

DRAFT

Town of Charlestown, Rhode Island

Natural Hazard Mitigation Plan



This house on Charlestown Beach Road was damaged during Hurricane Sandy.
Photo: Frieda Squires/The Providence Journal

Prepared by:
Charlestown Natural Hazard Mitigation Committee
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v 1.0



Strategy for Reducing Risks From Natural Hazards in Charlestown, Rhode Island

Created by: The Charlestown Natural Hazard Mitigation Committee

ACKNOWLEDGEMENTS

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SECTION 1.0 INTRODUCTION

Natural Hazard Mitigation is any sustained action taken to reduce or eliminate long-term risk to people and their property from the effects of natural hazards (e.g. wind, fire, floods, hurricanes, earthquakes, etc.).

Section 1.1 What Mitigation Can Do for Charlestown

An important benefit of hazard mitigation is that money spent today on preventive measures can significantly reduce the cost of post-disaster cleanup tomorrow. By planning ahead, Charlestown will minimize the economic and social disruption that can result from floods, blizzards, hurricanes and other natural disasters (destruction of property, loss or interruption of jobs and the loss of businesses).

During this plan update, members of the Charlestown NHMC re-assessed the risks to the town and updated mitigation actions that address a mix of structural initiatives to minimize the effects of future hazards (e.g. building code enforcement, retrofitting existing structures and removal of vulnerable structures) and non-structural initiatives (e.g. educational programs, preventing construction in high-hazard areas, enforcing regulations). By creating this strategy, Charlestown has established an ongoing process that will make hazard mitigation a routine part of municipal government. The Town Council named a permanent internal hazard mitigation committee that meets quarterly to review the plan and to move forward with solving hazard issues within the Town.

Many of the changes made to the plan were a direct result of natural hazard events that occurred during the plan update such as the March 2010 flooding, Tropical Storm Irene, Super Storm Sandy and Winter Storm Nemo. All these events caused damage to the Town, but none more than Sandy which destroyed many homes and businesses along the coast; caused major coastal erosion and caused wide spread flooding. To assist with the costs associated with the storm, the Town received over \$265,000 in FEMA reimbursements, which does not include assistance provided to homeowners and businesses that were impacted. As a direct result of the damage caused by Hurricane Sandy as well as some of the damage caused by Tropical Storm Irene many homeowners who have decided, with input from the Town, to rebuild their homes further back from the shoreline or rebuild the structure on stilts to mitigate the damage created by storm surge in future events.

Formal adoption and implementation of this updated hazard mitigation strategy will help Charlestown gain credit points under the Federal Emergency Management Agency's (FEMA) Community Rating System (CRS) Program, which provides discounts on National Flood Insurance Program (NFIP) insurance premiums for residents of communities that voluntarily participate in this program. The Town currently does not participate in the CRS, however, an application has been submitted and is currently under review with the NFIP. In order to participate in the CRS, the Town must have a floodplain management program that meets the requirements of FEMA and the NFIP that is reviewed during a Community Assistance Visit (CVA) conducted by FEMA. In November 2013 the Town participated in the CVA and successfully met the

requirements. In addition, the adoption of this mitigation strategy increases Charlestown's eligibility for federal grants for hazard mitigation, which include FEMA's pre-disaster Flood Mitigation Assistance (FMA) Program and FEMA's post-disaster Hazard Mitigation Grant Program (HMGP). Please refer to Appendix A and B for further information.

Section 1.2 Charlestown's Mission Statement

To preserve and enhance the quality of life, property and resources by identifying the potential natural hazards that affect Charlestown and by mitigating their effects to reduce or eliminate the loss of life, property values and natural resources as well as economic losses.

Section 1.3 Goals

The goals developed by the NHMC for Charlestown's Natural Hazard Mitigation Plan are to:

- Protect present and future residential and commercial structures subject to flooding, coastal erosion, snowstorms, hurricanes and other identified natural hazards.
- Preserve, enhance and protect the areas subject to erosion and flooding from coastal processes and coastal storms.
- Incorporate mitigation strategies that will ensure that current and future roads, bridges and dams that are subject to flooding, erosion and other natural hazards will withstand the effects of these hazards and remain functional to the community.
- Protect, preserve and maintain environmental resources and structures vulnerable to Forest Fires

Section 1.4 Planning Process

Beginning in March 2004, members of the Town of Charlestown Natural Hazard Mitigation Committee began to meet to update and revise the mitigation plan that was previously submitted to FEMA in 1997. The Committee was comprised of a mix of Town employee's, residents and business owners. All meetings the Committee held were posted as public meetings and open for public input and comments. Additionally, each meeting notice was posted to the State Website. Over the next several months, meetings were held to discuss the original plan, the hazard profile, risk identification, mitigation actions and plan maintenance. The final meeting of this Committee was held on September 22, 2004 in which the Committee unanimously approved the Plan.

In November 2004 The Charlestown Town Council approved a resolution in support of the revised plan which cleared the way to obtain approval from RIMEA and FEMA. In February 2005 the Town received feedback from FEMA regarding several revisions to be

made to the plan before it could receive approval. Upon receipt of the revision needed, the committee met again to make the necessary changes and submitted the plan to FEMA once again in March 2005 and gained conditional FEMA approval on March 11, 2005 pending receipt of formal adoption by the Town, which was granted on April 11, 2005.

On October 27, 2009 Town Administrator William DiLibero formed a new mitigation committee as a result of personnel changes within the Town. In late 2010 the Town received notification from RIEMA that their plan was in need updating to comply with the 5 year update schedule. Therefore in November 2010 the Town issued a Request for Proposal for assistance with updating the current plan. An award was made to the individual that assisted with the 2005 plan update and the initial kick off meeting with the Committee was held on January 20, 2011 (see Appendix C for meeting notes). At this meeting the FEMA Crosswalk of the plan from 2005 was reviewed as well as progress made on mitigation measures; new hazards based on significant weather events and new mitigation measures to consider.

Following this meeting, the Committee set out to make the necessary revisions to the plan and review actions that had been taken since 2005. In addition, the Committee tried to formulate ways to get input from the public since this was a challenge during the previous update. All previous meetings were publicly advertised and open to the public, however, no residents or business owners outside of the Committee ever attended. Therefore, ex-officio members were invited, including the fire chiefs, which helped to receive public input since they are all Town residents and are able to provide comments on the plan. Furthermore, this time around it was suggested that the plan be posted online where residents could review and comment at their leisure. This will be done after the majority of the update had been completed. In addition, several opportunities to get the public thinking about mitigation have been supplied by the Town in the form of an NFIP letter going to homeowners in hazard areas, mitigation stories posted in the "Pipeline Newsletter" that is mailed to residents and current and upcoming workshops being offered on climate change (supporting documents located in Appendix C)

Another formal meeting of the full Charlestown Hazard Mitigation Planning Committee, was held in the Charlestown Town Hall, Council Chambers, on Tuesday, November 26, 2013, from 9:00am-11:00am to review the updates that had been made to the plan and determine what else needed to be reviewed and updated to complete the plan (notes in Appendix C).

In February 2014 several Committee members met with mitigation staff from RIEMA to review the updated plan to date. During this meeting the Town received additional guidance on plan elements to incorporate as well as an updated timeline for submittal to RIEMA and FEMA.

Finally, on June 19, 2014 the Committee, including ex-officio member for public input, held their final review meeting prior to the plan being submitted to the Council and RIEMA for initial approval. The meeting took place at the Meadow Brook Inn in Charlestown and lasted approximately 2 hours. During the meeting the final section of

the plan (Section 4) that needed to be updated was reviewed and revised. All changes were incorporated into the plan and it will be sent to RIEMA.

SECTION 2.0 HISTORICAL REVIEW OF HAZARDOUS EVENTS FOR CHARLESTOWN

The following hazards have been identified for the Town of Charlestown: Hurricanes; Heavy Rains/Floods; Snowstorms; Hailstorms; Windstorms; Lightning Storms; Severe Weather, Nor'easters, Earthquakes and Wildfires. To profile the history of these events in Charlestown, the National Climatic Data Center's on-line database was utilized since this is the most comprehensive source for past weather events. In addition, some members of the committee contributed their recollection of events that have affected Charlestown.

Section 2.1 Hurricanes

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.

Although Rhode Island has not been hit by extremely intense hurricanes (Category 4 or 5) as seen in other parts of the East Coast, we have had our share of major hurricanes that have caused extensive damage to our State. In the sixteen-year period from 1938 to 1954, Rhode Island experienced three major hurricanes that caused a tremendous amount of damage and resulted in almost 300 deaths across the State. The great un-named hurricane of 1938 devastated Rhode Island and caused \$100 million dollars in property damage and took 262 lives. Hurricane Carol in August of 1954 caused similar damage dollar-wise, but thankfully only resulted in the loss of 19 lives. Even though Rhode Island has not had hurricanes as severe in recent history, in 2012 Super Storm Sandy swept up the east coast and caused extensive damage to the Town. Considering Charlestown's proximity to the Coast, with 10 miles of shoreline, as well as the damage experienced by Tropical Storm Irene and Super Storm Sandy, hurricanes are a great risk to the town. Charlestown residents have been fortifying their properties and the town has greatly increased the local emergency management budget.

Table 1 – Significant Hurricanes for Rhode Island

Date	Name	Category ¹	Winds at landfall	Property Damage (\$ million)	Deaths
September 21, 1938	N/A	3	95 mph	100	262
September 14, 1944	N/A	3	82 mph	2	0
August 31, 1954	Carol	3	110 mph	90	19
September 11, 1954	Edna	3	40 mph	0.1	0
September 12, 1960	Donna	2	58 mph	2.4	0
September 27, 1985	Gloria	2	81 mph	19.8	1
August 19, 1991	Bob	2	63 mph	115	0
August 27, 2011	Irene	1		9.6	0
October 29, 2012	Sandy	1		31.1	0

Source: 1998 Journal Bulletin: Rhode Island Almanac, 112th Annual Edition
Rhode Island Hurricanes and Tropical Storms: A Fifty-Six Year Summary, National Weather Service Office, Providence, RI
Rhode Island Hazard Mitigation Plan 2014 Update

Section 2.2 Heavy Rains and Floods

Flooding is a localized hazard that is generally the result of excessive precipitation. Charlestown's proximity to the coast and the several rivers and brooks that run through the town makes it extremely susceptible to flooding. The Pawcatuck River for example causes several roads to be affected during periods of heavy rains and the Charlestown and Quonochontaug Breachways are also prone to flooding, causing property, economic and ecological losses. Approximately 34% of Charlestown is located in an A or V zone² which could result in huge amounts of property loss during a heavy rain event.

In regards to 2010 flooding, a series of later winter/early spring heavy rain events arrived in rapid succession. The majority occurred while the ground was still frozen and no transpiration was in process as the local trees had not leaved out for the season. Pond and water holes became overloaded. The Pawcatuck River (Charlestown's northern boundary) overflowed its banks and in many places normal, non-wetland areas had reached their saturation point. This resulted in water settling and/or flowing into basements and other low lying areas that had historically been dry.

¹ Category 1 74-95 mph winds, 4'-5' storm surge; Category 2 96-110 mph winds, 6'-8' storm surge; Category 3 111-130 mph winds, 9'-12' storm surge; Category 4 131-155 mph winds, 13'-18' storm surge; Category 5 winds greater than 155 mph, with a storm surge of greater than 18'
source: Saffir-Simpson Hurricane Scale.

² A zone is an area that would be inundated by a 100-year flood event, but not subject to velocity wave impact. A V zone is a velocity zone that is subject to breaking wave action.

Table 2 – Significant Heavy Rain/Flooding for Washington County

Date	Rainfall (inches)	Comments
April 1, 1993	Flashflood	Pawcatuck River flooding onto Driftwood Dr.
September 18, 1996	2"-3.5"	Early season coastal storm
December 7, 1996	2"	No damage reported
January 10, 1997	Coastal flood	A new moon in combination with strong SE winds resulted in a 2'-4' storm tidal surge in Narragansett Bay.
August 29, 1997	2.5"-5"	Extensive flooding along Route 1
November 1, 1997	2"- 3"	No damage reported
February 18, 1998	2"-3.5"	Flooding in poor drainage areas
March 8, 1998	2"-3"	Flooding in poor drainage areas and flood prone property
April 1, 1998	2"	No damage reported
June 13, 1998	6"-8"	Numerous small streams flooded their banks
May 23, 1999	3.15"	No damage reported
September 10, 1999	2"-5"	No property damage reported
September 16, 1999	2"-5"	Several trees downed, no flood damage reported
March 29, 2003	2"-3"	Flooding in poor drainage areas
October 15, 2005	2.5-4.5"	Heavy rain caused flooding across the region and forced some roads to close as a result
October 28, 2006	0 NBV2-4"	Rainfall produced significant urban flooding and caused some minor flooding of rivers and streams
March 2, 2007	2-3"	Snow quickly changed to heavy rain and caused widespread urban and small stream flooding
April 16, 2007	3-5"	Slow moving coastal storm produced heavy rain and gusty winds, minor to moderate coastal flooding
March 8, 2008	2-3"	Heavy rain coinciding with snowmelt caused some river flooding. Along the coast high astronomical tides combined with rough seas and storm surge to produce minor coastal flooding
August 22, 2009	2-4"	Tropical depression cause heavy rain and high surf in the area. Several driveways on Charlestown Beach Road were flooded with ocean waters
March 14, 2010	3-6"	Heavy rain caused flooding of small steams, urban and poor drainage areas. Strong winds associated with the storm also downed trees, limbs and wires
March 29, 2010	/*5-10"	The Pawcatuck River set a record of nearly 15 ½' and overflowed its banks in Charlestown closing Route 91 and Shannock Road. Numerous roads and basements were flooded. The entire state was impacted by this event and a Presidential Disaster Declaration was made. It is estimated that there were over \$26 million in damages.

Source: National Climate Data Center

Section 2.3 Significant Snow Events

Winter weather includes heavy snows, ice, and extreme cold and can affect the entire State. A heavy snow is generally defined as having more than eight (8) inches of

accumulation in less than 24 hours. Although Charlestown is a coastal community, it still experiences its share of snowstorms. Most of the significant snowstorms result in hazardous road conditions, power outages, school/business closings and transportation disruptions. The most recent storm that dumped a significant amount of snow is the Blizzard of February 8-9, 2013. This storm had total snowfall amounts of 18-24 inches across the state and left hundreds without power for extended periods of time.

Table 3 – Significant Snow Events for Washington County

Date	Snowfall (inches)	Comments
January 7, 1996	12"-24"	Schools closed, transportation systems disrupted
February 2, 1996	6"-8"	Difficult travel
February 16, 1996	5"-7"	Highway travel disrupted
March 2, 1996	6"-11"	Many minor accidents reported
April 9, 1996	6"-10"	Heavy wet snow with scattered power outages
April 1, 1997	4"-7"	Heavy wet snow with scattered power outages
February 25, 1999	9"-12"	Hazardous travel, schools closed
March 15, 1999	11"	Poor travel conditions, schools closed
February 18, 2000	3"-5"	None noted
December 5, 2002	6"	No storm damage or injuries reported
February 7, 2003	6"-8"	No major problems reported
February 17, 2003	15"-20"	Storm fell on President's Day so only minor accidents reported
March 6, 2003	6"-10"	Dozens of minor accidents
December 5, 2003	10"-20"	Major disruption to transportation due to poor visibility
January 27, 2004	4"-8"	No major problems reported
December 26, 2004	6-10"	Powerful winter storm brought heavy snow and strong winds to the region with 50 mph gusts along the coast and numerous accident due to poor visibility and slick roads
January 22, 2005	15-25"	Major winter storm brought heavy snow, high winds and coastal flooding to the area creating near blizzard conditions and making travel impossible at the height of the storm
February 24, 2005	5-8"	Heavy snow
March 1, 2005	4-8"	Heavy snow and gusty winds, no major damage reported
February 12, 2006	9-14"	Nor'easter produced heavy snow and windy conditions.
March 16, 2007	4-7"	Winter storm brought heavy snow and sleet to the area before changing to sleet, freezing rain and then all rain
December 19, 2008	10"	Heavy snow and high winds were associated with this storm
December 31, 2008	5-7"	Fast moving system brought snow along with very cold temperatures, strong winds and bitterly cold wind chills.
March 1, 2009	11-12"	This late season storm affected most of the east coast and resulted in hundreds of flight cancellations as well as numerous car accidents.
December 19, 2009	18"	Snow and wind created blizzard conditions at times across the area and resulted in numerous flight cancellations; school closings and a struggle by plows to keep the roads clear.
February 10, 2010	5-8"	Heaviest snow fell across southern RI and was accompanied by strong winds which resulted in numerous downed trees and power lines, knocking out power to many

December 26, 2010	8-12"	High winds brought down wires as this storm brought heavy snow and strong winds to the area along with blizzard like conditions.
February 8-9, 2013	18"-24"	Blizzard conditions with hurricane force winds, downed trees and power lines

Source: National Climate Data Center

Section 2.4 Hailstorms

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. Hailstorms are typically associated with severe thunderstorms. The data that is available through the National Climate Data Center lists several hailstorms that have affected Charlestown in the past with hail ranging in size from .75" to 2.75".

