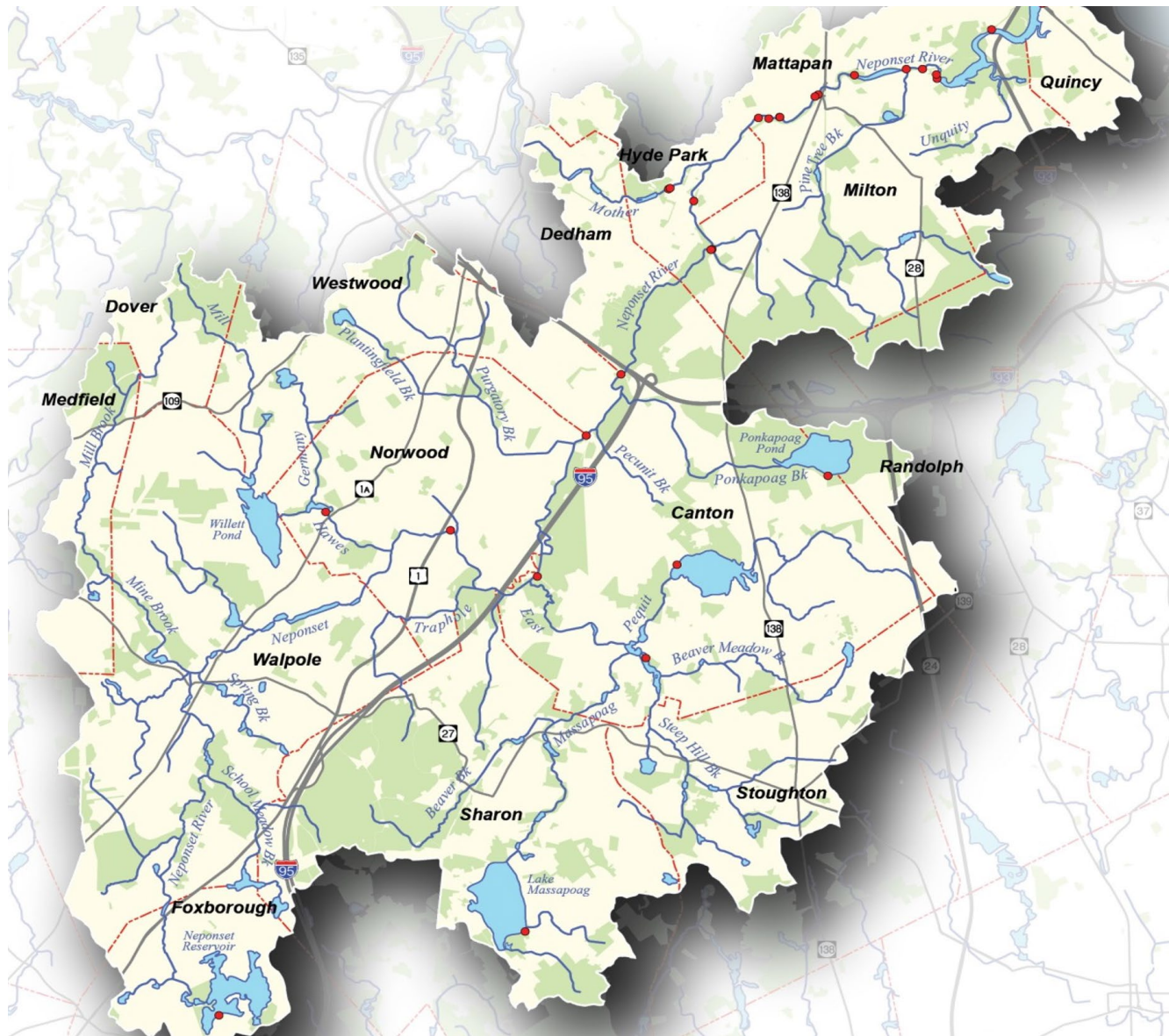




WELCOME

Resilient Neponset Flood Modeling and Climate Collaborative Project

Public Meeting

June 16, 2025



Tonight's Agenda



- 6:30 Welcome and Project Team Introductions
- 6:35 Climate Impacts in the Neponset Region
- 6:40 Project Activities and Goals
- 6:45 Resilient Neponset Climate Collaborative
- 7:05 Resilient Neponset Community Advisory Group
- 7:20 Neponset Regional Flood Model
- 7:40 Final Thoughts/Discussion
- 7:55 Next Steps & Adjourn



Our Public Meeting Norms



Be respectful of others and our time together to discuss important topics.



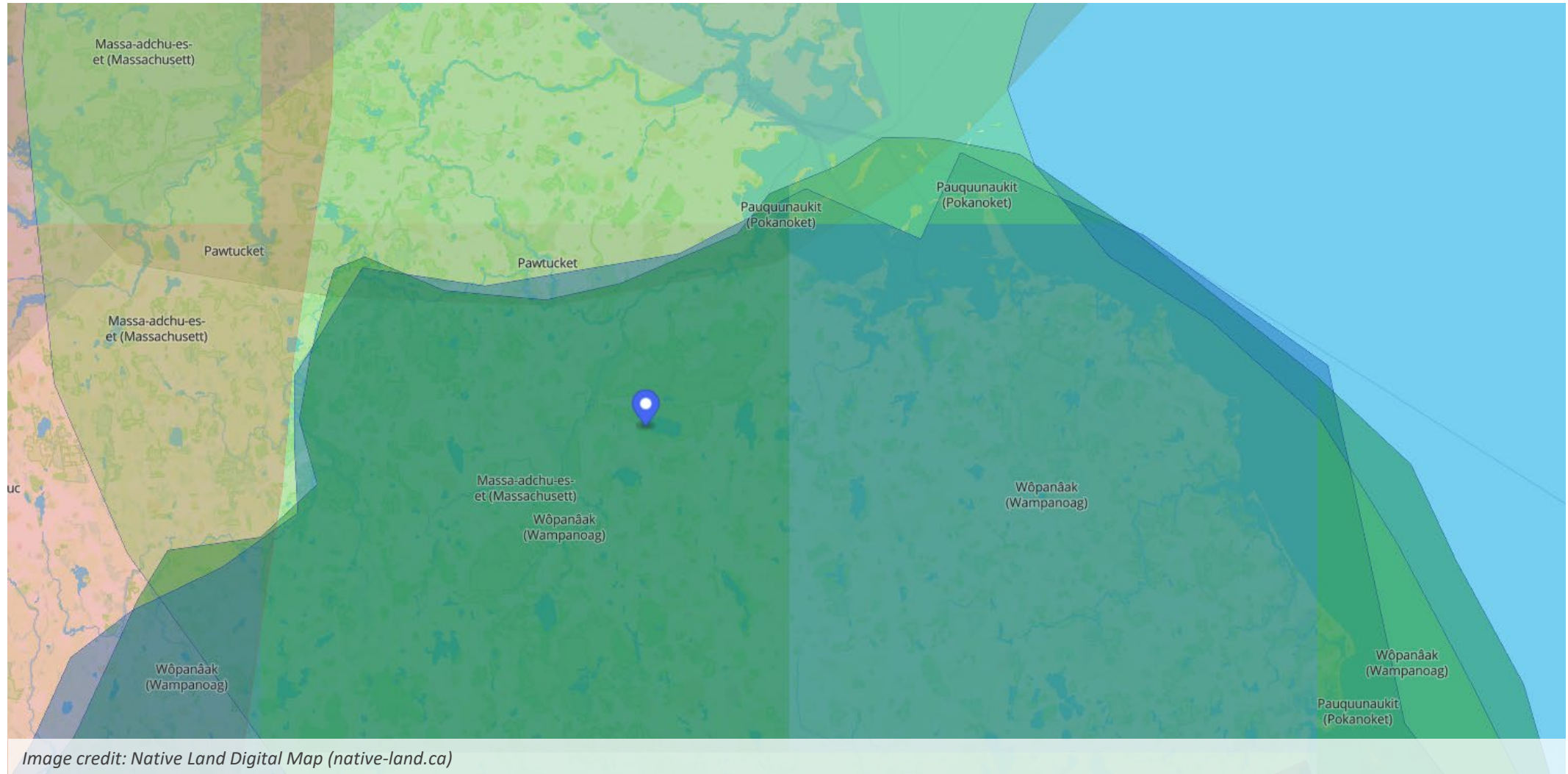
Disruptive behavior is not welcome in this forum.



While there may be wide ranging opinions about climate science in our world today, **our agenda tonight is about making our communities more resilient to worsening storms** and not to have a debate about whether climate change is real or not. We appreciate everyone respecting this focus.



Historic Indigenous Lands



Project Team & Partners

Project Team

- Neponset River Watershed Association
- Weston & Sampson Engineering
- Metropolitan Area Planning Council



Project Partners

- **Town of Dedham-Fiscal Agent**
- City of Boston
- Boston Water & Sewer Commission
- Town of Canton
- Town of Foxborough
- Town of Medfield
- Town of Milton
- Town of Norwood
- City of Quincy
- Town of Sharon
- Town of Stoughton
- Town of Walpole
- Town of Westwood





Image Credit: NOAA

CLIMATE CHANGE: Local Impacts and Consequences

Kerry Snyder, JD
Managing Director for Community Resilience
Neponset River Watershed Association



