

What is stormwater, and why does it cause pollution?

Stormwater is water from rain or other precipitation. Stormwater runoff is stormwater that does not soak into the ground. Stormwater flows off hard surfaces, like roofs, driveways and any other compacted surfaces during heavy rainstorms and when snow melts. The water eventually flows into BWSC's stormwater system.

As stormwater flows over these hard surfaces, it collects trash, sediment, and pollutants like motor oil and fertilizer. Most of BWSC's storm drains take that water directly to our brooks and streams without treatment. The City of Boston lies within the Charles, Neponset, and Mystic River watersheds, which means that our city's streams ultimately drain into Boston Harbor. Managing stormwater helps minimize pollution in our waterways. BWSC is responsible for any stormwater that is discharged into our system.

How do we manage stormwater?

A stormwater system's primary function is to collect stormwater runoff, which is then discharged into receiving waters, like the Charles, Neponset, Muddy, Mystic Rivers and Boston Harbor. The Commission's stormwater system includes more than 30,000 catch basins. Catch basins are structures with grates with a chamber and pipe below them. These lead to 600 miles of pipe (storm drains) that carry water safely away from homes and businesses to more than 250 outfalls, where stormwater enters the waterways. Stormwater management is regulated. The US Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) require us to manage stormwater properly.

Why is BWSC investing in stormwater infrastructure?

Boston is a historic city, which means much of our infrastructure is also historic. Our earliest sewers are combined sewers that carry wastewater (also called sanitary sewage) from your house and stormwater in a single pipe. Although common in older cities, this type of combined system is rapidly being replaced because it is outdated, and there are more effective ways of handling sewage and stormwater. As the City expanded in the early 1900s, separate sewer and storm drains were installed. A separate system collects sanitary sewerage and transports it to treatment facilities. Flow in storm drains does not receive treatment.

About 18% of our stormwater system is still combined with sewers—including parts of Back Bay, Beacon Hill, Roxbury, North Dorchester, and East, South, and Downtown Boston. This old infrastructure wasn't designed for today's needs. BWSC is actively upgrading the combined system to separate stormwater and sewer pipes.

Boston is a leader in stormwater management, but we must do more to upgrade our stormwater system and comply with the regulations that protect our natural waterways and Boston Harbor; that's why we're continuously looking for ways to improve our system. BWSC is under a Consent Decree with the EPA and the Conservation Law Foundation (CLF) to ensure compliance with the Clean Water Act. The Consent Decree requires BWSC to implement pollution prevention, treatment and removal techniques, monitoring, and other measures that assist in removing pollutants from stormwater before they enter local rivers and Boston Harbor.

What is an impervious surface?

An impervious surface prevents water from absorbing into the ground. Impervious surfaces include roofs and pavement, such as patios and parking lots, in addition to crushed stone and compacted gravel and soil. When stormwater is absorbed into soil, it is partially filtered before it flows into local waterways. But when stormwater flows over impervious surfaces, more pollutants enter our stormwater infrastructure and local waterways.

What is green infrastructure as it relates to stormwater?

One way of managing stormwater is called green infrastructure. Green infrastructure acts like nature and catches rainwater at the point where it falls allowing it to soak into the ground slowly. This method enhances infiltration, improves water quality and groundwater levels, and creates green spaces within urban areas, among other benefits.

Where are examples of green infrastructure in Boston?

There are examples of green infrastructure all over Boston, many done in partnership with property owners and the City. These examples include rain gardens, porous paving materials and stormwater bioswales that allow stormwater to filter into the soil around trees instead of running off into streets. Here are some locations:

- Central Square in East Boston
- Audubon Circle
- South Street and Bussey Street Rain Garden
- Harrison Avenue Tree Trenches
- Codman Square
- City Hall Plaza

Green infrastructure has also been established at the following schools and is accompanied by a curriculum for fifth and seventh-grade students:

- Washington Irving Middle School in Roslindale
- Rafael Hernandez K-8 School in Roxbury
- David A. Ellis Elementary School in Roxbury
- Jackson/Mann K-8 School and Horace Mann School for the Deaf and Hard of Hearing in Allston
- Edward M. Kennedy Academy for Health Careers in Roxbury

How much does BWSC invest in stormwater management and infrastructure?

