

Community Resilience  
Building Workshop

# WILLIAMSBURG, MA



## SUMMARY OF FINDINGS

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Prepared For:  
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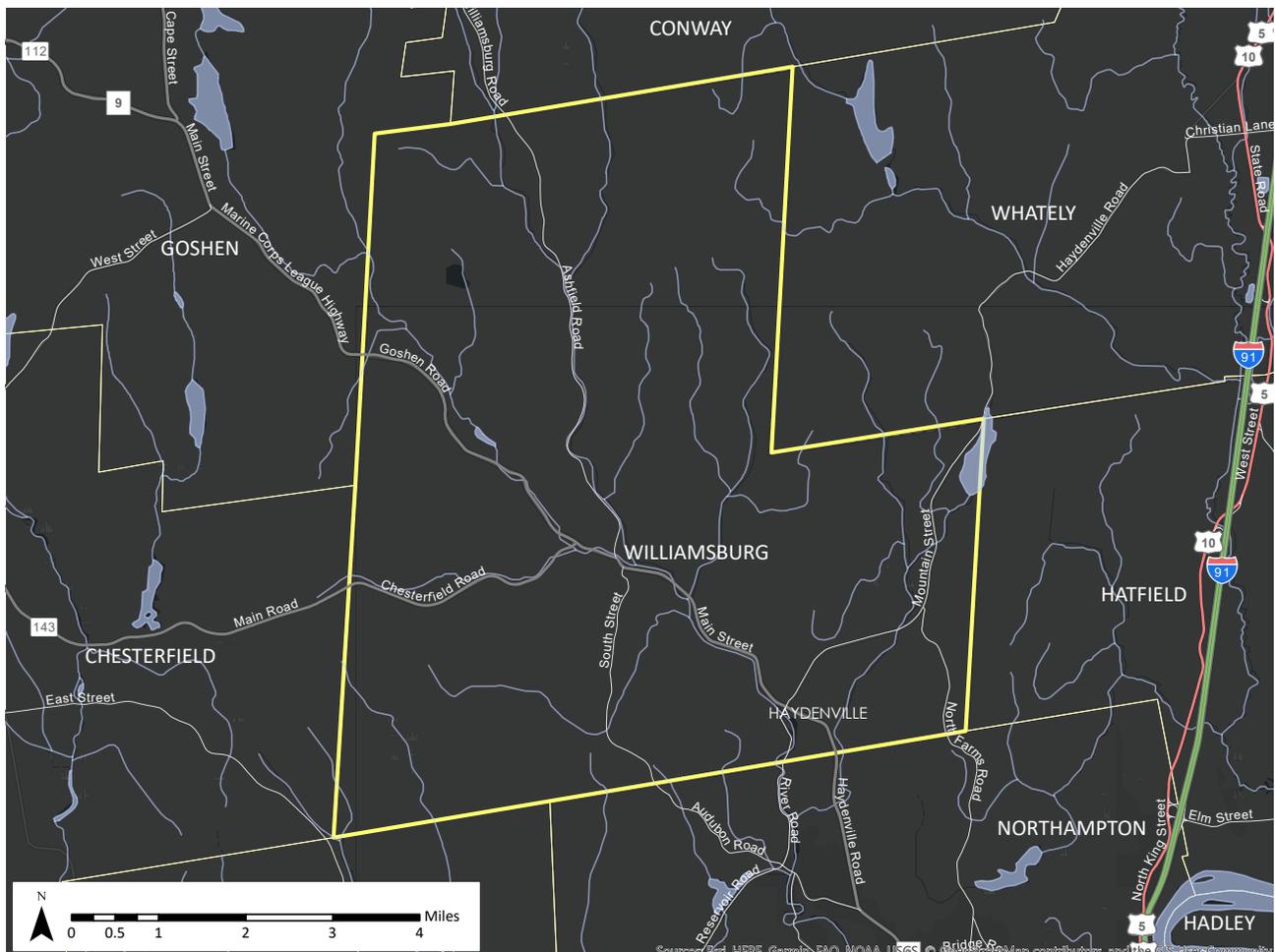


# 1. OVERVIEW

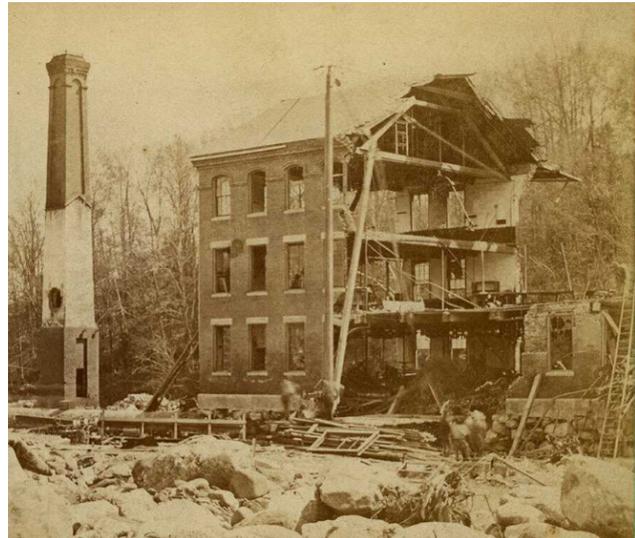
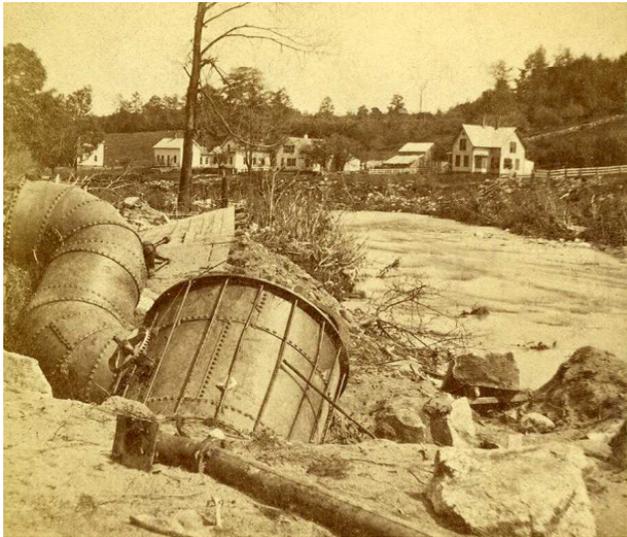
The Mill River is central to the town of Williamsburg’s identity and its greatest recreational asset. It flows through its most developed areas—the Route 9 Corridor—and unites its two villages, Williamsburg and Haydenville. During the Industrial Revolution of the nineteenth century, the river’s narrow channel and steep drop provided a steady stream of hydropower that fueled the growth of bustling industries. The town, which had been characterized by rugged upland homesteads created by pioneering farmers, became a bustling industrial center concentrated in the four riverside villages of Haydenville, Williamsburg, Searsville, and Skinnerville. But the town’s power source ultimately endangered it. In 1874, a poorly-constructed dam burst, causing a massive, calamitous flood that destroyed homes, businesses and mills, and killed 139. It was the United States’ first major dam disaster, and still the second-worst in US history

to this day. That event still looms large in local memory, and had a profound impact on the town’s development. Some mills and houses were quickly rebuilt, but others relocated after the disaster and never returned.

Today, as a changing climate brings hazards like high temperatures, increased potential for drought, and more frequent and intense storms, residents are well aware of natural hazards’ destructive potential. Massachusetts has seen an 81% increase in extreme precipitation events since 1948 (Environment America Research and Policy Center, 2012), including some directly affecting Williamsburg. Tropical Storm Irene dropped 10 inches of rain onto an already-saturated landscape after a particularly rainy summer in 2011. During that storm, the Mill River broke its previous high-water record by nearly five feet (USGS, High-



*Williamsburg is a small town of approximately 2,500 residents, sitting at the nexus of the Connecticut River Valley towns to its east and the rural hilltowns to its north and west.*



***These 1874 images show the extent of the damage after a dam collapse triggered a massive flood in Williamsburg. The event killed 139 people and destroyed dozens of homes and businesses.***

Water Marks from Tropical Storm Irene for Selected River Reaches in Northwestern Massachusetts, August 2011).

Williamsburg is currently engaged in a number of major projects that will build community resilience, though most have not explicitly examined the potential impacts of climate change. These projects include planning a new public safety complex; road, culvert, and water line improvements; the rebuilding of Route 9 from Haydenville to Williamsburg including the adjacent Mill River Greenway; and updating the Open Space and Recreation Plan.

Mindful of its history, that its future will be shaped by climate change, and that the Town is planning major investments now, Williamsburg applied for and was awarded a grant for Municipal Vulnerability Preparedness (MVP) Planning from the Executive Office of Energy and Environmental Affairs (EOEEA) MVP program. The MVP program is Massachusetts' flagship effort to support towns in building local resilience and preparing for climate change. Towns that complete the MVP Planning process become "MVP-certified" which makes them eligible for MVP Action grants to implement projects identified during the planning process. Communities across the state have received millions of dollars in recent years to protect or update local infrastructure, harness natural processes to reduce flooding and its impacts, update local bylaws, improve emergency communication, and more.

This report describes the planning process, records the key information it gathered, and presents recommendations for increasing resilience in Williamsburg.



***Flooding adjacent to Route 9 in Williamsburg Center during Hurricane Irene. (Source: Folktopography by Tom)***

## 2. COMMUNITY RESILIENCE BUILDING WORKSHOP

Williamsburg received a Municipal Vulnerability Preparedness (MVP) grant in 2019. The project was led by Gaby Immerman and Nick Dines of the Mill River Greenway Committee, supported by a core team which included Sally Loomis (Open Space Committee), Charlene Nardi (Town Administrator), Bill Turner and Dan Banister (former and current Town Highway Superintendent), Marcianna Caplis (Conservation Commission, Zoning Board of Appeals), Amy Bisbee (Planning Board), and Denise Bannister (Board of Selectmen).

The Core Team selected MVP-certified provider Dodson & Flinker of Florence, Massachusetts to facilitate the process. The planning process began with a kick-off meeting on July 11, 2019. Over the course of

the following months, the Core Team and consultants gathered background information, developed a schedule and agenda for a two-day workshop series, and recruited a group of invited stakeholders. Stakeholders were selected to represent a variety of Town departments, boards and committees, as well as local businesses, regional organizations, and vulnerable populations. The 40 participants included representatives from Town departments, including Police and Fire, the Planning Board, Conservation Commission, Zoning Board of Appeals, the Mill River Greenway Committee, the Open Space Committee, Williamsburg Woodland Trails Committee, the Owner's Project Manager Steering Committee (aka Public Safety Complex feasibility study committee), the Community Development Advisory Committee (CDAC), experts on river hydrology, forests ecology, and transportation engineering, among others, and regional organizations including Pioneer Valley Planning Commission and Hilltown Land Trust. See the full list of participants at the end of this report.



*Workshop attendees listen as resident Nick Dines presents his group's priority action items during the October 23, 2019 workshop.*



*This bird's-eye view of Haydenville shows the close relationship between the village center and the river. The Bridge Street and South Main Street bridges shown are at risk of scouring and occasional overtopping during severe storms. A current MassDOT project is redesigning the bridges.*

The Community Resilience Building (CRB) workshop was held over two sessions on October 15 and October 23, 2019. The workshops followed a community-driven planning process that has been tested and refined in dozens of communities throughout Massachusetts and beyond (see the CRB Workshop guide available at [www.communityresiliencebuilding.com](http://www.communityresiliencebuilding.com)).

The workshop's central objectives were to:

- Define top local natural and climate-related hazards of concern
- Identify existing and future strengths and vulnerabilities
- Develop prioritized actions for the community
- Identify immediate opportunities to collaboratively advance actions to increase resilience.

In addition, local goals for the workshop were to identify how climate change could impact key projects that are underway in the Town and to provide an

opportunity for the Town's numerous volunteers to gather and discuss their respective focus areas and how they overlap and relate.

The October 15 workshop began with a presentation that explained the workshop process and terminology, gave background information on past hazard events in Williamsburg, and summarized current major town projects (see the Appendix for the full presentation). A brief group discussion of climate-related hazards followed. For the remainder of the first workshop, participants worked in small groups to identify Williamsburg's top hazards and its infrastructural, societal, and environmental strengths and vulnerabilities.

The second workshop began with a presentation about how to craft effective actions for building local resilience with a focus on nature-based solutions (see the Appendix). Workshop participants worked in small groups to brainstorm and prioritize actions that could build on Williamsburg's strengths or mitigate its vulnerabilities to the top climate change related natural hazards identified by the group.



## 2016 TOWN OF WILLIAMSBURG HAZARD MITIGATION PLAN UPDATE

Williamsburg's 2016 Hazard Mitigation Plan (HMP) was completed as an update to its 2010 FEMA-approved HMP. The plan assessed and prioritized natural hazards likely to affect Williamsburg and the community's vulnerabilities. Floods are a frequent hazard caused by hurricanes, nor'easters, and thunderstorms. Rainfall in Massachusetts has increased by approximately 10% in the last 50 years, and this trend is expected to continue. In Williamsburg, important infrastructure, public facilities, and businesses are concentrated along the river, making floods a pressing concern.

Key findings of the report are summarized as follows:

- The hazards most likely to affect Williamsburg are floods; severe snowstorms/ice storms; hurricanes and tropical storms; and severe thunderstorms, tornadoes, and microbursts.
- There is a >70% chance of Williamsburg experiencing a flash flood or general flood in any given year. Approximately 35 structures are located within the areas of Williamsburg that have a documented history of flooding, with a total replacement cost of \$9,173,500.
- The entire town of Williamsburg is considered susceptible to severe snowstorms, with potential ramifications including disrupted power and phone service, unsafe roadways, reduced ability of emergency officials to respond effectively, and additional flood risk during snowmelt.
- Williamsburg has approximately a 1-10% chance of experiencing a hurricane in any given year.
- Southern New England typically experiences 10-15 days per year with severe thunderstorms causing hail, high winds, and flooding.
- Northampton's Mountain Street Reservoir Dam is considered by Massachusetts' Office of Dam Safety to be a "High Hazard" dam, meaning that such a dam failing would likely cause loss of life and serious damage to homes, facilities, and roads. The "high hazard" classification is not an evaluation of the condition of the dam.

### 3. TOP HAZARDS & VULNERABLE AREAS

Natural hazards are natural events that threaten lives, property, and other assets. Often, natural hazards can be predicted. They tend to occur repeatedly in the same geographical locations because they are related to weather patterns or physical characteristics of an area.

Williamsburg's 2016 Hazard Mitigation Plan identified the following **High Risk Hazards**:

- severe snowstorms/ice storms,
- hurricanes and tropical storms,
- severe thunderstorms, tornadoes, and microbursts,

and the following **Medium Risk Hazard**:

- inland flooding.

The town's 2016 Hazard Mitigation Plan was innovative in that it considered climate change. That said, the MVP workshop offered an opportunity to look further into the future than the typical five-year window of a Hazard Mitigation Plan, to incorporate the latest information about climate change and its interactions with natural hazards, and to draw on the wisdom and experience of a broad range of Williamsburg's citizens. See the section below for a discussion of the potential interactions between climate change and natural hazards.

Each workshop group identified four natural hazards as the focus their work. The groups identified the following as top hazards which Williamsburg faces:

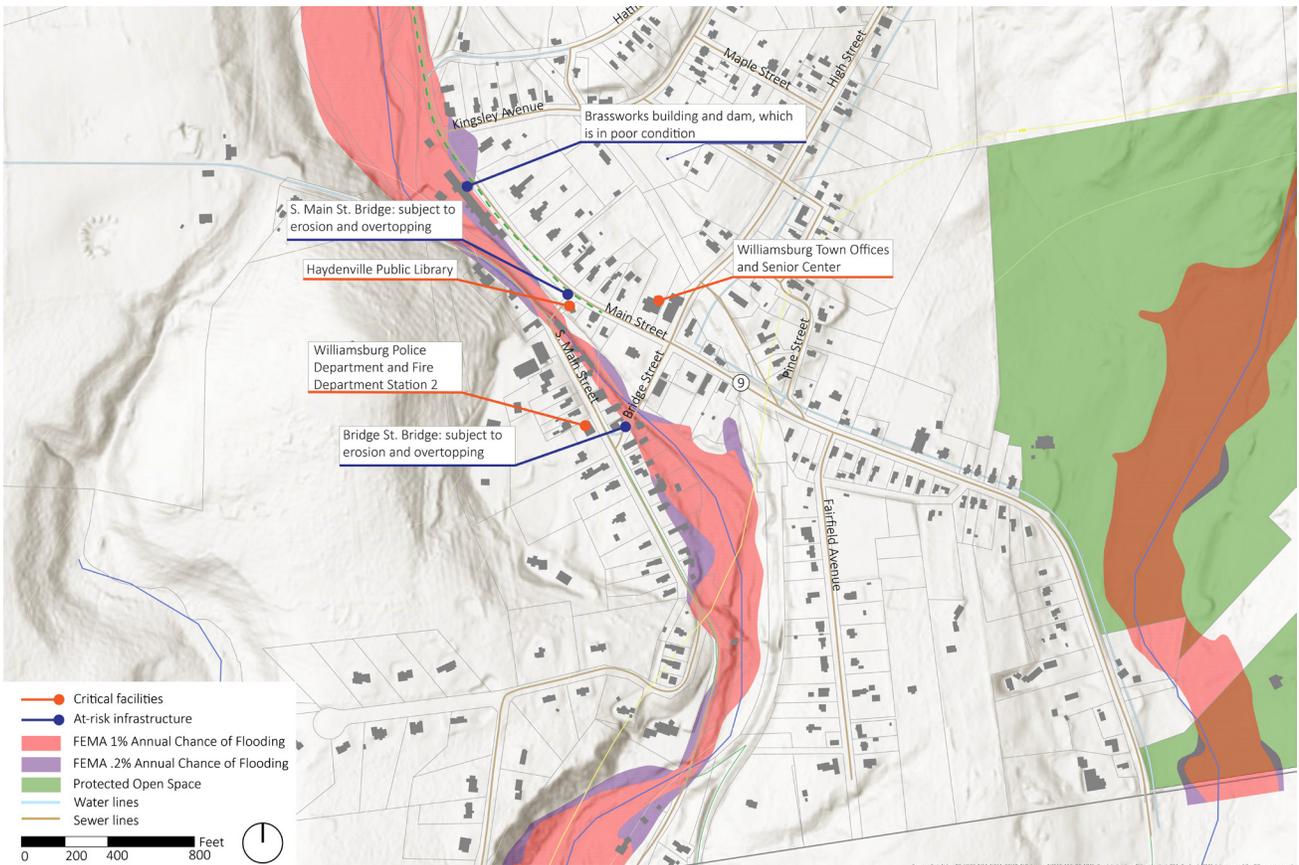
- Flooding
- Severe storms
- Ice storms and nor'easters
- Loss of forest due to climate-related ecosystem disruption



- Drought
- Invasive species
- Vector-borne diseases

**Areas of Concern (Specific Locations):** Workshop groups mapped specific locations where natural hazards are particularly problematic. Many of the areas of greatest concern occur where the Mill River's floodplain threatens critical infrastructure, especially Route 9, or local businesses. These include:

- Undersized culvert on Depot Road, which floods about 1-2 times per year, leading to road closures. This culvert has failed resulting in damage to the road. Currently, the Town is using a steel plate on the road to keep the road open, but it may need to be closed in the near future. During the MVP planning process, the town received a MassWorks grant to fund replacement of the culvert.
- Route 9 at the bend where Williamsburg Snack Bar is located. This area usually floods in the spring, blocking the road for 12-24 hours. It is also subject to scouring and erosion. Flooding on this road contributes to ice in the winter.



- The Mill River is undermining the wall that supports Route 9 just upstream of the Brassworks. A major storm event could have catastrophic impacts on Route 9 at this point.
  - Bridges located on Bridge Street and South Main Street in Haydenville, which are subject to scouring and have overtopped in the past. Replacement of these bridges are part of a current MassDOT project.
  - Bridge on North Street in Williamsburg town center, which constricts the flow of the Mill River, leading to scouring and overtopping.
  - Highway Department building in Williamsburg town center is within the floodplain.
  - Goshen Road (Route 9) traveling west, where storm runoff from the road floods 5 homes' driveways and basements
  - Mill River East Branch, which floods every 2-3 years
  - Automotive businesses located in the floodplain,
- such as the Cumberland Farms gas station, Worthington Air Automotive, and Cichy's Garage. These could leak hazardous materials into the river in a flood event.
  - Williamsburg Center. A major flood (larger than current FEMA designated 500-year flood) on the Mill River could cause catastrophic destruction in Williamsburg Center.



*Above: The North St. bridge during Hurricane Irene in 2011. The river's water level reached a record-breaking 16.42' during that storm, and its velocity was recorded at over 7,000 cubic feet per second. A new stone cap on the wall at Meekins Library likely prevented the river from damaging the street, unlike in 1936 when the river spilled its banks and destroyed the street. (Source: Folktography by Tom)*

*Facing page: Key features identified by workshop participants are indicated on the basemaps for Haydenville (top) and Williamsburg (bottom).*

## 4. CURRENT CONCERNS AND CHALLENGES PRESENTED BY HAZARDS AND CLIMATE CHANGE

### HOW WILL CLIMATE CHANGE IMPACT WILLIAMSBURG?

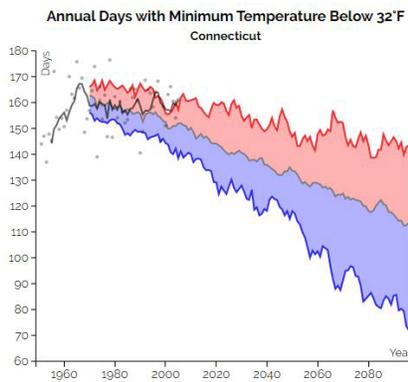
In order to prepare for the future, Williamsburg needs to know how climate change will impact natural hazards. The workshop built on the following key information resources: Williamsburg's 2016 Hazard Mitigation Plan, the 2018 Massachusetts State Hazard Mitigation and Climate Adaptation Plan, and "Massachusetts Climate Change Projections" by Northeast Climate Science Center at the University of Massachusetts.

