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# Three Lakes Association 50th Anniversary

Bellaire Room  
Shanty Creek Resort  
Bellaire, Michigan  
August 11, 2016



**THREE LAKES**  
ASSOCIATION

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*After fifty years, still swimming with the fish!*

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## Mission Statement

The mission of the Association is to provide leadership to preserve, protect, and improve the environmental quality of the Elk River Chain of Lakes Watershed for all generations with emphasis on Lake Bellaire, Clam Lake, Torch Lake and their tributaries.

Welcome to our 50th Anniversary Celebration  
Three Lakes Association  
1966 - 2016

5:30 p.m. Cocktails (cash bar)

6:30 p.m. Dinner

7:30 p.m. Annual Meeting & 50th Anniversary Program

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Special Thanks

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At the time we went to print, we did not yet know all the names of all the people who have contributed to the success of tonight's celebration. But, we did not want to fail to acknowledge the names we do know. The complete list will be published on the TLA website ([www.3lakes.com](http://www.3lakes.com)).

Thanks to Dr. & Mrs. Brian Rathke of Bellaire Family and Cosmetic Dentistry for graciously sponsoring the TLA 50th anniversary commemorative cookies.

Our gratitude to RWB Creative, LLC for helping to defray the costs of printing.



Special thanks to Sarah Rising of Rising Designs for creating our Mr. Fish anniversary mascot.

To the Antrim Review, our appreciation for all the technical help in printing our program.

Thanks to the Area Seniors for their assistance with decorations.

A great big "Thank You" to Pete Bigford and all the staff of Shanty Creek Resort for many months of support and guidance to make this celebration possible.

A short note from the TLA president -

The people who started TLA would be delighted, I am sure, to see how far this organization has come in the last fifty years. Indeed, I believe they would be pleased, and probably more than a little surprised at what their initial passion has accomplished through the hands of those who followed.

Tonight, let's celebrate the vision and determination of that small group of neighbors, whose example of dedication to a worthy mission has led us to this moment.

They understood the need to be vigilant, devoted, and faithful stewards of the precious waters that bless this region. They showed us the way. Now, it is our turn to point into the future and strive to show the way for the coming fifty years.

Let's raise a toast to the accomplishments of the past and the beckoning potential of the future!

*Sina Norris Fields*

- On July 11, 1966, a group of friends and neighbors gathered to discuss environmental health issues for Clam Lake, Lake Bellaire, and Torch Lake.
- In attendance were:  
Bill Lee;  
Martha & Lloyd Aemisegger; Margaret Campbell;  
Caroline & James Kirkpatrick;  
Kathryn & Hartley Comfort;  
Sam Comfort;  
Betty & John Kohl;  
Russ Wheeler; and  
Vi Patchen.
- Kathryn Comfort suggested the name, Three Lakes Association, reflecting the interdependence of Lake Bellaire, Clam Lake, and Torch Lake.
- Martha Aemisegger drew the first map.
- Hartley Comfort was the first president.
- Lloyd Aemisegger was the first treasurer
- Baseline water quality monitoring project began in 1967, measuring oxygen, clarity, phosphorus, temperature, bacteria, and algae.
- Thanks to Dr. LaVerne Curry, who chaired the Department of Biology at Central Michigan University, and Edward McDuffie who was the Bellaire High School science teacher. Their work provided us the baseline reference points for monitoring changes in water quality.
- In 1969, TLA sponsored a steering committee to preserve the Grass River. The work of this committee resulted in the formation of the Grass River Natural Area - officially launched in 1976

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Timeline of the 1970s

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- The Sunset Torch Condominium case began in 1970
  - Originally planned seventy-four units on the shore of Torch Lake
  - TLA filed suit to stop construction to avoid unacceptable pollution to Torch Lake
  - Settled by consent judgment in April 1978 with limit of twenty-eight units
- The Paradise Estates funneling consent decree of August 1973
  - Established the reasonable level of use concept
  - Limited simultaneous occupancy of the “keyhole” on the shore, established greenbelt and fencing requirements, restricted fertilizer use, prohibited boat mooring.
- TLA intervened following the 1976 accidental release of 3.5 million gallons of sewage from Bellaire treatment system
  - Spill caused algal bloom in Lake Bellaire
  - Overland water-flows went directly into Intermediate River
  - Ongoing maintenance problems
  - TLA opposed renewal of Bellaire’s DNR surface discharge permit unless corrections were made
  - New system approved by voters in 1985
- The White Sands case tried April 179 before the Hon. William R. Brown, Antrim County Circuit Court
  - Judge Brown’s order repeated many of the elements contained in the Paradise Estate case
  - This case (TLA vs. Kessler) cited repeatedly as precedent-setting in riparian law regarding “unreasonable over-use of the lake access.”