Regional Climate Change Impacts

Heat



Precipitation Changes



Sea Level Rise



Wind



Disproportionate Impacts

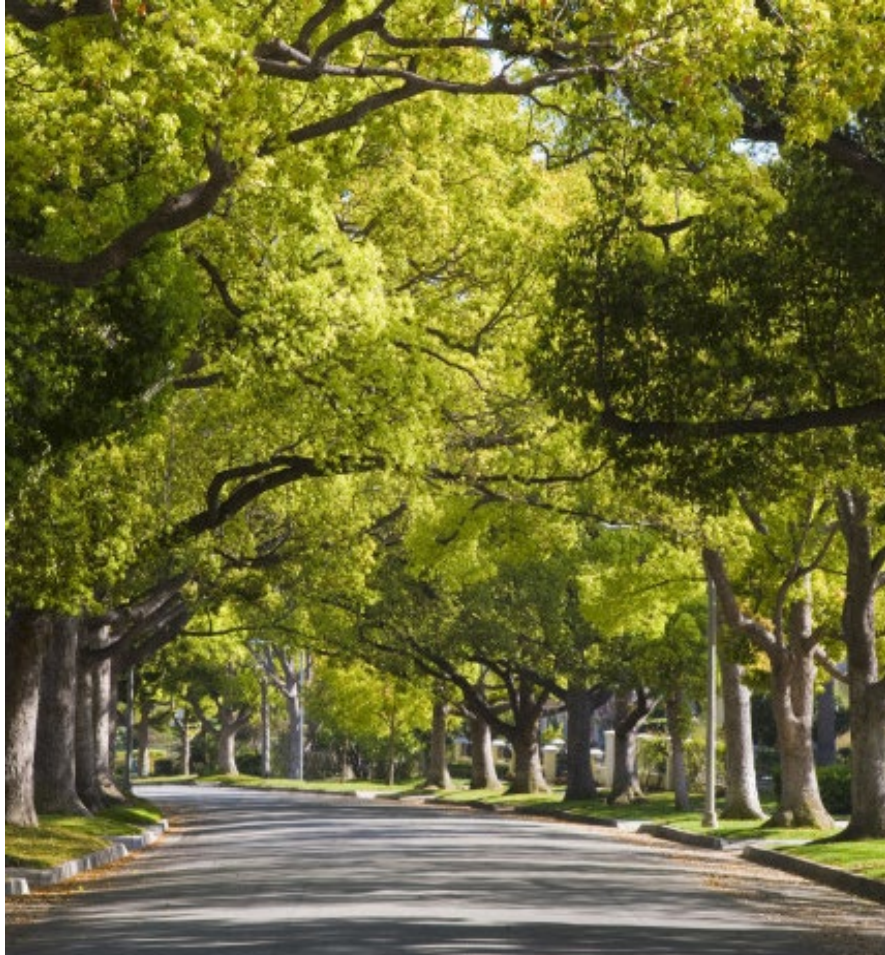


Photo Credit: Nigel Chadwick/WikiCommons

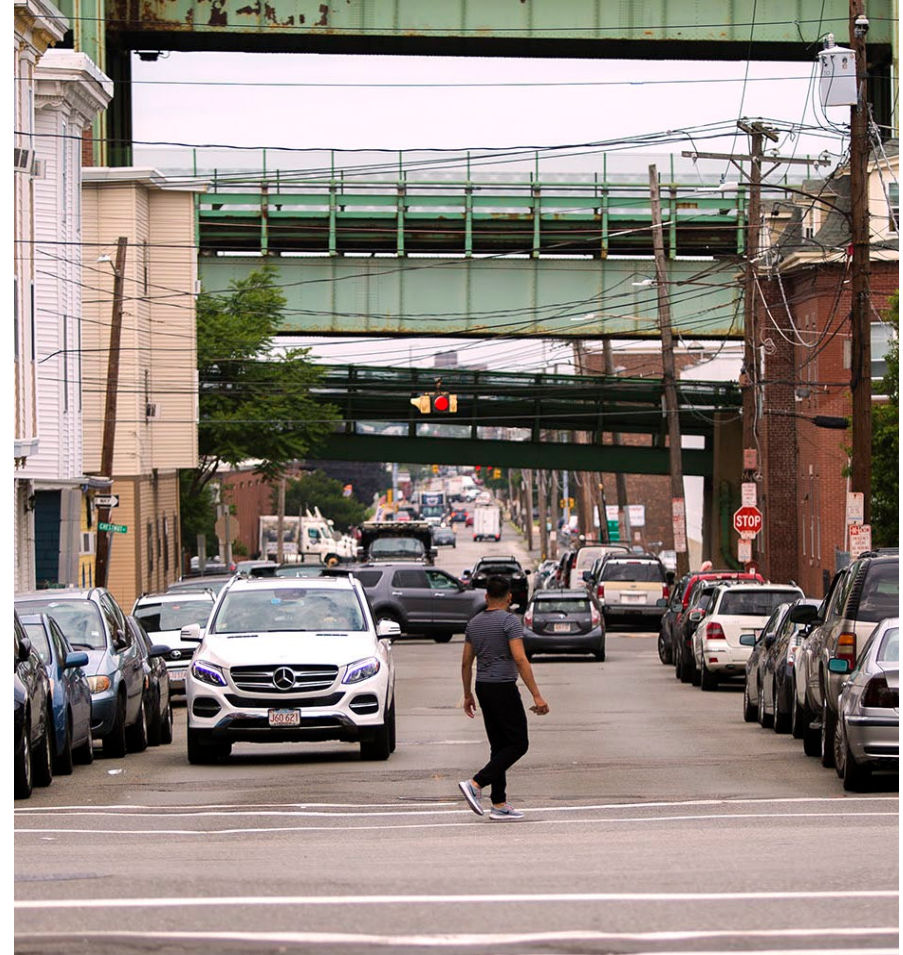


Photo Credit: Jesse Costa/WBUR



Consequences

Public Health



Image Credit: EPA

Public Safety and Property

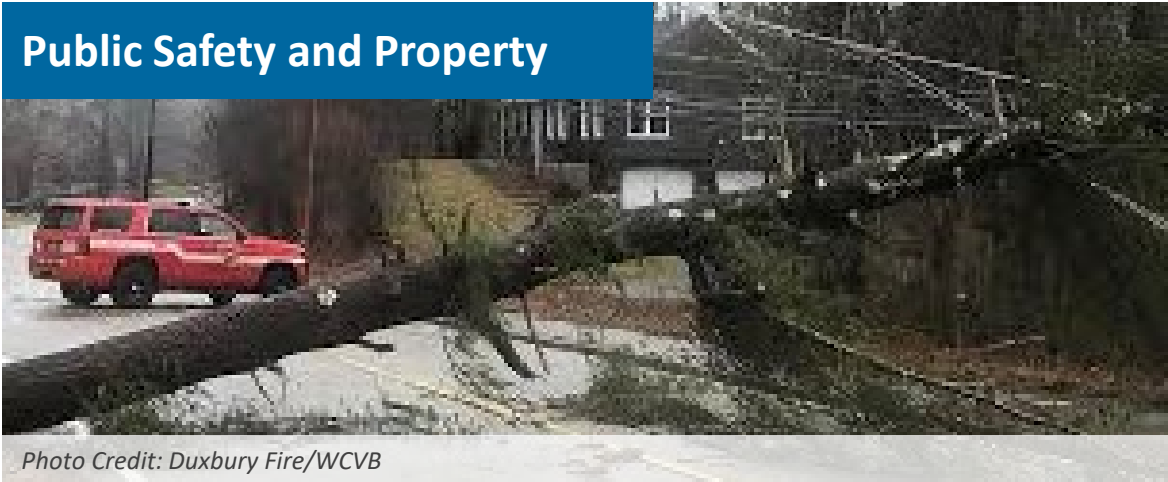


Photo Credit: Duxbury Fire/WCVB

Infrastructure



Photo Credit: NepRWA

Ecology



Photo Credit: Juli McDonald/WBZ





Resilient Neponset Project: Regional collaboration for climate adaptation

Kerry Snyder, JD
Managing Director for Community Resilience
Neponset River Watershed Association



Why a Regional Project?

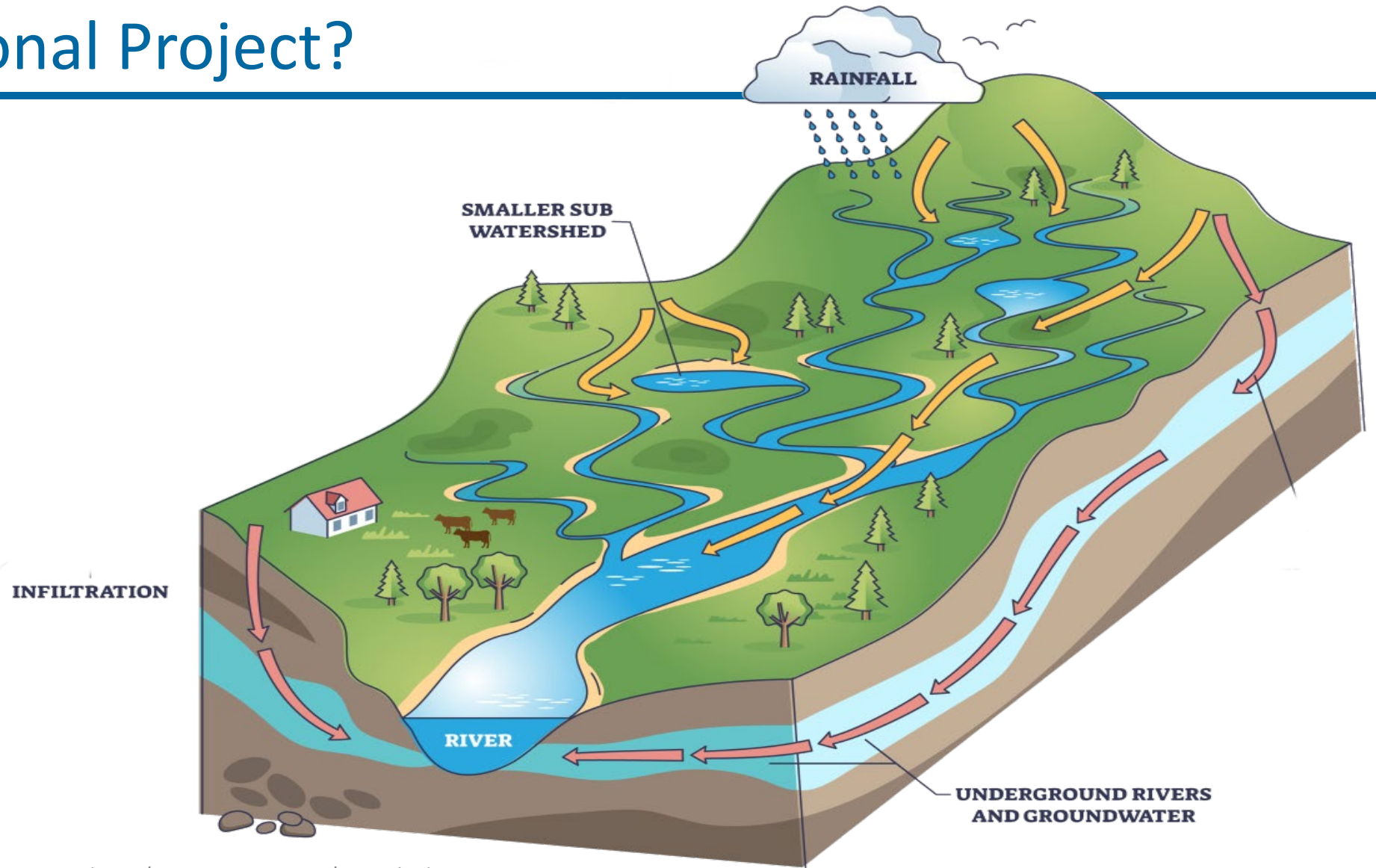
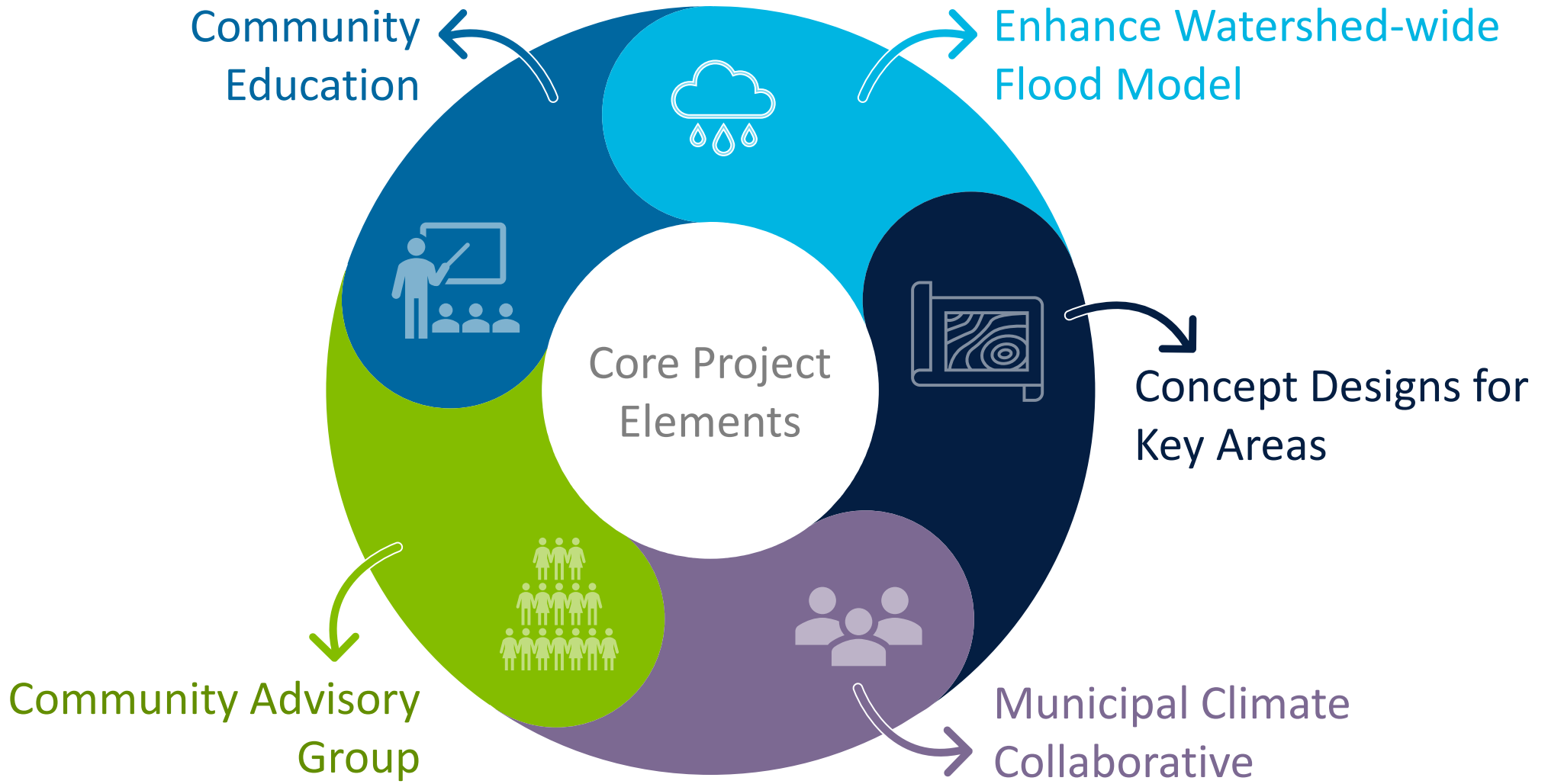
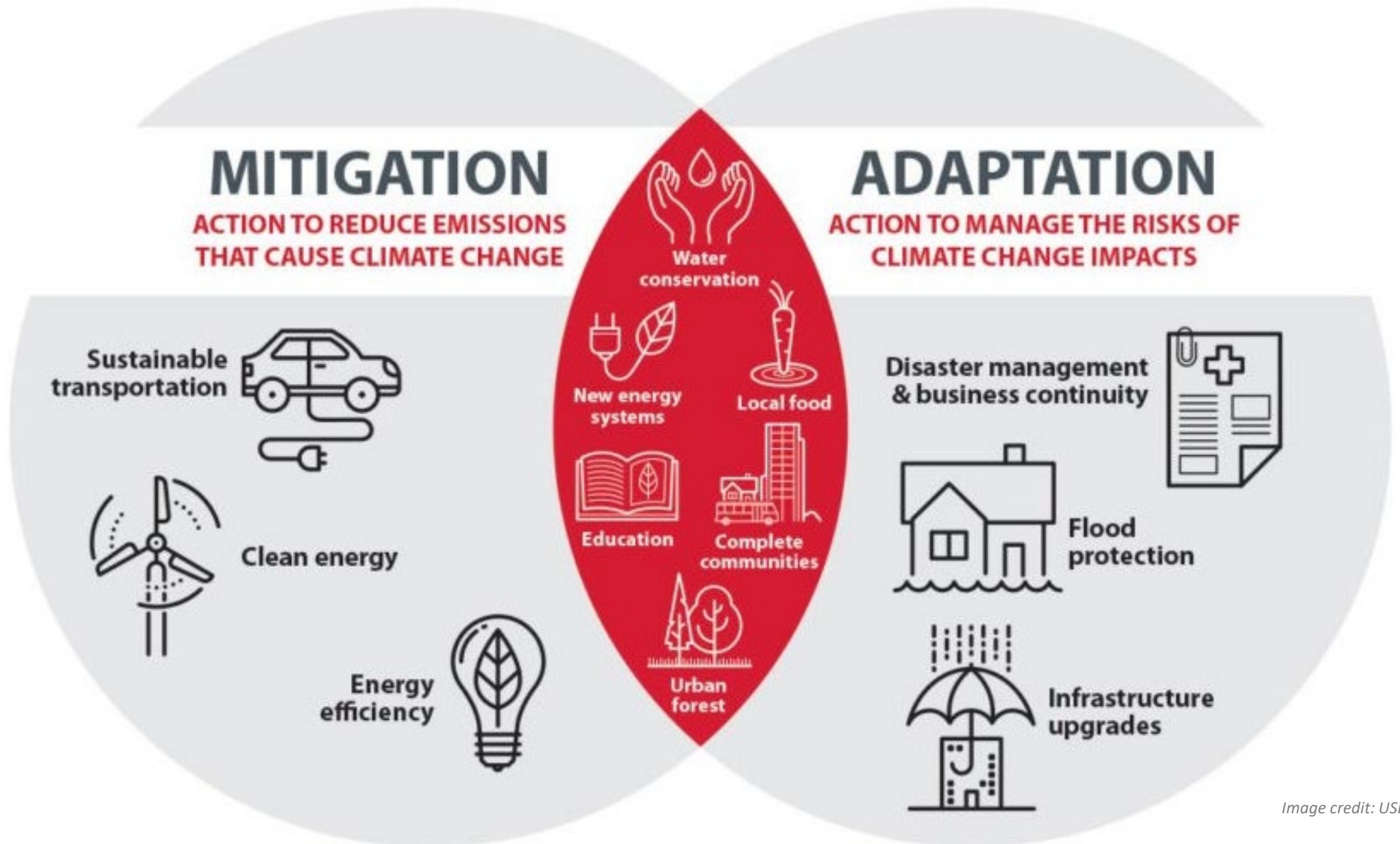


