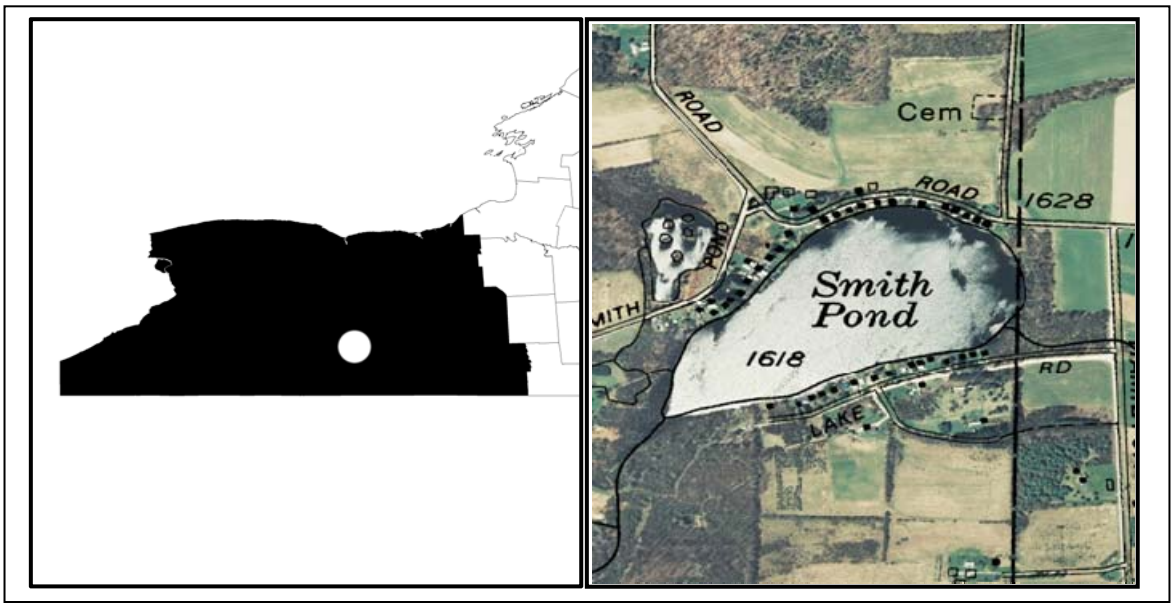
# CSLAP 2011 Lake Water Quality Summary:
# Smith Pond

## General Lake Information

| | |
|---|---|
| **Location** | Town of Howard |
| **County** | Steuben |
| **Basin** | Chemung River |
| **Size** | 18.1 hectares (44.7 acres) |
| **Lake Origins** | Augmented by Dam |
| **Watershed Area** | 143.3 hectares (353.9 acres) |
| **Retention Time** | 1.2 years |
| **Mean Depth** | 3.8 meters |
| **Sounding Depth** | 8 meters |
| **Public Access?** | no |
| | |
| **Major Tributaries** | no named tribs |
| **Lake Tributary To…** | unnamed outlet to Goff Creek to Cohocton River to Chemung River to Susquehanna River |
| | |
| **WQ Classification** | B (contact recreation = swimming) |
| **Lake Outlet Latitude** | 42.386 |
| **Lake Outlet Longitude** | -77.479 |
| | |
| **Sampling Years** | 2004-2011 |
| **2011 Samplers** | Lorraine Manelis, Frank Dass |
| **Main Contact** | Lorraine Manelis |

## Lake Map



## Background

Smith Pond is a 45 acre, class B lake found in the Town of Howard in Steuben County, in the western region of New York State. It was first sampled as part of CSLAP in 2003.

It is one of four CSLAP lakes among the more than 20 lakes found in Steuben County, and one of nine CSLAP lakes among the more than 50 lakes and ponds in the Allegheny River drainage basin.

## Lake Uses

Smith Pond is a Class B lake; this means that the best intended use for the lake is for contact recreation—swimming and bathing, and non-contact recreation—fishing and boating. The lake is used by lake residents and invited guests for boating and swimming. There is no public access to the lake.

It is not known by the report authors if Smith Pond has been stocked by lake residents or municipal officials.

General statewide fishing regulations are applicable in Smith Pond. In addition, the open season on trout runs from April 1st through October 15th, with no size limit and a daily take limit of five fish, with no more than two fish greater than 12 inches.

## Historical Water Quality Data

CSLAP sampling was conducted on Smith Pond from 2004 to 2011. The CSLAP reports for each of the past several years can be found on the NYSFOLA website at http://nysfola.mylaketown.com. The 2009 and 2010 CSLAP reports for Smith Pond can also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77838.html.

Smith Pond was sampled by the NYS Conservation Department (the predecessor to the NYSDEC) in July of 1937 as part of the Biological Survey of the Allegany River basin. Extensive water sampling was not conducted as part of this survey. However, the limited water quality data indicated that oxygen depletion occurred below a depth of at least 15 feet. pH readings were elevated at the lake surface, suggesting that algal blooms may have been common.

There are no RIBS monitoring sites on or near Smith Pond, and none of the tributaries are named nor have they been sampled through any statewide monitoring programs.

## Lake Association and Management History

Smith Pond is served by the Smith Pond Association and the Smith Pond Sportsman Association (formed in 1959 and incorporated in 1965). Recreational and management activities at the lake include:

- ice skating and fishing
- a boat parade, fireworks, and picnics
- weed harvesting back in the early years of the Association, mostly for lily control
- promotion of watershed management actions with the Steuben County Soil and Water Conservation District

The lake association maintains a website at http://www.smithpondny.com/.

## Summary of 2011 CSLAP Sampling Results

## Evaluation of 2011 Annual and Monthly Results Relative to 2006-2010

The Lake Condition Summary Table below and Appendix B compare annual and monthly results from 2011 to those measured in previous CSLAP sampling seasons. The pertinent deviations from normal conditions are discussed below.

## Evaluation of Eutrophication Indicators

Each of the trophic indicators (water clarity, chlorophyll *a*, and total phosphorus) were close to normal in 2011, despite much higher than normal algae levels in June and July. Algae levels have generally been higher in recent years, although neither phosphorus readings nor lake water clarity has exhibited any clear trends over this period. The lake can be characterized as *eutrophic*, or highly productive, based on water clarity, chlorophyll *a*, and total phosphorus readings (all typical of *eutrophic* lakes). The trophic state indices (TSI) evaluation suggests that each of these trophic indicators is "internally consistent"—each of these indicators is in the expected range given the readings of the other indicators. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

## Evaluation of Potable Water Indicators

Algae levels are usually high enough to render the lake susceptible to taste and odor compounds or elevated DBP (disinfection by product) compounds that could affect the potability of the water, although the lake is not classified for this use. Deepwater phosphorus readings are higher and deepwater ammonia readings are much higher than those measured at the lake surface, suggesting that deep potable water use would also be compromised (particularly since deepwater ammonia readings regularly exceed the state water quality standards). Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

## Evaluation of Limnological Indicators

Each of the limnological indicators were close to normal in 2011. Conductivity readings have decreased significantly since first evaluated through CSLAP in 2003, although these readings were close to normal in 2011. None of the other limnological indicators has exhibited any clear long-term trends. It is likely that the small changes in each of these indicators have been within the normal range of variability in the lake. Overall limnological conditions are summarized in the Lake Scorecard and Lake Condition Summary Table.

## Evaluation of Biological Condition

Macrophyte surveys were conducted through CSLAP from 2004 to 2008, although it is not known if these surveys could be considered complete inventories. At least 11 aquatic plant species have been found, including at least two exotic plant species (*Myriophyllum spicatum*, Eurasian watermilfoil, and *Potamogeton crispus*, curly-leafed pondweed). The 1930s Biological Survey of the lake found at least 17 plant species, and no exotics. The modified floristic quality index (FQI) for the lake, based on CSLAP plant survey data, indicates that the quality of the aquatic plant community is "fair"; however, it is not known if this plant community has changed significantly since the 1930s.

Information regarding the composition of the fish community is not available. It is likely that the lake can be characterized as a warmwater to coolwater fishery.

Phytoplankton, zooplankton, and macroinvertebrates have not been evaluated through CSLAP in Smith Pond.

Biological conditions in the lake are summarized in the Lake Scorecard and Lake Condition Summary Table.

