

Pomme de Terre Lake



Site 1

2010 DATA

Hickory and Polk County
 Latitude: 37.892 Longitude: -93.3108

Date	X	5/7	6/11	6/26	7/25	8/13	8/27	10/11	Mean
Secchi (inches)		115	60	65	86	62	65	36	66
TP (µg/L)		16	32	18	14	15	17	36	20
TN (µg/L)		490	520	410	400	470	420	590	467
CHL (µg/L)		8.8	28.2	6.2	6.4	11.7	10.7	40.8	12.6
ISS (mg/L)		0.1	1.4	0.7	0.5	1.5	0.6	0.7	0.6

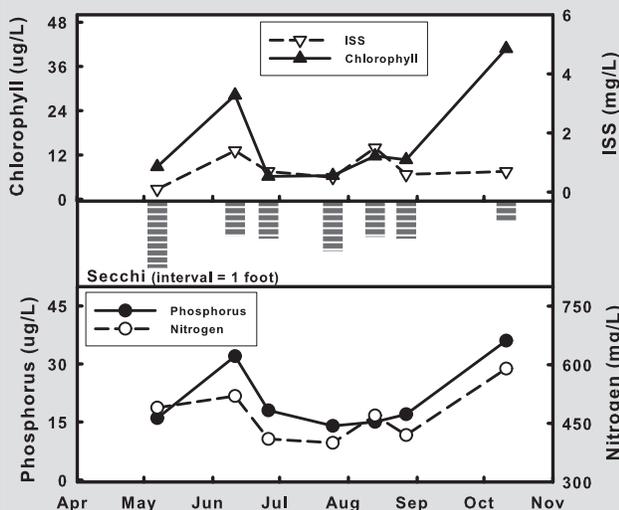
Pomme de Terre Lake sampling sites



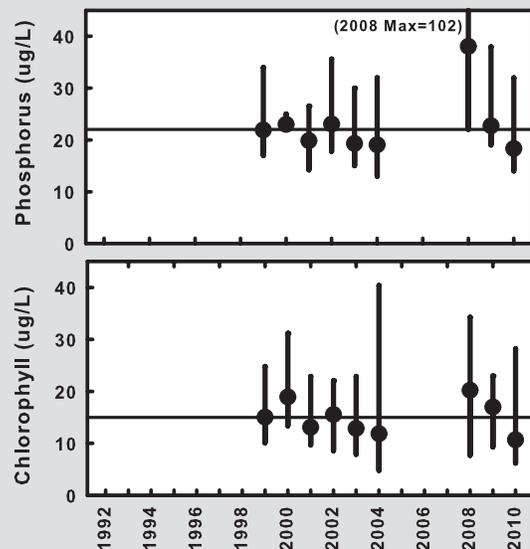
Phosphorus, nitrogen and algal chlorophyll tracked each other across the sample season, with peaks in early June and October. The ratio of chlorophyll to phosphorus (a measure of how efficient algae are at using the nutrient) ranged from 0.34 to 1.13, with a 0.68 average. Statewide this ratio tends to be around 0.40, suggesting the algal community in Pomme de Terre Lake was exceptionally efficient in 2010. One explanation for the high chlorophyll to phosphorus ratio is the low levels of inorganic suspended sediments. The average suspended sediment concentration in 2010 for Site 1 was 0.6mg/L, a value that was 40% of the regional average (1.5mg/L) and only 11% of the statewide average (5.5mg/L). Lower levels of suspended sediment translate to increased sunlight penetration and improved photosynthesis by the algae.

With the exception of 2008, phosphorus concentrations at Site 1 have shown nominal variation within individual summers (phosphorus ranges about 15µg/L most summers) and similar mean values among sampling seasons (range of summer means = 18 - 23µg/L). Comparison of phosphorus and chlorophyll data show similar year-to-year fluctuations. On average, chlorophyll values vary about 19µg/L during individual summers, a value that is close to that seen in phosphorus. Mean values for chlorophyll range from 10.7 – 18.9µg/L. none of the parameters displayed long-term trends.

