

Municipal Vulnerability Preparedness Community Resilience Building Workshop



Town of Agawam, MA

DRAFT SUMMARY OF FINDINGS

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Cover image courtesy of [John Phelan](#), via Wikimedia Commons.



Robinson State Park, a Massachusetts Department of Conservation and Recreation property, is considered to be an asset in town.

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Overview

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

- "Snowtober" October freak snow storm (2011) caused extensive
- Hurricane Irene (2011) caused erosion on the banks of the

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 many downed power lines. A town wide power outage left many without electricity for up to 5 days. Damage was severe and the Town received FEMA funding to help recover. Approximately 186,000 cubic yards of debris was removed and hauled.



Robinson State Park follows Agawam's northern border along the Westfield River, offering flood protection and scenic views.

Westfield River and the sheet piling along a 250' section of levy to fold. The Army Corps of Engineers has since worked with Agawam to reinforce the levy in this location, but there are already signs of slope failure. This is especially concerning because a sewer line runs within this section of slope. Relocation of the sewer line away from the river is a high priority.

- Extreme wind events, including:
 - the June 2011 EF3 tornado, which traveled from Westfield to Charlton, ripping its way through Agawam along the northern part of town, including Robinson Park. While neighboring towns had significant impacts from the tornado, Agawam escaped the event with minimal damage;
 - the 2006 microburst on River Road, which damaged nearby trees and homes; and
 - the 2013 microburst, which created two areas of straight line



Hurricane Irene caused sheet piling in a 250' section of levy along the Westfield River to erode and fold.

wind damage. One in the area of Harvey Johnson Drive downed several trees, damaging several houses. The other produced more significant damage around Meadow Street, uprooting 40 to 50 trees that damaged 6 to 8 vehicles. Estimated winds were 80 miles per hour.

These and other recent events in nearby communities have reinforced urgency for climate adaptation and compelled municipalities like Agawam to proactively plan and mitigate potential risks through a community driven process. Ultimately, the commendable leadership demonstrated by Agawam'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 Agawam 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 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 hazards, current concerns and challenges, strengths, and proposed actions to improve the Town of Agawam's resilience to natural and climate-related hazards today and in the future.

Community Resilience Building Workshop

The Town of Agawam 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 29, 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, and 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 a broad stakeholder network;
- Identify opportunities for the community to advance actions to reduce risk and increase resilience.

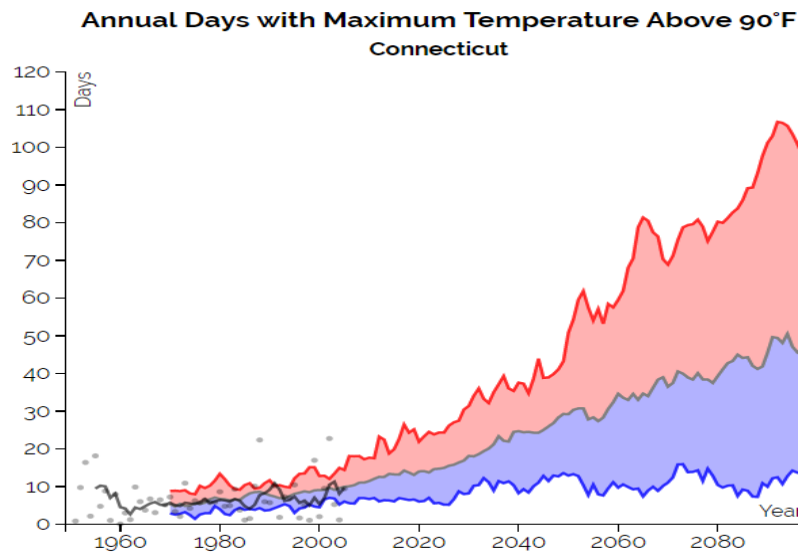
Approximately 30 participants from Town boards and committees, land-holding organizations, community organizations, and other interest groups attended the

workshop, which included a combination of large group presentations and small group activities. Pioneer Valley Planning Commission staff 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 Agawam 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.

Agawam 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



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

increase both in total precipitation and the frequency of heavy downpours, or days receiving precipitation over 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 Agawam 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 & Vulnerable Areas

Leading up to the workshop, PVPC worked with input from

Town officials to identify some of the top ongoing concerns and challenges for Agawam. In order to ensure a bottom-up approach, the core Town planning team made the decision to allow the workshops' participants to identify their own top four hazards rather than pre-determining 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 previous planning processes such as Agawam's 2016 Hazard Mitigation Plan, 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 workshop as identified by the CRB participants were:

- **Severe Storms**
- **Severe Winter Storms**
- **Extreme Temperatures**
- **Flooding (Urban & Riverine)**



Flooding during intense precipitation events have contributed to increased erosion in Agawam.

Areas of Concern

Transportation Infrastructure: the age and condition of culverts; stormwater flooding of Ramah Circle North and other roadways; the state of repair of vehicular bridges over the Westfield and Connecticut Rivers; and the passability of roads in times of emergency

Drinking and Storm and Wastewater Infrastructure: Bondi's Island; sewer lines running along the shores of the Westfield and CT rivers, forcemain crossings under the Westfield and CT rivers; pump houses; stormwater infrastructure; and drinking water distribution system

Flood Mitigation Infrastructure: dams, including Tuckahoe, Silver Lake, and Provin Mountain; the condition of levees along the Westfield and Connecticut Rivers

Natural Resources: loss of farmland and open space to development; lack of tree canopy in the urban and suburban areas of town; the impact of vegetative and insect invasive species on street trees, forested areas, riparian corridors, and agricultural lands; water quality and erosion in river and stream systems

Social Vulnerabilities: highly-concentrated population of low- to low-moderate income residents; aging population; lack of education and communication around the risks and impacts of climate change amongst the student population and residents in general; lack of public engagement in Town processes

Current Concerns & Challenges by Hazard

The Town of Agawam faces multiple challenges related to the impacts of climate change and natural hazard-related weather events. In particular, workshop participants expressed concern over the effect of extreme weather on aging infrastructure; and that all residents' needs be met after an extreme event.

Agawam's MVP workshop 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.

There was also common concern about the challenges of being prepared for future severe weather events, including the ability to shelter residents close to home; the resilience of the transportation network to changing weather and temperature fluctuations and the need for the system to remain operational for emergency travel, at a minimum; and the desire to ensure aging residents are able to access the resources they need in the face of extreme weather. Furthermore, participants established a common directive to address the uncertainty of what would occur if their drinking water and wastewater systems, both operated by Agawam DPW, were to be compromised. Finally, climate change-induced severe weather could impact the Springfield Water



Feeding Hills center is an area with known flooding problems.



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

and Sewer Commission's (SWSC) infrastructure located within the Town. Specifically, SWSC operates Provin Mountain Reservoir, transmission mains for drinking, and the Springfield Regional Waste Water Treatment Plant (WWTP) at Bondi's Island are all situated within Agawam's borders.

Specific Categories of Concerns & Challenges

Transportation Infrastructure: The specific issues identified within Agawam's roadway network were two-fold: infrastructure maintenance and culvert functionality. Road passability is important

for residents who may need to evacuate or travel in case of emergency, and it was noted that several major evacuation routes, such as Suffield Street and North Street, are prone to flooding due to undersized culverts. Undersized culverts, breached by runoff from more frequent and more intense rain, are impacting known flood problem areas like Feeding Hills center. In one instance, a failing culvert on North Westfield Street has been undermined by stormwater flooding, and the road will need to be shut down completely for the repair. Other areas where drainage infrastructure was never needed and therefore not installed are now experiencing flooding.

