

TLA QUARTERLY
September 2006

President's Letter:

It's considerably quieter since Labor Day weekend has passed. Many boats and docks are now stored, the loons are gone and other waterfowl are starting to form up for their trek south. Spots of color are beginning to appear among the maples along the shorelines. It's time to reminisce about a great summer.

Last weekend a group of volunteers from TLA, Antrim Soil Conservation District and the Conservation Club started putting cover down in Lake Bellaire. These pine tree bundles will provide protection for small fish. The fishermen among you should be happy with the result next summer.

Over 100 members attended our annual meeting in July. It was a huge success thanks to the wonderful hospitality of the Hannerts.

The education events in June and August attracted over 200 people interested in quality of life and water in northern Michigan. Many thanks to the TLA, Grass River Natural Area, and Torch Lake Protection Alliance volunteers who, with our friends from Antrim Soil Conservation District and Tip of the Mitt Watershed Council, put together these fun and informative afternoons. Special thanks go to the folks at DeWitt Marine for providing the location with a tent and the pontoon boats while hosting In the Drink III.

Water Quality Modeling will continue through the fall on Bellaire and Clam lakes and corresponding streams and rivers. The project should wrap up by year-end with a peer review. We thank the many volunteers who have given hundreds of hours to this important endeavor.

Power washing was available at DNR sites on all three lakes this summer thanks to the efforts of Charlie and Barbara Grube. In addition to providing the boat washing service, they passed out literature about invasive species and collected meaningful data about where the boats are operated.

It's not too soon to start talking to your friends and family about attending our annual golf tournament. Sponsored jointly with Grass River Natural Area, it will be at Hawks Eye again in June 2007 (details next quarter).

Our membership is growing and our year-end goal of 500 is in sight. Growth is essential and we welcome ideas from new and old members alike about the direction you feel we should take to protect our beautiful watershed for future generations.

Have a great fall.

Regards,
Bob Bagley

Summer Intern Program:

(insert photo) Photo ID from left: Jamie Lanter, Bethany Springsdorf, Kristine Vliet, Rachel Proudfoot, Jesse Belanger preparing analytical report.

The 2006 Summer Intern's completed their summer work and written report on August 24th and have headed back to school. They will be making a brief presentation about their summer activities at our October 10 Board meeting and to their respective school boards. The school board scheduling has yet to be determined. The students did a fine job with all the tasks presented to them and all survived, none the worse for wear. Once again, working with students and the public schools is a very important activity for TLA and I'm confident it will pay dividends for all who participate.

Annual Meeting and 40th Anniversary Celebration:

(insert photo) Photo ID: Andrew and Trish Narwold kick up their heels in a rousing county dance at the TLA 40th Annual Meeting

In The Drink III Report:

(insert photo) Photo ID: Norton Bretz providing some water quality narrative during In The Drink III

After a rainy early afternoon, the sun came out and so did 120 people who attended the third annual "In The Drink" program hosted by Dewitt's Marina. This is a record attendance for one of our educational events produced in collaboration with Grass River Natural Area, Torch Lake Protection Alliance, Tip of the Mitt Watershed Council, and the Antrim conservation District. Four pontoon boats loaned to us by Dewitt's carried folks on a 45-minute trip around the shores of Clam Lake, while guides explained the latest news from the Clam Lake/Lake Bellaire Water Quality Modeling Project. On shore displays included invasive species such as the lamprey eel and the rusty crayfish, a 3-D model of the TCE Plume, an electric powered septic system model, and many kinds of field equipment used in our research program. The wine and hors d'oeuvres were delicious and several new TLA memberships were recorded by the close of the program. Our thanks to Dewitt's and all volunteers who worked so hard to put on this event

New Members:

We extend a hearty welcome our newest members as of September 15. Your support and participation is crucial for our organization and we are grateful for it.

