

From Shore to Shore

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Minnesota Wetlands Are Healthy Overall, But Suffering in Some Regions

Reprinted with permission from the Minnesota Pollution Control Agency

As Minnesota's 2015 waterfowl hunting season began on Saturday, September 25, the Minnesota Pollution Control Agency (MPCA) released two reports on the health of wetlands around the state. The health of a wetland's vegetation can impact its quality as a habitat for ducks, geese, insects, and other animals.

The two reports — *Status and Trends of Wetlands in Minnesota: Depressional Wetland Quality Assessment (2007 – 2012)* and *Status and Trends of Wetlands in Minnesota: Vegetation Quality Baseline* — look at the quality of vegetation in the more than 10 million acres of wetlands in Minnesota. The first report covers the “prairie pot-hole” marshes and ponds found in northwestern, central, and south-southwestern Minnesota, whose quality has remained stable since they were last studied. The latter is the first study undertaken to assess the vegetative health of all Minnesota's wetlands. Overall, wetlands in the state are healthy, though the quality varies dramatically by region.

Vegetation quality is exceptional in approximately 49 percent of the state's wetlands. Exceptional quality is defined as plant diversity and health similar to

sites that haven't been affected by development, agriculture, and other human activities. Thirty-three percent of wetlands are in fair or poor condition, in which vegetation is degraded and native plants are being replaced by non-native invasive plants.

Although Minnesota wetlands can claim good health in total, that overall status masks some regional issues. Around 75 percent of the state's wetlands are in the north-central and northeast regions, where less development and lighter land uses have allowed wetlands to thrive. However, 80 percent of the remaining wetlands — in the central, southern, and western regions — have degraded vegetation quality, particularly from invasive plant species, such as cattails and reed canary grass. Aquatic invertebrates (insects, snails, leeches, and crustaceans) are not suffering as much: invertebrate communities in 57 percent of these regions' marshes and ponds are in fair or poor condition.

“Excess phosphorus and nitrogen levels from runoff pose a significant threat to the biological integrity of these wetlands,” says Michael Bourdaghs, MPCA research scientist and author of the report on overall vegetation quality.

Because Minnesota has lost roughly half of its wetlands since European settlement, much of the focus on wetlands has addressed maintaining or increasing the amount of wetland acreage. But wetland quality affects the way wetlands are able to support watershed health and serve as animal habitat, and is an important aspect of meeting state and federal policy goals. The MPCA is recommending a greater emphasis on wetland protection to promote the quality and biological diversity of the state's wetlands.

For more information, visit the MPCA website at www.pca.state.mn.us/pyri1131. ■

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What Are MS4 Communities and What Does it Mean to be One?

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What is an MS4?

Adapted from the Minnesota Pollution Control Agency (www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/municipal-stormwater/municipal-separate-storm-sewer-systems-ms4.html)

A Municipal Separate Storm Sewer System is a conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, storm drains, etc.) that is also:

- Owned or operated by a public entity having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law, an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges to waters of the United States;
- Designed or used for collecting or conveying stormwater;
- Not a combined sewer; and
- Not part of a publicly owned treatment works.

The MS4 General Permit is designed to reduce the amount of sediment and pollution that enters surface and ground water from storm sewer systems to the maximum extent practicable. Stormwater discharges associated with MS4s are subject to regulation under the National Pollutant Discharge Elimination System/State Disposal System. Through the General Permit, the system owner or operator is required to develop a Stormwater Pollution Prevention Plan incorporating best management practices. For additional information, see: www.pca.state.mn.us/index.php/view-document.html?gid=11856.

Stormwater runoff is considered to be the number one water resources issue in the United States because it carries nutrients, bacteria, and other pollutants to lakes, rivers, and wetlands. In Minnesota, many public waters do not meet minimum clean water standards due to water quality issues while others suffer from quantity challenges that impact downstream communities and waterways. Federal legislation mandates that states must address their water quality and quantity issues. One mechanism through which to do this is a Municipal Separate Storm Sewer System (MS4) permit and its associated Stormwater Pollution Prevention Plan (SWPPP). The intents of the MS4 permit and SWPPP are to improve water quality by reducing pollutants in stormwater discharges and to control surface flow to reduce flooding.

Environmental Impacts of Stormwater Runoff: Quality and Quantity

Stormwater runoff often contains pollutants that originate in rural and urban areas, such as nutrients (like nitrogen and phosphorus), bacteria, toxic metals, chemicals, pharmaceuticals and litter. Polluted stormwater contributes to a wide range of impacts such as reduced water clarity, excessive algae growth, fish consumption advisories, and swimming-beach advisories. Additionally, poorly managed stormwater runoff can lead to downstream flooding, stream bank erosion, adverse impacts to aquatic organisms, and reduced groundwater infiltration.