Like most suburban and urban communities, Agawam also experiences

stormwater flooding due to urban development patterns. As the community urbanizes, developers dedicate increased land area to continuous expanses of impervious surface, which generate stormwater runoff at a rate that existing drainage infrastructure cannot manage.

One area known to be impacted by urban flooding is Ramah Circle, a commercial street located in the northeast of town. Ramah Circle has experienced major flooding for years, with runoff largely generated by the impervious areas upstream. The entire length of Ramah Circle North has experienced severe flooding during heavy rainstorms to the point where vehicles have been unable to drive down the street. Commercial and industrial businesses along the street have suffered flooding on their property and in their buildings, causing profit loss due to business closures and damage to equipment and inventory.

Increases of impervious area upstream of Ramah Circle North, installed without any mitigation of post-development flows, have contributed greatly to flooding in this area of town. The drainage system is most likely undersized for the increase in development that has occurred in the Ramah Circle area over the years, and the Town has tried to encourage businesses and other properties with large paved areas to install best management practices (BMPs) to regulate the amount of runoff discharge to Ramah Circle. The DPW has met with little success in this strategy due to push-back from these businesses and property owners. The Town has also been re-working the Subdivision Regulations to reduce the required widths of new roads in town, especially new residential, low volume roads, as well as

trying to reduce the width of roads they re-pave.

Some workshop participants also expressed concern that the three bridges that connect Agawam to the major commercial communities of West Springfield and Springfield are vulnerable to riverbank erosion and ice-damming around their footings. There was concern that this could impact the condition and safety of the bridges.

Drinking and Wastewater Infrastructure:

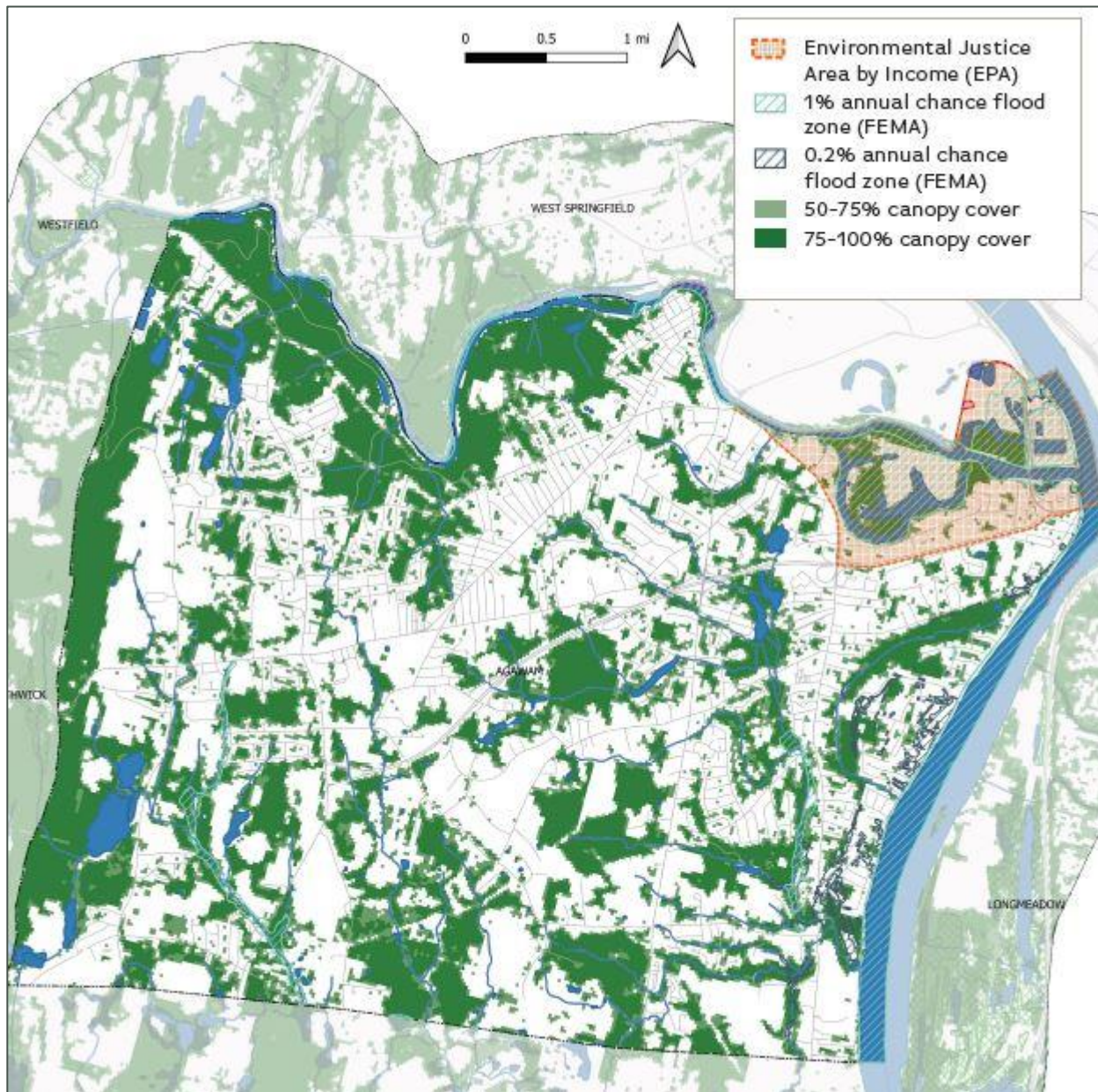
All drinking water in town is supplied through the Town DPW and Water Department. Agawam owns its drinking water distribution system and the wastewater collection system and pump stations. Springfield Water and Sewer Commission (SWSC) has facilities and infrastructure in town such as Provin Mountain Reservoir, drinking water transmission mains, and the Springfield Regional WWTP at Bondis Island. Drinking water is treated before entering Provin Mountain at West Parish Filters in Westfield by SWSC. While there is no precedent for concern over loss of these utilities, participants are aware of recent struggles by SWSC to control haloacetic acid 5 (HAA5). HAA5, which may have negative health impacts if consumed in high levels over a long period of time, is produced when chlorine reacts with dissolved natural organic matter (NOM) found in surface water supplies, such as Cobble Mountain Reservoir. SWSC reports, "Dissolved NOM enters the reservoir from rain and snow melt from the surrounding forest. In 2018, over sixty inches of rain fell in the Cobble Mountain watershed – over half of which fell between September and December – after two years of drought. This rainfall represented a 40% increase over a typical

year.” SWSC is adjusting the treatment process, planning new treatment upgrades, and pilot testing new treatment processes to help address the issue.

Workshop participants questioned what would happen to their access to clean drinking water should a catastrophic event take the Town’s system offline, or should the water become contaminated. MassDEP requires all public water systems to maintain

an Emergency Response Plan (ERP). While the document is confidential, the Agawam Water Department reports that its plan considers many different scenarios and details responses to each. The Water Department will also soon be following America’s Water Infrastructure Act (AWIA of 2018) guidelines to develop/update its risk and resiliency assessment (RRA) and ERP.

The town’s public sewer system is also



This Environmental Equity map illustrates the sparse canopy cover across much of Agawam's residential and commercial development, and shows how the one EJ community in town is situated in the floodplain.

operated by SWSC, and Bondi's Island, SWSC's regional wastewater treatment plant, is located in the northeast of town. Some participants speculated that the operations on Bondi's Island might be "antiquated" and that its protective infrastructure was not built to withstand more than one foot above the 100-year-flood, leaving the site potentially vulnerable to extreme precipitation and riverine flooding. Any sewage spill would affect the environmental health of the Connecticut River and threaten the public health of Agawam and other communities downstream of the plant.

