:19 PM
147	Gardens built up and sand bags when needed	1/6/2017 12:15 PM
148	No large trees that could land on tangible property.	1/6/2017 12:14 PM
149	I have a generator.	1/6/2017 12:14 PM
150	Cleared trees, put in fill, raised curb.	1/6/2017 12:13 PM
151	We have a sump pump, and water resistant coating on basement walls	1/6/2017 12:11 PM
152	Trees trimmed, automatic sump pumps in the basement.	1/6/2017 12:09 PM

153	Got generator	1/6/2017 12:07 PM
154	cut down trees clean debri	1/6/2017 12:06 PM
155	French drains added to home. Generator purchased.	1/6/2017 12:06 PM
156	We have a generator hooked into the house and plenty of batteries, flashlights, water and food when we are expecting a storm. We ALWAYS seem to lose power. ALWAYS.	1/6/2017 12:05 PM
157	keeping trees healthy, hurricane impact windows, generator	1/6/2017 12:05 PM
158	Unblock road drains and home gutters, trimmed trees away from house.	1/6/2017 12:05 PM
159	cut down all trees. They were internally destroyed by ants	1/6/2017 12:05 PM
160	well insulated, sealed, clean gutters regularly, generator, trim overhanging trees	1/6/2017 12:04 PM
161	Generator, wood stove, truck plow, good drainage	1/6/2017 12:02 PM
162	Cut down weak tress around my home	1/6/2017 12:02 PM
163	remodel basement. dry core and sump pump, purchase generator	1/6/2017 12:00 PM
164	We graded the land , put in a drain.	1/6/2017 11:59 AM
165	landscaping to prevent water damage to house	1/6/2017 11:59 AM
166	Drains at the ends of the downspouts	1/6/2017 11:59 AM
167	We have put everything away.	1/6/2017 11:58 AM
168	Sump pump and additional drains	1/6/2017 11:57 AM
169	cutting down trees	1/6/2017 11:57 AM
170	added drainage pipes and landscaped to runoff excessive water/melting snow, etc. pest prevention (caterpillars)	1/6/2017 11:54 AM
171	Cut down trees	1/6/2017 11:53 AM
172	Cut down threat branches/trees, leveled ground, walk-out basement to prevent flooding	1/6/2017 11:52 AM
173	Removed trees changed landscape	1/6/2017 11:52 AM
174	had diseased trees removed	1/6/2017 11:51 AM
175	supplies, waterproofing basement,	1/6/2017 11:50 AM
176	dug a "moat" arouns the back to keep the water from flooding the basement, got a generator and we've always had a sump pump	1/6/2017 11:44 AM
177	Sand bags	1/6/2017 10:57 AM
178	Cut down trees	1/6/2017 7:45 AM
179	Raising the grade and adding some drainage	1/6/2017 4:24 AM
180	After basement flooded and lost everything on floor reorganizing was done to prevent future.	1/5/2017 10:57 PM
181	Removed trees and branches	1/5/2017 10:55 PM
182	Installed a whole-house generator	1/5/2017 10:26 PM
183	Asked town to put in berm but rain still ruins my driveway	1/5/2017 10:24 PM
184	Better flooring downstairs and new outside weathering on the house to help prevent water from getting in	1/5/2017 10:23 PM
185	Generator, trimmed trees	1/5/2017 10:21 PM
186	Lightening rods--the house has been hit in the past. Not since a new rod went in.	1/5/2017 9:46 PM
187	Generator	1/5/2017 9:22 PM
188	During construction we added material and bracing for high winds and raised bottom floor over 100 year flood plain.	1/5/2017 9:16 PM
189	We have installed a generator, and corrected our drainage issues	1/5/2017 9:01 PM
190	Re did the hurricane barriers in our house walls	1/5/2017 8:16 PM
191	Installed a sub pump	1/5/2017 8:11 PM
192	Generator	1/5/2017 8:08 PM
193	Installation of French drains, slopping of my land away from my home, and adequate drainage outside of the home.	1/5/2017 8:02 PM
194	Trimmed back trees.	1/5/2017 7:49 PM
195	Try to keep the basin in the back of my yard clear of debris so the water flows	1/5/2017 7:26 PM
196	whole house generator, trees trimmed,ice melting roof wires	1/5/2017 7:11 PM
197	installed better drainage system	1/5/2017 6:26 PM
198	sump pump, pvc piping around the exterior of foundation underground, underground water barrier	1/5/2017 5:56 PM
199	Cut down rotten trees	1/5/2017 5:54 PM
200	I just did this survey	1/5/2017 5:30 PM
201	Tree removal away from home, garage and out buildings.	1/5/2017 4:32 PM
202	New gutters to address the issue of ice dams that happened a few years back.	1/5/2017 4:30 PM
203	Cleared drainage areas and improved gutter spouts.	1/5/2017 4:05 PM
204	Drains on pipes, regraded yard	1/5/2017 2:36 PM
205	Graded property. Waterproofed basement.	1/5/2017 2:35 PM
206	Removed trees near home, structures. Assessed trees for dead limbs, etc. and removed. Secured any loose materials (ex. Loose shutters) reinforced pool fencing. Use of GFI for all electronics.	1/5/2017 2:25 PM

207	Took down trees close to home, well pipe redone	1/5/2017 2:07 PM
208	move all important items out of basement	1/4/2017 7:22 AM

Q17 Are you interested in ways to make your home, business or neighborhood more resilient?