Although there is uncertainty about how rapidly the climate will change over the coming decades or how extreme the results will be, we do know the general direction of climate change and from that we can generally predict how climate change will influence natural hazards. We know that annual air temperatures in the Northeast have been warming at an average rate of 0.5°F (nearly 0.26°C) per decade since 1970. Winter temperatures have been rising at a faster rate of 0.9°F per decade on average ("Massachusetts Climate Change Projections" by Northeast Climate Science Center at the University of Massachusetts). The increases in temperature are projected to accelerate over the coming decades. Climate projections for the Connecticut River Watershed that were produced by the Northeast Climate Science Center at the University of Massachusetts predict that by 2050:

- Average annual temperature will rise 3°-6.4°F (6-13%)
- Average winter temperatures will rise from 25° to 28°-33°
- The biggest maximum temperature increases will happen in summer (2.8°-7.5°) and fall (3.8°-13.4°)

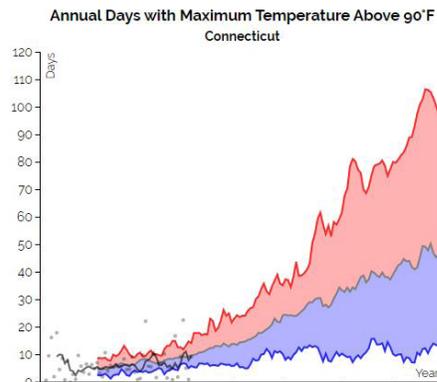


*Petticoat Hill Reservation, a 60-acre property managed by The Trustees of Reservations, is a prime example of how the intact forests that are important to Williamsburg's character can be impacted by invasive pests. Hemlock Woolly Adelgid has killed many trees in the reservation including the one shown above.*



Download Data

Observed	
5-yr Mean	days
Modeled days	
Max	days
Median	days
Min	days
Changes from 1971-2000 for:	
2020 -	-22.49days
2049 -	-31.41days
2060 -	-38.18days
2089 -	-43.02days
2097 -	-43.02days



Download Data

Observed	
5-yr Mean	days
Modeled days	
Max	days
Median	days
Min	days
Changes from 1971-2000 for:	
2020 -	14.89 days
2049 -	24.05 days
2060 -	32.93 days
2089 -	38.00 days
2097 -	38.00 days

**Climate-change projections for the Connecticut River basin predict that a typical year by the middle of the 21st century will have about thirty fewer days with temperatures below freezing and about twenty-four more days above 90° when compared to the end of the 20th century. These dramatic changes are likely to have significant impacts on human and ecological health in the area.**

Increases in winter temperature will result in a longer frost free season with 19-40 fewer days below 32°F (a decline of 13-27%) by the middle of this century. The longer growing season is already being noticed by gardeners and farmers in Williamsburg, residents who suffer from fall allergies, people who pay attention to the seasonal cycles of plants and animals, and others.

Williamsburg has historically been relatively cool in summer because of its high elevation. Many buildings do not have air conditioning. Over the coming decades residents will likely increasingly install air conditioning and will see home energy costs rise as the need for cooling outpaces reduced need for heating in the winter. This change will impact those with limited incomes the most.

Along with higher average temperatures there will also be more extremely hot days. By mid-century, Williamsburg may experience the following increases in extremely hot days:

- Days Over 90°F: from 6 days to 16-41 days per year
- Days Over 95°F: From <1 day to 2-7 days per year
- 5-50 more days over 90° per year by end of century

Extremely hot days can cause heat stress, especially for children, older adults and those with chronic health conditions. Heat waves can be extremely dangerous and result in more deaths than cold snaps. Extreme heat can result in blackouts, stress pavement on the town's roads, contribute to forest fire risk, and increase the prevalence of invasive species and vector-

borne diseases which can devastate ecosystems and human health.

With climate change more precipitation is expected, especially in winter where Williamsburg will experience a 1%-25% increase in precipitation. Meanwhile, precipitation in summer and fall could increase or decrease with the potential for droughts. More precipitation will fall in large events. Days per year with precipitation over 1" may increase from 7 days to 8 - 10 days.

Overall, changes in temperature and precipitation patterns are going to disrupt the relatively stable and hospitable climate that Williamsburg residents are accustomed to. Although New Englanders like to complain about our weather, the truth is we know how to deal with minor snow storms and our summers are relatively bearable. In the coming decades Williamsburg is likely to experience jumbled and more extreme weather patterns.

Winter may bring more crippling snow storms, more ice storms, winter flooding due to rapid thaws or rain on frozen ground, and decreased snow pack which will impact animal habitat and groundwater recharge.

Spring, summer and fall may bring more extreme temperatures, larger and more frequent tropical storms and hurricanes, thunderstorms, tornados and microbursts. These larger storm events may exceed the design-capacity of some of Williamsburg's flood control, road and stormwater infrastructure which were designed for more moderate events. Already, some other communities have decided to consider the 500-



*The Brassworks building, located adjacent to the Mill River in Haydenville, is underutilized.*

year flood plain the new 100-year flood plain. Larger storm events may result in erosion, and may reduce the ability of natural systems to cleanse and infiltrate stormwater which could reduce aquifer recharge and impact water quality. Because Williamsburg relies on public and private wells as opposed to reservoirs this could result in decreased drinking water supplies.

## **IMPACTS OF CLIMATE CHANGE ON HAZARDS IN WILLIAMSBURG**

Workshop discussions about the impact of climate change on hazards in Williamsburg recognized both the impacts on the developed portions of Williamsburg—with harm to human lives, properties, and infrastructure—and impacts on the town’s natural systems—with harm to forests, water systems, plants, animals, etc. Workshop participants also recognized that there are feedback loops between built and natural systems that could exacerbate harm to both.

On the human side, discussion of hazards largely focused on flooding and storms, particularly related to the potential effects of a severe Mill River flood on Route 9 and the two village centers of Haydenville and Williamsburg. Because the town’s key evacuation

route and much of its civic and commercial infrastructure are located near the river, this relatively small area is the subject of many of the residents’ concerns.

On the natural systems side, a large percentage of the town is in a relatively natural condition with close to 30% of the town permanently protected (4,900 acres). Most of that is forest land in the northeast and southwest of the town. The Mill River and associated wetlands and tributaries is another major natural feature. Many of Williamsburg’s residents view themselves as stewards and protectors of the natural areas. They see intrinsic value in nature and also recognize that Williamsburg’s natural areas provide essential ecosystem services like moderating temperatures, cleaning and absorbing water, sequestering carbon, and purifying air.

Workshop participants expect broad ecological changes as a result of climate change with impacts on plants and animals, carbon and water cycles, and ultimately people. Participants are particularly concerned about the possibility that changing temperature and precipitation patterns, combined with invasive species will result in wide spread forest

dieback. Forest dieback could, in turn, lead to forest fires, erosion, and more rapid movement of water into streams and rivers exacerbating flooding.

### Key Hazards

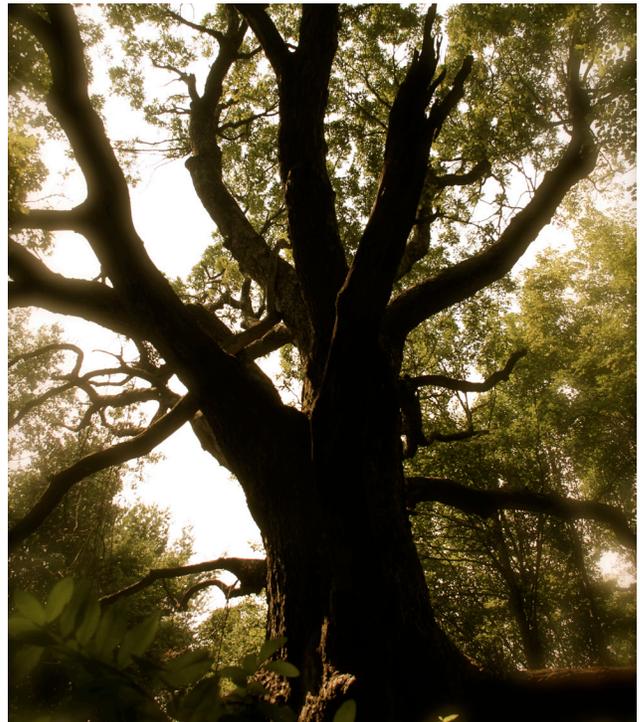
**Flooding:** Many residents' concerns center around flooding of the Mill River and its surroundings, and the impact those floods would have on nearby businesses, homes, and infrastructure. The Mill River has a very steep gradient which results in rapid flow of water through the river system. The steep drop powered Williamsburg's mills which shaped the town's settlement pattern. The town's key population centers, business centers, and roadways are concentrated in two village centers along the banks of the Mill River. The river's steep gradient has also resulted in the Mill River flooding repeatedly throughout the town's history. During 2011's Hurricane Irene, the Mill River's high-water mark was recorded at 16.42', topping its previous high-water record of 11.78' by nearly five feet. It took only 13 hours for the river to reach peak flow during that storm, highlighting just how quickly a severe flood could occur in a future rain event.

Parts of Route 9 run closely alongside the river and are in the FEMA-defined floodplains. This road is important as it is Williamsburg's main transportation and evacuation corridor, and an essential link for the towns to its west. Flooding also exacerbates existing infrastructure issues. Many of the town's culverts, bridges, and drainage pipes are aging, and are subject to scouring and erosion from years of water flow. High-velocity water flow during storm events places added pressure on already-strained infrastructure, which could fail and create additional flooding.

**Severe storms:** Between 1958-2012, the Northeast experienced a 71% increase in precipitation that falls as part of a heavy precipitation event. Severe storms create the risk of flood events, as highlighted above. They also bring additional hazards like high winds, lightning, snow and ice that create additional challenges for homes and electrical utilities. Williamsburg's power predominantly comes from Florence up Spring Street and along River Road into Haydenville. Additional power comes up Route 9 from Northampton. Loss of electricity is particularly threatening to the elderly and those with health concerns, who may depend on heating, cooling, or

lifelines machines for survival. Power outages are particularly likely during winter storms, when snow and ice buildup on power lines often occurs. About half of Williamsburg's population relies on private wells powered by electricity. Power outages can result in drinking water shortages for residents. In the October 2011, "Snow-tober" storm, Williamsburg was out of power for four days. The Fire Department delivered drinking water to impacted residents.

**Forest loss:** Current trends indicate that the climate in New England is steadily warming, with more extremes in both rainfall and drought. On average, the Northeast experienced 10 more frost-free winter days between 1991-2012 than it did from 1901-1960. Current trends also predict more and more days per year above 90 in the coming decades (Northeast Climate Adaptation Science Center). These changes are likely to affect the health and diversity of New England's forest ecosystems. Currently, Williamsburg is fortunate to have large areas of mostly intact forest that provide wildlife habitat, ecosystem services, recreational opportunities, and quality of life benefits. Changing temperature and precipitation patterns may stress or alter the forest ecosystem. The current species of forest trees are not likely to survive warmer conditions. Their demise opens the way for invasive tree and shrub species to take over. It is not likely that



Source: Folktopography by Tom

valuable native species of the warmer US states that will succeed Williamsburg's current forest species, but introduced non-native species that outcompete natives. Mile-a-minute vine and kudzu are two warm-weather species that could devastate Williamsburg's forests and open lands. In addition, climate change may worsen the impact of introduced pests, such as the Hemlock Woolly Adelgid, Emerald Ash Borer, and diseases, such as chestnut blight and Dutch elm disease. Forest dieback from stress or disease also increases the risk for forest fires. Lastly, heightened storm frequency and intensity increases the potential for destructive wind or ice storms to damage trees.

**Invasive species:** Invasive plants such as Japanese knotweed and barberry outcompete native plants. These plants spread quickly and do not retain soil as well as a robust network of native plants, so the spread of invasive plants increases erosion and reduces ecosystem diversity. Non-native plant species displace native plant species and reduce habitat and food for wildlife. Some non-native invasive plants alter soil acidity and nitrogen levels, reducing the biological activity of native soils. Others form dense layers, interfering with succession and regeneration of native species, often crowding out, shading, or smothering natives. Some outcompete native plant species for pollinators, which is even more critical in the face of bee colony collapse disorder, endangering crop and orchard success. Some non-native invasive plants threaten certain native butterfly species by out-competing their native host plants relied upon for egg laying and larval feeding. Caterpillars are often highly specialized and therefore particularly vulnerable to loss of native plants. The loss of caterpillars can then impact bird populations which rely heavily on caterpillars for feeding their young. Invasive plants can also reduce food supplies for other wildlife. Finally, invasive insects present widespread risks to trees and human health as described elsewhere.

**Vector-borne diseases:** Wetter and warmer conditions lead to increased mosquito populations which can increase human diseases like West Nile Virus, and Eastern Equine Encephalitis (EEE). Warmer winters can result in larger pest populations and increases the spread of tick-borne diseases like Lyme disease and babesiosis.

## 5. SPECIFIC CATEGORIES OF CONCERNS AND CHALLENGES

### INFRASTRUCTURAL VULNERABILITIES

- Route 9 is the Town's main transportation route, its commercial spine, the only evacuation route for most of Williamsburg, and it is vulnerable to flooding and bank erosion.
- In addition to Route 9, several other local roads are prone to flooding in heavy rain. These include Depot Road and Bridge Street. (Source: HMP 2016). Ashfield Road has previously washed out. Briar Hill Road has a very large beaver dam that has previously caused the road to wash out.
- Aging infrastructure creates safety hazards, particularly during flood conditions. Areas of particular concern include an undersized culvert on Depot Road, as well as bridges on Bridge Street, South Main Street, and North Street.
- Williamsburg's Police/Fire Station in Haydenville, and Fire Station in Williamsburg (which also serves as the primary Emergency Operations Center) are housed in aging and inadequate buildings. Both are in very poor condition and are could be impacted by flooding, which could reduce first responders' ability to mobilize in an emergency. Both are on the opposite side of the river from many residents and facilities. If bridges were flooded, emergency responders would not be able to reach those in need. The Town has completed several studies about building a new Public Safety Complex that would house the police department, fire department and emergency operations center. It is currently working with an owner's project manager on a feasibility study. The study has developed a program for a shared facility, identified potential sites for it, and determined that there is only one viable site for the facility, the Helen E. James School site. The back of the property contains a 500-year floodplain and the site is across Route 9 from a property that flooded during Hurricane Irene (Worthington Air Automotive).



***The current Police and Fire Station #2 building in Haydenville is over 100 years old and in poor condition. It is also on the opposite side of the Mill River from Route 9, the Town's major emergency access route. Haydenville's two bridges are in poor condition and are slated for replacement.***



***The site of the former Helen E. James School (at center above) is the most viable location for a new Public Safety Complex.***

- The water main running underground from the center of Williamsburg to the center of Haydenville is too small and needs to be replaced. This could impact firefighting as well as new commercial development. Its location also makes it susceptible to damage from severe flooding.
- Route 9 is the major transportation route through Williamsburg and has heavy trucking traffic. However, there are no local detours that are able to handle large vehicles. When traffic accidents or floods necessitate the closing of Route 9, there is no viable alternative for heavy vehicles.
- Underground floodwater seeps into water and sewer lines during storms, which can contaminate water lines and increase the possibility of sewer leakage. Water and sewer lines run under the river near Williamsburg Pharmacy and Hardware.
- The town's water, sewer, and stormwater infrastructure is aging and may experience future problems when taxed by droughts, flooding, etc.
- The Brassworks former mill building on Route 9 in Haydenville is on the banks of the Mill River. It is aging and in poor condition.
- Disruption to power lines can cause power outages.
- Cell-phone service is limited in parts of Williamsburg, especially in isolated areas. Damage to telecommunication structures could cut off communication for residents, limiting their access to emergency services.
- Private wells are susceptible to power failures and droughts
- during extreme weather, and about 6 of these rely on life-saving machines such as respirators. Other residents are on a call list. Extended power outages can be particularly threatening and even deadly for vulnerable residents.
- There are few rental units in Williamsburg, and limited affordable housing. Limited supply means there is little pressure on landlords to make climate resilience investments in their properties. For renters, it likely results in higher housing costs which can compromise a households ability to prepare for hazards. There is a cluster of rental units adjacent to the Mill River in Haydenville.
- Many volunteers, who dedicate countless hours serving on town boards and committees, feel overstretched. Communication between town groups and agencies suffers, and getting everyone together to share information can be challenging. Some boards and organizations, like the volunteer fire department, have difficulty recruiting adequate volunteers.
- The town's paid staff is small and generally overburdened. The town lacks staff dedicated to proactive planning and grant writing. This compromises the Town's ability to prepare for climate change and natural hazards.
- Public transportation is very limited, as are safe routes for pedestrians and cyclists. This reduces walking and bicycling for daily activities which has negative impacts on the health of people in Williamsburg, which in turn makes them more susceptible to harm from climate-related health hazards. It also reduces the resilience of the transportation systems.
- The local retail economy is limited, so residents have to travel to Northampton and beyond for most needs. This may hamper residents' ability to buy basic supplies during a hazard event. The potential closure of the Williamsburg Market would both undermine the ability of residents to get supplies and also reduce social connections within the town.
- The Town's tax rate is high and is heavily borne by

## **SOCIETAL VULNERABILITIES**

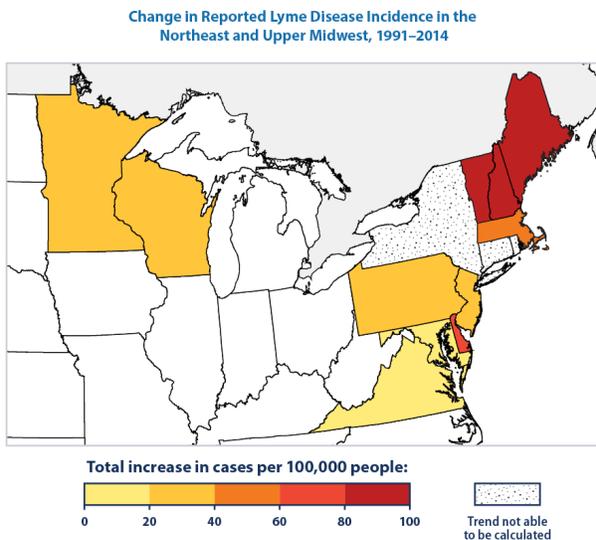
- Compared to the state as a whole, older adults make up a larger percentage of Williamsburg's population. Many older adults are isolated during large storms. The Senior Center, Police and Fire Departments maintain a list of the most vulnerable older adult residents. Police and firefighters personally visit 11 households to check on them

residential property owners because the town's has little commercial development. This limits the Town's fiscal resources for preparing for natural hazards and responding to them. It also makes taking crucial steps—like building a public safety complex—more politically challenging.

- Existing industries like forestry and maple sugaring may be vulnerable to changing forests.
- Important town records and artifacts are vulnerable both because they are located in some of the Town's less resilient buildings (Old Town Hall which has no heat and the Gristmill Farm Museum on Mill Street), and because the Historical Society lacks the resources to adequately catalogue and conserve them.

### ENVIRONMENTAL VULNERABILITIES

- Four large solar projects have already been completed, and at least one more is underway. Except in the Solar Photovoltaic Overlay District, ground mounted solar installations between 1.25 and 20 acres require a special permit with site plan review, while installations greater than 20 acres are prohibited. Within the three parcels of the Solar Photovoltaic Overlay District ground mounted solar installations between 1.25 and 20

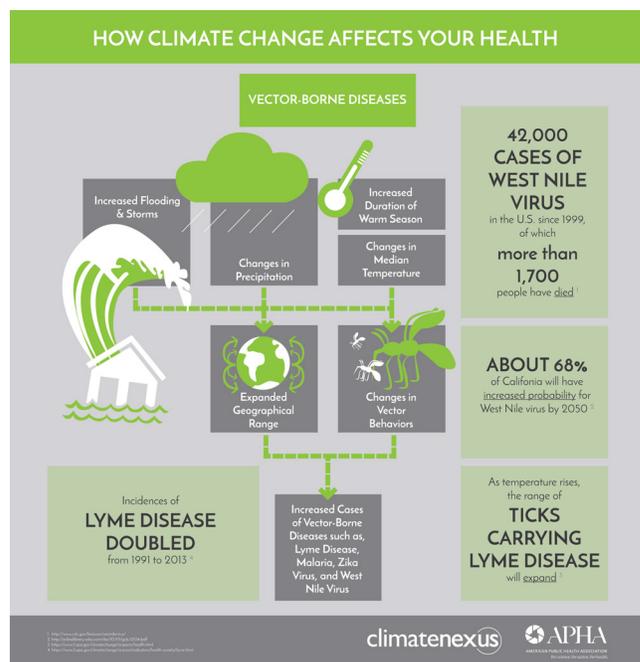


Data source: CDC (Centers for Disease Control and Prevention). 2015. Lyme disease data and statistics. [www.cdc.gov/lyme/stats/index.html](http://www.cdc.gov/lyme/stats/index.html). Accessed December 2015.  
For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at [www.epa.gov/climate-indicators](http://www.epa.gov/climate-indicators).

Source: EPA

acres are allowed by right with site plan review, while installations greater than 20 acres require a special permit. Many residents would like to update the bylaw with additional siting guidelines and performance standards, particularly for projects that clear forests or convert farmland.

- There is currently no specific local wetlands bylaw. The Commonwealth of Massachusetts protects wetlands through the Wetlands Protection Act, which is enforced by the town's Conservation Commission. However, Williamsburg does not have a local bylaw of its own.
- Invasive species such as bittersweet, barberry, and Japanese knotweed outcompete native plants, which harms the integrity of the native ecosystem.
- Warmer winter temperatures are likely to increase the number of ticks that carry Lyme disease, babesiosis, and other tick-borne diseases.
- Warmer, wetter conditions are likely to increase the populations of mosquitoes carrying diseases such as Eastern Equine Encephalitis (EEE) and West Nile Virus.
- Climate change may also impact the spread of water-borne illnesses



Source: American Public Health Association (APHA)

## 6. CURRENT STRENGTHS AND ASSETS

### INFRASTRUCTURAL STRENGTHS

**Emergency communication:** Williamsburg police and firefighters have robust emergency communication procedures including an automatic call service and a town-wide email service with strong enrollment. Police and firefighters also personally visit community members they know to be vulnerable. Police recently received a grant to buy 800-band radios with patch capability for each police cruiser so that they can communicate when out of cell phone service range, which is common in parts of Williamsburg. They would like to expand upon this by providing an 800-band radio to each individual officer and a base unit for the station, a total of 7 additional units.

**Town Facilities and Emergency shelters:** Over the past decade, Williamsburg has been engaged in planning and improving its Town Facilities. The Town expanded and renovated the Anne T. Dunphy school, and renovated the Meekins Library, both of which serve as emergency shelters. The Town Offices building has been upgraded including recent installation of a new boiler and also serves as an emergency shelter. The school and town office buildings are equipped with backup power facilities.

**Solar development:** There are currently four large-scale solar developments in Williamsburg and one more planned.

**Water supply:** Williamsburg's water comes from two gravel-packed wells located in the Unquomok Brook drainage basin. The entire drainage basin lies within Williamsburg town boundaries, ensuring that water quality protection is entirely under the town's control. The Water Department owns all of the land within the 400' Zone I protective radius of the wells, and several acres in Zones II and III. These two wells provide high-quality water to about 600 homes and businesses, or about half of the town's residents. The Unquomok Reservoir is maintained by the Water Department as an emergency backup water supply. An additional 600 homes have private wells.

### SOCIETAL STRENGTHS

**Community engagement and volunteerism:** Many town residents are engaged in the community, and volunteers provide many valuable services through committees. Williamsburg is also home to many people with valuable skills who donate their time and expertise in a variety of fields.

**Community spaces:** The Dunphy School and Meekins Library provide spaces and opportunities for social connection and community meetings. The Council on Aging also runs a wide variety of programs that help connect the town's seniors.