Steven and Katherine Berst PO Box 342 Eastport MI 49627

Christopher and Maureen Clore PO Box 295 Alden MI 49612

Mike and Peggy Dunlop PO Box 89 Alden MI 49612

Larry and Pennie Geresy 5673 Cottage Dr. Bellaire MI 49615

Michael J. James D.O. 2227 Terrace Central Lake MI 48864
Patrick and Sue Kelly 112 Spring Meadows Lane DeWitt MI 48820
Ron and Dee Lynch 8835 Clam Lake Rd Bellaire MI 49615
Dennis and Deb Malone 2574 SE Torch Lake Dr. Bellaire MI 49615
Lucy McArtor PO Box 100 Alden MI 49612
Jack McClellan 45930 Concord Dr Plymouth MI 48170
Skip and Nancy McCully 7185 Cottage Dr Bellaire MI 49615
Gordon Ragan 7415 Smithfield Greene Lane Prospect KY 40059
Richard Saul 4634 N US 31 HWY Eastport MI 49627
Lee and Doris Scott 347 NW Torch Lake Dr. Kewadin MI 49648
Mr. and Mrs. W.A. Siebenthaler 255 NW Torch Lake Dr. Kewadin MI 49648
Herbert and Kathryn Spence 49 Benton Rd Saginaw MI 48602
Carl and Marlene Stellin 2826 SE Torch Lake Dr. Bellaire MI 49615
Sheila Stevens 7553 Cottage Dr. Bellaire MI 49615
Phil and Gloria Weiss 5781 Cottage Dr. Bellaire MI 49615
Matthew Ryan 6779 Cottage Lane Bellaire MI 49615
Steven and Kate Weidner 5756 Fisherman's Paradise Rd. Bellaire MI 49615

Torch Lake Calcite Project

(insert photo) Photo ID (L to R): Jesse Belanger, Norton Bretz, Trish Narwold, and Rachel Proudfoot process Torch Lake water for the Calcite Project

When our Nutrient-Based Water Quality Project on Torch Lake concluded last year, we met with representatives from our eight Antrim County Township partners as well as observers from many other interested organizations to present our results. This meeting took place in Nov. 2005 at Camp Hayo-Went-Ha on the shores of Torch Lake. After this meeting, TLA and Great Lakes Environmental Engineering (GLEC) completed a report on this work for submission to the Michigan Department of Environmental Quality. This report was submitted in February 2006 and was about 150 pages long. Finally, last May we convened a group of experts to review this report and make recommendations the Lake Bellaire and Clam Lake project that we have been working on this summer. We were fortunate enough to have three world class scientists review our work: Prof. Steve Chapra of Tufts University in Boston, Prof. Ray Canale, retired from University of Michigan, and Prof. Jan Stevenson of Michigan State University.

Prof. Chapra is the author of several books and many papers on limnology, the study of lakes and streams. More importantly for us, he wrote the computer modeling code that we used to predict the future health of Torch Lake in response to several hypothetical changes in our watershed. In fact, Prof. Chapra's code has been used for this same purpose on many other lakes in the United States and is becoming a standard for this kind of work. His main criticism of our work was that we did not have a good model of calcium carbonate (CaCO₃) precipitation. That is, his computer model did not treat this process correctly. Since the burial of phosphorus in Torch is thought to be determined by calcium carbonate precipitation, this is an important omission. Further, although we measured the rate of phosphorus removal from Torch in our study, we did this for only a single set of conditions, the ones that are occurring right now. In order to predict the

future state of the lake we need to know how this burial process changes as the conditions of the lake change. For example, if the amount of phosphorus that enters the lake increases and the level of phosphorus in the lake increases how will these factors alter the burial rate? Without a good model, we don't know.