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Timeline of the 1980s

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- First Executive Director was hired in 1984.
  - The all-volunteer board could no longer keep up with the issues it considered important.
  - We needed to hire an executive director.
  - William G. Weiss, Jr., Ph.D., P.E. accepted the position and served from 1984 to 1998.
- Presentation by TLA at Michigan Water Resources Commission in Lansing, in 1985, with support from the DNR, regarding the Bellaire sewer system
  - Village voted overwhelmingly for a sewer bond issue, making possible the construction of a new wastewater system that included phosphorus removal.
- The TLA Lake Watch program concept developed in 1987, with formal adoption in 1988
  - White-Kuhn-Larsen-Norris method for detecting nutrient pollution from septic systems and fertilizer run-off.
  - Cooperative neighborhood approach to finding and correcting pollution problems
  - TLA trained groups of riparian owners in how to take samples for Health Department analysis.
- The 1987 case of Fox & Associates vs. Hayes Township, involved a funneling project on Lake Charlevoix.
  - TLA supported the township - issues similar to the Paradise Estates and White Sands cases
  - Settled by consent decree - cited in the 1992 Hess case.
- Rosemary’s Dockage, Kathy’s Kampground, and Lamont cases in 1988 and 1989 addressed issues of water quality impairment, unreasonable use of lake access, and denial of septic disposal permit on property known to be unbuildable. TLA participated with *amicus curiae* briefs and with expert scientific testimony.

- Watomie Pines case of 1990
  - Application to build U-shaped harbor with dock extending 112 feet into Clam Lake.
  - TLA led letter-writing campaign to the DNR to deny permit.
  - Ultimately, a new dock design, with no extension into Clam Lake, was permitted.
- Hess vs. West Bloomfield Township case of 1992
  - Michigan Supreme Court held that townships, under the TRZA, do have the authority to prevent funnel developments.
  - With the Hess decision in hand, TLA has approached the eight townships on our three lakes, asking for zoning ordinance language to ban funnel developments. Not yet fully successful.
- Cicinelli vs. Michigan DNR case of 1994
  - Cicinelli, Mayer, Grear, and Zahler sued DNR over proposed development of launch site on Torch Lake, for large boats.
  - The water depth is only 3.3 feet at a distance of 270 feet from shore, so plan included dredging a 300 foot channel into Torch Lake
  - TLA supported the plaintiffs with \$5,000 to help defray costs, and with an *amicus curiae* brief.
  - Judge Philip E. Rodgers, Jr., issued injunction against construction until all permits and environmental concerns were satisfied; administratively closed the case, retaining jurisdiction
- TLA worked with Planning and Zoning Center of Lansing, to develop a model ordinance for carrying-capacity

- The Star Buoy project was begun in 1995, inspired and led by John S. “Jinks” Ross.
  - A mooring buoy carrying a black 5-pointed star, placed at a measured distance of 100 feet from the shoreline, a dock, or raft.
  - To provide temporary boat mooring; to aid boat operators to abide by the “100 foot law”; and as an aid in marine law enforcement and education.
- Torch Tip Resort case of 1995
  - Citizen Tomlinson brought suit against the resort for over-use of the lake, inadequate septic system, and operation of unlicensed marina.
  - TLA supported with an *amicus curiae* brief.
  - Defendant ceased marina activity, property reverted to single-family residential, water quality improved.
- In 1996, the thirtieth anniversary of the TLA, the original corporate existence of “30 years” was formally changed to “in perpetuity.”
  - The written history of TLA’s first thirty years was published.
- Hany sack case of 1997
  - Defendant sought to dredge a channel into Torch Lake for his residential water intake.
  - Issues in this case led to the formation of TLPOA (transformed later into TLPA).
  - TLA supported the case with \$3,000 and an *amicus curiae* brief.
  - Judge Philip E. Rodgers, Jr., found in favor of the plaintiffs; his decision putting water quality concerns into the judicial record.

