

LAKE WINNIPESAUKEE

2015 SAMPLING HIGHLIGHTS

Station 2 Church Point

Meredith, NH



University of New Hampshire
Cooperative Extension

Station 2 Church Point (Figure 7) was used as a reference point to represent the overall inner Meredith Bay water quality. 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

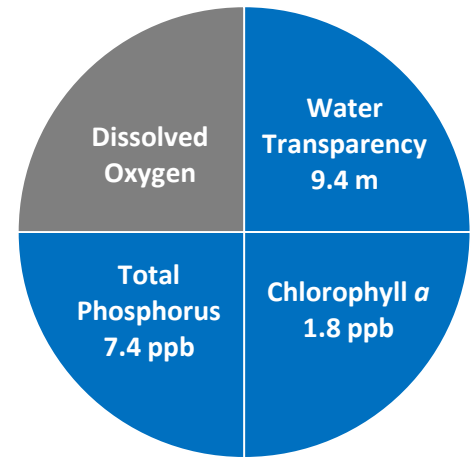


Figure 1. Church Point Water Quality (2015)

Table 1. 2015 Meredith Bay Seasonal Averages and NH DES Aquatic Life Nutrient Criteria

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	2 Church Point Average (range)	2 Church Point Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	9.4 meters (8.8 – 10.0)	Oligotrophic
Chlorophyll a (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	1.8 ppb (1.2 – 3.1)	Oligotrophic
Total Phosphorus (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	7.4 ppb (5.3 – 12.3)	Oligotrophic
Dissolved Oxygen (mg/L)	5.0 – 7.0	2.0 – 5.0	<2.0	Not Sampled	Not Sampled

Table 2. 2015 Meredith Bay Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					2 Church Point Average (range)	2 Church Point 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	6.6 color units (range: 4.4 – 10.8)	Uncolored

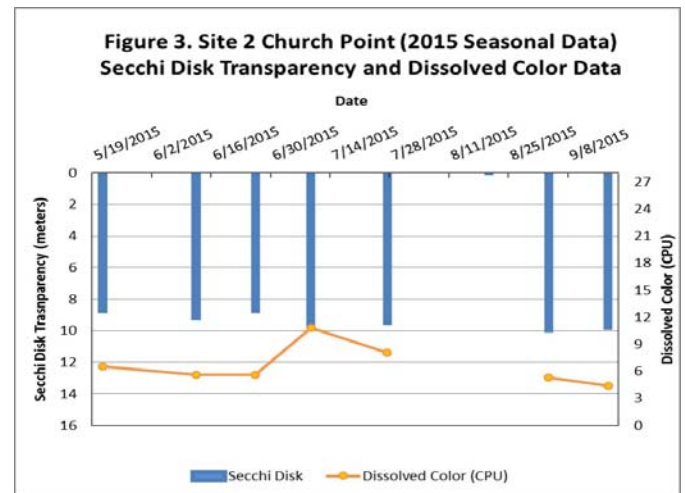
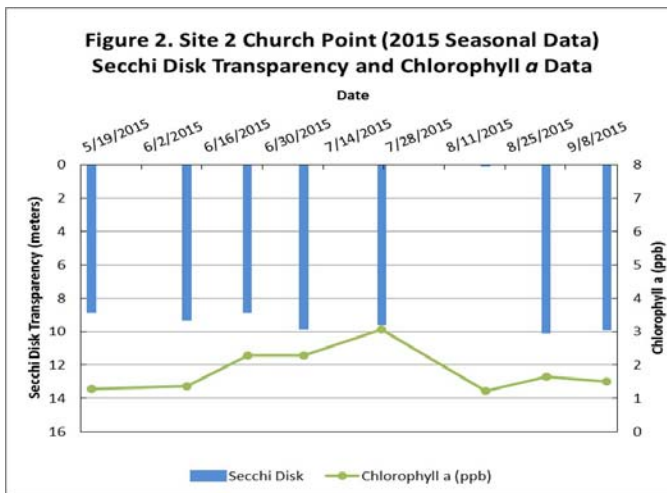


Figure 2 and 3. Seasonal Secchi Disk transparency, chlorophyll a and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll a and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll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

LONG-TERM TRENDS

WATER CLARITY: The Meredith Bay – Site 2 Church Point water clarity measurements, measured as Secchi Disk transparency, display a trend of increasing water clarity over the fourteen years of water quality monitoring between 2000 and 2015 (Figure 4).

CHLOROPHYLL: The Meredith Bay – Site 2 Church Point chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, have oscillated among years but have been relatively stable over the fourteen years of water quality monitoring between 2000 and 2015 (Figure 4).

TOTAL PHOSPHORUS: Phosphorus is the nutrient most responsible for microscopic plant growth. The Meredith Bay – Site 2 Church Point total phosphorus measurements display a trend of decreasing total phosphorus concentrations between 2000 and 2015 (Figure 5).

