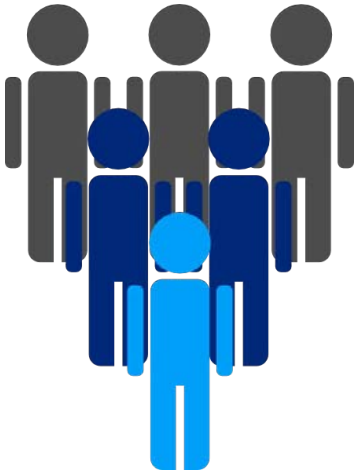

Charles River
Watershed Association
Emerald Necklace
CONSERVANCY
WHAT'S YOUR VISION FOR A RESTORED MUDDY RIVER?
NOV 14, 2023 | 5-7 PM | FENWAY COMMUNITY CENTER

# MEETING GOALS

1. To introduce the Muddy River Visioning process
2. To gather input for a community vision of a restored Muddy River, taking a watershed perspective



Information Sharing

Communal Learning

Small Group Discussions

Facilitation by:

Consensus Building Institute

# LAND & WATER ACKNOWLEDGEMENT

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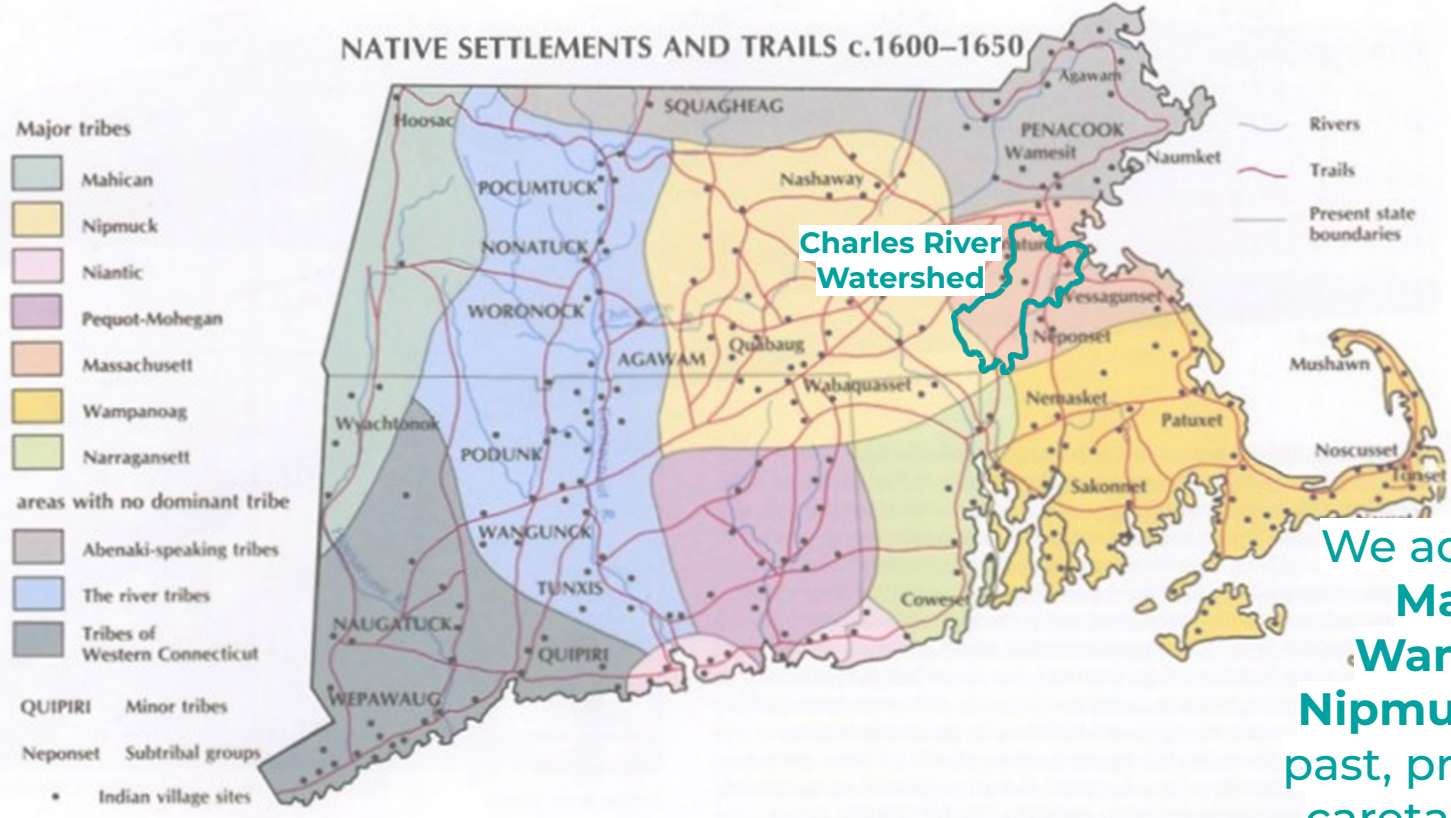


We acknowledge the **Massachusett, Wampanoag, and Nipmuc Nations** as the past, present, and future caretakers of this land.

# MEETING GUIDELINES

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## FOR ALL:

- Maintain a respectful, open space to share and learn together
- Assume good intentions
- Make space/take space
    - Actively contribute; be mindful of sharing airtime with others

## VIRTUAL ATTENDEES:

- Please stay on mute during presentations
- Participate actively in breakout discussions!
- Use chat freely to add any questions or comments

# AGENDA

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- WELCOME
- VISION PLANNING
- MUDDY RIVER HISTORY
- WHAT THE MUDDY RIVER MEANS TO ME (DISCUSSION)
- CURRENT CONDITIONS
- FUTURE POSSIBILITIES
- VISIONS FOR THE FUTURE OF THE MUDDY (DISCUSSION)
- NEXT STEPS


VISION PLANNING

# MUDDY RIVER PARTNERS

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**Thanks to our partner organizations focusing their time and effort caring directly for the Muddy River!**

Maintenance and Management Oversight Committee MMOC Muddy River Restoration Project

Charlesgate ALLIANCE

MUDDY WATER INITIATIVE

**And to the other many organizations, municipalities, and communities who are integral to the success of this project!**

# WHAT IS A VISION PLAN?

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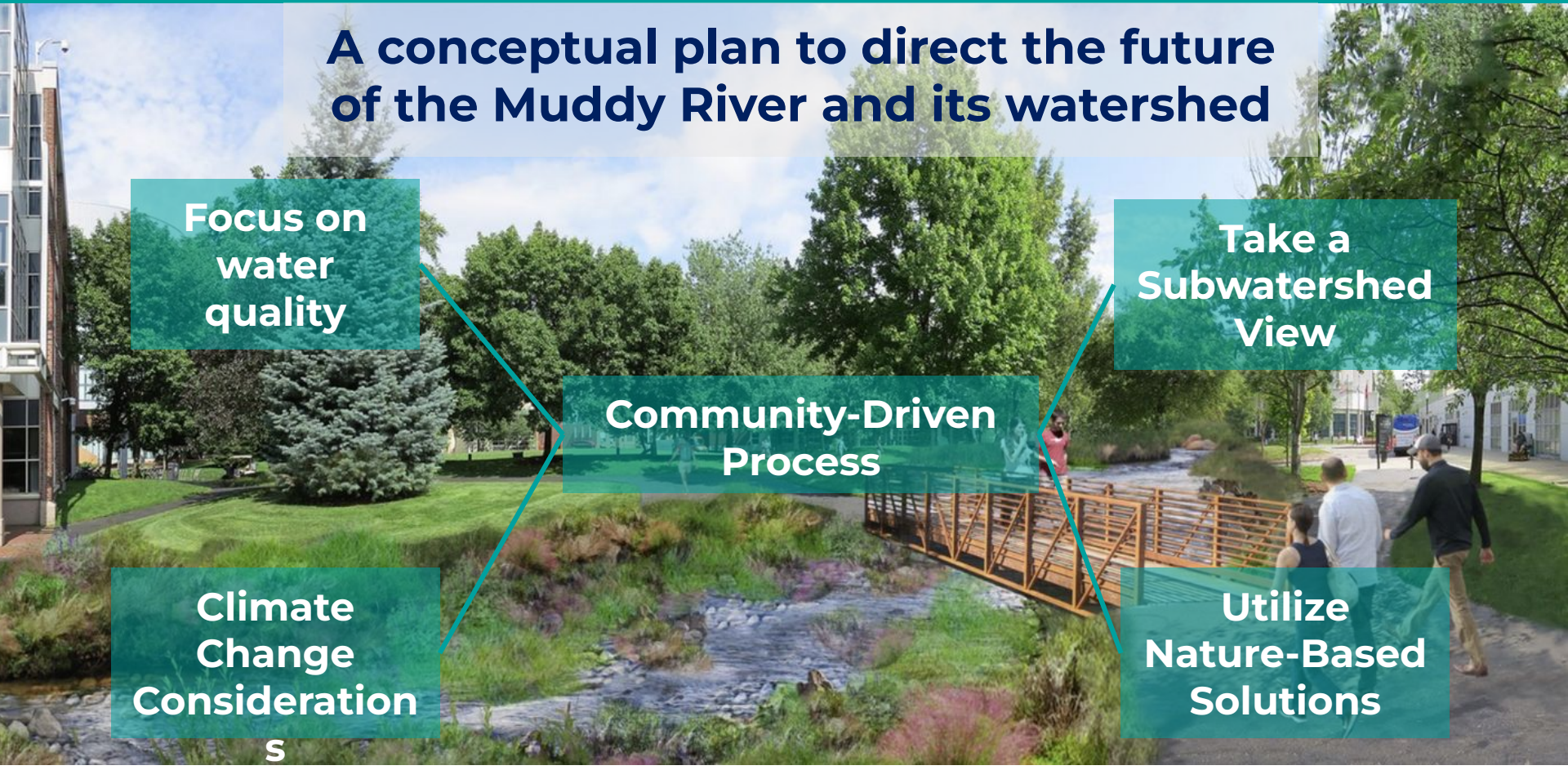