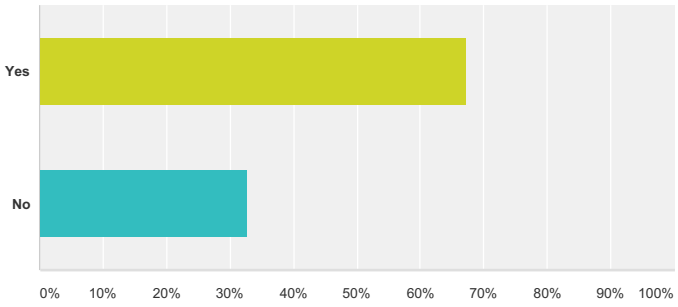
Answered: 592 Skipped: 401



Answer Choices	Responses	
Yes	63.68%	377
No	36.32%	215
Total		592

Q18 Are you in favor of spending tax dollars on mitigation projects for the benefit of the entire community?

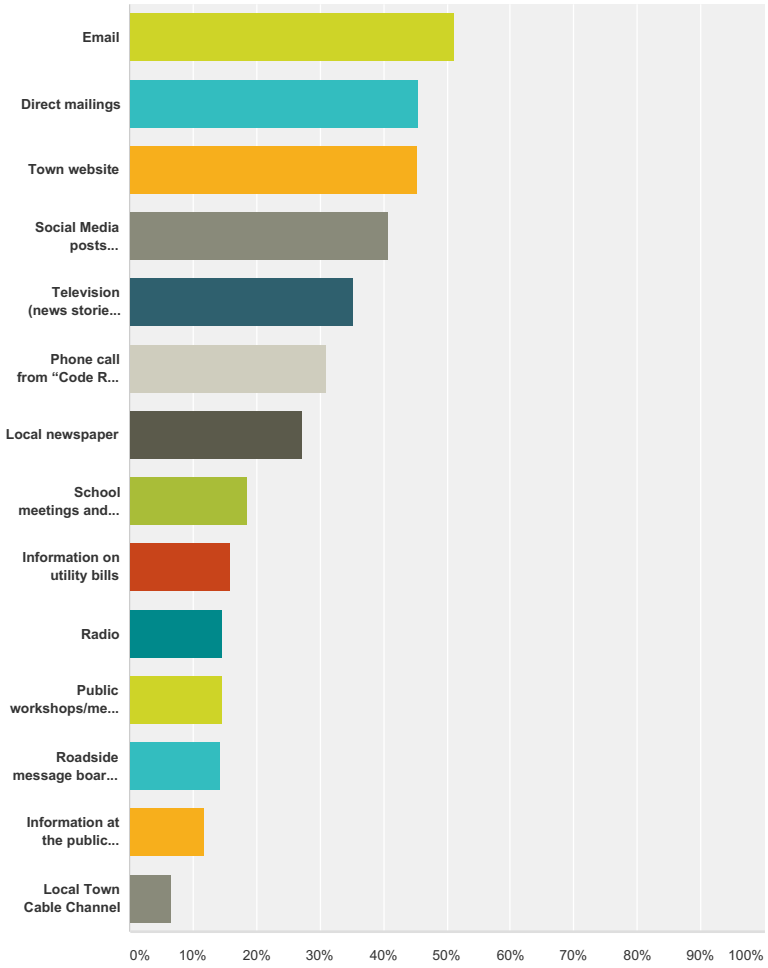
Answered: 578 Skipped: 415



Answer Choices	Responses	
Yes	**67.30%**	389
No	**32.70%**	189
Total		**578**

Q19 How do you prefer to receive information about how to better protect your home, business, or neighborhood? Check all that apply. (Don't worry, we aren't adding you to a list.)

