



Recommendation: Address regional water challenges

Strategy 1

Establish a Massachusetts Integrated Water Resources Management framework at watershed and ecosystem scales that advances from philosophy to comprehensive water policy, funding, and regulation.

Integrated Water Resources Management refers to an approach that coordinates across the major water sectors, including water supply, wastewater, and stormwater. Traditionally, these have been managed in “silos” that are artifacts of separate laws and funding sources, such as the Safe Drinking Water Act, the Clean Water Act, and the “MS4” Stormwater Permits. Administratively, both the US Environmental Protection Agency (EPA) and Massachusetts Department of Environmental Protection (MassDEP) are structured along the lines of these sectors. Integrated Water Resource Management facilitates to optimize solutions that achieve multiple benefits across these sectors.

Over the last 20 years, Massachusetts has developed several forward-looking water policy initiatives, but not an overall integrated water management framework. These include the Watershed Initiative led by the former Executive Office of Energy and Environmental Affairs (EEA), the Integrated Water Management Planning Guidelines proposed (but not implemented) by MassDEP, the Water Assets Study prepared by EEA, and the current Sustainable Water Management Initiative (SWMI). The Watershed Initiative provided the most comprehensive framework, organized into teams for each major watershed and engaging stakeholders from state agencies, municipalities, and NGOs. It showed much promise until it was abruptly terminated before being fully implemented. SWMI, the most recent initiative, is based on robust watershed science provided by the US Geological Survey that was not available just a decade ago. However, its focus on groundwater withdrawals and impervious cover limits its ability to serve as a truly integrated water management framework. By revisiting, updating, retooling, and coordinating these initiatives under a broad integrated framework, and adding a focus on equity and climate change, Massachusetts could bring water management fully into the 21st century.

► **Action 1.1: Perform a statewide comprehensive analysis of the state's watersheds and existing programs to evaluate options for managing water at the ecosystem level, across water sectors (drinking water, wastewater, and stormwater), and through the lens of climate change projections and impacts and equity.** The analysis will identify data gaps, evaluate watershed and ecosystem level interventions toward management, and analyze impacts of climate change precipitation projections on drinking water supply, pollution, ecosystem function, and water utility infrastructure. The plan should create design standards and efficiencies that enable natural and hard water utility systems to function for climate resilience while complying with the Clean Water Act, as well as identify dam removal opportunities that enhance ecosystem function and flood control for best water management practices. It should also use projections to identify the amount of green infrastructure that effectively recharges aquifers, reduces/eliminates stormwater runoff, and supports healthy freshwater and marine systems at the watershed and/or water catchment level.

► **Action 1.2: Based upon the results of a comprehensive watershed analysis, create an Integrated Water Resources Management (IWRM) plan for the Commonwealth that outlines regulations and policies across jurisdictions and state agencies.** Using the information gathered from the statewide analysis of the current state of existing watershed management programs, the Commonwealth should devise a framework for an Integrated Water Resources Management plan. The IWRM should begin on a pilot basis, focusing on one or two of the highest stress watersheds, then apply lessons learned to other areas of the state. Priority should go to watersheds with high Sustainable Water Management Initiative (SWMI) designations and significant Total Maximum Daily Loads (TMDL).¹ This process should include ongoing coordination with regional and statewide watershed stakeholders.

The MA Executive Office of Energy and Environmental Affairs (EEA) would be responsible for directing implementation across sectors and departments (e.g., MassDEP, Department of Conservation and Recreation, Department of Energy Resources, Water Resources Commission, Water Infrastructure Advisory Committee, etc.). The plan would manage water at the water catchment/ecosystem level, across utilities (drinking water, wastewater, stormwater, and water use), and through the lens of climate change projections and impacts and water equity. Following the United Nations standards for Integrated Water Resources Management, the Commonwealth should create, evaluate, and track benchmarks for degrees of success across sectors and institutions. The benchmarks will promote positive social, economic, and environmental impacts at the watershed and multi-jurisdictional levels.

