

# Crookston

Located on the bottom of a vast, ancient lake, Crookston and the surrounding farms are on some of the flattest land on earth.



Photo: USDA

This 1/4-inch-long crustacean (*Hyalella Azteca*) is common in aquatic systems and is used by scientists as an indicator of environmental health and water quality in streams, lakes, and other bodies of water.

## The Red Lake River and its tributaries are polluted with sediment, bacteria, and nutrients.

These pollutants are carried with sediment or water from fields and eroded streambanks. They limit the recreation opportunities on the river, and phosphorus causes algae growth, especially downstream in Lake Winnipeg.

Fish and aquatic insect populations are doing well in the Red Lake River main channel, but they are in poor condition on a majority of the tributaries. Challenges for aquatic life include barriers to migration such as culverts and control structures, and loss of consistent stream base flows in the summer and fall, a common condition in highly drained agricultural areas.



## Lake sturgeon—Minnesota's largest fish—are returning to the Red River and its tributaries.

Lake sturgeon, once abundant in the Red River of the North and its tributaries, went locally extinct in the early 1900s because of overfishing and dams.

Over the last 20 years, there has been a major effort by state, tribal, and federal agencies to reconnect fish habitat, increase water quality, and stock this culturally important species.

Seven of the eight dams in the U.S. portion of the Red River have been removed or converted into sloping rapids. And since 1997, 2.6 million sturgeon have been released.

Lake sturgeon are surviving well and reaching sizes over 48 inches in length.



Photo: MN Dept. of Agriculture

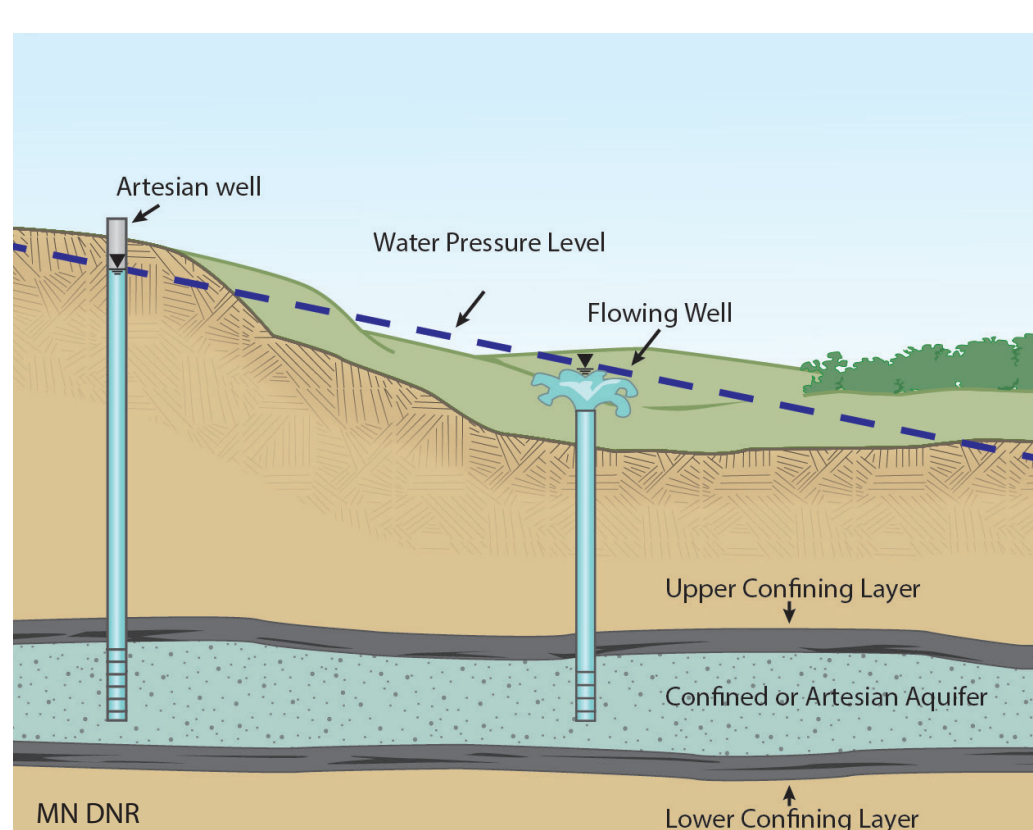
## Managing water for agriculture in the Red River Basin is hard.

Farm fields here are extremely flat so without ditches the water sits on the field. A layer of clay just under the top soil does not let the water soak in which worsens flooding.

