




# Building Equity in Nature Based Solutions in MA Communities

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EPA's Soak Up The Rain Webinar  
June 23, 2022



# About MassECAN

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The Massachusetts Ecosystem Climate Adaptation Network is a **community of practice** for climate adaptation practitioners and researchers interested in ecosystem resilience and natural resource conservation in Massachusetts.

The goal of Mass ECAN is to build community, increase knowledge sharing, and foster collaboration among climate adaptation practitioners and researchers interested in ecosystem resilience and natural resources conservation across Massachusetts.

Mass ECAN's "Mainstreaming Nature Based Solutions" workgroup works together collaborative efforts to identify and fill gaps in implementing nature based solutions across MA.



<https://www.massecan.org/>

# Speakers

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**Stefanie Covino** (she/her) manages the Blackstone Watershed Collaborative based at Clark University, which serves to improve climate resilience and watershed health in the bi-state watershed's 39 communities. She has an MS in Environmental Science and Policy from Clark University and is a Keystone Cooperator and MVP Certified Provider. Her interests include land use planning, natural resource protection, ecological restoration, and equitable nature-based solutions to reduce climate hazards and improve community resilience. She can be reached at [scovino@clarku.edu](mailto:scovino@clarku.edu).



**Emma Gildesgame** (she/her) is the Climate Adaptation Scientist for the Massachusetts chapter of TNC, where she works with communities and partners to co-develop and implement equitable nature-based solutions that provide multiple benefits to nature and people at a pace that matches the urgency of climate change. Previously, she has worked on water quality planning and restoration, wetland restoration, and climate communication, and environmental science education. She has a Masters of Environmental Management from the Yale School of the Environment. She can be reached at [emma.gildesgame@tnc.org](mailto:emma.gildesgame@tnc.org)



Hillary B. King (she/her) – Central MA Regional Coordinator, MA EOEEA Municipal Vulnerability Preparedness Program // Bio: One of six Regional Coordinators who administer and provide technical assistance on MVP Grants, Hillary has a particular interest in researching nature-based solutions and sharing best practices to inspire the work of others. With a foundation in landscape architecture and planning, experience working with engineers and regulators on public infrastructure projects, and now working for the Commonwealth - Hillary's work strives to assist communities to equitably plan for and achieve a more resilient future in our changing climate. Reach out at [hillary.king@mass.gov](mailto:hillary.king@mass.gov) or 617-655-3913.



Gretchen Rabinkin - Executive Director, Boston Society of Landscape Architects // Bio: Gretchen Rabinkin AIA, Affiliate ASLA is executive director of the Boston Society of Landscape Architects (BSLA) – the Massachusetts and Maine chapter of the American Society of Landscape Architects. The BSLA serves to connect, convene, and celebrate landscape architecture professionals and support the creation of resilient, equitable, and beautiful environments from the Berkshires to Bangor to Boston. A licensed architect and longtime educator, she has long worked at the intersection of students, organizations, and community groups to improve the public spaces of everyday experience. Reach out at [gretchen@bslanow.org](mailto:gretchen@bslanow.org) or 617-686-4362.



Perri Sheinbaum (she/her) - Tufts Urban and Environmental Policy & Planning Program // Bio: Perri Sheinbaum is a recent graduate of Tufts University's Urban and Environmental Policy and Planning program, where she focused on climate justice and transportation planning. Her graduate thesis focused on highlighting case studies in Massachusetts that centered equity and justice Nature-Based Solutions. [perri.sheinbaum@tufts.edu](mailto:perri.sheinbaum@tufts.edu)

# Nature Based Solutions

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# Framework to discuss NBS in Massachusetts

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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.



# Mainstreaming Nature-Based Solutions (NBS) Expert Work Group

- 
- Define NBS for work group communications
  - Identify and remove barriers to widespread adoption
  - Provide resources for municipalities, practitioners, other stakeholders

# MassECAN NBS Resources



Green Infrastructure & Climate Resiliency Policy



Green Roofs on Fairmount Line Bus Shelters



Cold Brook Restoration Project

## Massachusetts-based NBS Case Studies

[Taking Cues from Nature to Adapt to Climate Change: A Communications Resource for Nature-based Solutions](#)

## Taking Cues from Nature to Adapt to Climate Change

A COMMUNICATIONS RESOURCE FOR NATURE-BASED SOLUTIONS





# Incorporating Equity

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# Incorporating Equity



Low Tide (MLW Elev. 1.1' BCB)

Mid Tide (Elev. 5.5' BCB)

Clippership Wharf's living shoreline introduces native plantings and wave-dissipating features to accommodate many decades of sea level rise.

Clippership Wharf



# Incorporating Equity?



## Is 'green gentrification' driving displacement in East Boston? Researchers say yes, but locals push back

By [Denny McDermott](#) | Globe Staff, Updated April 7, 2022, 4:01 p.m.

Home // Local Coverage // Health



## In Chelsea, cooling an urban heat island one block at a time

04:14

May 12, 2022

By [Martha Behinger](#)



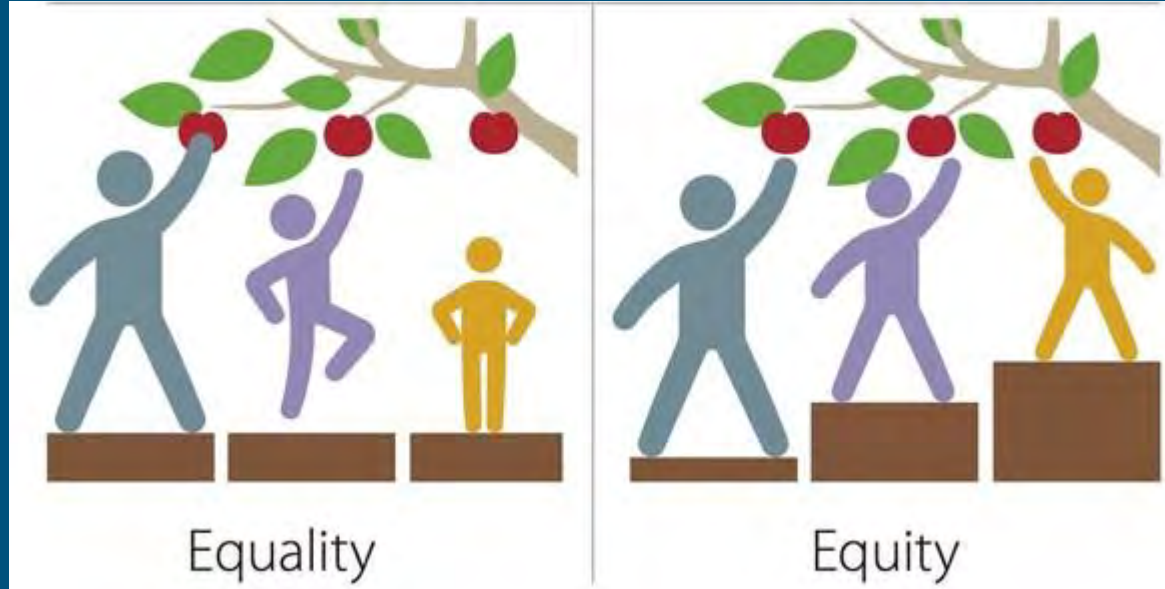
Members of the DCR's Urban and Community Forestry Program plant a cherry tree on Maverick Street in Chelsea, part of the "Chelsea Cool Block" project to help mitigate urban heat in the city. (Jesse Costa/WBUR)

# Incorporating Equity

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How are we incorporating equity in our work?

- Starting a conversation
- Defining equity in this project or process
- Educating ourselves on systemic racism





# State & Municipal Scale: MVP Program

# Climate Resilience in Massachusetts



**MVP**

Municipal Vulnerability  
Preparedness



**Climate resilience** is the ability of a community to address the needs of its built, social, and natural environment to **anticipate, cope with, and rebound stronger** from events and trends related to **climate change hazards**.