## Evaluation of Lake Perception

Water quality, aquatic plant and recreational assessments were close to normal in 2011. Despite increasing algae levels and occasionally low water clarity, water quality assessments (and other indicators of lake perception) have not exhibited any clear long-term trends. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

## Evaluation of Local Climate Change

Air and water temperature readings in the summer index period were close to normal in 2011, although air (but not water) temperatures have increased slightly over the last eight years. It is not known if this is an indication of the lack of local climate change or if these indicators are not sensitive enough to measure small but real changes in local climate conditions.

## Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Phycocyanin readings have regularly been above the levels indicating susceptibility for harmful algal blooms (HABs). An analysis of algae samples have indicated microcystin readings below levels needed to support safe swimming in the open water, but at times above these levels within blooms.

# Lake Condition Summary

| Category | Indicator | Min | 03-11 Avg | Max | 2011 Avg | Classification | 2011 Change? | Long-term Change? |
|---|---|---|---|---|---|---|---|---|
| Eutrophication Indicators | Water Clarity | 0.33 | 1.19 | 3.20 | 1.03 | Eutrophic | Within Normal Range | No Change |
| | Chlorophyll *a* | 0.10 | 33.07 | 120.8 | 41.41 | Eutrophic | Within Normal Range | Increasing Significantly |
| | Total Phosphorus | 0.003 | 0.057 | 0.189 | 0.047 | Eutrophic | Within Normal Range | No Change |
| Potable Water Indicators | Hypolimnetic NH4 | 0.02 | 1.08 | 4.71 | 1.19 | Highly Elevated Deepwater NH4 | Within Normal Range | Not known |
| | Hypolimnetic As | | | | | Not measured through CSLAP | | |
| | Hypolimnetic Iron | | | | | Not measured through CSLAP | | |
| | Hypolimnetic Mn | | | | | Not measured through CSLAP | | |
| Limnological Indicators | Hypolimnetic TP | 0.037 | 0.272 | 1.826 | 0.295 | Elevated Deepwater TP Readings | Within Normal Range | Not known |
| | Nitrate + Nitrite | 0.00 | 0.03 | 0.18 | 0.01 | Low NOx | Within Normal Range | No Change |
| | Ammonia | 0.01 | 0.06 | 0.56 | 0.04 | Low Ammonia | Within Normal Range | No Change |
| | Total Nitrogen | 0.37 | 1.07 | 2.00 | 1.16 | High Total Nitrogen | Within Normal Range | No Change |
| | pH | 6.74 | 8.10 | 9.18 | 8.07 | Alkaline | Within Normal Range | No Change |
| | Specific Conductance | 93 | 178 | 252 | 184 | Intermediate Hardness | Within Normal Range | Decreasing Slightly |
| | True Color | 12 | 45 | 407 | 34 | Intermediate Color | Within Normal Range | No Change |
| | Calcium | 19.8 | 24.0 | 30.0 | 24.3 | Highly Susceptible to Zebra Mussels | Within Normal Range | No Change |
| Lake Perception | WQ Assessment | 1 | 2.6 | 5 | 2.4 | Definite Algal Greenness | Within Normal Range | No Change |
| | Plant Coverage | 1 | 2.6 | 5 | 2.9 | Surface Plant Growth | Within Normal Range | No Change |
| | Rec. Assessment | 1 | 2.9 | 4 | 2.9 | Slightly Impaired | Within Normal Range | No Change |
| Biological Condition | Phytoplankton | | | | | Not measured through CSLAP | Not known | Not known |
| | Macrophytes | | | | | Fair quality of the aquatic plant community | Not known | Not known |
| | Zooplankton | | | | | Not measured through CSLAP | Not known | Not known |
| | Macroinvertebrates | | | | | Not measured through CSLAP | Not known | Not known |
| | Fish | | | | | No inventory information available | Not known | Not known |
| | Invasive Species | | | | | Eurasian watermilfoil, curly-leafed pondweed | Not known | Not known |
| Local Climate Change | Air Temperature | 5 | 22.1 | 34 | 22.1 | | Within Normal Range | Increasing Significantly |
| | Water Temperature | 13 | 21.4 | 27 | 21.4 | | Within Normal Range | No Change |
| Harmful Algal Blooms | Open Water Phycocyanin | 36 | 202 | 760 | 111 | Many readings indicate high risk of BGA | Not known | Not known |
| | Open Water Microcystis | 0.0 | 0.3 | 1.1 | 0.6 | All readings indicate low lakewide toxins | Not known | Not known |
| | Shoreline Phycocyanin | | | | | Some shoreline BGA blooms likely | Not known | Not known |
| | Shoreline Microcystis | 0.6 | 6.1 | 28.0 | 28.0 | Shoreline bloom toxins above drinking water criteria but below swimming criteria | Not known | Not known |
| | Other Toxins | | | | | Low anatoxin-a and cylindrospermposin | Not known | Not known |

## Evaluation of Lake Condition Impacts to Lake Uses

Smith Pond is presently among the lakes listed on the 2007 Allegheny/Chemung River drainage basin Priority Waterbody List (PWL), with public bathing and recreation listed as impaired due to heavy algae and weed growth. The PWL listing for Smith Pond is listed in Appendix C.

### Potable Water (Drinking Water)

The CSLAP dataset at Smith Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, and the lake does not support this use. The persistent algal blooms and highly elevated deepwater ammonia readings would likely threaten "unofficial" potable water use of the lake.

### Contact Recreation (Swimming)

The CSLAP dataset at Smith Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that swimming and contact recreation is *impaired* by excessive algae and nutrient levels, and low water clarity, although additional information about bacterial levels is needed to evaluate the safety of the water for swimming.

### Non-Contact Recreation (Boating and Fishing)

The CSLAP dataset on Smith Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that non-contact recreation is *stressed* by excessive weeds, particularly Eurasian watermilfoil.

### Aquatic Life

The CSLAP dataset on Smith Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *stressed* by elevated pH and deepwater anoxia, although additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

### Aesthetics

The CSLAP dataset on Smith Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics are *threatened* by excessive algae, particularly shoreline blooms, and the lake is often described as "looks bad".

### Fish Consumption

There are no fish consumption advisories posted for Smith Pond.

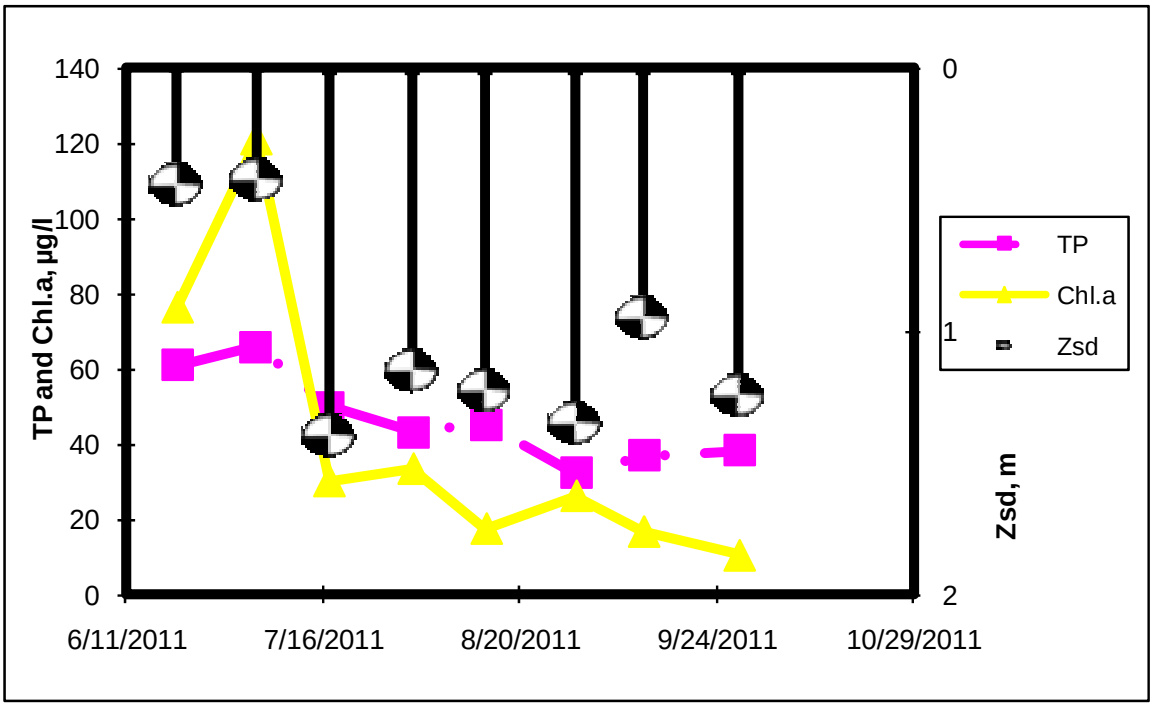
## Additional Comments and Recommendations

Smith Pond would be a good candidate for the DEC biomonitoring study, to evaluate whether benthic (bottom dwelling) organisms are impacted by high nutrient levels or other environmental stressors.

