

How Indiana Lakes Ranked this Year and an Indiana Clean Lakes Program Refresher

~ Melissa Clark

Why we are out sampling lakes each summer:

The Indiana Clean Lakes Program is a comprehensive, statewide public lake management program within the Indiana Department of Environmental Management's (IDEM) Office of Water Management. It has five components:

1. *Public information and education:* We produce and distribute educational material through various formats including this quarterly newsletter, lake assessment reports, workshops, and conferences, particularly with the Indiana Lake Management Society Conference.
2. *Technical assistance:* We help lake associations and citizens with interpreting water quality data and diagnose potential lake concerns. We also visit with lake associations at monthly meetings or workshops.
3. *Volunteer lake monitoring:* We have an army of dedicated volunteers that help us monitor on 80 lakes throughout the state. We are always working to expand this valuable resource of lake stewards so contact us if interested!
4. *Lake water quality assessment:* We sample approximately 80 lakes each summer in order for IDEM to report on the current condition of the state's surface freshwater and trends on water quality. Below is a summary of the status of Indiana Lakes for 2013.
5. *Coordination with other state and federal lake programs:* Other agencies and institutions share our common goal of lake stewardship. We work to share and spread our efforts.

What we do with the data:

The goals of the lake water quality assessment component include: (a) identifying water quality trends in individual lakes, (b) identifying lakes that need special management, and (c) tracking water quality improvements due to industrial discharge and runoff reduction programs (Jones 1996).

We collect lake water and analyze it for many different parameters, making it sometimes difficult to mentally sort through what it all means. Has the lake improved or degraded? One way to report and communicate the condition of a lake and to observe changes is to look at its trophic status through the use of a *trophic state index*. The trophic state index (TSI) represents the biological material (algae) in the lake at a specific time. TSIs are useful because they condense lots of lake data into one number. This allows us to evaluate the rate and direction of change for the lake.

The Carlson TSI (1977), the most often used index, uses chlorophyll-a, Secchi disk, and total phosphorus. Chlorophyll-s is often given priority because it is the most accurate at predicting algal biomass.

2013 Lake water quality assessment:

We sampled 80 lakes in 25 counties from June 24 to August 14, 2013 (Figure 1). Half of the Indiana lakes are eutrophic and characterized by high algal densities, high total phosphorus concentrations, and shallow transparency. Twenty-one of the lakes were classified as mesotrophic and only 12 were in the oligotrophic classification (Figure 2).

Summary results for 2013 for selected water quality variables are shown in Table 1. The mean total phosphorus concentration was 0.049 mg/L. A phosphorus concentration of 0.030 mg/L or greater can lead to eutrophic conditions, therefore, more than one-half of the lakes sampled had what we would consider to be excessive phosphorus concentrations. The excessive phosphorus will likely lead to the dominance by blue-green algae.

Remember that these analyses apply only to the lakes sampled in 2013 and are not necessarily

