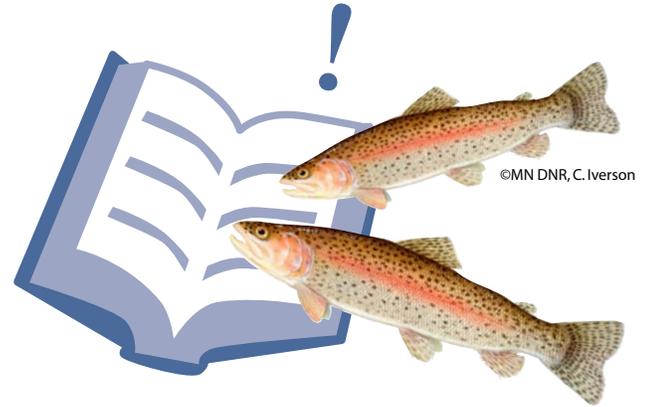


Minnesota Water Facts

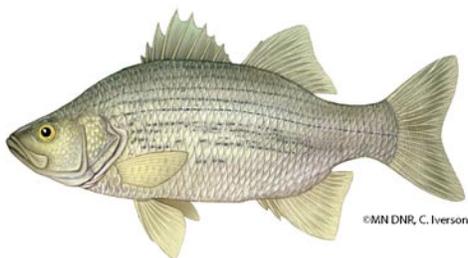


- Earth is often called the Blue Planet because as much as 75 percent of its surface is covered by water.
- Although water may seem abundant in Minnesota, the Land of 10,000 Lakes (there are actually 11,842 lakes of ten acres or larger), water is a limited resource. Throughout the world, clean fresh water is increasingly scarce.
- The fresh water in Minnesota aquifers, lakes, and rivers is a legacy of retreating glaciers that shaped the landscape more than 10,000 years ago.
- Water has the strange property of first condensing as it cools to 4°C and expanding when it further cools from 4°C to 0°C. The result of this is that ice is less dense than the water in which it floats. Fish are lucky in this respect—otherwise ice would sink and lakes would freeze from the bottom up during the winter. This is lucky for ice fishing anglers, too!
- The amount of water on earth today is exactly the same as it was when the earth was formed.
- Almost 98 percent of the world's water is salty or otherwise undrinkable. Almost two percent is locked in ice caps and glaciers. This leaves not quite one percent of all fresh water available for human needs, including agriculture, residences, industry, and communities.
- It takes 24 gallons of water to produce one pound of edible potatoes. It takes 182 gallons of water to produce one pound of corn.
- Number of pollutants the Environmental Protection Agency has found in U.S. drinking water: 700
- The average U.S. household uses more than 100 gallons of water a day. Landscape watering and toilets account for most of the water used in a typical home.
- U.S. households turn on water faucets an average of 70 times daily. Implementing simple conservation methods could save an estimated 50 percent of the water that families use.
- A dripping faucet can waste as much as 2700 gallons of water annually.
- A leaky toilet can waste as much as 200 gallons of water daily.
- The majority of surface water used in Minnesota is used for cooling in power generation, but this water is usually returned to the water body near the source from which it was removed—this isn't considered consumptive use.
- In Minnesota, 40 percent of total groundwater withdrawals are used for irrigation.
- Aquatic invaders (such as Eurasian water milfoil, zebra mussels, spiny water fleas, ruffe, and purple loosestrife.) cause habitat destruction, decrease biological diversity, and cause millions of dollars of damage in Minnesota. Many introductions are unintentional. Invasive species are carried on barges, boats and trailers, animals, vehicles, commercial goods, packing materials, produce, footwear and clothing, and in the ballast water of ships.

- Of the lakes and rivers tested in Minnesota, 40 percent are polluted with contaminants such as mercury, fertilizers, animal waste, human waste, and excessive phosphorus, which causes algal blooms.

Do you drink bottled water because you consider tap water unsafe? Many brands of bottled water are simply filtered and treated tap water. Public drinking water supplies are subject to more intense government regulation than bottled water.

