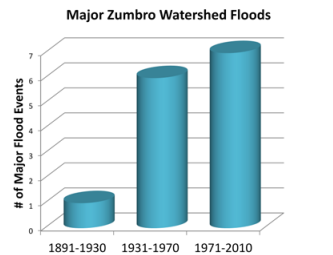


Historic Trends in the Zumbro

- Average annual river flow has risen dramatically since 1940.



- Flooding has become more common and more severe since 1940.
- Corn and soybean fields now dominate the farm landscape. Rain absorbing pasture, hay, small grains, and alfalfa fields are less common. So more rain runs off of farmland and into the river today.
- Cities like Rochester and Kasson continue to grow and add more parking lots, buildings, and other impervious rain-shedding surfaces to the landscape.
- Bacteria in the Zumbro has decreased dramatically once regulations required communities to clean their wastewater. Farmers also better manage manure on farms today.
- Virtually every artificial lake in rural areas has filled with sediment and needed dredging or dam removal.

What You Can Do To Help

- Find ways to “Slow the Flow” of water off your land with rain gardens, rain barrels, native plants, farm ponds, terraces, and no-till farming. These practices capture rain and allow it to soak into the soil rather than rushing to the river.
- Pick up litter, pet droppings, and yard waste in urban areas. Even grass clippings and leaves on the street can pollute the Zumbro. Cleaner streets=cleaner streams.
- Talk with your neighbors and legislators about the importance of clean water for healthy families and healthy communities.
- Join and support organizations, like ZWP, who are working for cleaner water in southeast Minnesota.

A special thanks to these organizations for their support.



What is a Watershed?

A **Watershed** is “all the land that drains to a particular river or lake.” The Zumbro Watershed consists of over 900,000 acres of farm cropland (primarily corn and soybeans, 70%), hayfields and pasture (12%), forest (11%), and cities (5%) in southeastern Minnesota.



Watersheds matter because the main causes of runoff pollution and flooding are tied to land use at the watershed scale. We can't reduce flood waters by building bigger levies on the river bank. We need to capture and store rain and snowmelt in ponds or grassy fields so it can soak into the ground rather than rushing to the river.

Who is the Zumbro Watershed Partnership?

The Zumbro Watershed Partnership (ZWP) is a member-supported nonprofit organization dedicated to working for “Cleaner Water and Fewer Floods” in southeastern Minnesota.

After European-American settlement in the 1850s, settlers began draining wetlands and converting water absorbing habitats like prairies and forests into water draining landscapes like crop land and cities. Technological advances starting in the 1940s accelerated the trend to drain more water off the land and into the river and stream system. Runoff from farms has increased due to changing farm practices, including the conversion of hayfields and pastures into larger corn and soybean fields.

As a result, average water flow in the Zumbro River **increased at least 40 percent** from 1910 to 1980 and this trend continues today. While small spring floods occurred in the early days of white settlement, floods became bigger, more common, and more destructive starting in the 1940s.

In 2005, a group of citizens formed ZWP to work for “Cleaner Water and Fewer Floods” in the Zumbro Watershed. Currently, the group is working to reduce sediment and fertilizer pollution in the watershed and working with land owners, nonprofits, and government agencies to “Slow the Flow” of water in the watershed, which will reduce riverbank erosion and downstream flooding, and recharge our drinking water aquifers.

BECOME A MEMBER OR BUSINESS SPONSOR!
www.zumbrowatershed.org/membership

ZUMBRO

WATERSHED

HISTORY



www.zumbrowatershed.org

A Brief History of the Zumbro River

450 MILLION YEARS AGO This region was the seabed of a warm, shallow, tropical ocean inhabited by armored squids, trilobites, and clam-like brachiopods. Layer upon layer of ocean sediment formed the limestone, dolomite, and sandstone bedrock we have today.

10,000 YEARS AGO The Ice Age ended and the retreat of the glaciers left behind deep soil on the western end of the watershed. The *Driftless Area* on the eastern part of the watershed has less soil and active karst geology with sinkholes and springs. Mammoths, giant ground sloths, and humans lived here.

1850s U.S. government policy encouraged European-American farmers to drain wetlands. “All drainage is good drainage” was the attitude about land use. Field erosion was widespread.

1910s Diversified farms were common in the region with a mix of small grains, hay, pasture, and corn. The Lake Zumbro Dam was completed in 1919, creating Lake Zumbro. Many communities built dams to create lakes for recreation or mills. **Rochester population in 1910 was 7,844 people. In 1911, average annual Zumbro River flow at Zumbro Falls: 384 cubic feet/second.**

1940s Technology improved for mechanized farming and large-scale drainage projects. **Up to 50% of all farmland was in perennial crops like pasture and hay. Rochester population in 1940 was 28,312 people. In 1941, average Zumbro River flow at Zumbro Falls: 408 cubic feet/second.**

1970s Corn and soybean farming dominated the region. Many farmers implemented conservation practices like terraces and contour farming to reduce field erosion. Chemical fertilizer and pesticide use became widespread. Nitrates from fertilizers began appearing in drinking water wells. Two major floods hit the City of Rochester. **Rochester population in 1970 was 53,766 people. In 1971, average Zumbro River flow at Zumbro Falls: 728 cubic feet/second. Nitrate Levels in the Middle Fork Zumbro River in Oxbow Park in June, 1970 are 2.6 ppm.**

1990s Rochester flood control projects used holding ponds and a wider river to “Slow the Flow” of water through town. Projects have reduced river flow out of the city by about 18% and protected the city from flooding.