## A conceptual plan to direct the future of the Muddy River and its watershed

- Focus on water quality
- Take a Subwatershed View
- Community-Driven Process
- Climate Change Considerations
- Utilize Nature-Based Solutions

# VISION PLAN PRECEDENT

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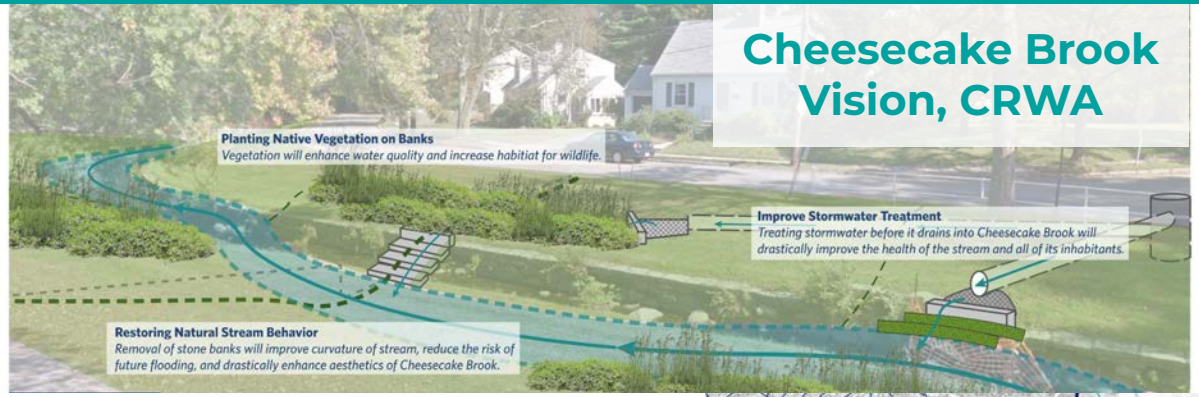
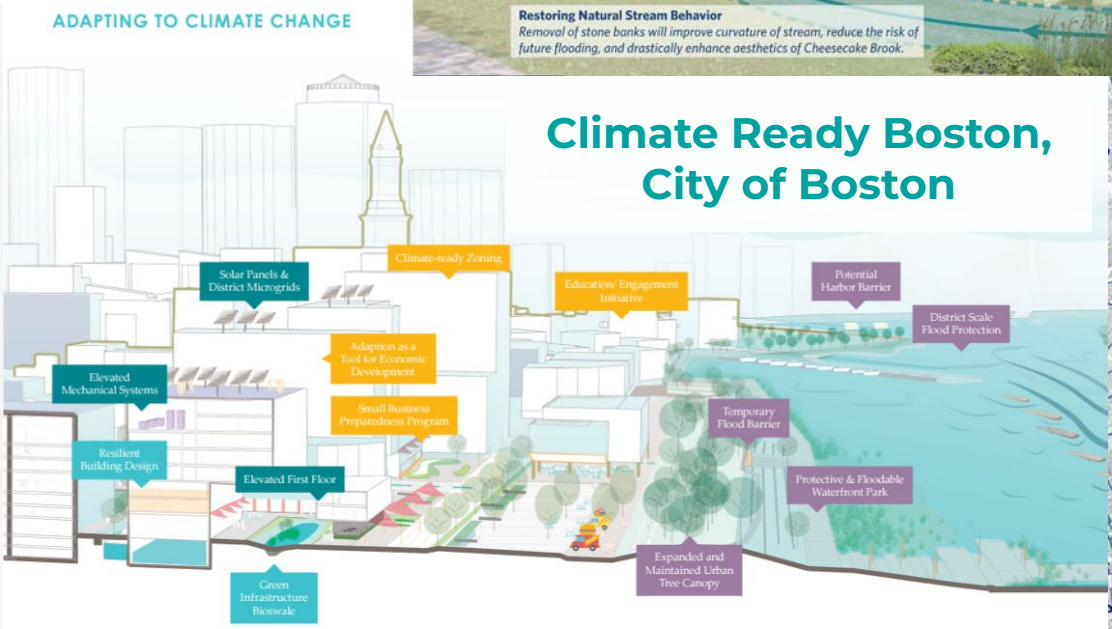
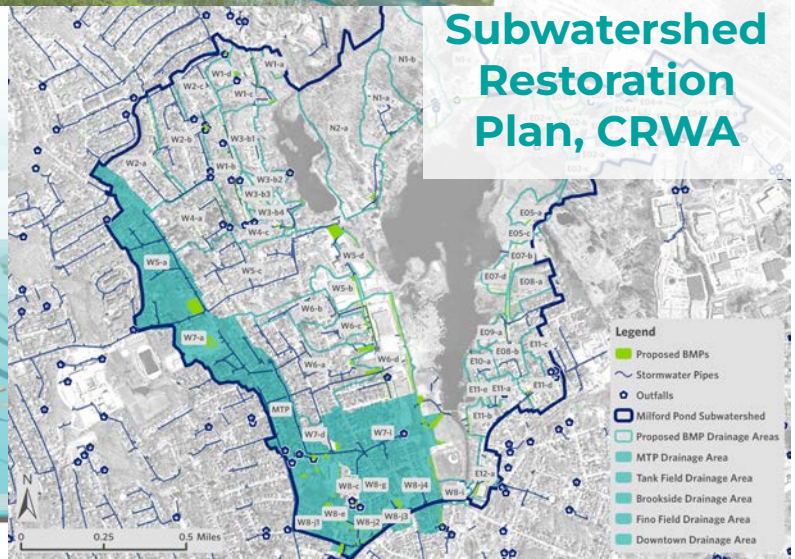
## Cheesecake Brook Vision, CRWA




## Climate Ready Boston, City of Boston




## Milford Subwatershed Restoration Plan, CRWA




MUDDY RIVER HISTORY

# MUDDY RIVER: A TIDAL BASIN

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**PRE-COLONIAL - BACK BAY WAS A TIDAL ESTUARY - INDIGENOUS PEOPLES MAINTAINED FISH WEIRS - REMAINS OF WHICH WERE FOUND UNDER PRESENT-DAY BOYLSTON STREET FOUND IN 1913 DURING SUBWAY CONSTRUCTION**

