Lake Taneycomo

Region - Ozark Highlands

Lake Taneycomo is a 22 mile long, 2,080 acre lake in the White River Basin. It is located between Table Rock Lake and Bull Shoals Lake. While the majority of Lake Taneycomo's watershed is forested, the lake is influenced by the location of Branson and other nearby developed areas. The majority of water flowing through Lake Taneycomo originates from the deep waters of Table Rock Lake. This water source plays a large role in determining the overall water quality of Lake Taneycomo. Another major influence on water quality in Lake Taneycomo is the **residence time** of the water in the lake, which can be very short (Knowlton and Jones 1990).

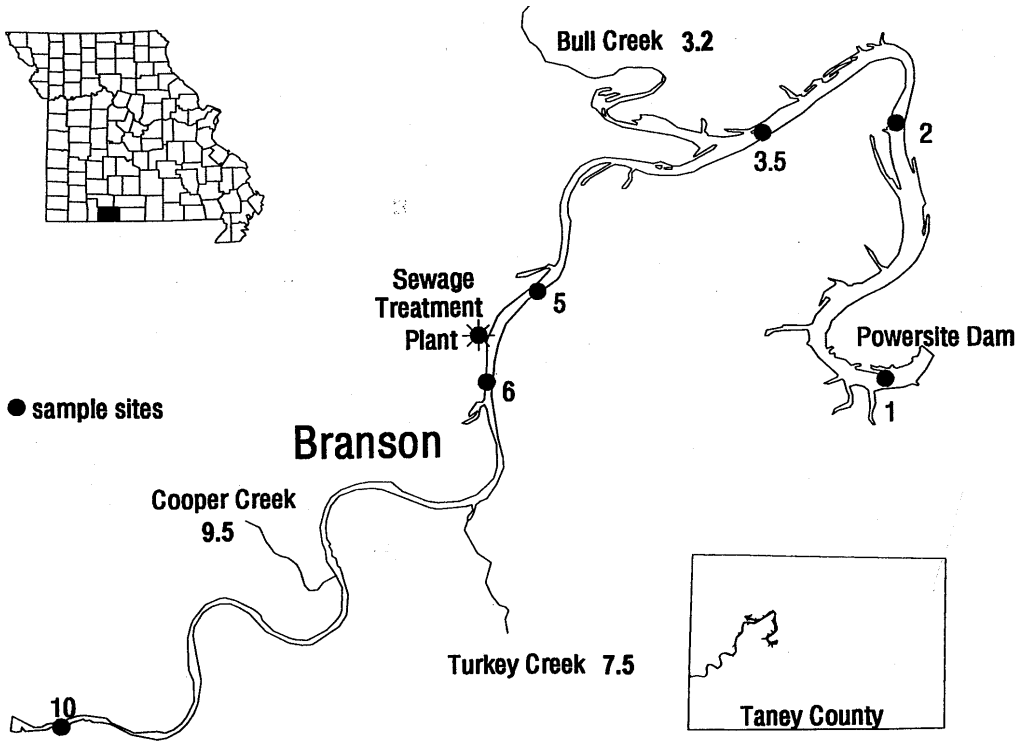

Figure 33. Location of Lake Taneycomo's sample sites.

1999 Results

Lake Taneycomo was sampled at six lake sites, three inflowing streams and the Branson sewage treatment plant during 1999. All sites were sampled five times with the exception of Site

10, which was sampled seven times. Parameters exhibited the following results:

- Elevated nutrient levels at Site 5 are a very common occurrence as this site is just downstream from the outlet pipe of the Branson sewage treatment plant. Only one of five phosphorus values at Site 5 was extreme (306 µg/L).
- Nutrient values, especially nitrogen, were not as high at Site 10 this year when compared to past years. This was probably due to differences in the hydrology and stratification of Table Rock Lake associated with the drought conditions in 1999. Water at Site 10 comes from the **metalimnion** or **hypolimnion** of Table Rock Lake.
- The pattern of algal chlorophyll across the lake was what we would expect. The maximum value of 9.9 µg/L at Site 1 was relatively low compared to past maximum values.
- Secchi values for Site 10 are not truly representative of water clarity as the Secchi disk often reached the bottom of the lake before disappearing.
- Secchi transparency at Site 2 was shallower than expected, given the low chlorophyll levels.
- Cooper Creek had nitrogen values that were relatively high while phosphorus levels were lower than the lake sites and the other two creek sites.
- Turkey Creek and Bull Creek had nutrient levels that were comparable to each other and not too different from those of most of the lake.
- Sites 1 and 3.5 were mesotrophic based on average chlorophyll values. All other lake sites were oliogotrophic based on chlorophyll.
- Average phosphorus values were in the mesotrophic range for all lake sites except Site 5, which was eutrophic.
- All lake sites were eutrophic based on average nitrogen values.