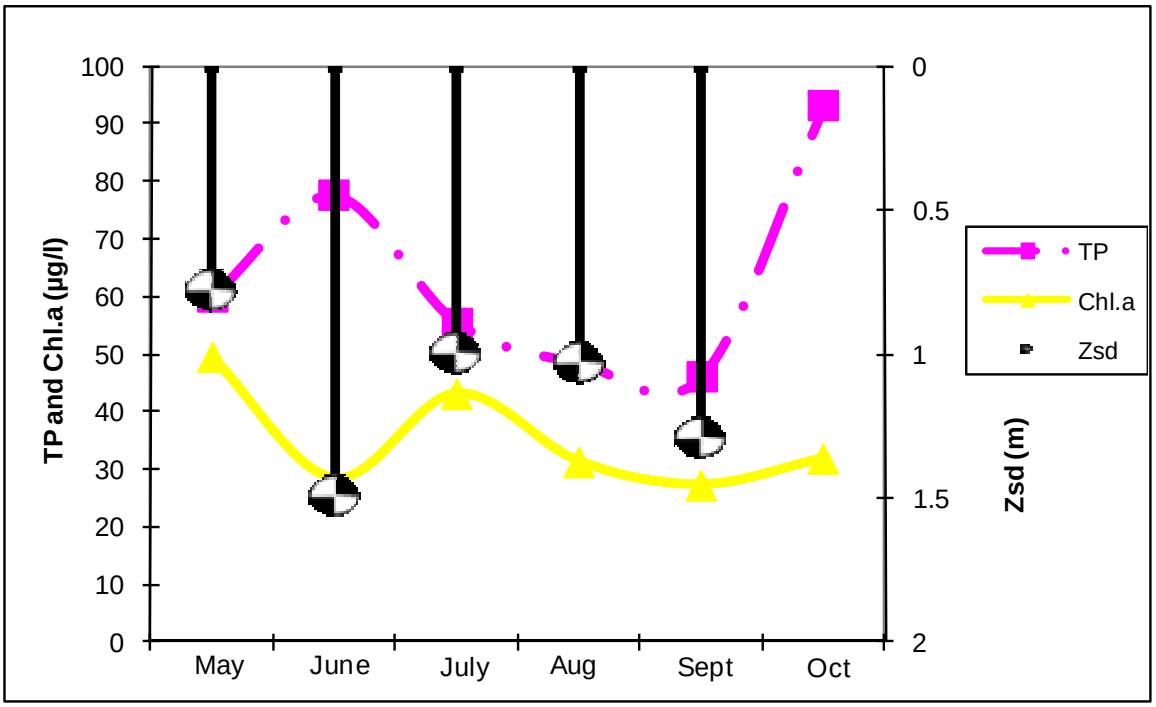
## Aquatic Plant IDs-2011

None submitted for identification.

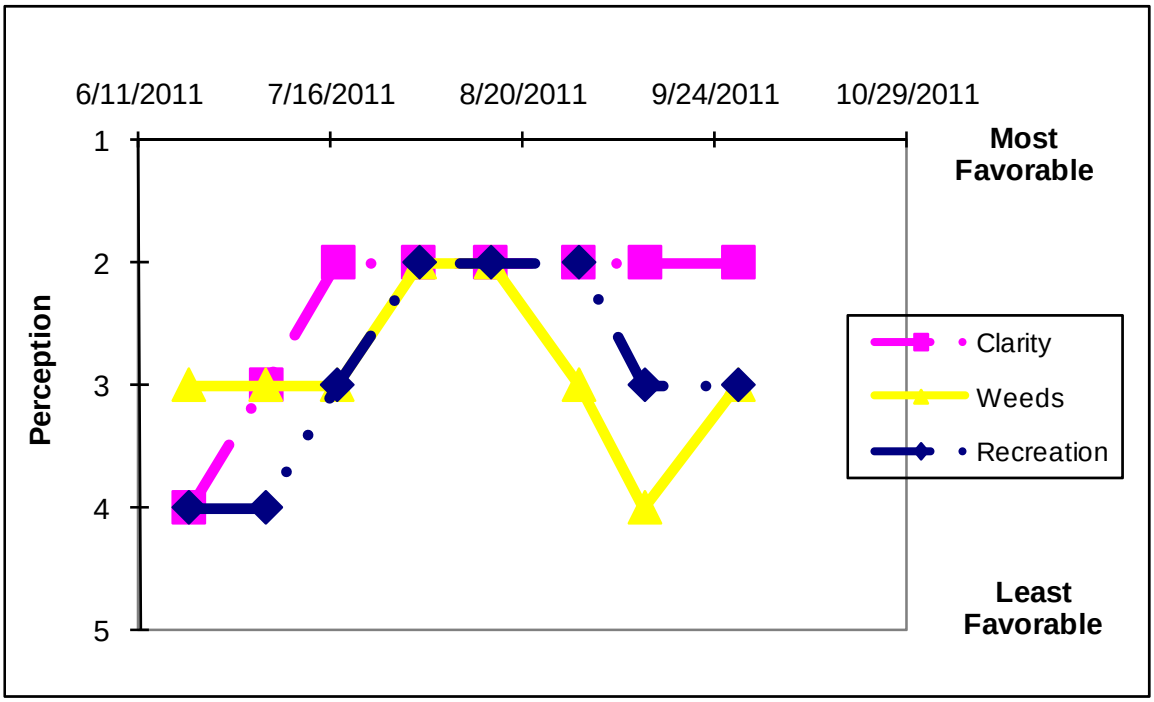
## Time Series: Trophic Indicators, 2011