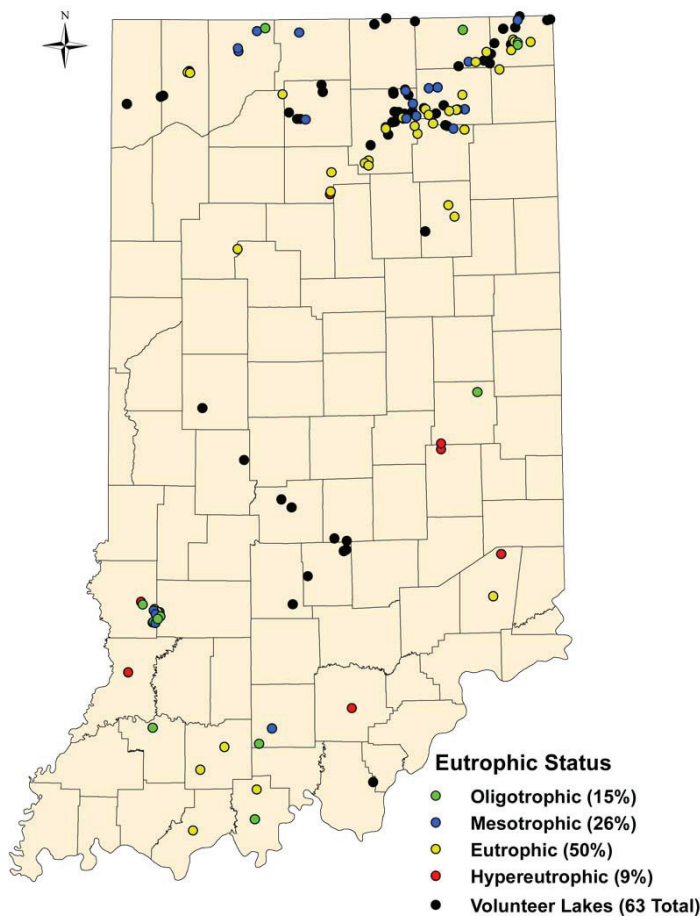


Figure 1. The 80 lakes sampled during the 2013 summer plus the 63 lakes with CLP volunteers.

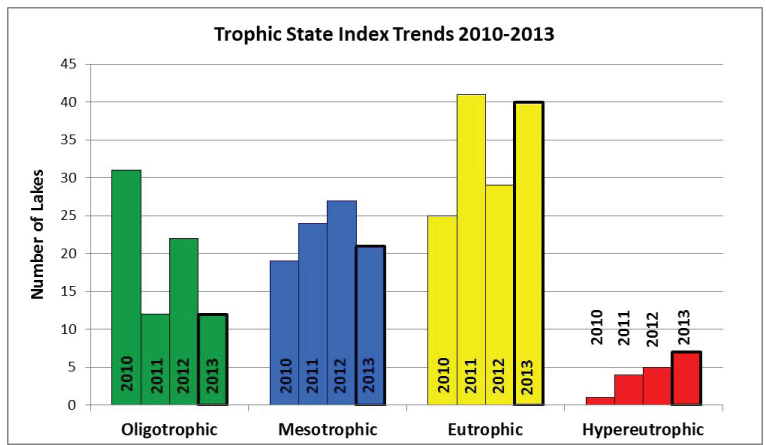


Figure 2. Trophic classification of the lakes sampled during the summers of 2010-2013.

Table 1. Mean values of select variables for all 2013 lakes sampled.

Statistic	Secchi Disk (m)	Total Phos. (mg/L)	Chlorophyll-a mg/L	TSI (Chl)
Mean	1.9	0.049	25.1	53.9
Median	1.4	0.033	9.1	52.0
Minimum	0.1	0.010	0.4	21.0
Maximum	6.0	0.441	292.1	86.0

representative of all lakes in Indiana. However, if you look at the data from the past four years you see similar distributions between the four classifications (Figure 3). While there are shifts from year to year, about half of the lakes fall in the eutrophic/hypereutrophic categories and the other half spread in the oligotrophic/mesotrophic categories. This also aligns with the national averages measured during the EPA's 2007 National Lakes Assessment

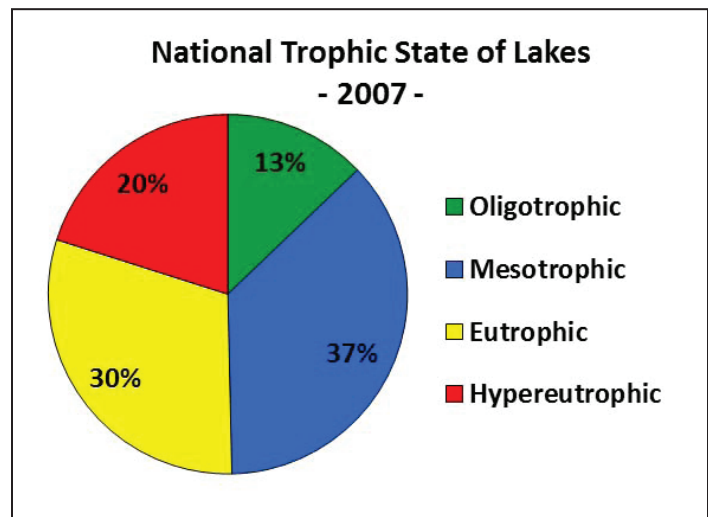


Figure 3. Trophic state of lakes in the lower continental U.S. from the EPA's National Lakes Assessment, 2007.

Why Are Wetlands Important For Your Lake?

~ Kelsey Thetonia

Wetlands are often found on lake edges or depressions in the landscape and provide our watersheds with many valuable functions. If you are interested in birding or know someone who is, then you're probably aware of how abundant avian wildlife is in a wetland. Wetlands provide our watersheds with not only wildlife habitat, but also soil stability, flood protection, and pollution removal. Unfortunately, wetlands get a bad rap for their unkempt vegetation or pesky mosquito populations, which can be undesirable for a lakeshore homeowner. So how important are wetlands to our lakes, and why do we value their ecosystem services?

