

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).

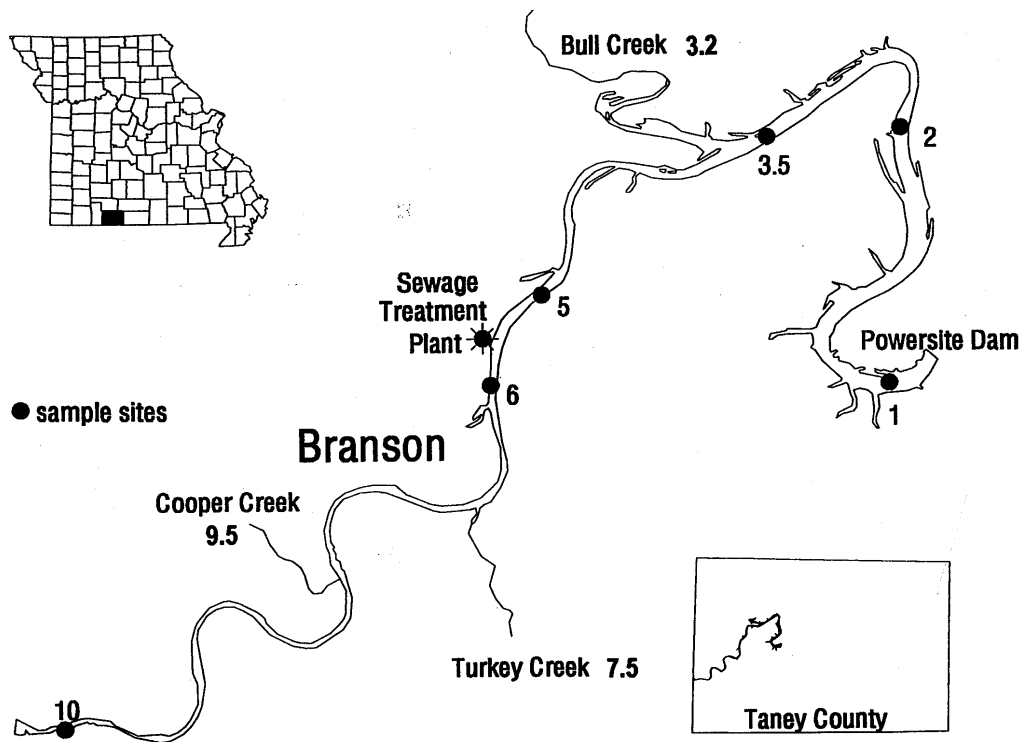


Figure 29. Location of Lake Taneycomo's sample sites.

2000 Results

Lake Taneycomo was sampled at six lake sites, three inflowing streams and the Branson Sewage Treatment Plant (STP) during 2000. Sites 3.5, 3.2, 1 and 2 were sampled five times. Sites 7.5, 6, 5, and the STP were sampled six times. Sites 9.5 and 10 were sampled seven times. Parameters exhibited the following results:

- ▶ Although elevated nutrient levels at Site 5 are a very common occurrence (this site is just downstream from the outlet pipe of the Branson Sewage Treatment Plant) there were no extreme values recorded this year at Site 5.
- ▶ Four out of the six phosphorus values measured at the STP site were $<100 \mu\text{g/L}$.
- ▶ The maximum phosphorus values at all sites occurred within two days of each other in early June. Volunteers reported no power generation had occurred for days before this sample.
- ▶ Site 2 only had four phosphorus samples, therefore the box on the box plot could skew the overall appearance of the box and how it compares to the other boxes on the graph.
- ▶ Maximum chlorophyll values recorded correspond to the maximum phosphorus values of early June. Chlorophyll values decreased and stayed relatively low. There was a relatively high value of $9.2 \mu\text{g/L}$ at Site 10 in late August.
- ▶ Cooper Creek was dry during the second half of the sample season. The season shows extreme variability in phosphorus ($7\mu\text{g/L}$ to $120\mu\text{g/L}$) with less variability in the nitrogen values ($490\mu\text{g/L}$ to $1110\mu\text{g/L}$). The samples taken on 7-20 were taken during a rainstorm. Extreme ISS values of 331mg/L and a Secchi reading of only 3 inches (a new record for the shallowest LMVP Secchi) were recorded.
- ▶ 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. Bull Creek did record an elevated phosphorus value of $121 \mu\text{g/L}$ on the last sample.
- ▶ Site 10 was oligotrophic based on average chlorophyll values. All other lake sites were mesotrophic 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.
- ▶ See page 75 for long term trend analysis.

