TOWN OF WEST SPRINGFIELD, MA

May 6, 2020

Municipal Vulnerability Preparedness
Community Resiliency Building Workshop

SUMMARY OF FINDINGS

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OVERVIEW

The need to increase planning for and implementation of extreme weather resilience and adaptation activities is strikingly evident and the Town of West Springfield is taking note. No stranger to extreme weather events, West Springfield's emergency response team and residents have learned to expect roadway flooding, downed trees and tree limbs, and extreme heat events on at least a yearly basis. Examples of recent events that disrupted routine activity in the town include:

- "Snowtober" October freak snow storm (2011) caused extensive power outages. Heavy snow falling on trees that still retained full foliage caused tree limbs to crack and fall under the combined weight, resulting in major damages and disruptions across New England and also in West Springfield. Most residents of the town were without electricity for more than a week.

- High intensity, short duration precipitation events that led to localized flooding, including a 2017 event during which the River Street underpass became impassable, a 2018 event that resulted in flooding up to a foot deep at the intersection of Ely Avenue and Verdugo Street, and a 2018 event during which $5,000 in property damage was reported and a car was trapped in flood waters on Old Westfield Road.

- The June 2011 EF3 tornado, which traveled from Westfield to Charlton. In West Springfield the tornado caused extensive damage to industrial buildings and homes. Several buildings had their roofs removed by the tornado, a few structures collapsed, and several multi-story buildings lost their upper stories. Three fatalities were directly attributable to the tornado, two in West Springfield. In addition, 200 people were treated for injuries sustained in the tornado.

These and other recent events in nearby communities have reinforced urgency for climate adaptation and compelled municipalities like West Springfield to proactively plan and mitigate potential risks through a community driven process. Ultimately, the commendable leadership demonstrated by West Springfield's efforts will reduce the exposure and vulnerability of its citizens, infrastructure, and ecosystems. This work also contributes to the greater climate resilience of the entire Pioneer Valley region.

Recognizing the importance of both mitigation and adaptation strategies to deal with the challenges of climate change, the Town of West Springfield used the Municipal Vulnerability Preparedness (MVP) Planning grant as an opportunity to integrate these objectives into existing programs. In 2019, the Town successfully pursued and received funding from the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) to advance a Community Resilience Building (CRB) workshop under the MVP program.

The core directive of the MVP program is to engage community stakeholders to facilitate the education, planning, and ultimate implementation of priority climate change adaptation actions. Completion of the MVP process will enable the Town to achieve MVP certified community status from EOEEA by June of 2020 and receive preference for future state grants.

This report provides an overview of the top climate change impacts of concern, current vulnerabilities and strengths, and proposed actions to improve the Town of West Springfield's resilience to natural and climate-related hazards today and in the future.

Community Resilience Building Workshop

The Town of West Springfield employed a unique "anywhere at any scale" community-driven process known as the Community Resilience Building framework to host an eight-hour workshop on January 23, 2020. The list of workshop invitees and workshop content was guided by input from the core MVP planning team, and comprised Town elected officials, community members, business stakeholders, and consultants from the Pioneer Valley Planning Commission. The workshop's central objectives were to:

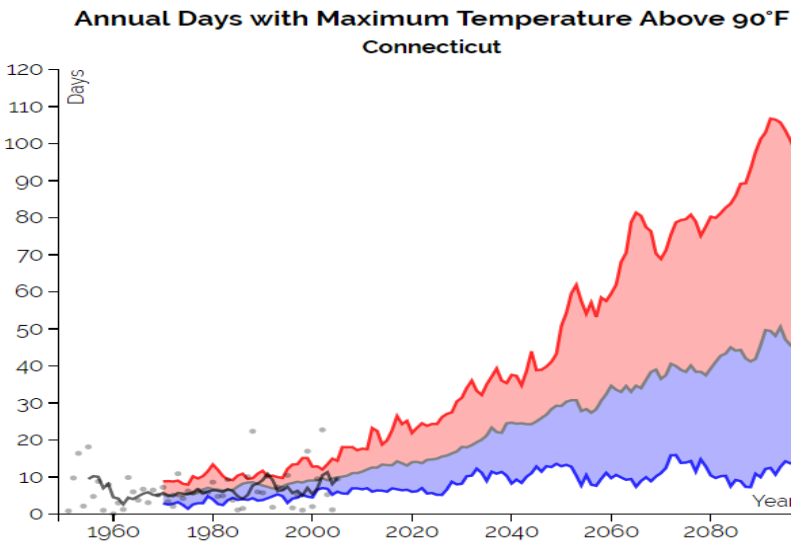
- Affirm community consensus of the local meaning of extreme weather and local natural and climate-related hazards;
- Identify existing and future vulnerabilities and strengths;
- Develop and prioritize actions for the Town and broaden stakeholder network;
- Identify opportunities for the community to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

Approximately 22 participants from Town boards and committees, land holding organizations, community organizations, and other interest groups attended the workshop, which included a combination of large group presentations and small group activities. Pioneer Valley Planning Commission began the workshop with a presentation outlining the workshop process and goals, updating participants on past and ongoing local planning efforts, and presenting new state-provided climate projection data to enable both decision-support and risk visualization. Participants then broke out into three small groups and over the course of the workshop assumed different participatory roles and responsibilities to engage in a rich dialogue and share ideas and experiences.

Climate Projections for CT River Basin

Climate change is impacting communities around the world, and residents of West Springfield and elsewhere in the Connecticut River Basin see these changes and their impacts almost every day. New climate projections from the Northeast Climate Science Center at the University of Massachusetts show with more certainty than ever that these changes can be expected to continue. Projections are based on simulations from the latest generation of climate models from the International Panel on Climate Change and scenarios of future GHG emissions, and are downscaled to the watershed county level across the Commonwealth of Massachusetts.

West Springfield lies primarily in the Connecticut River Basin, where projections show that by the end of this century, communities could see more than 7 inches of additional rainfall per year over a 1971-2000 baseline of 46.4 inches per. The winter season is expected to experience the greatest seasonal increase both in total precipitation and the frequency of heavy downpours, or days receiving precipitation over



Climate modelling from the Northeast Climate Science Center shows that West Springfield may experience up to 82 days per year over 90 °F by the end of the century.

one inch. Projections also suggest that summers may be drier and an increase in series of days without any rain at all.

With regards to temperatures, projections show that annual average and maximum temperatures will continue to rise. Even a very small rise in average temperatures can cause major changes in other factors, including impacts on species and ecosystem health and the relative proportion of precipitation that falls as rain or snow.

Beyond this general warming trend, the change that may impact West Springfield and neighboring communities the most is the increase in very hot days. Projections indicate a 1,280% (76 day) increase in 90-degree days/year by the end of the century from a baseline average of 6 days per year. Generally, extreme heat is considered to be over 90 °F, because at temps above that threshold, heat-related illnesses and mortality show a marked increase. Heat waves can lead to illness and death, particularly among individuals with existing health risk factors.

Finally, projections indicate an increase in the frequency and magnitude of extreme weather. This could come in the form of tropical storms, or other high intensity wind and rain events. Here, too, the greatest changes will occur in the spring and winter.

Top Hazards and Vulnerable Areas

Leading up to the workshop, the core MVP planning team worked with input from Town officials to identify some of the top ongoing concerns and challenges for West Springfield. In order to ensure a bottom-up approach, the core Town planning team made the decision to allow the workshop's participants to identify their own top four hazards rather than predetermining the hazards beforehand. To facilitate that process, PVPC presented a variety of past and current weather- and infrastructure-related challenges the town faces. These challenges were identified based on findings from an in-progress draft Hazard Mitigation Plan update, stakeholder input, and new climate change projections. The participants used this information to talk through the suite of priority climate hazards and negotiate common agreement on their top four hazards. For the workshop as a whole, four hazards were selected as the most pressing for the town.

TOP HAZARDS

The top four hazards for the workshops as identified by the CRB participants are listed below:

- Flooding
- Severe Weather (including severe winter storms, extreme precipitation, and high winds)
- Extreme Temperatures
- Invasive Species and Range Shift

AREAS OF CONCERN

Infrastructure: *Localized flooding at culverts, road passability, stormwater pumping capacity behind levees*

Numerous locations across town experience stormwater flooding, causing street closures, disrupting transportation, and severing access to goods and services. More than 200 acres of levee-protected zones comprise some of West Springfield's most developed land. Levees, built to protect from major riverine flooding, also block rainfall from flowing into the Connecticut River. In highly developed land, impermeable surfaces also limit rainfall from being absorbed into the ground. Pump stations serving these areas cannot handle the storm flows from ever-increasing precipitation events.

Human and Social: *Changing age-related demographics, residents with limited mobility, poverty-level and low income populations, emergency shelter network, emergency communications platform (NIXLE)*

The diversity of West Springfield's people is growing, placing greater demands on social services and public institutions. The most vulnerable populations — the poor, the unemployed, the very young and elderly, the disabled, the language-challenged, the mentally ill, to name some — present diverse tests of the town's ability to serve and communicate, especially in an emergency. Greater understanding of the ramifications of climate change is needed to prepare for the inevitable impact on all residents.

Environmental: *Tree canopy and hazard trees, invasive species, and ground water and aquifer protection*

The town's shrinking tree canopy was a concern of every workshop group. Trees not adaptive to severe weather and temperatures create a growing hazard. Invasive plant species in both wetlands and public and private uplands are uncontrolled. Greater attention must be paid to environmental regulations, especially involving emissions, hazardous materials, and dumping in order to be protective of environmental and public health. Open space retention and viability of wildlife corridors are threatened by overdevelopment.

CONCERNS AND CHALLENGES RELATED TO CLIMATE CHANGE

Like other municipalities in the region, the Town of West Springfield faces multiple challenges related to the impacts of climate change and associated extreme weather events. Early in the MVP workshop process, after brief introductions and a review of the day's agenda, facilitators asked participant stakeholders to describe recent climate-related changes they had seen and experienced in West Springfield. Participants wrote their responses on Post-it notes and shared them with the large group. All responses are included in Appendix D.

Many of West Springfield's MVP workshop participants' observations of climate change-induced environmental changes reinforced the concerns and challenges the consultant team had identified through stakeholder interviews and background research in advance of the workshop. In particular, workshop participants reported seeing shifts in seasonality of warm and cold temperatures, increased precipitation, humidity, and flooding, encroachment on natural features and open spaces due to development, and shifts in animal/insect numbers and behavior. Participants were generally in agreement that the town and region are experiencing more intense and frequent storm events, the impacts of which affect the daily activities of all residents.

Small groups worked to identify the community actions needed to alleviate vulnerabilities and fortify assets in town.

Later in the workshop, participants expressed concern over the public health impacts of extreme heat and secondary impacts of severe weather such as impassible roads, communication interruptions, and loss of electricity to critical facilities. Small groups discussed the challenges of being prepared for the impacts of increasingly frequent extreme heat and severe weather events, specifically with regard to ensuring that residents of all ages, primary language spoken, and socio-economic status are able to access the resources they need when faced with unprecedented heat or storm impacts. Furthermore, participants established a common directive to address the resilience of public critical facilities and buildings by providing backup power generation and energy storage to be best prepared to serve residents in future times of need.

Stormwater and Flood Infrastructure

The West Springfield draft 2020 Hazard Mitigation Plan update identified more than 17 locations where localized stormwater flooding occurs across town, forcing street closures and transportation disruption, and cutting off access to goods and services. Furthermore, West Springfield has a total of 202 acres in levee protected zones (according to FEMA National Flood Insurance Rate Maps). While these levees were built to protect West Springfield neighborhoods from major riverine flooding, they also serve to block rainfall water from flowing into the Connecticut River as noted above. The protected areas are some of the town's most heavily developed, limiting the amount of rainfall that will be reabsorbed into the ground through permeable natural surfaces. Pump stations in the protected area are unable to handle the increased rates of rainfall runoff associated with ever increasing precipitation rates. For all of these reasons, the low lying areas in levee protected zones will continue to be affected during major rain events.

Extreme Heat and Public Health

The projected increase in extreme temperatures, seasonal high temperatures, and consecutive dry days raises concern for the health and safety of many of West Springfield's residents. According to North Atlantic Aquatic Connectivity Collaborative (NAACC) data, Hampden County may see an increase in average temperatures of more than 6.4°F degrees by 2100. There are known risks associated with the interaction of heat and cardiovascular disease, just as studies show that heat waves are associated with an increase in violent crime and domestic abuse.

Extreme heat and heat waves are particularly dangerous in urban environments due to a phenomenon called the "urban heat island effect," whereby highly developed areas absorb and retain heat on sunny summer days more than their suburban or rural surroundings. The difference is most pronounced in the evening, when asphalt and other hardened elements of the built environment retain the heat long after the sun goes down. Heat islands impact communities by increasing summertime peak energy demand and costs due to air conditioning, air pollution, greenhouse gas emissions, and heat-related illness and mortality.

Compounding these issues, the Pioneer Valley traditionally has poor air quality compared to similarly rural and suburban counterparts in Massachusetts because of the air inversion that occurs in the valley. Of all Massachusetts counties between 2002 and 2012, Hamden County had the highest annual average emergency department visits due to asthma (110.1 to 125.6 visits per 10,000 people). These conditions are getting worse as temperatures increase and growing seasons lengthen, extending the time that pollen and other allergens are present in the air. Aging population is particularly vulnerable to respiratory complications from mold and pollen, as well as extreme heat. As a result, air quality issues also place a great burden on ambulances and emergency responders, especially during periods of prolonged extreme heat.

Finally, climate change can lead to increases in mosquito populations, with subsequent transmission and outbreaks of diseases like West Nile virus and Triple E. Prolonged frost-free seasons extend the periods of time during which residents are at risk.

Communication Networks

Workshop participants noted a need to increase education about and uptake of the existing emergency communication system, NIXLE — a reverse 911 system that can distribute information to any residents who sign up for alerts. It is important to note that the system can only help those residents who know about it and sign up, and workshop participants stated a need to increase registration for the service. Participants also expressed concern over the many residents in West Springfield who speak one of the more than 30 languages other than English in the home. The largest language group spoken is non-Spanish Indo-European languages, and the most spoken single language other than English is Spanish. Limited-English speaking populations face significant challenges receiving and understanding emergency alerts and notifications. MVP workshop participants noted that many primarily English speaking residents in the region have some formal or informal training in Spanish or another Indo-European language, and therefore minorities speaking other languages are at the greatest disadvantage in terms of receiving and exchanging communication with town staff and service providers.

Vulnerable Populations

Census data and population projections show us that West Springfield's population is growing. Its senior population is expected to grow at a faster rate than that of the overall population, and this age group is particularly vulnerable to extreme heat temperatures and severe weather. While seniors in West Springfield are less likely to be living in poverty than other age groups, 12% of residents live below the poverty line and 31% of all residents are low income; families and individuals in these economic brackets are less able to rebound from the stress and impact of days away from work, costly home repairs, hospital bills, or other expenses that may increase as a result of climate changes. Considering how financial well-being contributes to a household's readiness to anticipate or respond to extreme weather events, stakeholders expressed concern for the ability of low income and poverty-level residents, specifically children, to be resilient to the impacts of climate change.