**Recreation:** Williamsburg's abundant open space creates opportunities for hiking, bicycling, snowmobiling and cross-country skiing. The town has many miles of formal and informal trails, managed by the Williamsburg Woodland Trails Committee. The Anne T. Dunphy School grounds offer a baseball diamond and soccer field, and the Helen E. James School grounds is home to a basketball court. A survey of over 220 people conducted as part of the 2019 Open Space and Recreation Plan update revealed that Williamsburg residents have a strong interest in non-motorized recreational activities such as hiking and wildlife viewing. Many people requested improvements to trail signage and trail connectivity as well as improved access to rivers and streams for swimming and fishing. Access to rivers and streams can provide opportunities for cooling in extreme heat. Recreation may provide economic opportunities for the town, including additional foot and bicycle traffic when the Mill River Greenway is completed

**Independent/self-sufficient culture:** Williamsburg residents proudly characterize themselves as hardy New Englanders who know how to prepare for storms. Many residents already have woodstoves and backup generators to heat and power their homes during emergencies.

**Demographic Changes:** In the coming decades, Williamsburg is likely to experience demographic changes that will impact the town's resilience. Some trends that may drive demographic changes include: climate migration from areas that will become unbearably hot, storm-prone, or inundated by sea level rise; regional transportation changes

(for example, if commuter rail service is improved); digital communication improvements (for example, expansion of broadband and 5G); and changes in the broader economy (for example, according to the census bureau, self-employed people in the town grew from about 10% of the population in 2010 to nearly 18% in 2017). Demographic changes could impact the town's climate resilience in many ways: the number of members of vulnerable groups in the Town could go up or down; changes in the culture of the town could impact self-reliance, volunteerism, or community connectedness for better or worse; the economy of the town could strengthen or weaken; new development could be sited in vulnerable areas or could improve the resilience of existing areas. How the town plans for and responds to demographic and economic changes will play a major role in whether those changes decrease or increase the town's resilience.

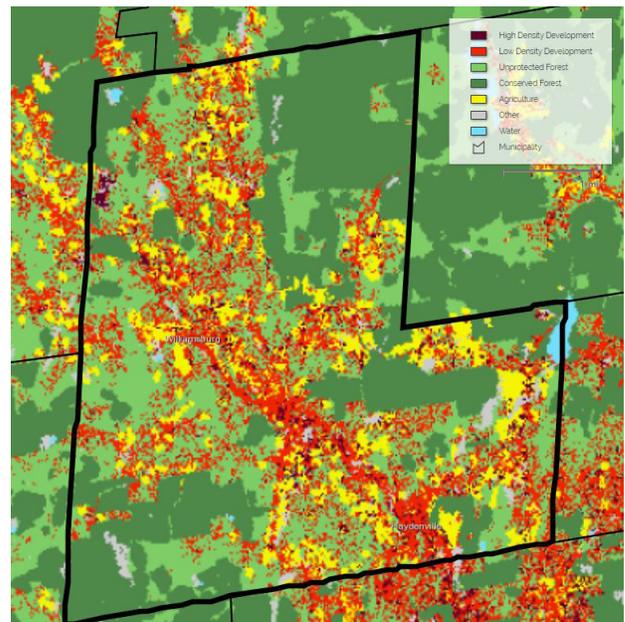
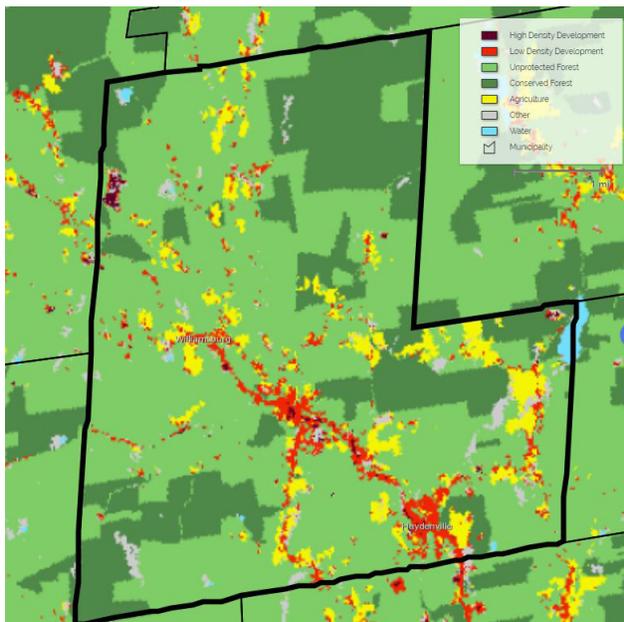
## ENVIRONMENTAL STRENGTHS

**Intact forests:** Over 80% of Williamsburg's land area is forested. The town lies in a transitional zone between northern and central hardwood species. Lower-lying areas in the southern and eastern areas of town are characterized by central hardwood species such as black, white, red, and chestnut oak, black and white birch, hickory and red maple. Higher-elevation areas

of town are characterized by northern hardwood species including sugar maple, red maple, birch, beech, red oak, ash, cherry, basswood and hemlock. The interaction of these two ecological communities, plus a diverse local geology, creates diverse ecosystems with high habitat value. Large forested areas also filter air and water and reduce the speed of stormwater runoff, which helps maintain the health of the Mill River and protects riverside development.

**Wetlands:** There are approximately 800 acres of wetlands in Williamsburg, with the largest concentrations in the town's southeastern corner off of Mountain Street. These provide habitat for a wide variety of plants and animals, including rare and endangered species. They also provide temporary storage of floodwaters, which helps to reduce water volume and velocity in rivers and streams during storms.

**Large quantity of protected land:** Nearly 5,000 acres of land are permanently protected in Williamsburg, representing nearly 30% of the town's land area (OSRP). An additional 7,700 acres are temporarily protected through Chapter 61 programs. This land is mostly upland forest, and provides ecosystem services such as water and air purification, as well as wildlife habitat.



*The map on the left shows Williamsburg's land use in 2010. The map on the right predicts land use in Williamsburg in 2060 if the town experiences significant population growth combined with limited conservation. Developed land is shown in red, agricultural land in yellow, unprotected forest in light green, and protected forest in dark green. The maps were created by the New England Landscape Futures Project. Explore more scenarios at <https://newenglandlandscapes.org/>. (Source: NEFL)*

## 7. TOP RECOMMENDATIONS TO IMPROVE RESILIENCE TO HAZARDS

Participants in the Community Resilience Building workshop identified dozens of potential actions to improve Williamsburg's climate resilience. During the CRB workshop, there was a strong consensus that several of the actions were the Town's top priorities. These priorities were subsequently confirmed by discussions of the Core Team, the Board of Selectman, and at the community Listening Session held on February 6, 2020. The top recommendations are described in detail below including recommended next steps, where appropriate. These are followed by lists of other recommended actions, which are organized by the workshop's three categories of infrastructural, societal, and environmental action items and classified into highest, moderate, and lower priority. The full list of recommended actions is included in the compiled matrix in the Appendix. The list below is also supplemented by top recommendations from the 2016 Hazard Mitigation Plan (HMP).

### WORK WITH MASSDOT TO IMPROVE THE RESILIENCE OF ROUTE 9

Route 9 is a major source of concern for Williamsburg as it is the town's major transportation corridor and evacuation route. Parts of Route 9 are located within the FEMA-designated floodplain of the Mill River. Sections of Route 9 flood periodically, forcing temporary closure of this important road. Route 9 is a major trucking corridor and a regional bus route. There are currently no effective detours in Williamsburg that are able to handle these large vehicles. This creates significant traffic issues when Route 9 is blocked.

The Mill River Greenway is a proposed multi-use bicycle and pedestrian pathway connecting the village centers of Haydenville and Williamsburg. This proposed path would connect with an existing network of multi-use trails running through Northampton to Hadley, Amherst, and Easthampton. Completing the Mill River Greenway project would expand Williamsburg residents' ability to safely walk or bicycle throughout the Pioneer Valley.

The Massachusetts Department of Transportation (MassDOT) is currently engaged in a redesign of Route 9 including the Mill River Greenway and the project is on the regional Transportation Improvement Plan (TIP).

Williamsburg views the Route 9 rebuild as a critical climate resilience action and the town wants to ensure that project will be designed based on the high end of current climate projections including flood levels. [A recent study by USGS](#) documented that peak flows on the Mill River have increased over time, and concluded that, "If the linear trend in annual peak flows persists [on the Mill River at Northampton], the flood with a given Annual Exceedance Probability will, on average, be 2, 4, and 7 percent greater in magnitude in 10, 20, and 30 years, respectively."<sup>1</sup> It is important to note that these estimates are based on historical data. As climate-change increases the frequency and intensity of large storms, we can expect that future flood magnitudes on the Mill River will be even larger than those predicted by linear trends from historic data.

While the Town wants to ensure that Route 9 is prepared for the future, it also wants to ensure the ecological integrity of the Mill River. The Route 9 project provides the opportunity to manage invasive species, incorporate green infrastructure to improve water quality, minimize water temperature increases, stabilize river banks, and incorporate nature based flood protection methods. These actions will be especially important as the river's aquatic and streambank species come under increasing pressure from climate change.

For its part, the Town wants to protect MassDOT's investment in Route 9, by ensuring that areas adjacent to Route 9 are prepared to deal with natural hazards. For example, the Town can take steps to ensure that as much stormwater as possible is infiltrated further up in the watershed to reduce flood flows in the Mill River adjacent to Route 9. The town can ensure that its culverts and stormwater systems that feed into and under Route 9 are sized and functioning appropriately.

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1. Zariello, P.J., 2017, Magnitude of flood flows at selected annual exceedance probabilities for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2016-5156, 54 p., <https://doi.org/10.3133/sir20165156>.

Finally, the Route 9 project provides an opportunity for the Town to upgrade town-owned infrastructure within Route 9's right of way, like the undersized water main between Williamsburg and Haydenville.

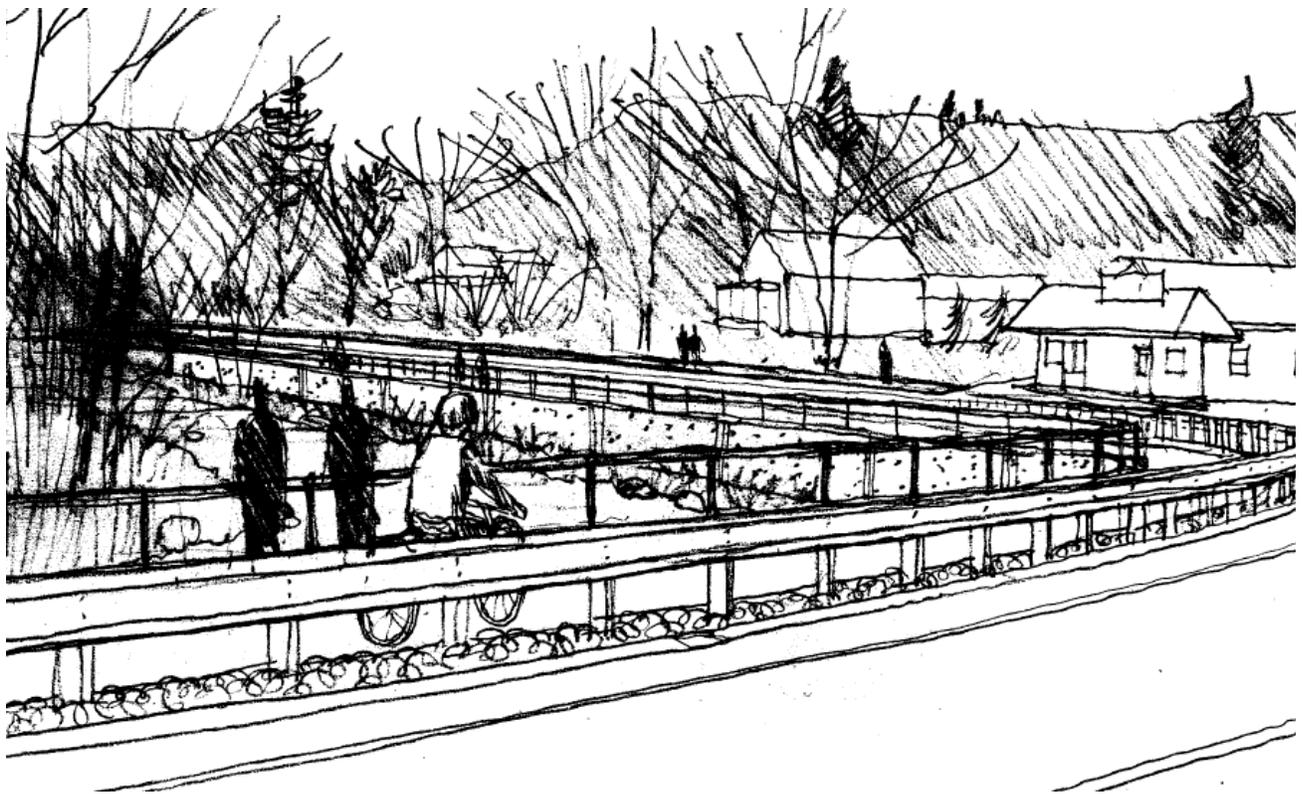
Next Steps:

- Continue to work with MassDOT on the design of Route 9, including the Mill River Greenway with a focus on preparing the road and the adjacent river for climate change.
- Replace the culvert at Deport Road using a recently awarded MassWorks grant.
- Design and set aside funding for upgrades to the Town's infrastructure that runs within Route 9's right of way, including water mains. Coordinate local and state work.
- Work with landowners and adjacent communities to reduce the quantity and velocity of stormwater entering the Mill River (see other recommendations related to Master Plan/Regulatory Review, Mill River Watershed Council, and Forest Management Plan).

## **BUILD A NEW, RESILIENT PUBLIC SAFETY COMPLEX**

Building a new public safety complex is a top priority of the Town as has been reiterated in numerous studies and plans over the past decade. The public safety complex will also serve as the town's emergency operation center and an emergency shelter and cooling site. As the town moves forward with the design and construction of this facility, it would like to ensure its resilience with features such as a renewable energy source that provide electricity even if the electrical grid goes down (for example, solar panels with batteries for backup power), backup water supply, and green infrastructure features to lower the risk of flooding on and adjacent to the site. Next steps include:

- Conduct a study of the specific climate-related hazards that the public safety complex may face, potential mitigation measures and their costs and benefits. This study could include: updating the boundaries of floodplains on the former Helen E. James school site and adjacent properties; identifying opportunities for nature-based



*This sketch by local landscape architect Nick Dines illustrates the proposed future Mill River Greenway, a multi-use path to run alongside Route 9 from Haydenville to Williamsburg.*



**Emergency services staff and volunteers (Source: Folktopography by Tom)**

solutions to reduce flooding on and upstream of the site; and/or augmenting site design with a focus on green infrastructure.

- Develop plans for resilient energy supply for the future public safety complex and other critical town facilities, including clean energy generation.
- Study how climate change may impact Williamsburg’s future public safety and emergency response needs, including staffing, equipment, and facilities. Incorporate those needs into the design of the public safety complex.
- Continue community outreach and education regarding the public safety complex project with a focus on how the project will help improve the town’s climate resilience.

**CREATE A COMPREHENSIVE TOWN MASTER PLAN/UNDERTAKE A REVIEW OF THE TOWN’S BYLAWS AND REGULATIONS FOR CLIMATE RESILIENCE**

Preparing for climate change will require coordinating actions of staff and boards across Williamsburg. The town will have to make numerous decisions about how to use its limited resources. The added strain created by climate change will make it increasingly difficult for the Town to continue to operate without the guidance a master plan. A master plan is one of the fundamental guiding documents for Town policy. Created by the Planning Board, it offers a

broad evaluation of land use, housing, economic development, natural and cultural resources, open space and recreation, circulation, public services and facilities, etc. The master plan establishes town goals and sets a detailed action plan to guide the activities of town boards, committees, and staff. Typically, municipalities update their master plan about every 10 years.

Williamsburg’s lack of a master plan and its need for one has been discussed in numerous committee meetings, public forums, reports, and studies over the past decades. The need for a master plan was reaffirmed by participants at the MVP workshop and listening session. Participants expressed it is difficult to advance efforts without agreed upon town goals. A holistic master plan is particularly needed because the town relies heavily on volunteers. Those volunteers, who are stretched already, have difficulty keeping abreast of how their work interacts with the work of other committees and how it contributes to the Town’s overall improvement. In addition, volunteer turnover can result in loss of institutional memory.

Creation of a master plan is a significant undertaking. It requires collecting baseline data on numerous aspects of the town, conducting extensive community outreach, and crafting the goals, objectives, and actions that will guide the Town for the coming decades. Towns usually hire a planning consultant to lead the process which costs \$100,000-\$250,000.

There several possible approaches Williamsburg could take to creating a master plan:

- Obtain the services of a professional planner to collect and synthesize past plans related to core master plan topics. This would help the town identify what remains to be done. The planner could also assist with drafting an RFP for a master plan and/or writing and managing other grants for the town. A planner could be hired part time by the Town, could be hired on a contract basis through a Request for Proposals process for a specific scope, or the town could contract with the PVPC which supports local planning needs for several communities in the region on a fee for service basis through their Planning Board Assistance program.

- Apply for an MVP action grant to create a Master Plan. The Town of Palmer was recently awarded with a \$112,500 MVP action grant to develop a master plan. This action could be combined with the one above.

Participants in the MVP planning process also identified the need for a thorough review of Town bylaws and regulations to ensure that they are in line with the Town’s goals and support the Town’s climate resiliency. The bylaw review could be combined with the creation of a master plan or it could be a standalone project. This review could address topics including, stormwater management, wetlands protection, large solar projects, other renewable energy projects, floodplain development, erosion control and sedimentation, water supply projection, low impact design, subdivision regulations, and open space residential development. Possible next steps include:

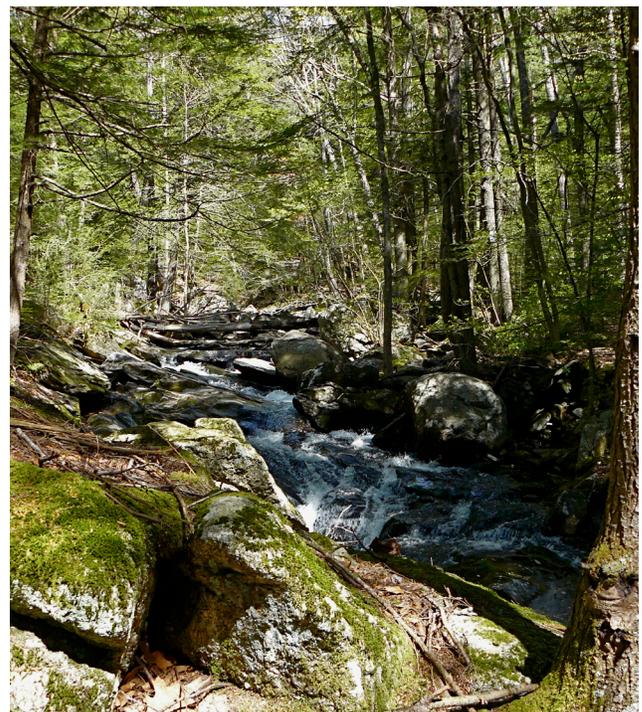
- Apply for funding for the review. Possibilities include an MVP Action Grant, District Local Technical Assistance from the Pioneer Valley Planning Commission, or a Planning Assistance Grant from EOEEA. A number of communities have been received MVP action grants to conduct regulatory reviews and updates.
- Arrange a meeting of key boards to identify low-hanging fruit, then task the boards with implementing changes. Boards could be supported by a professional planner if the town obtains the services of one as described above.

### **CREATE A MILL RIVER WATERSHED MANAGEMENT PLAN**

The Mill River is one of Williamsburg’s most important ecological and recreational resources. Flooding from the river is also the town’s most pressing climate-related hazard. However, the Mill River is bigger than just Williamsburg. Its watershed includes land in the towns of Goshen, Conway, Ashfield, Whately, Hatfield, Chesterfield, Westhampton, and Northampton. Land use changes and other human activities in upstream towns, have profound implications on the river and on Williamsburg. Cooperative management among all of the watershed towns is needed to reduce flood risk and preserve the river’s ecological health.

Potential next steps:

- Williamsburg could work with neighboring communities to establish a memorandum of understanding (MOU) to create a Mill River watershed council or working group that would coordinate how the watershed is managed across Town boundaries. For example, the group could attempt to align development regulations across the communities, undertake shared grant applications for conservation, land management, and ecological restoration, and promote public understanding of the importance of the Mill River. The group could potentially be organized under the auspices of the existing Mill River Greenway Initiative (MRGI), a working group of local citizens. Since 2009, MRGI has been studying the ecological, cultural, economic, and recreational aspects of the Mill River with the aim of protecting the watershed, preserving its cultural artifacts, enhancing its biological health and identifying access points to encourage recreational activities, with the ultimate goal of designing and creating a greenway along the Mill River. The local Mill River Greenway Committee is related to the MRGI, but is distinct from it.



*Source: Mill River Greenway Initiative*

## CREATE A FOREST MANAGEMENT PLAN

Williamsburg's forests provide important benefits to residents including clean air and water, recreational opportunities, carbon sequestration, and economic benefits. They also include regionally important lands for allowing the movement of species to adjust to climate change. The forests are owned and managed by a number of public and private entities, including the Town of Williamsburg and the City of Northampton. These entities have their own management goals, but their decisions ultimately impact the Town's overall climate resilience, especially related to the movement of species and the interactions between forests and water cycles. Meanwhile, information about how to manage forests for climate change is difficult to access and sometimes contradictory. This leads to confusion and inconsistent management practices. For example, during the recent update of the Town's OSRP, residents of Williamsburg expressed that they want information about how to steward their lands responsibly.

The town can lead the way by developing a comprehensive forest management plan for lands

under its control that addresses climate change mitigation and adaptation. The plan could include demonstration sites for management practices other landowners could implement on their properties, and guidelines for climate resilient forestry practices that are suitable for land in Williamsburg based on various landowner goals. A comprehensive forest management plan would help safeguard this important resource for future generations. It would also serve as a model for similar communities throughout western Massachusetts and the northeast. Next steps:

- Identify a local or regional lead for this work
- Apply for grants to create a forest management plan, including an MVP action grant.
- Use town-owned land to test and demonstrate techniques for managing invasive species and forest pests.
- Identify and coordinate groups of landowners to manage invasive species and forest pests, including applying for NRCS funds



Source: Folktopography by Tom

## ADDRESS VECTOR-BORNE DISEASES

Vector-borne diseases such as Lyme disease, West Nile Virus, and Eastern Equine Encephalitis (EEE) are already a public-health concern. Climate change is likely to bring warmer, wetter conditions, which are favorable to insects like mosquitoes and ticks that carry these diseases and others. Planning for this increased risk may help to mitigate its impact. Next steps include:

- Develop and/or publicize outreach materials about vector-borne diseases
- Further evaluate the risks from vector borne diseases, identify particularly impacted areas, and develop management practices for minimizing their host species including mosquitos and ticks. Ideally this study would be conducted on a regional level.
- Participate in the Pioneer Valley Mosquito Control District (PVMCD)

## ADDITIONAL PRIORITIES

### Infrastructural

#### *Highest Priority*

- Repair or replace key bridges and culverts, especially the collapsed culvert on Depot Road; vulnerable bridges on Bridge Street and South Main Street in Haydenville; and the vulnerable bridge on North Street in Williamsburg. Replacement of the Depot Road culvert has been funded by a MassWorks grant. MassDOT is designing improvement for the two bridges in Haydenville. There is not currently a project in the works for the North Street Bridge in Williamsburg.
- Ensure that the ongoing redesign of Mountain Street improves climate resilience and protects Northampton's water supply reservoir, including assessment of drainage and culverts.
- Continue to ensure that trees along powerlines are properly maintained. Require underground power lines for significant new developments.