Table 13. Descriptive statistics for lake sites on Lake Taneycomo - 2000.

Parameter		Site					
		10	6	5	3.5	2	1
Chlorophyll ($\mu\text{g/L}$)	average	2.8	7.0	5.9	4.8	23	5.1
	median	1.9	1.3	1.7	2.4	22	2.8
	minimum	0.5	0.8	1.0	1.3	12	1.4
	maximum	9.2	26.9	23.5	15.5	37	13.9
Phosphorus ($\mu\text{g/L}$)	average	13	19	24	18	23	19
	median	11	18	23	16	22	14
	minimum	7	7	11	8	12	12
	maximum	22	44	35	40	37	37
Nitrogen ($\mu\text{g/L}$)	average	570	538	567	472	545	540
	median	630	525	570	460	525	540
	minimum	380	340	410	320	480	450
	maximum	660	820	770	580	650	600
Secchi (inches)	average	31	96	100	74	81	72
	median	30	89	96	73	97	78
	minimum	21	34	33	37	37	43
	maximum	42	168	182	109	103	96

Table 14. Descriptive statistics for Lake Taneycomo supplemental sampling sites - 2000.

Site		Nitrogen ($\mu\text{g/L}$)	Phosphorus ($\mu\text{g/L}$)	ISS (mg/L)
Turkey Creek (Site 7.5)	average	497	31	4.4
	median	495	31	3.8
	minimum	360	27	2.4
	maximum	630	39	6.5
Bull Creek (Site 3.2)	average	683	47	6.6
	median	510	22	6.5
	minimum	430	21	3.8
	maximum	1295	121	9.1
Sewage Treatment Plant	average	4142	191	x
	geometric mean*	2795	133	x
	median	2855	58	x
	minimum	910	22	x
	maximum	12880	833	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.

Some samples were collected at site 9.5, Cooper Creek, but the site was dry for half of the year. Too few values to report.

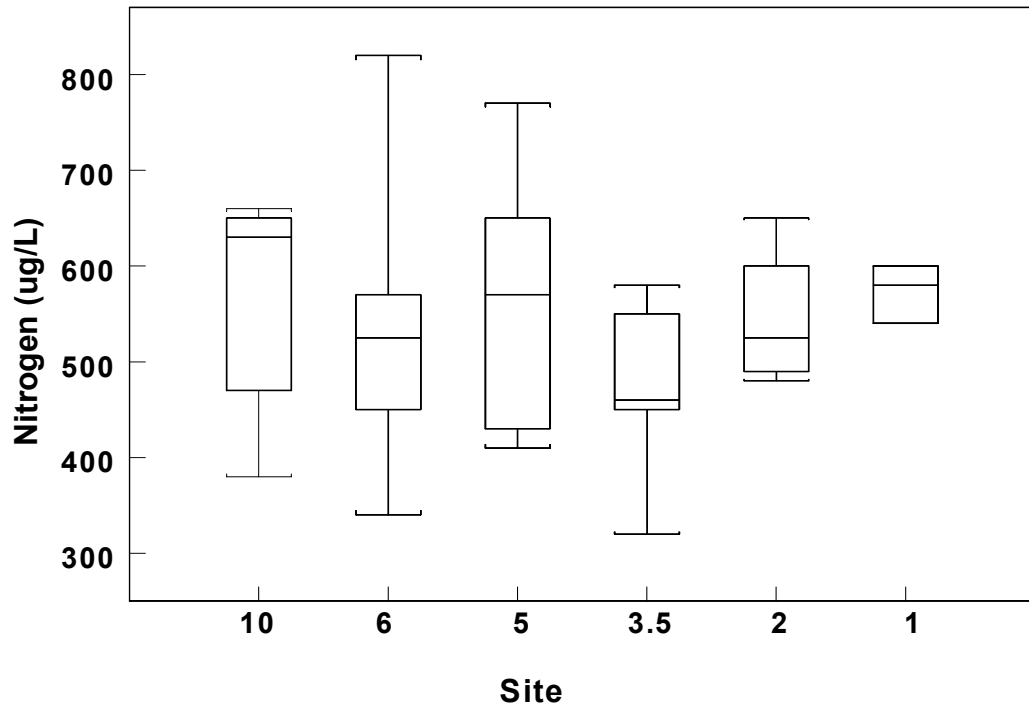


Figure 30. Nitrogen values for Lake Taneycomo - 2000.