**Resilient communities don't just recover—they *continuously build capacity* to reduce the impacts of future climate events.**

# Climate Resilience in Massachusetts



**MVP**

Municipal Vulnerability  
Preparedness

<https://resilientma.org/mvp>

## MVP PROGRAM

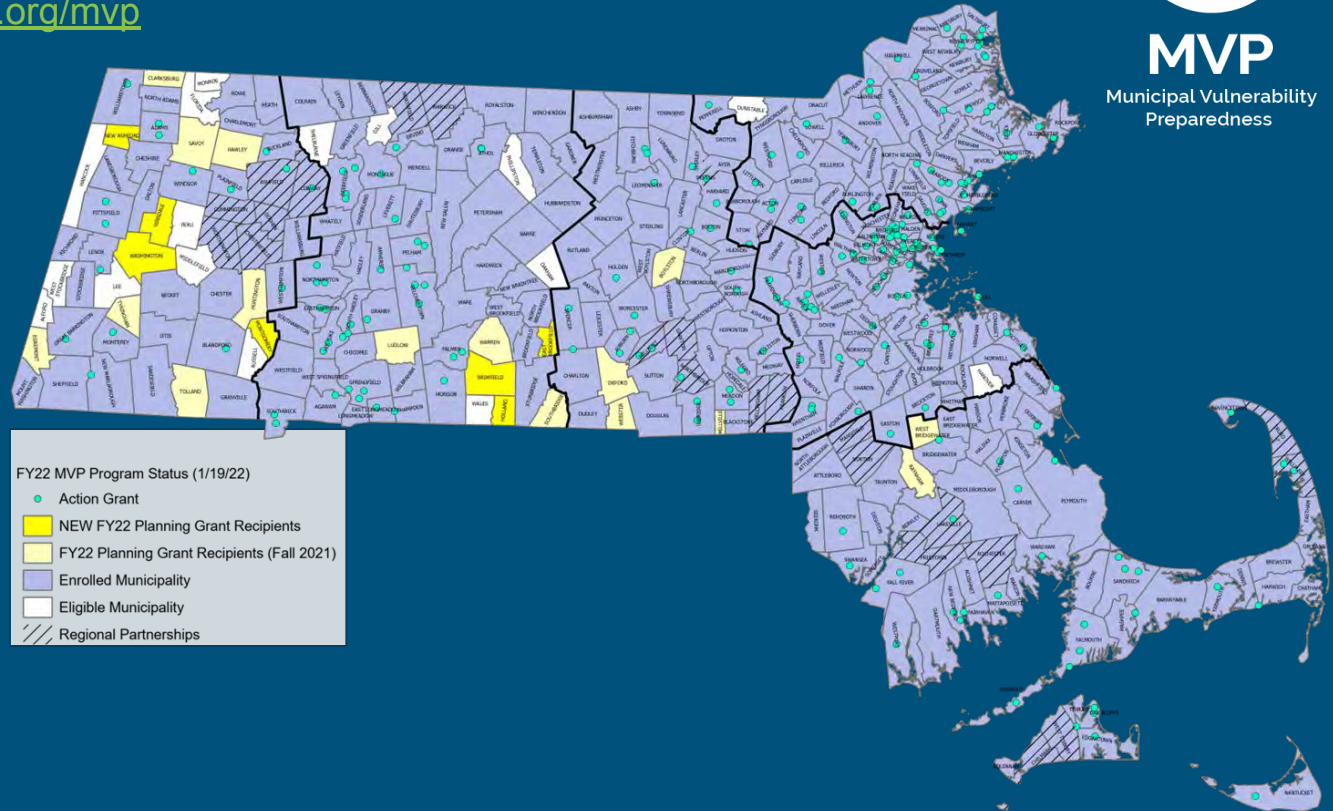
status as of 2/15/2022

### Planning Grants Process

- 95% Participation
- 335 communities

### Action Grant Projects

- FY 18: 37
- FY 19: 36
- FY 20: 52
- FY 21: 41
- FY 22: 66



Total Awards:  
\$65M+ to date

# Core Principles for Climate Resilience



**MVP**

Municipal Vulnerability  
Preparedness

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





# Education and Outreach



## Access MVP Toolkits

The MVP team created toolkits related to our core principles and other topics of interest that can be used when embarking on an MVP Planning Grant process and/or developing an Action Grant application. More toolkits are expected to be added in the future on other topics of interest.



Nature-Based  
Solutions



Environmental Justice  
& Equity



Public Health &  
Healthcare



Virtual & Remote  
Engagement

## Recent Webinars and Trainings



MVP FY23 Pre-Request for  
Responses Webinar - March  
2022 ([slides here](#))



Local and Regional Climate  
Adaptation Tools - January 2022  
([slides here](#))



Building Trust and Community  
Partnerships - January 2022  
([slides here](#))

## Older Webinars

[Community Engagement & Environmental Justice Webinar](#) - January 2021

[Implementing Nature-Based Solutions Webinar Part 1](#) - January 2021

[Implementing Nature-Based Solutions Webinar Part 2](#) - February 2021

[Building Resilience Through Partnerships](#) - February 2021

[MVP Planning Grant Municipal Training Webinar Recording](#) - January 2020

# Sharing Lessons Learned

## Worcester Senior Center: Urban Rain Gardens At Work



### Worcester FY20



Learn More:

[www.WorcesterEnergy.org](http://www.WorcesterEnergy.org)

AWARD \$378,356

PROJECT TYPE Construction

CORE PRINCIPLES  
DEMONSTRATED Employing Nature-Based Solutions  
Pursuing innovative, transferable approaches

**DESCRIPTION** To address flooding and extreme heat hazards in a dense largely impervious area of the city, Worcester incorporated nature-based solutions during a parking lot redesign of the Worcester Senior Center. Because the site was nearly 100% impervious with no stormwater management system, a hybrid approach was utilized – with a rain garden and bioswales installed to treat most of the light and moderate rain runoff, and an underground stormwater treatment system treating runoff from more intense rain events.



*Nashua River  
project open house*  
<https://climateresilient.wixsite.com/nashuariver>



*Education on the  
Coonamessett  
River*  
<https://www.criverrust.org/education-programs>

<https://www.mass.gov/info-details/municipal-vulnerability-preparedness-program-action-grant-projects>

Watershed Scale:  
Blackstone Watershed  
Collaborative



# Blackstone Watershed

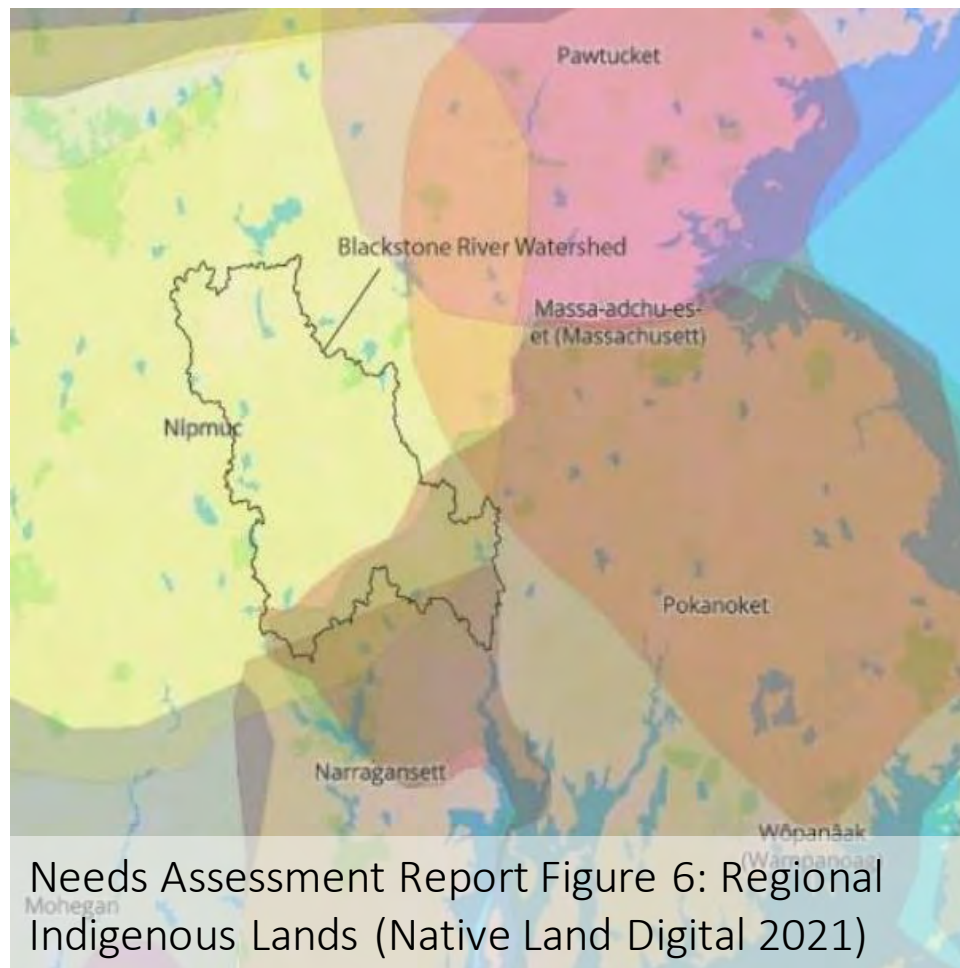
- 48 miles long
- Drops 438'
- 475 square miles
- 39 communities
- 2 states





# Indigenous Land

- [Nipmuc Nation](#)
- [Pokanoket Nation](#)
- [Mashpee Wampanoag Tribe](#)
- [Narragansett Indian Tribe](#)



PAKACHOAG  
WHERE THE RIVER BENDS

Linked!



