LAKE KANASATKA

2014 SAMPLING HIGHLIGHTS

Station – 1 Deep

Moultonborough, NH

University of New Hampshire
Cooperative Extension

Station 1 Deep (Figure 7) was used as a reference point to represent the overall Lake Kanasatka water quality. Water quality data displayed in Tables 1 and 2 are surface water measurements with the exception of the dissolve oxygen data.

Blue = Excellent = Oligotrophic

Yellow = Fair = Mesotrophic

Red = Poor = Eutrophic

Gray = No Data

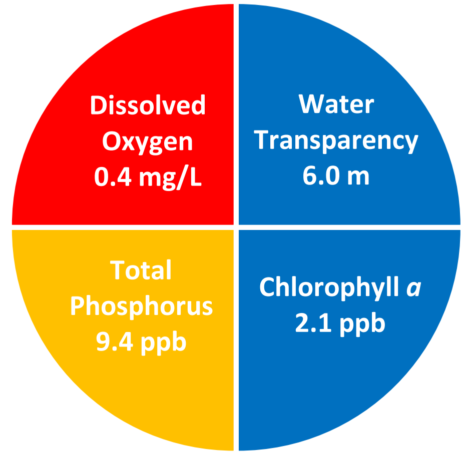


Figure 1. Lake Kanasatka Water Quality (2014)

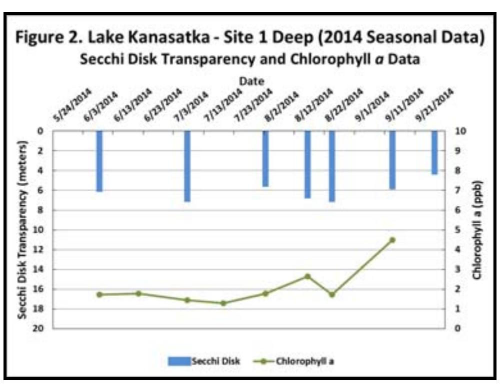
Table 1. 2014 Lake Kanasatka Seasonal Averages and NH DES Aquatic Life Nutrient Criteria

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Lake Kanasatka – 1 Deep Average (range)	Lake Kanasatka – 1 Deep Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	**6.0** meters (4.3 – 7.0)	Oligotrophic
Chlorophyll *a* (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	**2.1** ppb (1.3 – 4.5)	Oligotrophic
Total Phosphorus (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	**9.4** ppb (single sample)	Mesotrophic
Dissolved Oxygen (mg/L)	5.0 – 7.0	2.0 – 5.0	<2.0	**0.4** mg/L (0.4 – 0.5)	Eutrophic

* Dissolved oxygen concentrations were measured on August 20, 2014 between 10.5 and 13.0 meters, in the bottom waters.

Table 2. 2014 Lake Kanasatka Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Lake Kanasatka – 1 Deep Average (range)	Lake Kanasatka – 1 Deep Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	**11.5** color units (range: 8.6 – 13.8)	Slightly colored
Alkalinity (mg/L)	< 0.0 acidified	0.1 – 2.0 extremely vulnerable	2.1 – 10 moderately vulnerable	10.1 – 25.0 low vulnerability	> 25.0 not vulnerable	**14.7** mg/L (range: 14.6 – 14.6)	Low vulnerability
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**7.4** standard units (range: 7.4 – 7.4)	Optimal range for fish growth and reproduction
Specific Conductivity (*u*S/cm)	< 50 *u*S/cm Characteristic of minimally impacted NH lakes		50-100 *u*S/cm Lakes with some human influence	> 100 *u*S/cm Characteristic of lakes experiencing human disturbances		**83** *u*S/cm (range: 83 - 83)	Lakes with some human influence



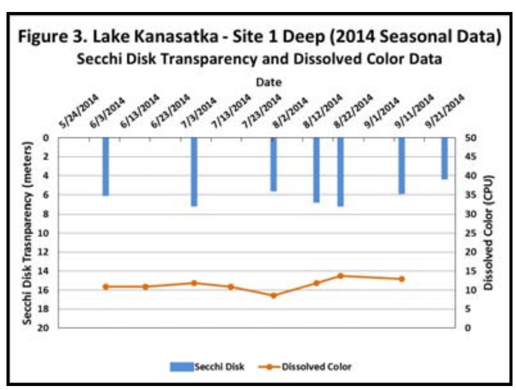


Figure 2 and 3. Seasonal Secchi Disk transparency, chlorophyll *a* changes and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in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

LONG-TERM TRENDS

WATER CLARITY: The Lake Kanasatka water clarity measurements, measured as Secchi Disk transparency, display a trend of increasing water clarity over thirty-two years of water quality monitoring conducted between 1983 and 2014 (Figure 4).

