

MANAGING FLOODING, POLLUTION, & EROSION: EVALUATING STORMWATER SOLUTIONS IN OHIO

What's happening?

A project led by the Old Woman Creek National Estuarine Research Reserve (NERR) and the Chagrin River Watershed Partners, Inc., will develop science-based tools that promote the use of practices that minimize the impact of stormwater on Ohio's coastal communities and Lake Erie. Municipal and consulting engineers, stormwater utilities, developers, regulators, and watershed organizations will collaborate with the project team to generate credible and locally verified performance information about innovative stormwater systems. Based on these results, the team will develop credits and incentives to encourage the use of the most effective systems.

Why is this project needed?

Stormwater runoff from impervious surfaces severely impacts Ohio's coastal communities and environments. It erodes streams, overloads drainage systems and water treatment facilities, and increases flooding which damages property and infrastructure. Increased runoff also impairs water quality and degrades habitats, and heightens the risk of waterborne diseases. The severity of these impacts has increased with the number of heavy storms in Ohio, which are up 31 percent over the past 50 years, according to the U.S. Global Change Research Program. This has been reflected in widespread and frequent flooding in Lake Erie counties over the last five years.

State stormwater regulations now require new development to treat the first ¼-inch of rain called the "water quality volume" and many communities have peak discharge requirements targeted at flood control. Yet, most new developments meet these regulatory requirements with traditional "end-of-pipe" ponds that do not adequately reduce the volume or improve the quality of stormwater runoff, and Ohio's streams continue to degrade.

Low impact development (LID), also called "green stormwater infrastructure" or "environmental site design," attempts to address these problems by integrating the functions inherent to natural landscapes into site design and stormwater systems. Ohio communities and design engineers have asked for design criteria and incentives if they are to shift to using new approaches. This project aims to provide the information and support requested by providing clear guidance and tools to help engineers, reviewers, and permitting agencies determine whether LID stormwater systems are appropriate for site conditions and meet state and local requirements. It will also demonstrate the design, construction, performance, and maintenance of these stormwater practices in local soils and climate.

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Right: Engineers, developers, program managers, and regulators are working together to develop science-based incentives for effective stormwater management.



The rain gardens and pervious pavers in the photos above are examples of Low Impact Development (LID) that integrates natural landscape functions into site design.



ABOUT THIS PROJECT

This project is a collaboration of the Chagrin River Watershed Partners, Inc., Old Woman Creek National Estuarine Research Reserve (NERR), Ohio Department of Natural Resources Divisions of Soil and Water Resources and Wildlife, Erie Soil and Water Conservation District, and the Consensus Building Institute. Intended users of this science and these planning tools include engineers, state and local regulators, stormwater program managers, plan reviewers, and watershed programs.

FOR MORE INFORMATION

The project team welcomes feedback by any interested stakeholder. If you would like to receive project updates or notices of how to get involved, please contact Amy Brennan, principal investigator and director, Chagrin River Watershed Partners, Inc.: abrennan@crwp.org, 440-975-3870. Or contact Heather Elmer, collaboration lead & coastal training program coordinator at the Old Woman Creek NERR: heather.elmer@dnr.state.oh.us, 419-433-4601.

ABOUT THE FUNDER

This project is supported by the National Estuarine Research Reserve System Science Collaborative, a partnership of the National Oceanic and Atmospheric Administration and the University of New Hampshire. Projects sponsored by this program bring intended users of science into the research process so that their perspectives can inform problem definition, research implementation, and ultimately, the practical application of research results to help manage coastal environments, protect human health and property, and support coastal economies.

For more information, visit: nerrs.noaa.gov/sciencecollaborative.



Chagrin River, Waite Hill, northern Ohio



Urban development and impervious cover increases flooding along Pipe Creek in Erie County, Ohio.

What will the science address?

This project aims to provide local validation of regional and national research by demonstrating how stormwater systems function under northern Ohio's soil and climate characteristics. Researchers will:

- Conduct on-site monitoring of stormwater practice hydrology and site characteristics to address questions about the runoff reduction performance of stormwater systems in the Lake Erie watershed;
- Identify a minimum of two LID stormwater systems for design assistance and monitoring;
- Collect information about system design, costs, and maintenance to lay the groundwork for life cycle (full cost) analysis;
- Combine monitoring data with stormwater modeling to assess the performance of systems under current climate conditions and future precipitation scenarios.

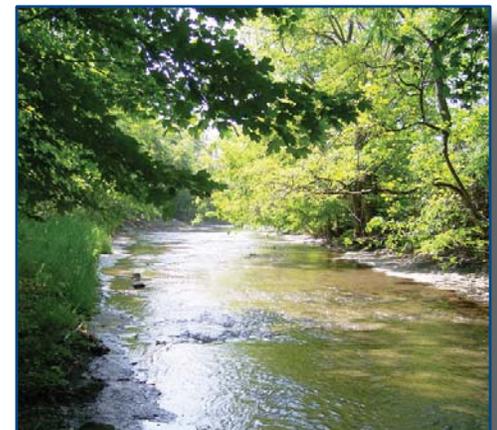
enhanced swales. With input from a group of key engineers and other stormwater professionals, the team will develop technical guidance, model local regulations, recommendations for state policy and stormwater utility credit programs, and training opportunities.

Project coordinators will help investigators and stormwater professionals work together to:

- Develop a shared vision of effective stormwater management and identify obstacles to achieving this goal;
- Plan research to evaluate how stormwater systems reduce runoff today and under future climatic conditions;
- Create design and policy tools that meet local needs and reduce barriers to sustainable stormwater management.

Working together

This project's success depends on the engagement of stormwater professionals who can provide expertise, practical experience, access to local data, input on crucial decisions, and who ultimately, will benefit from the project's results. The team plans to translate their research results into tools and resources that stormwater managers can use to calculate the water quality treatment and flood control benefits of systems such as pervious pavement, bioretention, or



Old Woman Creek, Erie, Ohio