Centuries of careful land stewardship with close ties to the river



# Industrial revolution & transformation

*“America’s hardest working river”*

*“America’s most polluted river”*



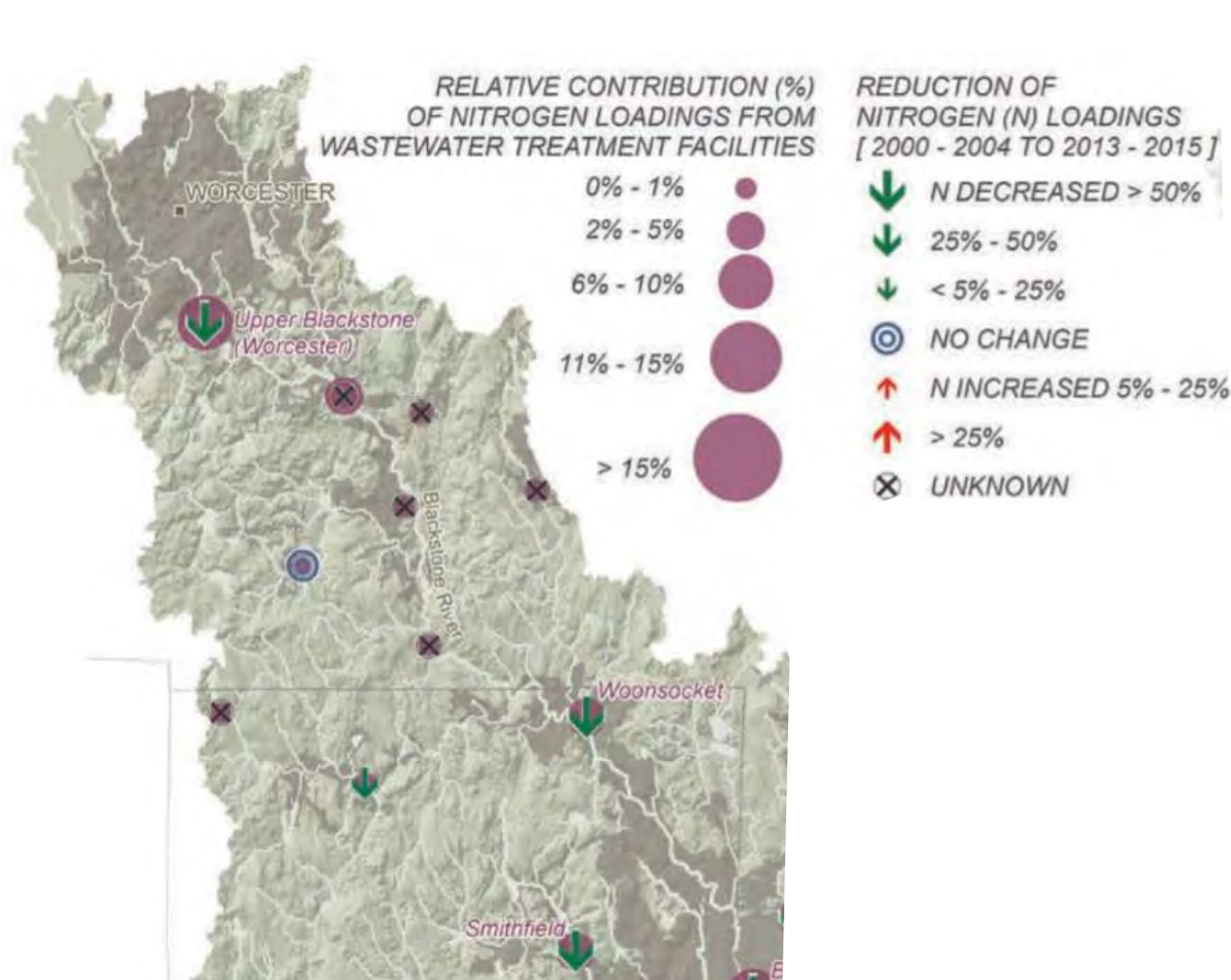
*Slater Mill, America's first water-powered cotton-spinning mill in Pawtucket, RI (c.1790)*



*A portion of the Blackstone Canal – created from and near the River to transport goods through 49 locks*