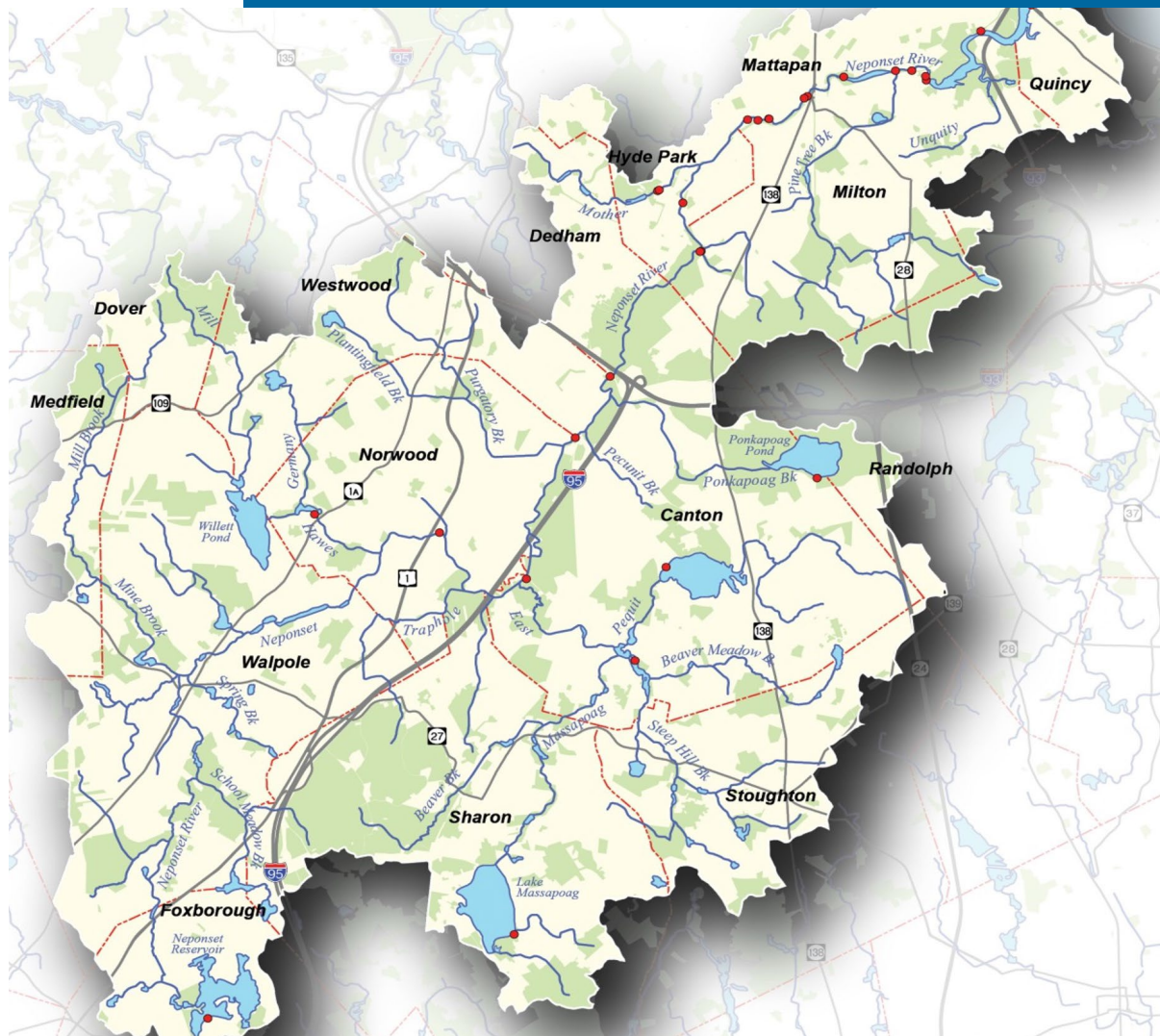
Image credit: USDA NRCS <https://www.nrcs.usda.gov/programs-initiatives/watershed-programs>



Communities Taking Action: Project Overview







Working Together: Community Collaboration for Regional Climate Resilience

Van Du, Assistant Director of Environmental Planning
Metropolitan Area Planning Commission

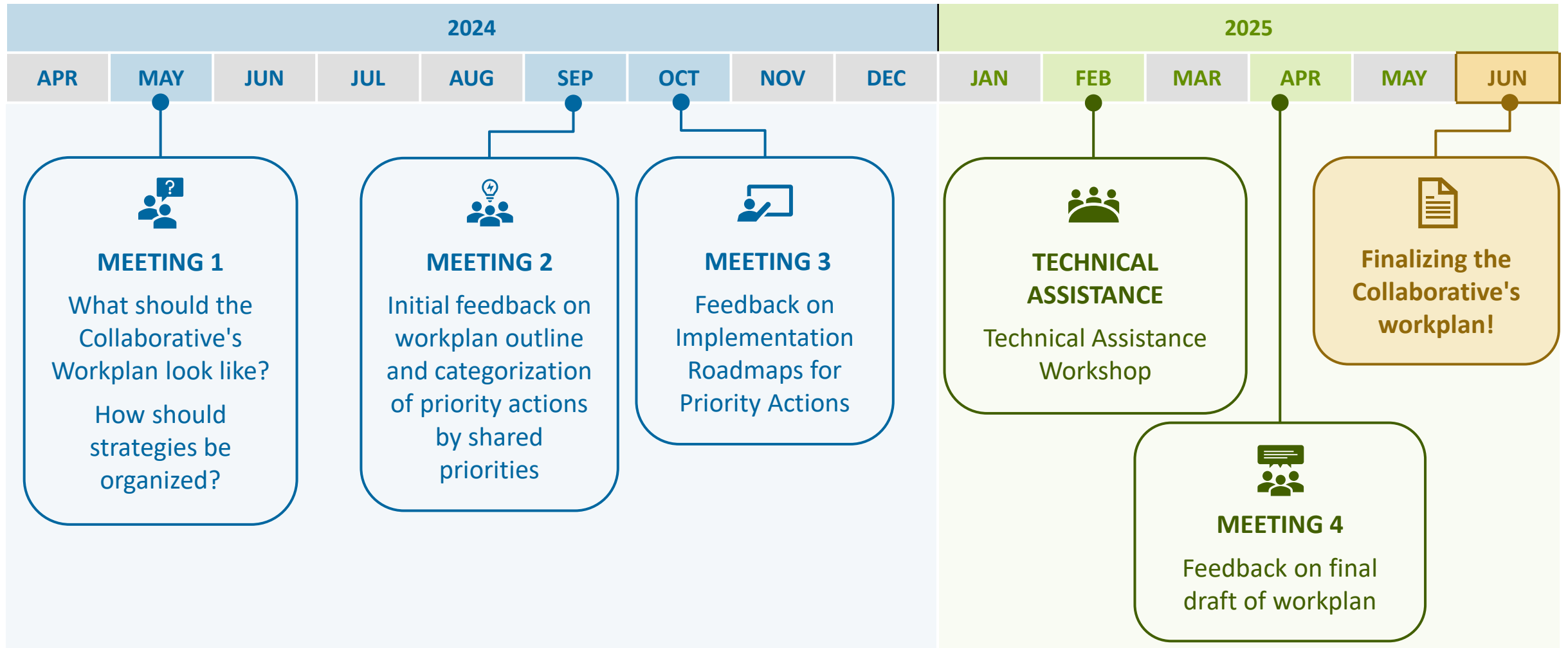


Resilient Neponset Climate Collaborative | Vision & Framework

- Fostering **partnerships and collaborations**
- Determining **collective goals and priority actions** to be implemented across communities, particularly **through the lens of equity**
- Identifying and pursuing technical assistance and funding opportunities to support **watershed-scale climate resilience projects**
- Supporting **implementation of projects**



Collaborative's Work Planning Timeline



The Collaborative's Workplan

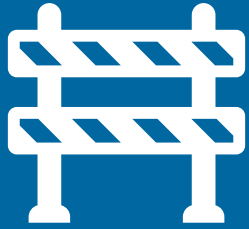


- I. Overview of the Resilient Neponset Climate Collaborative
- II. Priority Implementation Actions and Roadmaps
- III. Outreach and Engagement Plan

- A working document! **Outlining the Collaborative's work** for the next three to five years
 - three (3) **strategic focus areas**
 - nine (9) **priority implementation actions**
- **Centering equity and environmental justice** in the Collaborative's implementation priorities.



Organizing the Collaborative's Priority Actions



Infrastructure
Improvements



Natural
Resources,
Ecological
Restoration and
Open Space
Preservation



Policy and
Planning



Evaluation Criteria for the Collaborative's Priority Actions



Centering **Equity**



Co-benefit potential



Level of **implementation effort** (for municipal staff)



Cost to implement (for municipality, businesses and/or residents)



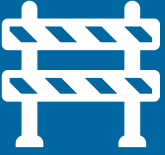
Alignment with other **local efforts** (e.g., projects that are planned or completed)



Potential for **public support** and **community engagement**



Priority Actions for Infrastructure Improvements



1. **Assess/upgrade (aging) municipal infrastructure** (including dams, culverts, stormwater, water/wastewater treatment plants, pump stations, etc.) to handle more extreme storm events (current 500-year or greater) such as intense rainstorms, snowstorms and flood events. and other impacts of climate change.
2. **Analyze future threats** to critical infrastructure, facilities and residential areas based on projections of sea level rise and intense storms.
3. **Perform vulnerability study** on transportation, bridges, and culverts affected, or potentially affected, by future flooding, including potential evacuation routes.





1. **Creation of pocket parks and implementation of street-to-park conversions to enhance local cooling.** Integrate opportunities to add new green space into street improvement projects. Provide spray parks in neighborhoods currently in "hot spot" areas or lacking resources (such as cooling centers, etc.)
2. **Protect and promote the preservation and creation of wetlands,** including restoration of filled and disturbed and degraded wetlands and floodplain areas.

Priority Actions for Policy and Planning



1. **Minimize impervious surface through revising relevant bylaws, zoning, and parking requirements.** Require new development to incorporate a certain percentage of pervious area.
2. **Conduct a bylaw review across the region** to identify regulations that address regional vulnerabilities and priorities and support towns in implementation of regulatory updates.
3. **Incorporate green infrastructure in all new development and redevelopment projects.** Create educational programs to promote green infrastructure techniques in landscaping practice.
4. **Require low impact development and water conservation techniques in new development and redevelopment** to reduce water usage and add connections to the surrounding open space network.



Implementation Roadmap Details



Recommended Implementation Lead and Support



Key Implementation Next Steps



Implementation Partners



Potential Co-benefits



Improving Equity



Potential Funding Sources



Measures of Success



Priority Action 4: Creation of pocket parks and implementation of street-to-park conversions to enhance local cooling. Integrate opportunities to add new green space into street improvement projects. Provide spray parks in neighborhoods currently in "hot spot" areas or lacking resources (such as cooling centers, etc.)