- Minnesota's total surface water area (including wetlands): 13,136,357 acres
- Deep-water lakes and rivers: 2,560,299 acres
- Fishing waters: 3,800,000 acres
- Minnesota lies in a unique position on the North American continent. The state is at the head of four continental watersheds and contains the headwaters, or the origins, of three of these watersheds. Water flows north (Red River of the North Basin), south (Mississippi River Basin), east (Great Lakes Basin), and west (Missouri River Basin). From these four basins Minnesota's waters flow to three destinations: northward to Canada's Hudson Bay, eastward to the Atlantic Ocean, and southward to the Gulf of Mexico.
- Minnesota receives very little surface water from outside its boundaries.
- Minnesota boasts an acre of water for each 20 acres of land. Six percent of the state is covered with water—more than any other state.
- Minnesota has more miles of shoreline than Hawaii, California, and Florida combined.



Minnesota's Major Rivers

There are 6,564 (approximately 69,200 miles) natural rivers and streams in Minnesota.

In the heart of North America lies one of the world's greatest rivers, the mighty **Mississippi River**.

- The Ojibwa Indian word for the river is *Messipi*, meaning big river. It's also called the *Mee-zee-see-bee*, meaning the father of waters.
- Minnesota's Lake Itasca, located within Itasca State Park, is the source of the Mississippi River. It begins as a tiny brook and, more than 2,300 miles downstream, it empties into the Gulf of Mexico. The precise length of the river is difficult to measure because the river channel changes constantly. Staff members at Itasca State Park offer the distance of 2,552 miles. The U.S. Geological Survey has published a distance of 2,300 miles; the Environmental Protection Agency states that it's 2,320 miles long, and the Mississippi National River and Recreation Area states its length as 2,350 miles.
- The Mississippi River drains a watershed that covers 41 percent of the continental U.S., an area as large as 1.8 million square miles, which includes tributary rivers from 32 states and two Canadian provinces. The first 680 miles of the Mississippi River are within Minnesota state boundaries.
- The cities of Minneapolis, St. Paul, and St. Cloud rely primarily on the Mississippi River for public drinking water supplies.
- A raindrop falling in Lake Itasca arrives downstream at the Gulf of Mexico in approximately 90 days.
- There are 113 fish species recorded in the Minnesota-Wisconsin stretch of the Mississippi. Half of these species exist above St. Anthony Falls Lock and Dam in Minneapolis, which prevents the upstream migration of fish.
- The Mississippi River Valley is a major North American migration route for ducks, geese, swans, raptors (particularly bald eagles), and other birds. The Minnesota-Wisconsin stretch of the Mississippi harbors, over the course of a year, 285 bird species.

- There are more species of mussels in the Mississippi River watershed than anywhere else in the nation.

The **Red River** is a remnant of Glacial Lake Agassiz, a massive prehistoric lake.

- The Red River meanders northward 550 miles from its source in Breckenridge, Minnesota, and stretches through a prairie landscape from northeastern South Dakota and west-central Minnesota through eastern North Dakota and northwestern Minnesota and into southern Manitoba where it empties into the southern end of Lake Winnipeg.
- The Red River Valley is one of the world's flattest landscapes. The river's flow sometimes fluctuates widely, resulting in devastating floods associated with spring snowmelt and summer rain.
- The Red River watershed drains approximately 37,100 square miles of northwestern Minnesota. 17,842 miles of streams and 668,098 acres of lakes are in the Minnesota portion of the Red River Basin.

The watershed basin of the **Rainy River** lies along the Minnesota-Canada border.

- The Rainy River flows for 80-miles connecting Rainy Lake and Lake of the Woods.
- It is home to walleye, northern pike, smallmouth bass, sturgeon, and muskies. The forested basin also contains a number of fine trout streams.
- The waters from the Rainy River Basin eventually flow north to Hudson Bay.
- Voyageurs National Park and the Boundary Waters Canoe Area Wilderness are located within the Rainy River watershed basin.

The **Minnesota River** was named *Watapa Minisota*, meaning river of cloud-tinted water or water that reflects the sky, by local Dakota Indians.