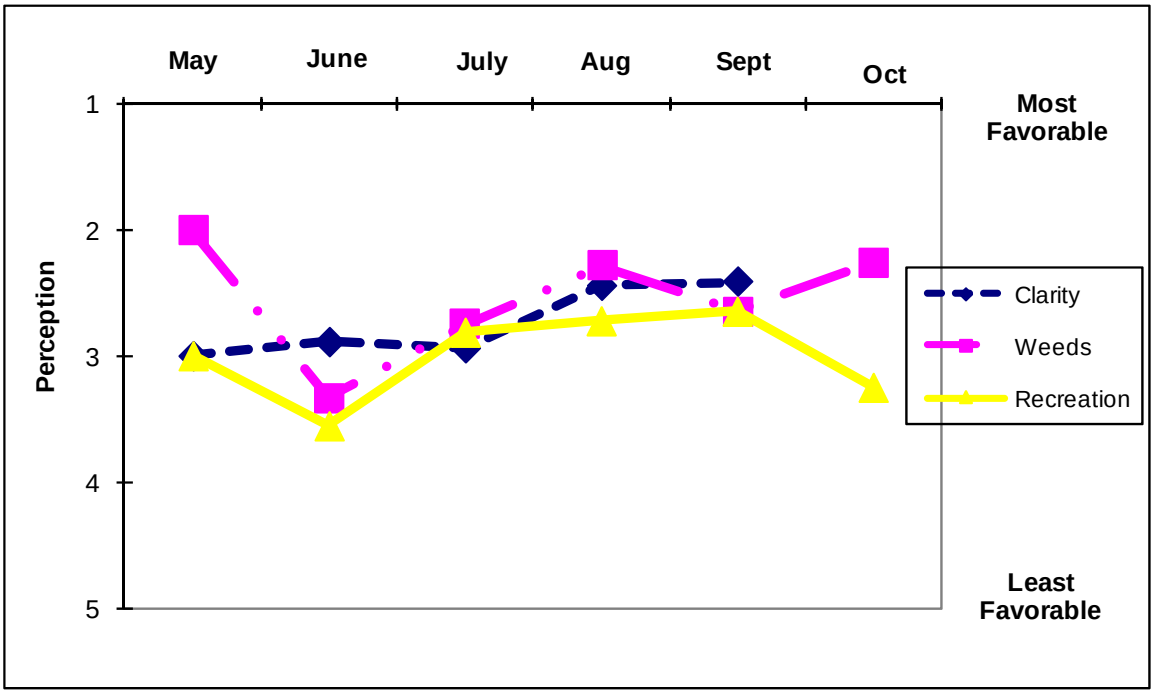

## Time Series: Trophic Indicators, Typical Year (2003-2011)



## Time Series: Lake Perception Indicators, 2011




## Time Series: Lake Perception Indicators, Typical Year (2003-2011)



# Appendix A: CSLAP Water Quality Sampling Results for Smith Pond

| LNum | PName | Date | Zbot | Zsd | Zsamp | Tot.P | NO3 | NH4 | TDN | TN/TP | TColor | pH | Cond25 | Ca | Chl.a |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 190 | Smith P | 9/9/2003 | | | 2.5 | 0.072 | 0.03 | 0.03 | 1.26 | 38.51 | 26 | 8.94 | 241 | | 10.32 |
| 190 | Smith P | 10/2/2003 | | | 1.5 | 0.189 | 0.00 | 0.05 | 1.12 | 13.06 | 24 | 8.01 | 252 | | 54.15 |
| 190 | Smith P | 6/8/2004 | 6.0 | 2.60 | 1.0 | 0.168 | 0.01 | 0.01 | | | 55 | 7.16 | 244 | 27.0 | 5.91 |
| 190 | Smith P | 6/24/2004 | | 3.20 | | 0.012 | 0.01 | 0.01 | 0.46 | 81.85 | 43 | 6.79 | 205 | | 5.40 |
| 190 | Smith P | 7/13/2004 | | 0.70 | 3.0 | 0.035 | 0.01 | 0.17 | 0.64 | 40.74 | 31 | 7.10 | 212 | | 2.00 |
| 190 | Smith P | 7/28/2004 | | 0.60 | 3.0 | 0.063 | 0.08 | 0.04 | 0.84 | 29.17 | 45 | 8.50 | 197 | | 78.10 |
| 190 | Smith P | 8/12/2004 | | 0.83 | 3.0 | 0.003 | 0.02 | 0.14 | 0.83 | 654.40 | 32 | 8.53 | 213 | 26.1 | 23.10 |
| 190 | Smith P | 8/25/2004 | | 0.90 | 3.0 | 0.031 | 0.02 | 0.20 | 0.61 | 43.28 | 63 | 8.13 | 197 | | 15.50 |
| 190 | Smith P | 9/7/2004 | | 1.75 | 3.0 | 0.058 | 0.01 | 0.15 | 1.00 | 37.85 | 48 | 7.73 | 197 | | 16.20 |
| 190 | Smith P | 9/21/2004 | | 1.43 | 3.0 | 0.066 | 0.13 | 0.11 | 0.98 | 32.59 | 32 | 7.19 | 199 | | 61.10 |
| 190 | Smith P | 6/15/2005 | 9.3 | 1.70 | 1.5 | 0.055 | 0.07 | 0.02 | 0.37 | 14.92 | 32 | 7.27 | 173 | 24.4 | 5.41 |
| 190 | Smith P | 7/6/2005 | 15.0 | 0.73 | 1.5 | 0.027 | 0.03 | 0.02 | 0.50 | 41.04 | 62 | 8.80 | 191 | | 20.70 |
| 190 | Smith P | 7/19/2005 | 8.0 | 1.60 | 1.5 | 0.066 | 0.05 | 0.05 | 0.82 | 27.34 | 73 | 8.68 | 159 | | 50.84 |
| 190 | Smith P | 8/3/2005 | 7.8 | 0.88 | 1.5 | 0.087 | 0.03 | 0.01 | 0.59 | 14.95 | 14 | 7.60 | 226 | | 15.61 |
| 190 | Smith P | 8/17/2005 | 7.7 | 1.15 | 1.5 | 0.063 | 0.10 | 0.01 | 0.59 | 20.87 | 18 | 7.61 | 146 | 21.7 | 21.52 |
| 190 | Smith P | 8/30/2005 | 6.4 | 1.00 | 1.5 | 0.035 | 0.01 | 0.01 | 0.44 | 27.83 | 23 | 7.57 | 179 | | 24.54 |
| 190 | Smith P | 9/12/2005 | 7.8 | 1.38 | 1.5 | 0.062 | 0.04 | 0.01 | 0.44 | 15.69 | 69 | 8.47 | 158 | | 33.12 |
| 190 | Smith P | 9/27/2005 | 8.0 | 1.50 | 1.5 | 0.038 | 0.01 | 0.06 | 0.43 | 24.69 | 38 | 7.32 | 193 | | 18.97 |
| 190 | Smith P | 6/12/2006 | 8.0 | 2.13 | 1.5 | 0.034 | 0.02 | 0.02 | 0.92 | 58.96 | 38 | | 191 | 22.9 | 0.78 |
| 190 | Smith P | 7/10/2006 | 8.0 | 0.95 | 1.5 | 0.047 | 0.00 | 0.01 | 1.19 | 56.20 | 123 | 9.06 | 187 | | 8.31 |
| 190 | Smith P | 7/30/2006 | 8.0 | 0.60 | 1.5 | 0.054 | 0.01 | 0.03 | | | 80 | 8.45 | 165 | | 16.03 |
| 190 | Smith P | 8/15/2006 | 7.7 | 1.35 | 1.5 | 0.052 | 0.07 | 0.05 | 1.46 | 61.53 | 26 | 8.04 | 208 | | 2.86 |
| 190 | Smith P | 8/28/2006 | 7.7 | 0.95 | 1.5 | | 0.00 | 0.02 | 1.06 | | 35 | 7.71 | 190 | 23.6 | 4.28 |
| 190 | Smith P | 9/12/2006 | 8.2 | 0.95 | 1.5 | 0.047 | 0.01 | 0.02 | 1.13 | 52.64 | 24 | 8.03 | 209 | | 3.40 |
| 190 | Smith P | 9/26/2006 | 8.0 | 3.00 | 1.5 | 0.035 | 0.01 | 0.01 | 0.93 | 58.57 | 35 | 7.19 | 116 | | 3.53 |
| 190 | Smith P | 7/10/2007 | 8.2 | 3.00 | 1.5 | 0.054 | 0.01 | 0.02 | 0.90 | 36.59 | 64 | 9.07 | 158 | 19.8 | 26.08 |
| 190 | Smith P | 7/24/2007 | 8.0 | 0.75 | 1.5 | 0.063 | 0.05 | 0.04 | 1.25 | 43.76 | 29 | 8.28 | 177 | | 66.68 |
| 190 | Smith P | 8/6/2007 | 8.0 | 0.85 | 1.5 | 0.067 | 0.01 | 0.07 | 1.27 | 41.76 | 80 | 8.72 | 177 | | 47.40 |
| 190 | Smith P | 8/21/2007 | 8.0 | 2.00 | 1.5 | 0.041 | 0.18 | 0.08 | 0.73 | 38.92 | 28 | 8.05 | 244 | | 31.44 |
| 190 | Smith P | 9/4/2007 | 8.0 | 1.35 | 1.5 | 0.044 | 0.01 | 0.01 | 1.26 | 62.68 | 46 | 8.25 | 154 | 23.2 | 26.12 |
| 190 | Smith P | 9/18/2007 | 8.0 | 1.50 | 1.5 | 0.030 | 0.00 | 0.03 | 1.16 | 84.58 | 28 | 7.74 | 222 | | 17.53 |
| 190 | Smith P | 10/2/2007 | 7.0 | 3.00 | 1.5 | 0.036 | 0.01 | 0.02 | 1.59 | 96.14 | 29 | 7.87 | 210 | | 30.58 |
| 190 | Smith P | 10/15/2007 | 9.0 | 1.50 | 1.5 | 0.043 | 0.01 | 0.06 | 1.09 | 56.32 | 20 | 7.21 | 184 | | 26.36 |
| 190 | Smith P | 6/23/2008 | 8.0 | | 1.5 | 0.084 | 0.00 | 0.02 | 1.97 | 51.80 | 30 | 8.95 | 133 | 22.9 | |
| 190 | Smith P | 7/7/2008 | 8.0 | 1.25 | 1.5 | 0.051 | 0.02 | 0.03 | 1.12 | 48.59 | 24 | 8.79 | 170 | | 22.24 |
| 190 | Smith P | 7/21/2008 | 8.0 | 1.00 | 1.5 | 0.054 | 0.01 | 0.03 | 0.95 | 38.43 | 21 | 8.63 | 147 | | 46.60 |
| 190 | Smith P | 8/4/2008 | 8.0 | 0.85 | 1.5 | 0.058 | 0.02 | 0.15 | 1.77 | 67.60 | 24 | 8.60 | 199 | | 52.28 |
| 190 | Smith P | 8/18/2008 | 8.0 | | 1.5 | 0.043 | 0.00 | 0.15 | 0.92 | 46.81 | 14 | 7.57 | 172 | 23.6 | 29.88 |
| 190 | Smith P | 9/2/2008 | 8.0 | 1.00 | 1.5 | 0.043 | 0.00 | 0.03 | 1.02 | 51.60 | 24 | 7.52 | 192 | | 37.86 |
| 190 | Smith P | 9/16/2008 | 8.0 | 0.95 | 1.5 | 0.043 | 0.02 | 0.17 | 1.11 | 57.44 | 12 | 7.38 | 185 | | 55.04 |
| 190 | Smith P | 9/29/2008 | 8.0 | 0.80 | 1.5 | 0.047 | 0.01 | 0.19 | 1.13 | 52.44 | 15 | 7.60 | 201 | | 51.92 |
| 190 | Smith P | 06/24/2009 | 8.3 | 1.00 | 1.5 | 0.052 | 0.01 | 0.05 | 1.07 | 45.51 | 96 | 8.29 | 191 | 24.7 | 9.90 |
| 190 | Smith P | 07/09/2009 | 7.9 | 1.11 | 1.5 | 0.036 | 0.00 | 0.01 | 0.94 | 58.38 | 407 | 7.65 | 151 | | 0.10 |
| 190 | Smith P | 07/26/2009 | 8.1 | 0.67 | 1.5 | 0.062 | 0.01 | 0.04 | 0.89 | 31.58 | 31 | 8.95 | 158 | | 41.44 |
| 190 | Smith P | 08/08/2009 | 8.0 | 0.79 | 1.5 | 0.054 | 0.05 | 0.04 | 1.08 | 44.16 | 45 | 8.62 | 93 | | 92.50 |
| 190 | Smith P | 08/08/2009 | grab | | bloom | | | | | | | | | | |
| 190 | Smith P | 08/08/2009 | grab | | bloom | | | | | | | | | | |
| 190 | Smith P | 08/23/2009 | 8.2 | 0.65 | 1.5 | 0.054 | 0.01 | 0.20 | 1.31 | 53.83 | 86 | 8.49 | 141 | 24.1 | 89.70 |
| 190 | Smith P | 09/06/2009 | 8.0 | 0.50 | 1.5 | 0.051 | 0.01 | 0.18 | 1.34 | 58.51 | 53 | 8.43 | 139 | | 72.80 |
| 190 | Smith P | 09/06/2009 | grab | | bloom | | | | | | | | | | |
| 190 | Smith P | 09/06/2009 | grab | | bloom | | | | | | | | | | |
| 190 | Smith P | 09/23/2009 | 7.8 | 1.05 | 1.5 | 0.043 | 0.01 | 0.18 | 0.98 | 50.59 | 52 | 7.50 | 130 | | 25.60 |
| 190 | Smith P | 10/12/2009 | 7.9 | 1.20 | 1.5 | 0.105 | 0.01 | 0.56 | 1.06 | 22.19 | 22 | 6.74 | 119 | | 16.20 |
| 190 | Smith P | 10/12/2009 | grab | | bloom | | | | | | | | | | |
| 190 | Smith P | 10/12/2009 | grab | | bloom | | | | | | | | | | |
| 190 | Smith P | 5/17/2010 | 7.5 | 0.78 | 1.5 | 0.060 | 0.02 | 0.03 | | | 41 | 8.73 | 140 | 30.0 | 49.50 |
| 190 | Smith P | 6/7/2010 | 8.1 | 0.60 | 1.5 | 0.082 | 0.01 | 0.04 | 1.84 | 49.10 | 33 | 9.18 | 109 | | 64.20 |
| 190 | Smith P | 6/20/2010 | | 0.33 | 1.5 | 0.149 | 0.01 | 0.03 | 1.77 | 26.13 | 43 | 9.02 | 182 | | 58.40 |
| 190 | Smith P | 7/5/2010 | 8.1 | 0.80 | 1.5 | 0.075 | 0.03 | 0.04 | 1.58 | 46.02 | 29 | 8.96 | 140 | | 57.20 |
| 190 | Smith P | 7/19/2010 | 8.2 | 0.45 | 1.5 | 0.085 | 0.08 | 0.05 | 2.00 | 51.69 | 65 | 8.89 | 175 | 21.3 | 101.90 |
| 190 | Smith P | 8/2/2010 | 8.0 | 0.50 | 1.5 | 0.065 | 0.04 | 0.02 | 1.49 | 50.22 | 28 | 7.99 | 209 | | 14.30 |
| 190 | Smith P | 8/17/2010 | 8.0 | 1.20 | 1.5 | 0.047 | 0.13 | 0.04 | 1.02 | 47.31 | 32 | 7.74 | 137 | | 20.00 |
| 190 | Smith P | 9/7/2010 | 8.2 | 1.40 | 1.5 | 0.027 | 0.01 | 0.06 | 0.66 | 53.65 | 22 | 8.41 | 136 | | 1.90 |

