

LET IT RAIN!

From Runoff to Renewal: Tools for Grassroots Advocates in the United States



Stormwater is now known to be a primary contributor to water quality problems across the country. The top three pollutants found in our impaired waters are suspended solids, pathogens, and nutrients - all major constituents of stormwater!

Stormwater occurs when rain or snowmelt flows over hard surfaces such as roofs, roads, and parking lots and collects oils, pesticides and fertilizers, road salt, bacteria, trash, etc. Under natural conditions, rain soaks into the soil, is filtered and absorbed by plants, replenishes aquifers, and enters surface water gradually as clean, cool groundwater. In our paved landscape, stormwater instead gains speed, volume, heat, and pollutants as it travels over artificial impermeable surfaces. Ultimately, stormwater degrades our rivers, lakes, and wetlands when it enters them through stormwater drains and outfalls, combined sewer overflows, or as polluted ground water. Whether your main concern is a degraded wetland, eroding riverbank, suffocating lake, or beach closings, stormwater is very likely a part of the problem. The purpose of this publication is to help you enhance your existing work by connecting it to community stormwater management efforts.

Make the Connection To Stormwater in Your Municipality

- ◆ Contaminated stormwater is one of the single largest pollution sources to watershed creeks, rivers or lakes.
- ◆ In places with combined sewer systems carrying both stormwater and sewage to treatment plants, heavy rains often exceed carrying capacity of sewers resulting in bypasses and overflows of untreated sewage into rivers and lakes.
- ◆ Contaminated stormwater is responsible for bacterial contamination leading to beach closings and nutrient enrichment of large and small lakes including the Great Lakes, extensive damage to natural habitat and can threaten the drinking water security of rural water supplies.

Turn Stormwater into a Resource!

Innovative stormwater management uses a variety of techniques to manage stormwater through maintaining or mimicking natural systems. Practicing innovative stormwater management takes careful planning and creative thinking, but in the long run provides great benefits to your local economy, environment, and quality of life.

- ◆ **Financial Savings**
 - Reduce or avoid the costs of mitigation, repair, and/or reconstruction required by damages from flooding, erosion, and combined sewer overflows.
 - Reduce or avoid the costs associated with expanding wastewater infrastructures.
 - Reduce or avoid the costs of construction site preparation and infrastructures for new developments.
- ◆ **Comply with State and Federal Laws**
- ◆ **Improved Quality of Life:** Clean, restored waters improve and expand recreational opportunities, contribute to healthier citizens and community, and help build local tourism.





Fast, Hot and Dirty – Our Legacy of Development

Fast

Traditional stormwater systems concentrate rain flows from impermeable surfaces, straight line drainage, and piping to route rainfall as rapidly as possible off of roofs, streets, driveways and sidewalks for disposal in local waters. Further, flooding, as a result of the lost capacity of the land to hold back water, is often addressed by the channelization of rivers and streams. Concentrated flows pick up speed as more water is added along the route resulting in flash flooding, where rivers rise and fall rapidly during and after rainfalls, eroding river banks and lake shores even more.

In so many of our cities and towns we have accelerated the flow of our rain so much that though it should take a rainfall an average of 72 hours to drain from a watershed, many urban watersheds drain within 8 hours.

Hot

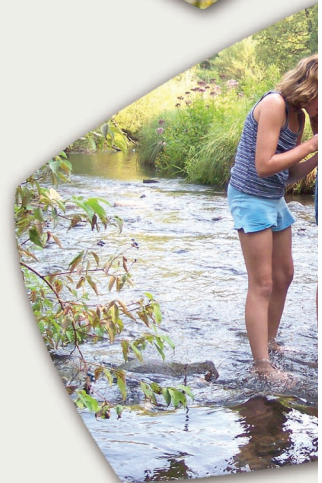
Paved and impermeable surfaces absorb heat energy and become urban heat islands. When it rains, warmer surface temperatures raise the temperature of runoff. This heat transfer substantially changes a river's temperature; degrading cold water habitats necessary for fisheries survival. Hotter temperatures also encourage the growth of bacteria and algal blooms.

Removal of shoreline vegetation can exacerbate water temperature rise due to the loss of shading.

Dirty


Rainfall that flows across impermeable surfaces or off of agricultural fields picks up non-point pollutants ranging from sediment, roofing tar, oil, and road salt, to pet and wildlife waste, pesticides, fertilizers, and trash. Non-point pollutants have chronic impacts over long periods of time that slowly destroy the ability of the watershed to sustain life. Non-point pollutants like road salts don't immediately kill but always degrade the overall health of the waters. Something as simple as soil washed into the river seriously degrades habitat for fish and other aquatic life.

More oil is dumped in waterways as a result of contaminated runoff from upland drips and spills than is contributed by all the tanker spills in the world.