2010 GRAPHS



TREND GRAPHS



See pages 10-11 for help interpreting graphs

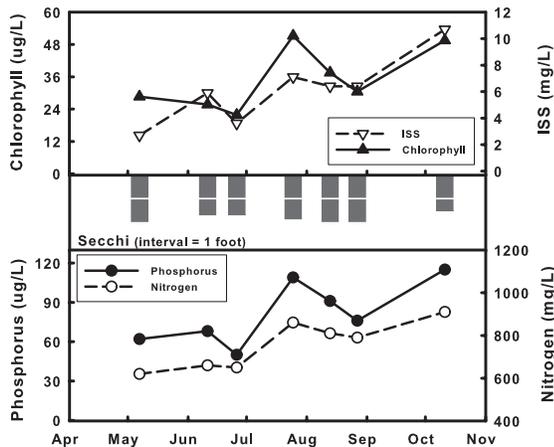
Pomme de Terre Lake

Site 3

2010 DATA

Hickory and Polk County
Latitude: 37.8357 Longitude: -93.2636

Date	X	5/7	6/11	6/26	7/25	8/13	8/27	10/11	Mean
Secchi (inches)		24	20	20	22	24	24	18	22
TP (µg/L)		62	68	50	109	91	76	115	78
TN (µg/L)		620	660	650	860	810	790	910	750
CHL (µg/L)		28.6	25.7	21.8	51.2	37.5	30.5	49.5	33.4
ISS (mg/L)		2.7	5.9	3.6	7.1	6.4	6.4	10.7	5.6



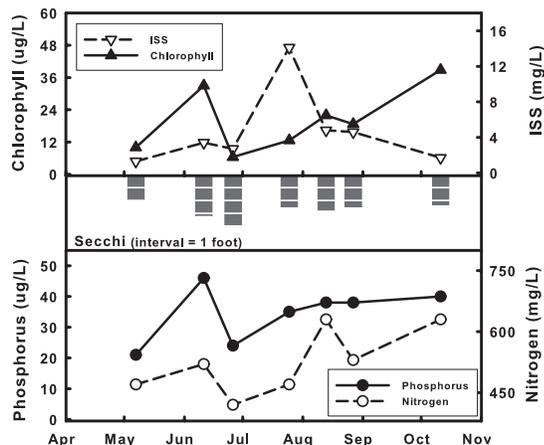
Phosphorus, nitrogen, chlorophyll and inorganic suspended sediment all showed a general trend of increasing concentrations as the sample season progressed. The other Pomme de Terre sites displayed fluctuations in water quality as the season progressed, but not the distinct pattern observed at Site 3. This pattern differs from most Missouri lakes which display a seasonal pattern of highest nutrient and suspended sediment values in the spring time, with decreasing levels as the summer progresses. Because algal chlorophyll and inorganic suspended sediment values levels were consistently moderate to high, Secchi transparency never exceeded 24 inches during the course of the 2010 sample season.

Site 4

2010 DATA

Hickory and Polk County
Latitude: 37.8337 Longitude: -93.3629

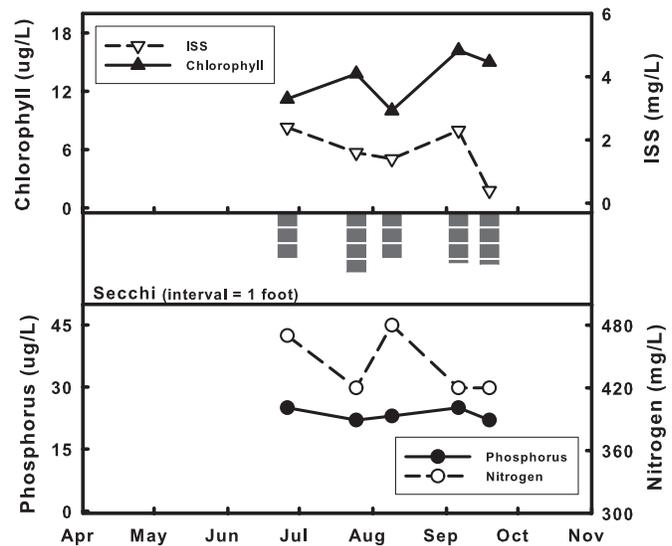
Date	X	5/7	6/11	6/26	7/25	8/13	8/27	10/11	Mean
Secchi (inches)		24	38	48	30	33	30	28	32
TP (µg/L)		21	46	24	35	38	38	40	33
TN (µg/L)		470	520	420	470	630	530	630	519
CHL (µg/L)		10.0	33.0	6.4	12.6	21.9	18.7	38.8	17.1
ISS (mg/L)		1.3	3.4	2.7	14.1	4.8	4.6	1.7	3.5



