Other Monitoring

Iowa DNR - Ambient Lake Monitoring Program.
Along with the volunteer monitoring that occurs through the CLAMP program, the lakes are routinely monitored throughout the summer by the Iowa State University Limnology Laboratory (2000-2006) and the University of Iowa Hygienic Laboratory (2005-2006). Through this program, the lakes are monitored for a number of parameters including nutrients, solids, common field parameters, phytoplankton, zooplankton, and microcystin. Results can be found at http://limnology.eeob.iastate.edu/lakereport/ and http://wqm.igsb.uiowa.edu/iastoret/.

Iowa DNR – Beach Sampling Program. Six state-owned beaches (Emerson Bay, Gull Point, Triboji, Pikes Point, Marble, and Sandy) and one county beach (Orleans) are monitored weekly during the outdoor recreation season for bacteria and microcystin. Results of beach monitoring can be found on the DNR website http://wqm.igsb.uiowa.edu/activities/beach/beach.htm.

Volunteer Opportunities

IOWATER – Iowa’s Volunteer Water Monitoring Program. Email: iowater@iowater.net Website: http://www.iowater.net.

Anyone interested in becoming a CLAMP volunteer should contact Jane Shuttleworth, CLAMP Volunteer Coordinator: 712-337-3669 ext. 7.

References


Acknowledgements

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The CLAMP program would not be possible without the hard work of the volunteers. Volunteers on Center Lake include: Marlys Catrysse, Catie Catrysse, Craig Cobb, Tim and Deb Grieves, Marv Johnson, Becky Mills, Alex Moffitt, Reith Ostenburg, Gary Rosemore, and Yvonne and Tim Taylor. Thanks also to CLAMP interns: Tasida Barfoot, Ted Klein, Emily Greives, and Laura Guderyahn.

Page 1 photo from Iowa State University Limnology Laboratory. Photo on page 4 from CLAMP Program.

Iowa Watershed Monitoring and Assessment Program Web Site – wqm.igsb.uiowa.edu

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Cooperative Lakes Area Monitoring Project

The Cooperative Lakes Area Monitoring Project (CLAMP) began in 1999 as a joint partnership between Iowa Lakeside Laboratory and Friends of Lakeside Laboratory to take advantage of a rich tradition of volunteer involvement in the Iowa Great Lakes region. CLAMP combines efforts of multiple organizations into a long-term, unified program for assessing the quality of the lakes in the region. A group of volunteers was organized and trained to monitor water quality on 10 lakes in northwest Iowa. CLAMP focuses on monitoring nutrient levels (nitrogen and phosphorus) as well as chlorophyll a (an index of algal abundance) and Secchi depth (an index of water clarity). By monitoring these parameters, CLAMP volunteers provide an integrated measure of each lake’s water quality. To address concerns of excessive algae growth, phytoplankton and microcystin were recently added to the program. Phytoplankton are microscopic plants, mainly algae, that live in water. Microcystin is a toxin produced by cyanobacteria, a type of algae.

Since its inception in 1999, over 100 volunteers have participated in CLAMP. These volunteers have taken over 3500 samples on 10 lakes in Dickinson County: Big Spirit, Center, East Okoboji, Little Spirit, Lower Gar, Minnewashta, Silver, Trumbull, Upper Gar, and West Okoboji. By volunteering their time, CLAMP participants are providing a long-term data set that will be useful in protecting these prized resources while learning more about water quality issues and the ecology of the lakes.
CLAMP Data

Secchi depth in Center Lake ranged from 0.2 meters (m) on 7/11/2002 to 3.0 m on 6/15/2003, with the deepest Secchi depths occurring in the spring, when algal productivity is lowest, and the shallowest in late summer, when algal productivity is the greatest. Overall, Secchi depths in Center Lake were in the middle of the range of other CLAMP lakes and slightly deeper than the median for other glacial lakes in Iowa.

Figure 1 shows the seasonal and site variation of Secchi depth for Center Lake in 2006. Secchi depths in Center Lake varied greatly in 2006. Site CL2 had the deeper Secchi depth (1.6 m on 7/9/06) as well as the shallower (0.4 m on 7/18/2006).

Carlson’s Trophic State Index

The large amount of water quality data collected by CLAMP can be confusing and difficult to evaluate. In order to analyze all of the data collected it is helpful to use a trophic state index (TSI). A TSI condenses large amounts of water quality data into a single, numerical index. Different values of the index are assigned to different concentrations or values of water quality parameters.

The most widely used and accepted TSI, called the Carlson TSI, was developed by Bob Carlson (1977). Carlson TSI values range from 0 to 100. Each increase of 10 TSI points (10, 20, 30, etc.) represents a doubling in algal biomass. The Carlson TSI is divided into four main lake productivity categories: oligotrophic (least productive), mesotrophic (moderately productive), eutrophic (very productive), and hypereutrophic (extremely productive). The productivity of a lake can therefore be assessed with ease using the TSI score for one or more parameters. Mesotrophic lakes, for example, generally have a good balance between water quality and algae/fish production. Eutrophic lakes have less desirable water quality and an overabundance of algae or fish. Hypereutrophic lakes have poor water quality and experience frequent algal blooms and a lack of oxygen in deep water.

Figure 2 shows the mean or average TSI scores for Center Lake by year. Chlorophyll and total phosphorus scores varied more from year to year with total phosphorus scores decreasing from 2004 to 2006. Secchi depth scores remained fairly constant.