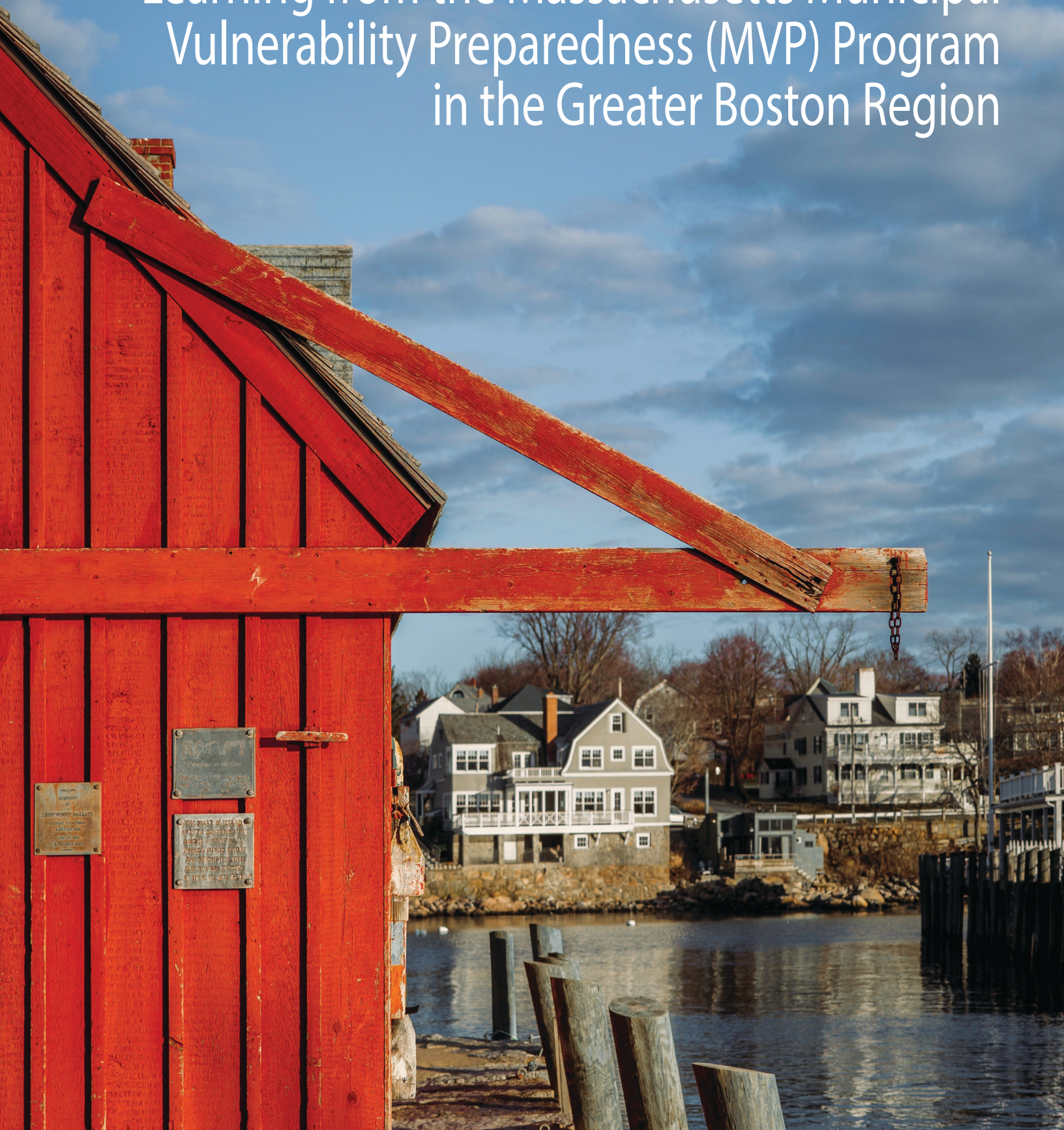


Learning from the Massachusetts Municipal Vulnerability Preparedness (MVP) Program in the Greater Boston Region



SUSTAINABLE SOLUTIONS LAB

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List of Abbreviations

Abbreviation	Definition	Abbreviation	Definition
BRAG	Boston Research Advisory Group	MVP	Municipal Vulnerability Preparedness
CBI	Consensus Building Institute	MWRA	Massachusetts Water Resources Authority
CLF	Conservation Law Foundation	NbS	Nature-based Solutions
CRB	Community Resilience Building	NGO	Non-Governmental Organization
CZM	Massachusetts Office of Coastal Zone Management	RFP	Request for Proposals
DER	Department of Ecological Restoration	RFR	Request for Response
EEA	Executive Office of Energy and Environmental Affairs	RGGI	Regional Greenhouse Gas Initiative
EJ	Environmental Justice	RMAT	Resilient Massachusetts Action Team
EO	Executive Order	RMC	Resilient Mystic Collaborative
EU	European Union	SHMCAP	MA State Hazard Mitigation and Climate Adaptation Plan
FY	Fiscal Year	SHMT	State Hazard Mitigation Team
GHG	Greenhouse Gases	SLR	Sea-Level Rise
GRC	Green Ribbon Commission	SSL	Sustainable Solutions Lab
GWSA	Global Warming Solutions Act	TNC	The Nature Conservancy
MAPC	Metropolitan Area Planning Council	MVP	Municipal Vulnerability Preparedness
MISTRA	Swedish Foundation for Strategic Environmental Research	MWRA	Massachusetts Water Resources Authority
MIT	Massachusetts Institute of Technology	NbS	Nature-based Solutions
MLG	Multi-Level Governance	NGO	Non-Governmental Organization
MyRWA	Mystic River Watershed Association	RFP	Request for Proposals

I. Introduction¹

In early 2022, a report by the National Oceanic and Atmospheric Administration (NOAA) confirmed that states in the US Northeast, including Massachusetts, are warming even faster than the globe as a whole.² While Massachusetts has been seen for years as an air pollution, climate change mitigation, and energy efficiency policy leader, focused attention by the Commonwealth's policymakers and environmental activists on the challenges presented by climate change impacts is more recent. The state-wide risks posed by sea level rise, coastal erosion, more frequent and stronger storms, localized inland flooding, and heat islands have garnered headlines and increased pressure on state and local policy makers to grapple with climate change adaptation.³ Different municipalities, local communities and neighborhoods, and regions of the Commonwealth experience these challenges and impacts differently, engendering debate about what mix of state-wide and highly localized policy responses and investments are needed.⁴

Over the last decade, a series of actions by Massachusetts governors, executive agencies, and legislators have begun to push climate change adaptation up in the agenda for citizens and local and state policymakers. One such initiative is the Commonwealth's Municipal Vulnerability Preparedness (MVP) program, created and launched in 2016 and 2017. At the same time, popular, activist, and policy maker attention to increasing racial, ethnic, and economic inequalities have also grown in the Commonwealth and nationally. These developments are reflected in a series of executive and legislative actions seeking to more explicitly address environmental justice (EJ) and climate justice concerns and communities. The MVP program, among the most important state-wide initiatives focused on climate adaptation at local, regional,

¹ See Annexes 1 and 2 for information about research methods and the authors of the report.

² See <https://statesummaries.ncics.org/>.

³ See, for example, Jon Gorey, "Climate change worries take backseat in hot real estate market," *Boston Globe*, April 16, 2017; Jon Gorey, "How do you protect Boston-area housing from climate change?" *Boston Globe*, July 26, 2020; John Laidler, "Bracing for Climate Change: state awards new funds to deal with crumbling sea walls and failing dams," *Boston Globe*, September 12, 2021; Tim Logan, "Waterfront developers prepare for a sea change," *Boston Globe*, February 10, 2018; Anthony Flint, "Tired of waiting for national push, a buzzing hive of climate resilience innovators is at work in Boston," *Boston Globe*, August 8, 2019; and Nestor Ramos, "At the Edge of a Warming World," *Boston Globe*, September 29, 2019.

⁴ See, for example, David Levy, "Financing Climate Resilience," 2018; Kirshen, P., "Feasibility of Harbor-wide Barrier Systems," 2018; Krueel, Herst & Cash, "Governance for a Changing Climate: Adapting Boston's Built Environment for Increased Flooding," 2018; Courtney Humphries, "When it comes to battling climate change and sea rise, what does it mean to be 'resilient'?" *Boston Globe*, April 19, 2020; Courtney Humphries, "Boston Versus the Rising Tide," *Boston Globe*, April 28, 2018; Miles Howard, "Set the Under Ground Rivers Free," *Boston Globe*, January 21, 2022; Jon Gorey, "Don't sweat it, plant it," *Boston Globe*, August 21, 2020; Daniel Grossman, "For protection from the rising sea, look to Europe's example," *Boston Globe*, November 22, 2015; David Scharfenberg, "The Radical Question at the Heart of the Boston Mayor's Race," *Boston Globe*, August 20, 2021; Laura Crimaldi, "Boston plans strategies to lessen effects of climate change," *Boston Globe*, October 28, 2017; Beth Daley and Shan Wang, "A call to cull homes threatened by the sea," *Boston Globe*, February 8, 2015; John Laidler, "Can the DPW Yard Save the Planet?" *Boston Globe*, February 21, 2021; and *Boston Globe* Editorial, "Massachusetts Lawmakers should move urgently on climate threats," *Boston Globe*, September 19, 2021.

and state levels, has seen a similar trajectory as its attention to EJ and climate justice concerns has increased over time. In the wake of the 2021 amendments to Massachusetts’ Global Warming Solutions Act (GWSA), this report seeks to draw lessons from several years of MVP program’s accomplishments and continuing challenges associated with ongoing efforts to better incorporate and more meaningfully center EJ in the Commonwealth’s climate adaptation initiatives. Can we adapt to climate change, seek justice, and include all of our diverse voices and communities in our decision-making processes, investments, and policy outcomes?⁵

II. Learning from Massachusetts and the Greater Boston Region

Climate change is not a future challenge.⁶ It is happening now, and its impacts are accelerating. The Commonwealth of Massachusetts and the many communities and ecosystems that make up the Greater Boston Region are experiencing the effects of our changing climate (see Box 1). These impacts include sea-level rise, changes in precipitation patterns and storm events, and higher temperatures. In turn, these impacts increasingly affect the area’s social, economic, and environmental systems. Projections for the U.S. Northeast region assume an inevitable change in climate conditions over the next three decades, at least, with higher uncertainty in the long run stemming in part from the different possible greenhouse gas (GHG) emissions trajectories and GHG concentration scenarios and other natural and human-induced phenomena.⁷ Repeated incidences of coastal and inland flooding across the region help drive home the reality that our behaviors and our institutions must change to meet the challenges posed by our changing climate.⁸ Extensive media coverage in outlets such as public radio and television, the *Boston Globe*, *CommonWealth Magazine*, and *The Conversation*—and substantial attention from the regions’ many institutions of higher education, private foundations, and local environmental organizations and community groups—have elevated these concerns in state and local politics.

Like many jurisdictions, climate adaptation research and policymaking emerged gradually after years of a greater focus on climate mitigation. The state of Massachusetts and cities such as Boston and Cambridge were early leaders in climate change goal setting and policymaking aimed at reducing GHG emissions,⁹ and the state continues to be identified as such until today.¹⁰ The Commonwealth’s GHG emissions levels are expected to meet the 2020 emissions reduction goal of 25% (compared to the 1990 baseline), despite a 14% growth in population and 24% growth in vehicle miles traveled. Energy sector emissions have been reduced in part by the state’s participation in the Regional Greenhouse Gas Initiative (RGGI), the first mandatory

⁵ See Estrada-Martinez et al. (2020), “Views that Matter: Race and Opinions on Climate Change of Boston Area Residents”; Johnson et al. (2021), “Climate and Housing: A Research Agenda for Urban Communities”; Belloy et al. (2021), “Opportunity in the Complexity: Recommendations for Equitable Climate Resilience in East Boston.”

⁶ Statement from 26 UMass Boston students, 2019

⁷ BRAG Report, 2016

⁸ Levy, 2018; Krueel, Herst & Cash, 2018

⁹ Selin & VanDeveer, 2009, 2011; Wissman-Weber & Levy, 2018

¹⁰ Kaufmann & Vaid, 2016; Kimmel, 2020

market-based program to cap and reduce GHG emissions from this industry in the United States, operating across the ten states in the Northeast region. Massachusetts also ranks among the most energy efficient states in the nation,¹¹ and the Union of Concerned Scientists ranked the state third nationally on clean energy momentum.¹² The current administration has committed to reaching net zero emissions by 2050, a pledge only made by California, Maine, Hawaii, Virginia, and Washington, and it has closed all of its coal-fired power plants. In late 2020 and early 2021, the Massachusetts legislature and Governor Baker's administration were working to reconcile their remaining differences in another substantial piece of state-wide climate change legislation.

But many climate adaptation challenges for the Commonwealth are different than those related to mitigation. Climate change adaptation poses an extremely complex, multilevel set of challenges—many of which require substantial investments and major changes to the institutions and behavior that shape investment.^{13,14} Massachusetts seeks to preserve existing infrastructures, ecosystems, and resources by adapting its communities and governance institutions and processes to a growing list of stressors associated with changing environmental conditions.¹⁵ Like any jurisdiction, it must meet these challenges while also increasing its ability to master other existing and new challenges, in part through innovative ways of mobilizing local capacities. Central to climate adaptation is the development of regulations, codes, and programs that build institutional expertise, support communities, shape investment, and sustain or restore ecosystem health. Such instruments provide formal guidelines and informal behavioral norms that enhance predictability, provide structure and, ideally, promote cooperation and engagement among different stakeholders.¹⁶

Massachusetts and the Greater Boston Region's responses to climate change can rely on several advantages, including a comparatively high level of economic wealth and an extensive set of academic institutions and researchers who have built a body of nationally and internationally networked knowledge and expertise. These institutions help to connect critical place-based knowledge and resources to national and international knowledge production institutions in ways that can inform and advance statewide and community level climate adaptation. Such actors may also act as policy entrepreneurs to influence institutional venues where agendas are set,¹⁷ and actively participate in the design, implementation, and evaluation of climate adaptation policies and experiments. Over the last two decades, Massachusetts and the Greater Boston region have amassed substantial expertise related to assessing vulnerabilities, scenario development, societal and policy research, and state, regional, and local planning and implementation (Boxes 2 and 3).

¹¹ Berg et al., 2019

¹² Union of Concerned Scientists, 2017

¹³ Wormser, 2017

¹⁴ Dimino, 2018

¹⁵ Collins et al., 2019

¹⁶ Anguelovski and Carmin, 2011

¹⁷ Kingdon, 1984

One recent attempt to consolidate and apply some of this expertise is found in the 2018 State Hazard Mitigation and Climate Adaptation Plan (SHMCAP), a road map for climate adaptation with more than a hundred actions for state agencies to implement under the coordination of the Resilient Massachusetts Action Team (RMAT). In line with the purpose of the plan, the state launched the Municipal Vulnerability Preparedness (MVP) program, a flagship initiative administered by the Commonwealth's Executive Office of Energy and Environmental Affairs (EEA) to identify local vulnerabilities, build capacity at the local level, and inform the SHMCAP with local, regional, and statewide data and perceptions. The following chapters provide a comprehensive outlook and assessment of the MVP program from its inception until its fifth funding round in 2020.

Box 1: Projected climate change impacts in Massachusetts and the Greater Boston Area

Sea-level rise (SLR)

- SLR for the coast of Massachusetts is likely to exceed global averages throughout the 21st century, regardless of mitigation efforts.
- Independent of emissions scenario, SLR is expected to reach between 7.5 and 18 inches within the next 30 years.
- After 2050, and considering higher uncertainty, the projected increase in SLR may fluctuate between 2.5 and 7.4 ft.

Coastal Flooding

- Hurricanes and extratropical storms (including nor'easters) will continue to be the primary source of flooding in the coast of Massachusetts.
- Under most emissions scenarios, projections anticipate moderate increases in coastal flooding magnitude and frequency until 2030 and more substantial increases in storm-driven flooding from 2050.
- Independent of an increase in coastal storms, it is likely that sea-level rise will have a substantial influence on coastal flooding.

Extreme precipitation & localized flooding

- In MA, from an average of 47 inches of yearly precipitation for the 1971-2000 period, a 13% increase is expected by 2050 (with 21% increases in winter precipitation).
- Extreme precipitation and inland flooding are likely to increase in the short term.
- 100-year floods in winter show consistent increase across the state of Massachusetts.
- There is a possibility for a circa 40% decline in seasonal average snow depth by 2100, with progressive delays in the start of the season.