| LNum | PName | Date | Zbot | Zsd | Zsamp | Tot.P | NO3 | NH4 | TDN | TN/TP | TColor | pH | Cond25 | Ca | Chl.a |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 190 | Smith P | 6/20/2011 | 7.6 | 0.45 | | 0.061 | 0.01 | 0.04 | 1.48 | 53.66 | 37 | 7.97 | 222 | 24.0 | 76.20 |
| 190 | Smith P | 7/4/2011 | 7.9 | 0.43 | 1.5 | 0.066 | 0.02 | 0.05 | 1.84 | 61.62 | 67 | 8.84 | 178 | | 120.80 |
| 190 | Smith P | 7/17/2011 | 7.8 | 1.40 | 1.5 | 0.050 | 0.01 | 0.04 | 1.28 | 56.30 | 34 | 7.92 | 184 | | 30.10 |
| 190 | Smith P | 8/1/2011 | 7.9 | 1.15 | 1.5 | 0.043 | 0.02 | 0.04 | 1.11 | 56.43 | 34 | 8.02 | 184 | | 33.40 |
| 190 | Smith P | 8/14/2011 | 7.7 | 1.23 | 1.5 | 0.045 | 0.01 | 0.01 | 1.05 | 51.12 | 15 | 8.26 | 186 | 24.6 | 17.50 |
| 190 | Smith P | 8/30/2011 | 7.8 | 1.35 | 1.5 | 0.032 | 0.03 | 0.05 | 0.80 | 54.76 | 28 | 7.55 | 178 | | 26.20 |
| 190 | Smith P | 9/11/2011 | 7.8 | 0.95 | 1.5 | 0.037 | 0.02 | 0.03 | 0.84 | 49.78 | 21 | 8.48 | 181 | | 16.70 |
| 190 | Smith P | 9/11/2011 | grab | | bloom | | | | | | | | | | |
| 190 | Smith P | 9/28/2011 | 7.8 | 1.25 | 1.5 | 0.038 | 0.01 | 0.02 | 0.90 | 51.47 | 33 | 7.51 | 157 | | 10.40 |
| | | | | | | | | | | | | | | | |
| LNum | PName | Date | Zbot | Zsd | Zsamp | Tot.P | NO3 | NH4 | | | | NO2 | Fe | Mn | As |
| 190 | Smith P | 06/24/2009 | 8.3 | | | 0.345 | | 1.34 | | | | | | | |
| 190 | Smith P | 07/09/2009 | 7.9 | | | 0.037 | | 0.03 | | | | | | | |
| 190 | Smith P | 07/26/2009 | 8.1 | | | 0.073 | | 0.03 | | | | | | | |
| 190 | Smith P | 08/09/2009 | 8.0 | | | 0.059 | | 0.02 | | | | | | | |
| 190 | Smith P | 08/23/2009 | 8.2 | | | 0.055 | | 0.09 | | | | | | | |
| 190 | Smith P | 09/06/2009 | 8.0 | | | 1.826 | | 3.63 | | | | | | | |
| 190 | Smith P | 09/23/2009 | 7.8 | | | 0.184 | | 4.71 | | | | | | | |
| 190 | Smith P | 10/12/2009 | 7.9 | | | 0.115 | | 0.52 | | | | | | | |
| 190 | Smith P | 5/17/2010 | 7.5 | | | 0.062 | | 0.05 | | | | | | | |
| 190 | Smith P | 6/7/2010 | 8.1 | | 6.5 | 0.097 | | 0.17 | | | | | | | |
| 190 | Smith P | 6/20/2010 | | | 8.1 | 0.439 | | 2.14 | | | | | | | |
| 190 | Smith P | 7/5/2010 | 8.1 | | | 0.081 | | 0.03 | | | | | | | |
| 190 | Smith P | 7/19/2010 | 8.2 | | | 0.102 | | 0.25 | | | | | | | |
| 190 | Smith P | 8/2/2010 | 8.0 | | | 0.070 | | 0.21 | | | | | | | |
| 190 | Smith P | 8/17/2010 | 8.0 | | | 0.451 | | 2.31 | | | | | | | |
| 190 | Smith P | 9/7/2010 | 8.2 | | | 0.162 | | 0.94 | | | | | | | |
| 190 | Smith P | 6/20/2011 | 7.6 | | | 0.143 | | 0.81 | | | | 0.01 | | | |
| 190 | Smith P | 7/4/2011 | 7.9 | | 6.5 | 0.197 | | 1.16 | | | | 0.01 | | | |
| 190 | Smith P | 7/17/2011 | 7.8 | | | 0.248 | | 0.95 | | | | 0.01 | | | |
| 190 | Smith P | 8/1/2011 | 7.9 | | 6.5 | 0.327 | | 1.38 | | | | 0.01 | | | |
| 190 | Smith P | 8/14/2011 | 7.7 | | 6.0 | 0.323 | | 1.46 | | | | 0.01 | | | |
| 190 | Smith P | 8/30/2011 | 7.8 | | 6.3 | 0.208 | | 0.66 | | | | 0.01 | | | |
| 190 | Smith P | 9/11/2011 | 7.8 | | 6.3 | 0.382 | | 1.97 | | | | 0.01 | | | |
| 190 | Smith P | 9/28/2011 | 7.8 | | 6.3 | 0.532 | | 1.16 | | | | 0.01 | | | |

