

Watershed-Scale Collaboration: Advancing Climate Resilience

March 23, 2024
MassLand Conference



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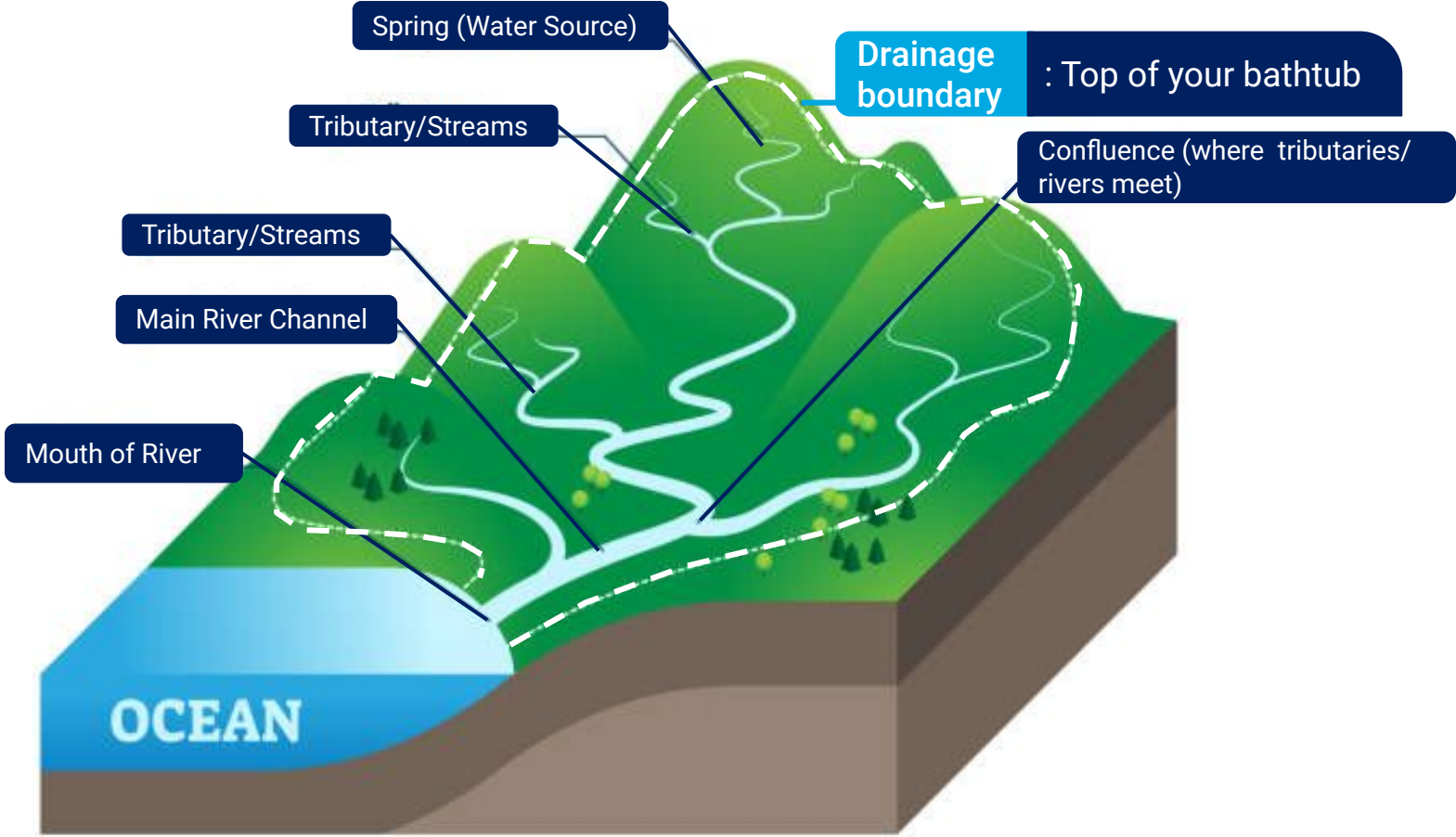


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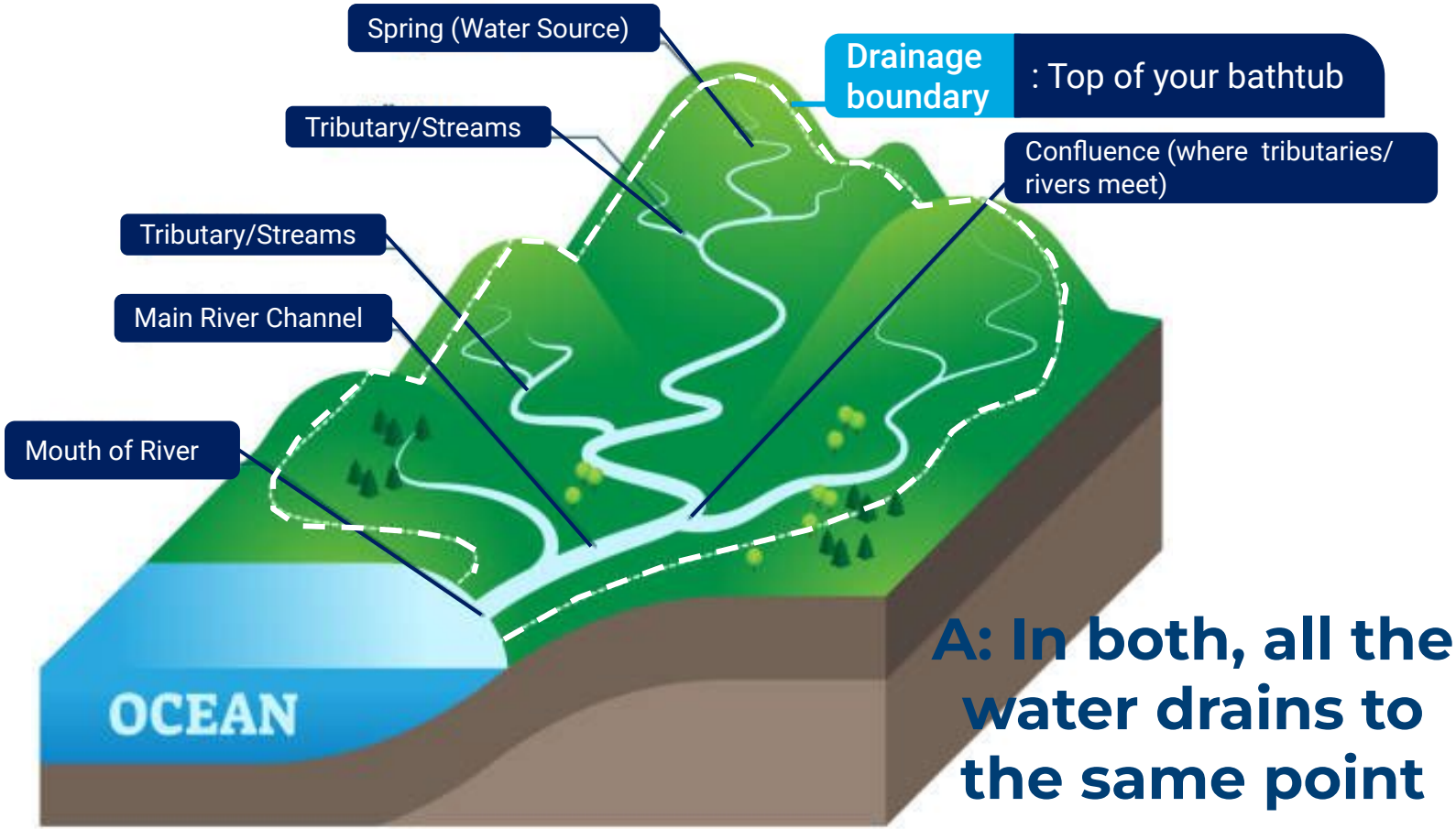