Extreme temperatures

- Evidence suggests that increases in average temperatures though at least 2030 are inevitable.
- In MA, from an average of five hot extreme days in summer (>90F), approximately 26 hot extreme days by 2050 are projected, and 32 days by 2100.
- Urban activities account for as much as 50% of warming in cities, with increased appearance of the Urban Heat Island (UHI) effect.

- Without adaptation measures, Boston’s heat-induced deaths may triple by 2050.

(sources: Boston Research Advisory Group (BRAG) Report, 2016, [link to report](#); Northeast Climate Adaptation Science Center, <https://necsc.umass.edu/>)

Box 2: Selected Climate Action Milestones in Massachusetts and MVP program funding cycles (2008-2022)

- **2008** – The Global Warming Solutions Act (GWSA) required reductions in greenhouse gas emissions and launched the Massachusetts Clean Energy and Climate Change Plan for 2020. It also required the Secretary of Energy and Environmental Affairs (EEA) to convene an advisory committee to analyze strategies for adapting to the impacts of climate change.
- **2009** – The GWSA Implementation Advisory Committee (IAC) originally created two working groups: mitigation and adaptation. Following the disbandment of the adaptation working group, some organizations kept working with the administration and the legislature to design a program that can support municipalities to plan for climate adaptation.
- **2012** – By January 1, the GWSA had yet to promulgate the regulations aiming to achieve the 2020 GHG emissions goal. Persistent opposition to increased climate action continued by groups that claimed such action would cost jobs and slow economic growth. The EEA reconvened leaders from the business, energy, environmental, building, transportation, and academic communities in Massachusetts to advise the Administration’s implementation of the GWSA.
- **2014** – Massachusetts witnessed rising GHG emission levels from 2009-10 and from 2013-14. The Conservation Law Foundation (CLF) sued the state for failing its legal obligations to enforce the GWSA.
- **2016** – The Massachusetts Supreme Judicial Court ordered the Commonwealth to create and implement regulations to ensure that GWSA carbon reduction provisions be realized by the 2020 deadline.
- **2016** – Executive Order 569 (EO 569) called for integration of the Commonwealth’s climate change mitigation and adaptation efforts, enacting the SHMCAP and the MVP Program.
- **2017** – The MVP program launched the first funding cycle, awarding 71 cities and towns with a total of \$1 million for climate vulnerability planning and prioritization of climate adaptation actions.
- **2017** – The Massachusetts Climate Change Clearinghouse (Resilient MA) became a gateway for policymakers, local planners, and the public to identify and access climate data, maps, websites, tools, and documents relevant to climate change adaptation and mitigation across Massachusetts.
- **2018** – The Commonwealth unveils the State Hazard Mitigation and Climate Adaptation Plan (SHMCAP). The plan integrated climate adaptation strategies with hazard mitigation planning and looked to comply with federal requirements for disaster recovery and hazard mitigation funding.
- **2018** – The H.4835 Environmental Bond codified EO 569 into law. It raised \$2.4 billion to work on climate change adaptation for the duration of the Bond Act, including expanded funding for the SHMCAP, the MVP Program, and the Climate Change Clearinghouse.
- **2018** – The MVP program launched its Action Grants first funding cycle, and a second for MVP Planning Grants. EEA committed \$7.2 million to fund 82 Planning Grants and 39 Action Grant projects. The program reached 43% of the cities and towns in the Commonwealth.
- **2019** – The governor launched the Resilient Massachusetts Action Team (RMAT), an inter-agency team that will work to implement the SHMCAP.

- **2019** – The EEA announced \$12 million in grants for the MVP program to fund 65 communities to conduct planning processes and 34 communities to implement projects via Action Grants. Later that year, the Baker Administration announced an additional \$8 million round of grant funding. The total of Massachusetts municipalities enrolled in the MVP program increased to 71%.
- **2020** – The MVP program announced the enrollment of 89% of municipalities in the Commonwealth and a budget of \$11.1 million to fund Planning Grants for 26 municipalities and 41 cities, towns and partnerships with Action Grants, bringing the total invested amount to \$44 million.
- **2021** – Massachusetts Governor Baker signed the legislation “An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy,” amending the state’s GWSA.
- **2021** – The EEA issued the [Guiding Principles, Cross-Cutting Policy Priorities, and Sector-Specific Policy Priorities for the Clean Energy and Climate Plan for 2030](#), prepared by the Work Groups participating in the IAC.
- **2021** – The governor announced a \$21 million budget for the MVP program, almost doubling the amount invested in 2020 and bringing the total investment in the program to over \$65 million. The budget awarded \$20.6 million in Action Grants to 66 cities, towns, and partnerships, and \$400 thousand to 16 municipalities to complete the MVP planning process in 2021-2022. This round brought the total of enrolled municipalities to 328, or 93% of the Commonwealth’s cities and towns.
- **2022** – Pursuant to the newly amended GWSA, state agencies and programs were tasked with setting climate goals, designing new initiatives and working on their Environmental Justice strategies.
- **2022** – EEA declared Massachusetts had reduced GHG emissions in 2020 by an estimated 28.6% below 1990 levels, exceeding the 25% reduction originally required by the 2008 GWSA. However, it remains unclear how much of the reduction is attributable to the state’s climate policy and how much to the effects of the COVID-19 pandemic.

Box 3: Selected Climate Action Milestones in Boston and related UMass Boston reports (2007-2021)

- **2007** – City of Boston Climate Action Plan (official name is “Climate: Change”) focused on mitigation and its co-benefits.
- **2010** – Mayor Menino convened the business community and leaders from Boston’s key sectors and launched The Boston Green Ribbon Commission (GRC) to support the outcomes of a new City Climate Action Plan.
- **2012** – Hurricane Sandy hit the American Northeast, leading real estate owners and the business community across the region to organize and prompt the city to take action to protect their assets.
- **2013** – Boston Harbor Now issued the Preparing for the Rising Tide report.
- **2014-2015** – The City of Boston, Boston Harbor Now, and the Boston Society of Architects ran the Boston Living with Water International Design Competition.
- **2015** – Mayor Walsh in collaboration with the GRC started the process to develop the Climate Ready Boston plan.
- **2016** – As part of the Boston Research Advisory Group (BRAG) report, UMass Boston coordinated a group of experts from different universities and research centers to work on climate impact projections aimed at informing the Climate Ready Boston plan.
- **2016** – Climate Ready Boston is launched as an adaptation plan to protect the City of Boston from the impacts of climate change. It divided the planning efforts into areas of the city:

Downtown and North End, East Boston and Charlestown, South Boston, Moakley Park, and Dorchester.

- **2017** – The Resilient Boston report outlined visions, goals, and actions that support climate change adaptation measures and solutions targeting the most vulnerable residents in the city.
- **2017** – Climate Ready East Boston and Charlestown plan completed.
- **2018** – Climate Ready South Boston plan completed.
- **2018** – UMass Boston issued the [Financing Climate Resilience report](#), requested by the GRC and intended to evaluate different funding alternatives for resilience in Boston.
- **2018** – UMass Boston issued the [Feasibility of Harbor-wide Barrier Systems report](#).
- **2018** – The City of Boston launched the Resilient Boston Harbor Vision to guide open space investments toward more resilient and accessible communities.
- **2018** – UMass Boston issued the [Governance for a Changing Climate report](#).
- **2019** – Climate Ready Moakley Park Vision plan completed.
- **2019** – Climate Ready Downtown and North End plan completed.
- **2020** – Climate Ready Dorchester plan completed.
- **2020** – UMass Boston issued the [Views that Matter: Race and Opinions on Climate Change of Boston Area Residents report](#).
- **2021** – UMass Boston issued the [Opportunity in the Complexity: Recommendations for Equitable Climate Resilience in East Boston report](#).
- **2021-22** – Michelle Wu elected and inaugurated as Mayor of Boston until 2026. Her campaign and administration proposed an ambitious policy roadmap for climate action that delivers structural change. Features of her plans for a [Boston Green New Deal & Just Recovery](#) pushed a procedural justice framework that lifts up environmental justice communities, accelerates decarbonization, expands green areas, increases sustainable transportation, and creates green jobs, among other measures. The Wu administration announced a fare-free program for three bus routes connecting diverse, underserved neighborhoods, and the elaboration of a new municipal harbor plan for East Boston, a rapidly gentrifying coastal neighborhood that has experienced increased flooding in recent years.

III. **Massachusetts’ Municipal Vulnerability Preparedness (MVP) Program: Connecting State & Local Adaptation Efforts**

A wide range of stakeholders active in environmental and conservation politics help shape Massachusetts’ responses to climate change. In the case of the Municipal Vulnerability Preparedness (MVP) program, organizations like The Nature Conservancy (TNC), Mass Audubon, and the CLF, among others, advocated at the GWSA Implementation Advisory Committee’s adaptation group and other venues for a state program that supports municipalities adapting to climate change, playing a key role in the inclusion of Nature-based Solutions (NbS) among the program’s core principles. Having worked with state government officials and multiple stakeholders—from the Massachusetts Municipal Association to the engineering sector—on previous legislative efforts, these organizations established strong relationships with key constituencies needed to develop a municipal-level vulnerability preparedness program.¹⁸ Their advocacy informed the design of the MVP program as did a shared conviction among

¹⁸Author interviews, 2020

many policymakers that local towns and cities needed to be engaged to develop local level priorities.

In 2016, Governor Charlie Baker signed Executive Order 569, which called for the integration of the Commonwealth's climate change mitigation and adaptation efforts. Included in that executive order was a call to establish a program to support adaptation efforts at the local level. After the executive order, a group of executive agency officials and civil society stakeholders developed the MVP program, a state-level grant program offered through the Executive Office of Energy and Environmental Affairs (EEA) to encourage cities and towns to participate in a planning process for climate change adaptation and to identify priority projects. The EEA awards municipalities a Planning Grant to complete a stakeholder-driven vulnerability assessment and develop an action-oriented adaptation plan. Municipalities that complete the planning process become certified as an MVP community and are then eligible for MVP Action Grant funding to implement projects supporting their plans, which also increases their eligibility for other state grant programs. These Action Grants were initially modeled after grant programs offered by the Massachusetts Office of Coastal Zone Management (CZM) and other EEA grants, evolving substantially since the first funding cycle.

Since its 2017 launch, the MVP program has completed five funding rounds for Planning Grants and four for Action Grants. As of 2021, 328 of Massachusetts' 351 municipalities (93%) had enrolled in the program, either completing their Planning Grant process and become certified or on their way to certification. Overall, over \$65 million dollars have been awarded in Planning and Action Grants. The average Action Grant amount in FY 20 was \$195,000.

Core principles of the MVP are listed in Box 4. Many seem to reflect the input provided by the supporting organizations. For example, the MVP Program places a strong emphasis on using NbS (see Box 5 for definition). Additionally, to ensure consistency in the planning process across municipalities, the program uses the Community Resiliency Building (CRB) framework, originally developed for TNC Connecticut.¹⁹ The CRB is discussed below, in section 4. The decision to adopt a vendor system was likely influenced by the experience with other state funded municipal assistance programs, like Green Communities Designation and Grant Program.²⁰ Vendors trained in the CRB framework can be hired by MVP Planning Grant recipients to facilitate municipal planning meetings.²¹

¹⁹ For more information about the framework, visit: <https://www.communityresiliencebuilding.com/>

²⁰ <https://www.mass.gov/green-communities-designation-grant-program>

²¹ Link to the complete list of MVP-certified vendors: <https://www.mass.gov/doc/mvp-approved-vendors-2/download>

Box 4: Summary of MVP Program Core Principles (as of October 2021)

- Furthering a community identified priority action to address climate change impacts.
- Utilizing best available climate change data for a proactive solution. Data from local-level climate change vulnerability studies may also be used.
- Employing Nature-based Solutions.
- Increasing equitable outcomes for and supporting strong partnerships with Environmental Justice (EJ) Populations (as defined by the [2021 EJ Policy](#)) and Climate Vulnerable Populations.
- Conducting robust community engagement.
- Achieving broad and multiple community benefits.
- Committing to monitoring projects success and maintaining the project into the future.
- Utilizing regional solutions for regional benefit.
- Pursuing innovative, transferable approaches to address communities' critical issues.

(Source: <https://www.mass.gov/doc/mvp-core-principles/download>)

Box 5: Nature-based Solutions

Nature-based Solutions (NbS) are defined as follows: Projects that restore, protect, and/or manage natural systems, and/or mimic natural processes to address hazards like flooding, erosion, drought, and heat islands in ways that are cost-effective, low maintenance, and multi-beneficial for public health, safety, and well-being.

(Source: <https://www.mass.gov/doc/resources-for-nature-based-solutions/download>)

Core program elements consistent with the influence of the environmental groups helping to design the program include an emphasis on the idea of NbS (see Box 5), a standardized adaptation planning framework, and vendor system. If the early involvement of well-established environmental groups in MVP resulted in a program policy reflective of their interests, then the initial lack of participation of EJ groups seems to have led to concerns about how to incorporate EJ issues into the original design of the program—a situation the MVP program addressed in later iterations (see section VI for a discussion about Just Adaptation).

The MVP program design also reflects how governance is organized at state and municipal levels in Massachusetts. By design, the MVP program issues small grants to municipalities (Planning Grants) to engage in vulnerability assessments and prioritize actions at the municipal/community scale. The planning process that results from the grant is emerging as a flagship initiative for promoting adaptation dialogue and initiatives efforts at the local level—prioritizing projects that advance regional or multi-municipality solutions. However, because the impacts of climate change do not respect municipal boundaries and Massachusetts has few regional or county governance structures with any notable authority, the MVP program underscores that adaptation governance gaps exist across communities at the regional level and regional or multi-city initiatives require additional efforts from the program and participating municipalities (see section 5 for a discussion about regional climate adaptation).

The MVP program offers a compelling and complex case to study contemporary multilevel climate change adaptation efforts, affording opportunities to examine the following themes:

1. The landscape of institutions for public participation, awareness raising, planning, policy learning, decision making, and public investment that engage and connect local communities to state-wide goals and needs.
2. A planning workshop and vendor system that shapes policy outcomes at the municipal level, including factors that shape the decision-making process from the planning stage to implementation of an Action Grant.
3. The ways in which municipal-level programs promote regional approaches to climate adaptation.
4. The case of environmental justice concerns manifested in the MVP program, and the challenges and opportunities to strengthen the MVP program as a *just* climate adaptation policy.

IV. MVP Processes: Workshops, Vendors, Participation & Outcomes

MVP program development, organization, and operation are described in two sections below. The first focuses on local MVP planning workshops and the system of vendors who help coordinate and implement planning and action grants and processes. The second focuses attention on attempts to increase municipal and local community capacities to engage adaptation planning and actions via the MVP program. As in the rest of the report, boxes are used to illustrate main arguments and offer empirical vignettes from MVP processes and cases.

1. The MVP Planning Workshop and the vendor system

MVP planning workshops are an adaptation of the Community Resilience Building (CRB) workshops designed to aid communities in identifying their action priorities based on the connection between climate change impacts and social, environmental and infrastructure resources in their cities and towns. It was developed over a decade ago by Adam Whelchel, director of science at The Nature Conservancy, Connecticut, to support public and private institutions elaborate community resilience plans and adapt to the impacts of climate change. A CRB workshop is a one-day community-driven process that promotes the exchange of information and experiences for participants to identify the most pressing hazards, challenges, strengths, and priority actions in their communities. Following a facilitated discussion about these issues, the organizing entity and the vendor produce a report summarizing relevant topics and priorities. This model has been used in more than 400 communities from nine states (For more information, visit <https://www.communityresiliencebuilding.com/>).

Certified MVP vendors—who can be self-employed or affiliated with planning agencies, NGOs, universities, consultancy firms, or other organizations—facilitate the planning workshops in local communities. The program trains vendors in the use of the CRB framework and provides

them with sources to access scientific and technical information about climate change trends and projections for Massachusetts. They receive support on how to incorporate NbS into workshop discussions, in addition to guidance on best practices for community outreach and engagement and on how to integrate the MVP process with local Hazard Mitigation Plans. Training sessions began in 2017 and hundreds of vendors have been certified to date.

Municipalities and vendors connect in a few different ways to carry out an MVP Planning Grants and the selection process varies widely across municipalities (see Box 6). Although it depends on local procurement policies, municipalities receiving a Planning Grant generally issue a Request for Proposals (RFP) to MVP certified vendors and initiate a selection process, while others may execute an expedited process and hire a vendor with whom the municipality had conducted previous work or who has a good reputation from working with other municipalities. In other cases, vendors reach out to municipal officials to communicate the benefits of the MVP program and provide assistance with the grant application process, and later become their workshop facilitators once the Planning Grant is received.

