

**TLA QUARTERLY**  
October 2005

**President's Letter:**

The high season is over. Most of the boats are off the water and the docks will soon follow. Many ducks are stopping by the lake on the way south. Some of the trees started to change a couple of weeks ago and the hillsides tell us autumn is here.

Your Three Lakes Association has had a busy and eventful summer. Your board of directors and our many volunteers expended hundreds of hours and much energy working on water quality related projects. Two very well attended educational events, 'Fishing for Answers' and 'In the Drink,' were held with our education partners Grass River Natural Area and Torch Lake Protection Alliance. 'In the Drink' showcased TLA's summer intern groundwater testing program and an excellent presentation by TLA board members about the Mancelona TCE plume. Tim Hannert's 3-D plume model, funded by ACUTE, was a star attraction.

The annual meeting in July, held at the Hannerts farm, was a huge success with 125 people attending. We enjoyed great food and drink and lots of square dancing. At that event we thanked Judy Dahlberg, outgoing secretary, and Dick Garcia, outgoing president, for the fine job they have done for our organization.

In November we are presenting our Torch Lake Water Quality Model to Township officials. This will help them when making decisions regarding water quality and future economic growth.

We are delighted that many new members have joined TLA and we welcome back some old friends. Our membership has grown to 410, just 40 short of our 2005 goal of 450. Let's sign up those 40 new members by December 31. I'm looking forward to an exciting year of working with our fantastic Board of Directors and our many volunteers to protect this magnificent watershed in which we live.

Hope you have a great fall.

Regards,

Bob Bagley

**New Champions of Water Quality, Summer Interns**

The following five outstanding high school interns contributed more than a total of 300 hours of community service time to TLA's Water Quality Modeling Project from June 13th to September 9<sup>th</sup>, 2005:

- Jessica Arnold, Central Lake High School

- Lauren Elbert, Elk Rapids High School
- Samantha Fox, Elk Rapids High School
- Emily Lowery, Bellaire High School
- Derek Walton, Elk Rapids High School

As these interns complete their senior year in high school and apply for admission and scholarships at a university of their choice, it is our hope that we may have ignited a genuine interest in their becoming new champions of water quality protection. In addition to learning about the chemistry and biology of phosphorus in Torch Lake and the way phosphorus affects water quality, these interns also learned how to collect deepwater samples using a Van Dorn sampler. Some of the other skills they acquired were; how to operate TLA's new Hydrolab instrument, how to measure tributary water flow rates, how to draw watershed boundary lines for creeks entering lakes using topographic maps, and how to collect groundwater samples from lake-bed shallow wells. Fortunately the weather was very cooperative this summer, which enabled good conditions for fieldwork every Thursday. Typically these interns were split into two or three team to actively participate in fieldwork with three or four TLA adult volunteers. This aggressive amount of fieldwork was part of TLA's project to build a predictive water quality model for Torch Lake.

TLA's Summer Internship Program is a partnership with the student's high school. The school agrees to enter 0.5 credit of Independent Environmental Study on the transcripts of those who satisfy the requirements of the Internship. Interns are also expected to prepare a brief PowerPoint presentation to be presented at one of the School Board Meetings and to TLA's Board. Starting this year, the State of Michigan requires a prerequisite 40 hours of community service for academically qualified students to receive a \$2,500 scholarship to one of Michigan's universities. Since TLA's Internship Program documents at least 60 hours of community service, the Internship Program also satisfies the State of Michigan's community service requirement.

In addition to 60 hours of hands-on community service, another important part of TLA's Summer Internship Program is the preparation of a report. This year's Interns are preparing reports with the following titles:

- *Seasonal Variation in Torch Lake Water Quality*
- *Estimates of Groundwater Flowing into Torch Lake*
- *Phosphorus Entering and Leaving Torch Lake*

Three Lakes Association is committed to this youth education and community service program and have made it a part of our regular programming. If you enjoy working with students and have some free time give us a call next spring to volunteer for this exciting approach to environmental education. The TLA phone is 231-533-4852.

## **Groundwater Research:**

By the time this newsletter reaches the membership the Torch groundwater project will have been completed. A total of 15 shallow wells in 13 sites were sampled three times by a crew of TLA volunteers and our five high school interns. A special thanks goes to Paul Roush, Tom Yocum, and Dean Branson for wading into Torch from April to October installing, maintaining, and sampling from these wells. We already have preliminary results on our estimate of the total groundwater flow and the amount of phosphorus brought into Torch by this route. In fact, the flow results are similar in magnitude to two other estimates giving us confidence that we are doing the right thing. Furthermore, we have enough phosphorus data to be able to compare one site with another. There are variations, but in general we see phosphorus amounts that are very similar around the whole lake. Finally, the amount of phosphorus entering from groundwater is found to be similar in magnitude to the amount entering the lake from rainwater and from Clam River. This information will be critical to our nutrient-based water quality model.

