

Lamar Lake

Lamar Lake provides drinking water for the City of Lamar. This 147 acre lake has a 3055 acre watershed that is comprised of 11% forest, 65% grassland, 15% cropland, and 4% urban. The high ratio of watershed size to lake volume limits the ability of Lamar Lake to dilute and settle out inputs of nutrients and sediments.

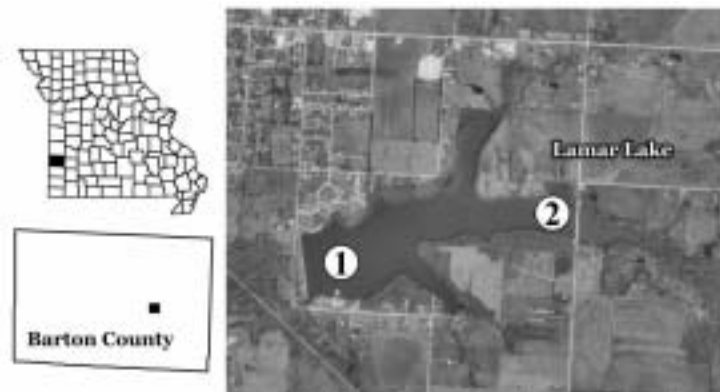


Figure 52. Location of Lamar Lake.

2004 Results

Figures 53 and 54 show how the parameters nitrogen, phosphorus, algal chlorophyll, inorganic suspended solids and Secchi transparency varied in Lamar Lake during 2004. The descriptive statistics appear in Tables 15 and 16.

A brief description of the results:

- Nutrients, chlorophyll and Secchi generally follow the same pattern through the season. This suggests that algae were limited by nutrient concentrations in Lamar Lake.
- Lamar Lake's maximum observed 2005 chlorophyll concentration occurred at Site 2 on June 11. This value is quite high and equals the phosphorus concentration, indicating the presence of an algae bloom. The same phenomenon is observed at Site 1, 3 weeks later.
- Secchi transparency never exceeds 3 feet at either site, due to algal biomass. Algae were efficiently using available nutrients, due to low ISS concentrations.
- Concentrations of ISS are low, given the location of the lake, the watershed land use and hydrology.
- The residence time of the lake is less than 5 months, probably a large factor in its high nutrient concentrations.
- Nutrient concentrations were 20-25% lower at Site 1 than at Site 2, reflecting some loss of nutrients to the settling of algae to the bottom.