Municipalities receiving an Action Grant may contract with the same vendor who facilitated their planning workshops or hire a different contractor depending on the nature of the Action Grant. Vendors and municipal officials report that, in a typical competitive bid, the hiring process encompasses a combination of qualifications and price for applicants to be selected. In MVP vendor selection processes, most vendors' prices are similar for their services, so salient differences among them might be their reputation, the match between the vendor's expertise and the municipality's needs, or the added value vendors offer by providing services that go beyond MVP requirements for planning and/or Action Grants.²²

Box 6: Building Local Adaptation Capacities: Vendor Roles and Selection

Wellesley offers an example of a municipality driving the vendor selection process. This town of 28,000 inhabitants in the Greater Boston Area ranks among the wealthiest towns in the Commonwealth and is best known for hosting its namesake college. It does not have a town manager. It is run by committees of elected and appointed officials from the community, which arguably makes decision-making more collaborative.²³ Committees are well-staffed and have dedicated funding to work on climate-related issues, which until recently mainly focused on mitigation. Following the receipt of an MVP Planning Grant, Wellesley issued an RFP and received several proposals, including one from a regional planning agency. Finally, they decided to hire a private consultancy firm with experience in activities they wanted to pursue. They planned to conduct the same process for the Action Grant application.

Similarly, Watertown selected a vendor based on the vendor's proposal to help the city to launch Resilient Watertown, a multimedia campaign to raise awareness about the town's climate resilience efforts, going beyond the public outreach and community engagement required for conducting a

²² Author interviews, 2020

²³ Ibid.

planning workshop. The enhanced scope of work offered by the vendor aligned with Watertown officials' view that a sustained public engagement strategy was needed to draw attention to the climate-related challenges facing the city and raise the profile of Watertown's adaptation efforts. The campaign involved spotlighting their MVP planning process on social media, local media print and television media, and a page on the City of Watertown website. The vendor committed to administer a survey, interview key individuals and institutions, and conduct focus groups with segments of the community that meet the criteria of an EJ population.²⁴

In contrast to Wellesley and Watertown, other municipalities may lack sufficient staff time and resources to shop for a vendor, instead pursuing a hiring process that tends to benefit vendors already known to them.²⁵ For example, one town selected their MVP vendor based on successful experience facilitating a workshop for another state program, Green Communities, which shared a similar certification-grant eligibility as the MVP program.²⁶ In the same vein, an MVP vendor mentioned that each of seven rural towns with whom they contracted to conduct planning workshops were existing clients from previous projects.²⁷

As evidenced by various municipalities, vendor selection processes vary considerably. What is clear, based on interviews and the program design, is that vendors play an important role in convening local stakeholders for planning meetings. Further research is needed to explore the scope of vendor influence in the selection of municipal adaptation policies and the extent to which these actors serve as agents of policy diffusion across the Commonwealth. Given their central role in local MVP processes, it seems likely that differences among the vendors may explain some of the variance in MVP outcomes across communities. Because local, municipal officials choose their communities' vendors, this initial choice may also be worthy of further exploration.

2. Local Level Capacity building for climate adaptation and policy learning

In principle, the MVP program aims to build the capacity of municipalities to advance adaptation efforts. Scholars emphasize the importance of enhancing institutional capacity at the municipal level as a key component of a multilevel governance framework that can proactively address the challenges of adapting to a changing climate.²⁸ Climate awareness and training help local officials not only to monitor state policy implementation in cities and towns, but also to learn from the policy process and effectively communicate with stakeholders for an improved exchange of information, knowledge, or experiences.²⁹ A possible line of further inquiry that arose during research conducted for this report is the extent to which the municipality or the vendor drives the MVP planning process (or other state programs) originally intended to be stakeholder driven.

²⁴ Author interviews, 2020

²⁵ Ibid.

²⁶ Ibid.

²⁷ Ibid.

²⁸ Amundsen et al., 2010; Measham et al., 2011; Eisenack et al., 2014

²⁹ Moser & Pike, 2015

Many municipalities across the Commonwealth lack the resources and staff necessary to assess climate-related risks and carry out an action plan. As such, the MVP grant program was intended to provide needed capacity-building support. However, once a municipality receives a Planning Grant, those financial resources are directed to hiring outside consultants to carry out the planning process.³⁰ Together with the core team of municipal officials representing cities and towns, vendors play an active role in setting the table for the discussions taking place at the workshop. They guide the planning process and generate creative ways to explain non-intuitive concepts in public engagement, like distinctions between hazard and vulnerability for example.³¹

One interviewed municipal official approves of vendors' roles, stating that they help towns achieve a climate change adaptation strategy in less time than it would take for municipal staff. However, some vendors, municipal staff, and participants from external organizations suggest that much of the learning via these stakeholder-driven processes seems to be happening among the vendors, rather than more broadly within and across municipalities.³² On the other side, communities that did the plan because they were contacted by consultants who then wrote the Planning Grants and did the work had more mixed results.

In contrast to often limited interaction among municipal officials working on environmental matters—especially from other cities and towns—the MVP vendors seem to be collectively evolving from a facilitation role to a repository of expertise for the MVP planning process. They get more efficient over time and workshops became excellent opportunities for junior staff to get acquainted with facilitation and environmental policy.³³ While growing expertise and capacity among the vendors may have a host of benefits, seemingly quite variable levels of learning and capacity building among and between municipal officials and citizens may be worrisome. Capacity building and policy learning goals also apply to non-governmental organizations, and local civil society more broadly, in their work and interactions with municipal organizations and officials. Our research suggests these groups tend to be well aware of local environmental concerns, but less experienced in municipal affairs and processes. One stakeholder who participated in several MVP workshops and advises various municipalities said that they have gained substantial knowledge about their municipal environment through their work with the MVP program over the last two years.

Further research could explore the influence of vendors in planning processes and priority selection and their impact on the stated goal of the MVP program to build adaptation capacity at the municipal level. Comparing municipalities that drove the process by hiring vendors to carry out projects identified by the municipality with those that hired a vendor to develop a new

³⁰ Author interviews, 2020

³¹ Ibid.

³² Ibid.

³³ Ibid.

portfolio could shed some light on adaptation decision-making processes. Perhaps most critically, although the MVP process was designed to be stakeholder driven, it remains unclear how much climate adaptation planning and action capacity is being constructed or augmented within local municipal governments and whether such capacity is institutionalized outside of local governments. While it is clear that capacity has grown in some cases, it is difficult to know whether, where, and to what extent that happens throughout the state. Prominent examples of capacity building are not the same as understanding how capacity development is evolving. Institutional capacity building is notoriously difficult to measure, so the assumption that capacity develops as a result of the program’s activities needs to be paired with a systematic assessment of institutional capacity building in climate adaptation.

Box 7: Community Profiles: MVP Planning Process and Participation Dynamics

Ideally, participation in MVP community meetings and dialogue processes should be broad and diverse in each community, connecting citizens, various types of expertise, representatives of a diverse set of local communities, and local officials. As noted above, vendors’ work may be important in how such participation and representational goals play out in each community. Of course, each community has pre-existing cleavages and patterns of social and political organization. Some communities report using the planning process to expand awareness and the conversations about adaptation and vulnerability across their municipality and across different communities within each city or town. But broadly diversified participation that includes representation from and engagement with traditional marginalized communities—also known as Environmental Justice communities, defined by economic, racial, and/or ethnic factors—remains difficult and not systematically tracked or assessed. We found occasional, ad hoc examples where MVP processes might be bridging these gaps.

Generally, based on data collected before the COVID-19 pandemic forced planning processes to go virtual, MVP participants had positive views and felt comfortable with the in-person format of CRB workshops. However, different factors may impact the level of discussion and the quality of the outcomes, such as date and time of the session, quantity or role of the participants, or quality of the facilitation. Opinions vary among those who prefer splitting the workshop between two sessions of four hours and those who favor a single day of work. Advocates for the two-day option point out that participants have concurrent activities that make it difficult for them to devote a whole day to the process, while others claim that, besides logistical complications, participants drop out and discussions lose consistency when the process is divided.

MVP vendors mentioned that a workshop is easier to moderate and produces better discussions when the number of participants fluctuates between 20 and 40, depending on the size of the town.³⁴ The workshop dynamic is basically the same for towns like Lowell and Hadley, although the population of the former is about twenty times larger than the latter.

Along with attendance patterns, an important part of the workshop is the role or capacity of the participants. More than an open discussion with the general public, vendors and officials highlight that topic experts at the local level are key for achieving deeper conversations and engaging more voices into them.

³⁴ Author interviews, 2020

Facilitators generally form groups of 6-10 people and prompt experts to be well mixed from table to table. An important step is to avoid people from a single municipal department clustering together and dominating the conversation at their group, which may cause their expertise to crowd out input from other tables. To address these challenges, the program incorporated best practices in the training sessions for vendors and municipal staff, and acknowledged that future planning processes will be substantially different than previous ones, in terms of community engagement.

Vendors also mention that town-level organizations—such as public works, roads, or parks and recreation issues and departments—are generally well represented in the workshops. Environmental issues seem to be well represented too, particularly from land trusts, conservation organizations, and watershed associations. According to most interviewees, minority communities, variously defined, often appear to be lightly represented. This may be a result of limited networks and connections between established NGOs, local officials, or the vendors. It might also be because levels of existing awareness and engaged interest in climate adaptation and community planning vary across social groups and communities. For example, vendors reported that underrepresentation within vulnerable groups is also often unequal. According to workshop observations, and supported by interviewees, senior citizens are better represented compared to the low-income population, immigrants, non-English speakers, people with disabilities, and/or communities of color. Finally, vendors suggested that workshops tend to favor English-speakers willing to speak in a public setting without prior training.

One environmental expert who has attended many planning workshops across a host of communities mentioned that one of the reasons why communities are not well represented in the final reports is because engineers, who regularly facilitate planning workshops for consultancy firms, are too often not very experienced with broad-based community engagement. One possible improvement for MVP planning processes she suggested is that, in areas where participation is likely to be low, outreach and facilitation work should be conducted by people trained in community engagement. She mentioned that some diverse and highly experienced cities, like Boston, Cambridge, or Somerville, know what they want and need to do to engage broader participation. They know individuals, organizations, and groups that can help produce broader community representation. Other cities and towns, where links between municipalities and under-served populations are historically thin, may rely too heavily on engineering firms and contracted vendors to shape community participation. Because such firms and consultancies bring needed expertise related to project feasibility assessment, particularly as related to the sort of physical infrastructure subsequent state grants may fund, they may end up with outsized influence.

In another municipality, participants voiced concerns about the limitations of the planning workshop format and strict adherence to the CRB framework. While having a shorter time frame to convene a workshop may be respectful of participants' limited availability and busy schedules, some participants were concerned that a one or two-day workshop may inadvertently limit public input in the planning process. One participant expressed a concern that the workshops serve to “check the box” for grant applications requiring public engagement processes. The same participant observed that well organized groups are more likely to show up to the workshops and drive the discussions with their agenda. Concern was voiced, in this particular municipality, that groups with an adaptation focus are not as well organized as groups focused on mitigation; therefore, without citizens pushing for adaptation actions, the town may be less likely to proactively advance an adaptation agenda.³⁵ In the same town, a city official serving on the MVP core team found the CRB framework to be “tedious and formulaic.”³⁶ While understanding the value of having a standardized format for all municipalities to follow across the state, asking participants to adhere to a strict format risks curbing creative thinking to address a

³⁵ Author interviews, 2020

³⁶ Ibid.

problem that by its nature has many overlapping impacts and challenges. Such participant comments hit on trade-offs inherent in the workshop structure: a short-term planning workshop may increase participation, but it may also limit in-depth discussion and provide a favorable environment for well-organized groups, leaving out other groups for whom the impacts of climate change are felt no less, but who may benefit from a more comprehensive public education campaign.

In rare cases municipalities receive MVP certification for having engaged in prior work to assess climate change related vulnerabilities. For example, Somerville, Cambridge, and Boston were designated as MVP communities because of technical vulnerability assessments they commissioned. One city official from Somerville observed that the value of the MVP planning workshops is that they convene community members to discuss and raise awareness about climate change. Although far less technical and expert-driven than formal vulnerability assessments, MVP planning workshops may potentially foster more stakeholder-driven processes.

3. From community-based processes and plans to action and implementation

The MVP program funds Planning Grants to municipalities to engage in community-driven planning processes that seek to understand climate vulnerabilities and adaptation actions. Municipalities applying for MVP Planning Grants must meet specific requirements, and applications are evaluated according to particular criteria.³⁷ One requirement is the inclusion of a detailed public involvement and community engagement plan. The plan should outline strategies the municipality will pursue to engage its communities and foster public involvement in the planning process (i.e., in the CRB workshops and other public meetings, such as town hall meetings), with an emphasis on increasing engagement with environmental justice and climate vulnerable populations (described below). Examples of outreach strategies include using print and digital media and conducting in-person community engagement. Attentive to equity concerns, these strategies can be modified to include translations of outreach materials into non-English languages and providing childcare, food, and gift cards to address barriers to participation. Action Grant applicants receive additional points in application scoring for utilizing equitable engagement modifiers³⁸ and when projects directly benefit EJ communities. Since its inception, the program evolved to include more detailed public involvement and community engagement requirements.

Planning Grants require an in-kind time match from municipal staff or volunteers, generally between 120-200 hours. Action Grants require municipalities to match 25% of total project budget using cash or in-kind. State funds cannot be used toward the match, but federal dollars are allowed. Other grant programs to help fund projects are encouraged and the MVP program has developed a list of grant programs for consideration by applicants to help pay for project

³⁷ For a more detailed overview of the Planning Grant application process and evaluation criteria, visit: <https://www.mass.gov/doc/mvp-webinar-recording-fy21-funding-round/download>

³⁸ According to the MVP Action Grant Public Involvement and Community Engagement Guidelines & Requirements, an Equitable Engagement Modifier is “a strategy that is specifically undertaken to overcome barriers to participation that EJ or Climate Vulnerable Populations regularly encounter.”

implementation. According to some interviewees, the match requirement may be a limitation for some communities.

Once a municipality receives a Planning Grant, it can utilize a state-certified MVP vendor (see Section 4), MVP toolkits,³⁹ and climate data to develop an MVP plan through workshops and community outreach. Upon completion of the planning process, the municipality publishes a planning report that enumerates the vulnerabilities and action priorities identified by the participants.⁴⁰ The MVP program then confers the “MVP community” designation on the municipality, making it eligible for Action Grant funding.

The steps between completing a planning report and receiving an Action Grant are less clear than the planning grant application process and workshops, which are open to the public. A review of a random sampling of planning reports reveals that municipalities identify an extensive list of action priorities in their reports, but Action Grants are not always necessarily pursuant to the priorities originally identified in the planning report. The community may drive the workshop process, but questions remain about who decides which of the priorities are selected for an Action Grant—and how. Most interviews and observations for this report were conducted in municipalities in the planning process, and thus could not speak to the dynamics and factors driving Action Grant project selection. As such, we selected a municipality that had completed an Action Grant to understand the decision-making process from the planning phase to the Action Grant application (see Box 8).

Box 8: Community Profile: Putting MVP Planning into Action in Somerville, MA

The City of Somerville, after its designation as an MVP community, applied for and received an MVP Action Grant to carry out a prioritized action. Having seen an Action Grant through to completion, Somerville offers a window into understanding the decision-making process of identifying vulnerabilities and selecting a priority action, and then implementing it. Somerville is a comparatively high-income city in the core of the Boston Metropolitan region. Analyzing policy decision-making processes in Somerville can shed light on factors that motivate actors to choose one policy instrument over another, in pursuit of climate change adaptation. In particular, it helps us explore what municipal level factors enable or impede the use of selected policy instruments.⁴¹

Policy implementation refers to the actions taken to execute a public policy decision. It is the stage in the policy process where goals and commitments are translated into concrete activities. Contrary to policy adoption, policy implementation requires tangible governmental actions that mobilize organizational and economic resources.⁴² Implementation, therefore, is the stage in the climate policy-making pipeline where climate rhetoric and climate action become distinctive elements.⁴³ This case

³⁹ As of December 2021, the MVP website lists toolkits on NbS, EJ & Equity, Public Health & Healthcare, and Virtual & Remote Engagement.