#### *Moderate Priority*

- Expand police access to 800 band radios with patch capability. Provide one per officer plus one base unit for the station (six radios plus one base unit).
- Continue to trim trees along power lines to reduce risk of power outages and replace trees as needed
- Develop an urban tree canopy plan
- Install energy resilience strategies at critical facilities. Priority facilities include emergency shelters—Anne T. Dunphy School, Meekins Library and Town Offices. Energy resilience strategies include installation of clean energy generation, energy storage, operation in isolation from the grid and/or microgrids.
- Create drought management plans and policies
- Create plans and secure funding to upgrade aging water supply infrastructure

#### *Lower Priority*

- Develop criteria for prioritizing town road and culvert projects based on climate resilience
- Track performance of private drinking water wells so that potential groundwater supply issues can be identified early.
- Publicize information about water conservation and potential impact of climate change on drinking water supplies.
- Evaluate feasibility of removal of dams throughout town. Two dams on the Mill River—the Brassworks dam and the dam upstream of Village Hill Road—have very high potential ecological benefit according to DER's Dam Removal and Ecological Benefit Evaluation Tool.<sup>2</sup> The dam on the Hopkins property above Village Hill Road has been partially removed but still constricts the flow of the river.

<sup>2</sup> The tool compares the ecological benefit of dam removal for dams statewide. The two dams rank in the 95th percentile. See: <https://mass-eoea.maps.arcgis.com/apps/MapTools/index.html?appid=f573dc437265480f87e31f413e527a3c>

## Societal

### Highest Priority

- Map hazards in the Town to a greater level of detail, including vulnerable power lines and houses that are vulnerable to tree damage. Combine these maps with an evaluation of the town's most vulnerable people to prioritize improvement actions.
- Advocate for an update to FEMA floodplain maps throughout the town.
- Engage young people and new residents in volunteerism, including recruiting them for town committees, as appropriate
- Expand outreach to new volunteers
- Continue to streamline the work of town boards and committees to reduce volunteer burnout. Increase opportunities for gatherings among various boards and committees to share information, coordinate actions, and build social connections.
- Create a packet of information about climate resilience and use it for outreach and education efforts to local townspeople and landowners
- Upgrade zoning ordinances to encourage development patterns that will reduce climate vulnerability, increase the town's tax base, and foster social connections.

### Moderate Priority

- Sign up more people for code red
- Maintain lists of most vulnerable populations to be visited or contacted in case of emergencies
- Commit to annual town events (i.e. Town Picnic) to reinforce and strengthen town ties
- Require fire ponds and/or hydrants for significant developments through subdivision regulations

- Support local businesses. They provide essential services during emergencies, build social cohesion, and contribute to local culture, and strengthen the local economy

### Lower Priority

- Continue to train emergency services personnel to ensure they are ready for natural hazard events
- Evaluate and implement strategies in the Town's healthy aging plan
- Protect important town records and artifacts—both those that are the Town's responsibility and those that are owned by the Historical Society.
- Develop a rideshare program for older adults to strengthen social connections and mobility
- Allow detached accessory dwelling units (ADUs) in climate resilient locations
- Create incentives for property owners to invest in climate resilience of their rental properties, including insulation and weather proofing, tree trimming, flood protection, installation of generators and/or generator tap boxes

## Environmental

### Highest Priority

- Conduct an ecological assessment of the impact of invasive species, and develop a management plan
- Create a Mill River Watershed Council to oversee opportunities for regional, watershed-based land management policies and strategies
- Complete Mill River watershed study identifying priority areas for flood storage, as well as strategies for reducing runoff volume and velocity
- Create a Forest Management Plan for both town-owned and private lands, including educational materials for land management.
- Work with area land trusts to inventory and prioritize parcels for additional conservation.

- Develop/update local bylaws to include consideration of increasing frequency and intensity of storm-related riverine flooding.

#### *Moderate Priority*

- Protect or acquire additional floodplain land along Route 9

#### *Lower Priority*

- Adopt a resolution to limit use of neonicotinoid insecticides in Williamsburg.
- Promote utilization of MassSave and other building energy efficiency programs. More efficient houses both mitigate climate change by reducing energy consumption but also maintain comfortable temperatures for a longer time in case of emergencies
- Promote efficient wood heating systems. These can improve air quality, mitigate climate change by reducing energy consumption, reduce pressure to harvest local forests, and increase household resilience in case of a power outage or disruption to fossil fuel sources.

## 8. POSSIBLE FUNDING SOURCES

Funding for implementation from public sector sources could include:

- MVP Implementation grants from Massachusetts Executive Office of Energy and Environmental Affairs, ranging from \$10,000 - \$2,000,000 are available to municipalities upon completion of the MVP planning process
- Massachusetts Emergency Management Agency (MEMA) grants
- FEMA's Hazard Mitigation Grant Program (HMGP)
- MassWorks Infrastructure grants from Massachusetts Executive Office of Housing and Economic Development
- Massachusetts Division of Ecological Restoration's Culvert Replacement Municipal Assistance grants
- Dam and Seawall Repair or Removal grants from Massachusetts Executive Office of Energy and Environmental Affairs, which addresses inland flood control infrastructure as well as coastal features
- Massachusetts Department of Environmental Protection 604b Water Quality Management Planning Grants
- Other state funds for land conservation
- EPA grants
- See additional grant opportunities on the Massachusetts Community Grant Finder at <https://www.mass.gov/lists/community-grant-finder>

## RECOMMENDATIONS FROM 2016 HAZARD MITIGATION PLAN<sup>1</sup>

Recommendations included:

- Replace problem culvert on Depot Rd.
- Evaluate whether to become part of FEMA's Community Rating System.
- Identify sources of funding for dam safety inspections.
- Participate in regional debris management plan.
- Implement top recommendations of Open Space and Recreation (OSRP) and Capital Improvement Plan (CIP)
- Educate owners of properties in floodplain about NFIP.
- Stay abreast of, and adopt as needed, new floodplain management regulations, including limits on new and substantially improved construction in Special Flood Hazard Areas.
- Conduct floodplain identification and mapping, including local requests for map updates.
- Fire Safety pamphlet and distribution.
- Culvert inspections.
- Municipal water interconnection aid agreement.
- Portable emergency electric power.

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<sup>1</sup> Town of Williamsburg Hazard Mitigation Plan Update 2016.  
Prepared by the Pioneer Valley Planning Commission.

## 2019 OPEN SPACE AND RECREATION PLAN

The Open Space Committee is currently in the process of re-writing Williamsburg's Open Space and Recreation Plan, which was last updated in 2011. Top findings from the ongoing process include:

- Much of Williamsburg's most important wildlife habitat, water resources, and climate change resilient lands are located in the northeast and southwest corners of town and much of this land is protected, though additional protection could link areas of protected land.
- There is limited land protected along the Mill River, though much of this resource is noted as priority habitat for rare and endangered species and town residents value the river as a key recreational asset.
- Approximately 30% of Williamsburg (4,900 acres) is permanently protected.
- Most protected land is forested including significant acreage owned as watershed protection land by the City of Northampton (1,500+ acres) and Town of Williamsburg (700 + acres).
- Development in Williamsburg is centered along Route 9 and the Mill River. This is likely the part of town most vulnerable to flooding – a likely local impact of climate change.
- Management of forest land in Williamsburg is inconsistent and a topic about which many landowners and concerned residents would like more information.

## CRB WORKSHOP INVITEES AND PARTICIPANTS

*\*Indicates participation in group workshop exercises*

First	Last	Entity
Amy	Bisbee*	Planning Board
Bill	Sayre*	Select Board
Bill	Turner*	Town Highway
Brenda	Lessard*	Clerk, OPM (Public Safety Complex)
Brett	Towler*	Mill River Greenway Committee (MRGC)
Catherine	Ratte*	Pioneer Valley Planning Commission
Charlene	Nardi*	Town Administrator
Charles	Dudek*	Zoning Board of Appeals
Daria	Darlenzo*	COA/Meekins Library
Dave	Christopolis	Hilltown Community Development
Dave	Mathers*	Select Board
Dave	Weber*	MRGC, Williamsburg Woodland Trails Committee
Dean	Acheson	Council on Aging
Denise	Banister*	Select Board, Emergency Management Director
Denise	Wickland*	Chief of Police, OPM (Public Safety Complex)
Emily	Slotnick*	Pioneer Valley Planning Commission
Eric	Bloomquist	Mill River Greenway Committee, Open Space
Eric	Weber*	Historical Society
Gaby	Immerman*	Mill River Greenway Committee
Gerald	Mann*	Zoning Board of Appeals
Jason	Connell*	Fire Chief, OPM (Public Safety Complex)
Jason	Soukop*	Police Department
Jean	O'Neil*	PB, OPM (Public Safety Complex)
Jennifer	Hoffman	Senior Center Director
Jim	Ayres*	OPM (Public Safety Complex)
Joe	Rogers*	Conservation Commission
Kenley	Clark*	Open Space
Kim	Boas	OPM (Public Safety Complex)
Marcianna	Caplis*	Zoning Board of Appeals, Conservation Commission
Margaret	McCarthy*	Council on Aging
Markelle	Smith*	Open Space
Mary	Dudek*	Energy Committee, Conservation Commission
Matt	Chase*	VHB Civil Engineering
Mitch	Cichy*	OPM (Public Safety Complex)
Nick	Dines*	Mill River Greenway Committee, Community Development Advisory Committee (CDAC)
Paul	Kennedy	Open Space, Zoning Board of Appeals
Paul	Wetzel	Finance Committee, OPM (Public Safety Complex)
Phil	Merritt*	Merritt Tree Farm
Robert	Reinke*	Police Department
Sally	Loomis*	Open Space, CDAC

## ACKNOWLEDGEMENTS

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## MVP PROJECT TEAM

Organization	Name	Role
Mill River Greenway Committee (Chair)	Gaby Immerman	MVP Core Team Leader
Mill River Greenway Committee	Nick Dines	MVP Core Team Leader
Emergency Management Director, Select Board	Denise Banister	MVP Core Team
Planning Board (Chair)	Amy Bisbee	MVP Core Team
Conservation Commission (Chair)	Marcianna Caplis	MVP Core Team
Open Space Committee (Chair)	Sally Loomis	MVP Core Team
Town Administrator	Charlene Nardi	MVP Core Team
Highway Superintendent	Bill Turner / Dan Banister	MVP Core Team
Dodson & Flinker	Peter Flinker	MVP Provider, Facilitator
Dodson & Flinker	Dan Shaw	MVP Provider, Facilitator
Dodson & Flinker	Dillon Sussman	MVP Provider, Facilitator
Dodson & Flinker	Allison Gramollini	MVP Provider, Facilitator
Pioneer Valley Planning Commission	Emily Slotnick	Facilitator

## CITATION

Town of Williamsburg (2020). Community Resilience Building Workshop Summary of Findings. Town of Williamsburg, Dodson & Flinker, Inc. Williamsburg, MA



# Community Resilience Building Risk Matrix



www.CommunityResilienceBuilding.com

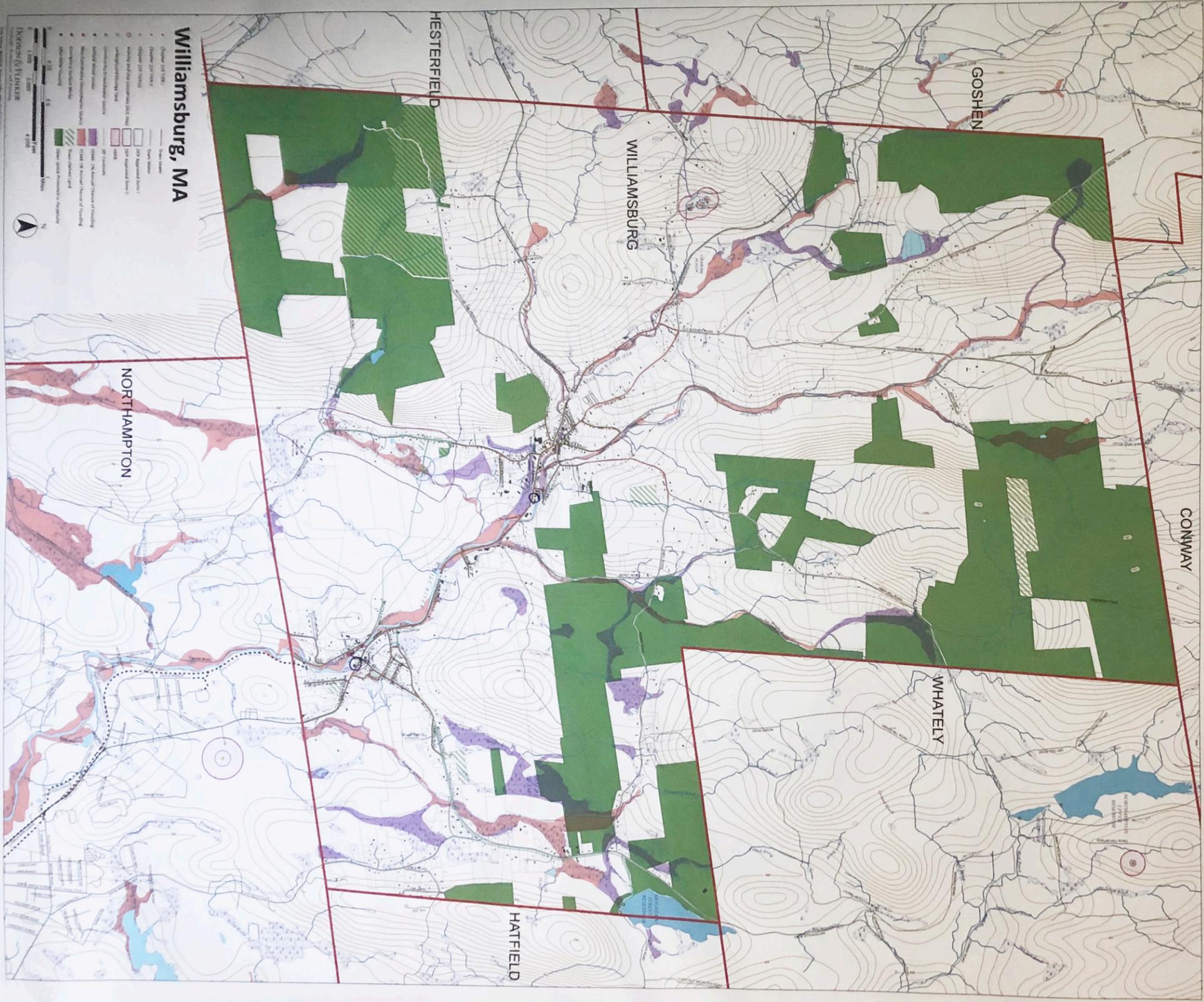
H-M-L priority for action over the Short or Long term (and Ongoing)  
 V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Heavy storms + flooding	Winter storms Ice storms	Deforestation + loss of natural resource	Priority		Time	
							H-M-L		Short	Long Ongoing
<b>Infrastructural</b>										
Emergency communication <small>- Can call list with power lines on poles Call towers - 3 radio call/text</small>	Town-wide	Town	S	Expand police with 800 band radios (ideally 6+)	Underground power lines					
Route 9 vulnerable to flooding	Rt 9 (see map)	MA (ROW Private)	V	Encourage DOT to enhance Rt 9 redesign for max. flood + stormwater mgmt.		Acquire land along river + tributaries for conservation		H *	S	
Insufficient emergency facilities		Town	V	New Public Safety Complex w/ stormwater mgmt. feature		resilient features		H *	S	
Traffic flow - Vulnerable b/c of limited routes through town (large vehicles can't detour)	Rt 9	MA	V	Strategic comprehensive plan w/ regulatory assessment inclusive of traffic, economics, ecology + stormwater, + implementation				H *	S	
Electrical infrastructure	Town-wide	Town/utility	V	Study (as part of above?) to assess feasibility of undergrounding						
Great elementary school <small>+ library (also used as a community space)</small>	See map	Town	S	Solar panels on school roof for backup power						
<b>Societal</b>										
Organization + community engagement	Town-wide		S	Commit to annual town events (ie. Town Picnic) to reinforce/strengthen community ties				L	S	
Technical knowledge <small>- lots of local experts</small>	Town-wide		S							
Risk of losing businesses/tax base <small>- loss of maple sugarbush</small>			V	Job-training programs to pass local business ownership on to younger generations				M/L	S/O	
Aging population			V	Rideshare program for seniors Allow unattached ADUs				.	S	
Lack of affordable housing			V	Strategic comprehensive planning to assess housing req/zoning (among other topics)						
NOT Strong local/retail economy			V	Alter/Strategic comprehensive plan w/ regulatory assessment incl. economic, ecological, affordable housing, stormwater, zoning factors, etc.				H *	S	
<b>Environmental</b>										
Invasive species: Japanese Knotweed <small>(affects stream banks)</small>	River		V	Strategic watershed river management study (part of Rt 9 project or separately)				H	S	
Forest concerns (potential for deforestation + land use change)	on steep slopes	private	V	Strategic comprehensive plan w/ regulatory assessment to assess ecological concerns + economic, stormwater, housing, traffic				H	S	
Lots of protected land			S	Inventorying + prioritizing parcels for additional conservation - current Ch. 61 + others				H	S	
Tick/s/vector-borne diseases			V	Town-wide invasive species survey				H	S	
Solar development (threaten landslides)			S/V	Participate in ongoing regional conversation about pros/cons of solar dev. + regulation				M	S	
Pollinator loss			V	Regl. for pollinator habitat mitigation similar to wetland mitigation bylaws						



Table 2



# Community Resilience Building Risk Matrix



www.CommunityResilienceBuilding.com

H-M-L priority for action over the Short or Long term (and Ongoing)  
 V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Heavy Equipment - a lot in town	Location	Ownership	V or S	Extreme Precipitation (flooding)	SEVERE WINTER STORM (+ flooding)	DROUGHT / EXTREME TEMPS	WIND (SHORT DURATION HIGH INTENSITY)	Priority	
									H-M-L	Time
<b>Infrastructural - AT Dunphy School Building - functions w/ em. cen as em. shelter</b> - at 9, Depot Rd culvert, 143 (side) Adams Rd., dirt roads, dead-end roads										
<b>Roads, CULVERTS, BRIDGES</b>				S+V	Every project must address elevation - estimate vulnerability factor		Develop project review criteria for climate resilience	Remove hazard trees on Pelt and 4th + 2nd St would have become dangerous because of shoreline erosion + straightening		
<b>Utilities - ELECTRICAL, MUM WATER</b>		2 wells, 2 water tanks on S. Street, line too small for sprinkler systems, dead-ended lines + limited loops		SV				Review local drought management operations/plans + ensure residents w/ private wells have adequate information + resources.		
<b>COMMUNICATIONS SYSTEMS</b>		no back up in town, could use more sign-ups? - new VOIP system relies on internet - power house phones/land lines - radio tower in Gordon = poor reception + channel congestion - cell dead areas		S/V				Participate in regional drought management plan		
<b>EMERGENCY SERVICE PERSONNEL</b>		no water training or equipment w/in fire of police, + no space		S/W	regional problem! City of Northampton					
<b>Reservoir (Mtn. Street) Earthen Dam</b>				✓						
<b>Gas Station, Fuel (Diesel + Propane)</b>		Lumberland farm, gas station, fuel garage (George's in Gordon)		✓ + flooding						
<b>Societal</b>										
<b>Ageing Population</b>		Wachusett Plaza (elderly fixed income housing) - has community room, gas meter		V	Get young people involved in planning + policy making in town. Engage young people with adults working on climate issues.					
<b>2 Veterinary offices</b>				S/V				Involve students from A.T. Dunphy School in public library session		
<b>School-Aged Population</b>		school buses disrupted b/c of climate		S/V	outreach to high school to invite students to participate in local committees					
<b>Lack of Social Trust</b>										
<b>POTENTIAL FOR OUTWARD MIGRATION</b>		lack of institutional knowledge								
<b>School</b>				S						
<b>DECLINING VOLUNTEER POOL + WORKFORCE</b>		Lacking non-motorized transportation infrastructure								
<b>FINANCIAL VIABILITY OF BUSINESSES</b>		N/A - connects + no attempt at services								
<b>SENIOR CENTER</b>		cooling center, lunch, meals on wheels, weekend meals, communication hub, vanpool (volunteer driver), mini-clinics		S						
<b>Environmental</b>										
<b>Forests</b>		uplands reduce flood impacts downstream	Private + Public					Propose new bylaw/updates bylaw to include riparian impacts, riparian floodplain as area of critical risk like coastal zone management plan		
<b>Water Supply</b>								work w/ Gordon for water, waterfield, etc		
<b>Wetlands - help mitigate flooding, improve drinking water</b>								conduct a comprehensive watershed assessment + identify opportunities for protection to public stormwater education, flood storage, etc		
<b>Mill River + Resource Area</b>				S/V				Review + revision of zoning ordinance, including stormwater requirements, + separate review analysis of steep slopes + riparian resource area		
<b>Recreational facilities - trails, fields</b>								Flood study to identify properties along Mill River to provide increase flood storage		
<b>Conservation lands - Chbl, permanently protected</b>								Lead or attract to riparian water projects		
<b>Agriculture - Saphire farm, etc.</b>				S/V				Pilot project to test out opportunities for regional watershed-based land management		

That flood w/ limited...  
 No full-time staff...  
 for run heating/cooling...  
 fridges

Flooded basement...  
 Main...  
 Kingsley Ave...  
 water coming down...  
 down...  
 kill rd...  
 Gordon Rd

Road flooded by...  
 Adams Rd + Depot...  
 at 5 @ small...  
 near Craig's Hwy...  
 on st. streams...  
 BA Kingsley Ave + High st.