► **Action 1.3: Create institutional arrangements such as intermunicipal or district/watershed agreements for implementation of the Integrated Water Resources Management Plan.** The Commonwealth should provide technical assistance to address existing stormwater management deficiencies and support the development of new infrastructure aligned with the Integrated Water Resources Management Plan. Following the development

¹ The Sustainable Water Management Initiative (SWMI) is a science-based framework that evaluates watershed and fishery impacts from streamflow alterations and water withdrawals.

of an IWRM Plan, the Commonwealth should be prepared to furnish technical assistance and facilitate agreements to support implementation of the plan's recommendations. In these intermunicipal or district/watershed agreements, all water-related infrastructure improvements and projects would utilize the framework of the IWRM Plan and permitting approvals would be contingent upon adherence to the plan. To support implementation and regional collaboration, the Administration should establish regional watershed grant programs to incentivize collaboration and intermunicipal agreements. At the same time, the Commonwealth should provide resources to cities and towns to support implementation of IWRM locally. Alongside support from regional planning agencies, this should include creating accessible databases and GIS tools to plan, monitor, and enforce performance requirements.

- ▶ **Action 1.4: Devise a consistent, science-based approach to coordinating local management of drought on a watershed basis.** The Massachusetts Drought Management Task Force has made significant progress, including an updated state Drought Management Plan in 2019, but the state still lacks authority to broadly implement water use restrictions during times of drought. Consistent regional, watershed and/or statewide measures are necessary to avoid confusion, create equity, and protect water supplies. An Act relative to maintaining adequate water supplies through effective drought management ([S.530/S.617/H.898](#), filed by Senators Jamie Eldridge and Bruce Tarr and Representative Carolyn Dykema) would establish a statewide drought task force and enable EEA to pursue statewide water conservation measures. To ensure these measures also happen at the local level, the Commonwealth should provide resources for cities and towns to implement water system-specific drought plans that take regional watershed conditions into account. These plans should provide flexibility for developing redundancy to allow water withdrawals to shift away from more impacted sources during droughts.

Strategy 2

Create sustainable funding sources for water infrastructure that enable an Integrated Water Management approach and support investments in water quality and quantity and climate resilience, with a particular focus on equity.

The Water Infrastructure Finance Commission's report to the Legislature projected a then \$21.4 billion funding gap for water (drinking water and wastewater) infrastructure investment statewide over 20 years.² It should be noted that this report is now almost a decade old, and the needs have likely increased in the interim. There was uncertainty about the costs for stormwater because the MS4 permit had not been issued, but the Commission estimated unfunded stormwater needs at an additional \$18 billion. The Commission considered various scenarios to reduce the funding gap over the next 20 years. The scenarios assume a range of \$50 million to \$200 million annual capital contributions by the state, paired

² Legislative Commission on Water Infrastructure Finance, 2012.

with a range of local water and sewer rates from 0.75 percent to 1.25 percent of Median Household Income. The commission proposed that the then \$21.4 billion funding gap could disappear within 20 years with a \$200 million annual capital contribution by the state along with local water and sewer rates equivalent to 1.25 percent of median household income. These estimates do not take into consideration any federal funding (water infrastructure investments are an eligible use of American Rescue Plan Act funds). Achieving this result would require a partnership that shares the costs between the state and the municipal water systems. The proposed Blue Bank described below builds upon and revamps this concept by leading with Integrated Water Management, climate change resiliency, and equity.

- ▶ **Action 2.1: Create a Blue Bank, a statewide water infrastructure bank to provide adequate capital investment for municipal and regional water supply, wastewater, stormwater, and green infrastructure.** Following on the recommendations of the Massachusetts Water Infrastructure Finance Commission for a Massachusetts Water Trust Fund, a Blue Bank would supplement the existing State Revolving Fund (SRF), which has proved insufficient to meet infrastructure improvement needs across the Commonwealth. A Blue Bank would fund projects that implement the Integrated Water Management framework, and inherent to this concept is that equity and green infrastructure are primary and fundamental to water infrastructure. Blue Bank funds should also be prioritized to address per- and polyfluoroalkyl substances (PFAS) contamination. The Commonwealth should ensure participation of all affected stakeholders in developing a Blue Bank, including municipalities, water and wastewater utilities, watershed groups, water users, and others.

Initially, a Blue Bank could be capitalized using federal recovery or infrastructure funding. Long-term, funding sources for a Blue Bank could include water rates, fees imposed for non-essential outdoor watering violations, the state match to the SRF, and state infrastructure bond funds. Water rates should be structured to meet three goals: (1) affordability, (2) encourage conservation, and (3) include the true cost of water, including environmental and sustainability costs. Water rate structures should not put environmental mitigation in opposition to affordability, but accommodate both, either by subsidizing water costs for some users, reducing costs for minimum daily usage, and/or increasing costs for excessive levels of water use.