Minnesota currently has over 2,450 Minnesota Pollution Control Agency (MPCA)-designated impaired waters, including 515 new impairments since 2012. Approximately 1,650 water bodies show high concentrations of mercury in fish tissue and water, 570 have high levels of nutrients, and another 530 have high levels of E. coli

or fecal coliform bacteria. Additionally, floods are the number one hazard in Minnesota in terms of frequency of occurrence and total damages, with damages averaging about \$43,000,000 per year since 2007.

Federal Mandate to Clean Up Water

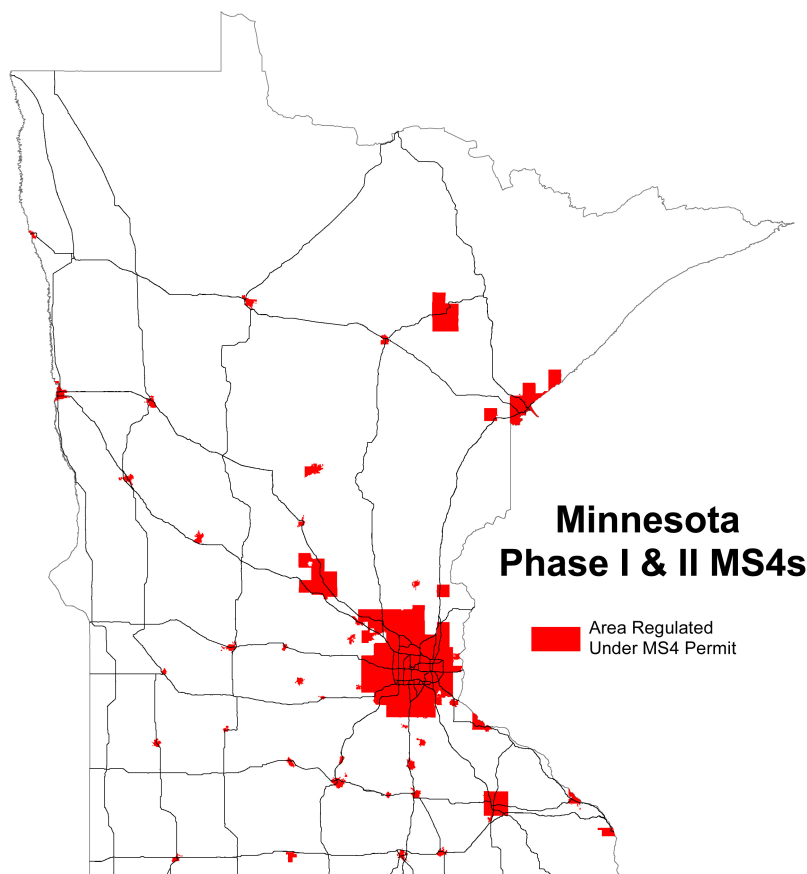
The federal Clean Water Act attempts to restore the nation's waters to provide for the following beneficial uses: fish and wildlife habitat, recreation, drinking water supply, agriculture, aesthetics, and navigation. The Clean Water Act and its goals are enforced in Minnesota by the MPCA. While the MPCA does little to control rural runoff sources in agricultural areas, it does attempt to address water quality and quantity issues from medium-sized and large communities through the MS4 permit.

What Makes an MS4 Community an MS4 Community?

Common owners of MS4 permits include cities, townships, counties, watershed districts, and public institutions such as colleges. The main criteria that qualify communities for MS4 designation are population, discharge into impaired waters, discharge into special waters, or by petition. There are approximately 270 MS4 communities in Minnesota and that number is growing as urban areas expand.

Communities that may meet MS4 designation requirements and that have publicly owned or operated stormwater infrastructure (not part of a wastewater treatment system) go through a screening process. Stormwater infrastructure includes curbs, ditches, culverts, stormwater ponds and storm sewer pipes. Upon designation by the MPCA, the community is required to apply for and obtain an MS4 general permit, which focuses on reducing →

What Are MS4 Communities and What Does it Mean to be One? *cont. from page 2*



Additional Information

Minnesota's Impaired Waters and TMDLs

www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesotas-impaired-waters-and-tmdls/minnesotas-impaired-waters-and-total-maximum-daily-loads-tmdls.html

Minnesota's Stormwater Manual

www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/stormwater-management/minnesotas-stormwater-manual.html

Stormwater Program for Municipal Separate Storm Sewer Systems (MS4)

www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/municipal-stormwater/municipal-separate-storm-sewer-systems-ms4.html

