



How Can Natick Build Community Resilience?

Wednesday, March 22, 2023

Presented by:

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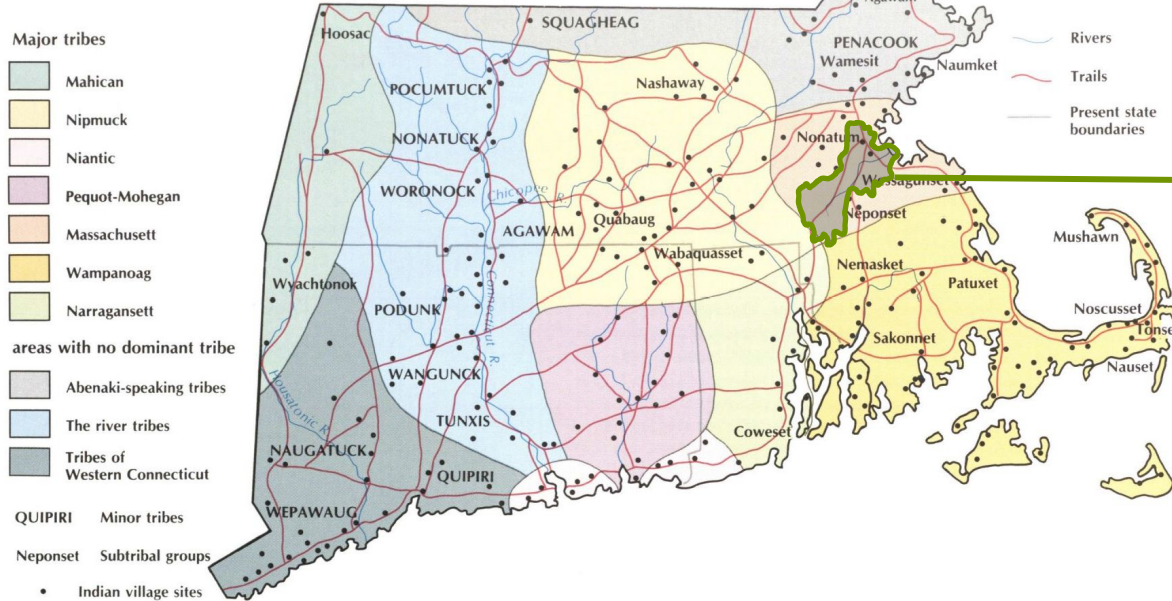
Agenda

- Introduction
- Background on Climate Change in Natick
- Actions Natick is taking
- Next steps/recommendations



Introductions

NATIVE SETTLEMENTS AND TRAILS c.1600–1650



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

CRWA's mission is to protect, restore, and enhance the Charles River and its watershed through science, advocacy, and law.

- Founded in 1965 by concerned citizens
- One of the oldest watershed associations in the country
- Work with EPA, state agencies, and 35 watershed municipalities
- Interdisciplinary staff
- Program Areas:
 - Climate Resilience
 - Education and Outreach
 - River Restoration
 - River Science
 - Stormwater Solutions

News

'We don't have enough trucks'; snow plow driver shortage may cause issues ahead of snowstorm

Updated: Jan. 27, 2022, 11:38 a.m. | Published: Jan. 27, 2022, 11:37 a.m.

Remnants Of Tropical Storm Fred Trigger Flash Flood Warnings For Much Of Mass.

Updated August 19, 2021

By [WBUR Newsroom](#)



Cars drive through a flooded Stuart Street during the heavy rain from Tropical Storm Elsa on July 9, 2021. (Jesse Costa/WBUR)

'Holy flash flooding': Massachusetts residents share photos of golfball-sized hail, lightning strikes and street flooding from Sunday night storm

Updated: Jun. 29, 2020, 11:02 a.m. | Published: Jun. 29, 2020, 11:02 a.m.



Norwood and many other Eastern Massachusetts communities saw the brunt of severe storms that swept through the state Sunday. Here, a car is pictured submerged under water. (Courtesy Norwood Police Chief Bill Brooks)

NEWS > WEATHER

Massachusetts heat advisory: Heat wave to become official Monday as temps near 100

Three straight days of 90-plus degrees

 Boston 25 News

Mayor Wu extends heat emergency in Boston as sizzling summer scorcher continues

BOSTON — Mayor Michelle Wu on Monday extended the heat emergency in ... that are in the forecast to start the work week, according to Wu.

4 hours ago



DROUGHT

'Never Seen Anything Like This': Drought Dries Up Areas of Charles River

In Millennium Park in Boston's West Roxbury neighborhood, the water level of the Charles River has dropped about six feet, revealing many spots that are normally underwater

By Bianca Beltrán • Published August 2, 2022 • Updated on August 3, 2022 at 8:44 am



Severe drought conditions in much of Massachusetts are making an impact.