- French fur traders christened the Minnesota River as *Riviere St. Pierre* in the late 1600s.
- It's approximately 340 miles long. It flows through a mostly agricultural landscape southeast from its source at Big Stone Lake (near the South Dakota border) into the

Mississippi just north of Pike Island at Ft. Snelling State Park in St Paul.

- It drains an area of 16,770 square miles, or approximately ten million acres.

The **St. Croix River** begins in Wisconsin and flows west and south to join the Mississippi River at Prescott, Wisconsin.

- Approximately 80 percent (129 miles) of the St. Croix River forms part of the boundary between Wisconsin and Minnesota.
- The St. Croix watershed covers approximately 7,760 square miles and extends from near Mille Lacs Lake in Minnesota on the west to near Cable, Wisconsin, on the east. Approximately 46 percent of the river's watershed area is located within Minnesota boundaries.
- Its beauty has earned the St. Croix River's status as Minnesota's first stream in the national Wild and Scenic Rivers system. Administered by the National Park Service, the St. Croix National Scenic Riverway was designated in 1968 to preserve the scenic qualities of the river and provide adequate access for recreational users.

The **St. Louis River** is the largest U.S. tributary to Lake Superior.

- The St. Louis River watershed basin covers 3,650 square miles.
- Its headwaters are located near Hoyt Lakes, Minnesota.
- Its waters enter Lake Superior and flow eastward, joining the waters of the Great Lakes and eventually flowing into the Atlantic Ocean.

Minnesota Lakes

- Minnesota is often called the land of 10,000 lakes, but the actual number is closer to 15,000, depending on the source of the count. There are 11,842 lakes ten acres in area or larger.
- Counties without natural lakes: Mower, Olmsted, Pipestone, and Rock.
- Largest border lake: Lake Superior is 20,364,800 acres, 962,700 of which are located in Minnesota. Lake Superior is the world's largest freshwater lake.

- Largest inland lake (completely within Minnesota borders): Upper Red Lake and Lower Red Lake, with a combined total of 288,800 acres (451 square miles)
- Deepest inland lake: Portsmouth Mine Pit near Crosby (450 feet deep and rising).
- Deepest natural lake: Lake Saganaga, Cook County (240 feet deep).
- Longest shoreline: Lake Vermillion in St. Louis County (290 miles of shoreline).
- Major lakes include: Lake Superior, Upper Red Lake, Lower Red Lake, Mille Lacs Lake, Lake Vermillion, Rainy Lake, Lake of the Woods, Leech Lake, Lake Winnibigoshish, Lake Pepin, Lake Minnetonka.
- Most common lake names: Minnesota has 201 Mud Lakes, 154 Long Lakes, and 123 Rice Lakes.
- The majority of Minnesota lakes are in the northernmost half of the state, but many are scattered throughout rest of the state, too.
- There are more than 1,000 lakes in the Twin Cities metropolitan area alone.
- Seasonal changes in Minnesota transform the density of lake waters. This accounts for large-scale mixing of the water in many lakes. In autumn, as surface waters cool, they sink and change places with bottom waters. In the spring, as the ice melts, the melt water becomes denser and sinks to the bottom, again mixing the lake as it moves. This double annual mixing of water in lakes is known as turnover.
- Total wetland areas in 1850: 18.6 million acres.
- Total wetland areas in 2006: 9.2 million acres. (According to the Minnesota DNR, these acres cover approximately 24.4 percent of the state. As many as 90 percent of the state's original wetlands have been lost in some areas.)
- Wetlands bolster water quality by, among other things, filtering pollutants from surface water and groundwater, using nutrients that would otherwise pollute waters, trapping sediments, protecting shoreline, and recharging groundwater supplies.
- Wetlands help retain floodwater and stormwater and provide low-flow augmentation during times of drought.
- Wetlands provide public recreation and education in the form of hunting and fishing areas, places to view wildlife, and other natural areas.
- Wetlands provide commercial benefits, including growing areas for wild rice and cranberries and aquaculture areas.
- Wetlands benefit fish and wildlife in the form of habitats for many plant and animal species.
- In 1991, reacting to public concern about Minnesota's disappearing wetlands, the Minnesota Legislature approved and Governor Arne Carlson signed the Wetland Conservation Act, one of the most sweeping wetlands protection laws in the country.