# MUDDY RIVER: A TIDAL BASIN

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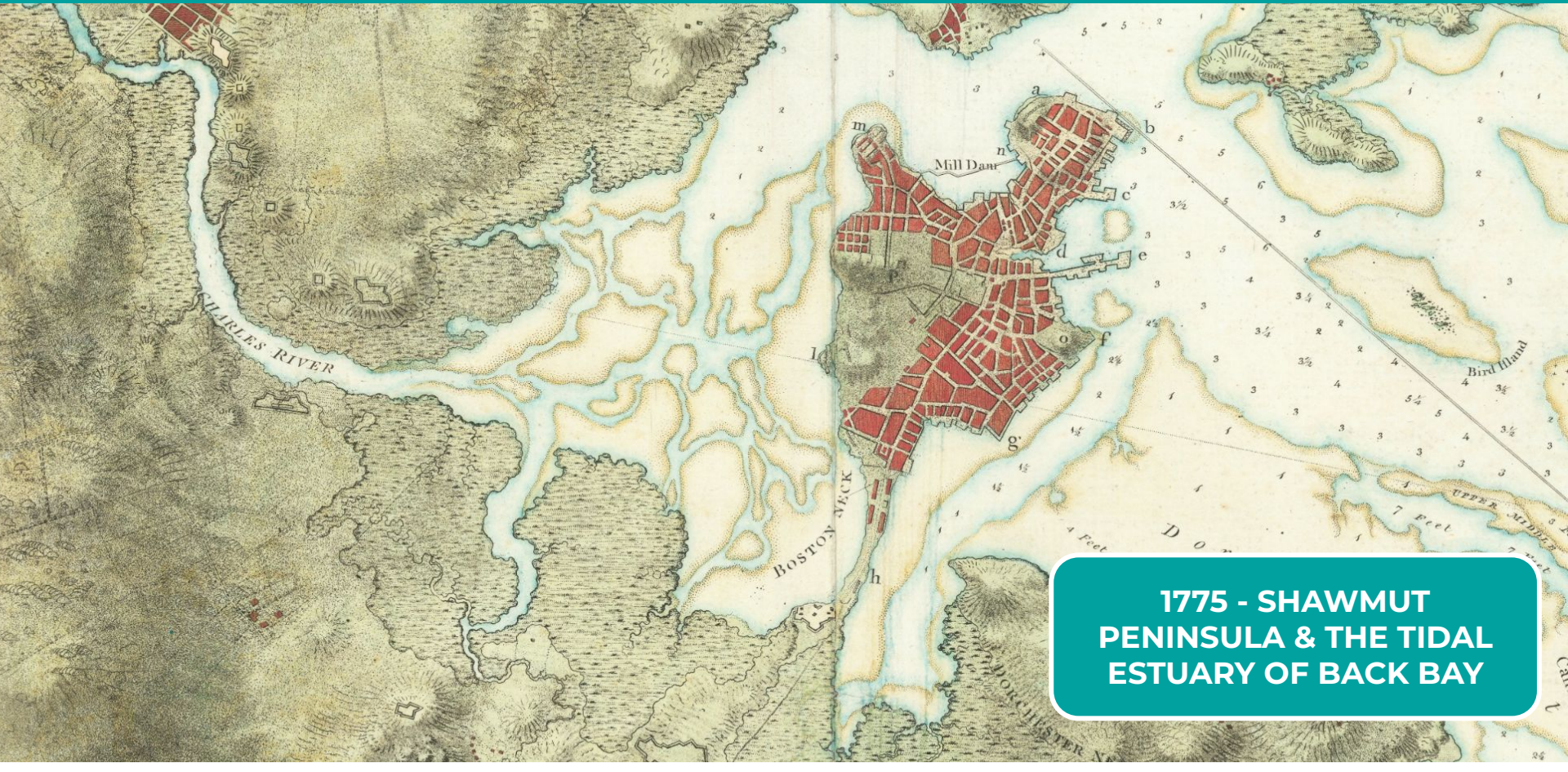


**1775 - SHAWMUT PENINSULA & THE TIDAL ESTUARY OF BACK BAY**

# MUDDY RIVER: A TIDAL BASIN

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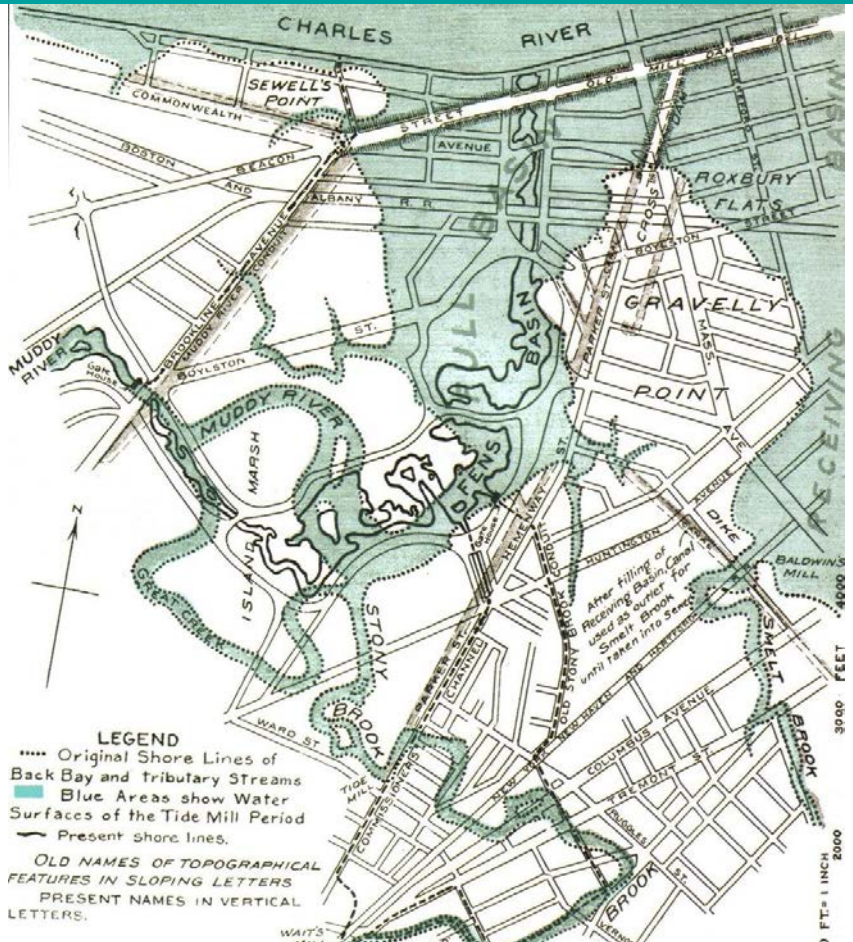

# A STINKY PROBLEM...

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*An 1849 report reads: "Back Bay at this hour is nothing less than a great cesspool… A greenish scum, many yards wide, stretches along the shores…whilst the surface of the water beyond is seen bubbling like a cauldron with the noxious gases that are exploding from the corrupting mass below."*

**Board of Health Map, Showing the Sources of Some of the Offensive Odors perceived in Boston, 1878**

# MUDDY RIVER: DRAINED + FILLED

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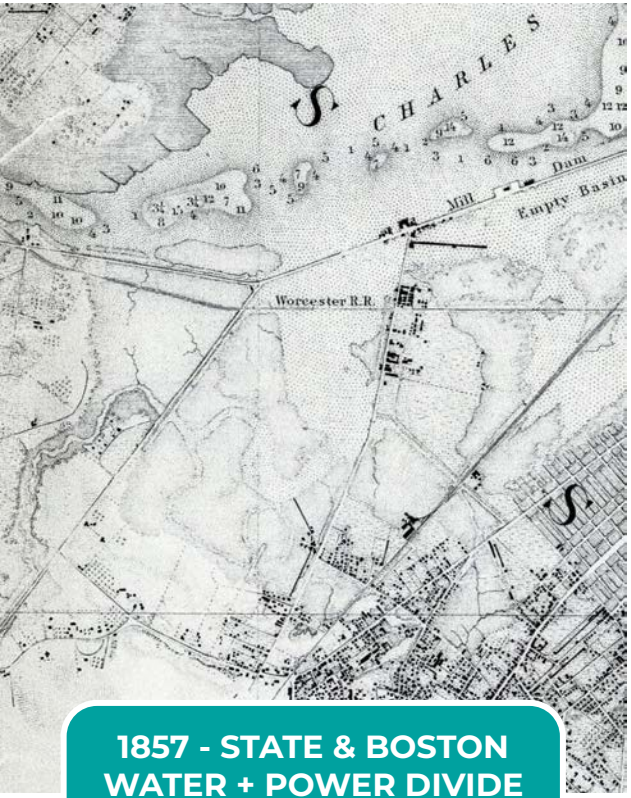
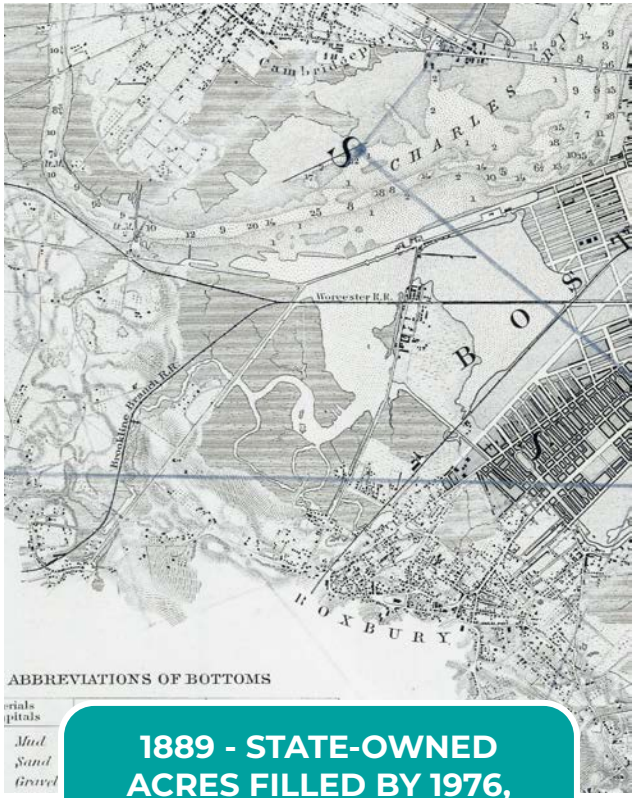