If there is too much water, crops can't grow properly. To help get better drainage, farmers divert water to ditches or put subsurface drain tiles in their fields. This helps stabilize or increase yields.

Unfortunately, traditional drainage intensifies the high and low flow levels in ditches and rivers, which is tough on fish and insects and can cause erosion. Drainage can also increase the movement of nutrients off the fields.

There are innovations in drainage that are helping. These drainage systems temporarily store water or use outlet controls to reduce the loss of nutrients and slow the flow of water. Red River Basin farmers are working to build soil health, improve fertilizer management, and improve drainage system design.



## Flowing wells are common around Crookston.

A flowing well is a well that produces water without pumping. Flowing wells occur when the aquifer is under enough pressure that the water rises above the land surface when a well is drilled. Flowing wells in northwestern Minnesota are commonly found along Glacial Lake Agassiz beach ridges like those located to the east of Crookston.

Some flowing wells are constructed so that the water is controlled and contained in a water supply system. Others let the water flow, which can waste groundwater.



Photo: US Fish and Wildlife Service

## Glacial Ridge is the nation's largest prairie and wetland restoration project.

The grasslands and wetlands on this 24,000-acre site protect water quality for the city of Crookston and help reduce flooding in the Red River Valley.

The restoration also provides excellent habitat for prairie nesting birds, threatened prairie plants, and wildlife. Tallgrass prairie originally covered more than 18 million acres in Minnesota, but only about 1% remains.



Photo: MN DNR

## Rare calcareous fens are found at Glacial Ridge National Wildlife Refuge.

Calcareous fens are one of the rarest natural communities in Minnesota, the United States, and the world. Glacial Lake Agassiz beach ridges in northwestern Minnesota provide the ideal environment for these rare wetlands.

Fens are wetlands dependent on upwelling groundwater that we find along these beach ridges. The groundwater is cold and rich in calcium and magnesium. Because of this chemistry and upwelling groundwater, only certain rare plants can tolerate growing in the fen. They provide critical habitat to numerous rare and endangered species. Fens are an indicator for the health of the ecosystem.



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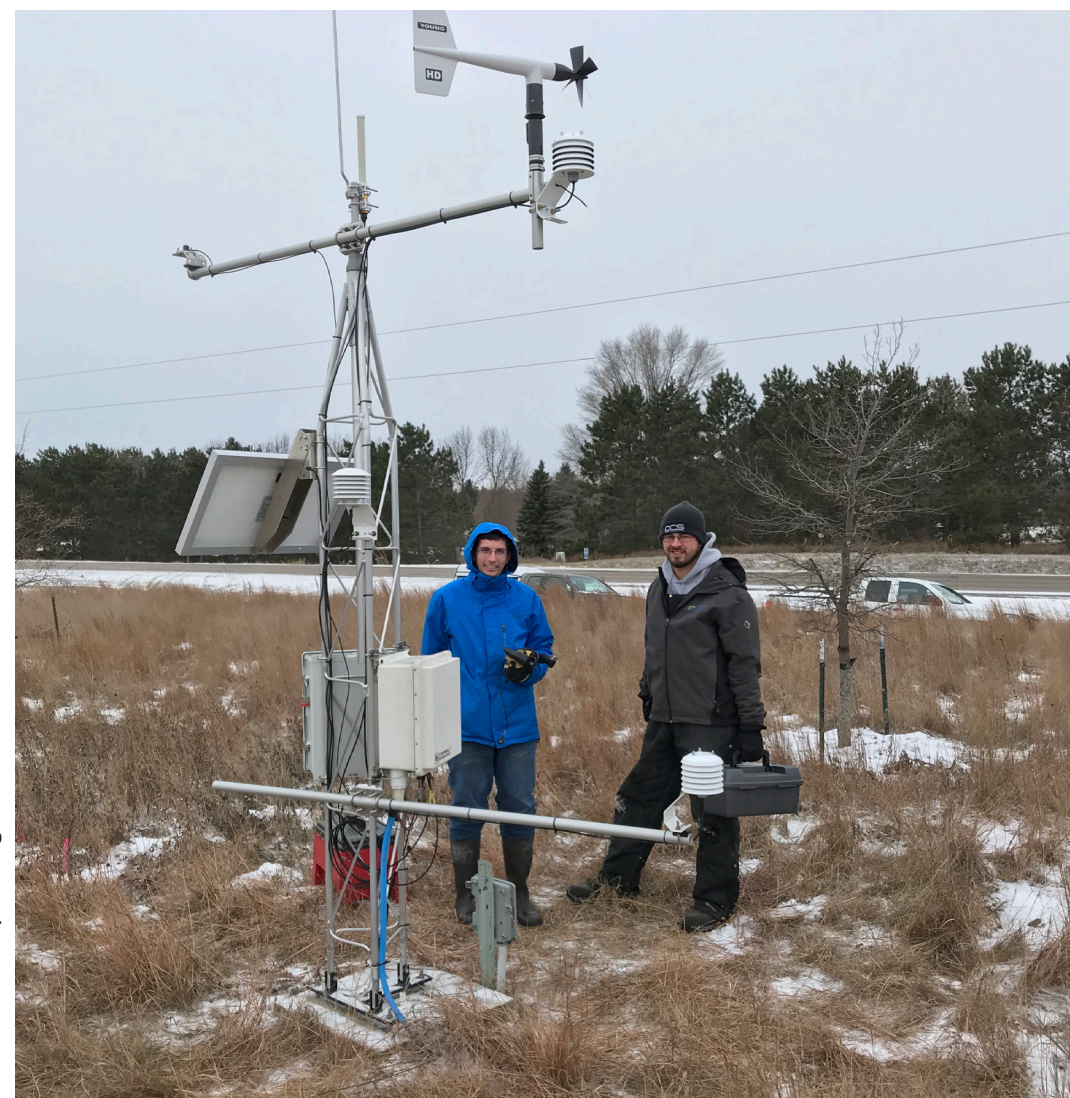