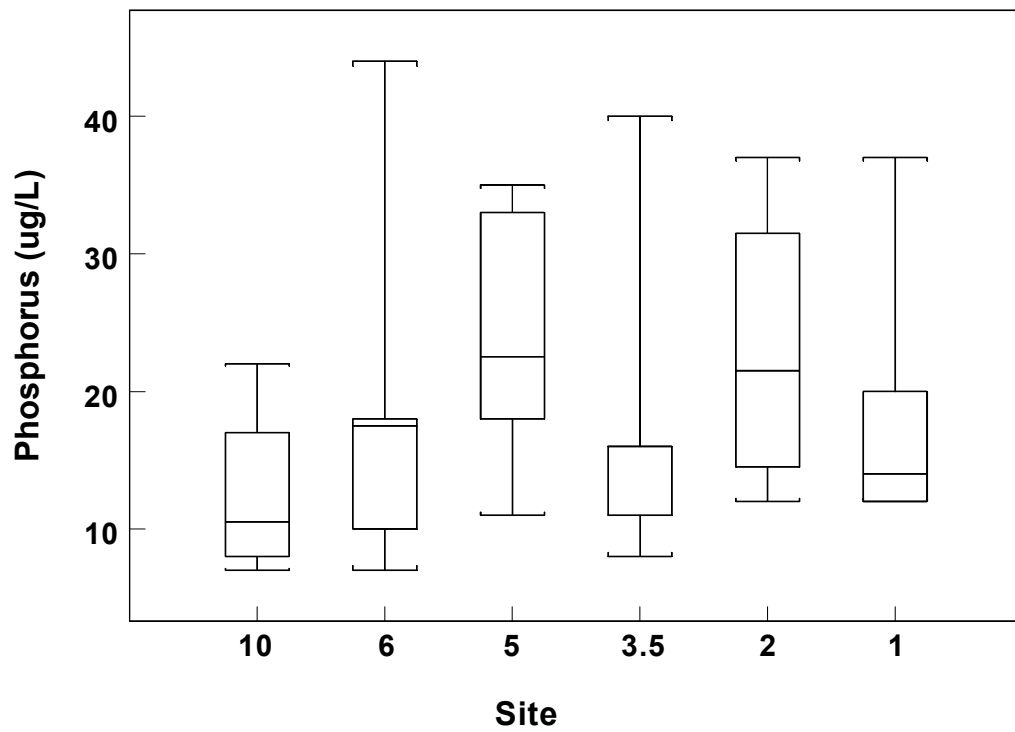


Figure 31. Phosphorus values for Lake Taneycomo - 2000.

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 sites 5, 6, 7.5, 9.5 and 10.
- ▶ The extremely high values this year are probably due to the low flow from Table Rock Lake. Low flow decreases the volume of water moving through Taneycomo, therefore the releases from the treatment plant are not diluted and dispersed throughout the lake.

Table 15. Coliform colonies per 100 ml of sample from Lake Taneycomo sites on eight separate dates in 2000.

Site	Location	April 23	May 14	June 4	June 25	July 16	Aug. 6	Aug. 27	Sept. 17
1	Powersite Dam	x	x	x	134	54	x	185	x
2	5 mile	x	x	x	128	69	x	185	x
3.5	Bull Creek	x	x	x	114	60	x	38	x
5	12 mile	<1	x	36	21250	204	x	x	24
6	12.5 mile	480	x	402	6300	1850	x	x	24
7.5	Turkey Creek	2857	x	1600	6702	1250	x	x	65
9.5	Cooper Creek	320	1010	x	2525	tntc	x	x	x
10	Fish Hatchery	450	8320	x	86	2100	157	x	12
	Boat Ramp	5	810	x	230	2900	138	x	12

x = no sample collected

tntc = too numerous to count.