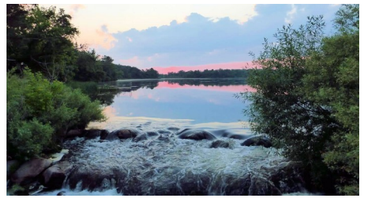
Sallie/Melissa

Water Management Area

Spring 2022



PELICAN RIVER watershed district

Our Work: The Watershed District continues to move forward in many directions with water quality monitoring, capitol improvement projects, rules and permitting, education and One Watershed One Plan (1W1P) planning.

- July 2021: A new funding project, Data Collection and Monitoring (DCM-01), was established to better serve the District with water quality monitoring needs.
- Summer 2021: PRWD staff began actively collaborating with the City of Detroit Lakes, and various individuals and agencies, developing the South Shore Park planting plan, which will include a pollinator area with a handicap accessible path and educational signs, approximately 1 acre in size.
- Fall 2021: Phase I of the Rice Lake Capitol Improvement Project was completed, and barring any setbacks, our hope is to complete Phase II of the project in 2023.
- Fall 2021: Staff is collaborating with Becker, Hubbard and Ottertail County COLA groups to host a Minnesota Aquatic Invasive Research (MAISRC) update to be held at M State on June 9, 2022.
- Spring 2022: District resumed classroom education with local students for the first time since COVID-19 reared its ugly head.
- 1W1P: Administrator Guetter and Water Resource Coordinator, Kemper, have been involved in all aspects of planning including technical advisory, policy, and landscape stewardship.
- Grants: District staff continue to work with MPCA to develop the 319 Grant Work Plan for the Campbell Creek area. Grant Agreement documents have been submitted to the Minnesota Department of Public Safety, Homeland Security and Emergency Management for the FEMA Flood Hazard Grant. Grant documents were also completed for the MN DNR and Becker SWCD to help offset the cost of AIS treatments in District lakes.

Water Quality: The Pelican River Watershed District has maintained a comprehensive water quality monitoring program since 1995. The primary goal of the program is to identify areas of decreased and impaired water quality so nutrient reduction efforts can be focused on the locations with the most benefit.

This program maintains an emphasis on tracking phosphorous as it travels through the watershed. Additional water quality metrics including water clarity (secchi depth), chlorophyll-a (CHL-A), total suspended solids (TSS), Dissolved oxygen (DO), etc. are captured at sample points to maintain a robust data set that is reported to MPCA.

In 2021, PRWD staff conducted water quality sampling on 14 lakes and 17 locations on 5 different stream systems. Stream bank assessments were performed in partnership with the Minnesota Department of Natural Resources at several locations on Campbell Creek. Diagnostic sampling of E. coli on the Pelican River between State Highway 34 and Detroit Lake occurred to locate the E. coli source.

The water quality was above average on lakes across the District, which may be attributed to zebra mussels, improved stormwater management, and shoreline restoration. Zooplankton sampling continued in 2021 on various District lakes, including Sallie and Melissa, with samples being sent into the MN DNR for analysis.

Two college interns are hired each summer to collect water samples from area lakes and streams, conduct shoreline and aquatic plant surveys, and update monitoring databases. We appreciate lake association groups when they share our Facebook or website posts and help us find qualified students to hire for this important work.

