Illinois Environmental

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ILLINOIS

# Volunteer Lake Monitoring Program

NEWSLETTER

## End of 2001 Season Wrap-Up

Congratulations! You've all made it through another sample season, making the VLMP's 21st year quite a success. Now what? For first year and veteran volunteers alike, the following is a list of tips for proper maintenance of your monitoring equipment for the off season:

- If you are finished taking Secchi readings for the season, remember to bring your Secchi in from the boat, dry off the disk and rope and store in a dry area, like your garage or basement. Sun and other weather exposure will fade and rust the Secchi. Don't forget to bring in the color chart as well.
- Send in all Secchi data forms that you may still have. Check for completeness and keep your pink copy.
- For those in the Water Quality program, remember to rinse with water all equipment (graduated cylinder, plastic flask, filtering cup, half gallon jug). Do not use any detergents, as it will affect sample analysis. Dry the equipment and store in the provided Rubbermaid containers or something similar in a dry place, like a garage or basement. DO NOT rinse any remaining sample collection bottles. The nutrient bottles (ones with the yellow stickers on them) contain acid for preservation.
- Please keep all equipment until May 2002, when new water quality participants are established and equipment is re-distributed.
- Please keep all unused sample collection bottles and they will be picked up along with the other equipment for re-distribution in May 2002.

In February or March, you will receive a new 2002 VLMP Registration Form. Fill that out and send it back in to take part in the VLMP's 22nd season.

**Special points of interest:**

- End of Season Wrap-Up.
- NALMS 21st International Symposium Highlights.
- ILMA conference, April 18-20, 2002.
- Illinois EPA/ILMA scholarship program.

**Inside this issue:**



## Water Quality Results: What do they mean?

Have you ever wondered what it means to get a total phosphorus level of 0.06 mg/L or an ammonia nitrogen level of 0.70 mg/L in your lake? What does it mean if your lake is turbid or clear? How do chlorophyll and phosphorus play a role in telling a story about your lake trophic status?

The answers to these questions can be found in a very useful *Lake Notes* publication called "Common Lake Water Quality Parameters." A summary of that data can be found below. Keep in mind these numbers are used by Illinois EPA merely as guidelines for lake water quality assessments. There are many other contributing factors used when making an overall characterization of the water quality of lakes.

Continued on page 4

## Notes from the Statewide Coordinator

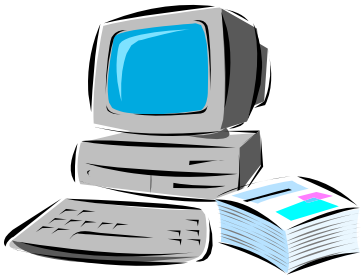
Well, we've made it through another sample season. Thank you all for taking the pains to ensure the success of the Illinois VLMP in its 21st year. Please take a glance at the "End of 2001 Season Clean-Up" article for suggestions on closing out the season.

Also, for those of you in the advanced water quality program, we are still receiving results back from the lab. I am in the process of compiling all of the results for individual lakes onto spreadsheets, which I will send to you once I've received all of the sheets from the lab. If you need results now, please contact me and I can fax or send copies of the lab sheets to you that I have for your lake. See the newsletter article in this issue on interpreting water quality results.

As always, call or email me or your area wide VLMP coordinator with questions or comments.

I hope you all have a safe and happy holiday season!

## Web-based Volunteer Database



After much anticipation, we have finally produced a functional database to store volunteer data. The web component of this database is still under construction and we have high hopes that we will be ready for small-scale web-based data entry before next sample season. At that time, area wide coordinators will be able to enter volunteer data for their regions. Web-based data entry for volunteers will be the next step once the small-scale testing is proven effective.

Another component of this database that remains under construction is the automation of many of the sections of the annual volunteer report. Once completed, the output of the annual report will be exponentially quicker, which I'm sure we're all very much looking forward to.

## IEPA/ILMA Scholarship Program

The Agency recently joined forces with the Illinois Lake Management Association (ILMA) to set up an "IEPA/ILMA Scholarship Program." Two $1,000 scholarship grants will be offered annually for course work or research involving Midwest lake ecosystems management. Applications for grants are available annually and are due no later than November 15. Eligible applicants must be full time junior, senior or graduate students who are either Illinois residents enrolled in an accredited college or university in Illinois, Indiana, Michigan, Minnesota, Ohio or Wisconsin; or junior, senior or graduate students residing in one of the states mentioned above and enrolled in an accredited Illinois university or college. The course work or research must be related to the biology, ecology or management of lake systems in the Midwestern United States. Grants may be used by the recipients to cover costs associated with education and research expenses. Applications will be evaluated on a basis of college grades, information obtained from references, quality and relevance of course work, a proposed budget if research projects are planned, and other relevant considerations.

The first two recipients of the scholarship were David Derek Aday, a PhD candidate at the University of Illinois at Champaign and Mark Druffel, a senior at Eastern Illinois University at Charleston. Both attended the ILMA conference held in Peoria March 30-April 1, 2000.