Table 4 – Significant Hailstorms for Washington County

Date	Magnitude (size in inches)
June 20, 1995	1"
August 4, 1995	.75"
June 19, 1998	.75"
June 30, 1998	1"-2.75"
May 24, 2000	.75"-.88"
May 23, 2004	.75"
July 2, 2004	1"
July 18, 2006	1"
June 24, 2008	1.25"-1.75"
July 1, 2009	.75"

Source: National Climate Data Center

Section 2.5 Windstorms

Wind is the motion of air past a given point caused by a difference in pressure from one place to another. Severe wind poses a threat to Rhode Island in many forms, including that produced by severe thunderstorms and tropical weather systems. Since Charlestown is located along the southern coast of Rhode Island, it is susceptible to windstorms during several types of weather events including hurricanes, tropical storms and severe thunderstorms (no tornados have been reported in this area, but their effects would fall into this category). The windstorms that affect Charlestown can cause major damage to beachfront properties as well as cause beach erosion from the high surf. Properties away from the coast can be affected by power outages and downed tree limbs.

Table 5 – Significant Windstorms for Washington County

Date	Magnitude (kts or mph)	Comments
January 19, 1996	63 kts.	Minor property damage, scattered power outages
January 27, 1996	55 kts.	No damage reported
February 25, 1996	70 kts.	Scattered power outages due to falling tree limbs, minor property damage
January 13, 1996	64 kts.	Falling trees and limbs caused scattered
October 19, 1996	70 kts.	None reported
March 6, 1997	50-62 mph gusts	Scattered power outages, minor property damage
March 26, 1997	30-40 mph	No damage reported
March 31, 1997	60-70 mph gusts	Scattered power outages
April 1, 1997	35 mph	Scattered power outages
July 25, 1997	30-40 mph gusts	No damage reported
August 21, 1997	60 mph gusts	Scattered power outages, boats sunk and broke loose from moorings
November 1, 1997	68 kts	Scattered power outages
November 27, 1997	50 mph gusts	No damage reported
December 2, 1997	40-50 mph gusts	No damage reported
December 14, 1997	40-55 mph gusts	No damage reported
December 29, 1997	40-55 mph gusts	No damage reported
February 4, 1998	40 mph	Minor beach erosion
February 24, 1998	52 mph gusts	No damage reported
March 9, 1998	40-55 mph	No damage reported
March 21, 1998	35-50 mph	No damage reported
March 26, 1998	35-50 mph	No damage reported
June 27, 1998	35-45 mph	Some small boats capsized, no injuries reported
September 27, 1998	50 kts	No damage reported
November 11, 1998	40-50 mph	No damage reported
November 26, 1998	30-40 mph	No damage reported
January 3, 1999	40-50 mph	Minor damage reported
January 18, 1999	55 mph	No damage reported
March 4, 1999	40-50 mph	Few downed tree limbs
March 22, 1999	40-50 mph	No damage reported
September 16, 1999	50 kts.	No damage reported
October 14, 1999	40-50 mph	No damage reported
October 18, 1999	45-55 mph gusts	No damage reported
November 2, 1999	50 mph gusts	Downed tree limbs, scattered power outages
January 16, 2000	5-55 mph gusts	No damage reported
January 21, 2000	45-50 mph gusts	No damage reported
February 14, 2000	55 mph gusts	No damage reported
December 12, 2000	60 mph	Downed tree limbs and wires
December 17, 2000	60 mph	Downed trees and limbs and power lines
December 30, 2000	40-50 mph gusts	No damage reported
February 10, 2001	45-55 mph gusts	No damage reported
June 11, 2001	50 kts.	No wind damage reported
November 13, 2003	50 kts.	Downed trees and power lines
September 29, 2005	40-60 mph gusts	High winds caused power outages and knocked down trees, limbs, power poles and wires across the region
January 15, 2006	30-35 mph gusts	Strong gusty northeast winds were strongest across the south coast
February 18, 2008	40 mph	Trees, branches and wires were downed by the winds resulting in power outages in some areas
March 8, 2008	50 mph gusts	Multiple trees were downed causing scattered power outages

Source: National Climate Data Center

Section 2.6 Lightning Storms

All thunderstorms produce lightning, and therefore all thunderstorms are dangerous. Lightning often strikes outside of areas where it is raining, and may occur as far as 10 miles away from rainfall. It can strike from any part of the storm, and may even strike after the storm has seemed to pass. The National Climate Data Center lists only one lightning event for Charlestown. This event occurred on June 11, 2001 when a severe thunderstorm downed several large trees in the area and lightning from this storm struck the Charlestown Rescue Squad causing \$10,000.00 in damage. One of the committee members recalled an event in December 2000 in which lightning struck the Charlestown Town Hall/Police Department causing damage and disrupting normal operations. See Appendix D for newspaper article that outlines this event.

Table 6 – Significant Lightning Storms for Washington County

Date	Magnitude	Comments
December 17, 2000	Critical	Lightning struck Charlestown Town Hall/Police Department
June 11, 2001	Critical	Lightning struck Charlestown Rescue Squad
August 11, 2004	Critical	Lightning struck two men fishing at East Matunuck Beach; one of the men succumbed to his injuries
July 27, 2008		Line of strong thunderstorms brought lightning to the area which struck trees that landed on a house in Wakefield
February 8, 2013	Critical	Lightning struck during major winter storm damages electrical power infrastructure making the facility and town's main communications hub unusable.

Source: National Climate Data Center

During the height of winter storm NEMO the Charlestown Emergency Manager attempted to setup an overnight reception station for people who had lost their utilities as the storm was raging and could not remain in the building they were at. As equipment and supplies were being brought into the Charlestown Town Hall, a large blue flash occurred overhead in the sky. Shortly thereafter, it was found that electrical equipment had been surged and overloaded. The fire alarm announced a small fire in the Town Council Chambers and 150kw emergency power generator failed. The fire was quickly extinguished with minimal damage. The building was abandoned and another site was used. The town's primary communications in the form of radio repeaters and email servers were offline. These critical communications remained offline until power was restored.

Section 2.7 Earthquakes and Wildfires

An earthquake is caused by a sudden displacement within the earth. Strong and destructive earthquakes usually result from the rupturing or breaking of great masses of rocks far beneath the surface of the earth. The ultimate cause of these deep ruptures has not been established. All earthquakes produce both vertical and horizontal ground shaking. Although Rhode Island is not prone to major earthquakes, we do have our share of them. Thankfully most quakes in and around RI are usually only felt as a slight rumble

lasting several seconds or less. The most recent earthquake centered in RI was on October 6, 2003 in West Warwick. This quake had a magnitude of 1.8 on the Richter Scale of 1 to 10 (10 being most severe). Most quakes that are felt in Rhode Island are not centered in the State, but in surrounding States (see Table 7). Therefore, earthquakes do need to be considered as a hazard to our community and most buildings in this area are not built to withstand the effects of an earthquake. According to the RI Emergency Management Agency (RIEMA), Charlestown faces seismic risk since much of the town is located on outwash soils. These soils, subject to liquefaction, make the town particularly susceptible to damage should an earthquake occur.

Table 7 – History of Earthquakes in Rhode Island

Date	Point of Origin	Impact on RI
February 28, 1925	St. Lawrence River region	Intensity V affects felt on Block Island and in Providence. Intensity IV effects felt in Charlestown
November 19, 1929	Grand Banks of Newfoundland	Moderate vibrations felt on Block Island and in Chepachet, Newport, Providence and Westerly
November 1, 1935	Quebec, Canada	A magnitude of 6.25 with intensity IV felt on Block Island and in Providence and Woonsocket
December 20 & 24, 1940	Lake Ossipee, NH	Intensity V affects knocked pictures off walls in Newport. Intensity IV effects were felt at Central Falls, Pascoag, Providence and Woonsocket. Intensity I-III effects were felt at Kingston, New Shoreham and Wakefield.
September 4, 1944	Massena, NY	Intensity I-III was reported in Kingston, Lonsdale, Providence, Wakefield and Woonsocket
October 16, 1963	Coast of Massachusetts	A magnitude 4.5 quake caused Intensity V to be felt in Chepachet with reports of some cracked plaster. There were also reports of rattling windows and dishes and rumbling earth sounds. Other Northern RI locations felt the tremor, but with less intensity.
December 7, 1965	Unknown	Windows and doors shook in Warwick and furniture and small objects moved in Bristol.
February 2, 1967	Unknown	A magnitude 2.4 created intensity V effects in Middletown, Newport, North Kingstown and Jamestown. No damage reported.
February 3, 1973	Unknown	Explosion like or sonic boom noises were heard throughout RI and houses and windows shook, but nothing was reported by seismographs.
June 14, 1973	Western Maine	Intensity IV effects felt at Charlestown and Intensity I-III felt at Bristol, E. Providence, Harmony and Prov.
October 6, 2003	West Warwick	A magnitude of 1.8 caused minor shaking in the community, no damage reported

Source: US Geological Survey; Earthquake History of Rhode Island

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. Though there have been no major forest fires in Charlestown according to officials, there have been small brush fires in and around the Town that were easily extinguished, of which there are no detailed records on file, wildfires are another threat that need to be considered, due to the fact that water supply and accessibility of fire-fighting equipment

are inadequate to protect against potential forest fires. The occurrence of a drought in this region could also increase the risk of a wildfire in this community. If a fire were to occur in the forested area of the community, it could quickly spread and destroy acres of property before the fire department could get adequate amounts of water to suppress it. In addition, many residential structures are now located near these forested areas which brings an added risk to these structures as well.

Section 2.8 Nor'easters

An extra-tropical cyclone producing gale-force winds and precipitation in the form of heavy snow or rain. Charlestown experiences its share of Nor'easters. Most of the Nor'easters result in hazardous road conditions, power outages, school/business closings and transportation disruptions. The most recent storm that dumped a significant amount of snow is the Blizzard of February 8-9, 2013. This storm had total snowfall amounts of 18-24 inches across the state and left hundreds without power for extended periods of time.

Table 8 – Significant Nor'easters for Washington County

Date	Snowfall (inches)	Comments
February 12, 2006	9-14"	Nor'easter produced heavy snow and windy conditions.
February 8-9, 2013	18"-24"	Blizzard conditions with hurricane force winds, downed trees and power lines

Source: National Climate Data Center

Section 2.9 Hazard Profile Summary

This Hazard Profile Summary lists the specific hazards that can and have affected Charlestown along with specifics regarding probability of occurrence, magnitude (% of community affected), speed of onset (warning time available), seasonal pattern, possible affects to the community and risk priority.

Table 9 – Hazard Profile Summary

Hazard	Probability ³	Magnitude ⁴	Speed of Onset	Seasonal Pattern	Possible Affects	Risk Priority
Hurricane	Likely	Critical to catastrophic	24+ hrs.	June-Nov. with Aug. & Sept. most likely	Coastal erosion, flooding, property damage, power outages, loss of life	High
Heavy Rains Flooding	Highly likely	Limited	12-24 hrs.	Spring and Summer	Flooding, property damage, roads closed	High
Windstorm	Highly likely	Critical	12-24 hrs.	Any season	Coastal erosion, power outages, downed trees and limbs, property damage	High
Snowstorm	Highly likely	Limited	12-24 hrs.	Winter	Power outages, poor travel conditions	Medium
Nor'easter	Likely	Limited	8-12 hrs.	Any season	Power outages, flooding, property damage	Medium
Wildfire	Possible	Limited	Minimal	Any	Environmental, Property damage	Medium
Hailstorm	Possible	Negligible	6-12 hrs.	Summer	Property damage	Low
Lightning	Highly likely	Negligible	6-12 hrs.	Spring, summer, fall	Property damage, fire	Low
Earthquake	Possible	Catastrophic	Minimal	Any	Property damage, loss of life	Low

***Special note regarding sea level rise.** This is a hazard that is not currently affecting the Town, but is one that will be monitored during the next several years and most likely incorporated into the future update to this plan. The main concern, besides loss of public and private property, is the effect the sea rise will have on coastal level wells and what the salt water intrusion may do. Again, this not currently a hazard, but is being monitored so that changes in sea rise can be addressed and mitigated as soon as possible.

³ 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

⁴ Catastrophic= more than 50% of community affected; Critical=25 to 50% affected; Limited=10-25% affected; Negligible=less than 10% affected.

Hold for Risk Map

Hold for Wildfire Risk Map

Hold for Critical Facilities in Charlestown Map A

Hold for Critical Facilities in Charlestown Map A

SECTION 3.0 VULNERABILITY/RISK ASSESSMENT

This section focuses on assessing the community's risk and vulnerability. It will identify what areas are at risk, how vulnerable those areas (e.g., structures, population or natural resources) are and what the impacts (loss of life, environmental damage or inconvenience to residence) will be if those area are affected by a natural disaster. The risk matrix (Table 11) summarized what is vulnerable within each risk area.

With the assistance of the Town Planner, Charlestown mapped high-risk areas in the Town.

Map 1: Risks in Charlestown, indicates public infrastructure (dams, bridges, major roads), social/economic risks, land use/land cover, flood zones, repetitive loss areas and areas of historic flooding (not marked on the FEMA Flood Insurance Rate Map).

Map 2 and 3: Critical Facilities in Charlestown (A) and (B), indicates public infrastructure (Town Hall, Fire Stations, Police Station and schools), utilities, critical facilities, evacuation routes and American Red Cross-approved shelters.

Map 4: Wildfire Risks in Charlestown indicates the wildfire risk assessment to specific land areas within the Town.

Section 3.1 Population at Risk

The risk to the people of Charlestown from natural disasters has increased over the years, with the increase of development in vulnerable areas (both year-round and seasonal). A study conducted by the U.S. Army Corps of Engineers estimated that over 20 percent of Charlestown's permanent population is vulnerable to a weak hurricane, while almost 40 percent of the population is vulnerable to a strong hurricane.⁵ The study revealed that 2,500 residents, year-round and seasonal, reside in areas recommended for evacuation during hurricanes.

The study also, highlighted the need to evaluate existing shelter capacity to insure that the town has sufficient resources to accommodate that part of the population that may require shelter during a disaster. The primary short-term shelter, located at the Charlestown Elementary School, has a capacity of 200 persons. The Red Cross approved shelter is the Chariho Regional Middle School, 445B Switch Road, Wood River Junction which has a capacity of 1,000 (total capacity). It has been sufficient to date for Charlestown's projected demand of 1,000 evacuees during a severe hurricane. However, seasonal influx of summer residents and storm stresses on the other two communities of the school system have caused local officials to provide for additional overflow sheltering on the Chariho campus in the high school and the vocational technical buildings.

⁵ U.S. Army Corps of Engineers, Rhode Island Hurricane Evacuation Study, May 1995

Section 3.2 Property at Risk from Flood and Wind Events

Given the pressures of growth in this community, consideration must be given to the increased risk to people and property from flood and wind events when approving new development in vulnerable areas. A 100-year flood has a one percent chance of happening in any given year. The 100-year floodplain incorporates almost 4,210 acres in Charlestown (approximately 34 percent of the town).⁶ It has been estimated that a coastal storm with the intensity of a 100-year flood would cause over \$16 million in losses in Charlestown, resulting primarily from structural losses and the cost of evacuating.

Currently, state and local regulations specify enhanced building code provisions within the 100-year floodplain. The U.S. Army Corps of Engineers' 1996 report stressed that the town should consider less severe storms for planning and design purposes, since over 150 homes in the floodplain would experience substantial flood losses during the 25-year storm, which has a greater frequency and less intensity than the 1% chance of happening every year (100-year flood). The flood waters of a 25-year event (which has a four percent chance of occurring in any given year) could rise to 9.9 feet above sea level. The damage incurred by a five-year event (20 percent chance of occurring in any given year) would cause \$338 thousand in damages.

Presently, approximately 60 percent of the properties prone to a 100-year flood are covered by flood insurance. FEMA lists that 820 properties in Charlestown are insured by the NFIP with a total value of approximately \$220 million as of December 31, 2013. From 1978 through 2013, there were 189 paid losses in Charlestown through the NFIP with over \$2,606,728 million in total payments to policyholders. Currently, there are nine repetitive loss properties or critical infrastructures in flood zones. Mitigation to reduce vulnerable areas has occurred in recent years as a number of properties have been elevated. Between the years of 2005 and 2013, 55 pre-FIRM structures in the special flood hazard area have been voluntary elevated. All new structures are required by law to be elevated. Of the 12 repetitive loss properties, 3 have been elevated. On October 16, 2013, 941 residents were affected by the adoption of the new flood maps on way or another. Public hearings were held at the Town Hall. The Building Official also notified residents in the repetitive loss areas of the pending participation of CRS Application informing residents of the risk with new flood maps (a sample of the building official's letter is in Appendix C).

