Charles River Watershed Association

Gardening for Clean Water

Presentation to the Lincoln Garden Club. November 4th, 2024 | Max Rome PhD

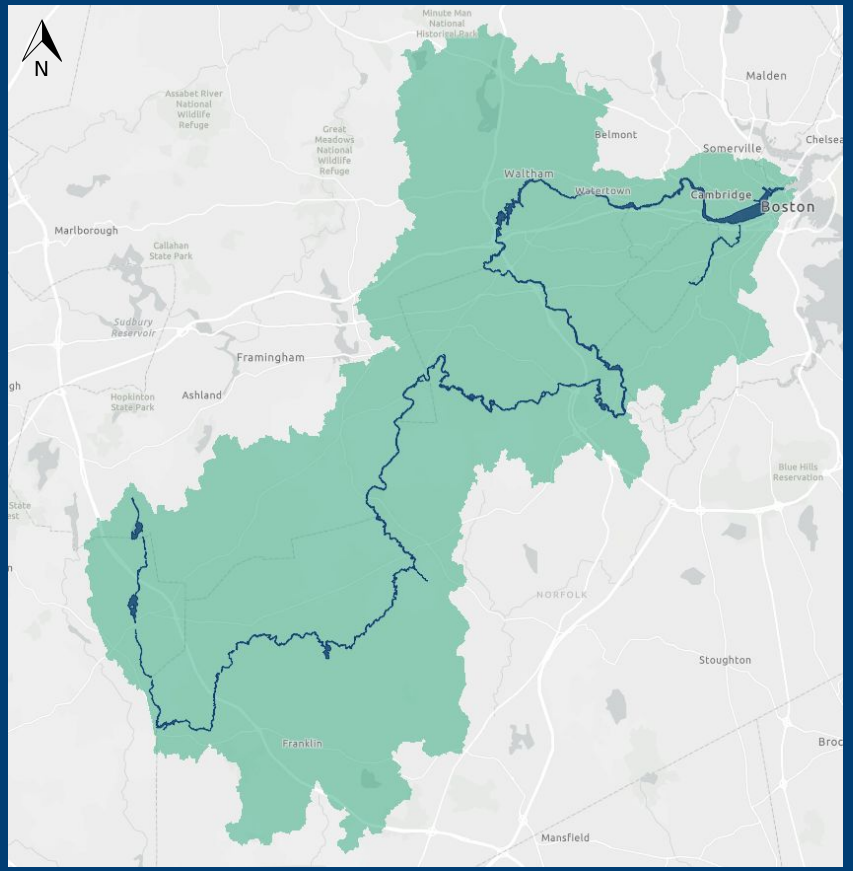
CHARLES RIVER WATERSHED ASSOCIATION

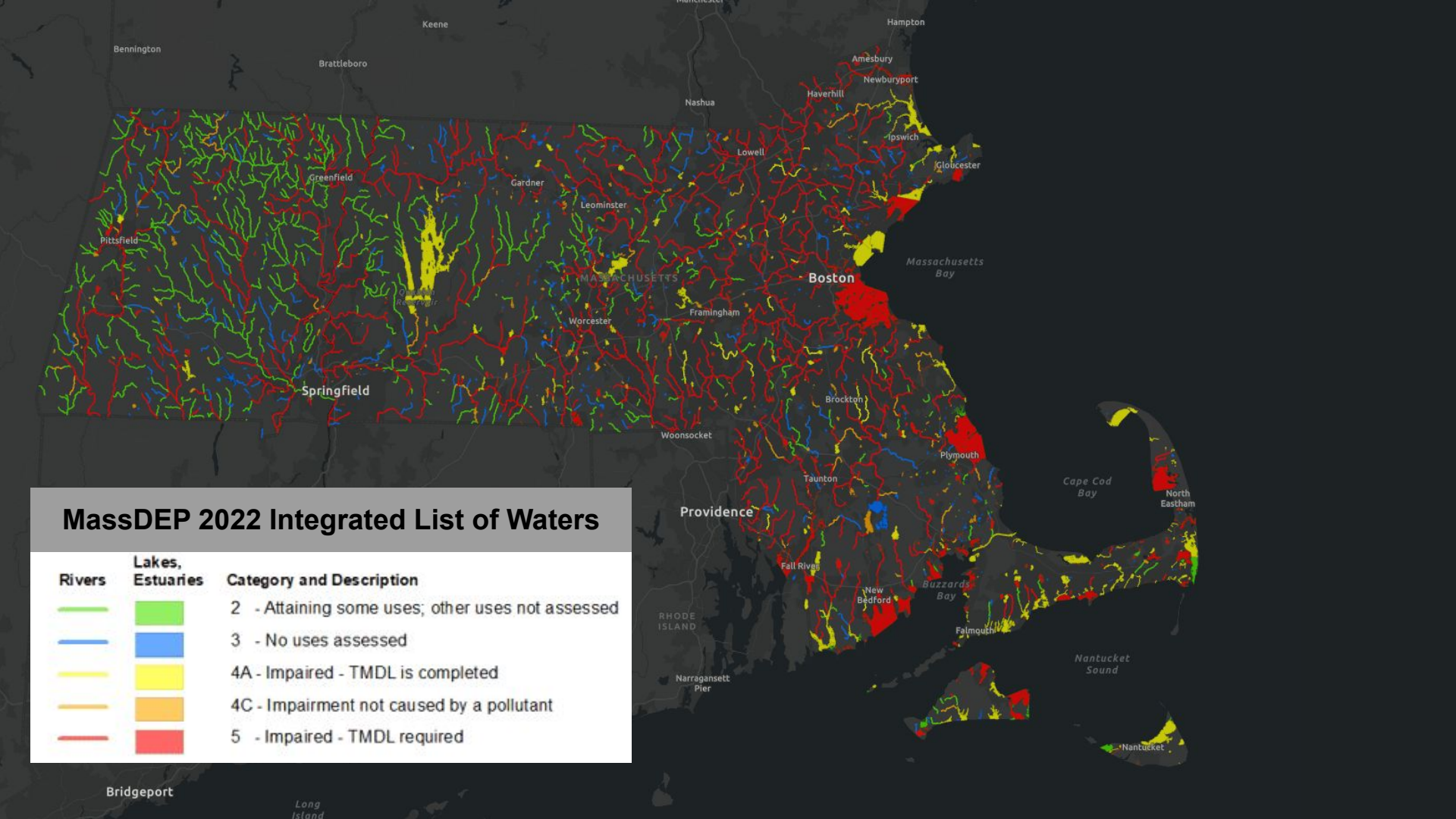
MISSION: Protect, restore and enhance the Charles River and its watershed through science, advocacy, and law.

