ResilientMass Metrics

FEBRUARY 2025

ResilientMass

1. Executive Summary

What are the ResilientMass Metrics?

In 2024, the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA), in partnership with the Massachusetts Emergency Management Agency (MEMA), took a whole-of-government approach to develop a framework and corresponding set of metrics that measure and evaluate progress in implementing the ResilientMass Plan, and guide related strategies for the state's climate adaptation and resilience funding and action.

These agencies brought on a team of consultants with expertise in adaptation and resilience policy and metrics development. Together, this project team conducted extensive engagement within and outside of state government to develop and refine the resulting framework and metrics, and to ensure that it embeds environmental justice and equity throughout. This year-long process resulted in the ResilientMass Metrics (RMM) presented here.

The ResilientMass Metrics are intended to provide a strategic framework for driving the Commonwealth's climate adaptation and resilience work. The framework's goals, strategies, indicators, and metrics can be used as guideposts to focus cross-sector climate resilience action. Some metrics track the actions taken, others show the impact of state actions and can spur new conversations and opportunities to adjust course as needed. Other public, private, and community-based organizations in Massachusetts can similarly reference the metrics to inform their own climate resilience work or foster alignment with the Commonwealth to achieve greater shared impact.

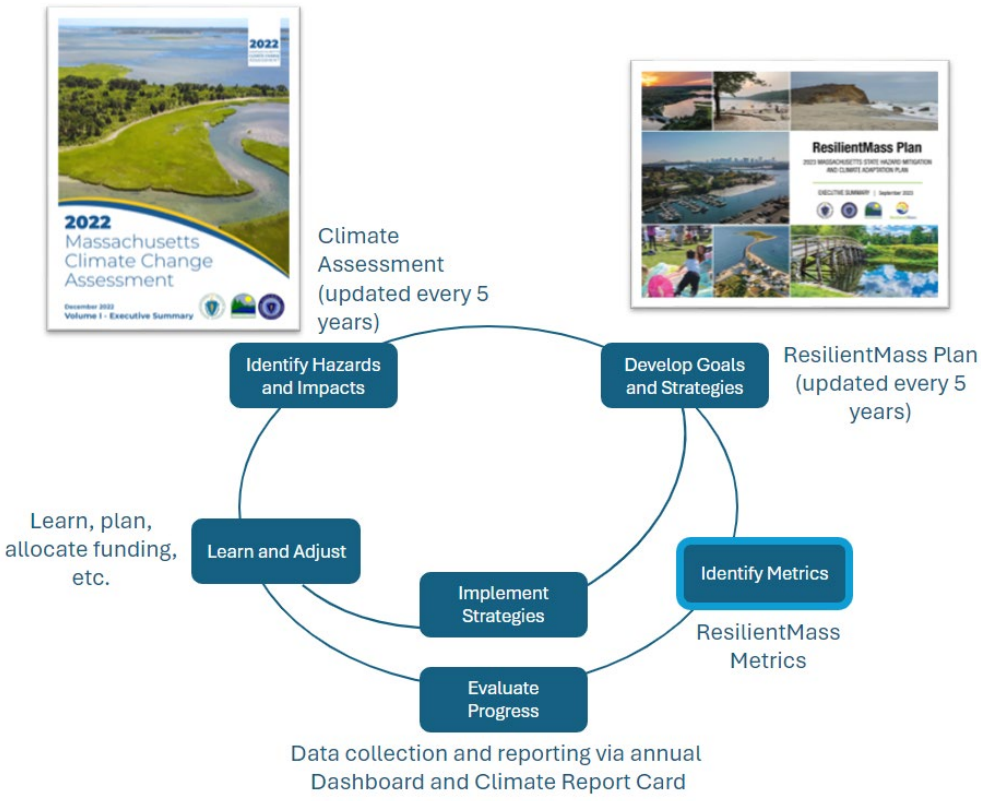
Throughout the US, policymakers are increasingly recognizing the importance of developing climate resilience indicators and tracking metrics. In reviewing other states' and cities' initiatives, the ResilientMass Metrics project team found examples in various stages of development and with different focus areas within climate resilience. In creating the ResilientMass Metrics, Massachusetts is among the early developers of these metrics at the state level and is contributing to the evolution of climate resilience metrics development efforts across the country by providing a model for other states and demonstrating how to align these metrics with state-led climate plans.