Some of the sewer lines themselves are vulnerable to the impact of increased intense precipitation on the Westfield and Connecticut Rivers. As stated in the Overview, a 250 foot section of levee along the Westfield River was impaired during the high waters of Hurricane Irene (2011), and streambank erosion exposed a length of sewer line that had formerly been protected by the levee. There are other sewer lines running along the banks of the Connecticut River, and workshop participants noted that SWSC should consider relocating those lines at risk of damage from future weather events.

Flood Mitigation Infrastructure:

Participants expressed concern over the known and unknown conditions of local dams and levees. According to the Department of Conservation and Recreation (DCR)'s Office of Dam Safety (ODS), there are 11 known dams in town, one of which is ranked as a significant hazard and one of which is ranked as a high hazard. High hazard dams are classified as likely to cause loss of life and serious damage to public and/or private infrastructure should a dam failure occur; significant hazard dams

may cause loss of life and damage to property and infrastructure.

While Provin Mountain Reservoir Dam, the high hazard dam, is located within Agawam, it is owned and operated by Springfield Water and Sewer Commission. At its most recent inspection, Provin Mountain Dam was rated in satisfactory condition. The significant hazard dam, Silver Lake Dam, is owned by the Silver Lake Corporation in Agawam and was rated satisfactory as well. Of the remaining five regulated dams, four were rated as being in less than satisfactory condition. Residents wanted to understand the potential fallout should any of these dams breach, and ensure that owners and operators were educated and in communication with ODS.¹

Concern around levees mostly centered on the levees protecting Bondi's Island and other sewer line infrastructure, as described in the "Drinking and Wastewater Infrastructure" section above.

Natural Resources: A common theme throughout the day was the loss of farmland to development. Once an agricultural community, Agawam identifies with a small-town aesthetic and agrarian character. Agricultural lands represent a large proportion of the remaining undeveloped, buildable land left in town. As such, as with many communities in the Pioneer Valley, farmland is being developed into commercial and residential development at an increasing rate. Agawam's 2014 Open Space and Recreation Plan (OSRP) identifies the importance of continuing to promote Agricultural Preservation Restriction (APR) to safeguard farmlands.

¹ DCR Office of Dam Safety records request, November 2019

As the town has adopted the Community Preservation Act (CPA), there exists a local source of revenue to support future APR applications by providing the local match for the state's purchase of development rights.

Invasive species and habitat shifts were another topic of conversation, especially as they relate to street trees and vector-borne diseases. Participants noted that vegetative invasive species are encroaching on conservation land and riparian areas, and that there is a need for education around best practices for landscaping at home with non-invasive or with native species. Of higher concern were the north-shifting habitats of mosquitoes and ticks, and the introduction of new insects into the Town's landscape.

Participants discussed the destruction or weakening of street trees and forested land by invasive insects, such as the emerald ash borer and the hemlock woolly adelgid. Participants also noted the cultural effect that new or more prevalent occurrences of vector-borne diseases, such as eastern equine encephalitis (EEE) and Lyme disease, were having on their communities and recreational activities. Agawam residents are hiking less, spending less time outdoors, and participants recalled that last summer, youth sports were curtailed during evening hours to avoid exposure to mosquitos.

A lack of tree canopy around residential and commercial centers in town was identified as a vulnerability as well. Concern over rising temperatures and urban heat island (UHI) effect drove the conversation around strategies to implement more street tree planting despite an underfunded budget line in Public Works.



Workshop participants identified farmland as a key resource for climate resilience.

Finally, stormwater management was also a big topic of conversation. The Town is in the process of revising its stormwater regulations for compliance with the 2016 federal stormwater permit, and is considering a stormwater utility and associated fee structure to fund compliance



Steve Lemanski, a science teacher at Agawam High School, and the three participating high school students are concerned about lack of education and engagement around climate change for youth.

activities. As with many communities across the eastern portion of the country, Agawam's stormwater infrastructure is aged, undersized, and in some places in poor repair. The Town's subdivision ordinance is worded such that detention basins are owned by individual homeowners, not by the association, and as a result, these facilities often go unmaintained. The Town is considering funding the restoration of existing basins, then either taking on maintenance and repair of the detention basins within subdivisions or increasing enforcement of maintenance requirements including mowing to keep them functional.

Social Vulnerabilities: As with many Western Massachusetts communities,

Agawam has an aging population. While the town has a senior center with robust programming, participants identified the need to advertise and conduct outreach to Council on Aging and senior center services to those residents who are eligible, but not making use of existing programming.

Because seniors may be more at risk for health issues related to extreme heat and cold, participants also wanted to ensure that heating and cooling shelters were available with extended open hours.

There was also conversation around how to reach potentially isolated populations, such as seniors living alone, speakers of other languages, who may be disengaged or less-

involved with municipal affairs, and any residents who were otherwise unable to engage regularly with town programming or communications. Nearly 15% of Agawam's residents speak a language other than English at home, and 26% of that population reports speaking English "less than well."²

One particular area of concern was the Environmental Justice by Income community located in the northeast of town—a neighborhood MassGIS delineated based upon 2010 Census Data where residents of low-to-moderate income are concentrated, and which therefore may be more at risk for environmental hazards such as flooding, air pollution, etc.

Two teachers and three students from Agawam's high school attended the CRB workshop, and these participants identified a specific need to engage the town's youth around planning for and adapting to the effects of the changing climate. The students expressed anxiety that there was no education around climate change in their curriculum, and because of that, they were uncertain as to what to expect for the future and how they could help their town make progress in adaptation efforts. For more information on how climate change will impact Agawam, see "Climate Projections for the CT River Basin" on page 3.

Current Strengths & Assets

As a result of Agawam's broad experience with extreme weather in addition to residents' pride of place, workshop participants were quick to point out their

communities' 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.

Some of the key strengths discussed included:

- A well-used senior center with robust programming
- Six Flags Amusement Park, the taxes from which support the town budget
- Well-used municipal water parks, including a splash pad and pool, for which the Parks and Recreation Department implements extended hours during high-heat days
- Proximity to the Westfield and Connecticut Rivers
- The Massachusetts Emergency Management Agency's local office is located in Agawam
- Proximity to Robinson State Park
- Farmland in APR
- Tuckahoe Farm

Top Recommendations to Improve Resilience

Workshop participants identified 72 actions that the Town of Agawam, 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 top priority actions to the large group. These nine actions were assembled with like

² American FactFinder Census Table DP02

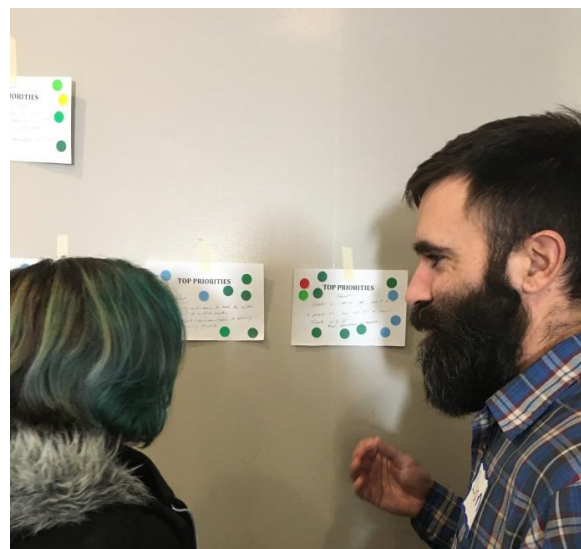
actions from the other small groups, resulting in the eight priority actions listed below (in no specific order). The four highest priority actions, as subsequently voted on by the large group, are shown in bold green.

