

LAKE WINNIPESAUKEE (SAUNDERS BAY)

2017 SAMPLING HIGHLIGHTS

Station LRPCSB2

Gilford, NH



Blue = Excellent = Oligotrophic
Yellow = Fair = Mesotrophic
Red = Poor = Eutrophic
Gray = No Data

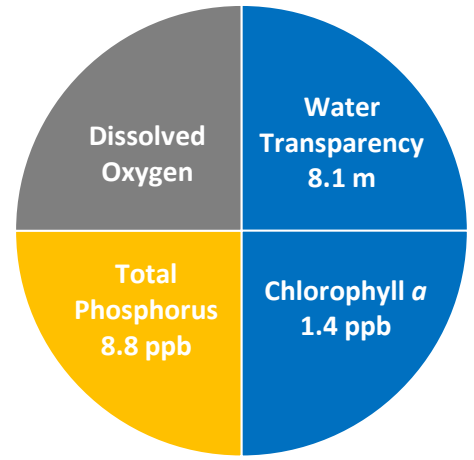


Figure 1. Saunders Bay Water Quality (2017)

Station LRPC SB2 (Figure 7) was used as a reference point to represent the general condition of the Saunders Bay sub watershed drainage. Water quality data displayed in Tables 1, 2 and 3 were collected in the surface waters.

Table 1. 2017 Saunders Bay Seasonal Averages and NH DES Aquatic Life Nutrient Criteria¹

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	LRPCSB2 Average (range)	LRPCSB2 Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	8.1 meters (7.8 – 8.3)	Oligotrophic
Chlorophyll <i>a</i> ¹ (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	1.4 ppb (single value)	Oligotrophic
Total Phosphorus ¹ (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	8.8 ppb (single Value)	Mesotrophic
Dissolved Oxygen (mg/L)	5.0 – 7.0	2.0 – 5.0	<2.0	Not Sampled	Not Assessed

Table 2. 2017 Saunders Bay Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					LRPCSB2 Average (range)	LRPCSB2 Classification
	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored		
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	7.3 color units (single value)	Uncolored

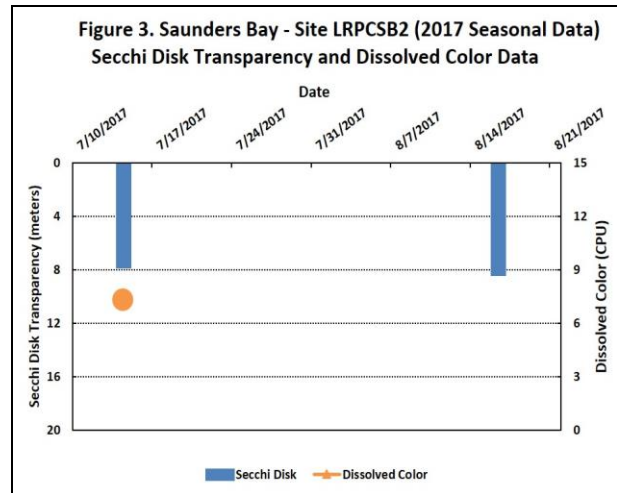
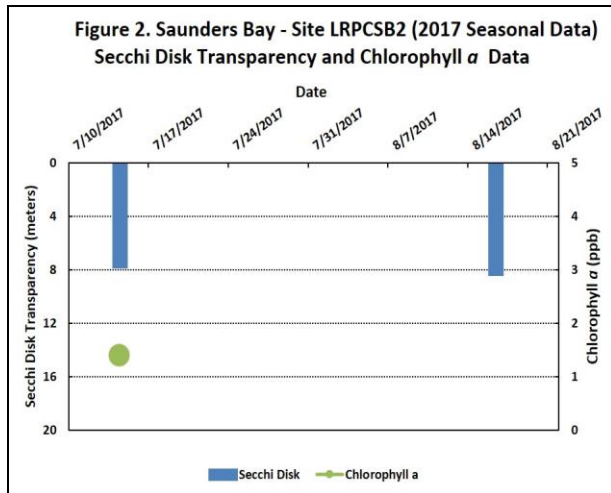


Figure 2 and 3. Seasonal Secchi Disk transparency, chlorophyll *a* and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

LONG-TERM TRENDS

WATER CLARITY: The Saunders Bay LRPCSB2 water clarity measurements, measured as Secchi Disk transparency, have been collected over a span of eight sampling seasons. Due to the limited number of years sampled (less than ten) a trend analysis was not performed on the Secchi Disk transparency data (Figure 4).

CHLOROPHYLL: The Saunders Bay LRPCSB2 chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, have been collected over a span of eight sampling seasons. Due to the limited number of years sampled (less than ten) a trend analysis was not performed on the chlorophyll *a* data (Figure 4).

TOTAL PHOSPHORUS: Phosphorus is the nutrient most responsible for microscopic plant growth. The Saunders Bay LRPCSB2 total phosphorus concentrations have been collected over a span of seven sampling seasons. Due to the limited number of years sampled (less than ten) a trend analysis was not performed on the total phosphorus data (Figure 5).

