

Little Saint Germain Lake

WBIC: 1596300

Author: Ashley Beranek

Representative Stations

Prior to the 2020 assessment cycle there were no active stations selected for use in the assessment package, which resulted in none of the phosphorus data being used in the initial assessments. To use the data the representative station(s) needed to be selected. Based on 2020 WisCALM protocol and the input of the regional biologist, Kevin Gauthier, a station was selected from each lobe of the lake (Table 1).

Table 1. Stations chosen as representative of the individual lobes of Little Saint Germain Lake.

SWIMS Station ID	Station Name	Lobe/Basin
643170	Little St Germain Lake - Northeast Bay Near St Germain WI	NE
643171	Little St Germain Lake - West Bay At St Germain WI	W
643172	Little St Germain Lake - South Bay Near St Germain WI	S
643557	Little St Germain Lake - Upper East Bay Near St Germain WI	E
10041317	St. Germain Lake Runoff Lake	E

Station 10041317, the station further south in the east lobe, was used for a specific study, but there were no associated TP data. This station is over a deep spot so if TP data is collected here in the future it could be used in an assessment if it met data requirements.

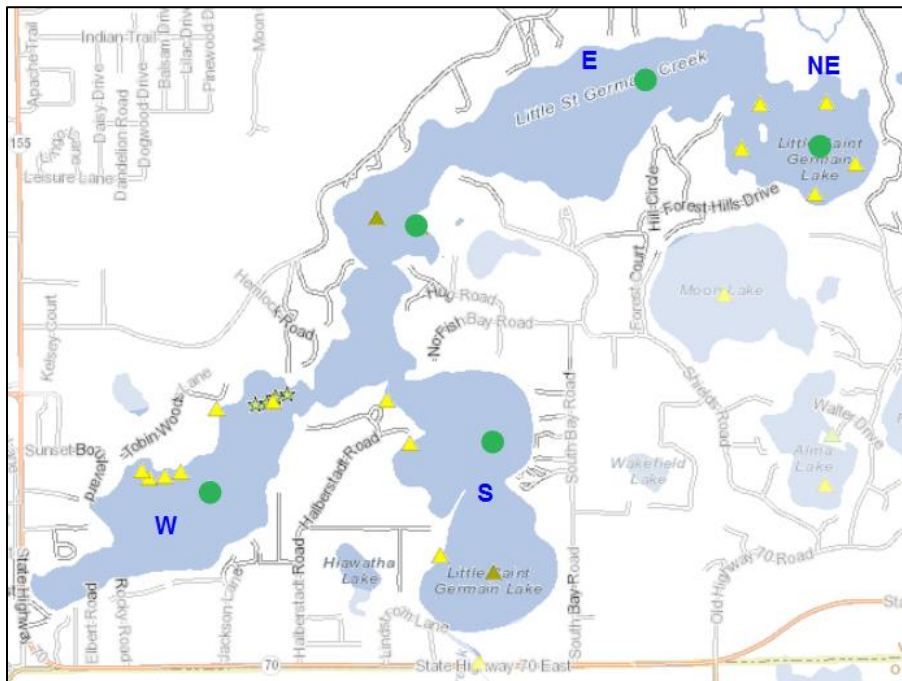


Figure 1. Map of selected representative stations (green circles) in their respective lobes/basins. Lobes are labeled, and other stations are represented by the triangle and star symbology.

Surface Water Quality Criteria

Each lobe of Little Saint Germain Lake has different characteristics in terms of hydrology (Table 2). These differences indicate that separate water quality criteria are needed for each lobe. Initially in the 2020 assessment process the entire lake was given phosphorus criteria for Two-Story Fishery lakes. The only lobe in this lake that qualifies as Two-Story Fishery based on hydrology is the West Lobe where the maximum depth is about 53 feet. The other lobes better resemble Shallow Drainage systems. Based on this all lobes but the West should have criteria associated with a shallow system (Table 3).

Table 2. Determination of shallow versus deep for lobes of Little Saint Germain Lake. Lobe maximum depth and area from USGS report on Little Saint Germain Lake (Robertson et al. 2005).

Lobe (Robertson et al. 2005)	Lobe (DNR)	Max Depth (feet)	Area (acres)	Lillie-Lathrop Value	Shallow vs Deep
Upper East	NE	15	119	2.7	Shallow
East	E	12	336	1.7	Shallow
No Fish	C	6	69	1.2	Shallow
West	W	53	213	8.3	Deep
South	S	21	122	3.7	Shallow
Second South	S	9	119	1.6	Shallow

Table 3. Applicable total phosphorus and chlorophyll-a thresholds for each lobe of Little Saint Germain Lake.