- In 1997 the Cedar Meadows Boat Owners Association applied for a marina permit.
  - The Property Owners Association opposed the plan, which violated the Cedar Meadows deed restrictions and by-laws.
  - TLA supported the Property Owners and the project was abandoned
- TCE Plume from the Dura location - 1997
  - Contamination in drinking water wells from TCE plume flowing through the groundwater.
  - Contamination reached the Shanty-Schuss area by mid 2000.
  - TLA a major part of ACUTE (Antrim County United Through Ecology), an informal group of stakeholders seeking to find solutions through collaboration.
- TLA donated and posted boat safety law signs at the launch sites around our three lakes in 1997
  - Signs outlined the law and explained the use of the Star-marked mooring buoys.



- 2003 - the inaugural year of the TLA summer internship program.
  - The project for the summer was an *E. coli* survey of five beaches.
  - Interns: Sarah Conkle, Jessi Dewey, Savannah Bryant, Nathan Graham, and Brianne Lunn.
  - Advisors: Tim Hannert and Norton Bretz.
- 2004 - there were two intern programs this summer:
  - Program one: Cladophora survey on Bellaire, Clam, and Torch Lakes - identified 114 sites.
    - Interns: Sarah Conkle, Brianne Lunn, and Jocelyn Menestrina.
    - Advisors: Norton Bretz, Trish Narwold, and Tim Hannert.
  - Program two: water flow and water quality testing on Torch Lake.
    - Interns: Keenan Bailey and Anna Ash.
    - Advisors: Norton Bretz, Tim Hannert, and Dean Branson.
- 2004 - Water Quality Predictive Model project - Phase 1 begins.
  - Characterize the water profile for Torch Lake.
  - DEQ \$62K grant for Torch Lake.
  - Complete phase 1 by fall of 2005.
- 2005 - there were four intern programs this summer.
  - Program one: ground water flow.
    - Interns: Jessica Arnold and Emily Lowery
    - Report: "*Estimates of Groundwater Entering Torch Lake.*"
    - Advisors: Tim Hannert, Norton Bretz, and Dean Branson

- Program two: ground water flow.
  - Interns: Lauren Elbert and Samantha Fox
  - Report: *“Seasonal Variations of Temperature, Dissolved Oxygen, pH, and Specific Conductivity in Torch Lake.”*
  - Advisors: Tim Hannert, Norton Bretz, and Dean Branson
- Program three: Torch Lake phosphorus input and output.
  - Intern: Derek Walton
  - Report: *“Total Phosphorus Input and Output of Torch Lake plus the Watershed Boundary of Shanty Creek.”*
  - Advisors: Tim Hannert, Norton Bretz, and Dean Branson
- Program four: Torch Lake groundwater flux and phosphorus loading.
  - Intern: Mike Nelson (Notre Dame)
  - Report: *“Piezometric Determination of Groundwater Flux and Phosphorus Loading in Torch Lake.”*
  - Advisors: Tim Hannert, Norton Bretz, and Dean Branson
- 2006 - internship program as part of the Predictive Water Quality Model project - Phase 2.
  - Interns: Jesse Belanger, Rachel Proudfoot, Bethany Sprignsdorf, Kristine Vliet, and Jaime Lanter.
  - Report: *“Analysis of Hydrolab Profiles for Torch Lake, Lake Bellaire, and Clam Lake in Antrim County, Michigan.”*

- 2007 - internship program - survey of glacial relict benthic invertebrates in Lake Bellaire and Elk Lake (organisms at the bottom of the food chain, good indicators of the health of the lake).
  - Interns: Courtney Platte, Danielle Haydell, Jesse Belanger, Brittani Mizckiewicz, Maggie Petersen, Andrew Mach, and Cameron Schaefer.
  - Report: *“Glacial Relicts of the Elk River Chain-of-Lakes, Antrim, Kalkaska, and Grand Traverse Counties, Michigan.”*
- 2007 - Water Quality Predictive Model completion.
  - Reports: *“Development of a Predictive Nutrient-Based Water Quality Model for Torch Lake”* and *“Characterization of Groundwater Phosphorus in Torch Lake.”*
- 2008 - internship program - Lake Bellaire shoreline survey.
  - Interns: Braden Ackerman, Billy Bohannon, and Wilhelmina Witt
  - Report: *“Lake Bellaire Shoreline Survey - Summary Report.”*
  - Advisors: Tim Hannert, Norton Bretz, Trish Narwold, and Peg Comfort.
- 2008-09- Science Education Outreach Program began.
  - Wish lists granted for the following teachers:
    - Bellaire: Diane Bennett, Kim Clark, and Tom Baedkeroot
    - Central Lake: Kari Groll, Bridget McAvoy, Brenda Jones, Tim VanderHart, Barb Schecter, Laura Brown, Dennis Richardson, and Eric Boyce.
    - Kalkaska: Michelle Moeggenberg, Diane Wildfong, Kathy Liverance, Paul Guy, Andy Henderson, and Staci Short.
    - Mancelona: Jenny Angell.