Trending Stories



'We dread summers': dangerous 'fire weather' days are on the rise in northern California



By John Upton

Follow @johnupton

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Published: November 9th, 2021

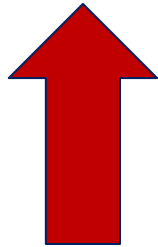
By John Upton, Climate Central and Maanvi Singh, The Guardian



Climate Change

Climate Change – the *long-term shift* in global or regional climate patterns. Often climate change refers specifically to the *rise in global temperatures* from the mid-20th century to present.

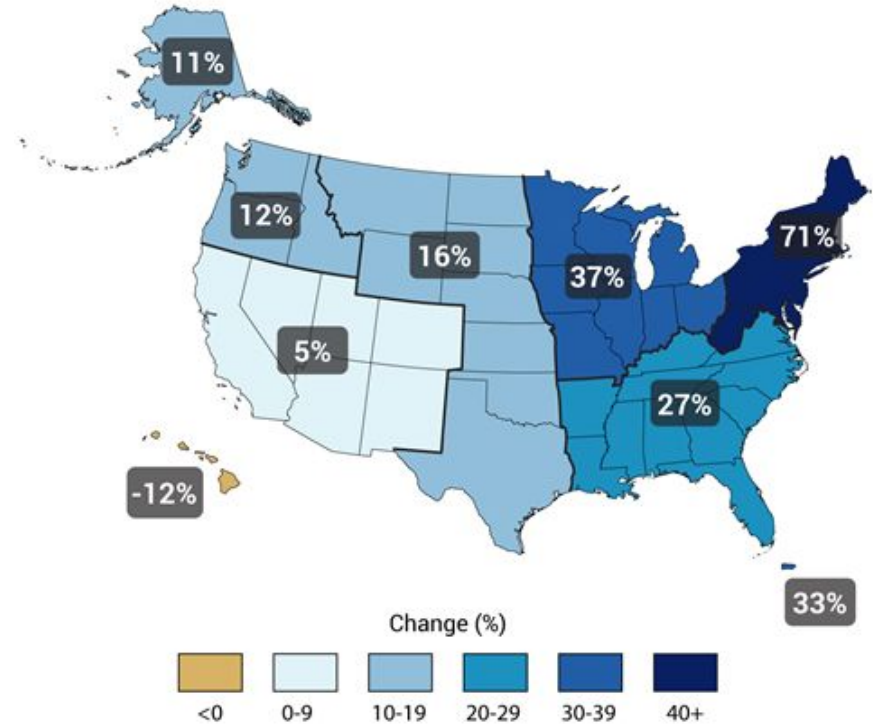
Expected threats from climate change



- Total extreme precipitation events
- Recurrent flooding/flash floods
- Heat related deaths/injuries
- Drought

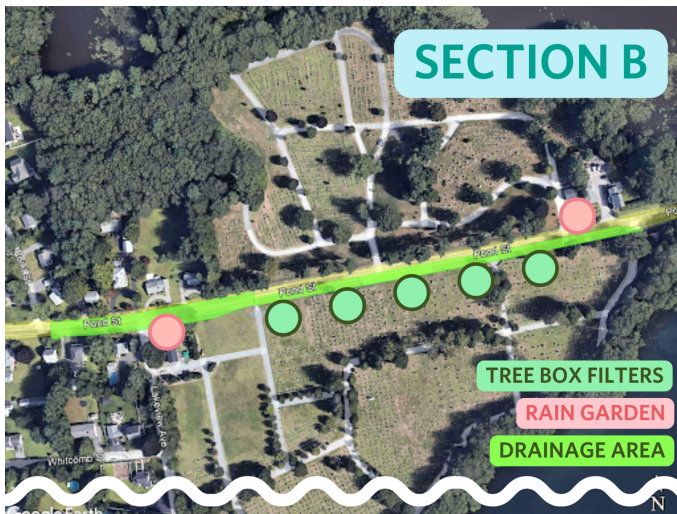
Climate Change increases risks to water quality and human health