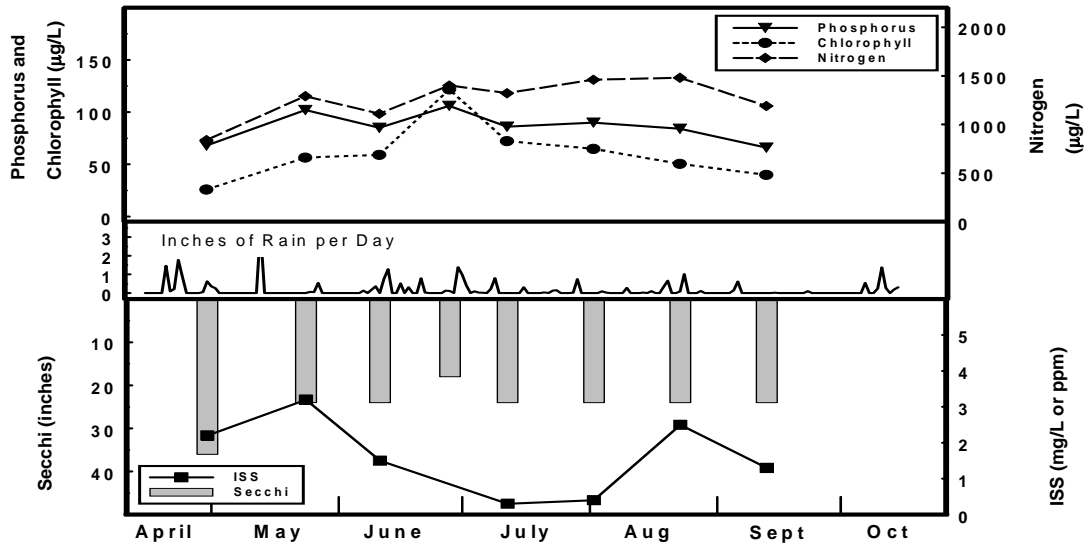


Figure 53. Seasonal fluctuations of parameters for Lamar Lake Site 1 – 2004

Table 15. Descriptive statistics for Lamar Lake Site 1 – 2004.

	Secchi (inches)	TP (ug/L)	TN (ug/L)	CHL (ug/L)	ISS (mg/L)
Geometric Mean	24	85	1243	56.1	1.2
Minimum	18	66	840	25.8	0.3
Maximum	36	106	1480	121.8	3.2
Number of Samples	8	8	8	8	7

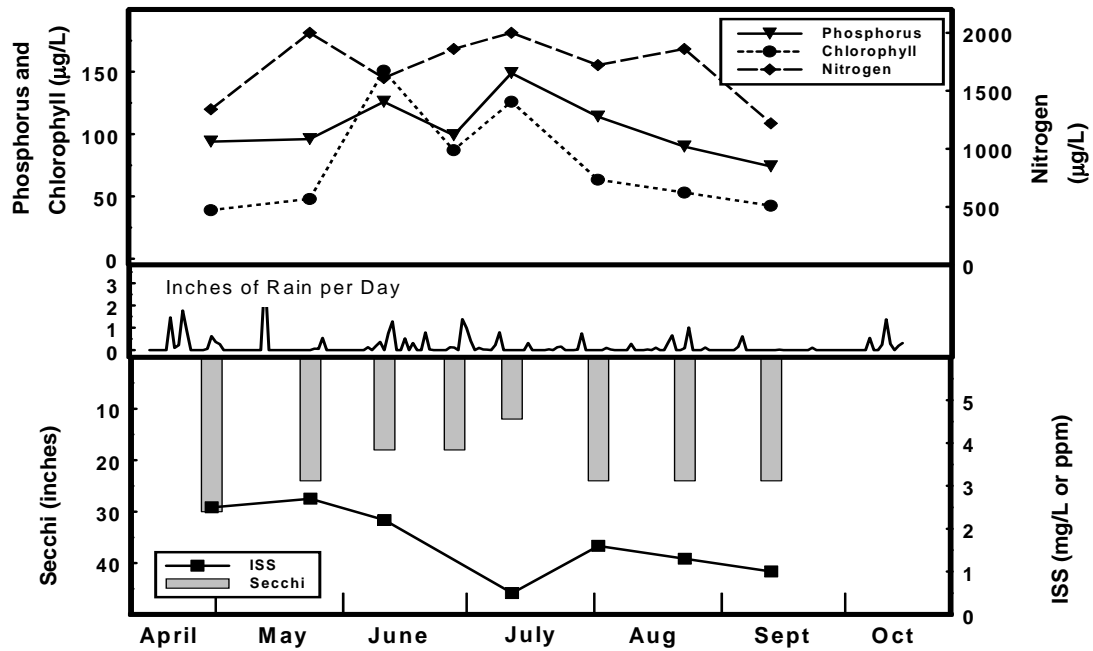


Figure 54. Seasonal fluctuations of parameters for Lamar Lake Site 2 – 2004

Table 16. Descriptive statistics for Lamar Lake Site 2 – 2004.

	Secchi (inches)	TP (ug/L)	TN (ug/L)	CHL (ug/L)	ISS (mg/L)
Geometric Mean	21	103	1677	67.6	1.5
Minimum	12	74	1220	38.9	0.5
Maximum	30	149	2000	150.9	2.7
Number of Samples	8	8	8	8	7