- 2009 - internship program - lake bottom survey for Torch Lake and Lake Bellaire.
  - Interns: Braden Ackerman, Billy Bohannon, Jordan Gunderson, Wilhelmina Witt, David Witt, Alisha Youmans.
  - Report: *“Survey of Food-Chain Macroinvertebrates: Torch Lake and Lake Bellaire.”*
  - Advisors: Norton Bretz, Trish Narwold, Dean Branson, and Becky Norris.
- 2009-10 - SEOP grants to the following teachers:
  - Bellaire: Judy Scheiber, Kim Clark, and Tom Baeckeroot
  - Central Lake: Kari Groll, Tim BanderHart, Barb Schecter, Dennis Richardson, and Eric Boyce.
  - Kalkaska: Andy Henderson, Andy McCarty, and Ryan Moore
  - Mancelona: Jenny Angell, Matt Smith, and Staci Short.
- 2010 - internship program - Cladophora shoreline survey of Torch, Clam, and Bellaire - by kayak.
  - Interns: Marisa Kerr, Sadie Small, Natalie Ranger, Emily Blaney, Jake Crawford, and Jessica Kubin.
  - Report: *“A Shoreline Algal Survey of Torch Lake, Clam Lake, and Lake Bellaire.”*
  - Advisors: Norton Bretz, Melissa Makowski, Doug Morse, Art Hoadley, Dean Branson, Trish Narwold, and Becky Norris.
- 2010-11- SEOP grants to the following teachers:
  - Bellaire: Rebecca Benson, Judy Schieber, Sue Mills, Kim Clark, and Tom Baeckeroot
  - Central Lake: Kari Groll and Laura Brown.
  - Kalkaska: Randall Atwood, Andrew McCarty, Andy Henderson, Carrie Baic, Tim VanderHart, Ryan Moore, and Andy Urquhart.
  - Mancelona: Barb Costello, Jenny Angell, and Gina Middaugh.

- 2011 - internship program - beginning of the collaborative river sedimentation study for Grass River and Rapid River.
  - Interns: Roger Barber, Eric Youmans, Carrick Conway, and David Witt.
  - Advisors: Gary Knapp, Dean Branson, Norton Bretz, Fred Sittel, Trish Narwold, Braden Ackerman, Jim Kelderhouse, and Becky Norris.
- 2011-12 - SEOP grants to the following teachers:
  - Bellaire: Sue Mills, Kelli Hammond, Kim Clark, Diane Bennett, and Tom Baeckeroot
  - Central Lake: Kari Groll, Eric Boyce, and Tim VanderHart.
  - Kalkaska: Greg Beach, Randall Atwood, Andy Henderson, and Ryan Moore.
  - Mancelona: Michael Southwell and Matt Smith.
- 2012 - internship program - various kinds of water quality science, first time at the Antrim County Fair.
  - Interns: Sierra Kintigh, Alec Stillwell, and Zach Pederson.
  - Advisors: Leslie Meyers and Becky Norris



Zach Pederson demonstrates fish shelters to Governor Snyder at the 2012 Antrim County Fair