- 80-mile long river
- 308 mi^2 watershed
- 35 towns & cities
- 1M+ residents
- 60% of residents in Environmental Justice neighborhoods (primarily Lower watershed)

CRWA TAKES A WATERSHED VIEW

BECAUSE WHAT HAPPENS UPSTREAM DOESN'T STAY UPSTREAM




Keene
Hampton
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Brattleboro
Amesbury
Newburyport
Haverhill
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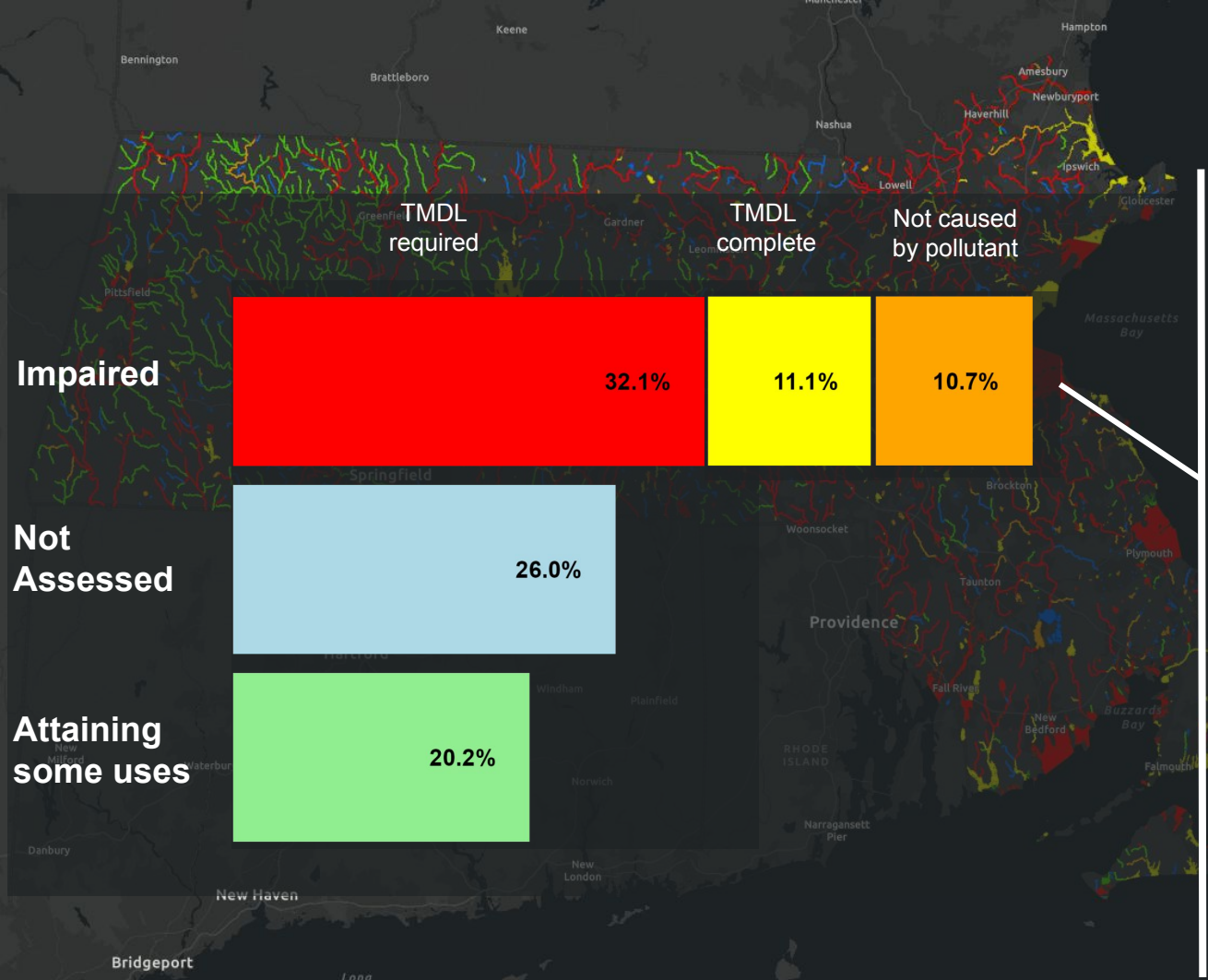
Ipswich
Lowell
Gloucester
Greenfield
Gardner
Leominster
Pittsfield
Massachusetts Bay
Boston
Framingham
Worcester
Springfield
Brockton
Woonsocket
Plymouth
Taunton
Cape Cod Bay
North Eastham
Providence
Fall River
New Bedford
Buzzards Bay
RHODE ISLAND
Falmouth
Nantucket Sound
Narragansett Pier
Nantucket
Bridgeport
Long Island
MassDEP 2022 Integrated List of Waters
Rivers
Lakes, Estuaries
Category and Description
2 - Attaining some uses; other uses not assessed
3 - No uses assessed
4A - Impaired - TMDL is completed
4C - Impairment not caused by a pollutant
5 - Impaired - TMDL required



2,549 Assessed water body “Units” (AU)

54% (1,372) of water bodies are **Impaired**

Of those, 17% (238) are caused by **excess phosphorus**

30% (417) identify **stormwater** as a **driver of impairment**

Changes to Hydrology

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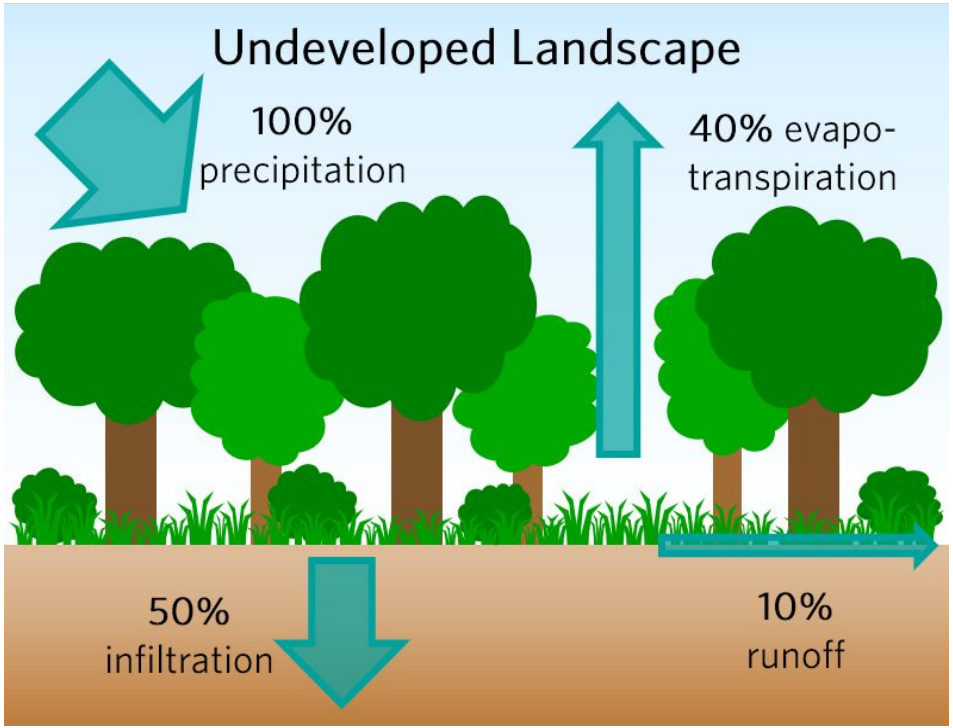

