

# Watershed Management: What Local Government Officials Should Know

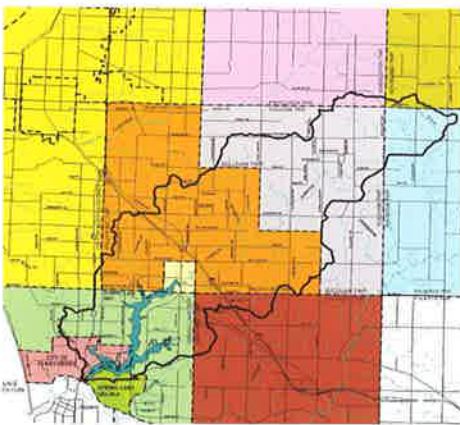
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This is the second part of a two-part article on watershed management. The first article entitled “*Watershed Management – What Every Riparian Property Owner Should Know and Do*” appeared in the Spring 2010 issue of the **Michigan Riparian**.

With 11,000 inland lakes, 52,000 miles of rivers and streams, and 4,000 miles of Great Lake’s shoreline, Michigan is certainly a “water wonderland.” Tax revenues from waterfront property and the fishing, boating and tourism industries all help drive Michigan’s economy. Clearly, proper management of Michigan’s water resources will be essential to the state’s long term economic viability.

It is important to understand that managing Michigan’s lakes, rivers, and streams involves more than just the water itself; it also requires that we manage their watersheds. A watershed is the land area that drains to a lake or stream. Watershed management is a holistic approach to management that recognizes land use activities in a watershed directly impact both water quality and quantity. Watershed boundaries do not follow political jurisdictions, and often several municipalities must coordinate efforts to effectively manage a common water resource. This article addresses management challenges and potential opportunities for Michigan’s government officials to consider.



Spring Lake watershed map.

The Spring Lake watershed includes 11 governmental units.

## CHALLENGES

### Fragmented Authority

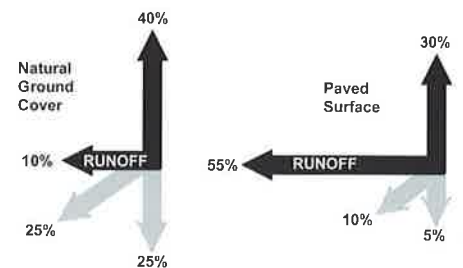
In Michigan, various governmental jurisdictions have land and water management authority. In fact, fragmented authority presents one of the biggest challenges to cohesive watershed management in Michigan. With 83 counties, 1,242 townships, and over 600 cities in Michigan, all of which may have different land and water management policies, garnering local government collaboration on a watershed basis can be a formidable undertaking.

### Stormwater

An integral component of watershed management that becomes more critical as land is developed and urbanized is stormwater. Ideally, stormwater should be managed to mimic pre-development conditions. As depicted below, the hydrologic cycle is the process by which water falls to the ground as rain and snow, infiltrates into the ground, evaporates or transpires back to the atmosphere, or runs off the land to lakes and streams. A challenge facing many communities is how to plan and design development in a way that will not substantially alter the natural hydrologic regime, especially with respect to the amount of runoff versus infiltration.