| LNum | PName | Date | Type | TAir | TH20 | QA | QB | QC | QD | QF | QG | AQ-PC | AQ-Chla | MC-LR | Anatoxin-a | Cyclin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 190 | Smith P | 9/9/2003 | epi | 20 | 19 | 2 | 2 | 1 | 8 | | | | | | | |
| 190 | Smith P | 10/2/2003 | epi | 5 | | | 2 | 4 | 25 | | | | | | | |
| 190 | Smith P | 6/8/2004 | epi | 32 | 19 | 3 | 4 | 4 | 123 | | | | | | | |
| 190 | Smith P | 6/24/2004 | epi | 21 | 21 | 3 | 5 | 4 | 123 | | | | | | | |
| 190 | Smith P | 7/13/2004 | epi | 21 | 22 | 3 | 3 | 4 | 125 | | | | | | | |
| 190 | Smith P | 7/28/2004 | epi | 18 | 20 | 5 | 2 | 4 | 134 | | | | | | | |
| 190 | Smith P | 8/12/2004 | epi | 17 | 20 | 3 | 3 | 4 | 145 | | | | | | | |
| 190 | Smith P | 8/25/2004 | epi | 25 | 22 | 3 | 1 | 4 | 134 | | | | | | | |
| 190 | Smith P | 9/7/2004 | epi | 20 | 21 | 3 | 3 | 3 | 13 | | | | | | | |
| 190 | Smith P | 9/21/2004 | epi | 12 | 17 | 3 | 2 | 3 | 1346 | | | | | | | |
| 190 | Smith P | 6/15/2005 | epi | 22 | 24 | 2 | 3 | 4 | 23 | | | | | | | |
| 190 | Smith P | 7/6/2005 | epi | 15 | 24 | 3 | 3 | 3 | 1358 | | | | | | | |
| 190 | Smith P | 7/19/2005 | epi | 30 | 27 | 3 | 3 | 3 | 1578 | | | | | | | |
| 190 | Smith P | 8/3/2005 | epi | 27 | 24 | 2 | 2 | 2 | 8 | | | | | | | |
| 190 | Smith P | 8/17/2005 | epi | 21 | 24 | 2 | 3 | 3 | 28 | | | | | | | |
| 190 | Smith P | 8/30/2005 | epi | 23 | 22 | 2 | 2 | 3 | 8 | | | | | | | |
| 190 | Smith P | 9/12/2005 | epi | 26 | 22 | 2 | 3 | 3 | 8 | | | | | | | |
| 190 | Smith P | 9/27/2005 | epi | 18 | 19 | 1 | 2 | 2 | 0 | | | | | | | |
| 190 | Smith P | 6/12/2006 | epi | 17 | 17 | 2 | 2 | 3 | 25 | | | | | | | |
| 190 | Smith P | 7/10/2006 | epi | 28 | 26 | 3 | 3 | 3 | 12356 | | | | | | | |
| 190 | Smith P | 7/30/2006 | epi | 23 | 24 | 3 | 3 | 3 | 1236 | | | | | | | |
| 190 | Smith P | 8/15/2006 | epi | 28 | 25 | 2 | 2 | 3 | 12 | | | | | | | |
| 190 | Smith P | 8/28/2006 | epi | 22 | 23 | 3 | 3 | 4 | 1256 | | | | | | | |
| 190 | Smith P | 9/12/2006 | epi | 15 | 18 | 2 | 2 | 2 | 0 | | | | | | | |
| 190 | Smith P | 9/26/2006 | epi | 13 | 17 | 1 | 2 | 1 | 0 | | | | | | | |
| 190 | Smith P | 7/10/2007 | epi | 34 | 26 | 4 | 3 | 2 | 128 | | | | | | | |