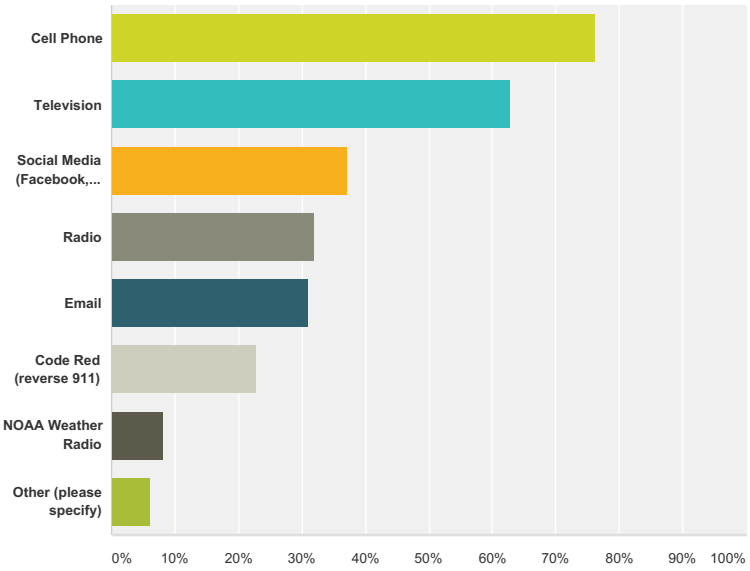
Answered: 584 Skipped: 409



Answer Choices	Responses	
Email	51.20%	299
Direct mailings	45.55%	266
Town website	45.38%	265
Social Media posts (Facebook, Twitter, etc.)	40.75%	238
Television (news stories, Public Service Announcements)	35.27%	206
Phone call from "Code Red" Systems	30.99%	181
Local newspaper	27.23%	159
School meetings and messages	18.49%	108
Information on utility bills	15.92%	93
Radio	14.55%	85
Public workshops/meetings	14.55%	85
Roadside message boards or billboards	14.21%	83
Information at the public library	11.64%	68
Local Town Cable Channel	6.51%	38
Total Respondents: 584		

Q20 How do you currently receive weather alerts?Check all that apply.

Answered: 596 Skipped: 397



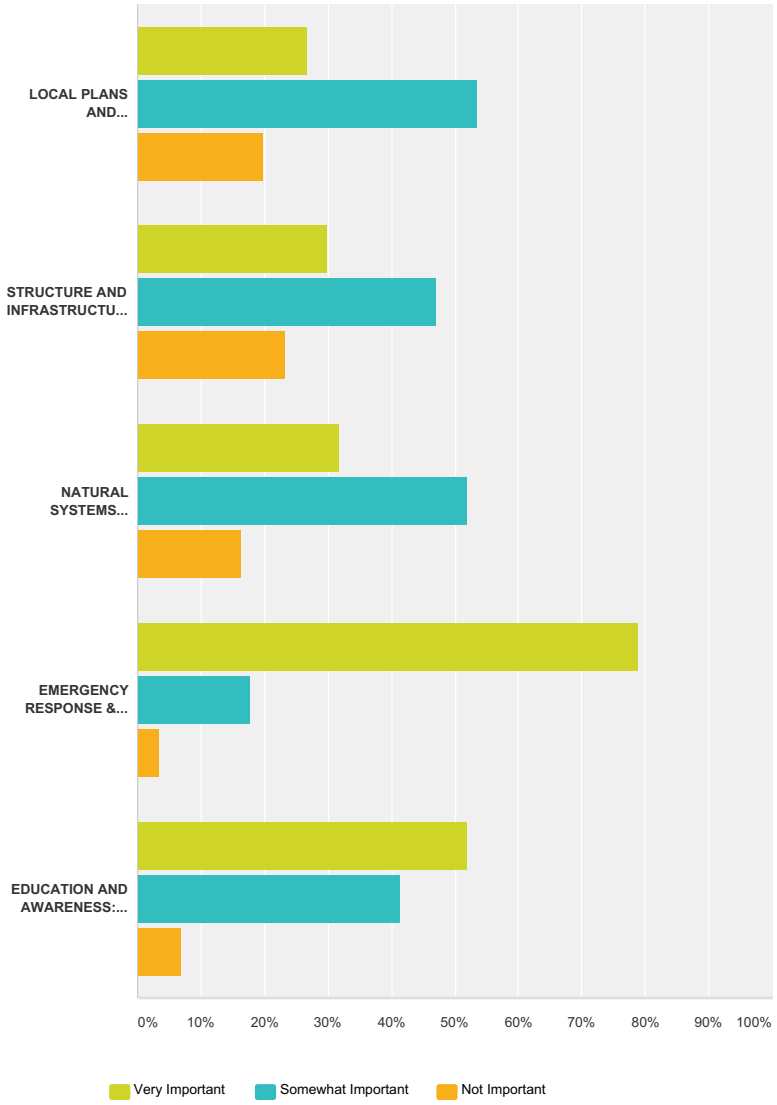
Answer Choices	Responses	
Cell Phone	**76.17%**	454
Television	**62.92%**	375
Social Media (Facebook, Twitter, etc.)	**37.08%**	221
Radio	**31.88%**	190
Email	**30.87%**	184
Code Red (reverse 911)	**22.82%**	136
NOAA Weather Radio	**8.22%**	49
Other (please specify)	**6.04%**	36
Total Respondents: 596		