Nevertheless, Prof. Chapra's was very impressed both with the data we had accumulated on the clarity of Torch Lake though the summer season and with the fact that calcium carbonate precipitation in Torch is simple compared to most other lakes. That is, the precipitation is driven by a single parameter, temperature. Biological processes in Torch are so weak that they contribute very little. He felt that with a little more information he could change his code to include a model for calcium carbonate precipitation. And in a further stroke of good fortune for us, he had a PhD candidate working on this very problem who was willing to work with us this season to tune and calibrate the code. This resulted in the Torch Lake Calcite project that we have been working on in parallel with our Bellaire/Clam work this summer. We go out every two weeks to the north basin of Torch and carry out a set of measurements directed by Prof. Chapra's PhD student to follow one summer cycle.

We have been focusing on calcite precipitation. This is the precipitate that reduces the clarity of Torch in the summer. We are taking samples in the warm waters above the thermocline and in the colder waters below it, filtering the calcite out of these samples and sending both the filters and the samples off to be characterized more fully for alkalinity, dissolved calcium, and inorganic carbon. In addition we have been making careful observations of the water clarity with the Secchi disk, the new LiCor optical transparency instrument purchased by Elk-Skegemog Lake Association, and with a turbidometer, on loan from Tufts University. We have also installed another sediment trap that has been in the north basin since mid-June. With both results from the water chemical and clarity analyses, we expect a better computer model.

We have some results already. Profs. Chapra and Canale met with us Aug. 8 at the Water Studies Institute in Traverse City to show a first cut at the newest computer model and its predictions for Torch clarity. The new code was able to predict the observed water clarity in Torch for a full season. This work is very new and represents a real breakthrough in the modeling of all the lakes in our area including the Great Lakes. All of them have similar chemistry to Torch. The issue of how phosphorus burial is related to all this has not been completed yet. However, our calcite samples from this summer are currently being analyzed to see how phosphorus is being carried along with it to the sediments in the bottom of the lake. We are happy to be getting so much attention by so many gifted researchers in this area, but this is because Torch Lake is a uniquely pristine system and provides an excellent testing ground for a widespread but poorly understood process.

Having "discovered" us, Profs. Chapra and Canale have some new plans for how we can help each other complete this model development. They made several proposals about what kinds of measurements are needed next. They would also like to involve other lake organizations and other lakes in the area to test the model on lakes that are less pristine

than Torch – Elk Lake, Lake Bellaire, Lake Charlevoix, Walloon Lake, Crystal Lake, Glen Lake, etc. We are exploring the possibility of doing a small cooperative project followed by an application for a state or national grant. We are currently looking for other research groups in Michigan who may want to participate with us in this work.

Obviously, we are in the very early stages of a project that could give us significant benefits. The future of our own watershed and that of the entire Great Lakes watershed, which share many of the same issues, is at stake.

Norton Bretz

Trichloroethylene Plume: Update

(insert photo) Photo ID: The entire TCE plume stretches six miles long and is over one mile wide at the leading edge. The direction of movement is northwest from Mancelona at a rate of close to 150 feet per year.

There is good news and not-so-good news about the trichloroethylene (TCE) plume traveling in the groundwater from Mancelona to the Cedar River.

The good news is that ACUTE (Antrim County United Through Ecology) learned on May 3rd that M-DEQ Administrators recommended to the State Legislators that enough money (several million dollars) be included in the State's 2007 Budget to extend public water into three newly identified areas affected by the expanding TCE plume not served by existing public water lines. Part of M-DEQ's rationale for expediting a water extension project in 2007, almost a year before completing their site investigation and their feasibility study with recommended corrective actions, is that TCE in concentrations that significantly exceed the State's criteria for safe drinking water of 5 ppb, is now in an existing residential well of at least one resident in the Five Corners Area.

(insert photo – TCE Plume 2) The Five Corners area of Schuss Mountain is the location for the proposed extension of public drinking water service.

As part of the community's support of M-DEQ's recommendation, ACUTE prepared a "RESOLUTION IN SUPPORT" with the idea to formally document strong community support for M-DEQ's recommendation to our State Representative Kevin Elsenheimer, State Senator Jason Allan, and to M-DEQ's Administrators. By the end of July the following seven organizations signed and submitted the Resolution and/or a cover Letter:

- Antrim County Commissioners
- Custer Township Trustees
- Kearney Township Trustees
- Mancelona Area Water and Sewer Authority
- Antrim County United Through Ecology
- Three Lakes Association
- Schuss Mountain Property Owners Association

A copy of this RESOLUTION can be requested by calling Three Lakes Association (231-533-4853) or by sending an e-mail note to info@3lakes.com.