Photo: MN Dept. of Agriculture

## Local weather data is important for irrigators, producers.

Weather information is used to determine the best time for irrigation and chemical applications. Responding to real-time weather conditions can help reduce total water used for irrigation and protect environment and human health.

The Minnesota Ag Weather Network and the North Dakota Ag Weather Network work collaboratively to provide real-time weather data for farmers throughout central and northwestern Minnesota.

New in 2019, there will also be temperature inversion sensors at all ag weather stations in Minnesota. Producers can use a mobile app to receive a notification when a selected station measures inversion conditions.



Photo: Creative Commons

## In the last five years, this area has seen expansion of irrigated acres and also some problems with well interference.

Well interference happens when a high volume water appropriation reduces water levels beyond the reach of public water supply or private domestic wells. By law, drinking water supply has the highest priority for groundwater use.

In this region, groundwater resources are not evenly distributed. Some areas have limited groundwater resources and a history of well interferences. Expansion of agriculture irrigation is occurring which has resulted in additional well interferences. The groundwater system is highly complex and only partially understood. Studies are underway so that we can understand the groundwater better. Many people are working hard to prevent well interferences and ensure a sustainable water supply to all area water users.



Photo: MN Dept. of Health

## Groundwater can have high, naturally occurring levels of arsenic.

Arsenic is a part of the earth's crust and occurs naturally in soil and rock in Minnesota. Arsenic has no taste or odor.

Arsenic in groundwater is common here—23% of the wells constructed in northwest Minnesota since 2008 have arsenic above the federal drinking water standard of 10 micrograms per liter ( $\mu\text{g/L}$ ).

Public water systems make sure your water does not have arsenic levels above 10  $\mu\text{g/L}$ . If you get your drinking water from a private well and the arsenic level is above 10  $\mu\text{g/L}$ , Minnesota Department of Health recommends that you use an alternate source of drinking water or install a treatment system to reduce arsenic levels in the water.



## Pembina ox cart trail followed the beach ridge near Crookston.

In the 1800s, a network of ox cart trails connected people from the Canadian plains through Pembina, North Dakota, and south to St. Paul. Many Métis people—a person of mixed American Indian and Euro-American ancestry—transported furs, pemmican, and handmade items to St. Paul and returned with goods from the city. The noisy carts were made from wood and could be repaired along the trail. The cart was designed so that the wheels could come off and become a raft that would float across the river.



## How do we talk about water today?

The language used by state and national authorities has changed, reflecting the goals and values of the time.

A 1922 report from State of Minnesota on flood control on the Red Lake River discusses the “benefit” of proposed and existing dams. It describes the need for drainage of some areas and sending that water into existing creeks and ravines.

By 1974, a federal report studying a proposed dam on the river shifted the language to how a dam would destroy irreplaceable sections of the river used for recreation and by wildlife.

## Minnesota produces more sugar beets than any other state in the country.

Rich soils of the Red River Valley are the base for this crop's \$2.3 billion economic impact on the region.



Photo: Creative Commons