

Lamar City Lake



Site 1

2010 DATA

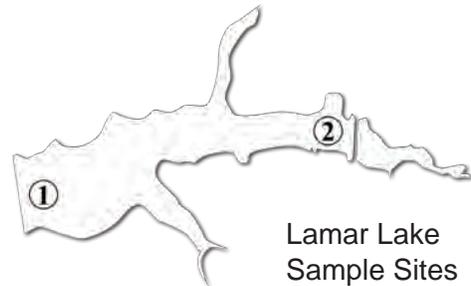
Barton County
 Latitude: 37.4801 Longitude: -94.2602

| Date | 4/30 | 5/21 | 6/11 | 7/2 | 7/23 | 8/16 | 8/31 | 9/20 | Mean |
|-----------------|------|------|------|------|------|------|------|------|------|
| Secchi (inches) | 42 | 18 | 30 | 24 | 24 | 32 | 24 | 30 | 27 |
| TP (µg/L) | 85 | 117 | 77 | 98 | 115 | 98 | 90 | 60 | 91 |
| TN (µg/L) | 950 | 640 | 1040 | 890 | 1320 | 1590 | 1240 | 960 | 1044 |
| CHL (µg/L) | 13.4 | 11.3 | 43.9 | 76.7 | 45.5 | 57.7 | 31.5 | 19.8 | 30.9 |
| ISS (mg/L) | 3.7 | 17.1 | 2.1 | 1.7 | 2.3 | 1.1 | 3.2 | 1.9 | 2.8 |

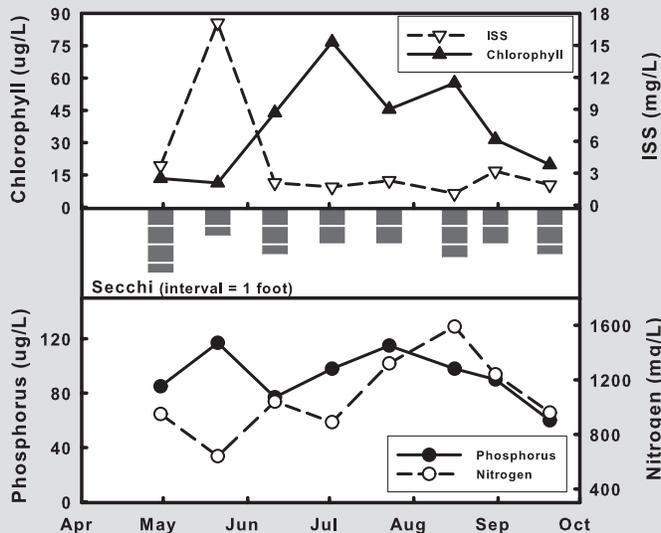
Similar to the pattern observed in previous years, nitrogen levels in Lamar City Lake generally increased as the sampling season progressed. This differs from the pattern observed in most Missouri lakes, where nitrogen concentrations decrease through the summer. Lamar City Lake tends to have high levels of phosphorus relative to nitrogen, creating a situation where blue-green algae that have the ability to fix atmospheric nitrogen may have a competitive advantage over other types of algae. These algae will create floating mats across the surface of the lake and are not desirable due to aesthetic issues, potential taste and odors problems and their general poor quality as a food item for aquatic life.

Inorganic suspended sediment values have been low in Lamar City Lake, with an overall average of around 2mg/L. This is a low level of suspended sediment for a lake located in the

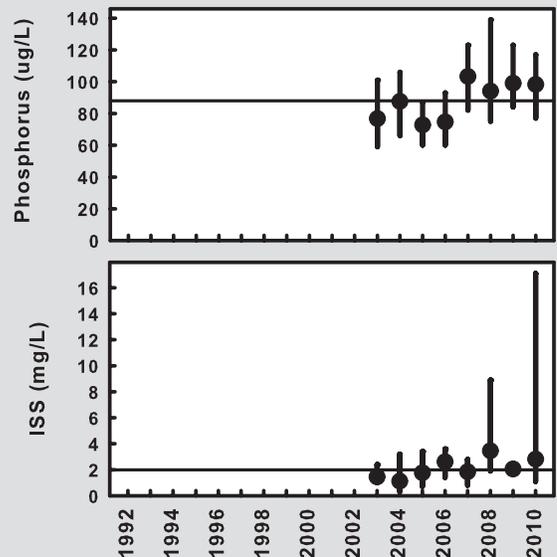
Osage Plains Region of the state (regional average of 6.8 mg/L). The two high values that have been measured (6/10/2008 and 5/21/2010) in Lamar City Lake were samples collected on days preceding substantial rain events (1.9" and 2.3", respectively). Average phosphorus values for the last four summers have been higher than the long-term average (and higher than those measured between the years 2003-06). None of the other parameters reflect this pattern.



