LAKE WINNIPESAUKEE (SAUNDERS BAY)

2017 SAMPLING HIGHLIGHTS

Station LRPCSB2

Gilford, NH

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.

Blue = Excellent = Oligotrophic

Yellow = Fair = Mesotrophic

Red = Poor = Eutrophic

Gray = No Data

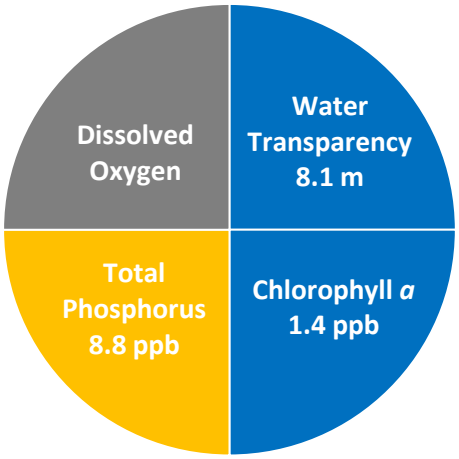


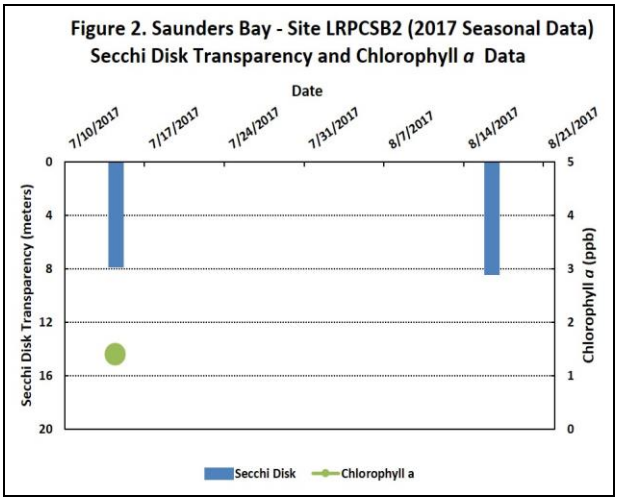
Figure 1. Saunders Bay Water Quality (2017)

Table 1. 2017 Saunders Bay Seasonal Averages and NH DES Aquatic Life Nutrient Criteria[1]

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 *a* [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
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



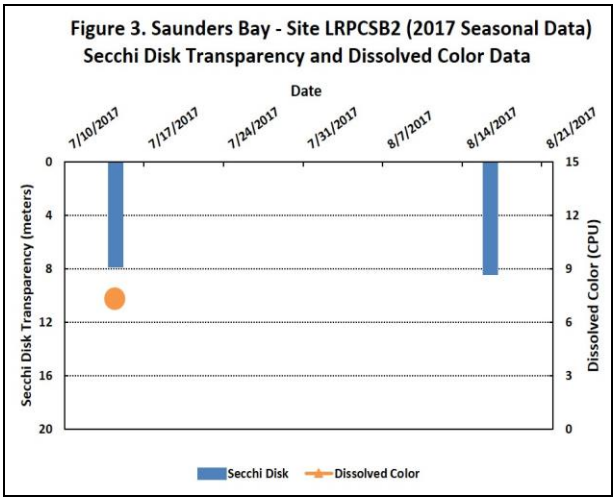


Figure 2 and 3. Seasonal Secchi Disk transparency, chlorophyll *a* and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll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

Figure 4. Saunders Bay - Site LRPCSB2 (2009-2017)
Long-term Secchi Disk Transparency and Chlorophyll *a* Data

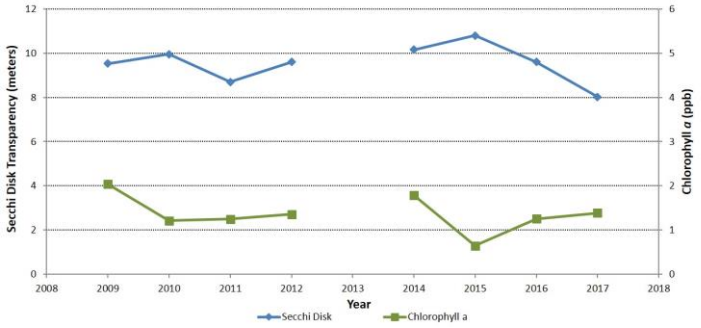


Figure 5. Saunders Bay - Site LRPCSB2 (2009-2017)
Long-term Total Phosphorus and Dissolved Color Data