- **Education: Establish a MoA (Memorandum of Agreement) between the Agawam Public Schools and the senior center to promote an intergenerational program of education and advocacy for climate mitigation, preparedness, and adaptation.**
- Develop a local wetland bylaw and incorporate considerations of climate change impacts.
- Continue communication and collaboration with SWSC to encourage the modernization of Bondi's Island to withstand more than the 100-year flood, and collaborate with other municipalities that rely on SWSC to ensure resilience needs are met.
- **Complete a town wide culvert conditions assessment and maintenance/repair/replacement plan, and implement.**
- Ensure capital improvement plans identify funding sources for priority projects, and replace priority water mains to make the distribution system more resilient to extreme weather.
- **Pilot a green roof and other green infrastructure techniques at a Town-owned building.**
- **Install a pervious pavement pilot project at Fire Stations #1 and #2.**
- Protect open space that drains to Feeding Hills center and promote stormwater facilities that are

designed for retention and infiltration rather than detention.

A full list of the final recommendations from the CRB Workshop, organized by high, medium, and low priority, follows on the next few pages. The actions shown in bold were selected by the workshop participants as either a top priority, or as part of an expanded top priority project design.

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



Workshop participants vote on their top priority actions to have emerged from the workshop.

Infrastructure	Society	Environment		Feature	High Priority Actions ³
X			1	Stormwater Drainage (especially Feeding Hills area, Kellogg & Yale, and Hall Street area)	Protect open space that drains to Feeding Hills Center to avoid adding to existing localized flooding problem.
X			2		Promote more infiltration rather than detention in stormwater facilities.
X			3		Develop and/or communicate existing evacuation routes by neighborhood and increase related signage on roads.
X			4	Bridges over Westfield and Connecticut Rivers	Shore up areas around upstream of bridge footings to protect from future bank erosion and ice damming.
X			5		Maintain communication with MassDOT about maintenance of South End Bridge over the Connecticut River.
X			6		Develop a culvert prioritization plan and complete assessment of the conditions of the culverts which haven't yet been assessed.
X			7	Culverts	Continue to explore and then implement stormwater utility to provide funding for projects.
X			8		Redesign and reconstruct North Westfield Street and North Street culverts to NAACC standards.
X			9		Continue communication with SWSC to ensure Bondi's Island is up-to-code and keep up preventative maintenance.
X			10	Bondi's Island	Communicate with SWSC to encourage modernization of Bondi's Island to withstand more than the 100-year-flood.
X			11		Communicate and collaborate with other municipalities who rely on SWSC for drinking water and sewer services to ensure all are advocating for systems protection.
X			12	Flooding at Ramah's Circle	Advocate for design-stage reduction of impervious surface in Site Plan Review.
X			13	Reliance on Personal Vehicles	Continue to design capital improvements to Complete Streets standards.
X			14	Power Grid	Encourage underground utilities in future development and streetscape improvement.

³ Actions in **BOLD** were identified by MVP workshop participants as top priorities

Infrastructure	Society	Environment		Feature	High Priority Actions ³
X			15	Sewer lines under the Westfield River and along the shore	Continue coordination with Army Corps of Engineers to shore up eroding shoreline and levee
X			16		Consider relocating the sewer lines located along riverbeds
X			17	Town Water Infrastructure	Isolate areas of gravity sewer system
X			18		Replace pipelines with better materials and explore looping of system
X			19	Dams, including Tuckahoe, Silver Lake, Provin Mountain	Update understanding on status of each dam and work with MA Office of Dam Safety and owners
	X		20	Library as cooling shelter only during open hours	Work with the Town to develop an emergency plan to increase hours during heat emergencies/extreme temperature days.
	X		21	Council on Aging	Work with the Town to develop and communicate an emergency plan for use of the CoA shelter
	X		22		Promote services (brown bag groceries, clothes closet) provided by the CoA to local seniors and their families
	X		23	Lack of Communication and Education around Climate Change and Emergencies	Establish "resource center" / predetermined locations so it is clear to people where they need to go for information
	X		25		Incorporate climate change education into school classes/curriculum and develop a special climate seminar to introduce students to climate science, future projections, and actions they can take to mitigate and adapt
	X		26		Initiate a Model UN partnership between the public schools and CoA to promote intergenerational cooperation and policy education around climate change
	X		27		Conduct an educational campaign and manual for municipal staff about the emergency needs of different populations in town
	X		28	Water-based Parks & Rec facilities (slash pad, pool)	Continue with policy to increase hours on high temperature days
	X		29	Six Flags Amusement Park	Conduct a traffic flow study and utility usage study to promote readiness scenarios in the event of mass evacuation of 6 Flags
	X		30		Conduct a study on emergency sheltering and short term housing capabilities within

Infrastructure	Society	Environment		Feature	High Priority Actions ³
					park property, in the event of shelter-in-place or the Town needing additional sheltering capacity
	X		31		Continue to update and enact mutual aid agreements between park and Town
	X		32	Pillar Age Groups (young children, seniors)	Communicate emergency and evacuation plans for families getting kids from schools and seniors from CoA
	X		33	Households with pets	Revisiting policies for pets/animals being allowed in temporary emergency shelters identifying those shelters that may have additional capacity
	X		34	Public Apathy	Be creative in providing incentives for engagement, perhaps working with media club at the high school and elementary school, and making better use of the town website
		X	35	Westfield River and	Continue with outfall monitoring
		X	36	Connecticut River	Continue to shore-up eroded shoreline
		X	37	Loss of Farmland to Development	Conduct a zoning review to compare to best practices for farmland preservation
		X	38	Wetlands	Support adoption of local wetlands bylaw

Infrastructure	Society	Environment		Feature	Medium Priority Actions
X			39	Power Grid	Conduct study to determine if any existing above-ground utilities are in particularly hazardous areas and should be buried.
X			40	Stormwater Drainage	Explore rooftop gardens, additional retention/detention areas, collection cisterns, pervious pavement and other BMPs
X			41	Aging Public Buildings	Identify feasibility of controls and backup power for Town infrastructure, microgrids for specific buildings
X			42	Temporary cooling and warming shelters	Ensure proper operations and maintenance plan

Infrastructure	Society	Environment		Feature	Medium Priority Actions
X			43	Pumphouses	Re-elevating, critical infrastructures and/or building dikes around pumphouse
	X		44	Lack of Communication and Education Around Climate and Emergencies	Investigate push notifications on Town website and customization of Code Red to disperse notifications on emergency disruptions
	X		45	Water-based Parks & Rec facilities (slash pad, pool)	Continue with policy to increase hours on high temperature days
	X		46	Pillar Age Groups (young children, seniors)	Collaborate between school systems and CoA re: needs of young and seniors in the built environment and communications
	X		47	Highly concentrated population of Low- to Low-Mod Income Residents	Coordinate with churches, social providers and establish central community location for emergencies
	X		48		Provide communication in other languages and with understanding of customs to inform residents
	X	X	49		Increase tree canopy in neighborhoods
	X		50	Food and fuel locations (Stop & Shop in particular)	Use these key locations to distribute information
	X		51	Emergency shelters	Add high school as emergency shelter
		X	52	Westfield River and Connecticut River	Conduct a regulatory review of what development is permitted in floodplain compared to best standards
		X	53		Information to residents in low lying areas for mitigation
		X	54	Loss of Farmland to development	Continue to promote APR program to farm owners in town
		X	55		Continue to reach out to farmers regarding organic waste, pesticides, etc. and how to mitigate them
		X	56	Still Brook (flooding of)	Investigate upstream sources of sedimentation
		X	57	Invasive Species	Conduct a community education campaign around identifying vegetative and insect invasives, reporting, and best practices around planting and landscaping property
		X	58	Lack of tree canopy	Encourage tree planting in private and public locations, especially schools

Infrastructure	Society	Environment		Feature	Low Priority Actions
X			59	Lack of Public Transportation / reliance on personal vehicles	Work with PVTa to increase service to area and advocate for to Baker administration for increased funding to regional transit
X			60		Explore establishing a contract to subsidize/incentivize alternative transportation options with companies like Lyft or Uber
	X		71	Six Flags Amusement Park	Identify regional assets for support to Six Flags
	X		72		Create additional storage for waste water

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.

