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UNH Stormwater Center

Cooperative Institute for Coastal and Estuarine Environmental Technology

New UNH Study Helps New Englanders Weather The Storm

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DURHAM, N.H. -- Research from the University of New Hampshire Stormwater Center is poised to help communities throughout the Northeast improve water quality and reduce runoff through better stormwater management. The center is the only one of its kind in the country.

“Our data is telling us that updated and improved standards of practice for stormwater management would enhance water quality, and do a better job of handling the volume of runoff,” said center Co-director Robert Roseen.

Results from the new NOAA-funded center’s first year of operation were reported at an event today attended by U.S. Senator Judd Gregg (R-N.H.) and UNH President Ann Weaver Hart.

The UNH Stormwater Center evaluates the effectiveness of different stormwater treatment systems in protecting water quality and reducing runoff. It addresses nonpoint source pollution, which has become the single biggest threat to water quality nationwide.

Called “nonpoint” because there is no one smokestack or storm sewer outfall at fault, this type of pollution is a byproduct of modern life. Stormwater runoff washes contaminants off impervious surfaces like roads and parking lots, and into streams, rivers, and coastal waters, where they degrade water quality and threaten human health.

“Over the past week, areas of southwestern New Hampshire have been devastated by torrential flooding. After the homes and buildings are rebuilt, and the roads and bridges are repaired, the environmental effects will still affect the region,” said Senator Gregg, who secured funding for the center through the UNH/NOAA Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET).

“The water from storms and flooding like New Hampshire experienced this week has the potential to be contaminated with a variety of pollutants. The Stormwater Center is working to solve that problem. By testing different methods of cleaning polluted stormwater, reducing runoff, and then making this information available, these researchers will help communities affected by similar storms and floods in the future. This will greatly improve our natural environment, and I commend those from UNH, CICEET, and the Stormwater Center for their significant work,” Gregg said.

What makes the UNH Stormwater Center unique is its capacity to evaluate the performance of different stormwater treatments under the same conditions and side by side.

“When you compare the storm loading of a treatment system in California to one in New Hampshire, it’s apples to oranges, El Niño to Nor’easter,” said Co-director Thomas Ballestero, professor of civil engineering. “Testing these systems side by side, where the loading is similar, gives us a much better measure of their relative effect on water quality.”

Over the last year, center researchers have evaluated the performance of three classes of stormwater treatment systems: manufactured devices such as manhole retrofits; conventional structural designs such as swales and ponds; and Low Impact Development (LID) such as biorentention systems and treatment wetlands.

“We’ve found that LID systems are the top performers in terms of protecting water quality and reducing the volume of stormwater runoff,” said Roseen. “The manufactured devices cover a wide range of types and effectiveness, some excellent, others not.”

He is quick to caution that “there is no one size fits all when it comes to stormwater management systems; one that performs beautifully in handling water quality and quantity but demands a lot of space will not be the answer for a densely developed urban environment.”

The impact on water quality varies with the kind of system; some, in fact, actually create poor water quality, according to Ballestero. “If a retention pond filled with standing water sits next to an attractive environment for animal use, it becomes a reservoir for bacterial growth. Some of these microbes can be dangerous to human health.”

Managing runoff in a way that protects water quality depends on choosing the correct stormwater treatment system. Until now, reliable information about how well (or poorly) these systems work in preserving water quality has been in short supply. The data gathered by UNH researchers is being packaged for stormwater managers throughout the Northeast to use to improve water quality and runoff management.

Communities will be able to use this information to comply with the Environmental Protection Agency’s Storm Water Phase II, a program that requires cities and towns under 100,000 to reduce the stormwater discharge of pollutants to the "maximum extent possible” to protect water quality.

Along with the evaluation of existing stormwater treatments, researchers at the UNH Stormwater Center are also developing innovative designs of their own. One such project is a gravel wetland that has done extremely well in terms of managing water quality and runoff volume. Researchers have also constructed an all-porous pavement parking lot that greatly reduces runoff, and may reduce the amount of salt used to maintain roads in the winter.