



# Minnesota's Strategy to Reduce Nutrients in Water

## Achieving in-state and downstream water quality goals

Excessive phosphorus and nitrogen losses to water pose a significant problem for Minnesota's rivers, lakes and groundwater, as well as the downstream to Lake Winnipeg and Gulf of Mexico.

### Why is it important?

Nutrients are important for all living things; however, when they become excessive in water, problems can include excessive algae growth, low levels of oxygen, toxicity to aquatic life and unhealthy drinking water.

Nutrient losses to water can show up in local drinking water, nearby lakes, or farther downstream in regional lakes and rivers. Nutrients leaving Minnesota via the Red River contribute to algae problems in Lake Winnipeg. Nutrients flowing down the Mississippi River contribute to a large oxygen-depleted zone in the Gulf of Mexico, affecting commercial and recreational fishing and the overall health of the Gulf.

### How much reduction is needed?

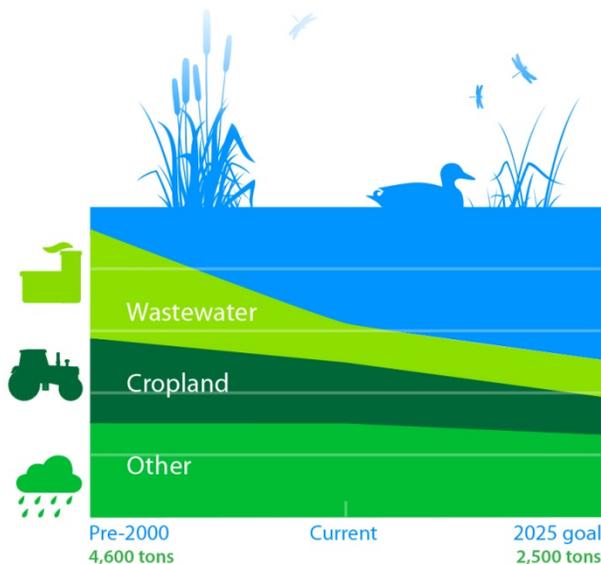
To do its fair share for the Gulf of Mexico, Minnesota needs a 45 percent reduction in nitrogen and phosphorus to the Mississippi River compared with loading occurring prior to the year 2000. City wastewater treatment improvements and other rural and urban sources have substantially reduced phosphorus; however, more work is needed to reach the following targets:

- Achieve a progress milestone of a 20 percent nitrate load reduction by 2025 (45 percent by 2040).
- Reduce phosphorus by 45 percent in nearly 500 lakes impaired for eutrophication (algae growth).
- More than 40 percent reduction in phosphorus for many eutrophication-impaired Minnesota rivers.
- Reduce nitrate to meet standards for thousands of wells and some cold water streams.

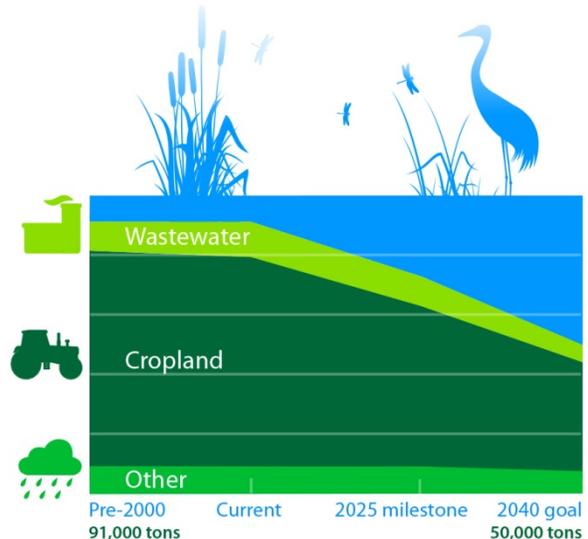
### How will nutrients be reduced?

On Minnesota's urban and crop land, combinations of tactics are needed to meet initial *(continued on back)*

### Phosphorus loads in the Mississippi



### Nitrogen loads in the Mississippi



*(continued)* nutrient reduction targets for the Mississippi and Red Rivers:

- Conservation tillage and erosion control on an additional 6.5 million acres of cropland.
- Vegetative cover increases during spring and fall on 2.6 million acres, including cover crops where crops are harvested early, and perennials on riparian lands and marginal cropland.
- Fertilizer and manure application efficiency improvements on 2.2 million acres for phosphorus and 11.9 million acres for nitrogen.
- Storing and treating tile line waters draining 0.6 million acres of row crops by constructing wetlands, bioreactors and restricting drainage at non-critical times of the year.
- Municipal wastewater treatment improvements to greatly reduce nitrate and to address phosphorus reduction at sites not yet fixed.
- Continued progress on full regulatory compliance for urban runoff, feedlots and septic systems.

To meet long term water quality objectives, we also need additional vegetative cover to protect soil and capture nitrate during the spring and fall months on corn and soybean acres.

### **What are the keys for success?**

To achieve the large-scale levels of needed change:

- Advance cover crop and perennial crop options for our climate and develop markets for those additional crops.
- Improve soil health for protection of soil during the increasing frequency of high intensity rains.
- Co-op agronomists, certified crop advisers, and agricultural producers working to achieve greater nutrient efficiencies, especially on corn following soybeans. Reduce the perceived risk of lowering fertilizer rates by offering incentives such as crop nutrient insurance.
- Private sector leadership by co-op agronomists, certified crop advisers, and equipment and agricultural industries to support increased delivery of voluntary Best Management Practices (BMP) and optimize opportunities to improve the rate of BMP adoption in targeted areas.
- Education and outreach about water quality issues and the changes needed to achieve goals.
- Demonstrations, promotion and incentives for implementing controlled drainage, wetland construction and other practices to reduce nutrients from tile drainage waters.
- Address erosion from bluffs, ravines and stream banks by mitigating the causes of increased erosive flows.
- Minnesota's revised Nitrogen Fertilizer Management Plan for groundwater protection fully implemented.
- Local, state and federal support for changes at the local watershed level.
- Local watershed planning to ensure that cumulative local efforts protect and restore water resources within the watershed and downstream of the watershed.
- Tracking strategy progress and applying lessons learned.

The Nutrient Reduction Strategy is a joint effort of eleven agencies: Metropolitan Council Environmental Services, Board of Water and Soil Resources, Dept. of Agriculture, Dept. of Employment and Economic Development, Dept. of Natural Resources, Dept. of Health, Pollution Control Agency, Natural Resources Conservation Service, University of Minnesota Extension, United States Geological Survey and the Farm Services Agency.

The full report is available on the Nutrient Reduction Strategy webpage:

[www.pca.state.mn.us/nutrientreduction](http://www.pca.state.mn.us/nutrientreduction).