Observed Change in Very Heavy Precipitation

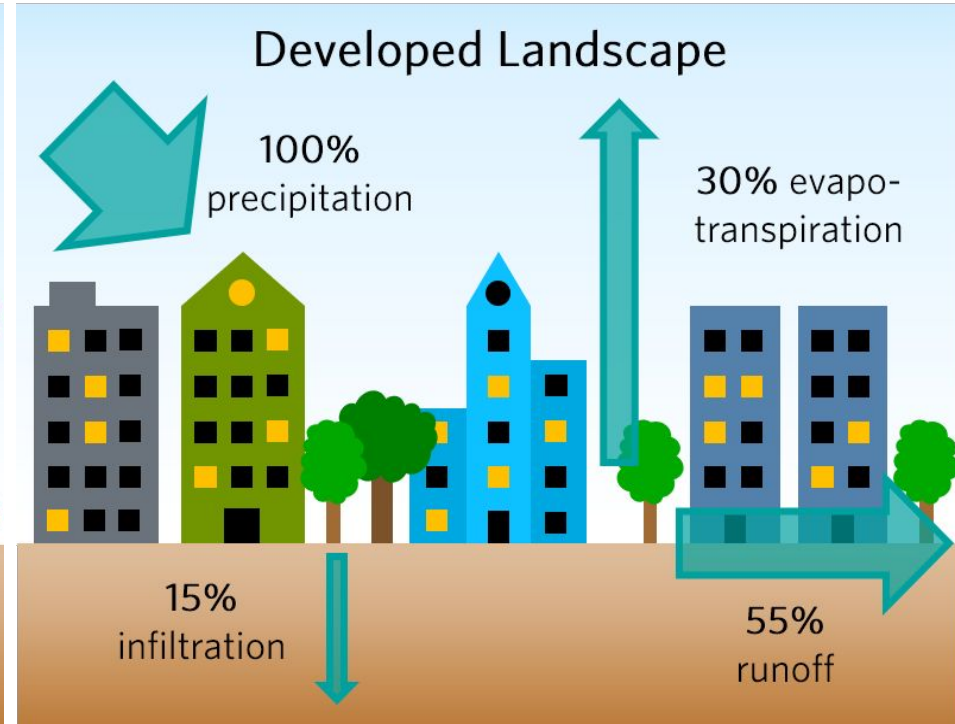
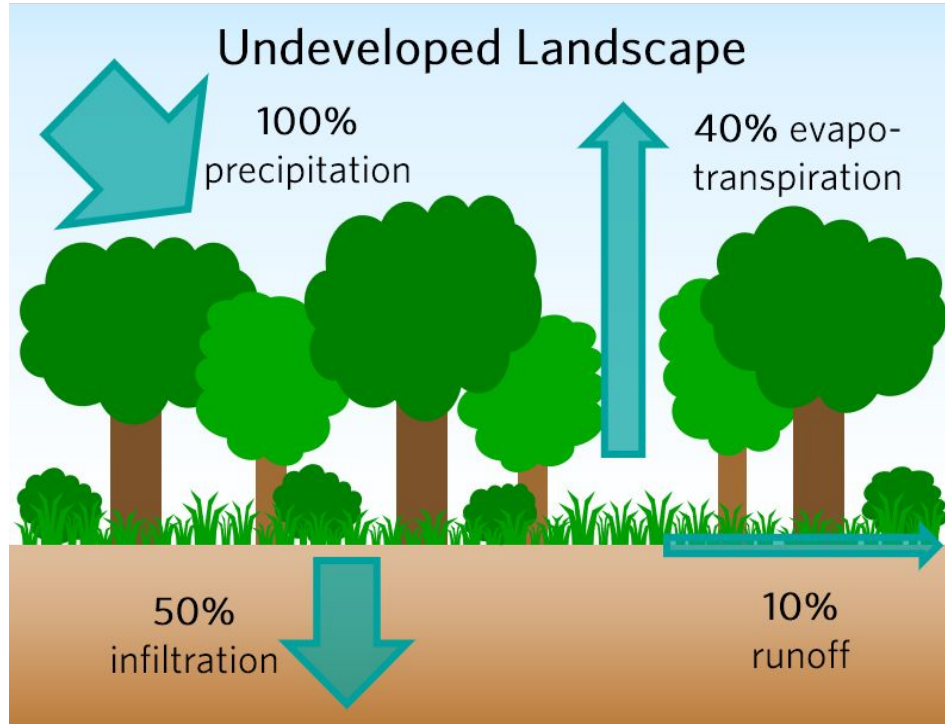


Natick is Making Moves!

- Lead Community on Flood Model
- Town Staff Training in Culverts
- Active Climate Compact Membership
- Just passed CPA
- Working on river restoration
- Planning for Green Infrastructure and Green Streets
- Stormwater Bylaw updates