# While the water has gotten cleaner



**Reductions in Nitrogen Loading**





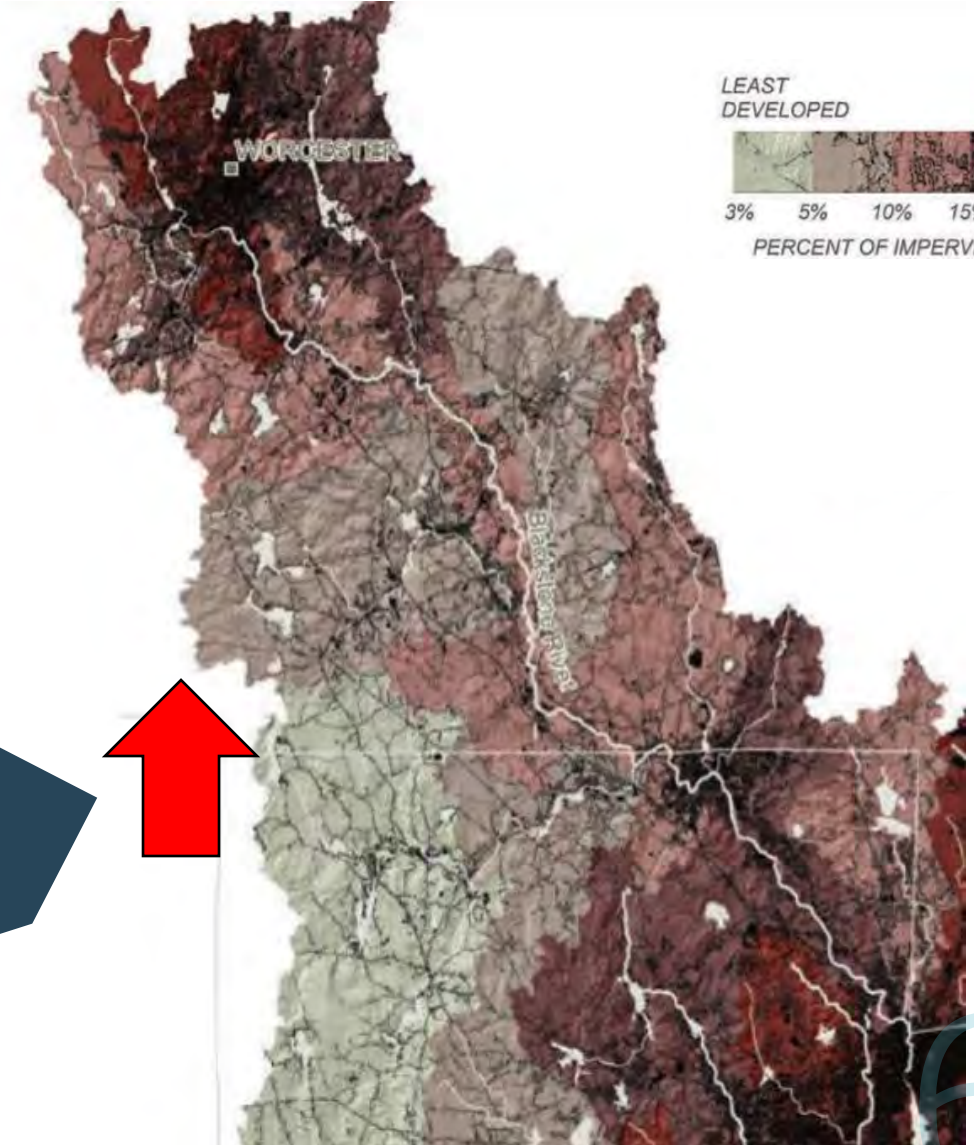
# ...current challenges are growing

WATER QUALITY CONDITIONS FOR AQUATIC LIFE



Water quality

Impervious surfaces



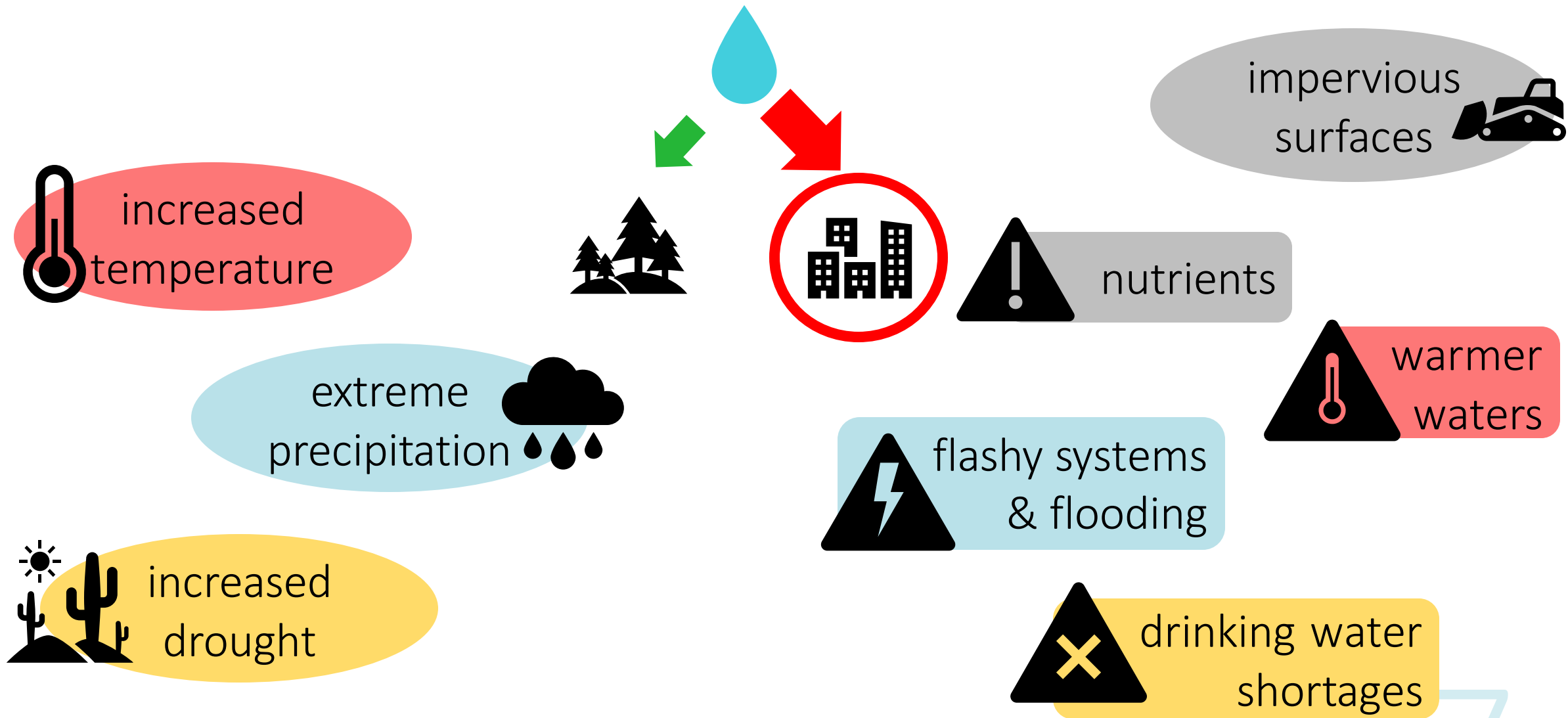
LEAST DEVELOPED      MOST DEVELOPED

3% 5% 10% 15% 20% 47%

PERCENT OF IMPERVIOUS COVER

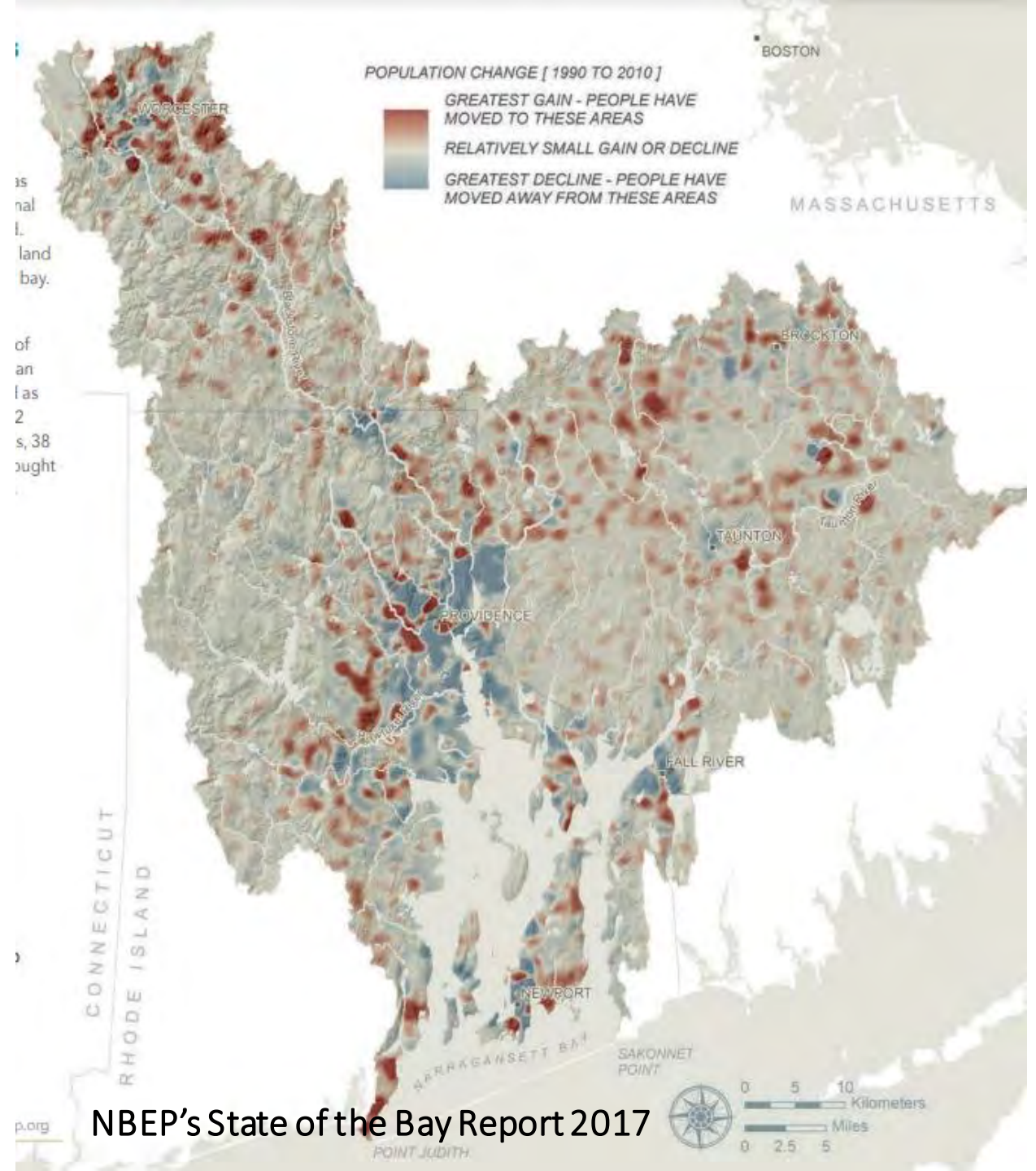


# ...climate change exacerbates impacts

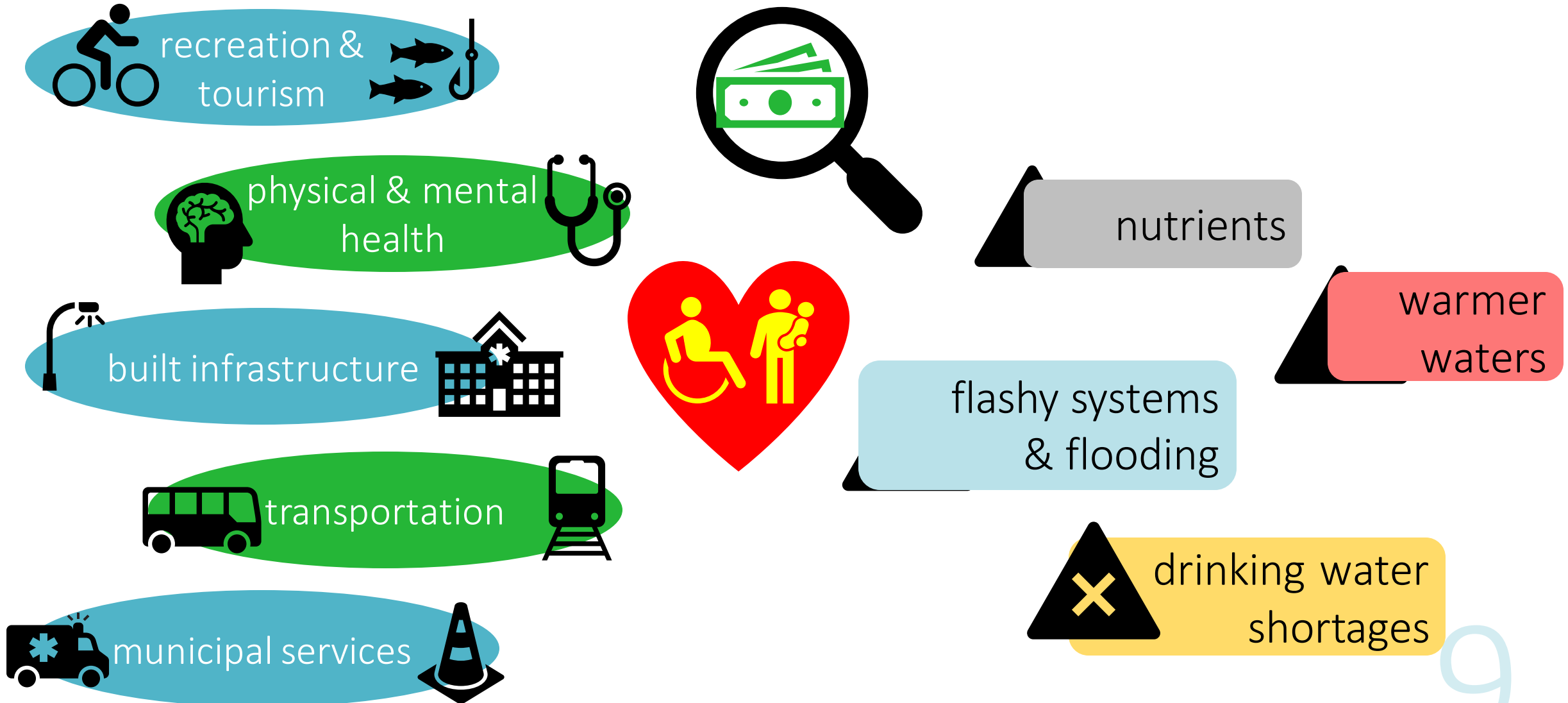