Rising Ground Water Supply - Risk to H2O quality

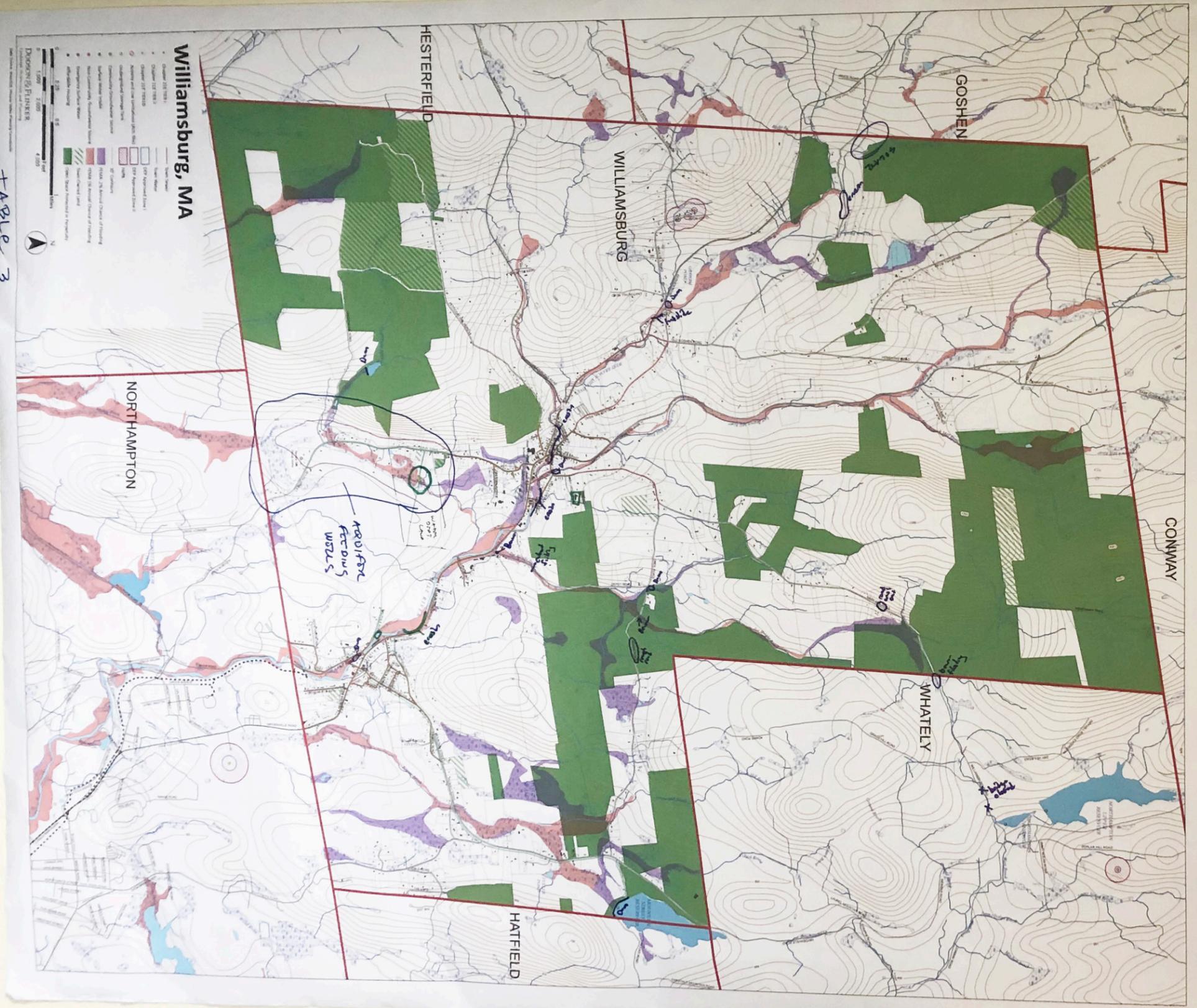
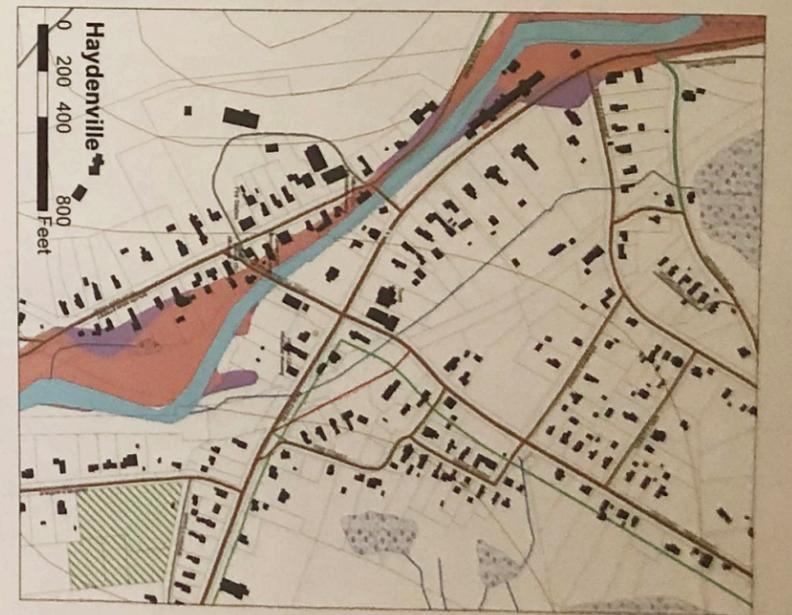


TABLE 3

Community Resilience Building Risk Matrix



www.CommunityResilienceBuilding.com

H-M-L priority for action over the Short or Long term (and Ongoing)  
 V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	MILL RIVER EROSION (esp. Rt. 9)	SEVERE WEATHER EVENTS	INVASIVE SPECIES	VECTOR-BORNE DISEASE	Priority	
								H-M-L	Short Long Ongoing
<b>Infrastructural</b>									
ELECTRICAL GRID	TOWN-WIDE	NAT'L GRID	V/S		PRUNING TREES	CUT DISEASED TREES + REPLACE		M-H	O
WATER MAINS + SEWER LINES (UNDER-SIZED; UNDER RIVER BED)	WILLIAMSBURG + HYCO/VINE	TOWN	V/S	MOVE VULNERABLE LINES	" "			H	S
ROADS - KEY EVALUATION RTES. (RT. 9; DEPOT/ADAMS; SOUTH ST; 145)	TOWN-WIDE	TOWN + STATE	V/S	SUPPORT MADOT PUNISH TO FIX 9	REPLACE CULVERTS + KEEP EVAL. RTES IN SHAPE			H	O
BRIDGES + CULVERTS (esp. DEPOT RD; OLD GOSHEN ROAD)	TOWN-WIDE	TOWN/STATE	V	" "	" "			H	O
DAMS + OLD MILL WALLS	MILL RIVER + BROOKS	PRIVATE	V	FORM MAP UPDATES ASSESSMENTS	STREAM GAUGES (WARNING)				
SOLAR PROJECTS	TOWN-WIDE	PRIVATE	S		ENHANCE EROSION CONTROL INSPECTION + MAINTENANCE				
<b>Societal</b>									
ELDERLY			V/S		ENHANCE OUT REACH		* CONTINUOUS WORKING WITH FRCOY		
DISABLED (INCLUDING TEMPORARY)			V				* HEALTH PROGRAMS		
PUBLIC TRANSPORTATION		RTA	S	MAINTAIN RT. 9			* MOSQUITO DISTRICTS		
PUBLIC HEALTH (WATER, AIR, FOOD, DISEASE)			V/S		MAINTAIN RT. 9.				
VOLUNTEER STRUCTURES + SERVICES			V/S	REMOVE ALL TENT KEEPS	TRAINING: CHAIN SAW SAFETY - CULVERT PUMPING - SANDBAGGING				
FINANCIAL RESOURCES		TOWN + IND.	S/V	TRAIN + SUPPORT TOWN STAFF EQUIPMENT + EMERGENCY FUND.					
<b>Environmental</b>									
FORESTED LAND		MOST PRIVATE	S/V		BRING IN FORESTRY EXPERTS	ASSESS FOREST HEALTH		M	L
WATER QUALITY (RIVERS, STREAMS, DRINKING WATER)			S		PROTECT KEY OPEN SPACES (LOS R.P.)				
WILDLIFE CORRIDORS		LAND TRUSTS	S		PROTECT + ST. POND BUFFERS	ANNUAL ASSESSMENTS		M	L
WETLANDS		PUBLIC + PRIVATE	S					M	L
AGRICULTURAL BASE		PRIVATE							

SOLAR PROJECTS WILL IMPACT 200 ACRES OF LAND.

W FORESTS TOO LAND PROTECTS FLOODING

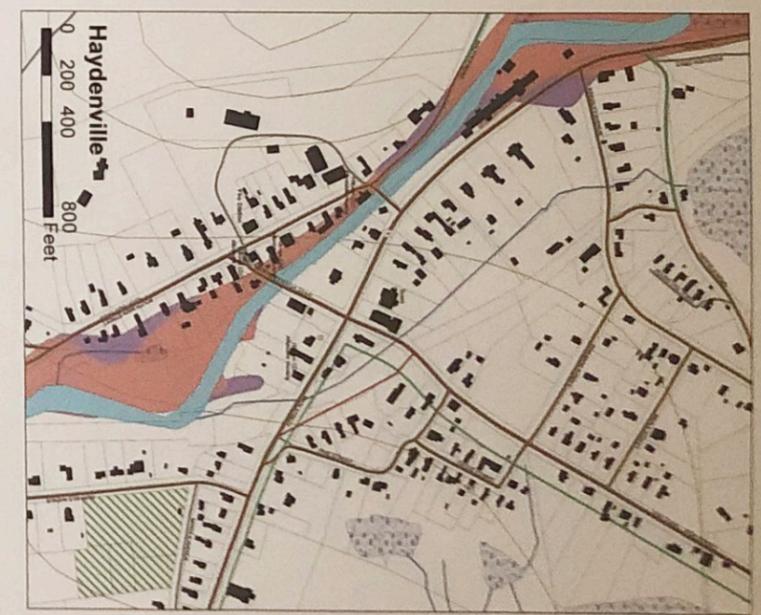
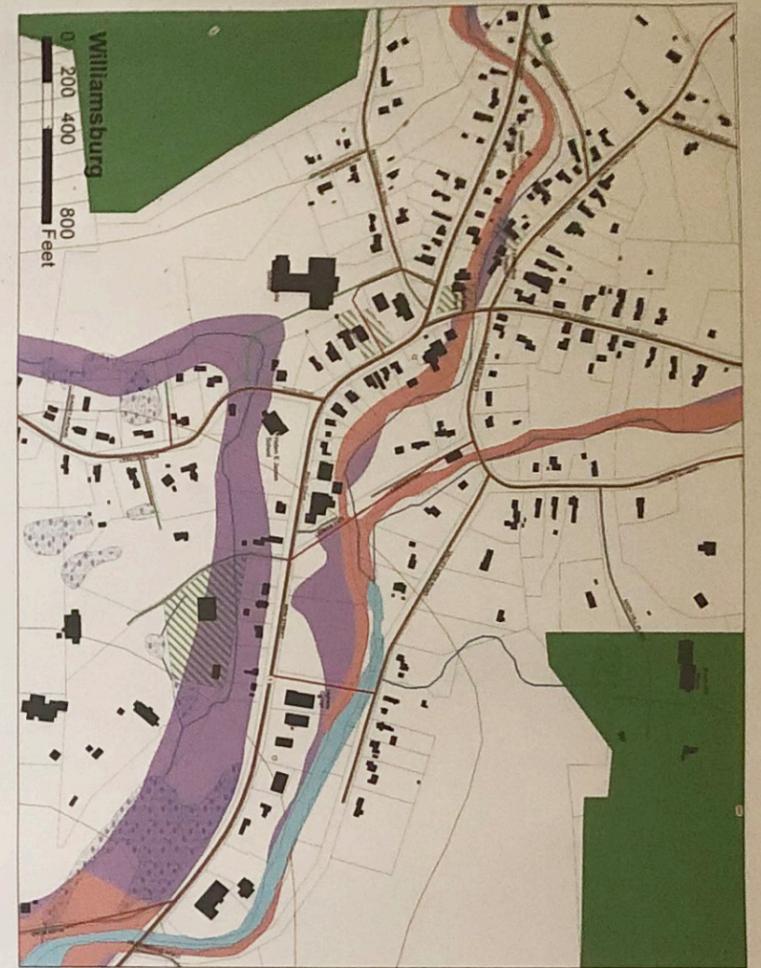


TABLE 4

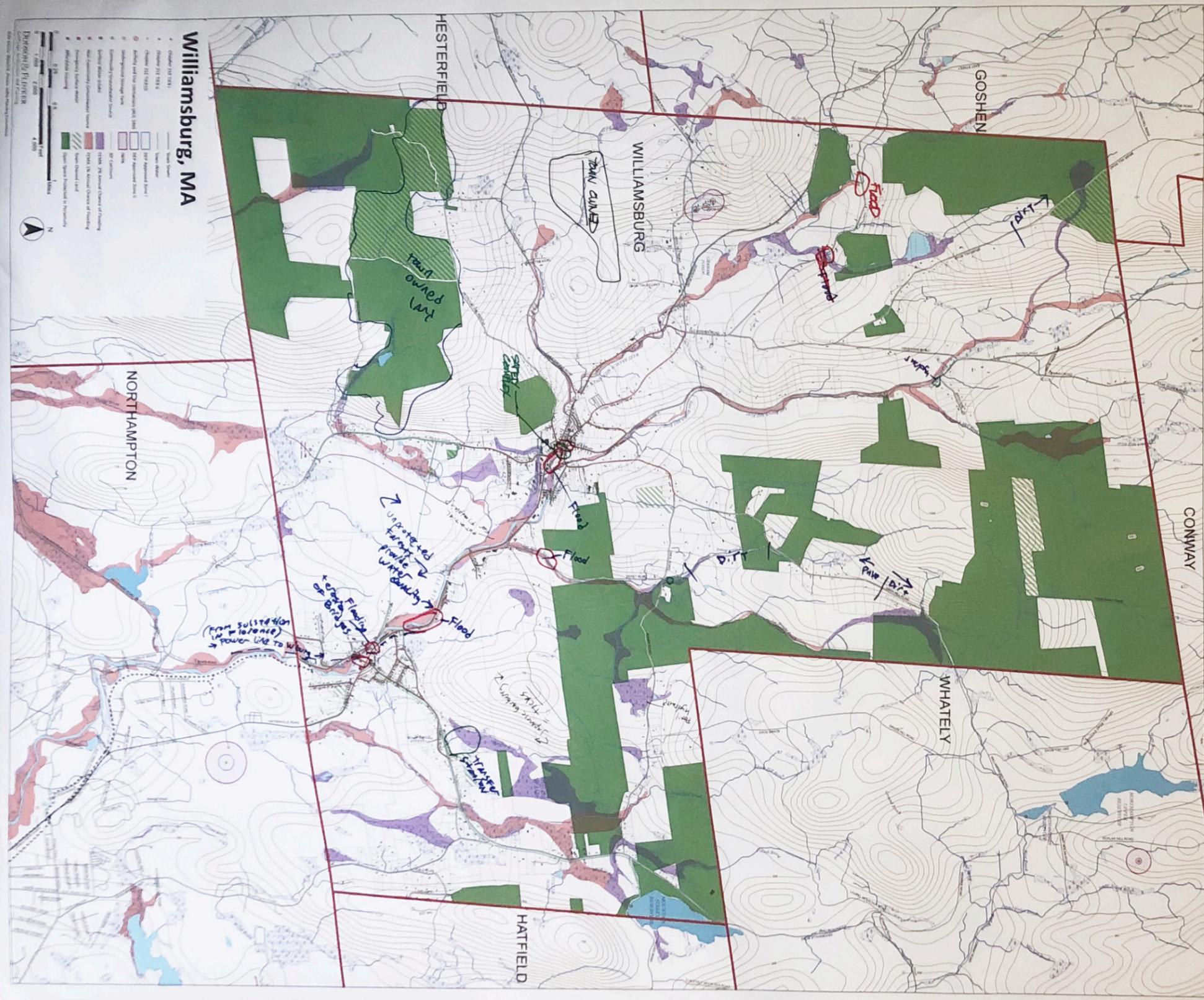


TABLE # 4

Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.com					
H-M-L priority for action over the Short or Long term (and Ongoing)				Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)					
V = Vulnerability S = Strength				pests/vector borne illness	SEVERE STORMS (RAIN) + Flooding	WINTER STORMS, ice	Heat waves + Drought	Priority	Time
Features	Location	Ownership	V or S					H-M-L	Short Long Ongoing
<b>Infrastructural</b>									
RT 9	corridor	STATE	V/S		ACUTE ADD'L Floodplain along RT 9				
Bridges (on map)	Specific (on map)	STATE-All but Dept Rd	V		Upgrade priority culverts + bridges to serve as evacuation and sized for more stormwater			M*	0
Flood risk of future pub. safety	Comp. James School	TOWN	V		Grow infrastructure for public safety complex site design			H	S
Power grid	All over	NAT. grid/verion	V		more detailed solar bylaws designate areas as appropriate for solar, etc.	transmission along power lines		M	S
Water + sewer lines	specific roads, RT 9	TOWN	V		LARGER/BETTER WATER MAIN IN RT9			H	S
4 SOLAR ARRAYS, + Generators AT TOWN FACILITIES	(specific)	Solar-private Generator TOWN	S						
<b>Societal</b>									
Elderly	Scattered, growing	private	V					M	0
Children	Schools, homes, outdoors		V	education prevention				M	0
Renters	Village centers	landlords w/TOWN CDC	V		mostly in village centers so include green infrastructure Area Rentals		Quality housing, heating, A/C for renters	M	0
SELF SUFFICIENCY + COMMUNITY support, churches, soc. orgs - veterans			S						
Carless	Village centers		V		encourage/allow more clustered development in village centers			M	0
Isolated homes out in Hills etc	RURAL	PRIVATE	V/S				fire pads + hydrants in rural areas		
TOWN RECORDS	OLD TOWN HALL	TOWN	V		RELOCATE TOWN RECORDS				
<b>Environmental</b>									
INVASIVE/colonizer plants decline in native plants/species	widespread		V	invasive species threat for landowners encourage them to use NRCS funds, build mulch	manage private lands along river or purchase floodplain lands			H	0
pests/blights (trees)	"		V						
Vector Borne diseases	"		V	control burberry etc tick habitat introduce tick-eating animals??	public edu on preventing mosquitoes			H	0
Air Quality	"		V	Forest Mgmt plan			more efficient wood heating		
Forest Management	The Forest Rural		V/S		plans for forest management to increase age + species diversity			H	0
Water Quality/Water supply lands on map			V		participate with northwestern on land/forest management plans				
River erosion/debris dams etc	River		V				increased protection of water supply watersheds not just borders		

Master Plan High Priority (H) 5/0

Have a town master plan solar bylaws, wood shed, water supply lines, forest management, security in village, water supply, water lines

FARMERS:  
 • Incorporate more farming (in decline)  
 • Integrate conservation + farm land protection incentives

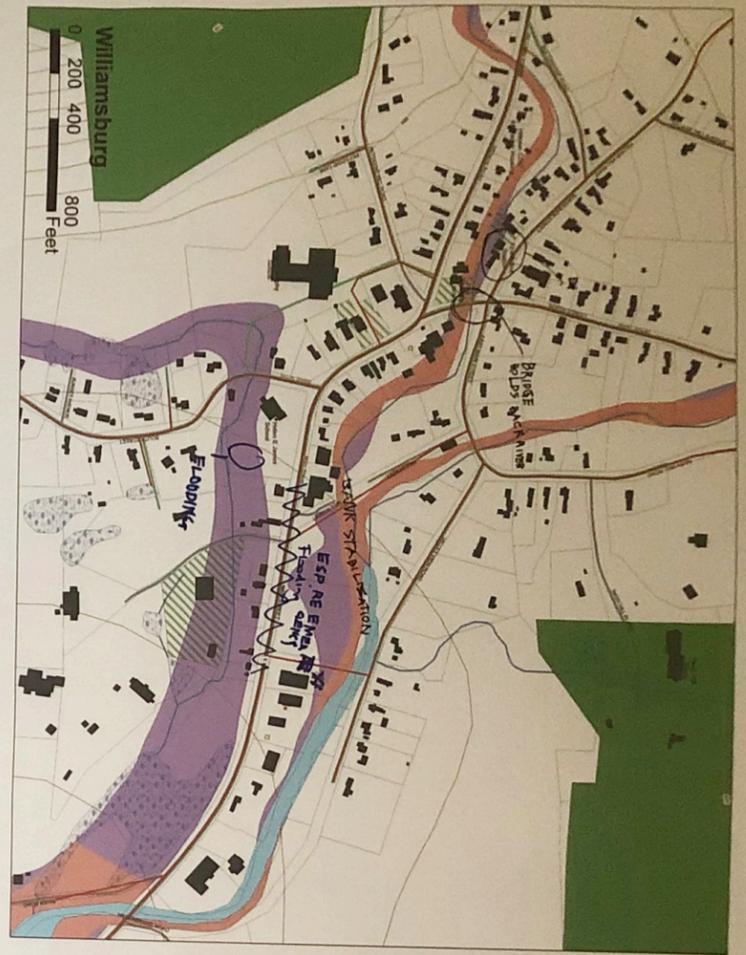
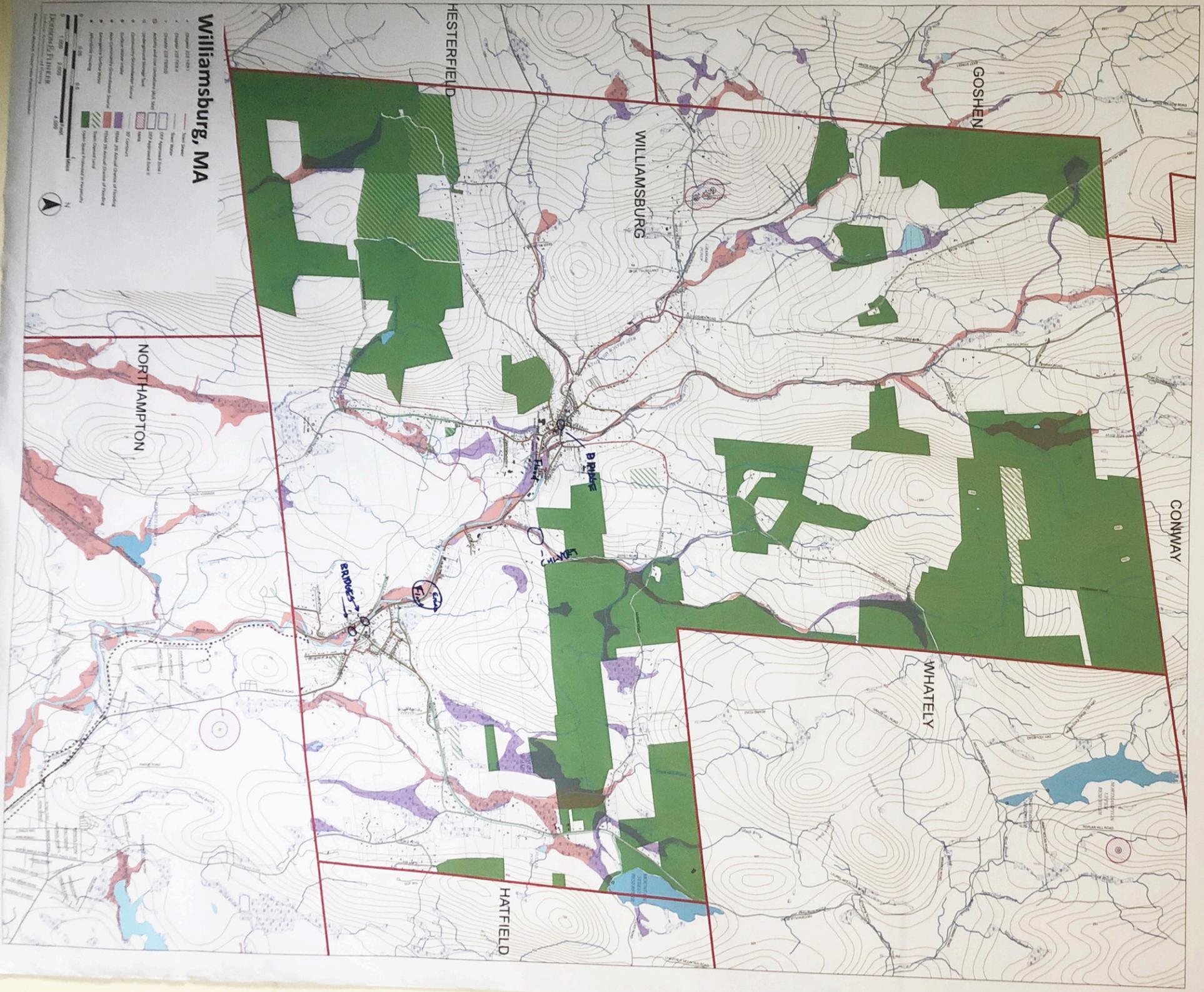


