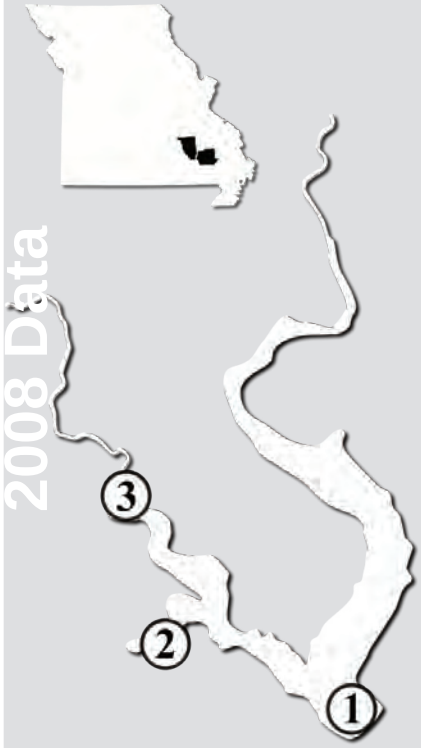
Clearwater Lake



Reynolds and Wayne County

Site 1

Latitude 37.1376 Longitude -90.7744

Date	Secchi (inches)	TP (µg/L)	TN (µg/L)	CHL (µg/L)	ISS (mg/L)
5/3	57	9	140	5.3	2.3
5/23	71	8	110	4.1	1.6
6/9	79	6	110	3.2	1.1
7/7	60	13	120	6.3	2.5
7/28	78			8.8	0.6
8/19	70	15	170	6.6	1.5
9/12	58	13	190	8.0	2.1
10/4	30	15	270	9.2	6.9

Site 2

Latitude 37.1478 Longitude -90.8069

Date	Secchi (inches)	TP (µg/L)	TN (µg/L)	CHL (µg/L)	ISS (mg/L)
5/3	31	21	280	6.3	9.6
5/23	51	12	150	5.0	2.8
6/9	28	20	170	5.2	8.4
7/7	25	33	280	10.5	10.1
7/28	20	33	250	10.2	11.6
8/19	24	30	230	7.3	11.4
9/12	30	23	190	8.2	8.6
10/4	40	10	100	0.6	3.8

Site 3

Latitude 37.1664 Longitude -90.8116

Date	Secchi (inches)	TP (µg/L)	TN (µg/L)	CHL (µg/L)	ISS (mg/L)
5/3	24	15	230	4.9	6.5
5/23	40	14	190	6.5	4.6
6/9	21	20	160	10.8	7.9
7/7	24	31	240	8.9	10.8
7/28	18	24	200	5.4	6.1
8/19	18	42	220	7.7	23.3
9/12	26	14	190	7.2	5.0
10/4	54	6	120	0.5	3.5

Site 1

The three sites monitored in Clearwater Lake differ in their 2010 seasonal patterns, which probably reflect the difference in their location within the lake. Water quality at Site 1 at the dam was consistent during the season, with slight increases in the nutrients and chlorophyll during the second half of the season. High inorganic suspended sediment and nitrogen values were measured on the last sample day of the season, October 4. These higher values were probably a result of the lake surface cooling off and the lake water mixing deeper, incorporating water from the lower layer of the lake.

Site 2

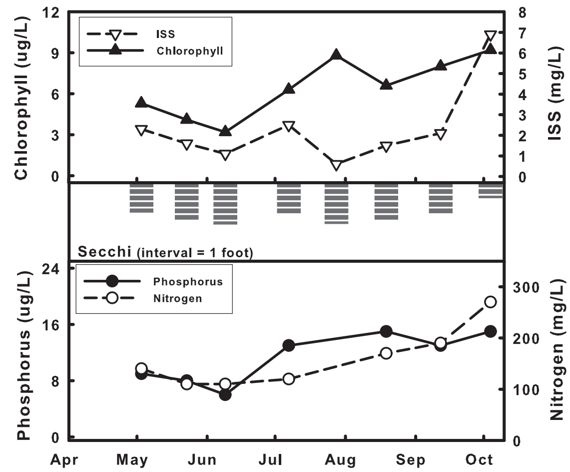
The water quality parameters at Site 2, located in a tributary flowing into the Logan Creek Arm of the lake, all followed the same general pattern during the 2010 season. Nutrients, algal chlorophyll and inorganic suspended sediment all decreased from the first to second sample, followed by an increase to peak values in July, and another decrease through fall. Secchi transparency reflects the seasonal changes in chlorophyll and suspended sediment, with the deepest readings occurring in late-May and October.