# ...and populations are still expanding

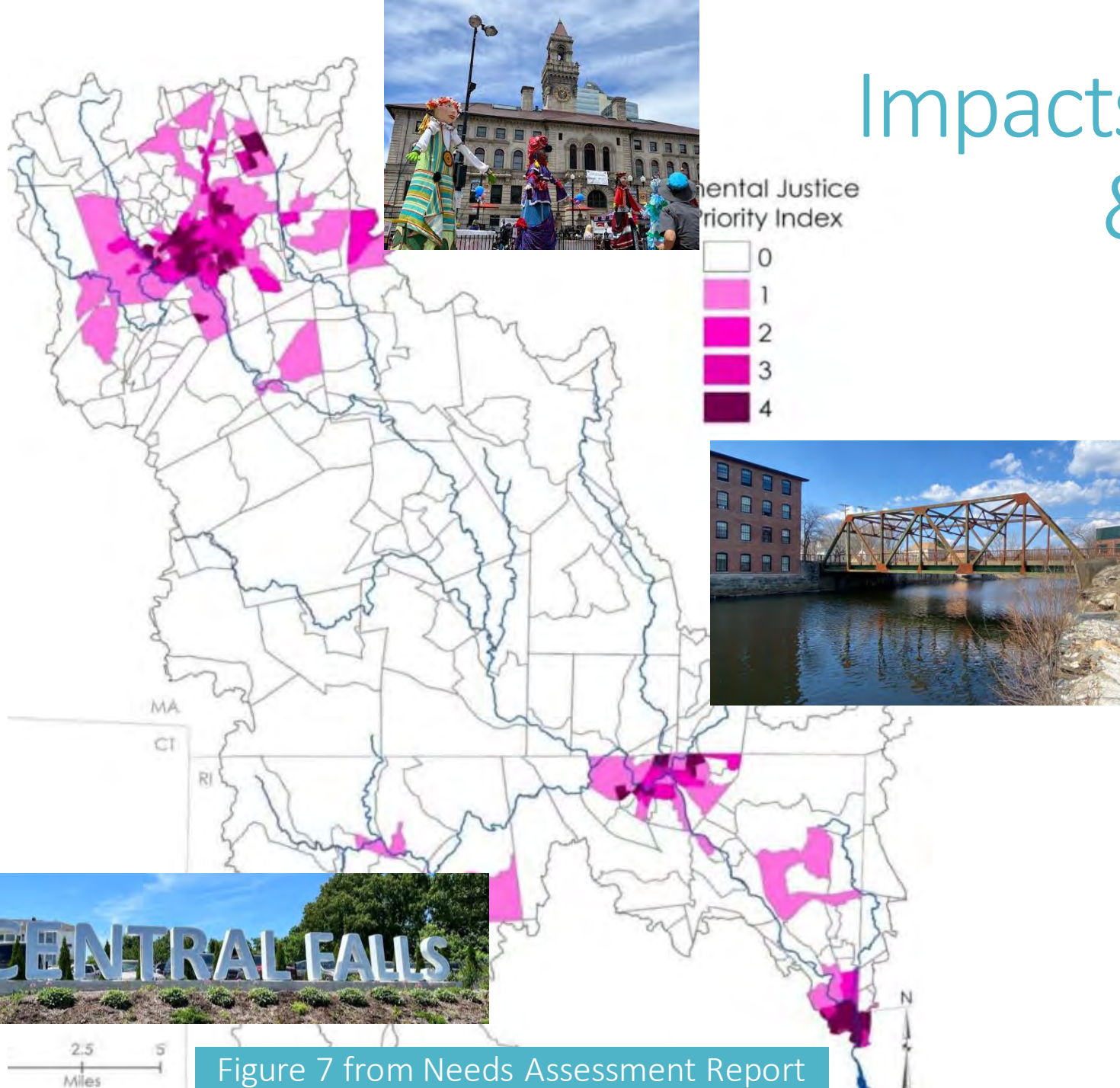
- ▶ 2020 Census: Worcester is fastest growing city in New England
- ▶ Watershed is in the sprawl frontier ([Losing Ground](#))
- ▶ Population gains throughout urban and rural



# Healthy communities depend on a healthy watershed



# Impacts are compounded & not felt equitably

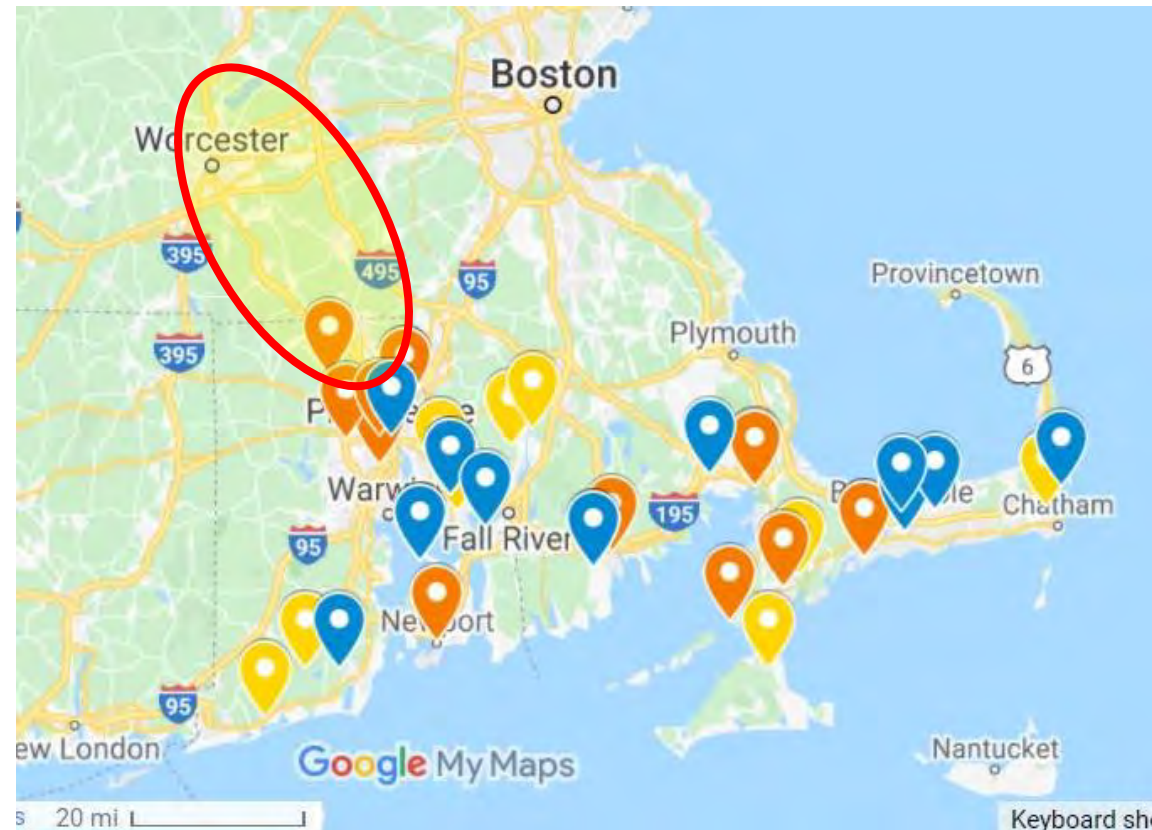


- ▶ Heat islands
- ▶ Tree cover
- ▶ Asthma rates
- ▶ Flooding impacts
- ▶ Water quality