Description: Expanding green space can reduce urban heat, boost air quality and mitigate flood waters. The aim of this priority action is to increase the Neponset River Watershed region's green cover by strategically planting (and maintaining) trees and plants in priority locations, such as neighborhoods that are susceptible to high heat. In addition to absorbing heat, pocket parks can also serve as stormwater buffers. These public spaces will be designed to accommodate additional infrastructure (for example, temporary spray units and cooling centers) to provide cooling to community members. This will build upon ongoing tree maintenance programs, while prioritizing native and climate-resilient tree species.

Recommended Implementation Lead and Support

- Parks and Recreation OR Public Works OR Engineering
- Forestry department (where applicable)
- Designated Tree Warden
- Planning
- Conservation
- Public Works
- Engineering
- Board of Health
- Board of Selectmen- Delegation (primary))
- City Council

Key Implementation Next Steps

- Conduct a community-wide assessment of available and potential sites to add new green spaces (including pocket parks or 'parklets', street-to-park conversions, spray parks, shade structure, etc.)
- Identify top sites for project implementation in the next 3-5 years. For site selection, consider identified "hot spot" areas (e.g., concrete-heavy parking lots, areas with lack of tree canopies, etc.), as well as flood-prone areas.
- Select native and climate resilient species for planting and maintenance.
- Evaluate capacity and feasibility of adding cooling features such as shade structures or temporary 'spray' infrastructure in new green spaces as well as existing public spaces such as town libraries, school fields/playgrounds.
- Conduct cost assessment and budget for selected projects.

Implementation Partners

- Mass Audubon
- Massachusetts Land Trust Coalition
- Metropolitan Area Planning Council
- Neponset River Watershed Association
- Local environmental advocacy groups and community groups
- Arbor Day Foundation
- Speak for the Trees (Boston)
- The Trustees of Reservations
- Boston Food Forest Coalition
- Landscape architects/planners

Potential Co-benefits	• Reduced air pollution. • Increased aesthetics and walkability in public spaces • Improved stormwater management and flood control (runoff) • Increase in compliance with municipal regulations (e.g., stormwater regulations) • Increase in local wildlife and biodiversity • Reduce urban heat island impacts • Increase in opportunities for passive recreation • Increase in market values of homes due to better neighborhood aesthetics
Improving Equity	• Prioritize native tree planting and heat mitigation strategies in identified ‘hot spots’ (i.e., areas that experience rapid increase in the hottest temperatures) • Prioritize installation of pocket parks/green spaces in identified densely populated areas, priority population neighborhoods and/or environmental justice communities (EJ) to ensure equitable access to benefits of cooling solutions. • Involve community members in the planning and decision-making processes to ensure that their needs and concerns are addressed. • Ensure educational resources and outreach are available in multiple languages • Proactive engagement of communities, especially identified priority populations, in the planning and assessment as well as during implementation
Potential Funding Sources	• Department of Conservation and Recreation (DCR), Cool Corridors Grant Program • Executive Office of Energy and Environmental Affairs (EEA), Municipal Vulnerability Preparedness (MVP) Action grants • Department of Conservation and Recreation (DCR)- Land Conservation Assistance Grants • National Fish and Wildlife Foundation • Community Preservation Corporation (CPC) grants
Measures of Success	• An increase in percentage of green space coverage • Increased usage of outdoor spaces (community gatherings and events, etc.). Increase in availability of sites to host outdoor meetings • Increased availability of cooling site options (and equitable distribution of these sites across the community), and increased usage of cooling sites.



We would love your input!

- How can we ensure public participation and support for successful implementation?
- What resources or assistance does your community need with engagement efforts?



Next Step:

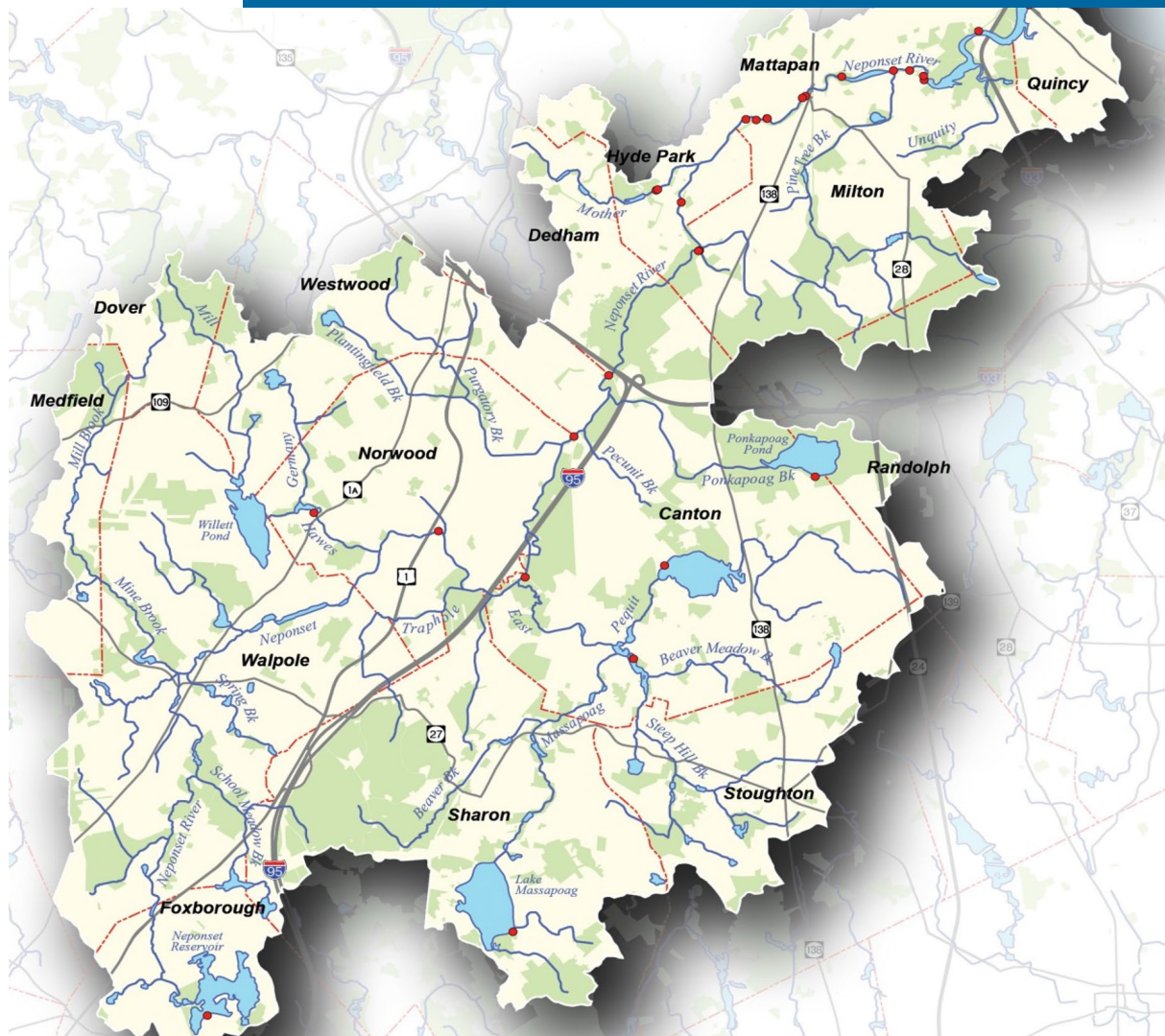
- Stay tuned for the Collaborative's Workplan on the NepRWA website.





What are your questions?





Working Towards Community-Led Resilience

Karen Groce Horan, Community Engagement Strategist

Neponset River Watershed Association



Resilient Neponset Community Advisory Group



- Many of the **watershed towns and municipalities** represented
- **Community based organizations** included
- **18** Members
- **7** meetings over the 2 year project
- Mostly **on-line**, one **hybrid** and last **in-person**
- Next stage **will be**



Resilient Neponset Community Advisory Group



Image Credit: NOAA

OUR First Year MEETING TOPICS

Climate Change

- Local Impacts and Consequences
- Green Infrastructure – Heat
- Building a framework for collaborative resilience



Aligned Priorities Municipalities and Community - Extreme Heat



More Green Space



Dedicated programming/clear messaging to establish and direct people to cooling facilities



Nature based strategies to reduce local temperatures



Keeping cool during heat waves



Improving communication from municipalities ahead of extreme conditions



Image Credit: American Academy of Family Physicians



Image Credit: EPA



Photo Credit: Jeffrey Thompson/MPR



Resilient Neponset Community Advisory Group



OUR Second Year MEETING TOPICS

- Community Engagement and community involved planning
- Communities at work – Malden & Braintree
- Moving Forward



Engaging with our Communities

**Community-driven
planning respects
and honors
these values:**

Source: Danley, K. S., & Ellison, M. L. (1999). *A handbook for participatory action researchers*.



Power-Sharing



Mutual respect for experience / expertise



Informed decision-making



Maximum involvement



Relationship building



COMMUNITY-DRIVEN PLANNING

A definition

The process by which residents of vulnerable and impacted communities **define for themselves the challenges they face**, and the **solutions most relevant** to their unique assets and threats.