- Report: *“Sampler of Water Quality Science.”*
- 2012-13 SEOP grants to the following teachers:
  - Bellaire: Karen Smolinski, Sue Mills, Kelli Fischer.
  - Central Lake: Kari Groll, Lisa Hoogerhyde, Michelle Perkins, and Eric Boyce.
  - Kalkaska: Randall Atwood and Anne DeVol.
  - Mancelona: Ann Grammer, Nikki Willison, and Larry Rager.
- 2013 - internship program - Clam River plume into Torch Lake, road-ends erosion, Maury Creek macroinvertebrates, demonstration greenbelt at Butch’s Tackle & Marine, Antrim County Fair.
  - Interns: Sabeth Dalbo, Annika Stoldt, Ashley Robbins, Tineka Witt.
  - Final work product: *Updates to 3lakes website*
  - Advisors: Norton Bretz, Trish Narwold, Dean Branson, Leslie Meyers, and Becky Norris.
- 2013-14 SEOP program realigned to academic calendar year - no grants given:
- 2014 - internship program - Eurasian water milfoil, fish shocking, Hydrolab, macroinvertebrate inventory., and *E. coli*.
  - Interns: Meike Stoldt, Caitlin Scroggins, Haley Dole, and Kyle Russell.
  - Report: *“2014 TLA Interns Presentation”* and *“Hydrolab for Dummies - Manual.”*
  - Advisors: Leslie Meyers, Trish Narwold, Norton Bretz, Heather Hettinger, and Becky Norris.
- 2014-15 SEOP grants to the following teachers:
  - Bellaire: Sue Mills and Kim Clark.
  - Central Lake: Lisa Hoogerhyde.
  - Kalkaska: Greg Beach, Andy McCarty, and Matt Lonn..

- 2015 - The TLA Interns experimented with Benthic Barriers to combat the invasive Eurasian water milfoil. Eurasian water milfoil (EWM) is a nuisance invasive aquatic plant that can reduce the quality of the aquatic environment through excessive growth. This causes native plants to be replaced, reduces plant diversity, adversely impacts fish habitat, and can interfere with boating and swimming activities due to the effects of large weed beds.

TLA has been monitoring EWM since the late 1990's. Over the years we have utilized limited chemical treatment, diver assisted suction and rudimentary benthic barriers to combat its spread. EWM continues to make its home in 4 locations: Butch's Marine, the Clam River (adjacent to Butch's), the Embayment between Stony and Lone Tree Points and Alden Harbor

This year, we experimented with a formalized non-toxic benthic barrier approach. Benthic barriers prevent plant growth by blocking out the light required for growth. These barriers are non-exclusive, meaning they prevent ALL plant growth. By starting small, our goal is to see if we could eliminate the bad and allow the good plant life to return.

- Interns: Olivia Hall and Kyle Russell, with assistance from Americore volunteer Jared Elm and Josh Vey of the NMC Freshwater Studies Institute.
- Report: *“2015 TLA Interns Presentation.”*
- Advisors: Leslie Meyers, Heather Hettinger, Norton Bretz, Fred Sittel, and Becky Norris.



Jared, Kyle and Olivia assembling a Benthic Barrier.



- 2015-16 SEOP grants to the following teachers:
- Bellaire: Sue Mills and Kim Clark.  
Central Lake: Kari Groll, Sally Kinery, and Dino Pizzino.  
Kalkaska: Greg Beach and Paul Guy.  
Mancelona: Jenny Angell, Michelle Schuette.
- 2016 - internship program - This year's focus is LWD.

**What is LWD?**

Natural wooden structures have been placed along the banks of rivers and creeks to improve aquatic habitat. Methods vary, but it means simply placing trees into a river. The trees then provide many types of aquatic habitat, just as if they had fallen into the river naturally. Whole trees or logs that are harvested close to the site where they will be installed, placed and anchored with some simple hardware. After just one year, it's difficult to identify these structures as man-made—they appear to be natural log jams.

In a creek or river with heavy deposits of sediment (most often from human activities), the technique can greatly improve the habitat for fish and their food sources. LWD can convert a river from a relative desert to a lively fishery. Trout Unlimited endorses the concept and has dedicated funding to LWD projects throughout North America.

**How would LWD help navigation on Grass River?**

These log structures will reflect some of the flowing water and cause subtle shifts in current direction and velocity. As a result, deeper pockets and channels will form as sediment is scoured from the riverbed around the structures. This should expose gravel beds as well, which will improve habitat.

- Interns: Donn Stone, John Sabins, and Hailey Casillas.
- Advisors: Leslie Meyers, Trish Narwold, Rachael Horn, Kyle Russell, Heather Hettinger, and Becky Norris.

