SUMMARY FACT SHEET

Water Quality of the Minnesota River

in the Twin Cities Metropolitan Area 1976-2015

www.metrocouncil.org

ENVIRONMENTAL SERVICES

The Minnesota River flows though agricultural areas, which affects its water quality, before reaching the metro area. In the metro area, the Minnesota flows through more urban areas. The Minnesota enters the Mississippi River at historic Fort Snelling.

Pollutants considered in assessing river water quality

Sediment is sand, soil, silt, or clay particles, measured as "total suspended solids," from sources such as eroded fields, banks and gullies and poorly managed construction sites. Sediment can decrease the light available in rivers, harm aquatic life, and carry nutrients to receiving waters.

Nutrients, like phosphorus (measured as total phosphorus) and nitrogen (measured as nitrate), are substances used for growth and to support life. However, excessive nutrient levels (eutrophication) caused by materials like fertilizers, animal manure, pet waste, or grass clippings can cause excessive algae growth, which harms aquatic wildlife, insects, and fish.

Bacteria are microscopic living organisms, measured as "fecal coliform." Harmful types of bacteria – from sources such as animal waste, untreated wastewater, and malfunctioning septic systems – can cause illness in humans.

Chloride is a component of salt. Common sources of chloride in urban areas include de-icing salts and home water softeners. Too much chloride can harm aquatic life.

How the Minnesota River's water quality has changed, 1976 to 2015

Sediment decreased. Improvements in wastewater treatment technology, farming practices, land management, and stormwater management have likely contributed to lower sediment concentrations. In addition, many successful water quality improvement projects have helped reduce the amount of sediment flowing into the river from tributary streams.

Phosphorus decreased. Wastewater treatment improvements, such as enhanced biological phosphorus removal, and bans on phosphorus in laundry detergent and lawn fertilizers, have likely helped reduce phosphorus. In addition, a decrease in sediment entering the river from tributary streams may also have reduced phosphorus, since phosphorus can adsorb (stick to) sediment.

Nitrogen showed mixed results. At both monitoring sites, nitrate increased steadily until 2005 but then declined. The decline created an overall decrease since 1976 at Jordan. At Fort Snelling, the decline was not large enough, resulting in an overall increase. Further monitoring is needed to understand if the decline since 2005 will continue.

Increased nitrogen can be caused by many factors, including changes to the landscape, increased use of fertilizers, expansion of livestock production, and increased pollution from a growing population and industrial activities.

Bacteria decreased. Better wastewater treatment and urban stormwater management practices, and improved management of feedlots and manure in agricultural areas, have likely helped reduce bacteria.

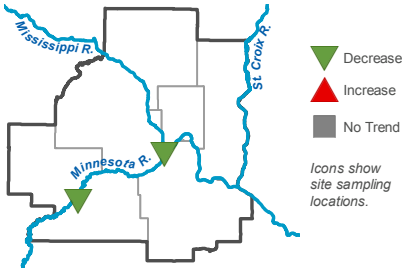
Chloride increased slightly at Jordan, but no trend was found at Fort Snelling. In addition to winter de-icing salt and water softeners, some agricultural fertilizers may also be contributing to the chloride levels.

IS THE MINNESOTA RIVER IMPROVING?

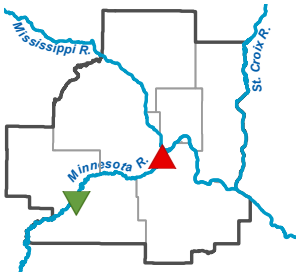
Concentrations of sediment, bacteria, and phosphorus decreased (conditions improved) from 1976 to 2015. Nitrogen showed mixed results (decreased at Jordan but increased at Fort Snelling).

Chloride increased slightly at Jordan (conditions declined), but no trend was found at Fort Snelling. "Concentration" is the pollutant amount measured in a specific volume of water.

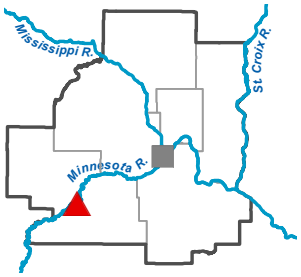
Sediment, Phosphorus, and Bacteria



Nitrogen



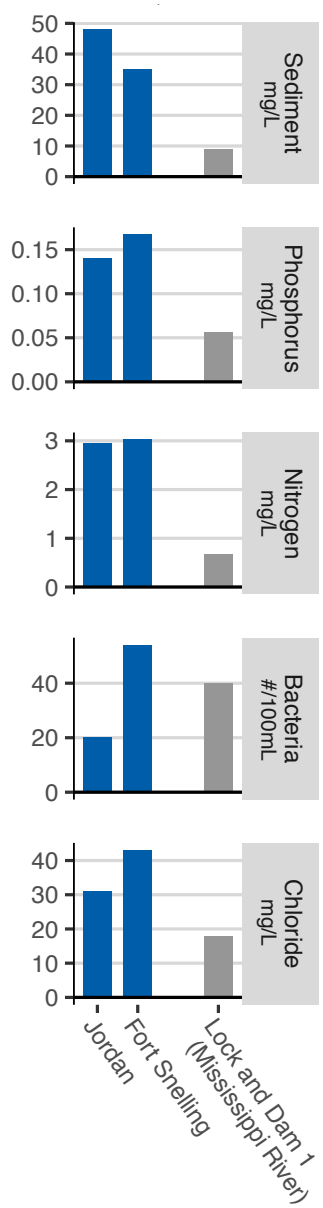
Chloride



METROPOLITAN COUNCIL

Site Locations

Typical (Median) Concentration, 2006–2015



Despite improvements, the Minnesota Pollution Control Agency has designated certain reaches of the river as impaired for sediment (total suspended solids or turbidity), nutrients/eutrophication (related to phosphorus), and bacteria (as fecal coliform). The impairments mean the levels of these pollutants in the river are higher than water quality standards. However, many groups are working to protect and restore the water quality of the Minnesota River.

Water quality in the metro area

Overall, the water quality of the Minnesota River is generally poor compared to other rivers in the region. The median pollutant concentrations from 2006 to 2015 typically showed that:

- The concentrations of all five parameters in the Minnesota River water entering the Mississippi (at Fort Snelling) were higher than those already in the Mississippi (at Lock and Dam 1), indicating that the Minnesota River contributes to an increase in the concentrations in the Mississippi. The land use surrounding the Minnesota River is heavily agricultural and naturally more susceptible to erosion, which likely contributed to higher levels of the pollutants.
- Bacteria and chloride levels were higher in the river at Fort Snelling compared to Jordan. Fort Snelling is closer to the urban core of Minneapolis-Saint Paul, and higher levels of bacteria and chloride are generally associated with contamination from developed areas.
- Sediment was lower at Fort Snelling compared to Jordan. Fort Snelling is located on a deeper section of the river maintained for barge traffic, which creates slower moving water that allows sediment to settle out to the bottom of the river.

More information

The following documents are available on the Metro Council website: metrocouncil.org/river-assessment.

Complete Report: Regional Assessment of River Water Quality in the Twin Cities Metropolitan Area 1976-2015: Minnesota, Mississippi, St. Croix Rivers

Summary Report

Related Fact Sheets

- Regional Rivers Overview
- Mississippi River
- St. Croix River

For questions

Erik Herberg
erik.herberg@metc.state.mn.us
651.602.1473

Hong Wang
hong.wang@metc.state.mn.us

Metropolitan Council
390 Robert Street North
Saint Paul, MN 55101
Main: 651.602.1000
TTY: 651.291.0904
Public Information: 651.602.1500
public.info@metc.state.mn.us