- ▶ **Action 2.2: Mainstream the implementation of local and regional Stormwater Enterprise Funds or Stormwater Utilities.** Stormwater traditionally has no dedicated local revenue source to maintain and improve the infrastructure. Municipalities may establish local Stormwater Enterprise Funds under state law, but to date only about 15 cities and towns have done so, about half of which are in the MPAC region. Barriers toward implementation are often pushback on instituting new fees and taxes at the municipal level. EEA should work with cities and towns to identify strategies to reduce these barriers and enable more widespread use of enterprise fees. Widespread

adoption enables water quality advancements, water quantity baselines, and resilience to climate change extreme precipitation events. Statewide, this would help close the overall funding gap identified by the Water Infrastructure Finance Commission, as described below.

- ▶ **Action 2.3: Pass state enabling legislation to expand use of water banking as a tool to increase water efficiency and accommodate growth in existing systems.** Water banking entails levying a small fee on new development to capture the impact it has on local water infrastructure and to make necessary improvements. A handful of communities, including Danvers and Weymouth, have implemented Water Banking, but many communities are hesitant to employ this important tool without state enabling legislation. The Legislature should pass [S.2499/H.2152](#), An Act providing for the establishment of the sustainable water resources fund, filed by Senator Jamie Eldridge and Representative Carolyn Dykema. The bill would make explicit the authority of cities and towns to leverage a fee on new development dedicated to a Drinking Water Infrastructure Enterprise Fund.

Strategy 3

Strengthen and expand tools for minimizing and eliminating water pollution.

In addition to supply, water quality is a critical issue for the Commonwealth and cities and towns to address. As is the case in other regions, there are several sources of water pollution, but the primary challenge in Massachusetts is related to stormwater runoff. The Massachusetts Clean Water Trust is a state agency that works to improve water quality in the Commonwealth by providing low-interest loans to municipalities and other eligible entities. The Clean Water Trust provides several targeted funding programs designed to address various issues that affect water quality, including lead abatement programs, asset management planning grants, and community septic management. PFAS, a family of chemicals widely used to manufacture common consumer goods, are of increasing concern. The Clean Water Trust recently awarded \$3 million in PFAS mitigation grants to cities and towns to reduce the presence of this substance in our water supply. Managing water quality issues is a complicated and ever-evolving challenge, but there are actions the state and cities and towns can take to ensure a consistent clean water supply in the future.

- ▶ **Action 3.1: Ensure existing statewide conservation programs require a program for restoration of degraded wetlands, waterbodies, and aquatic habitat to accelerate natural solutions to climate change and minimize water degradation.** Natural lands in themselves are an effective defense to minimize water pollutants through runoff. However, lands for parks and open space often contain degraded ecosystems with invasive species, compacted soils, or degraded wetlands. Utilizing existing conservation programs to require a restoration plan accelerates natural solutions to climate change and minimizes water quality degradation. All EEA grants related to conservation, parks, and open space (LAND, PARC, LWCF,

Landscape Partnerships, Community Partnerships) and other conservation programs (Community Preservation Act, Conservation Restrictions) should require natural system restoration plans that support an integrated water management approach for climate resilience, clean water, and ecosystem health.

Best/emerging practice: The California Water Resilience Portfolio implements the existing “Make Conservation A Way of Life” laws (SB 606 and AB 1668, 2018), which create new efficiency standards for residential use and reporting requirements for agricultural use.³ The portfolio of actions was selected and designed to ensure the state’s long-term water resilience and ecosystem health. This blueprint will help California become more resilient to the growing threats posed by extreme droughts and floods, rising temperature, increased reliance on groundwater, and other climate related challenges.