COLOR: The Saunders Bay LRPCSB2 color data, the result of naturally occurring “tea” color substances from the breakdown of soils and plant materials, have been collected over a span of eight sampling seasons. Due to the limited number of years sampled (less than ten) a trend analysis was not performed on the dissolved color data (Figure 5).

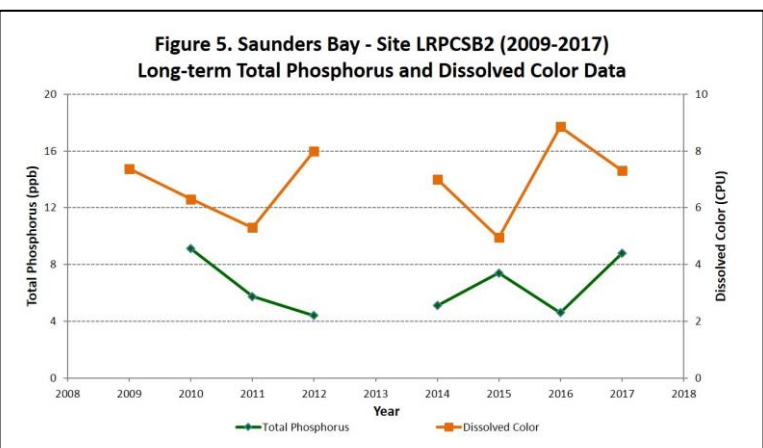
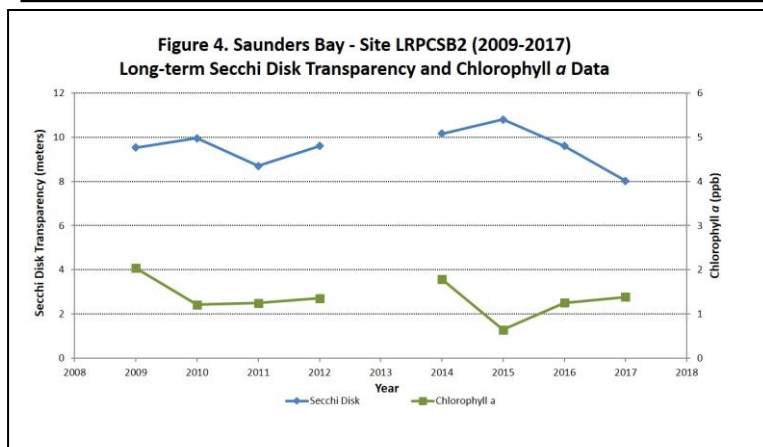
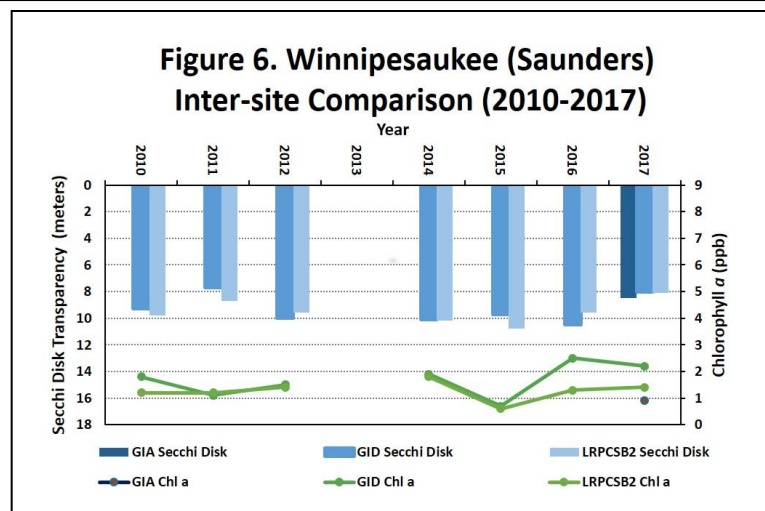


Table 3. Saunders Bay Seasonal Average Water Quality Inter-site Comparison (2017)

Site	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll <i>a</i> (ppb)	Average (range) Total Phosphorus (ppb)
GIA	8.5 (6.0 – 10.6)	0.9 (0.8 – 0.9)	7.2 (single value)
GIC	Not Sampled	Not Sampled	Not Sampled
GID	8.0 (7.3 – 8.7)	2.2 (1.4 – 3.1)	7.8 (7.6 – 7.9)
LRPCSB2	8.1 (7.8 – 8.3)	1.4 (single value)	8.8 (single value)

Figures 4 and 5. Changes in the Lake Winnepesaukee – Site LRPCSB2 water clarity (Secchi Disk depth), chlorophyll *a*, dissolved color and total phosphorus concentrations measured between 2009 and 2017. **These data illustrate the relationship among plant growth, water color and water clarity. Total phosphorus data are also displayed and are oftentimes correlated with the amount of plant growth.**

Figure 6. Lake Winnepesaukee inter-site comparison among Sites GIA, GID and LRPCSB2. Both the annual average Secchi Disk transparency and annual average chlorophyll *a* values are displayed.