⁴⁰ All planning reports are accessible on the MVP website: <https://www.mass.gov/info-details/municipal-vulnerability-preparedness-mvp-program-planning-reports>

⁴¹ Ajzen & Kruglanski, 2019

⁴² Mazmanian and Sabatier, 1983

⁴³ Ryan, 2015

study uses the Theory of Reasoned Goal Pursuit⁴⁴ to guide the identification of factors that motivate actors to choose and use the MVP program to seek adaptation outcomes, and the identification of factors that enable or impede the use of the MVP program. For a policy agent, the motivation to choose the MVP program is influenced by two goals: (1) *procurement goals* (i.e., the desired outcomes related to the policy, namely adaptation), and the perceptions of advantages and disadvantages associated with the MVP program; (2) *approval goals* (i.e., the desire for approval and social pressure from significant actors). As the following community profile highlights, policy agents strategically utilized the MVP program to achieve the procurement goal of carrying out a detailed stormwater assessment, also factoring approval goals into their decisions about which project to pursue.

The MVP Program granted the City of Somerville \$350,000 in 2018 to plan natural stormwater management solutions to mitigate precipitation flooding hazards, which are projected to increase in frequency and intensity due to climate change (see Box 1). Somerville was designated as an MVP certified municipality because of its prior work to assess climate change related vulnerabilities to assets and vulnerable populations. Around the same time as the roll out of the MVP Program, Somerville produced its *Climate Change Vulnerability Assessment* (June 2017), a data-driven report that determined top priority focus areas based on the assessment of vulnerabilities and risks. The report identified citywide extreme heat and precipitation flooding as top priorities and identified at-risk systems and assets, such as transportation, dams (specifically the Amelia Earhart Dam), economic development and commercial zones, public health of vulnerable populations, police and fire departments, and open green spaces.

The following year, Somerville issued its *Climate Forward Plan* (November 2018), which prioritizes 13 action areas supported by 22 key priority actions. The plan refers to an MVP Action Grant Somerville received to develop a “citywide hydrologic/hydraulic model to better quantify flooding impacts in the future” and to help the city “develop an understanding of the extent to which green infrastructure can reduce flooding...as well as identify specific locations where green infrastructure can be most effective” (p. 60). By June 2019, the MVP-certified vendor, Stantec, under contract from the City of Somerville, completed the MVP Action Grant and produced a final report titled *Green Stormwater Infrastructure Feasibility Study*.

Somerville also got a second MVP Action Grant to work on a project with regional scope in partnership with Boston, Chelsea, Revere, Winthrop, and Medford, as well as with the Mystic River Watershed Association. The project consists of an assessment of critical infrastructure in the Mystic River Watershed and of the impacts of flooding on communities, using a tabletop exercise led by the Department of Homeland Security.⁴⁵

Based on a review of Somerville’s vulnerability assessment reports, climate change adaptation plan, and MVP Action Grant report, and an interview with a municipal sustainability and environment official, we identified a number of factors that influenced Somerville’s decision to conduct a more in-depth assessment of flooding risks (instead of a project to address the impacts of extreme heat) and pursue an MVP Action Grant to carry out the project.

First, Somerville had the political interest and resources to produce a detailed, data-driven vulnerability assessment. This report led city officials to determine that a more detailed assessment of localized risks to precipitation-related flooding was required before shoring up a short-list of concrete action steps. The 2017 assessment established that precipitation-related flooding posed a significant risk to the city

⁴⁴ Ajzen, 1991

⁴⁵ Author interviews, 2020

in terms of geographic coverage and impact on infrastructure and systems, such as transportation. The hydraulic modeling used for the assessment, however, lacked geographic coverage of the city and detail to provide an accurate picture of flood risks under different storm scenarios. Before embarking on climate adaptation projects, Somerville needed more detailed information to understand the risks and target actions. Existing political will and material resources, therefore, enabled an in-depth, data-driven vulnerability assessment that justified the need for an even more in-depth assessment of flood risks using a citywide hydrologic/hydraulic model.

Having received certification as an MVP community for its prior work on assessing vulnerabilities to assets and communities, Somerville was knowledgeable about and eligible to apply for an Action Grant. Reviewing the criteria for applying, particularly the limited timeframe for carrying out to completion a project (12 months) and the preference for NbS, Somerville selected the detailed flood assessment from other priorities (e.g., addressing the impacts of extreme heat) and modified the proposal accordingly.

Somerville's engineering department had a plan already drawn up for the hydraulic modeling, and the required matching funds were available. The city also had a contractor hired for the proposed project. The time required to draw up a proposal, apply for matching funds, hire a contractor, and complete the project within a 12-month time frame resulted in the elimination of many other priorities identified by vulnerability assessments. To put it simply, a main driver for the priority action Somerville officials chose was confidence that the city had the capacity—the resources, staff, and contractor—to complete the project.

According to interview data, if not for the aforementioned considerations, the city might have proposed a project to address the impacts of extreme heat. After all, Somerville's vulnerability assessment identified extreme heat, alongside flooding, as a top priority. However, the city did not have all of the components for a concrete, feasible proposal for a heat project as it did for a stormwater flooding assessment. Based on Somerville's assessment, it lacked the internal resources and expertise to tackle such an initiative, and would have also needed a longer time frame, which would not fit into the 12-month timeframe of an MVP Action Grant. Additionally, the MVP Program has a strong preference for Action Grant proposals that pursue a NbS. Based on the perception that modifying the proposal for a stormwater flooding assessment would increase the likelihood of producing a proposal that would score higher according to the grant evaluation criteria of the MVP Program, the Somerville officials decided to include a green infrastructure component.

The inclusion of green infrastructure into the stormwater flooding assessment proposal also aimed to seek the approval of select city officials and key community groups that favored NbS and green approaches to climate adaptation. From the perspective of Somerville officials, incorporating green infrastructure into the assessment allowed them to demonstrate the capacity, as well as the limitations, of green infrastructure to mitigate stormwater flooding in Somerville.

The incorporation of green infrastructure into the flooding assessment aims in part to win approval for the grant application, and also tries to influence the behavior of targeted actors at the municipal level who vocalize support for green infrastructure approaches to climate change adaptation. This municipal-level policy instrument serves as a “decision-making tool” to provide scientific data to assess the relative costs and benefits of a green infrastructure solution in specific locations of Somerville.⁴⁶ One interviewee provides an example:

⁴⁶ Author interviews, 2020

“There is a general misunderstanding of the effects green infrastructure can actually have on mitigating flooding in Somerville. And so, our study is very helpful for demonstrating what green infrastructure can and can't do. So, that is an example of something that is good for us to have but doesn't dramatically change what we do as a city, because we already understand this. But it is really useful to be able to share it publicly, you know, to say that maximizing treatments and rain gardens can shave 10% off of a nuisance storm, and then everything else is exactly the same as if we didn't have it. And so, we really need to look at green infrastructure to solve *some* of our flooding problems. That is really valuable information that we hope to be able to share more... Through no fault of their own, people who are sort of environmentally attuned here think that work in other parts of the country, or even in the state... would be just as impactful in a dense urban area like the Boston area—without understanding that it actually has very little impact or pay off for us here.”

I would say [the flooding assessment] is a decision-making tool. And it really helps us understand what costs are worth incurring. So, if we redo a major transportation corridor, and this is hypothetical, but we have narrow streets. So, are you going to use six feet for a separated bike lane, or for a planting strip? So, if you ever have to make that decision, you really understand that that planting strip is going to do very little with respect to flooding. It will do some[thing] with respect to water quality. Maybe a separated bike lane is going to do much more for air quality and transportation equity. And so, then you're actually looking at, with data behind all of these different forces, at those different actions instead of this common misunderstanding that if you plant a tree, suddenly all your flooding is gone.⁴⁷

The assessment also targets the general public and aims to influence its behavior, as well. With the assessment, Somerville gained greater understanding of what its flood risks are, the relative costs and benefits of green infrastructure, and a catalogue of typologies of green infrastructure the city could consider deploying (e.g., streetscapes, etc.) to the general public. The city created infographics for public service announcements about preparing for flooding that are available in English, Spanish, Portuguese, and Haitian Creole. This information is dispersed on social media and different print media, strategically, when storms are more frequent.

In sum, the green infrastructure stormwater flooding assessment that Somerville conducted with the support of an MVP Action Grant was not required by a regulation but was selected by city officials on the strong recommendation of the *Climate Change Vulnerability Assessment* that identified flooding as a top priority. Somerville officials saw that the procurement goal they wanted to pursue—to better understand the localized impacts of flooding in the city—fit well within the framework of the MVP program.

From a policy perspective, the MVP program provides a needed funding stream to municipalities that have a feasible and timely adaptation project *waiting in the wings*. Somerville had the resources, expertise, and staff to conduct an action it perceived as likely to be able to over carry to completion. Somerville could have considered pursuing a project to address the impacts of extreme heat if it had the internal resources, expertise, and a longer time frame to develop a plan. This highlights the limitations of a funding source that, on one hand, created incentives toward the use of NbS, but on the other hand limited projects to a 12-month time frame. It is possible that shorter timeframes favor certain construction-type projects (e.g., stormwater infrastructure) whereas allowing for a multi-year project may provide municipalities with the needed support to pursue other priorities and to use NbS. Even for sophisticated cities like Somerville, it is hard to use the money well within the 12-month timeframe. In

⁴⁷ Author interviews, 2020

recent years, feedback from municipalities led the MVP program to work with the EEA financial department to allow for two-year projects for Action Grants for communities needing longer timeframes than a year. The program is still restricted by its fiscal year capital budgeting requirements, but it's making efforts to accommodate these two-year projects.

Further policy-relevant research might examine how different, yet related, funding streams and grant programs could be integrated into one project by a municipality. The specific requirements and timeframes of respective state and federal grants may compel municipalities to select and tailor specific projects to the requirements of the respective grants. Do these different grants and the policies that result from them support one another, or do they pose obstacles, or create inefficiencies and maladaptation? How might a municipality integrate different grants or existing policies? For example, fitting together resiliency, energy, and coastal zone management into a new construction? How might the state help lower the barrier for municipalities to dedicate the resources to fitting these different pieces together?

V. The MVP Program and Regional Climate Adaptation: Between State & Local

Massachusetts has very little authoritative governance between state government and local cities and towns. The notable exceptions to this general rule are a set of regional transportation authorities and the Massachusetts Water Resources Authority (MWRA) (whose main remit focuses on drinking water and sewage services for many cities and towns in central and eastern Massachusetts). These exceptions demonstrate that, when state authorities determine authoritative regional governance is needed, it can be created. But beyond these exceptions the regional governance gap leaves multi-municipality efforts rather rare in the Commonwealth.

Regional planning organizations (described below) provide a host of planning, research, information, and convening functions for the communities across the state, but they have no decision-making authority and limited capacity to induce neighboring municipalities to collaborate. As such, most MVP program activities are single municipality focused. However, because MVP staff and local officials know that many climate change adaptation plans, projects, investments, and institutions need to involve several municipalities at the same time, then the MVP program has evolved to promote regional, multi-municipality collaboration.

The two subsections below focus on regional climate change adaptation in Massachusetts and the MVP. The section ends with an illustrative box about an MVP initiative around the Lower Mystic River Watershed.

1. Regional governance in Massachusetts and its implications for multi-municipality adaptation efforts

Climate change impacts do not respect municipal boundaries. The diversity of impacts and local conditions given the regional scale and regional actors in climate change adaptation⁴⁸ highlights

⁴⁸ Termeer et al., 2011; Ekstrom and Moser, 2014

the importance of the regional scale. As a result, the lack of regional governance structures is a barrier to effective climate change adaptation. There is evidence that regional partnerships produce expanded benefits and catalyze policy innovations for climate change response through increased collaboration among partners, escalating activities beyond the regional partnership, and by informing adaptation at the national and state level.⁴⁹

In the US, this regional level is traditionally associated with counties, but these rarely corresponds to geographic areas sharing climate impacts and vulnerabilities. While the importance of counties varies widely among US states in terms of administrative and governance capacities, in Massachusetts most county government has been abolished. County government is mainly only relevant in the judicial system. The state's capacity to coordinate multi-city efforts is, therefore, constrained by the lack of a county-level governance structure to promote regional climate adaptation action. In addition to that limitation, the relationship between the state and municipal levels is marked by a constitutional amendment from 1966 adopting *Home Rule* provisions. Massachusetts municipalities are highly constrained in the ability, for example, to raise additional funds without explicit legislative permission. They are therefore quite dependent on the state funding, much of which is explicitly dedicated to particular areas of local government. In relation to climate change, cities and towns often lack the resources to plan and implement climate resilience initiatives or raise money to match state funding.

In terms of inter-municipality cooperation, experiences shared by officials working in environmental programs in Massachusetts support the claim that Home Rule is an obstacle to managing this intermediate governance gap and pursuing regional adaptation, adding that it may reinforce an individualistic character on municipalities, making it difficult to cooperate at the regional level.⁵⁰ As municipalities struggle to pay for the responsibilities and programs they already have, many are disinclined to seek out new—especially costly—areas of policymaking, like greenhouse gas reduction and climate change adaptation. The challenges created by this lack of regional, multi-municipality governance authority led an earlier report on climate adaptation governance and finance to suggest that state leaders should consider tasking MWRA with greater stormwater and flood protection responsibilities.⁵¹

One MVP vendor, acknowledging the need for regional approaches to climate adaptation planning, implementation and investments, mentioned that most hydrological issues cross towns and watershed boundaries, including systemic problems in culvert quality and location that cannot be fixed only at one side of the stream.⁵² He mentioned the situation of the Town of

⁴⁹ Bauer and Steurer, 2014

⁵⁰ Author interviews, 2020

⁵¹ For more information, see *Governing for a Changing Climate: Adaption Boston's Built Environment for Increased Flooding* (Kruel, Herst & Cash, 2018)

⁵² Author interviews, 2020

Hadley, where culvert infrastructure is undersized and needs to be replaced. The area around the town is mainly agricultural, and there are drainage ditches in the farm fields in neighboring towns that have been building up sediment for decades. Hypothetically, an MVP Action Grant could provide the funding to help increase the size of the culvert, but if the flood capacity of ditches in other towns is not maintained, then it will only work as a short-term solution and could worsen flooding risk in neighboring communities. As this example suggests, inland flooding and coastal flooding are particularly important examples of the need for multiple community adaptation planning and implementation. As such, previous research suggested that Massachusetts officials invest more regional, trans-jurisdictional authority in the MWRA or related organizations to coordinate and prioritize planning, implementation and investments in flood prevention and mitigation.⁵³

But physical features such as watersheds are not the only examples. Regulatory and investment competition creates the need for multiple jurisdiction collaboration, as well. If one community changes zoning restrictions or expectations of proposed real estate developments while its neighbor does not, commercial developers may favor the lower standard and lower cost jurisdiction over the community with more longer-term, climate change informed regulation.

2. Regional adaptation and the MVP Program

Early discussion among state officials of adaptation actions recognized that regional approaches were needed alongside those providing support to local governments. This need is reflected in views of two members of the Senate Committee on Global Warming and Climate Change, who sponsored the bills creating the State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) and the MVP program. They noted that most vulnerabilities stemming from climate change impacts take place at regional scale, while individual municipalities are limited in their ability to address regional issues. They saw the MVP program as an opportunity to inform a statewide resiliency strategy, and as a vehicle to promote multi-municipality, valley, or watershed level adaptation.⁵⁴ This mandate from state legislators was made explicit with the incorporation of specific hazard mitigation and climate adaptation *actions*⁵⁵ requesting state agencies' support for regional work on adaptation.⁵⁶

One action in the SHMCAP encourages work with local and regional partners to provide technical assistance and funding for local hazard mitigation plans. It considers the MVP program and NGOs as potential partners. A second action, perhaps more explicit in terms of expanding the MVP focus to a regional level, calls for the state's Department of Ecological Restoration

⁵³ Kruel et al., 2018

⁵⁴ Author interviews, 2020

⁵⁵ The SHMCAP's strategy outlines specific actions for state agencies to lead by example and to begin to tackle the challenges of increasing state and local capacity to address climate change and natural hazards in a coordinated and forward-looking way (SHMCAP, 2018:11).

⁵⁶ SHMCAP, 2018

(DER) to support the MVP program in building capacity in regional organizations to implement climate adaptation and habitat restoration. SHMCAP requests DER to partner with up to five regional NGOs supporting municipalities in their MVP planning processes to facilitate regional solutions across municipal levels, and to identify projects that address climate adaptation and habitat restoration simultaneously.⁵⁷

The MVP program has evolved to rely on two different approaches to promote increased regional and multi-city collaboration, so that climate adaptation projects can impact areas that cross municipal boundaries⁵⁸: the work of six Regional Coordinators around the Commonwealth who are MVP focal points for municipal core teams and facilitators, and incentives such as higher score for Action Grant applications that include other municipalities in their adaptation work.