- ▶ **Action 3.2: Operationalize green infrastructure and low-impact development across the Commonwealth for an interconnected and integrated stormwater management strategy by requiring that all new and redevelopment capture and/or retain stormwater on-site at the parcel level.** Enforcement of stormwater regulations occurs through the site plan review and building permit process. In 2012, Boston Water and Sewer Commission (BWSC) filed a consent decree settlement with the EPA, the Department of Justice, MassDEP, and the Conservation Law Foundation to enhance its ongoing efforts to comply with the Clean Water Act and to clean and revitalize Boston Harbor and its tributaries, including the Charles, Neponset, and Mystic Rivers. As such, BWSC mandates all new and redevelopment must capture the first inch of stormwater onsite at the parcel level and enforces it during permitting. In 2016, EPA issued the Massachusetts Municipal Storm Sewer System Permit, which requires most cities and towns to implement similar requirements through local bylaws and ordinances. Local regulations should require redevelopment projects to match peak runoff rates to undeveloped conditions to the maximum extent practicable, rather than matching existing (degraded) conditions. In some stormwater systems, older grey infrastructure (such as dams, seawalls, pipes, and water treatment plants) will complement newer green infrastructure. The Commonwealth should ensure cities and towns have adequate resources to upgrade and/or maintain the grey infrastructure components to ensure effective performance of the entire system and to protect water quality.
- ▶ **Action 3.3: Update the Commonwealth’s land use regulations, including the Wetland Protection Act, and provide municipalities resources to update zoning laws to reflect climate change projections related to sea level rise, flooding, and precipitation changes.** Updates to land use regulations should maximize climate change resiliency measures, such as flood protection, clean water, and minimized stormwater in concert with the Integrated Water Resources Management plan. As a first step, the Commonwealth

³ https://waterresilience.ca.gov/wp-content/uploads/2020/07/Final_California-Water-Resilience-Portfolio-2020_ADA3_v2_ay11-opt.pdf.

should update the Wetland Protection Act to ensure it continues to follow the most up to date climate projections and centers on the needs of Environmental Justice communities.

Additionally, given that most land use and zoning powers rest with municipalities, the Commonwealth should provide them with technical assistance and incentives for the adoption of “water smart” land use policies and regulations. This includes zoning changes that enable sustainable and “smart growth” land use policies to address sources of water quality and water quantity impacts, particularly reduction of impervious surfaces. State policies and regulations should support the adoption of best practices such as local subdivision controls on wetland, floodplain, water quality, and water quantity protection, as well as reducing impervious surface to minimize stormwater runoff. For example, local subdivision bylaws should require that all runoff and stormwater be infiltrated at the parcel level and require drought tolerant and native species plantings. Calculation of runoff volumes should be based on updated precipitation data, as well as climate projections of more intense and larger storms in the future.

- ▶ **Action 3.4: Prioritize infrastructure improvements to existing stormwater systems to accommodate the impacts of climate change, including more frequent and intense precipitation, inland flooding, and sea level rise in coastal communities.** The threat of climate change is already taking a heavy toll on the region, and we need to invest in resilient water infrastructure now to minimize the impacts to the extent possible. As the Commonwealth devises an IWRM Plan and directs additional funding for water infrastructure improvements, priority should go to investments in areas that are most likely to see the effects of climate change today. This includes more frequent and intense precipitation, inland flooding, and sea level rise in coastal communities. Environmental Justice communities, which already face an undue share of environmental burdens and associated economic and public health consequences, should also receive priority. For more details on how the Commonwealth can prioritize these investments, see Action 2.2 in **“Prepare for and respond to the threats of climate change.”**

Strategy 4

Ensure all communities have access to safe, clean, affordable drinking water and wastewater services.

The drought of 2016 was the second worst in Massachusetts history, and climate change projections of increasing temperatures and changing precipitation patterns indicate that drought will likely be a more frequent and severe event. In 2019, the state updated its Drought Management Plan, revamping categories of drought stages, revising drought tracking status, and modifying indicators of drought stage declaration. Less than six months after its adoption, Massachusetts announced drought conditions in the spring of 2020 in several regions. The Southeast region and the Charles River watershed were the most affected areas of the 2020 drought.

One indicator of the stress on local water supplies is the prevalence of water use restrictions declared by municipal water suppliers. These restrictions are more frequent and severe during periods of drought. During the drought of 2016, eastern Massachusetts, including much of the MAPC region, had the highest concentration of restrictions, particularly in the highest category of one day or less of outdoor watering per week. Although water restrictions are less frequent in the core of the MAPC region, which is served by the Massachusetts Water Resources Authority (MWRA), water is a common resource that needs to be managed across all municipal boundaries and watersheds. Water restrictions illustrate the limits of many local water systems outside of the MWRA service area, which rely on groundwater and surface water withdrawn from local aquifers and relatively small watersheds. There are several actions the Commonwealth and municipalities can take to get ahead of future droughts and to ensure equitable access to clean water supply.