TABLE 5



# Community Resilience Building Risk Matrix



H-M-L priority for action over the Short or Long term (and Ongoing)  
 V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Building.com	
				Priority	Time
				H-M-L	Short Long Ongoing

Infrastructural Town's trends go out at different times

<b>POWER DISTRIBUTION</b> → may be able to power backup but not if	ROADS OPEN TO ROAD IN WINTER TOWN WHERE ARE MAIN LINES		V/S	SCAM BATTERY BACKUP	MICROGRIDS R.M.	RISK MAP FOR POWER OUTAGE		
<b>ROADS</b> → HAZARDOUS → ADDS TO FLOOD RISK & TRAFFIC JAMMING	ROADS - SHAKY	MAYBE OUT TOWN? MAYS OPT	V	WORK W/ MAYS OPT				
<b>CULVERT AT DEPT RAMP</b>	IN WILLY ROAD BRIDGE	TOWN	V					
<b>ROUTE 9 AT WOODHOLLOW</b> → FLOODING IN SEVERE → COULD IMPACT FUTURE PUBLIC JAMMING, CONSTRUCTION → COULD IMPACT SITE	WOODHOLLOW BRIDGE	WILLY DOT / PRIVATE	V			ROUTE 9 R.M. ESPECIALLY ADDS COM TO ROUTE 9 CULVERT ETC.		
<b>FIRE STATION WILLIAMSBURG</b> → INADEQUATE + MODERN AT GRADE → POTENTIAL FOR FLOODING	ROUTE 9	TOWN	V					
<b>FIRE/PLUMBER STATION HAZARDOUS</b> → INADEQUATE + COULD BE CUT OFF BY BRIDGE FAILURE	IN WILLY ROAD	TOWN	V					
<b>NEAR 3 BRIDGE</b> → BRIDGE → COULD BE OVERTOPPED BY FLOODS	NEAR 3 BRIDGE	TOWN?	V			RESOLVE UPSTREAM FLOW EVALUATE		
<b>PRIVATE WELLS</b> → NO POWER → NO WATER, BUT REDUNDANCY	RURAL AREAS	PRIVATE	S/V					
<b>MILL RIVER GREENWAY/ROUTE 9 PROJECT</b> → PROJECT IN PROCESS	HAZARDOUS → WILLY ROAD	STATE MAYS DOT PRIVATE	S/V					

## Societal SENIOR CENTER

<b>VOLUNTEERS</b> → BUILD COMMUNITY BUT HAS TO OFFER SERVICES, OVERWORKED, NOT ENOUGH VOLUNTEERS	ALL		S/V					
<b>PEOPLE WHO SPEND TIME OUTSIDE</b> → OUTDOOR PEOPLE - FOREST, FARMERS, GARDENERS, MENTAL HEALTH BENEFITS, TOWN LIVABILITY	WILLY ROAD - EXT FOREST - TREES TRAIL	MIXED	V/S					PUBLICIZE, GRANT, MANAGE HABITAT
<b>ELDERLY</b> → PEOPLE DEPENDENT ON ELECTRICITY & HEALTH	ALL / WILLY ROAD	ALL	V			EXPAND VOLUNTEER ON TREES & MANAGEMENT EXPAND HEAT HEALTH IMPACT, OUTREACH		
<b>CAR DEPENDENCY</b> → RURAL LIVABILITY → CURRENTLY VOLUNTEER TRANSPORTATION FOR ELDERLY	MEL EST. PUBLIC RELATIONS, LOW WAGE		V					
<b>COMMUNITY RAISES IN MAJOR EVENTS</b> → BUT NOT FOR LOCAL MAINTENANCE EVENTS			S/V					
<b>SCHOOL / LIBRARY</b> → COMMUNITY CONNECTIONS		TOWN	S					
<b>NO CELL SERVICE</b> → LOCAL POPULATION → BUT TRUCKS PASS → COULD BE USED FOR COMMUNICATION IN EMERGENCY	ROUTE 9S (LONG)	TOWN + PRIVATE	V					

## Environmental POLLUTANTS

<b>FORESTS</b> → MODERATE TEMPS, CLEAN WATER → PROBLEMS WITH WATER → VULNERABLE TO TRENDS FROM TEMPS / PRECIPITATION CHANGE, IMPACTS, FOREST FLORA → GETTING INTO GOOD FACILITY → MAY BE IMPACT WILDLIFE	VARIOUS	TOWN, NEIGHBORHOOD PRIVATE, COMMERCIAL ONLY, PRIVATE, COMMERCIAL	S/V			FOREST MANAGEMENT: POLICY FOR LANDSCAPES - OUTREACH		TOWN RESOLUTION RE NEW (NIC) / PESTICIDES
<b>GROUNDWATER - WELLS</b>	ALL	PRIVATE	S/V					
<b>HAZARDOUS MATERIALS</b>	MN/SE - TOWN	MIXED	S					
<b>PROXIMITY OF ROUTE 9 TO RIVER</b> → HAZARDOUS MATERIALS → ASH TO OIL, OIL TANKS WATER IN FACILITIES	WILLY ROAD MIL - TOWN FACILITY		S/V			ADAPT LOCAL WETLANDS BYLINE TO RIVER		EVALUATE MIL AREA FOR FLOOD MANAGEMENT, GROUND, ETC. FOR NATURE BIODIVERSITY
<b>BEAVER RAMP GOLF COURSE AS FLOOD STORAGE</b>	ROUTE 9 NEAR LANE	BEAVER BROW GOLF	S/V					
<b>PINCH POINTS ON RIVER</b> → VULNERABLE TO BACKUP WITH TREES			V					
<b>FOREST MANAGEMENT</b> → REPORTS INCONSISTENT	VARIOUS	MIXED	V/S?			FOREST MANAGEMENT PLAN - TOWN CALLED		INSPECT TREES NEAR BUILDINGS
<b>SCAR FARMS</b> → CUTTING TREES			V/S?					

WILLY RIVER WATERSHED

FLOODING

LOSS OF FOREST - LAND USE CHANGES

FOREST DIEBACK

SEVERE WEATHER EVENTS

INVASIVE SPECIES

VECTOR-BORNE DISEASES

Building.com

rise, heat wave, etc.)

CULVERT ROUTE 9

FIRE STATION

TICKETS & VECTORS - DISEASES

RT - 100

EDUCATE RESIDENTS / REGIONAL WATERSHED COUNCIL

REVISE LARGE JOBS ZONING ZONES

# APPENDIX B: COMPILED MATRIX

Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org							Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)					
H-M-L priority for action over the Short or Long term (and Ongoing) V = Vulnerability S = Strength				Priority	Time											
Features	Location	Ownership	V or S	Priority	Short	Long	Ongoing	Floding	Severe Storms	Winter Storms/ Ice Storms	Wind (Short Duration, High Intensity)	Loss of Forest	Drought	Invasive Species, Vector-Borne Disease		
<b>Infrastructural</b>																
Emergency Communication	Town-wide	Town	S					Expand police access to 800 band radios with patch capability - one per officer (6 needed) plus one base unit for station	Underground power lines (in cooperation with neighboring communities that share power infrastructure, i.e. Northampton)						M	S/O
Route 9 vulnerable to flooding	Route 9 (see map for focus area)	State road; private land adjacent	V					Advocate for DOT to enhance planned Route 9 redesign project by designing for highest possible flood scenario, and incorporating additional stormwater management features						Acquire land along river and tributaries for conservation	H	S
Insufficient emergency facilities	16 S. Main St, 5 N. Main St. (see map)	Town	V					New Public Safety Complex with storm-resilient features i.e. backup energy supply, stormwater mangement features							H	S
Limited routes through town/reliance on Route 9 for transporation and evacuation	Route 9	State road; private land adjacent	V					Strategic comprehensive plan with regulatory assessment to address traffic issues, housing, economics, ecology and stormwater, plus implementation strategies (possible funding for staffing)							H	S
Electrical infrastructure	Town-wide	Town, utility	V					Assess feasibility of undergrounding power lines to reduce vulnerability during storms, in cooperation with neighboring towns that share infrastructure (i.e. Northampton)							M	L
Great library and elementary school - connect residents and serve as emergency shelters	See map	Town	S					Add solar panels to school roof for backup energy supply during storms							M/L	S
Roads, Culverts, Bridges	Rt 9, Depot Rd Culvert, Rt 143, Adams Rd, Dirt Roads, Dead-end Roads		S/V					Every project must address elevation, climate vulnerability factor		Develop project review criteria for climate resilience	Remove hazard trees on Petticoat Hill and Route 143 which have become dangerous because of shoreline erosion and sloughing					
Utilities - Electrical, Municipal Water (2 wells, 2 water tanks on South Street, line too small for sprinkler systems, dead ended lines and limited loops)			S/V											Review local drought management operations/plans, ensure residents with private wells have adequate information and resources. Participate in regional drought management plan		
Communication Systems: VOIP system relies on Comcast; fewer house phones/land lines; radio tower in Goshen = poor reception and channel congestion; cell phone dead areas			S/V					Code Red intact; could use more sign-ups								
Emergency Service Personnel: No water training or equipment within fire or police, and no space			S/V													
Reservoir (Mountain Street) Earthen Dam			V													
Gas Station (Cumberland Farm, Ross Brothers), Diesel and Propane Fuel (Hwy Garage, George's in Goshen)			V													
Electrical Grid	Town-Wide	National Grid	V/S						Prune Trees					Cut diseased trees and replace	M-H	O
Water Main & Sewer Lines (Under-sized; under riverbed)	Williamsburg and Haydenville (village centers)	Town	V/S					Move vulnerable lines							H	S

Roads - key evacuation routes (Rt. 9, Depot/Adams, South St., 143)	Town-Wide	Town and State	V/S	Support MassDOT plans to fix Route 9	Replace culverts and keep evacuation routes in shape						H	O
Bridges and Culverts (esp. Depot Rd and Old Goshen Rd)	Town-Wide	Town/State	V	Support MassDOT plans to fix Route 9	Replace culverts and keep evacuation routes in shape						H	O
Dams (V) & Old Mill Walls (S)	Mill River and Brooks	Private	V	FEMA Map Updates and Assessments	Stream Gauges (warning)							
Solar Projects	Town-Wide	Private	S		Enhance erosion control inspection and maintenance							
Route 9: major evacuation route, located in floodplain	Corridor	State	V/S	Acquire Additional Floodplain Along Route 9	Town Master plan: solar bylaws, water supply lands, forest management, density in village centers, smaller lots, CPA					H	S	
Bridges	See Map	State (except Depot Rd.)	v	Upgrade priority culverts and bridges to serve as evacuation and sizes for more stormwater							M	O
Flood Risk of Future Public Safety Complex/James School		Town	V	Green infrastructure for Public Safety Complex site design							H	S
Power Grid	Town Wide	National Grid/Verizon	V	More detailed solar bylaws, designate areas as appropriate or not for solar, design, etc.	Trimming along power lines					M	S	
Water and Sewer Lines	Specific Roads, Rt. 9	Town	V	Larger/Better Water Main in Rt. 9							H	S
4 Solar Arrays and Generators at Town Facilities	Specific	Solar - Private; Generators - Town	S									
Power distribution: new solar could provide backup but currently doesn't; town systems go out at different times; route 9 curve at snack shack	Tends to go out in neighborhoods, rather than whole town		V/S	Solar battery backup microgrids		Risk map for power outages						
Haydenville - access to fire/police and Town Hall shelter	Snack Shack, South Main + Bridge St	MassDOT, town?	V	Work with MassDOT								
Culvert at Depot Rd	Depot Rd: 1/4 mile from Route 9	Town	V	R.M. especially adjacent to Route 9 culverts etc.								
Route 9 at Worthington Ave: flooding during Irene could impact future public safety complex and crosstown evacuation if built at Helen E. James site	Worthington Air Auto	MassDOT, private	V									
Fire Station, Williamsburg: inadequate	S. Main + Bridge St.; N. Main + North St.	Town	V									
Fire/Police Station, Haydenville: inadequate and could be cut off by bridge failure; potential for flooding	S. Main St.	Town	V									

North Street Bridge, Williamsburg: could be overtopped; holds back river	North Street near Meekins Library	Town?	V					Reduce upstream flow - evaluate				
Private wells: No power --> no water, but redundancy	Rural areas	Private	S/V					Evaluate				
Mill River Greenway/Route 9 - Project in progress	Haydenville to Williamsburg	MassDOT	S/V									
Buildings	Everywhere			Risk MPSP - Trees especially Helen E. James site								

Societal												
Organization and community engagement	Town-wide		S	Commit to annual town events (i.e. Town Picnic) to reinforce and strengthen community ties							L	S/O
Technical knowledge - lots of local experts	Town-wide		S									
Risk of losing businesses/tax base (as local retailers retire and/or close)	Town-wide		V	Job-training/mentoring/apprenticeship programs to pass local business ownership on to younger generations							M	S/O
Aging population	Town-wide		V	Rideshare program for seniors to strengthen community connections and mobility; allow unattached ADUs to add housing options								
Lack of affordable housing	Town-wide		V	Strategic comprehensive plan with regulatory assessment to address traffic issues, housing, economics, ecology and stormwater, plus implementation strategies (possible funding for staffing)							H	S
Weak local/retail economy	Town-wide		V	Strategic comprehensive plan with regulatory assessment to address traffic issues, housing, economics, ecology and stormwater, plus implementation strategies (possible funding for staffing)							H	S
Town staff and volunteers are an asset, but no full-time staff to run heating/cooling shelter, or other facilities			S/V									
2 churches that provide community services are in floodplain			V									
Aging Population	North Hill Place (elderly/fixed-income housing)		V	Get young people involved in planning and policy-making in town, engage young people with adults working on climate issues --> involve students from AT Dunphy School in public listening session, outreach to high school to invite students to participate in local committees								
School-Aged Population: School being disrupted b/c of climate, lack of autonomy, outdoor activity			S/V									
Lack of Social Trust			V									
Potential for Outward Migration - lack of institutional knowledge			V									
School			S									
Declining Volunteer Pool and Workforce			V									
Lacking Public Transportation			V									

Declining Financial Viability of Businesses			V									
PVTA connects to Northampton and services			S									
Senior Center: cooling center, provides lunch			S									
Elderly			V/S			Enhance outreach					Continue working with FRCOG health programs	
Disabled (including temporary)			V/S								Continue working with FRCOG health programs	
Public Transportation		PVTA	S	Maintain Route 9								
Public Health (water, air, food, disease)			V/S			Maintain Route 9					Mosquito Districts	
Volunteer Structures and Services			V/S	Reverse 911 text alerts		Training: Chainsaw Safety, Cellar Pumping, Sandbagging						
Financial Resources		Town and Individual	S/V	Train and support town staff - equipment emergency fund								
Elderly: population may be isolated during storm events	Scattered, growing	Private	V								M	O
Children	School, homes, outdoors		V							Education, prevention	M	O
Renters	Village Centers	Landlords, Hilltown CDC	V	Mostly in village centers - include green infrastructure around rentals							M	O
Self-sufficiency and community support, churches, orgs, village centers			S									
Carless residents	Village Centers		V	Encourage/allow more clustered development in village centers							M	O
Town Records	Old Town Hall	Town	V	Relocate town records								
Farmers	Town wide			Incentivize more farming (in decline); integrate conservation and farmland protection and incentives								
Isolated homes in Hills	Rural	Private	V/S						Fire ponds and hydrants in rural areas			
Volunteers: builds community, but hard to staff boards, overworked, not enough volunteer firefighters	All		S/V	Expand volunteer outreach and management; expand heat health impacts outreach**								
People who spend time outside: farmers, gardeners, foresters; contributes to mental/physical health, town livability	Wetlands, trails, fields: EEE, ticks	Mixed	V/S	**						Publicize, educate; manage habitat		
Elderly, people dependent on electricity for health	Town wide		V	**								
Car dependency (currently there is volunteer transportation for elderly)	Town wide, especially rural areas		V									
Community rallies in major events, but not for "normalized" events; volunteer/community burnout	Town wide		S/V									
School/Library: key social connectors, emergency shelters	Williamsburg center	Town	S									
Route 143: no cell phone service, these people could be out of communication in an emergency	Route 143 (parts of)	Town and private	V									
Businesses concentrated in flood prone area	Village centers	Private	V									
<b>Environmental</b>												
Invasive species - Japanese knotweed and others	Many locations, especially riverbanks		V	Strategic watershed management study, as part of the Route 9 project or separately; town-wide invasive species survey							H	S
Forest concerns: potential for deforestation, land use change due to rising temperatures	Town-wide	Private	V	Strategic comprehensive plan with regulatory assessment to address traffic issues, housing, economics, ecology and stormwater, plus implementation strategies (possible funding for staffing)							H	S
Lots of protected land	Town-wide		S	Inventory and prioritize parcels for additional conservation, especially Ch. 61 parcels								
Ticks and vector-borne diseases	Town-wide		V	Strategic comprehensive plan with regulatory assessment to address traffic issues, housing, economics, ecology and stormwater, plus implementation strategies (possible funding for staffing)							H	S
Solar development - can threaten landslides when steep slopes are cleared	Town-wide		V/S	Participate in regional conversation about pros/cons of solar development and regulation							M	O
Pollinator loss	Town-wide		V	Strategic comprehensive plan with regulatory assessment to address traffic issues, housing, economics, ecology and stormwater, plus implementation strategies (possible funding for staffing)							H	S
Forests: uplands reduce flood impact downstream		Private and Public								Propose new bylaw/updated zoning bylaw to include riverfront impacts, using 500 year floodplain as area of concern/risk. Like coastal zone management plan, include steep slope considerations		
Water Supply, Wetlands (help mitigate flooding, improve drinking water)				Complete a comprehensive Mill River watershed assessment to identify priority areas for protection to provide stormwater reduction, flood storage etc. in collaboration with Chesterfield, Goshen, other watershed towns						Vector-borne disease risk assessment/impact study and mitigation plan		
Mill River and resource area			S/V	Review and revision of zoning ordinance, including stormwater requirements, review and analysis of steep slopes and riverfront resource area. Flood study to identify properties along Mill River to provide/increase flood storage								
Recreational Facilities: trails, fields			S									

Conservation Lands: Ch. 61, permanently protected lands				Pilot project to look at opportunities for regional, watershed-based land management						
Agriculture: Sapphire Farm, etc			S/V							
Rising ground water supply - risk to water quality										
Forested Land		Most private	S/V	Bring in forestry exports				Assess forest health	M	L
Water Quality (rivers, streams, drinking water)			S	Protect key open spaces (OSRP)						
Wildlife Corridors		Land Trusts	S	Protect and expand floodplain buffers					M	L
Wetlands		Public and Private	S	Protect and expand floodplain buffers					M	L
Agricultural Base		Private								
Invasive/colonizer plants, decline in native plants/species	Widespread		V	Manage private lands along river or purchase floodplain lands				Invasive species management for landowners, encourage them to use NRCS funds, build awareness	H	O
Pests/Blight (Trees)	Widespread		V							
Vector Borne Diseases	Widespread; Transfer Station		V	Public education on preventing mosquitoes				Control barberry etc (tick habitat). Introduce tick-eating animals? Anticipate next disease vector animal and prevent	H	O
Air Quality	Widespread		V			More efficient wood heating				
Forest Management	Forest, rural areas		V/S	Plans for forest management to increase age and species diversity; Partner with Northampton on land/forest management plans				Forest Management Plan	H	O
Water Quality/Water supply lands	See Map		V					Increased protection of water supply watersheds, not just buffers		
River Erosion/Debris jams, etc.	River		V							
Pollinators	Town wide		V					Town resolution re: pesticides		
Forests: moderate temps, clean water, absorb stormwater. Vulnerable to trees dying from temperature/precipitation change, invasives, forest fires, cutting for solar farms, unclear management	Various	Town, City of Northampton, private, conservation organizations, forestry companies	S/V	Forest management: information for landowners, outreach						
Groundwater wells	Town wide	Private	S/V							
Intact ecosystems	NW/SE	Mixed	S							
Proximity of Route 9 to river			S/V	Consider selected conservation; adopt local wetland bylaw for river				Consider selected conservation; adopt local wetland bylaw for river		
Hazardous materials/facilities near river: auto oil, oil tanks, water in facilities	Worthington Air, Cichy's Garage		V	Consider selected conservation; adopt local wetland bylaw for river				Consider selected conservation; adopt local wetland bylaw for river		
Beaver Brook: golf course as flood storage; pollutants?	Route 9 near town line	Beaver Brook Golf Course	S/V							
Pinch points on river vulnerable to backup with trees			V							
Inconsistent forest management - cutting for solar farm development	Various	Mixed	V/S			Inspect trees near buildings		Forest management plan for town-owned land; revise large-scale solar zoning		
Mill River Watershed			V/S	Educate residents; regional watershed council				Forest management plan for town-owned land		