Landscapes in the Watershed

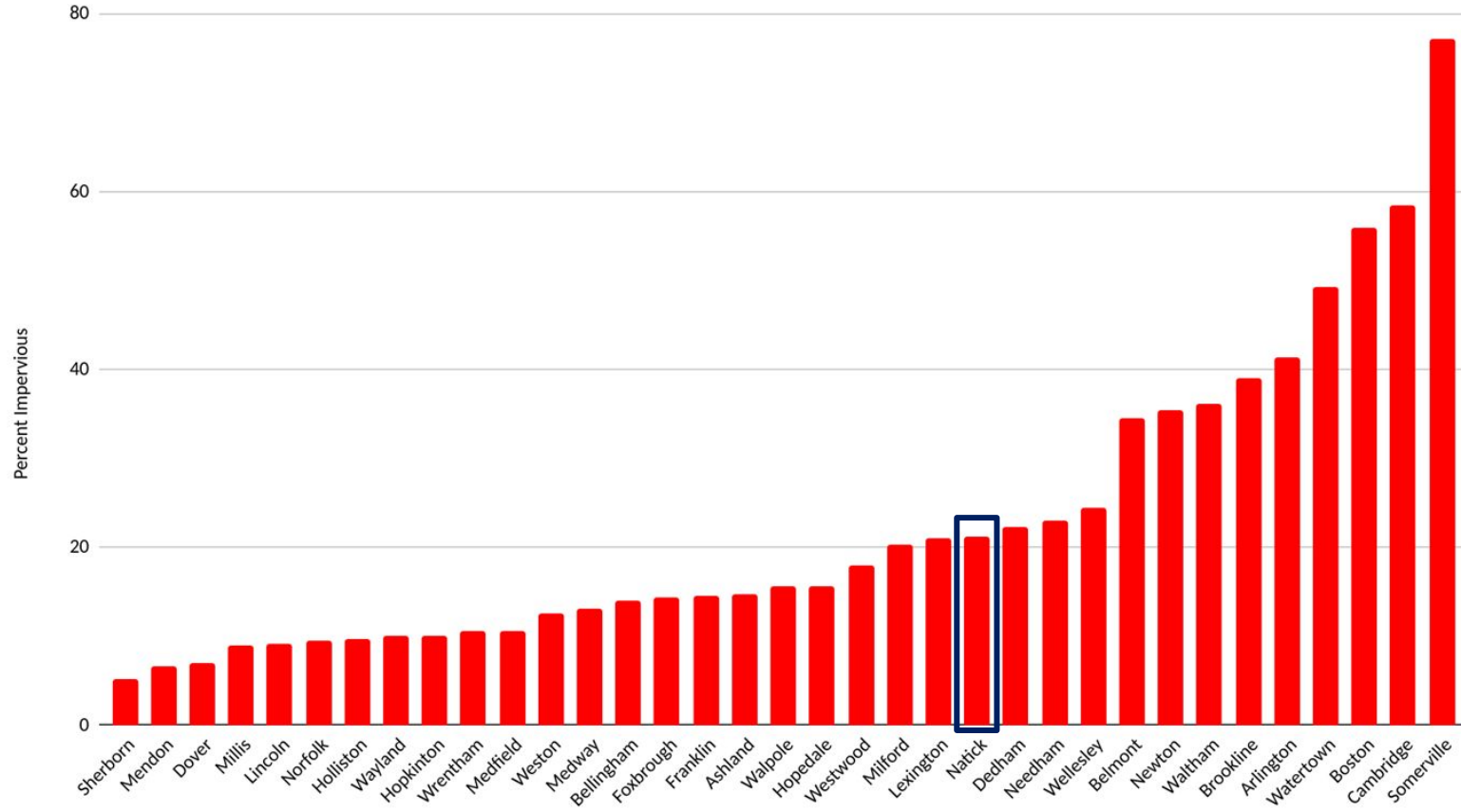


Development alters the water cycle, leading to increased runoff and pollution of our local water bodies & flooding!

