

Lake Augusta delisting reflects trend



Water quality improvements throughout the Clearwater River Watershed District contribute to two lakes' removal from the impaired waters list, show cumulative effect of rural conservation, Clean Water Fund-backed urban stormwater treatment



Two Clean Water Fund grants from BWSR supported stormwater work in Kimball that directly affected Lake Augusta: \$70,900 awarded in 2010, and \$666,080 in 2012. Two more Clean Water Fund grants from BWSR support the CRWD's work elsewhere in the watershed: \$351,900 awarded in 2015 for a project near Watkins, and \$361,000 awarded in 2022 to support work centered on Clear Lake.

SOUTH HAVEN — The Clearwater River Watershed District's (CRWD) decades-long cooperation with landowners, cities, state and federal agencies to improve water quality has resulted in two South Haven area lakes' removal from the impaired waters list in 2022: Lake Augusta and Union Lake.

"It means we're on the right track. Everything we've done has been to do that, and if it's happening we must be on the right track," said Bob Schiefelbein, CRWD board president and a Meeker Soil & Water Conservation District (SWCD) board member whose family beef farm borders the Clearwater River in Kingston Township.

Lake Augusta, one of nine in the Clearwater Chain of Lakes south of St. Cloud, straddles the Stearns-Wright county line. Union Lake, one of 17 more throughout the three-county, 159-square-mile watershed, sits on the Wright-Meeker county line. Both were impaired for nutrients.

When the CRWD was founded in 1975, Lake Augusta's nutrient levels were sometimes five times higher than the acceptable threshold. The 187-acre, 82-foot-deep fishing, boating and swimming lake experienced intense



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— Bob Schiefelbein, CRWD board president

and frequent algae blooms.

Phosphorus concentrations have declined. From 2016 through 2021, average levels were below the deep-lake threshold of 40 micrograms per liter. Water clarity also shows a positive trend, with average Secchi disk readings bettering the deep-lake standard of 1.4 meters for the past 10-plus years.

Because water quality improvement work started in the headwaters area, all of the lakes in the chain are showing significant water quality improvements.

"Water's not going to be crystal-clear in our watershed. It's got a big, big farming area that comes into it," Schiefelbein said.

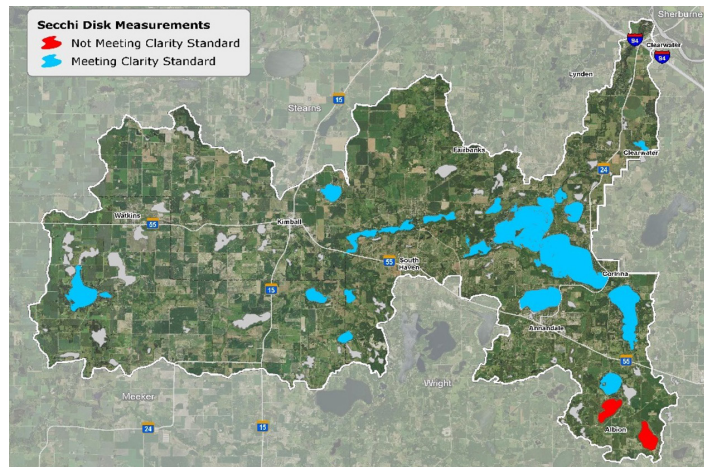
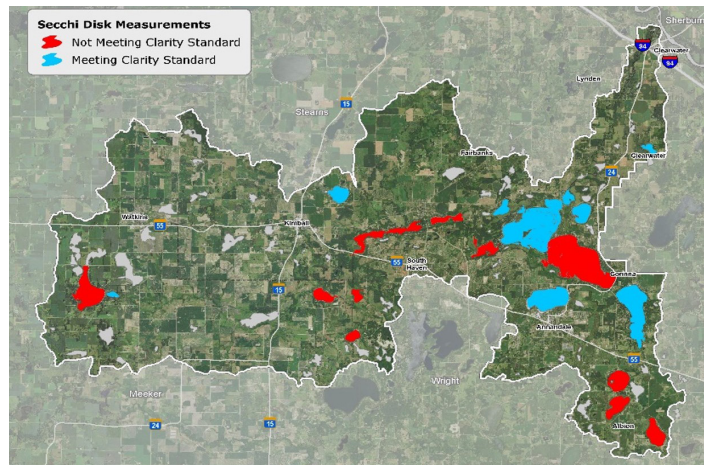
From left: A site shown during and after construction depicts part of the project off Highway 55 near Watkins in Meeker County that treats a 6,500-acre urban and rural drainage area. The treatment tapped a Clean Water Fund grant from BWSR, reducing phosphorus to the Clearwater River by an estimated 796 pounds a year. **Photo Credits:** Clearwater River Watershed District