Land development can have a profound impact on the natural hydrology. As

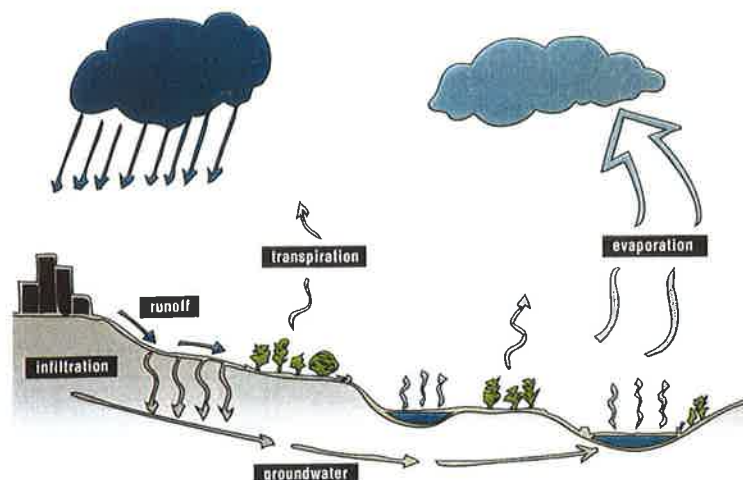
roads, roof tops, driveways, parking lots, and other impervious surfaces are constructed, the amount of runoff can increase dramatically, causing a host of problems. On a watershed level, imperviousness as little as 10% can significantly alter stream ecology and flow characteristics (Schueler and Holland 2000). Often, as imperviousness and runoff increase, the quality of downstream lakes and streams decreases.



Source: Tourbier J.T. and R. Westmacott (1981)

### The Fuss about Phosphorus

Phosphorus is the nutrient that most often stimulates aquatic plant and algae growth leading to a number of problems collectively known as eutrophication. Once in a lake, a pound of phosphorus can generate hundreds of pounds of aquatic vegetation. Recognizing problems associated by excessive phosphorus loading, Michigan limited phosphorus in laundry detergents in 1977 and more recently adopted legislation



The Hydrologic Cycle

to reduce phosphorus in dishwasher detergent. However, lawn fertilizers and septic systems remain primary sources of phosphorus pollution in Michigan.

## OPPORTUNITIES

Federal, state and local governments are all involved in stormwater management. Each has a role to play to help ensure stormwater management issues are addressed on a watershed basis.

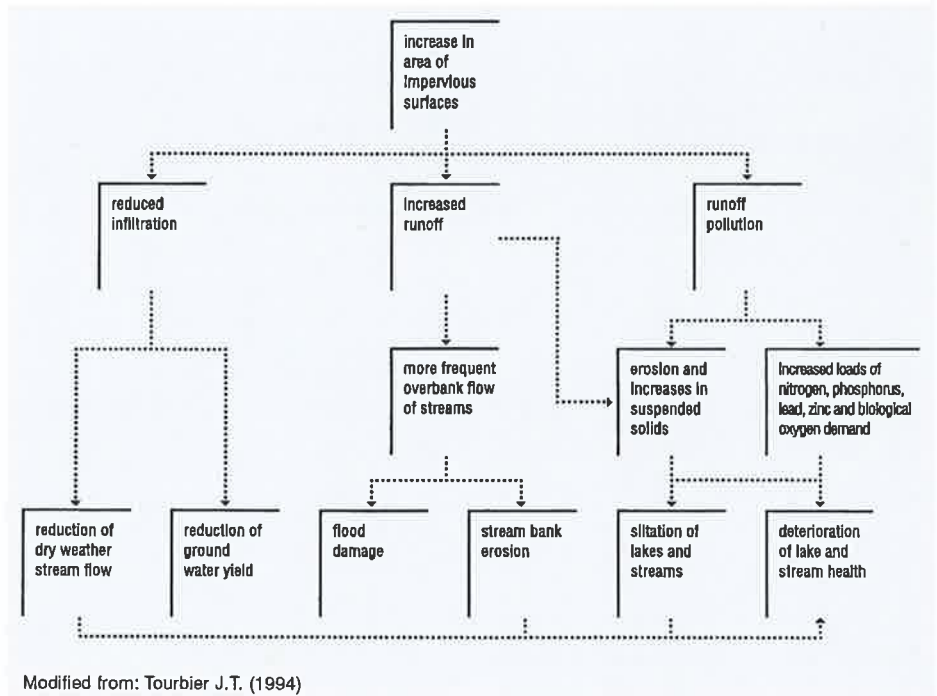
### Federal

Federal authorities provide the national standards that state and local governments must meet to be in compliance with federal regulations. Many of the stormwater mandates promulgated at the federal level do not have financing and funding mechanisms. While there are some state and federal grants available through the Michigan Department of Natural Resources and Environment Nonpoint Source Control Program for watershed-based projects, federal grants often cannot be used to match federally-mandated stormwater programs.