## **Clam Lake and Lake Bellaire Modeling Project:**

**(Photo ID: 1 to r** Emily Lowery, Paul Roush, Lauren Elbert, Carl Schiele, Corey Arsnoe, Derek Walton, Bob Kollin.

It's official. Steve Chester's letter announcing the DEQ's \$80,000 grant award for modeling Lake Bellaire and Clam Lake has arrived. The DEQ contract has been signed, and co-project managers Corey Arsnoe and Bob Kollin have prepared the Quality Assurance Project Plan (QAPP). Our summer interns and volunteer team started accumulating critical measurements and samples from both Clam and Bellaire in order to not miss the vital summer season. This modeling project will include more of the Chain of Lakes watershed than the Torch Lake model did and will include some land-use modeling as well. The second model will also be used as a decision-making tool for township officials and the specific results will help further calibrate the Torch model.

**Note:** In the last three years, the sum of the grants TLA has received, including matching funds and the Dole Challenge Grant, equals **\$230,000**. That is a very significant number for an organization with an annual budget of approximately \$30,000. However, none of this money is used for TLA operating expenses. All grant money is spent on outside contractors and subcontractors. We still depend solely on membership dues, gifts, and modest earnings from our small investments. We certainly need your continued support to complete our work.

## **Boat Noise Measurement Project:**

**(Photo ID:** Dr. Clark Radcliffe and his graduate students measuring boat noise on Torch Lake.)

Lake residents are frequently frustrated by inability to enforce State of Michigan boat noise standards defined by the Marine Safety Act (Act 451 of 1994). Marine Safety Act

enforcement has proven difficult or impossible to generate convictions in Michigan courts for exceptionally noisy boats.

The marine manufacturing industry has developed boat noise measurement standards for manufacturing of quiet boats. This 25-meter pass-by measurement standard has been adopted by industry in both in the United States (SAE J34) and Internationally (ISO 14509). The Boat Noise Measurement Project has produced a law enforcement device that can enforce reasonable boat noise levels consistent with these accepted manufacturer's standards adopted by government.

Adapting Three Lakes Association board member Jack Norris' noise gun concept, Dr. Clark Radcliffe, Professor of Mechanical Engineering, MSU, designed and built the portable noise gun for law enforcement. Just as Jack proposed, it will work as a point-and-click device to measure boat noise. The device uses the distance of a boat, and the directional sound level at the law enforcement officer's location to compute a value consistent with industry tests. Distance is measured with a laser rangefinder, sound is measured with a directional shotgun microphone and all the calculations and displays are run by a programmable microcontroller. The unit also takes into account all possible errors associated with the measurement such as, ambient sounds levels, background noise, and errors due to distance measurements.

At the end of the project, we will have a self-contained noise measurement device that is easy-to-use. The law enforcement officer will simply need to "point" the device at a boat and "click" the trigger. The decibel value for the boat will be displayed.

The Torch Lake tests were sponsored by Michigan State University, Michigan Department of Natural Resources, Michigan Lake and Stream Associations, with arrangements made by Three Lakes Association. A special thanks to John Peal and the Torch River Marine who generously donated equipment and supplies and made arrangements for test boats. Betsy and Stan Dole hosted the MSU team and provided the test course at Lone Tree Point. Marine Officer Tim Tilley provided Antrim County Sheriff's Department support. Torch Lake Protection Alliance provided financial and lobbying support to the noise gun project. TLPA has also worked with Sheriff Johnson and has partnered with other lake associations to engage lobbying support for the project.

For further information contact: Dr. Clark Radcliffe, Professor of Mechanical Engineering, Email: [radcliffe@me.msu.edu](mailto:radcliffe@me.msu.edu) Phone: 517-355-5198

**Water Quality Model Workshop for Township Decision-makers:**

TLA will conduct a workshop November 11, 2005, at Camp Hayo-Went-Ha, to introduce the Torch Lake Model to township officials and other watershed partners. Topics of discussion will include:

- What is a predictive Water Quality Model and why do we need one.
- The construction of this mathematical simulation of Torch Lake.
- How decision makers can use the model to help protect water quality.

There will also be a hands-on demonstration of the Torch Lake2K Model using the scenario: 'If Alden built an offsite waste treatment facility with phosphorus removal capacity, what would happen to water quality'.

This by-invitation-only event is one of the goals for our first Michigan Department of Environmental Quality 'Clean Michigan' grant that will terminate December 31, 2005. If you would like to attend, please reserve a seat by October 31 by calling the TLA office at 231-533-4852, or send email to [info@3lakes.com](mailto:info@3lakes.com) We will post the final project report on the TLA website by January 2006.

### **Second Summer Educational Event: "In – The - Drink II"**

The August 17<sup>th</sup> joint educational event, "In – The – Drink, II" was a roaring success. Over 120 people gathered to learn about the TCE Plume, listen to the summer interns tell about their experiences during the groundwater study, and identify mysterious critters with the help of a GRNA Naturalist. Wine, cheese, and hors d'oeuvres, continue to be a winning formula for bringing people together for some "info-tainment". Plans have been made to repeat this format next summer.