The MVP program clustered municipalities into six regions and filled all six regional coordinator positions by 2019. MVP regional coordinators travel throughout their respective region visiting municipal officials to promote and expand the MVP program. At first, their main task was to identify and facilitate connections between municipalities and relevant stakeholders and move all of these toward successful completion of the planning grants. Tasks of regional coordinators include assisting municipalities with establishing contact with a permitting or regulatory agency to move a priority action forward, serving as liaisons between municipalities and the state. If two or more municipalities work on a project or there is the potential for a multi-city project, the regional coordinators will facilitate communication between the relevant municipal officials. As one regional coordinator states: “I really see us as people who can connect the grantees with whatever they need to have a successful project.”⁵⁹ Besides their formal responsibilities, stakeholders mention that regional coordinators have been effective at networking, connecting and coordinating with vendors and municipal staff, guiding them about what issues are considered local or regional, and stressing the potential of the latter as priorities for the MVP program.⁶⁰

By 2022, regional coordinator roles have evolved to become programmatic points of contact for communities, their regions and the state. According to MVP staff, they collaborate with some state level projects, including the Commonwealth’s Climate Design Standards Tool. They also conduct climate resilience training for state staff and for the MA statewide Climate Change Assessment.⁶¹ Several regional coordinators helped to host regional workshops to bring different

⁵⁷ SHMCAP, 2018

⁵⁸ Author observations, 2020

⁵⁹ Author interviews, 2020

⁶⁰ Ibid.

⁶¹ According to the official website of the EEA, the MA Climate Change Assessment is “*a statewide analysis detailing how Massachusetts people, environments, and infrastructure may be affected by climate change and related hazards through the end of the century. This assessment will directly inform the first five-year update to the State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) that will be released in Fall 2023*”.

regional stakeholders together and explore projects that benefit their communities. They are helping refine the Action Grants criteria around regional projects, both for communities explicitly working together and for projects that, due to their nature, benefit multiple communities. In the view of our interviewees, grant scoring has been the main programmatic incentive, which seemed to work because almost 25% of the projects awarded in FY21 were multi-community projects. The number increased by about 5% over FY20.

In addition to regional coordinators' attempts to encourage multi-city planning and projects, the MVP Action Grant selection process also allocates extra points to projects that demonstrate regional benefits, and if the project results are transferable and serve as models to other communities facing similar issues. The MVP Action Grant explicitly encourages partnering municipalities to submit a joint application, with one municipality serving as the fiscal agent for the award. Applications from regional partnerships of multiple municipalities are eligible, provided that the lead applicant is an MVP designated community.⁶² Feedback from municipal staff indicates that one municipality serving as lead and fiscal agent can be challenging for regional projects. As of 2022, this requirement remains, so grants can only be awarded to single municipalities. Nevertheless, the expanding roles of the regional coordinators and the efforts to promote more collaborations between cities show that the program is trying to upscale its focus on individual projects, covering areas less defined by administrative borders and more defined by common vulnerabilities and opportunities for climate action.

Our research identified two regional, multi-municipality actors who are trying to facilitate the complex task of coordinating municipalities as they partner and work on climate adaptation at the regional scale: regional planning associations and, where available, local non-governmental organizations working in environmental matters and climate change issues. Regional planning organizations are semi-public entities that support local municipalities' planning efforts in a wide variety of areas, including improved municipal management, transportation, housing, economic development, public health and safety, energy, equity, land use, and protection of natural resources. Since the MVP program's first year, these organizations have actively supported municipalities and prompted towns to start MVP certification processes—sometimes running MVP workshops. A Wellesley municipal official points out that the Metropolitan Area Planning Council (MAPC), which serves the Boston Metro Area, encouraged them to join an MVP planning process with neighboring towns. The invitation was not accepted at that time, so the town conducted its own MVP planning workshop with the assistance of a private consultant. In cases where regional planning association staff were not facilitating MVP planning processes of given cities or towns, they regularly attend the CRB workshops and contribute with their place-based knowledge to the discussions.

⁶² Request for Responses (RFR) ENV 20 MVP. Dated: October 3, 2019

The involvement of regional planning agencies is questioned by some stakeholders, however. One state senator who supported the creation of MVP remains uncertain about the role of regional planning agencies in addressing regional climate impacts and developing regional solutions. He would rather see leadership from state agencies in collaboration with other regional actors, like watershed associations.⁶³ One problem regional planning agencies face when conducting multi-city work on climate adaptation is their lack of regulatory authority and their inability to generate revenue, compared to other state or semi-public actors.⁶⁴ Similarly, one town official affirmed this assessment, noting that regional planning associations are good partners but “*have no teeth.*”⁶⁵

Other actors trying to fill the regional governance gap include non-governmental organizations like conservation land trusts and watershed associations. Some have been operating in their regions for decades, accumulating place-based knowledge, personal and professional networks, and reputations for supporting municipal efforts. They also possess or know how to access resources like well-trained staff and private funding. One MVP vendor praised the role of environmental NGOs participating in MVP planning workshops because they bring deep knowledge about regional environmental problems, highlighting opportunities to solve them.⁶⁶ However, another environmental expert coordinating a local planning process points said they do not see NGOs as effective multi-city coordinators, but only for working on specific issues.⁶⁷ He argued that municipal staff are often so busy they cannot afford the extra effort to enter regional partnerships with an external organization. As an example, he mentioned that his town participates in a regional watershed association but grants external organizations minimal influence on what the municipality decides and what projects it implements.⁶⁸

⁶³ Author interviews, 2020

⁶⁴ Ibid.

⁶⁵ Ibid.

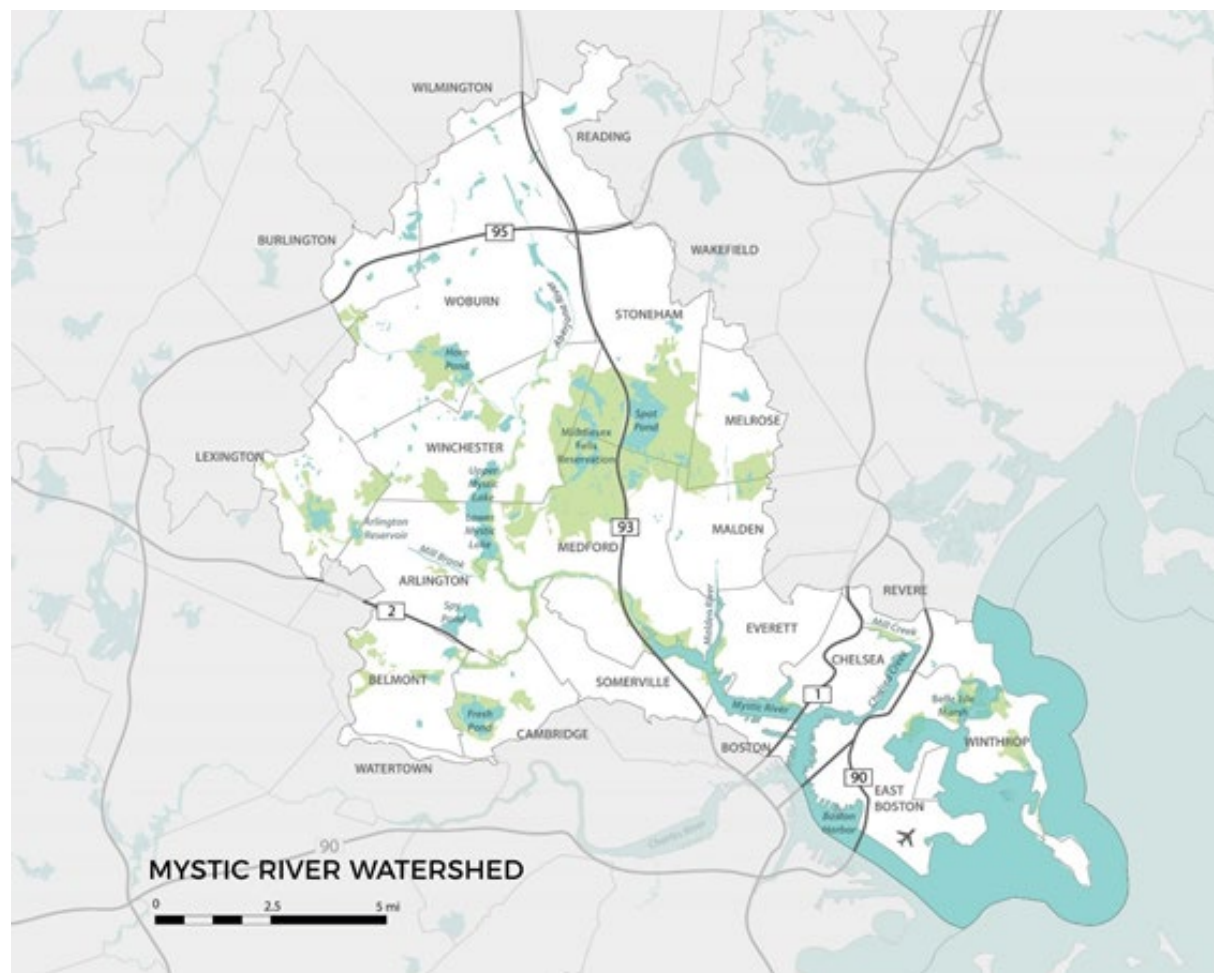
⁶⁶ Ibid.

⁶⁷ Ibid.

⁶⁸ Ibid.

Box 9: Regional Adaptation Profile: Lower Mystic River Watershed

The Mystic River Watershed is among the most densely populated watersheds in Massachusetts, encompassing 8% of the population in less than 1% of the Commonwealth's area.⁶⁹ Once a heavily industrialized river, it now contains both wealthy suburbs of Metropolitan Boston and cities with a high percentage of low-income residents. The river empties into the Boston harbor following a course that starts in Reading and meanders through 21 municipalities to the north and west of Boston (see map below). The watershed has an area of approximately 76 square miles and includes portions of Boston, Cambridge, Somerville, Malden, Medford, and Chelsea.



Source: <https://mysticriver.org/maps>

The [Mystic River Watershed Association](#) (MyRWA) was founded as a nonprofit organization in 1972, with the mission of advocating for the Mystic River Watershed at the state and local levels, making visible the watershed's problems and benefits among residents. The MyRWA is composed of a diverse membership of municipal governments, grassroots organizations, businesses, federal and state environmental agencies, and recreational associations, among other groups. It is among the most important non-governmental organizations in the watershed conducting action-oriented research for environmental protection and climate resiliency in the Greater Boston Area.

⁶⁹ Agyeman & Bryan, 2017

Since 2018, the MyRWA has been working with 20 communities of the Mystic River Watershed and the [Consensus Building Institute \(CBI\)](#) to form the Resilient Mystic Collaborative (RMC), an initiative that emerged after advocates and senior municipal staff urged increased collaboration across administrative and political boundaries to address climate change resiliency in the Lower Mystic. As the website states, RMC work seeks to address the fact that *“Massachusetts lacks the formal regional government structures needed to plan, finance, and implement regional climate resilience measures.”*⁷⁰

More than partnering as an environmental organization, RMC participants try to use the governance structure of a regional watershed association provide a forum for the group of towns and cities in the watershed to collaborate. In the words of Julie Wormser, Senior Policy Advisor of the MyRWA, *“...it turns out that our organizational footprint is identical to how water floods, and we provide a useful governance function in the absence of counties.”*⁷¹

The RMC defines its work as a data-driven and action-based effort to advance a regional approach to climate resiliency. The collaborative has four working groups to mitigate different climate-intensified risks in the participating municipalities: Social Resilience: Preparing People for Extreme Weather; Lower Mystic: Storm Proofing Critical Infrastructure; Advocacy and Outreach: State Funding and Policy; and Upper Mystic Stormwater: Managing Regional Flooding.⁷² RMC receives funding from foundations and government agencies, and partners with the MAPC and various experts to provide these working groups with cutting-edge scientific and technical data.

Apart from municipal officials, RMC’s steering committee includes thought leaders working in architecture, land use regulation, environmental justice, and the Greater Boston MVP regional coordinator. All are resources for RMC and working group discussions, but they do not vote. In RMC, each community has one vote and the level of consensus needed to make high-level decisions is 80%. Currently, the RMC manages three major regional projects. The first is in the Upper Mystic River, where they are using green infrastructure to restore wetlands and manage stormwater as a region, instead of town by town. They are working on up to 20 sites of three acres or more, selected based on technical and equity criteria.

In the Lower Mystic River, RMC supports Somerville’s second MVP Action Grant, in which the city acts as fiscal agent on behalf of six communities. RMC facilitates a process with critical regional infrastructure agencies to do a simulation of a major storm with cascading effect scenarios, looking at the interdependencies among their major infrastructure and their vulnerabilities, with the aim of coordinating the response of agencies and municipalities. This project also integrates a climate equity piece: half of the budget is allocated to engineering support and the other half funds social scientists and community-based organizations to understand how the most vulnerable residents and workers of the region will be affected by a potential infrastructure disruption. The third RMC project is called “Wicked Hot Mystic,” launched in September 2020 and awarded by the MVP program to the Town of Arlington on behalf of the RMC. Its purpose is to create a real time, day- and night-time heat and humidity map for the whole watershed.

An NGO coordinating the work of state agencies and municipalities is not particularly common. MyRWA staff thinks that the main reason the organization is facilitating these entities is because it fills a critical governance gap. To prepare, MyRWA staff and stakeholders reached out to organizations doing similar regional work with infrastructure in New York City and other places, asking for advice. The multi-stakeholder, multi-community facilitation processes are supported by expert practitioners

⁷⁰ See <https://resilient.mysticriver.org/about>

⁷¹ Author interviews, 2020

⁷² More information at <https://resilient.mysticriver.org/our-work>

from the Consensus Building Institute (CBI), a non-profit specialized in collaborative approaches to problem solving.

RMC staff and participants are enthusiastic about municipalities allowing them to facilitate these processes.⁷³ On the other hand, many analysts and participants know that the lack of significant regional governance capacity for climate change adaptation in Massachusetts is a serious problem. Clearly, trying to deliver long-term critical governance services across a host of diverse communities based on individually grant funded projects is an inadequate governance solution to the widespread and complex challenges of adapting to climate change and advancing environmental and social justice goals. Even widely lauded projects, like Malden’s work to create a new waterside park on the banks of the Mystic River, are funded in part via association with MVP plans and the MyRWA, and partly by grants from the state and the MAPC.⁷⁴ While the park is consistent with many MVP goals and engendered diverse community support, it remains unclear how this and other individual projects “add up” to a more resilient, climate change ready Mystic River Watershed of 21 municipalities—or Massachusetts as a whole. RMC has coordinated actors and institutions in its region in ways that remain rare. This regional collaboration has achieved impressive results, given the constraints on how regional governance is structured in the Commonwealth. Both RMC and MVP experience illustrates, however, that achieving resilience in regionally clustered municipalities—and across the state—likely require additional, more authoritative, regional governance structures.

VI. Pursuing Environmental Justice and Equity through Adaptation Efforts

Although the threat of climate change is global, its impacts and burdens are not distributed equally. In fact, under-resourced and marginalized communities that have contributed the least to the problem have and will continue to bear the brunt of the effects of climate change (Shi et al. 2016). Climate change aggravates social, economic, health, and racial disparities. Furthermore, a growing body of evidence shows that policies that fail to focus on justice and equity risk perpetuating, even worsening, injustices and inequities that vulnerable communities suffer.⁷⁵ Well-intended policies, therefore, can result in unintended, negative consequences. For example, investments in retrofitting and greening housing can result in raising housing costs for Environmental Justice (EJ) populations⁷⁶ and displacing them from their communities—a phenomenon called *climate gentrification*.⁷⁷ These are very real concerns in a metropolitan region like greater Boston, where enormous inequalities exist related to income, accrued wealth, race, ethnicity, gender, transportation access, food security, and housing affordability.

More recently, policymakers, scholars, activists, and community leaders have called attention to the immediate concern (and important opportunity) to address issues of justice and equity in adaptation policies.⁷⁸ Efforts toward climate adaptation can and should be a path toward addressing existing injustices and inequities. To that end, scholars have identified an urgent need to improve implementation of *just climate adaptation*.⁷⁹ For this section, we utilize the

⁷³ Davis & Garate, 2021

⁷⁴ Laidler, 2021

⁷⁵ Adger et al, 2006

⁷⁶ Johnson et al., 2021

⁷⁷ Keenan et al., 2018

⁷⁸ Altemose & Chen, 2019

⁷⁹ Shi et al., 2016; Anguelovski et al., 2016; Fitzgerald, 2020; Malloy & Ashcraft 2020

conceptualization of just climate adaptation developed by Malloy & Ashcraft (2020) to offer preliminary insights into how concerns about EJ manifest in the MVP Program. The MVP Program provides a compelling case through which to study how efforts towards building adaptation at the municipal level can also serve as a path toward addressing existing inequities and injustices across the Commonwealth of Massachusetts.