- 2016-17 SEOP grants to the following teachers:
  - Bellaire: Sue Mills, Kim Clark, and Chris Vandergriff.  
Central Lake: Kelly Barry.
  - **SEOP** is the acronym for Science Education Outreach Program. Ten years ago, the TLA Board of Directors approved a proposal to provide an opportunity for our area science teachers to give their students materials, equipment or experiences that would enhance students' science education but could not be provided by the school districts due to budget constraints. TLA partners with Bellaire, Central Lake, Kalkaska and Mancelona Schools for this program as they are the districts that border on our three lakes. Each year, the board decides on the amount of funding for SEOP, teachers apply for those items or experiences that they feel would enrich their students' science education and TLA grants as many of the applications as we can. TLA requires feedback from students and teachers during and at the end of the school year, informing us about what they did, how they did it, how and what the students learned, etc. Over the years, TLA has awarded over \$68,000 in grants to area teachers. We are proud of our partnership with the schools. We do believe that:

Students who receive  
Environmental education  
Opportunities help our lakes to  
Prosper

- **2012-2016 - Fish Shelter Project** - this five-year project, in collaboration with the Watershed Center, Friends of Clam Lake, Antrim Conservation District, Tip of the Mitt Watershed Council, Elk-Skegemog Lakes Association, and the Intermediate Lake Association, has succeeded in placing over 80 fish shelters in five lakes of the lower Elk River Chain of Lakes. Full map of the shelter locations is on the Fish Shelters Overview page on our website (<http://3lakes.com/fish-shelters-overview/>).

Deploying a crate fish shelter in Torch Lake



Diver surveys crate fish shelter already populated by many small fish.

### 2015-2016 - What is Golden Brown Benthic Algae?

Golden Brown Benthic Algae (GBA for short) is algae, mostly of the diatoms family of organisms that grow on near-shore sand and rocks. Our 2015 investigation discovered about 140 different species of diatoms in these assemblages of GBA. Eight of the species had not previously been reported in the scientific literature. Each diatom consists of cellular material encased in glass-like silica shells or valves. Diatoms contain photosynthetic pigments (chlorophyll a or c) as well as a brown pigment (fucoxanthin) and yellow beta-carotene, which give them their characteristic color. Diatoms are at the bottom of the food chain. Diatoms derive energy from the sun through photosynthesis, which converts carbon dioxide into sugars, liberates oxygen, and serves as a food source for zooplankton and aquatic animal larvae.

### Where is GBA found?

GBA is native to the local environment; it is not an invasive species. Some diatom species can be found in sand, on sand and rocks, and in water as well as in damp soil and may even grow in non-aquatic locations that remain damp (such as bark on certain trees). Diatoms in soil can be carried into the air by wind and serve as the condensation points for water vapor, resulting in spread through rainfall.

### Is GBA toxic or otherwise harmful?

The forms of diatom species in Torch Lake are not toxic. Other microbial species, including cyanobacteria, can produce toxins, which is an issue of concern with the algae blooms in Lake Erie. Some species of diatoms develop a symbiotic relationship with some species of cyanobacteria. Symbiosis means that each type of organism helps the other type of organism. To date, we have not found evidence that the cyanobacteria associated with the GBA in our area are toxin-producing.

One “harm” being produced by the GBA is that the yellow-brown color of the diatoms coating the lake floor is causing the “Caribbean-blue” appearance of Torch Lake to change into an off-green, a most unwelcome aesthetic change for those who love this area.

### What is causing the increase in recent years?

People have speculated as to the reasons for the increased amount of GBA seen in this region in the past several years. Among the most likely possibilities are (1) an increase in groundwater nutrients, which could be associated with more people living around the lake, (2) a slight increase in water temperature, (3) an increase in sunlight reaching the near-shore areas due to greater water clarity, and (4) a decrease in the zooplankton species that eat diatoms. Because the GBA are growing on the lake floor rather than in the lake water, it seems more likely that the excess supply of nutrients is coming through groundwater.

Atmospheric deposition of debris (such as pollen, dirt, or insect residues) is another potential source of nutrients that may be stimulating the GBA growth.

The real puzzle is what has changed in recent years. Among the things to consider in addition to more dense human population around the lakes are increased light penetration into the water due to the clearing effect of the invasive Zebra mussels that filter phytoplankton and diatoms from the lake water. Other contributing factors may also exist.

**What have we learned so far?**

In the summer of 2015, many samples of lake water, groundwater, and algae were collected and analyzed to more fully characterize the visible GBA and determine the sources and amounts of nutrients available to it for growth. As expected, the concentrations of both phosphorus and nitrogen in lake water were very low and the concentrations in groundwater were substantially higher than in lake water. These findings are consistent with earlier study results and are consistent with the possibility that groundwater supply of phosphorus is encouraging the growth of the GBA.

