Long Island Nitrogen Action Plan (LINAP) - Newsletter

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Tackling Stormwater Runoff: Protecting Long Island's Waters

In this edition of the LINAP newsletter, we delve into understanding the issue of stormwater runoff and explore effective methods for managing stormwater at the regional and local level. Stay tuned for tomorrow's edition, where we spotlight the Town of East Hampton and Village of Sag Harbor; communities confronting stormwater management head-on.

Understanding Stormwater Runoff

Stormwater runoff is the excess water from rain or snowmelt that flows over surfaces such as roads, driveways, rooftops, or other impermeable areas that don't absorb water. It is a major cause of water pollution on Long Island. As it flows, stormwater collects various pollutants like oil, chemicals, debris, and nutrients from these surfaces, and eventually discharges into our waterbodies impacting water quality, aquatic life, and ecosystems.

Stormwater Runoff Graphic. Source: EPA

Higher flows resulting from heavy rains can also cause erosion and flooding in streams, damaging habitat, property, and infrastructure. Traditionally, stormwater is contained within “gray” infrastructure such as gutters, storm drains, and pipes and culverts, which are designed to move stormwater away from urban and suburban areas. This is the opposite of a natural environment where the water would be absorbed and filtered by soil and plants where it lands. Managing stormwater appropriately is vital to the health of our waterways, community, and our quality of life.

Addressing Stormwater Pollution: Exploring Effective Methods for Stormwater Treatment

Stormwater runoff poses a significant threat to water quality, but fortunately, there are effective methods to mitigate stormwater runoff and reduce nitrogen pollution. Maybe you have heard the term Green Infrastructure and wondered what it meant? The term describes a collection of stormwater practices that mimic nature and natural landscapes. These practices hold water in place so it can slowly percolate into the soil, being treated as it filters through the plants and soil. There are a variety of green infrastructure practices and below is a description of some of the more common ones.

Retention Ponds: Constructing retention ponds involves creating large, shallow basins to collect stormwater runoff. It helps prevent flooding by storing excess water during heavy rainfall and allows pollutants and sediments to settle out before the water is discharged. Additionally, retention ponds support groundwater recharge by allowing water to slowly infiltrate into the soil, replenishing underground aquifers. These ponds often feature vegetation and are engineered to optimize water retention, filtration, and gradual release into the environment.

Bioswales: These specially constructed channels with vegetation or mulch create natural filtration systems, allowing stormwater to slowly percolate through soil and plant roots. Swales effectively trap sediments and pollutants, enhancing water quality before it enters larger drainage systems or water bodies. They are often found along curbs and in parking lots.

Bioretention Areas: Engineered with specific soil mixes and plant species, these areas detain stormwater, allowing it to filter through the soil and plant root systems. As with other green infrastructure practices, the plants absorb nutrients while the soil's microbial activity breaks down pollutants, effectively treating the water.

Native Plant Gardens: Utilizing native plants in gardens can help absorb excess water and filter pollutants. Often their deep root systems aid in the soil's absorption capacity, prevent erosion, and improve water quality.

Rain Gardens: These gardens are specially designed to collect excess precipitation. The plants within the garden can withstand the surplus water for a short period of time. The gardens are designed to mimic the natural ways water flows over and absorbs into the ground. Rain gardens reduce and treat runoff by slowing the flow and allowing water to percolate through the garden’s root and soil.

Rain Garden Before and After Rainfall. Photo Credit: EPA

Planter Boxes: Planter boxes are urban rain gardens with vertical walls and either open or closed bottoms. Usually found in downtown areas, they collect and absorb runoff from streets, sidewalks, and parking lots. Ideal for areas with limited space, planter boxes can be a useful way to beautify city streets.