- Adapted from National Association of Climate Resilience Planners

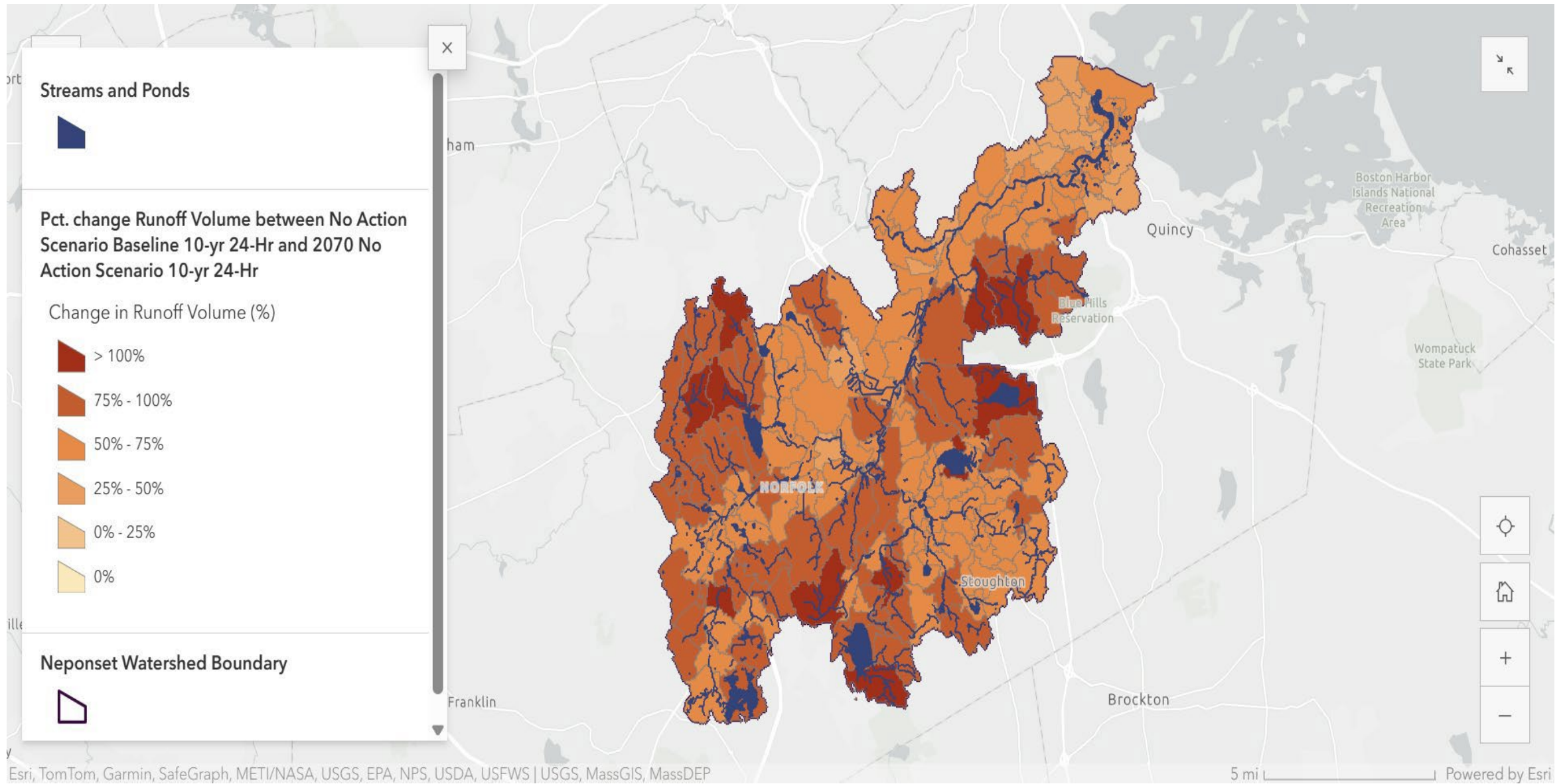


Malden River Works



Braintree Catchment

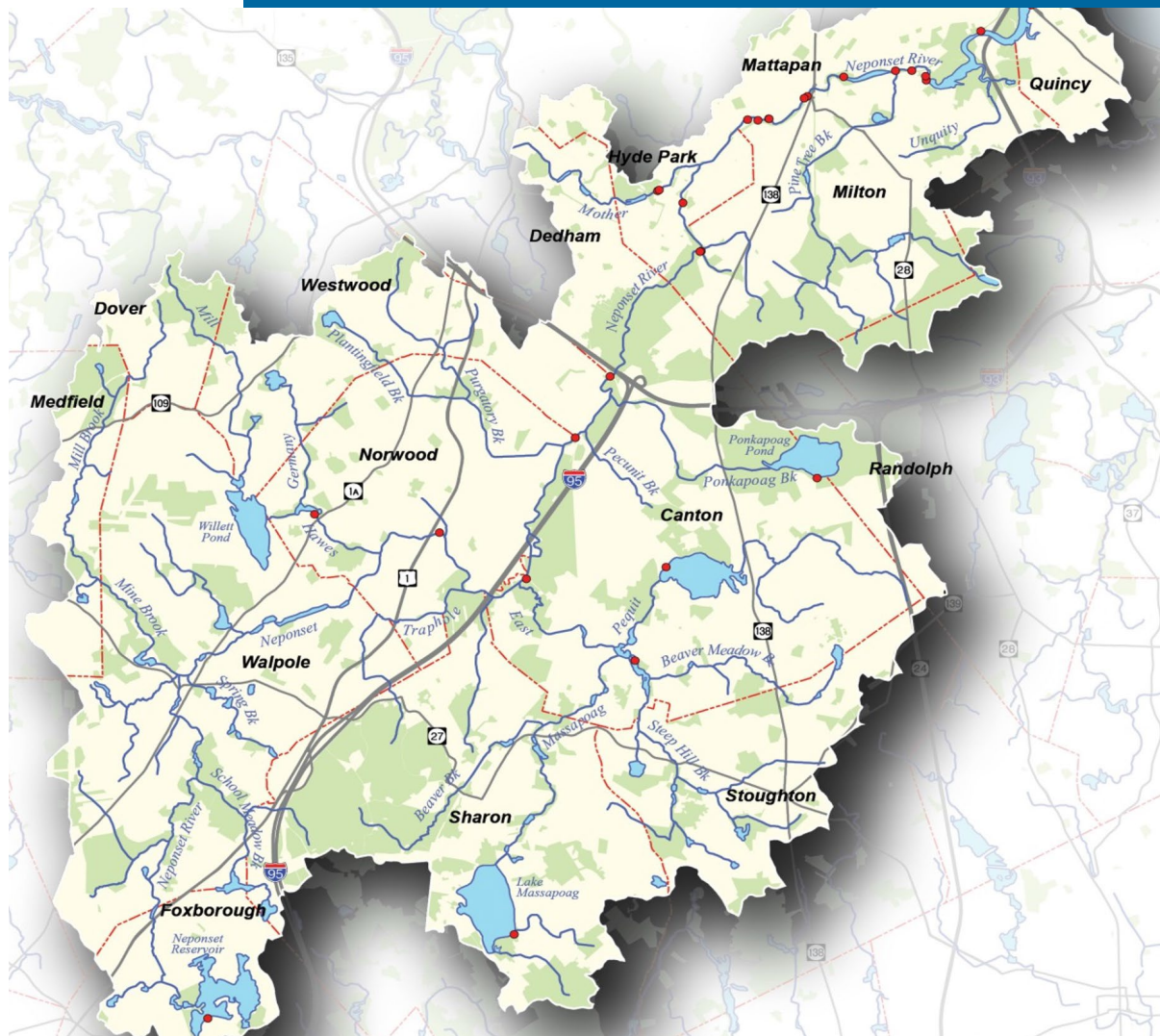






What are your questions?





Closer Look: Using the Neponset River Flood Model to Analyze Community Needs

Indrani Ghosh, PhD, Practice Leader
and
Janet Moonan, PE, Senior Project Manager
Weston & Sampson



How much rain should we prepare for?

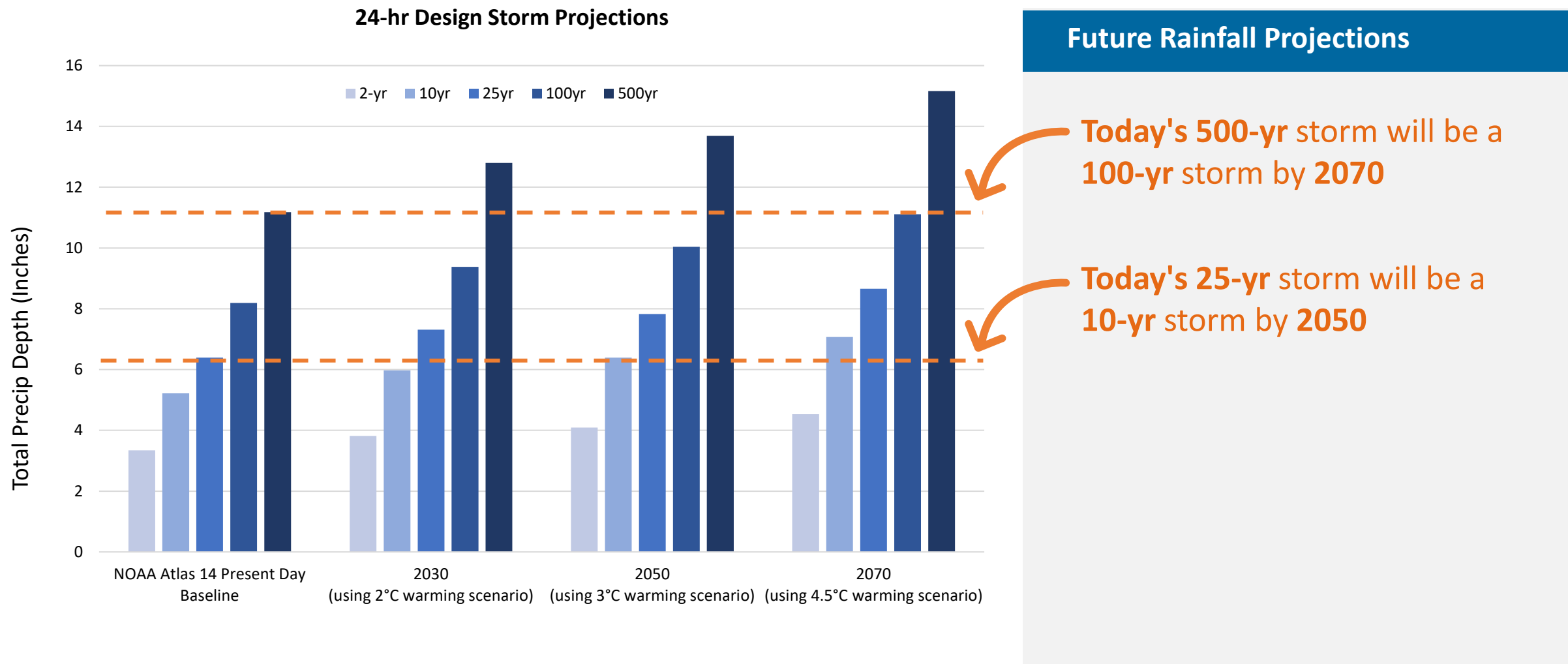


Image credit: Weston & Sampson Source: NOAA Atlas 14, Climate Resilience Design Standards & Guidelines, Climate Resilience Design Standards Tool. https://resilientma.org/rmat_home/designstandards/

Neponset River Watershed Flood Model

Developed in 2022/2023

Updated in 2023/2024

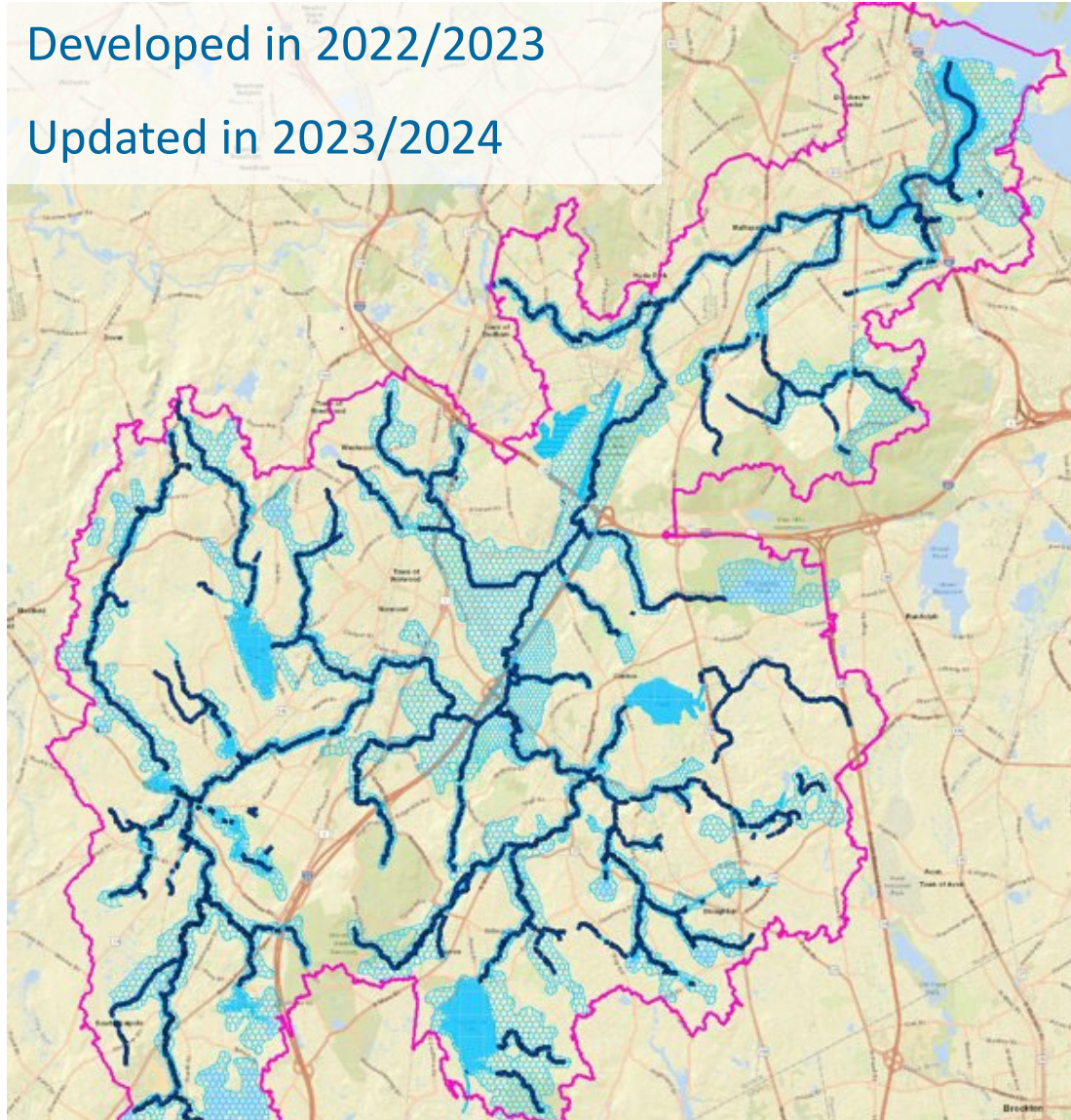


Image credit: Weston & Sampson

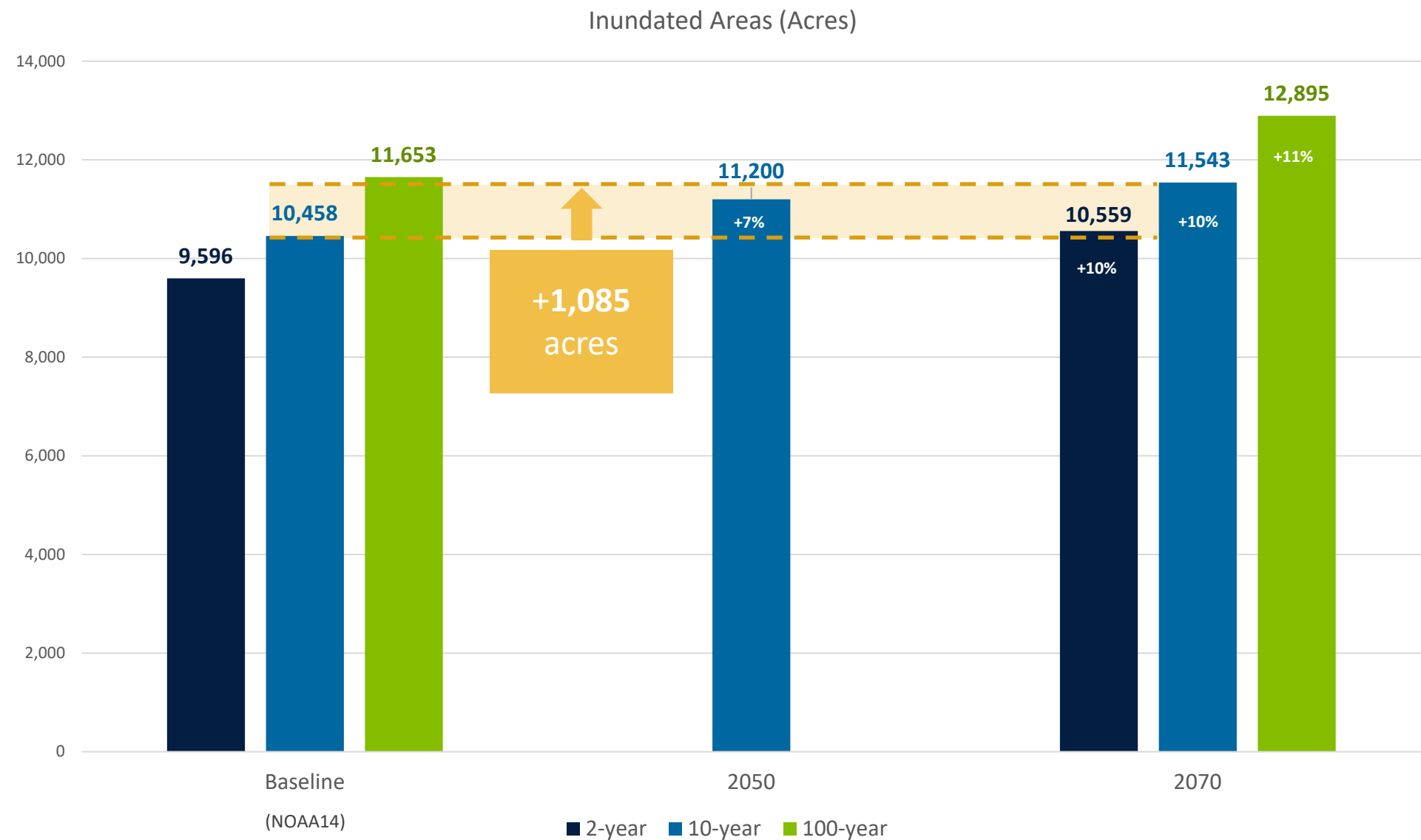
Key Statistics

-  117.2 square mile area
-  157,000 linear feet of Neponset River
-  594,000 linear feet of tributaries
-  811,000 linear feet of conduits/pipes
-  50 dams
-  388 culverts

Watershed Wide Impacts – Increase in Flooded Area

What happens in the future if we don't take action to reduce flooding?