West Springfield is one of the most diverse communities in the region, with its non-white population having increased by 3.5 times in numbers from 1990 to 2017. Other demographics include:

- the third-highest population (15.5% of total) of foreign-born residents of all Pioneer Valley communities
- nearly 25% of West Springfield residents over the age of 5 speak a language other than English at home
- 13% of West Springfield High School students did not achieve proficiency in reading/language arts, according to 2016–2017 data
- 11% of residents age 25 years or older have less than a high school education or did not attend school[1]

[1] https://www.towncharts.com/Massachusetts/Education/Springfield-city-MA-Education-data.html –American Community Survey data 2017; https://www.publicschoolreview.com/west-springfield-high-school-profile re 2016–2017 academic year

The Merrick/Memorial neighborhood shown here has a diversity of food retail options, but many of its residents are economically or socially vulnerable to the impacts of climate change.

Many of the town's foreign-born residents live in the urban Merrick/Memorial neighborhood. While this diversity has great benefits to the community as a whole, 16% of the town's total foreign-born population lives below the poverty line. The Merrick/Memorial neighborhood, along with the Mittineague Park neighborhood, and the neighborhoods surrounding Interstate 91, make up West Springfield's three environmental justice communities. They are characterized by a prevalence of minority and linguistically isolated populations and low income households. Workshop stakeholders were encouraged to consider the ways in which differing cultural norms and languages spoken either help or hinder resilience and/or the use and understanding of existing municipal communications systems or programs.

Another major consideration for West Springfield involves climate migrants — those forced to leave their home region due to sudden or long-term changes to their local environment. Displaced families responding to changes that compromise their well-being or livelihood find temporary lodging in the many hotels and motels located on the town's commercial arteries. In 2017, Hurricane Maria brought many families from this extremely vulnerable population to West Springfield's hotels and motels. This influx increased local need for social services, as well as increased enrollment in public schools.

TREES

In recent years, trees have been downed or removed in West Springfield faster than they have been planted. Workshop participants noted the need to "plant trees for the future," to lower temperatures, mitigate street flooding, prevent soil erosion, reduce air pollution, and filter water. Several events and related responses were discussed:

- The tornado of June 2011 cut a swath through the Merrick section that brought down most of the longstanding trees in the area. After the tornado, state and federal funds were applied to cleanup and restoration. Through an outpouring of funds from residents, businesses, and organizations such as the West Springfield Garden Club, a long-established citizens' tree committee replaced some trees on the Town Common. Another citizen committee known as Trees for Merrick formed and also raised funds.
- A snow storm in October 2011 felled trees throughout the town, and in the Merrick section many large trees left standing after the tornado succumbed to the snow storm. Cleanup of fallen limbs and stumps in the Merrick neighborhood was not completed until 2014. During this time there were neither the funds nor personnel in the Forestry Division to begin a significant restoration program of tree replacement.

These events prompted the formation of an Urban Forestry and Tree Committee and the appointment of a tree warden, marking the transition of the citizens' committees to a public entity committed to restoring and protecting the urban forest throughout town. Grant funds of $30,000 were secured in 2015 to plant 200-plus trees in the Merrick section, utilizing Town personnel, private contractors, and volunteers to plant and water the young trees.

Presently, resources, personnel and funding are lacking to provide a complete restoration of the tree canopy of the Merrick neighborhood. Even if its tree population were restored to its pre-tornado state, the Merrick section would still be one of the sparsest areas of town with regard to tree canopy.

West Springfield's canopy cover is disproportionately distributed. More cover is needed in the low income and "environmental justice" Merrick/Memorial and Mittineague Park.

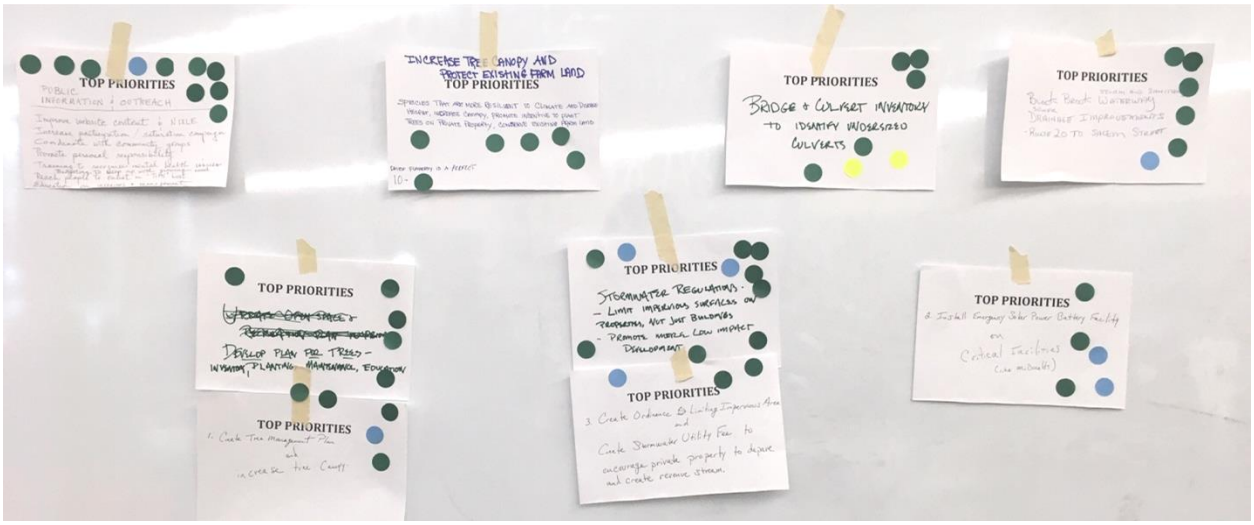
CURRENT STRENGTHS AND ASSETS

As a result of West Springfield's broad experience with extreme weather and the impacts of climate change, workshop participants were quick to point out their community's strengths in responding to the challenges identified above. Reinforcing and expanding upon these strengths and community assets to increase resiliency against the impacts of climate change is a common theme to the proposed actions within this report.

Stakeholders write on sticky notes to describe environmental changes they have observed in West Springfield.

Some of the key strengths discussed included:

- Diversity of ethnicity and economic status
- Strong local economy of retail and service providers, including an abundance of grocery and food options that bring shoppers from around the region
- Strong community of faith-based institutions
- Active Senior Center and Council on Aging that provide resources and strong programming
- Historical value placed on trees and tree canopy
- Longtime efforts and historical successes in land protection and protection of wildlife corridors: Historical patterns have left most of West Springfield's open space in the northwest part of town, site of the 1,700 acre Bear Hole Reservoir and Watershed area. In 2018 the Town purchased 71 more acres near the reservoir with Community Preservation Act (CPA) funds. In 2019 the Town approved the purchase with CPA funds of a five acre section of the wildlife corridor along Block Brook known as Birchwoods. Efforts to link those assets to the rest of the community's natural resources — the Connecticut River and its greenway, the Westfield River, Mittineague Park, and other town parks and resources — is ongoing.
- Strong regional transportation connectivity
- Robust local government with professional staff to advance meaningful projects in climate resilience
- Array of social service providers and nonprofit resources for marginalized populations



Top Recommendations to Improve Resilience

Before workshop participants set to the task of filling out the CRB matrix with their small groups, they were asked to complete another Post-it note exercise answering the question, "What does climate vulnerability preparedness look like to you?" The responses, listed in Appendix D, foreshadowed many of the top priority actions that would be developed later in the day. Ideas included tree planting and management, actions to reduce language barriers, active planning to protect the environment through zoning and local ordinances, management of water resources and waste control, improving the town's communications infrastructure, and placing an emphasis on public health, education, and preparedness.

Participants identified 99 actions that the Town of West Springfield, in collaboration with neighboring municipalities, regional partners, and state agencies, should take to improve resilience to climate change impacts.

Toward the end of the workshop, each of the three small groups presented its three top priority actions to the large group. These nine actions were assembled with like actions from the other small groups, resulting in the seven priority actions listed below (in no specific order). The three highest priority actions, as subsequently voted on by the large group, are shown in bold.

- Install emergency solar power battery facility on critical facilities, including town buildings and emergency shelters.
- Complete storm drainage and sanitary sewer improvements along the Block Brook Waterway as it runs from Route 20 to Salem Street.[2]
- Conduct a town-wide bridge and culvert inventory to identify undersized culverts.

[2]The Town's Natural Resources Planner reached out to MassDOT District II about replacing the Route 20 culvert at Block Brook, but had not received a response as of March 2020.

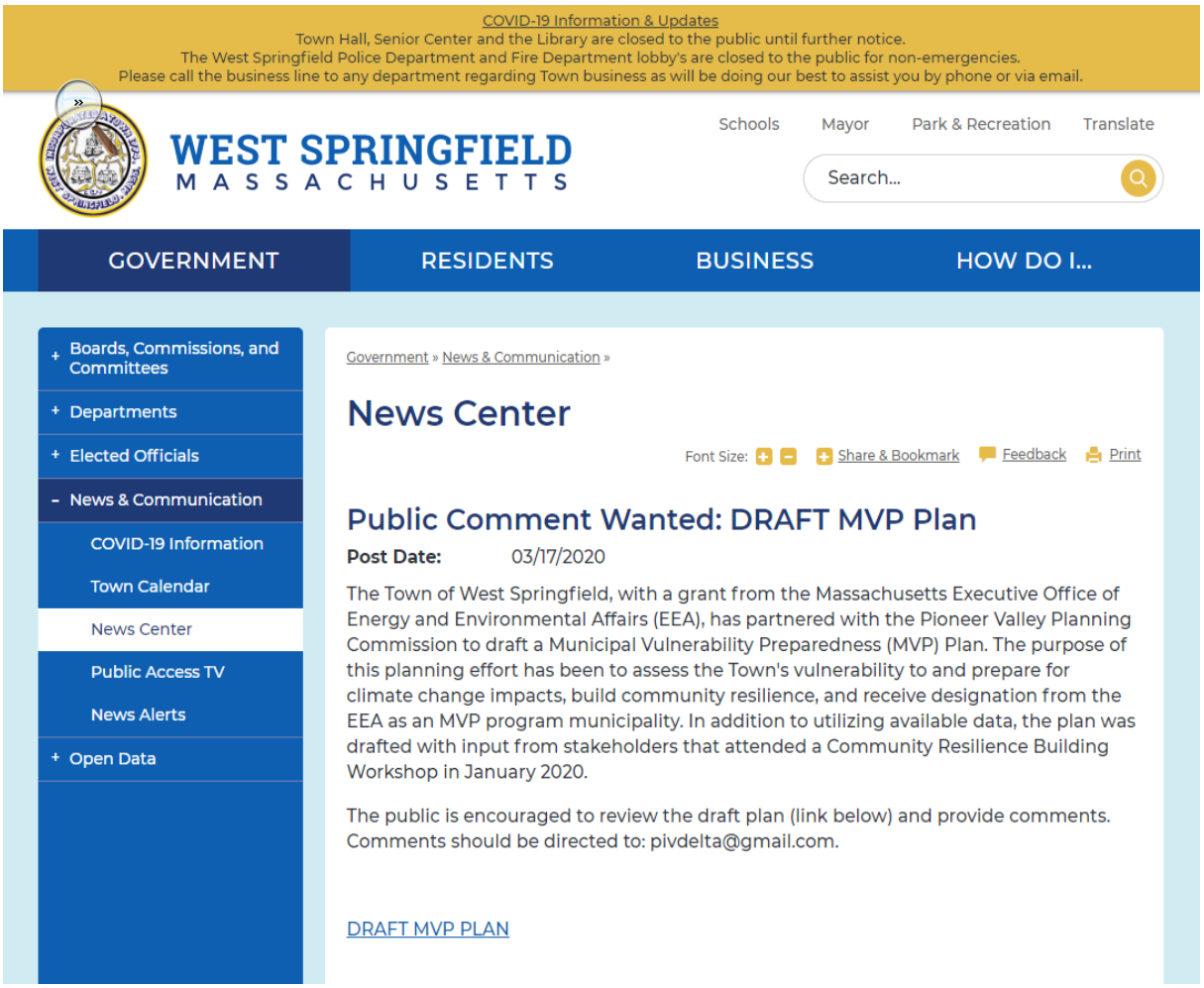
West Springfield CRB small group participants reported out to the large group on their top priority actions.

- **Develop and adopt new stormwater regulations to limit impervious surfaces on buildings and landscape, and promote more low impact development. Also, establish a stormwater utility fee to encourage private property owners to remove pavement and also create a new revenue stream for the town.**
- **Coordinate with community groups to undertake a public information and outreach campaign for climate resilience.**
    - **Improve town website content and NIXLE capabilities.**
    - **Increase participation in emergency alerts through a saturation campaign.**
    - **Secure necessary budget for town departments to keep up with growing mental health needs related to climate change.**
    - **Offer trainings for Town staff and local service providers to recognize mental health issues.**
    - **Enlist broader participation in the "TIPS" list to inform the Town of a person's medical condition so that in the event of an emergency the Town can be prepared to address individuals' needs.**
    - **Promote personal responsibility for climate resilience.**
    - **Provide public education on invasive species and invasive species management.**
- **Increase tree canopy and improve management**
    - **Create baseline reports about the existing tree canopy condition in each neighborhood by measuring average monthly temperatures, rainfall, species distribution, age, health, location, and soil to improve the resilience of the urban forest in the face of a changing climate. Wherever possible, engage the assistance of neighborhood residents and conduct public education in this process.**

- **Protection of open space and working lands**
    - **West Springfield's remaining open space, largely located along riparian corridors and wetlands, makes open space protection very important to building a resilient community. As more frequent natural disasters occur the ability of the community to recover may depend upon the community's ability to access resources produced nearby on its remaining farmland and other working lands.**

PUBLIC ENGAGEMENT

All actions recommended during the CRB workshop were shared with the public in a draft report posted to the Town's website, with links posted on the Town's Facebook pages, for a one month public comment period. Posting of the draft Summary of Findings Report was announced on March 17, 2020 as a news item on the homepage of townofwestspringfield.org, with a thumbnail linked to the full news story describing the MVP planning process in West Springfield. That article ran on the website until April 17th.



The draft Summary of Findings Report was posted on townofwestspringfield.org from March 17 until April 17, 2020.

Original plans to conduct a series of informal listening sessions and focus groups to share the results of the MVP workshop and continue to gather public feedback on climate adaptation solutions were thwarted with the arrival of COVID-19 to the United States and the subsequent restrictions placed on public gatherings.

On March 23, 2020, due to the COVID-19 pandemic Governor Charlie Baker directed the Department of Public Health to issue a stay at home advisory to all Massachusetts residents, encouraging self-isolation and social distancing protocols. Residents were advised to stay home and avoid unnecessary travel and other unnecessary activities during this time period, which at the time of this report extends from March 24 through an anticipated end date of May 4, 2020.