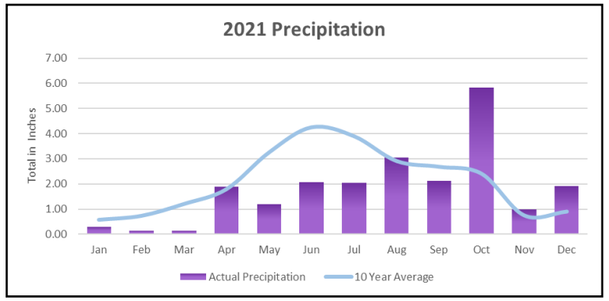
Water Management Area	Lake	2021 Average			Historical Averages (2001-2020)			MNPCA Lake Standards		
		TP (ppb)	Chl-a (ppb)	Sechhi (feet)	TP (ppb)	Chl-a (ppb)	Sechhi (feet)	TP (ppb)	Chl-a (ppb)	Sechhi (feet)
Sallie/Melissa	Sallie	20	4.73	13	32	12.35	9	<40	<14	>4.6
	Melissa	15	4.83	16	20	6.69	11	<40	<14	>4.6
	St. Clair*	55	19.03	5	86	40.67	3	<60	<20	>3.3
	Muskrat	23	5.98	10	--	--	--	<40	<14	>4.6

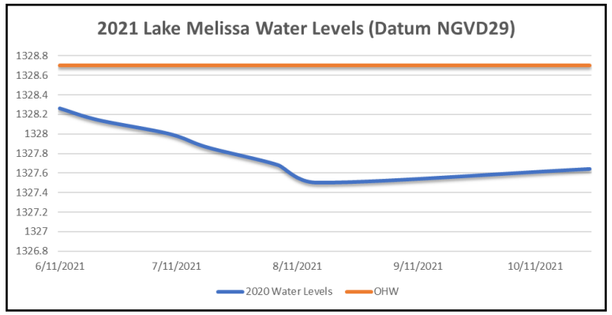
2021 Weather

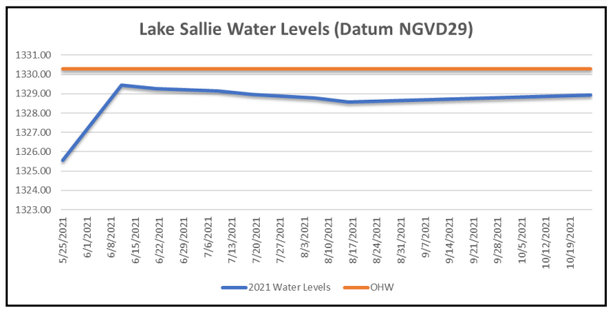
Weather: The year 2021 will be remembered for widespread summer drought, the June Heat Wave, the two-week Arctic Cold Wave of February, the record number of air quality alerts during the summer (mostly due to smoke from wildfires in the west and in Canada), and the tornadoes in December.

2021 will go down as the 5th warmest year in state history. On a statewide basis, only one month was cooler than normal. February was 7 to 9°F below normal. In contrast June was 5°F warmer than normal, making it the 3rd warmest June in state history.

Precipitation was less than normal in 2021, but only the 31st driest year in state history. May, June, and July were all drier than normal, putting most of the state landscape into drought. Statewide average precipitation for 2021 was under 24 inches, marking the driest full year since 2006.







District Rules & Permitting, Cost Share

Permitting: The Watershed District works in cooperation with property owners, contractors and engineers, and local government units to maintain or increase the water quality in our district through the rules and permitting process. PRWD has a Memorandum of Understanding with both the City of Detroit Lakes and Becker County to oversee permits relating to shoreline alterations and impervious surface requirements.

Although more permits are issued each year for Shore Impact Zone alterations than any other category, a larger quantity of staff time is spent on sites requiring an engineered stormwater management plan. These applications often need one or more revisions to meet all the necessary requirements, and likewise, the construction of the larger sites, such as the City of Detroit Lakes South Shore Park project and the local school additions and remodels continue from one calendar year to the next before they are complete.

Permit Type	2021 Issued
Shore Impact Zone Alterations (sand blanket, rip rap, vegetation changes)	35
Subdivisions/PUD	2
Stormwater Management Commercial Residential	 15 6
Roads, Parking Lot, Bridges, Culverts, Storm Sewer	5

Cost Share: We encourage residents to apply for the PRWD Cost Share Program grants that are available for Best Management Practices such as raingardens or vegetated swales. They are also available for native shoreline plantings and buffers. Funding is a 75% match of eligible expenses as follows: Single family homes—up to $500, Condos and apartment complexes—up to $1,000 and Not-for profit, religious organizations, public and private schools, and local government agencies—up to $1,500. Contact our office for more information (218) 846-0436.