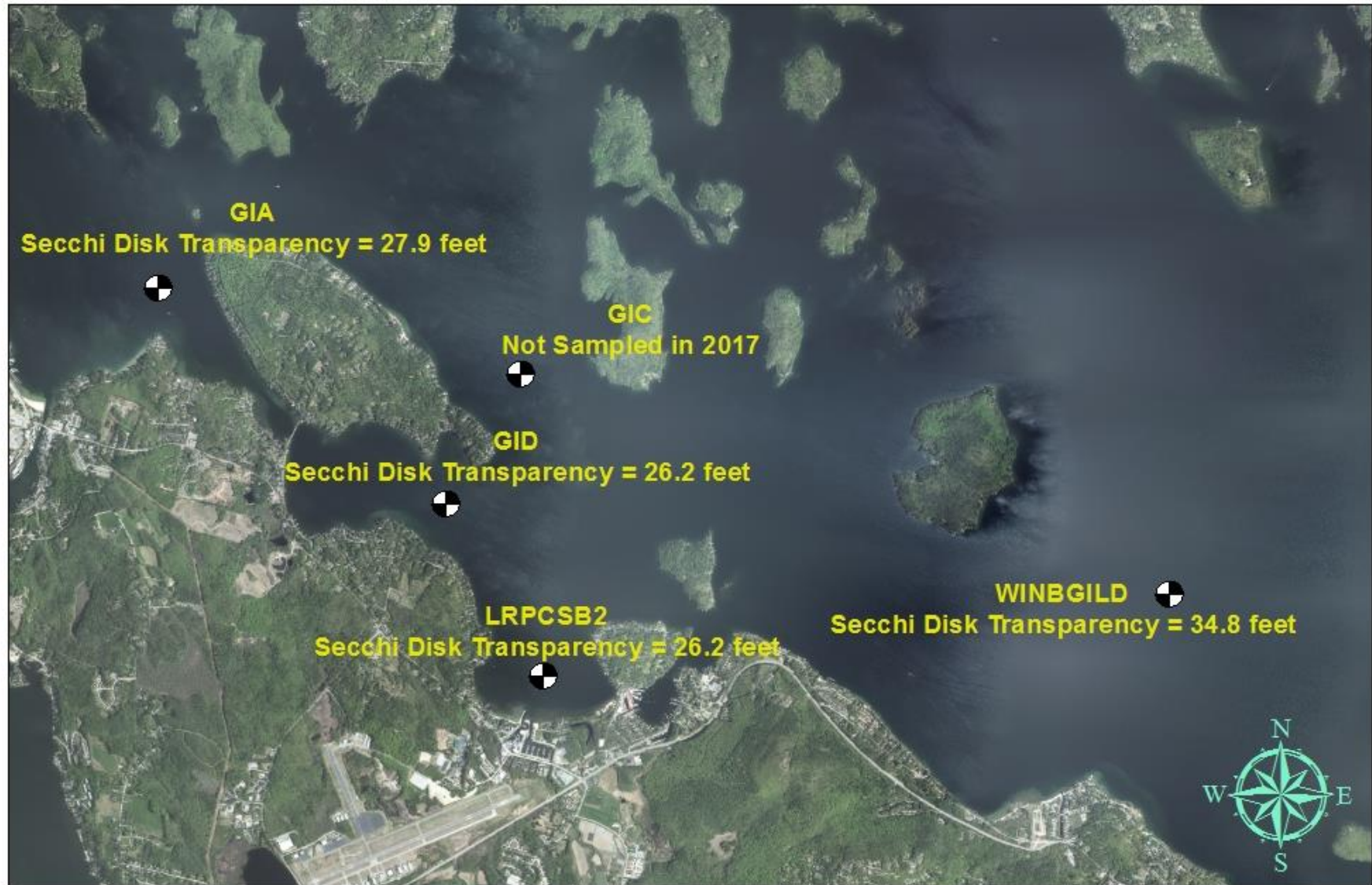
Recommendations

Implement Best Management Practices within the Lake Winnepesaukee watershed to minimize the adverse impacts of polluted runoff and erosion into Lake Winnepesaukee. Refer to “Landscaping at the Water’s Edge: An Ecological Approach” and “New Hampshire Homeowner’s Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home” for more information on how to reduce nutrient loading caused by overland run-off.

- http://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf
- <http://soaknh.org/wp-content/uploads/2016/04/NH-Homeowner-Guide-2016.pdf>

Figure 7. Lake Winnepesaukee - The Broads and Saunders Bay Gilford, NH

2017 sampling sites and seasonal average water clarity



Aerial Orthophoto Source: NH GRANIT
Site location GPS coordinates collected by the UNH Center for Freshwater Biology



Extension