This order came just as the Town of West Springfield's MVP team was working to schedule a Public Listening Session (PLS) to share results from the MVP workshop and collect public feedback on priority action recommendations. As a result, the West Springfield MVP team set out to make the best use of web-based technology, and took to the internet to continue the discussion. Rather than an in-person meeting, workshop participants and core team members collaborated on a webinar on April 24th that introduced the MVP process, reviewed climate change projections, and summarized all actions recommended during the CRB workshop. The team publicized the virtual PLS webinar on the Town Website and Facebook page, and in a press release resulting in an article in the West Springfield Record on April 23, 2020, the day before the webinar.

The live webinar was recorded and posted the same day on the West Springfield the Planning Division Page, the Town Facebook page, and was linked in the Town's news page. Furthermore, the Mayor of West Springfield shared information about the webinar in one of his live Facebook "conversation starters," encouraging residents to watch the recording and participate in the priority action survey. The survey described the seven priority actions identified on pages 12-13 of this document and asked respondents to rank them in order of importance. The survey also provided the opportunity for respondents to submit their own strategies for consideration. A link to the priority action survey was posted on the town's Facebook page and the survey was open from April 24 to May 7, 2020. A full documentation of the survey questions and responses can be found in Appendix G.

The survey received a total of 16 responses, all but 1 of which were from residents of West Springfield. Respondents tended to be middle-aged or older, with nearly 60% of respondents identifying as being between 45 and 74.

Out of the seven top priority actions, "Protection of West Springfield's remaining open space, and working lands, largely located along riparian corridors and wetlands" ranked the highest, with "Increases the tree canopy and improve management" ranking second, and "Complete storm drainage and sanitary sewer improvements along the Block Brook Waterway" in third place.

Finally, when offered the opportunity to share their own recommendations for the Town to increase resilience, two respondents answered with the following ideas:

1. Increase Town budgets to support earlier stated initiatives.

2. Private parties installing blacktop driveways that rain can penetrate, is a great idea. However, it is cost prohibitive at this time. Perhaps it could be required on new developments. Plantings on business roofs, and incorporation of rain gardens, sounds like a reasonable short term goal. Business owners and private residences needs to be educated on this. Bear Hole needs close monitoring, to protect future generations. A Conservation Restriction is a must!

3. Please rank the following priority projects to indicate the most important actions that West Springfield should take to address climate resilience.

Item	Overall Rank	Rank Distribution	Score	No. of Rankings
Protection of West Springfield's remaining open space, and working lands, largely located along riparian corridors and wetlands	1		58	12
Increase tree canopy and improve management - Create baseline reports about the existing tree canopy condition in each neighborhood by measuring average monthly temperatures, rainfall, species distribution, age, health, location, and soil to improve the resilience of the urban forest in the face of a changing climate. Wherever possible, engage the assistance of neighborhood residents and conduct public education in this process.	2		52	12
Complete storm drainage and sanitary sewer improvements along the Block Brook Waterway as it runs from Route 20 to Salem Street.	3		49	12
Develop and adopt new stormwater regulations to limit impervious surfaces on buildings and landscape, and promote more low impact development. Also, establish a stormwater utility fee to encourage private property owners to remove pavement and also create a new revenue stream for the town.	4		47	12
Conduct a town-wide bridge and culvert inventory and conditions assessment to identify undersized culverts.	5		46	12
Install emergency solar power generation and battery storage on critical facilities, including town buildings and emergency shelters.	6		43	12
Coordinate with community groups to undertake a public information and outreach campaign for climate resilience.	7		41	12

Lowest Rank Highest Rank

COMPLETE LIST OF STRATEGIES FOR RESILIENCE

A full list of the final recommendations from the CRB Workshop, organized by high, medium, and low priority, follows on the next few pages. In addition to the actions identified at the CRB Workshop and Public Listening Session, the Town solicited comments on the draft Summary of Findings Report from various Town and public partners.

Please note that within each category, the actions are not in any specific order.

Category	No.	Feature	High Priority Actions
Environmental	1	Tree Canopy	Develop a plan to plant more trees – include maintenance program for publicly and privately owned trees; include street trees in carbon sequestration program; identify preferred species, with shorter types for near utility lines, etc.
	2		Continue and increase education and outreach on trees
	3		Plant species that are more resilient to both climate and disease to create a resilient tree canopy
	4		Increase tree canopy and promote incentives for planting on private property
	5	Vector-borne Disease/Ticks	Increase public awareness and education about ticks
	6	Open Space and Farmland Protection	Update Open Space and Recreation Plan (OSRP)
	7		Conserve remaining farmland
	8	Illegal Dumping	Provide more information on dump hours and costs of disposal
	9		Conduct research on best practices to reduce illegal dumping
Societal	10	Emergency Preparedness and Communications	Coordinate more with community groups to better reach vulnerable populations
	11		Promote greater self-reliance, personal responsibility, including emergency supply kits through saturation campaign
	12		Improve Town website content for public information/communication and NIXLE
	13		Get more funding for NIXLE so that the town can add enhancements and increase participation
	14		Evaluate and improve internal and external communication systems – Educate community about NIXLE, set up to call in different languages, use multiple outlets, work with schools, agencies that work with immigrants, disseminate info at bus stops, housing authority properties
	15		Hire a full-time Emergency Management Director
	16	General Diversity (population, food, faith, etc.)	Acknowledge cultural differences on things like trees, paving patterns and educate on preferred/best practices. Engage communities in education/outreach.

Category	No.	Feature	High Priority Actions
	17	Old/Substandard Housing Stock	Increase tenant and landlord education about risks and opportunities relative to older housing stock and climate change
Infrastructure	18	Undersized Culverts	Conduct a bridge and culvert inventory
	19	Renewable Energy Resources	Provide educational resources to residents of renewable energy options
	20		Explore community solar and other renewable energy options for the town
	21		Participate in state supported renewable energy programs like Solarize Mass and HeatSmart
	22		Support solar plus battery storage for municipal facilities and residents
	23		Install renewable energy and battery storage on critical facilities
	24	Drinking water and sewer systems	Bring water and sewer lines up to Code
	25		Establish a program to disconnect basement sump pumps from sanitary sewer system
	26	Roads/Transportation	Support and implement Complete Streets and alternative transportation options
	27	Tree-induced electrical failure	Continue communications with utilities
	28	Stormwater System	Create ordinance limiting impervious area
	29		Create stormwater utility fee to encourage private property owners to reduce impervious surfaces and create a revenue stream for funding stormwater and green infrastructure projects.
	30		Identify locations of combined overflow into sewer system
	31	Pumps and Levees	Maintain flood protection system, including stormwater system elements
	32	Drinking Water Protection	Continue outside watering restrictions to preserve drinking water
	33		More outreach on drinking water quality and quantity protection, including using Town property as demonstration for good practice
	34		Find and fix leaks in drinking water distribution system
	35	Critical Facilities & Public Buildings	Make sure natural gas connected to pumps and generators at public buildings, especially Town Hall, schools, police, fire, and library

Category	No.	Feature	High Priority Actions
	36		Conduct a more comprehensive analysis to understand the reach of weather events/impacts to critical public facilities, especially flooding

Category	No.	Feature	Medium Priority Actions
Environmental	37	Stormwater System	Update regulations to require more infiltration in paved areas, and offer incentives for nature based solutions
	38		Promote installation of rain gardens and green roofs in regulations, with incentives
	39	Open Space and Farmland Protection	Protect Birnie Avenue Farm (formerly Newlands Farm) from future development
	40		Pursue grants for land conservation
	41		Encourage infill development through policy change
	42	Tree Canopy	Review site plan review standards – types of species of trees, require more trees in parking lots; possible solar canopies in parking lots to reduce extreme heat and produce renewable energy, but keep trees wherever possible
	43	Barriers to Wildlife Movement	Design new culverts to accommodate wildlife
	45	Wetlands	Update draft local wetlands protection bylaw with any appropriate climate considerations and then adopt
	46	Invasive Species	Explore resources for invasive species management and undertake a more active management program
	47		Provide more education and information on invasive species
Societal	48	Emergency Preparedness / Education	Conduct outreach and education to prepare residents and employers about what to do in the case of an emergency – where to go, what supplies to have on hand, procedure
	49		Cultivate relationships between people of all cultures/backgrounds; identify locations of emergency food supplies; provide emergency preparedness training in multiple languages

Category	No.	Feature	Medium Priority Actions
	50	Long-term Planning	Conduct multi-department collaborative review of all plans with climate change focus
	51	Effect of Climate Change on Mental Health	Create plan to increase number of trees to prevent urban heat island, reduce noise pollution
	52		Ensure that budgeting anticipates growing mental health needs relative to climate change impacts
	53		Provide mental health training to recognize risk behaviors (relative to climate change and hazards)
	54	Faith-based Orgs	Work with faith-based organizations in town to develop an intercultural understanding of climate impacts
	55	Council on Aging	Form public/private partnerships to prepare and educate residents about emergencies
	56	Social Service/Mental Health Providers	Work at neighborhood level to cultivate relationships and conduct trainings on social services and mental health services – use social media as well as outreach within neighborhoods
	57	General Diversity (population, food, faith, etc.) / Non-native English Speakers	Better communication with the State Department regarding refugees
	58		Engage with existing immigrant/refugee populations in planning for future immigrant/refugee populations
	59		Create partnership with faith-based groups to provide education and increase outreach on emergency preparedness, emergency response, climate change risks, and climate adaptation strategies.
	60		Identify multiple streams for disseminating information
	61		Utilize children/youth as interpreters in education/outreach efforts
	62	Schools as Resource	Conduct analysis to better understand capacity of the Middle School and High School as emergency shelters and whether each location is/is not vulnerable
	63		Continue to improve relationship with mutual aid resources
	64	Old/Substandard Housing Stock	Continue utilizing CDBG funding for rehabs
	65		Continue Sanitary Code enforcement
	66		Increase participation in state efficiency programs like Mass Save
	67	Environmental Justice Blocks in flood zones and high risk areas	Increase awareness and provide education on how to address Environmental Justice (EJ) communities in flood zones and other high risk areas. Translate all communications/outreach materials.
	68		Engage with community groups in outreach and education to EJ communities
	69		Increase implementation of nature based flood mitigation and stormwater infiltration strategies

Category	No.	Feature	Medium Priority Actions
	70	Aging Population	Implement Age Friendly Communities recommendations
	71	Food Security	Prearrange with vendors for availability of food during emergencies
	72		Expand food availability capacity by promoting involvement with local agriculture/farms/home gardening
	73	Urgent Care/EMS	Conduct outreach to get people in need on check-in list (that emergency services has to check in on people during emergencies) that destigmatizes and normalizes getting this assistance.
	74	Community Groups/Volunteerism	Better utilize volunteers (possibly even in clearing of invasive species)
Infrastructure	75	Pumps and Levees	Study of existing levees to determine if capacity can handle severe storm events and flooding. Model amount of rainfall that could be offset by increasing infiltration
	76		Explore needs for expansion of levees and nature based solutions to reduce flood impacts
	77	Dams	Determine which dams are in need of repair/maintenance – inform owners of responsibility for maintenance
	78	Critical Facilities & Municipal Buildings	Locate new public safety building outside of flood plain; identify emergency shelters outside of flood plain
	79		Relocate emergency operations outside of vulnerable areas, thinking of nature-based solution
	80		Ensure backup systems at critical public facilities are in working order
	81	Roads/Transportation	Evaluate traffic flow and evacuation routes, particularly when Big E is in progress – traffic congestion creates bad air quality
	82		Complete an engineering study to explore options to stop flooding on Route 5
	83		Plan for food access when roads are flooded
	84		Explore funding sources to improve or replace high priority culverts
	85	Stormwater System	Two-part program: reduce impervious cover wherever possible; increase pipe capacity where needed
	86		Explore nature based options for stormwater/flood management
	87	Wetlands	Provide public education on maintaining healthy wetlands and waterways (no dumping leaves, grass clippings, etc.)

Category	No.	Feature	Medium Priority Actions
	88		Pass bylaws to support best practices for wetland and waterway health
	89		
	90	Renewable Energy	Integrate solar in parking lots
	91		Consider implementing new standards through an ordinance or incentive program for porous paving and solar over parking lots; integrate solar for shading, to reduce urban heat island effect where trees aren't viable, and produce renewable energy. Program should consider including solar lease agreements as an option.

Category	No.	Feature	Low Priority Actions
Environmental	92	Parks	Use more pervious surfaces in parks - research surfaces that allow for greater mobility/access by people with mobility limitations but that also infiltrate water; more rain gardens in parks
	93	Wildlife Movement	Keep wildlife movement/connectivity under consideration in any planning for road projects and/or dam removal
	94		Explore options for wildlife movement over/under Mass Pike
	95	Bear Hole	Explore options for modification/removal/incorporation of green infrastructure to existing Bear Hole reservoir and dam
Societal	96	Food Security	Increase number and location of community gardens
Infrastructure	97	Drinking Water	Monitor conditions of existing water storage solutions and plan for increased demand
	98	Critical Facilities & Municipal Buildings	Consider resiliency in ongoing planning efforts relative to siting critical facilities
	99	Hazardous Materials in Flood Zones	Educate property owners and businesses on risks and responsibilities of hazardous materials in flood zones

Note: In most cases, actions are presented in the table above as written by CRB Workshop participants. Where proposed actions in their original form lacked clarity or detail, the project team expanded upon the action in order to promote project-readiness.

Action Implementation Design

Once participants at the CRB Workshop voted on the top priority actions, each team was asked to select one action and begin to develop an implementation plan. For each action, the small groups filled out an Action Implementation Design worksheet, providing information on the project feasibility and management, ideas on community outreach and engagement around the proposed project, an estimated cost for the project, known or potential funding sources, and implementation milestones. This exercise was a tool for West Springfield decision makers to get a head start on the thought process that would be required to apply for a MVP Action Grant.

Workshop Participants

Approximately 22 participants from Town departments, committees, and boards, large land owners, community organizations, and businesses were in attendance at the MVP workshop. The participant check-in list is provided in Appendix C.

Citation

West Springfield Community Resilience Building Workshop Summary of Findings (2020). Pioneer Valley Planning Commission. West Springfield, Massachusetts.

MVP Working Group

- Ed Sullivan, Former Mayor
- Bill Flaherty, Fire Chief
- Allyson Manuel, Assistant Planner
- Deena Maniscalchi, Conservation Commission
- Melissa Hensen, Conservation Commission
- Hannah Spare, All Farmers
- Emily Slotnick, Pioneer Valley Planning Commission

Workshop Facilitators

- Emily Slotnick, Pioneer Valley Planning Commission
- Patty Gambarini, Pioneer Valley Planning Commission
- Becky Basch, Pioneer Valley Planning Commission
- Jill Decoursey, Pioneer Valley Planning Commission

ACKNOWLEDGEMENTS

Special thanks to the Town of West Springfield staff for their willingness to enhance this process, and to the West Springfield Public Library for providing the facilities to convene. This project was made possible through funding from the Massachusetts Executive Office of Energy and Environmental Affairs.