Evolving From Runoff to Renewal



Integrated Stormwater Management involves utilizing on-site practices to re-establish pre-development rain flows, prevent pollution, and return to managing rain water as a resource as opposed to a nuisance. One way to shift from Runoff to Renewal is to incorporate Low Impact Design (LID) into your municipality's stormwater management standards. Though LID may take time to incorporate into policy framework, it will reap significant benefits. LID reduces runoff and protects water quality by re-establishing natural stormwater functions within either urban or rural settings. LID practices what is referred to as the lot-level approach. That means treating rain as a resource where it falls. By combining bioengineering, social change marketing, and appropriate-scale infrastructure each and every property in a retrofit or greenfield community can significantly limit its impact on the watershed, save money, reduce sprawl, and garner a more natural, healthy community.


Low Impact Development

LID maintains and/or restores natural hydrological flows and water quality for developed watersheds.

The Approach: using new management paradigms, LID implements lot level control practices that achieve greater infiltration and pollution prevention measures.


The Goal: Achieve cumulative benefits through the practice and principles of LID to maintain and/or restore watershed functions.

Basic Principles of LID:

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1. Conservation – maintain tree canopy and infiltration
 2. Minimization – reduce hard surfacing wherever possible
 3. Strategic Timing – ensure rain flows and drainage enter the watershed drainage system in a manner that avoids flooding or erosion
 4. Integrated Management Practices – utilize a wide variety of actions for infiltration, bioremediation, and storage of runoff flows
 5. Pollution Prevention – limit known nonpoint source pollutants arising from private property and municipal maintenance activities – e.g. road salts, pesticides, car washing, etc.

How Does LID Protect My Watershed?

By retaining, filtering, treating and using the water on-site, LID reduces or eliminates most problems associated with stormwater volume and runoff. LID also provides visual and environmental benefits to the local landscape. Many LID practices are highly effective, comparatively low cost and relatively easy to implement in contrast to traditional methods. LID practices for capture, bio-infiltration and pollution prevention include:

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- ◆ rain harvesting through barrels or cisterns
 - ◆ rain gardens
 - ◆ permeable paving and naturalization
 - ◆ infiltration trenches on lot or in-line
 - ◆ multifunction swales (storage, infiltration and conveyance)
 - ◆ soakaway pits
 - ◆ green roofs
 - ◆ salt alternative de-icing
 - ◆ pesticide free maintenance and weeding



From Runoff to Renewal: Working with Local Officials

As you prepare to approach your local decision-makers, consider the following suggestions.

- ◆ Know the basics of stormwater and the impacts in your community. Investigate via local news media and the online resources provided on www.glhhabitat.org.
- ◆ Understand the benefits of using BMPs and LID to minimize and manage stormwater. Identify case studies of successful stormwater management efforts in communities similar to yours and use them to help promote the cause in your community.
- ◆ Be clear about what you are asking. You may start by asking what, if any, existing plans or regulations address stormwater and whether any are planned or under consideration. Or, you may be interested in the status of a Stormwater (NPDES Phase II) Permit. Ask about specific opportunities for public comment on local ordinances or master plans, how such opportunities are advertised, and request to be on notification lists if possible.
- ◆ Be knowledgeable and respectful of decision-makers' perspectives, and decide who and when to approach strategically.
- ◆ Know what you are offering. You may simply be interested in contributing as a concerned citizen or organization. Once familiar with the status of existing and proposed stormwater efforts, determine how you can help what is underway or initiate new efforts and offer to partner on such projects.
- ◆ Be persistent. It may take some time for you to identify the best contact(s) in your community, and longer for you to build respect and develop productive relationships. If you have contacts and/or are known and respected in your community, you are already ahead of the game!



Resources

There are a number of excellent resources on Integrated Stormwater Management and Low Impact Design. Please see Runoff to Renewal Resources on the web: www.glhhabitat.org.

This is one of several tools developed by the Great Lakes Aquatic Habitat Network and Fund, Inc. with the help of various other organizations. Designed to help grassroots advocates and municipal leaders creatively address stormwater in their communities, we encourage you to pursue this conversation with others. Published March 2007.



Great Lakes, Connecting Communities

P.O. Box 2479 • Potoskey, MI 49770
info@glhabitat.org • www.glhhabitat.org



Cover Photos: Members of the Junior Pennsylvania Lake Erie Watershed Association (middle and high school students) established a rain garden in downtown Erie, Pennsylvania. Image courtesy of JrPLEWA.

Inside Photos: Since Chicago's City Hall rooftop garden project, over two million square feet of green roofs have been installed in the city; Chicago, Illinois now leads the nation in green roof acreage. The City Hall green roof was designed by Conservation Design Forum, in Elmhurst, Illinois. Image courtesy of CDF. • Three young friends play in Bear Creek, Kent county, MI, once unsafe for bodily contact, healthy now thanks to sound stormwater management. Image courtesy of Rain Gardens of West Michigan, a project of the West Michigan Environmental Action Council.

Above Photos: Seth Hildebrand fishing at Rondo on the Sturgeon.