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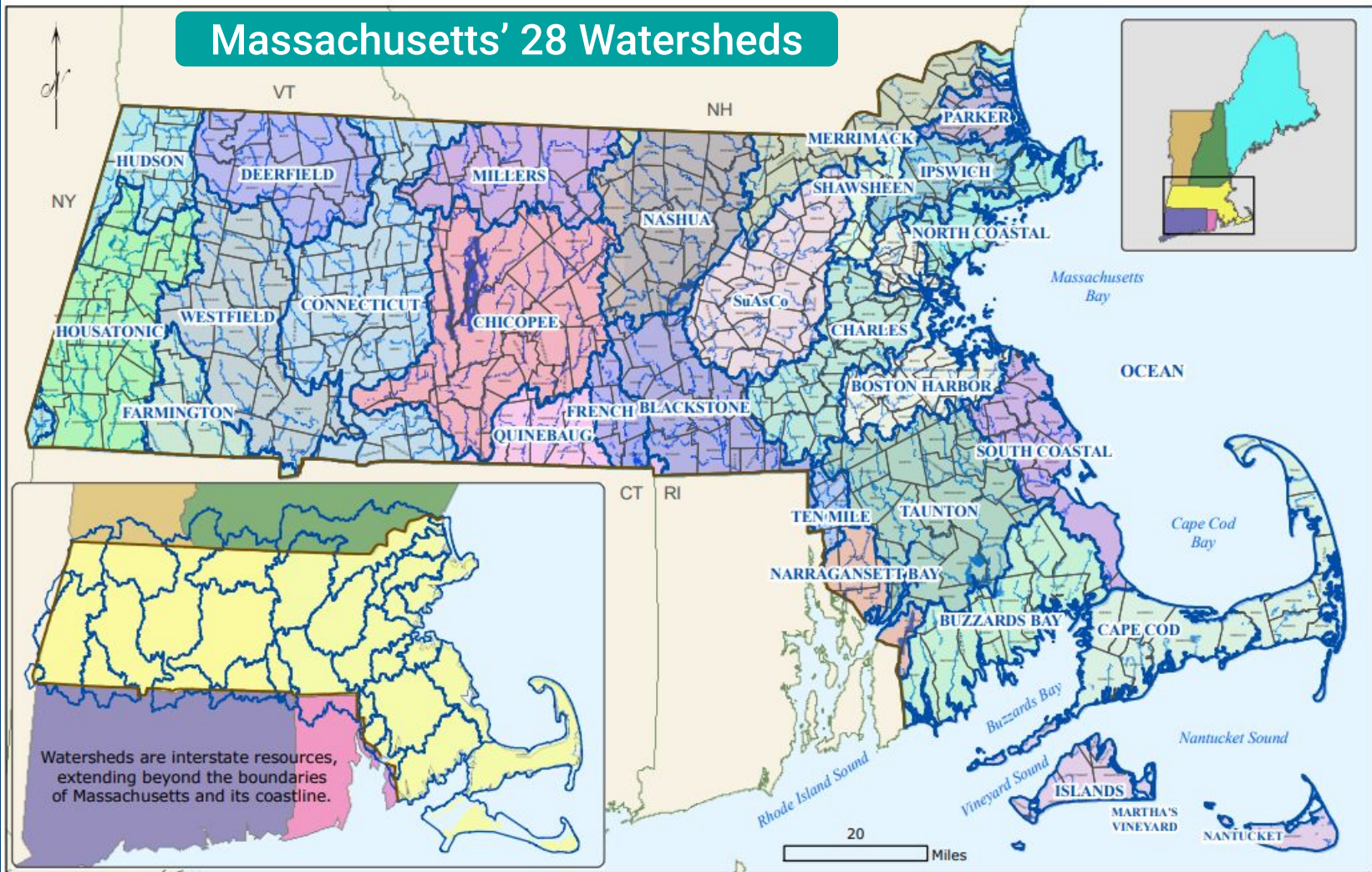
How is a watershed like a bathtub?



How is a watershed like a bathtub?



Massachusetts' 28 Watersheds



Watersheds are interstate resources, extending beyond the boundaries of Massachusetts and its coastline.

Why watershed scale?

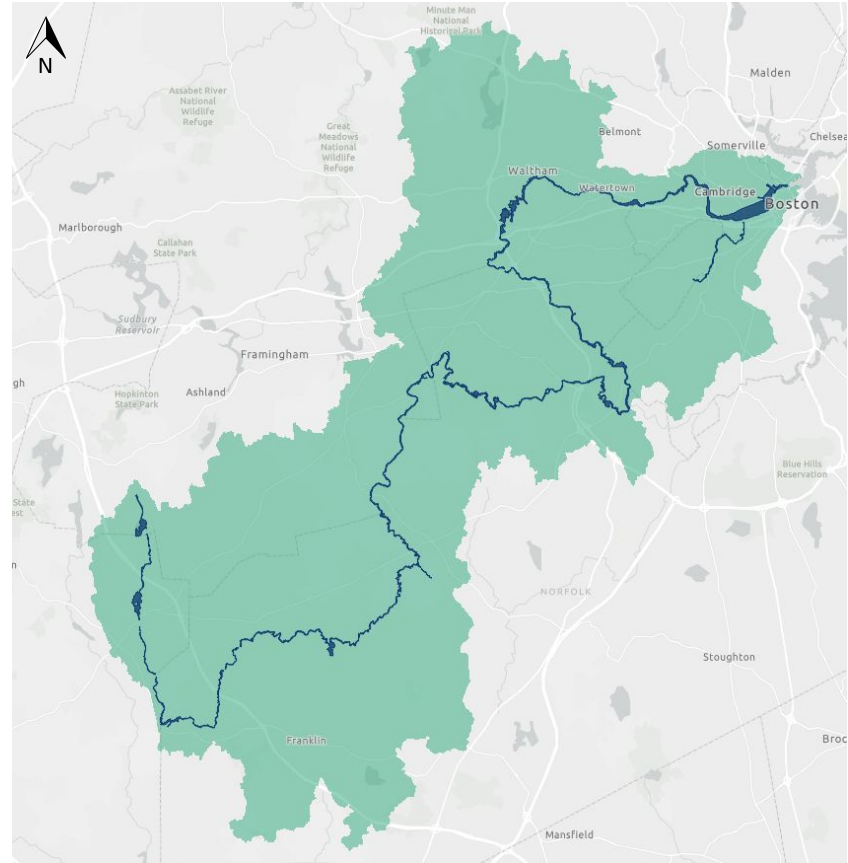
- Only appropriate scale to look at flooding as watersheds **define how and where water moves?**
- **Goldilocks scale:** large enough to have significant impact small enough to include meaning community engagement and input