#	Other (please specify)	Date
1	automated school calls	1/17/2017 8:55 PM
2	house phone	1/8/2017 9:34 PM
3	iPhone apps	1/8/2017 8:27 PM
4	RIBC Alerts	1/7/2017 6:37 PM
5	The coventry school automated weather notification.	1/7/2017 9:51 AM
6	Cell phone apps and local list serves	1/7/2017 8:41 AM
7	weather websites (weather underground)	1/7/2017 7:30 AM
8	internet	1/6/2017 10:13 PM
9	Weather app	1/6/2017 8:42 PM
10	Web	1/6/2017 8:38 PM
11	website	1/6/2017 6:23 PM
12	Text (SMS)	1/6/2017 6:19 PM
13	battery/crank operated radio	1/6/2017 5:43 PM
14	News websites	1/6/2017 4:41 PM
15	internet	1/6/2017 4:12 PM
16	Text	1/6/2017 4:01 PM
17	Alerts from school dept	1/6/2017 2:41 PM
18	NOAA App	1/6/2017 1:57 PM
19	text	1/6/2017 1:37 PM
20	Weather App	1/6/2017 1:19 PM

21	News station website. Weather app	1/6/2017 12:40 PM
22	AAA alert texts	1/6/2017 12:33 PM
23	Weather bug app	1/6/2017 12:24 PM
24	Weather Channel App	1/6/2017 12:23 PM
25	CHS High School Alerts	1/6/2017 12:20 PM
26	do not receive weather alerts	1/6/2017 12:06 PM
27	word of mouth	1/6/2017 11:54 AM
28	websites	1/6/2017 6:50 AM
29	Online sites	1/6/2017 12:50 AM
30	Weather Apps	1/5/2017 10:26 PM
31	.	1/5/2017 8:16 PM
32	Weather apps	1/5/2017 8:09 PM
33	NOAA Website	1/5/2017 7:37 PM
34	Amateur Radio	1/5/2017 6:18 PM
35	Weather Channel app	1/5/2017 4:05 PM
36	personal computer	1/5/2017 3:15 PM

Q21 There are many ways Coventry can reduce the risk from natural hazards. Overall, these actions fall into one of the five categories. Please indicate how important each one is for your neighborhood.

Answered: 573 Skipped: 420



	Very Important	Somewhat Important	Not Important	Total
LOCAL PLANS AND REGULATIONS: Policies to reduce the impact of hazards such as zoning, planning, and building codes.	**26.72%** 35	**53.44%** 70	**19.85%** 26	131
STRUCTURE AND INFRASTRUCTURE PROJECTS: Modifications of existing homes and buildings to protect them from hazards, such as elevation of electrical equipment. Engineering of structures (such as levees) to reduce the impacts of hazards.	**29.88%** 49	**46.95%** 77	**23.17%** 38	164
NATURAL SYSTEMS PROTECTION: Actions that not only reduce the impact of hazards but also preserve and restore natural habitats. Examples include open space preservation and wetland restoration.	**31.63%** 62	**52.04%** 102	**16.33%** 32	196
EMERGENCY RESPONSE & SERVICES: Actions that protect people and property during or immediately after a disaster or hazardous event. Examples include Code Red emergency warning systems, and emergency response training.	**78.95%** 195	**17.81%** 44	**3.24%** 8	247
EDUCATION AND AWARENESS: Citizen preparedness seminars, direct mailings, public meetings, public service announcements, Q&A sessions.	**51.88%** 234	**41.24%** 186	**6.87%** 31	451

Q22 Please provide additional thoughts on how Coventry can better prepare for and recover from the next disaster.