The same seasonal fluctuations in water quality were observed at sites 1 and 4, suggesting a strong link between these two sites. The only real difference between the two site in terms of patterns was a July peak in suspended sediment at Site 4, which showed up at Site 1 in August. While the patterns were the same, nutrient, suspended sediment and chlorophyll concentrations at Site 4 were higher than those measured at Site 1. The lower concentrations at the dam site reflect the loss of suspended materials and nutrients to sedimentation.

Pomme de Terre Lake

Site 5		2010 DATA					Hickory and Polk County		
	X	X	X	6/26	7/25	8/9	9/6	9/19	Mean
Secchi (inches)				36	46	36	39	40	39
TP (µg/L)				25	22	23	25	22	23
TN (µg/L)				470	420	480	420	420	441
CHL (µg/L)				11.2	13.8	10.0	16.2	15.0	13.0
ISS (mg/L)				2.4	1.6	1.4	2.3	0.4	1.4



Site 5 is located in the tributary located between the much larger arms of the lake. The watershed that drains into this area is relatively small, with a fair amount of forest land cover. This site was only sampled during the last half of the season, so we are limited in commenting on seasonal trends. Water quality at Site 5 was extremely stable during the four months of sampling, with only

minor fluctuations in nutrient, chlorophyll and suspended sediment concentrations. Nutrient levels were similar to those measured at Site 1, as were chlorophyll concentrations. Site 5 did have slightly more suspended sediment, leading to Secchi transparency readings that were about 50% of those measured at the dam.

Pomme de Terre Lake

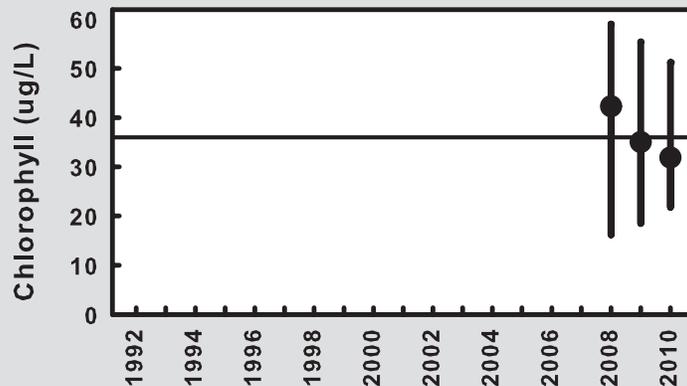
Trends (Sites 3, 4 and 5)

Sites 3 and 4 have been monitored for three years while 2010 was the first season for Site 5. We do not have enough data to truly evaluate for long-term trends, but we can start to identify the normal variation that can be expected at these sites. Phosphorus concentrations at both sites have shown the same year-to-year pattern of decreasing average values since 2008. The difference in phosphorus levels among years probably relates to differences in rainfall. Total rainfall in 2008 was 56.1 inches, 53.1 inches in 2009 and 43.1 inches in 2010. More rainfall generally equates to more nutrient inputs from the watershed. Site 3 had the same long-term pattern, with values that were twice those measured at Site 4. Chlorophyll concentrations follow the same pattern as phosphorus (this nutrient usually limits algal growth). Again, there were higher values at Site 3 than Site 4.

Not only is water quality at these sites related to the overall rainfall within the watershed, these sites can also respond to short-term events. The inorganic suspended sediment data from Site 4 show higher values in 2010 compared to the two previous summers. The maximum value of 14.1 mg/L was measured a week after it had rained 3 inches in a single day. This extreme rain event led to an abnormal suspended sediment measurement that skews the data (the next two sample dates had the second and third highest suspended sediment values, respectively).

TRENDS

Site 3



Site 4