Charles River Watershed Association

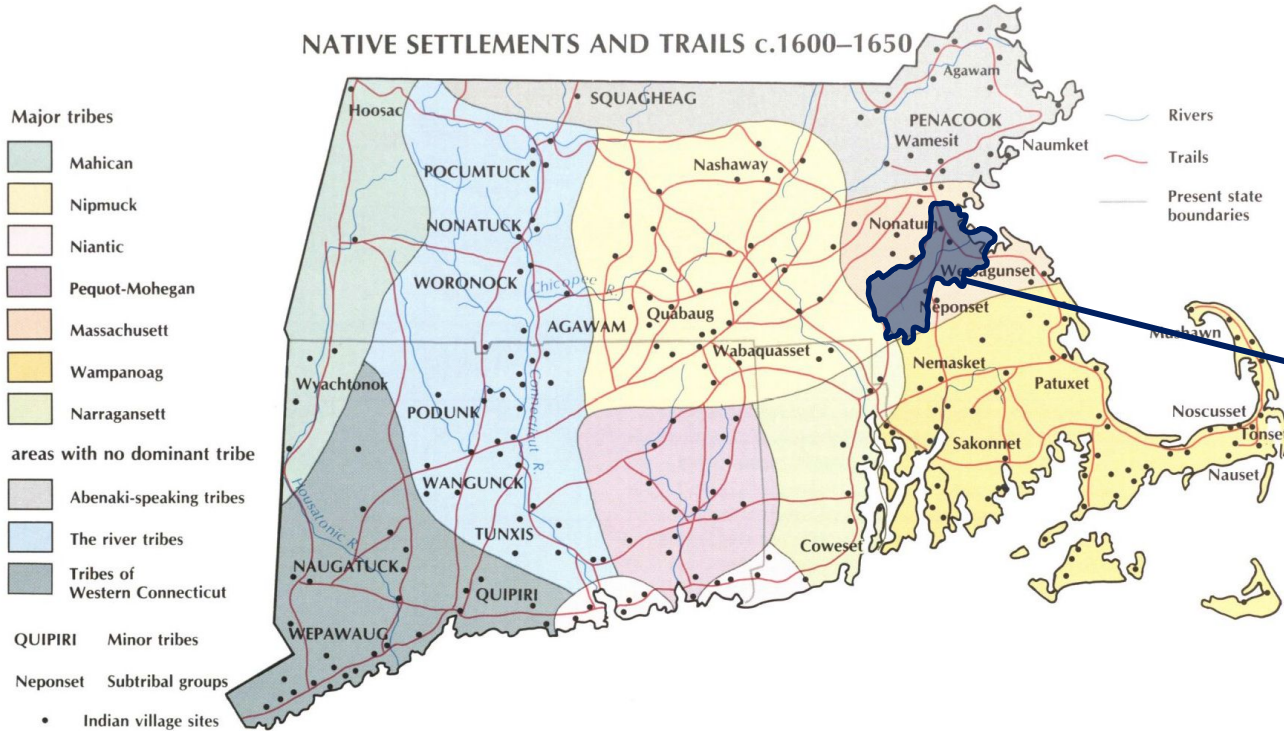
MISSION: Protect, restore and enhance the Charles River and its watershed through science, advocacy, and law.

- 80-mile long river
- 308 mi² watershed
- 35 towns & cities
- 1M+ residents
- 60% of residents in Environmental Justice neighborhoods (primarily Lower watershed)

CRWA TAKES A WATERSHED VIEW



Land Acknowledgement



The Charles River Watershed resides on occupied territory of the **Massachusetts, Nipmuck and Wampanoag** tribes.

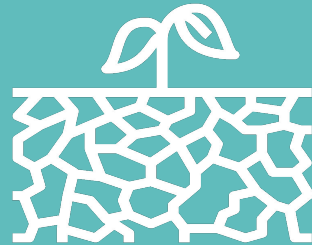
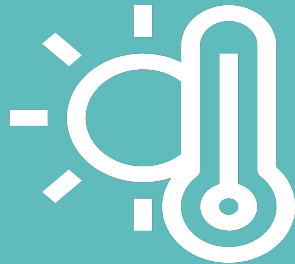
Map image of native settlements and trails c. 1600-1650 in Southern New England. Source credit: Harvard Map Collection

Charles River Climate Compact: Regional Collaboration for Climate Action

Mission Statement: *The Charles River Climate Compact's mission is to work collaboratively to increase climate resilience for people, and the natural ecosystems in the Charles River watershed by taking a regional approach to implementing climate adaptation and mitigation solutions.*



- Founded in 2019
- Regional partnership of 28 watershed towns and cities focused on climate resilience



Charles River Flood Model

Project Objectives:

- Use the Charles River Flood Model (CRFM) to identify and assess various alternative “pathways” to mitigate flooding
- Develop concept designs for numerous flood mitigation projects (site & neighborhood scale)
- Meaningfully engage the community in climate adaptation planning activities
- Conduct culvert assessments
- Publish a *Charles River Climate Adaptation Flood Mitigation Plan*

Project Team



Thank you to MA MVP Action Grant Program for funding this project.

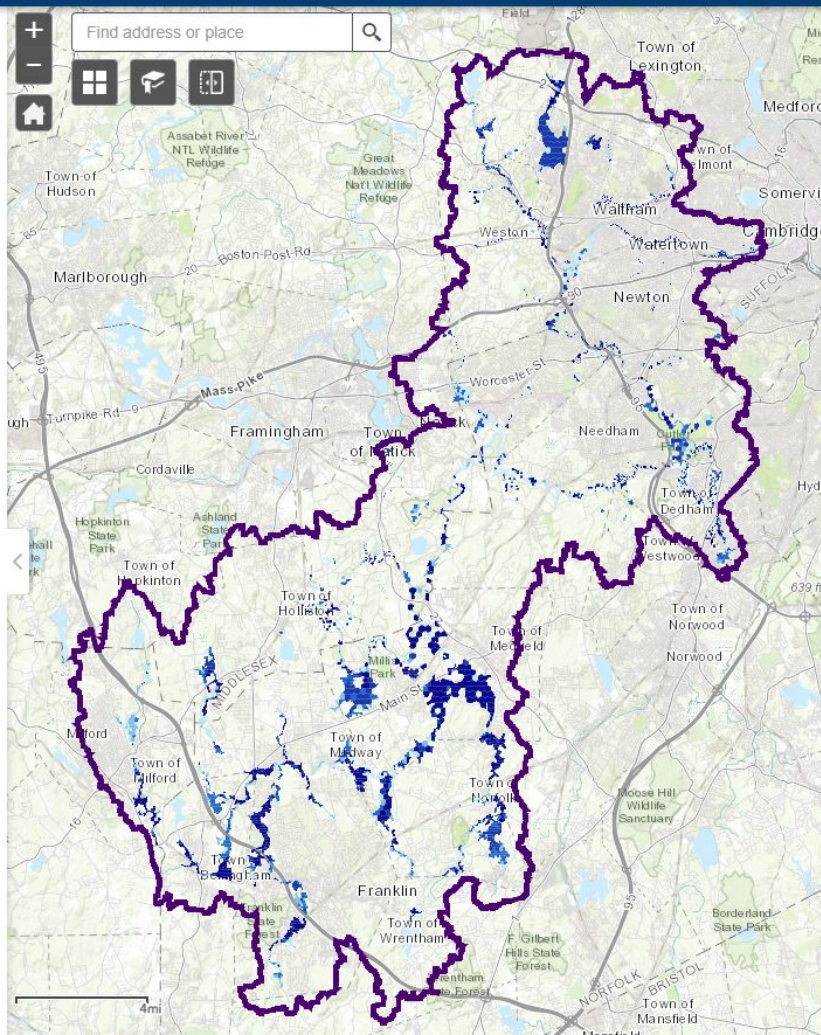
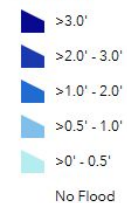
Arlington
Belmont
Boston
Brookline
Cambridge
Dedham
Dover
Franklin
Medfield
Medway
Millis
Natick
Needham
Newton
Sherborn
Waltham
Watertown
Wellesley
Weston
Wrentham

Watershed



100-yr (1% AEP) 24-hour storm - 2070

MAXDEPTH



Charles River Flood Model

Model future flood depths
(2030 & 2070)