The first section explores the three requirements necessary for climate adaptation to be just and how the design and implementation of the MVP program has the potential to meet each. Next, an overview of the MVP program explores how EJ policy is evolving within its design and practice and argues that advancing EJ through a just climate adaptation approach requires monitoring and evaluation through a multi-stakeholder process involving the participation of stakeholders representing EJ populations. Third, an analysis of the inclusion, over time, of more explicit attention to EJ conceptualization and procedural operationalization in the MVP program. This section then concludes with two community profiles that showcase how the MVP program serves as a policy vehicle through which to address concerns about EJ.

1. Just Climate Adaptation: three requirements

Malloy and Ashcraft (2020) develop three propositions concerning the conditions that need to be present for improving implementation of adaptation efforts that address environmental and climate justice:

- a) Just adaptation requires the full inclusion of socially vulnerable populations as participants who have agency to inform and shape the decisions that affect them ('nothing about us without us').
- b) Just adaptation requires recognizing the causes of systemic injustice.
- c) Just adaptation requires incremental evaluations of implementation so as to avoid lengthy evaluation timeframes inconsistent with advancing justice.

These are discussed in turn below, as applied and related to the MVP program and its processes.

Just adaptation goes beyond focusing only on policy outcomes, such as a fair distribution of services, by recognizing the specific needs of vulnerable populations and fostering their agency and participation in adaptation decisions.⁸⁰ Typically, the implementation of adaptation policies occurs through established governance structures, which risks reinforcing existing inequities and vulnerabilities, and vulnerability assessments require technical expertise, which often results in expert-led processes that are difficult for marginalized groups to access. Malloy & Ashcraft (2020) argue that a capabilities approach to climate adaptation can help to create the conditions necessary for marginalized communities to utilize the freedoms, resources, opportunities, and institutions necessary for participating in adaptation decisions.

⁸⁰ Belloy et al., 2021

In the context of urban climate change governance, Malloy & Ashcraft offer *strategic urbanism*⁸¹ as one adaptation approach to identify the specific needs of vulnerable populations and build up their capabilities to exercise their agency in decision-making and implementation. This approach advocates for meaningful and continuous interactions between city representatives and community participants through which the community knowledge serves as the basis for defining and implementing adaptation efforts. The urban focus recognizes the important role cities play in adaptation, their contribution to climate change, the resources and expertise they often possess to develop adaptation policies, and the presence of marginalized populations. We argue for developing a *strategic municipalism* approach that relies on intense interactions between municipal representatives and community participants in suburban and rural (not just urban) municipalities, which accounts for variation in governance structures, degree of community organization, and access to resources.

The MVP Program may be well suited for both the study and practice of a just adaptation approach that seeks to foster stronger ties between municipal officials and communities—especially vulnerable populations—because it seeks participation of municipalities across the entire Commonwealth, in both resource-rich and resource-limited cities and towns, not just in urban centers often regarded as the vanguard of urban climate adaptation. The program also explicitly seeks to engender greater participation of voices and communities traditionally left out of municipal government and/or climate change adaptation discussion and policy making in the Commonwealth.

Malloy & Ashcraft (2020) observe that adaptation efforts focus on vulnerability but rarely frame problems and potential solutions in terms of root causes that underlie systemic injustices (such as the dramatic wealth gap between White and BIPOC populations,⁸² which has worsened following the Covid-19 pandemic⁸³) or focus on strengths to build on. Additionally, they often don't consider EJ populations as actors with preferences. Framing adaptation in terms of equity by seeking a fair distribution of environmental benefits and burdens in a community, can also risk ignoring the substantive sources of inequity. In relation to the first proposition, the meaningful participation of vulnerable populations representative of diverse categories of vulnerability—elderly, linguistically isolated, low-income, homeless, and so on—has the potential of analyzing vulnerabilities with a lens that puts the focus on systemic causes of injustice. But meaningful participation is unlikely to be enough to engender fuller inclusion and the recognition of causes of systemic injustice, if addressing the root causes of injustice and inequity do not sit at the center of a climate adaptation effort's goals and processes.

Related to this, the MVP program's framing of climate adaptation probably started with a disproportionate focus on physical investments and NbS. While these are undoubtedly important,

⁸¹ Chu, 2018

⁸² Imagine Boston 2030, 2017:84-8

⁸³ Walker & Zondervan, 2021

the program did not explicitly place EJ at the center of adaptation planning and capacity building from the beginning, probably failing to attract community members whose main focus or concerns lie in these areas. This situation is changing in line with the evolution of Massachusetts legislation and as a result of feedback to MVP program, but many aspects remain challenging.

The evaluation of policy implementation traditionally focuses on top-down theories that frame it in terms of objectives and whether those objectives were achieved. The time frame for top-down evaluation of implementation also tends to focus on lengthy timeframes—years, if not decades. A top-down, multi-year evaluation approach misses shorter-term, incremental processes during which marginalized groups either break through into decision-making spaces or are pushed (whether inadvertently or intentionally) to the margins. A top-down approach is also blind to the important, but often overlooked, influence of less traditional policymakers such as street level bureaucrats⁸⁴ and the full array of other stakeholders, such as concerned citizen groups, community organizations, and coalitions of activists who have the potential to engage in the continuous, incremental implementation of policy.⁸⁵

For the MVP Program, short-term, incremental evaluations have a better chance of capturing the myriad spaces and processes in which concerns of justice are either being advanced or ignored. In 2022, and as mandated by the EJ policy, each agency and program are in the process of developing their own EJ strategy. However, a longer-term evaluation still focused exclusively on outcomes risks missing (and accounting for) bottom-up, incremental influences on the MVP Program that seeks to address EJ.

2. The MVP program and Environmental Justice

The MVP Program exhibits characteristics of both top-down and bottom-up, incremental approaches. The program is state policy operated by the EEA that disperses grants and provides technical assistance to municipalities to assess vulnerabilities and develop adaptation efforts; therefore, top-down. However, its design strongly emphasizes public involvement and community outreach, thus fostering a bottom-up approach to municipal-level adaptation decisions. Furthermore, an expressed core principle of the MVP Program is to learn from adaptation approaches designed at the municipal-level to guide state-level approaches. Initial findings seem to support the argument that the MVP Program is actively engaged in an iterative process of learning and refining approaches to addressing EJ through both top-down and bottom-up approaches. This dynamic of intense interactions between municipal-level actors—both municipal officials and community participants—and MVP staff at the regional and state levels has the potential to lend itself to further developing just climate adaptation approaches and fostering the agency and participation of traditionally marginalized populations.

⁸⁴ Lipskey, 1980

⁸⁵ Hjern, 1982

In the Commonwealth of Massachusetts, the pursuing of environmental justice existed as part of an executive order but was just recently codified into statutory law by the 2021 Climate Law: *An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy*. The EEA is tasked with developing energy and environmental policy to be implemented through a variety of related agencies and divisions. In 2002 the EEA issued an EJ policy, which was then revised in 2017 and 2021. The EEA also operates the MVP Program. As such, the MVP Program is mandated to follow the guidance articulated in the EJ policy that EJ should be integral consideration in all EEA programs, including the grant of financial or technical assistance, a central component of the MVP Program. The incorporation of EJ policy into the MVP Program is reflected in its core principles: *increasing equitable outcomes for and supporting strong partnerships with EJ Populations and Climate Vulnerable Populations*, as defined and outlined in the EJ policy.

Complementing this top-down approach, is a bottom-up approach to the incorporation of EJ concerns in the MVP Program reflected in the role of environmental groups in the design of the MVP Program and the subsequent concern voiced on the part of EJ groups about what they perceived to be an initial lack of sufficient attention paid to EJ communities and their concerns. Environmental groups played a significant role in the MVP Program's design and worked directly with key political decision-makers at the state-level on the drafting of legislation for its implementation.

After the initial roll out of the MVP Program, and as municipalities across the Commonwealth began to apply for Planning Grants, engage in community resiliency building workshops, and put together planning reports with identified priorities for potential Action Grants, EJ groups voiced concern that issues related to social equity and climate justice were not sufficiently highlighted or addressed in the MVP Program. While environmental groups' contributions to the substance of the MVP program were significant, they also collaborated with some EJ advocacy organizations that raised concerns about the lack of participation of EJ communities in the MVP Program. TNC communicated to them their experience advocating for the inclusion of NbS into the MVP Program and partnered with the EJ groups to assist them in their own efforts to bring their concerns to the MVP Program. TNC also consulted with the EJ groups to demonstrate that the Community Resiliency Building framework used in the planning meetings includes a component to address issues related to social equity and the social impacts of climate change and supported their participation in municipal planning meetings.⁸⁶ Furthermore, the various watershed associations also seek to incorporate social equity and EJ concerns into the MVP Program, in addition to their regional- and ecosystem-level approach to climate change adaptation.⁸⁷ This brief review shows that environmental groups and EJ activists have attempted to play a significant role in advancing environmental concerns at the state level and within many community MVP program efforts.

⁸⁶ Author interviews, 2020

⁸⁷ Ibid.

Since 2020, EEA has been making more concerted efforts to incorporate EJ sensitivity into procedural aspects of the MVP Program, such as including EJ in the Request for Response (RFR) language. It included more requirements for equitable engagement, and guidelines around community engagement plans required in Action Grant applications. EEA also introduced equitable engagement modifiers (see section 3), crafted with the EEA’s EJ director. MVP staff have examined the work of other institutions with a reputation as leaders in equitable engagement about their approaches to equitable climate resilience from the municipal level—like the Seattle Department of Neighborhoods.⁸⁸ MVP staff joined discussions facilitated by the US Climate Alliance with other staff from across the country, on how to measure equitable adaptation outcomes. MVP program staff endeavor to identify and learn from communities that adopt heavier and more equitable engagement in each round and provide examples of increasing and more diverse participation. We include some examples below.

Box 10: Examples of good practices in community engagement by MVP participating municipalities

- Towns such as Oxford and Webster included stipends for engagement in their planning grants, providing low-income residents with transportation to and from the workshop, including childcare and extra public listening sessions to try to engage beyond the usual people that generally comes to planning meetings.
- The Great Barrington Project partnered with a trusted community organization called Multicultural Bridge, to facilitate 14 cultural competence and critical trainings throughout their MVP grant. Training focused on topics such as shared knowledge and understanding culture, valuing diversity, navigating differences, accountability, and climate justice. Training sessions were open to all town staff, board members, and the community. Following the training, a series of chatting session were held, where BIPOC community members, non-profits, and town staff met to discuss priority projects for climate adaptation.
- Natick, Framingham, and Ashland are collaborating in a project focused on increasing climate resilience and engagement of populations in the Metro West area. As part of that work, municipal staff are completing equity training and collaborating with community liaisons to better understand regional equity and resilience needs.
- In the Malden River Works project, a coalition of representatives from communities of color have been steering the project since its inception. This community engagement aims to design a waterfront park for more accessibility and climate resilience.

MVP program staff and participants have also begun exploring models for municipal partnering with community-based organizations that include funds for such organizations’ engagement work and participation in Action Grant project teams to do engagement work. The increasing efforts to integrate and implement EJ sensitivity and goals into MVP guidelines aims to create a so-called “domino effect” of community level impacts. In many respects, this is a top-down

⁸⁸ Author interviews, 2021

approach to engendering more community level EJ: state programs exert pressure on municipalities by requiring outreach to EJ communities, municipalities place that expectation on vendors hired to run the MVP planning meetings.⁸⁹ Programmatically, the effort to essentially require more diverse and equitable participation in community processes is laudable. But pressure to ensure diverse representation from EJ communities is not necessarily the same as ensuring that these communities' needs, views, and priorities actually sit at the center of climate adaptation plans and implementation actions.

Taken together, these observations reveal a dynamic, iterative process of interactions between municipal-level actors—both municipal officials and community participants, including environmental and EJ groups—and MVP Program staff at the regional and state levels to advance concerns of EJ through the MVP Program. Advancing just climate adaptation through the MVP program will require clear goals and measures of outcomes in future iterations of the program in order to hold grant recipients accountable to meeting the three requirements of just climate adaptation listed above. In this regard, MVP staff declare that efforts to increase participation to other stakeholders are a priority for future planning process—sometimes known as “MVP 2.0.” Ongoing goals and changes include more training for vendors and municipal staff on equity and environmental justice, for example, and lesson drawing across municipalities (as illustrated in Box 10). Program changes implemented to date may be yielding some results. In the 2020-21 Action Grants funding cycles, for example, over half of the funds went to design and construction of projects located within or directly adjacent an EJ block group.⁹⁰

3. Environmental Justice and MVP workshops and planning reports

The just climate adaptation framework mentioned above indicates important conditions that need to be in place for adaptation efforts to include environmental justice concerns in substantive ways. For example, a focus on vulnerable groups without fostering their full participation and agency in adaptation decisions risks perpetuating systemic injustice. Even the 2021 EJ Policy definition of environmental justice emphasizes the “meaningful participation of all people” with respect to the “development, implementation, and enforcement” of adaptation efforts in addition to pursuing their “equal protection.”

Environmental justice is based on the principle that all people have a right to be protected from environmental hazards and to live in and enjoy a clean and healthful environment regardless of race, color, national origin, income, or English language proficiency.

Environmental justice is the equal protection and meaningful involvement of all people and communities with respect to the development, implementation, and enforcement of energy,

⁸⁹ Author interviews, 2021

⁹⁰ Ibid.

climate change, and environmental laws, regulations, and policies and the equitable distribution of energy and environmental benefits and burdens.⁹¹

How does the concept of environmental justice manifest in the MVP planning reports? Which are records of the vulnerability assessments conducted and priorities identified by participants in the CRB workshops? Examining these records through the analytical lens of just climate adaptation allows for a preliminary assessment of the extent to which the framing of vulnerability, equity and justice relate to the conditions necessary for just climate adaptation. Do they foster the agency and participation of vulnerable communities and do they recognize systemic injustices?

In the first two years of the program, EJ was not as central as it is now. At the end of 2019, we explored these questions and conducted a word-search of the term “environmental justice” in each MVP planning report written by the municipalities that participated in the MVP Program and that have designated EJ communities. Because every municipality, whether or not it has designated EJ communities, uses the CRB framework that includes an assessment of threats to vulnerable populations, focusing on the term “environmental justice” allows for (1) whether municipalities with environmental justice communities made specific reference to them or identified them within their reports, (2) how they conceptualized the term, and (3) how that conceptualization related to key components of just adaptation. Based on 2010 Block Census Data, EJ communities reside in 137 of the Commonwealth’s 351 municipalities. Of the 155 municipalities that had completed an MVP CRB workshop and produced a planning report, 76 had EJ communities. Of those 76, about one-third (24) included any specific mention of the term “environmental justice.”

Twenty-two planning reports included demographic information about the categories of EJ communities (e.g., low-income, English isolation, elderly, minority, homeless) and maps indicating their geographic location. Eighteen reports made explicit reference to EJ communities as an area of concern, mentioned that they are vulnerable to the impacts of climate change. Only 7, however, discussed either the intention or efforts made to conduct outreach to include EJ communities in the workshop or expressed plans to conduct outreach for future adaptation planning meetings.

This preliminary analysis revealed that EJ was not central in the first three years of the program. Only a few reports made reference to EJ in terms of fostering inclusion, and only one made explicit reference to using climate justice frameworks to guide the meaningful incorporation of EJ communities in decision-making processes and spaces. As described above, MVP program staff have made substantial efforts to move EJ toward the center of MVP processes and actions.

⁹¹ EEA EJ Policy, 2021:3

The 2021 GWSA further encouraged the centrality of EJ in all state agencies programs and plans.

Boxes 11 and 12 contain two brief case studies that highlight the challenges of fostering EJ community participation, as well as strategies to address these challenges, and the incorporation of EJ concerns in the workshop may permit for a meaningful engagement with existing power and governance structures to reconcile (sometimes competing) interests of conservationists/environmentalists and EJ communities.

Box 11: Community Profile: Fostering Community-identified Adaptation Priorities in Watertown, MA.

The City of Watertown applied for and received an MVP Planning Grant and conducted two planning meetings (using the Community Resiliency Building framework) and one public listening session in December 2019. Drawing from observations made at one of the planning meetings and interviews with select participants, this section discusses the perceived benefits and challenges of planning meetings as an adequate forum for identifying priorities, raising awareness about the local impacts of climate change, and involving the participation of environmental justice communities.