Constructed Wetlands: A constructed wetland is a human-made ecosystem designed to mimic the functions of natural wetlands. These areas are built using various combinations of soils, plants, and sometimes artificial liners and act as sponges, capturing and treating stormwater. Plant roots and microbial activity within these areas break down pollutants, effectively cleansing the water. Additionally, constructed wetlands serve as habitats for wildlife and contribute to biodiversity conservation.

Permeable Pavements: Replacing traditional impermeable pavements with permeable materials allows rainwater to infiltrate the ground. This reduces runoff, minimizes flooding, and helps recharge groundwater. These specialized surfaces—like porous concrete or permeable pavers—allow water to pass through, minimizing runoff and allowing infiltration into the ground. They significantly reduce surface water runoff and decrease the load of pollutants reaching water bodies.

Permeable Pavement. Photo Credit: EPA

Green Roofs: Green roofs feature vegetation atop buildings, reducing runoff by absorbing and storing rainwater. The growing medium and vegetation on green roofs filter pollutants and sediments from rainwater as it passes through the layers, improving water quality before it reaches drainage systems or natural water sources. They also act as insulators, reducing energy consumption, and contribute to cleaner air.

Green Roof. Photo Credit: EPA

Rain Barrels: Placed at downspouts, rain barrels collect roof runoff for later use, reducing the volume of water entering storm drains and lessening pressure on storm sewer systems during heavy rainfall. This practice also can be a water conservation measure.

Dry Stream Bed: A dry stream bed, also known as a dry creek bed or dry riverbed, is a landscape feature that mimics the appearance of a natural stream or river but remains dry for most of the time, only filling with water during periods of heavy rain. These beds are often lined with rocks, gravel, or plants that help manage water flow when it occurs, creating an aesthetically pleasing and functional element in landscaping while serving a practical purpose in stormwater management.

Maintenance of Stormwater Management Systems: It is important to note that these stormwater mitigation techniques function best when properly maintained. Maintenance of stormwater management systems includes routine inspections, cleaning, and repair of stormwater infrastructure. Ensuring these systems remain unclogged and efficient prevents pollutants from entering water bodies.

Addressing Long Island's stormwater runoff is pivotal to safeguarding our waters from pollutants and preserving our ecosystems. These innovative strategies not only filter pollutants and mitigate flooding but also recharge groundwater and restore

ecosystems. The Long Island Nitrogen Action Plan (LINAP) plays an active role in this effort. Through collaborative efforts, LINAP champions the implementation of many of these innovative solutions across the Island. Explore many of these ongoing stormwater projects in our newsletter archive available here.

Feeling inspired? Everyone can play a role in mitigating stormwater runoff and nutrient pollution. By adopting eco-friendly practices at home, you can make a substantial difference. Try these tips on your property!

- **Don't Mow Too Low -** Only remove the blade height of your lawn mower and leave clippings on lawn to allow nutrients to return to the soil—they act as a natural fertilizer!
- **Careful with Chemicals -** Only use pesticides and fertilizers when needed and read the label to make sure you are applying them correctly. Avoid applying chemicals to pavement. When there is rain in the forecast, any chemicals you apply can wash downstream.
- **Only Rain in the Drain -** Don't rake, sweep, or hose debris down the storm drains. Leaves, yard clippings, and trash can clog storm pipes, causing floods and polluted waterways. Also, yard waste can add additional nitrogen to waterways.
- **Curb Your Water Waste** - Irrigate only when necessary. Make sure sprinkler heads are aimed toward the lawn and away from pavement to save water and keep chemicals and debris out of storm drains. Consider installing a rain sensor to save water.

For more tips, visit DEC's Sustainable Landscaping webpage here.

Stay tuned for the second January edition, which will be sent out tomorrow January 30, 2024. The next edition features exciting interviews with Kimberly Shaw and Mellissa Winslow from Town of East Hampton and Mary Anny Eddy from the Village of Sag Harbor who take us through the innovate stormwater reduction practices that have been implemented!

*Information from this newsletter came from the Environmental Protection Agency Stormwater Smart Outreach Tools.