Shows approximate location
and depth of flooding

Covers Charles River from
Watertown & Newton
upstream to Hopkinton

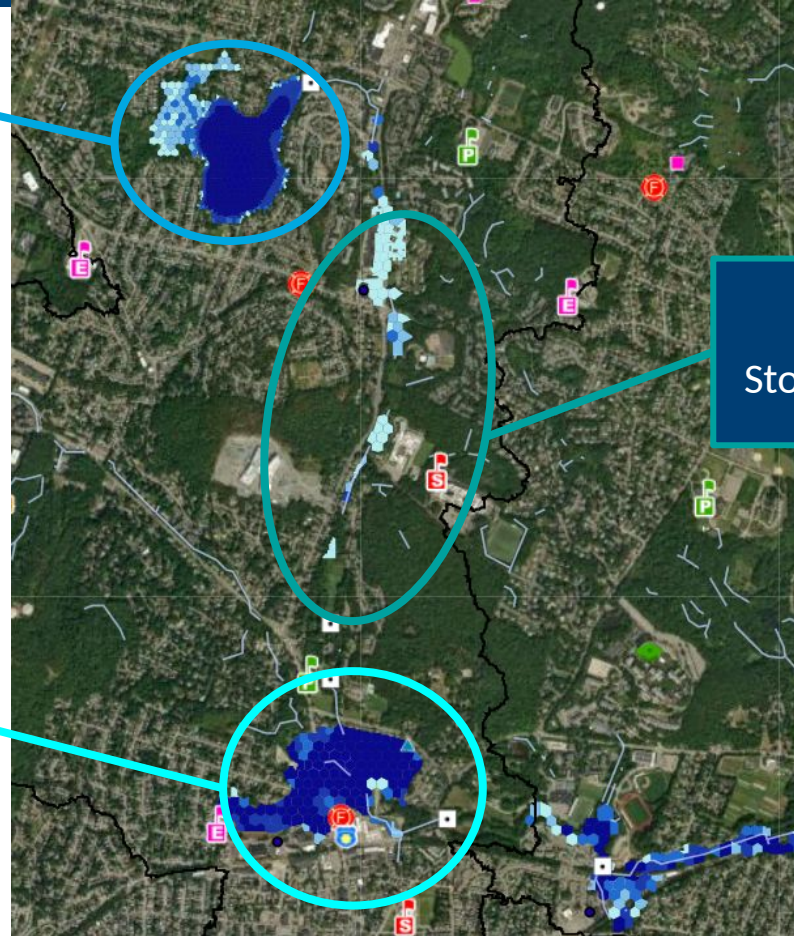
All results available online!

The Watershed Approach: More Tools in the Toolbox!

HEADWATERS
Store the water!

DOWNSTREAM/CONFLUENCE
Conveyance of water
or
retreat/protect

MIDDLE WATERSHED
Store & conveyance of water





Watershed Municipal Boundaries



Watershed








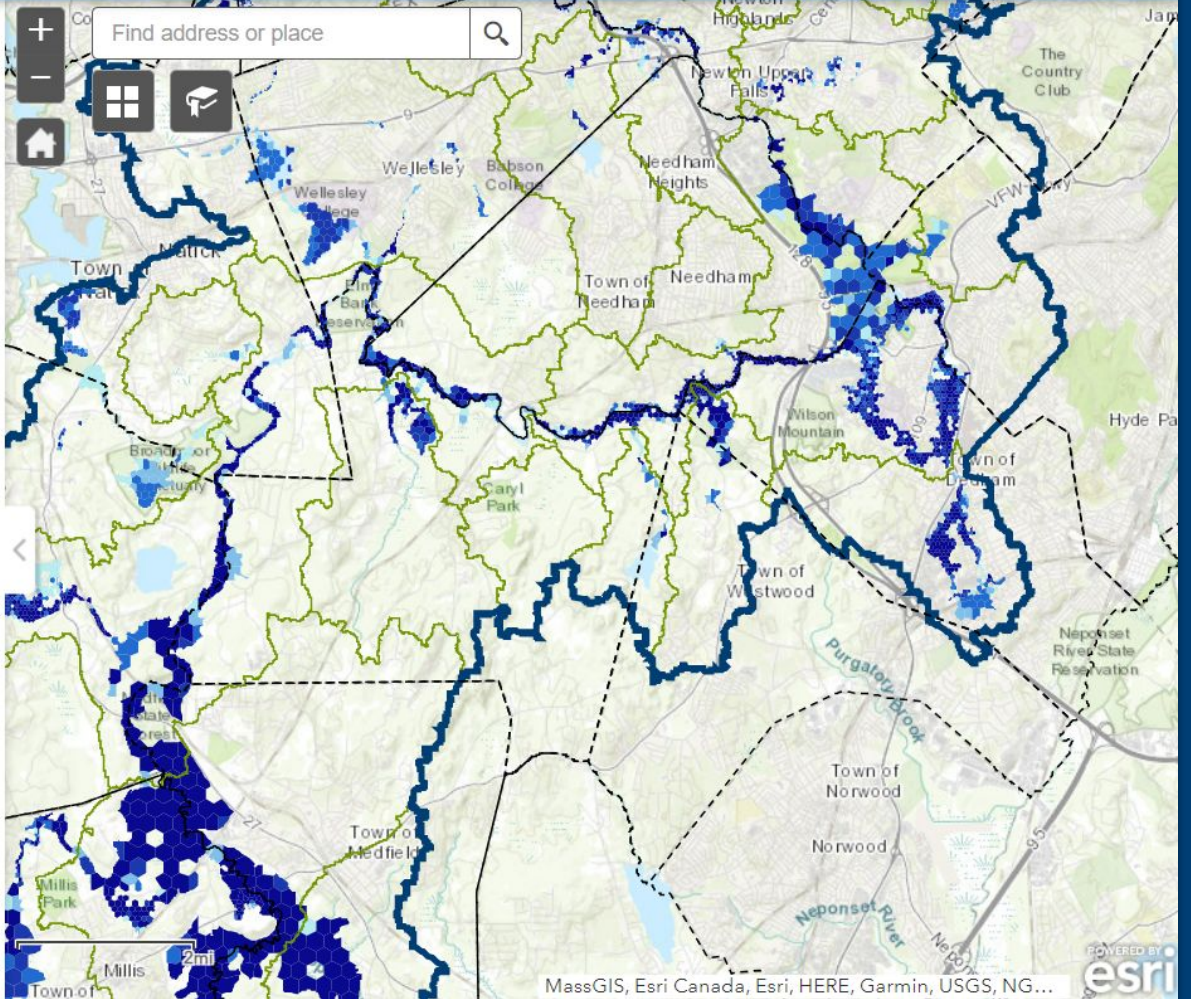
Subbasins



100-yr (1% AEP) 24-hour storm - 2070

MAXDEPTH

-  >3.0'
-  >2.0' - 3.0'
-  >1.0' - 2.0'
-  >0.5' - 1.0'
-  >0' - 0.5'
- No Flood



CLIMATE IMPACTS & SOLUTIONS

BY 2070, A 100-YEAR STORM WOULD CAUSE:

100-year storms have a 1% chance of occurring every year.