The City of Watertown, like many municipalities in the Commonwealth of Massachusetts, faces threats to their community's social, environmental, and infrastructural assets, as well as obstacles to their efforts to adapt to climate change. In recent years, Watertown has experienced an increase in extreme weather events and storms, extreme heat, and flooding. Flooding, for example, challenges the capacity of the city's aging stormwater and sewer infrastructure; poses threats to the public health and safety of vulnerable populations; and damages property and disrupts the transportation system. Watertown straddles two watersheds: the Charles River Watershed and the Mystic River Watershed, both of which drain into Boston Harbor. As the impacts of climate change increase over time, so too will the risk of flooding for Watertown.

In addition to participating in the MVP Program, Watertown is engaged in other efforts to build up the city's ability to adapt to climate change and mitigate associated hazards. For example, the city implemented *Watertown Electricity Choice*, a group buy program for electricity supply that aims to increase the amount of renewable energy residents consume. The city also adopted a rooftop solar ordinance that requires the installation of solar panels on all new buildings with certain dimensions. The city also claims to have a robust stormwater management ordinance that requires new developments to have the capacity to manage a 100-year-level storm.⁹²

Compliance to ordinances is not without its challenges, however. Watertown is facing governance challenges in relation to climate change adaptation. Short on staff in a city undergoing a development boom makes it difficult to keep up with the pace of development and enforce regulations. Adaptation also comes with a sizeable price tag (even if the upfront cost pays off in the long run) and a strong anti-tax contingency in the city undermines efforts to invest the financial resources in personnel to implement and enforce policies.⁹³

The city hired a new person to fill the position of Senior Environmental Planner and Conservation Agent. The position itself was fairly new in part because the city wanted to participate in the MVP Program and wanted an individual with a background in environmental affairs and urban planning who

⁹² Author Interviews, 2020

⁹³ Ibid.

could serve as the conservation agent in charge of enforcing the State Wetlands Protection Act and as the new environmental planner. Participants at the MVP planning meeting regarded the new Senior Environmental Planner and Conservation Agent as an important asset for the city and capable of guiding the MVP process, while also bringing needed leadership to Watertown's climate change adaptation efforts.⁹⁴

Once Watertown received the MVP Planning Grant, the Senior Environmental Planner and Conservation Agent formed a core team consisting of other municipal staff to manage the grant. The core team then issued a call for proposals from MVP certified vendors. After interviewing multiple candidates, Watertown selected one vendor based in part on their proposal to conduct public engagement and community outreach efforts beyond the requirements of the MVP program. Beyond what is required for Watertown to become MVP certified, the vendor had an enhanced scope of work with the city to engage in extensive community engagement. For example, they committed to administer a survey, interview key individuals and institutions in town, and conduct focus groups with segments of the community that meet the criteria of an EJ population. They also formulated an awareness campaign about climate change adaptation on social media and local news outlets.

Watertown deemed outreach to EJ communities to involve them in the MVP process a top priority because their participation in the planning meetings was very low. Over half of those who attended the two sessions were city employees and the rest were representatives of environmental groups, advocacy groups, watershed associations, energy businesses, public school officials, and the housing authority, among others. Effort was made to do outreach to faith communities, cultural organizations, the Armenian community (which is sizable in Watertown), and senior centers. When asked about outreach to EJ communities, city staff responded that according to the definition of an EJ community utilized by the MVP program, the only criteria that mapped onto the city was low-income communities. Reviewing who participated in the planning meetings and who did not, city staff came to the conclusion that individuals and groups with whom the city already had a strong relationship participated, whereas individuals and groups with whom the city had little to no regular contact did not participate. This experience underscored Watertown's decision to hire an MVP-certified vendor with experience in community outreach.

Related to the issue of fostering participation of EJ communities, participants in the workshop observed that groups already well-organized and engaged on issues related to the environment and climate change are more likely to participate and drive the agenda, whereas less engaged and less organized communities often remain on the sidelines. Also, the short time frame of the planning process—which usually lasts no more than one or two days and involves at least one public hearing—did not allow for enough time to generate wider participation among the community, nor did it permit for in-depth discussions to understand the impacts of climate change in the community and identify priorities. One participant shared that while the two-day workshop has the benefit of bringing some people together, the short time frame and narrow format of the CRB framework do not allow for the extensive awareness-raising and public outreach to educate the public about what is already happening around adaptation and what more is needed. Further research would be needed to assess how Watertown eventually engaged with the public, how successful the vendor's community outreach efforts were, and how they made decisions about the Action Grant application.

If the MVP Program requires municipalities to provide a detailed public engagement and community outreach plan to EJ populations, efforts to foster their inclusion will need to go beyond inviting them to a one-off event, such as the workshop or the public meeting. Sustained efforts to include EJ populations in the decision-making process will require more time and effort. In the case of Watertown,

⁹⁴ Author Interviews, 2020

recognizing that over half of the participants in the two-day CRB workshop were city staff and efforts to invite members of EJ communities did not yield high turn-out led the city to work with the vendor to engage in extensive community engagement.

Box 12: Community Profile: Engendering Environmental Justice Dialogue in Hadley, MA

Hadley is among the most agricultural municipalities in Massachusetts. The town is situated right along the Connecticut River floodplain, which makes its soil good for agriculture. Because of that, they have a significant migrant worker population to work the farms during the growing season. Historically, farmers have allowed them to stay on unpermitted campsites in their mobile homes along the banks.

This situation leads to two different problems. One is an environmental problem related to the loss of the vegetated buffer along the banks of the river, in addition to wastewater issues caused by approximately a hundred mobile homes. However, the more serious problem is that these seasonal workers are camping in a place where they are at high risk. When the river overtops its banks, they are exposed to flooding.

Farmers have an incentive to continue with this behavior because they want their workers to be able to camp freely on their land, even if the places that they can provide are the areas that put these workers at greatest risk. An MVP vendor mentioned that farmers would generally turn a blind eye in case of any environmental downside. Tensions around this issue persist because few in Hadley wanted open discussion of these issues in the town. Farmers influence local politics and officials who work to enforce environmental rules are usually on the margins.

The problem did make it onto the agenda at the town's MVP planning workshop because some town officials—particularly those from the local Conservation Commission—were in direct conflict with the farmers. The participants of the workshop discussed how to make sure that these migrant workers have a safe place to live while they are working, allowing the river floodplain to remain as natural as possible, without cutting trees to make more space for mobile homes.

The vendor—who facilitated the MVP Planning workshops of three other rural towns—mentioned that this was the only time he witnessed a discussion about social/environmental justice taking place, besides those involving senior populations. He suggested that the MVP planning workshop worked as a venue for this discussion to happen because it was a non-regulatory setting. The issue ended up being one of the three highest priorities in the report, and the town expressed their interest in tackling this problem through the next Action Grant round.

Centering EJ in MVP processes and outcomes is no small challenge. It often requires significant transformation in practices, guidelines, data gathering, and analysis. MVP program staff will need to provide support to municipalities to meet EJ requirements. Just requiring or expecting it does not automatically engender the capacity to meet EJ process requirements. A possible next step might be an advisory committee including representatives of EJ communities and advocacy groups to provide regular monitoring and evaluation of MVP outcomes at municipal, regional, and state levels. How best to incentivize and/or compensate involved individuals and organizations for such work—given that vendors are compensated for their work—would need to be explored.

The two years since March 2020 have been characterized and substantially shaped by the Covid-19 pandemic, which significantly changed community processes and individual and

organizational work practices even as it exposed a host of related public health, economic and racial inequalities in Massachusetts and the United States as a whole. The same period saw high-profile Black Lives Matter protests and community activism, sparked by a series of tragic deaths of Black Americans at the hands of police officers. Marches and other activism were seen on cities and towns across the Commonwealth and around the country. It is now clearer than ever that the climate crisis and the COVID-19 pandemic disproportionately impact BIPOC communities.⁹⁵ These events sparked additional efforts by environmental activists and agencies to incorporate anti-racist policies in their programming and advocacy initiatives. Whether these developments force more Massachusetts citizens and policymakers to acknowledge the intersections between EJ and racial justice and work much harder to incorporate these concerns into all of the Commonwealth's environmental and climate change policy institutions remains to be seen. The MVP program has the potential to be a policy vehicle through which to work at the intersection of climate and racial justice and equity.

VII. Learning from the MVP Program in the Greater Boston Region: Seven Lessons

In conclusion, our research draws seven preliminary lessons from MVP program experience to date. These lessons offer opportunities for future research, and for future dialogue, exploration and program development within the MVP program, local communities and municipal governments, and other state and local climate adaptation and climate justice programs.

Advancing Climate Change Adaptation Dialogue, Planning and Initial Action: It is clear from reviewing MVP program documents and from our interviews and participant observation that the MVP program engenders increased dialogue among local officials and some community leaders, and an increase in adaptation planning and implementation dialogue and action across over 90% of cities and towns in the Commonwealth. However, increased policy learning and capacity building at the municipal level may be limited by the disproportionate influence of vendors in both the Planning and Action Grant phases of the program, the somewhat ad hoc nature of action grant projects, and by a number of factors in some of the six additional lesson paragraphs below.

Bottom-Up Variance and Top-Down Goals: A process designed to allow over 300 local communities to articulate their own priorities will, by design, simultaneously produce both many similarities and broad variance in those priorities. While MVP designers, officials, and local participants often praise aspects of this bottom-up structure, many also lament wide variance in local participation patterns and the plans and priority actions that emerge. State legislators interviewed expressed skepticism about whether the many, varied planning processes and action priorities and grants “add up” to identifiable or measurable gains in state-wide climate adaptation, preparedness and/or resilience. This is in line with increased focus on multi-

⁹⁵ Kantamneni, 2020; Verduzco-Gutierrez et al., 2021

municipality Action Grant projects in the most recent rounds of the MVP program and with wide-spread state agency climate change planning and programming required by the 2021 amendments to the GWSA.

Huge Needs, Small, Uneven, and Uncertain Funding: The enormous scale of climate adaptation needs (and investments) is widely acknowledged by environmental activists, state-level officials, local planners, and adaptation experts.⁹⁶ Despite increasing competitiveness to access Action Grant money over time, neither state or municipal officials have shown much appetite for larger funding options—or even for fully funding many of the rather modest actions listed in many MVP plans and reports. The 2021 legislation holds the promise of increased future funding for this and related programs, and for local climate action generally,⁹⁷ but that remains to be seen. To date, we have not seen much movement toward the substantial regulatory and behavioral changes necessary to make Massachusetts “ready” for current and future climate change impacts. Furthermore, actions prioritized at the local level seem heavily influenced by existing state grant programs. In this sense, local priority actions funded through a host of state programs may reflect existing state priorities at least as much as they reflect what communities want or think they need.

Diversity, Marginalization, and Participation: While MVP program design, documents, and staff clearly intend for local MVP processes to include—and even expand—diversity of participants and better representation of marginalized and more vulnerable communities, results appear to be mixed or limited. First, interviews and participant observation give some indication that cities where awareness of climate and environmental justice issues is higher are already better at including diverse populations in public processes. In other words, it is not clear how much change in participation patterns is being driven by MVP, particularly in towns and cities with little history of broadly inclusive participation. Secondly, the often technocratic framing of planning and the needed investments, together with a frequent lack of explicit goals to increase equity and justice and confront root causes of inequality, seem likely to be limiting broad participation and better engagement with other social and political issues.

Regional Adaptation Requires Regional Institutions and Authority: Despite formal mandates for adaptation work at the regional level, cities continue to have limited incentives to collaborate toward regional climate adaptation. Some areas have more resourceful pre-existing regional organizations that can serve as a forum for regional collaboration. Some municipalities have more resources to host or participate in regional partnerships. Despite growing efforts from the MVP program to encourage multi-municipality collaboration, the Commonwealth’s lack of organizational bodies with regional authority continues to limit the scope and impact of climate adaptation projects.

⁹⁶ Levy, 2018; Dineen, 2021; Murray, 2021

⁹⁷ Lisinski, 2021

Climate Justice: Adding It On or Building It In? Climate justice and environmental justice, particularly as related to racial inequality, have grown in importance (rhetorical, activist, and policy maker attention) in Massachusetts over the lifetime of the MVP program. But the more ambitious goals of environmental and climate justice advocates, as well as addressing the underlying or root causes of injustice and inequity, remain mostly outside the scope of MVP planning processes and Action Grants—although recent cycles of MVP Action Grants have seen a growing share of projects in EJ communities. As the title of this point suggests, stakeholders report increased interest in adding justice issues into the most recent iterations of the evolving MVP program. However, centering justice and equity related goals in local and statewide adaptation initiatives that can generate substantial different outcomes for socially vulnerable groups does not appear to be happening—at least not yet. Implementation of the newly amended GWSA may offer additional opportunities to elevate climate and environmental justice communities and related goals in state and local action.

Many Goals, too Few Metrics and Resources for Assessment: Lastly, the MVP program appears to include a host of broad environmental, social, and political goals—and a host of concerns related to physical infrastructures and ecosystems. But metrics for progress and systematic data collection and analysis of MVP processes, planning and implementation outcomes remain under-developed (and under-resourced). If we are to assess progress toward climate change adaptation and EJ across the Commonwealth, additional investment in assessment and evaluation of local, regional, and state projects and policies is necessary.

As both the needs for climate adaptation efforts and the number of related governance initiatives continue to increase, drawing lessons from MVP programs' achievements, limitations, and program reforms over time can help inform and improve future policies and governance. We hope that this analysis and its seven lessons contribute to policy learning and reform across the Commonwealth and well beyond.

References

- Adger W. N., Paavola, J., Huq, S., & Mace M. J. (2006). Fairness in adaptation to climate change. MIT Press, Cambridge.
- Agyeman, J., & Bryan, D. (2017). Environmental Justice Across the Mystic: Bridging Agendas in a Watershed. In D. Brugge & P. Hynes (Eds.), *Community Research in Environmental Health: Lessons in Science, Advocacy and Ethics* (pp. 81-100). Routledge.
- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*, 50 (2), 179-211.
- Ajzen, I., & Kruglanski, A. W. (2019). Reasoned action in the service of goal pursuit. *Psychological review*, 126(5), 774-786.
- Altemose, C., & Chen, K. (2019, June 15). Climate, housing activists find common ground on tax. *CommonWealth*. <https://commonwealthmagazine.org/opinion/climate-housing-activists-find-common-ground-on-tax/>
- Amundsen, H., Berglund, F., & Westskog, H. (2010). Overcoming barriers to climate change adaptation—a question of multilevel governance? *Environment and Planning C: Government and Policy*, 28(2), 276-289.
- Anguelovski, I., & Carmin, J. (2011). Something borrowed, everything new: innovation and institutionalization in urban climate governance. *Current opinion in environmental sustainability*, 3(3), 169-175.
- Anguelovski, I., Shi, L., Chu, E., Gallagher, D., Goh, K., Lamb, Z., Reeve, K., & Teicher, H. (2016). Equity impacts of urban land use planning for climate adaptation: Critical perspectives from the global north and south. *Journal of Planning Education and Research*, 36(3), 333-348.
- Bauer, A., & Steurer, R. (2014). Innovation in climate adaptation policy: are regional partnerships catalysts or talking shops?. *Environmental Politics*, 23(5), 818-838.
- Belloy, P., Raciti, A., Rivera-Kientz, K., & Herst, R. (2021). *Opportunity in the complexity: recommendations for equitable climate resilience in East Boston*. Sustainable Solutions Lab – University of Massachusetts Boston.
https://www.umb.edu/editor_uploads/images/centers_institutes/sustainable_solutions_lab/Opportunity_in_the_Complexity_Recommendations_English_final.pdf
- Belloy, P., Herst, R., & Raciti, A. (2022, March 10). Make a green future work for all Bostonians. *Boston Globe*. <https://www.bostonglobe.com/2022/03/10/opinion/make-green-future-work-all-bostonians/>
- Berg, W., Vaidyanathan, S., Junga, E.; Cooper, E.; Perry, C.; Relf, G.; Whitlock, A.; DiMascio, M.; Waters, C., & Cortez, N. (2019). *The 2019 State Energy Efficiency Scorecard*. American

Council for an Energy-Efficient Economy (ACEEE).

<https://www.aceee.org/sites/default/files/publications/researchreports/u1908.pdf>

Boston Research Advisory Group (BRAG). (2016). *Climate Change and Sea Level Rise Projections for Boston*. Climate Ready Boston & University of Massachusetts Boston.

City of Boston. (2017). *Imagine Boston 2030: a plan for the future of Boston*.

https://www.boston.gov/sites/default/files/embed/file/2018-06/imagine20boston202030_pages2.pdf

Chu, E. K. (2018). Urban climate adaptation and the reshaping of state–society relations: The politics of community knowledge and mobilisation in Indore, India. *Urban Studies*, 55(8), 1766–1782.