1857 - STATE & BOSTON WATER + POWER DIVIDE BACK BAY, BEGIN TO DRAIN + FILL WETLANDS




1889 - STATE-OWNED ACRES FILLED BY 1976, BOSTON WATER + POWER ACRES NEARLY DRAINED


1899 - IN JUST A DECADE, OLMSTED DESIGNS FOR THE MUDDY RIVER COMPLETE

# BACK BAY: REIMAGINED

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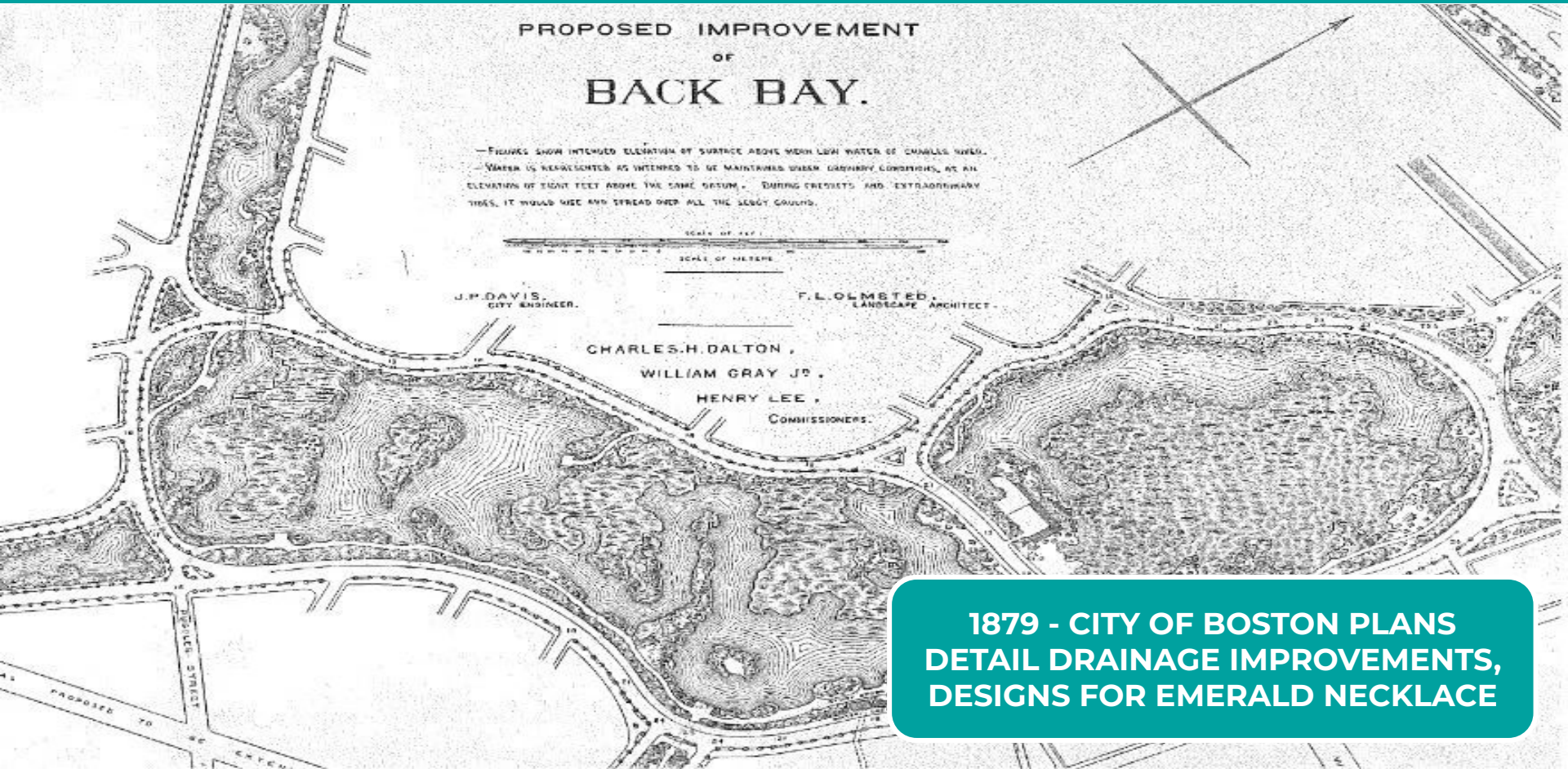


**1879 - CITY OF BOSTON PLANS DETAIL DRAINAGE IMPROVEMENTS, DESIGNS FOR EMERALD NECKLACE**

# MUDDY RIVER TRANSFORMED

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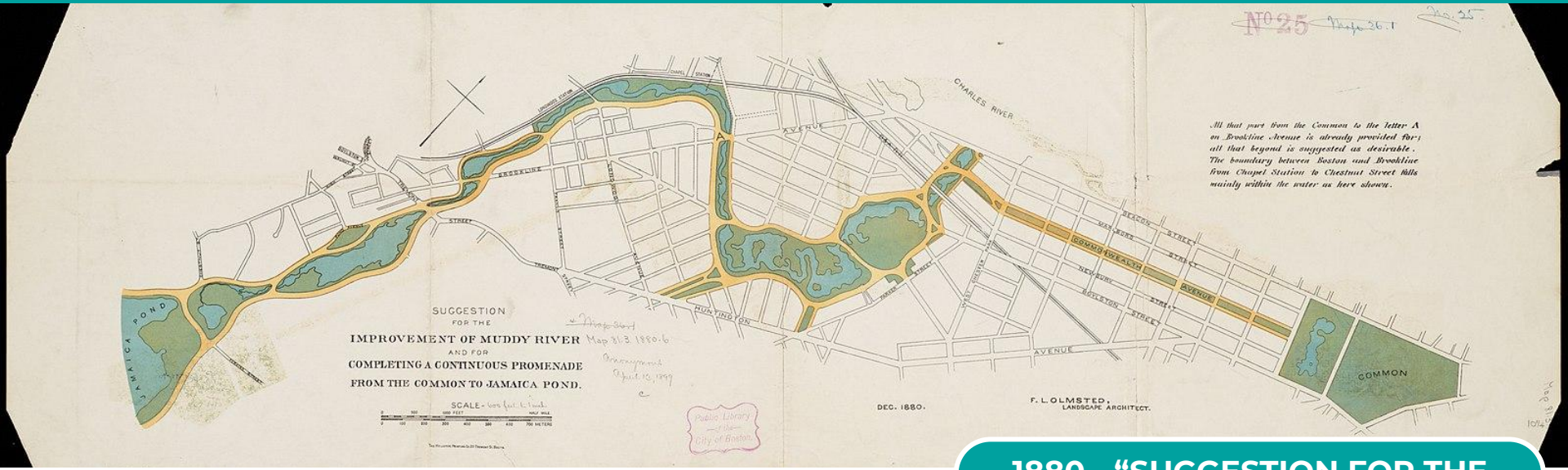


**"The simple schematic plan shown here was Olmsted's preliminary design for improving the waterway. In it, he sculpted the erratic river into a gently meandering stream, and transformed the swamp south of Tremont Street into a large pond. Olmsted would later alter this plan, going so far as to reroute the river and shift the Boston-Brookline border; this change was legally adopted in 1890."**

**1880 - "SUGGESTION FOR THE IMPROVEMENT OF THE MUDDY RIVER" - DESIGNS SHOW TRANSFORMATION OF THE MUDDY RIVER**

Frederick Law Olmsted, 1880, Norman B. Leventhal Map Center

# ENGINEERING AN URBAN WATERWAY

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**INITIAL WORK CONTINUED UNTIL 1895 - LAND FILLING, REROUTING SEWAGE, CLEARING FARMLAND - TO CREATE TODAY'S MUDDY RIVER.**