APPENDIX A: WORKSHOP BASE MAP

APPENDIX B: PARTICIPATORY MAPPING RESULTS

APPENDIX C: PARTICIPANT HANDOUTS (CRB WORKSHOP)

SIGN-IN SHEET

MVP Stakeholder Invitation List and RSVP Tracking - Workshop date January

Initial Here	Table	Name	Affiliation	Phone #	Email Invitation (date and initial who sent)	RSVP (Y or N if unable to attend)	Notes
	1	Hannah Spare	All Farmers		y, ES 12/14	Y	MVP Core Team
	1	Stephanie Straitiff	WS Chief Technology Officer		y, ES 12/14	Y	
	1	Bill Flaherty	WS Fire Chief	(413) 263-3226	y, ES 12/14	Y	HMP Committee
	1	~~Jim Czaja~~	~~WS Town Engineer~~	(413) 263-3244	y, ES 12/14	Y	HMP Committee
	2	Dori Hayes	WS Neighborhood Association, Tree Committee	413-733-3843	Melissa	y	has to leave at noon
	1	Deena Maniscalchi	WS Conservation Commission	(413) 734-2231	y, ES 12/14	Y	MVP Core Team
	1	Todd Steglinski	WS Environmental Committee		AM 1/3	Y	
	1	Caroline Davis	Ascentria Sevices for New Americans	508-221-5215 call	y, PVPC 1/14	Y	
	2	Scott Moore	WS Central Maintenance Director	(413) 495-1838	y, ES 12/14	Y	HMP Committee
	2	Mark Noonan	WS Conservation Director	(413) 263-3072	y, ES 12/14	Y	HMP Committee
	2	Laurie Cassidy	WS Council on Aging Director	(413) 495-1803	y, ES 12/14	Y	HMP Committee
	2	Beverly Brown	WS Planning Board	(413) 204-0279	AM 1/3	Y	
	2	Jean Galloway	WS Public Health	[illegible]	y, ES 12/14	Y	HMP Committee
	2	Melissa Hensen	WS Conservation		y, ES 12/14	Y	MVP Core Team
	2	Jay Steup	WS Building Commissioner	(413) 495-1860	y, ES 12/14	Y	HMP Committee
	3	Steve Svec	Science Teacher	413-263-3400	AM 1/3	Y	Will be providing names of 2 students.
	3	Ed Sullivan	Former W.S. Mayor		y, ES 12/14	Y	MVP Core Team
	3	Allyson Manuel	WS Planning and Development, Director	(413) 495-1873	y, ES 12/14	Y	HMP Committee
	3	Jeff Auer	WS Water Superintendent	(413) 263-3230	y, ES 12/14	y	HMP Committee
	3	Pat Garbacik	WS Tree Committee, School Committee, PCC	413-221-0089	AM 1/3; MH 1/20	y	
	3	Mark Wamsley	Kestrel Land Trust		ES, 1/15	Y	
	3	Martha Tighe	Open Pantry		AM 1/3	Tentative	Can only come in morning, asked if she can send someone else who is avail all day
		Gabrielle Daley	Student	413-336-8383		Y	
	1	[illegible]	Student			Y	
		[illegible]	[illegible]				
		[illegible]	[illegible]				

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3	Martha Tighe	Open Pantry		AM 1/3	Tentative	Can only come in morning, asked if she can send someone else who is avail all day
		Student			Y	
		Student			Y	
1	JESSE ENGLISH	WS PROJECT MANAGER	413-320-7460			IN PLACE OF JIM CZACH
8	CAMILLE WASHINGTON	SMITH COLLEGE	440-934-8769			

APPENDIX D: POST-IT NOTE EXERCISE RESULTS

What changes have you seen in your natural environment?

- Bears out all winter
- Flooding becoming more and more common
- Lack of snow cover
- Less snow during winter. More ice.
- Less farmland, less open space
- Run air conditioning more frequently than in the past. Increasing temperatures.
- Had to purchase additional air conditioning capacity/output
- More mild winters, comfortable temperatures through January
- Ponds don't freeze for ice skating
- Frozen services and water mains
- Shorter winters with long lasting snowpack
- Hot/warmer summers with high humidity
- More heat waves
- Increase in summer heat
- There are more heat waves now than 14 years ago
- More ticks
- Fewer people going outside
- Ocean erosion of beach where I fish
- Lower water levels in Connecticut River
- Flooding of property due to nearby construction
- There's always water dripping from the high school and middle school roof
- Basement flooding is increased
- Since buying my house 35 years ago, one corner of my property has become a wetland with permanent standing water
- Encroachment on streams and wetlands as developable property is used up
- More houses and housing developments in town. Less open space
- Severe weather, tornado in 2011
- How the October snowstorm killed 8 trees on my property and damaged trees across the town
- Changes in vegetation type, mostly tied to disease
- Increase in tick populations
- Increase in insect-borne diseases
- New mosquito species are on our doorsteps, as are new diseases
- Tree canopy is disappearing – cooling costs increase as temperatures increase
- Increased tree decline from insect and disease
- Increase in invasive species (plants and animals)
- More pest and disease pressure on crops
- Birds using plastic to build nests

- My dogs started shedding in the winter for their summer coats
- More invasive shrubs
- More urban wild animals due to humans feeding them and building in new areas
- Fewer native birds

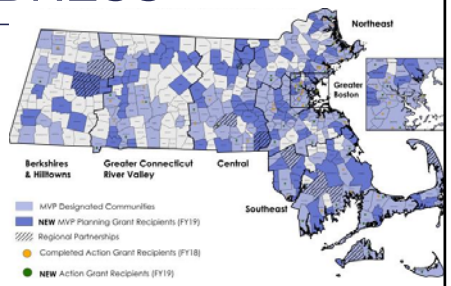
What does Climate Vulnerability Preparedness look like to you?

- Control wasteful use of drinking water during a drought
- Adequate and reliable drinking water system for fire protection, water quality and quantity at all times
- Adopt regulations to restrict lot coverage – restrict paved areas – recharge storm water onsite
- Active planning – updating zoning and ordinances in order to protect the environment
- Food security for burdened households – affordable and consistent supply
- Prevent extreme heat, especially in low income areas. Increase the tree canopy, reduce heat storage (change to light colored hard tops and roofs)
- Plant trees for the future to lower temperatures, mitigate street flooding, prevent soil erosion, reduce air pollution, filter water
- Preventing extreme flooding through watershed ecosystem management and reducing impermeable surfaces/concentration
- Language barrier – action plan to impact education of our vulnerable populations
- Need to link new migrants/immigrants to the town to help understand our situations with climate, etc.
- Join with the school department to reach non-English speaking populations. The school department already is required to reach this population
- Being aware of vulnerabilities and being comprehensively prepared to do best we can (proactive)
- Addressing social issues like poverty, English language, education, interactive social resources
- Understanding all natural areas will respond in a particular disaster – flood, drought, etc. – and being able to communicate to public that lives there information about those disasters and how they will be impacted
- Expanding environmental education
- Being fully prepared to respond and assist residents in an emergency
- Public health is fully funded to implement prevention and preparedness activities
- All towns in the Pioneer Valley are members of the PV mosquito control district
- Disaster preparedness making sure people have what they need to survive floods, blizzards, fires, droughts, and epidemics
- Increase in solar and renewables
- Improvements to infrastructure to handle more extreme weather events
- Getting our infrastructure ready to handle it

APPENDIX E: MVP WORKSHOP PRESENTATION

MUNICIPAL VULNERABILITY PREPAREDNESS

Town of West Springfield, Ma



Introductions

1. Name
2. Your role in / relationship to West Springfield (staff, board and committee members, business owner, resident, etc.)
3. What personally motivates you in your work these days?

Global Climate Trends

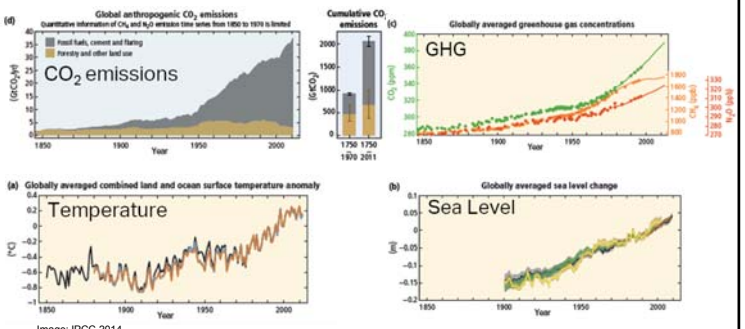
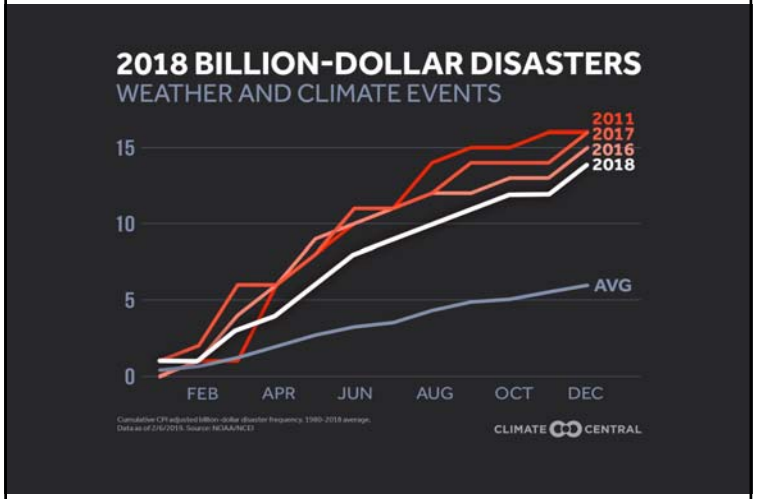


Image: IPCC 2014

- 14 of 15 hottest recorded years since 2000
- July, August 2016, then July 2017 – hottest months on record



MA Climate Projections

By end of the century:

Changes in precipitation	• 18% increase in consecutive dry days • 57% increase in days with > 1 in. rainfall • 7.3 inches additional annual rainfall
Rising temperatures	• 10.8°F increase in average annual temperature • 42% decrease in days/year with min. temperatures < 32* F • 1,280% increase in 90-degree days/year
Extreme weather	• Increase in frequency and magnitude

Principles of MVP Planning and Actions

- Employs local knowledge and buy-in
- Utilizes partnerships and leverages existing efforts
- Is based in best available climate projections and data
- Incorporates principles of nature-based solutions
- Demonstrates pilot potential and is proactive
- Reaches and responds to risks faced by EJ communities and vulnerable populations

West Springfield MVP Process

- Define and characterize hazards using latest science and data
- Identify existing and future community vulnerabilities and strengths
- Develop and prioritize community adaptation actions
- Determine overall priority actions
- Incorporate resilience and adaptation into HMP
- Receive MVP designation

MVP Planning Grant

MVP Action Grant

Implement priority adaptation actions identified through planning process

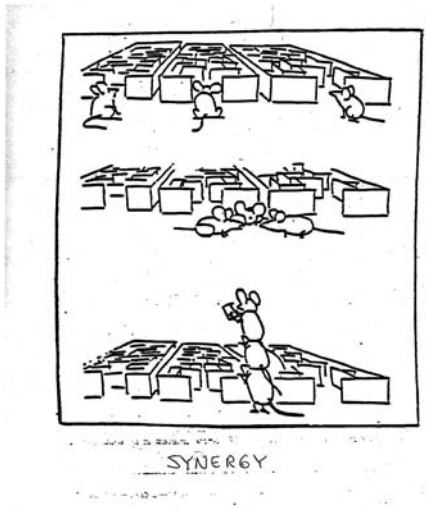
Outline of Today's Workshop

DURING WORKSHOP

A	Prepare for the Workshop	1. Establish a core team with goals. 2. Engage stakeholders. 3. Prepare materials for workshop. 4. Decide on participant arrangements.
B	Characterize Hazards	1. Identify past, current, and future impacts. 2. Determine the highest-priority hazards.
C	Identify Community Vulnerabilities and Strengths	1. Identify infrastructural vulnerabilities and strengths. 2. Identify societal vulnerabilities and strengths. 3. Identify environmental vulnerabilities and strengths.
D	Identify and Prioritize Community Actions	1. Identify and prioritize infrastructural actions. 2. Identify and prioritize societal actions. 3. Identify and prioritize environmental actions.
E	Determine the Overall Priority Actions	1. Identify highest-priority actions. 2. Further define urgency and timing.
F	Put It All Together	1. Generate final workshop products.

Community Components

- Infrastructural
- Societal
- Environmental



Agenda

Time	Activity
8:00 a.m.	Introductions, MVP, Climate Data, Local Conditions
9:45 a.m.	Select Hazards
10:00 a.m.	**Break**
10:15 a.m.	Small Team: ID/Map Community Vulnerabilities and Strengths
11:15 a.m.	Report out
11:40 p.m.	Introduce Action Development Exercise
12:00 p.m.	**Lunch**
12:30 p.m.	Small Team: Identify and Prioritize Community Actions
2:00 p.m.	Small Team: Identify Priority and Urgency/Timeline
2:25 p.m.	**Break**
2:35p.m.	Report Outs, Vote on Top Priorities
3:00 p.m.	Implementation Design Exercise and Report out
3:30 p.m.	Wrap-up and Next Steps

Activity #1: How has climate change impacted you over the course of your lifetime?