2010s A 500-year flood hit the Middle Fork, Zumbro River in September, 2010, flooding Pine Island, Zumbro Falls, Hammond and other communities. Nitrates from fertilizers were increasingly found in drinking water wells, especially in the eastern “karst” part of the watershed. **Only 15% of farmland is in perennial cover. Rochester population in 2010 was 106,769 people. Nitrate Levels in the Middle Fork Zumbro River in Oxbow Park in June, 2014, are up to 15 ppm, a 570% increase in pollution.**

Historic and Recreation sites in the Zumbro Watershed

(see watershed map for locations; search online for more information)



Where to go in the Zumbro Watershed

- A. Oxbow County Park, Zollman Zoo**
Camp, picnic, hike, tour live animal exhibits, visit the nature center
- B. Chester Woods County Park**
Camp, picnic, swim, canoe
- C. Lake Zumbro**
Boat, waterski, fish, camp, swim
- D. Covered Bridge Park**
Picnic, camp, bike, swim, cross the historic bridge
- E. Zumbro Bottoms Forestry Unit**
Camp, hike, horseback ride
- F. Mantorville Historic District**
1850s era historic buildings, opera house
- G. History Center of Olmsted County**
Historic exhibits and photos of the region



Canoers on the Zumbro near Rochester, early 1900s Photo © History Center of Olmsted County



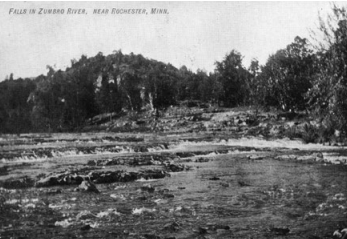
The Natural, Historic Zumbro River

Historic accounts describe the Zumbro River (also known as the “Pine River” and the “Embarrass River”) as a slow-flowing shallow river with sloped, grass-covered banks. Early explorer accounts describe a river with a tangle of tree trunks and branches at the river mouth. This seems to indicate a river with relatively low average flow, since a river with high flow or frequent flooding events would wash fallen trees into the Mississippi.



Early 1900s postcard of the Zumbro River in Rochester. (Photo ©History Center of Olmsted County)

In 1820, a U. S. Army Expedition traveling through the area described the Zumbro River. Lieutenant Stephen Kearney described the South Fork Zumbro River near what is now



Falls of Rochester. Photo © History Center of Olmsted County

Rochester as “12 yards wide, sandy bottom, & 2 or 3 feet deep...” Captain Andrew Talcott described the river as “very crooked.” When they crossed the Zumbro near what is now Hammond,

Kearney describes it as “30 yards wide, 5 feet deep, with a stony bottom ... The river is well bordered by oak, pine, white ash, & slippery elm ...” Talcott describes the river as having “wide banks.”

The Modern Zumbro River

Today’s Zumbro River looks very different than it did prior to the 1940s.

EROSION AND SEDIMENTATION

Increased river flows have cut into the river bed and eroded the banks.

Instead of the stony river bottom that explorers describe, much of the river now has a muddy bottom from eroded sediments.



Erosion and lake sedimentation are big problems in the watershed. Every mile of the river’s main channel has evidence of bank erosion, some of it severe. Most artificial lakes fill with sediment and need to be dredged.

FLOODS

Floods, which were rare before 1940, are now increasingly common with 4 major floods in the watershed between 2000 and 2010. Floods are also becoming more severe. The 2010 flood was the largest of all previous floods in Zumbro Falls and Hammond.



Two major floods hit Rochester in the 1970s. Flood control efforts to hold water in reservoirs and in an engineered river in the 1980s and 1990s have reduced average river flow and protected the city from flooding. Photo © History Center of Olmsted County.

CHEMICAL POLLUTION

The river and groundwater supplies are suffering from increased pollution from agricultural fertilizers like chemical nitrates and phosphates. A recent study by the Minnesota Pollution Control Agency found that 89% of the nitrate fertilizer pollution in southeast Minnesota came from agricultural sources.

Some surface water soaks into the ground to replenish underground water aquifers. This means that polluted surface water can pollute underground drinking water supplies as well. In some parts of the watershed, groundwater flows out of springs and into streams and rivers. This means that polluted groundwater can also pollute surface rivers and streams.

DRINKING WATER

While public wells continue to meet drinking water standards in the region, **about 25% of private drinking water wells tested in the 1990s and 2000s** were polluted with unsafe levels of nitrogen or coliform bacteria. Both pollutants primarily come from agricultural operations. Nitrate pollution in watershed wells was almost unheard of prior to 1970.

