

**Rein in
the Runoff**



Stormwater Runoff Problems and Solutions

Wetland Detectives Meeting
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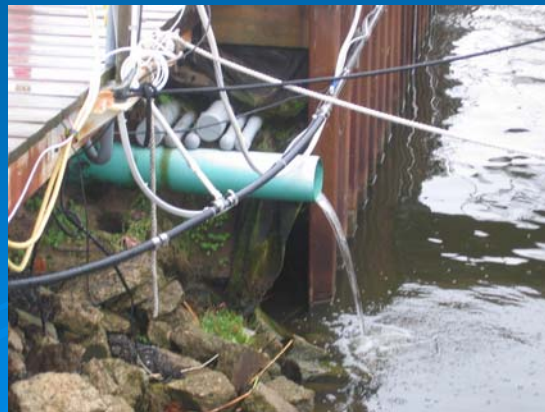
What is “Rein in the Runoff”?



- ❖ Integrated Assessment
- ❖ Involving stakeholders and citizens
- ❖ To solve policy problem or resource management question

Policy Question

What stormwater management alternatives are available to the Spring Lake that allow for future development and also lessen the impacts of stormwater and improve the water quality of Spring Lake, the Grand River and Lake Michigan?



What is Stormwater Runoff?

- ❖ Stormwater is rain, sleet or snow
- ❖ Stormwater runoff
 - Rain or melting snow that cannot soak into the ground
 - Flows over land and hard surfaces into waterways
 - Collects pollutants and debris which also end up in our lakes, rivers and streams



Why is stormwater runoff a problem?



Photo credit: Spring Lake Lake Board

- ❖ Poor water quality
- ❖ Too much water, too fast
- ❖ Human factors
- ❖ Consequences to people and wildlife



Photo credit: A. Steinman

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Poor Water Quality

- ❖ Sediment from construction sites and eroding streambanks
- ❖ Biological matter like leaves, grass, lawn clippings
- ❖ Oil/gasoline from boats, cars, storage tanks
- ❖ Nutrients (phosphorus/nitrogen) from fertilizers
- ❖ Pesticides from lawns, gardens, agricultural fields, golf courses
- ❖ Bacteria/viruses from pet waste, farm animals, wildlife, failing septic systems
- ❖ Trash/garbage
- ❖ Road salt/chemicals



Water Volume & Velocity

- ❖ Stormwater falls on hard surfaces
 - Cannot seep into the ground
 - Runs off to lower areas
- ❖ More water flows into rivers and lakes
- ❖ Heavier flows are faster
 - Erode streambanks
 - Cause local flooding
 - Washout wildlife/habitat



Photo credit: C. Morse, Muskegon Chronicle

Human Factors



- ❖ Polluted stormwater runoff generally occurs where people go about their normal, daily routine

- ❖ Example problems

- Excessive fertilizing or pesticide use
- Failing to pick up pet waste
- Using salt/chemicals to de-ice driveways, parking lots, sidewalks
- Failing to maintain vehicles that leak oil
- Littering
- Washing cars or watering lawns
- Failing to maintain septic systems



Photo credit: Progressive AE

Consequences

- ❖ Clean drinking water costs more
- ❖ Excess water contributes to flooding problems
- ❖ Bacteria/viruses lead to beach closings and illnesses
- ❖ Excess phosphorus/nitrogen causes algae blooms
- ❖ Problems for fish
 - Warmer water temperatures
 - Loss of habitat from too much sand build up
 - Loss of oxygen in the water from too many organisms feeding on decaying algae
- ❖ Chemicals damage plants, animals when they enter the water



Photo Credit: NOAA



What Can We Do About Stormwater Runoff?



❖ Best Management Practices (BMPs)

- Keep pollutants out of waterways
- Controls how much and how fast stormwater gets into the waterways
- Structural (built) or non-structural BMPs

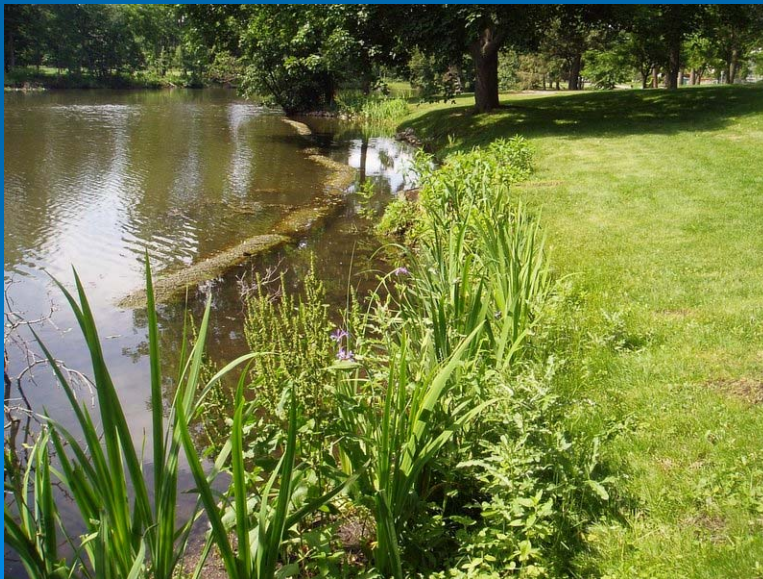


Photo credit: Environmental Consulting & Technology

Structural BMPs



- ❖ Rain gardens
- ❖ Riparian buffers
- ❖ Vegetated swales
- ❖ Porous pavement

- ❖ Rain barrels, cisterns
- ❖ Green roofs
- ❖ Constructed wetlands

Non-Structural BMPs

- ❖ Maintaining natural features and vegetation
- ❖ Local laws, policies
 - Stormwater
 - Wetlands
 - Riparian buffers
 - Fertilizers
- ❖ Good house-keeping
 - Regular maintenance
 - ◆ Vehicles (cars/boats)
 - ◆ Septic systems
 - Clean up after your pet
 - Store/dispose of chemicals properly
 - Don't fertilize your lawn if it might rain
 - Don't sweep leaves into the street
 - Seed bare spots on your lawn to avoid erosion
 - Use captured rainwater to water your garden



Pop Quiz

What is good or bad in the following pictures?







Photo credit: N. DeMol









Photo credit: Environmental Consulting & Technology







Photo credit: Progressive AE





Photo credit: WMEAC