Although the Governor signed the Budget in August, there are still a couple hurdles to clear before a water extension project is authorized, including that M-DEQ Administrators must prioritize their list of recommended projects within the State and then to receive their 2007 funding from the State's Appropriations Committee, which is expected sometime in October to December 2006. Only about \$20MM of the State's \$400MM Bond for cleaning up contaminated sites remains in this Fund. Given that there are more projects (state-wide) than there are funds to address them, The M-DEQ met with the Mancelona Area Water and Sewer Authority on August 30th to explore engineering and geographic options to minimize costs and maximize extension of water to affected areas. Rather than three areas around the plume, M-DEQ is expected to focus their attention on the most critical area at the leading edge of the plume in the Five Corners area where the newly identified residential well is located and public water is not currently available. This recommendation will include sufficient funds to complete their site investigation and feasibility study in 2007.

In the meantime M-DEQ and MacTec (M-DEQ's contract environmental engineering firm), are continuing their investigation of the "nature and extent" of TCE in the groundwater by drilling bore holes around the edge of the plume and characterizing the concentration of TCE every few feet from the top of the water table to bed rock, which is in the range of 500 to 600 ft deep. As MacTec compiles the data from each borehole, they prepare and distribute a one-page Borehole Update that includes an interpretation of findings from that hole. In addition to information summaries from each borehole, and up-to-date map of the plume is provided. ACUTE arranges for these Borehole Updates to be posted on the MSU-TOSC Website (<http://www.egr.msu.edu/tosc/mancelona/>). The 10th Borehole Update was posted on July 19, 2006. In addition to information summaries from each borehole, including an up-to-date map of the plume, this Website also provides easy access to M-DEQ's monitoring results and site investigation reports.

Part of M-DEQ's investigation will include an environmental assessment of measured amounts of TCE seeping into the Cedar River. The TCE concentrations are not expected to exceed M-DEQ's water quality criteria of 100 ppb, especially a few hundred feet down stream from where the seepage enters the river because the characteristics of TCE drives the chemical out of the water and into the air. A preview of this expectation was observed last year by Bellaire High School students who worked with Tim Hannert and found no difference in aquatic insect populations living above and below the TCE seepage area.

The most disappointing "not-so-good news" was the preliminary lab findings from Professor Greg Lowry, Carnegie Mellon University, regarding the mobility and reactivity of coated nano-scale metallic iron in soil samples and water samples from the TCE plume site. Dr. Lowry's conclusions, based on these screening studies, are that the oxygen and the calcium concentrations in this deep aquifer are too high, which results in a rapid decay of the reducing properties of the nano-scale iron. Although the mobility of this promising remediation agent in the sand/soil samples was ideal, Dr. Lowry did not encourage us, or M-DEQ, to continue developing research proposals for field pilot evaluations of

remediation technology at this site, unless a “hot spot” is found near the source of the TCE plume in Mancelona. Alternative remediation technologies may not be practical at this site.

In order to keep the community informed ACUTE and M-DEQ are planning the following public forums, time & place to be determined:

- Site Investigation Findings by Dec. 2006,
- Three-Dimensional Model of the TCE Plume capable of forecasting the footprint of the plume in the future, by March 2007
- Feasibility Study (pros & cons of corrective action options), by April 2007
- M-DEQ’s Recommended Remedies, for public review and comment, on May 24, 2007

For additional information please contact Gary Knapp (231-587-5085) or Dean Branson (231-544-2700) or visit the ACUTE/TOSC website referenced above.