# OLMSTED'S EMERALD NECKLACE

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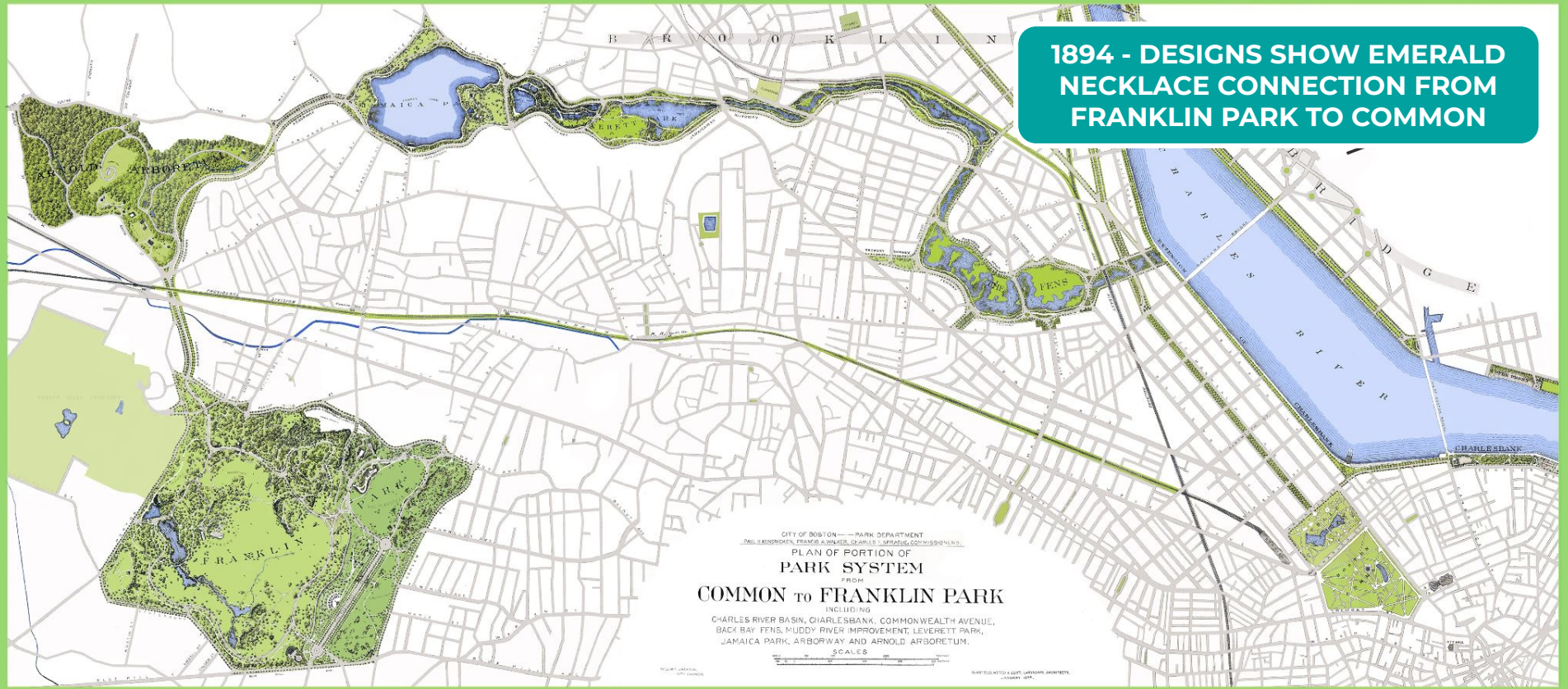


Olmsted, Olmsted & Eliot, Landscape Architects, 1894 **Composition by:** Elena Saporta

# AN EARLY MUDDY RIVER VISION

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**“The Muddy River was central to Frederick Law Olmsted’s vision of the Emerald Necklace. Within decades, his designs sculpted a sinuous flow through Leverett Pond, the Riverway, and the Fens into the Charles River.”**

# URBANIZATION & RESTORATION

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**Boston's 20th-century development severely compromised Olmsted's vision, and the effects are still felt today. By the 1950s, cars and industry led to widened roads, overpasses, and parking lots - which could not absorb + treat stormwater as Olmsted's "green infrastructure" could. Decades of urban development led to large swaths of the Muddy being culverted and driven underground. By 1959, a parking lot for Sears Roebuck & Co. buried one section entirely, leading to flooding.**

# BREAKOUT SESSION #1

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## WHY I CARE

Do you live, work, or play around the river?

Why is the Muddy River important to you?

# CURRENT CONDITIONS

# A WATERSHED-SCALE VIEW

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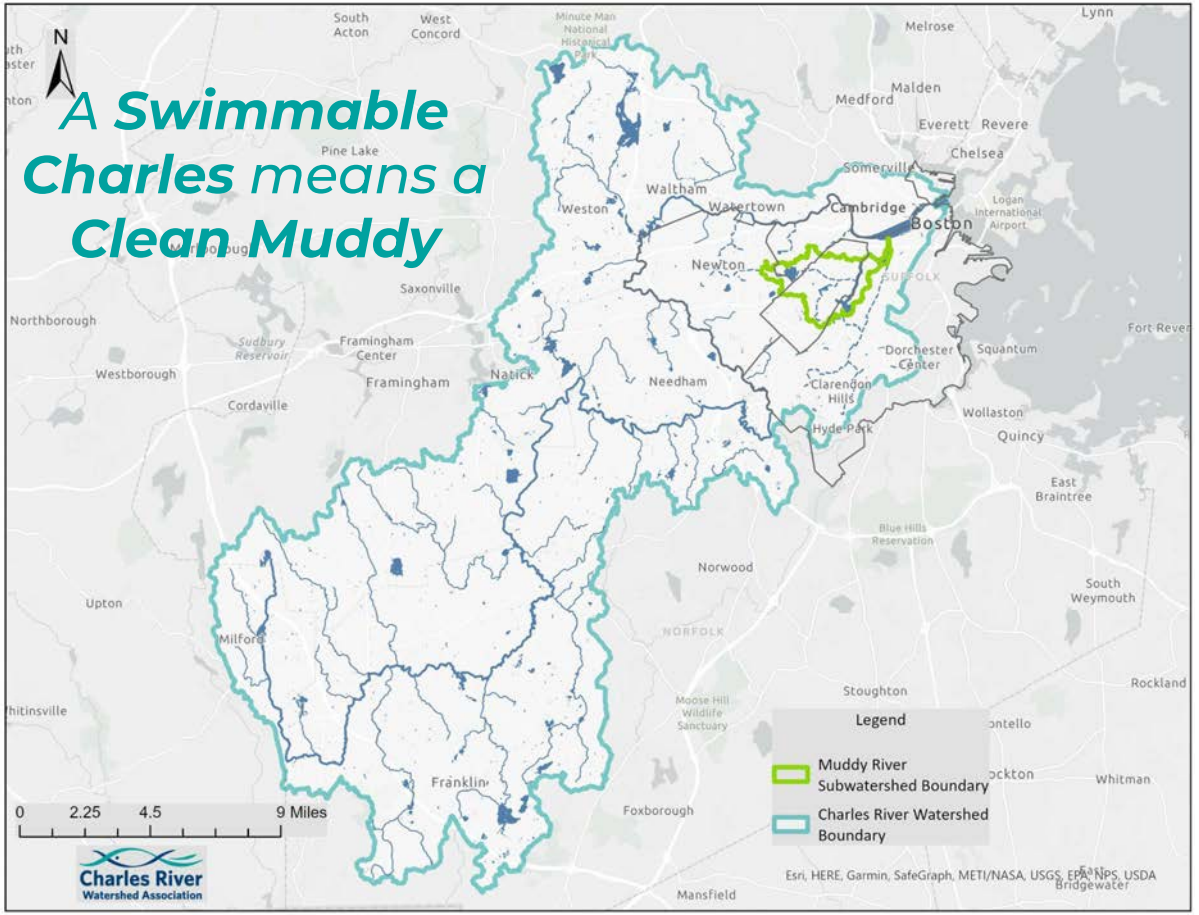
## MUDDY RIVER WATERSHED:

- **2% of Charles River watershed**
- **Approx. 6 mi²** - spans Brookline, Newton, and Boston neighborhoods of Brighton, Jamaica Plain, Mission Hill, Longwood, and Fenway
- **3.9%** of total nutrient pollution
- **14%** of pollution from the Lower Basin