Zooplankton Survey- Lakes Sallie & Melissa

District Staff has been involved in a cooperative project with the MN DNR and Concordia College in Moorhead to examine the effect of zebra mussels on the microscopic communities of zooplankton which form the base of the food web. Zebra mussels filter large amounts of water and strip the water column of resources. Through this study, District Staff collect monthly zooplankton samples and preserve for later analysis. Analysis of these samples requires specialized identification knowledge. Staff from MN DNR and Concordia College will analyze the samples and report to the District once multiple years of population data has been collected. This project is on-going.

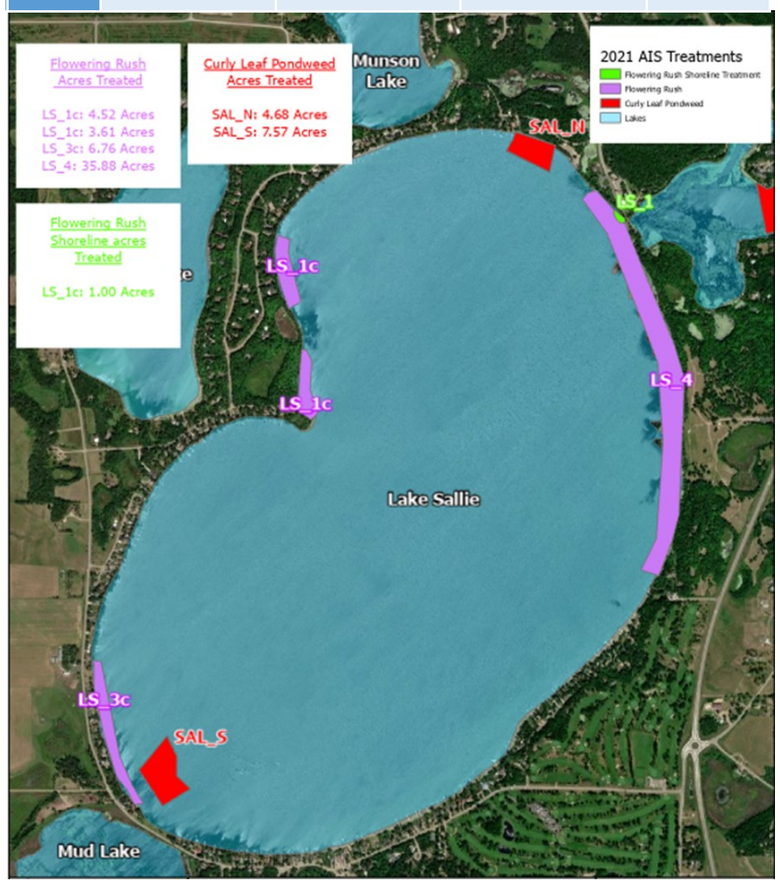
Water Quantity – Lake Sallie

Water levels on Lake Sallie are recorded at the outlet at County Hwy 22. Water Levels in 2021 were extremely low, falling way below the OHW for the majority of the year. Water levels fluctuated between the low 1325.57' MSL on 5/25/21 to high of 1329.44' MSL on 6/11/21.

Aquatic Invasive Species Control – Lake Sallie

No treatments for Curly-leaf pondweed were required in 2021. However, a 35.88-acre bed of Flowering on the east shore required two treatments. This stand is intermixed with hardstem bullrush, making it difficult to access. Because of the proximity to the Pelican River and the water movement in this area, the contact time between the chemical and the plant needs to increase to make the treatment more effective.