Answered: 98 Skipped: 895

#	Responses	Date
1	People don't like spending tax money, but it's important for the good of the community as well as the protection of individual property value. So, frankly, be pushy. :)	1/17/2017 8:55 PM
2	I believe that an electrical outage (long term) or a virus affecting a large portion of population are most likely hazards which not only Coventry but the US is ill prepared for in general	1/16/2017 4:22 PM
3	I think the most immediate type of natural disaster in Coventry seems to be flooding/Hurricane/Tropical storm which are all kind of lumped together. I big part of keeping the town's power going is making sure ALL the trees are cut back and some even down. The trees in the older areas are growing over the roads which is a danger to drivers and pedestrians in wind/snow and rain events. Mitigation the flooding around Johnsons pond would be better if the town of Coventry actually owned the dam at the south branch of the Pawtuxet river where johnsons pond spills out. I belive that if that area was managed better during 2010, many homes would not have been flooded. I was getting information 3-4 days prior to the rain starting here from Texas weather service that was warning of a large "funnel' of rain in a multi day event heading to RI but no one listened. I feel if the water level was lowered as quickly as possible over those 3-4 days the pond would have been able to handle the rain and the level below spillway could have been micro managed during that event. I feel because there is not a proper working relationship between quidnick reservoir and the town about the level of the water. the owner of the quidnick reservoir does not seem to take residents flooding very seriously. someone that lives on the pond should be responsible for the level of the pond or at least the town should have responsibility so that during an emergency a quicker response should happen. Thanks for doing this.	1/11/2017 6:08 PM
4	Landowners need to be allowed to install solar without NIMBY craziness. Income from such project will allow landowners to retain their land and keep if from being developed for more impactful uses. The format of the public hearings for the planning commission regarding the solar project in Greene allows the opposition to monopolize the floor asking inane questions and spewing falsehoods. To be resilient in the face of climate change and to have access to affordable electricity as places like Pilgrim Nuclear close down, we need an all-hands approach to adding renewable energy to the grid. Let's cover all the old landfill sites in the town with solar and use the revenue to help relocate folks in places that will continue to flood more regularly as sea levels rise. Let's support local food production and consumption so our food system is less reliant on petroleum... If you decide for form a sustainability committee, I would like to help. Shannon Donovan sciencepup@hotmail.com.	1/10/2017 10:26 AM
5	ensure all vehicles are off the road and all drainage areas are open and not clogged for proper drainage	1/10/2017 8:14 AM
6	Proactive people take care of themselves. Reactive people will want you to take care of them. You will never solve this problem before it happens. The response system will be slave to the ignorant and ignore the informed by necessity.	1/9/2017 3:24 PM
7	I do not think that people should be continuously able to build in wetlands, on stilts on the ocean, or flood plains! We should have learned this when Katrina hit! Hurricanes, Noreaster's, blizzards and lightning are to be expected in RI and all should make preparations for them.	1/9/2017 12:27 PM
8	An annual brochure with tips and recommendations where homeowners might be lacking is sufficient.	1/9/2017 8:51 AM
9	properly plow side roads including Maple street for students to safely walk to school!	1/8/2017 10:26 PM
10	Listen to residents. Perform the public service the way it should be done. Know the map of Coventry.	1/8/2017 10:20 PM
11	I think the police are doing a great job	1/8/2017 9:27 PM
12	Encourage people to be ready on their own.	1/8/2017 3:39 PM
13	All of the above needs to be addresses	1/8/2017 8:32 AM
14	We have alot of areas that flash flood perhaps setting up a better drainage system in those areas because sometimes I'm not able to get home due to flooding and I know a few other people that have the same problem	1/7/2017 11:45 PM
15	The above question is not allowing me to properly pick a response.	1/7/2017 7:40 PM
16	we need to all be one! we are all together on this and we want both families on the same page	1/7/2017 5:20 PM
17	1. Develop a formal Emergency Action Plan. There are a number of agencies with publications that could assist with this (PEMA, EPA, etc.) 2. To extent possible, acquire tools/equipment to assist in disaster recovery (generators, spare parts for pump stations and other critical facilities, sand bags, pumps, etc.) 3. Public education to assist property owners on how to prepare and respond to emergencies. I understand Town budgets restrict what a municipality is capable of doing, public education and information can go a long way in helping to create support for emergency preparedness. RIDEM will soon be requiring that projects applying for SRF Dollars address climate resiliency; however, this may change with pending change in the executive office. Regardless, climate change is happening (the only reasonable debate is only what is causing it), therefore, the community needs to consider what will happen "if" ... Feel fee to contact me if you wish to discuss further. Sincerely, Mike Caruolo 401-954-8981	1/7/2017 1:41 PM
18	Town meeting	1/7/2017 10:27 AM
19	All of the above not just one.	1/7/2017 10:13 AM
20	I feel that coventry has done well in recovering from disasters - power outages, floods, big snow storms. I feel that as long as people can see the authorities or personnel working, they can see progress. Additionally, tapping into media (channel 10, etc) to provide updates will be helpful and keeps the population at ease.	1/7/2017 9:51 AM
21	it is difficult to know what the ArcGIS map key indicates exactly..you asked if we were on a floodplain but the map key only indicates a flood "way". This survey had some bugs also, I was only able to select one of the above 'natural hazard' catagories..when I tried to select an answer for each of the items...the others got deleted. That's a program code problem. Also, how do we know which of the Coventry Burroughs we live in? I live in Wood Estates so where does that put me? It would be much better our address determined that for us...my husband has lived here all his life and has never heard of most of those Burroughs. Thanks	1/7/2017 9:11 AM