# Williamsburg Municipal Vulnerability Preparedness (MVP)

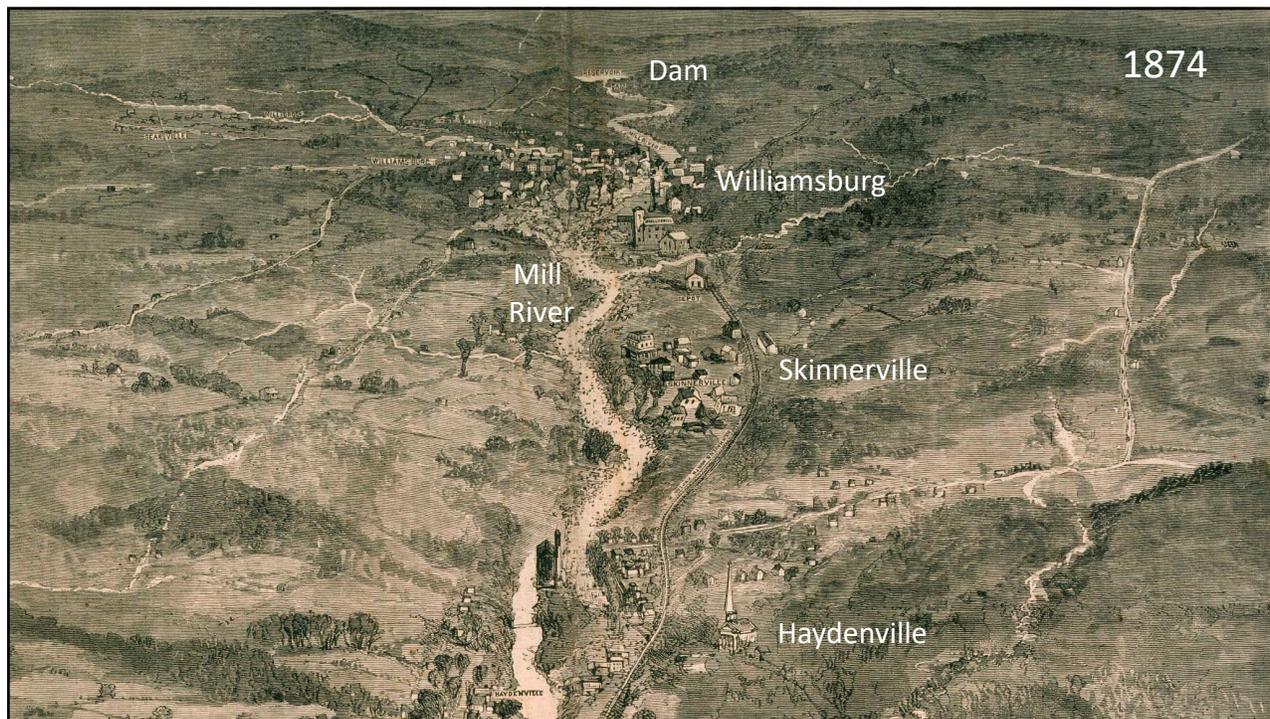
Workshop 1

1

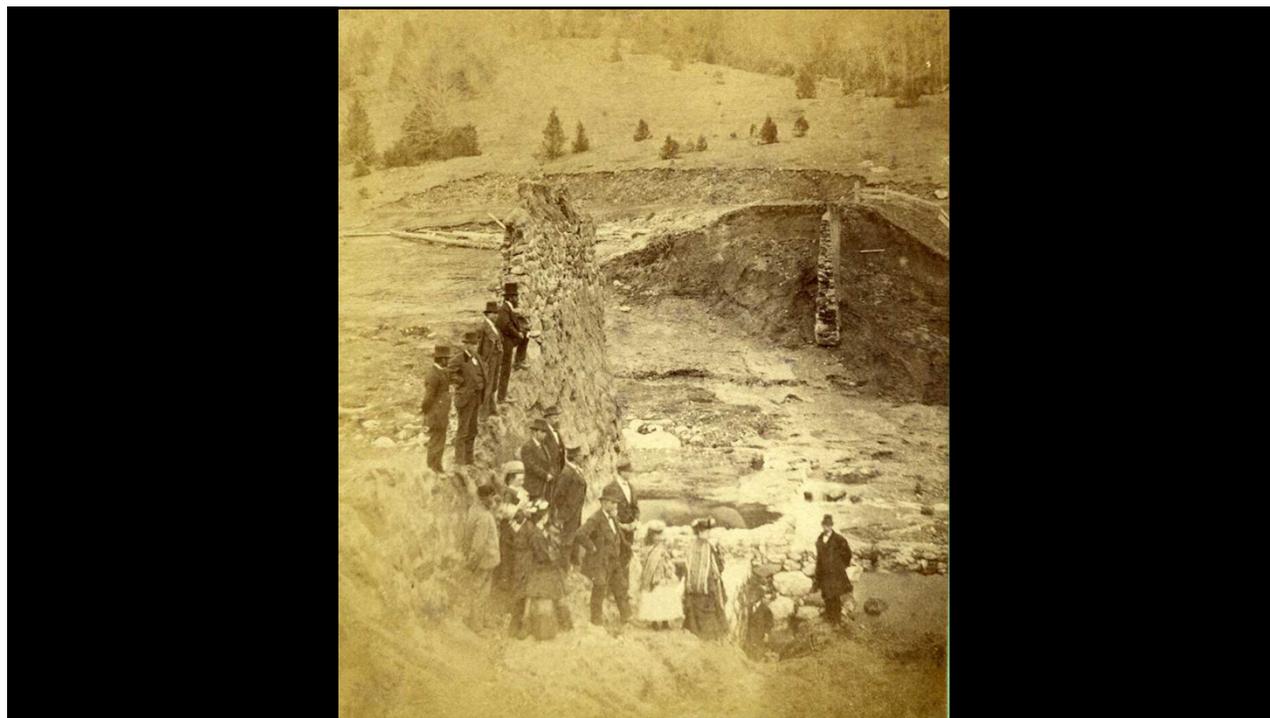
## Tonight's Agenda

- 5:30 PM** Dinner and Welcome
- 5:45 PM** Introductory presentation during dinner
- 6:15 PM** Large group discussion: Identify past, current, and future hazards
- 6:30 PM** Small group discussions: Determine top-priority hazards
- 7:15 PM** Small group discussions: Identify community vulnerabilities and strengths (infrastructural, societal, environmental)

2



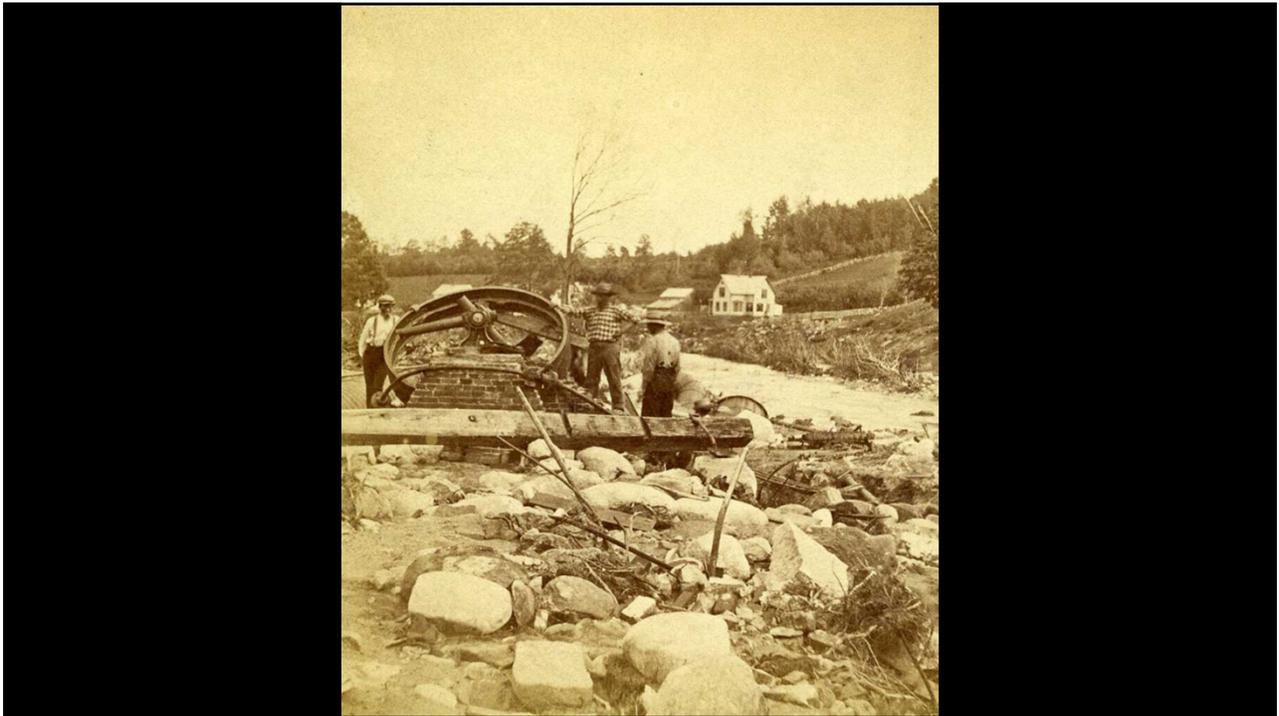
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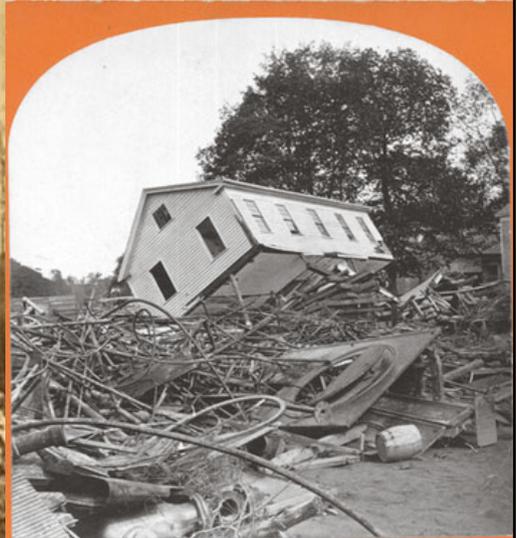
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5



6



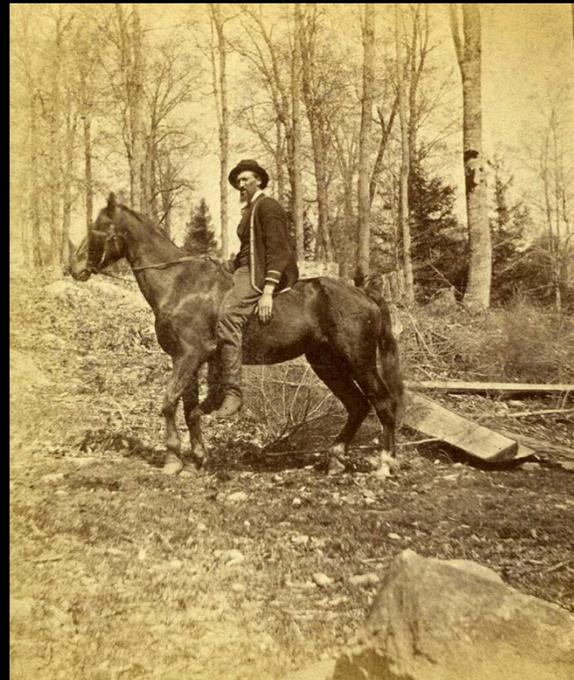
7

What would you do to Prepare?  
A faster horse? More riders?

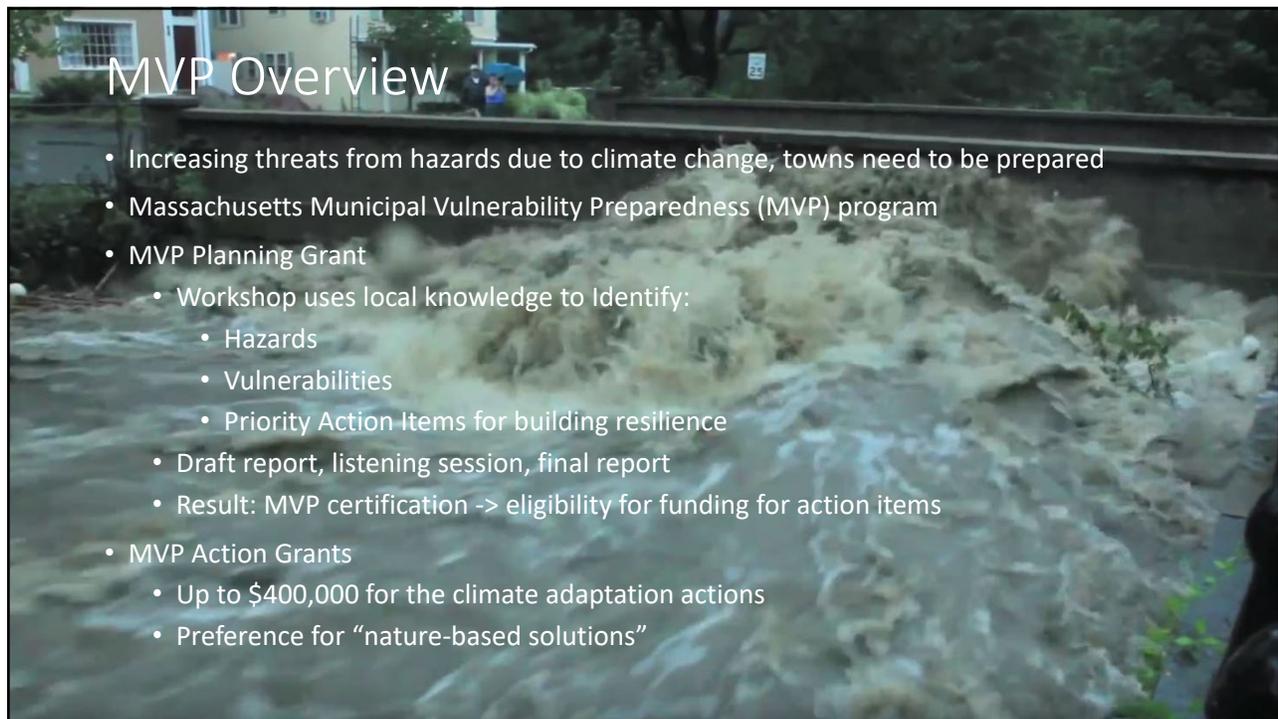
Build a stronger dam?

Build the villages far from the Mill  
River?

Plant trees in the uplands so that  
rain doesn't move so quickly into  
the reservoir?



8



## MVP Overview

- Increasing threats from hazards due to climate change, towns need to be prepared
- Massachusetts Municipal Vulnerability Preparedness (MVP) program
- MVP Planning Grant
  - Workshop uses local knowledge to Identify:
    - Hazards
    - Vulnerabilities
    - Priority Action Items for building resilience
  - Draft report, listening session, final report
  - Result: MVP certification -> eligibility for funding for action items
- MVP Action Grants
  - Up to \$400,000 for the climate adaptation actions
  - Preference for “nature-based solutions”

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## Definitions

- **Hazard:** something with the potential to harm infrastructural, societal, or environmental features.
- **Vulnerability** = The thing that will be harmed by a hazard. Includes how often and how severe the harm.
- **Resilience** = the capacity to anticipate, absorb, accommodate or recover quickly from the effects of a hazardous event

10



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# Hazards

(Adapted from SHMCAP and Williamsburg HMP)

 <u>Inland flooding</u>	 <u>Drought</u>	 <u>Wildfire</u>
 <u>Invasive species</u>	 <u>Average and Extreme Temperatures</u>	
 <u>Hurricanes/Tropical Storms</u>	 <u>Severe Thunderstorms, Wind, Tornadoes, Microbursts</u>	
 <u>Severe Winter Storm/Nor'easter</u>	 <u>Other Severe Weather</u>	
 <u>Landslide</u>	 <u>Dam Failure</u>	

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High Risk and Medium Risk Hazards  
According to Williamsburg Hazard Mitigation Plan, 2016

 <u>Inland flooding</u>	 <u>Drought</u>	 <u>Wildfire</u>
 <u>Invasive species</u>	 <u>Average and Extreme Temperatures</u>	
 <u>Hurricanes/Tropical Storms</u>	 <u>Severe Thunderstorms, Wind, Tornadoes, Microbursts</u>	
 <u>Severe Winter Storm/Nor'easter</u>	 <u>Other Severe Weather</u>	
 <u>Landslide</u>	 <u>Dam Failure</u>	

13

But will the future look like the past?

Trends from past century

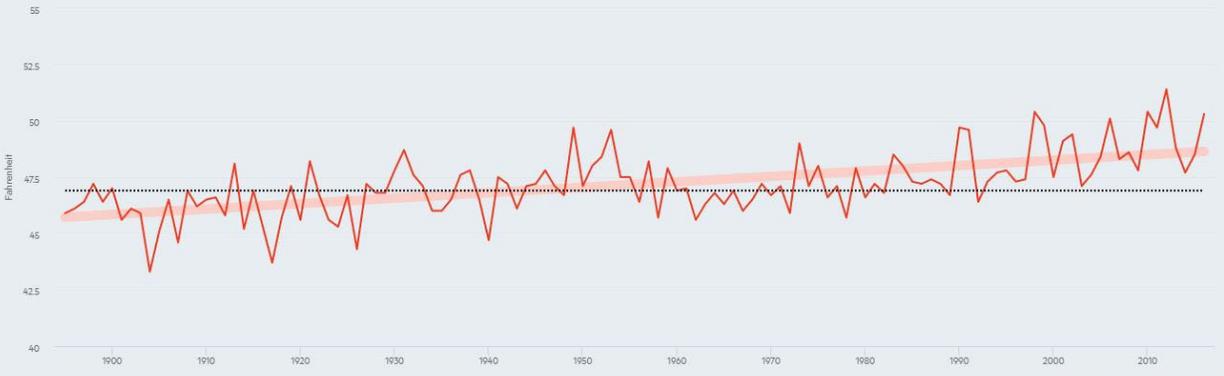
14

Annual air temperatures in the Northeast have been warming at an average rate of 0.5°F (nearly 0.26°C) per decade since 1970. Winter temperatures have been rising at a faster rate of 0.9°F per decade on average.

--"Massachusetts Climate Change Projections" by  
Northeast Climate Science Center at the University of Massachusetts

## Annual Temperature Average

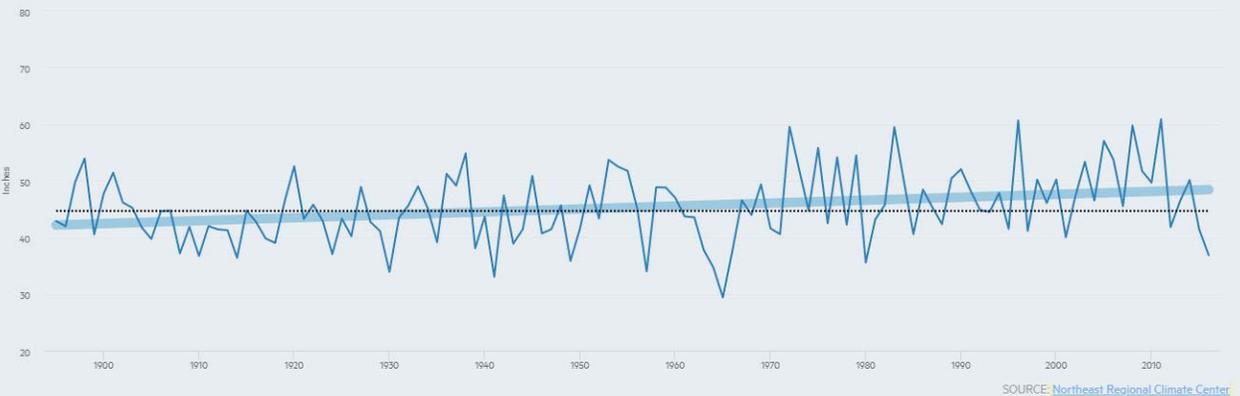
Massachusetts Boston\* Worcester\* Blue Hill Edgartown



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## Annual Precipitation

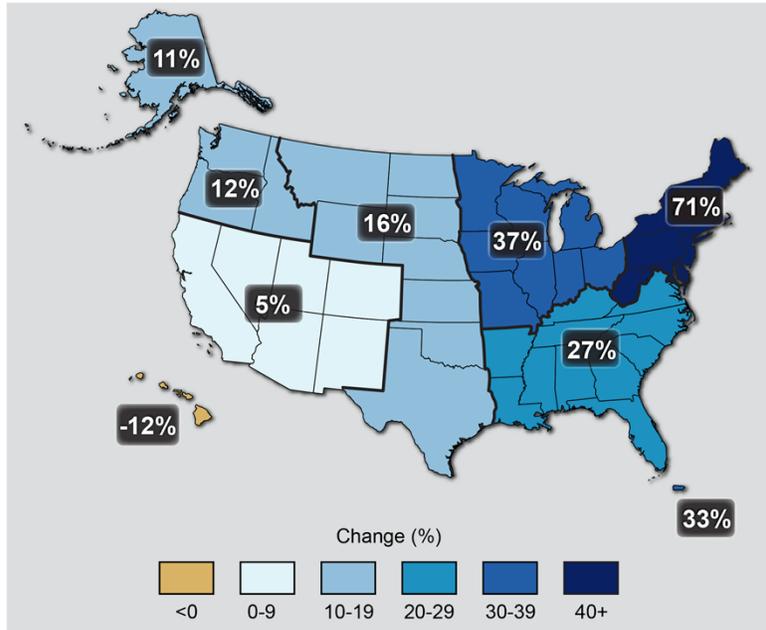
Massachusetts Boston\* Worcester\* Blue Hill Edgartown



16

Percent increase in precipitation falling in heaviest 1% of all daily precipitation events. 1958-2012

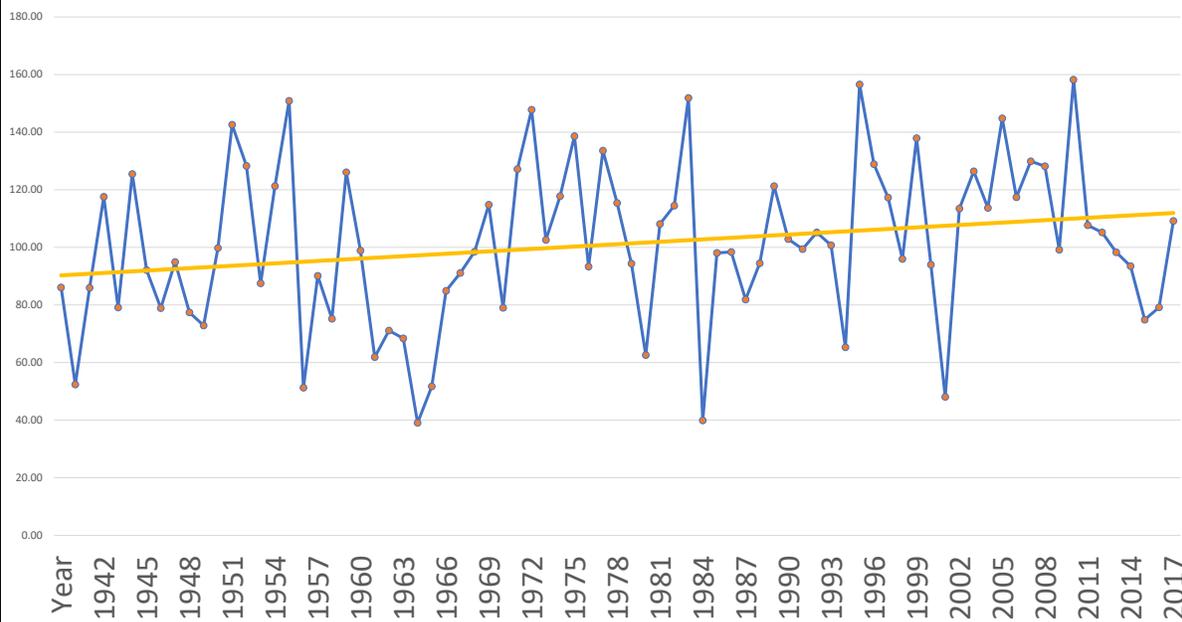
Observed Change in Very Heavy Precipitation