Redevelopment is an opportunity to build climate resilience

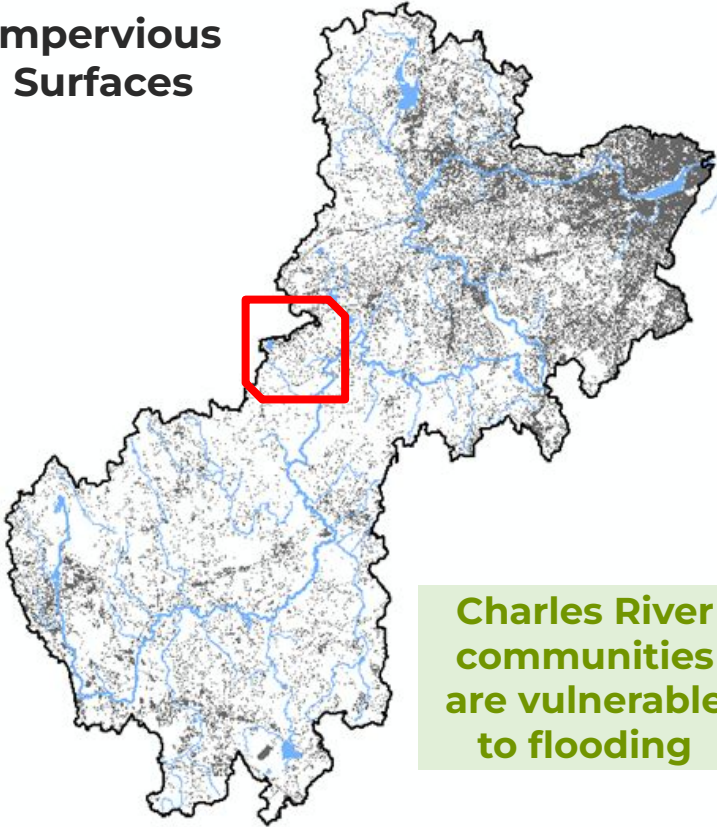
Impervious Surface in Natick

Impervious Acres Percentage by Town



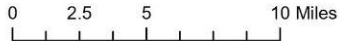
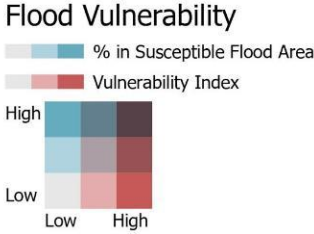
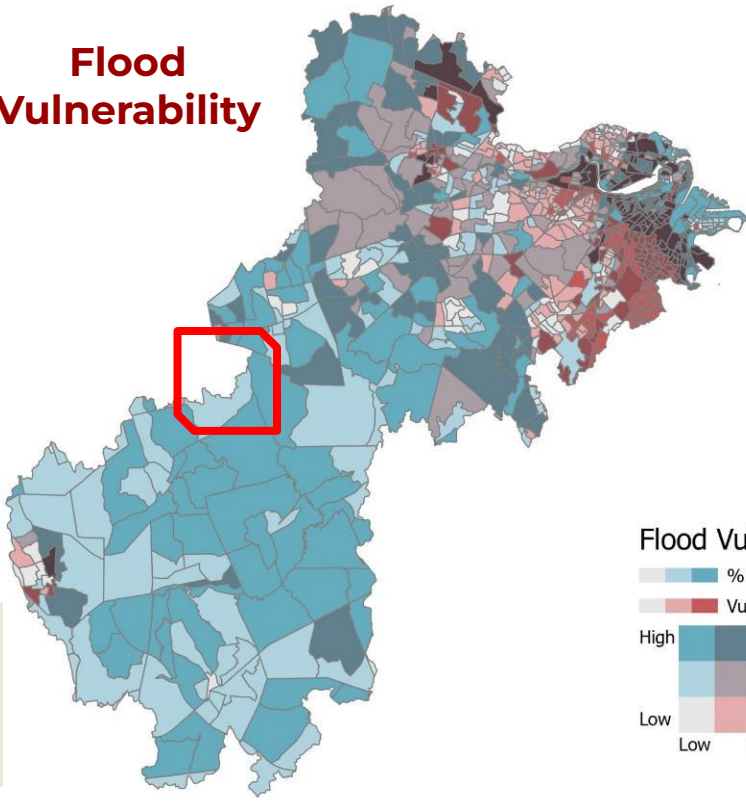
Impervious Surface & Flooding