22	The only suggestion I would have is working with NGrid for restoring or preserving power better during/after emergencies. We have been fortunate but have had several neighbors and family members that needed heat showers cooking and refrigeration and used our home as our power has been spared every storm since 2006 (we don't have a generator)	1/7/2017 8:54 AM
23	The above selections on my phone would only allow me to select one important level so I could only vote on three of the five options above, FYI	1/7/2017 8:41 AM
24	Trim tree branches over/around/through electrical wires to prevent outages during storms.	1/7/2017 8:34 AM
25	Na	1/7/2017 8:24 AM
26	Not sure	1/7/2017 2:45 AM
27	I feel each of the above categories are very important, however, i am not able to select very important for all of them	1/7/2017 1:42 AM
28	Have a strong well trained EMA group that works well together. Fix the fire dept district issues and make one district. Combine police and fire dispatch.	1/7/2017 1:33 AM
29	Disseminate info clearly. Have staffing to answer phone Essie's etc... Have set designated places for neighborhoods to go to in case of emergency,	1/6/2017 10:59 PM
30	Don't build in hazardous areas - you can't control nature.	1/6/2017 10:13 PM
31	Ensure proper road maintenance for the weather	1/6/2017 10:06 PM
32	Put a plan in action on paper and have the community aware of such plan. If something should happen all will know what to expect and where to go to help.	1/6/2017 9:03 PM
33	Lower property tax rate and car tax rate so that homeowners can use their own money to prepare their own homes - not the town.	1/6/2017 9:03 PM
34	The public works could better to concerns and complaints made by residents	1/6/2017 8:20 PM
35	inform people how to be more aware of how to take care of themselves....actually, most people show know this by now.as i look around, i see some who just don't have a clue!!!!	1/6/2017 7:53 PM
36	Coventry police have been doing a great job. I like the sex offender alerts via cell phone and email. Are weather alerts on that also? Promote and make affordable Solar panels. Encourage Wind turbines	1/6/2017 6:08 PM
37	I couldn't mark each of the above systems in question #19 the way I wanted to.	1/6/2017 5:43 PM
38	Stay active. Continously reviewing, updating data,action plays	1/6/2017 5:15 PM
39	Question 15 is defective. They seem to be radio buttons where you can't choose one answer per line.	1/6/2017 4:56 PM
40	Sand/salt of roads before impending snow or ice storms. I am a school bus driver and have found 3 times so far this year in which roads were unsafe and clearing or treatment of snow or ice has started too late. This makes buses later, and causes more traffic on the roads because parents do not want to wait for buses. In turn it causes more crashes and weather related emergencies. If the roads were treated school buses would be on time and it would take some of the congestion off the roadways.	1/6/2017 4:53 PM
41	cannot answer question 15. the check mark delete if u answer questions certain ways.	1/6/2017 4:51 PM
42	some type of volunteer civil defense to help out the police and especially the fire department in an emergency; informational mailings included with taxes- town and fire; continuous cleaning of clogged drainage areas and continuous trimming of trees away from power lines. Social media may work for an initial announcement, but there are many of us who DO NOT have these social media accounts and prefer the "old fashioned way" -- robo calls, tv, radio.	1/6/2017 4:18 PM
43	Being more proactive and preparing - instead of panicking once it has already occurred.	1/6/2017 4:13 PM
44	Help each other out. Have emergency personnel making rounds immediate after a storm floss ect, or during if possible	1/6/2017 3:52 PM
45	Fix the broken Fire and Rescue system.	1/6/2017 2:58 PM
46	Consolidate into at the most a county wide Fire/Rescue Dept. With volunteer's. Just like the Military has reservists and National Guard members. There is no need for a the Chiefs we have. LA is bigger than our State and has one Dept.	1/6/2017 1:56 PM
47	From my experience, Coventry does a nice job with my neighborhood. Thank you for all you do!	1/6/2017 1:45 PM
48	I am unable to choose more than one answer above by the way	1/6/2017 1:37 PM
49	All the trees hanging over power lines need to be cut back. Most of our issues w/snow/wind and hurricanes is from limbs downing power lines. The power company comes out and cut this foolish looking u shape right at the lines but then leaves everything on each side which still knocks the lines down. That is a waste of time do it right or not at all.	1/6/2017 1:35 PM
50	Tree trimming the power seems to go out way too often	1/6/2017 1:19 PM
51	The taxes are high enough to already have things in place and yet they arent! Surveys are useless when you don't care!!	1/6/2017 1:15 PM
52	Disaster's are hard to fully prepare for but I think communication and trust in government is key to keeping us all safe. Also I don't think it is the full responsibly of the government we the people need to do our part. Maybe a disaster committee with town administrators , police, fire and community members.	1/6/2017 1:15 PM
53	All of above are important, but the form does not allow choosing options that match for each of the 5- it seems you must prioritize only top 3?	1/6/2017 1:08 PM
54	spend/use tax dollars more wisely	1/6/2017 1:03 PM
55	Question 19 will not allow selection of same rating more than once	1/6/2017 1:01 PM
56	Enforcement of parking ban ..tow the cars	1/6/2017 12:48 PM
57	Plans for flooding and forest fires in times of drought/wind swept fires.	1/6/2017 12:41 PM
58	Making it more a priority to plow streets where handicapped people live	1/6/2017 12:38 PM
59	Very impressed that this survey is being conducted. Hopefully, there will be a follow up with community information releases and alerts of any dangers.	1/6/2017 12:38 PM
60	Better communication to people about what local assistance is available	1/6/2017 12:37 PM