Public Engagement


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 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 several days before the Town of Agawam's MVP team was scheduled to host a Public Listening Session (PLS) at the Senior Center to share results from the MVP workshop and collect public feedback on priority action recommendations.

Making the best use of the resources and tools available, the team pivoted to prepare for a virtual session. Rather than an in-person meeting, workshop participants and core team members collaborated on a webinar that introduced the MVP process, reviewed climate change projections, and summarized all actions recommended

during the CRB workshop. This virtual PLS webinar was recorded on April 15th, and posted the next day on the Agawam Media Facebook page, the Town of Agawam Facebook page, as well as various Agawam forums. The Town's Facebook post received 1,253 unique views of the link. The video also appeared on Agawam Media's channel 15 the following Saturday, April 18, at 2pm and 7pm and Sunday at 4pm and 8pm, and was made available as Video On Demand on www.AgawamMedia.tv.

Residents and stakeholders that viewed the webinar and/or were interested in providing feedback on the draft Summary of Findings report were encouraged to do so by either taking a 3-question survey to vote on the top priority actions, provide their own project ideas, and reaching out directly to project team members whose contact information The responses to the online survey were limited at the time of writing this report, with only one respondent who prioritized the pervious pavers and green rooftop projects. The MCP core team will continue to collect community input on priorities, and will utilize voting results and any comments submitted to guide future MVP finding priorities.

15 PEG  Search Search Watch

Agawam 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

Schedule

- Now** COVID-19 Update March 24, 2020
- 3:40 pm Senior Center Updates with Mike ...
- 3:43 pm What is novel coronavirus
- 3:44 pm Mayor COVID-19 Update Apr 10, ...
- 3:56 pm COVID-19 5 Things to Know Abo...
- 3:58 pm Senior Center Updates with Mike ...
- 4:01 pm COVID-19 5 Things to Know Abo...

[See the entire schedule](#)

A recording of the Public Listening Session posted to Agawam Media's front page.

Workshop Participants

Approximately 30 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

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

MVP Working Group

Michael Albro, Assistant Town Engineer

Kathleen Auer, Health Agent

Christopher Soto, Police Sergeant

Marc Strange, Planning and Community Development

Workshop Facilitators

Emily Slotnick, Pioneer Valley Planning Commission

Patty Gambarini, Pioneer Valley Planning Commission

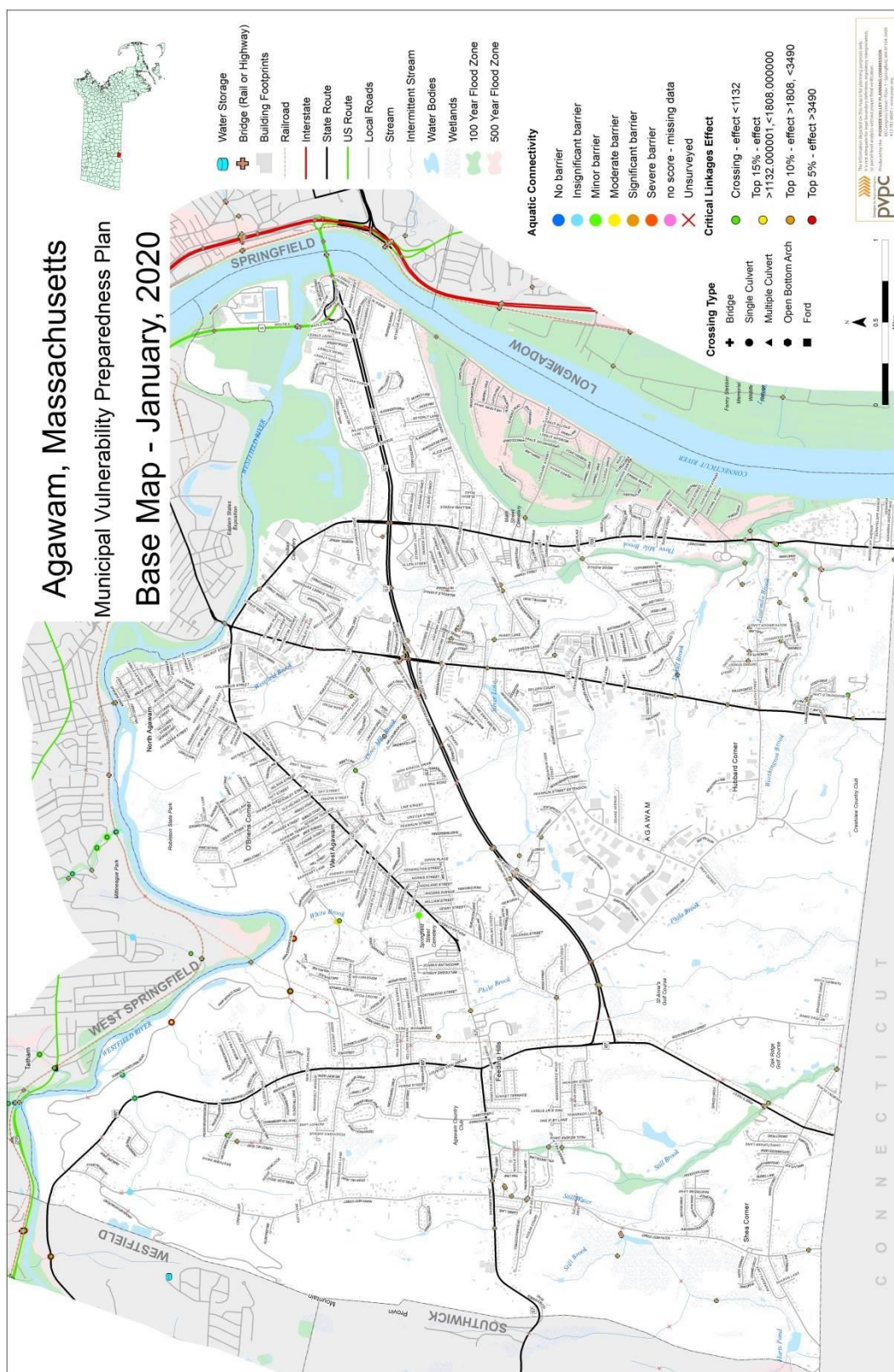
Ken Comia, Pioneer Valley Planning Commission

Corrin Meise-Munns, Pioneer Valley Planning Commission

Acknowledgements

Special thanks to the Town of Agawam staff for their committed engagement in this process, and to the Agawam Municipal Golf Course for providing the facilities to convene for the CRB workshop. This project was made possible through funding from the Massachusetts Executive Office of Energy and Environmental Affairs.