Where Does ResilientMass Metrics Fit In?

The Commonwealth of Massachusetts has taken significant steps to address climate change and enhance resilience through its ResilientMass program[1]. Massachusetts has demonstrated its commitment to climate action through the development of a comprehensive approach that includes:

- The 2022 Massachusetts Climate Change Assessment, which is a statewide analysis detailing how the Commonwealth's people, environments, and infrastructure are already and may be affected by climate change and related hazards through the end of the century.
- The 2023 ResilientMass Plan, which serves as the state's current integrated Hazard Mitigation and Climate Adaptation Strategy. The Plan was directly informed by the 2022 Assessment.
- The ResilientMass Climate Resilience Design Standards Tool, which helps agencies and municipalities incorporate climate projections into planning and design processes to assess and mitigate risk.
- The ResilientMass Action Tracker, which monitors over 142 state agency-led actions to increase resilience and reduce climate-related risks.

Figure 1. ResilientMass Metrics as a part of the ResilientMass program



1 ResilientMass is Massachusetts' cross-government initiative for reducing risks and building resilience to natural hazards and local impacts of climate change, and encompasses the State's climate adaptation and resilience planning, programs, and partnerships. https://resilient.mass.gov/home.html

- The Massachusetts Climate Report Card, which informs Massachusetts residents of some of the progress the Commonwealth's executive offices are collectively making to achieve both greenhouse gas reduction (mitigation) and resilience (adaptation). goals and mandates.

The ResilientMass Metrics (RMM) framework is the next tool in this suite of interrelated documents and guidance meant to support the Commonwealth in advancing climate resilience by providing a clear indication of progress in adapting to the Commonwealth's highest priority climate impacts. Together, the metrics will help tell the story of what is working, where more resources are needed, and where the state should go next.

How Were the ResilientMass Metrics Developed?

The Metrics development project team conducted a one-year metrics development process with broad engagement across state government and external partners to develop a framework and corresponding metrics that effectively measure progress toward climate resilience goals. ResilientMass Metrics builds on existing efforts within the Commonwealth and draws from relevant experiences in other states to design an effective framework for climate resilience metrics. A review of similar frameworks used in other states, municipalities, and organizations was conducted (see Appendix A) and identified six characteristics that make a climate resilience metrics framework effective and actionable, including: Development Process, Implementation, Indicator Types, Equity Focus, Baseline and Target Setting, and Visualization and Reporting (see Figure 2).

Figure 2. Six characteristics of effective and actionable climate resilience metrics

Following this review, the project progressed stepwise through development of the individual framework elements with engagement of the state agency representatives as detailed in Figure 3.

As part of EEA's focus on centering equity throughout the Metrics development project—from the framework and metrics to the engagement strategy—an Equity Advisory Group (EAG) was assembled to advise the project. EAG members represented a range of experiences, backgrounds, and geographies and were connected to, or have lived experience in, environmental justice communities and/or priority populations. EAG members reviewed and provided input at various stages of the metrics development project.