Example: My street floods once or twice per year now, and it never did in the past

Example: Less snowpack for skiing

Example: Fewer blue jays at my bird feeder in the winter

Example: Early thaws followed by late cold snaps have damaged fruit yields

Fill out sticky note, and add to board

Assessing Natural Hazards

Table 9. Hazard Profiling and Risk Index

Primary Climate Change Interaction	Natural Hazard	Location	Extent	Probability of Future Events	Hazard Risk Index Rating
Changes in Precipitation	Flooding (including Dam Overtopping and Dam Failure)	Medium (100-year and localized) Small (dam failure)	Limited (100-year) Minor (Localized) Critical (dam failure)	Low (100-year) Very High (Localized) Very Low (dam failure)	Low (100-year) High (Localized) Medium-Low (dam overtopping/ failure)
	Drought	Large	Minor	Low	Low
Rising Temperatures	Average/Extreme Temperatures	Large	Critical	High	High
	Wildfire/Brushfire	Medium	Limited	Low	Low
	Invasive Species	Medium	Limited	High	Medium-Low
Extreme Weather	Severe Winter Storm (including Ice Storms) / Nor'easter	Large	Critical	High	Medium-High
	Hurricanes/ Tropical Storms (including severe wind)	Medium	Limited - Critical	Moderate	Medium
	Tornado (including microburst)	Medium	Catastrophic	Low (tornado) Moderate (micro-burst)	Medium-Low
Non-Climate-Influenced Hazards	Earthquake	Large	Minor	Very Low	Low
Man-Made Hazard	Hazardous Materials	Small	Limited - Critical	Low	Medium-Low

Concerns and Challenges

Localized Street Flooding

- SR 20 / Westfield Street, Block Brook crossing at Plymouth Terrace; Just west of Elm Street and also near Ohio Avenue
- Ashley Street near Nelson Circle (near elderly housing facility)
- Schoolhouse Brook - Labelle Street, West side of Riverdale Street
- River Street underpass
- Ely Avenue and Verdugo Street
- Exit ramp from U.S. Route 5 to I-91
- Union and Side Streets under CSX underpass
- Piper Cross Road, Front Street, Old Westfield Road, Memorial Avenue, Morgan Rd, SR 5 / Riverdale Street, AND MORE

Levees

- 202 acres in levee protected zones
- Built to protect from major river flooding
- Pump station can't handle increased rates of runoff
- Limited-English speaking populations may face challenges receiving and understanding emergency alerts and notifications

"Small stream flooding occurs on a regular basis due to increased residential development over the past thirty years. Only in high intensity storms could flooding become a problem with the Connecticut and Westfield Rivers."
– West Springfield 2015 OSRP

Concerns and Challenges

- Extreme Heat
  - Compounded by poor air quality in Pioneer Valley
  - Aging population is particularly vulnerable to respiratory complications from mold and pollen, as well as extreme heat
  - Hamden County had the highest annual average emergency department visits due to asthma (110.1 to 125.6 visits per 10,000 people) between 2002 and 2012.
- Prolonged Frost-Free Season
  - Disease Vectors – High level of risk of EEE showing up until after first frost
- Trees and tee canopy
  - How to replenish stock?
  - Need to place permanent protection on existing forest lands

Concerns and Challenges

- Severe Winter Weather
  - Roadway hazards: numerous locations cited as particularly vulnerable due to significant grade and a dangerous turns, causing driving difficulties and impairing visibility.
  - Widespread downed trees and power outages
  - Limited access to critical resources such as medical care, food, and heating shelters
  - Limited-English speaking populations may face challenges receiving and understanding emergency alerts and notifications
- Communication
  - Vulnerable populations
  - Widespread education about climate change and adaptation
- Food security

West Springfield's Assets and Features

Natural resources

- Carbon Sequestration Program: carbon credits for 2,000 acres of Bear Hole and 329-acre Mittineague Park
- 100 acres of new open space and 45 acres around wells in Southwick and Westfield since 2015
- Trees!
- Participant in the Source Water Assessment and Protection (SWAP) Program, which publicizes inventories of land uses in recharge area and assessment of contamination susceptibility to improve protection

West Springfield's Assets and Features

Regulations & Policies

- Zoning & Land Use
  - Complete Streets Policy in place and actively implementing projects
  - Planned Unit Development District
  - Flood Hazard Overly District
  - Subdivision Rules & Regs require planting of shade and street trees
  - General Ordinances establishes a citizen-led Urban Forest Committee
  - Zoning allows for Cluster Development by special permit (less effective than de facto or by right)
- Buildings & Energy
  - Certified Green Community
- Public Health
  - Mass in Motion partner community, working on food security & access to parks/nature
  - Age Friendly Community planning with the COA through Mass in Motion

West Springfield's Assets and Features

Social Resources

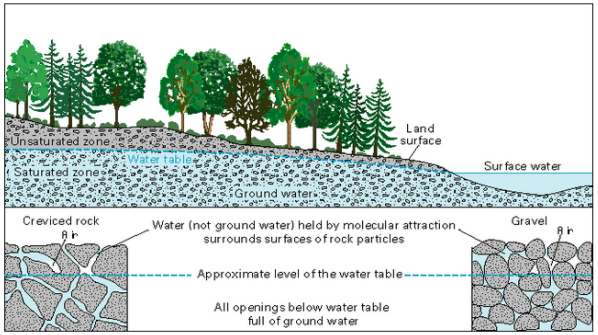
- Middle school back-up generator powers critical functions enabling that facility to serve as an emergency shelter
- Senior Center and Public Library currently serve as heating and/or cooling stations equipped with cell phone charging stations and lockboxes for residents without power who need to charge their devices
- Council on Aging promotes emergency preparedness and strategizing for the future during their meetings with clients at the senior center and during in-home visits.
- Multiple non-profit service organizations including Ascentria Care Alliance

Drinking water

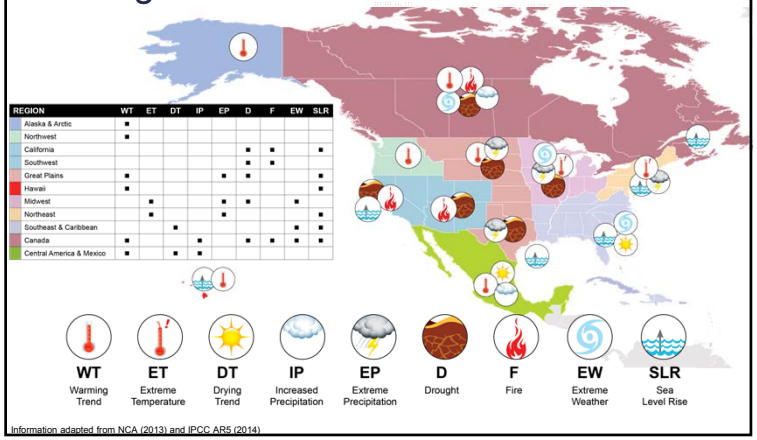
Three characteristics that shape nature of supply

- Geology
- Soils
- Land use/forest cover

What do we know about drinking water?



High Level Overview of Climate Change Trends in North America

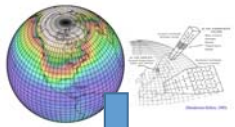


Information adapted from NCA (2013) and IPCC AR5 (2014)

MA Climate Projections

- Statewide projections comprised of county-and basin-level information

Global Climate Models (GCMs)



Model Selection
Rigorous assessment of model performance and projections

Karmalkar et al., *under review*

Latest, state of the art climate model simulations (CMIPS) used in the IPCC report (2013)

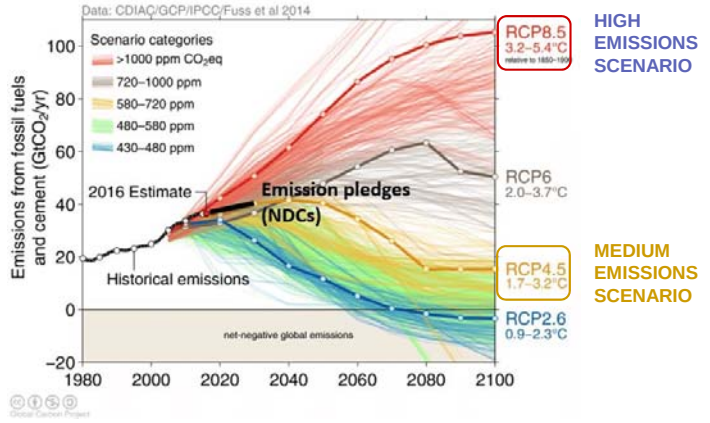
Daily data for MA at 6-km resolution

DOWNSCALED MODEL DATA

Statistical Downscaling

Pierce et al., 2014

Emission Scenarios



Westfield River Basin Climate Projections

By 2100

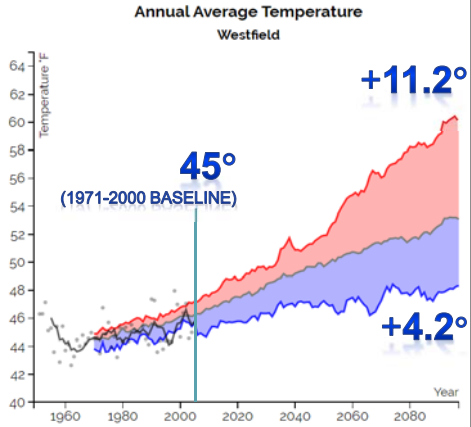
- Increase (↑) in:
  - Average temperatures (annual and seasonal)
  - Min and max temperatures
  - # of days with temps over 90, 95, and 100
  - Cooling degree days (65 and above)
  - Winter precipitation
  - Frequency of heavy precipitation (winter and spring)
- Decrease (↓) in:
  - # of days below 32 and 0
  - # of heating degree days (65 and below)
  - Fall precipitation (potential)

Average Temperatures

- ↑ in annual and seasonal average, max., and min. temps
- Summer highs may ↑ 9% by 2050, 17% 2100
- Fall highs may ↑ 13% by 2050, 21% 2100

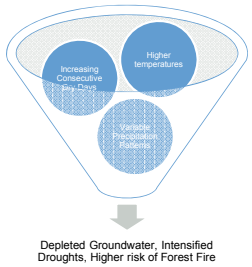
Impacts

- Rain v. snow
- Ecosystem viability
- Consecutive dry days
- Drought and fire



Average Temperatures PLUS…

- ↑ in Consecutive dry days
- Invasive Species
  - Changing hierarchies in ecosystems
  - Ecosystem stress opens invasive pathways
- ↑ in mosquito populations - West Nile virus and triple E.
- ↑ in existing tick-borne diseases and change in geographical distribution of others

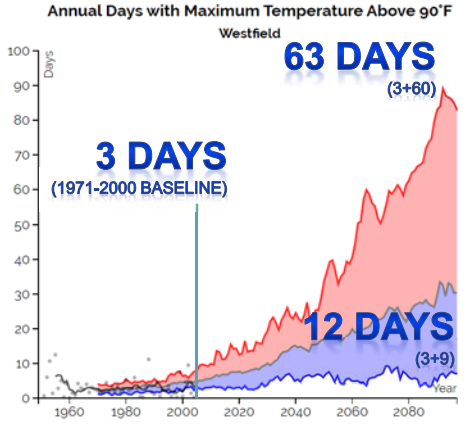


Extreme Temperatures

- Major jump w/ high emissions scenarios
- By 2100, up to +49 days above 90 in summer, +8 days above 90 in fall.

Impacts

- Heat impacts vulnerable pops.
- ↑ in cooling degree days



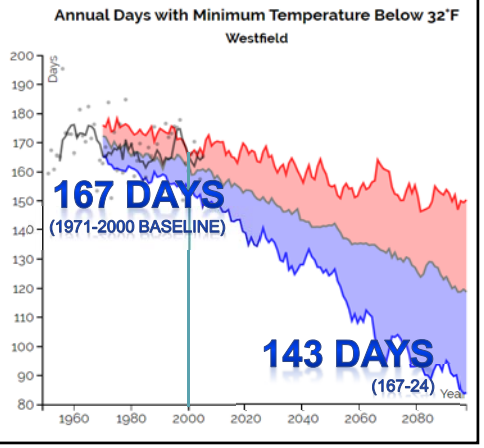
Show # days over 90 by year from local monitoring station

Cold Temperatures

- Fewer days below 32° and 0°
- ↓ in 32° days by 2050 mostly in fall and spring
- ↑ length of frost-free season

Impacts

- Pests and insects
- Vegetative growing season
- Maintenance costs

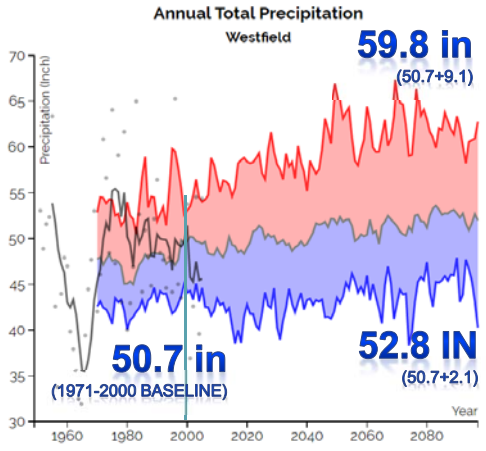


Precipitation

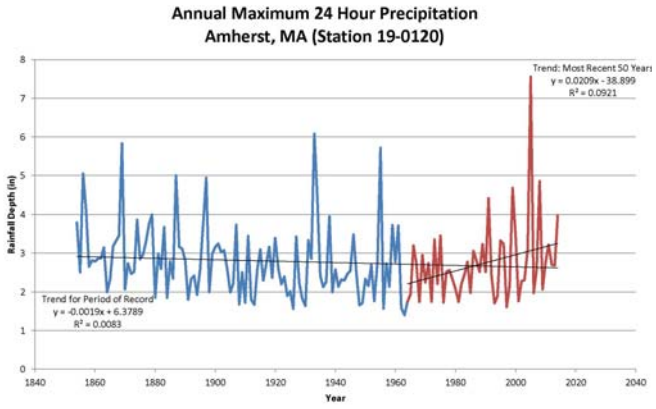
- Annual precipitation ↑ 1.2 – 6.9" by 2050, 2.1 - 9.1" by 2090
- Greatest ↑ in spring and winter

Impacts

- Winter rain
- Reduced snow cover and ice melt



Historical Trend: Maximum Precipitation



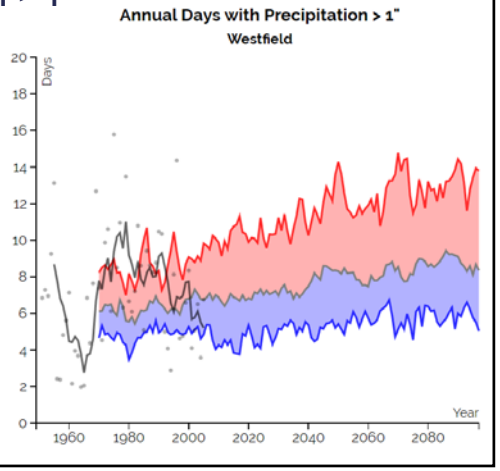
Source: Linnean Solutions

Precipitation >1”

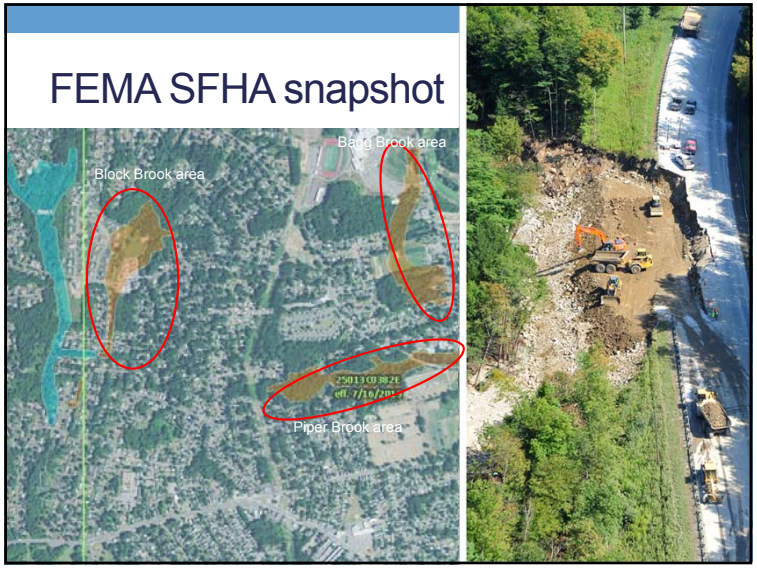
- Annual ↑ 1.48 days by 2050
- Greatest ↑ in spring and winter

Impacts

- Water quality
- Flood risk
- Erosion
- Stormwater infrastructure



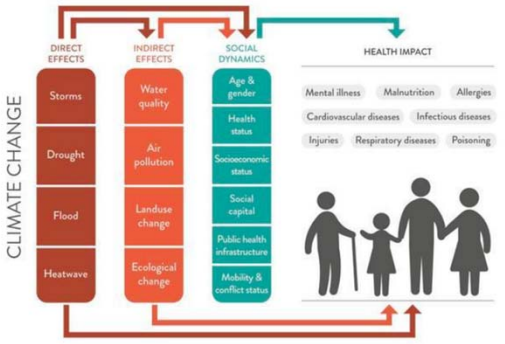
FEMA SFHA snapshot

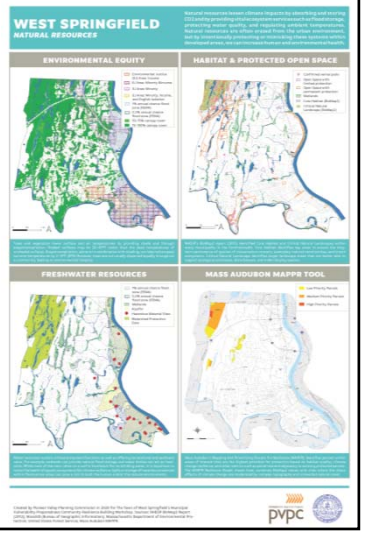


Consecutive Dry Days

Who and what is especially vulnerable?