Since 1981, the CRWD has worked with landowners and local, state and federal partners to implement nearly \$7 million in water quality improvement projects and programs that contributed to Lake Augusta's delisting.

That included about \$4 million that leveraged Environmental Protection Agency (EPA) grants available through the Minnesota Pollution Control Agency's (MPCA) Clean Lakes Fund with CRWD tax levies and landowners' matching funds. Over the past 10 years, two Clean Water Fund grants from the Minnesota Board of Water and Soil Resources (BWSR) contributed to about \$3 million in leveraged funding.

The first BWSR Clean Water Fund grant affecting Lake Augusta, \$70,900 awarded in 2010, supported Kimball's \$115,200 stormwater management project. The infiltration basin captured urban runoff to protect Willow Creek — a trout stream — Lake Betsy, and ultimately, Lake Augusta, from temperature impacts, and from sediment- and phosphorus-loading. It treated a 428-acre drainage area, and kept an estimated 244 pounds of phosphorus and 6.5 tons of sediment out of the waters each year. One pound of phosphorus can feed 500 pounds of algae.

BWSR awarded the CRWD a \$666,080 Clean Water Fund grant in 2012 to support Kimball's second phase of stormwater work. That \$889,815 project reduced phosphorus loading by an estimated 1,175 pounds a year through a wetland restoration; a system that irrigates a park with water from stormwater basins; a stormwater pond expansion; and best management



Secchi disk readings indicate water clarity. Lakes shown in blue meet the state standards; those in red do not. The CRWD maps compare lakes' water clarity before the CRWD was formed, **top**, and show improvements made as of 2017, **bottom**. Courtesy CRWD

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—Bob Schiefelbein,
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practices such as vegetated swales and sediment-trapping chambers.

While the total reductions weren't huge, Schiefelbein said the Kimball projects clean nearly all of the water that runs from the city's drainage area to the Clearwater River.

“Without (Clean Water Funds) we had no shot,” Schiefelbein said.

In the case of Union Lake, the

CRWD credits landowners' actions as having the most direct effect on its improved clarity and reduced phosphorus. One landowner converted row crops to pasture. Another spearheaded rough fish removal in a downstream lake.

Several other efforts throughout the watershed contributed to Lake Augusta and Union Lake's delistings.

The CRWD-led Variable

Project partners, CWRD watershed details & lakes

PROJECT PARTNERS: Included cooperating landowners, the cities of Kimball and Watkins, BWSR, the MPCA and the EPA. The watershed district convened the Tri-County Conservation Project (supported by local CRWD levies and an EPA grant made available through the MPCA), which involved Meeker SWCD, Stearns County SWCD and Wright SWCD. The Central Minnesota Initiative Fund and the Agricultural Utilization Research Institute (AURI) also contributed.

WATERSHED: 159 square miles, extending across parts of Meeker, Stearns and Wright counties, from Watkins to the confluence of the Mississippi River at Clearwater.

LAKES: The Fairhaven dam divides the lakes through which the Clearwater River flows into upper and lower chains. The Upper Chain includes lakes Betsy, Scott, Louisa and Marie (which includes the Mill Pond). The Lower Chain includes lakes Caroline, Augusta, Clearwater, Grass and Wiegand. Other major lakes within the CRWD are Albion, Bass, Cedar, Clear, Henshaw, Little Mud, Otter, Pleasant, School Section, Swartout, Union and Willow lakes. Minor lakes are Edwards, Island, Laura, Rohrbeck and Round.