CHLOROPHYLL: The Lake Kanasatka chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, display a trend of decreasing concentrations over thirty-two years of water quality monitoring conducted between 1983 and 2014 (Figure 4).

TOTAL PHOSPHORUS: Phosphorus is the nutrient most responsible for microscopic plant growth. The Lake Kanasatka total phosphorus concentrations display a trend of increasing concentrations over twenty-nine years of water quality monitoring conducted between 1985 and 2014 (Figure 5).

COLOR: The Lake Kanasatka color data, the result of naturally occurring "tea" color substances from the breakdown of soils and plant materials, display a trend of increasing concentrations over twenty-nine years of water quality monitoring conducted between 1985 and 2014 (Figure 5).

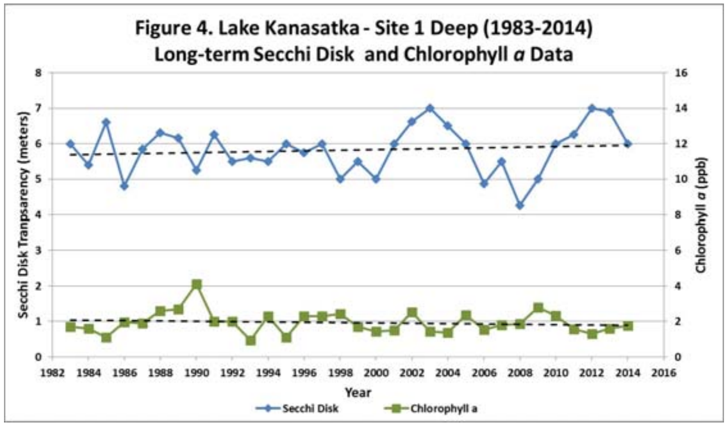
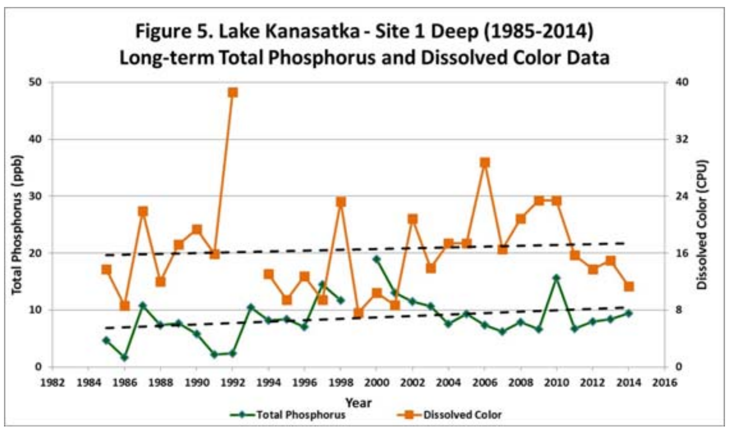


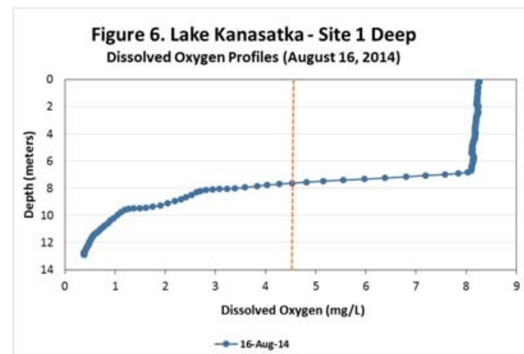
Table 3. Lake Kanasatka Seasonal Average Water Quality Inter-Site Comparison (2014)

Sampling Station	Average (range) Secchi Disk (meters)	Average (range) Total Phosphorus (ppb)	Average (range) Chlorophyll *a* (ppb)	Average (range) Dissolved Color (CPU)
1 Deep	**6.0** ppb (range: 4.3 – 7.0)	**9.4** ppb (range: 9.4 – 9.4)	**2.1** ppb (range: 1.3 – 4.5)	**11.5** CPU (range: 8.6 – 13.8)
2 Animal	**6.0** ppb (range: 5.0 – 6.7)	**8.3** ppb (range: 8.3 – 8.3)	**1.8** ppb (range: 1.6 – 2.1)	**16.0** CPU (range: 12.9 – 18.1)
3 West	**5.2** ppb (range: 4.3 – 6.3)	**9.8** ppb (range: 9.8 – 9.8)	**2.1** ppb (range: 1.4 – 3.6)	**13.9** CPU (range: 10.0 – 24.1)



Figures 4 and 5. Changes in the Lake Kanasatka water clarity (Secchi Disk depth), chlorophyll *a*, dissolved color and total phosphorus concentrations measured between 1983 and 2014. **These data illustrate the relationship among plant growth, water color and water clarity. Total phopshorus data are also displayed and are oftentimes correlated with the amount of plant growth.**

