# The Case for Adopting the Watershed Protection Standard: Information for Municipalities

## What is the Watershed Protection Standard (WPS)?

**The WPS is a stormwater design standard applied to sites undergoing new development or redevelopment.** Formulated using the latest scientific research, the WPS aims to protect and restore water resources and the environment. It requires management of a site's stormwater to match certain pre-development conditions, meaning that on an average annual basis, the amount of stormwater and pollution leaving a developed site is the same as before development.

**Compliance with the WPS is achieved by retaining a target volume of stormwater on site.** This target volume is determined by the site's hydrologic soil conditions, or its natural ability—before development— to absorb water into the ground. (The WPS provides alternative requirements for sites that cannot absorb stormwater because of physical constraints.)

**The WPS also requires an approach to site layout and design that helps achieve compliance.** This approach involves minimizing impervious cover, or surfaces such as pavement and roofs that water cannot pass through; maximizing infiltration, or encouraging water to soak into the ground; and clustering development to preserve natural areas, among other strategies.

For more details, the WPS Toolkit includes the resource, Regulatory Language for Adopting the Watershed Protection Standard, which lays out all aspects of the WPS.

## Why Should My Municipality Adopt the WPS?

### To Protect Community Resources

If sites do not manage their stormwater to pre-development conditions, development will lead to flooding, depleted water supply, and degradation of downstream waterbodies. The WPS protects natural resources and infrastructure, leading to higher quality of life for current and future generations.

### To Save Money

The WPS is the most cost-effective way local governments can protect water resources and infrastructure. By using smart practices to address the impacts of development as it occurs, the WPS spares taxpayers from costly clean ups, repairs, and retrofits that would be necessary to address the impacts later.

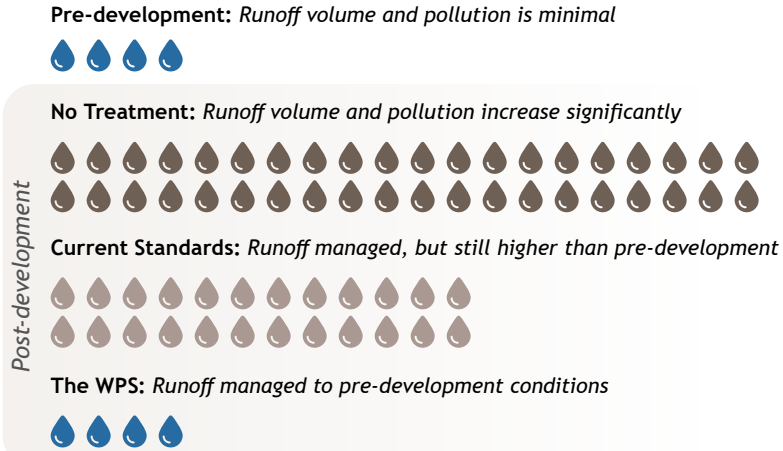
### It's Practical

The WPS can be comfortably achieved when designers consider stormwater management early in the planning process, designing sites to minimize impervious cover, disconnect areas that generate runoff, and infiltrate whenever possible. Further, the latest research is used to evaluate compliance with the WPS, allowing for sites to be designed without oversized infrastructure or lost real estate potential.

## Current Stormwater Design Standards Aren't Enough

Today's state and local standards typically do not manage stormwater to match pre-development conditions. With each new development, impacts accumulate—resulting in degradation of waterbodies, depletion of aquifers, more frequent flooding, and dried-up streambeds. Forecasted increases in development and rainfall will exacerbate these impacts across New England.