Appendix A: Workshop Basemap

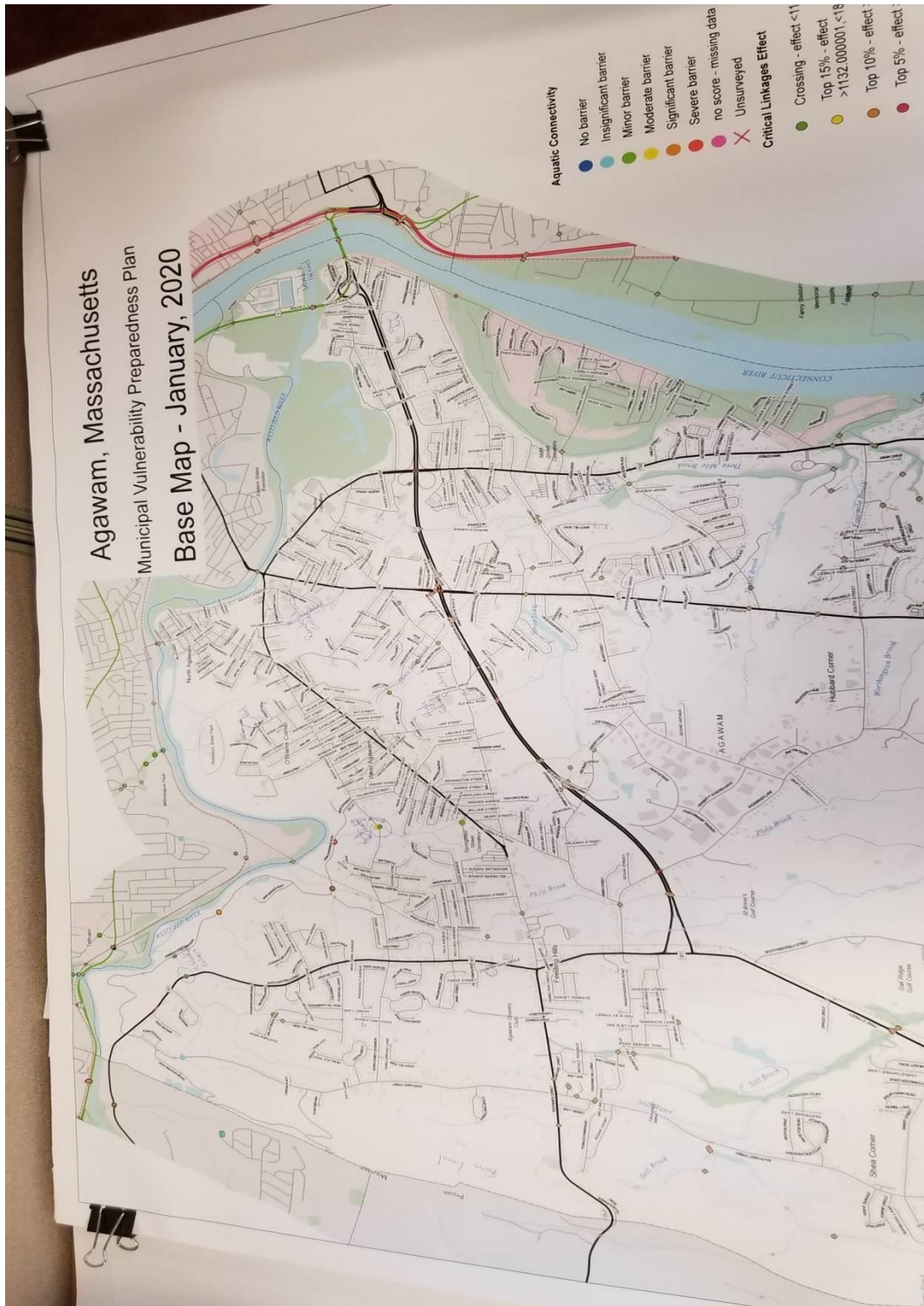


Appendix B: Participatory Mapping Results

Table 1

(Table 1 did not mark their basemap, so an image is not included.)

Table 2



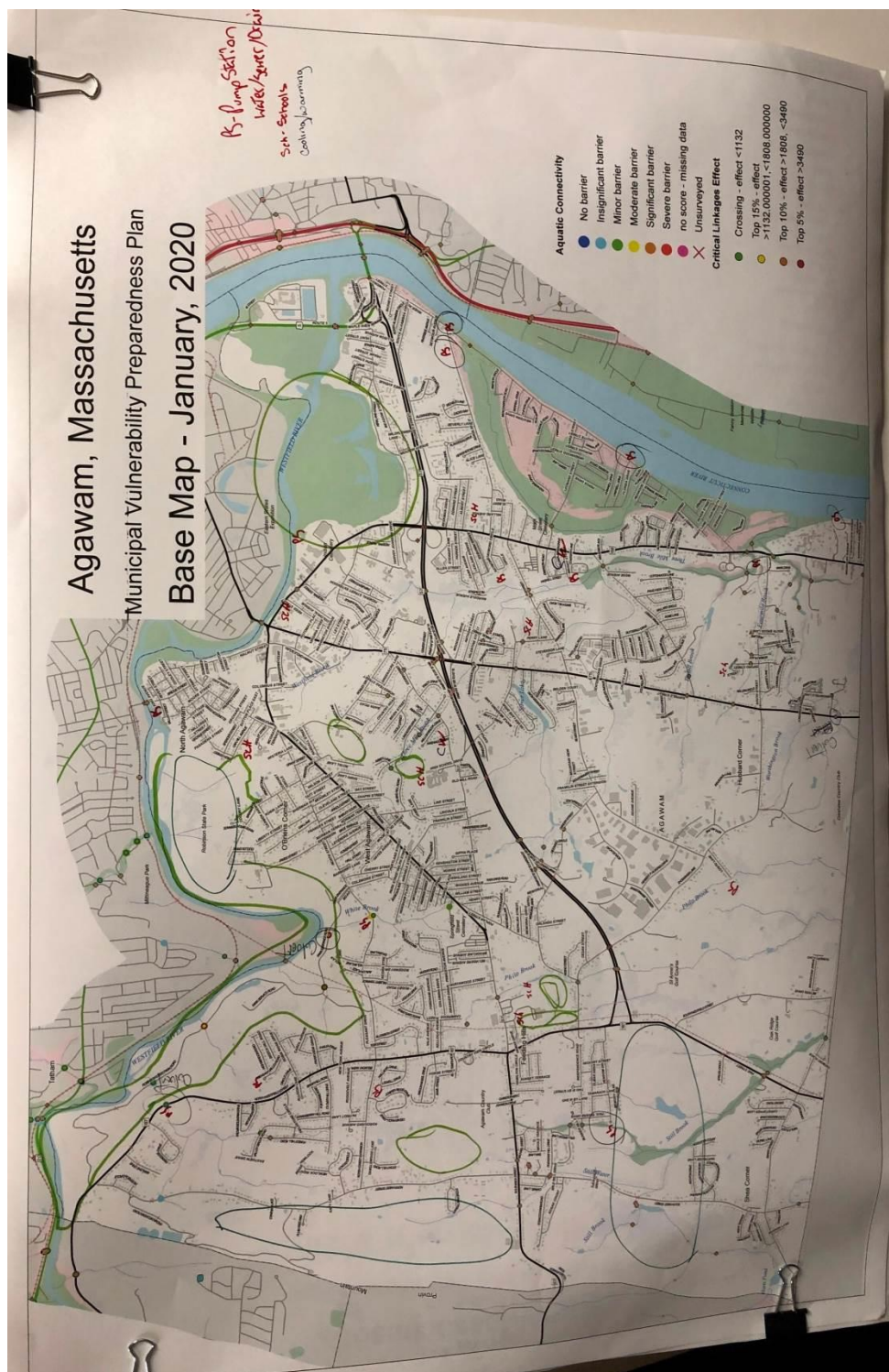


Table 3

Appendix C: Participant Handouts

Agenda

Municipal Vulnerability Preparedness Workshop

DATE: 1/29/20

TIME: 8:30a.m. – 4:30p.m.

