

Tools to Increase Awareness of Stormwater During Extreme Storms



Stormwater can cause many problems in a community. It is possible to apply stormwater management techniques to new sites or when redeveloping. Numerous resources exist to help communities understand and plan these design elements.

Stormwater is rain and snowmelt that does not infiltrate into the ground and runs off of driveways, parking lots, roads, yards, fields, and other hard surfaces. The larger the storm event, the more stormwater and the larger the potential for it to impact communities.

Natural systems have many ways to reduce the impact of stormwater to bodies of water such as dense vegetation (slows the flow), wetlands (capacity to hold water), permeable soils (allows water to infiltrate into ground water), and evaporation (going back into the atmosphere). These natural systems are all filters that protect bodies of water during storm events from runoff.

However, many cities were developed in just the opposite manner. Often natural systems were removed and replaced with developments such as drain pipes, gutters, storm sewers, and channelized streams. All of these systems increase runoff during a storm because they are designed to move stormwater away from the site as quickly as possible and do not allow infiltration. Hardscape development (e.g. buildings, roads, parking lots) also increases storm runoff during a storm event which then carries pollutants and sediment into bodies of water and reduces the water quality of streams, lakes, wetlands, and the Great Lakes.

Stormwater runoff also can cause erosion and flooding as fast-moving water overwhelms drains and streams. New developments with bare soils, agricultural fields without

buffers, parking lots, and roads that are not cleaned all have the potential to cause great harm to bodies of water during storms due to the runoff.

“Green infrastructure” is a way to manage stormwater in a way that mimics the natural system. The use of rain gardens, bioswales, green roofs, permeable pavers, and open spaces all help reduce runoff of stormwater. Increasing green infrastructure elements in communities will help mitigate the impact of extreme storms and increase the quality of local bodies of water.

Here are some online resources communities within the Saginaw Bay watershed might use to assess their risk from stormwater impacts.

LOW IMPACT DEVELOPMENT MANUAL FOR MICHIGAN

semcog.org/Reports/LID/files/assets/basic-html/page-1.html

Low Impact Development (LID) is the cornerstone of stormwater management and uses design techniques that filter, store, evaporate, and detain runoff close to its source. Because LID uses a variety of useful techniques for controlling runoff, designs can be customized according to local regulatory and resource protection requirements, as well as site constraints.

This manual provides communities, agencies, builders, developers, and the public with guidance on how to apply LID to new, existing, and redevelopment sites.

The manual provides information on integrating LID from the community level down to the site level. It not only outlines technical details of best management practices, but also provides a larger scope of managing stormwater through policy decisions, including ordinances, master plans, and watershed plans.

Source: Southeast Michigan Council of Governments

STORMWATER PLANNING – COMMUNITY SOLUTIONS FOR LONG-TERM STORMWATER PLANNING

www.epa.gov/sites/production/files/2016-10/documents/draftlongtermstormwaterguide_508.pdf

This document describes how to develop a comprehensive long-term community stormwater plan that integrates stormwater management with communities' broader plans for economic development, infrastructure investment, and environmental compliance. Through this approach, communities can prioritize actions related to stormwater management as part of capital improvement plans, integrated plans, master plans, or other planning efforts.

Early and effective stormwater planning and management by communities as they develop will provide significant long-term cost savings while supporting resilience, economic growth, and quality of life.

Source: Environmental Protection Agency

LEARN ABOUT GREEN INFRASTRUCTURE

www.epa.gov/green-infrastructure/learn-about-green-infrastructure

The Environmental Protection Agency (EPA) website has information about green infrastructure basics, performance, climate resiliency, research, benefits, cost-benefit resources, policy, and regulations. Learn more about green infrastructure elements that can be woven into a community, from small-scale elements integrated into sites to larger-scale elements spanning entire watersheds.

Source: Environmental Protection Agency



Household items damaged in a flood.

PREPARING FOR THE FUTURE

For communities in the Saginaw Bay region, preparing for extreme storms means using available tools to assess their risks. Communities face a range of potential issues if caught by surprise by these events. Given the impact to finances and quality of life, communities cannot afford to be caught unprepared for extreme events.

Michigan Sea Grant is working with decision-makers throughout the Saginaw Bay Watershed to provide education about extreme storms and tools for risk assessment and planning. Additional information can be found at www.michiganseagrant.org.

CONTACT

Dr. Heather Triezenberg
Program Leader, Michigan Sea Grant
(517) 353-5508
vanden64@msu.edu

This report was prepared by Michigan Sea Grant College Program under awards NA14OAR4170285 from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce through the Regents of the University of Michigan. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the National Oceanic and Atmospheric Administration, U.S. Department of Commerce, or the Regents of the University of Michigan.

michiganseagrant.org



Michigan Sea Grant helps to foster economic growth and protect Michigan's coastal, Great Lakes resources through education, research, and outreach. A collaborative effort of the University of Michigan and Michigan State University, Michigan Sea Grant is part of the NOAA-National Sea Grant network of 33 university-based programs.

MICHU-17-707