In addition to flood hazards, property in Charlestown is also at risk from wind. The Rhode Island Building Code indicates that the entire town is in a high wind area, denoting a significant risk of wind damage during a hurricane. Critical structures that are in the wind zone are the police station, ambulance barn, senior center and the Cross Mills Fire Department (120 mph wind zone). However, there are no documented dollar amounts associated with this type of damage from past events in the community.

⁶U.S. Army Corps of Engineers, New England Division, Planning Directorate, Study of Coastal Flooding Charlestown, RI: January 1996

Historical Property Consideration:

This information locates historic properties along the Charlestown/Boston Post Road Historic Corridor. None of these properties are located within the floodplain, however they could be vulnerable to wind events.

Charlestown Historical Properties (Compiled on 6/10/14)

Name of Building	When Established	Address	North or South of Rte 1
The Albert Sission House	1893-1898	4021 Old Post Road	South
Joseph Stanton House/Wilcox Tavern and General Stanton Monument	1738	4115 Old Post Road	South
The Macomber House	1810, rev 1850	4029 Old Post Road	South
The Betsy Babcock House	1685	4051 Old Post Road	South
The Blue Parrot Tea Room	1840	4210 Old Post Road	South
The Stagecoach House	1720	4229 Old Post Road	South
Ocean House	1848	60 Town Dock Road	South
Cross Hall	1855	4459 Old Post Road	South
Cross Patch House	1848	10 Town Dock Road	South
Carolina Village Historic District	1802	Intersection of Rte 112 and Shannock Hill Rd to the north and the intersection of Rte 112 and 91 is the southern limit	North
District Schoolhouse No. 2	1838	Old Post Road, Cross Mills	South
Historic Village of the Narragansetts	1709-1880	Rtes 2 and 112 to the east, Rte 1 to the South, Kings Factory Rd to the west and 91 to the north	North
Joseph Jeffrey House	1709	Rte 112 Town House Road	North
Shannock Village Historic District	1850-1900	Main Street, North Shannock Road and West Shannock Road	North
Royal Indian Burial Ground	18 th century and before	Narrow Lane	North
Fort Ninigret	1620	Fort Neck Road	South
Coronation Rock	1770	Post Road	South
Sheffield House	1685-1713	Quonochontaug	North
Babcock House	1685-1713	Quonochontaug	North

Name of Building	When Established	Address	North or South of Rte 1
Foster Cove Archaeological Site		Vicinity of Rte 1	
Arnolda	1900	Ninigret Pond	South
First Baptist Church of Cross Mills	1873	4403 Old Post Road	South
S. B. Hoxie House	1840	Cookestown Road	South
First Baptist Church of Charlestown	1840	5073 Old Post Road	South
Hathaways	1863	Post Road	South
Capt. Taber House	1840	10 Town Dock Road	South
Ocean House	1848	Town Dock Road	South
Card House	1700	4436 Old Post Road	South
Charles Church House	1860		
Cross Mills Public Library	1913	4417 Old Post Road	South
Cross Mills Baptist Church	1870	Post Road	South
George Ward's Farm	1800	Town Dock Road	South
Stagecoach House	1700	4299 Old Post Road	South
House	1600-1700	4259 Old Post Road	South
District No. 1 Schoolhouse	1843		
Post Road Garage			
House	1780	289 Narrow Lane	North
John Paull Lunch Room & Cabins	1926	4009 Old Post Road	South
Asa Church House	1897	3985 Old Post Road	South
Stone House	3809	3809 Old Post Road	South

Sources:

Charlestown Historical Society, Personal Communications Pam Lyons, 2014

The National Register of Historical Places

Charlestown Planning Board Document, Description of Historic Houses Along the Old Post Rd., Rte 1, Charlestown – Cross Mills Village through the Post Office

Historic and Architectural Resources of Charlestown, RI: A Preliminary Report, RI Historical Preservation Commission 1981

Section 3.3 Estimating Potential Losses

Since property taxes account for approximately 74 percent of the town's revenues (residential taxes contributing the greatest amount), it is imperative that the community and its residents take precautions to protect their investments.

In addition to property values, the Charlestown beaches and coastal ponds are both a natural and an economic resource for the community. Two of Charlestown's attractions are its beaches and coastal ponds. The town's potential for future economic growth through tourism will depend on sustaining its rural character and its rich coastal, cultural and historic resources. In order to maintain these valuable assets, the town must insure that this economic base is not compromised by excessive risks from natural hazards.

Additional growth within Charlestown's coastal and riverine floodplains poses an increased risk of private property loss and public infrastructure maintenance and repair costs following a natural hazard event. Flooding and erosion will be exacerbated with the increase in sea level rise over the next century.⁷ Although short-term shoreline change may not affect tax revenues, long-term (spanning 100 years) shoreline change could severely alter the landscape and existing use of the barriers.⁸ The natural tendency for the barriers to migrate landward and cause erosion of the shorefront, combined with potential coastal flood damages, could impact approximately 300 residential structures. Protection of the existing barriers with dune walkovers, beach nourishment or acquisition should be pursued. In addition, the town should investigate free snow fencing for dune rebuilding. As development in the Pawcatuck River Valley increases, natural flood storage areas could be lost and existing water control structures (culverts and dams) proven inadequate. Additionally, as development expands into the undeveloped forested areas of the town, the risk of forest fires increases and the problems of water supply and water pressure become an important consideration. Attention must also be given to transportation infrastructure and appropriate signage, which could prove to be inadequate to accommodate additional growth and support the evacuation needs for year-round and seasonal populations.

Section 3.4 Identifying the Issues

As an oceanfront community, Charlestown faces many threats from natural disasters, risking potential loss to the local economy, natural resources, quality of life and community character. The town's shorefront barriers were decimated by both the 1938 and 1954 hurricanes and in many instances have been heavily redeveloped in spite of similar risks today. The coastal environment defines the character of the town and is a major attraction for tourists and year-round residents. Following a major storm, however, the benefits of living and working in a coastal area can be outweighed by the damage to life, property and natural and economic resources.

The town's vulnerability to natural disasters must be measured in terms of the population, property and natural and economic resources at risk, as well as the probability and magnitude of the event. The following Risk Assessment Matrix (Table 10) outlines

⁷ Gallagan, Chris, "Effect of Future Sea Level Rise along the Southern Rhode Island Coast", 1990, University of Rhode Island.

⁸ U.S. Army Corps of Engineers, New England Division, Planning Directorate, Study of Coastal Flooding Charlestown, RI: January 1996

several risks within the community. After identifying these primary threats, the town summarized these risks and determined there are four major areas at risk in the community.

Risk Area #1- Residential and commercial structures subject to flooding, coastal erosion, fire and earthquakes

Many of the residential neighborhoods adjacent to the salt ponds are low-lying and are in flood hazard areas, which makes them vulnerable to hurricanes. Many seasonal cottages are being converted to year-round homes. Despite currently being zoned as two-acre lots with setbacks from resource areas, many are non-conforming uses on substandard lots. Although many residential structures have been brought up to current floodplain standards, the U.S. Army Corps of Engineers estimates that a high percentage would be impacted during less intense storms. These structures are on individual septic systems with increased potential impact from failure during flood events and increased potential for failure with sea level rise; posing additional concern for water quality.

Risk Area #2- Beaches subject to erosion from coastal processes and coastal storms

The barrier spits act as natural wave barriers, protecting landward resources and property and providing recreational opportunities for residents and visitors. Flooding of the barriers during a 100-year storm would over wash the barriers and cause extensive erosion. The existing residential structures in the area or near the beach are vulnerable to storm damage and erosion ranging from 0.1 – 3.7 feet per year. Town and state beach facilities are moderate in size and are not built to current flood resistant construction standards. The comprehensive plan indicates that access to the shore is limited both by lack of sites and lack of parking and that the public demand for access to the shore continually increases.

Quonochontaug and Charlestown are stabilized inlets/breachways, which provide a stable opening from Block Island Sound to Quonochontaug and Ninigret ponds. These coastal salt ponds are important ecological and economic resources for the community and the state. They provide habitat for fisheries, recreational boating and a buffer to landward shores from direct storm attack. The inlets are considered flood tidal deltas and shoaling of sediments occurs directly landward of the jetties, which may reduce the ability of the pond to drain adequately during high storm activity and increase flooding potential. Additionally, the shoaling of these areas makes navigation difficult and extremely dangerous. The town considers the incremental shoaling of these breachways to be a natural hazard that increases their risk of economic losses over time.⁹

⁹ Research and models indicate that the shoaling does not reduce the ability of the pond to drain adequately. Therefore the shoaling does not increase the potential of low lying areas adjacent to the pond and does not contribute to poor circulation or water quality impacts (Boothroyd, Jon; URI Department of Geology, Personal Conversation, 1996).

Risk Area #3- Roads, bridges and dams subject to flooding, erosion and earthquakes

The primary threat regarding infrastructure is the flooding of secondary roads, which could limit or curtail evacuation during times of natural disaster and cause a public safety problem. In many areas of the community, detours caused by flooded roads could also adversely impact evacuation routes. Several roads flood where they cross brooks. While many old culverts have been replaced and/or upsized for increased capacity, by their very nature they require constant maintenance. Debris washing downstream or out of the adjacent wooded areas often chokes the inlets of this drainage with fresh debris, resulting in new, additional flooding or diminished capacity.

Risk Area #4- Environmental resources vulnerable to forest fires, flooding, earthquakes and coastal erosion

Charlestown has large parcels of undeveloped forested land. With increased development within and adjacent to the forested areas, there is a greater risk of forest fires and resulting damage to people, property and natural resources. These developed rural areas have no public water system and additional water for fire protection must be trucked in.

Section 3.5 Capability Assessment

This capability assessment refers to the existing plans, programs and policies that have incorporated hazard mitigation or other proactive tools.

The town implements and enforces the State Building Code and participates in the NFIP, as do all the communities in Rhode Island. Charlestown has initiated many studies and activities over the years that have laid the foundation for the development of its mitigation strategy. In 2006, the town re-adopted a comprehensive plan that outlines the vision of the community and sets forth a progressive agenda for implementing actions to address increased development pressures, economic stability, open space and recreation issues, public infrastructure and facilities. The comprehensive plan was officially adopted by the RI DOA in 2008.

The comprehensive plan reflects the overall vision for the town and outlines goals, policies, issues and actions to be taken by the community to fulfill that vision, providing a framework for everyday operations within the town. Charlestown has recognized that inclusion of mitigation initiatives (both pre and post-disaster) into their Comprehensive Plan would not only benefit the community by reducing human suffering, damages and the costs of recovery, but would also help build and maintain sustainability and economic health of the community over the long run. This will also further involve the public in mitigation initiatives for the town. For this reason, the Town of Charlestown has decided to make this completed and approved Natural Hazard Mitigation Plan an appendix to the next revision of the Town's Comprehensive Plan.

The adopted and approved Emergency Operations Plan (EOP) addresses the response to extraordinary emergency situations associated with natural, technological and man-made disasters. The EOP further addresses pre- and post-disaster strategies to deal with the hazards addressed in this plan such as hurricane and flooding evacuation, public warning and sheltering during natural disasters. In addition to the above listed plans, hazard mitigation strategies are incorporated into new and existing subdivision or land use regulations and local building codes as noted in various actions in Section 4.1.

Section 3.6 Future Development Trends

As with all the other communities in Rhode Island, Charlestown continues to grow in terms of new residential development. In the period from 2003 to 2012, 271 new housing units were constructed in the Town. Along with this type of growth, is the problem of residents converting “seasonal” property to year-round use.

Future development in these hazard areas will be limited by Rhode Island State Floodplain regulations as well as existing state and local laws. In addition, strict septic system regulations will further limit future development in these areas.

Table 10 Summary of Land Use Changes

Land Use	2004			2013		
	Acres	Parcel Count	Percent	Acres	Parcel Count	Percent
Residential	6,659	4,838	30.34%	6,794	5,042	31.14%
Commercial	730	148	3.33%	727	158	3.33%
Agricultural	1,987	68	9.05%	1,978	70	9.06%
Exempt Properties*	8,943	204	40.74%	9,165	244	42.00%
Undeveloped	2,062 (Resid)	848	9.39%	2,989(Resid)	851	13.70%
	1,568 (Comm)	161	7.14%	168(Comm)	42	0.77%
Total Land in Charlestown	21,949	6,267	100%	21,821	6,407	100%

*Exempt Properties = Federal, State, Municipal, Exempt by Charter and Exempt by Vote of City properties

Section 3.7 – National Flood Insurance Program

NFIP program participants maintain and enforce floodplain regulations conforming to NFIP requirements as part of their zoning ordinance or as a standalone ordinance. FEMA recently visited Charlestown with a Community Assistance Visit (letter attached) affirming Charlestown NFIP compliance. Per the recent assessment conducted by FEMA, Charlestown’s local ordinances regarding floodplain regulations are compliant with the NFIP minimum standards and were updated when the new flood insurance rate maps were released in 2013. The town has also recently appointed a national certified floodplain manager which will ensure the Town remains in compliance with NFIP standards. Currently there are 820 flood policies in force in the Town which totals over \$219 million dollars in coverage and to date over \$2 million dollars has been paid out as part of the program for losses.

Section 3.8 Risk Assessment Matrix

The Town of Charlestown Hazard Mitigation Committee in reviewing the natural hazards that can impact the town completed the following Risk Assessment Matrix (see Table 11). In completing this matrix, the committee identified areas in town that are at risk and are vulnerable to costly damage and loss of life. The Committee determined the vulnerable areas that needed to be addressed first in order for the mitigation strategy to produce the most benefit for the town and its residents and these items have been ranked as such on the matrix.

Table 11 Risk Assessment Matrix

Rank	Vulnerable Area	Risk Area	Location	Ownership	Natural Hazard	Primary Problem or Effect	Mitigation Benefits	Risk Historic= H Probable= P	2014 Review Rank
1	Coastal beaches and property	1 & 2	Barrier Beach, Blue Shutters Beach, Charlestown State and Town Beaches	Public	Flooding Hurricane Windstorm Freezing	*Beach erosion *Economic Loss *Loss/damage of life and property	*Maintain beaches for economic and social benefits *Protection of life and property	H & P	1
2	Critical Public Facilities	1, 3, 4	Town Hall Police Department Fire/Rescue Dept Charlestown School Town Garage (DPW) Communications Towers Primary & Secondary Evacuation Routers	Public	Hurricane Heavy Rain/ Flooding Windstorm Lightning Earthquake Freezing Wildfire	*Loss of critical infrastructure *Loss of Public Safety equipment *Disruption of emergency services *economic and social hardships	*Protection of essential services *Minimize disruption to emergency services *Minimize or reduce economic hardship and loss of life and property	H & P	2
3	Inland Residential Property	1 & 4	Town-wide	Private	Hurricane Heavy Rain/ Flooding Windstorm Lightning Earthquake Freezing Wildfire	*Economic and social hardships *Loss of life and property *Inadequate water supply and suppression equipment *Septic system failure/leakage	*Reduce or eliminate economic and social hardship *Protection of life and property *Improve public safety with proper fire suppression equip. *Reduce contamination to water sources	H & P	3
4	Streets subject to flooding and wash-out	5	Sherman Ave Driftwood Dr Old Coach Rd Charlestown Beach Road Route 1A	Public and Private	Heavy Rain Hurricane Flooding Earthquake Freezing	*Poor drainage *Dirt roads wash out *Disrupts evacuation routes *Clean-up costs *Loss of life and property *Economic hardships *Infrastructure damage *Public safety concerns *Viability of primary/secondary evacuation routes	*Improved drainage *Evacuation routes remain passable *Reduce or eliminate clear-up cost *Reduce or eliminate loss of property *reduce economic hardships *Reduce or eliminate cost to repair infrastructure *Public safety concerns reduced or eliminated	H & P	4

5	Dams	3	Pawcatuck River -Lover falls -Horseshoe Falls -Kenyon Industries Cross Mills King Tom Pond Burlingame Reservoir Carolina Pond Clausen Farm Pond Gobeille Pond Indian Ce Wannase McLeod Farm Pond Olaf Farm Pond	Public and Private	Heavy Rain Hurricane Windstorm Earthquake Freezing	*Loss of life and property *Economic hardship *Effects to communities downstream	*Reduce or eliminate loss of life and infrastructure *Reduce or eliminate economic hardship *Reduce threat to other communities	H & P	5
6	Utilities Electrical Substation Telephone Switching Station/Cables Cellular/Radio Towers	1, 3, 4	Shannock Road Shumankanic Hill Road Cross Mills Carolina Back Rd West Beach/Rt1 Mat Schihse Rd Old Coach Rd MCI (Rte 1A) Kings Factory Rd Rte 112/NIT Police Kingswood Court Rte 216 (Gun Club) Ambulance Tower Police Towner	Public and Private	Heavy Rain /Flood Hurricane Windstorm Lightning Earthquake Wildfire Freezing	*Loss of critical infrastructure *Loss of Public Safety equipment *Disruption of emergency services *Loss of life	*Protection of essential services *Minimize disruption to emergency services *Minimize or reduce economic hardship and loss of life and property	H & P	6
7	Industry in a Floodplain	1 & 4	Kenyon Mill (Sherman Ave)	Private	Heavy Rain /Flood Hurricane Windstorm Lightning Earthquake Wildfire Freezing	*Economic and social hardships *Loss of life and property *Septic system failure/leakage	*Reduce or eliminate economic and social hardship *Protection of life and property *Reduce contamination to water sources	H & P	7
8	Burlingame State Park Management Area on other forested areas	4	Town-wide	Public and Private	Lightening Wildfire Windstorm	*Wildfire damage *Loss of life and property *Access to forested land *Inadequate water supply and suppression equipment	*Protection of forested area *Social and economic benefits *Protection of life and property *Improved ingress/egress routes *Improved public safety with proper fire suppression equipment	P	8

SECTION 4.0 MITIGATION ACTIONS

In completing the risk and vulnerability analysis, the Charlestown Hazard Mitigation Committee considered projects and actions that would reduce Charlestown's vulnerability to the identified hazards. The Risk Assessment Matrix presented in Table 11 is the basis for the mitigation actions presented in Section 4.1. The Charlestown Hazard Mitigation Committee reviewed the following actions to be the objectives of this plan and prioritized the matrix and the associated actions based on historical damage, safety of the population, property protection and consistency with Town-wide goals and objectives. The actions, which are the objectives to reach the goal of each hazard area, were aligned and prioritized with regards to public health risks, evacuation and mass care considerations, disruption of essential services and potential economic losses to the Town. These actions, which comprehensively address the key issues, combine to create the hazard mitigation strategy to be implemented by Charlestown. The Committee prioritized each action through the use of the STAPLEE Method.