Climate Change is a **threat multiplier!**





Activity #2: What does **Climate Vulnerability Preparedness** Look Like to You?

Examples:

"Able to weather disasters and long-term emergencies with joy, grace, and safety."

"Having water and heat available during all weather events."

"Variable and flexible social network. Flexible plan to address short-term problems in the context of long-term goals."

"Sharing resources with others in my community. Communication."

"Prepare for the unprecedented."

Fill out sticky note, and add to board

Strategies from Other Planning Efforts

Plan / Code	Identified Action (May Not Yet Have Been Implemented)
Hazard Mitigation Plan (2019)	• Replace top priority culverts on replacement list • Outreach to private dam owners to educate around inspection • Explore opportunities to implement a stormwater utility to mitigate flood risk by 2022 • Identify potential dam removal sites for natural hazard risk reduction and habitat restoration • Update the town's Emergency Operations Plan to include inventory and deployment protocol for warming and cooling stations/comfort centers around the town. • Ensure roadways across town remain accessible during and after heavy snow events by, among other strategies, improving accessibility of messaging across languages, and evaluate off-street parking alternatives for residents in the Merrick neighborhood.

Strategies from Other Planning Efforts

Plan / Code	Identified Action (May Not Yet Have Been Implemented)
Open Space & Recreation Plan	• Encourage patterns of design and development that emphasize conservation of natural resources through modification of existing subdivision regulations • Establish Transfer of Development Rights (TDR) in order to encourage new developments in areas that are already partially developed in exchange for leaving certain areas untouched. • Work to preserve open space through the Community Preservation Committee and other land conservation organizations prior to land being purchased by a developer. • Create a grant writer position for the City of West Springfield and hire an experienced individual who will seek out grants for open space and recreation as well as opportunities for other Departments.

Strategies from Other Planning Efforts

Plan / Code	Identified Action (May Not Yet Have Been Implemented)
Merrick & Memorial Canopy Cover Assessment	• Encourages establishing canopy cover goals for individual neighborhoods and methodologies for prioritizing which benefits to enhance.
Food Network Study of Merrick	• Research potential land agreements between the owners of potential farm sites for All Farmers. • Protect and celebrate Merrick's plethora of distinct food cultures represented by the many ethnic grocers and restaurants concentrated in the neighborhood. Consider establishing a cultural food festival and/or a local business association. • Individual land owners or the Town of West Springfield to preserve farmland through Agricultural Preservation Restrictions.
Carbon Sequestration Program	• Credits are sold to developers looking to offset the impact of their projects. Money will go toward eliminating illegal dumping, enhancing passive recreation and improving the ability of wildlife to migrate across the properties.

MVP and Nature-Based Solutions

- The sustainable management and use of nature for tackling challenges such as climate change, water and food security, biodiversity protection, human health, and disaster risk management.
- Provides co-benefits for people and nature

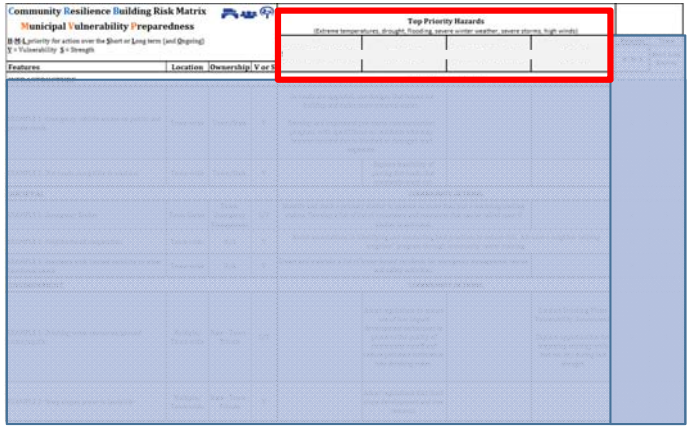
Nature-Based Solutions: Examples

- Maintaining healthy, resilient forests will help them continue their critical function of carbon sequestration.
  - Using controlled burns to reinstitute natural fire regime
  - Monitor for early detection and removal of invasive plant species
  - Maintaining species- and age-diverse forest
- Flood and fish friendly culverts protect infrastructure and aquatic habitat
- Rain gardens to reduce localized flooding and recharge aquifer

Any Questions?

Regroup at 10:15

Risk Matrix Exercise 1a: Characterize Hazards



Assessing Natural Hazards

Table 9. Hazard Profiling and Risk Index

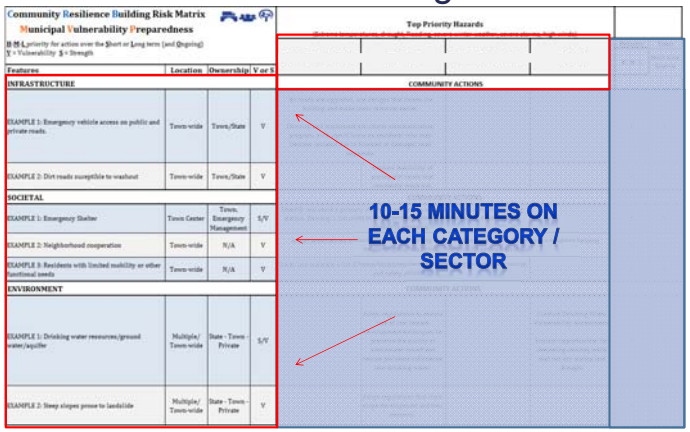
Primary Climate Change Interaction	Natural Hazard	Location	Extent	Probability of Future Events	Hazard Risk Index Rating
Changes in Precipitation	Flooding (including Dam Overtopping and Dam Failure)	Medium (100-year and localized) Small (dam failure)	Limited (100-year) Minor (Localized) Critical (dam failure)	Low (100-year) Very High (Localized) Very Low (dam failure)	Low (100-year) High (Localized) Medium-Low (dam overtopping/ failure)
	Drought	Large	Minor	Low	Low
Rising Temperatures	Average/Extreme Temperatures	Large	Critical	High	High
	Wildfire/Brushfire	Medium	Limited	Low	Low
	Invasive Species	Medium	Limited	High	Medium-Low
Extreme Weather	Severe Winter Storm (including Ice Storms) / Nor'easter	Large	Critical	High	Medium-High
	Hurricanes/ Tropical Storms (including severe wind)	Medium	Limited - Critical	Moderate	Medium
	Tornado (including microburst)	Medium	Catastrophic	Low (tornado) Moderate (micro-burst)	Medium-Low
Non-Climate-Influenced Hazards	Earthquake	Large	Minor	Very Low	Low
Man-Made Hazard	Hazardous Materials	Small	Limited - Critical	Low	Medium-Low

Top Hazards

Which CLIMATE-INFLUENCED natural hazards are the top priorities to consider in assessing vulnerability, preparedness, and planning for resiliency?

2019 HMP Hazards	Rating	MVP Hazards
Flooding (including 100-yr flood, localized flooding, dam overtopping and dam failure)	Low-High	**Flood** (may include dam failure, may result in landslide)
Hurricanes/ Tropical Storms (including severe wind)	Medium	**Severe Storm** (hurricane, severe thunderstorm wind, tornado, microburst)
Tornado (including microburst)	Medium-Low	
Severe Winter Storm (including Ice Storms) / Nor'easter	Medium-High	**Severe Snow Storm / Ice Storm**
Wildfire/Brushfire	Low	Wildfire / brushfire
Drought	Low	Drought
Average/Extreme Temperatures	High	**Extreme Temperatures (and temp fluctuation)**
Invasive Species	High	Invasive Species

Risk Matrix Exercise 1b: ID Vulnerabilities and Strengths



Data and maps available during workshop

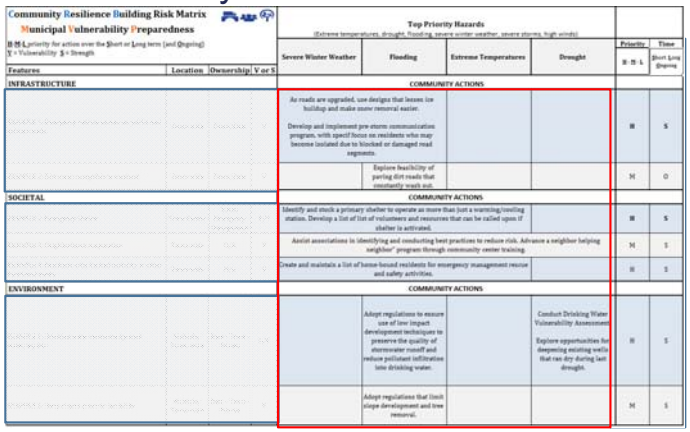
- Resources for today
  - Maps
    - Base map – for mapping exercise
    - Critical Facilities and (Past) Hazard Area Map
  - Social Vulnerabilities and Natural Resources Poster
  - Downscaled climate projections (on computer)
  - 2019 Draft HMP Update
  - 2018 Report: *Assessing Urban Tree Canopy Cover in the Merrick and Memorial Neighborhoods from a Public Health Perspective*
  - 2018 Report: *Culture & Community: A Food Network Study of the Merrick Neighborhood of West Springfield*

Report out at 11:30

Break

- Break for lunch at 12:00 p.m.
- 12:30 p.m. Identify and Prioritize Community Actions (Cont.)
- 2:00 p.m. Identify Priority and Urgency/Timeline
- Break at 2:25

Risk Matrix Exercise Part 2: ID Community Actions


Community Resilience Building Risk Matrix
Municipal Vulnerability Preparedness

Top Priority Hazards

Features	Location	Ownership	V or S	Severe Winter Weather	Flooding	Extreme Temperatures	Drought	Priority H-M-L	Time Short Long Ongoing
INFRASTRUCTURE				COMMUNITY ACTIONS					
				As roads are upgraded, use designs that lessen ice buildup and make snow removal easier. Develop and implement pre-storm communication program, with specif focus on residents who may become isolated due to blocked or damaged road segments.				H	S
					Explore feasibility of paving dirt roads that constantly wash out.			H	O
SOCIETAL				COMMUNITY ACTIONS					
				Identify and stock a primary shelter to operate as more than just a warming/cooling station. Develop a list of list of volunteers and resources that can be called upon if shelter is activated.				H	S
				Assist associations in identifying and conducting best practices to reduce risk. Advance a neighbor helping neighbor" program through community center training.				H	S
				Create and maintain a list of home-bound residents for emergency management rescue and safety activities.				H	S
ENVIRONMENT				COMMUNITY ACTIONS					
					Adopt regulations to ensure use of low impact development techniques to preserve the quality of stormwater runoff and reduce pollutant infiltration into drinking water.		Conduct Drinking Water Vulnerability Assessment. Explore opportunities for deepening existing wells that ran dry during last drought.	H	S
					Adopt regulations that limit slope development and tree removal.			H	S

West Springfield 2019 Hazard Mitigation Strategies

Table 32: Prioritized Implementation Schedule – Action Plan

#	Type	Description	Hazards Addressed	Responsible Department / Board	Timeline	Funding Source/ Estimated Cost	Incorporation into Existing Plans	Priority
1	SIP	Replace top priorities on culvert replacement list—Ashley, Union, Block Brook, Schoolhouse Brook, etc.	Flood	DPW	Ongoing	Grants and Town Tax funds, FEMA HMGP High	MVP Summary of Findings	Very High
2	EAP	Ensure private dam owners realize their responsibility to inspect the dams. Identify dams in town that are privately owned and have not been inspected, and do outreach to owners.	Flood	DPW	Short	MEMA Low	OSRP, Master Plan	High
3	NSP / LPR	Implement the goals and strategies of the West Springfield Open Space and Recreation Plan dealing with protection of floodplain, forests, and farmland, including: Draft changes to subdivision regulations to promote cluster development. Rewrite this part of the code to provide better incentives for developers to choose cluster development. See Open Space Development regulations.	Flood, Drought	Conservation Commission, City Council, Planning and Zoning, Parks and Rec	Ongoing	MA DCR Low - Medium	OSRP	Med

What is a "Winning" MVP Action?

Projects to build resilience, are proactive and clearly demonstrate efforts to redesign, re-evaluate, or reconsider and incorporate new climate change data.

Projects are encouraged to utilize nature-based strategies to address climate change impacts.