This year's recipients are Julie Mortimer, a junior at Eastern Illinois University in Charleston and Bryan Harmon, a senior attending the University of Wisconsin at Stevens Point.

For more information concerning the scholarship, call ILMA at (800) 338-6976 access 01 or visit the ILMA web page at http://ilma-lakes.org.

## "Lake Notes" Fact Sheets

*"Lake Notes"* is a series of publications produced by the Agency about issues confronting Illinois' lake resources. The objective of these publications is to provide lake and watershed residents with a greater understanding of environmental cause-and-effect relationships, and actions we can all take to protect our lakes.

Twenty-one fact sheets have been completed to date; copies are available upon request. In the near future, they will be available on the Agency's homepage. They include:

- Illinois Clean Lakes Program
- Illinois Volunteer Lake Monitoring Program
- Home and Yard
- Shoreline Stabilization
- Shoreline Buffer Strips
- Aquatic Exotics
- Where To Go For Help
- Stormwater Detention Ponds
- Monitoring Lake Quality
- Beavers and Muskrats
- Aquatic Plant Management Options
- Septic Systems
- Fertilizers and Pesticides Basics
- Canada Geese
- Lake Aeration and Circulation
- Lake Education Assistance Program
- Lake Stratification and Mixing
- Lake Dredging
- Common Lake Water Quality Parameters
- Determining Your Lake's Watershed
- Pressure Treated Wood

*"Lake Notes"* are available in hard copy, free of charge, by contacting Steve Kolsto at 217-782-3362.

The next two *"Lake Notes"* slated for completion will be "Common Shorebirds" and "Milfoil Weevil."

## NALMS 2001 International Symposium By Michelle Bodamer, CLM

The 21st annual International Symposium of the North American Lake Management Society (NALMS) was held on November 7-9, 2001, at the Monona Terrace Community and Convention Center in Madison, Wisconsin. The theme of this year's conference was "2001: A Lake Odyssey-Bridging the Gaps between Science, Policy and Practice." The beautiful Frank Lloyd Wright-designed Monona Terrace is located on the shores of Lake Monona and was the perfect location for delegates to exchange ideas and information pertaining to lake management and research.

The conference started with several workshops that included algae identification, shoreland and aquatic ecosystem restoration, phosphorous inactivation, stormwater practices and conservation marking. The Plenary Session opened with a beautiful slide presentation followed by two terrific, motivational discussions on lake management by Richard Lathrop and C.Y. Allen. Key Session topics included land use and watershed management, exotic invaders, shallow lake management, boating impacts, rivers and streams and reservoirs. The conference concluded with several more workshops that included macrophyte ecology and identification, stream restoration and assessing water quality.

Of course, the Symposium was not all work and no play. There were plenty of activities scheduled throughout the week to keep everyone happy. There were receptions and the awards banquet, the clean lakes classic 5k run and several tours of the Madison area. The banquet featured a "taste of Wisconsin" dinner with entertainment by White Water. And it didn't take long for the delegates to discover State Street. This street was full of unique gift shops and great places to eat and drink. The New Glarus Spotted Cow became a favorite among many; some even followed us home. Madison was a great host city and made this year's NALMS symposium very memorable.

# Water Quality Results: What do they mean? Cont'd

## Water Clarity

All volunteers, like our Illinois EPA lake biologists, measure water clarity when they take their Secchi readings. The Secchi depth gives us an idea of how deep sunlight can penetrate into the water (about two to three times the Secchi depth). Why do we care about this? We care because sunlight allows for the growth of algae and rooted aquatic plants which oxygenate the lake through photosynthesis. Algae, suspended sediment and water color can all interfere with visibility into the lake depths. Secchi transparency is one of three parameters used to describe the trophic status of a lake, or how productive or nutrient-rich the lake is. Phosphorus and chlorophyll a are the other two parameters used to describe trophic status. In addition to the VLMP basic program, about 100 lakes in the VLMP advanced program sample water chemistry. These parameters include total phosphorus, nitrate+nitrite nitrogen, ammonia nitrogen, total suspended solids, volatile suspended solids and chlorophyll. There is no set standard for water clarity, but the Illinois Department of Public Health has suggested at least a 48 inch transparency guideline for swimming safety.

## Phosphorus

Phosphorus and nitrogen are key players in the productivity of a lake. Being the limiting nutrient, it takes less phosphorus than nitrogen to cause algae growth, thus making phosphorus the focus of lake and watershed management plans. Total phosphorus concentrations greater than 0.030 mg/L can stimulate nuisance algae growth. Illinois' water quality standard for lakes is 0.050 mg/L. It is not uncommon to see total phosphorus levels higher than the standard here in the Corn Belt where we have very fertile soils, which in turn produce eutrophic (productive) lakes.

## Nitrogen

As mentioned above, the advanced program samples for nitrate+nitrite nitrogen and ammonia nitrogen. These inorganic forms of nitrogen are readily used by algae for growth. Research has found that inorganic nitrogen concentrations above 0.30 mg/L are able to stimulate algae growth. The Illinois' standard concentration for nitrate nitrogen is set at 10 mg/L for public drinking water supplies because of the potential adverse effects it may have on infants. Nitrates at this concentration are not harmful to aquatic life.