Table 15. Descriptive statistics for lake sites on Lake Taneycomo - 1999.

Parameter		Site					
		10	6	5	3.5	2	1
Chlorophyll (µg/L)	average	1.9	1.9	1.5	3.0	1.8	4.6
	median	1.7	1.8	1.6	2.9	1.7	4.2
	minimum	0.6	0.8	1.1	1.5	1.2	1.3
	maximum	5.0	2.7	2.0	5.7	2.7	9.9
Phosphorus (µg/L)	average	21	13	78	18	15	21
	median	20	14	18	17	14	19
	minimum	14	11	16	14	14	15
	maximum	30	14	306	22	17	33
Nitrogen (µg/L)	average	771	724	1072	636	648	678
	median	860	780	970	660	660	690
	minimum	440	600	910	550	550	630
	maximum	940	790	1540	740	730	730
Secchi (inches)	average	39	147	148	75	113	83
	median	42	162	159	56	111	74
	minimum	22	70	87	47	88	60
	maximum	46	174	174	113	135	133

Table 16. Descriptive statistics for Lake Taneycomo supplemental sampling sites - 1999.

Site		Nitrogen (μg/L)	Phosphorus (μg/L)	ISS (mg/L)
Cooper Creek (Site 9.5)	average	1112	9	0.8
	median	1130	9	0.7
	minimum	960	6	0.4
	maximum	1230	14	1.4
Turkey Creek (Site 7.5)	average	526	29	6.0
	median	540	23	5.4
	minimum	440	19	2.7
	maximum	620	52	9.1
Bull Creek (Site 3.2)	average	622	30	x
	median	620	33	x
	minimum	510	23	x
	maximum	690	35	x
Sewage Treatment Plant	average	4108	765	x
	geometric mean*	2937	126	x
	median	3420	25	x
	minimum	630	22	x
	maximum	7780	2935	x

ISS = Inorganic Suspended Solids x = no sample collected

*geometric mean - a statistical analysis method that reduces the effect of extreme values in a data set that does not have a normal distribution. It gives a more accurate description of the data than the average value in these types of data sets. Note the wide range between the minimum and maximum values. See page 18 for further explanations of geometric mean.

