

# Vermillion River

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ENVIRONMENTAL SERVICES

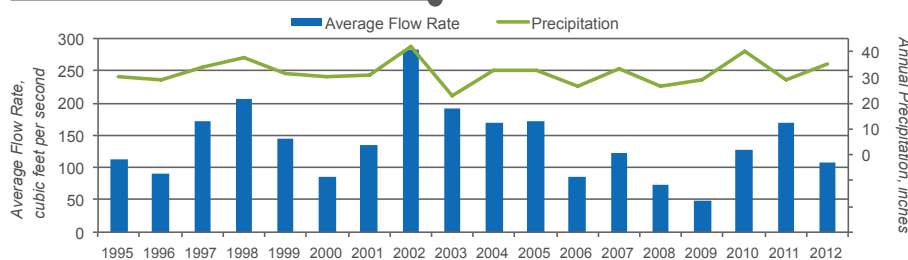
**Vermillion River** is located in the southern metropolitan area and is made up of smaller streams (like North Creek, South Creek, and South Branch), the outlet of Lake Marion in Lakeville, and wetlands in New Market and Castle Rock townships. The river runs through wetlands, forest, and agricultural and urban areas before discharging into the Mississippi River. Several portions of the river are designated as trout streams, and the Empire Wastewater Treatment Plant discharged into the river in Empire Township until 2008 when it was diverted to discharge to the Mississippi River. The Elko-New Market Wastewater Treatment Plant was also diverted from the Vermillion River in 2011.

## Flow

Stream flow, or the rate of water flowing in a stream, affects aquatic life and the ecosystem. High flows can lead to flooding and erosion, and transport pollutants.

The Vermillion River flows year-round and is influenced by how much rain or snow has fallen in any given year. The diversion of the Empire Wastewater Treatment Plant discharge likely generated lower flows when less precipitation has occurred. Since 2003, the average flow is 127 cubic feet-per-second. At that rate, it would take the Vermillion River about 50 hours to fill the Target Center in Minneapolis.

Vermillion River Annual Flows and Precipitation



## Nutrients

Nutrients, like nitrogen and phosphorus, are necessary for stream health. However, elevated nutrient levels, caused by materials like fertilizers, animal manure, pet waste or grass clippings, can cause excessive algae growth and harm aquatic wildlife, insects and fish.

The Vermillion River has a lower concentration of nitrogen (measured as nitrate) than other Mississippi River streams of a similar size, but is higher than some of the urban streams. Its phosphorus concentration is comparable to other streams in the river basin. Future monitoring will likely show that diverting the Empire Wastewater Treatment Plant discharge away from the Vermillion River improved water quality by lowering the level of nutrients.

## FAST FACTS

**Major river basin:** Mississippi River

**Water source:** lake and wetland outflow, surface water runoff and shallow groundwater discharge

**Length:** 50 miles

**Watershed area:** 234 square miles

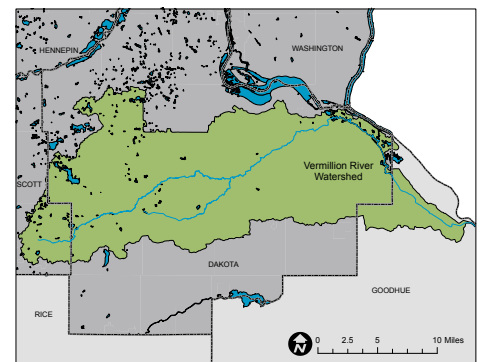
**Watershed land use:** Agriculture, forests and grasslands, some urban