| LNum | PName | Date | Type | TAir | TH20 | QA | QB | QC | QD | QF | QG | AQ-PC | AQ-Chla | MC-LR | Anatoxin-a | Cyclin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 190 | Smith P | 7/24/2007 | epi | 16 | 21 | 3 | 3 | 2 | 38 | | | | | | | |
| 190 | Smith P | 8/6/2007 | epi | 26 | 25 | 3 | 2 | 2 | 5 | | | | | | | |
| 190 | Smith P | 8/21/2007 | epi | 13 | 18 | 3 | 2 | 4 | 156 | | | | | | | |
| 190 | Smith P | 9/4/2007 | epi | 26 | 23 | 3 | 3 | 3 | 3 | | | | | | | |
| 190 | Smith P | 9/18/2007 | epi | 18 | 18 | 2 | 2 | 2 | 8 | | | | | | | |
| 190 | Smith P | 10/2/2007 | epi | 17 | 18 | 2 | 2 | 4 | 5 | | | | | | | |
| 190 | Smith P | 10/15/2007 | epi | 15 | 15 | 1 | 2 | 1 | 5 | | | | | | | |
| 190 | Smith P | 6/23/2008 | epi | 24 | 23 | 4 | 3 | 4 | 1256 | | | | | | | |
| 190 | Smith P | 7/7/2008 | epi | 28 | 26 | 2 | 2 | 1 | 0 | | | | | | | |
| 190 | Smith P | 7/21/2008 | epi | 30 | 25 | 2 | 2 | 2 | 0 | | | | | | | |
| 190 | Smith P | 8/4/2008 | epi | 28 | 25 | 3 | 2 | 2 | 8 | | | | | | | |
| 190 | Smith P | 8/18/2008 | epi | 25 | 22 | 2 | 2 | 1 | 8 | | | | | | | |
| 190 | Smith P | 9/2/2008 | epi | 20 | 22 | 3 | 3 | 3 | 13 | | | | | | | |
| 190 | Smith P | 9/16/2008 | epi | 18 | 19 | 2 | 2 | 2 | 15 | | | | | | | |
| 190 | Smith P | 9/29/2008 | epi | 13 | 17 | 3 | 2 | 4 | 15 | | | | | | | |
| 190 | Smith P | 06/24/2009 | epi | 32 | 23 | 2 | 4 | 3 | 2 | | | | | | | |
| 190 | Smith P | 07/09/2009 | epi | 25 | 20 | 3 | 4 | 3 | 2 | | | | | | | |
| 190 | Smith P | 07/26/2009 | epi | 22 | 22 | 3 | 2 | 3 | 1235 | | | | | | | |
| 190 | Smith P | 08/08/2009 | epi | 23 | 22 | 3 | 3 | 4 | 1234 | | | | | 1.05 | | |
| 190 | Smith P | 08/08/2009 | bloom | | | | | | | | | | | 3.67 | | |
| 190 | Smith P | 08/08/2009 | bloom | | | | | | | | | | | 2.69 | | |
| 190 | Smith P | 08/23/2009 | epi | 27 | 24 | 3 | 3 | 3 | 125 | | | | | | | |
| 190 | Smith P | 09/06/2009 | epi | 20 | 21 | 5 | 4 | 4 | 1234 | | | 759.80 | | 0.00 | | |
| 190 | Smith P | 09/06/2009 | bloom | | | | | | | | | | | 2.50 | | |
| 190 | Smith P | 09/06/2009 | bloom | | | | | | | | | | | 4.27 | | |
| 190 | Smith P | 09/23/2009 | epi | 19 | 19 | 3 | 3 | 4 | 125 | | | 627.70 | | | | |
| 190 | Smith P | 10/12/2009 | epi | 13 | 13 | 3 | 3 | 4 | 1256 | | | | | | | |
| 190 | Smith P | 10/12/2009 | bloom | | | | | | | | | | | 0.90 | | |
| 190 | Smith P | 10/12/2009 | bloom | | | | | | | | | | | 0.62 | | |
| 190 | Smith P | 5/17/2010 | epi | 25 | 15 | 3 | 2 | 3 | 125 | 0 | 0 | | | | | |
| 190 | Smith P | 6/7/2010 | epi | 23 | 20 | 3 | 3 | 3 | 1235 | 0 | 0 | | | | | |
| 190 | Smith P | 6/20/2010 | epi | 27 | 24 | 3 | 3 | 3 | 14 | 4 | 4 | | | | | |
| 190 | Smith P | 7/5/2010 | epi | 27 | 24 | 2 | 3 | 2 | 12 | 0 | 4 | | | | | |
| 190 | Smith P | 7/19/2010 | epi | 25 | 25 | 3 | 2 | 3 | 15 | 0 | 4 | | | | | |
| 190 | Smith P | 8/2/2010 | epi | 24 | 24 | 2 | 2 | 2 | | 0 | 0 | 57.00 | | 0.01 | | |
| 190 | Smith P | 8/17/2010 | epi | 18 | 23 | 2 | 2 | 2 | 0 | 0 | 0 | | | | | |
| 190 | Smith P | 9/7/2010 | epi | 23 | 20 | 2 | 3 | 2 | 0 | 0 | 0 | 93.00 | | 0.09 | | |
| 190 | Smith P | 6/20/2011 | epi | 24 | 24 | 4 | 3 | 4 | 12346 | 4 | 4 | 250.50 | 20.90 | | | |
| 190 | Smith P | 7/4/2011 | epi | 23 | 23 | 3 | 3 | 4 | 123 | 4 | 4 | 35.70 | 17.30 | | | |
| 190 | Smith P | 7/17/2011 | epi | 30 | 25 | 2 | 3 | 3 | 2 | 0 | 0 | 80.40 | 16.20 | | | |
| 190 | Smith P | 8/1/2011 | epi | 33 | 25 | 2 | 2 | 2 | 2 | 0 | 0 | 78.90 | 18.60 | 0.55 | <0.5 | <0.1 |
| 190 | Smith P | 8/14/2011 | epi | 23 | 23 | 2 | 2 | 2 | 15 | 0 | 0 | 53.70 | 8.50 | | | |
| 190 | Smith P | 8/30/2011 | epi | 19 | 20 | 2 | 3 | 2 | 2 | 0 | 0 | 123.30 | 7.00 | | | |
| 190 | Smith P | 9/11/2011 | epi | 21 | 20 | 2 | 4 | 3 | 2 | 0 | 4 | 137.70 | 5.80 | | | |
| 190 | Smith P | 9/11/2011 | bloom | | | | | | | | | | | 27.96 | <0.8 | <0.1 |
| 190 | Smith P | 9/28/2011 | epi | 22 | 20 | 2 | 3 | 3 | 5 | 0 | 0 | 124.70 | 4.50 | | | |

# Legend Information

| *Indicator* | *Description* | *Detection Limit* | *Standard (S) / Criteria (C)* |
|---|---|---|---|
| **General Information** | | | |
| **Lnum** | lake number (unique to CSLAP) | | |
| **Lname** | name of lake (as it appears in the Gazetteer of NYS Lakes) | | |
| **Date** | sampling date | | |
| **Field Parameters** | | | |
| **Zbot** | lake depth at sampling point, meters (m) | | |
| **Zsd** | Secchi disk transparency or clarity | 0.1m | 1.2m ( C) |
| **Zsamp** | water sample depth (m) (epi = surface, hypo = bottom) | 0.1m | none |
| **Tair** | air temperature ( C) | -10C | none |
| **TH20** | water temperature ( C) | -10C | none |
| **Laboratory Parameters** | | | |
| **Tot.P** | total phosphorus (mg/l) | 0.003 mg/l | 0.020 mg/l ( C) |
| **NOx** | nitrate + nitrite (mg/l) | 0.01 mg/l | 10 mg/l NO3 (S),<br>2 mg/l NO2 (S) |
| **NH4** | total ammonia (mg/l) | 0.01 mg/l | 2 mg/l NH4 (S) |
| **TN** | total nitrogen (mg/l) | 0.01 mg/l | none |
| **TN/TP** | nitrogen to phosphorus (molar) ratio, = (TKN + NOx)*2.2/TP | | none |
| **TCOLOR** | true (filtered) color (ptu, platinum color units) | 1 ptu | none |
| **pH** | powers of hydrogen (S.U., standard pH units) | 0.1 S.U. | 6.5, 8.5 S.U. (S) |
| **Cond25** | specific conductance, corrected to 25C (umho/cm) | 1 umho/cm | none |
| **Ca** | calcium (mg/l) | 1 mg/l | none |
| **Chl.a** | chlorophyll a (ug/l) | 0.01 ug/l | none |
| **Fe** | iron (mg/l) | 0.1 mg/1 | 1.0 mg/l (S) |
| **Mn** | manganese (mg/l) | 0.01 mg/l | 0.3 mg/l (S) |
| **As** | arsenic (ug/l) | 1 ug/l | 10 ug/l (S) |
| **AQ-PC** | Phycocyanin (aquaflor) (unitless) | 1 unit | none |
| **AQ-Chl** | Chlorophyll *a* (aquaflor) (ug/l) | 1 ug/l | none |
| **MC-LR** | Microcystis-LR (ug/l) | 0.01 ug/l | 1 ug/l potable (C)<br>20 ug/l swimming (C) |
| **Ana** | Anatoxin-a (ug/l) | 0.3 ug/l | none |
| **Cyl** | Cylindrospermposin (ug/l) | 0.1 ug/l | none |
| **Lake Assessment** | | | |
| **QA** | water quality assessment; 1 = crystal clear, 2 = not quite crystal clear, 3 = definite algae greenness, 4 = high algae levels, 5 = severely high algae levels | | |
| **QB** | aquatic plant assessment; 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = surface plant coverage | | |
| **QC** | recreational assessment; 1 = could not be nicer, 2 = excellent, 3 = slightly impaired, 4 = substantially impaired, 5 = lake not usable | | |
| **QD** | reasons for recreational assessment; 1 = poor water clarity, 2 = excessive weeds, 3 = too much algae, 4 = lake looks bad, 5 = poor weather, 6 = litter/surface debris, 7 = too many lake users, 8 = other | | |
| **QF, QG** | Health and safety issues today (QF) and past week (QG); 0 = none, 1 = taste/odor, 2 = GI illness humans/animals, 3 = swimmers itch, 4 = algae blooms, 5 = dead fish, 6 = unusual animals, 7 = other | | |