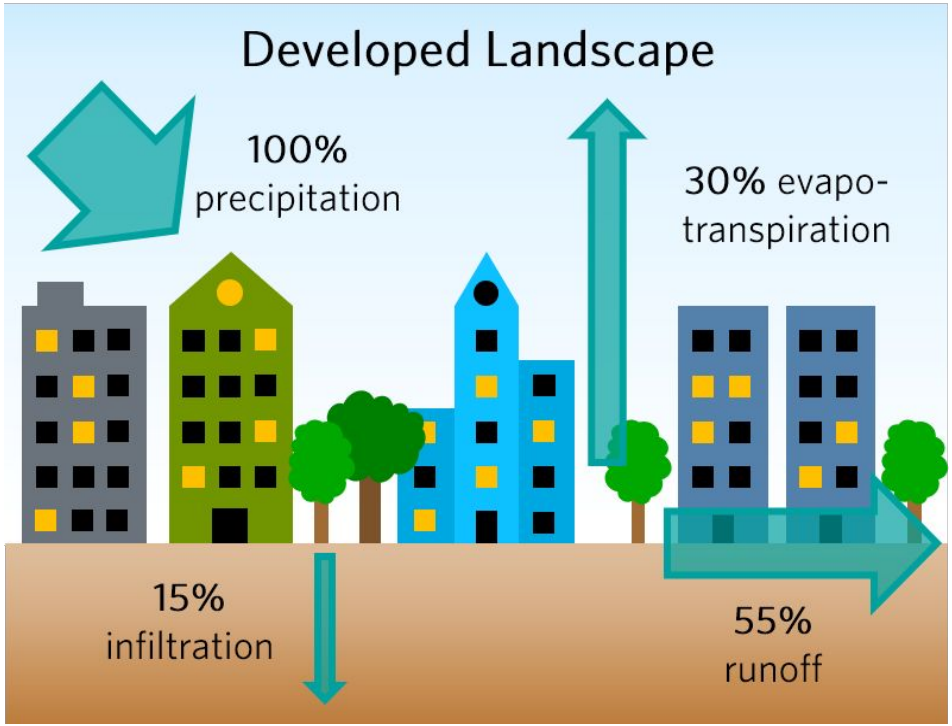

Changes to Stream Quality

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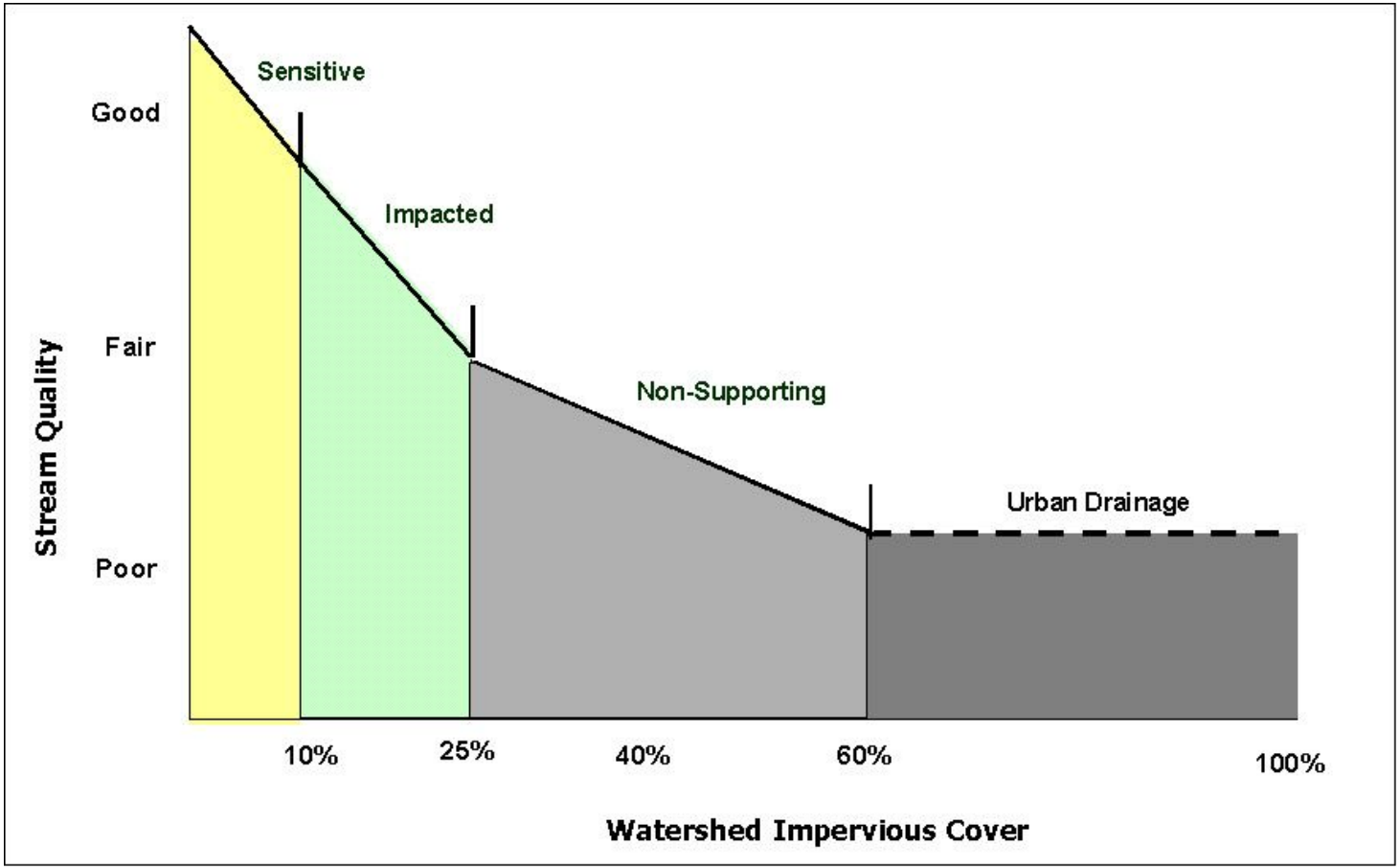

Source: Impervious cover model, [Center for Watershed Protection](#).