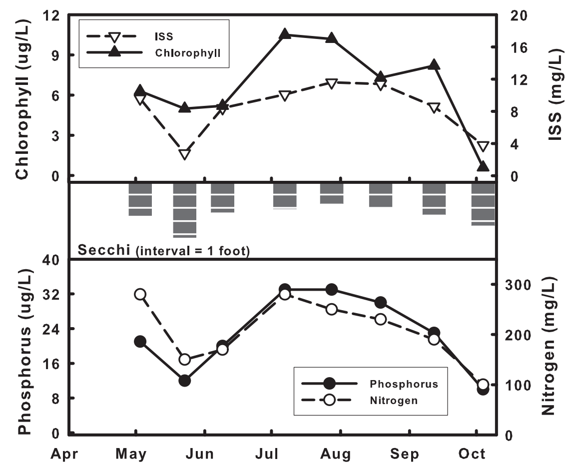
Site 3

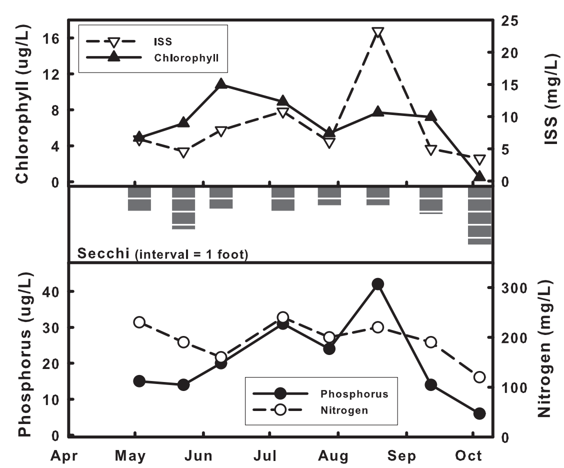
At Site 3, located in the upper portion of the Logan Creek Arm, there was not the synchronization of parameters seen at the other two sites. There was a very strong relation between phosphorus and inorganic suspended sediment values at this site. This is common as phosphorus tends to bind to soil materials and enter the lake as part of erosional runoff.

Water quality at sites 2 and 3 (both located in a tributary of the lake) differed from that of Site 1, but the differences were not consistent among the water quality parameters. The most notable difference was inorganic suspended sediment levels were about four times higher in the tributary sites compared to the dam. The higher levels of suspended sediment were accompanied by more phosphorus, though levels at tributary sites were only 2 times higher than at the dam. Nitrogen was only slightly higher at tributary sites. Water clarity at tributary sites was about half of that measured at the dam. Increased clarity at the dam relate to lower levels of suspended sediment and not differences in chlorophyll levels, as all three sites had similar chlorophyll levels.

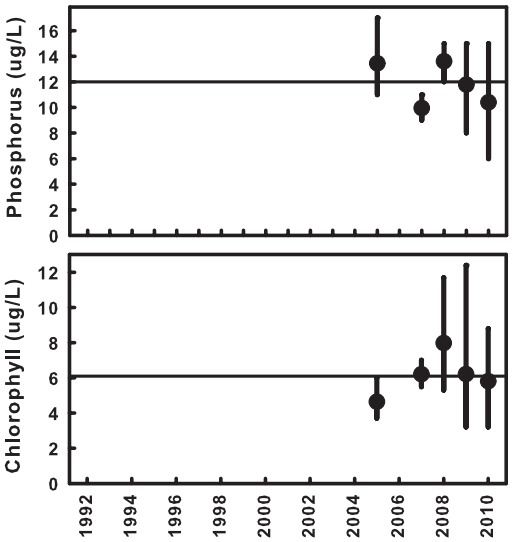
2010 Seasonal Graphs







Long-Term Trend Graphs

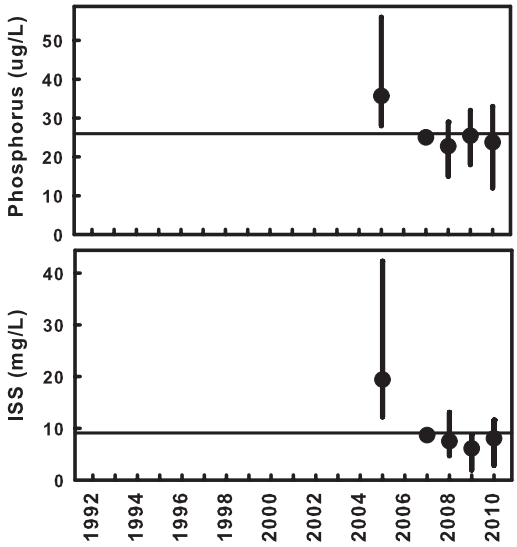


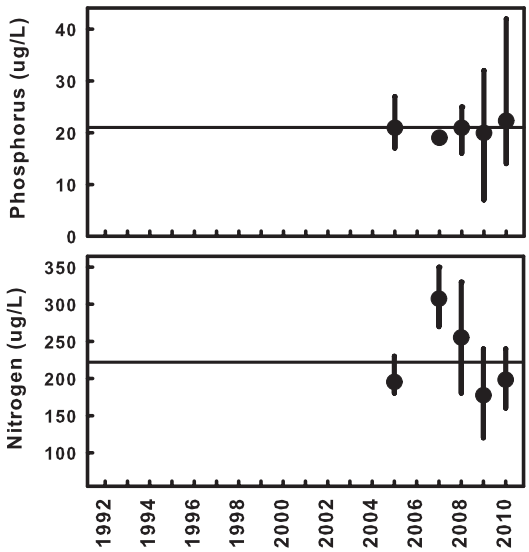
Site 1

The year-to-year shifts in average chlorophyll values at Site 1 have mimicked the annual fluctuations in phosphorus over the last four summers. Values from 2005 do not fit the pattern, as phosphorus levels were higher than the long-term average and chlorophyll was lower than average. During the summer of 2005 the nitrogen concentrations were extremely low, and nitrogen probably limited the production of algal chlorophyll. There are no obvious trends in water quality at Site 1.

Site 2

The long-term graphs for Site 2 show just how tight the parameters phosphorus and inorganic suspended sediment relate to each other. Values from the last four years have been stable relative the higher levels measured in 2005. Phosphorus is often bound to soil particles, explaining this strong relationship. Water clarity as measured with the Secchi disk also trends with suspended sediment. Currently there are no long-term trends in water quality at Site 2.





Site 3

The year-to-year trends in phosphorus and nitrogen differ at Site 3 in Clearwater Lake. Summertime averages for phosphorus have been very similar for the five years of monitoring, while average nitrogen values have varied from roughly 174 to 300µg/L. This range in nitrogen is common in Missouri lakes, and it is the stability of the phosphorus concentrations that is unusual. None of the parameters show obvious long-term trends.