The recommendations include local initiatives, as well as strategies to be employed at the state or regional level to improve hazard mitigation. Many of the actions have several elements or tasks, illustrating the various methods of implementation in the Town strategy. Some actions have been either completed or re-worked from the updated plan that was submitted to FEMA in 2005 to reflect the changes that have occurred in the community over the last several years. All action items have information listed as to what activities have occurred on the item since 2005, whether completed, no action taken, etc. No items have been removed from the plan update in order to show the progress that was made. In addition, no new items have been added in this update.

The Charlestown Hazard Mitigation Committee determined that the below identified goals and objectives could be met by considering actions aligned to the following:

- Planning and Regulations
- Property Protection, Structural Projects and Maintenance (acquisition, elevation, flood gates, repairs)
- Public Information and Outreach, Incentive Programs
- Emergency Services (Protection of Critical facilities)
- Post Disaster Opportunities
- Community Rating System

This Committee has worked to set goals and objectives for each risk area, as defined in the Action Plan (Section 4.1), that are bounded by a time frame and are compatible and consistent with State Hazard Mitigation Goals. Upon submittal of this plan to RIEMA, the State Hazard Mitigation Committee (SHMC) is expected to review and approve these goals and objectives to ensure consistency with the statewide goals and objectives. The time frame used for this strategy is as follows:

Short Term = 0 to 6 Months

Medium Term = 6 to 18 Months

Long Term = 18 Months to 5 Years

Section 4.1 Action Plan

The recommended actions are classified into four general risk areas in which the community is vulnerable, as previously identified. Each action offers a discussion of the project and if applicable, includes the options considered. Multiple actions associated with a vulnerable area reflect Town priorities and are prioritized high, medium, or low depending on how significant an impact the strategy would have on protecting the community versus the actual risk associated. If known, the actions include cost estimations and assign responsible parties to lead the efforts to complete the action. Other relevant departments/ agencies that can offer support to the project are also identified, as well as funding options.

Risk Area # 1 – Goal: Protect present and future residential and commercial structures subject to flooding, coastal erosion, snowstorms, hurricanes and other identified natural hazards.

Existing conditions – Many of the residential neighborhoods adjacent to the ponds in Charlestown are low-lying and are in flood hazard areas, vulnerable to hurricanes. Based on 1993 data, approximately 170 houses in the floodplain would experience flood-related losses as a result of a 25-year storm event (USACE, 1996). Many of the cottages are being converted to year-round homes, some of which are on non-conforming lots. Although currently zoned as two-acre lots with setbacks from resource areas, there are many cases of non-conforming uses on substandard lots. For instance, on Charlestown Beach Road, pre-existing lots are not wide enough to accommodate currently zoned three-acre lots or the required 50-foot front yard setback. Additionally, areas on the barrier beach are subject to eroding shorelines. Charlestown's entire barrier system, salt ponds and much of the headlands (which encompass over 2,000 feet) are subject to battering waves over 2.9 feet because these areas are in the V zone. All of these structures are on individual sewage disposal systems (ISDS) with increased potential impact from failure during flood events and increased potential for failure with sea level rise, posing additional concern for water quality.

To weigh the benefits versus the cost in mitigating this hazard area, the general consensus of the committee was that cost could not be too great in this area considering they are dealing with saving lives. Any actions taken to reduce or eliminate the loss of life in this area would be well worth the cost, not to mention the millions of dollars in residential and commercial property in this area that would also benefit from incorporating the suggested actions.

Action 1 – Incorporate Hazard Mitigation into Project Review

- a) Create GIS Database That Is Specific For Charlestown – High priority. Data would incorporate locations of hazard-prone structures and risk areas into the planner's database and map which have been proposed in the comprehensive plan to identify red flags for reviewing developments.

Historic and cultural resources at risk would also be included as well as data from the Charlestown DPW.

Responsible Party: GIS

Benefit: Protection of Life and Property

Actions since 2005: **Completed** – *Full time GIS person has been hired and all previous GIS issues have been addressed.*

- b) Enforce Floodplain, Building And Zoning Regulations – High priority. Develop strong criteria for variances to reduce the number issued in marginal locations. Strictly enforce 50 percent substantial improvement requirements.

Responsible Party: Building Official/Floodplain Manager

In Coordination With: Zoning Board

Benefit: Protection of Life and Property

Actions since 2005: **Completed** - *Continue to strictly enforce the locally adopted floodplain ordinance, RI State building codes town zoning ordinance and FEMA regulations.*

Action 2 – Develop and Implement Public Education and Outreach

- a) Investigate Pre- & Post-Financial Incentives For Mitigation – Medium priority. Investigate resources for incentives such as insurance credits or deductions for flood-proofing measures, conservation easements or flood-aversive measures. Further study the feasibility of taxing undeveloped land at a lower rate.

Priority Score: 15

Responsible Party: Floodplain Manager/CRS coordinator

In Coordination With: Town Council, Town Administrator, Town Treasurer

When: Long term

Models: Rhode Island Hazard Mitigation Project, Blue Sky Project

Benefit: Protection of Life and Property, Reduction in Social/Economic Hardship

Estimated Cost: \$3,500.00

Actions since 2005: **In-Process** – *An application for CRS has been submitted and approval is pending and anticipated in October 2014*

- b) Distribute Information On The Location Of Hazard-Prone Areas – High priority. Provide information to contractors and homeowners on risks of building in hazard-prone areas and to inform builders and homeowners of the benefits to building and renovating structures to current standards. Provide the public with FEMA floodplain maps and other technical information developed by FEMA, state agencies and other qualified institutions to assist the public in understanding the risks and the options for mitigation.

Responsible Party: Building Official/Floodplain Manager

In Coordination With: Private sector, State Agencies

Benefit: Protection of Life and Property, Reduction of Social/Economic Hardship

Actions since 2005: Completed - *In conjunction with 2f below, completed, posted and regularly updated on Town of Charlestown website at www.charlestownri.org under Town Departments, Building/Zoning, Flood Docs. In 2013 an outreach letter went to residents regarding the adoption of the floodplain maps, map changes and flood insurance information.*

- c) **Develop Public/Private Partnerships To Create Financial Incentives** – Low priority. Participate in public/private partnerships to develop and implement public and private incentives for mitigation. Actively participate in incentive programs. Identify sources for low-interest loan programs for private sector.

Priority Score: 10

Responsible Party: Planner

In Coordination With: Neighborhood associations, private sector, Town Council, Town Administrator

When: Short term

Resource available: Rhode Island Hazard Mitigation Project, local/regional private sector partnerships

Models: Rhode Island Hazard Mitigation Project, Rhode Island Marina Programs

Benefit: Reduce or Eliminate Economic and Social Hardship

Estimated Cost: \$3,500.00

Actions since 2005: In-Process – *The Town is supporting efforts to have the Pawcatuck River designated as part of the scenic waterways.*

- d) **Provide Information On ISDS Upgrade Options** – High priority. Target education efforts for maintaining and upgrading individual sewage treatment systems (ISDS) in flood zones.

Priority Score: 21

Responsible Party: Wastewater Manager

In Coordination With: Wastewater Management Commission, Department of Environmental Management

When: Short term

Resources available: Low interest bank loans, URI Cooperative Extension's Home *A*SYST Program

Models: Charlestown's ISDS Upgrade Program, Greenwich Bay Initiative

Benefit: Reduce Contamination to Water Sources

Estimated Cost: Currently funded through Wastewater Management Commission

Actions since 2005: In Process – *Additional information on wastewater can be found on the Town's website:*

http://www.charlestownri.org/index.asp?Type=B_BASIC&SEC=%7B57BE787A-1F23-406A-906B-4FBC5BCACF34%7D

- e) Provide Training Programs – Medium priority. Participate in training opportunities for boards and local officials regarding natural hazards and hazard mitigation.

Priority Score: 13

Responsible Party: Emergency Management Director

In Coordination With: Town Officials, board and commission members

When: Short term

Resources available: Rhode Island Hazard Mitigation Program

Benefit: Continued support for Hazard Mitigation Program

Estimated Cost: \$1,000.00

Actions since 2005: In Process – *Courses that are available through the Independent Study Program at EMI will be offered to board members and local officials to help them better understand mitigation and what it can do for the community. Some of the courses being considered are: IS-393.A: Introduction to Hazard Mitigation; IS-318: Mitigation Planning for Local and Tribal Communities; IS-320: Wildfire Mitigation Basics for Mitigation Staff; IS-321: Hurricane Mitigation Basics for Mitigation Staff; IS-322: Flood Mitigation Basics for Mitigation Staff; IS-212.A: Introduction to Unified Hazard Mitigation Assistance (HMA)*

- f) Develop A List Of Appropriate Techniques For Homeowners – High priority. A list should be compiled to assist homeowners in self-inspection of their property and provide guidance to subsequent implementation of mitigation activities.

Responsible Party: Building Official

In Coordination With: RIEMA, Rhode Island Building Commission, Institute for Business and Home Safety

Benefit: Protection of Life and Property

Action since 2005: Completed - *In conjunction with 2b above, completed, posted and regularly updated on Town of Charlestown website at www.charlestownri.org under Town Departments, Building/Zoning, Flood Docs*

Action 3 – Determine Post-Disaster Mitigation Opportunities

- a) Property Acquisition or Land Swap. (See Action 5)
- b) Implement Structural and Non-Structural Retrofit Programs – High priority.

Responsible Party: Building Official

In Coordination With: Planning Commission, RIEMA, FEMA

Benefit: Protection of Life and Property

Actions since 2005: Completed - *Dwellings were retrofitted to conform to compliance with wind and flood zones. Non-structural retrofit program –packets were handed out to prepare people for storms; how to make your home safer. In addition a map and listing of all structures elevated since 2005 is available.*

- c) Document Areas Of Destruction And Risk Post-Disaster – High priority.

Responsible Party: Building Inspector

In Coordination With: Town Council, citizens, Town Administrator, Coastal Resources Management Council

Benefit: Continued evaluation of risk areas

Actions since 2005: Completed - *The town has made GIS maps of the areas that were hit badly by storms. The CRMC maps are available with the new coastal changes (coastal features). There is also a map available of the repetitive loss areas with a list of all the structures within those zones.*

Action 4 – Develop a Shoreline Overlay

- a) Develop A Hazard Zoning Overlay – High priority. Include standards/restrictions and best management practices for land in vulnerable areas. Standards would guide development appropriately for hazards due to flooding, shoreline erosion and barrier spit dynamics.

Responsible Party: Planner

In Coordination With: Hazard Mitigation Committee, Town Council

Benefit: Protection of Life and Property

Actions since 2005: Completed – *GIS maps have been created that include 12 levels such as flood zones, wetlands, soils, ect.*

Action 5 – Acquire Lands in Hazard-Prone Regions of the Community

- a) Establish A Revenue Source To Purchase Hazard-Prone Property – Low priority. Develop a program to fund purchases within hazard-prone areas. Such a fund can be used to leverage state and federal grants to target buy-out of repetitive damage areas. Incorporate hazard-prone areas into high priority land purchases.

Priority Score: 9

Responsible Party: Emergency Management Director

In Coordination With: Hazard Mitigation Committee, Town Council, Town Treasurer, Town Administrator, Coastal Resources Management Council

When: Long term

Resources available: Trust for Public Lands, Nature Conservancy

Models: Martha's Vineyard Land Bank, State of Rhode Island Surcharge for Building Permit, Watercrest County (FL) Program, All Hazards Protection District Fund

Benefit: Reduce/Eliminate Repetitive Loss Property

Estimated Cost: \$10,000.00

Actions since 2005: *There were 12 repetitive loss properties in town, but 3 were mitigated so only 9 remain and they do not warrant acquisition at this time, but will be monitored.*

- b) Acquire Vulnerable Properties Subject To Natural Hazard Risk – Low priority. Promote the purchase of land in hazard-prone areas as benefiting multiple objectives within the community. Utilize the open space and private land trusts purchase to acquire vulnerable lands by incorporating hazard-prone areas as priority criteria for public and private land trusts and open space purchase decisions. Develop partnerships between the town and Charlestown conservancies to identify and purchase vulnerable land.

Priority Score: 9

Responsible Party: Emergency Management Director

In Coordination With: Hazard Mitigation Committee, Town Council, Town Administrator, Coastal Resources Management Council

When: Medium term

Resources available: Trust for Public Lands, U.S. Department of Interior-National Wildlife Refuge, U.S. Fish and Wildlife Service, State-Implemented Federal Land and Water Conservation Fund, U.S. Park Service-Rivers & Trails, South County Conservancy, Nature Conservancy

Models: FEMA's Property Buy-Out Program

Benefit: Reduce/Eliminate Repetitive Loss Property

Estimated Cost: To be determined

Actions since 2005: In-Process - *There are currently 1,895 acres of open space which is actually in a floodzone owned by the Town, State and public entities. Mud Cove, which is 5.2 acres and in a flood hazard area, was once used for active recreation but has been since changed to a passive recreation area.*

- c) Identify Opportunities For Post-Disaster Open Space Acquisition In A Pre-Disaster Time Frame – Medium priority. Initiate discussions with land owners for future purchase with state and federal hazard mitigation grant funds following federally declared disasters.

Priority Score: 14

Responsible Party: Emergency Management Director

In Coordination With: Hazard Mitigation Committee, neighborhood associations, Department of Environmental Management, Coastal Resources Management Council

When: Medium term

Models: NFIP

Benefit: Reduce/Eliminate Repetitive Loss Property

Estimated Cost: still being determined

Actions since 2005: Under review – *This action will be reviewed further since the committee feels this would be expensive to do, there would be a loss to the tax base and property owners generally do not want to give up their property. In addition there are only 9 properties that currently fall into this category and acquisition is not warranted at this time.*

Action 6 – Floodplain Management Program

- a) Establish a strong Floodplain Management Program and submit the necessary application and documentation to FEMA to qualify the Town as a participant in the Community Rating System (CRS).

Responsible Party: CRS Coordinator

In Coordination With: GIS Specialist and State CRS Coordinator

When: Short term

Resources available: RIEMA, FEMA, ISO (Insurance Services Office)

Models: CRS Manual

Benefit: Flood Insurance Discounts for residents as well as the Town; Protection of life & property

Estimated Cost: \$20,000.00

Risk Area # 2 – Goal: Preserve, enhance and protect the areas subject to erosion and flooding from coastal processes and coastal storms.