However, high concentrations of ammonia can be toxic to fish and other aquatic organisms. Though it is difficult to set stringent standards on ammonia due to the complicated nature of water characteristics, such as, temperature, pH and time of year, a guideline has been set that at no time of year may a sample exceed 15 mg/L total ammonia.

## Suspended Solids

Total suspended solids (TSS) include organic (algae) and inorganic (soils) materials that can limit a lake's transparency. These suspended particles causes light to scatter, which directly affects waters turbidity. The more turbid the water, the greater the scattering of light. TSS is divided into volatile suspended solids (VSS) and non-volatile suspended solids (NVSS). Volatile suspended solids include organic materials such as algae and detritus. Non-volatile suspended solids are non-organic mineral substances like sediment particles. There are no state standards for TSS, VSS or NVSS, but the Illinois Environmental Protection Agency's general lake assessment guideline suggests that NVSS above 15 mg/L could impair recreational lake use.

## Chlorophyll

The reason a chlorophyll sample is taken at twice the Secchi depth is because that is about how far down the sunlight can penetrate into the water column. This means that photosynthetic cells in that "euphotic" zone should be viable and producing oxygen. Chlorophyll a is found in all photosynthesizing plants and therefore is the most common type of chlorophyll concentration estimated. There are also chlorophyll b and c. When reading your lab sheets for chlorophyll, the text that you would want to look at is the chlorophyll a corrected for pheophytin (a breakdown product of chlorophyll a that can interfere with the chlorophyll a measurement). The general Illinois standard for lake assessment criteria suggests that levels of chlorophyll a greater than 55 μg/L could impair recreational lake use.

Anyone interested in a full copy of this *"Lake Notes"* factsheet or any of the other factsheets listed in the attached article, please contact Sandy Nickel or Steve Kolsto at 217/782-3362.

## Secchi Disk Spruce-Up by Holly Hudson

Has your Secchi disk seen a few seasons? Is the paint on the disk or are the markings on the rope faded? Wintertime provides the perfect opportunity for refurbishing this standard lake monitoring tool.

To repaint the Secchi disk, ***flat*** black and white paint must be used (flat paint reduces reflection). Either spray paint (preferably) or brush-on paint can be used. Wash and sand the disk so it is clean and smooth. If possible, remove the eye bolt with its attached rope (and attached weight if your particular Secchi model has one) to make painting easier. If you don't remove the eye bolt, protect the rope by wrapping the lower portion of it with paper and/or masking tape so the rope doesn't get paint on it. Then, completely cover the two black sections on the top of the disk with masking tape. Turn the disk over, and first paint the underside of the disk white. Let the paint dry completely before turning the disk back over to paint the two white sections on the top side of the disk. Let these sections dry completely (you may wish to let the paint dry overnight) before carefully removing the masking tape from the protected black sections. Then carefully cover the newly painted white sections completely with masking tape, and proceed to paint the two black sections. Again, let these sections dry fully before carefully removing the masking tape from the white sections. Re-attach the eye bolt (and weight) if you had removed it.

To remark the calibrated rope, you'll need a yard stick or tape measure and a red and black waterproof/permanent marker. Do not replace the original rope with a new one of any sortCit won't be guaranteed against shrinking or stretching! Re-mark the rope while it is attached to the Secchi disk. Start by checking that the 6-inch and 1-foot marks are indeed 6 inches and 1 foot, respectively, above the top surface of the Secchi disk. If not, readjust the rope accordingly, making sure that the rope is securely knotted to the eye bolt. (We sure wouldn't want the disk to go swimming away on your first monitoring trip next spring!) Then, using the yard stick or measuring tape as guidance, simply Are-ink@ the old marks with the appropriate color marker. Because the old marks may have bled, it is critical to use the yard stick or tape measure to ensure you are re-marking the color bands at exactly the correct locations. As you know, each foot mark is black *except* for every fifth foot (5, 10, 15, etc.) which is red. And, every tenth foot (10, 20, 30, etc.) is delineated as a double red or double black band, depending on the Secchi model you received. Also in red are the 2-inch increments within the first four or five feet of the rope (again, depending on which model Secchi disk you have).

Remember to contact your areawide coordinator if you have any questions in making changes to your Secchi disk or rope. Also, please note any changes on the Secchi data form the next time you take a reading. See back page for the contact information of the coordinator in your area.

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WWW.EPA.STATE.IL.US

## ILMA Conference

Remember to mark your calendars for the 2002 Illinois Lake Management Association (ILMA) meeting being held April 18—20 at the Clock Tower in Rockford, Illinois. Be sure to check ILMA's website for conference updates.

www.ilma-lakes.org.

## Who to contact in your area

VLMP Coordinators:

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*"There is only one thing worse than training your volunteers and having them leave - and that's not training them, and having them stay."*
*--unknown*