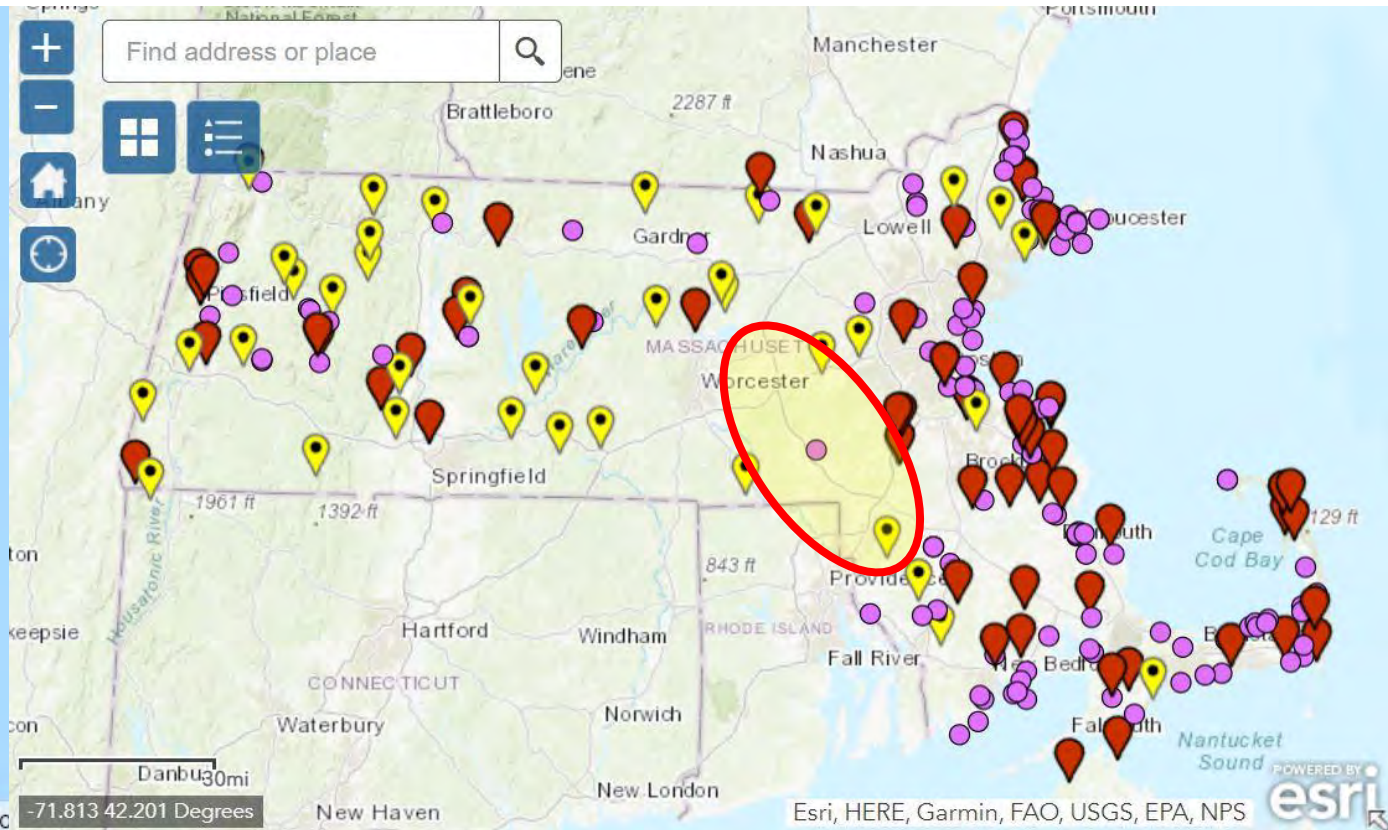
Figure 7 from Needs Assessment Report



# Historic lack of participation/representation in funding and projects



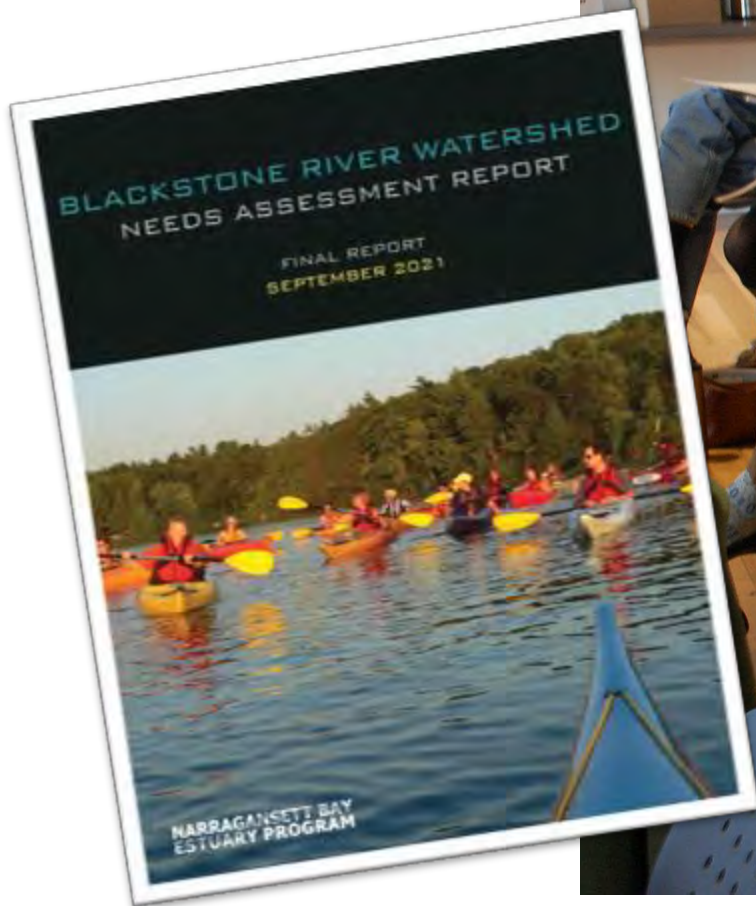
<https://estuaries.org/snepgrantprogram/map/>



<https://www.mass.gov/service-details/the-division-of-ecological-restoration-project-map>



“How can we help?”



## NARRAGANSETT BAY ESTUARY PROGRAM

- 2 years
- 8 meetings
- 140 people
- 40 organizations
- 11 govt agencies



# A Shared Watershed with Shared Goals



Expanding the bike/greenway



Water chestnut management



Equitable access to waterways



# A Shared Watershed with Shared Goals





# Working together to achieve more



Blackstone Canal, looking toward the Stanley Woolen Mill

- Fill in **capacity** gaps
- **Prioritize** projects
- Provide technical **assistance**
- Regional **funding** & grant mgmt
- Unified **messaging**
- **Centralized** place to meet & share
- Celebrating **successes**



# Blackstone Commons

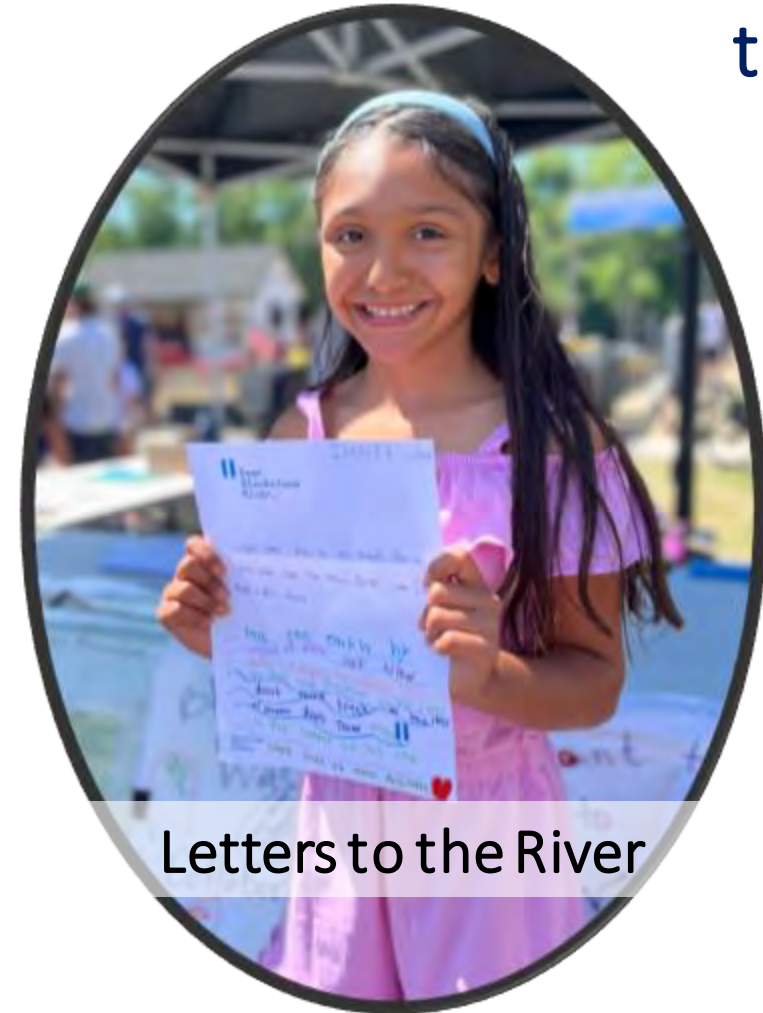
The Blackstone River is a commons - a resource shared by the community, to be kept open and protected for future generations.