**Impervious
Surfaces**



**Charles River
communities
are vulnerable
to flooding**

**Flood
Vulnerability**



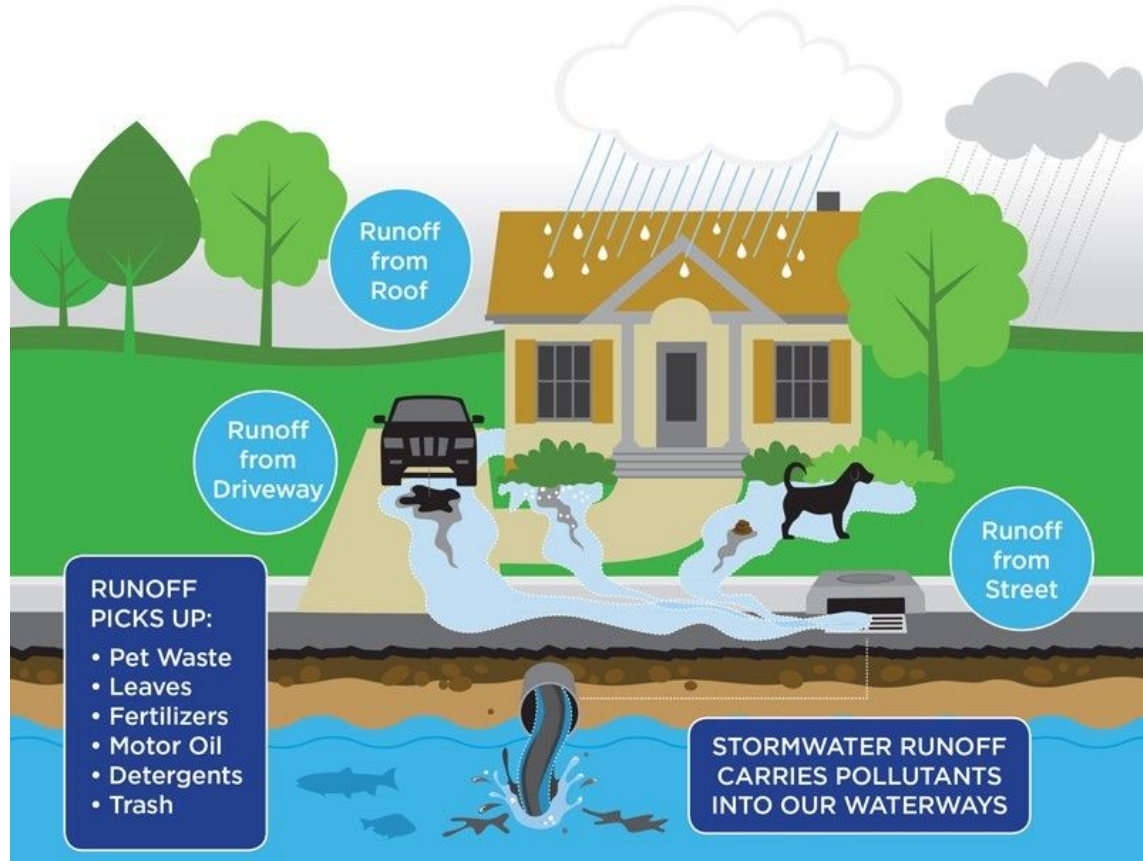
Threats to the Charles River

Stormwater Runoff

- Pollution coming from everywhere: **non-point source**
- Stormwater carries pollution into river
- Worsened by leaky pipes

Main pollutant is **PHOSPHORUS**, a nutrient from:

- Leaves decomposing
- Fertilizers
- Detergents



Bring nature back to built environment

- Green streets, parking lots, greenways
- Integrate stormwater with open space
- Bioretention, rain garden, porous pavement
- Stream daylighting, dam removal
- Wetland restoration



Municipal Vulnerability Preparedness (MVP)

- **Top hazards:** (1) precipitation-based and riverine flooding; (2) extreme snow and ice events; (3) higher temperatures; (4) severe drought; and (5) wind.