61	Living in a rural area = last to get utilities restored however, living in a rural area = well water and farm animals that require care (and an abundance of water). a better response to loss of electricity would be a HUGE benefit to folks living in rural areas	1/6/2017 12:32 PM
62	Underground electric	1/6/2017 12:24 PM
63	Educate and train local residents of importance of having a disaster plan that will effectively reduce the amount of damage to the community	1/6/2017 12:24 PM
64	I'm new here so I'm not sure	1/6/2017 12:19 PM
65	I would need more time to think about this.	1/6/2017 12:14 PM
66	NA	1/6/2017 12:11 PM
67	Create a team from each department (not the manager) to formulate a plan as to how to deal with EVERY possible disaster. One department may provide a service that is not usually thought of as essential to the well being of the Town i.e. taken for granted. The people who work in it everyday have so much knowledge that can be tapped into to avoid a debacle. Common Sense is important.	1/6/2017 12:09 PM
68	Accept my answers in the above categories. They keep disappearing.	1/6/2017 12:05 PM
69	to prepare, the town needs a way to bring in money. There is nothing there except housing and small local businesses. Extra income can be used to improve town. Nothing that i can see generates a huge influx of revenue for the town.	1/6/2017 12:05 PM
70	Stop spending tax dollars on governmental take over	1/6/2017 12:02 PM
71	Drainage systems	1/6/2017 12:02 PM
72	I cannot rate each option above...just choose one for each category.	1/6/2017 12:00 PM
73	By updating to undergroud electeicity	1/6/2017 11:59 AM
74	Coventry is fairly unlikely to suffer a large scale disaster. While engaging in general blizzard and hurricane preparedness makes sense, I'm not sure there are other reasonably foreseeable risks that resources should be dedicated to planning for or mitigating.	1/6/2017 11:57 AM
75	through lessons learned from other disasters;	1/6/2017 11:54 AM
76	Don't assume that everybody watches TV or watches the news just because they have kids or just because they're young. I don't watch TV but I do have a phone and I do have social media	1/6/2017 11:49 AM
77	As far as i know, i thought we are doing well.	1/6/2017 9:36 AM
78	Make sure the cops and ems know the new streets and neighborhoods.. I live in the oaks and teakwood zigzags ... they had trouble finding my neighbor when her baby needed medical help	1/5/2017 11:08 PM
79	Get power back to all residents in less time than it has taken in previous natural disasters (6 days)	1/5/2017 10:23 PM
80	help from the federal government, the state, and good communication between police, fire, and emergency services	1/5/2017 8:09 PM
81	Plow roads, cut overhanging tree limbs	1/5/2017 7:55 PM
82	remember that most people rely on internet or cell phone usage to communicate and get information These are vulnerable in natural disasters and likely to be unavailable. Amateur radio operators are readily available in town and have equipment necessary to provide communications under emergency power. Developing a network of Amateurs and cataloging who and what is available could be beneficial. My Husband and I both have Ham Radio Licenses	1/5/2017 7:37 PM
83	the system would not let me answer all of the questions! Q's 1,2 &3 - Very Important Q's 2 & 5 - somewhat important	1/5/2017 6:26 PM
84	Educate about different disasters	1/5/2017 5:30 PM
85	Helping to look after elderly in your area checking in on them with a routine phone call or stopping by	1/5/2017 5:11 PM
86	Discussions regarding disasters allow people to become aware and make changes to reduce exposure.	1/5/2017 4:32 PM
87	The above question wouldn't allow me to check off more than one thing for very important, some what important or not important.	1/5/2017 4:30 PM
88	The survey above will only allow you to check each important level once for all 5. I think education on how we can shore up our homes and how to respond in a disaster is crucial. Also, I have some sinkholes that just keep coming back, I'm worried about my house and property. I'm at 1 Marie Dr.	1/5/2017 4:11 PM
89	The click buttons on Question 17 aren't working properly. Answers: Local Plans: Somewhat important Structure and Infrastructure: Somewhat important Natural Systems: Very important Emergency Response: Very important Education and Awareness: Somewhat important	1/5/2017 4:05 PM
90	I would like to stay informed on what the town is doing during hazardous weather - for us, personally, the flooding in the road is a hazard and some trees near us (but not necessarily on our property) look like they could fall victim to high winds and potentially cause damage. Losing electricity in very cold weather would also be extremely problematic because we do not have alternative methods for heat (no fireplace/wood stove).	1/5/2017 3:39 PM
91	Keep the roads and bridges as well as water pathways in good repair	1/5/2017 3:36 PM
92	Trim all the tree limbs that grow, and hang over our roadways.Broken branches cause many blackouts to our electrical lines..	1/5/2017 3:15 PM
93	? pretty well covered that i can judge	1/5/2017 3:02 PM
94	Make one effective fire and rescue department managed by the Town like every other community in the State. All of this planning is great, but how will it be implemented during an emergency. The emergency services in this town are in shambles and can barley handle a basic emergency, I don't want to think of the chaos and loss of life should we face a large scale emergency or disaster. I think you should start preparing for a disaster by preparing to rebuild a better emergency response system .	1/5/2017 2:53 PM
95	Trim or remove trees along roads to reduce power failures Most straddle or are on town right of way	1/5/2017 2:44 PM
96	None	1/5/2017 2:36 PM
97	The above section is not holding my responses. I feel all of these areas are important. I strongly support the town being proactive in disaster preparation. Removing weak/dead limbs that hang over roads and power lines, pile snow to the right at intersections to reduce hazards. Continue town wide alert systems.	1/5/2017 2:25 PM

98	Improve roads	1/5/2017 2:07 PM

Appendix E

Resources

Technical and Financial Assistance for Mitigation
State Resources

Coastal Resources Center
University of Rhode Island
Narragansett Bay Campus
Narragansett, RI 02882
(401) 874-6224

