Francis Lake—Bradford Township Monitoring Report 2019

What: Volunteers assisted with collecting Total Phosphorus (TP), chlorophyll-a, and transparency information from May through September at the deepest part of the lake. SWCD staff provided training, equipment and coordinated lab testing.

Why: The SWCD proposed collecting water samples in 2019 because no phosphorus samples have been collected on the lake. Phosphorus is typically the nutrient that limits the amount of algae and aquatic plants that can grow in lakes. It is a great indicator of how healthy (or unhealthy) a lake is.

Estimates of phosphorus levels for the lake have been made in the past by creating relationships using transparency and chlorophyll-a inforamtion. Reports and lake management plans have been built on the estimates.

The information collected in 2019 can help us verify whether past studies were accurate in their estimates and it can be used to make decisions regarding lake health improvement.

Lake Data for Francis Lake—Bradford Township	
Township	Bradford
MN Lake ID	30-0080-00
# of Public Boat Access	1
Aquatic Invasive Species	Curly Leaf Pondweed Purple Loosestrife
Surface Area	270 acres
Maximum Depth	7ft
Does the lake meet Clean Water Goals?	Total Phosphorus: **No**
	Chlorophyll-a: **No**
	Secchi Transparency: **No**

Definitions

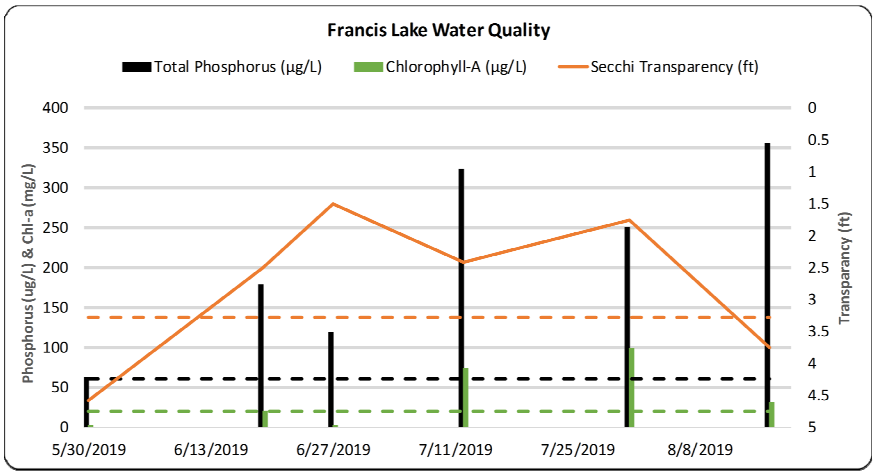
Total Phosphorus (TP): An essential plant nutrient in which an excess can cause severe algae blooms.
Chlorophyll-a (Chl-a): A pigment found in green plants, used to estimate quantity of algae in a lake.
Secchi Transparency: A measure of how far you can see into the lake, an indication to the amount of algae in the water.

Francis Lake Monitoring Results 2019

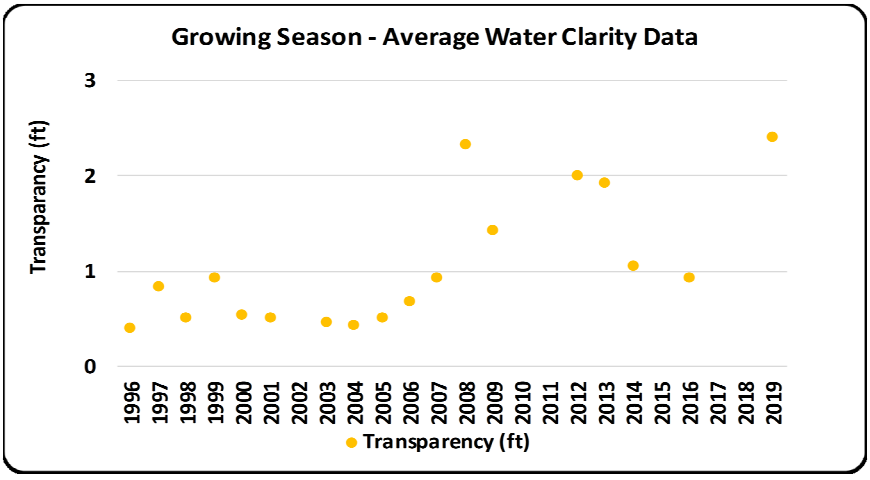
MN Clean Water Goals for Shallow Lakes

Total Phosphorus (TP): ≤ 60 µg/L Chlorophyll-a: ≤ 20 mg/L Secchi Depth: ≥ 3.28 feet

Growing season average (June-September)	245.2 µg/L	44.9 mg/L	2.38 ft



- 2019 sampling results verify that phosphorus is very high.
- Increasing phosphorus and chlorophyll-a concentrations over the summer period (as shown in the chart to the left) indicate some level of recycling of nutrients from within the lake (Internal loading).
- Factors influencing internal loading: curlyleaf pondweed die-off, bottom sediment disturbance by wind and boat motor action, and lack of native plants due to foraging fish.



- In addition to nutrients being recycled from the lake bottom, County Ditch 10 and lakeshore runoff also contribute to nutrients in the lake.
- Lake Francis was historically a wetland and therefore inherently highly productive. They system was altered significantly when County Ditch 10 was routed into the lake and the outlet was dammed.
- There has been a significant amount of water clarity data collected for the lake. It appears that clarity has improved slightly since the early 2000's.

Monitoring Recommendations: Continue collecting secchi transparency data. This is cheap (no lab needed), a volunteer can easily do it, and the information can provide insight into lake health trends.

Lake Management Recommendations: Septic System compliance, identify locations for nutrient reduction from CD 10*, internal strategies such as curlyleaf pondweed management and/or lake drawdown to consolidate sediments (there may be other options). The lake group(s) and interested citizens should consider having a conversation about lake health goals/visions.

* The SWCD will address this as opportunities arise.