Wetlands are unique because they serve as transition zones between land and water (Figure 4). Defining exactly where the land ends and the water begins is not always easy – a wetland is defined by having soils that retain water long enough to support certain vegetation that only grows in a wet environment. You'll see many of these plants on your lakeshore, such as pickerelweed or black willow trees. Wetland plants that are especially good for trapping nutrients are fast-growing herbaceous species such as cattails. These wetland zones serve as natural buffers for our aquatic environments by trapping sediment, nutrients, and pollutants from its watershed (Figure 5).

We've heard many times that large amounts of nutrients (such as phosphorus from lawn fertilizers or nitrogen from agriculture) are not healthy for our lakes because excess nutrients, with the right conditions, can cause nuisance algal blooms. Whenever it rains, water carries sediment and nutrients through storm pipes or over the ground and downhill to the lake. Wetlands slow down the flow of surface runoff by trapping the water and the nutrients it carries. The sediment in the



Figure 5. Friendship Marsh in Bloomington, Indiana, is connected to the headwaters of Monroe Lake.

slower-moving water settles out and the nutrients are taken up for use and storage by wetland plants. Even pollutants such as heavy metals can be treated by a wetland in this way.

The EPA's 2007 National Lakes Assessment determined that high nitrogen and phosphorus concentrations and poor shoreline habitat cause the