# THE BIG PICTURE: A CLEAN RIVER

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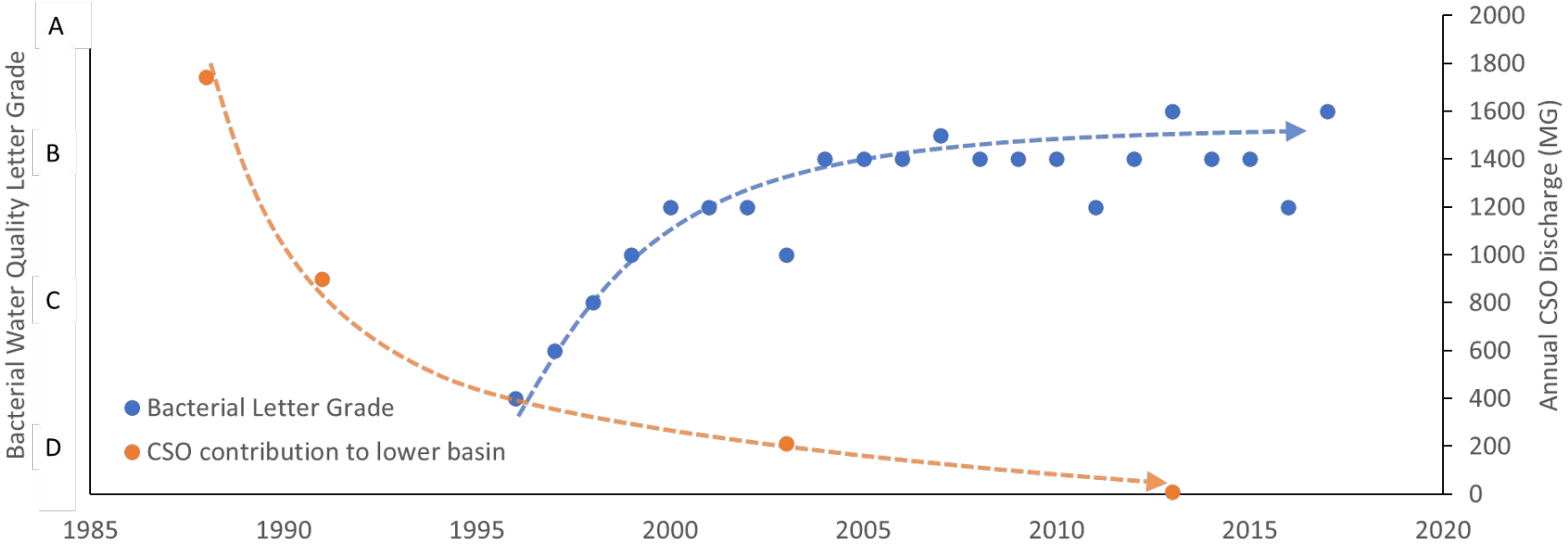
## EPA Sets Clean Up Goal for Charles River by Earth Day 2005

News Release - 10/22/1995: The U.S. Environmental Protection Agency set a goal of making the Lower CharlesRiver swimmable and fishable by Earth Day 2005. Noting severe pollution problems in the

"Today rowers will hope not to get to get wet," DeVillars added. "But if we work hard and invest wisely, a decade from now they'll be able to go for a swim at Magazine Beach after the race."



# MUDDY RIVER WATER QUALITY

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- **Most polluted tributary** in Charles River watershed
- Receiving water quality grades D- to C since 2019
- Sources of Contamination:
  - Stormwater Runoff
  - Combined Sewer Overflow
  - Illicit Connections

**D-**

**MUDDY RIVER AT CHARLESGATE**

## Impairments in 2018/2020 Integrated List of Waters

- Odor
- Oil & Grease
- Turbidity
- *E. coli*
- Total Phosphorus
- Dissolved Oxygen
- PCBs in Fish Tissue
- DDT in Fish Tissue
- Bottom Deposits
- Flow Regime Modification
- Non-native Aquatic Plants
- Physical Substrate Habitat Alteration

# MUDDY RIVER WATERSHED

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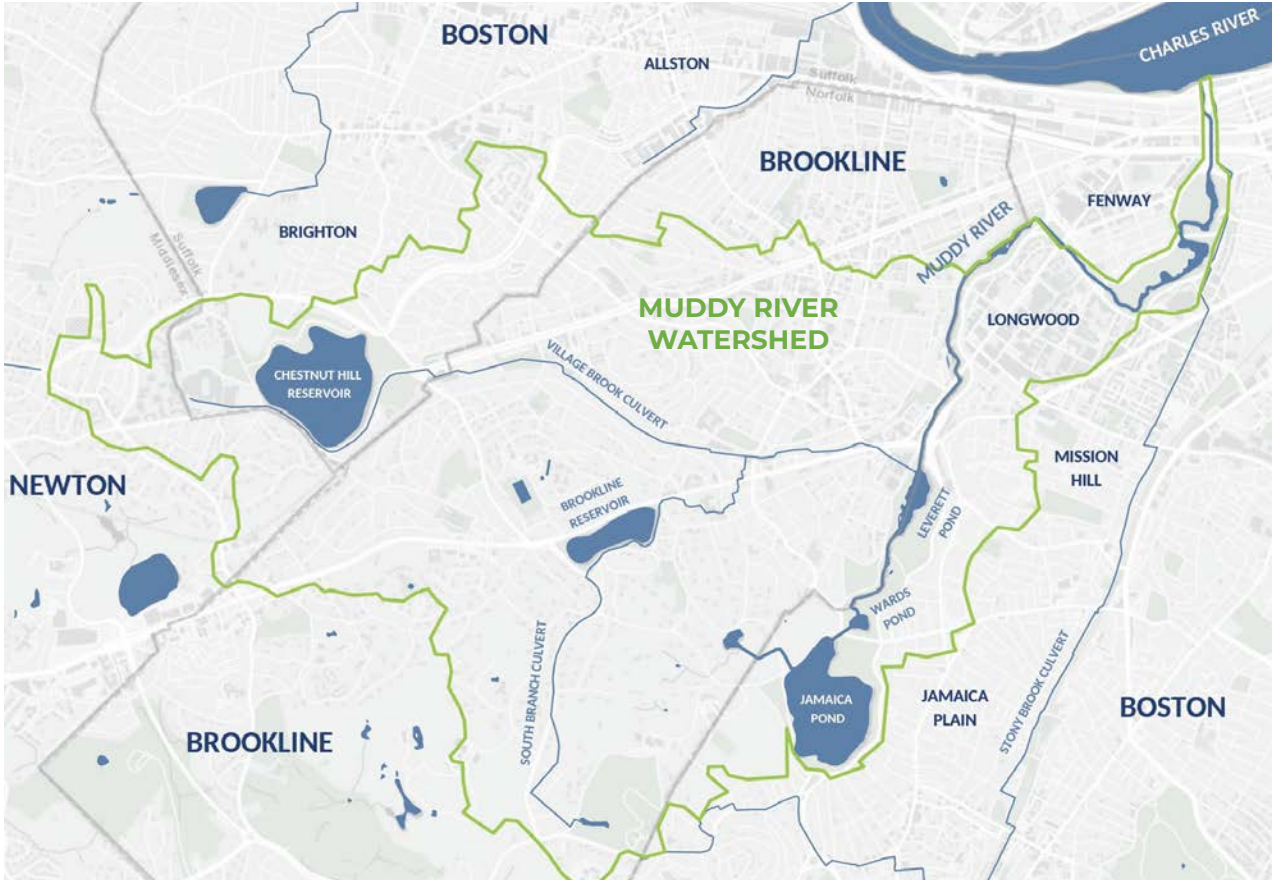
- **Highly-developed watershed**
- **Vulnerable to climate change** - flooding, drought, extreme heat
- Many existing relevant plans for restoration & development

***Water quality** in the Muddy depends on its **inputs***



# THE STORMWATER PROBLEM

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**STORMWATER PICKS UP ALL THE POLLUTION FROM OUR HIGHWAYS, PARKING LOTS, AND ROADS - DEGRADING THE RIVER ECOSYSTEM & THREATENING PUBLIC HEALTH.**

# THE IMPERVIOUS PROBLEM

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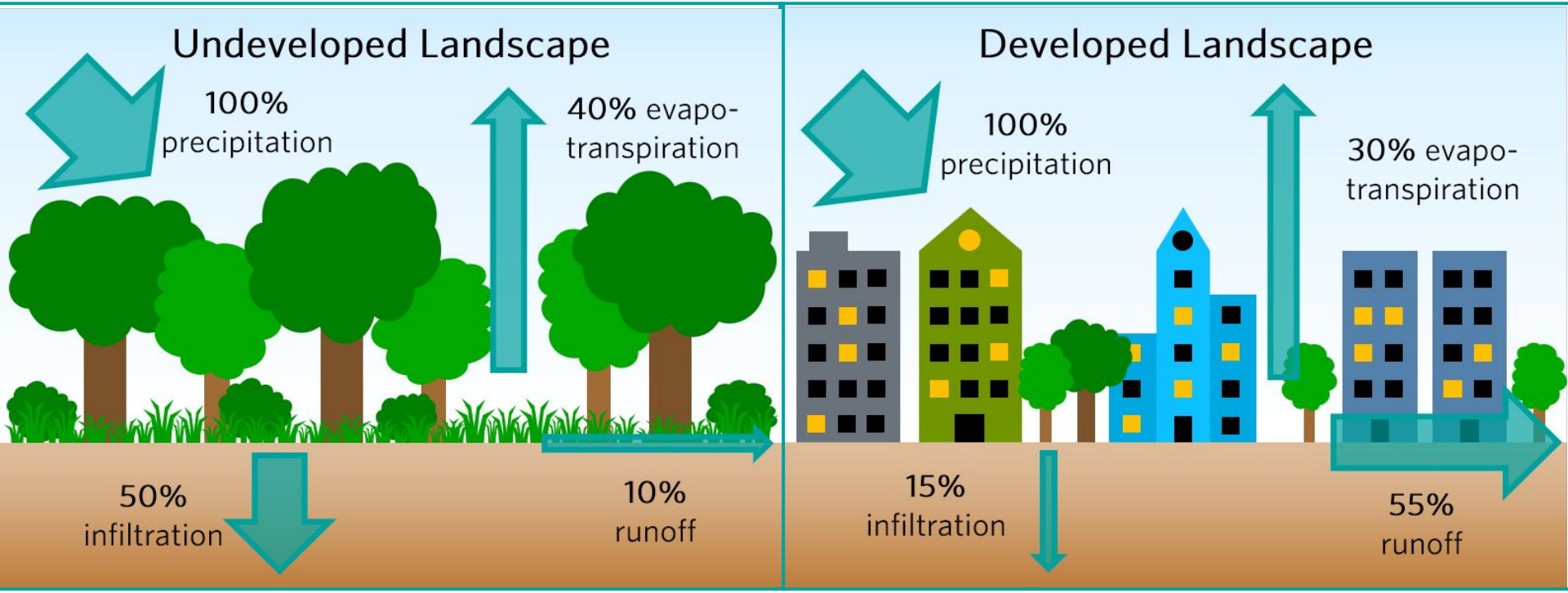