Existing Conditions – The land south of Route 1 that is adjacent to the ocean and coastal lagoons is flat and sandy. Because of this geomorphology, the land is threatened by severe storms, beach erosion and rising sea levels. Development on Charlestown Beach has raised concerns about increased erosion and flood damage from coastal storms. The barrier spit provides storm protection for the salt ponds and the backshore and is a unique habitat for wildlife. Therefore, it is important to maintain a healthy barrier system. Natural landward migration of barriers threatens permanent structures built upon them, since the barrier will eventually move out from under the buildings. Charlestown Beach was totally over washed in both the 1938 and 1954 hurricanes and many of the structures were destroyed. Structures have been rebuilt since then, many of which have been moved landward because shoreline erosion has threatened their stability. However, structures were not rebuilt on East Beach subsequent to the 1954 hurricane.

During a 100-year storm, the barriers (with an elevation of 12 feet above sea level) are vulnerable to over wash from surge waves as large as 18 feet above sea level. During such a storm event, waves will enter the ponds. Recent storms have caused damage to the jetties. The channels landward of the jetties serve as flood tidal deltas, which deposit sand on incoming tides. The jetties do not block the long shore sand (littoral) transport occurring on the ocean side of the barriers. Some of the sand that is transported along the shore is deposited inside the salt ponds due to incoming tides.

Mitigating the hazards that are faced in this area not only saves the community from loss of life and property, it benefits the economic community as well. The beautiful beaches are what attract the tourists and seasonal residents to Charlestown. If these beaches and surrounding areas were to be damaged or destroyed by a natural hazard, even though a specific dollar amount has not been calculated as of yet, it would greatly affect many small businesses and the economic community as a whole that rely on the seasonal tourists.

Action 6 – Incorporate Hazard Mitigation into Project Review

- a) Implementation Of Hazard Mitigation Measures – High priority. Strictly enforce floodplain standards for structures in V zone and A zone. Ensure that areas below the base flood elevations are not used inappropriately after the certificate of occupancy is received.

Responsible Party: Building Inspector

Benefit: Protection of Life and Property

Actions since 2005: Completed - *Building Inspector continues to strictly enforce.*

Action 7 – Develop and Implement Public Education, Outreach and Incentives

- a) Provide Public Education Materials – High priority. Educate homeowners and contractors on appropriate methods for landscaping to reduce erosion and damage from wind.

Responsible Party: Building Inspector

In Coordination With: Hazard Mitigation Committee

When: Short term

Resources available: URI Cooperative Extension, Sea Grant

Models: Nantucket, MA “Guide to Indigenous Landscaping”

Benefit: Protection of Property, Reduction of Social Hardship

Estimated Cost: Refer to Action 2b

Actions since 2005: In-Process - *New landscape ordinance has been passed and is posted on the Town’s website, but public education on the ordinance is still needed.*

- b) Provide Public Education Materials On Hazards And Types Of Mitigation For Homeowners (Including Seasonal Residents and Visitors) – High priority. Includes evacuation maps and signs posted along state roads, Charlestown Beach Road, Narrow Lane, Routes 1, 2, 112, 216 and East/West Beach roads.

Responsible Party: Emergency Management Director

In Coordination With: Police officers, Chamber of Commerce, Army Corps of Engineers, Hazard Mitigation Committee

Benefit: Protection of Life, Reduction of Social/Economic Hardship

Actions since 2005: Completed - *Evacuation maps have been created, evacuation routes/signs are posted on roadways.*

- c) Provide Workshops For Residents – Long-term priority. Discuss the current regulations and standards on building, renovation and floodplain management.

Priority Score: 18

Responsible Party: Building Inspector

In Coordination With: Hazard Mitigation Committee, Planner, Town Council, URI Cooperative Extension

When: Medium term

Resources available: Rhode Island Division of Planning – Floodplain Management Division, FEMA

Benefit: Protection of Property

Estimated Cost: \$3,000.00

Actions since 2005: In-Process - *In 2012 workshops were held for the adoption of floodplain maps and the affects they would have on residents. In addition, Dr. Jon Boothroid from URI has conducted workshops on coastal erosion and sea rise. More workshops will be held in the future as needed on various mitigation topics.*

Action 8 – Identify Post-Disaster Mitigation Opportunities

- a) Property Acquisition. (See Action 5)
- b) Encourage Retrofit Of Damaged Property. (See Action 3)
- c) Implement Non-Structural Alternatives To Shoreline Protection (Nourishment or Dune Planting) Where Appropriate. (See Action 3)
- d) To help build the barrier, sand overwash should remain as is, as it occurs not resulting in impassable roadways and where feasible– Medium priority.

Priority Score: 16

Responsible Party: Director of Public Works

In Coordination With: Town Council, Citizens, Town Administrator, Building Inspector, Hazard Mitigation Committee, Coastal Resources Management Council

When: Medium term

Resources available: Institute for Business and Home Safety, RIEMA, FEMA, World Wildlife Fund, Coastal Resources Management Council

Models: Institute for Business and Home Safety Retrofit Guidelines for One- and Two- Family Residences

Location: Charlestown Beach Road

Benefit: Protection of Life and Property

Estimated Cost: \$100,000.00

Actions since 2005: In-Process

Action 9 – Enhance Public Beach Facilities and Public Access

- a) Improve Public Access Opportunities – High priority. Develop dune/beach nourishment program for all barrier beaches to maintain appropriate beach profile for public properties on eroding barrier beaches.

Priority Score: 18

Responsible Party: Director of Public Works

In Coordination With: Hazard Mitigation Committee, Citizens, Department of Public Works

When: Medium term

Resources available: Beach fees, post-disaster funds, dredge material disposal

Benefit: Maintain Beaches for economic and social benefit

Estimated Cost: \$15,000.00

Actions since 2005: In-Process - *The Town received a \$3.5 million grant from the CRC to dredge sand out of Ninigret Pond to build up the areas around it. Also, beach replenishment on Charlestown Beach took place following Hurricane Sandy.*

- b) Upgrade Public Beach Facilities – High priority. The state beach facilities should be elevated and relocated, while the town should consider alternatives to new permanent sanitary facilities in the future, including portable units.

Responsible Party: Director of Public Works

In Coordination With: Department of Public Works, Department of Parks and Recreation, Rhode Island Department of Environmental Management

Benefit: Reduce/Eliminate Damage to Infrastructure, Reduce Contamination to Water Sources

Actions since 2005: Completed – *New facilities have been built at Charlestown Beach and Blue Shutters and all structures are elevated. Cost was \$1.2 million.*

Action 10 – Enhance Disaster Preparedness

- a) Develop Post-Storm Recovery Plan For Barrier Beach – High priority. Recovery plans should include provisions for minimal issuance of variances and review 50 percent rebuilding criteria, which states that structures which require substantial rebuilding (50 percent or greater the replacement value) shall rebuild according to current standards.

Responsible Party: Building Official

In Coordination With: Town Council, Building Inspector, Army Corps of Engineers, Coastal Resources Management Council, Hazard Mitigation Committee

Benefit: Protection of Life and Property

Actions since 2005: - Completed – *Following Sandy, a number of structures that were damaged were required to be re-built to current standards and this will be the continued practice following disasters.*

- b) Formalize Mutual Aid Agreement – High priority. Work with neighboring towns and communities to provide assistance for post-disaster inspections and issuance of building permits.

Responsible Party: Building Official

In Coordination With: Rhode Island State Building Commission, Town Administrator, Town Council

Benefit: Expedite Recovery Efforts Post-Disaster

Actions since 2005: Completed - *Agreement with the State.*

- c) Maintain A Disaster Recovery Team – High priority. Formalize a disaster recovery team in cooperation with RIEMA and Charlestown Emergency Management Agency (CEMA) to coordinate post-disaster procedures for designation of “substantial improvement” structures, emergency permitting and rebuilding standards

Responsible Party: Building Official

Benefit: Expedite Recovery Efforts Post-Disaster

Actions since 2005: Completed - *The Building Official is a nationally recognized Certified Floodplain Manager. He along with the GIS Specialist, Wastewater Manager and the field inspector to the Building Official comprise the Charlestown Disaster Recovery Team, with mutual aid from the State if needed. Having this team also expands the knowledgebase of members as to what can occur within the Town during disasters.*

Action 11 – Enhance Circulation in Coastal Ponds

- a) Evaluate Options To Improve Flow, And Examine The Existing Structural Integrity Of The Existing Jetties – High priority. Evaluate whether dredging would improve safety in the jetties or pond entrance

Responsible Party: Harbormaster

In Coordination With: Department of Environmental Management, Coastal Resources Management Council, Coastal Ponds Management Commission, Army Corps of Engineers

Benefit: Restore natural flushing action in ponds to remove effects of fecal coli form from wild bird populations

Estimated Cost: Harbormaster’s salary

Action since 2005: Completed - *Dredging continues on a regular basis to improve flow and enhance constant circulation in coastal ponds through an open permit to dredge with the RI Coastal Resources Management Council. Current research studies are being conducted to ascertain the proper dredging schedule to optimize flow. Dredging is cost shared with the Town of Charlestown and the federal government. The GIS professional in the town also works on this program. Also there was a recent rock removal project in the breach way to remove rocks that were displaced during Hurricane Sandy.*

Action 12 – Insure Continued Safety of Navigation in the Ponds

- a) Improve Navigation Facilities In Charlestown Breachway – High priority. Navigation markers and flood stage markers should be installed and maintained to improve navigation landward of the Charlestown Breachway.

Responsible Party: Harbormaster

In Coordination With: Coastal Ponds Committee, Department of Environmental Management, Army Corps of Engineers, Coastal Resources Management Council

Benefit: Reduce damage to estuarine ecology and personal (boats) property

Estimated Cost: Harbormaster's salary

Actions since 2005: Completed - *Harbormaster maintains navigation markers and flood stage markers landward of the Charlestown Breachway. Additional flood markers and weather stations are also planned to be added.*

- b) Inspect Shoreline Structures – High priority. Inspection of coastal structures and existing jetties to ensure structural stability and ability to withstand wave attack during high storm activity.

Responsible Party: Harbormaster

In Coordination With: Department of Environmental Management, Coastal Resources Management Council, Army Corps of Engineers, Hazard Mitigation Committee

Benefit: Protection of Life and Property from Surge

Estimated Cost: Harbormaster's salary

Actions since 2005: Completed - *Harbormaster stated that there are two breachways in Charlestown (Charlestown and Quannie Breachways) that are important to ensure structural stability and to inspect (and repair if necessary) after a natural disaster.*

Risk Area # 3 – Goal: Incorporate mitigation strategies that will ensure that current and future roads, bridges and dams that are subject to flooding, erosion and other natural hazards will withstand the effects of these hazards and remain functional to the community.

Existing Conditions – The U.S. Army Corps of Engineers identifies several low-lying roads vulnerable to flooding from storms – Shore Drive, Sea Lea Avenue, Wall Street, Meadow Lane near Ninigret Pond, Ram Island, East Beach and West Beach roads. It is important to keep in mind that 55 percent of the roads in Charlestown are privately owned. The primary evacuation routes for Charlestown are Routes 1, 2 and 112, which will also serve as the principal evacuation roads for adjacent communities that may need to evacuate simultaneously. Many of the north/south arteries in the northern part of Charlestown will be required to carry the majority of the evacuating population. These roads are the only access from the east/west connectors.

Although a true cost/benefit analysis has not been completed, the Committee agreed that to lose vital roads and bridges which serve as evacuation routes for residents in time of emergency was something that needed to be addressed. Furthermore, first responders will also be impacted if roads are washed out or flooded while trying to respond to emergencies.

Action 13 – Incorporate Hazard Mitigation into Project Review

- a) Incorporate Best Management Mitigation Practices – High priority. Define and incorporate maintenance and improvement projects into town, state and private infrastructure.

Responsible Party: Director of Public Works

In Coordination With: Department of Public Works, Rhode Island Department of Transportation, Charlestown Parks and Recreation Director, Hazard Mitigation Committee

Benefit: Protection of Infrastructure, Public Safety, Evacuation Routes

Actions since 2005: Completed - *The Charlestown Public Works Department routinely and as a part of best management practices addresses flooding by regularly cleaning out swales to allow flow and to reduce ponding on the roads. Additionally, the DPW maintains retention ponds on the town's right of way in Burlingame Estates and on Buckeye Brook Road.*

Action 14 – Develop and Implement Public Education and Outreach

- a) Evacuation Routes – High priority. Install flood elevation signs and evacuation signs on barrier beaches within flood zones and evacuation routes.

Responsible Party: Emergency Management Director

In Coordination With: Department of Public Works, Building Inspector, Town Administrator

Benefit: Protection of Life

Actions since 2005: Completed - *All evacuation routes have proper signage.*

Action 15 – Determine Post-Disaster Mitigation Opportunities

- a) Document Problems Associated With Disaster For Future Mitigation Activities. (See Action 3)
- b) Evaluate The Appropriateness Of Replacing Under-Sized Culverts With Adequate Culverts on Buckeye Brook Road, West Beach Road and East Beach Road

Actions since 2005: Committee decided to remove since it is not a feasible action item – *Culverts can only be replaced at the same size per the environmental permitting process, therefore this is not a feasible item.*

c) Reevaluate Evacuation Plan

Responsible Party: Emergency Management Director

In Coordination With: Hazard Mitigation Committee

Benefit: Ensure Quickest/Safest Evacuation Routes for Citizens

Actions since 2005: Completed – *Plan is evaluated periodically and if/when new roads are created.*

d) Incorporate Adequate Drainage Facilities in Design For Road Repair.

Responsible Party: Director of Public Works

In Coordination With: Hazard Mitigation Committee

Benefit: Ensure Adequate Drainage to Reduce Flooding/Washout of Roads

Actions since 2005: Completed - *Town roads have been repaired and designed with adequate drainage facilities. Town has replaced failed catch basins with pre-cast concrete instead of cement materials. Improve materials and methods to retard the flow of stormwater. Utilizing all best management practices as prescribed by the Rhode Island Stormwater Design and Installation Standards Manual.*

Action 16 – Project Development/Capital Facilities Budget

a) Incorporate Mitigation Infrastructure Improvements Into Ongoing And New Projects – High priority (i.e. new subdivision, repaving of roads). Identify other opportunities (i.e. natural resource enhancements, drainage improvements) where feasible to leverage alternate/additional funding (i.e. Intermodal Surface Transportation and Efficiency Act, TEA 21) and additional benefits.

Responsible Party: Director of Public Works

In Coordination With: Department of Public Works, Town Administrator, Town Treasurer

Benefit: Protection of Life and Infrastructure, Minimize Damage and Clean-up Costs

Actions since 2005: Completed – *All projects are reviewed to ensure they incorporate mitigation measures*

Risk Area # 4 – Goal: Protect, preserve and maintain environmental resources and structures vulnerable to Forest Fires

Existing Conditions – Charlestown has large parcels of undeveloped forested land. With increased development within and adjacent to the forested areas, there is a greater risk of forest fires and resulting damage to people, property and natural resources. These

developed areas have inadequate public water supply and water pressure for fire protection.

It is difficult to determine what the cost would be to lose a portion or portions of the forested areas in Charlestown. However, these areas are what give Charlestown part of its charm and attracts tourists to the area. Therefore, the Committee decided on the following actions to better prepare the community in the event of a fire in these areas while at the same time protecting the residential/commercial property and critical facilities that would also be at risk from this type of hazard.

Action 17 – Incorporate Hazard Mitigation into Land Development Review

- a) **Develop Standardized Policies for Risk Area – Medium priority**
Priority Score: 16
Responsible Party: Emergency Management Director
In Coordination With: Hazard Mitigation Committee, Town Council, DEM, U.S. Fish and Wildlife
When: Short term
Model: Massachusetts Department of Environmental Management Fire Annex to State Hazard Mitigation Strategy
Benefit: Ensure Proper Protections are in Place Before Land is Developed
Estimated Cost: Emergency Manager's salary
Actions since 2005: *In-Process – Firewise program was created, but has yet to be incorporated.*

- b) **Maintain Adequate Fire Breaks And Access To And Within Forested area – High priority.**
Actions since 2005: *Remove, not applicable – No formalized easement to grant fire department access to private, state or town owned land. Fire district does not pursue it and it is not part of the fire districts duties. David Walker, Fish and Wildlife Biologist from the U.S. Fish and Wildlife plans for a burn off of overgrown vegetation in the Trustom Pond National Wildlife Refuge (including Moonstone Beach) and any actions to be taken will be discussed with the Town fire districts as appropriate.*

- c) **Subdivision and Land Development Plans To Include Granting Of Easement For Fire Breaks And Installation Of Concrete Water Tanks – Medium priority.**
Store adequate supply of water for fire protection.
Responsible Party: Planner
In Coordination With: Planning Commission, Fire Districts
When: Long-term
Benefit: Improved Ingress/Egress Routes, Improved Public Safety
Estimated Cost: Town Planner's salary
Actions since 2005: *In-Process – Long term project*

Action 18 – Develop and Implement Public Education and Outreach

- a) Educate Public About Safe Fire Practices – Medium priority. Provide resources to the Parks and Recreation and Fire Departments for staff training and public education regarding campfires and appropriate practices in times of drought.