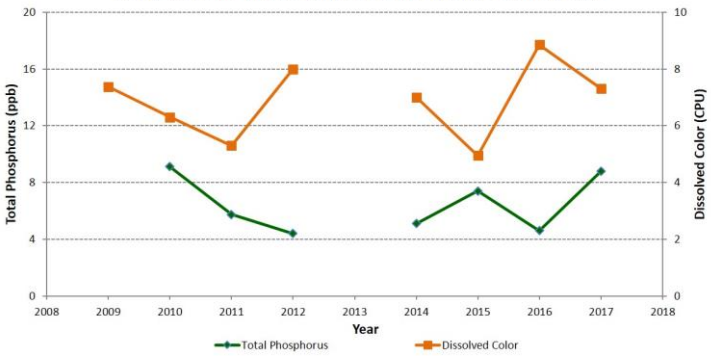


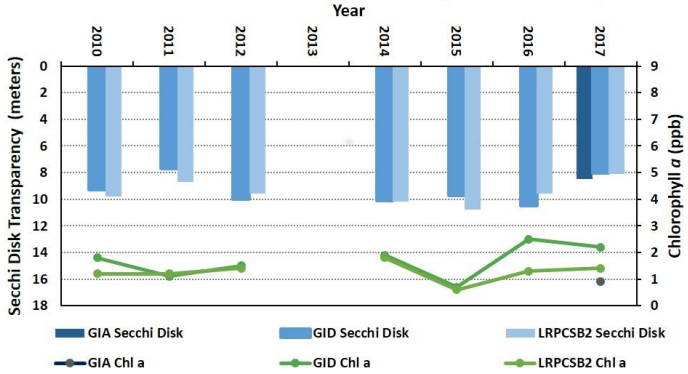
Table 3. Saunders Bay Seasonal Average Water Quality Inter-site Comparison (2017)

Site	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll *a* (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 Winnipesaukee – 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 Winnipesaukee inter-site comparision among Sites GIA, GID and LRPCSB2. Both the annual average Secchi Disk transparency and annual average chlorophyll *a* values are displayed.

Figure 6. Winnipesaukee (Saunders) Inter-site Comparison (2010-2017)



Recommendations

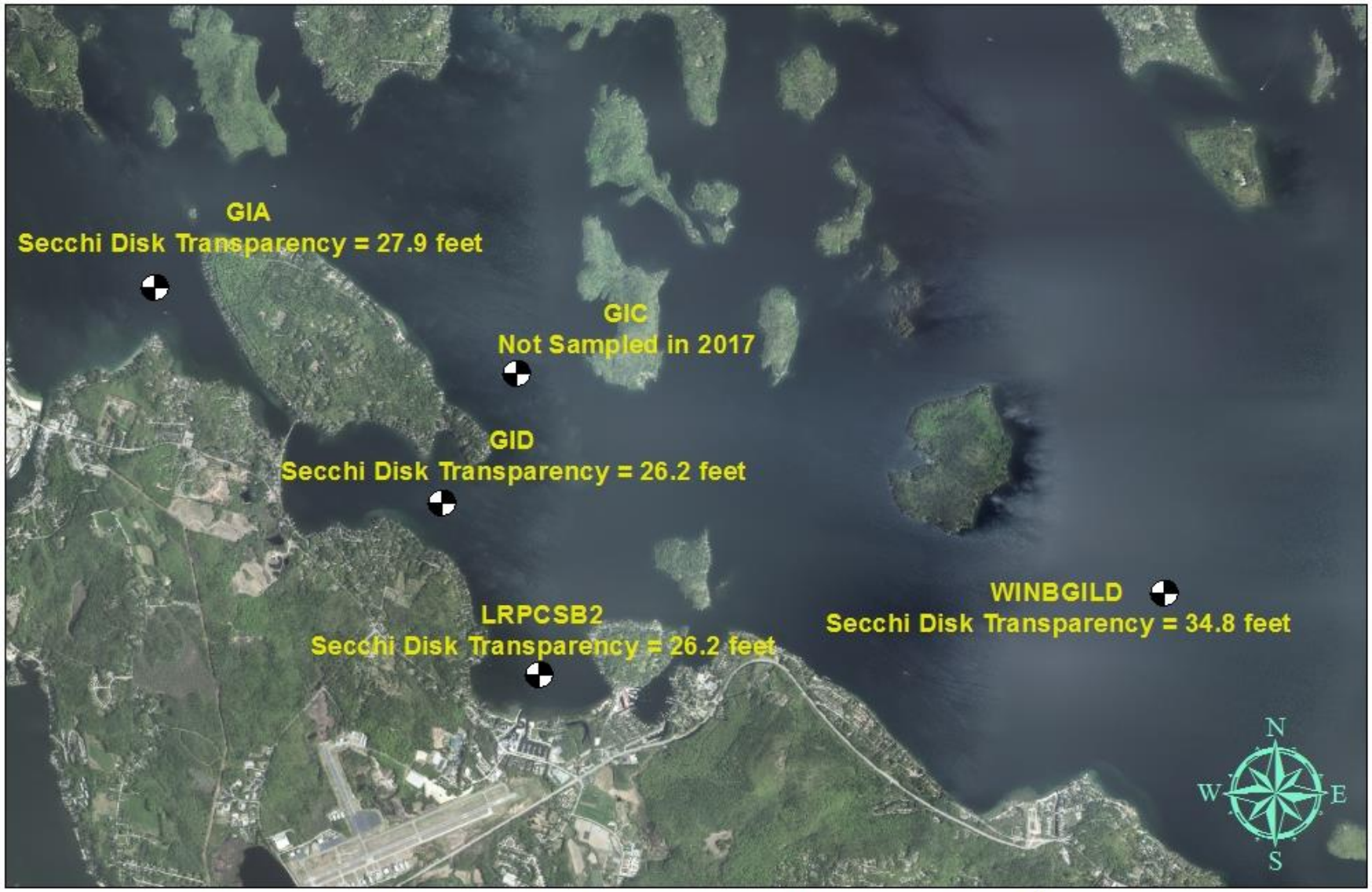
Implement Best Management Practices within the Lake Winnipesaukee watershed to minimize the adverse impacts of polluted runoff and erosion into Lake Winnipesaukee. Refer to "Landscaping at the Water's Edge: An Ecological Approach" and "New Hampshire Homeowner's Guide to Stormwater Management: Do-It-Yourself 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 Winnipesaukee - 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

NH Extension