COLOR: The Meredith Bay – Site 2 Church Point color data, the result of naturally occurring “tea” colored substances from the breakdown of soils and plant materials, have oscillated among years but have been relatively stable over the fourteen years of water quality monitoring between 2000 and 2015 (Figure 5).

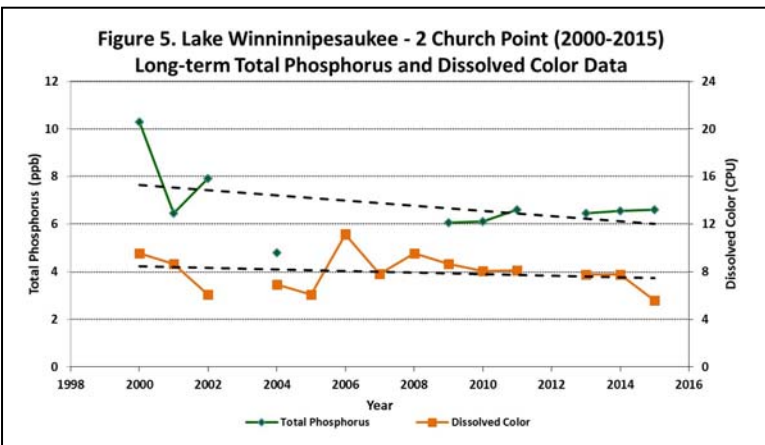
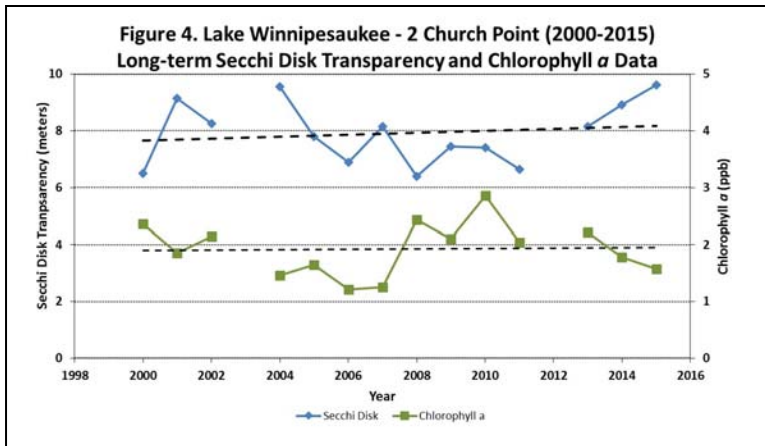


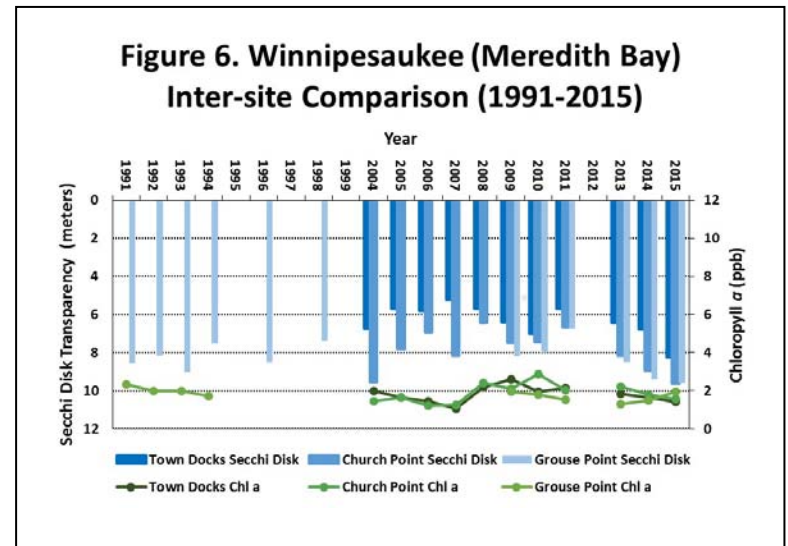
Table 3. Meredith Bay Seasonal Average Water Quality Inter-site Comparison (2015)

Site	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll <i>a</i> (ppb)	Average (range) Total Phosphorus (ppb)
1 Town Docks	7.9 (range: 6.1 – 9.1)	1.4 (range: 0.9 – 1.9)	5.9 (range: 5.0 – 7.3)
2 Church Point	9.4 (range: 8.8 – 10.0)	1.8 (range: 1.2 – 3.1)	7.4 (range: 5.3 – 12.3)
3 Grouse Point	9.6 (range: 8.5 – 10.8)	1.8 (range: 0.9 – 2.4)	6.3 (range: 5.3 – 8.4)

* The Town Docks Secchi Disk Transparency measurements were collected with a black disk and are reported as conventional black/white Secchi Disk readings.

