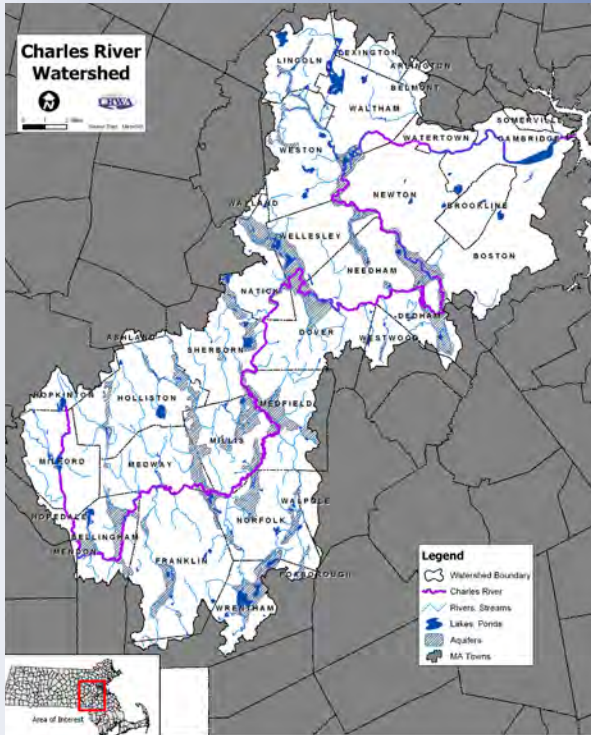


The Charles River watershed...



- Includes 35 communities

- Has more than 1 million residents, and over 60% live in urban areas

- Covers 308 square miles

- Encompasses urban, suburban, rural, industrial, residential and farming areas



Charles River Watershed Association's mission is to use science, advocacy and the law to protect, preserve and enhance the Charles River and its watershed.

Charles River Watershed Association
 190 Park Road
 Weston, MA 02493
 781-788-0007
www.charlesriver.org
charles@crwa.org

CRWA is a 501(c)(3) non-profit dependent on philanthropic support. We welcome your contributions.

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 Watershed map: CRWA
 Impervious ground cover graphic: California Nonpoint Education for Municipal Officials Program
 Water's Journey map: Boston Water and Sewer Commission
 Green roof: Urban Agriculture Online, www.urbanag.org.au/Greenroofs_Australia.html
 Rain garden, top: Urban Resources & Borderland Alliance Network, www.urbanwaterquality.org/RainGardens/rgindex1.htm
 Rain garden, bottom: Rain Gardens of West Michigan, www.raingarden.org
 Tree pit: Filterra, www.filterra.com
 Porous pavement: UNH Stormwater Center, www.unh.edu
 Cisterns: SmartStorm system, CRWA



Charles River Watershed Association

Water Primer



What you need to know about **your** water!

You live in the Charles River watershed,

a 308 square mile area including Boston, Cambridge, Brookline, Newton, and other communities to the south and west along the 80 miles of the river.

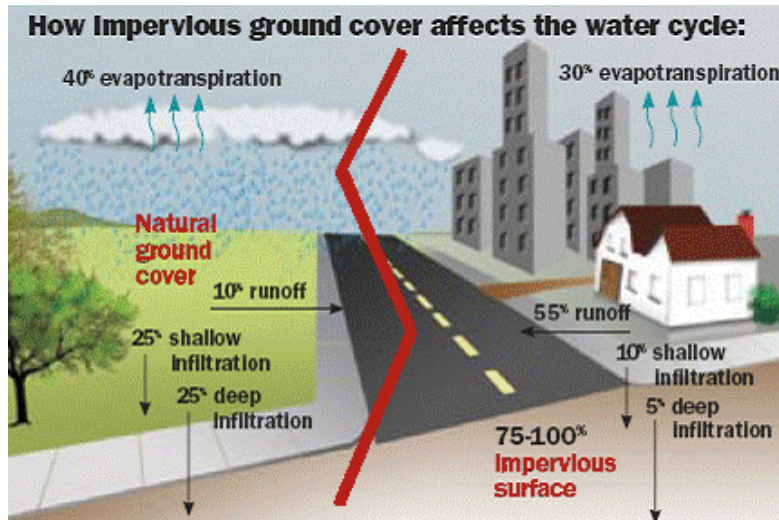
As a part of the Charles River watershed, you play a role in the health of the Charles River! Things that you put on the ground or into a storm drain – whether candy wrappers, cigarette butts, rinse water from washing your car, or your extra coffee – will eventually end up in the Charles.