**Land use alters natural hydrology**

# THE IMPERVIOUS PROBLEM

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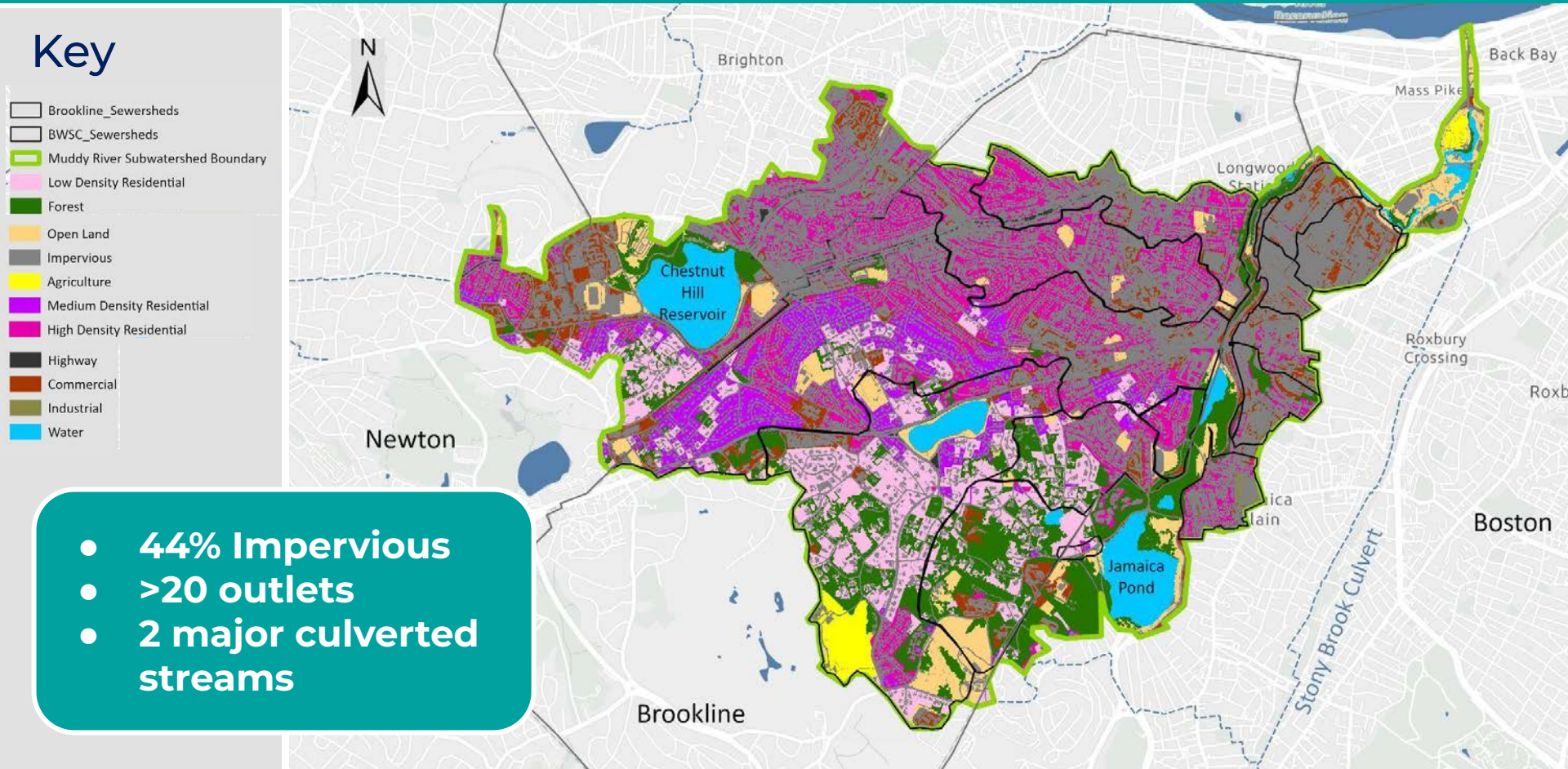


- 44% Impervious
- >20 outlets
- 2 major culverted streams

# THE STORMWATER PROBLEM

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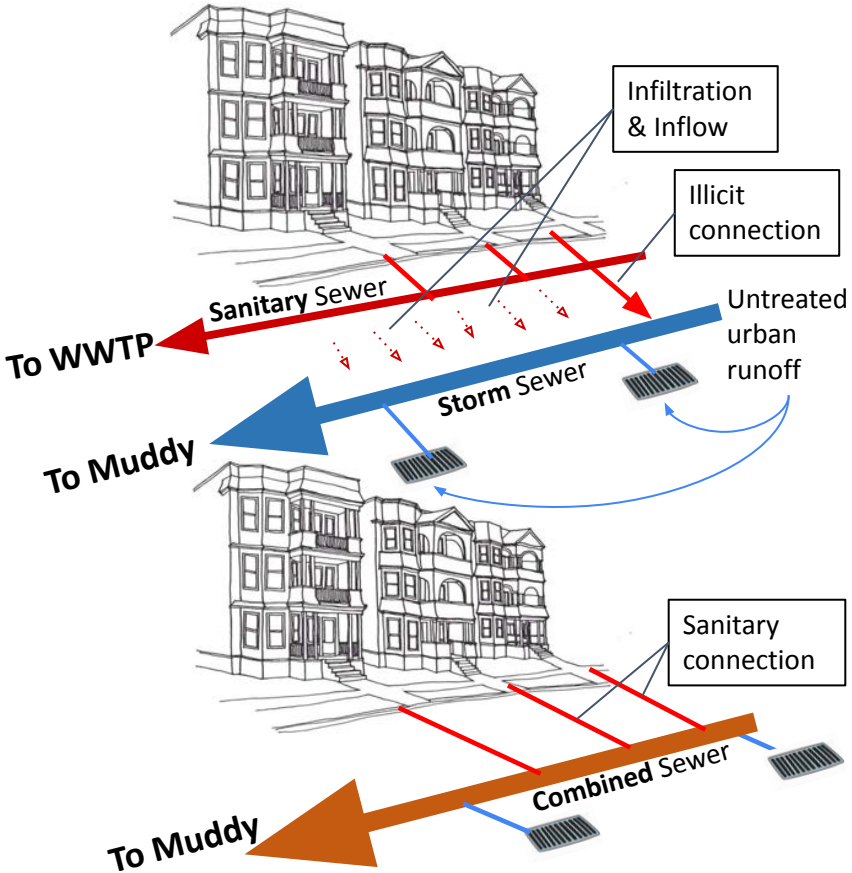
## Anatomy of wet-weather pollution



# COMBINED SEWER OVERFLOWS

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**In heavy rains, BOS046 routinely overflows sewage + stormwater from the Stoney Brook Conduit into the Back Bay Fens, carrying trash, bacteria, and more.**


FUTURE POSSIBILITIES

# CLIMATE CHANGE

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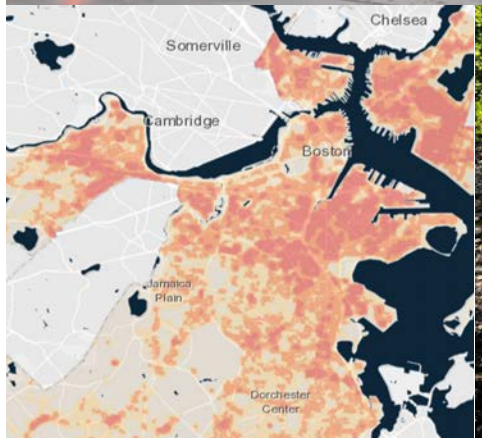
- Increase in **frequency & intensity** of precipitation
- Trigger for CSOs
- **Risk of flooding** highest in Longwood Area

- **More frequent drought**
- Higher temperatures & **extreme heat**
- Exacerbates existing **urban heat islands**