**Waterfall:** Vermillion Falls in the city of Hastings is over 35-feet tall

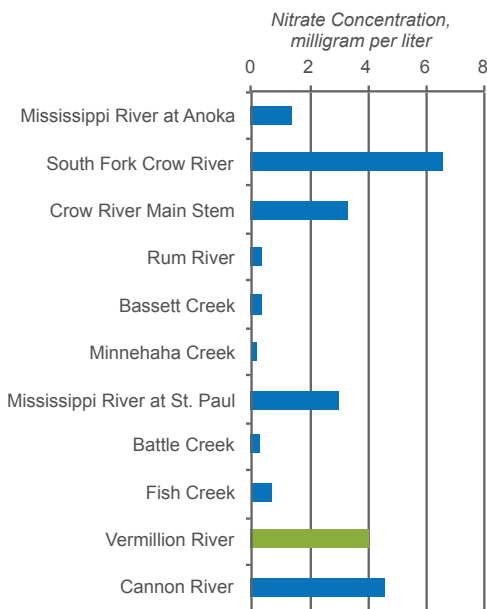
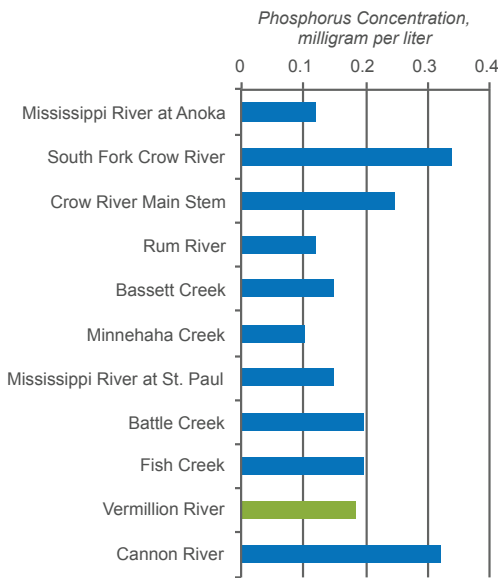
**Regional parks:** Whitetail Woods

**Cooperator organizations:** Dakota Soil and Water Conservation District

**Year first monitored:** 1995



**Median Nutrient Concentrations in the Mississippi River and Tributary Streams, 2003–2012**



**For more information**

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Visit [www.metrocouncil.org/streams](http://www.metrocouncil.org/streams) for the full results of the Comprehensive Water Quality Assessment of Select Metropolitan Area Streams.

**Aquatic insects**

Aquatic insects are excellent indicators of the overall health of a stream since they spend the majority of their lives in the water, and are an important food source for fish, birds and other wildlife. The Vermillion River has a healthy population of aquatic insects, meaning the stream is clean enough to provide a meal for the trout living in it!

**Chloride**

Chloride, one component of salt, is typically used for winter road, parking lot, and sidewalk maintenance and home water softening. Large-lot rural, residential areas also have many individual on-site septic systems to manage wastewater since there is no centralized sewage system. Failed septic systems can leak chloride into the groundwater and eventually pollute the stream.

Vermillion River has a moderate concentration of chloride – less than the urban streams, but more than the rural streams. The chloride concentration has likely been influenced by water softening salt draining through the Empire Wastewater Treatment Plant.

**Preserving our Creeks**

The Vermillion River Watershed Joint Powers Organization (VRWJPO) is the local governing body responsible for maintaining the watershed and improving water quality. The VRWJPO is governed by a Joint Powers Board made up of county commissioners from Dakota and Scott Counties. They partner with private landowners, cities, Dakota County Soil and Water Conservation District, Dakota and Scott counties, the University of Minnesota, MCES, and Department of Natural Resources (among others) to complete various improvement projects, including:

- Constructing curb-cuts and rain gardens
- Restoring wetlands
- Stabilizing stream channels and stream banks
- Restoring the trout habitat
- Planting trees and shrubs along the river to stabilize streambanks and cool water temperatures for the trout
- Diverting the Empire Wastewater Treatment Plant discharge away from the river

**Is the Stream Improving?**

Long-term data analysis and computer modeling indicate the Vermillion River’s water quality has improved because phosphorus, nitrate and sediment levels have decreased. The nitrate trend identified by MCES is likely affected by the diversion of high nitrate wastewater treatment plant discharge from the Vermillion in 2008. However, additional monitoring by the VRWJPO and Dakota County SWCD shows that nitrate delivered from farm fields and shallow groundwater may be affecting the small tributaries entering the Vermillion, for example the South Branch. These sources may be causing rising concentrations in these small tributaries, especially at low flow. This is a complex issue that needs additional study.

**Protecting the Region’s Water Resources**

This work supports the regional policies established in the Metropolitan Council’s *Thrive MSP 2040* and *Water Resources Policy Plan* to collaborate with partners to promote the long-term sustainability and health of the region’s water resources, including surface water, wastewater and water supply.