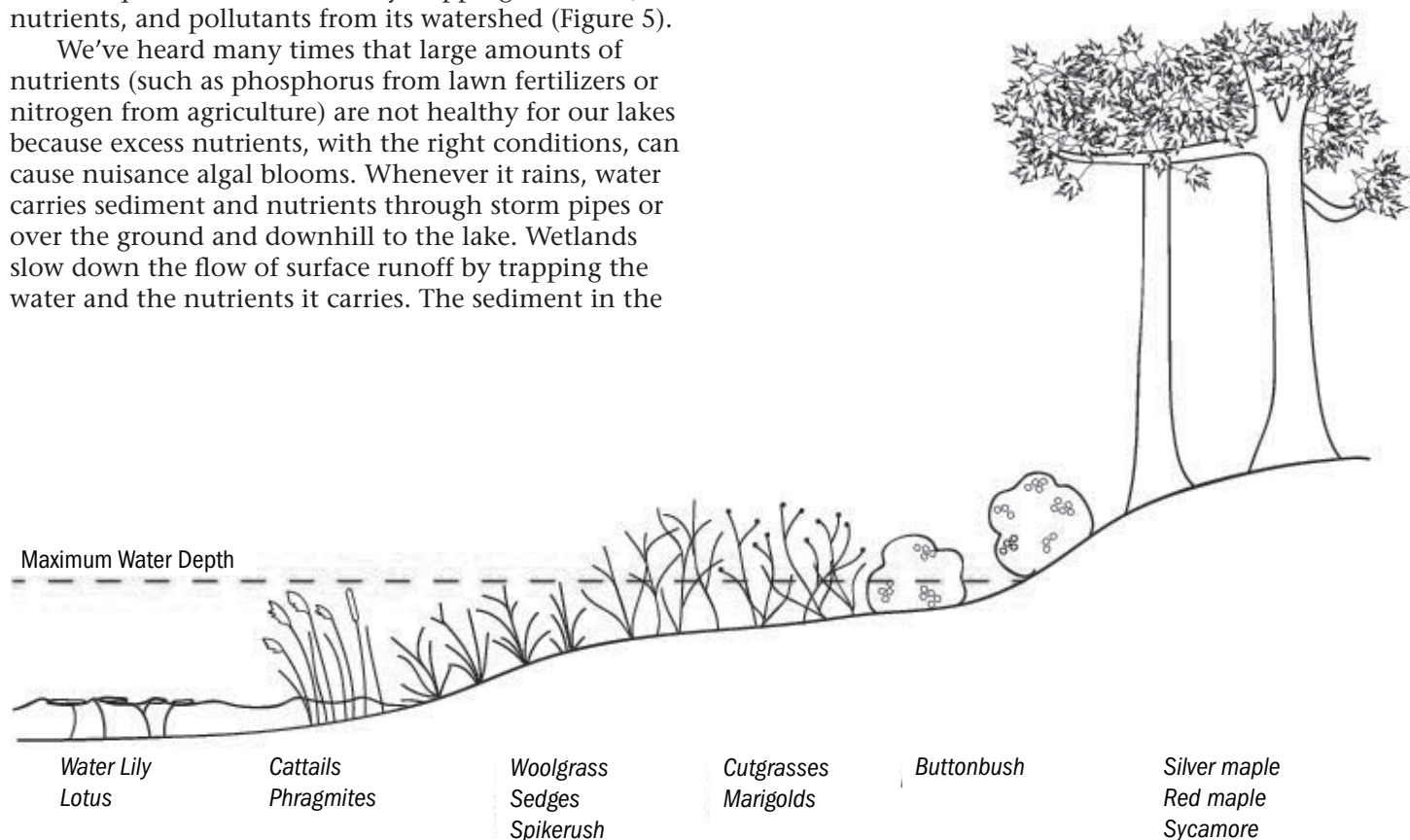


Figure 4. Wetland transitional zone between the terrestrial and aquatic ecosystems.

most stress on our lakes' biological health. In addition to simply decreasing nutrient inputs to our

lakes, maintaining and restoring wetland habitats can strengthen the ecologic health of a shoreline, dampen wave impacts, and provide more valuable habitat for fish and birds. But what if wetlands aren't immediately connected to my lake? Should we care? Yes! Probably all wetlands within your watershed are hydrologically connected to your lake and capture sediments, nutrients, and pollutants before they get washed into the nearest waterbody.

The best way to learn about these valuable ecosystems is to put on your boots and explore! Or, for more information on wetlands in Indiana, visit <http://www.in.gov/idem/4138.htm>.

Did You Know?

Before agriculture, Indiana was covered by 25% wetlands. Now, that number is only 4%. We have lost 85% of our wetlands.

Indiana Watershed Group Finder

Watershed groups are working to improve water quality throughout Indiana. But how can you find them?

Introducing the **Indiana Watershed Group Finder** – a companion site to the Indiana HUC Finder, both developed through the Indiana Watershed Leadership Program in collaboration with the Indiana Department of Environmental Management and the Indiana Association of Soil and Water Conservation Districts.

The Indiana Watershed Group Finder is a Google Map based tool that makes it easy to find active watershed groups throughout Indiana. "Watershed groups" are defined as anyone actively working with a watershed focus, including watershed-focused organizations (such as Friends of the St. Joe River Association or Wabash River Enhancement Corporation) and also projects through SWCDs (such as Washington County SWCD Mill Creek-Blue River Watershed Project).

Do you know of a group not yet included?

Be a part of this great tool by taking a moment to provide the group's information at <http://tinyurl.com/watershedgroup>.

How to find a watershed group:

Go to http://inwater.agriculture.purdue.edu/huc_group/ and click on Watershed Group Finder. Locate active groups working by clicking on highlighted areas of interest, or searching for specific groups, waterbody names, or Indiana county names. Basic contact