PLACE: Agawam Municipal Golf Course

AGENDA

8:30 a.m. **Registration**

8:45 a.m. – 10:15 a.m. **Introductions**

Presentation: MVP, Climate Resources, and Priority Hazards

Break

10:30 a.m. – 10:40 a.m. **Presentation:** Priority Hazards

10:45 a.m. – 12:00 p.m. **Morning Small Team Workshop**

- Identify Community Vulnerabilities and Strengths
- Identify and Prioritize Community Actions

12:00 p.m. – 12:30 p.m. **Lunch**

12:30 p.m. – 2:45 p.m. **Afternoon Small Team Workshop**

- Identify and Prioritize Community Actions (continued)
- Identify Priority and Urgency
- Report Outs

Large Group Vote on Top Priorities

2:45 p.m. – 3:00 p.m. **Break**

3:00 p.m. – 4:00 p.m. **Implementation Design and Final Report Outs**

4:00 p.m. – 4:30 p.m. **Wrap-up and Next Steps**

Sign-in Sheet

Agawam MVP Stakeholder Invitation List and RSVP Tracking

Table Assignment	Name	Sign In	Affiliation	Email Address	Phone Number
1	Alan Sirois		Agawam Fire Department	asirois@agawam.ma.us	413-786-0657
3	Alison Strong	X	Agawam Animal Control	astrong@agawam.ma.us	413-821-0600
1	Brian Pagella		Agawam Building Maintenance	bpagella@agawam.ma.us	413-821-0506
1	Chet Nicora		Agawam Emergency Management	cnicora@agawam.ma.us	413-726-6925
2	Chris Sparks	X	Agawam Parks and Rec	csparks@agawam.ma.us	413-821-0513
2	Christopher Soto		Agawam Police Department	csoto@agawam.ma.us	413-786-4767
2	Doreen Prouty	X	Agawam ZBA	dbprouty@comcast.net	413-250-5236
2	Filipe Cravo	FC	Engineering/Landscape Arch	fcravo@gmail.com	508-207-8133
2	Jeffrey Webb	X	Six Flags Security Manager	jwebb@sftp.com	
1	Jennifer Bonfiglio	X	Agawam Procurement	jbbonfiglio@agawam.ma.us	413-726-9742
2	Joe Mitchell	X	Eversource	joseph.mitchell@eversource.com	413-579-2389
3	John Decker	X	Agawam Water/Sewer	jdecker@agawam.ma.us	413-821-0600
1	Kathy Auer	X	Agawam Health Department	kauer@agawam.ma.us	413-726-9721
3	Marc Strange	X	Agawam Planning Department	mstrange@agawam.ma.us	413-726-9738
3	Marie Provost	X	Six Flags Safety Manager	mprovost@sftp.com	
1	Mario Tedeschi	X	Allied Flooring	marioallied@gmail.com	413-233-3100
2	Michael Albro	X	Agawam Engineering	malbro@agawam.ma.us	413-821-0600
2	Michael Squindo	X	Agawam Senior Center	msquindo@agawam.ma.us	413-821-0604
2	Nancy Siegel	X	Agawam Public Library	nsiegel@agawam.ma.us	413-789-1550
1	Pam Kerr	X	Agawam Planning Department	pkerr@agawam.ma.us	413-726-9737
1	Rich Barth	X	OMG	AHassin@omginc.com	413-789-0252 x1018
3	Steve Lemanski	X	Agawam Public Schools	slemanski@agawamed.org	413-821-0548
1	Student #1	X	Agawam Public Schools	slemanski@agawamed.org	413-821-0551
2	Student #2	X	Agawam Public Schools	slemanski@agawamed.org	413-821-0551
3	Student #3	X	Agawam Public Schools	slemanski@agawamed.org	413-821-0551
TR 3	Todd Kovalski		OMG	AHassin@omginc.com	413-789-0252 x1018
3	Tracy DeMaio		Agawam Recycling	tdemaio@agawam.ma.us	413-821-0600
3	Uli Nagel	X	Grinspoon Charitable Foundation	education@ener-g-save.com	413-329-3514

3 Johnson, Sandee

Frank McIntosh FIRE

aflick@agawam.ma.us

413-726-2251

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1	Brian Pagella		Agawam Building Maintenance	bpagella@agawam.ma.us	413-821-0506
1	Chet Nicora	X	Agawam Emergency Management	cnicora@agawam.ma.us	413-726-6925
2	Chris Sparks	X	Agawam Parks and Rec	csparks@agawam.ma.us	413-821-0513
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1	Kathy Auer	X	Agawam Health Department	kauer@agawam.ma.us	413-726-9721
3	Marc Strange	X	Agawam Planning Department	mstrange@agawam.ma.us	413-726-9738
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3	Uli Nagel	X	Grinspoon Charitable Foundation	education@ener-g-save.com	413-329-3514

100? Robert W. Griffith RWE
1 Dan Balbany DWT

Social Vulnerability Infographics

TOWN OF AGAWAM SOCIAL VULNERABILITY

Social factors, such as age, race and ethnicity, and socioeconomic status, can increase vulnerability to the impacts of climate change. These factors can increase exposure to dangerous environmental conditions, and/or make it more difficult for individuals to take precautions against extreme events or access help before, during, and after those events.

WHO'S MOST AT RISK FROM CLIMATE IMPACTS?

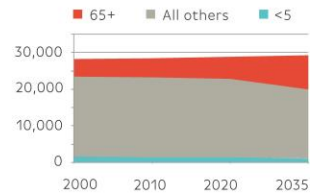
The old, the young, and those with pre-existing health conditions. These people may be more physically vulnerable to the health impacts of extreme temperatures and poor air quality, and/or require assistance for medical services, during power outages, and to meet daily needs.

The marginalized, including low-income residents, residents who speak English as a second language, residents who identify with minority racial and/or ethnic groups, socially and/or physically isolated residents. Low income people can have more difficulty evacuating before and recovering after extreme weather events, and may lack the ability to secure adequate provisions and meet medical needs. Social isolation, as can come from linguistic isolation and/or living alone, can limit access to critical information and social support systems.

Those who live and/or work in particularly vulnerable locations, such as areas prone to flooding or urban heat islands, and those who work outside. People subjected to repeated environmental or weather-related stress may face health and financial risks.

RECENT & PROJECTED POPULATION BY AGE

Agawam's senior population is expected to grow, while the rest of the population groups are projected to decline.



RATES OF DISABILITY BY POPULATION SEGMENT

The Census defines disabilities as reports of one of the following six disabilities: hearing, visual, cognitive, ambulatory, self-care, or independent living.

14%
of all residents

9%
of children <18

33%
of seniors 65+

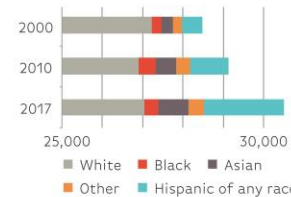
ADULTS LIVING ALONE

In Agawam, 32% of households are comprised of adults living alone. Half of the single-person households are comprised of seniors aged 65 or older, which also makes up ~33% of the senior population over all.



POPULATION BY RACIAL/ETHNIC IDENTITY

Agawam is becoming more diverse, with non-white populations comprising just over 2.5% of the population in 2000 to over 5% in 2017. The Hispanic/Latino (of any race) population grew from 1.8% of the population to 6.9%.