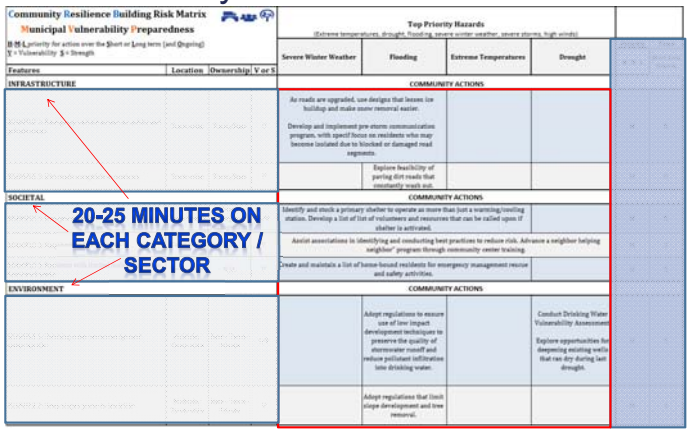
Many of these projects might also be funded through existing grant programs

- e.g. EEA's Dams and Seawalls, CZM/s coastal resilience, DER's culvert replacements

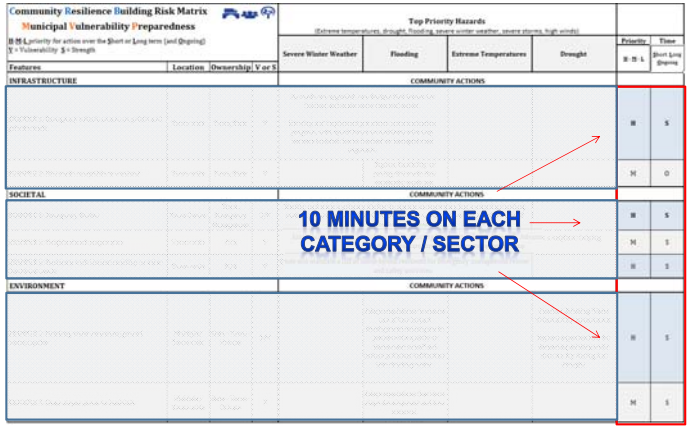
What is a "Winning" MVP Action?

Natick	Tree Planting Plan to Mitigate Heat Islands and Reduce Runoff	$9,025
Arlington	Mill Brook Corridor Flood Management Demonstration Project: Pilot Study and Implementation	$399,260
Gloucester	Watershed and Water Supply Vulnerability, Risk Assessment and Management Strategy	$107,044
Newburyport	Wastewater Treatment Plant Climate Resilience	$122,695
Belchertown	Town-wide Road Stream Crossing Assessment and Climate Change Adaptation Plan	$151,437
Northampton	Northampton Designs with Nature to Reduce Storm Damage	$400,000

Risk Matrix Exercise Part 2: ID Community Actions



Risk Matrix Exercise Part 3: Prioritize Actions



After Risk Matrices are Complete…

- Report Outs
- Turn in Priority Cards
- Dot Voting

Stretching Activity

Silently think of your favorite animal

You must all arrange yourselves in a row from Largest to Smallest

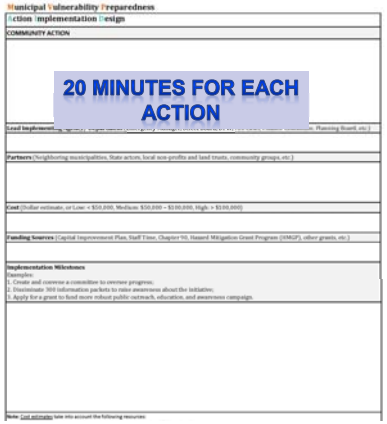
You are NOT allowed to speak

BUT you may make sounds and gestures of your animal

Regroup at 3:15

After Prioritization…

- Implementation Exercise
- Report Outs



Thank You!

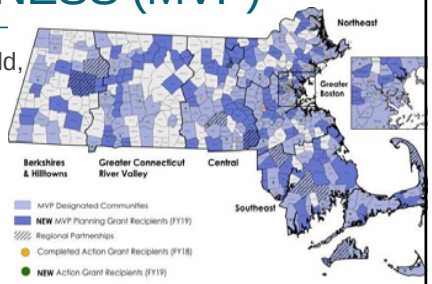
Next Steps

- PVPC will incorporate feedback gathered and priority actions resulting from the workshop into the HMP, resulting in a final draft HMP
- MVP Summary of findings/final report complete by late-February
- 1-hour public listening sessions to share results of MVP, HMP, and educate about climate impacts mid-March and April

APPENDIX F: PUBLIC LISTENING SESSION PRESENTATION

MUNICIPAL VULNERABILITY PREPAREDNESS (MVP)

Town of West Springfield, Ma



Introductions

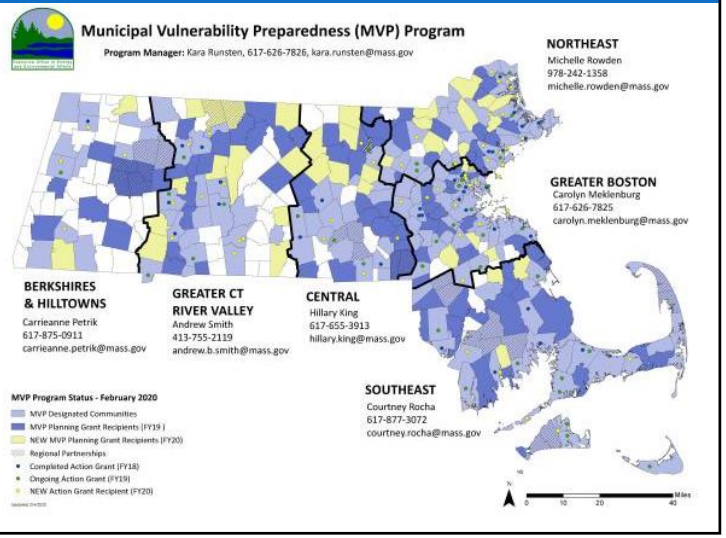
Please type your name and local affiliation into the Zoom chat box.

Examples:

Emily Slotnick, Pioneer Valley Planning Commission

Allyson Manuel, West Springfield Planning & Development

Jane Doe, West Springfield resident



Adaptation vs Mitigation

- **Adaptation** – adapting to life in a changing climate – involves adjusting to actual or expected future climate. It's doing what we can to live with and minimize the destruction and suffering that comes from climate change.
- **Mitigation** – reducing climate change – involves reducing the flow of heat-trapping greenhouse gases into the atmosphere.

Principles of MVP Planning and Actions

- Employs local knowledge and buy-in
- Utilizes partnerships and leverages existing efforts
- Is based in best available climate projections and data
- Develop projects that:
  - Incorporate principles of nature-based solutions
  - Demonstrate pilot potential and is proactive
  - Reach and respond to risks faced by Environmental Justice communities and vulnerable populations

Resilient communities don't just recover – they *continuously build capacity* to reduce the impacts of future climate events.

West Springfield MVP Process

Define and characterize hazards using latest science and data

Identify existing and future community vulnerabilities and strengths

Develop and prioritize community adaptation actions

Share results with the public

Receive MVP designation

MVP Planning Grant

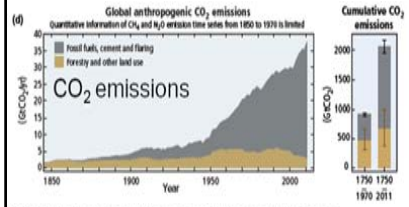
MVP Action Grant

Implement priority adaptation actions identified through planning process

Nature-Based Solutions: Examples

- Maintaining healthy, resilient forests will help them continue their critical function of carbon sequestration.
- Flood and fish friendly culverts protect infrastructure and aquatic habitat
- Solar power and battery storage for back-up power on critical facilities
- Rain gardens to reduce localized flooding and recharge aquifer

Global Climate Trends



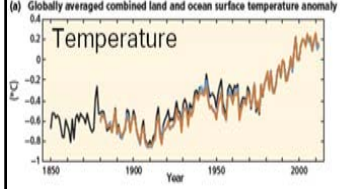
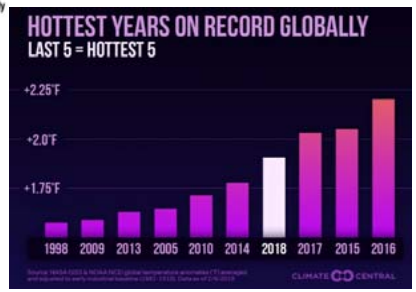


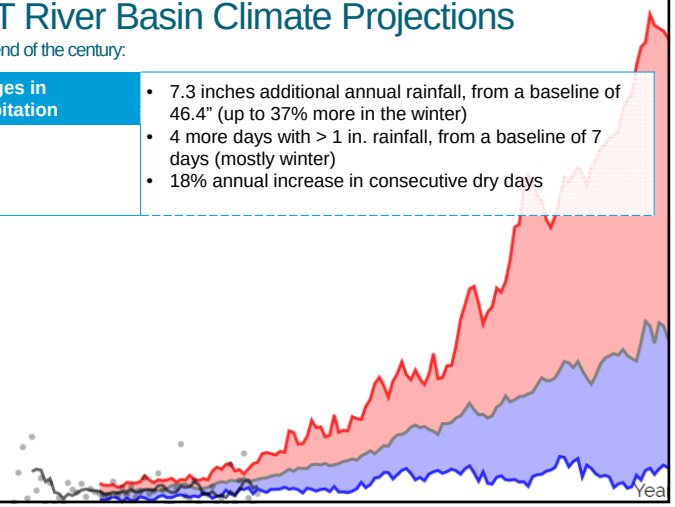
Image: IPCC 2014



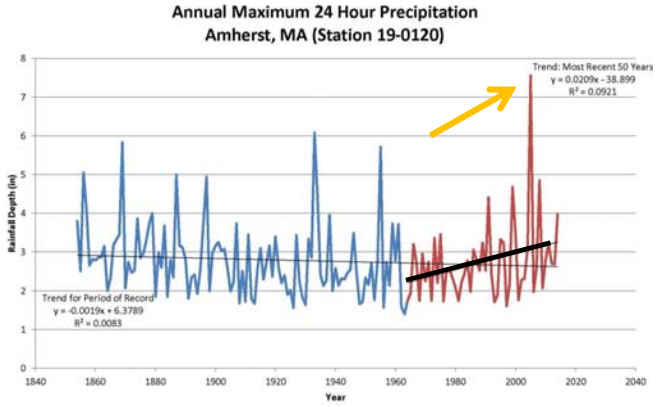
CT River Basin Climate Projections

By end of the century:

Changes in precipitation	• 7.3 inches additional annual rainfall, from a baseline of 46.4" (up to 37% more in the winter) • 4 more days with > 1 in. rainfall, from a baseline of 7 days (mostly winter) • 18% annual increase in consecutive dry days



Historical Trend: Maximum Precipitation



Source: Linnean Solutions

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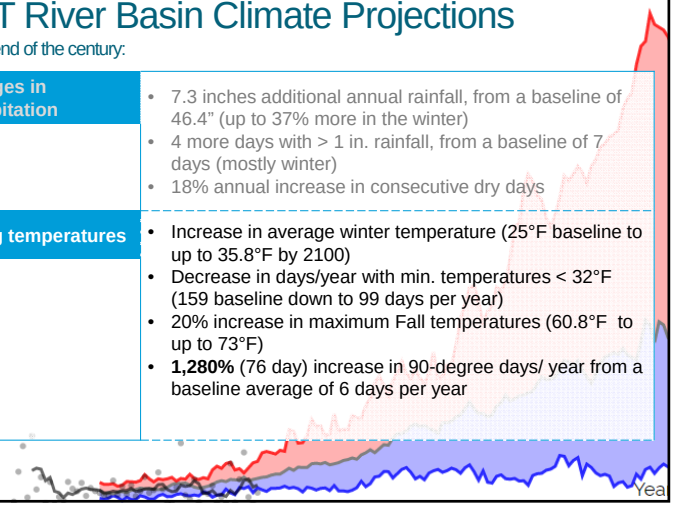
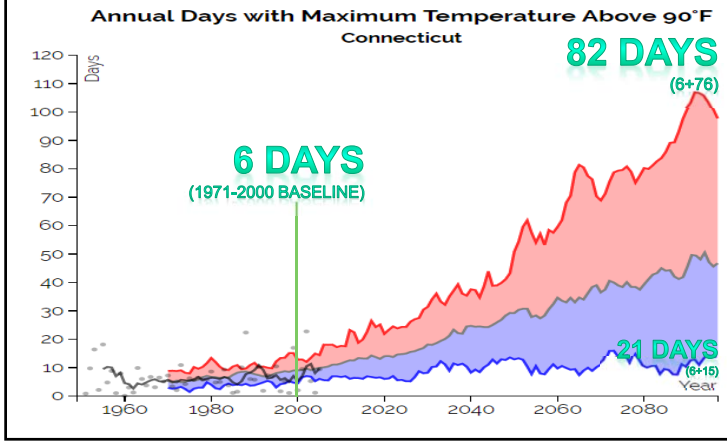
Rising temperatures	• Increase in average winter temperature (25°F baseline to up to 35.8°F by 2100) • Decrease in days/year with min. temperatures < 32°F (159 baseline down to 99 days per year) • 20% increase in maximum Fall temperatures (60.8°F to up to 73°F) • **1,280%** (76 day) increase in 90-degree days/ year from a baseline average of 6 days per year



Extreme Temperatures



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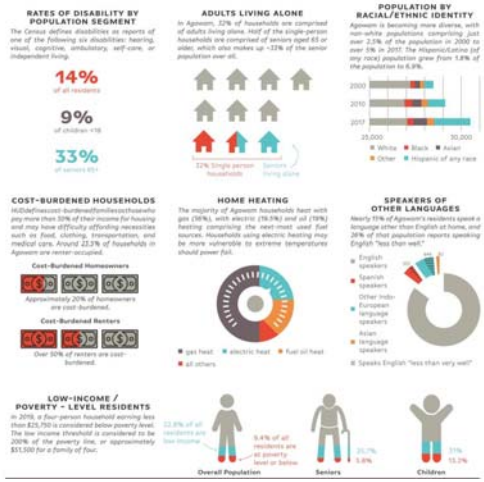
Extreme weather	• Increase in frequency and magnitude

Who is especially vulnerable?

- **Elderly**
- **Social minorities**
- **Low income families**
- **Those who already experience inequities**

Climate change is a threat multiplier!