Collins, N., Peake, S., & Campbell, B. (2019, December 17). Climate change demands raising infrastructure standards. *CommonWealth*.

<https://commonwealthmagazine.org/environment/climate-change-demands-raising-infrastructure-standards/>

Commonwealth of Massachusetts. (2018). Statewide Hazard Mitigation and Climate Adaptation Plan (SHMCAP). <https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>

Crimaldi, L. (2017, October 28). Boston plans strategies to lessen effects of climate change.

Boston Globe. <https://www.bostonglobe.com/metro/2017/10/28/boston-plans-strategies-lessen-effects-climate-change/EyKyQMmzFwkc6z98HIwqnN/story.html>

Daley, B., & Wang, S. (2015, February 8). A call to cull homes threatened by the sea. *Boston Globe*.

<https://www3.bostonglobe.com/metro/2015/02/08/coastal-flooding-worsens-calls-take-vulnerable-homes-out-harm-way/DAYejBqkIvP74NPW2yRRYN/story.html>

Davis, R., & Garate, M. (2021, May 21). Gearing up to cope with extreme heat. *CommonWealth*.

<https://commonwealthmagazine.org/opinion/gearing-up-to-cope-with-extreme-heat/>

Dimino, R. (2018, December 9). BIDs can play role in climate resiliency. *CommonWealth*.

<https://commonwealthmagazine.org/opinion/bids-can-play-role-in-climate-resiliency/>

Dineen, K. (2021, April 14). Now is the time to invest in climate resilience. *CommonWealth*.

<https://commonwealthmagazine.org/environment/now-is-the-time-to-invest-in-climate-resilience/>

Eisenack, K., Moser, S. C., Hoffmann, E., Klein, R. J., Oberlack, C., Pechan, A., ... & Termeer, C. J. (2014). Explaining and overcoming barriers to climate change adaptation. *Nature Climate Change*, 4(10), 867–872.

Ekstrom, J.A., & Moser, S.C. (2014). Identifying and overcoming barriers in urban climate adaptation: case study findings from the San Francisco Bay Area, California, USA. *Urban climate*, 9, 54-74.

Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs, Commonwealth of Massachusetts. (2021). <https://www.mass.gov/doc/environmental-justice-policy6242021-update/download>

Estrada-Martinez, L., Watanabe, P., & Rivera-Kientz, K. (2020). *Views that matter: race and opinions on climate change of Boston Area residents*. Sustainable Solutions Lab – University of Massachusetts Boston.
https://www.umb.edu/editor_uploads/images/centers_institutes/sustainable_solutions_lab/SSL_Views_That_Matter_9-2020.pdf

Fitzgerald, J. (2020). *Greenovation: Urban leadership on climate change*. Oxford University Press.

Flint, A. (2019, August 11). Tired of waiting for national push, a buzzing hive of climate resilience innovators is at work in Boston. *Boston Globe*.
https://www.bostonglobe.com/ideas/2019/08/08/tired-waiting-for-national-push-buzzing-hive-climate-resilience-innovators-work-boston/2sB7iGViaQ3ukNOfp59rKM/story.html?event=event12&fbclid=IwAR3NqqlXF9ZsN9B8xesplT_F1pCzG3od1CpfsjDR5p4WUa9BggcGTFeDY

Gorey, J. (2017, April 16). Climate change worries take backseat in hot real estate market. *Boston Globe*. <https://www.bostonglobe.com/lifestyle/real-estate/2017/04/15/climate-change-worries-take-backseat-hot-real-estate-market/ltsS2KpPjRwJ1zOTOSgLGO/story.html>

Gorey, J. (2020, July 26). How do you protect Boston-area housing from climate change? *Boston Globe*. <https://www.bostonglobe.com/2020/07/24/real-estate/how-do-you-protect-boston-area-housing-climate-change/>

Gorey, J. (2020, August 23). Don't sweat it, plant it. *Boston Globe*.
<https://www.bostonglobe.com/2020/08/21/real-estate/dont-sweat-it-plant-it-trees-boost-overhaul-health-cut-cooling-costs/>

Grossman, D. (2015, November 22). For protection from the rising sea, look to Europe's example. *Boston Globe*.
<https://www3.bostonglobe.com/ideas/2015/11/22/grossman/4xbZ5V8xJUe1rtYTJjMXZL/story.html>

Hjern, B. (1982). Implementation research: The link gone missing. *Journal of Public Policy*, 2(3), 301–308.

Humphries, C. (2018, April 28). Boston vs. the rising tide. *Boston Globe*.
<https://www3.bostonglobe.com/ideas/2018/04/28/boston-rising-tide/BFmPPpwaewV0Gj90tZ2sVK/story.html>

Humphries, C. (2019, April 19). When it comes to battling climate change and sea rise, what does it mean to be ‘resilient’? *Boston Globe*.

<https://www.bostonglobe.com/2020/04/19/opinion/when-it-comes-battling-climate-change-sea-rise-what-does-it-mean-be-resilient/>

Johnson, M., Belloy, P., MacLean, H., & Kandel, S. (2021). *Climate and housing crisis: a research agenda for urban communities*. Lincoln Institute of Land Policy Working Paper WP21MJ1.

https://go.lincolninst.edu/Johnson_WP21MJ1.pdf?_ga=2.105517958.447505765.1646866893-813962454.1645807446

Kantamneni, N. (2020). The impact of the COVID-19 pandemic on marginalized populations in the United States: A research agenda. *Journal of vocational behavior*, 119, 103439.

Kaufmann, R. K., & Vaid, D. (2016). Lower electricity prices and greenhouse gas emissions due to rooftop solar: empirical results for Massachusetts. *Energy policy*, 93, 345-352.

Keenan, J. M., Hill, T., & Gumber, A. (2018). Climate gentrification: from theory to empiricism in Miami-Dade County, Florida. *Environmental Research Letters*, 13(5), 054001.

Kimmel, S. (2020, January 28). Massachusetts is a leader on climate change—but it can do better. *The Boston Globe*. <https://www.bostonglobe.com/2020/01/28/opinion/massachusetts-is-leader-climate-change-it-can-do-better/>

Kingdon, J. W. (1984). *Agendas, alternatives, and public policies*. Little, Brown.

Kruel, S., Herst, R., & Cash, D. (2018). *Governance for a changing climate: Adapting Boston’s built environment for increased flooding*. Sustainable Solutions Lab, UMass Boston.

https://www.umb.edu/editor_uploads/images/centers_institutes/sustainable_solutions_lab/Governance_for_a_Changing_Climate_Executive_Summary_UMB_SSL.pdf

Kirshen, P. (2018). Feasibility of Harbor-wide Barrier Systems: Preliminary Analysis for Boston Harbor. Sustainable Solutions Lab, UMass Boston.

<https://www.dropbox.com/s/zwznes9jin41i5k/Feasibility%20of%20Harbor-wide%20Barriers%20Report.pdf?dl=0>

Laidler, J. (2021, September 8). Bracing for climate change: state awards new funds to deal with crumbling sea walls and failing dams. *Boston Globe*.

<https://www.bostonglobe.com/2021/09/08/metro/bracing-climate-change-state-awards-new-funds-deal-with-crumbling-sea-walls-failing-dams/>

Laidler, J. (2021, February 19). Can this DPW Yard help save the planet?. *Boston Globe*.

<https://www.bostonglobe.com/2021/02/19/metro/can-this-dpw-yard-help-save-planet/>

Levy, D. (2018). *Financing climate resilience*. Sustainable Solutions Lab, UMass Boston. https://www.umb.edu/editor_uploads/images/centers_institutes/sustainable_solutions_lab/Financing_Climate_Resilience_Report_April_2018.pdf

Levy, D. (2018, December 6). Climate change resilience could save trillions in the long run – but finding billions now to pay for it is the hard part. *The Conversation*. <https://theconversation.com/climate-change-resilience-could-save-trillions-in-the-long-run-but-finding-billions-now-to-pay-for-it-is-the-hard-part-108143>

Lipskey, M. (1980). *Street level bureaucracy: The dilemmas of individuals in the public service*. Russell Sage Foundation.

Lisinski, C. (2021, March 26). Baker signs climate change bill into law. *CommonWealth*. <https://commonwealthmagazine.org/environment/baker-signs-climate-change-bill-into-law/>

Logan, T. (2018, February 10). Waterfront developers prepare for a sea change. *Boston Globe*. <https://www.bostonglobe.com/business/2018/02/10/boston-waterfront-developers-prepare-for-sea-change/JhhHB5QIjQuCFBVCR5P20H/story.html>

Malloy, J. T., & Ashcraft, C. M. (2020). A framework for implementing socially just climate adaptation. *Climatic Change*, 160(1), 1-14.

Mazmanian, D. A., & Sabatier, P. A. (1983). *Implementation and public policy*. Scott Foresman.

Measham, T. G., Preston, B. L., Smith, T. F., Brooke, C., Gorddard, R., Withycombe, G., & Morrison, C. (2011). Adapting to climate change through local municipal planning: barriers and challenges. *Mitigation and adaptation strategies for global change*, 16(8), 889-909.

Moser, S. C., & Pike, C. (2015). Community engagement on adaptation: Meeting a growing capacity need. *Urban Climate*, 14(1), 111-115.

Murray, H. (2021, March 27). What's missing from the climate change legislation? *CommonWealth*. <https://commonwealthmagazine.org/opinion/whats-missing-from-the-climate-change-legislation/>

Ramos, N. (2019, September 26). Cape Cod: at the edge of a warming world. *Boston Globe*. <https://apps.bostonglobe.com/metro/2019/09/26/cape-cod-climate-change/story/>

Ryan, D. (2015). From commitment to action: a literature review on climate policy implementation at city level. *Climatic Change*, 131(4), 519-529.

Scharfenberg, D. (2021, August 20). The radical question at the heart of the Boston mayor's race. *Boston Globe*. <https://www.bostonglobe.com/2021/08/20/opinion/radical-question-heart-boston-mayors-race/>

Selin, H., & VanDeveer, S. D. (2009). Climate leadership in northeast North America. In S. Pulver, B. G. Rabe, & P. J. Stoett (Eds.), *Changing climates in North American politics: Institutions, policymaking, and multilevel governance* (pp. 111-136). MIT press.

Selin, H., & VanDeveer, S. D. (2011). US climate change politics and policymaking. *Wiley Interdisciplinary Reviews: Climate Change*, 2(1), 121-127.

Shi, L., Chu, E. K., Anguelovski, I., Aylett, A., Debats, J., Goh, K., Schenk, T., Seto, K. C., Dodman, D., Roberts, D., Roberts, T. J., & VanDeveer, S. D. (2016). Roadmap towards justice in urban climate adaptation research. *Nature Climate Change*, 6(2): 131–137

Termeer, C., Dewulf, A., Van Rijswick, H., Van Buuren, A., Huitema, D., Meijerink, S., Rayner, T., & Wiering, M. (2011). The regional governance of climate adaptation: a framework for developing legitimate, effective, and resilient governance arrangements. *Climate law*, 2(2), 159-179.

The Editorial Board. (2021, September 19). Massachusetts lawmakers should move urgently on climate threats. *Boston Globe*. <https://www.bostonglobe.com/2021/09/19/opinion/massachusetts-lawmakers-should-move-urgently-climate-threats/>

UMass Boston Students. (2019, March 15). Climate change: it's about us. *CommonWealth*. <https://commonwealthmagazine.org/opinion/climate-change-its-about-us/>

Union of Concerned Scientists. (2017). *Clean Energy Momentum: Ranking State Progress*. <https://www.ucsusa.org/resources/clean-energy-momentum-ranking-state-progress#ucs-report-downloads>

Verduzco-Gutierrez, M., Lara, A. M., & Annaswamy, T. M. (2021). When Disparities and Disabilities Collide: Inequities during the COVID-19 Pandemic. Pm & R.

Walker, V., & Zondervan, Q. (2021, July 17). Dealing with climate change with justice and equity. *CommonWealth*. <https://commonwealthmagazine.org/opinion/dealing-with-climate-change-with-justice-and-equity/>

Wissman-Weber, N. K., & Levy, D. L. (2018). Climate adaptation in the Anthropocene: Constructing and contesting urban risk regimes. *Organization*, 25(4), 491-516.

Wormser, J. (2017, March 26). Preparing for a shrinking Boston. *CommonWealth*. <https://commonwealthmagazine.org/environment/preparing-for-a-shrinking-boston/>

Annex 1: Research Methods

Report Methodology

- **Semi-structured interviews** conducted with MVP program staff, MA state senators, municipal environmental planner and conservation agents, environmental organization and watershed association staff, concerned citizen and advocacy group members, and MVP vendors.
- **Participant observation** conducted at Community Resiliency Building planning workshops (Watertown & Dartmouth).
- **Document analysis** of MVP planning reports and Action Grants.
- **Coding and analysis** of interviews, field notes, and documents (e.g., MVP planning reports, Action Grants, public presentations of the MVP program, Community Resiliency Building worksheets).
- Primary data collection took place between 2019 and 2021, during which time many in-person events and meetings were moved online after March of 2020 as a result of the COVID-19 pandemic.
- We are also grateful for the detailed comments of a number of engaged stakeholders on an earlier draft of this report.

Annex 2: Author Bios

Patricio Belloy is a PhD candidate in Public Policy at the McCormack Graduate School of Policy and Global Studies and research assistant at the Sustainable Solutions Lab, UMass Boston. His research intends to understand how urban climate resilience policies can concurrently meet local communities' needs and promote equitable socioeconomic development. Patricio earned a Master of Science in Public Policy from UMass Boston, a Master of Arts in Global Studies from Leipzig University in Germany and Wroclaw University in Poland, and a BBA degree from Austral University of Chile, where he is an adjunct lecturer at the Institute of Economics and an associate researcher at the Transdisciplinary Center for Environmental Studies. He was awarded a Mel King Community Fellowship at MIT, a policy traineeship at the European Commission's Directorate-General for Climate Action, and a Civic Action Project fellowship to help the Environmental League of Massachusetts understand regulatory barriers to climate resilience.

David Sulewski is a PhD candidate in Global Governance and Human Security at the McCormack Graduate School of Policy and Global Studies, UMass Boston. His dissertation takes a multilevel governance (MLG) approach to examine the negotiation process to expand refugee admission policies in Europe between state and non-state, particularly faith-based, groups. His doctoral research contributes to nascent theoretical debates about how MLG arrangements react in times of large mixed flows of migrants, how new ones may emerge, and how religious actors are able to assume increasing authority and autonomy as governors of refugee admission policies. Before commencing his graduate studies, David worked for 10 years in refugee resettlement in Boston and served for two years as co-coordinator of the Colombian Refugee Project in Quito, Ecuador, with the Mennonite Central Committee. He was a Sustainable Solutions Lab Fellow from 2019-2020 conducting research on climate adaptation policies in Massachusetts. In 2020, he was also a Civic Action Project Fellow investigating policy pathways for advancing racial justice in the New England offshore wind industry. His research interests are in forced migration, refugee resettlement, faith-based communities, conflict resolution, as well as the intersection of justice and equity with climate adaptation and clean energy transitions.

Stacy D. VanDeveer is Professor of Global Governance and Human Security and Chair of the Department of Conflict Resolution, Human Security, and Global Governance at the University of Massachusetts Boston's John C. McCormack Graduate School of Policy and Global Studies. His

research interests include EU environmental and energy politics, global environmental policymaking and institutions, comparative environmental politics, connections between environmental and security issues, the roles of expertise in policymaking, and the global politics of resources and consumption. In addition to authoring and co-authoring over 100 articles, book chapters, working papers and reports, he has co-edited or co-authored ten books including *Routledge Handbook of the Resource Nexus* (2018), *The European Union and the Environment* (2015), *Waste, Want or War?* (2015), *Transnational Climate Change Governance* (2014) and *Comparative Environmental Politics* (2012). Dr. VanDeveer is a faculty fellow at UMass Boston's Center of Governance and Sustainability and McCormack School faculty representative to UMass Boston's Sustainable Solutions Lab (SSL). With SSL faculty and student colleagues, he studies climate change policies and governance in Massachusetts and communities in the Greater Boston region. He has been awarded fellowships from Harvard University's Belfer Center for Science and International Affairs, Brown University's Watson Institute for International and Public Affairs, and the Transatlantic Academy at the German Marshall Fund of the United States in Washington, DC. He received research grants from the U.S. National Science Foundation, the European Union, the Swedish Foundation for Strategic Environmental Research (MISTRA), and the Research Council of Norway, among others.