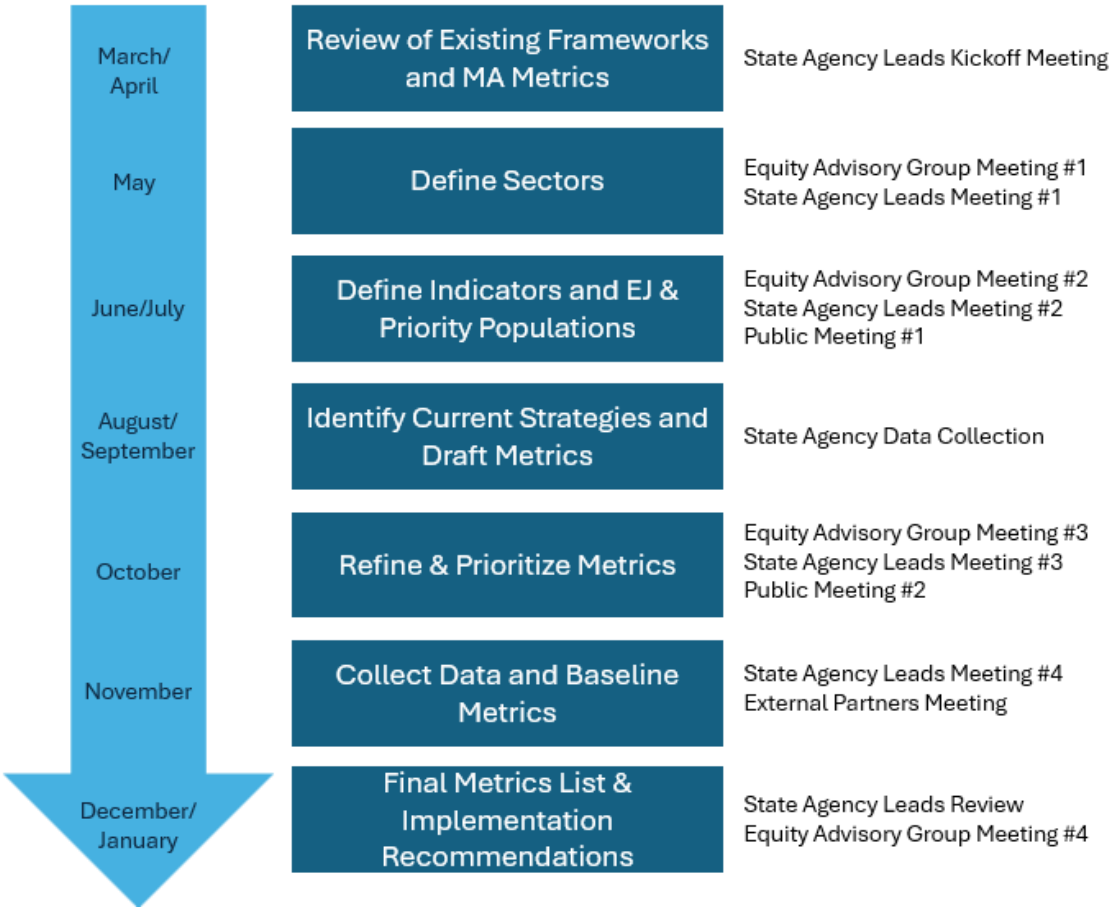
Two public meetings were held, and external partners (NGOs, academic partners, local governments, and others) were consulted to inform key stages in the framework and metrics development process.

Detail on stakeholder activities and feedback is provided in Appendix B.

A comprehensive metrics framework should include a mix of qualitative and quantitative indicators and metrics of the following types:

- **Inputs/Adaptive Capacity**: metrics reflecting the enabling conditions for adaptation
- **Process**: metrics of the quality and effectiveness of approaches to plan, implement, engage and communicate adaptation efforts

Figure 3. ResilientMass Metrics development and stakeholder engagement process



- **Outputs**: metrics of concrete products, services, or actions delivered in the process of adaptation
- **Outcomes/Impacts**: metrics of long-term primary or secondary effects of adaptation interventions

To develop an initial set of metrics, state agencies were asked to report on their activities, data they track, and the targets they have established. The ResilientMass Metrics consultant team conducted a thorough review of these actions and data to generate many of the draft metrics. The early phases of developing a set of resilience metrics yielded nearly 200 potential metrics across all sectors considered. Where Massachusetts-specific data or state-led actions that would have helped to generate a metric were not apparent, the consultant team drafted metrics based on expert judgement, the extant literature, and drawing from other relevant state and federal frameworks.

The project management team and consultant team worked iteratively to refine this list into a smaller set of priority metrics that focus on high-priority issues, are implementable and actionable over time, and help illustrate the scope and scale of state-led efforts across sectors (see Appendix C for additional detail on the prioritization criteria and process). Additional sorting occurred following state agency and EAG review and input into the metrics, especially with respect to data availability and readiness.