A post-construction view depicts part of the CRWD's Clean Water Fund grant-supported work near Watkins.

Rate Targeted Fertilizer Program helped producers work with a local co-op to implement precision farming techniques.

Carp management focused on select lakes.

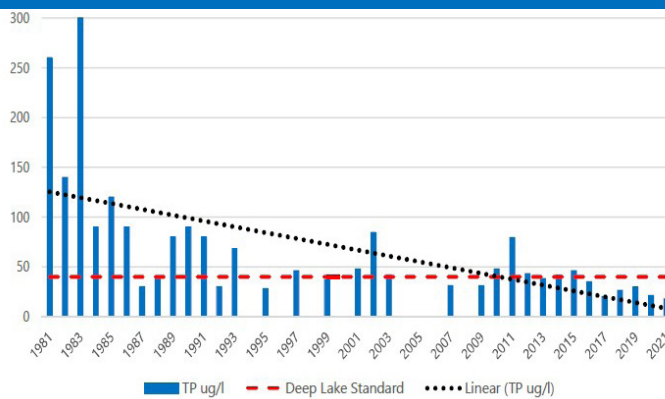
The CRWD's Alternative Tile Intake Program provided water quality improvements to field drainage infrastructure, building upon sediment and bacteria studies that identified critical areas and specific projects.

Capital improvement projects addressed impairments including dissolved oxygen and nutrients.

Two more Clean Water Fund grants from BWSR support the CRWD's work elsewhere in the watershed.

Just off State Highway 55 near Watkins in Meeker County, the watershed district treated 6,500 acres that drained urban and agricultural runoff. The \$610,470 project reduced phosphorus to the Clearwater River by an estimated 796 pounds per year. It drew from a \$351,900 Clean Water Fund grant BWSR awarded to the CRWD in 2015. The treatment diverts

Lake Augusta: Historical Phosphorus Readings



Phosphorus concentrations are measured in micrograms per liter. The red line indicates the deep-lake standard that applies to Lake Augusta. Courtesy CRWD

part of the water from a tributary through a series of practices including a pre-treatment sedimentation basin, a phosphorus-capturing limestone filter, a stormwater pond nearly 1 acre in size, and native prairie plantings.

In 2022, BWSR awarded the CRWD a \$361,000 Clean Water Fund grant centered on Clear Lake south of Watkins. The lake is close to meeting water quality standards for phosphorus. The project, estimated at \$451,250, would install an iron-enhanced sand filter to capture phosphorus entering the lake from a wetland complex.

"We have the big plan. We know where the problems are," Schiefelbein said. "It's

not many big problems anymore. Most of those are solved. It's more of the small ones now."

Those small projects tend to be more expensive per pound of pollutant reduction. So the CRWD aggressively pursues grants. Schiefelbein said board members shared the goal of pursuing clean water at the best price, spending money prudently, as if it were their own.

"We want the water clean, but we don't want to do it at the expense of hurting anybody," Schiefelbein said. "Everybody wants clean water. You've got that going for you right away. It's how do you attack it the right way to make them buy in. Sometimes it's really slow."

Lake Augusta delisting details

BY THE NUMBERS:

Phosphorus concentrations over the past six years have averaged 23 micrograms per liter — well below the deep-lake threshold of 40 micrograms per liter. Lake Augusta's 10-year average is 38 micrograms per liter. The lake's water clarity also shows a positive trend, with average Secchi disk readings bettering the deep-lake standard of 1.4 meters for the past 10-plus years.

Lake Augusta's average phosphorus levels met deep-lake water quality standards from 2016 through 2021; its Secchi disk readings, which measure clarity, met standards each year from 2009 through 2021. Under Minnesota's two-part water quality standard, phosphorus levels must be at or below a certain level — 40 micrograms per liter in the case of deep lakes such as Lake Augusta. Additionally, to be delisted, either Secchi disk readings or chlorophyll-a readings must meet the standards — 1.4 meters' clarity or 14 micrograms per liter of chlorophyll-a.