61%

increase in runoff
+ 11 inches of
precipitation



2,600+

acres that don't
currently flood to
see severe flooding



50+

critical facilities like
hospitals, schools, +
highways impacted

WAYS TO PREPARE FOR FUTURE FLOODING:



**BUILD GREEN
INFRASTRUCTURE**



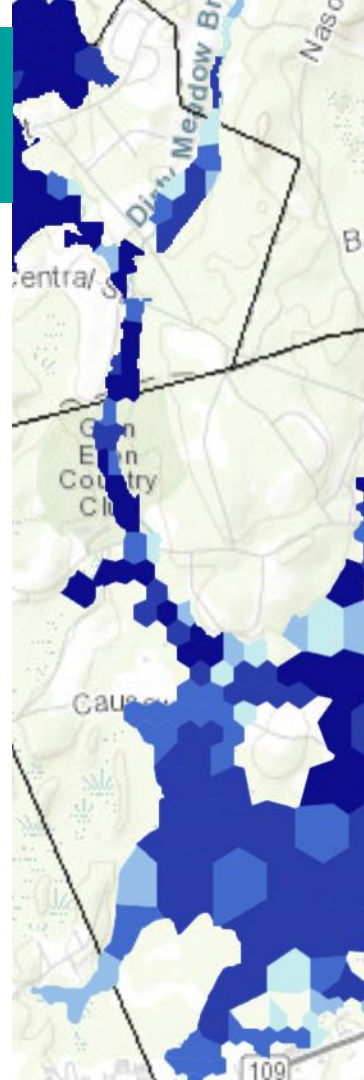
**INCREASE TREE
CANOPY**



**PROTECT &
RESTORE WETLANDS**



**CONSERVE
OPEN SPACE**



Mitigation Priorities

Prevents flooding of critical infrastructure (hospitals, police, fire, schools, etc.)

Flooding impact of today do not get any worse into the future

Prevents flooding in Environmental Justice neighborhoods (or other areas with climate vulnerable residents)



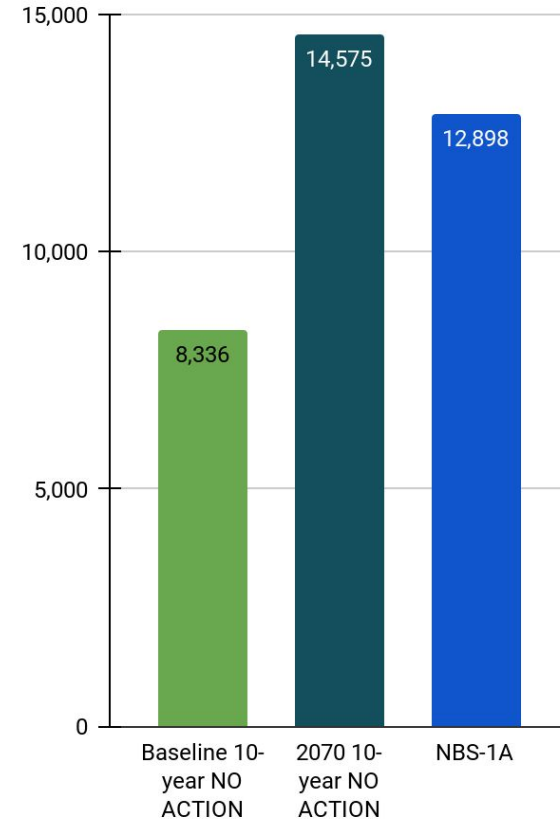
MODELED RESULTS

- We can do things to **reduce** future flooding impacts
- Example: Updating regulations to require flood storage

Modeling Scenario NBS-1A

Use green stormwater infrastructure (GSI) to store the 2070 2-year storm (4.5") runoff from 50% of all impervious cover

Total runoff volume during the 2070 10-year event



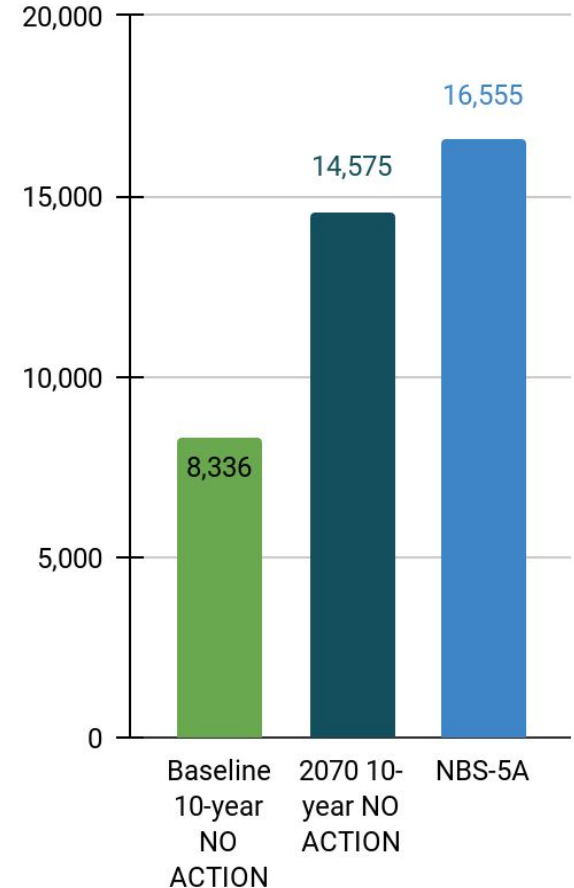
MODELED RESULTS

- We can do things to **exacerbate** future flooding impacts
- Example: Not valuing the flood protection properties of undeveloped areas

Modeling Scenario NBS-5A

15% of current undeveloped/
unprotected land is developed

Total runoff volume during the 2070
10-year event



WALTHAM

Restoring wetlands in Hardy Pond to store floodwaters in extreme weather and designing green infrastructure, infiltration, and de-paving in the priority impact area of west Waltham.

NEWTON

Building green infrastructure + infiltration chambers on Albemarle Field to reduce flash flooding of nearby channelized stream, Cheesecake Brook.

WESTON

Maximizing benefits of green infrastructure, pervious pavement, infiltration, and flood storage in the priority impact area of Weston Town Center.

WELLESLEY

Restoring Longfellow Pond and Rosemary Brook using wetland restoration, and culvert repair to prevent flooding on Rt. 9 + surrounding neighborhoods.

NATICK

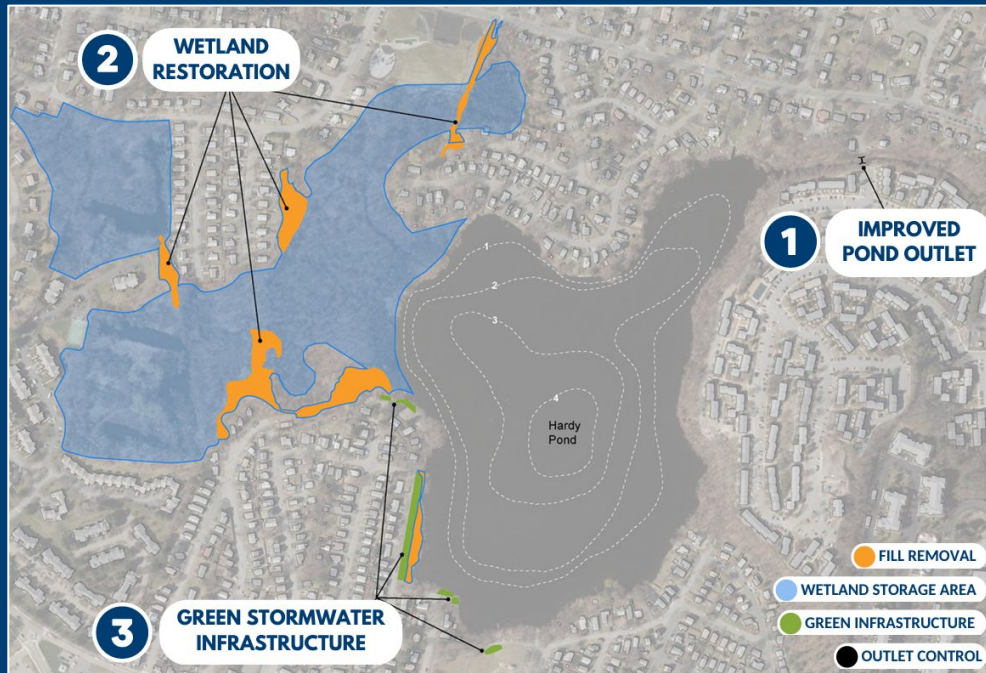
Constructing infiltration chambers, adding rain gardens, and restoring wetlands to prevent future flooding at Natick High School.