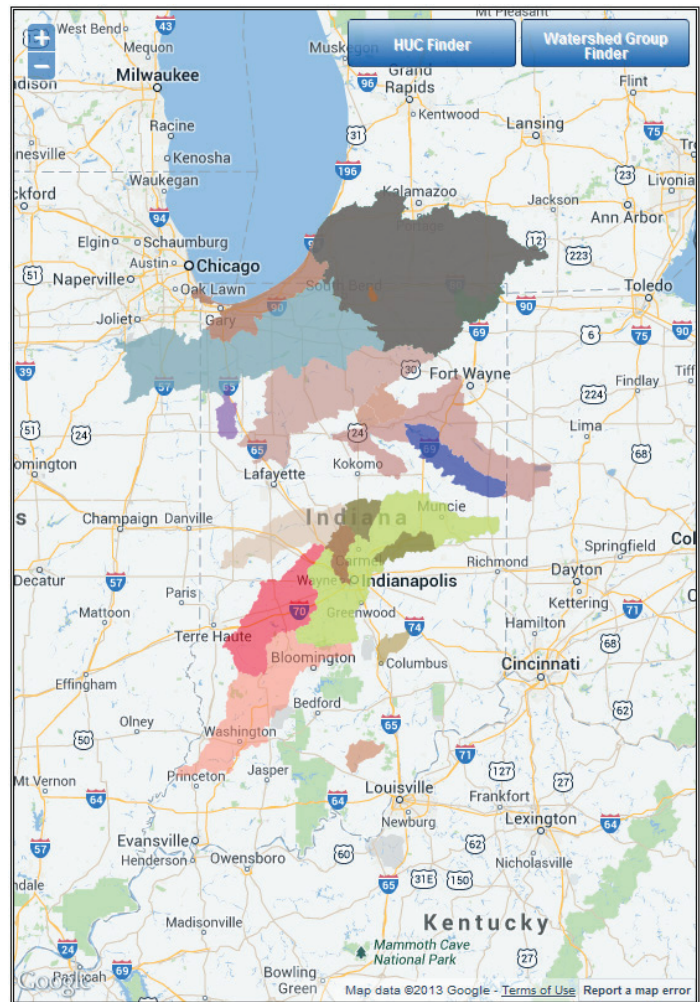


Figure 6. Current watershed groups in Indiana. Use the online "Watershed group finder" tools and generate a map of one or all groups.

information is provided to allow you to contact the group for more information.

As an added feature to the Watershed Group Finder, you can also download your watershed boundary as a shapefile or KML file. Once you locate your watershed and have displayed the information balloon on the map, just click on the HUC number within the balloon to get the option to download the watershed outline as either a shapefile or KML to use in your GIS software.

Perspectives

"Water belongs to us all. Nature did not make the sun one person's property, nor air, nor water, cool and clear."

~ Michael Simpson, The Metamorphoses of Ovid

The Volunteer Lake Monitoring Corner

~ Sarah Powers

The past two summers we have been piloting an aquatic invasive plant monitoring program with plans to add other invasive's in the future. This past summer we had two training workshops, one in May and another in August. We had a really nice turn-out at both workshops working with both current and new volunteers to learn how to identify aquatic plants, both native and invasive, and what to do if they find an invasive.

The workshops were sponsored by different organizations this year. For the May workshop the Wawasee Area Conservancy Foundation sponsored the workshop and we had 12 attendees. They provided a location for the workshop and beverages. The Pretty Lake Conservation Club hosted the August workshop and we had 19 attendees. They provided the meeting space and beverages. The Indiana Lakes Management Society also sponsored the August workshop. They provided snacks and gave away a one year membership and conference registration for 2014. We are thankful to all of the sponsors of our workshops, their support helps advertise our workshops and helps make them a success.

The greatest challenge we have had thus far with the invasive monitoring program is getting feedback



Figure 8. Sarah Powers showing plant identification characteristics of Eurasian Watermilfoil.

from the volunteers. We have had a difficult time getting volunteers to submit the time they are working on invasive plant monitoring. We added a data entry form to our website with the volunteer ID number linked to the lake. Volunteers only need to enter the lake name and county and the volunteer ID will automatically fill in. We ask that volunteers submit the time you spend on looking for or learning about invasive plants to the online entry form.



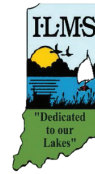
Figure 7. Sarah Powers describing the Aquatic Species Monitoring Program to workshop attendees on August 31st at the Pretty Lake Conservation Club.

While we have been successful at getting volunteers to attend our workshops we need to demonstrate that people are in fact monitoring/looking for invasive plants after they leave the workshop. We would really appreciate more feedback on the workshops. What do you think worked and what did not? How do you think we could improve the workshops?

We use your feedback to continue the invasive monitoring program and further develop the program. If you have comments or suggestions please let us know. We will also be looking for locations for more workshops in 2014. If your lake association would like to host one please let us know. If you host a workshop we ask that you provide a venue for the workshop and allow us to advertise the workshop to people outside of your group as well.

If you are interested in aquatic invasive monitoring and would like more information please contact Sarah Powers at indianaclp@gmail.com.

Save the Date!



The 26th Annual

Indiana Lakes Management Conference

Thursday and Friday,

March 20th and 21st, 2014

Bloomington Convention Center

Bloomington, Indiana

Aquatic Weed Watchers Plant Highlight

This will be the sixth plant in the plant highlight series. We will be featuring one aquatic plant in each *Water Column* issue. We will feature both native and invasive plants to improve our plant identification skills.