Responsible Party: Parks and Recreation Department

In Coordination With: Fire Districts, Department of Environmental Management, State Fire Marshall

Benefit: Reduce Risk of Forest Fire

Actions since 2005: Completed - *The Parks and Recreation Supervisor said that Charlestown has worked closely with the Boy Scouts of America at Ninigret Park to educate the public about fire safety practices. Additional opportunities can be accomplished through the summer camp program to educate children about fire safety tips. There are multiple events happening at Ninigret Park (i.e. community concerts, movies, etc) and this is an opportunity to educate the audience about fire safety. Another audience is the senior luncheons held at the park. Signage at the park can be increased through future funding.*

A kiosk could be added at Little Nini Beach in Ninigret Park to showcase the fire suppression pond that is currently functioning. This kiosk could illustrate the historical and current functionality of the fire pond while educating visitors about fire safety.

The Chief from the Charlestown Fire District stated that a Fire Prevention show and tell is conducted annually during fire prevention week (usually in October) at the Charlestown Elementary School.

The Chief from the Charlestown Fire District has also formed an exploratory committee to participate in the Firewise Communities Program that encourages local solutions for safety by involving homeowners to take individual responsibility for preparing their homes from the risk of wildfire. The program is co-sponsored by the USDA Forest Service, the US Department of the Interior and the National Association of State Foresters.

Action 19 – Improve Fire Fighting Capability

- a) Review Aid Agreements – High priority. Ensure that aid agreements between the Fire Districts and necessary entities are adequate to support the needs of Charlestown in time of fire/disaster.

Responsible Party: Emergency Management Director

In Coordination With: Hazard Mitigation Committee, Fire Districts, Department of Environmental Management, U.S. Fish and Wildlife

Benefit: Improved Coordination/Response During a Fire

Actions since 2005: Completed - The Chief from the Charlestown Fire District stated that all mutual aid agreements are automatically renewed or that mutual aid is also provided by request per instance in writing. The mutual aid agreements are open-ended with no expiration date and are held within certain fire districts within Southern RI exclusively. Charlestown participates in the Southern New England Fire Emergency Assistance Plan which is a Rhode Island specific mutual aid response system.

Section 4.2 – Strategy Adoption

The Town's 2005 Natural Hazard Mitigation Plan was approved for adoption by the Charlestown Natural Hazard Mitigation Committee on September 22, 2004 and the Town Council on April 11, 2005. A quorum of the Charlestown Natural Hazard Mitigation Committee met on June 19, 2014 to review and finalize the 2014 Charlestown Hazard Mitigation update so that it could be approved by the state. The next step will be to gain the approval of the State Hazard Mitigation Committee (SHMC), the executive director of the RIEMA, FEMA Region I and then be adopted by the Charlestown Town Council.

Section 4.3- Evaluation and Revision of Strategy

In order to establish the authority and accountability for implementation, Charlestown incorporated this Plan into the Comprehensive Plan as appropriate to address the theme of natural hazard mitigation. The second step was to review Actions (see Section 4.1) previously identified that enable preventative or protective measures to be accomplished by mitigating vulnerable areas within each Risk Area. The third step was to prioritize the updated Actions based on criteria that the community established (see Risk Assessment Matrix) and by using the STAPLEE method outlined by FEMA. The criteria used to prioritize each Action was based on which area was most vulnerable with regards to public health risks, evacuation and mass care considerations, disruption of essential services and potential economic losses to the Town. Charlestown will now work to secure sufficient resources in order to carry out the remaining recommended actions that need to be addressed.

Priority for each action was also decided by the Committee on the bases of what would create the largest benefit in protecting the community, and that was also financially feasible (i.e. funding sources are available). Therefore, priority for implementing these actions will be given to those projects that can be completed in the shortest amount of time, that have been assigned high priority, protect the most at risk areas and that have funding sources already identified. Priority will then work downward to medium priority and lower priority projects as identified by the Committee.

Section 4.4 - Implementation

The NHMC will meet quarterly (March, June, September and December to coincide with the update of this version of the Plan) to review the various sections of the plan as well as the Mitigation Action Progress Form (see Appendix D). Each quarterly meeting will focus on a specific section of the plan to ensure it is still current as well as any actions submitted for the Mitigation Action Progress Form. The Mitigation Action Progress Form will be maintained by the Emergency Management Director to record the progress of each mitigation action. Each responsible agency will be required to report progress to the Emergency Management Director who will have overall coordination with each department/agency and maintain the documented progress. Any new mitigation actions or hazard areas that are identified through these review sessions will be added to the yearly revision/update of the Plan. In addition, the NHMC will complete a full update of the Plan every 5 years. All updates or revisions to the Plan will be submitted to RIEMA upon local approval to insure the State Hazard Mitigation Strategy also remains current.

Section 4.5 – Continued Public Involvement

Once the plan is completed and approved it will be posted to the Town's website and there will be a section available for the public to comment, especially following natural disasters that impact the Town. The Town also plans to fortify efforts to increase public outreach by creating a survey to be randomly sent to residents to ask for their input on the plan. Furthermore, additional data collection methods will be explored to gain public input, such as interview or assessments following real events that impact the Town that targets residents and business people directly affected. In addition, the public will be invited to attend each revision meeting that is held and their input will be included in further updates as well. The public education and outreach actions throughout this Plan will also provide further opportunities for the public to be further involved in future mitigation actions that are planned for the Town.

REFERENCES

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- State and Local Mitigation Planning How-To Guides. FEMA. FEMA 386-2, August 2001. FEMA 386-3, April 2003. FEMA 386-4, April 2003.
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- Town of Charlestown Floodplain Ordinance: Amending Ch. 117, Flood Damage Protection, Ordinance No. 358, Adopted September 9, 2013, in effect, October 16, 2013

Town of Charlestown Zoning Ordinances: Flood Zone Overlay, Barrier Beach, Erosion & Sediment Control; Landscaping Ordinance; Flood Hazard Boundaries

Tyrell, T.J. 1989. Economic Impacts of Sea Level Rise. University of Rhode Island Resource Economics Department.

U.S. Army Corps of Engineers. 1996. Section 206: Floodplain Management Services – Study of Coastal Flooding, Charlestown, Rhode Island.

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APPENDIX A – 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
Steadman 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
Division of Parks and Recreation
2321 Hartford Avenue
Johnston, RI 02919
(401) 222-2635

**Department of Transportation-Design
Section/Bridges**
2 Capitol Hill, Room 231D
Providence, RI 02903
(401) 222-2053

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

Rhode Island Builders Association
The Terry Lane Corporation
Terry Lane
Glocester, 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

Federal Resources

Economic Development Administration
143 North Main Street, Suite 209
Concord, NH 03301
(603) 225-1624

Federal Emergency Management Agency
Mitigation Division
Region I Office
J.W. McCormack POCH, Room 462
Boston, MA 02109
(617) 223-9561

Small Business Administration
360 Rainbow Blvd., South, 3rd Floor
Niagra Falls, NY 14303
(716) 282-4612 or (800) 659-2955

U.S. Army Corps of Engineers
New England District
424 Trapelo Road
Waltham, MA 02254
(617) 647-8505

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

U.S. Fish and Wildlife Service
New England Field Office
22 Bridge Street, Unit #1
Concord, NH 03301-4986

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**
Comm. Development Block Grants
Region I-O'Neill Federal Building
10 Causeway Street
Boston, MA 02222
(617) 656-5354

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

**U.S. Environmental Protection
Agency – Region I**
JFK Federal Building
Government Center
Boston, MA 02203
(617) 565-3400

Other Resources

The Association of State Floodplain Managers (ASFPM)

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.

Floodplain Management Resources Center

Free library and referral service of the ASFPM for floodplain management publication. Co-located with the Natural Hazards Center at the University of Colorado in Boulder, staff can use keywords to identify useful publications from the more than 900 flood-related documents in the library.

Institute for Business and Home Safety (IBHS) (formerly Insurance Institute for Property Loss Reduction)

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: flood, windstorm, hail, earthquake and wildfire. 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.

Volunteer Organizations

Organization, 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 organization, 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.

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, one or more local churches or an ad hoc committee. No government disaster declaration is needed. Local officials should recommend that the funds be held until an applicant exhausts all sources of public disaster assistance. Doing so allows the funds to be used for mitigation and other projects that cannot be funded elsewhere.

New England States Emergency Consortium (NESEC) – Lakeside Office Park

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. NESEC maintains a world wide web home page that is accessible at <http://www.serve.com/NESEC>.

The New England Floodplain and Stormwater Managers Association (NEFSMA)
Professional organization for New England floodplain and stormwater managers. Provides workshops, conferences and a newsletter to membership and interested individuals and companies. NEFSMA home page is accessible at <http://www.seacoast.com/~nefsma>.

APPENDIX B – Existing Protection Systems – State and Federal

State

Earthquakes and Hurricanes:

A certain amount of funding is allotted to each state per year based on a risk formula for earthquakes. Coastal states are allocated funds based on a risk formula for hurricanes. Each state receiving such funds has the ability to grant project funds to a community. There is not a match requirement on the part of the community, but the funds are limited and are generally only available once a year. The projects or products proposed for such funding must demonstrate that earthquake or hurricane risk will be reduced or eliminated and that the proposed projects or product is a cost-effective measure (a stringent cost/benefit analysis need not be performed). Information about the amount of funding available per year and the state requirements for eligibility and performance may be obtained from the RIEMA at (401) 946-9996.

Economic/Community Development

There may be programs existing to help flood proof homes using Community Development Block Grant funds. There may be housing assistance programs in the community that can be used following a major flood, achieving both the objectives of reducing flood damage and improving the community's housing stock (see Appendix A, "Federal Resources", for more information).

Evacuation Plans and Systems

The community's emergency operations center should have evacuation plans in place. For communities near a nuclear power plant, evacuation plans are required and may also be used for flood evacuation. The RIEMA may have additional evacuation plan information.

Land Use Restrictions

There are several federal and state regulations that serve to restrict land use in certain areas that may help reduce flood hazard vulnerability. If the community has open land owned by the state or federal government, examine what restrictions are placed on its development. In addition, the state Wetlands Protection Act regulates the development of all lands identified as significant to the protection of resources identified in the act.

Septic Systems

If there are areas in the community not served by a public sewer system, state septic system regulation influence development and may be a consideration for mitigation alternatives that include rebuilding and elevation of structures. Specific design requirements must be met for any construction in coastal velocity zones or river floodways. Generally, an inspection of a septic system is required if there is a change in use of the structure, an increase in flow or failed system. Limited inspections are required if the footprint of the structure is being changed. Upgrades are required by the state if an inspection reveals a failed system. However, local regulations may be more restrictive than state requirements, requiring inspections or upgrades in other cases.

State Barrier Beaches

The community may have barrier beaches, as defined by the state's R.I. Coastal Resources Management Program. The regulations applying to these areas are enforced by CRMC. These regulations restrict alteration of the beach and/or dunes and the construction of coastal engineering structures. New or substantially reconstructed buildings generally must be elevated to a minimum of 1 foot above base flood elevation. No new commercial development is allowed on barrier beaches. If a structure is damaged more than 50 percent, it cannot be rebuilt.

Warning Systems and Emergency Operations Plans:

The community may have a flood warning system in place and should have a plan for response to flooding.

Federal

Coastal Barrier Resource Act

Administered by the U.S. Fish and Wildlife Service, the program has mapped public and private land identified as undeveloped coastal barrier areas. These areas may be denoted as "Otherwise Protected Areas" if they are owned by public entities. In the coastal barrier areas shown on FEMA's flood insurance rate maps, structures newly built or substantially improved after the date shown on the maps are ineligible for federal flood insurance. This serves to restrict new development in these areas because the purchase of flood insurance is required to obtain federal-backed mortgages and improvement loans for structures located in special flood hazard areas.

Community Rating System (CRS)

A voluntary initiative of the NFIP, the CRS was developed to encourage communities to perform activities that exceed the minimum NFIP floodplain management standards. If a community participating in the CRS performs activities that include maintaining records for floodplain development, publicizing the flood hazard, improving flood data and conducting floodplain management planning, then the flood insurance premiums paid by policy holders in the community will be reduced by 5 to 45 percent. Developing a flood mitigation plan will help communities gain additional credit under the CRS.

Hazard Mitigation Grant Program

Also known as the 404 Program or HMGP, this program is available only after a federally declared disaster occurs. It represents an additional 15 percent of all the infrastructure and individual assistance funds that are provided to states to repair damages and recover from losses and is administered by the state in partnership with FEMA. Having a plan or completed mitigation action matrix prior to a disaster event is required by FEMA and is extremely helpful in meeting the states' deadlines for applications and ensuring the project is eligible and technically feasible. It provides 75/25 matching grants on a competitive basis to state, local and tribal governments, as well as to certain nonprofit organization that can be matched by either cash or in-kind services. The grants are specifically directed toward reducing future hazard losses and can be used for projects protecting property and resources against the damaging effects of floods, earthquakes,

wind and other hazards. Specific activities encouraged under the HMGP include acquiring damaged structures to turn the land over to the community for open space or recreations use, relocating damaged or damage-prone structures out of the hazard area and retrofitting properties to resist the damaging effects of disasters. Retrofitting can include wet- or dry-flood proofing, elevation of the structure above flood level, elevation of utilities or proper anchoring of the structure.

Two programs that have been authorized under the National Flood Insurance Reform Act of 1994 include the Flood Mitigation Assistance (FMA) program and a provision for increased cost of compliance (ICC) coverage. FMA makes grants available on a pre-disaster basis for flood mitigation planning and activities, including acquisition, relocation and retrofitting of structures. FMA grants for mitigation projects will be available only to those communities with approved hazard mitigation plans. ICC coverage has recently been implemented for all new NFIP policies and renewals and is intended to be “mitigation insurance” to allow homeowners whose structures have been repeatedly or substantially damaged to cover the cost of elevation and design requirements for rebuilding with their flood insurance claim up to a maximum of \$15,000. A certain amount of funding is allotted to each state per year based on a risk formula for floods. Each state has the discretion to award funds to communities or to state government agencies. States may use whatever criteria or method they choose to award the funds as long as the applicant and the proposal are eligible. The program may fund up to 75 percent of the total cost of the proposed project, with a minimum of 25 percent of the cost coming from the community. A minimum of half the community share must be cash or “hard match”. Funds can also be granted to communities to help them prepare local flood mitigation plans. The same match requirements apply. Once a community receives a planning grant, however, it is not eligible to receive additional planning grants for another five years. For further information on the FMA program or ICC coverage, contact the RIEMA at (401) 946-9996.

National Flood Insurance Program (NFIP)

All of Rhode Island’s 39 municipalities participate in the NFIP. This program is a direct agreement between the federal government and the local community that flood insurance will be made available to residents in exchange for community compliance with minimum floodplain management regulations. Communities participating in the NFIP must:

- Adopt the flood insurance rate maps as an overlay regulatory district
- Require that all new construction or substantial improvement to existing structures in the flood hazard area be elevated or (if nonresidential) flood proofed to the identified flood level on the maps
- Require design techniques to minimize flood damage for structures being build in high hazard areas, such as floodways or velocity zones

In return for community adoption of these standards, any structure in that community is eligible for protection by flood insurance, which covers property owners from losses due to inundation from surface water of any source. Coverage for land subsidence, sewer backup and water seepage is also available subject to the conditions outlined in the NFIP standard policy (see Appendix A, “Federal Resources”, for contacts regarding insurance

coverage and purchase). Since homeowners insurance does not cover flooding, a community's participation in the NFIP is vital to protecting property in the floodplain as well as being essential to ensure that federally backed mortgages and loans can be used to finance flood prone property.

APPENDIX C – Meeting Notes, Public Information and Outreach

Notes from NHMC January 20, 2011 Kick-off Meeting

- This is the second meeting (is info available from first meeting for documentation) regarding the update of the current plan. An RFP went out after the first meeting, but no one responded. After that, that is when Kevin tracked the prior consultant down.
- Ashley (?) spoke to Michelle at RIEMA regarding the public involvement components....results
 - They can have public meetings to try to get input, then another for the final
 - The Town will use an internal process and must obtain a quorum
 - Andy will send consultant prior meeting minutes (which he already has)
 - Televised meetings are also an option
 - Not mentioned at meeting, but I thought of later...you can also use your website to try to obtain input. Perhaps if you put an ad in a local paper that the Town is updating the plan and that it is available for residents to view on the website, then provide a way for them to comment as well, perhaps through a designated email (this will help with documentation). We should also be able to tell how many hits the site received to show resident involvement.