Impervious Surface in Lincoln

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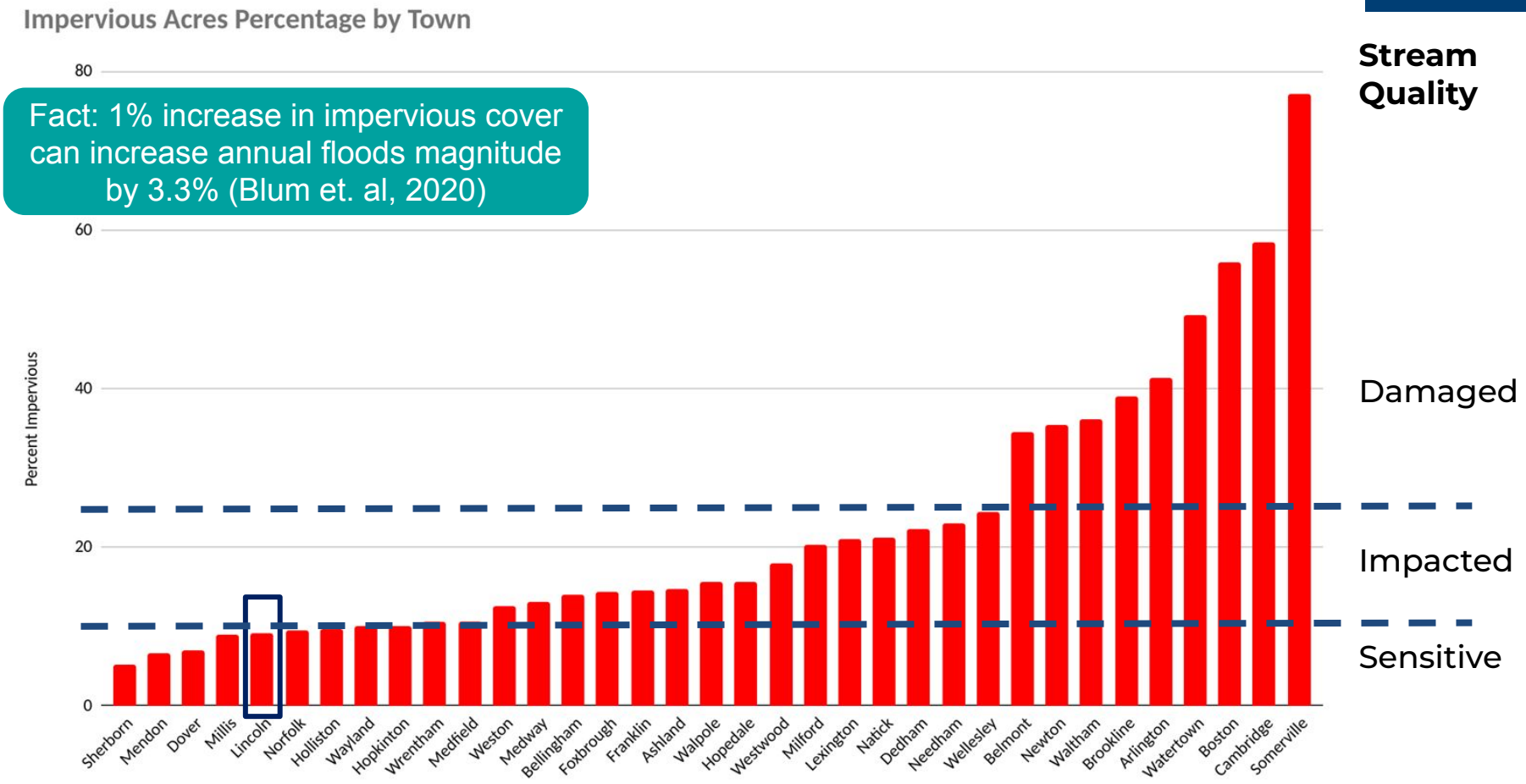

Rainfall 2013-2023

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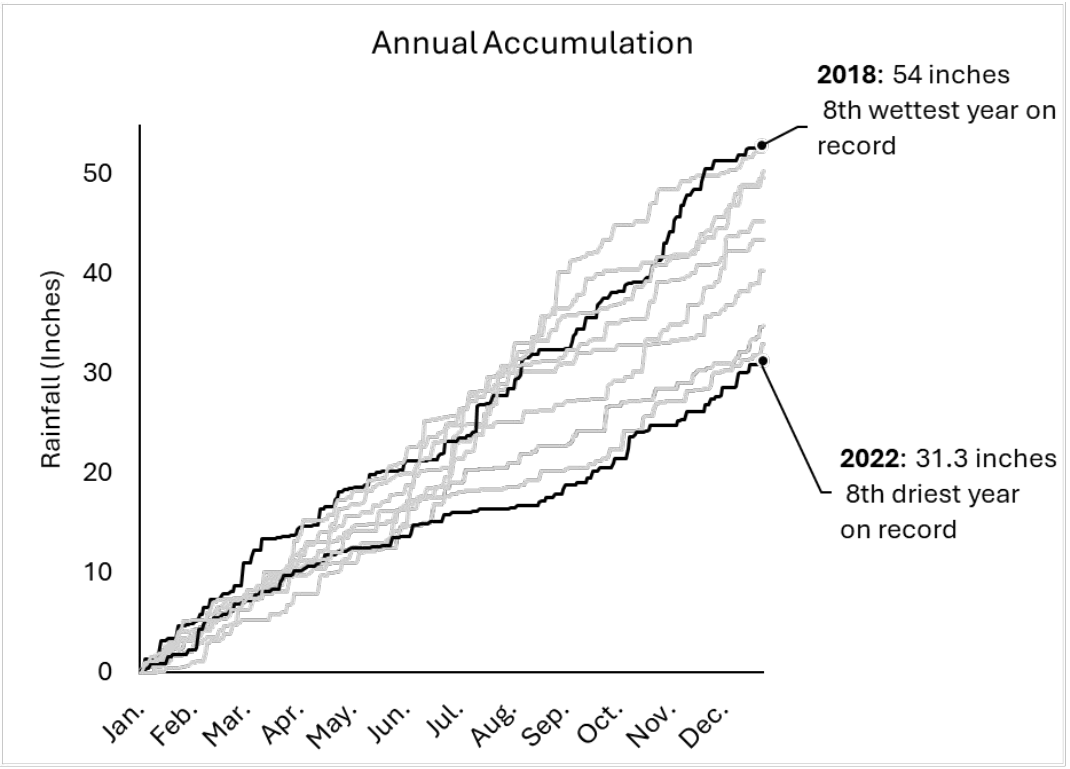