### How does development affect runoff volume and pollution?




### *Did you know?*

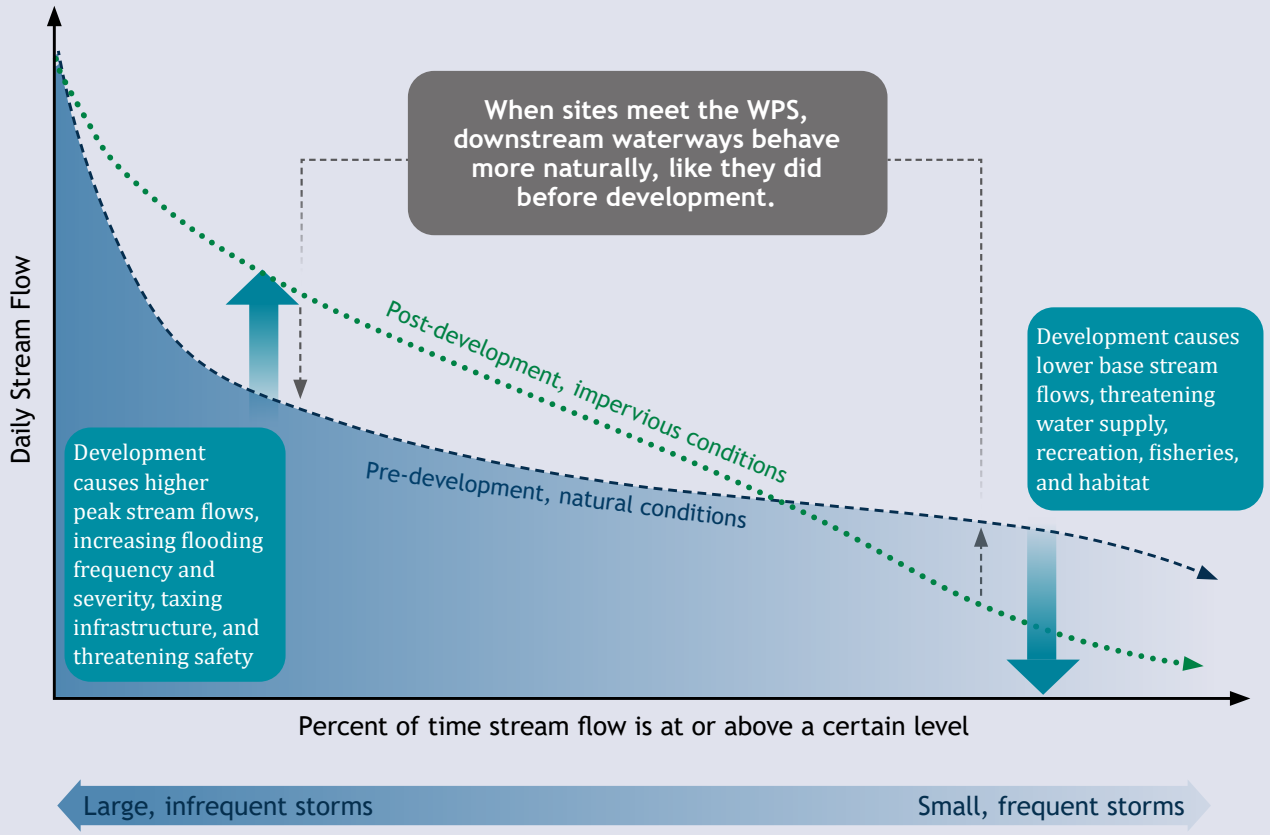
- On natural land, vegetation soaks up **over 50% of rain** and release it back into the air. That water rushes downstream when we pave these areas.
- Even when developed sites meet current state standards, they still release **2-5x more pollutants** than they did in their natural state.
- As climate change leads to more rain, sites that meet the **WPS will capture about 60% more runoff** than sites meeting current standards.
- Every **$1 invested** in protecting communities from hazards yields a **$6 return**.

# Too Much or Not Enough: Development Increases the "Flashiness" of Streams

## A Strong Foundation: The WPS is Rooted in Years of Scientific Research

- The WPS is the culmination of years of research led by the U.S. Environmental Protection Agency (EPA) Region 1 to understand and develop solutions for the growing impacts of development on the health of our water resources.
- Up-to-date precipitation data and the latest modeling techniques (29-year continuous simulation) were used to quantify the impacts of development on water quality and quantity and optimize stormwater treatment measures for performance and cost effectiveness.
- In 2022, this information was used to simulate behavior of a typical New England River and its drainage area (the Taunton River)[1]. Using current-day scenarios, as well as projections of future development and climate change, the simulation revealed that current standards are not enough to maintain pre-development stormwater conditions, and that development under current standards can lead to dramatic changes in stormwater behavior at the site level and cumulatively across the landscape.
- The simulation was then used to determine the level of stormwater control needed to mitigate these changes, that is, create a "de facto" pre-development condition. This level of control became established as the WPS.
- An evaluation of a range of site-level design standards demonstrates that the WPS is both technically feasible and provides cost savings compared to current standards.