General comments from various participants

- New flooding in areas that never flooded before
- Low areas flooded as a result of water coming from higher locations
- Basements flooded that never did before and affected oil tanks that were on the ground
- Rt 2 has normal flooding, but not major problems – repetitive flooding of properties that needs to be addressed
- Some bridges had to be closed due to March 2010 floods
- Contaminated drinking water can be a major problem since all properties are on well water
- New flood maps have been developed, ramping up flood planning
- Fire trails still an issue
- Lots of protected open space
- Lots of public buildings being hit by lightning as of late
- Nor'easters were taken out of the last plan, but need to be put back into this one
- Sea level rise is a concern, the acting Town Planner has data available for the consultant
 - 4 or 5 properties will be affected by this
- House on Driftwood Drive has flooded 3 times – insurance was never maintained so finger pointing is going on as to who is responsible for the property and associated damage.
- Charlestown Beach has 1 home with issues for the future (not sure what this means)
- Some storms are replenishing the beach (those from the north/northeast) by bringing more sand....southern storms take the sand away
- Dredge project being looked at so that too will help replenish the beach

- Flooding at Kenyon Mills – chemicals that could contaminate wells
 - Moved chemicals prior to March 2010 storms, but what if no notice
- Bradford had stuff damaged/ tanks moved, but building is abandoned
- Post Rd at South Kingstown line to Crossmill – DOT is redoing the drainage
- Jackson's (a business) someone said "they may as well put fish in it"...but I don't know why or what they were referring to
- Ocean ridge has property regularly flooded
 - Looks like something has been done, but still an issue
- Dams being moved
 - Need to evaluate if other area are being placed into a hazard zone now

Other various assignments and take aways

- Kevin will look for old crosswalk from FEMA from when the current plan was approved (Mary looked for it in Planning but couldn't find it. I suggested checking with you or John to see if you had a copy and if not then with Michelle at RIEMA since they would have received a copy as well)
- Kevin will look for other crosswalk information he may have from RIEMA
- Other Plans Kevin will try to get to consultant for review
 - South Kingstown Plan – still in effect
 - Richmond just finished theirs – but not yet approved
 - Bristol 2010 plan approved (I actually have a copy of this)

What I (Roberta) am working on at this point is going through the plan section by section and will add information regarding what needs to be placed there for the update as well as the potential department within the town were the information will come from. I am also updating the hazard event information through the national climate data database.

Charlestown Hazard Mitigation Planning Committee
Charlestown Town Hall – Council Chambers
Tuesday, November 26
9:00am – 11:00am

Attendees: Charlestown Fire District Chief Donald Rathbone (ex-officio), Police Chief Jeff Allen, Public Works Director Alan Arsenault, GIS Specialist Steve McCandless, Environmental Scientist Matt Dowling, Harbormaster Justin Vail, Town Administrator Mark Stankiewicz, Town Treasurer Patricia Anderson, Emergency Management Director Kevin Gallup, Acting Town Planner Jane Weidman and Dorian Boardman. On the committee but not present Building/Zoning Official Joe Warner, Dunn's Corners District Chief Michael Fink (ex-officio)

K. Gallup began the meeting with a timeline on the last four disasters to affect Charlestown:

- 2010 The Great RI Flood of 2010
- 2011 Tropical Irene; FEMA added a crosswalk checklist requirement (August 20, 2011 – August 28, 2011)
- 2012 Hurricane Sandy (October 22, 2012 – October 31, 2012)
- 2013 Superstorm NEMO information needs to be added against the latest FEMA template (February 7, 2013 - February 20, 2013)

K. Gallup told the committee that the Charlestown Hazard Mitigation Plan is an all hazard type of plan for natural disasters. The State of RI is currently updating their Statewide Hazard Mitigation Plan. Once submitted, Charlestown's hazard mitigation plan update is on the top of the pile to be approved by the State.

Additionally, J. Warner Building/Zoning Official Charlestown would like to get into the FEMA Community Rating System program, whereby citizens in the flood zone can apply for a coastal insurance reduction. The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: reduce flood damage to insurable property; strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management.

There are more changes anticipated in the NFIP. In July 2012, the U.S. Congress passed the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12) which calls on the Federal Emergency Management Agency (FEMA), and other agencies, to make a number of changes to the way the National Flood Insurance Program (NFIP) is run. Some of these changes already have occurred, and others will be implemented in the coming months. Key provisions of the legislation will require the NFIP to raise rates to reflect true flood risk, make the program more financially stable, and change how Flood

Insurance Rate Map (FIRM) updates impact policyholders. The changes will mean premium rate increases for some—but not all—policyholders over time. m

In prior a Charlestown administration, former administrator William DiLibero decided to bring in Matt Dowling to work manmade disasters into the Charlestown Hazard Mitigation Plan. FEMA did not like having manmade elements in hazard mitigation plans and so manmade disasters are now covered under the local comprehensive plan instead (Charlestown's comprehensive plan update is ongoing (10 year update) through CDR Maguire).

K. Gallup reviewed the current committee members list and the benefit/talent each member brings to the table. K. Gallup discussed that the new updates to the hazard mitigation plan will be weather updates and to check the information against the latest FEMA checklist (crosswalk). Without an approved hazard mitigation plan, Charlestown cannot be accepted into the National Flood Insurance Program's (NFIP) Community Rating System (CRS).

A. Arsenault asked if K. Gallup and D. Boardman can put together a department section checklist to update the hazard mitigation plan. K. Gallup asked A. Arsenault to include a list of roads, culverts, and any other transportation infrastructure that is flood prone in a natural disaster and may need to be repaired after an event. If these items are added into the hazard mitigation plan prior to another natural event, then they will be covered.

J. Vail asked D. Boardman if she can put together a checklist for the Harbormaster items. K. Gallup said that for the majority of the updates, the harbormaster will be reviewing the document and adding comments before final submittal.

First Committee Deadline: January 31, 2014 Hazard Mitigation Plan update is due.

Second Committee Due Date: March/April 2014 for FEMA Approval NFIP CRS program

The State of RI (and FEMA) extended the hazard mitigation grant for one year until September 2014. K. Gallup has two goals for the hazard mitigation plan update: 1. If Charlestown does not update and misses the deadlines, then it is possible that Charlestown would have to give back disaster funds for 2010 Flooding, Irene, Sandy and NEMO. 2. An approved hazard mitigation plan will allow Charlestown to apply for the NFIP CRS (driving force to update the hazard mitigation plan).

Roberta Crawford has been the consultant in the past for the Charlestown Hazard Mitigation Plan. She has added in information for the 2010 Flooding and for Irene. Sandy and NEMO information needs to be added to the plan. Roberta is traveling in Puerto Rico and may not be available for these current deadlines. K. Gallup wants to complete a hazard mitigation plan update submitted to RIEMA by January 31, 2014 and have one (preferably three) public meetings to meet FEMA requirements.

K. Gallup has gotten Ken to put an email address on the Charlestown town website that will accept comments from the public on any one of the four past natural disasters.

Former Town Planner Ashley Hahn Morris put language into the current hazard mitigation grant that Charlestown will have a URI professor and two interns conduct a beach survey and housing standard study – covered by 40% of the grant. M. Stankiewicz and P. Anderson said that the current hazard mitigation plan update timeframe/deadline is not conducive to conducting this study at this time and should be removed from the grant requirement.

J. Veil asked what information on the coastal ponds and as harbormaster he would need to update. K. Gallup stated that debris removal for houses and gas tanks could be added as part of the plan for the Harbormaster.

Matt said he could help with small writing sections/updates of the plan.

Steve said he would update the GIS maps by next week (week of December 2nd)

K. Gallup asked A. Arsenault what highway improvements on evacuation routes could be added to the update. A. Arsenault said gravel portions of Charlestown Beach Road could be added (incremental process to improve). These roads and infrastructure improvements should be added into hazard mitigation plan update to have the reimbursement power if the town needs it.

Joseph L. Warner Jr.
Deputy Official
Zoning Official
Assistant Planning Supervisor



TOWN OF CHARLESTOWN

4540 South County Trail
Charlestown, RI 02813

Tel: (401) 364-1215
Fax: (401) 364-1234
Hearing/Speech Impaired,
Dial 711-564-1210

June 1, 2014

RE: National Flood Insurance Program Community Rating System

Dear Property Owner:

You have received this letter because your property is located in an area in which historical evidence indicates there have been repetitive insurance claims as a result of flooding. This letter is part of an annual outreach project as required by the Federal Emergency Management Agency (FEMA) to qualify for the National Flood Insurance Program Community Rating System (CRS).

The Town of Charlestown is currently in the application process with FEMA to participate in the CRS program, a voluntary program for recognizing and encouraging community floodplain management activities exceeding the minimum National Flood Insurance Program (NFIP) standards. Upon completion of the application process and acceptance into the program, all residents in the Town of Charlestown will receive discounts on their Flood Insurance Premiums.

As you may already be aware, recent and upcoming changes to the National Flood Insurance Policy, specifically the "Biggert-Waters Flood Insurance Reform Act of 2012" (BW12), had a significant impact on flood insurance policies. The BW12 Act, passed by Congress in 2012, has implemented flood insurance premium rate increases, with a long-term objective of making the NFIP more sustainable and financially stable. Due to the large public outcry, the "Homeowners Flood Insurance Affordability Act" was implemented to repeal and modify portions of the BW12 Act; however many of the provisions of the Act remain and are still being implemented.

The Town is working hard to reduce your premiums through the CRS program; however there are steps you can take as well:

Get a Flood Insurance Policy

- Homeowner's insurance policies do not cover damage from floods. However, because our community participates in the National Flood Insurance Program, you can purchase a separate flood insurance policy. This insurance is backed by the Federal Government and is available to everyone, even properties that have been flooded.
- A flood insurance policy will help pay for repairs after a flood and, in some cases it will help pay the costs of evacuating a substantially damaged building.
- Don't wait until the next flood to buy insurance protection. In most cases there is a 30-day waiting period before National Flood Insurance Program coverage takes effect.
- Renters should also consider buying a flood insurance policy for their contents.
- Be sure to photograph your home's contents and put important papers and insurance policies in a safe place.

In accordance with Federal law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, or disability. (Not all prohibited bases apply to all programs.) For more information, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice), or (202) 720-6382 (TDD). This institution does not discriminate on the basis of sex in its education programs and activities.

Bus Trip

Saturday, July 10th
 Fenway Park -- Boston vs Chicago White Sox
 Depart: 1:30 pm - Charlestown Town Hall
 4:05 pm game
 Leave Fenway for Charlestown immediately after game
 Cost: \$75 includes coach transportation and ticket

Fitness Classes

Zumba: Monday Evenings 5:30-6:30pm
 Pilates & Strength Conditioning - Tues/Thurs-5:30-6:30pm
 Tai Chi: Monday Mornings- 10:30am
 Yoga: Monday Evenings: 6:45pm
 Tuesday Mornings 8:30 am
 Thursday Mornings: 9:00am
 Saturday Mornings: 8:30am
 All classes are \$5/class no pre-registration necessary
 Held at the Community/Senior Center in Ninigret Park

Yoga on the Beach

July 9th - August 20th
 Wednesdays, 6:00 - 7:15pm
 Charlestown Town Beach
 \$10/class



Free Disposal of Electronic Waste

Electronic waste can be disposed of for free at the Charlestown Residential Collection Center. This disposal program is open to all state residents, and is available without the purchase of a CRCC sticker. Examples of items that can be disposed of are computers, computer monitors, televisions, printers, keyboards, mice, adapters, stereos, speakers, VCR's, scanners, fax machines, copiers, telephones, computer drives, storage devices, circuit boards, laptop batteries, and related computer and electronic equipment. The Charlestown Residential Collection Center is open Mon, Thurs, Fri and Sat from 8am until 4pm. Please call (401) 364-1230 with related questions.



See the **LAST PAGE** of this newsletter for helpful RI recycling information website.

Because You Need To Be Sure!

Get the facts about well water safety.



Free workshop for private well owners

Protect yourself, your family, your property and your investment.

Learn:

- The importance of regular testing
- How to protect your well water from pollution
- Proper well maintenance

Tuesday, June 24, 2014 7:00—8:00 p.m.

Where?

Charho Middle School Cafeteria
 455B Switch Road Wood River Junction, RI

Hosted in partnership with the
 Charlestown Conservation Commission

To register call URI at 401-74-4910

Space is limited; pre-registration is required.

See www.rowelltesting.org for more information on private well protection.



Boulder and Rock Removal at Breachway



The above photo shows the start of the Boulder and Rock Removal Project conducted in the Charlestown Breachway by the RI Coastal Management Council (CRMC) and the Town of Charlestown. This project was initiated due to the damage sustained to the Breachway during Super Storm Sandy. The project consisted of two parts: 1) removal of rocks that were transported from the east breachway wall during Sandy as well as rocks that have historically been known to be an issue to navigation. 2) dredging of the sandbar that was established just outside of the breachway during Sandy and was found to be a severe hindrance to navigation. The project was completed as of May 9th 2014 and was a great success. Thanks to all that were involved.

Stephen J. McCandless
 Charlestown GIS Coordinator

Flood Insurance and What You Should Know!

The Town of Charlestown is currently in the application process with the Federal Emergency Management Agency (FEMA) to participate in the Community Rating System (CRS) program, a voluntary program for recognizing and encouraging community floodplain management activities exceeding the minimum National Flood Insurance Program (NFIP) standards. Upon completion of the application process and acceptance into the program, all residents in the Town of Charlestown will receive discounts on their Flood Insurance Premiums.

As you may already be aware, recent and upcoming changes to the National Flood Insurance Policy, specifically the "Biggest Waters Flood Insurance Reform Act of 2012" (BW12), has had a significant impact on flood insurance policies. The BW12 Act, passed by Congress in 2012, has implemented flood insurance premium rate increases, with a long term objective of making the NFIP more sustainable and financially stable. Due to the large public outcry, the "Homeowners Flood Insurance Affordability Act" was implemented to repeal and modify portions of the BW12 Act; however many of the provisions of the Act remain and are still being implemented.

The Town is working hard to reduce your premiums through the CRS program; however there are steps you can take as well.

Get a Flood Insurance Policy

- Homeowner's insurance policies do not cover damage from floods. However, because our community participates in the National Flood Insurance Program, you can purchase a separate flood insurance policy. This insurance is backed by the Federal Government and is available to everyone, even properties that have been flooded.
- A flood insurance policy will help pay for repairs after a flood and, in some cases, it will help pay the costs of elevating a substantially damaged building.
- Don't wait until the next flood to buy insurance protection. In most cases there is a 30 day waiting period before NFIP coverage takes effect.
- Renters should also consider buying a flood insurance policy for their contents.
- Be sure to photograph your home's contents and put important papers and insurance policies in a safe place.

If you already have a flood insurance policy

- Verify your Flood Zone – with recent updates to the Flood Insurance Rate Maps (FIRM's), your home may be located in a different zone from what your insurance company has on file.
- Obtain an Elevation Certificate for your dwelling and verify your insurance company has based the premium on your dwelling's true height. (Note: Should you already have an Elevation Certificate or should you obtain one, please submit a copy to the Building Department for our records. Retaining copies of all Elevation Certificates is a requirement of the CRS program.)
- Higher deductibles may also reduce your premium.

Consider some permanent flood protection measures

- Proper grading around the exterior of your home should drain water away from the foundation.
- Install gutters and downspouts and verify proper drainage away from the foundation.
- Incorporate Flood Mitigation into your remodeling projects such as elevating your mechanical and electrical equipment.
- Some properties may be mitigated by installing flood vents and/or filling in basement/crawlspace areas that are below grade on all sides.
- Elevate your dwelling above the Base Flood Elevation (BFE). Drastic discounts may be achieved for each foot of elevation above the Base Flood. Note: The RI State Building Code requires a minimum of one foot of freeboard above the BFE (lowest floor at BFE plus 1 foot).
- Before you build, obtain the proper Building Permits and do it right the first time.

- You may look up your property's Flood Zone Information on the Town's website at
- <http://www.charlestown.org> (see GIS link symbol below); additional information is also available under the Building/Zoning Department or at <http://www.townofchar.org/floods>.



Additional flood protection measures with no cost

- Keep debris and trash out of streams, ditches and storm drains.
- Report missing or damaged silt fence; they help keep our streams clean.
- Sign up with the Town for "Coxie Red" an emergency messaging system and "Constant Contact" to stay informed.
- Elevate your belongings from the basement floor
- During heavy rains check the current river status (flood gauge) at <http://water.weather.gov/ahps>.

You may want to contact your insurance agent to discuss your policy and options. Additionally, I would encourage you to visit FEMA's webpage at <http://www.fema.gov/hazard-mitigation-assistance> to learn more about programs the Town may be able to participate in for financial assistance, pending funding under FEMA's Hazard Mitigation Assistance Program. Feel free to contact me at (401)364-1215 or by email - warner@charlestown.org should you have any questions pertaining to mitigation measures for your property.