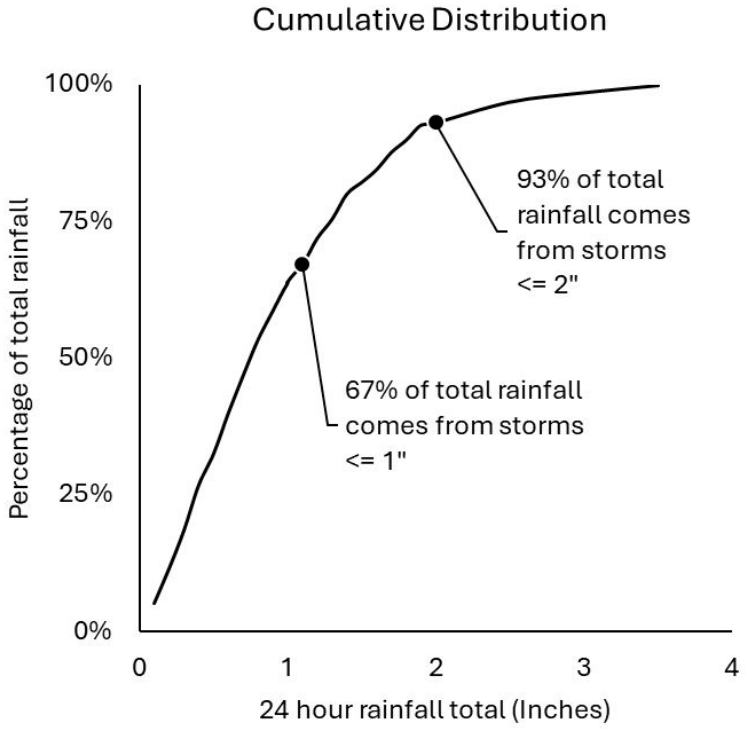

Climate Change

neponset river WATERSHED ASSOCIATION

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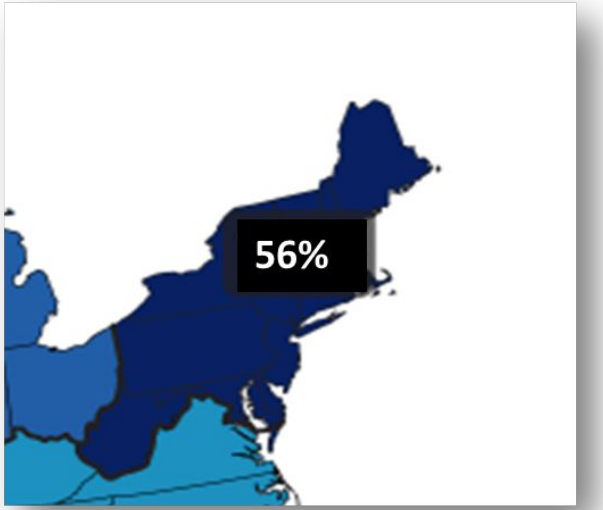
Climate Change – the *long-term shift* in global or regional climate patterns. Often climate change refers specifically to the *rise in global temperatures* from the mid-20th century to present.

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



For the Northeast United States: 56% increase in the amount of rain that falls in the top 1% events from 1958 – 2016.

Source: US National Climate Assessment 2018

Extreme Storms & Floods

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'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)

WICKEDLOCAL.com

Storm floods streets, basements in Medfield, Monday bus routes OK

Staff Writer Wicked Local

Published 12:01 a.m. ET March 15, 2010 | **Updated 3:18 p.m. ET March 15, 2010**

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.

Droughts & Heat Waves

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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


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

By John Upton

Follow @johnupton 16.8K followers

Published: November 9th, 2021

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

Gardening Tips

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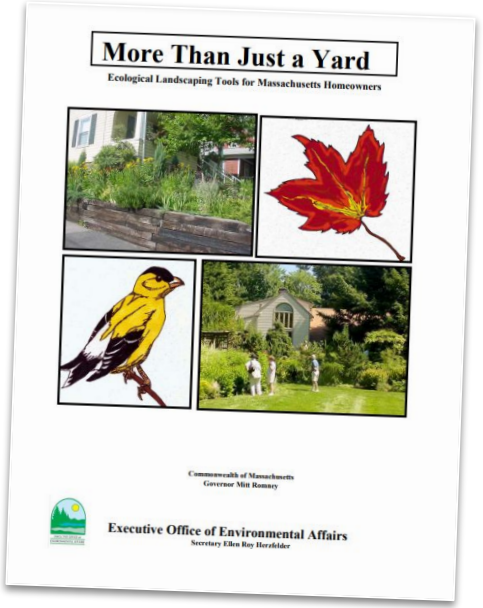
- **Lose (limit) the Lawn**
  - Especially on sloped areas
- **Plant Natives**
- **Improve soils**
- **Avoid use of fertilizers**

Lawn Facts

- **The average lawn is ⅓ of an acre.**
- **US homeowners use 40-60% of household water on lawns**
- **Fertilizers contribute to excess algal growth and can be a significant source of “non-point source pollution”**



Source: More than Just a Yard Ecological Landscaping Tools for Massachusetts Homeowners