[1]Holistic Watershed Management for Existing and Future Land Use Development Activities: Opportunities for Action for Local Decision Makers. U.S. Environmental Protection Agency, Region 1. October 19, 2022.




### Reversing the Damage: Tackling Development Impacts One Site at a Time

**Impacts add up.** When many sites are developed, site-scale changes to stormwater behavior can build up and have dramatic effects on nearby streams and lakes.

**Solutions start upstream.** Tackling the cumulative impacts of development on waterbodies directly is often expensive and temporary. Addressing these effects at each development site is a more sustainable solution.

**Smart Planning Pays Off.** The best time to manage stormwater effectively is during new development or redevelopment. This saves money and ensures each site's impacts are minimized from the start.

# Why This Matters: A Closer Look at How Development Impacts the Water Cycle

### Increased Runoff Volume
Causes flooding, erosion, and destruction of infrastructure.

### Loss of Natural Filtering
Increases pollutant export to local waterbodies, causing waterbody degradation.

### Loss of Evapotranspiration
Raises local temperatures, degrades local air quality, and contributes to drought.

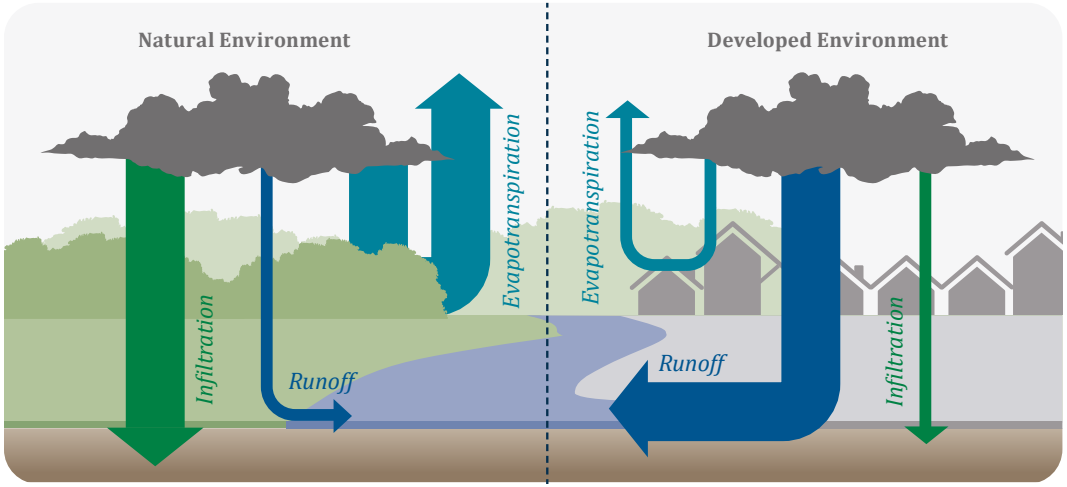
### Decreased Groundwater Recharge
Leads to depleted water supply, low stream flows, and land subsidence.

Impervious cover generates up to **400x** more runoff than natural cover

Impervious cover exports **93x** more pollutants than natural cover

Impervious cover results in temperatures **1-7°F** higher than surrounding natural areas

Runoff diverted from aquifers by one acre of impervious cover could annually supply **up to 9 single-family homes** with water




*Impervious cover decreases infiltration and evapotranspiration and increases runoff, unless stormwater is managed to match pre-development conditions.*

## The Water Cycle and Important Terms

The water cycle is the process in which water circulates through the Earths environment. Key processes within the water cycle that are important to understand stormwater management include:

**Precipitation:** water that falls from the atmosphere onto the Earth's surface

**Runoff:** the movement of water across Earth's surface to a collection system or waterbody

**Evapotranspiration:** the movement of water from Earth's surface to the atmosphere through the processes of direct evaporation and transpiration by vegetation

**Infiltration:** the movement of water from Earth's surface into the ground

**Impervious cover:** surfaces that do no allow water to penetrate, such as pavement and rooftops

## Discover the Complete WPS Toolkit:

The Watershed Protection Standard Toolkit is a set of materials consisting of design guidance, sample regulatory language, compliance checklists and more to help municipal staff implement the Watershed Protection Standard and help designers comply with this new standard.
The Toolkit can be found at: https://snepnetwork.org/watershed-protection-standard-toolkit/

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