COST-BURDENED HOUSEHOLDS

HUD defines cost-burdened families as those who pay more than 30% of their income for housing and may have difficulty affording necessities such as food, clothing, transportation, and medical care. Around 23.5% of households in Agawam are renter-occupied.

Cost-Burdened Homeowners



Approximately 20% of homeowners are cost-burdened.

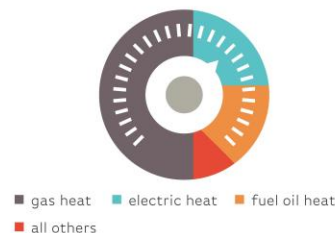
Cost-Burdened Renters



Over 50% of renters are cost-burdened.

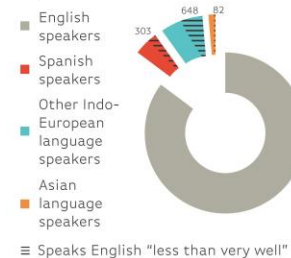
HOME HEATING

The majority of Agawam households heat with gas (56%), with electric (19.5%) and oil (19%) heating comprising the next-most used fuel sources. Households using electric heating may be more vulnerable to extreme temperatures should power fail.



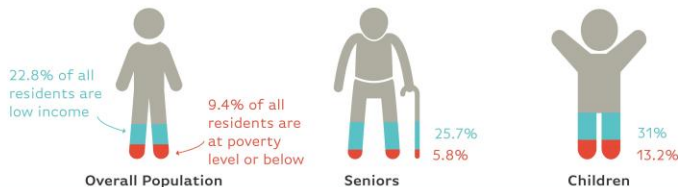
SPEAKERS OF OTHER LANGUAGES

Nearly 15% of Agawam's residents speak a language other than English at home, and 26% of that population reports speaking English "less than well."



LOW-INCOME / POVERTY - LEVEL RESIDENTS

In 2019, a four-person household earning less than \$25,750 is considered below poverty level. The low income threshold is considered to be 200% of the poverty line, or approximately \$51,500 for a family of four.



Created by Pioneer Valley Planning Commission in 2019 for the Town of Agawam Municipal Vulnerability Preparedness Community Resilience Building Workshop. Sources: American FactFinder Census Tables DP02, DP03, S1101, B17024, S2506, B25070, B25040; MLRI 2019 Federal Poverty Level Guidelines (January 2019); UMass Donahue Institute. The data presented in poster is for illustrative purposes only and may not be depicted with consideration to margin of error. The icons are sourced from the TheNounProject.com

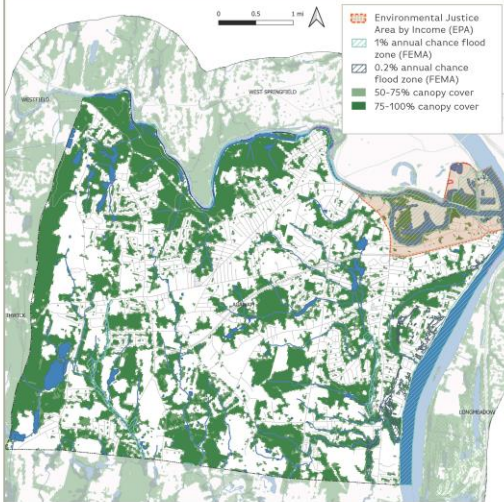


Natural Resources Mapping

TOWN OF AGAWAM NATURAL RESOURCES

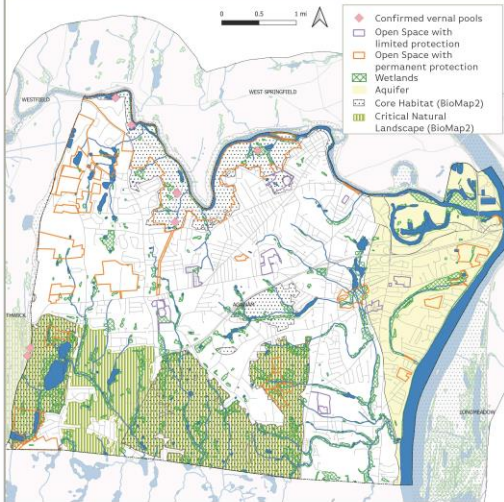
Natural resources lessen climate impacts by absorbing and storing CO₂ and by providing vital ecosystem services such as flood storage, protecting water quality, and regulating ambient temperatures. Natural resources are often erased from the urban environment, but by intentionally protecting or mimicking these systems within developed areas, we can increase human and environmental health.

ENVIRONMENTAL EQUITY



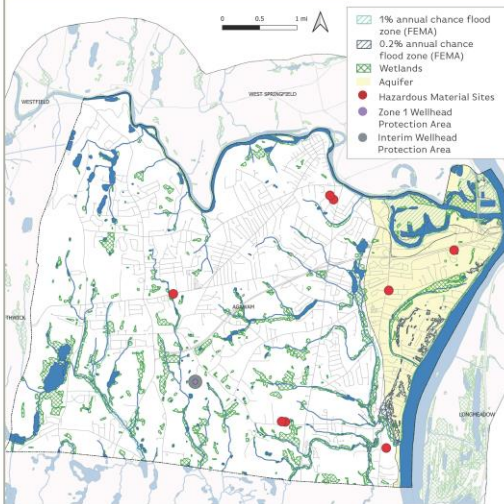
Trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration. Shaded surfaces may be 20–45°F cooler than the peak temperatures of unshaded surfaces. Evapotranspiration, alone or in combination with shading, can help reduce peak summer temperatures by 2–9°F (EPA). However, trees are not usually dispersed equally throughout a community, leading to environmental inequity.

HABITAT & PROTECTED OPEN SPACE



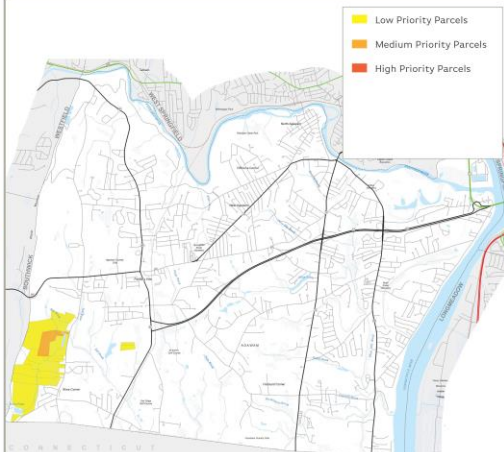
NHESP's BioMap2 report (2012) identified Core Habitat and Critical Natural Landscapes within every municipality in the Commonwealth. Core Habitat identifies key areas to ensure the long-term persistence of species of conservation concern, exemplary natural communities, and intact ecosystems. Critical Natural Landscape identifies larger landscape areas that are better able to support ecological processes, disturbances, and wide-ranging species.

FRESHWATER RESOURCES



Agawam's water resources sustain critical ecosystem functions as well as offering recreational and aesthetic value. For example, wetlands can provide natural flood storage and water bodies can act as heat-sinks. While Agawam relies on SWSC for its drinking water, it is important to retain the health of local aquatic ecosystems for climate resilience. Spills or storage of hazardous materials within flood-prone areas can pose a risk to both the human and/or the natural environments.

MASS AUDUBON MAPPR TOOL



Mass Audubon's Mapping And Prioritizing Parcels for Resilience (MAPPR) identifies parcels within areas of interest that are the highest priorities for protection based on habitat quality, climate change resilience, and other metrics such as parcel size and adjacency to existing protected parcels. The MAPPR Resilience Model, shown here, combines BioMap2 values with sites where the direct effects of climate change are moderated by complex topography and connected natural cover.

CRB Workshop Presentation