Limit the Lawn

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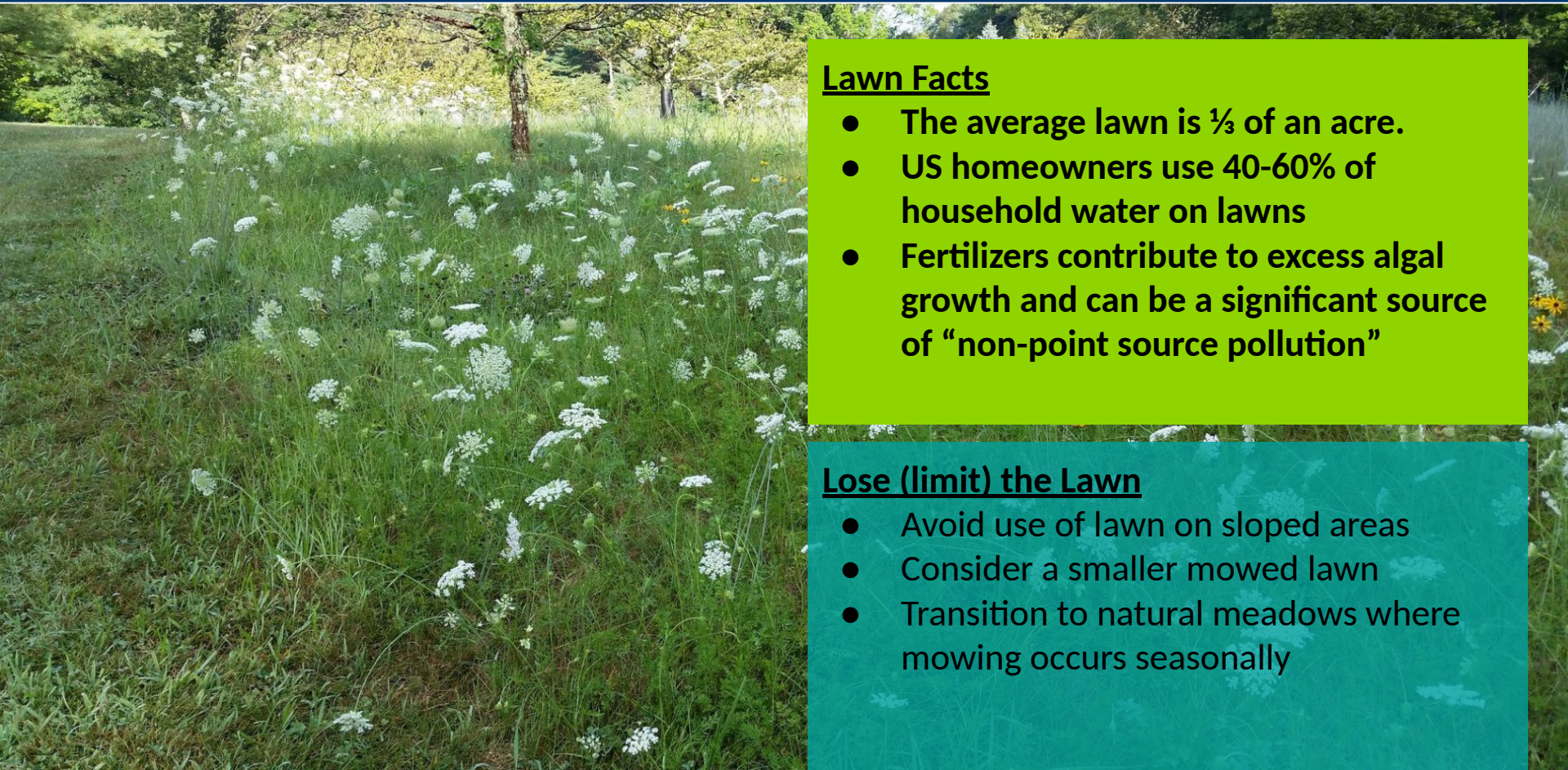

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Lose (limit) the Lawn

- Avoid use of lawn on sloped areas
- Consider a smaller mowed lawn
- Transition to natural meadows where mowing occurs seasonally

Explore Native Plant Paletes

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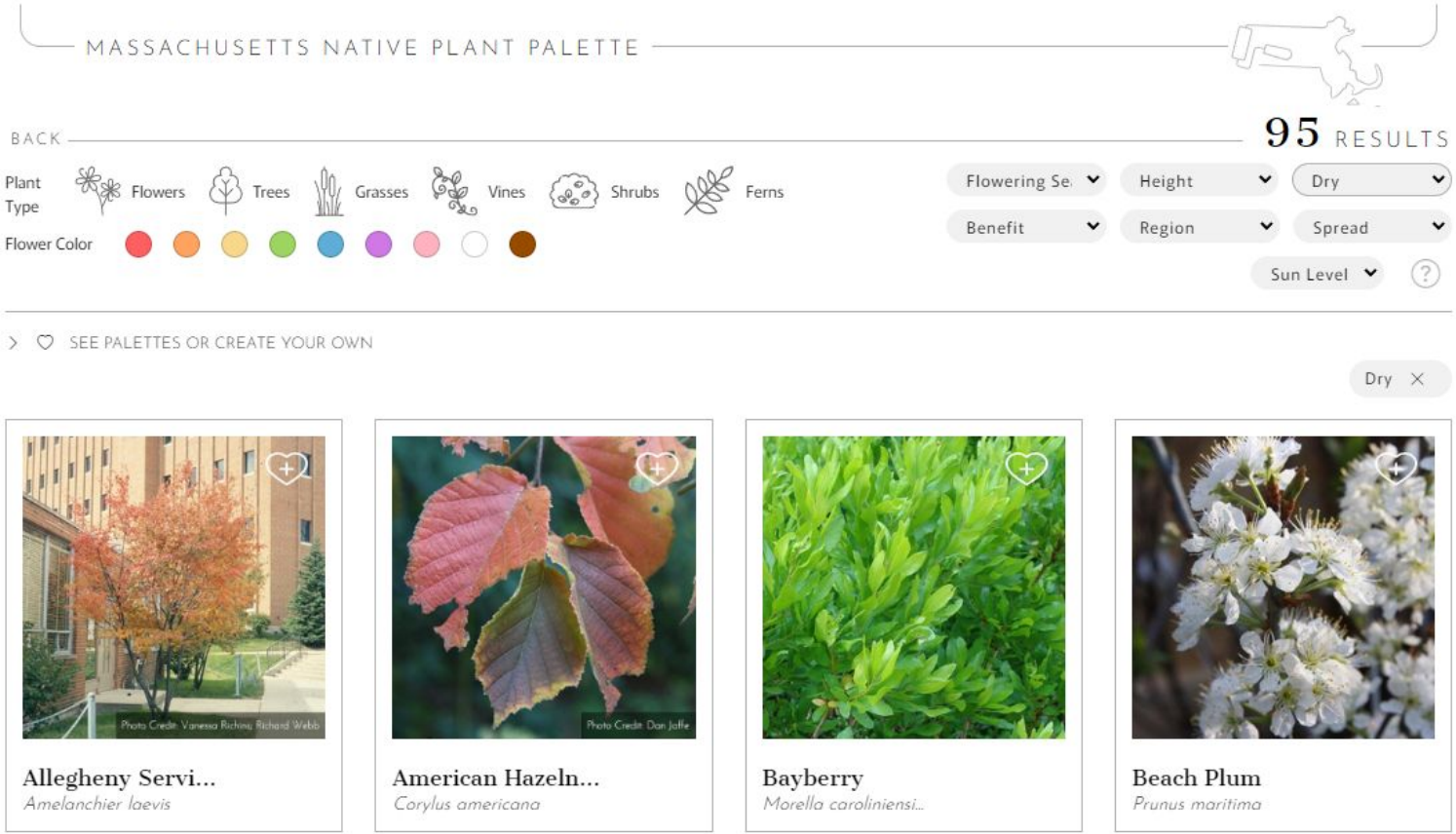

-Web application developed by Massachusetts Water Resource Commission

-Explore native plants and create lists ("plant palettes") to bring to their local nurseries or garden centers.