BLACKSTONE RIVER  
WATERSHED COUNCIL  
*Friends of the Blackstone*



16



Letters to the River



Paddle: August 11-14, 2022

# Representing our watershed

▶ CMRPC [Imagine 2050](#) Steering Committee



▶ [MassECAN](#) Nature Based Solutions



▶ [MA Statewide Climate Change Assessment](#) Working Group

▶ [NBEP](#) Steering Committee

**NARRAGANSETT BAY  
ESTUARY PROGRAM**







- Started 2014
- Formed after grant brought groups together
- 42 muni & 560 sq mi
- Hosted by RPA
- Meets monthly
- 0-1 staff
- Comprised of NGO, muni, FP
- No formal board



- Started 2018
- Formed when munis needed to work x-boundary
- 21 munis & 76 sq mi
- 600,000 people
- Hosted by NGO
- Several FT staff
- Munis only
- Formal structure



- Started 2021
- Formed after Report ID'ed minimal capacity
- 39 munis & 475 sq mi (2 states)
- Hosted by uni
- 1 FT staff
- 100+ partners
- No formal structure



Project Scale:  
Malden River Works

# Why Equitable Nature-Based Solutions?

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## Community Buy-In

Include those traditionally and historically excluded in processes



## Foster Collaboration

Involve groups and stakeholders not in traditional environmental fields

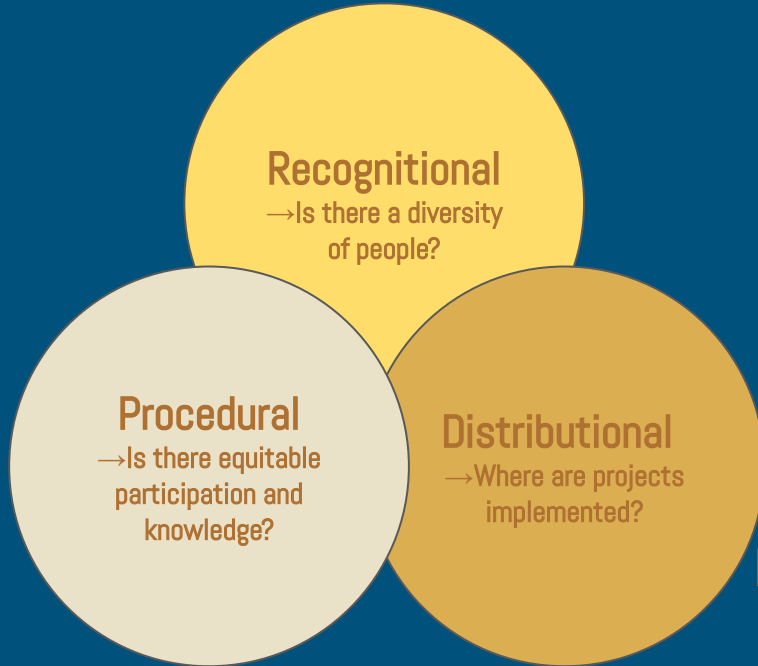


## Mitigate Green Gentrification

The increase in green space can lead to unintended consequences

# Equity Considerations

## *Climate Justice Framework*



## *Just Nature-Based Solutions*

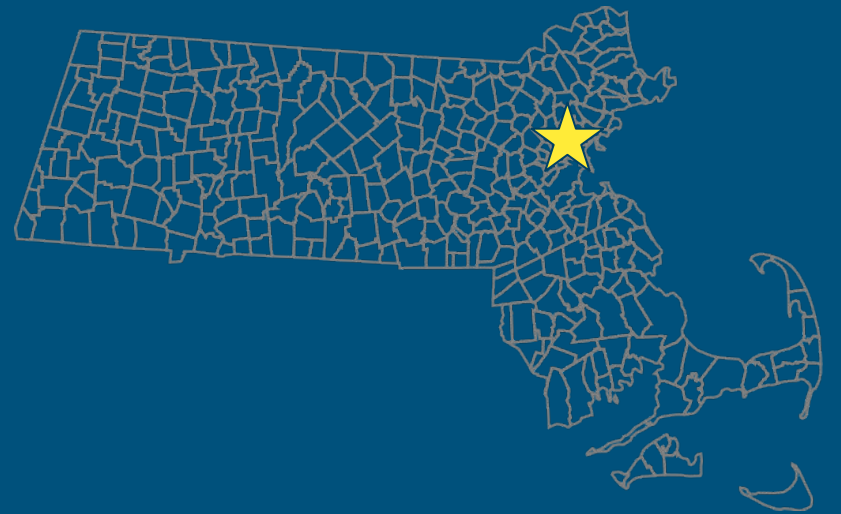
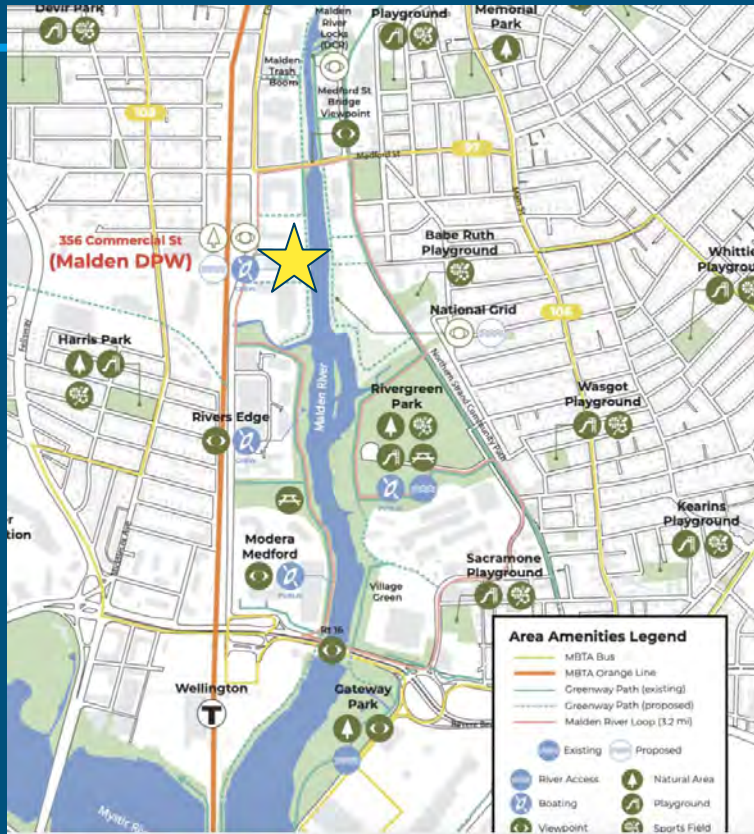
Value Articulations

Transformative  
Co-production

Race and Class



# MALDEN RIVER WORKS FOR WATERFRONT EQUITY + RESILIENCE



# Malden River Works

*“Bringing together a new coalition of community leaders of color, environmental advocates, and government stakeholders in action to achieve a common goal: to create a climate resilient waterfront park on the Malden River for all”*



# Using Malden as a Model Case Study

## Equitable Engagement Methods

- Creation of a Steering Committee
- Brought community into the fold from the beginning
- 6 community meetings throughout design process
- On publicly accessible land
- Intentional with outreach and inclusion
- Youth engagement
- Multiple surveys distributed

## Fifth Public Meeting

**Date:** February 11th, 2021, 6:30PM- 7:30PM

**Location:** Virtual - [Powerpoint Presentation](#)

**Attendees:** 68

**Goal:** To share an update on the next phase of the project and introduce new members of our design/engineering team.

**Summary of Initial Presentations:** The fifth public meeting, also held virtually due to COVID restrictions, began with a reflection about Black History Month and the historic significance of Kamala Harris as the first Black, South Asian, and woman Vice President of the US. This was followed by a recap on recent project activities and achievements, including a new Malden River Works website, participation in the MVP webinar about environmental justice communities, and the award of the MVP and MAPC grants for \$200,000 to continue the