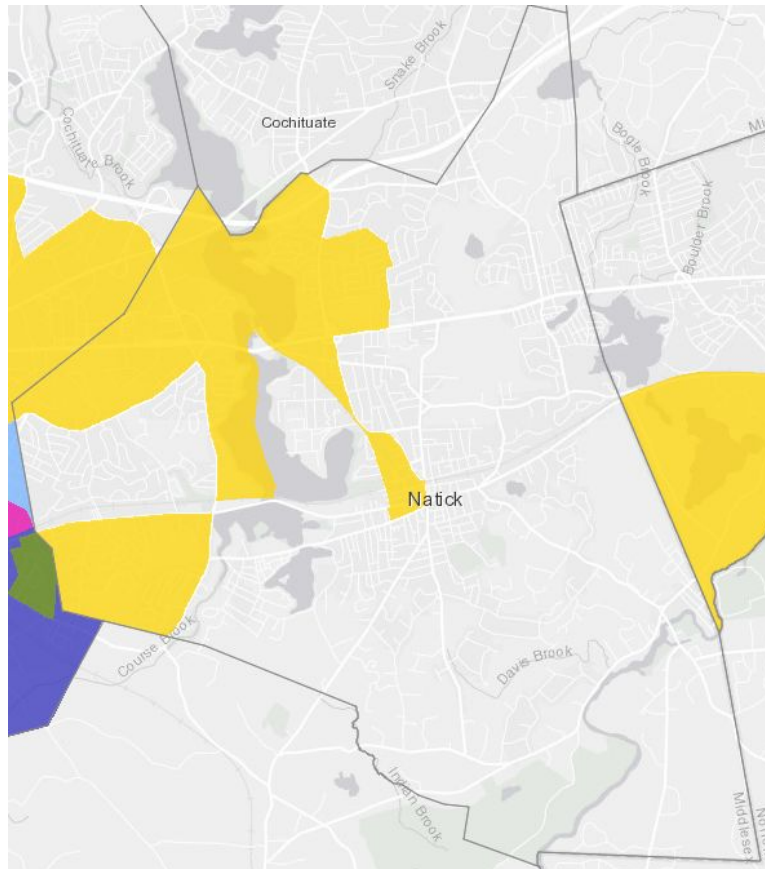
Priority Actions Identified

- **Green and resilient infrastructure in upcoming public projects**
- **Introduce infiltration regulations for new construction.**
- **Encourage Low Impact Development in regulations for new construction and major renovations.**
- **Incorporate updated climate data into permitting processes, identify heat islands**
- **Install green infrastructure on public and private property**
- **Conduct feasibility study of stormwater utility for infrastructure upgrades and maintenance.**
- **Allocate resources to proactively manage Natick's conservation land for the provision of ecosystem services such as flood control, nutrient cycling, and purification of air and water.**
- **Identify and acquire prioritized open space parcels for increased flood storage/protection.**
- **Acquire properties in the Special Flood Hazard/Repetitive Flood Loss Areas.**



MVP Community Resilience
Building Workshop October 2017

Environmental Justice (EJ) Maps



Areas yellow (Minority)

Layers



MA 2020 Environmental Justice Blockgroups

Minority: the block group minority population is $\geq 40\%$, or the block group minority population is $\geq 25\%$ and the median household income of the municipality the block group is in is $< 150\%$ of the Massachusetts median household income

Income: at least 25% of households have a median household income 65% or less than the state median household income

Language isolation: 25% or more of households do not include anyone older than 14 who speaks English very well

Minority and income

Minority and English isolation

Income and English isolation

Minority, income and English isolation

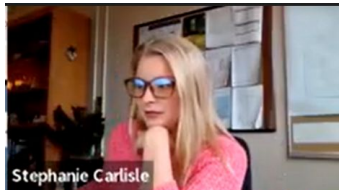
Note: No EJ Neighborhoods in the Charles River watershed part of Natick, downstream in Wellesley around Wellesley College by Charles River

Charles River Climate Compact

Founded August 2019

- Bring together Charles River watershed communities to work on climate adaptation by sharing information and experiences and taking a watershed/regional view of adaptation strategies.
 - Challenge of lack of information about local impacts
 - Opportunity to coordinate with neighboring municipalities
 - Meet bi-monthly on Zoom

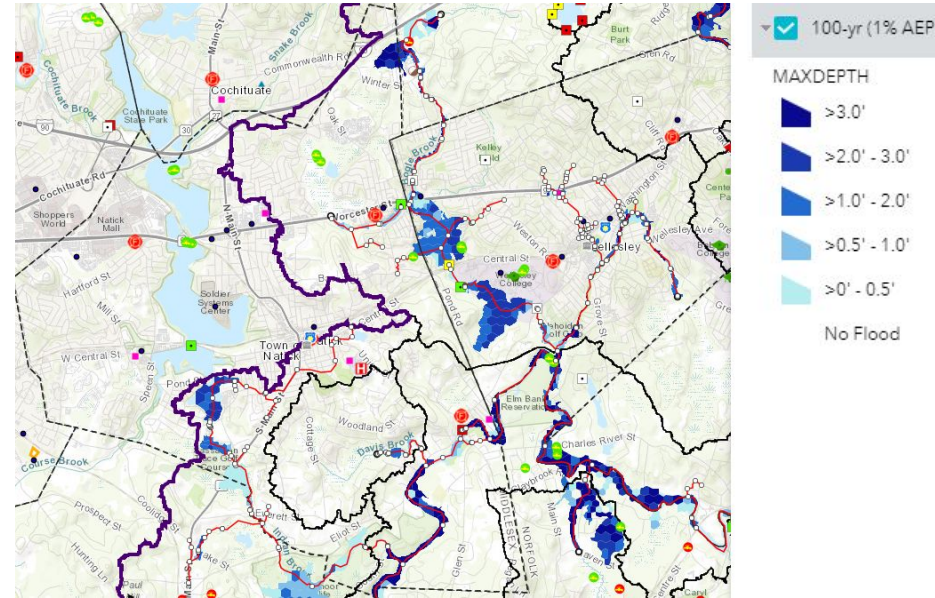
Natick is an active member and lead community to MVP



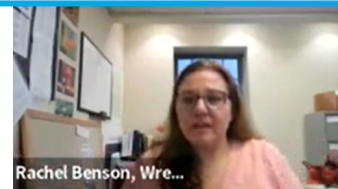
Charles River Flood Model

- Developed in partnership with CRWA and Weston & Sampson - funded by the **MA MVP Action Grant** program
- **Computer Flood model:** predicts where flooding will occur under future climate scenarios
- Identifies and tests nature-based solutions and how it can reduce flooding impacts
 - Upland Storage, Green Infrastructure and other actions
- Assessing Culverts vulnerability to flooding & wildlife passage
- Created a [Flood Model Toolkit Matrix](#) to support local initiatives

Natick is an active member and lead community to MVP



Natick areas of concern: Increased flooding along the Charles River and Route 9 by Jennings Pond in the 2070 100 year 24 hour storm.