A Guide for Citizens and Town Officials: Best Management Practices to Control Non-Point Source Pollution

<http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-03-42.pdf>

Summary of the Clean Water Act

www2.epa.gov/laws-regulations/summary-clean-water-act

← the pollution that enters the community's public systems and subsequent discharges to wetlands, streams and lakes. One of the most important sections in the application is the general description of the Best Management Practices the community will employ to meet the pollution and flow reductions established by the MPCA. These management practices, which can be structural or non-structural, need to fit into the following six categories and be laid out in a Stormwater Pollution Prevention Plan submitted as part of the application:

1. Public education and outreach (e.g., teaching citizens about better stormwater management via festivals, websites, and newsletters).
2. Public participation (e.g., inclusion of citizen input at required public annual meeting and an annual report).
3. A plan to detect and eliminate illicit

discharges to the stormwater system (e.g., such as chemical dumping and disconnection of wastewater sources from the storm sewer system).

4. Construction-site runoff controls (e.g., silt fences, sand bag barriers).
5. Post-construction runoff controls (e.g., grass swales, rain gardens).
6. Pollution prevention and municipal "good housekeeping" measures (e.g., covering salt piles, street sweeping).

After application review and acceptance, the MPCA issues the permit which becomes a tool in the hands of city, township, and county officials who want to improve the quality of lakes and rivers.

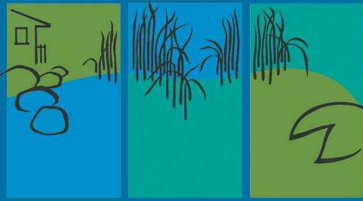
Your Role in the MS4 Process

While MS4 administrators can improve the quality of life for their citizens by adopting specific management practices

identified in their SWPPP, citizens can play a role as well. Citizens served by an MS4 can encourage the owner or operator of their community to tackle stormwater pollution problems originating from public spaces. Since private spaces also contribute stormwater runoff, citizens can urge their leaders to identify and tackle runoff problems there as well. Additionally, citizens can change the way they manage their own stormwater runoff, which can cumulatively reduce stormwater pollution. ■

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EXTENSION

SNAPSHOTS: Water Resources Team Programming and Research – Recent Past and Upcoming Opportunities



The Water Resources Team wrapped up a series of nine workshops in the Windom/West Fork of the Des Moines River Watershed area in September. The workshops were funded by a grant from the Toro Corporation and run in collaboration with the Windom Chamber of Commerce, Windom Education and Collaborative Center, Good Sam Society of Windom, and the Windom Area High School. The last of the workshops was an all-day event at the high school, working with the 10th grade biology students and their teacher, Jeff Huska. Water Resources Team educators Karen Terry and Doug Malchow joined school administrators and Jared House with the Pomme de Terre River Association to teach 75 students about their watershed and the connection between land use and the quality of their water. The day started with a presentation about the watershed and land use impacts, followed by three rounds of the new classroom version of The Watershed Game. In the afternoon, the students cycled through three learning stations: collecting and identifying macroinvertebrates in the river, observing and discussing channel shape and associated land use changes, and manipulating water and sediment supply in an artificial stream model to learn how it would react to simulated land use impacts. This was the first all-day high school workshop the Team had done, and it was well-received by the students and faculty.

The Watershed Game: Classroom Version is scheduled to be released this fall! Watch the Watershed Game website for

announcements. <http://northlandnemo.org/watershedgame.html>.

AIS Detectors and Trackers Wanted: U of MN Extension is developing citizen science opportunities, AIS Detectors and Trackers. If you would like to be "in the know" for the latest information please sign up for our email list at <http://z.umn.edu/aisextension>.

Visit the websites to view some of the conference presentations and handouts.

The "Green Infrastructure for Clean Water Summit: Reconnection Rainwater and Groundwater in our Communities" (www.arboretum.umn.edu/2015CleanWaterSummit.aspx) was held September 15 at the Minnesota Landscape Arboretum. More than 175 were in attendance. The Water Resources Team's John Bilotta was on the planning committee.

The 2015 Pollinator Summit: Designing for Pollinators – Enhancing our Communities (www.arboretum.umn.edu/Pollinators2015.aspx) was held August 13 at the Minnesota Landscape Arboretum.

The 2015 AIS Research and Management Showcase (www.maisrc.umn.edu/news-and-events-new/) was held September 15 at the University of Minnesota St. Paul Campus.

The Water Resources Center has a new director! Get to know Dr. Jeff Peterson by reading this article from the *Minnegram*: www.wrc.umn.edu/new-director-peterson. ■