Joseph L. Warner, Jr., CBO, CFM
 Building/Zoning Official
 Floodplain Manager

Boundary Questions and Answers

*Where does my property end?
 Don't I own all the way up to the pavement?*

Many residents are uncertain in regard to their boundary at the street front. Many homeowners presume that they own and control the property from their home to the pavement. **IN ALMOST ALL CASES THE FRONT BOUNDARY OF YOUR PROPERTY IS NOT THE ROAD PAVEMENT!** In most areas Town property known as the "shoulder" is situated between your home and the pavement. The road shoulder may be grass, or natural un-improved woodland and brush. The shoulder may vary from twelve (12) feet in newer subdivisions to thirty (30) feet or just one foot or less along the original colonial roads in the community. It is important to know your boundaries before planting trees, shrubs, fences or other improvements. The shoulders are very important to the Town as they provide space to dodge traffic, infiltration of stormwater, and storage for snow in the winter. To determine your true boundary, we recommend a survey by a surveyor licensed in the State of R.I.

The DPW is not responsible for damage to items placed within the Town owned right-of-way by residents, i.e. landscaping, fences, timbers, etc.

Adoptable Pets

Charlestown Animal Shelter
 Call ahead, 364-1211
 M-F 8:30 AM - 4:00 PM, Saturday 8:00 AM to Noon





Wood-Pawcatuck Watershed Association

203 Arcadia Road, Hope Valley, RI 02852

401-539-9017 www.wpwa.org

Adapting the Watershed

June 26, July 10 and July 24

WPWA is presenting "Adapting the Watershed" lecture series which is being co-sponsored by the [University of Rhode Island's Coastal Institute](http://www.uri.edu). The lectures will address how communities, organizations, and residents within the Wood-Pawcatuck watershed can adapt to the changes that may be experienced as a result of climate change. Rhode Island towns in the watershed are West Greenwich, Exeter, South Kingstown, Charlestown, Westerly, Hopkinton and Richmond. Connecticut towns in the watershed are Stonington, N. Stonington, Voluntown and Sterling.

These proactive and informative talks will take a watershed approach, to how we can prepare for and adapt to challenges that lie before us. The lectures are free and open to the public; all attendees will receive a free 12-month membership to WPWA.

Where:

Charito Middle School Auditorium, 455D Switch Road, Wood River Junction, RI 02894

When:

All talks will be held from 6:30-8:30pm, doors open at 6pm

Thursday, June 26

Storms and Floods: Are They the New Normal?

David R. Vallee, NOAA, NERFC Hydrologist in Charge

Michelle Burnett, RI Emergency Management Agency, RI State Floodplain Coordinator

Thursday, July 10

Water: Will There Be Enough ... or Too Much?

Tom Boying, URI, Professor of Geosciences/Civil and Environmental Engineering, WPWA Trustee

Alyson McCann, URI, Water Quality Program Coordinator

Thursday, July 24

Conserving Tomorrow's Plants and Animals ... Today!

Peter August, Professor, URI Department of Natural Resources Science, WPWA Trustee

Gary Cosabona, USDA NRCS, State Biologist

Contact:

Chris Fox 401-539-9017

chris@wpwa.org

Additional Resources:

-Adapting to Climate Change in the Ocean State -

http://www.c-acc.ri.gov/climatechange/RICCC_2012_Progress_Report.pdf

-RI's Climate Challenge - <http://www.ri-climatechange.org/>

-National Climate Assessment: [Home nca2014.globalchange.gov/](http://www.nca2014.globalchange.gov/)

-IPCC Fifth Assessment Report - <http://www.ipcc.ch/report/ar5/index.shtml>

To Protect and Preserve the Lands & Waters of the Wood-Pawcatuck Watershed

APPENDIX E – Supporting Documents (Resolutions; STAPLEE Matrix; Lighting article; CAV letter from FEMA)

STAPLEE METHOD MATRIX

Action No.	Mitigation Action	Staplee Method Matrix								TOTAL	Additional Comments (i.e. Action Completed, Action no longer needed, etc.)
		Social	Technical	Administrative	Political	Legal	Economic	Environmental			
	Incorporate Hazard Mitigation into Project Review										
1a	Create GIS Database That Is Specific For Christstown	3	3	3	3	3	3	3	3	21	Complete
1b	Reforce Floodplain, Building And Zoning Regulations	3	3	3	3	3	3	3	3	21	Complete
	Develop and Implement Public Education, Outreach and Incentives										
2a	Investigate Pre- & Post-Financial Incentives For Mitigation	2	2	1	3	2	2	3	3	15	
2b	Distribute Information On The Location Of Hazard-Prone Areas	3	3	3	3	3	3	3	3	21	Complete
2c	Develop Public/Private Partnerships To Create Financial Incentives	1	1	1	2	1	1	3	3	10	
2d	Provide Information On ISDS Upgrade Options	3	3	3	3	3	3	3	3	21	
2e	Provide Training Programs	2	3	1	2	2	1	3	3	13	
2f	Develop A List Of Appropriate Techniques For Homeowners	3	3	3	3	3	3	3	3	21	Complete
	Determine Post-Disaster Mitigation Opportunities										
3a	Implement Structural and Non-Structural Retrofit Programs	3	3	3	3	3	3	3	3	21	Complete
3c	Document Areas Of Disturbance And Risk Post-Disaster	3	3	3	3	3	3	3	3	21	Complete
	Develop a Shoreline Overlay										
4a	Develop A Hazard Zoning Overlay	3	3	3	3	3	3	3	3	21	Complete
	Acquire Lands In Hazard-Prone Regions of the Community										
5a	Establish A Revenue Source To Purchase Hazard-Prone Property	1	2	1	1	1	1	2	3	9	
5b	Acquire Vulnerable Properties Subject To Natural Hazard Risk	1	2	1	1	1	1	2	3	9	
	Identify Opportunities For Post-Disaster Open Space Acquisition In A Pre-Disaster Time Frame										
6a	Incorporate Hazard Mitigation into Project Review	2	2	1	2	3	1	3	3	14	
6c	Implementation Of Hazard Mitigation Measures	3	3	3	3	3	3	3	3	21	Complete
	Develop and Implement Public Education, Outreach and Incentives										
7a	Provide Public Education Materials	3	3	3	3	3	3	3	3	21	
7b	Provide Public Education Materials On Hazards And Types Of Mitigation For Homeowners (Including Seasonal Residents and Visitors)	3	3	3	3	3	3	3	3	21	Complete
7c	Provide Workshops For Residents	3	3	2	3	3	1	3	3	18	
	Identify Post-Disaster Mitigation Opportunities										
	Sand Overwash Should Remain In The Position, Where Not Raising In Improbable Roadways And Where Feasible, To Help Build The Barrier										
8d	Enhance Public Beach Facilities and Public Access	2	3	2	2	2	2	3	3	16	
	Improve Public Access Opportunities										
9a	Improve Public Access Opportunities	3	3	3	2	2	2	3	3	18	
9b	Upgrade Public Beach Facilities	3	3	2	2	3	1	3	3	19	
	Enhance Disaster Preparedness										
10a	Develop Post-Storm Recovery Plan For Barrier Beach	3	3	3	3	3	3	3	3	21	
10b	Formulate Mutual Aid Agreement	3	3	3	3	3	3	3	3	21	Complete
10c	Maintain A Disaster Recovery Team	3	3	2	3	3	2	3	3	19	Complete
	Enhance Circulation In Coastal Ponds										
	Evaluate Options To Improve Flow, And Examine The Existing Structural Integrity Of The Existing Jetty										
11a	Improve Navigation Facilities In Christstown Bypassway	3	3	3	3	3	3	3	3	21	Complete
12a	Inspect Shoreline Structures	3	3	3	3	3	3	3	3	21	Complete
12b	Incorporate Hazard Mitigation into Project Review	3	3	3	3	3	3	3	3	21	Complete
13a	Incorporate Best Management Mitigation Practices	3	3	3	3	3	3	3	3	21	Complete
	Develop and Implement Public Education and Outreach										
14a	Evacuation Routes	3	3	3	3	3	3	3	3	21	Complete
	Determine Post-Disaster Mitigation Opportunities										
	Evaluate The Appropriateness Of Replacing Under-Sized Culverts With Adequate Culverts on Buckeye Brook Road, West Beach Road and East Beach Road										
15b	Reevaluate Erosion/Runoff Plan	3	3	2	2	2	3	3	3	18	Removes, not feasible
15d	Incorporate Adequate Drainage Facilities in Design For Road Repair	3	3	3	2	2	3	3	3	19	Complete
	Project Development/Capital Facilities Budget										
16a	Incorporate Mitigation Infrastructure Improvements into Ongoing And New Projects	3	3	3	3	3	3	3	3	21	Complete
	Incorporate Hazard Mitigation into Land Development Review										
17a	Develop Standardized Policies for Risk Area	2	2	2	2	2	3	3	3	16	
	Maintain Adequate Fire Breaks And Access To And Within Forested area										
17b	Subdivision and Land Development Plans To Include Grading Of Easements For Fire Breaks And Installation Of Concrete Water Tanks										
17c	Develop and Implement Public Education and Outreach										
18a	Educate Public About Safe Fire Practices	3	3	3	3	3	3	3	3	21	Complete
	Improve Fire Fighting Capability										
19a	Review Aid Agreements	3	3	3	3	3	3	3	3	21	Complete

U.S. Department of Homeland Security
Region I
99 High Street, 6th Floor
Boston, MA 02110-2320



FEMA

November 19, 2013

Joseph L. Warner Jr.
Building and Zoning Official
Town of Charlestown
4540 South County Trail
Charlestown, RI 02813

Subject: Community Assistance Visit follow-up

Dear Mr. Warner:

This letter is a follow-up to the Community Assistance Visit (CAV) held on November 14, 2013 in the Town of Charlestown, RI. I greatly appreciate you taking time out of your busy schedule to meet with us to discuss Charlestown's administration of its Flood Hazard regulations. I hope the meeting provided a better understanding of the National Flood Insurance Program (NFIP) and the resources that are available to you through the Federal Emergency Management Agency (FEMA) and the Rhode Island Emergency Management Agency (RIEMA).

The November 14th visit included a discussion of Charlestown's Flood Hazard regulations, an assessment of development in the Special Flood Hazard Area (SFHA), a review of the permitting and enforcement processes, and discussion of the Town's Flood Insurance Study and Flood Insurance Rate Map (FIRM).

FEMA conducts CAVs for the purpose of maintaining periodic contact with communities participating in the NFIP in order to assess their need for technical assistance and coordination, as necessary. In addition, the visits provide an opportunity for assessing the effectiveness of local floodplain management ordinances and enforcement practices.

At the meeting we also discussed Charlestown's application to participate in the Community Rating System (CRS). A successful CAV is required before a community can participate in CRS. We are pleased to inform you that we found no issues with the floodplain management program in Charlestown and there is no follow-up required from Charlestown at this time. We have informed ISO, FEMA's CRS contractor, that they may proceed in assisting you with the town's CRS application.

FEMA would like to commend Charlestown for the proactive actions that have been taken to ensure sound floodplain management. Several structures have been elevated above base flood elevation and/or moved back away from the shore. This reflects that you are effectively communicating flood risk and flood insurance implications to your residents.

We'd like to take this opportunity to reemphasize some of the items we discussed during the visit.

Permitting Procedures

We discussed Charlestown's procedures for permitting development in its adopted SFHAs. Specifically, NFIP minimum standards require permits for all development in the SFHA. *Development* is defined as "any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment and materials." Note that this definition does include other activities not associated with structures. We discussed your review procedures for various kinds of non-structural development.

Communities are required to keep as-built documentation on file for all new or substantially improved structures in order to confirm that they have been built with a lowest floor elevation at or above Base Flood Elevation. Charlestown uses Elevation Certificates (ECs) to capture elevation information. Use of Elevation Certificates is required for all communities participating in CRS.

Flood Insurance Study and Flood Insurance Rate Maps

Charlestown's current maps are part of the Washington County maps, which have two effective dates: October 16, 2013 for the coastal panels and October 19, 2010 for the non-coastal panels. You indicated that in general, the new maps accurately reflect flood risk and that there were only a few areas that didn't make sense or were confusing.

Local Ordinances

The Town of Charlestown's floodplain regulations, found in the Town Ordinance under Chapter 117: Flood Damage Prevention, are compliant with NFIP minimum standards. The ordinance was last updated when the new maps became effective.

Flood Insurance

The Town of Charlestown currently has 820 flood insurance policies in force, accounting for \$219,929,000 in coverage. Since the beginning of the program, there have been 189 paid losses totaling \$2,606,728.

Repetitive Loss

During the visit, we discussed the repetitive loss properties in Charlestown. As you know, the number of repetitive loss properties in town will determine what repetitive loss category Charlestown will be in for CRS purposes. Having more than 10 repetitive loss structures would make Charlestown a Category C community, which carries additional requirements for participation in CRS. We discussed how you are working on the AW-501 forms for the properties that have been mitigated. The ISO representative will assist you in determining the number of repetitive loss properties in order to determine what category Charlestown should be classified as.

Grants

As a benefit of participation in the NFIP, Charlestown is eligible to apply for grant funds under FEMA's Hazard Mitigation Assistance (HMA) program. These grants can be used to mitigate floodprone structures. A fact sheet that discusses the types of projects eligible under the HMA program may be found here: <http://www.fema.gov/library/viewRecord.do?id=2648>. For more information on HMA grants, please call Jessica Stimson, the State Hazard Mitigation Officer, of Rhode Island Emergency Management Agency at 401-462-7115 or jessica.r.stimson.nfg@mail.mil.

Training

FEMA offers training opportunities at FEMA's Emergency Management Institute (EMI) facility in Emmitsburg, Maryland, such as *Managing Floodplain Development Through the NFIP* and the *NFIP Community Rating System*. FEMA covers the cost of lodging and travel; the only cost to municipal officials is for a meal ticket. EMI offers many courses related to floodplain management, hazard mitigation and emergency management. It is recommended that local officials involved in floodplain administration attend course E273 "Managing Floodplain Development through the National Flood Insurance Program." For more information please visit EMI's website at: <http://training.fema.gov/index.asp>. To apply for a course please contact Michelle Burnett at RIEMA at 401-462-7048 or michelle.f.burnett.nfg@mail.mil.

Summary

We appreciate your community's continued commitment to the NFIP and managing development in its floodplains. Thank you for taking the time out of your busy schedule to accommodate the visit. We hope that the information discussed during the meeting will be helpful to your community.

FEMA, in conjunction with the RIEMA, provides technical guidance and support to Rhode Island communities regarding floodplain management regulations and requirements. If there is any additional information I can provide regarding floodplain management and the NFIP in general, or the recommendations/information provided for the CAV in particular, please do not hesitate to call me at (617) 956-7618 or contact me via e-mail at: karl.anderson@fema.dhs.gov.

Sincerely,



Kari Anderson
Natural Hazards Specialist
FEMA Region I

cc: Michelle Burnett, State NFIP Coordinator, RIEMA (via email)
Chris Markesich, CRS Coordinator, FEMA Region I (via email)
Julie Grauer, Natural Hazards Specialist, FEMA Region I (via email)
Ivy Frances, Chief, Floodplain Management & Insurance Branch, FEMA Region I (via email)

Charlestown police continue to assess damage caused by lightning strike

By Tim Ryan
The Sun

Charlestown — It's been a long week for Sgt. Patrick Maddison, and not only because of the holidays.

Maddison has been in every day, since the Charlestown Police Station was struck by lightning Dec. 17, damaging the computer system, and phones. He and the rest of the force, along with some outside technical help, have been working to get everything back to normal.

"It's been non-stop," he said. "You get to have a day off."

The damages to the department's equipment have been

estimated at between \$100,000 and \$150,000, although the total numbers will be known until everything is repaired.

The department lost 10 cameras, the closed-circuit television system, five of the six base radios, and the phone lines, Maddison said. The town hall building also lost five computers in the storm.

The phone lines were repaired with nearly non-stop work from Sunday to Tuesday. Despite the difficulty of working with just one phone line for a few days, the department was able to continue service, with help from other departments and the state police.

"The vans were not affected," Maddison said.

Not one car data from the computers lost, though a temporary system has been dis-

abled for members of the force to use because of its slowness. Several computer support people, and some town officials are working to get the computers working again.

The temporary emergency armband has a positive option, said Maddison.

"All the equipment that was damaged will be replaced with new equipment," he said.

Everything should be back to normal by Dec. 30, Mr. Maddison said.

"Nobody wants to be here on New Year's Eve," he said. "We want to be up and running by the end of this week."

The department has been hit by lightning before, said Maddison.

"We've been hit before," he said. "Usually we can recover quickly. It's usually not a problem."

Serving all areas in Southern Rhode Island and Southeastern Connecticut
Westerly, R.I. Thursday, December 28, 2000