What is a watershed?

A **watershed** is all of the land that, when it rains, will drain into a particular body of water. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge. Large watersheds, like the Mississippi River basin, contain thousands of smaller watersheds.



Water in the City



In rural and suburban areas that have natural groundcover, about 50% of rain infiltrates into the ground and aquifer, and only 10% is runoff.

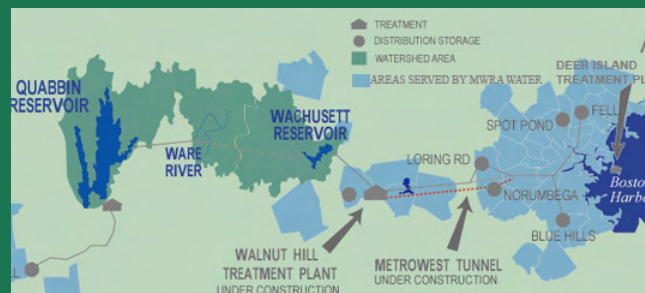
In highly urbanized areas with impervious surfaces like roads, parking lots, and buildings (which water can't flow through), more than 50% of rain becomes runoff, and deep infiltration is only a fraction of what it was naturally.

In urban areas there are many impacts to water quality and the Charles River:

- Fewer areas covered with trees, plants and soil, means **less water soaks into the ground**
- Less water soaking into the ground means **more water runs off directly into streams and rivers**, taking everything on the ground along with it
- Excess runoff from paved areas often causes **flash floods** in streams, and on roadways
- Things that pollute the river in urban and suburban areas include fertilizers, chemicals, leaks from sewer pipes, oil, grease and exhaust from cars, leaves and grass clippings, pet waste, and other litter - anything left on the ground that can be carried away by water
- Combined sewers, which carry rain water and sewage through the same pipes, overflow directly into the river during large rainstorms

Your Water's Journey

When you turn on your kitchen faucet or flush your toilet, the water comes to you through a complex system of reservoirs and pipes. Greater Boston's water comes from the Quabbin and Wachusett Reservoirs in Central Massachusetts, managed and operated by the Massachusetts Water Resources Authority (MWRA). The water is treated and then piped through aquaducts and tunnels to all of the cities and towns in light blue on the map. Your local water department purchases water from MWRA, and delivers it to your home or business. Used water is flushed out into sewers that carry our wastewater to the Deer Island Wastewater Treatment Plant. Finally, the water finishes its journey in Massachusetts Bay, discharged from the treatment plant into the sea.



How Can We Prevent Water Problems?

Our goal is to make urban, developed areas be more like natural areas and have a more natural water cycle. Urban redevelopment projects present tremendous opportunities to improve the environment, reverse degradation, and correct mistakes. One way to do this is through **Low Impact Development (LID)** - a comprehensive site planning and engineering approach that seeks to maintain and enhance the natural, pre-development water behavior in any location. LID's goal is to mimic a site's natural hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.

Best Management Practices (BMPs) are technologies designed to prevent or reduce water pollution. They include management practices (such as reducing fertilizer use) or structural practices (such as rain gardens) designed to reduce the quantity of pollutants - sediment, nitrogen, phosphorus, and animal wastes - that are washed by rain and snow melt into nearby waters. In the boxes below are some examples of BMPs that are used in LID approaches.

A green roof absorbs rain and cools the building and surrounding area.

A rain garden, placed in a low area to intercept runoff, slows the water in order to prevent erosion and allow it to be absorbed into the ground. Plants are often chosen for their ability to remove pollution and toxins.

Cisterns of various types can be used to collect roof runoff and store rain water for use in landscaping.

Porous pavement, which allows rain to filter through into the ground, helps reduce runoff and mimic the natural water cycle. It even helps prevent icy conditions in winter, as the snow will melt right through it.

A stormwater tree pit, or tree box filter, is a structure which collects rain and stormwater runoff and filters it through gravel, soil and vegetation to improve water quality.