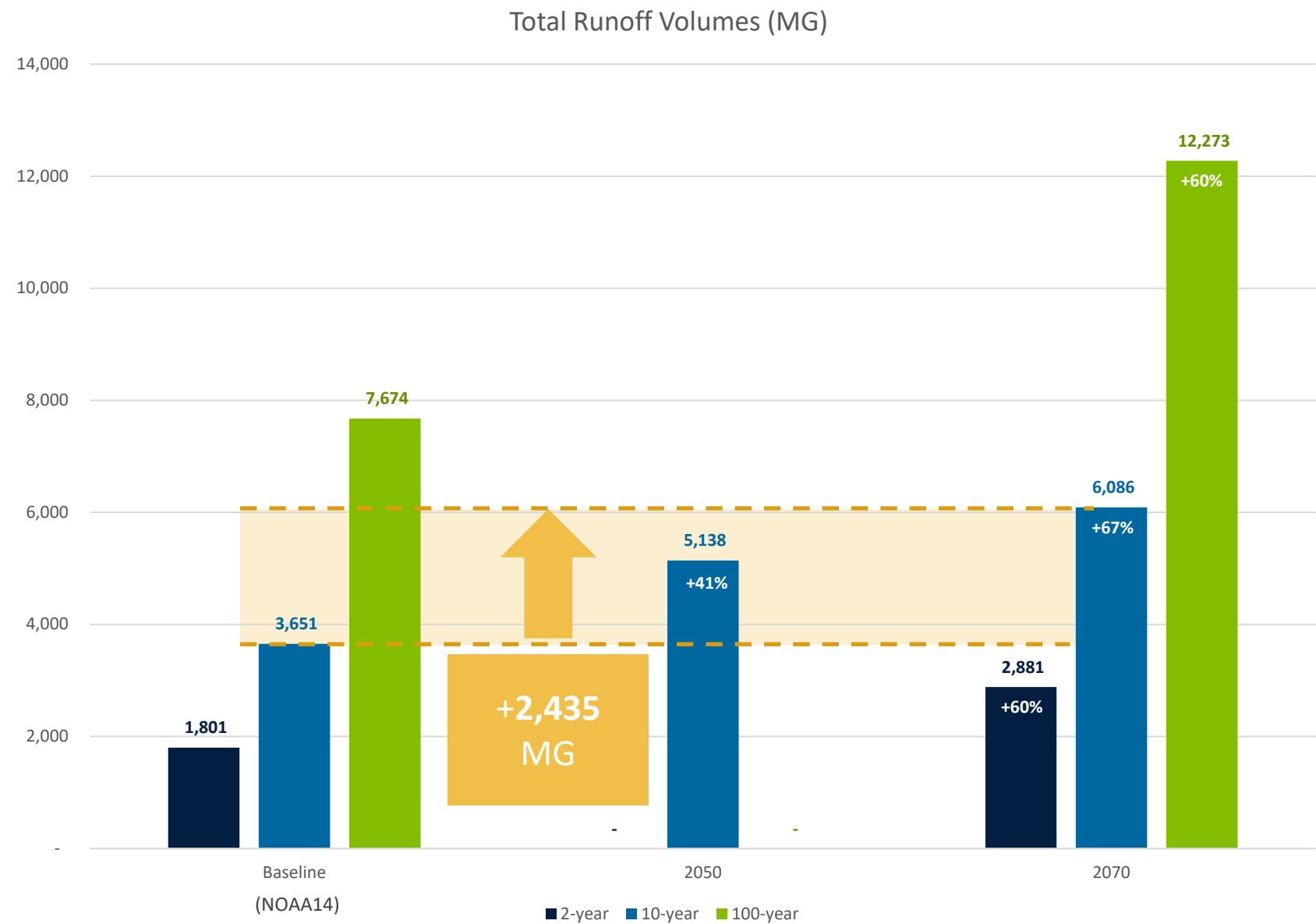
Approx. **1,085 additional acres** are likely to be flooded from the **10-yr storm by 2070** compared to present day (baseline, NOAA14)



Watershed Wide Impacts – Increase in Volumes

What happens in the future if we don't take action to reduce flooding?

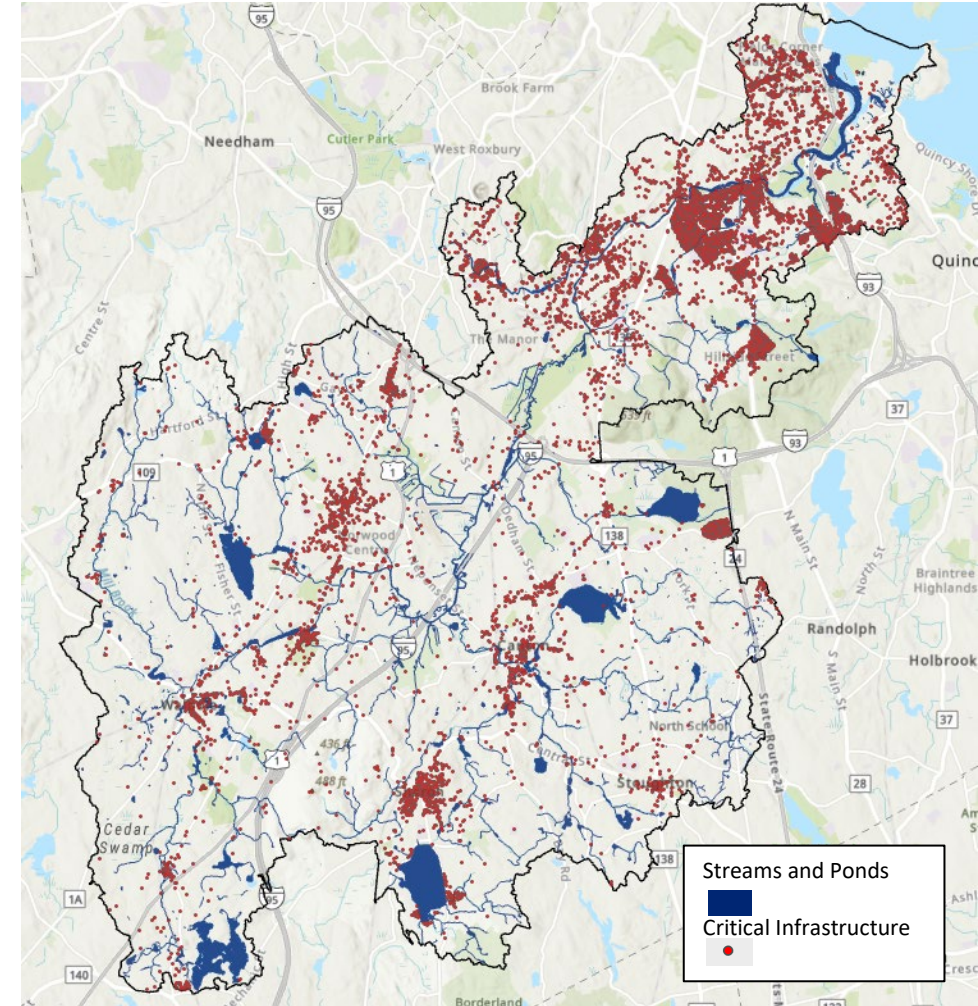
Approx. **2,435 MG** of additional runoff volume is likely to be generated from the **10-yr storm by 2070** compared to present day (baseline, NOAA14)



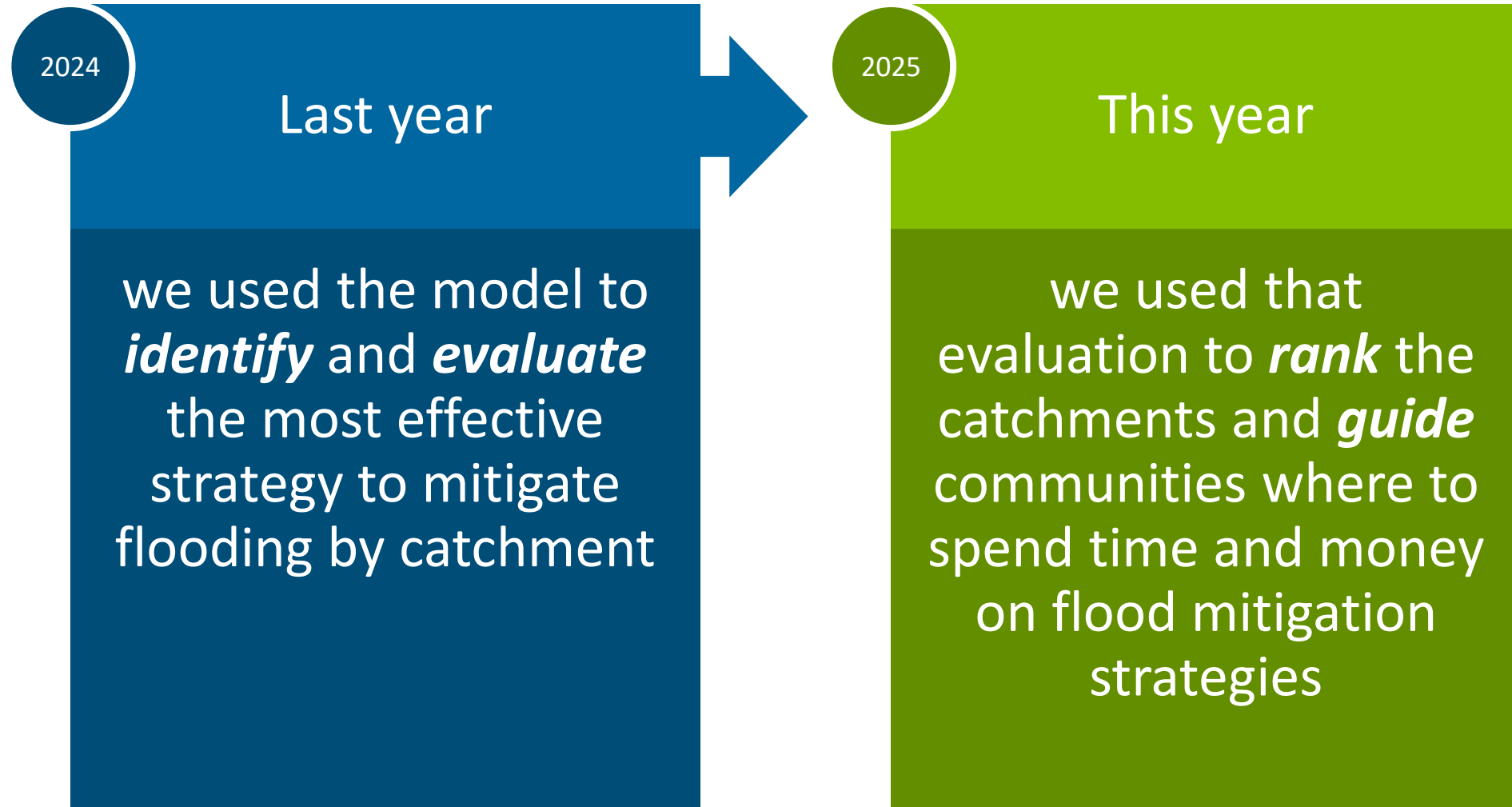
How flooding affects critical facilities...

There are ~**4,400** critical assets, which are divided into **26** categories.