### **Fun on the Farm**

**(Photo ID: Mary Lee and Norton Bretz square dancing in the Hannert's barn)**

As I watch the leaves falling, I smile when I remember the warm summer evening of the Three Lakes Annual Meeting. Even the short shower couldn't dampen the fun that night. The pig roast was delicious, the square dancing hilarious, and the company enjoyable. It was such a treat to hear the live fiddle music wafting out of the barn and the dance caller laughing so hard he could hardly continue. He did mention to me that he was convinced we were directionally challenged.

Perfect evenings like that don't just happen. It took a great deal of efficient helpers. Dorothy Clore was the hors d'oeuvres chair. Thanks to all of you who brought them. Thanks to Sue Keller for the table flowers and to Mary Lee Bretz who took care of the decorations and tableware. Connie Garcia did a super job of arranging for the wonderful music of Dan Gorno and friends. She also made arrangements for the wine. Bellaire's North Perk Café donated a great deal to the evening by providing the wine below cost and giving TLA all the profits of the cash bar. Len and Karen Franseen helped with set-up and takedown. Judy Dahlberg and Bev Isenbarger worked the registration and welcome table. Melynda Bagley took care of the tent, tables and chairs. The Hannerts provided the farm setting.

Everyone seemed to enjoy the evening immensely. During the meeting part of the program new officers were elected and an overview of the present projects was presented. Several attendees joined Three Lakes that night.

We will be happy to host it again next summer. Hope y'all can come!

Sally Hannert

### **Three Cheers for Three Lake's Water Quality Volunteers**

(Photo ID: L to r Derek Walton, Lauren Elbert, Bob Spencer)

Although TLA's Project to build a Water Quality Model for Torch Lake is almost finished, we would like to take this opportunity to THANK the following very special volunteers who have helped build this model by contributing their time and talent:

Paul Roush	Tom Yocum	Carl Schiele
Bob Spencer	Bob Oswald	Bob Kollin
Tina Fields	Trish Narwold	Rebekah Fuller
Duane Drake	Art Hoadley	Bob Charlton
Cory Arsnoe	Ken Geohegan	Larry Fields
Phil von Voigtlander	Bob Anderson	Tom Donley
Gregg Nowfel	Bob Clore	Bob Bagley
Norton Bretz	Tim Hannert	Dean Branson
Dick Garcia	Mike Nelson	Anna Ash
Keenan Bailey	Jessica Arnold	Emily Lowery
Lauren Elbert	Samantha Fox	Derek Walton
John Nelson	Gary Knapp	Paul Murphy
Don Watkins	Bob Dennis	Howard Yamaguchi
David Schultz		

**Labors of Love:** The following list of tasks provides a rough idea of the kinds of tasks performed by these volunteers...

- Driving lake-bed groundwater wells, about 20 wells around Torch Lake
- Measuring the flow of Torch and Clam Rivers, five times
- Gauging the height of Torch River weekly
- Collecting storm event water samples and flow data from Spencer Creek
- Recording rain gauge data in Alden
- Measuring dissolved oxygen, etc., at 20 depths, 2 locations, 18 times, Hydrolab
- Mentoring High School summer Interns; 5 in 2004 and 5 in 2005
- Manufacturing groundwater well points and other special equipment
- Building four rain collection boxes; collecting rain water for phosphorus analysis
- Collecting hundreds of water samples from Torch Lake, total phosphorus analysis
- Measuring the clarity of Torch Lake, Secchi Disk depth and Licor light extinction
- Collecting Torch Lake sediment samples and releasable phosphorus testing
- Preparing and submitting quarterly progress reports to MDEQ
- Collecting groundwater flow data and samples from 13 functioning wells
- Compiling and calculating groundwater flow and phosphorus data by the university intern
- Diving to retrieve and re-deploy sedimentation trap samples at mid-lake depths
- Measuring tributary flow rates via floating-object time through culverts
- Mapping tributary watersheds using topographic maps and land-use maps

- Tracking volunteer's time in TLA's database, part of In-Kind matching "funds"  
**(For project's 18 months totaled 1,600 hours, corresponding to \$47,000)**

TLA's 2006 water quality modeling project for Lake Bellaire-Clam Lake will need volunteers for similar tasks. Please express your interest in volunteering by sending an e-mail, [info@3lakes.com](mailto:info@3lakes.com).

### **Membership Goal:**

We have 415 members now, just 35 short of our 2005 goal of 450. You can help by checking the mailing label to see if your 2005 dues are paid. If the year is highlighted you should renew promptly. Thank you for your continuing support. There is a membership form in this newsletter that you can use or give to a friend or neighbor. Let's try to reach our goal!

### **Executive Director's Corner:**

As another spectacular summer of Three Lakes Association fun and intense fieldwork draws to a close I am exhausted and at the same time gratified for the hundreds of hours contributed by our volunteers. The impressive list of water quality workers is only a portion of the total number of people who have made Three Lakes Association a vibrant, growing organization. My best estimate of the total number of volunteers that contributed to all of this year's projects and programs is over 100. That, my friends, is a measure of success. A sincere thank you to all who contributed time and effort this past summer. I hope you'll be working with us again during next summer's plethora of programs.

Tim Hannert