The Commission spends around \$23.0 million annually on stormwater management. The money goes to maintaining infrastructure, meeting environmental regulations, and improving drainage. But there are still more costs to upgrade our system to handle future challenges. The Commission has budgeted \$68.0 million to continue to upgrade and improve the City's stormwater system through 2027.

How is BWSC charging for stormwater services?

BWSC is charging all customers in a manner that is fairer given BWSC's obligations to fund improvements to our stormwater system which is increasingly being entirely separated from our sewer system. Charging separately for stormwater ensures that everyone pays for the service they use. The stormwater charge is based on how much hard surface, like driveways and patios, is on each property.

This separate charge is fairer because impervious area is related to each property's use of stormwater services. Charging this way means that thousands of properties—like parking lots—that place a demand on the stormwater system, but don't receive water and sewer service from BWSC, are now being charged for stormwater services.

Who pays for stormwater services?

All properties with more than 400 square feet of impervious areas are charged. Charges are based on the amount of impervious surface on the property. Parcel owners charged include, but are not limited to, owners of residential properties, commercial and industrial properties, non-profit organizations, schools, colleges/universities, houses of worship, state and federal-owned properties, and parking lots.

Is basing a stormwater charge on impervious area a common thing to do?

Many cities across the country, including in New England, charge customers for managing stormwater infrastructure based on the amount of hard surface—also called impervious surface—on their property. This method is considered the fairest way to charge for stormwater services. Other large cities that have implemented a stormwater charge include Washington, D.C., Baltimore, and Philadelphia.

How is the stormwater charge utilized?

The stormwater charge is funding BWSC's costs to comply with the Clean Water Act and our Consent Decree with the EPA and CLF, including the funding of projects that ease the impact of impervious surfaces on our stormwater infrastructure. These projects include:

- New storm-drain infrastructure
- Repair and replacement of existing infrastructure
- Installation of stormwater control measures
- Green infrastructure installations
- Outfall restoration and numerous other drainage improvement projects

How does BWSC determine how much impervious area is on my property?

The Commission uses Geographic Information System (GIS) data and pictures taken from planes or satellites above our city to determine the amount of impervious (hard) surface on each property. The greater the amount of impervious surface, the larger the charge for stormwater services.

How is the stormwater charge calculated?

The stormwater charge is being billed based on the customer's property classification as (1) Small Residential or (2) Non-Small Residential. Small Residential Properties (SRPs) have one to six units (one to six family residences). Non-Small Residential Properties (NSRPs) include all other property types: residential with more than six units; all condominiums; institutional; industrial; and commercial.

To calculate the stormwater charge, a unit called the Equivalent Residential Unit (ERU) is being used. One ERU represents the amount of impervious area on a typical Small Residential Property in Boston, which is 2,164 square feet.

- Parcels with less than 400 square feet of impervious surface will not be charged for stormwater.
- Small Residential Properties are charged a single rate of one ERU.
- Each ERU results in an \$8.98 per month charge.

- Non-Small Residential Properties are being charged per ERU of impervious area on the property. To calculate the stormwater charge on these NSRPs, BWSC divides the total square footage of impervious area of the property by 2,164 square feet to determine the number of ERUs and rounds up. For example, a property with 45,000 square feet of impervious area is being charged for 21 ERUs.

How can I estimate my stormwater charge and see my impervious area?

BWSC developed an online estimator to calculate your stormwater charge. To use the estimator, you'll need to enter some basic information about your property. The calculator will then use this information to estimate your stormwater charge. It's important to note that this is just an estimate, and your actual stormwater charge may vary depending on various factors. The estimator is available at <https://www.bwsc.org/stormwater>.

How can I keep my stormwater costs down?

All customers are eligible to apply for credits or grants. Please see our credit and grant documents available online at <https://www.bwsc.org/stormwater>. A credit means that you will get a reduction on your monthly stormwater charge if you do things that manage stormwater and meet specific criteria. A grant is a one-time reimbursement that helps cover part of the cost of an activity that manages stormwater and meets specific criteria.