	#1 CLP Trmt 5/26/2021	#1 FR Trmt 5/26/2021	#2 FR Trmt 8/9/2021	Totals Per Lake
Sallie	4.7 Acres $8,918	50.93 Acres $7,246	37 Acres $5,298	$21,462



Water Quality – Lake Sallie

Lake Sallie experienced an improvement in water quality in 2021 compared to historic averages. The annual average TP, CHL-A and secchi depth of 0.020 mg/l, 4.73 ppb, and 13.06' were a drastic improvement from the historic averages of 0.032 mg/l, 11.66 ppb, and 8.73'.

These improved readings are likely due to multiple factors including improvement of upstream phosphorous sources (impervious surfaces in the City of Detroit Lakes, St. Clair loading, Detroit Lake water quality improvement etc.), shoreline restorations and stabilizations, outflow of in lake nutrients over the years, and zebra mussels.

The District has performed extensive work in the area upstream of Lake Sallie to reduce the nutrient load reaching the lake. Multiple projects reducing the phosphorus loading to Lake St. Clair has directly affected the phosphorus loading to Lake Sallie. As the load has been reduced entering the lake, the lake has had the opportunity to flush nutrients out downstream. The effects of zebra mussels also cannot be negated as seen in the increase in secchi depth and decreasing CHL-A. Even the worst readings for both did not reach the 20-year average.

Water Quantity – Lake Melissa

Water Levels on Lake Melissa in 2021 were very low and stayed below the OHW for the season. Water levels fluctuated between 1328.26' MSL and 1327.50' MSL throughout the season.

Aquatic Invasive Species Control – Lake Melissa

No chemical treatments for Curly Leaf Pondweed were required in 2021. The only treatments the District performed were for Flowering Rush, a total of 24.12 acres were treated twice (June 28th and August 9th). The District will continue to assess the lake for Flowering Rush and Curly Leaf Pondweed in 2022.

	#1 FR Trmt 5/26/2021	#2 FR Trmt 8/9/2021	Totals Per Lake
Melissa	24.0 Acres $3437	24.0 Acres $3437	$6,874

Vegetation Survey – Lake Melissa & Sallie

Lake Melissa is the larger of the two basins sampled during the 3 week period in July of 2021. It contained the most points in the littoral zone (a total of 233 points). The most common plant collected throughout the lake was Macroalgae with 69% frequency and was followed by Common Bladderwort with a plant frequency of 47%. Of the 233 points sampled on Lake Melissa, only 8 points (3%) came back without any plants present.

Lake Sallie was the second basin sampled during the same period in July of 2021 and this lake contained 150 sampling points in the littoral zone around the lake. The most common plant sampled in Lake Sallie was Star Duckweed with a plant frequency of 66% and was closely followed by northern watermilfoil having a plant frequency of 50%. Across the 150 sampling points spread across the lake, only 7 sampling points came back without plants present, accounting for 5% of the total number of points.

Both Lake Sallie & Melisa are heavily developed lakes and are commonly used for recreation. Lake Sallie tends to be deeper closer to shore in spots where Lake Melissa remains shallow for quite some time. Both lakes had the highest plant diversity in areas where the water depth was between 10 and 15 feet deep. Northern watermilfoil and Richardson's pondweed were the dominant species in these areas.

Water Quality – Lake Melissa

Lake Melissa experienced average water quality in 2021. The average TP and secchi depths of 0.015 ppb and 16' were similar to historic averages of 0.020 ppb and 11.4'. The average CHL-A of 4.84 ppb was decreased from the historic average of 6.52 ppb.

The effects of zebra mussels have been less pronounced on Lake Melissa. Other lakes have experienced a dramatic increase in secchi depth and decrease in CHL-A. While a decrease in CHL-A has been observed, samples still peaked above the average on 8/13/21, 8/25/21 and 9/26/21 (8.46 ppb). Both TP and secchi depth remained average throughout the season. Overall, water quality is good with little changes from previous years.