## Appendix B- Monthly Evaluation of Smith Pond Data, 2006-2011

### June Data

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| *Zsd* | NORMAL | | HIGH | NORMAL | LOW | LOW |
| *TP* | NORMAL | | NORMAL | NORMAL | HIGH | NORMAL |
| *Chl.a* | LOW | | | NORMAL | NORMAL | HIGH |
| *NOx* | NORMAL | | NORMAL | NORMAL | NORMAL | NORMAL |
| *NH4* | NORMAL | | NORMAL | NORMAL | NORMAL | NORMAL |
| *TN* | NORMAL | | HIGH | NORMAL | HIGH | NORMAL |
| *pH* | | | NORMAL | NORMAL | HIGH | NORMAL |
| *SpCond* | NORMAL | | LOW | NORMAL | NORMAL | HIGH |
| *Color* | NORMAL | | NORMAL | HIGH | NORMAL | NORMAL |
| *Ca* | NORMAL | | NORMAL | NORMAL | | NORMAL |
| *QA* | NORMAL | | HIGH | NORMAL | NORMAL | HIGH |
| *QB* | NORMAL | | NORMAL | HIGH | NORMAL | NORMAL |
| *QC* | NORMAL | | NORMAL | NORMAL | NORMAL | NORMAL |
| *TH20* | NORMAL | | NORMAL | NORMAL | NORMAL | NORMAL |

High = average monthly reading > 90th percentile reading for lake, 2000-2010
Low = average monthly reading < 10th percentile reading for lake, 2000-2010
Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

### July Data

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| *Zsd* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *TP* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *Chl.a* | NORMAL | NORMAL | NORMAL | NORMAL | HIGH | HIGH |
| *NOx* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *NH4* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *TN* | NORMAL | NORMAL | NORMAL | NORMAL | HIGH | NORMAL |
| *pH* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *SpCond* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *Color* | HIGH | NORMAL | NORMAL | HIGH | NORMAL | NORMAL |
| *Ca* | | LOW | | | LOW | |
| *QA* | NORMAL | HIGH | NORMAL | NORMAL | NORMAL | NORMAL |
| *QB* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *QC* | NORMAL | NORMAL | LOW | NORMAL | NORMAL | NORMAL |
| *TH20* | NORMAL | NORMAL | HIGH | NORMAL | NORMAL | NORMAL |

High = average monthly reading > 90th percentile reading for lake, 2000-2010
Low = average monthly reading < 10th percentile reading for lake, 2000-2010
Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

## August Data

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| *Zsd* | NORMAL | NORMAL | HIGH | NORMAL | NORMAL | NORMAL |
| *TP* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *Chl.a* | NORMAL | NORMAL | NORMAL | HIGH | NORMAL | NORMAL |
| *NOx* | NORMAL | HIGH | NORMAL | NORMAL | HIGH | NORMAL |
| *NH4* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *TN* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *pH* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *SpCond* | NORMAL | NORMAL | NORMAL | LOW | NORMAL | NORMAL |
| *Color* | NORMAL | NORMAL | LOW | NORMAL | NORMAL | NORMAL |
| *Ca* | NORMAL | | NORMAL | NORMAL | | NORMAL |
| *QA* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *QB* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *QC* | NORMAL | NORMAL | LOW | NORMAL | NORMAL | NORMAL |
| *TH20* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |

High = average monthly reading > 90th percentile reading for lake, 2000-2010
Low = average monthly reading < 10th percentile reading for lake, 2000-2010
Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

## September Data

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| *Zsd* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *TP* | NORMAL | NORMAL | NORMAL | NORMAL | LOW | NORMAL |
| *Chl.a* | NORMAL | NORMAL | NORMAL | NORMAL | LOW | NORMAL |
| *NOx* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *NH4* | NORMAL | NORMAL | NORMAL | HIGH | NORMAL | NORMAL |
| *TN* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *pH* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *SpCond* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *Color* | NORMAL | NORMAL | LOW | NORMAL | NORMAL | NORMAL |
| *Ca* | | NORMAL | | | | |
| *QA* | LOW | NORMAL | NORMAL | HIGH | NORMAL | NORMAL |
| *QB* | NORMAL | NORMAL | NORMAL | HIGH | NORMAL | HIGH |
| *QC* | LOW | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |
| *TH20* | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL | NORMAL |

High = average monthly reading > 90th percentile reading for lake, 2000-2010
Low = average monthly reading < 10th percentile reading for lake, 2000-2010
Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

# Smith Pond (0502-0012) Impaired Seg

## Waterbody Location Information

Revised: 02/06/2007

| | | | | | |
|---|---|---|---|---|---|
| **Water Index No:** | Pa 3-58-31- 7-P66 | | | **Drain Basin:** | Chemung River |
| **Hydro Unit Code:** | 02050105/070 | **Str Class:** | B | | Chemung River |
| **Waterbody Type:** | Lake | | | **Reg/County:** | 8/Steuben Co. (51) |
| **Waterbody Size:** | 44.7 Acres | | | **Quad Map:** | AVOCA (L-11-1) |
| **Seg Description:** | entire lake | | | | |

## Water Quality Problem/Issue Information

(CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

| Use(s) Impacted | Severity | Problem Documentation |
|---|---|---|
| PUBLIC BATHING | Impaired | Suspected |
| RECREATION | Impaired | Suspected |

**Type of Pollutant(s)**

Known: ALGAL/WEED GROWTH, NUTRIENTS (phosphorus)
Suspected: Pathogens
Possible: - - -

**Source(s) of Pollutant(s)**

Known: HABITAT MODIFICATION
Suspected: ON-SITE/SEPTIC SYST, Agriculture
Possible: Other Source (nutrient rich sediment)

## Resolution/Management Information

**Issue Resolvability:** 1 (Needs Verification/Study (see STATUS))
**Verification Status:** 4 (Source Identified, Strategy Needed)
**Lead Agency/Office:** ext/WQCC **Resolution Potential:** Medium
**TMDL/303d Status:** 1*

## Further Details

Public bathing and other recreational uses in Smith Pond are thought to be impaired by elevated nutrient levels and algal blooms and aquatic weed growth. Onsite wastewater treatment systems serving shoreline residences and other nonpoint source loadings are the most likely source of nutrients.

Smith Pond has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 2003 and continuing through the present. An Interpretive Summary report of the findings of this sampling was published in 2005. These data indicate that the lake continues to be best characterized as eutrophic, or highly productive. Phosphorus levels in the lake regularly exceed the state guidance values indicating impacted recreational uses, resulting in transparency measurements that fail to meet what is recommended for swimming beaches in about half of the samples collected. Sampling also reveal elevated pH readings in about 20% of samples, however it is not known if aquatic life impacts occur as a result of this condition. (DEC/DOW, BWAM/CSLAP, May 2006)

Public perception of the lake and its uses is also evaluated as part of the CSLAP program. These assessment also indicate recreational suitability of the lake to be mostly unfavorable. The lake is frequently described as "slightly" to

"substantially" impaired for most uses. Lake assessments reflect high algal growth with the lake being described as having "definite algal greenness." Assessments have also noted that aquatic plants regularly grow to the lake surface and are frequently quite dense. Aquatic plant monitoring indicates the surface weed growth is associated with Eurasian milfoil. The impacts on the recreational uses of the lake are frequently attributed to poor water clarity and often the result of excessive weed growth. Mechanical harvesting has been used in the past to control weed, however due to poor access to the lake it is no longer conducted. (DEC/DOW, BWAM/CSLAP, September 2005)

This lake waterbody is designated class B, suitable for use as a public bathing beach, general recreation and aquatic life support but not as water supply. Water quality monitoring by NYSDEC focuses primarily on support of general recreation and aquatic life. Monitoring to assess public bathing use is generally the responsibility of state and/or local health departments. The Steuben County SWCD reports that pathogen monitoring results from 2004 are available.

Primary contribution of nutrients and pathogens is thought to be from on-site septic systems for cottages on the lakeshore. Substantial recent work has been done around the lake by individuals upgrading their own systems. Contributions from nutrient enriched sediments may contribute to water quality problems as well. (Steuben County WQCC, August 2004)