Figure 6. Lake Kanasatka dissolved oxygen profile collected on August 16, 2014. The vertical red line indicates the dissolved oxygen concentration commonly considered the threshold for successful growth and reproduction of cold water fish such as trout and salmon. *Notice the low dissolved oxygen concentrations near the lake bottom.*



Reccomendations

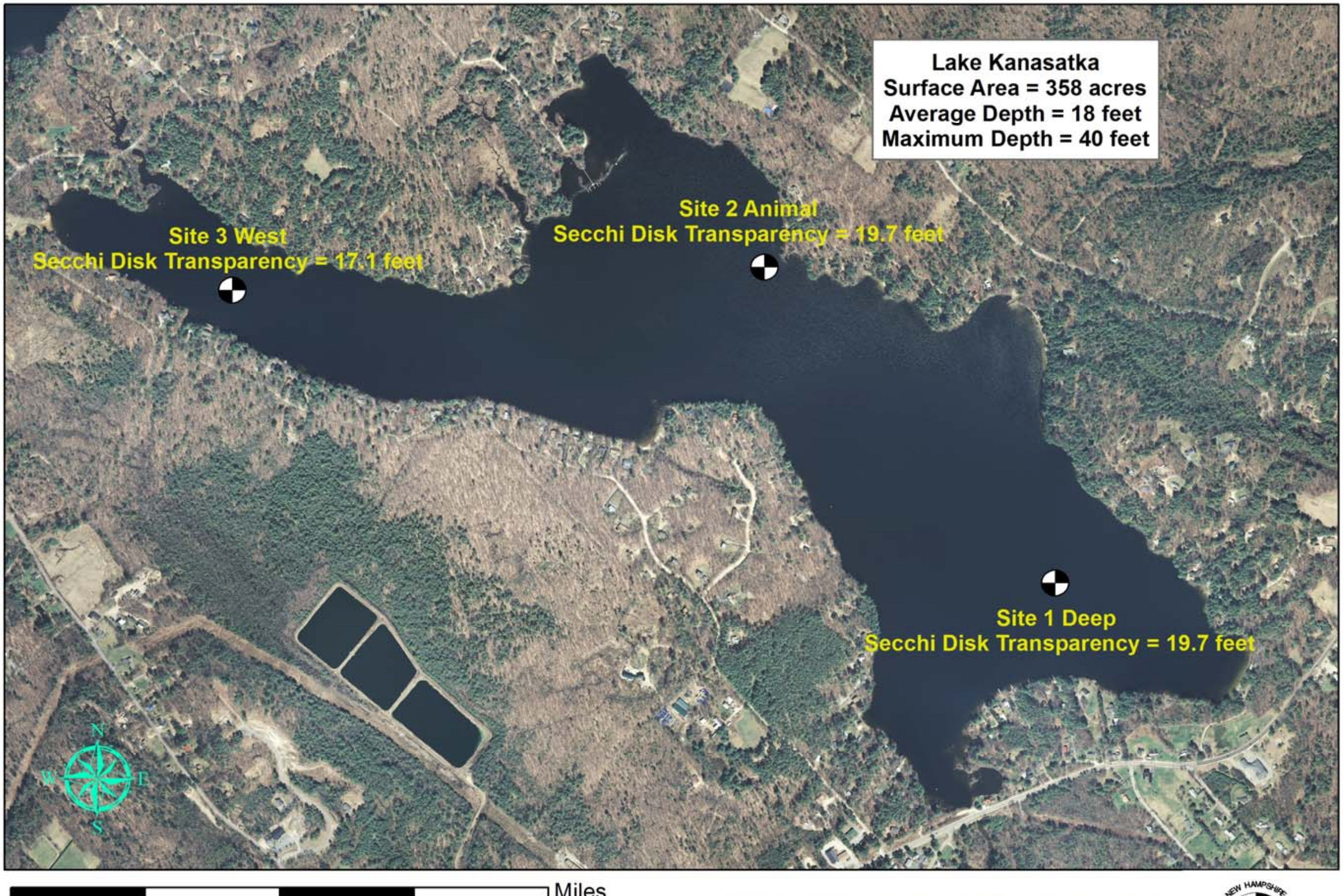
Implement Best Management Practices within the Lake Kanasatka watershed to minimize the adverse impacts of polluted runoff and erosion into Lake Kanasatka. Refer to "Landscaping at the Water's Edge: An Ecological Approach" and "New Hampshire Homeowner's Guide to Stormwater Management: Do-It-Yourself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

Moultonborough, NH

2014 Deep water sampling sites with seasonal average water clarity



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New Hampshire Lakes Lay Monitoring

Aerial Orthophoto Source: NH GRANIT
Site locations GPSed by the UNH Center of Freshwater Biology