- ▶ **Action 4.1: Create a water equity commission to ensure clean, healthy, and plentiful water systems in underserved communities.** The Commission would coordinate with the Blue Bank to prioritize water quality and quantity investments in underserved and overburdened communities. A newly created water equity commission would be designed to shift the decision-making authority to those affected most by water disparities. It would coordinate with the Blue Bank (see Action 2.1 above) to prioritize water quantity and quality investments in underserved communities, including but not limited to green infrastructure for greening cities for health, water quality, and climate resilience. It would also ensure that water and sewer rates are structured equitably. In addition, the commission would identify strategies to prioritize the provision of water supply and wastewater services to support affordable housing. The commission should identify consistent metrics, such as gallons of water used per person per day, to ensure uniform evaluation of water use.

Water equity refers to just and fair inclusion – a condition in which everyone has an opportunity to participate and prosper. Water equity occurs when all communities have access to safe, clean, affordable drinking water and wastewater services; are resilient in the face of floods, drought, and other climate risks; have a role in decision-making processes related

to water management in their communities; and share in the economic, social, and environmental benefits of water systems. Other essential aspects of water equity include access to water-based open space and recreation areas, such as rivers, streams, and coastal waters. For more information on promoting equitable access to open space in the region, see “**Ensure land preservation, conservation, and access to recreational spaces.**”

- ▶ **Action 4.2: Advance a regional approach to water distribution and management to ensure equity in water quality and quantity.** Efforts to regionalize must be made in the context of local land use policies that foster smart growth rather than sprawl. Water is the most important natural resource shared across jurisdictions. However, water’ distribution and supply are not equitable everywhere. Aged infrastructure contributes to water inequity, particularly for disinvested or low-income cities. Neglected neighborhoods are more likely to have water quality issues and deteriorating infrastructure, and low-income communities may have difficulty replacing infrastructure due to costs. For example, since 2018, the City of Chelsea has been working to replace its water infrastructure to eliminate lead pipes.

There are also significant regional differences in water availability. The Ipswich River watershed, for example, is more stressed than most other parts of the state. In some cases, regional approaches such as interconnections with less stressed water systems or a regional solution such as the MWRA may alleviate stressed watersheds and/or inequity in supply. However, such connections should incorporate local land use policies that foster smart growth rather than sprawl. A series of centralized drinking water systems with strategically planned improvements and the direct involvement of leaders that represent the neighborhoods and communities served by the system will create more drinking water equity, provide water supplies to stressed watersheds to support healthy ecological systems and climate resilience, and minimize localized supply stress from drought.

- ▶ **Action 4.3: Significantly reduce and/or eliminate non-essential outdoor water use wherever and whenever possible.** Non-essential outdoor water use should be charged at higher rates, and use of second water meters for outdoor use should be restricted, or their rates should be set higher than those for essential water use. Non-essential water use does not include food production, nurseries and other uses of water as part of a business operation; for the most part it is irrigation of lawns and landscaping. Non-essential outdoor water use should be charged higher rates, with proceeds directed to the Blue Bank (Action 2.1) watershed fund or other grants for water quality/quantity equity programs in communities underserved by clean and plentiful water. Outdoor watering puts stress on both water supply systems and the surface and groundwater sources they rely upon, which can lead to impacts on stream flows that affect entire watersheds and the health of their supporting ecological systems. In the MAPC region, the Ipswich River watershed is perhaps the most notable, but not the only example of seasonal low flow stress.

- ▶ **Action 4.4: Support community efforts for public education and local policies and programs that directly or indirectly reduce water use in more natural ways.** There will inevitably be resistance to measures to reduce nonessential water use. To confront these challenges, cities and towns need to be prepared to collaborate with community groups and volunteers to educate residents on the benefits of more mindful water consumption and strategies for reducing water use. There are some efforts municipalities can pursue on their own, such as revising lawn mowing requirements. Cities and towns can also encourage residents to pursue xeriscaping, which is the practice of designing landscaping that reduces or eliminates the need for water. Cities and towns should identify local entities, such as conservation commissions, groups of committed volunteers, or other organizations, to support these public awareness and education campaigns.