MEDWAY

Building green infrastructure + flood storage in Oakland Park to build climate resilience, restore groundwater, and reduce flooding.

MILFORD

Maximizing benefits of protected open space, constructed wetland, stream restoration, de-paving, and permeable pavement in the priority impact area of north Milford.



\$100K in the operating budget for the City of Waltham to support further feasibility study and design



MVP

Municipal Vulnerability
Preparedness

MVP Planning Grant Process

99% participation

349 communities

MVP Action Grant Projects

FY 18: 37

FY 19: 36

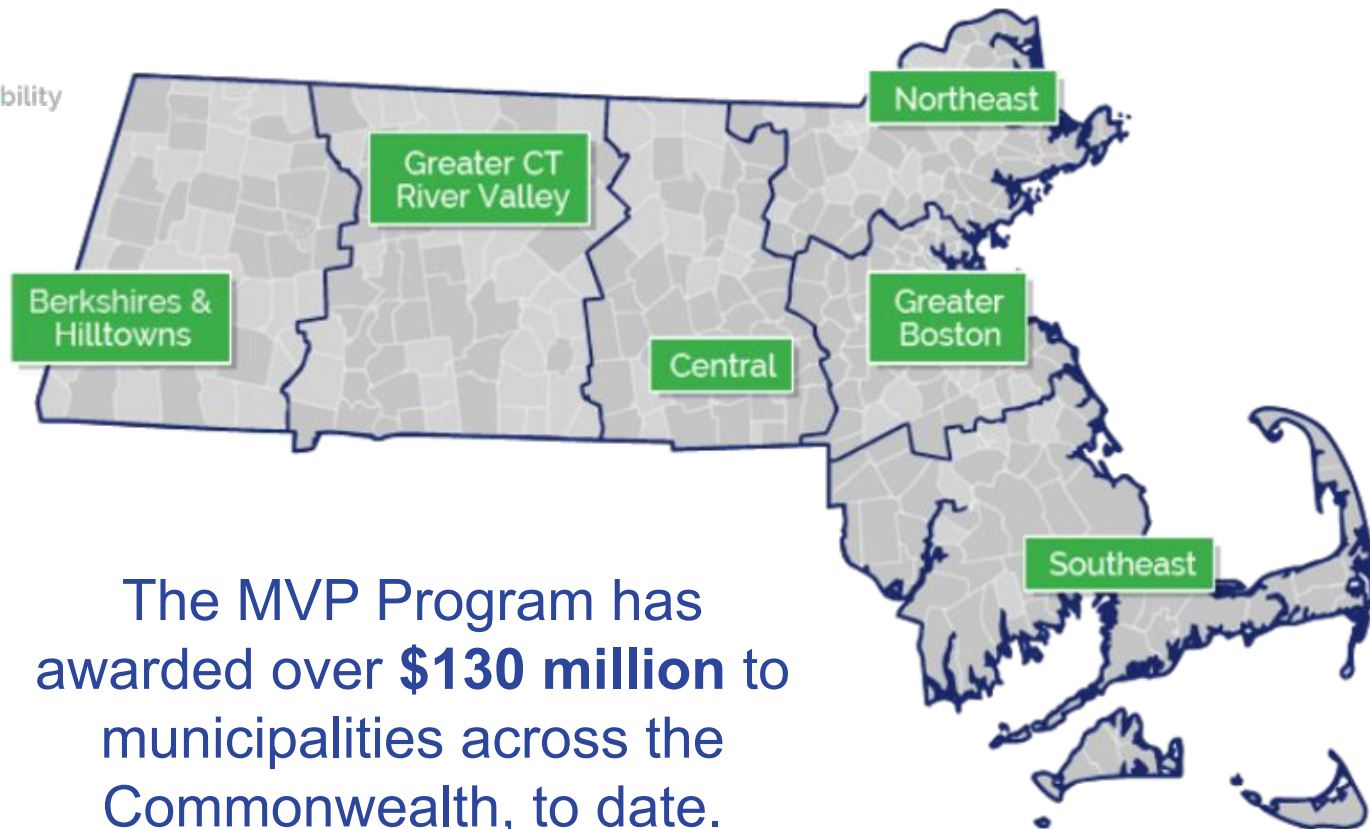
FY 20: 53

FY 21: 41

FY 22: 66

FY 23: 73

FY 24: 79 (\$28.5M)





MVP Core Principles



Furtheres a community identified priority action to address climate change impacts.



Employs Nature-based solutions (NBS).



Increasing equitable outcomes for Environmental Justice (EJ) and other priority populations and addressing the root causes of social vulnerability.



Achieves broad and multiple community benefits.



Builds community capacity for climate resilience.



Commits to monitoring project success and maintaining the project into the future.



Conducts robust community engagement and supports strong partnerships with EJ and other priority populations.



Utilizes regional solutions for regional benefit.



Utilizes climate change data for a proactive solution.



Pursues innovative, transferable approaches.

MVP Project Examples: Watershed-Scale Collaborative

Neponset River (Dedham)

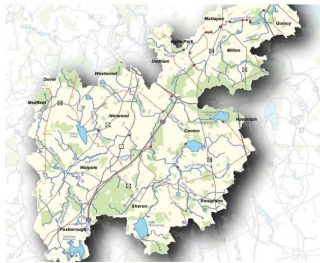
F23 - FY25: \$997,591

Developing **watershed-wide stormwater model** and **assessing NBS opportunities**

Establishing **Neponset Region Climate Resilience Collaborative**, including a **Community Advisory Group**

NEPONSET RIVER WATERSHED REGIONAL COLLABORATIVE ON CLIMATE RESILIENCE

PROPOSED FRAMEWORK
JUNE 30, 2023



Saugus/Pines River (Revere)

F23 - FY24: \$309,459

Assessing **vulnerability of the coast** through 2070 flood projections, using **MC-FRM**

Developing and implementing **individualized engagement and outreach strategies** for each community



MVP Project Example: Regional Land Conservation in a Watershed Context

Mattapoissett River Valley Water Supply Resilience (Mattapoissett)

F23: \$4,500,000

- Secured the quality, quantity and **long-term resilience of a multi-town public drinking water supply** resource by protecting 240+ acres
- Involved **multiple partners** and funding sources **providing broad community benefit**
- Achieved **extensive community co-benefits** for fish/wildlife, local agriculture and public access for regional outdoor recreation opportunities.

To explore other MVP regional projects...