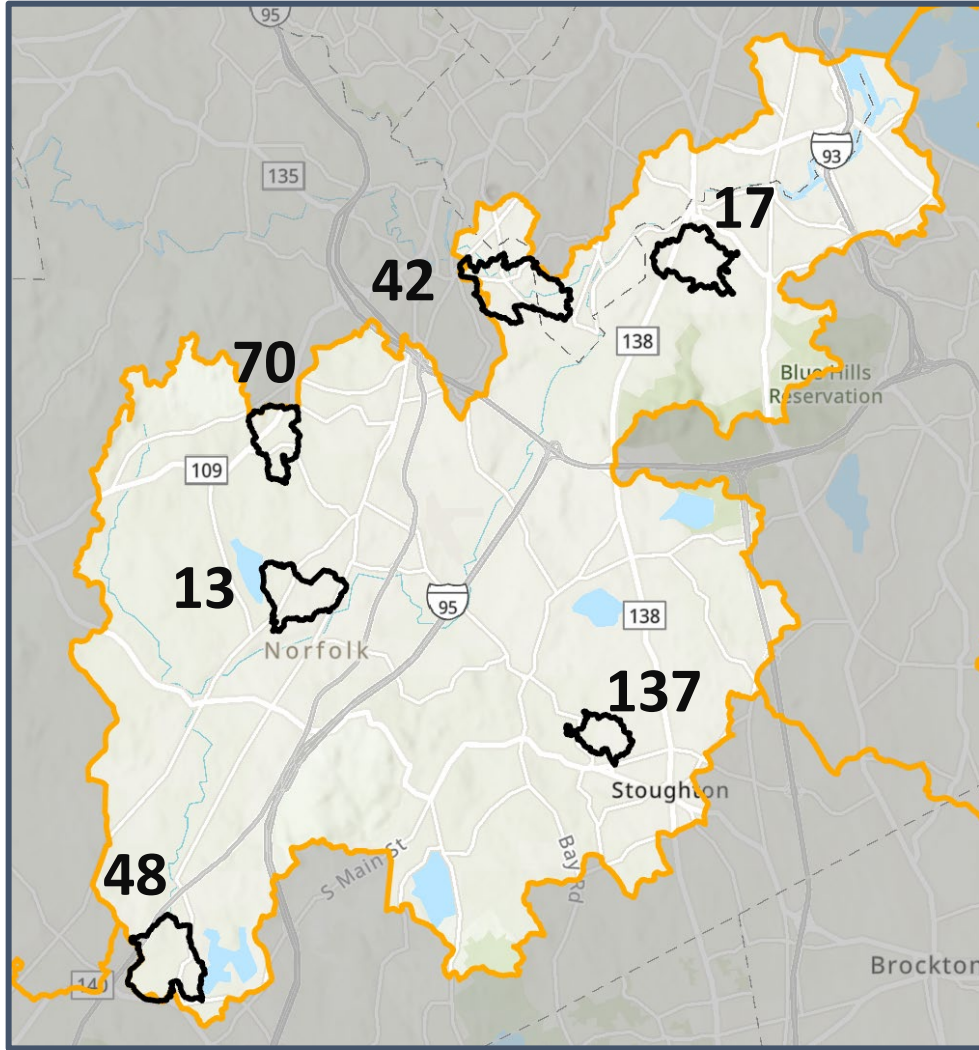
- Airports
- Child Care Facilities
- Communication/Cell & Radio Towers
- Community Health Centers
- Courthouses
- Dams
- Elder Care Facilities
- Emergency Operation Centers
- Energy
- Fire Stations
- Hospitals
- Housing Authority
- Libraries
- Long-Term Care Facilities
- MBTA Infrastructure/Transit
- Pharmacies
- Places of Worship
- Police Stations
- Power Plants
- Public Water Supply Infrastructure
- Recreation
- Schools
- Sewers and wastewater infrastructure
- Supermarkets
- Town and City Halls



How are we Prioritizing Interventions?



Priority Areas Selected



13 Walpole and Norwood

17 Milton

42 Dedham and Boston

48 Foxborough

70 Westwood

137 Stoughton and Canton



Flood Mitigation Goals

Catchment	Town	Mitigation Target (MG)*	Football Fields of Storage**	Impervious Cover Reduction (%)	Pervious Storage (in)	Impervious Storage (in)
13	Walpole and Norwood	9.4	22	60%	2.1	2.5
17	Milton	8.4	20	49%	2.0	2.1
42	Dedham and Boston	17.2	40	66%	1.8	2.6
48	Foxborough	11.7	27	49%	1.6	1.8
70	Westwood	8.5	20	65%	1.8	2.8
137	Stoughton and Canton	5.8	14	52%	1.9	2.1

* 2070 – Baseline 2-year 24-hour storm

** Impervious storage equivalent in terms of football fields filled to a depth of 1 foot

What can we do to reduce flooding?

Reduce Effective Impervious Cover



Rain Gardens

Photographs from NepRWA



Bioswale (long rain garden)

Photograph from EPA Publication

What can we do to reduce flooding?

Reduce Effective Impervious Cover



Pervious Pavement

Photographs (left two) from U.S. EPA publications (right from Wikipedia)



What can we do to reduce flooding?

Create More Storage in Pervious Spaces



Floodable Parks/Fields

Image from Weston & Sampson



Protect / Construct Wetlands

Photograph from NepRWA



What can we do to reduce flooding?

Create More Storage on Impervious Cover



Rain Barrels and Cisterns

Photographs from U.S. EPA publications



Subsurface Storage

Photograph from Weston & Sampson



What can we do to reduce flooding?

Combine solutions!



Green Streets

Image credit: Weston & Sampson

Image credit: Weston & Sampson

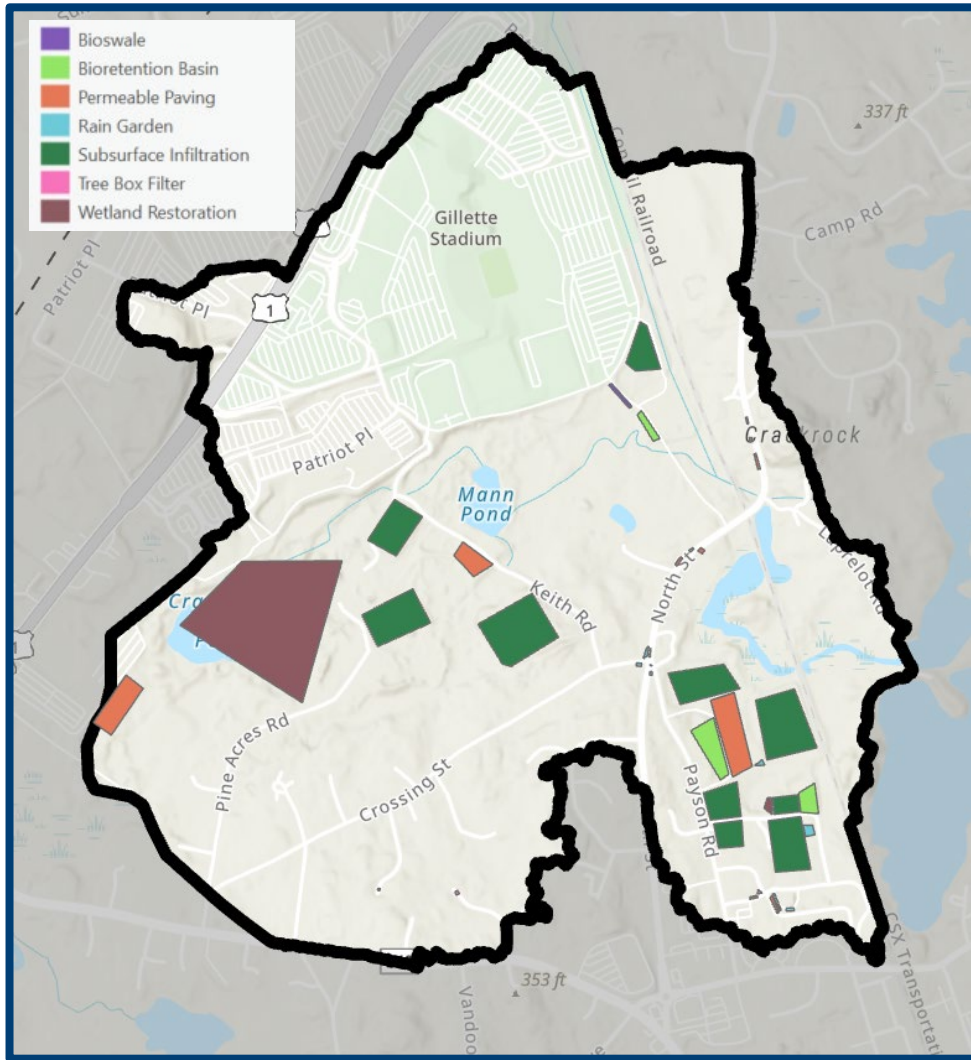


Additional Benefits

- ✓ Improve local **water quality**
- ✓ Reduce localized **temperatures**
- ✓ Improve/create **wildlife habitat**
- ✓ Foster **biodiversity**
- ✓ Add **pollinators**
- ✓ Improve local **air quality**
- ✓ Sequester **carbon**
- ✓ **Visually pleasing**
- ✓ **Reduce noise** from traffic/roads

- ✓ Create **job opportunities**
- ✓ Improve physical and mental **health of community**
- ✓ Enhance/create new **recreational opportunities**
- ✓ Create outdoor spaces (a.k.a. "**placemaking**")
- ✓ Increase local **property values**
- ✓ Improve **public safety**

Green Opportunities in Foxborough's Catchment



- 1 Opportunity for bioswales
- 3 Opportunities for bioretention basins
- 8 Opportunities for permeable paving
- 10 Opportunities for rain gardens
- 10 Opportunities for green+ subsurface chambers
- 6 Opportunities for tree box filters
- 2 Opportunities for wetland restoration