For more on frequently asked questions concerning Minnesota lakes, see:

mndnr.gov/lakes/faqs.html

www.pca.state.mn.us/water/lake-faq.html

Minnesota Wetlands

- What is a wetland? It can be a swampy, marshy place filled with ducks and cattails, or a place that appears dry for most of the year. It could even be covered with trees and shrubs. A wetland has mostly wet soil, is saturated with water either above or just below the surface, and it has plants adapted to wet conditions.

Groundwater

- Groundwater lies beneath the land surface, filling the spaces between rocks and sediments. It exists everywhere beneath Minnesota's land surface, but it's *not necessarily available for use* everywhere.
- Groundwater discharge to surface waters allows streams to flow beyond rain and snowmelt periods and sustains lake levels during dry spells.
- Groundwater supplies approximately 75 percent of Minnesota's drinking water and nearly 90 percent of the water used for agricultural irrigation.
- There is one hundred times more groundwater than the quantity of surface water in all of the world's rivers and lakes.
- Of Minnesota's total water usage between 1985 and 1997, 18.6 percent came from groundwater.

- More than 70 percent of Minnesotans rely on groundwater for drinking water.
- Groundwater and surface water are connected as part of the hydrologic cycle. Withdrawing water from the ground can eventually impact springs; deplete wetlands, streams, lakes, and rivers; draw contaminants into the water system; and result in other ecological effects.

Climate Affects Waters

Minnesota's water resources are profoundly affected by the water cycle, which is, in turn, impacted by weather conditions. The very existence of many of Minnesota's aquatic resources has largely been determined by Minnesota's climate, the composite of day-to-day weather over a long period.

Water Conservation and Stewardship

“... building a sustainable society does not mean reverting to a primitive existence. The challenge is to find a new synthesis that melds the wisdom of nature with human institutions and technologies and lifestyles. The benefit of such an approach can be told in one word: survival.”

—Daniel Chiras, *Lessons From Nature*, 1990

Increased water conservation will be important in the future. Minnesota's total water use increased 55 percent between 1985 and 2003, about twice the percentage increase in its population for the same period. Increased water use results in increased environmental effects, costs, and conflicts. All water users—large or small—including individuals, communities, businesses, and government, must play a role in conserving water. Voluntary action, conserving water, and adopting efficient water-use practices is critical, as are mandated actions for resource protection.

Households

Each person has many daily opportunities to save water in and around the home, including:

- Actions as simple as fixing leaky sinks and toilets. (One drop per second wastes as many as 2,700 gallons of water annually!)
- Install water-saving fixtures. If all plumbing fixtures in the country were replaced with water-conserving fixtures, we could save between 3.4 and 8.4 billion gallons of water a day.
- Use appliances efficiently or replace existing appliances with newer, more efficient ones. Installing a 1.6 gallon per flush toilet, for example, can save more than 15,000 gallons of water each year—and cost half as much to operate. Replacing showerheads with ultra-low-flow versions saves substantial amounts of water used for showering. Some of these fixtures use as little as 2.5 gallons of water per minute, as opposed to the five to seven gallons per minute used by many older showerheads.
- Outdoor landscape watering causes summer usage peaks. Limit quantities of water used on lawns and for showers, garbage disposals, and faucets. Reduced and efficient use of water indoors and outdoors is critical.
- Don't run the water while brushing your teeth, washing your face, or shaving.
- Use no-phosphate or low-phosphate cleaners and detergents.
- Consider taking your car to a commercial carwash that recycles water. If you wash your own car, park on the grass so that you can water the lawn at the same time. Water landing on impermeable surfaces, such as driveway pavement, flows through the watershed to the nearest body of water and deposits its contaminants. Your lawn, on the other hand, can trap and break down most foreign agents.
- Don't overwater your lawn. Lawns only need water every five to seven days in the summer—most of the year, lawns need just an inch of water per week. Position sprinklers so the water lands on the lawn and shrubs and not on paved areas.
- Limit the use of lawn fertilizers and be sure to use only those that are phosphorus-free. Most lawns already have sufficient phosphorus—when you add more, it flows through the watershed, fueling algae growth in surrounding lakes.
- Planting thickly and using mulches helps shade the soil and prevents precious available moisture from evaporating. Chipped bark, straw, grass