ResilientMass Maps and Data Center

Massachusetts Executive Office of Energy and Environmental Affairs Climate Grant Viewer

HOW TO USE THIS VIEWER

View the MVP grants in the tabs below: Municipal Vulnerability Preparedness Program

Planning Grants Action Grants All MVP Grants

Enter City or Town

Action Grants Filter

Project Type
0 Selected

Climate Impacts Addressed
0 Selected

Regional Partnership
- All -

Apply Cancel

50 mi

Esri, HERE, Garmin, USGS, EPA, NPS | EEA GIS | EEA | Esri, HERE, NPS Powered by Esri



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MASS ECAN

Massachusetts Ecosystem Climate Adaptation Network

[LEARN MORE](#)

Watershed-Scale Climate Collaboration Group



Photos: Steven King & Marilyn Humphries

2023 Conference



See all the conference materials at masecan.org/2023-conference

Watershed-Scale Climate Collaboration Toolkit

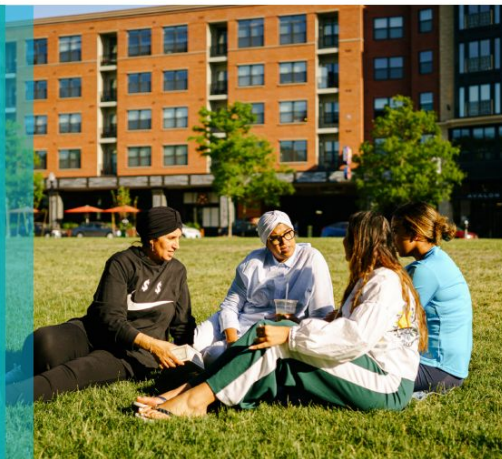
- **Inspire and build capacity** of collaboratives
- **Showcase stories** from existing watershed collaboratives in MA
- **Increase support** from those we'd like more engaged, such as funders and decision makers



www.massecan.org/wsc-Toolkit

PART ONE

Centering Racial Equity in Authentic Community Engagement



Chris McInnes



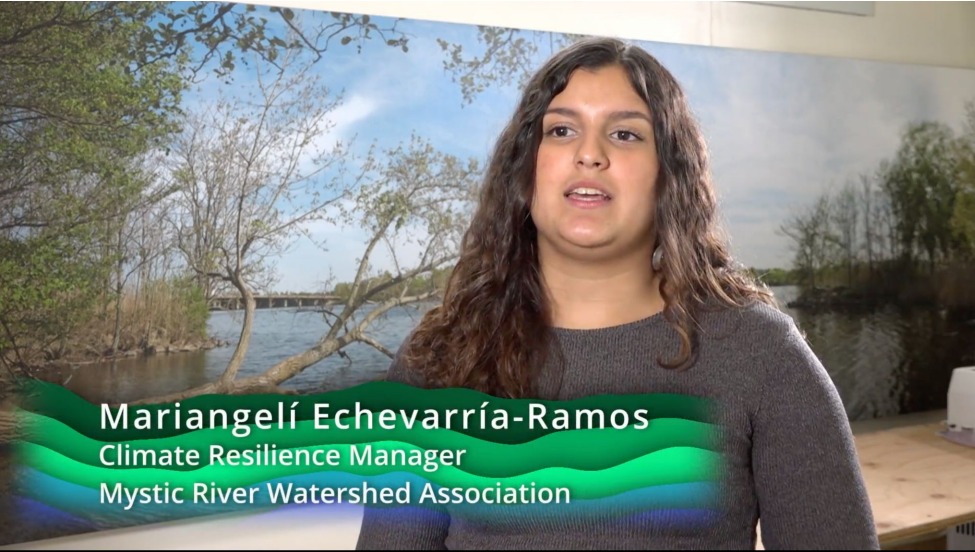
PART TWO

Partnering on Community Engagement with Community Based Organizations



Abigail Castagna

Videos

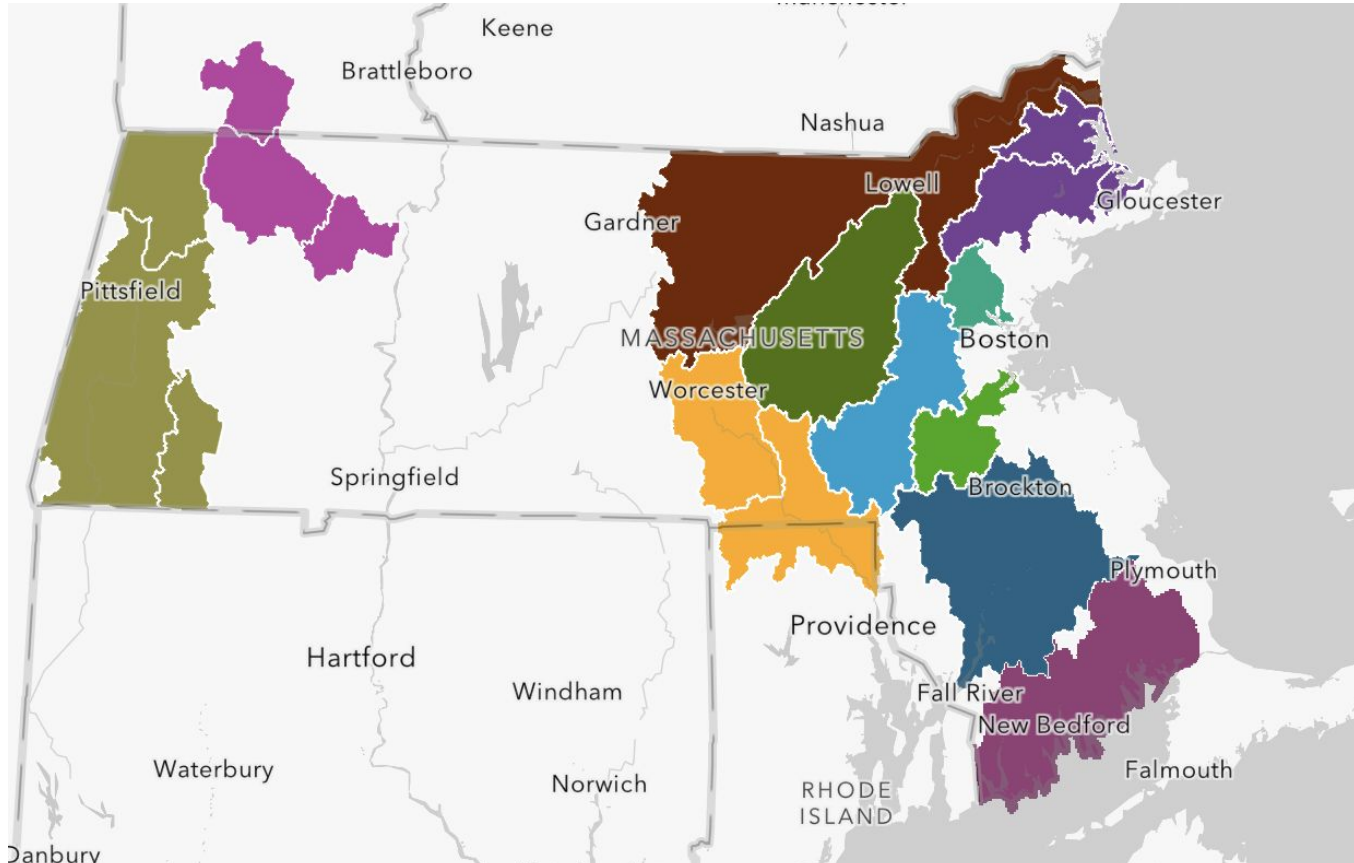


Mariangelí Echevarría-Ramos
Climate Resilience Manager
Mystic River Watershed Association



Alison Field-Juma
Co-founder - Sudbury Assabet Concord (SuAsCo)
Climate Resiliency Coalition

Storymap



[Introduction](#)

[What's in this StoryMap?](#)

[Meet the Collaboratives](#)