Lobe	Natural Community	TP Criteria ($\mu\text{g/L}$)	Chl-a Thresholds ($\mu\text{g/L}$)
East	Shallow Drainage	40	27
Northeast			
Central			
South			
West	Two-Story Fishery	15	10

Surface Water Quality Assessment

Based on the criteria assigned in Table 3 and 2020 WisCALM guidance, Little Saint Germain's water quality assessment results showed impairment in only a portion of the lake (Table 4).

Table 4. Assessment of threshold exceedance for phosphorus and chlorophyll-a based on updated criteria for each lobe.

Lobe	Natural Community	TP Attainment	Chl-a Attainment
East	Shallow Drainage	Clearly Exceeds	Clearly Exceeds
Northeast		Clearly Exceeds	Clearly Exceeds
Central		--	--
South		Clearly Meets	Clearly Meets
West	Two-Story Fishery	May Exceed	Clearly Meets

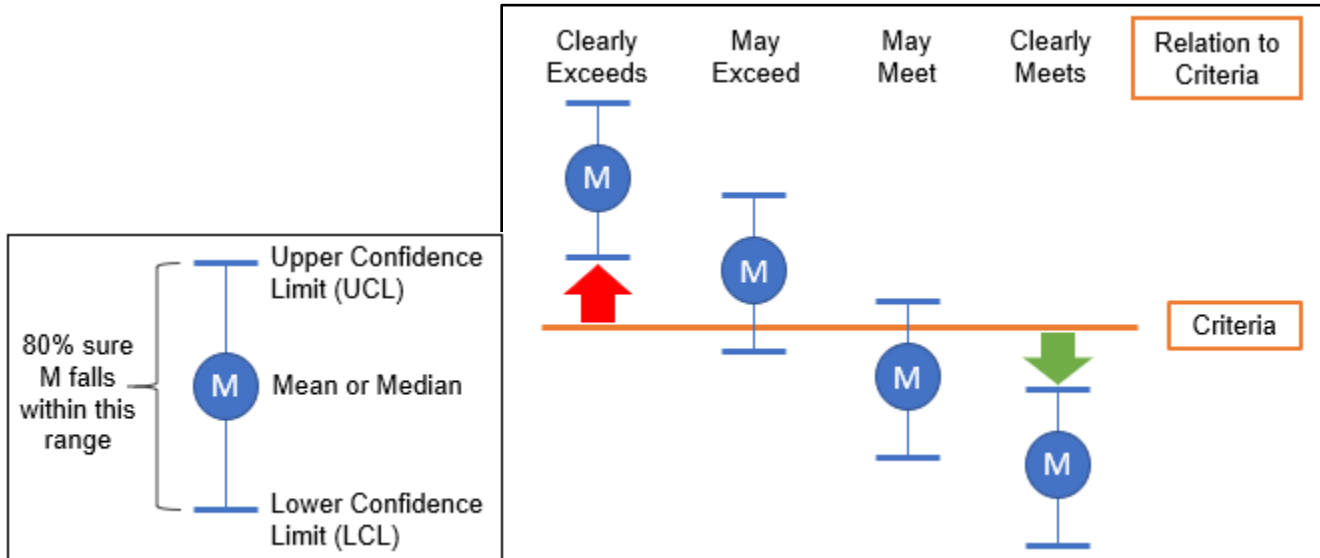


Figure 2. A copy of Figure 13 in the 2020 WisCALM guidance document showing phosphorus and chlorophyll-a attainment determination methods.

Based on the phosphorus and chlorophyll-a data in the West and South lobes these portions of the lake are not recommended for listing. The East and North lobes both demonstrate high phosphorus and chlorophyll-a levels, exceeding water quality thresholds. These two lobes of the lake are recommended for listing.

Table 5. Listing and Condition Category determinations from the revised 2020 assessment.

AU ID	Local Waterbody Name	2020 Condition Category	Pollutant/Impairment
8128745	Little Saint Germain Lake North and East Lobes	Category 5C	Total Phosphorus/ Eutrophication
8128683	Little Saint Germain Lake South Lobe	Category 2	NA
8128714	Little Saint Germain Lake Central Basin	Category 2	NA
128538	Little Saint Germain Lake West Lobe	Category 2	NA

Resources

Wisconsin DNR. 2019. Wisconsin 2020 Consolidated Assessment and Listing Methodology (WisCALM). <https://dnr.wi.gov/water/wsSWIMSDocument.ashx?documentSeqNo=190091155>

Robertson, DM; WJ Rose; DA Saad. 2005. Water Quality, Hydrology, and Phosphorus Loading to Little St. Germain Lake, Wisconsin, with Special Emphasis on the Effects of Winter Aeration and Ground-Water Inputs. USGS Scientific Investigations Report 2005–5071. <https://pubs.er.usgs.gov/publication/sir20055071>