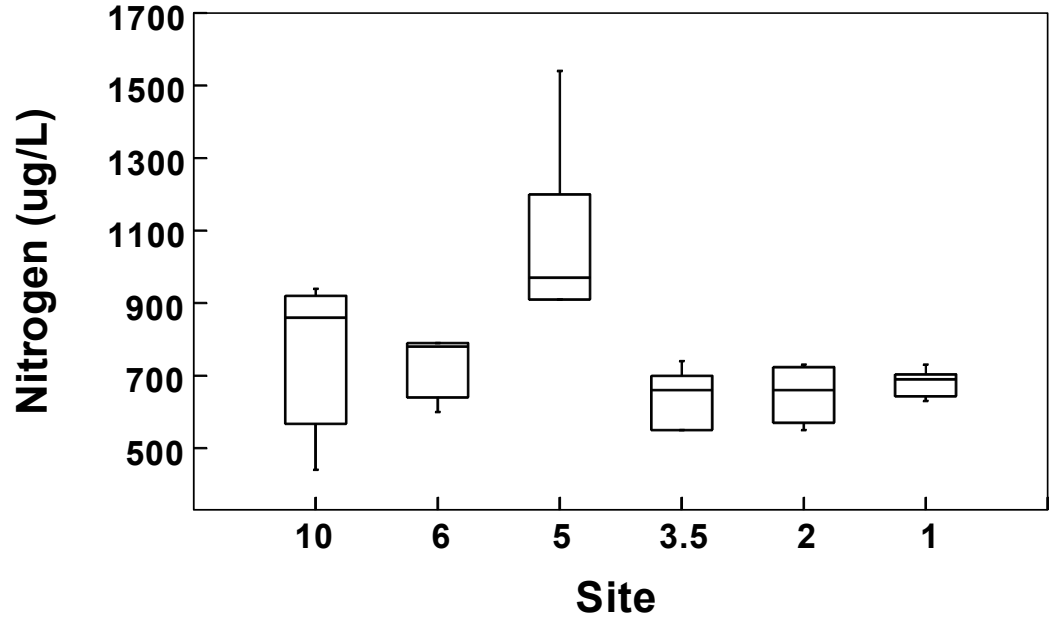

Figure 34. Nitrogen values for Lake Taneycomo - 1999.

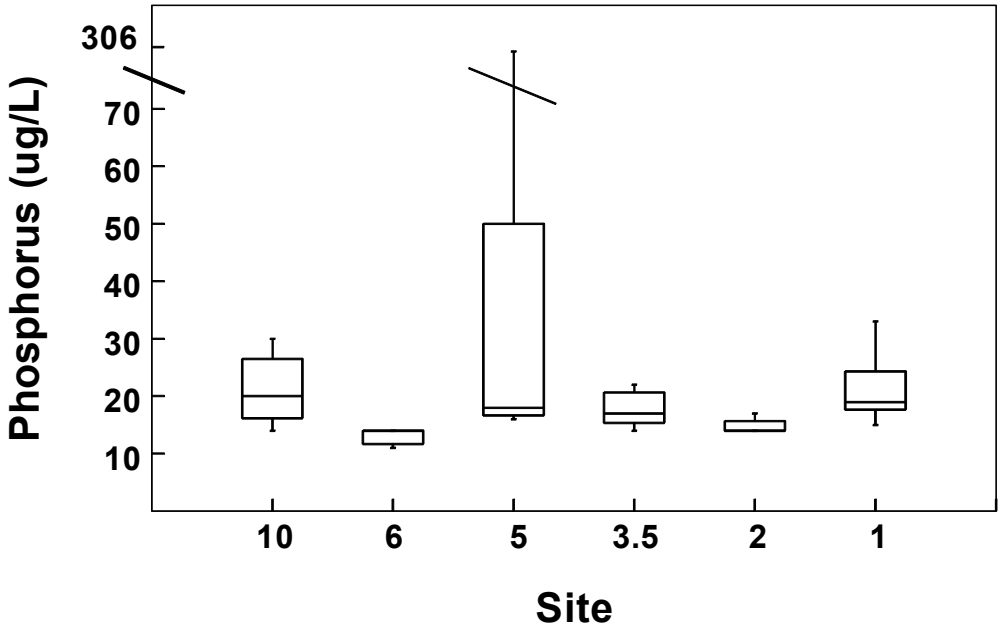

Figure 35. Phosphorus values for Lake Taneycomo - 1999.

Coliform

Coliform samples were collected by volunteers on Lake Taneycomo and analyzed by the Branson Wastewater/Water Department. Samples were collected on seven dates and the results can be found in Table 17. The results are reported in number of colonies per 100 ml of sample. The Missouri Department of Health uses 200 colonies per 100 ml as the maximum safe level for full body contact. Sewage treatment plant effluent released into Lake Taneycomo and its tributaries was probably the source of the coliform bacteria.

- Coliform counts above the state limit for full body contact were measured at 5 out of 8 sites.
- At least one site had counts over 200 colonies on every sample occasion except for September 5th.

Table 17. Coliform colonies per 100 ml of sample from Lake Taneycomo sites on seven separate dates in 1999.

Site	May 9	May 29	June 13	July 4	July 25	Aug. 15	Sept. 5
1	x	x	90	x	100	80	180
2	x	x	110	x	1580	170	30
3.5	x	x	80	x	230	720	140
5	x	60	x	60	110	1540	x
6	x	60	x	70	60	150	x
7.5	x	450	x	450	230	400	x
9.5	360	110	340	230	x	x	x
10	20	20	110	<1	x	180	x

x = no sample collected