

NATURAL RESOURCES

Minnesota's lakes and rivers, towering pines, rolling prairies and wetlands are iconic. But these trees, waters and lands also are an important part of our economy, home to wildlife and where we go for outdoor recreation. They also contribute to the big climate picture: America's forests, grasslands and wetlands absorb about 40% of our greenhouse gases. How to sustain the diversity and health of Minnesota's natural resources so they mitigate climate change—and build resilience to it—are questions facing us now. Conservation is one answer.

WHAT'S HAPPENING?

Water

Minnesota is known as the “Land of 10,000 Lakes,” but our **surface water** resource actually includes 11,842 lakes greater than 10 acres and nearly 70,000 miles of rivers and streams. Our **groundwater** resource includes several aquifers that support about 400,000 drinking water wells. As the headwaters of the Mississippi, Great Lakes and Red River, virtually all of Minnesota's available water comes as rain and snow.

Climate change leads to problems with too much and too little water. Ensuring the water we have remains clean and abundant requires wise management and conservation.

Too Much Water

Intense storms cause flash and river flooding, putting the quality of our water at risk. When stormwater flows over land and pavement, it gathers trash, chemicals, animal waste and other contaminants that can pollute waterways and drinking water.

One inch of rain falling on a one-acre parking lot (about the size of a football field) generates enough stormwater runoff to fill three 9,000-gallon semi-tanker trucks.

Increased flows can overwhelm our water infrastructure, such as storm sewers. We can minimize the magnitude of stormwater runoff and flooding—while improving water quality—by restoring wetlands, which store and filter excess water. Innovative technology helps, too. For example, green infrastructure uses trees, shrubs and rain gardens to manage rainwater where it falls, before it flows to waterways. Its vegetation also beautifies landscapes and reduces emissions.



Maplewood Mall
55 rain gardens, 6,733 square feet of permeable pavers, 375 trees, and one decorative 5,700-gallon cistern built to catch stormwater greet visitors. Together, they help intercept 20 million gallons of runoff per year before it reaches nearby Kohlman Lake.

Too Little Water

Minnesotans use water for drinking, cooking and sanitation; growing crops and lawns; running businesses; and generating electricity. Water also supports natural habitats and contributes to our quality of life.

Our water supplies are at risk from drought and overuse. And, less predictable rainfall poses further challenges. When rain falls hard and fast, for example, it lowers the likelihood that water will saturate sub-soils and recharge or “refill” our aquifers, decreasing our water supply. Our growing population and development, which require more water, add to these challenges.

Efficient use and careful management are needed to sustain many water-dependent habitats and businesses.



30% LESS WATER USAGE

Bob and Steve's Shell

Facing well levels nearly 12 feet below the 16-year average in Worthington in 2014, the gas station decided to stop selling its top two car washes to help conserve water. The move saved about 30% of the station's water usage, while only reducing revenue slightly.

LOOKING AHEAD

Ensuring sustainable use of our groundwater and protecting its quantity and quality are key concerns for our future. Studying our demand for groundwater and methods to protect this water source and ecosystems for future generations are underway. The Department of Natural Resources is piloting Groundwater Management Areas in three areas with stressed resources: the north and east metro, the Straight River area and Bonanza Valley. The projects will help state agencies, local communities and water users understand how to work together to address groundwater challenges.

By the Numbers

WATER USAGE ON THE RISE



1.4 Trillion gallons of water per year

Minnesotans' overall water use has risen from about 850 billion gallons per year in the mid-1980s to almost 1.4 trillion gallons per year in 2010.

CARBON REDUCTIONS, NATURALLY



15 Billion metric tons of CO₂

Minnesota's peatlands are estimated to store the equivalent of about 15 billion metric tons of carbon dioxide.



5.8 Billion metric tons of CO₂

Minnesota's forests store the equivalent of about 5.8 billion metric tons of carbon dioxide.

Trees

Trees sequester, or absorb, carbon dioxide from the atmosphere. They convert the carbon dioxide into oxygen, which they release. They store the remaining carbon in their wood.

In one year, an acre of trees absorbs the same amount of carbon dioxide produced by driving a car 2,700 miles. The DNR manages more than 3.5 million acres of state forestland with sustainable management practices that improve carbon retention, soil quality and habitats.

Conserving Carbon Reducers

Minnesota Forests for the Future Program uses state, federal and private dollars to protect large blocks of private forestland that could instead be converted to other land uses. These easements protect our forests' carbon-storing capacity and conserve timber-related jobs; increase public access for recreation; and build our resiliency to climate change. Continuous forests speed recovery from wildfires, floods and droughts, and preserve animal and plant habitats.



The **Upper Mississippi Forest Project** protects more than 187,000 acres of northern forests; more than 60,000 acres of wetlands; and 280 miles of shoreline. A working forest, the property supplies 17 manufacturing facilities supporting more than 3,200 families. Combined with adjacent public forestlands, the project connects more than 4,000 square miles of uninterrupted habitat.

A New Way Of Planting

Community tree gravel beds—irrigated boxes filled with gravel—hold bare root trees for three to six months. The trees develop a dense network of roots, increasing chances they will survive once planted and thrive for generations. More than 25 Minnesota communities use gravel-bed systems, from Hendricks (pop. 700) to Rochester. Building on its own success, the **Sherburne County Soil and Water Conservation District** established a tree gravel bed for six communities in the county to share.

The Helping Tree

One large tree provides almost \$4,000 in environmental and other benefits over its lifetime. Here are just a few:

Trees near buildings can reduce the demand for heating and air conditioning.

Tree-filled neighborhoods report lower levels of domestic violence, are safer and more sociable, and reduce stress.

Land

Sound land management prepares us for a changing climate and provides an opportunity to store and capture carbon. Preserving and restoring wetlands, prairies and grasslands, and buffer zones by lakes and streams, reduces the vulnerability of ecosystems, wildlife populations and critical carbon stocks.

With climate change, Prairie Pothole Region wetlands could shrink and shift optimal waterfowl breeding conditions from Canadian prairies and the Dakotas into western Minnesota. Without major restoration efforts to replace drained wetlands there, ideal habitat for ducks could gradually disappear.

Striving for Balance

Minnesotans made a significant commitment to conservation by passing the **2008 Clean Water, Land and Legacy Amendment**. Funded by the amendment, the Minnesota Prairie Plan balances the needs of prairie-wetland ecosystems with working farmland, including cropland and pastureland. Its goal is to protect remaining prairies and connect them with a corridor of high-quality habitat for wildlife such as ducks, meadowlarks and Monarch butterflies. The plan's goals have multiple co-benefits including protecting and increasing the carbon stored in grasslands and wetlands and enabling greater ecological resilience to climate change.



Plant trees and other native plants in your yard and community. Visit the [Minnesota Shade Tree Council website](#) to learn more.

Use water wisely. Get started on the [Minnesota Pollution Control Agency's Conserving Water webpage](#).

Collect rainwater and use it to water your lawn.

