

Governor's Clean Water Initiative: Shoreland Rules Update Project Article Number 4

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Your Lake, Our Lakes: Where does the Rainwater go?

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If you are concerned about lake water quality, then you should ask, where does each raindrop go once it falls in the lakes area? How many raindrops are infiltrating into the ground near where they fell? The more raindrops that infiltrate where they fell, the better water quality will be for our lakes.

The Pollution Control Agency has estimated that about a quarter of the area lakes do not fully meet aquatic recreational use criteria due to excessive nutrients running into them. Nationally, the U.S. Environmental Protection Agency has determined that poorly managed rainwater is responsible for 15 percent of lake impairments.

Rainwater runoff originates from our roads, parking lots, roofs and lawns. Rainwater that does not infiltrate into the ground or evaporate runs down hill to our lakes or lake inlets. Runoff carries pollutants, such as oil, pesticides, suspended solids, pet waste and nutrients. However, if the water infiltrates into the ground, the soil and plants can clean it.

Nutrient additions to a lake increase with the intensity of land use. When nutrient levels increase in a lake, water clarity decreases due to an increase in algae. One predictor of nutrient runoff to our lakes is the amount of impervious surface coverage.

Your home's roof is an impervious surface, as is your paved driveway and other constructed hard surfaces that prevent or retard rainwater infiltration. Impervious surfaces inhibit recharge of groundwater, and they provide an express route for pollutants to our lakes.

As impervious surface coverage increases on a lot or in a watershed, the amount of nutrients entering our lakes increases linearly. Hydrology research consistently shows that when impervious surface coverage exceeds about 12 percent, water quality is negatively impacted.

In areas with low amounts of imperviousness, only 10 percent of the rainwater runs off. Around our more developed lakes, 50 percent of the rainwater becomes runoff.

There are two ways to manage rainwater. The traditional way has been to move water off fast. The "five C's" were the predominant rainwater management philosophy: collect, concentrate, convey, centralize and control. This approach uses stormwater sewers, pipes

and ponds. Unfortunately, after we used this expensive approach across many areas, civil engineers found that the approach did not work well. Often, the only outcome was the creation of larger problems downstream or downhill. The traditional way is now seen as a failed system.

The new way of managing rainwater is to get the water into the ground near where it falls. This approach uses infiltration basins, rain gardens, grass overflow parking areas, grass swales, porous or pervious pavers, parking lot infiltration islands and overall less imperviousness. The key principle of this new way to deal with rainwater is to get back to infiltrating most of the rainwater where it falls, with only 10 percent running off. This approach reduces pollutants and nutrients entering into our lakes, thus protecting the lake water quality.

This new way is small-scale and decentralized, and it mimics the natural hydrologic cycle. In addition to infiltration basins, rain gardens and other practices, the approach also includes protecting natural areas important for water transport and filtering, such as wetlands, streams and vegetated buffers near water.

Homeowners can use rain gardens to manage rainwater on their property. Rain gardens are landscaped areas planted with wild flowers and other native vegetation that soak up rainwater coming right off the roof and driveway. The rain garden fills with water after a rain, and the water slowly infiltrates rather than contributing to the runoff problem.

Cumulatively, numerous rain gardens in a neighborhood can have substantial positive environmental benefits. They can reduce drainage problems and pollutants entering lakes and streams, and they can recharge groundwater and create bird and butterfly habitat.

In the lakes area, many governments and people concerned about degrading lake water quality are looking for more effective, less expensive rainwater management systems.

The Governor's Clean Water Initiative pilot project in the north central lakes area aims to bring people together to create an alternative set of shoreland development standards in the lakes area. Citizens working on the Shoreland Rules Update project have been discussing the need for higher rainwater management standards to protect lake water quality. The updated standards developed by this project could serve as the foundation for local government ordinances.

Details of the Shoreland Rules Update project can be found at: <http://www.dnr.state.mn.us/waters> [click on the Governor's Clean Water Initiative link]. Email comments to shorelandupdate@dnr.state.mn.us .

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