Coastal Resources Management Council
Stedman Government Center
4808 Tower Hill Road
Wakefield, RI 02879
(401) 222-2476

Department of Administration/Division of Planning
One Capitol Hill
Providence, RI 02908
(401) 222-6478

Department of Environmental Management
235 Promenade Street
Providence, RI 02908
(401) 222-6800

Rhode Island Banking Commission/Associate Director
233 Richmond Street
Providence, RI 02903
(401) 222-2405

Rhode Island Builders Association
Terry Lane
Gloucester, RI 02814
(401) 568-8006

Rhode Island Department of Business Regulations
233 Richmond Street
Providence, RI 02903
(401) 222-2246

Rhode Island Emergency Management Agency
645 New London Avenue
Cranston, RI 02920
(401) 946-9996

Public Utilities Commission
100 Orange Street
Providence, RI 02903
(401) 222-3500 Ext. 153

State Fire Marshal's Office
272 West Exchange Street
Providence, RI 02903
(401) 222-2335

State of Rhode Island Building Committee Office
Building Commissioner's Office
One Capitol Hill
Providence, RI 02903
(401) 222-3529

Technical and Financial Assistance for Mitigation

Federal Resources

Economic Development Administration
Philadelphia Regional Office
The Curtis Center
601 Walnut Street, Suite 140 South
Philadelphia, PA 19106-3323
(215) 597-8822

Federal Emergency Management Agency
Mitigation Division
Mitigation Division
Region I Office
99 High Street
Boston, MA
(617) 223-9561

Small Business Administration
10 Causeway Street
Room 265
Boston, MA 02222
(617) 565-5590

U.S. Department of Agriculture
Natural Resources Conservation Service
451 West Street
Amherst, MA 01002
(413) 253-4362

U.S. Department of Commerce
National Weather Service Forecast Office
445 Myles Standish Boulevard
Taunton, MA 02780 (508) 823-2262

U.S. Department of Housing and Urban Development
Community Development Block Grants
Region I – O'Neill Federal Building
10 Causeway Street
Boston, MA 02222
(617) 565-5354

U.S. Department of the Interior
National Park Service
Rivers and Trails Conservation Program
Regional Office
15 State Street
Boston, MA 02109
(617) 223-5203

U.S. Environmental Protection Agency
Region I Offices
5 Post Office Square - Suite 100
Boston, MA 02109-3912
(617) 565 3400

U.S. Fish and Wildlife Service
Northeast Regional Office
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587
(413) 253-8200

Other Resources

National/Regional Resources

The Association of State Floodplain Managers (ASFPM)
http://www.floods.org

A professional association with a membership of almost 1,000 state employees that, assists communities with the NFIP. ASFPM has developed a series of technical and topical research papers and a series of proceedings from their annual conferences. Many mitigation "success stories" have been documented through these resources and provide a good starting point for planning.

The Rhode Island Flood Mitigation Association (RIFMA):
http://www.riflood.org

The goal of the organization is to form a network of associates who could bring their ideas and experiences to a forum for people to share and learn from. The result of the Association is a network of floodplain managers who can improve the effectiveness and efficiency of all aspects of floodplain management in the State of Rhode Island. RIFMA regularly provides training opportunities and an annual floodplain conference.

Natural Hazards Center at the University of Colorado, Boulder
Tel: (303) 494-6818
http://www.colorado.edu/hazards

The Natural Hazards Center is an international/national information center that provides information on natural hazards and human adjustments to hazards and disasters, by providing information dissemination, free library and referral services, research, and an annual workshop.

Flood Relief Funds
After a disaster, local businesses, residents, and out-of-town groups often donate money to local relief funds. They may be managed by the local government, or by one or more churches. No government disaster declaration is needed. Local officials should recommend that the finds be held until an applicant exhaust all sources of public disaster assistance. Doing so allows the funds to be used for mitigation and other projects that cannot be funded elsewhere.

Volunteer Organizations
Organizations, such as the American Red Cross, the Salvation Army, Habitat for Humanity, Interfaith, and the Mennonite Disaster Service, are often available to help after disasters. Service organizations, such as the Lions, Elks, and VFW are also available. These organizations have helped others with food shelter, clothing, money, etc. Habitat for Humanity and the Mennonite Disaster Service provide skilled labor to help rebuild damaged buildings incorporating mitigation or flood proofing concepts. The offices of individual organizations can be contacted directly, or the FEMA Regional Office may be able to assist.

New England States Emergency Consortium (NESEC)
Lakeside Office Park
http://www.serve.com/NESEC

NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Brochures and videotapes are available on such topics as earthquake preparedness, mitigation, and hurricane safety tips.

Institute for Business and Home Safety (IBHS)
http://www.ibhs.org

An insurance industry-sponsored, nonprofit organization dedicated to reducing losses-deaths, injuries, and property damage-resulting from natural hazards. IBHS efforts are directed at five specific hazards: floods, windstorms, hail, earthquakes, and wildfires. Through its public education efforts and information center, IBHS communicates the results of its research and statistical gathering, as well as mitigation information, to a broad audience.