Figures 4 and 5. Changes in the Lake Winnepesaukee – 2 Church Point water clarity (Secchi Disk depth), chlorophyll *a*, dissolved color and total phosphorus concentrations measured between 2000 and 2015. 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. Meredith Bay inter-site comparison among Sites 1 Town Docks, 2 Church Point and 3 Grouse Point. Both the Secchi Disk transparency and chlorophyll *a* measurements are displayed.



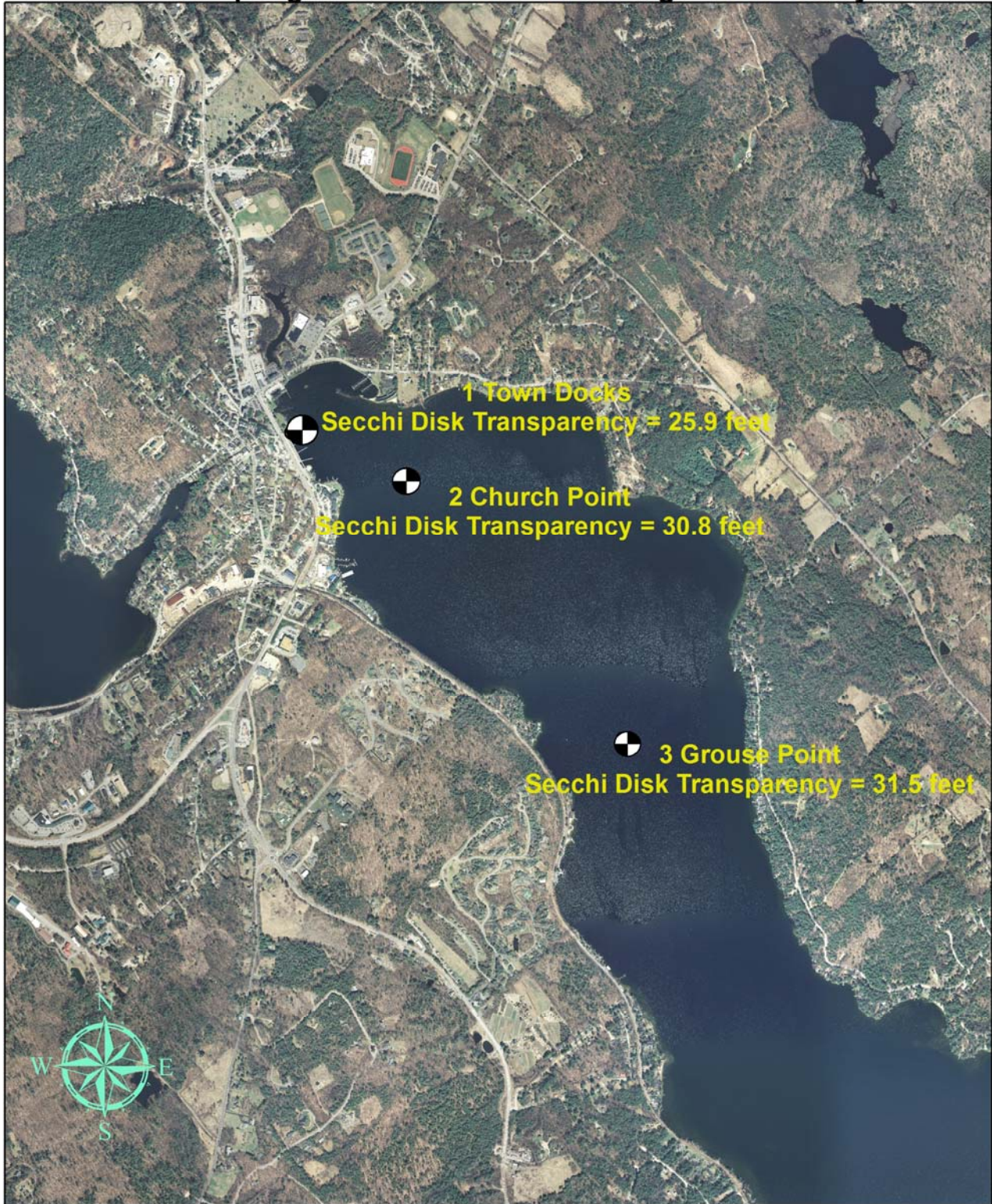
Recommendations

Implement Best Management Practices within the Meredith Bay 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://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-11.pdf>

Figure 7. Lake Winnepesaukee - Meredith Bay Meredith, NH

2015 sampling sites and seasonal average water clarity



0 0.3 0.6 0.9 1.2 Miles



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