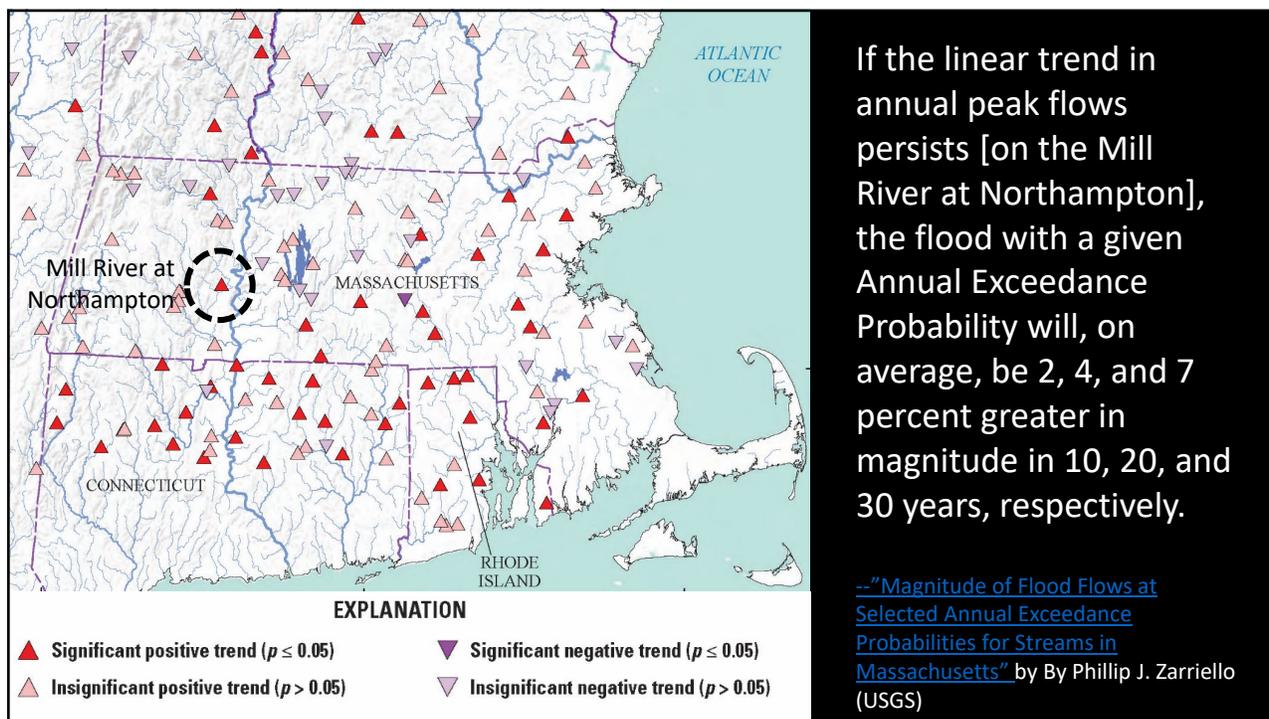
Source: Third National Climate Assessment

17

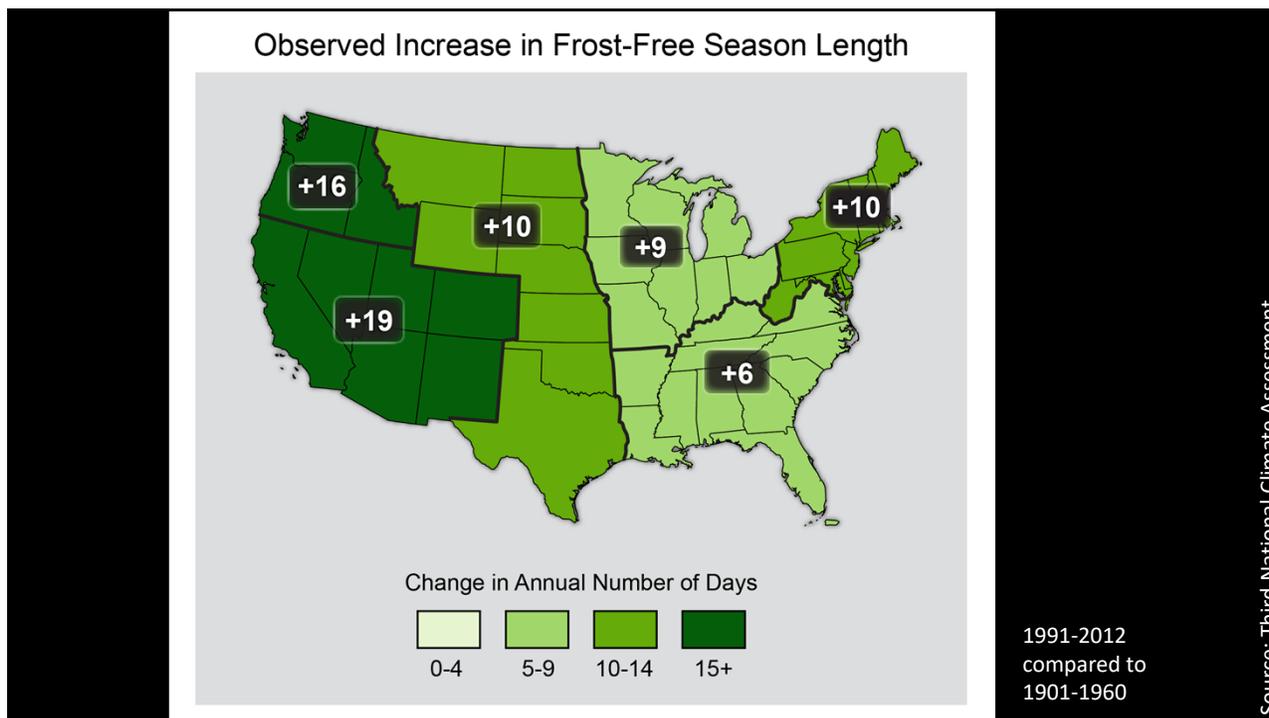
Average Annual Discharge (cfs) (1938-2018)  
Mill River at Clement Street Bridge, Northampton



18



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20

## But will change be linear?

### Projections of impacts of climate change

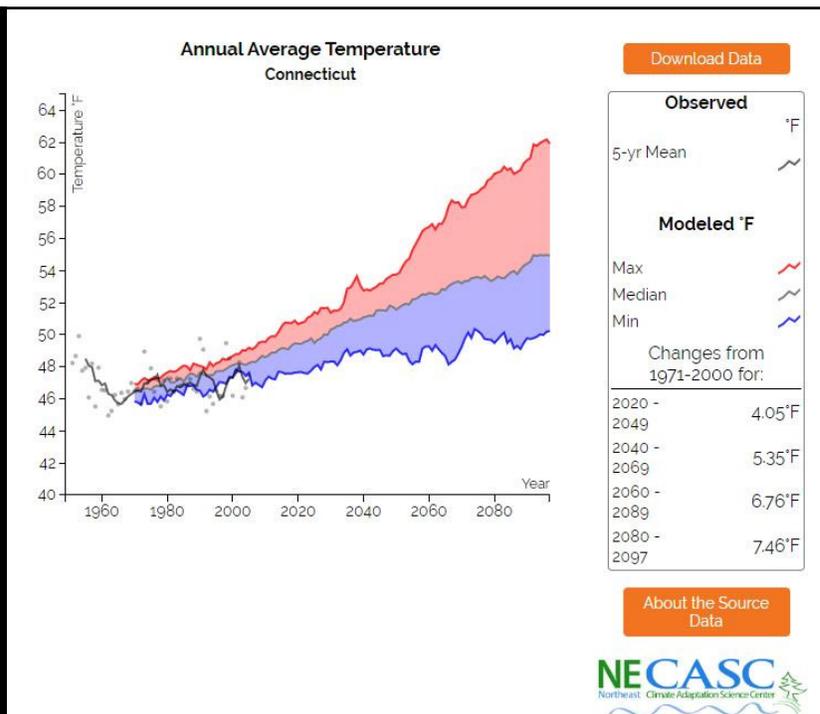
- Based on computer models
- Developed for Massachusetts by Northeast Climate Center at Umass Amherst

21

## Expected in Connecticut River Basin by mid-21st Century

*\*Relative to the 1971-2000 average*

- Average annual temperature rises 3° to 6.4°F (6-13%)
- Average winter temp rises from 25° to 28°-33°
- Biggest maximum temperature increases in summer (2.8°-7.5°) and fall (3.8°-13.4°)

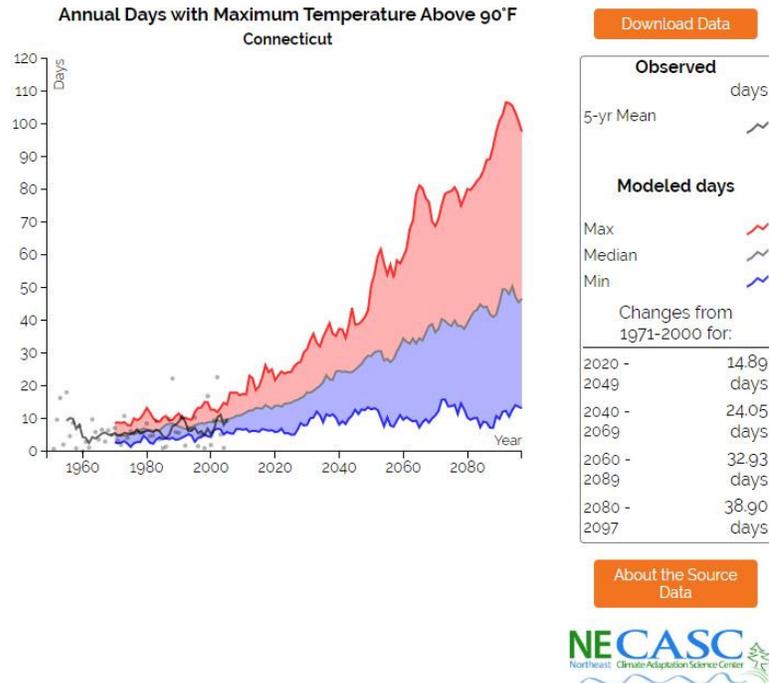


22

## Expected in Connecticut River Basin by mid-21st Century

*\*Relative to the 1971-2000 average*

- Days Over 90°F: From 6 days to 16-41 days per year
- Days Over 95°F: From <1 day to 2-7 days per year
- 5-50 more days over 90° per year by end of century

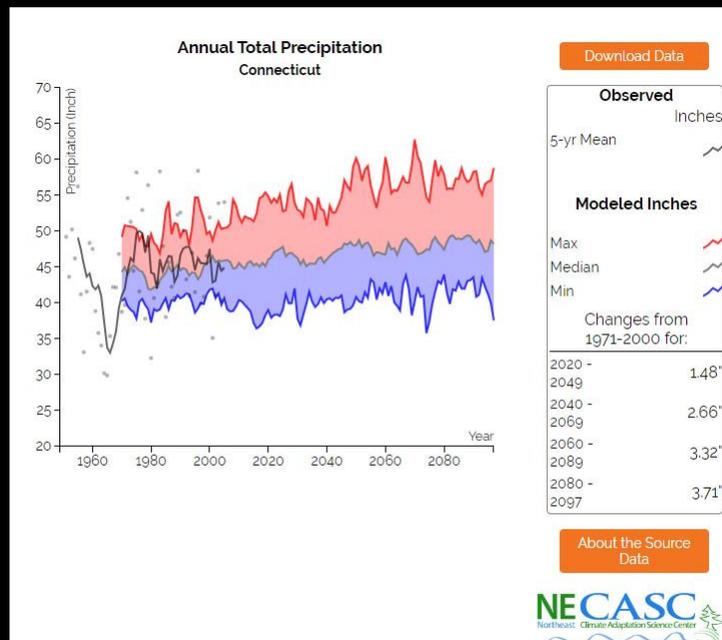


23

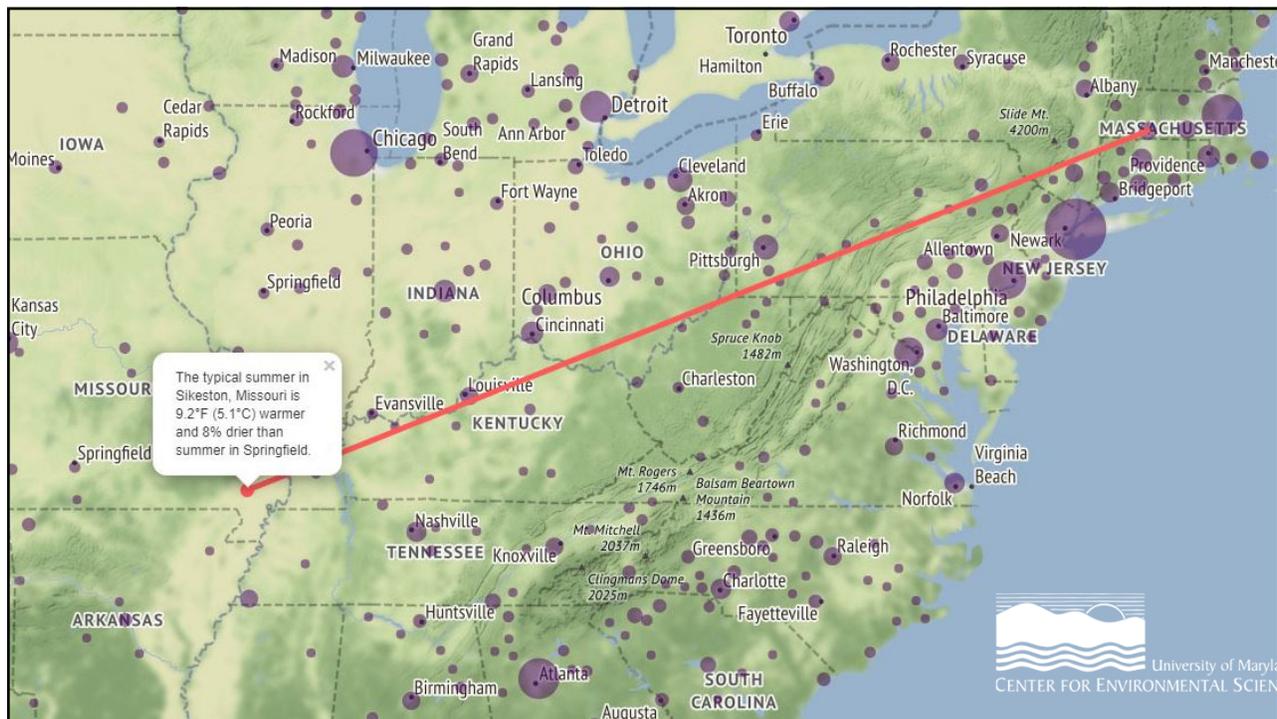
## Expected in Connecticut River Basin by mid-21st Century

*\*Relative to the 1971-2000 average*

- More precipitation expected
- More precipitation in winter (1%-25% increase)
- Precipitation in summer and fall could increase or decrease
- Days per year with precipitation over 1": increase from 7 days -> 8 - 10
- Major precipitation events are very impactful, but happen so rarely that model projections do not show much variation



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Climate/Hazard Linkages  from Massachusetts State Hazard Mitigation and Climate Adaptation Plan	CLIMATE CHANGES	RELATED NATURAL HAZARDS
	<b>Changes in precipitation</b> 	<ul style="list-style-type: none"> <li>- Inland flooding</li> <li>- Drought</li> <li>- Landslide</li> </ul>
	<b>Rising temperatures</b> 	<ul style="list-style-type: none"> <li>- Average/extreme temperatures</li> <li>- Wildfires</li> <li>- Invasive species</li> </ul>
<b>Extreme weather</b> 	<ul style="list-style-type: none"> <li>- Hurricanes/tropical storms</li> <li>- Severe winter storms/nor'easters</li> <li>- Tornadoes</li> <li>- Other severe weather</li> </ul>	

Source: MA State Hazard Mitigation & Climate Adaptation Plan

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## Vulnerabilities and Strengths

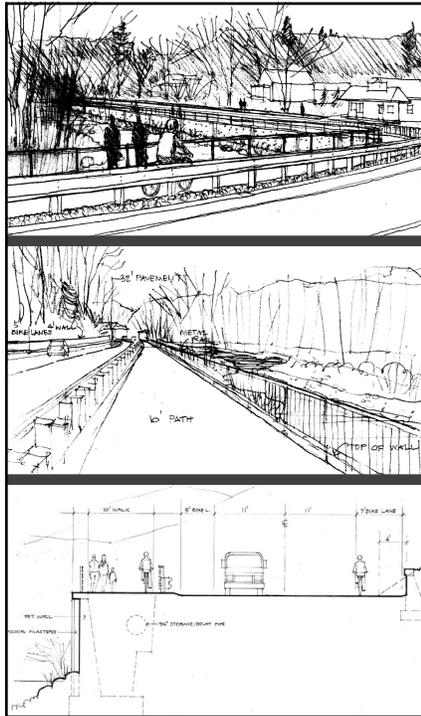
- Infrastructural
- Societal
- Environmental

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## Town Roads, Bridges, Culverts, Utilities

- Roads
  - Route 9 has occasional flooding
  - Old Goshen Road floods occasionally
- Culverts
  - Depot Road Culvert—seriously compromised
  - Town applied for MassWorks grant this year. Funding uncertain. Road may need to be closed.
- Bridges
  - Bridge Street Bridge in Haydenville subject to scour
  - South Main Street Bridge in Haydenville is deteriorating
  - Haydenville bridges will be addressed by MassDOT—possibly converted to one-way pair
  - North Street Bridge in Williamsburg—ok, but could be overtopped in major flood
- Water Main from Haydenville Center Williamsburg Center
  - Undersized, needs to be upgraded

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## Mill River Greenway/Route 9 Project

- Two-miles of the Route 9 Corridor (South Street to South Main Street)
- Primary business corridor, emergency route, trucking route
- Limited pedestrian and bicycle connectivity
- Significant embankment erosion along Mill River (Snack Shack to Brassworks)
- Drainage discharges directly to Mill River
- Route 9 occasionally floods
- Culverts and associated headwalls adjacent to and cross under Route 9

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## Public Safety Feasibility Study Key Findings

- New spaces for police and fire departments are crucial and necessary
- Using privately owned sites is *not* an option
- The questions of what to do about public safety spaces and with the Helen E. James School Building are inextricably linked
- The community will not support the construction of structures it sees as excessive

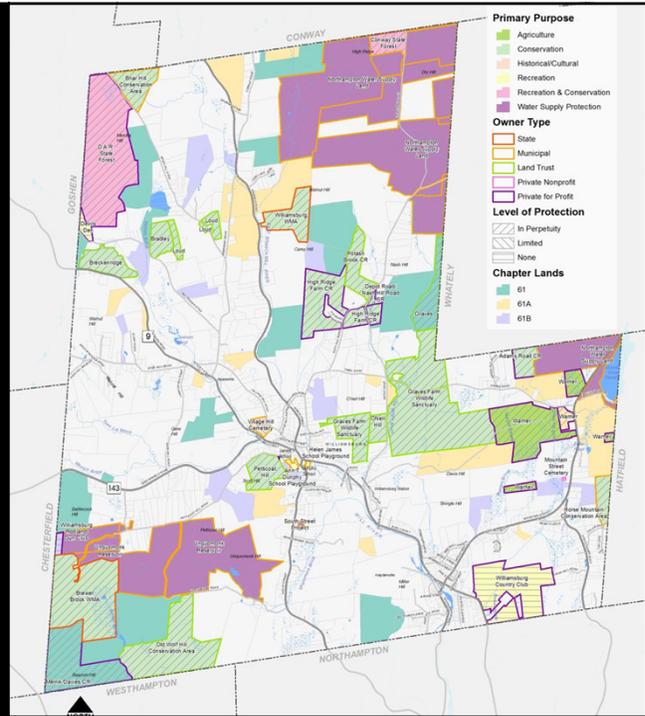
3

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# Open Space & Recreation Plan Update

Initial Findings for MVP by Sally Loomis

- Approximately 30% of Williamsburg (4,900 acres) is permanently protected.
- Protected land is mostly forested, including watershed protection land owned by the City of Northampton (1,500+ acres) and Town of Williamsburg (700 + acres).
- Large areas of protected open space in northeast and southwest corners of land. Key wildlife habitat, water resources, and climate change resilient lands. Opportunity to link areas of protected land.
- Mill River--Limited land protected along the Mill River. Priority habitat for rare and endangered species. Key recreational asset.
- Route 9—Most developed part of town, vulnerable to flooding, important habitat.
- Management of forest land in Williamsburg is inconsistent and a topic about which many landowners and concerned residents would like more information.
- Climate change is coming and needs to be factored into the updated OSRP. Need input from the MVP Plan.



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# MVP Process

- Community Resilience Building Workshop (today and next Wednesday)
  - Characterize hazards
  - Identify community vulnerabilities and strengths
  - Identify and prioritize community actions
  - Determine the overall priority actions

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Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.com					
Priority for action over the Short or Long term (and ongoing)				Top Priority Hazards (tornado, flood, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)					
Features	Location	Ownership	V or S	Flooding	Erosion	Wildfire	Drought	Priority	Time
								H L	Short Long
<b>Infrastructure</b>									
Bridge	Specific	town	V						
Main Rd	Specific	county	V						
Fire Station	Specific	town	S/V						
Dam	Specific	county	V						
Water Supply	townwide	town	V						
<b>Societal</b>									
Low-income residents	townwide	private	V						
Elderly Population	townwide	private	V						
<b>Environmental</b>									
Maple Forests	townwide	state	S/V						
Wetlands	townwide	state	S/V						
Tick habitat	townwide	all	V						

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Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.com					
Priority for action over the Short or Long term (and ongoing)				Top Priority Hazards (tornado, flood, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)					
Features	Location	Ownership	V or S	Flooding	Erosion	Wildfire	Drought	Priority	Time
								H L	Short Long
<b>Infrastructure</b>									
Bridge	Specific	town	V	Elevate out of floodplain				H	S
Main Rd	Specific	county	V	Elevate portion out of floodplain				H	S
Fire Station	Specific	town	S/V			Upgrade water supply		L	L
Dam	Specific	county	V	Maintain, repair				H	S
Water Supply	townwide	town	V			Drought resistant infrastructure		M	L
<b>Societal</b>									
Low income residents	townwide	private	V	Targeted outreach to those who live in floodplain				M	O
Elderly Population	townwide	private	V	Develop Emergency communication plans				M	O
<b>Environmental</b>									
Maple Forests	townwide	state	S/V	Selected harvesting to prevent fire fuel accumulation				M	L
Wetlands	townwide	state	S/V	Revise wetlands bylaw				L	S
Tick habitat	townwide	all	V	Establish deer and mouse management plan				L	S

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NORTHEAST LITH. CO., TROY, N. Y.

75-694512

- 1. Congregational Church.
- 2. Baptist Church.
- 3. Public Schools.
- 4. Masonic Hall.
- 5. Railway Station.

# HAYDENVILLE, MASS.

1886.

- 6. Post Office.
- 7. Haydenville House, H. Corbin, Prop.
- 8. Haydenville Mills, Co., Manufacturers of Flour and Iron Works.
- 9. Agricultural College.
- 10. High School and Jail.

6374  
1886  
1886  
-88