The resulting metrics were grouped into two main categories:

ResilientMass priority metrics:
Metrics that are already or will be developed and tracked annually, including:

- **Metrics "currently being tracked."** These consist mostly of metrics which already have data readily available and ranked high on the prioritization criteria. These metrics will be reported on the upcoming ResilientMass Metrics dashboard. A subset is also being reported in the annual Climate Report Card.
- **Metrics "prioritized for development."** These consist of metrics that were identified and prioritized by stakeholders as important metrics to develop and begin tracking as soon as possible, within the current five-year ResilientMass Plan cycle.

Metrics for further consideration:
By far the largest grouping of metrics, this set includes the remaining metrics that have been identified and reviewed through the initial Metrics development process. These metrics did not rank as highly on the prioritization criteria for a variety of reasons such as the need for gathering data from private sector entities, the need for more research into a topic, or that the metric may be most useful at the state agency level but not necessarily relevant for a statewide, public audience.

Section 2 provides a summary of each framework sector and corresponding metrics "currently being tracked." The list of all metrics developed through this project is available in Appendix E.

How Do ResilientMass Metrics Advance Climate Resilience?

Massachusetts has conducted essential, foundational work to understand local and state vulnerability to climate change impacts, and advance climate resilience projects, programs, and funding. The most recent Massachusetts Climate Change Assessment identifies and prioritizes impacts across five sectors (human, infrastructure, natural environment, governance, and economy). The ResilientMass Plan builds upon the Climate Assessment and provides a set of goals and

corresponding actions aimed at increasing capacity for addressing natural and other hazards and climate impacts through preparation, mitigation, adaptation, and risk reduction.

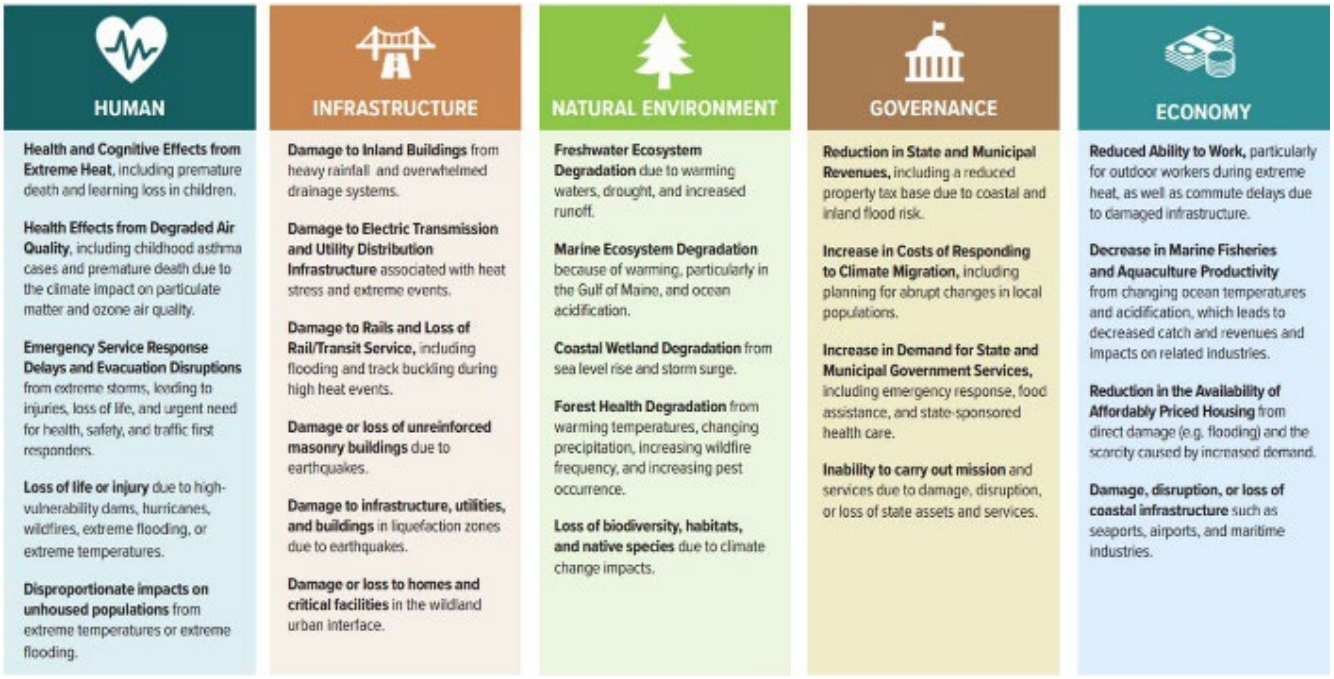
Both the Climate Assessment and ResilientMass Plan were developed by the ResilientMass Action Team—the inter-agency working group responsible for implementation, monitoring, and maintenance of the ResilientMass Plan—with involvement from local, regional, and community partners.