### State

At the state level, there are several legislative opportunities on the horizon. Legislation is pending for state-wide phosphorus fertilizer regulations (House Bill No. 5368 and No. 5369) and septic system inspections (Senate Bill No. 45).

Phosphorus in lawn fertilizers has long been known to be a significant source of phosphorus pollution to lakes and streams. Recognizing this problem, many communities across Michigan have adopted ordinances that regulate the use of phosphorus lawn fertilizers. In addition, several states including Minnesota, Maine, Wisconsin, and Florida have enacted state-wide phosphorus fertilizer regulations. These regulations generally exempt agricultural phosphorus fertilizer applications and phosphorus fertilizer applications on newly-established lawns.



Modified from: Tourbier J.T. (1994)

Interaction of stormwater problems

The regulations also generally require soil testing as a prerequisite to phosphorus fertilizer applications on established lawns. A similar state-wide approach for Michigan makes good sense.

Much of rural Michigan is served by on-site septic systems, and it is estimated that 50% of new housing development will rely on on-site wastewater treatment (Public Sector Consultants Inc. 2007). Surprisingly, Michigan is the only state in the Midwest that does not have uniform, state-wide sanitary code requirements. While some county codes require septic system inspections at the time property is sold, many counties do not have inspection requirements. Pending legislation would require periodic inspections to help ensure septic systems meet code and set the stage for the development of uniform state-wide standards for on-site wastewater systems.

While Michigan has many good and effective environmental laws on the books, additional state-wide standards for phosphorus fertilizer and septic systems would be a cost-effective way to address two important environmental issues. Both of these proposed pieces of legislation deserve careful consideration and passage.

### Local

Many counties and townships are considering or have incorporated Low Impact Development (LID) strategies into their planning and zoning policies. LID is an approach to land development that uses various planning and design practices that protect natural resources and reduce infrastructure costs. This is generally accomplished by controlling stormwater at the source by preserving natural site features that perform stormwater functions, by reducing impervious surfaces, and by directing stormwater discharges to open grass areas, swales and bioretention facilities such as rain gardens. Potential impacts associated with LID include reduced land clearing and grading costs, reduced infrastructure costs, increased lot yields, and increased lot marketability. A properly designed LID can be a “win” for the developer, the community, and the environment.

In many communities, stormwater regulations are enacted through the office of the county drain commissioner. However, the state’s drain code is designed primarily to address drainage and flooding issues. While drain commissioners often

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play an important role in stormwater management, the role local governments can play in developing LID design and review standards through zoning authority cannot be overstated.

Effective watershed management presents many challenges. Michigan's "home-rule" approach to land use policy and regulation allows considerable flexibility and innovation at the local level. However, while there are many tools available to address watershed management issues, there is often no organizational or financing mechanism in place to incentivize watershed planning and management at the local level. This represents both a challenge and an opportunity for local units of government to work together to more effectively marshal forces on a watershed-basis to protect our lakes and streams. Given the inherent value of Michigan's water resources, coordinated watershed management will prove a solid, long term investment.

On the Web

For More Information, visit:

Low Impact Development

- [www.lowimpactdevelopment.org](http://www.lowimpactdevelopment.org)
- [www.raingardens.org](http://www.raingardens.org)
- [www.stormwatercenter.net](http://www.stormwatercenter.net)

Michigan's Nonpoint Source Program

- [www.michigan.gov/deqnp](http://www.michigan.gov/deqnp)