Giant Salvinia (*Salvinia molesta*) – INVASIVE

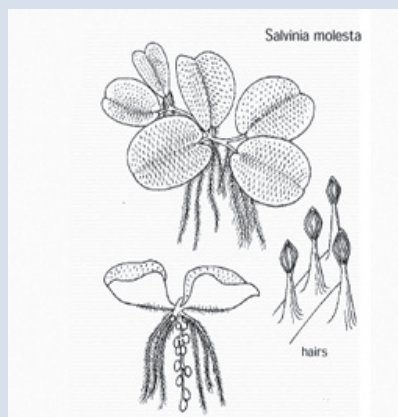
Giant salvinia is native to South America. It was introduced to the United States as an ornamental plant in water gardens and has spread in the southern U.S. The primary pathways of spread include transport by boats, dumping by boats, and unintentional transport. Sale, transport, release and other activities with this plant are prohibited in the United States by federal and state law in Indiana.

While giant salvinia has never been found in Indiana, it is on our watch list. This plant can have detrimental effects on lake ecology once established. It forms dense mats, depleting oxygen and shading out all other aquatic plants. While it is unlikely it would survive harsh winters, trends show a decrease in lake ice in the winter, especially in the southern region of the state.

You can find more information about our Invasive Species Monitoring Program, this plant and many others on the Clean Lakes Program website: www.indiana.edu/~clp. We have updated the Invasive Species Monitoring page to include links to several resources and tips on identification guides.

Identification tips

- Small free floating in clusters
- Oblong leaves
- Leaf may fold forming chains



Black Asphalt vs. Clean Water – Keeping PAHs out of our Lakes, Streams, and Wetlands

~ From UW-Extension, David S. Fiebl, Stormwater Specialist

Many of you may have already sealed your driveways preparing for the winter weather, might still be considering it, or just haven't gotten to that item on the "To Do" list. Either way, this article provides some good information to consider, especially for those that live closer to the water's edge.

Thinking about fixing up your blacktop driveway or parking lot? Did you know some of the sealcoats on the market could be hazardous to our health and the health of our waters and the creatures that live there? Polycyclic aromatic hydrocarbons (PAHs) can contaminate stormwater that runs off driveways, parking lots and playgrounds where coal tar-based asphalt sealcoats have been applied. This class of environmental pollutants contains carcinogens affecting both human and aquatic health.

Sealcoats are applied to improve the appearance and longevity of asphalt pavements. When pavements are in close proximity to water bodies, it is recommended that sealcoats low in PAHs should be used to minimize risk to people and the environment.

When shopping for sealcoats, or contracting with a sealcoat applicator, be sure to specify coal tar-free products for your asphalt surfaces. To learn more about protecting your health and the environment, and where to purchase coal tar-free sealcoats, check out the following UW-Extension fact sheets:

Coal Tar-Based Asphalt Sealcoats – A Health and Environmental Hazard

www4.uwm.edu/shwec/publications/cabinet/p2/Sealants_health_and_enviro3.pdf

Avoiding Coal Tar-Based Asphalt Sealcoats

www4.uwm.edu/shwec/publications/cabinet/p2/Non-Coal%20Tar%20applicators%206-7-13.pdf

This factsheet gives a list of carcinogens found in coal tar-based sealcoats.

Choosing a Coal Tar-Free Sealcoat

www4.uwm.edu/shwec/publications/cabinet/p2/Choosing_A_Sealcoat_6-7-13.pdf

Have you checked out the
Indiana Clean Lakes Program Web page lately?
Take a look at www.indiana.edu/~clp/
and see what's new and happening with the program
and with Indiana lakes!

i guess you could say it's an itch

sometimes we need to feel the fact
to make this world a little more exact
and venture below the surface's glare
where plankton grow
and the rivers flow

to the
man-made majesties of concrete wall
and
ancient dimples formed by the glacial fall

we go from lake to lake
across the great state
driven by curious excitement
(and the one most awake)

we sit above
and
look
down
to the murky mystery
the riddle needing solved
so we drop in our questions
our boat is weighed down by the answers

we return to the shore
skeeters swarm as we adjust the hitch
we must hurry
there's so much more
i guess you could say it's an itch

by Tim Clark

WATER COLUMN



Published quarterly by the Indiana Clean Lakes Program as a medium for open exchange of information regarding lake and watershed management in Indiana.

Address all correspondence to:
Melissa Clark, Editor
SPEA 445, 1315 E. Tenth Street
Indiana University
Bloomington, IN 47405-1701

E-mail: mlaney@indiana.edu
Phone: (812) 855-6905
FAX: (812) 855-7802