Dean Branson and Gary Knapp

Thank You Water Quality Volunteers:

There were many people who contributed time, effort, and expertise, during this past summer’s massive water quality projects. The list includes: Skip McCulley, Bob Kollin, Bob Bagley, Dave Dahlberg, John Conant, Jim Ferguson, Dean Branson, Norton Bretz, Ray Ludwa, Trish Narwold, Jamie Lanter, Rachel Proudfoot, Bethany Sprinsdorf, Kristine Vliet, Jesse Belanger, Duane Drake, Dick Garcia, Kristin Bunte, Thom Yocum, Paul Roush, Bob Oswald, Jack Norris, Art Hoadley, Bob Spencer, Jack Meyer, Chuck and Barb Grube, Howard Yamaguchi, Dave Howelman, Tina Fields, Gary Knapp, Scott Zimmerman, and Tim Hannert. We thank you all for a fantastic job.

Craven Pond Dredging Proposal Raises Concerns:

The Village of Bellaire has approved a proposal by Janet Person, Council Executive, to hydraulically dredge Craven Pond. The intent is to restore the pond, making it a better fishing site. Our concern is that the project design, if approved by the DEQ, must prevent sediment and phosphorus from entering Cedar River. We have just learned from our studies this summer that Cedar River supplies Lake Bellaire with more water than the entire upper chain of lakes. Preliminary discussions with the Antrim County Conservation District staff revealed plans to dewater all dredged sediment in large sausage-like bags placed around the ball diamonds at Craven Park. Given the large volume of water and potential for phosphorus loading to the river, alternative strategies are being explored. TLA is paying very close attention to this proposed project.

Lake Foam, Again:

Lakeshore property owners sometimes become concerned about lake foaming. However, most foam observed in lakes and streams is a product of nature; foam is not necessarily an indicator of pollution. Small trout streams, for example, often have naturally

occurring pools of foam where fish will hide.

The foaming of surface waters on lakes is not a new phenomenon. It is a natural process that has been going on for a long time. Foam is created when the surface tension of water (attraction of surface molecules for each other) is reduced and the air is mixed in, forming bubbles. Man-made agents such as soaps and detergents can also reduce surface tension.

All lakes contain organic matter, such as algae and plants, and when these decompose they release cellular products (surfactant) into the water, which lessens the surface tension. When the wind blows, the waves on the lake agitate this surface agent, thus transforming it into sudsy white foam. Currents and boats also mix air with the organic compounds present in the lake to produce foam.

In the late 1950s and early 1960s, many communities experienced tremendous foam problems in lakes, rivers, sewage treatment plants, and even in drinking water from contaminated wells. This foam was caused by laundry detergents that were highly resistant to chemical breakdown, and only slowly degradable (broken down by bacteria). By law, the sudsing agent of all detergents now on the market must be biodegradable. This means that they quickly lose their ability to cause foaming and are unable to produce the long-lasting foam found along many shores.

The foam will frequently form parallel streaks in the open water, caused by wind-induced surface currents. It will also collect in large quantities on windward shores, coves, or in eddies. Natural foam has a somewhat earthy fishy aroma and may have an off-white, tan, or brown color. Detergent foam in contrast will have a noticeable perfume smell, and is usually whiter in color.

New Hampshire Department of Environmental Services

Executive Director's Corner:

“Whizbang” was how our summer interns described this past summer’s activities in a PowerPoint summation to the local school boards. I couldn’t say it better. I can’t remember a more productive three summer months. Five massive projects including the Clam Lake/Lake Bellaire Model, the Torch Lake Calcite Project, the Cooperative Lake Monitoring Program, the invasive species boat washing program, and the fourth annual summer high school intern program ran concurrently. It is a testament to the power and commitment of our volunteers that we were able to accomplish all of our goals for these activities. To all those who dedicated their invaluable summer time to complete these tasks I give a sincere thank you.

It’s time for the Board of Directors to consider goals for 2007. If you have suggestions for new directions or projects for TLA please send them to me at thannert@3lakes.com or contact your neighborhood zone director. Thanks.

Tim Hannert