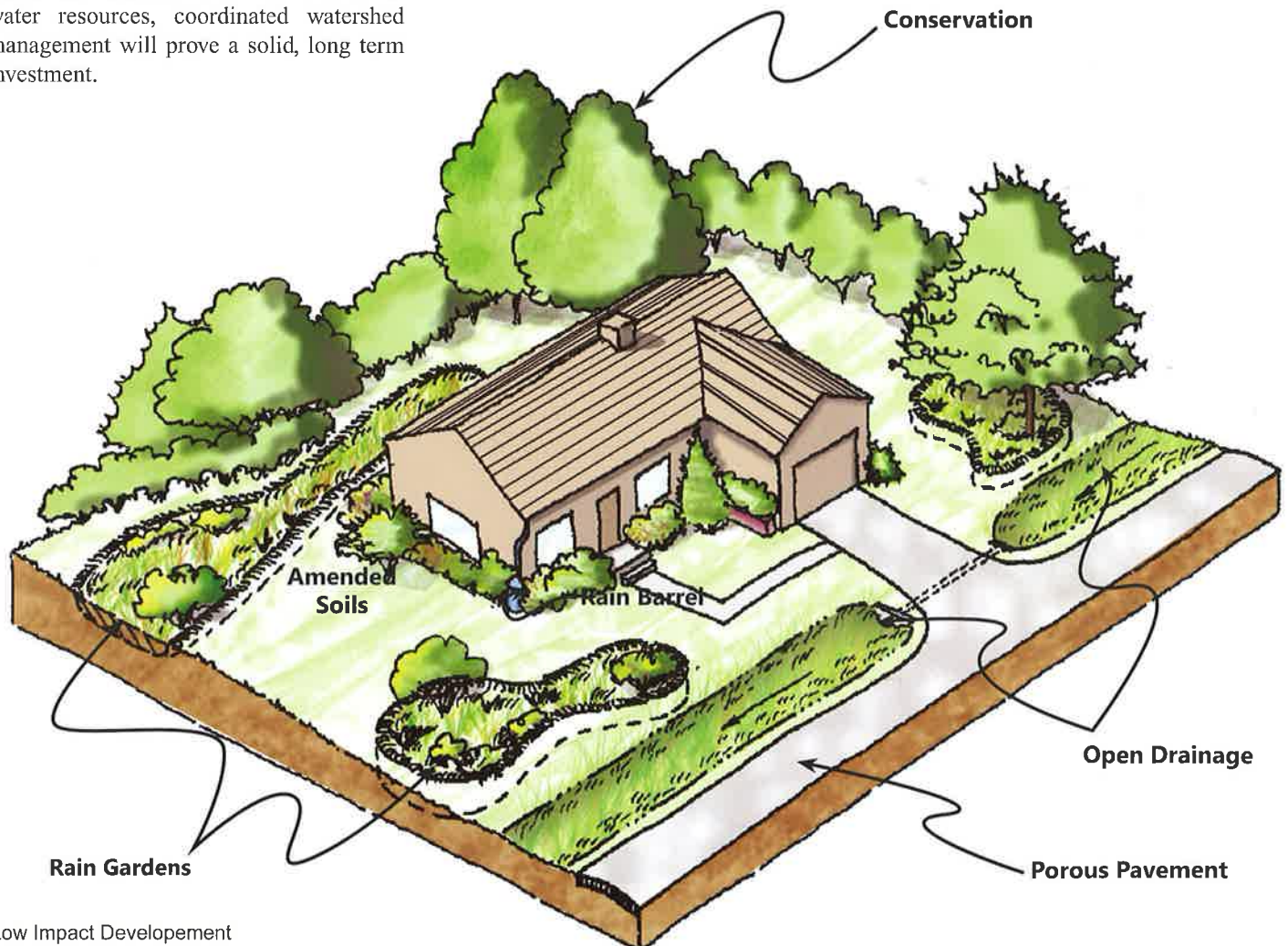
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Tourbier, J.T. 1994. Open Space Through Stormwater Management: Helping to Structure Growth on the Urban Fringe. Journal of Soil and Water Conservation.

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Low Impact Development