clippings, cocoa hulls, and compost are effective mulches.

- Use rain barrels for collecting rainwater for the garden.

Communities

Communities can implement practices to minimize summer peak water demand. In the Twin Cities metropolitan area, summer peak demand is an average of 2.6 times larger than winter demand, although in some communities, demand is as much as four times greater in summer. Most of the summer peak demand is for outdoor watering. Reducing summer peak demand includes several approaches, such as instituting effective watering habits, landscaping with plants that require less water, watering schedules that stabilize demand, watering restrictions, and the use of rain- or soil-moisture sensors for sprinkler systems.

Community water utilities can reduce waste from unaccounted water use, including those from system leaks. Water utilities can also consider water pricing that encourages conservation.

Business and Agriculture

Given the natural limitations of groundwater resources, Minnesota businesses can evaluate water supply needs much earlier in expansion or development planning than may have been practiced in the past. By becoming better water stewards and more knowledgeable about the sources of their water supply, businesses can reduce their risk and uncertainty as they save water, energy, and money.

The University of Minnesota offers MnTAP (Minnesota Technical Assistance Program), a free service, to Minnesota businesses and industries. A MnTAP team of specialists helps businesses by identifying ways to use water more efficiently. With assistance from MnTAP, one company saved \$400,000 and thirteen million gallons of water per year. Another company saved more than \$27,400 and 2.5 million gallons of water per year. This program is funded by a grant from the Minnesota Pollution Control Agency and is part of the University's School of Public Health.

The State of Minnesota

In the most recent update to Minnesota's water plan, *Watermarks: Gauging the Flow of Progress 2000-2010*, highlighted water conservation as important to future ecosystem and economic health. A key conservation objective recognized the need to maintain groundwater levels in relation to precipitation to sustain surface waters and provide for human needs. In support of that objective, the state collects and disseminates climatic and resource data, regulates water use and collects usage data, and requires appropriation permit holders to adopt and implement conservation plans. With public input, the state government and state agencies continue to review and improve regulatory and permitting methods and guidelines to improve water conservation and water-use efficiency.

On the National Level

Water is generally managed at the state level through state water laws. The federal government has instituted water efficiency standards for manufacturers of plumbing fixtures and appliances. Nationally, water conservation is implemented by several agencies (such as the Environmental Protection Agency, U.S. Department of Agriculture, and others) that set policy and require conservation measures as a condition of grants and loans to states and communities. Organizations, such as the American Water Works Association, National Ground Water Association, and others, work through their members and provide information to the public.

Take Action: Conserve, Protect, Learn, and Change

- Reconsider and change your daily habits to conserve water and reduce water pollution. Bike, walk, or travel by carpool to help reduce the production of toxic air pollutants that cause acid rain.
- Encourage local governments, employers, schools, and your own family to promote water conservation and to develop and promote a water conservation ethic.

- Support projects that lead to increased use of reclaimed wastewater for irrigation and other uses.
- Promote water conservation through community newsletters, bulletin boards, and by example. Encourage your friends, neighbors, and co-workers to be “water smart.”
- Share your knowledge with others—people’s actions, choices, and decisions have long-lasting and extensive impacts on the quality of freshwater resources—and each of us can make a difference.

Some sources for these facts include: The Environmental Protection Agency; *The Green Consumer*, by John Elkington, Julia Hailes, and Joel Makower, 1990; U.S. Geological Survey; National Drinking Water Alliance; and the Minnesota DNR.