The ResilientMass Action Tracker currently tracks progress toward completing the ResilientMass Plan—actions intended to address the prioritized climate change impacts — ResilientMass Metrics, however, goes beyond tracking implementation of those initial set of strategies and actions. It helps state agencies and others outside of state government to grapple with the key question, "What does climate resilience look like in the Commonwealth?" as a way to develop a *compelling, shared vision of success* which will anchor and orient adaptation and resilience-building strategies going forward. As such, it helps identify a set of metrics that measure the Commonwealth's progress toward achieving that vision of resilience.

The ResilientMass Metrics framework focuses on the priority impacts to human, infrastructure, natural environment, governance, and economic resilience identified in the MA Climate Assessment. Stakeholder input also elevated food and water security as critical. Given the cross-cutting importance of equity and environmental justice on each of these sectors, the metrics address equity and justice dimensions in each sector. Further, a distinct category of metrics for Environmental Justice, Equity, and Collaboration was developed to capture unique goals and efforts not captured by the cross-cutting ones.

The ResilientMass Metrics can be used in several ways to support climate resilience work in the Commonwealth. These are detailed in Table 1. Additionally, information on the rationale for using metrics to support resilience

Figure 4. Priority Impacts from the Massachusetts Climate Change Assessment



capacity-building can be found in Appendix D.

Table 1. How ResilientMass Metrics Will Be Used

Uses of resilience metrics[2]		How ResilientMass Metrics will be used in MA
Deliberate planning and decision making	▪ Serve as guidepost for coordinated planning within and across agencies and sectors ▪ Provide a foundation for policymakers to set clear goals, align them with needed resources and strategies, and then track progress toward specific targets	▪ ResilientMass Metrics framework goals are directly linked to MA Climate Assessment priority impacts and ResilientMass Plan strategies and related state agency actions allowing EEA, MEMA, and RMAT determine the effectiveness and adequacy of current state-led actions in decreasing climate vulnerability, centering environmental justice, and increasing climate resilience along multiple dimensions. ▪ State grant programs can use the RMM to effect changes in grant program eligible activities, eligible entities, guiding principles, or selection criteria to incentivize action toward RMM goals and/or support data collection.
Justification and expansion of funding for adaptation and resilience actions	▪ Support requests for adaptation and resilience funding with metrics that show progress and/or needs. ▪ Shift the perception of expenditures from costs to strategic investments in community prosperity by providing both • Quantifiable evidence of the potential benefits, based on existing, associated metrics, and • Clear, measurable indicators of what success will look like, based on new or updated metrics.	▪ An annual review of progress across all priority metrics supports EEA, the RMAT Co-Chairs, and Secretariat Climate Change Coordinators in identifying areas that may require more resources to fill gaps while also highlighting demonstrated successes and where there is a high return on investment. ▪ Metrics can also be used to set priorities for securing new funding and to develop partnerships with the private sector (e.g., insurance, investors).
Communications and public engagement	▪ Bridge scientific understanding with public motivation to act by providing accessible data on tangible benefits of adaptation and highlighting positive actions and success stories. ▪ Communicate hope by focusing on achievable goals rather than just threats.	▪ RMM goals and corresponding metrics focus on what the state is doing to address climate change and provide a way for non-state partners to act in alignment toward those goals. Public, private, and community-based organizations in Massachusetts can also use these metrics to inform their own resilience work or initiate local actions in alignment with the Commonwealth to achieve greater shared impact. ▪ Metrics related to specific sectors can be used by relevant agencies or within specific initiatives to support conversation and communicate progress within that sector. ▪ Metrics also support collaboration with municipalities, Tribal nations and Tribally (Native) serving organizations, non-governmental organizations, community-based, and private partners to work together to generate new data to improve the picture of resilience in Massachusetts, identifying additional financing avenues and other resource to implement adaptation actions.