Source: [Massachusetts Native Plant Palette]

Landscaping

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- **Identify locations where water leaves your property**
- **Focus on these areas, create a dense vegetated buffer using native perennials, shrubs, and trees.**

Source:MassDEP Lawns and Landscapes in Your Watershed

Winter Street

Rain Gardens

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Step 1: Choose your site

Identify a spot for your rain garden that can collect water from your roof or driveway. Sites should be near a downspout to collect roof runoff or downhill of your driveway to collect runoff from it. Avoid steep slopes, rocky areas and areas that often puddle. Set your rain garden about 10 feet away from your foundation and direct any overflow away from the foundation. Once you have selected your site, check your soil to ensure it will infiltrate water (see box at lower right).

Step 2: Design the garden

Sizing a rain garden to hold runoff from a one inch rain storm is a good target, although smaller rain gardens can still make a big difference. To figure out the ideal size for your garden, measure the area in square feet (length x width) of the roof or driveway that your rain garden will collect water from and then divide by 6. This gives you the target size for your rain garden in square feet. Smaller rain gardens will also work, just provide an overflow point where water can exit the rain garden once full.

Rain Gardens

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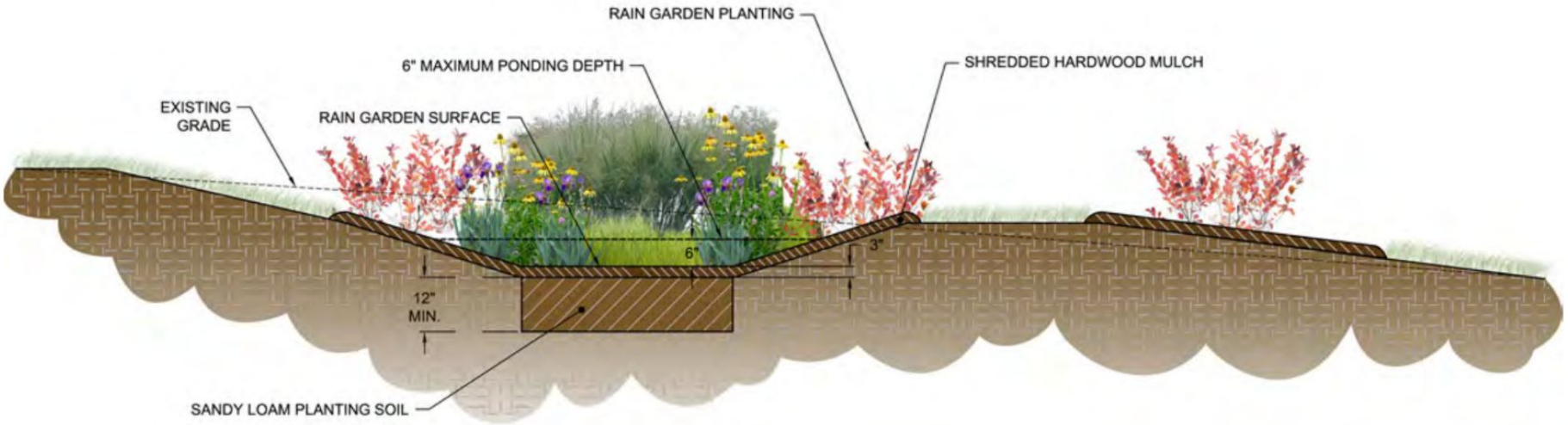
SOIL CHECK

1. Dig a 6-8 inch deep hold 6-8 inches in diameter
2. Fill with water
3. Time how long it takes to soak into the ground

< 6 hours : Perfect for a rain garden

6-12 hours: Amend soil to improve drainage



Rain Gardens

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Step 3: Prepare the ground

Before you start digging, always call 811 to avoid disturbing buried utility lines. Mark out the area where you will build your garden and remove 9-12 inches of soil from that area. If your site is able to infiltrate water in less than 6 hours, mix some of the soil you excavated with compost and add to the garden. Otherwise, use garden soil from a garden center. Do not add fertilizer. Fertilizer will make it harder for the rain garden to do its job. If directing stormwater into your garden via a downspout, position the outlet in the garden and add stones around the opening to help slow the water and avoid erosion, being careful not to block the outlet.

Step 4: Landscape the garden

Garden edges can be sloped or vertical. If the garden edge is vertical, consider reinforcing with edging stones. Lay out the plants in the garden. Avoid blocking short plants with taller plants. For a great looking garden, group plants in odd numbers, and avoid planting in straight lines. Next, dig holes for each plant. Each hole should be as deep and twice as wide as the plant's root structure. If the plants are root-bound, try to loosen up the roots before planting them. Place the plants in each hole and cover with soil. Make sure to water your plants thoroughly.

Rain Gardens

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Blue Flag Iris

Joe Pye Weed

Cinnamon Fern

Arrowwood

Step 5: Maintain your garden

For the first 1-3 months, your new rain garden will need extra care. When it does not rain, water your garden once a week with 1 inch of water (about half a gallon of water per square foot). After the plants have been established, you no longer need to water your garden. Weed your garden regularly, especially during the first couple of months. As the plants age, remove any dead branches or plants and prune shrubs and trees as desired. Check the areas where water enters and exits the garden for signs of erosion. Fix any problems and add additional stones if necessary. Check the garden for excess sediment and shovel out as necessary. If your property changes hands, make sure to inform the new owner(s) about the special value and function of the rain garden.

Conclusion

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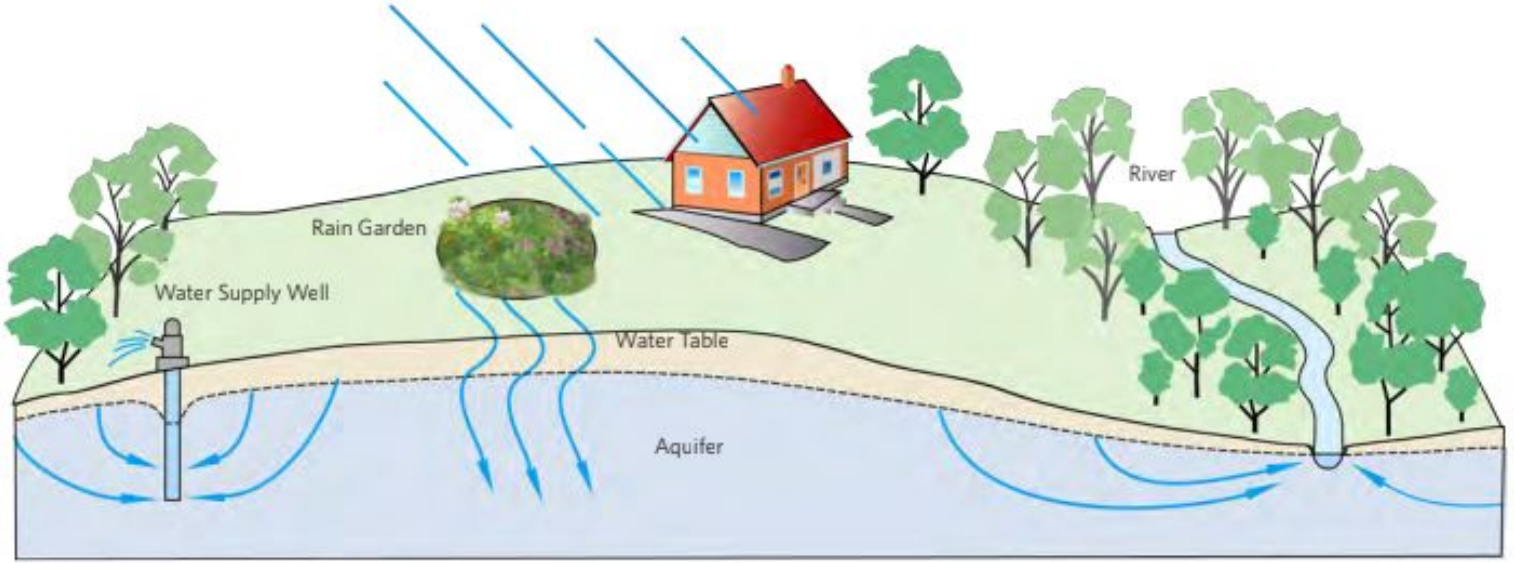
- Climate change will increase intense rainfall AND drought
- Reduce runoff and retain your rain
- Use native plants and explore Massachusetts ecological landscaping tools
- Backyard decisions have watershed impacts