2010 GRAPHS



TREND GRAPHS



See pages 10-11 for help interpreting graphs

Lamar City Lake



Site 2

2010 DATA

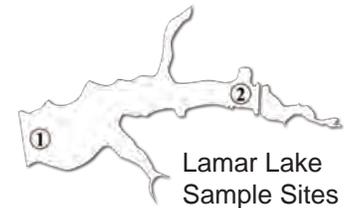
Barton County
Latitude: 37.483 Longitude: -94.2451

| Date | 4/30 | 5/21 | 6/11 | 7/2 | 7/23 | 8/16 | 8/31 | 9/20 | Mean |
|-----------------|------|------|------|------|------|------|------|------|------|
| Secchi (inches) | 42 | 18 | 28 | 24 | 24 | 36 | 24 | 32 | 28 |
| TP (µg/L) | 72 | 106 | 102 | 147 | 103 | 85 | 82 | 65 | 92 |
| TN (µg/L) | 1010 | 630 | 1400 | 1110 | 1160 | 1050 | 1180 | 810 | 1018 |
| CHL (µg/L) | 18.0 | 21.1 | 89.2 | 71.9 | 69.0 | 43.7 | 38.6 | 30.9 | 41.5 |
| ISS (mg/L) | 3.7 | 10.6 | 2.0 | 2.2 | 1.9 | 2.4 | 1.6 | 1.1 | 2.5 |

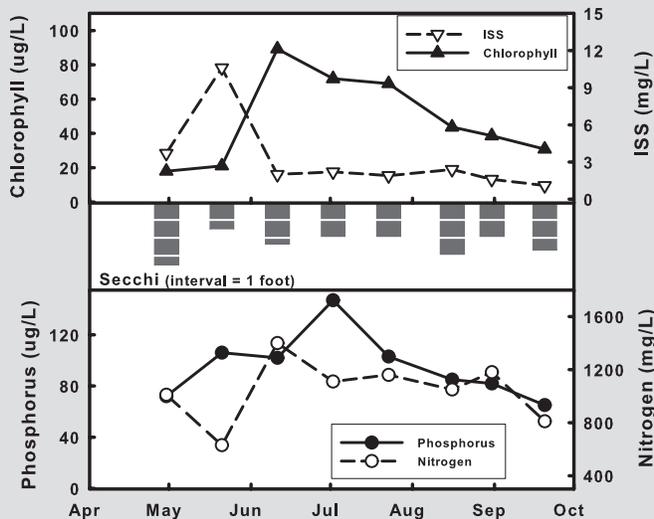
Water quality at Site 2 followed the same general seasonal pattern observed at Site 1. Comparison of the two sites is interesting in that the expected spatial trend of higher nutrient and inorganic suspended sediments concentrations at the up-lake site do not always hold true in this lake. In half the samples (especially in the second half of the season) nutrient levels at Site 1 were higher than at Site 2. Inorganic suspended sediments levels were fairly low at both sites, so the small differences between sites on most sample dates are not significant. The exception would be the May sample when inorganic suspended sediment at the down-lake site was 17.1mg/L compared to 10.6mg/L at the up-lake site. This represents a notable difference that goes against the norm. Algal chlorophyll was the one parameter that showed a tendency for higher values at the up-lake site (though not always). On two occasions the chlorophyll up-lake was twice the level

at the dam (May and June).

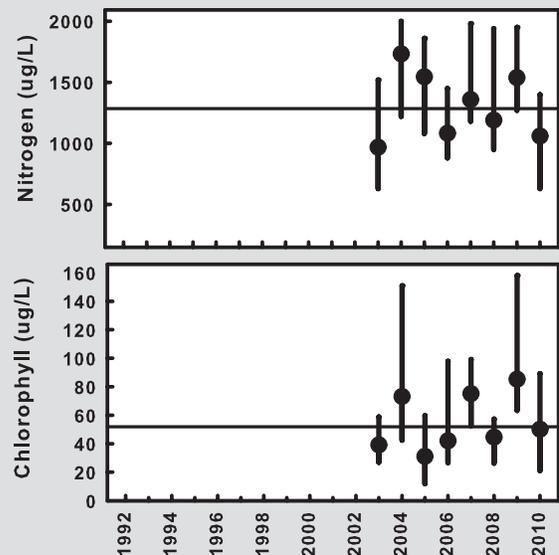
Chlorophyll levels at Site 2 have fluctuated both within and among years. Comparison of the long-term chlorophyll and long-term nitrogen graphs show similar trends. Site 2 in Lamar City Lake tends to have nitrogen concentrations that are low relative to phosphorus values. The ratio of nitrogen to phosphorus, which is useful in gauging which nutrient limits algal growth, tends to range from 11 to 15 units of nitrogen for each unit of phosphorus. This ratio suggests that both nutrients are important in determining algal growth (depending on the species of algae present at any given time). This may explain why chlorophyll mimics nitrogen in the long-term graphs.



2010 GRAPHS



TREND GRAPHS



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