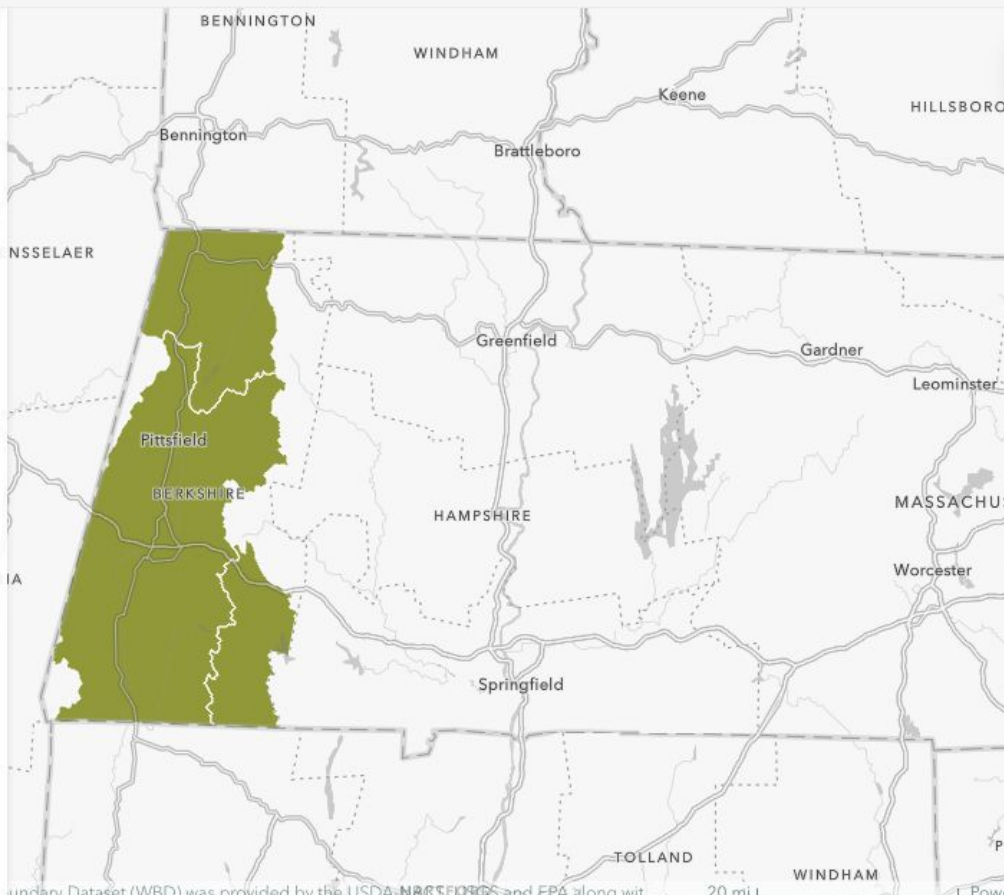
[Successful Project Examples](#)

[Get Involved](#)



Berkshires Clean, Cold & Connected Partnership

MISSION: The Berkshire Cold, Clean, Connected Partnership is a collaboration of environmental organizations with the goal of catalyzing ecological restoration projects in Berkshire rivers and streams that protect cold-water



Mystic



Ipswich

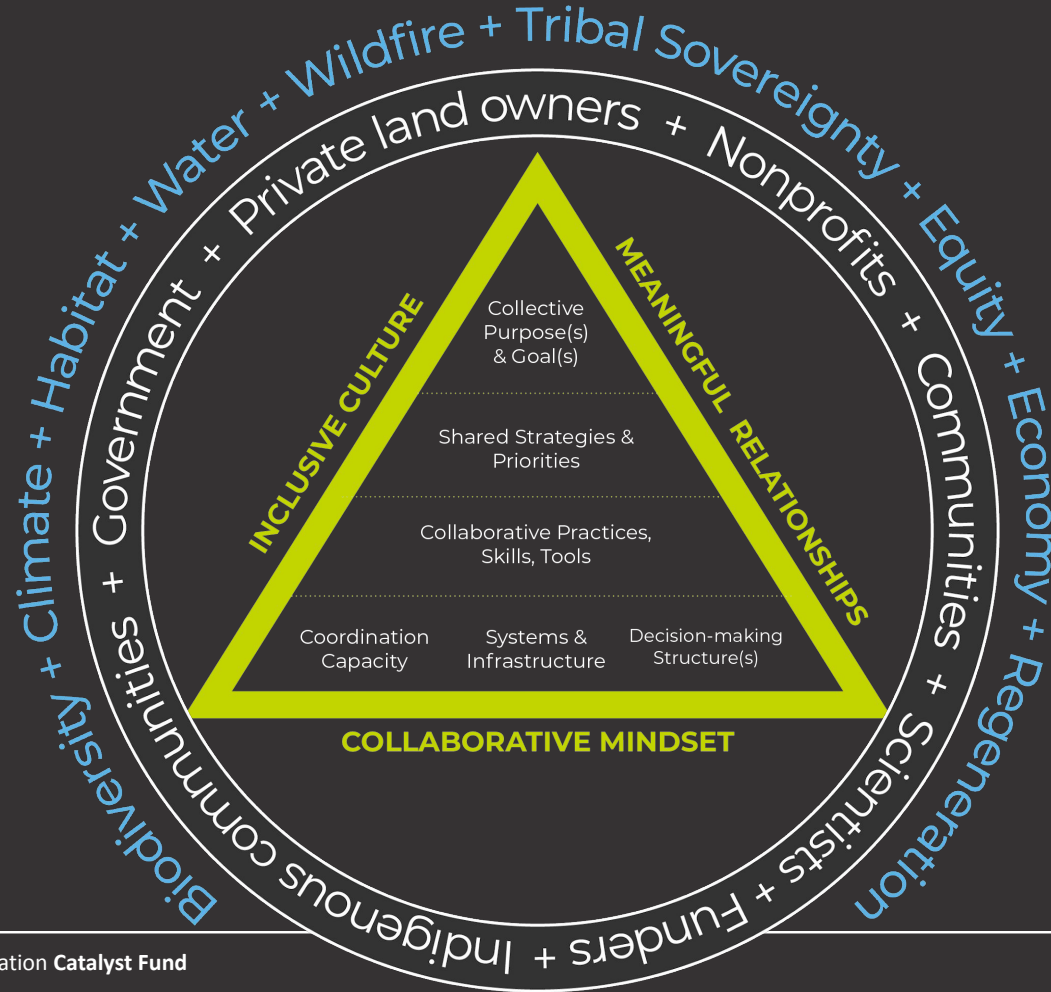


Mattapoisett



Mattapoisett

Collaborative Capacity



Adapted from deSilva, S., Farrell, S., Knoblock, G. (2022). Increasing collaborative capacity and infrastructure for landscape stewardship [White paper]. California Landscape Stewardship Network.

Funding for Collaboration Workshop

Align funding programs to incentivize collaboration and enable relationship-building over multiple years

Support dedicated staff/facilitators for collaboratives

Create convening spaces for funders and practitioners to build community

Equip collaborative leaders with the skills they need

Mainstream watershed thinking and increase public awareness



Resources for Further Reading

[Watershed Scale Climate Collaboration Toolkit](#) - Mass ECAN & partners

[Mass Rivers Alliance Member Organizations](#) - Check out groups near you!

[Peer to Peer Learning for Climate Adaptation](#) - ASAP Network of Networks

[Network Building Resources](#) - USDN (Sustainability Directors Network)

[Connecting to Change the World Book](#) - Plastrik, Taylor, and Cleveland

[Regional Adaptation Collaborative Toolkit](#) - ARCCA (California)

Discussion

1. How could your work benefit from being more watershed-based?
2. Where do you see opportunities for greater collaboration between land trusts and watershed scale collaboratives (or watershed associations)?
3. What do you see as the challenges to these collaborations and what are some potential solutions?

Thanks for your feedback!