The elderly and disabled discount of 30% applies to the water, sewer and stormwater charges.

Are there any steps I can take to do my part?

The things we do every day, like walking the dog or fertilizing our yards, can pollute the water in our local waterways. While BWSC is implementing projects and processes to reduce the impact of stormwater runoff on our local waterways, residents and businesses can take the following actions:

- Use plants and landscaping to slow down rainwater.
- Use green (vegetated) infrastructure whenever possible.
- Replace hard surfaces with porous ones.
- Pick up pet waste and throw it in the trash.
- Tell us if you see someone dumping into catch basins.
- Take care of swimming pools and drain them onto grassy areas to keep chemicals out of waterways.
- Don't use too many fertilizers and insecticides and follow the directions on the package.
- Dispose of waste properly and let someone know if there's a spill.
- Use commercial car washes and take good care of your car so fluids don't leak onto the street and get washed into storm drains.
- Clear leaves, yard waste, and trash from catch basins and put them in trash receptacles instead of sweeping them into the catch basins.
- Help clean up your neighborhood by organizing an [Urban Wilds clean-up](#) through the Parks and Recreation Department.
- Suggest a street for the [City's Streets Clean-up](#) program through the City of Boston's Public Works Department.

BWSC Stormwater Glossary

Bioretention: A green infrastructure stormwater control measure that uses soil and plants to filter and treat stormwater runoff.

Biofiltration: The process of using natural materials such as vegetation and soils to remove pollutants from stormwater runoff.

Biofiltration planter: A type of green infrastructure stormwater control measure that uses a decorative planter to filter and treat stormwater runoff.

Bioswale: A type of landscaping that uses plants and soil to help filter and clean stormwater runoff from nearby surfaces like roads, sidewalks, and buildings.

Blue roofs: A type of roof that is designed to provide initial temporary water storage from rainfall and then gradual release of stored water to the ground.

BMP: Best Management Practice, a structural or non-structural measure designed to reduce the number of pollutants in stormwater runoff.

Capital improvement: A major infrastructure project intended to improve or upgrade the stormwater management system.

Catch basin: A type of stormwater infrastructure designed to capture and temporarily store stormwater runoff before it is conveyed to a larger stormwater management system.

Cisterns: A type of stormwater infrastructure designed to capture and store stormwater runoff for later non-potable use, such as for landscape irrigation.

Clean Water Act: A federal law that regulates the discharge of pollutants to surface waters, including stormwater runoff.

Combined sewer overflow: A discharge from a combined sewer system that occurs when the system becomes overwhelmed by stormwater and discharges a mixture of untreated sewage and stormwater to a waterway.

Combined sewer system: A type of sewage system that collects both stormwater runoff and household sewage in the same pipes.

Consent decree: A legal agreement between a regulatory agency and a facility or entity that outlines specific actions and timelines for addressing environmental (or other) violations or issues.

Cost-of-service: A method for setting stormwater charges based on the actual costs of providing stormwater management services.

Credit program: A program that allows property owners to earn credits for implementing stormwater management practices that meet regulatory requirements to offset stormwater charges.

Detention basin: A stormwater management structure designed to temporarily store and slowly release stormwater runoff.

Drainage: Removing stormwater from a site or area using pipes, ditches, or other infrastructure.

Equivalent residential unit (ERU): A unit of measure used to assess stormwater charges based on the amount of impervious surface on a property. One ERU represents the amount of impervious area on a typical Small Residential Property in Boston, which is 2,164 square feet.

Erosion: The process by which soil or other materials are worn away by stormwater, wind, or other forces.

Geographic information system (GIS): A software tool that allows users to map and analyze spatial data, including stormwater infrastructure and impervious surfaces.

Grant program: A program that provides funding to support stormwater management projects, including green infrastructure and habitat restoration.

Green infrastructure: Stormwater management practices that use natural or engineered systems to capture and treat stormwater runoff.

Green roof: A type of roof covered with plants that helps soak up rainwater and prevent flooding by reducing the amount of water that runs off the roof and into the ground.