Charles River Watershed Association

Climate Resilience

Advocating for nature-based solutions, climate-smart development, and regional adaptation efforts to protect our communities and ecosystems from the impacts of climate change.

River Science

Collecting robust water quality data to understand the health of our river, advocate for effective cleanup and restoration strategies, and protect public health.

River Restoration

Removing defunct dams, tackling invasive species, daylighting streams, and more to restore natural ecology and build climate resilience.

Education & Outreach

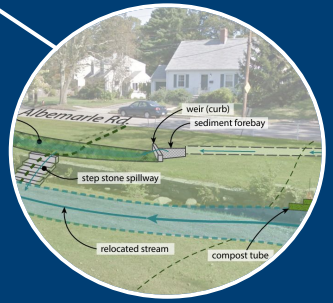
Informing and supporting community members to advocate for laws, policies, and behaviors that build community resilience and promote well-being for all.

Stormwater Solutions

Curbing stormwater pollution with green infrastructure and stronger stormwater regulations to achieve a clean river.

CRWA PROJECTS

Stormwater Infrastructure



Stream/River Restoration

Advocacy for Climate Resiliency

Dam removal

GROWING FOR GREATER IMPACT

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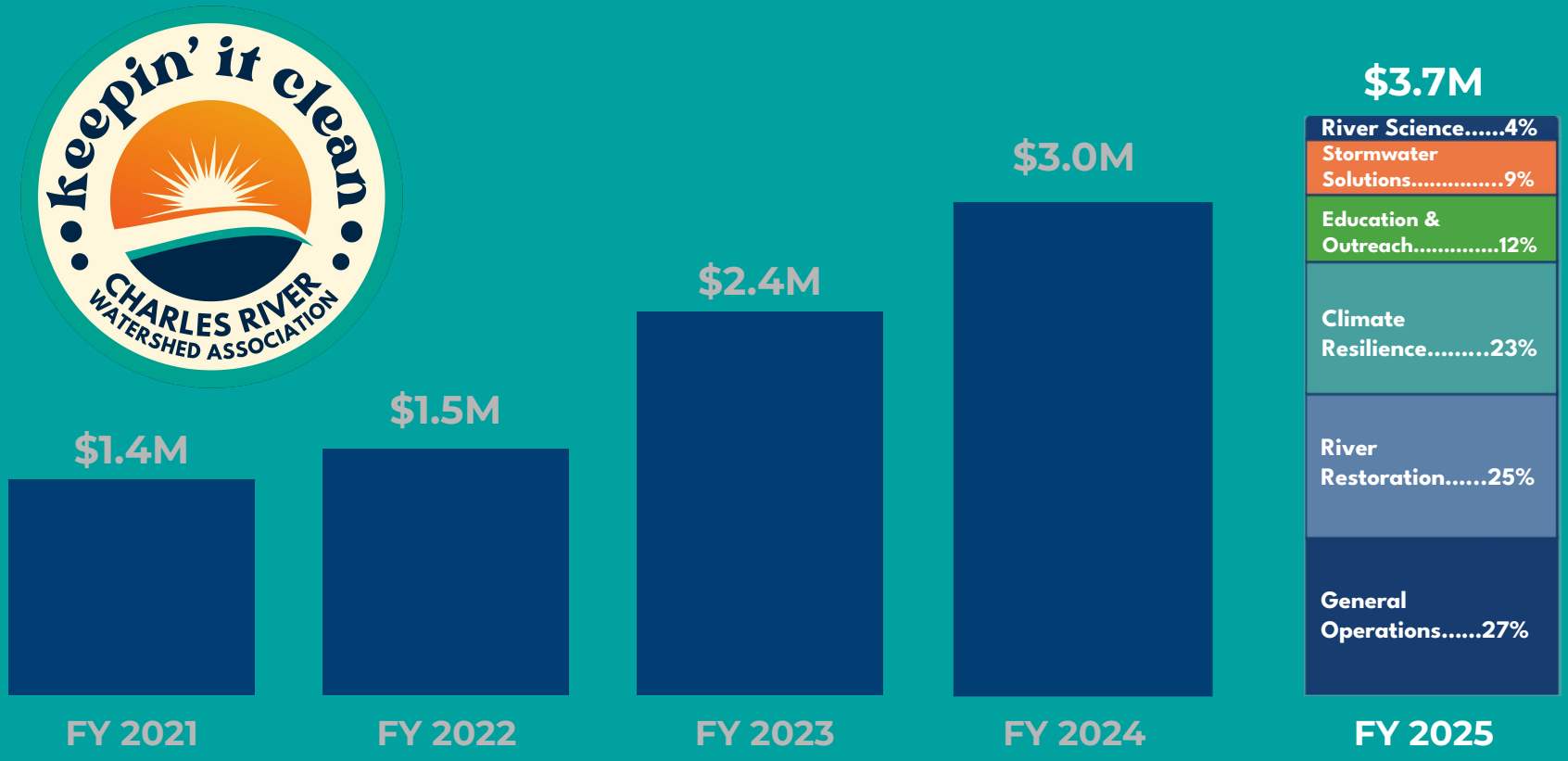

Questions?

Charles River Watershed Association

Max Rome

mrome@CRWA.org

https://www.crwa.org/

bit.ly/rivercurrentsignup

Thank you!