2 Adapted from https://resiliencemetrics.org/

Uses of resilience metrics[2]		How ResilientMass Metrics will be used in MA
Accountability and good governance	▪ Demonstrate transparency and commitment to climate resilience goals through clear, measurable targets and regularly reporting on progress. ▪ Details allow for a more accurate assessment of adaptation progress and effectiveness and helps identify where more work is needed. ▪ Helps to sustain trust between government and Massachusetts' residents as metrics tracking actions and progress show good-faith efforts to address climate risks.	▪ For public audiences, the resilience metrics framework and corresponding set of metrics will communicate progress in key areas across sectors through the RMM dashboard and as a component of the MA Climate Report Card, showing how state funding and efforts are resulting in positive outcomes for the state's residents.
Support for learning and adaptive management	▪ Provide a feedback loop that enables ongoing strategy adjustments in response to changing conditions (e.g., climate risks, non-climate trends affecting vulnerability). ▪ Allow for systematic tracking and evaluation of adaptation efforts, helping organizations learn from both successful and unsuccessful interventions.	▪ Statewide metrics, as well as those disaggregated to track progress for specific EJ and other priority populations, enable the state to determine the effectiveness and adequacy of current state-led actions in decreasing climate vulnerability, centering environmental justice, and increasing climate resilience along multiple dimensions. ▪ Coordination among state agencies and programs responsible for climate, biodiversity, or related metrics (e.g., the Clean Energy & Decarbonization Metrics, biodiversity metrics) will provide opportunities for learning, alignment, efficiencies, and improvement on metric development initiatives ▪ Metrics prioritized for development or for further consideration that prove difficult to track, or that require more attention, can inform the next MA Climate Change Assessment so that relevant analyses on emerging risks are undertaken.

The framework and associated metrics will be broadly accessible via the ResilientMass website and links from other relevant areas of mass.gov and will be incorporated in the state's annual Climate Report Card.

A vision of success

A *resilient Massachusetts* is one that is well-prepared to face the challenges of climate change, with communities, businesses, and natural systems that are able to withstand, adapt to, and rapidly recover from extreme weather events and long-term environmental shifts. In this vision, Massachusetts displays preparedness, strength, and responsiveness in the face of climate hazards such as inland flooding, coastal erosion, and extreme heat. For example, transportation infrastructure remains reliable, businesses persevere despite supply chain disruptions, and public health systems are equipped to handle extreme events (with better health outcomes and fewer incidences of disease in the first place). A resilient Massachusetts is also proactive, innovative, and creative in developing solutions to an uncertain future.

In this vision of success, environmental justice and equity are at the forefront of all these resilience efforts: decision-making, resource allocation, and capacity building prioritize vulnerable populations and address disparities in climate impacts and related opportunities. In

a resilient Massachusetts, all communities, regardless of socioeconomic status or geography, benefit from climate adaptation measures and are actively involved in the resilience-building process. ResilientMass Metrics will enable the state to measure and track the results and effectiveness of Massachusetts' resilience efforts.

Achieving this vision requires setting tangible goals, developing feasible strategies, and devising a way to check on, and sustain, progress. Vision is the destination, with concrete goals; strategies are the vehicles and routes; and metrics give us information on how far state agency-led efforts in implementing strategies and advancing goals have come. One of the most important aspects of developing the ResilientMass Metrics was co-creating this vision and associated goals so that the strategies, indicators, and metrics can be aligned toward them.

While some climate-related sets of metrics focus on tracking **vulnerability** (in other words, which people, structures, and systems are most susceptible to the effects of climate change and least able to deal with them), the ResilientMass Metrics tell a story of efforts to advance **adaptation**—the proactive and responsive measures that Massachusetts is taking to better protect its communities, economies, and environment from current and future climate challenges—and the outcomes of those efforts.