West Springfield Areas of Concern

INFRASTRUCTURE

- Localized flooding at culverts, road passability, stormwater pumping capacity behind levees

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- Changing age-related demographics, residents with limited mobility, poverty-level and low income populations, emergency shelter network, emergency communications platform (NIXLE)

ENVIRONMENTAL

- Tree canopy and hazard trees, invasive species, and ground water and aquifer protection

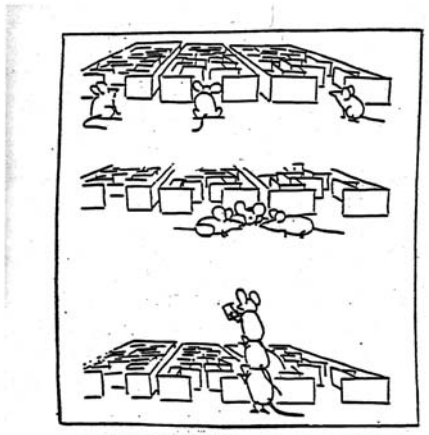
West Springfield's Assets and Features

- Ethnic and economic diversity
- Strong local economy of retail and service providers, including an abundance of grocery and food options
- Strong community of faith-based institutions
- Active Senior Center and Council on Aging
- High value placed on trees and tree canopy
- Longtime efforts in land protection and protection of wildlife corridors
- Array of social service providers

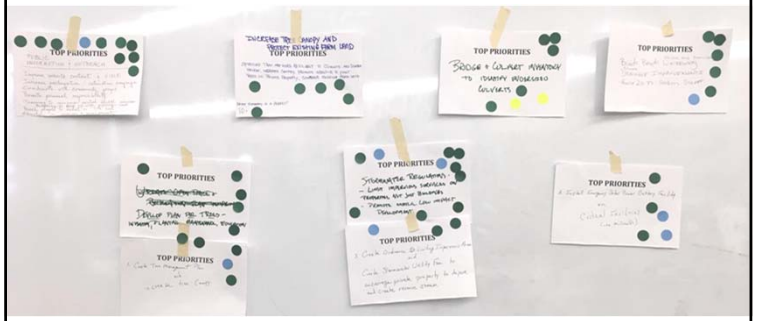
COMMUNITY RESILIENCE BUILDING WORKSHOP

MVP Planning Process

1. **Define and characterize hazards using latest science and data**
2. **Identify existing and future community vulnerabilities and strengths**
3. **Develop and prioritize community adaptation actions**
4. **Share results with the public**
5. **Receive MVP designation**

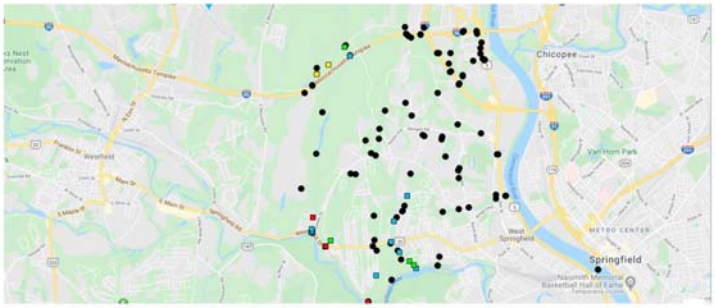


TOP RECOMMENDATIONS TO IMPROVE RESILIENCE



Install emergency **solar power and battery storage on critical facilities**, including town buildings and emergency shelters.

Complete **storm drainage and sanitary sewer improvements** along the Block Brook Waterway as it runs from Route 20 to Salem Street.



Complete a **town wide bridge and culvert inventory and conditions assessment** to identify undersized culverts.

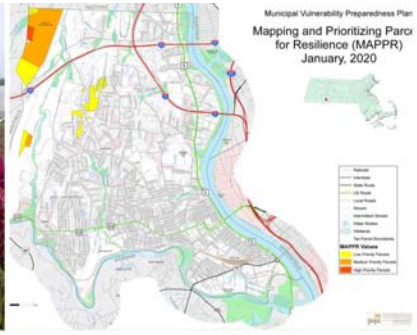
Develop and adopt new stormwater regulations to limit impervious surfaces on buildings and landscape, and promote more low impact development. Also, establish a stormwater utility fee to encourage private property owners to remove pavement and also create a new revenue stream for the town.

everbridge NIXLE

Coordinate with community groups to **undertake a public information and outreach campaign** for climate resilience.

. Improve town website content and NIXLE capabilities.
. Increase participation in emergency alerts through a saturation campaign.
. Secure necessary budget for town departments to keep up with growing mental health needs related to climate change.
. Offer trainings for Town staff and local service providers to recognize mental health issues.
. Enlist broader participation in the "TIPS" list to inform the Town of a person's medical condition so that in the event of an emergency the Town can be prepared to address individuals' needs.
. Promote personal responsibility for climate resilience.

Increase tree canopy and improve management. Create baseline reports about the existing tree canopy condition in each neighborhood by measuring average monthly temperatures, rainfall, species distribution, age, health, location, and soil to improve the resilience of the urban forest in the face of a changing climate. Wherever possible, engage the assistance of neighborhood residents and conduct public education in this process.



Protect open space and working lands. West Springfield's remaining open space, largely located along riparian corridors and wetlands, makes open space protection very important to building a resilient community. As more frequent natural disasters occur the ability of the community to recover may depend upon the community's ability to access resources produced nearby on its remaining farmland and other working lands.

Next Steps

1. Finalize Summary of Findings Report
2. Apply for MVP Action Grant

Questions? Comments?

- https://www.surveygizmo.com/s3/5560576/West-Springfield-Municipal-Vulnerability-Preparedness-Priority-Action-Survey
- Allyson Manuel amanuel@townofwestspringfield.org

Learn more about MVP

Read West Springfield's MVP Summary of Findings report
- https://www.townofwestspringfield.org/home/showdocument?id=6993

Municipal Vulnerability Preparedness grant program (MVP)
- Learn more about the MVP program. https://www.mass.gov/municipal-vulnerability-preparedness-mvp-program

Resilient MA Climate Change Clearinghouse
- Interact with the latest climate science and data at http://www.resilientma.org/

Natural & Nature-based Solutions for Vulnerability Reduction & Resilience
- Click through this slide deck by The Nature Conservancy all about Nature Based Solutions at https://www.mass.gov/doc/nature-based-solutions-training/download

Thank you!

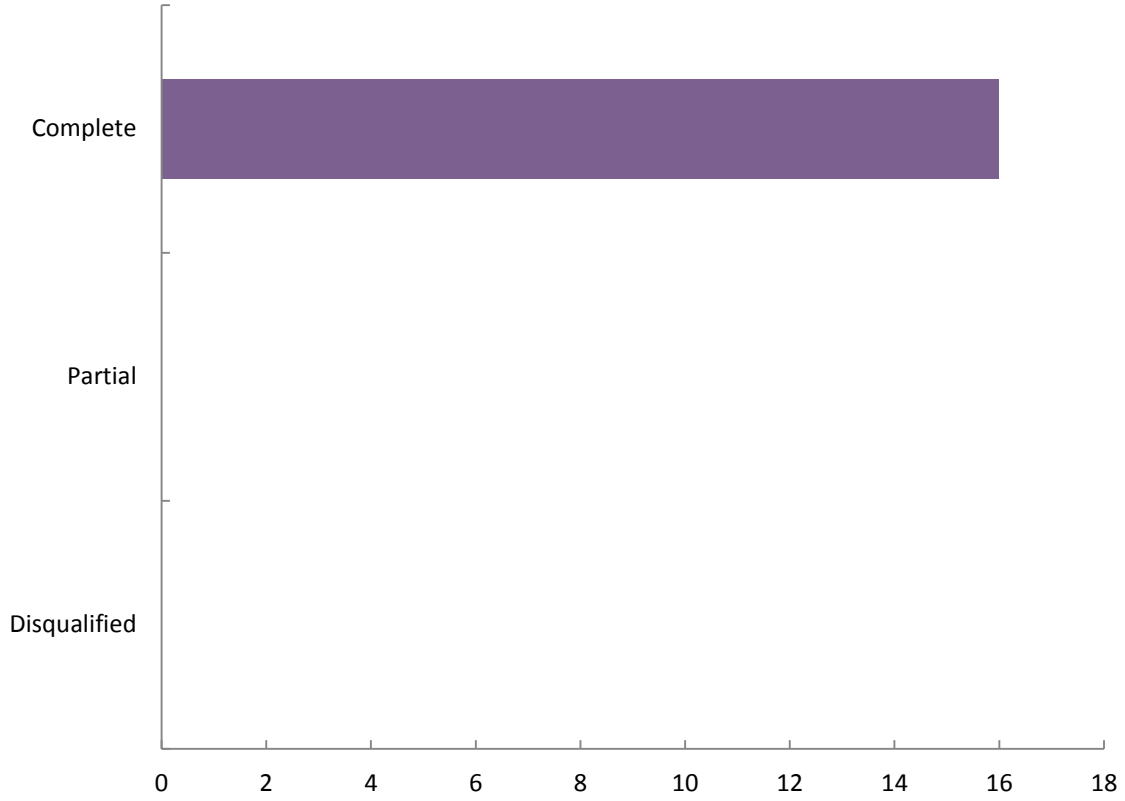
References

Priority action slides:
- Photo credit: Needpix.com. Author sabinevanerp (pixabay.com). https://www.needpix.com/photo/899034/solar-panels-solar-energy-battery-storage-sun-energy-green-power-environment-solar-cell
- Photo credit: Google Maps street view
- Photo credit: UMass Stream Continuity Project (2005 - 2016)
- Photo credit: Left: Author Pgccmarketing. Green Roof. November 2015. https://en.m.wikipedia.org/wiki/File:06-29-2015_CHS_green_roof-2-4.jpg. Right: Chris Hamby, Flikr, June 2013
- Photo credit: Left: Michael Mandiberg, Intergenerational support at Wikipedia Art+Feminism Edit-a-thon, at Eyebeam in New York City . Right: NIXLE.com
- Photo credit: Left: Rusty Clark, "Tree City USA" West Springfield MA." November 2011. https://www.flickr.com/photos/rusty_clark/6318256421. Upper Right: Walton LaVonda, USFWS. "children, learn, young, trees, buckets, planting." August 2016. https://pixnio.com/people/children-kids/children-learn-how-to-remove-young-trees-from-buckets-for-planting Lower Right: John Phelan. Town Common, West Springfield MA.jpg. September 2009. https://commons.wikimedia.org/wiki/File:Town_Common,_West_Springfield_MA.jpg
- Photo credit: Local Harvest, https://www.localharvest.org/new-lands-farm-west-springfield-M57340

APPENDIX G: SURVEY RESULTS

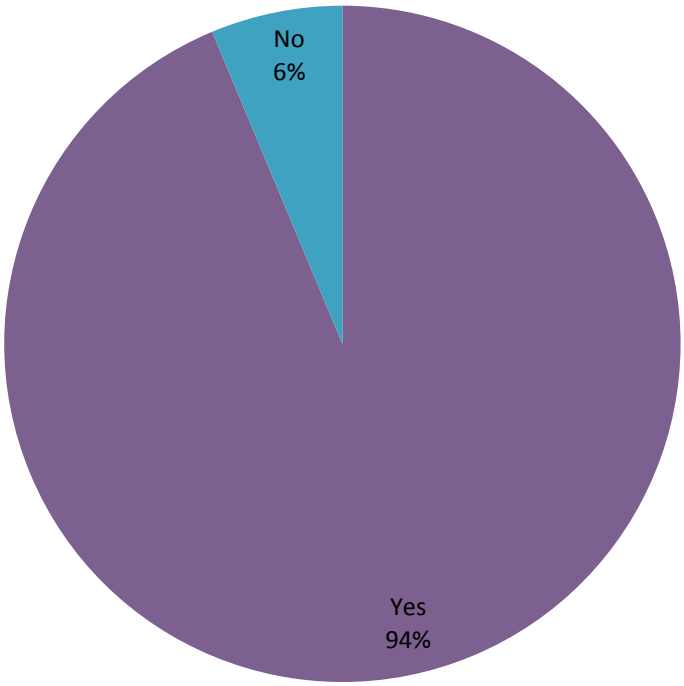
REPORT FOR WEST SPRINGFIELD MUNICIPAL VULNERABILITY PREPAREDNESS PRIORITY ACTION SURVEY

Response Statistics



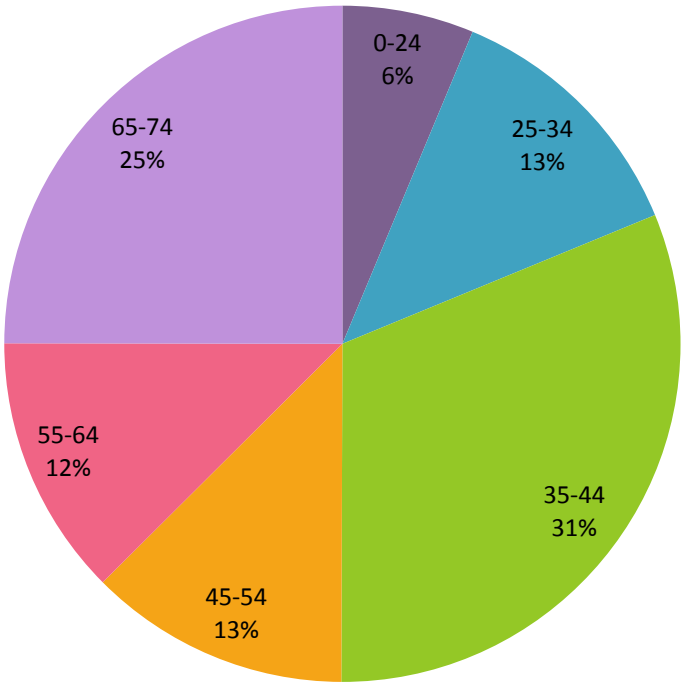
	Count	Percent
Complete	16	100
Partial	0	0
Disqualified	0	0
Totals	16	

1. Do you live in West Springfield?



Value	Percent	Count
Yes	93.8%	15
No	6.3%	1
	Totals	16

2. What is your age?



Value	Percent	Count
0-24	6.3%	1
25-34	12.5%	2
35-44	31.3%	5
45-54	12.5%	2
55-64	12.5%	2
65-74	25.0%	4
	Totals	16

3. **Please rank the following priority projects to indicate the most important actions that West Springfield should take to address climate resilience**.

Item	Overall Rank	Score	Total Respondents
Protection of West Springfield's remaining open space, and working lands, largely located along riparian corridors and wetlands	1	76	16
Complete storm drainage and sanitary sewer improvements along the Block Brook Waterway as it runs from Route 20 to Salem Street.	2	67	16
Increase tree canopy and improve management - Create baseline reports about the existing tree canopy condition in each neighborhood by measuring average monthly temperatures, rainfall, species distribution, age, health, location, and soil to improve the resilience of the urban forest in the face of a changing climate. Wherever possible, engage the assistance of neighborhood residents and conduct public education in this process.	3	66	16
Develop and adopt new stormwater regulations to limit impervious surfaces on buildings and landscape, and promote more low impact development. Also, establish a stormwater utility fee to encourage private property owners to remove pavement and also create a new revenue stream for the town.	4	64	16
Install emergency solar power generation and battery storage on critical facilities, including town buildings and emergency shelters.	5	62	16
Conduct a town-wide bridge and culvert inventory and conditions assessment to identify undersized culverts.	6	60	16
Coordinate with community groups to undertake a public information and outreach campaign for climate resilience.	7	53	16

4. If you would like to submit your own suggestion for an action the Town can take to reduce vulnerability to the impacts of climate change that was not included in the list above, please do so here.

Response ID	Response
1	Increase Town budgets to support earlier stated initiatives.
3	Private parties installing blacktop driveways that rain can penetrate, is a great idea. However, it is cost prohibitive at this time. Perhaps it could be required on new developments. Plantings on business roofs, and incorporation of rain gardens, sounds like a reasonable short term goal. Business owners and private residences needs to be educated on this. Bear Hole needs close monitoring, to protect future generations. A Conservation Restriction is a must!