Groundwater: Water that is stored underground in soil and rock formations.

Habitat restoration: The process of restoring or enhancing natural habitats that human activities, such as stormwater runoff have impacted.

Impervious surface: A surface that does not allow water to infiltrate the ground, such as pavement, rooftops, sidewalks, driveways, crushed stone and compacted gravel or soil.

Infiltration: The process by which water seeps into the ground and is absorbed by the soil or other permeable materials.

Infiltration trench: A type of stormwater control measure that involves excavating a trench filled with gravel or other permeable material to promote infiltration of stormwater runoff.

Infrastructure: The physical components of a stormwater management system, including pipes, culverts, channels, and other structures.

Long-term control plan: A plan developed by a utility or other entity to address combined sewer overflow and other stormwater management issues over several years or decades.

Low-impact development: Land use and development practices that aim to minimize the impact of development on the environment, including stormwater runoff.

Municipal Separate Storm Sewer System (MS4): A stormwater drainage infrastructure system owned and operated by a municipality or other local government entity.

National Pollutant Discharge Elimination System (NPDES): A permit system established by the EPA to regulate point sources of pollution, such as industrial and municipal discharges, under the Clean Water Act.

Native vegetation: Plant species that are indigenous to a particular region and have evolved to thrive in local environmental conditions.

Nonpoint source pollution: Pollution that comes from diffuse sources, such as runoff from agricultural fields, parking lots, or residential areas.

Non-small residential property (“NSRP”): A type of Boston Water and Sewer Commission customer that is either a residential property with seven or more units, or a property used for commercial, institutional, or industrial purposes, including condominiums.

Outfall: A point where stormwater runoff is discharged from a stormwater management system to a waterway.

Parcel: A piece of land that an individual or organization owns.

Permeable pavers: A type of pavement allowing stormwater to infiltrate the ground, reducing runoff and promoting infiltration.

Point source pollution: Pollution from a single, identifiable source, such as a discharge pipe from a factory or wastewater treatment plant.

Pollutant: A substance harmful to water quality that can be carried in stormwater runoff, such as chemicals, nutrients, bacteria, or sediment.

Porous asphalt: A type of pavement allowing stormwater to infiltrate the ground, reducing runoff and promoting infiltration.

Rain barrel: A container that collects and stores rainwater from a building's roof for later use in watering plants or gardens

Rain garden: A shallow depression in the ground that is planted with native vegetation and designed to collect rainwater from roofs, driveways, and other surfaces, allowing it to slowly soak into the ground rather than running off and causing erosion or flooding.

Runoff: Water that flows over land or other surfaces and is not absorbed or infiltrated into the ground.

Sediment: Soil, sand, or other materials carried in stormwater runoff.

Small residential property (“SRP”): A type of Boston Water and Sewer Commission customer that is a residential property with six or less units.

Stormwater: Water that originates from precipitation events, such as rain or snow, and flows over land or impervious surfaces.

Stormwater management: Planning, designing, and implementing strategies and practices to manage stormwater runoff and reduce its impact on water quality and infrastructure.

Stormwater permit: A permit issued by a regulatory agency that allows a facility or entity to discharge stormwater runoff to a body of water, subject to certain conditions and requirements.

Subsurface infiltration: An underground area that can receive and hold on to stormwater, letting it slowly filter deeper into the ground.

Surface infiltration basin: A grassy depression in the ground that remains dry until a heavy rainfall. The depression temporarily stores the rainfall so it can slowly drain into the ground over time.

Tree filter: This essentially combines a tree with a curb gutter. It collects stormwater and helps it filter slowly underground to a stormwater collection system. The tree adds a visual benefit.

Tributary: A smaller stream or body of water that feeds into a larger waterway.

Wastewater: Refers to water that has been used and contains pollutants and other contaminants, such as from toilets, sinks, and industrial processes. Also known as sewer.

Wastewater treatment: The process of removing pollutants and contaminants from wastewater before it is discharged to a waterway or reused for other purposes.

Waterway: A natural or artificial channel for the passage of water, such as a river, stream, creek, canal, or harbor.