# NATURE-BASED SOLUTIONS

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Rain Garden, Milford

**Green Stormwater Infrastructure**

Depaving, Puget Sound

**Depaving**

Fuller Brook Restoration, Wellesley

**Riverbank Restoration**

**When adopted & implemented throughout the watershed, can improve water quality & climate resilience!**

# GREEN INFRASTRUCTURE

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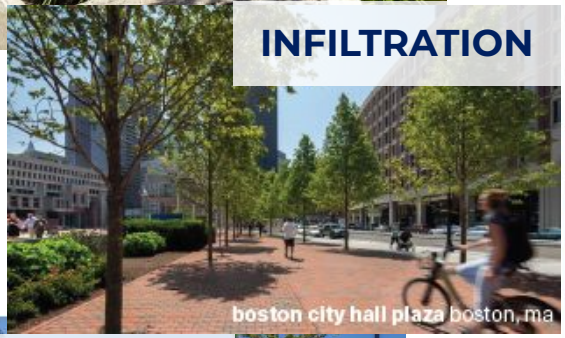
## BIORETENTION

## INFILTRATION




## PERMEABLE PAVEMENT


| | Improved Quality of Life | Reduced Heat Island | Improved Air Quality | Community Involvement | Job Creation | Reduced Energy Costs | Carbon Sequestration | Habitat Improvement | Increased Property Value |
|---|---|---|---|---|---|---|---|---|---|
| Bioretention (Infiltration) | ● | ● | ● | ● | ● | ◐ | ● | ● | ● |
| Biofiltration | ● | ● | ● | ● | ● | ◐ | ● | ● | ● |
| Bioretention Planters | ● | ● | ● | ● | ● | ◐ | ● | ● | ● |
| Tree Filter | ● | ● | ● | ● | ● | ◐ | ● | ● | ● |
| Sub-Surface Infiltration | ○ | ○ | ○ | ○ | ◐ | ○ | ○ | ○ | ○ |
| Infiltration Trench | ○ | ◐ | ◐ | ○ | ◐ | ○ | ◐ | ◐ | ○ |
| Surface Infiltration Basin | ● | ● | ● | ● | ● | ◐ | ● | ● | ● |
| Porous Asphalt | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Permeable Pavers | ◐ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ◐ |
| Green Roofs | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Blue Roofs | ○ | ◐ | ○ | ○ | ◐ | ◐ | ○ | ○ | ○ |
| Cisterns | ◐ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ◐ |

○ Little to No Benefit ◐ Moderate Benefit ● High Benefit

## CO-BENEFITS

- Habitat Improvement
- Reduce Heat Island
- Improve Air Quality
- Carbon Sequestration
- Reduced Energy Costs
- Job Creation

Source: BWSC GI Handbook

# IMAGINE A RESILIENT FUTURE

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**Before | After**

**Cheonggyecheon Stream Restoration,** Seoul, South Korea

- Completed in 2005
- Highway removal and daylighting of a buried stream.

# IMAGINE A RESILIENT FUTURE

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**Municipal Stormwater Treatment,** Long Beach, California

- Treat and divert stormwater from >5,000 acres
- Capacity of 2-4 MGD
- Advanced treatment, constructed wetlands, Water Reuse

More information

**Alewife Reservation Constructed Wetland,** Cambridge, MA

- 3.5 acres wetland habitat treats stormwater from 400 acres
- Equalizes flow from up to 10 year event.
- Treated water flows to Alewife Brook

More information

# A RESILIENT FUTURE IS POSSIBLE!

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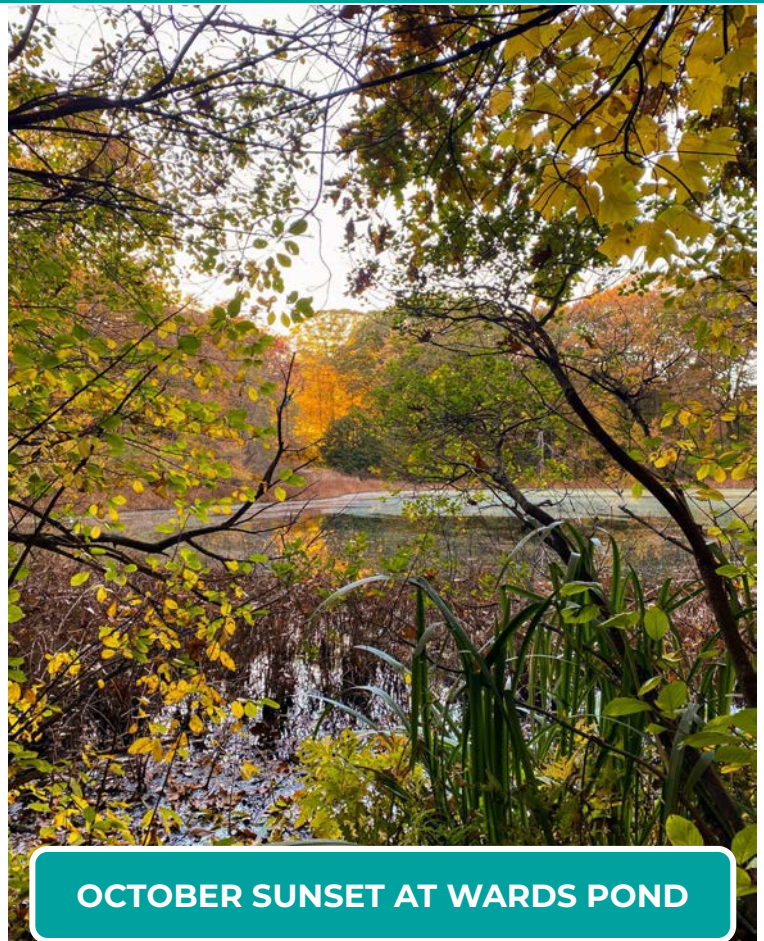
- **Millions of dollars** being spent on climate adaptation & infrastructure
- Opportunity to **restore the ecology** while **adapting to climate change**
- Charles River Lower Basin went from **D to A- in 25 years**

**TO RESTORE THE RIVER, WE NEED TO REIMAGINE OUR RELATIONSHIP WITH NATURE**



OCTOBER SUNSET AT WARDS POND

# BREAKOUT SESSION #2

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## WHAT'S MY VISION?

What is your vision for a fully restored Muddy River?

What do you want the future landscape to look like?

What features will the watershed have?

What measures will we need to adapt to climate change?


NEXT STEPS

# CREATING A COMMUNITY VISION

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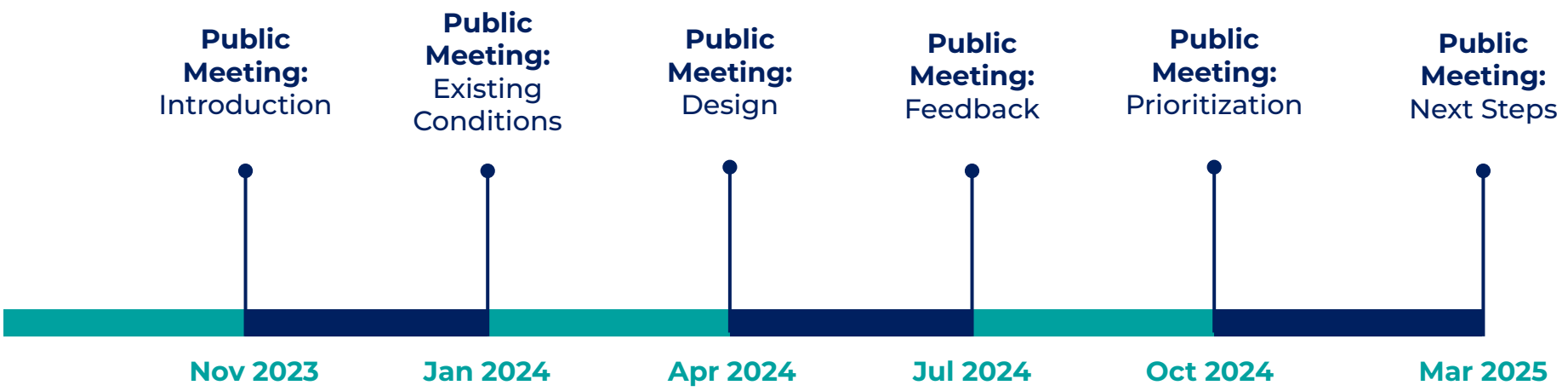
## COMMUNITY PROCESS




## TECHNICAL REVIEW

# HOW TO STAY INVOLVED

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Charles River Watershed Association

**email:** charles@crwa.org

@charlesriverwatershed

@charlesriverwatershed

@charlesriver

**LEARN MORE** Visit [crwa.org/stream-restoration](crwa.org/stream-restoration) to learn about our Stream Restoration program.

**SIGN UP FOR UPDATES** We will share announcements, future meetings, and more opportunities for input.

**TELL A FRIEND** Know someone else who may be interested? Share our the vision process with your networks!