Estimated Potential Flood Mitigation Volume

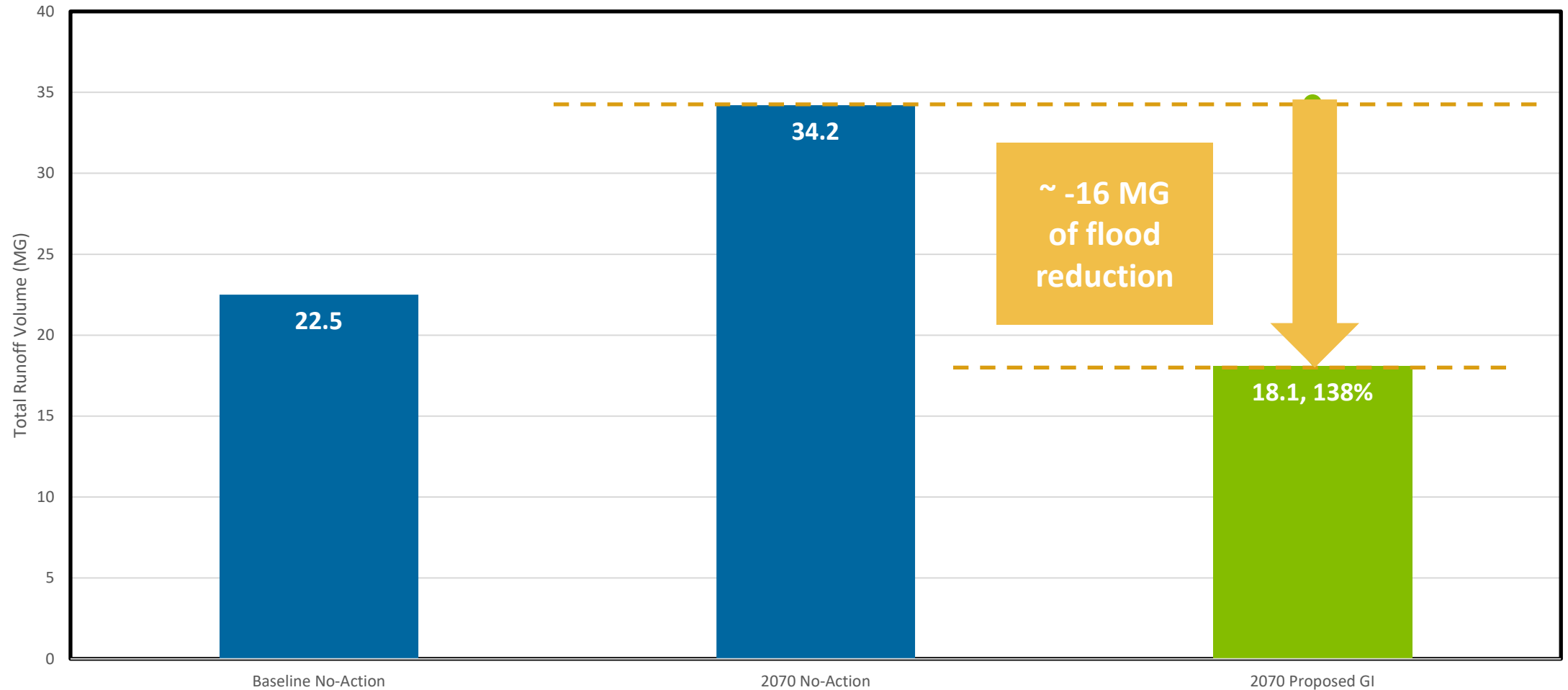
18.2 MG

Effective Impervious Area Reduction

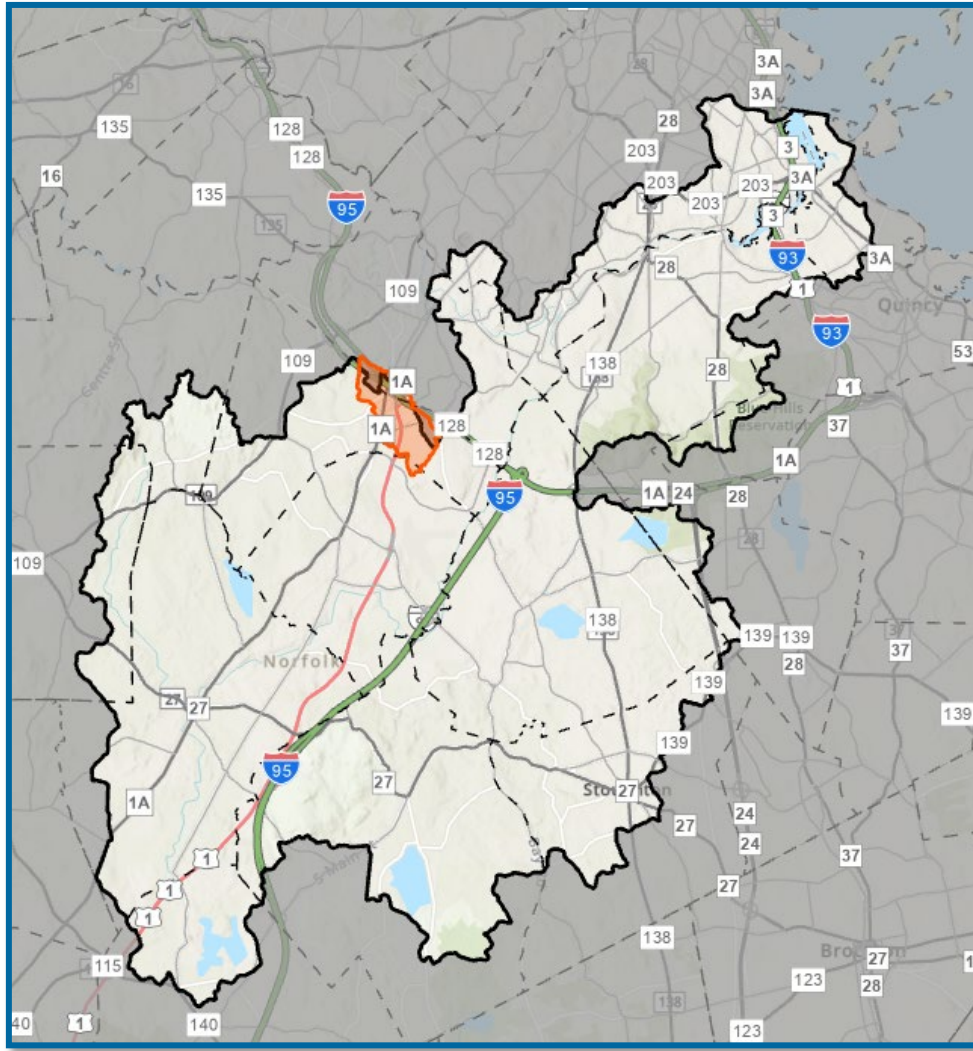
453 acres

Green Opportunities Example Model Results

Foxborough, 48 | 2070 2-year



Westwood Catchment



We also selected one priority area within the Neponset River watershed for focused evaluation of high-intensity short-duration storms and green + grey strategies.



Weston & SampsonSM



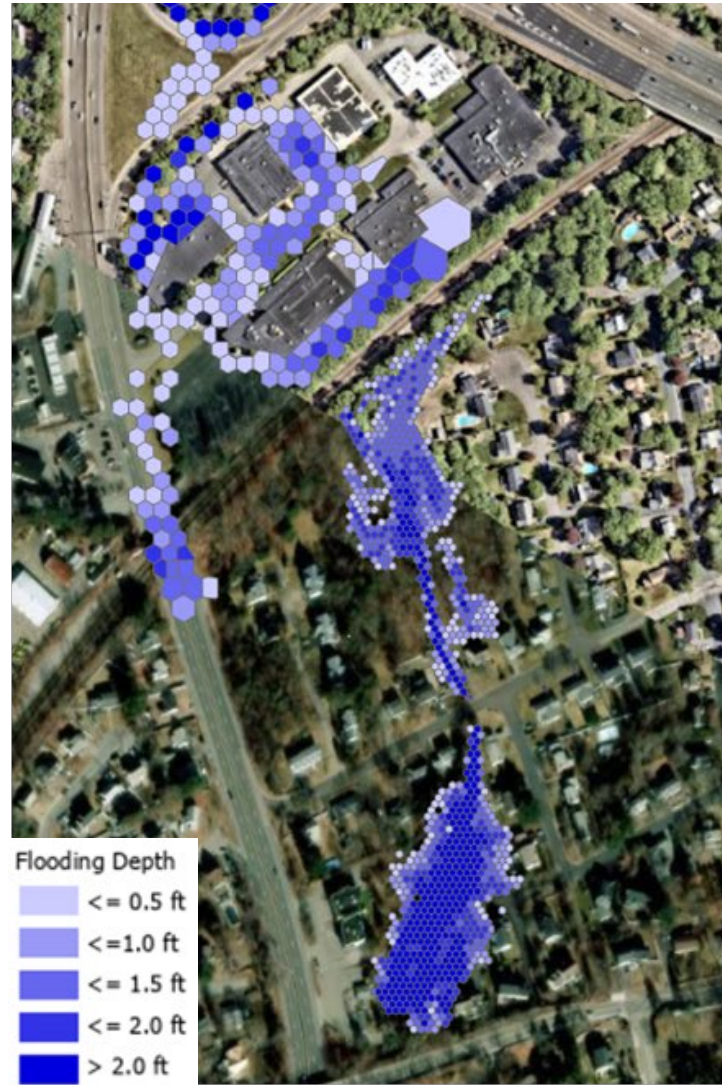
Storm Duration Comparisons

*Flooding extents and depths during the
2070 100-year event*



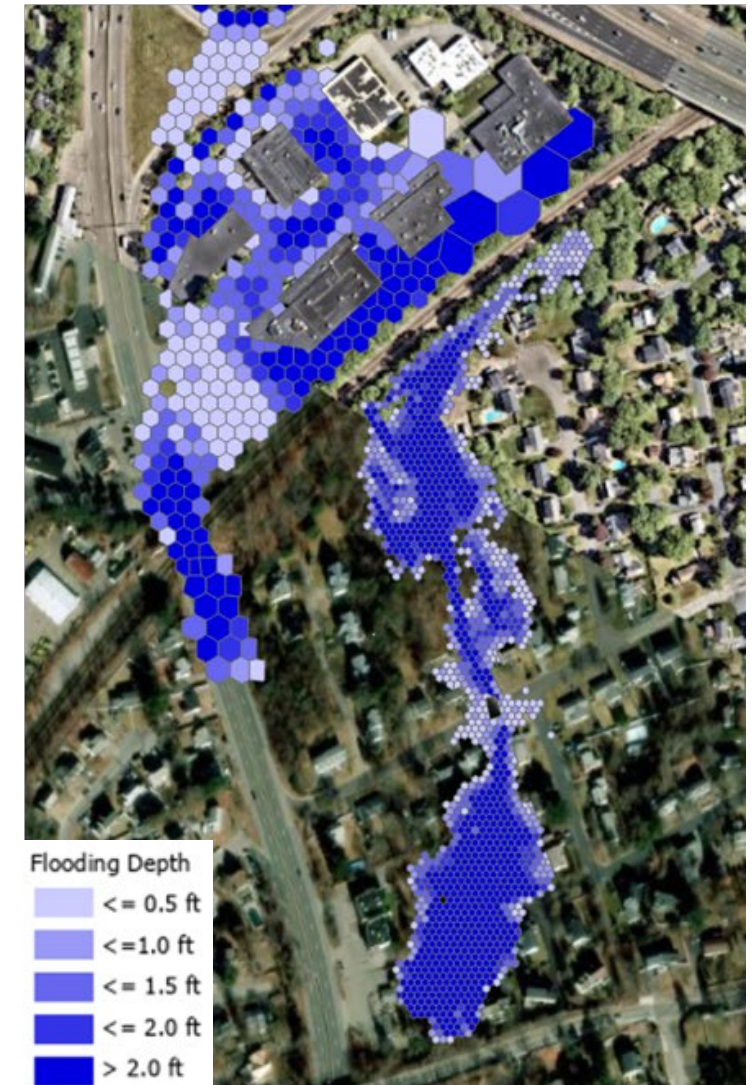
2-Hour Storm

Rainfall depth: 5.08 in; Peak intensity: 2.5 in/hr



6-Hour Storm

Rainfall depth: 7.46 in; Peak intensity: 1.2 in/hr



24-Hour Storm

Rainfall depth: 11.32 in; Peak intensity: 0.7 in/hr

Green + Grey Practices Evaluated

Catchment Wide

- Nature-based solutions
- Grey – Storage
- Grey – Infiltration

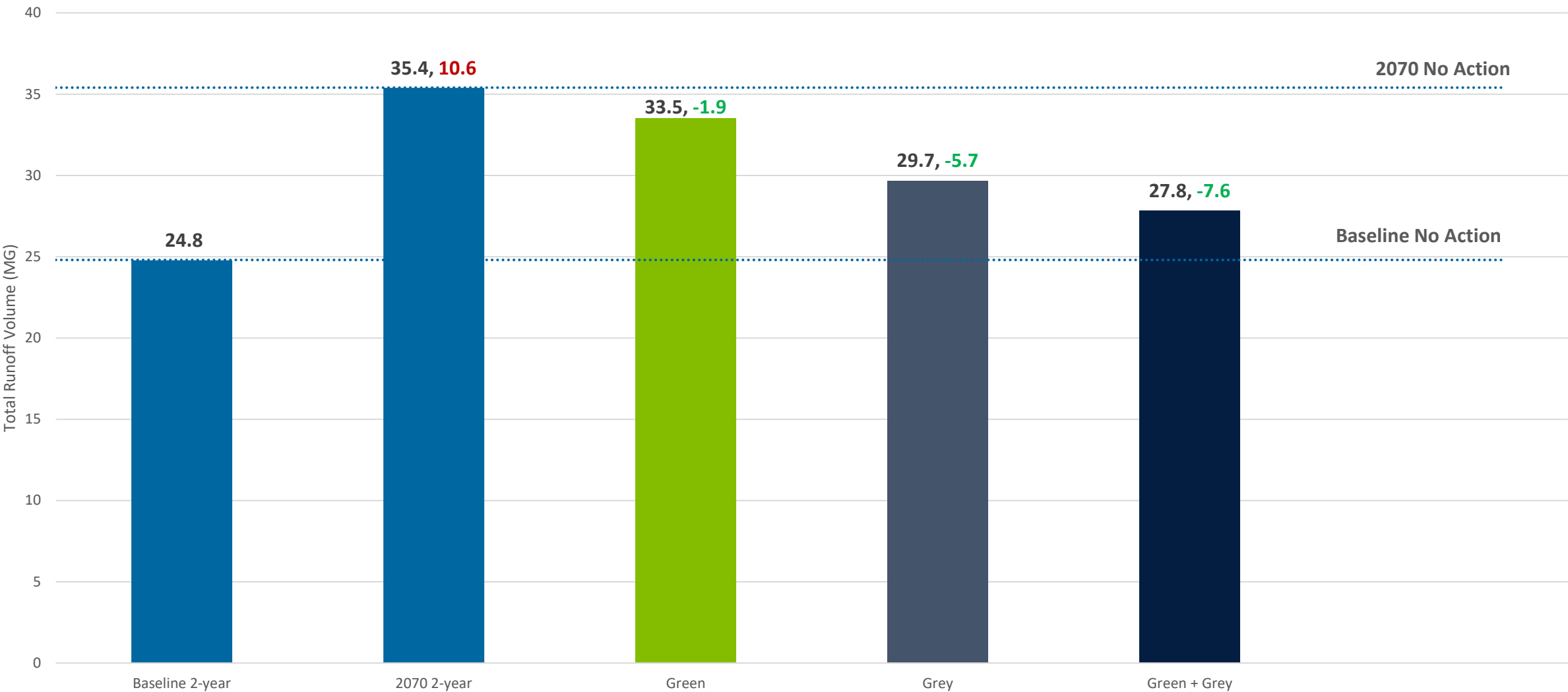


Site Specific

- Grey – Additional catch basins
- Grey – Infiltrating catch basins
- Grey – Drain upsizing
- Grey – Drain rerouting



Green, Grey, and Green + Grey Model Results for Westwood 2070 2-year



Increase from Baseline No-Action, Decrease from 2070 No-Action



Key Takeaways

- 1 Flooding is predicted to **worsen in the future.**
- 2 Where and when it floods will **depend on where you live in the watershed.**
- 3 **There are actions we can take** to reduce flooding. Actions should be **prioritized** based on various factors.
- 4 Significant flood reduction will require **changes be made across all communities in partnership with the state and private entities.**

Grey + Green + Policy + Floodproofing + Retreat = Mitigation





What are your questions?





Final thoughts:

How would you like to be involved?

What would you like to see your city or town do?





Thank you!

Sign up for updates!
[Neponset.org/climate](https://neponset.org/climate)

Contact snyder@neponset.org