# Using Malden as a Model Case Study

## What made it a unique project?

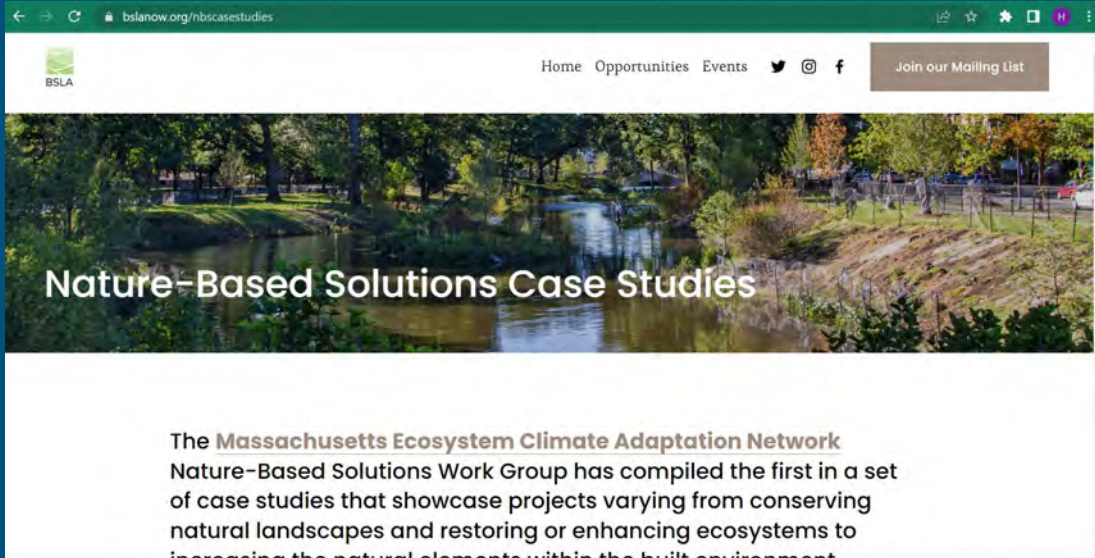
- Funded by multiple sources (MIT, MVP)
- Held community meetings prior to applying for grant and after
- Developed a final design proposal with the assistance of community input



# Mass ECAN Case Studies

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# Nature-Based Solutions Case Studies



The screenshot shows a web browser window with the URL [bslanow.org/nbscasestudies](https://www.bslanow.org/nbscasestudies). The page features a navigation bar with links for Home, Opportunities, and Events, along with social media icons for Twitter, Instagram, and Facebook. A "Join our Mailing List" button is also present. The main content area is dominated by a large, scenic photograph of a river flowing through a lush, green landscape with trees and grass. Overlaid on this image is the title "Nature-Based Solutions Case Studies" in a large, white, sans-serif font. Below the image, the text reads: "The **Massachusetts Ecosystem Climate Adaptation Network** Nature-Based Solutions Work Group has compiled the first in a set of case studies that showcase projects varying from conserving natural landscapes and restoring or enhancing ecosystems to increasing the natural elements within the built environment."

<https://www.bslanow.org/nbscasestudies>



# Case Study Template

NATURE BASED SOLUTIONS CASE STUDY

## Green Roofs on Fairmount Line Bus Shelters

**PROJECT SUMMARY**

In the summer of 2014, three bus shelters along the Fairmount/Indigo Commuter Rail line, near Talbot Station, were retro-fitted with green roofs. The roofs help to improve air quality and sequester carbon, capture rainwater, and provide cooler temperatures to combat urban heat islands. In addition to the ecological benefits, the project also trained and employed local youth through YouthBuild Boston and the TNT Eco-Teens Programs. Funding supported the project for a two year period, however, Trevor Smith (ReEarth) believes there is huge potential with this and similar projects in the future.

**LOCATION**  
Dorchester, MA

**CLIMATE HAZARD ADDRESSED**  
\*Change in precipitation  
\*Rising temperatures

**ACTIONS/TECHNIQUES**  
\*Green Roofs

**CO BENEFITS**  
\*Community engagement  
\*Equity engagement  
\*Job opportunities and training  
\*Habitat creation

**PROJECT STATUS**  
(as of Feb. 2021)  
The roofs were up for two years, 2014-2016. Pilot program has ended.

**SCALE/SIZE**  
Site: Each green roof covered 60-80 sq. feet. 14 roofs installed for total of 980 sq. feet

**COSTS**  
\$5000 per shelter

**FUNDING**  
Land Escapes Design Inc. and Green Living Technologies International donated \$15,000 in materials and labor for the project

**PROJECT PARTNERS**  
Fairmount/Indigo Line CDC Collaborative, the Talbot Norfolk Triangle Eco Innovation District, and Land Escapes Design Inc., YouthBuild Boston and the TNT Eco-Teens Program.

**CONTACT**  
Trevor Smith  
Trevor@ReEarthBoston.com

Along with ecological and climate benefits, this project provided green job training for local youth.

**Nature-Based Solutions Spectrum**  
Nature based solutions use natural systems or mimic natural processes to address natural hazards and climate impacts like flooding, erosion, drought, and heat islands.

Make base-level collaborations across many scales, and include cooperation of existing and emerging networks across local to regional or worldwide scales. Restoration of degraded or disrupted ecosystems, and incorporating nature into the built environment.

**CONSERVE EXISTING NATURAL AREAS**

**RESTORE OR ENHANCE ECOSYSTEMS**

**INCREASE NATURAL ELEMENTS IN THE BUILT ENVIRONMENT**

**MASS ECAN**  
Massachusetts Ecosystems Conservation and Assessment Network

**BSLA**  
Boston Society of Landscape Architects  
A Professional Organization of Landscape Architects

**The Nature Conservancy**

**SNEP**  
Sustainable Neighborhood Ecosystem Program

Before installation could happen, the bus shelters were inspected to make sure they had the structural capacity to be able to carry the weight of the green roofs. The bus shelter roofs were then retrofitted with hardware to accommodate the green roofs. The edging and sedum mats used were purchased from a woman-owned business, and all laborers involved in installation and maintenance were paid a living wage. The 4" green roof mat was overseeded with a house-made, drought tolerant meadow mix.

To monitor the effectiveness of the project, the team used thermal imaging cameras that recorded the temperature on the roads and sidewalks compared to the roofs. They also collected stormwater runoff from the roads and the roofs into water bottles to compare clarity and cleanliness. The differences between the roadway and sidewalk conditions to the roof conditions were dramatic. These simple approaches made an impactful point, however Trevor Smith's advice for anyone looking to replicate a project like this is to invest more time and resources into these metrics. Having hard facts and numbers to present to the public and local decision-makers committees can help to convince that it is a worthwhile undertaking.

This project, although it was only up for a short amount of time, taught the team valuable lessons and dispelled a few myths. It was often



The roofs help to improve air quality and carbon sequestration, reduce and filter stormwater runoff, and cool urban heat islands.

discussed that projects like these that require periodic maintenance are doomed to fail because there is no workforce available to maintain them properly. This can easily be solved by training local youth. They are eager to gain job experience and are excited to branch into different fields that may not be currently available to them. Additionally, the notion that positive steps towards climate resiliency hinge around large scale projects

isn't necessarily the only approach available. Each green roof covered 60-80 sq. feet which on its own isn't much, but if cities committed to the common practice of installing green roofs on every new bus shelter, the individual areas add up. Smith says that "we can all do small things for large impacts." One acre of green roof can divert 27,000 gallons of water from strained city sewers during a single one-inch rainfall event."

"We can all do small things for large impacts." Trevor Smith, ReEarth

#### REFERENCES

Fairmount Line Bus Shelter Living Roof Initiative (2014, August 01). Retrieved February 23, 2021, from <https://www.ecobuilding.org/fairmount-line-bus-shelter-living-roof-initiative/>

"Lessening the Landscape to Manage Water" (2011, January 12). Retrieved February 23, 2021, from <https://doi.edu.org/10.1002/ltmngj.the-landscape-to-manage-water>

#### ADDITIONAL RESOURCES

- [Q & A with project partner Trevor Smith](#)
- [Mass ECAN Nature Based Solutions Resource](#)
- [Municipal Vulnerability Preparedness Program Nature Based Solutions Toolkit](#)

Send us your case study ideas:  
<https://tinyurl.com/NBScasestudy>

# Key Takeaways

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- None of us has all the answers, but don't let that be an excuse not to start this work.
- Start early - ask to learn more about groups you want to engage with; invite them to a conversation without a specific ask, and ask these groups who is missing.
- Meet people where they are -- conceptually and geographically. Recognize lived experience as an essential expertise in the planning & design process.
- Be humble, be honest.
- Community-based Organizations can fill in a needed gap, but they're often not eligible for funding, while munis are but don't have capacity - we need to think about how to use coming funding sources to empower communities to really make a difference.

# Thanks!

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