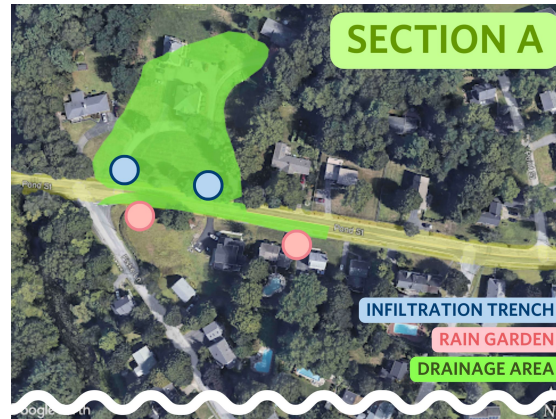


Goals for Natick

- 1. Update Wetlands Bylaw for Climate Change like Arlington and Boston*
- 2. Explore adopting tree protection Bylaw for private property to enhance policy for public shade trees.*
- 3. Support acquiring new protected conservation land for flood mitigation (and co-benefits wildlife, recreation)*
- 4. Investigate adopting a stormwater utility to fund green infrastructure & stormwater*

- Stormwater Utility

- Dedicated revenue source for staff, education and green stormwater improvement projects, fix drainage and comply with MS4
- 24 Communities in Massachusetts:
 - Ashland, Ayer, Belchertown, Bellingham, Braintree, Chelmsford, Chicopee, Dracut, East Longmeadow, Fall River, Franklin, Gloucester, Longmeadow, Millis, Milton, Newton, Northampton, Pepperell, Reading, Shrewsbury, Tewksbury, Westfield, Westford, Yarmouth
- Franklin Stormwater Utility [factsheet](#)



*Bioswale
overflow
post rain
event*

Massachusetts regulates wetlands through the Wetlands Protection Act (WPA)

- Baseline level of protection for most wetlands, streams, and rivers; Conservation Commissions permitting authority over projects in and around these areas.

Natick's Wetlands Bylaw

- Protects Isolated Wetlands, Protects Vernal Pools, Protects Intermittent Streams

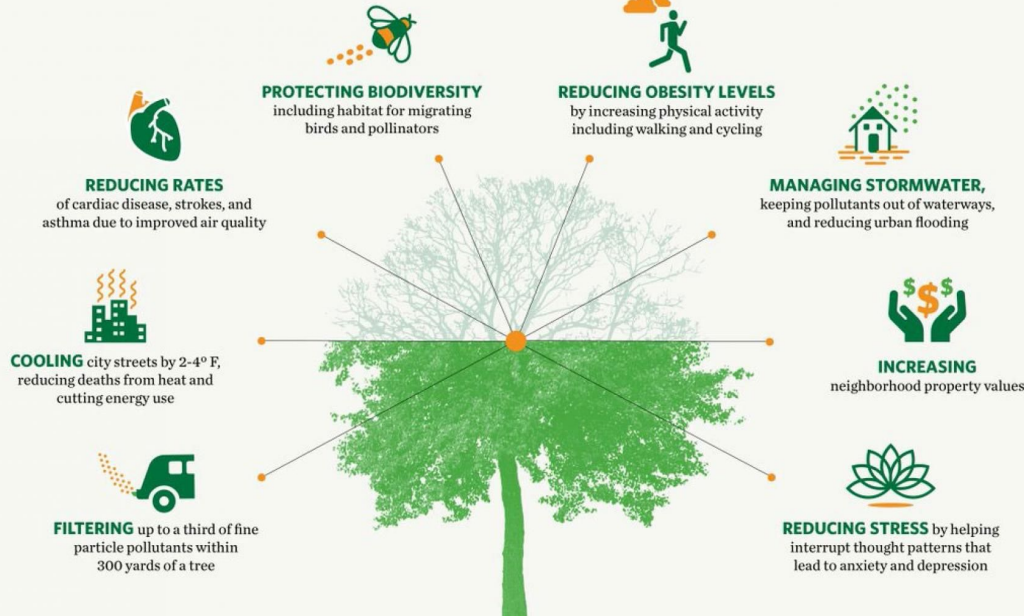
CRWA Recommendations

- Include climate change as reason for wetland protection & local climate action
 - Arlington and Boston are good examples

Benefits of Urban Trees

Research has linked the presence of urban trees to...

The Nature
Conservancy 



Natick has no tree protection Bylaw

Tree Protection Bylaw

- Protect mature trees on private land
- Require permits for tree removal and mitigation of removed trees
- Provide exemptions for hazardous or diseased trees
- Incorporate climate objectives
- Somerville: good example