In the summer of 2015 we also carried out a Nutrient Diffusing Substrate experiment to see what types of diatoms were encouraged to grow on an artificial medium placed in the lake floor and enriched with either nitrogen, or phosphorus, or both, or unenriched. The results of this experiment were consistent with the possibility that the nutrient concentrations in the lake were so low that both phosphorus and nitrogen were limiting for the growth of the GBA. Under these conditions only a small increase in nutrient supply could trigger a growth spurt



Aerial photo of Golden Brown Algae in Torch Lake near Stoney Point

**THREE LAKES ASSOCIATION  
INCOME STATEMENT (UNAUDITED)**

	December 31, 2015			2014
	Operating Fund	Restricted Funds	Total Funds	Total Funds
<b>Revenue:</b>				
Memberships	21,830	4,000	25,830	25,265
Contributions	16,811	5,095	21,906	20,641
Grants	2,500	5,634	8,134	9,450
Fund Raising Events	-	246	246	312
Other Revenue	120	-	120	73
Releases From Restrictions	13,495	(13,495)	-	-
Investment Income	12,401	-	12,401	11,781
<b>TOTAL REVENUE</b>	<b>67,157</b>	<b>1,480</b>	<b>68,637</b>	<b>67,522</b>
<b>Expenses</b>				
Program Expenses:				
Water Quality	18,508	-	18,508	9,296
Education	14,136	-	14,136	13,252
Membership and Other	6,059	-	6,059	5,291
Total Program Expense	38,702	-	38,702	27,838
Administrative Expenses	26,090	-	26,090	29,015
<b>TOTAL EXPENSES</b>	<b>64,792</b>	<b>-</b>	<b>64,792</b>	<b>56,853</b>
<b>NET INCOME (LOSS)</b>	<b>2,365</b>	<b>1,480</b>	<b>3,845</b>	<b>10,669</b>
BEGINNING FUND BALANCE	115,755	117,075	232,829	223,342
Gain on Investments	(19,002)	-	(19,002)	(1,181)
<b>ENDING FUND BALANCE</b>	<b>99,118</b>	<b>118,555</b>	<b>217,672</b>	<b>232,829</b>

**THREE LAKES ASSOCIATION  
INCOME STATEMENT (UNAUDITED)**

	June 30, 2016			2015
	Operating Fund	Restricted Funds	Total Funds	Total Funds
<b>Revenue:</b>				
Memberships	13,380	2,000	15,380	10,465
Contributions	16,770	3,570	20,340	17,505
Grants	-	-	-	600
Fund Raising Events	-	-	-	-
Other Revenue	57	-	57	66
Releases From Restrictions	8,653	(8,653)	-	-
Investment Income	3,734	-	3,734	2,912
<b>TOTAL REVENUE</b>	<b>42,594</b>	<b>(3,083)</b>	<b>39,511</b>	<b>31,548</b>
<b>Expenses</b>				
Program Expenses:				
Water Quality	12,570	-	12,570	4,545
Education	5,521	-	5,521	10,266
Membership and Other	3,318	-	3,318	3,925
Total Program Expense	21,409	-	21,409	18,736
Administrative Expenses	14,271	-	14,271	11,843
<b>TOTAL EXPENSES</b>	<b>35,680</b>	<b>-</b>	<b>35,680</b>	<b>30,579</b>
<b>NET INCOME (LOSS)</b>	<b>6,914</b>	<b>(3,083)</b>	<b>3,831</b>	<b>969</b>
BEGINNING FUND BALANCE	99,118	118,555	217,672	232,829
Gains on Investments	7,168	-	7,168	(697)
<b>ENDING FUND BALANCE</b>	<b>113,200</b>	<b>115,472</b>	<b>228,672</b>	<b>233,102</b>

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Members and Donors

**Life Members**

Willis G. Ashby  
 Richard J. and Susan Bingham  
 Reg & Ann Bird  
 Mr. & Mrs. J.A. Blanchard, III  
 Jerry & Hendrieka Bloom  
 John & Marianne Boukamp  
 Bud & Donna Brian  
 Barbara Brownell  
 Craig & Martha Burns  
 Sue Burns  
 Thomas & Pam Caldwell  
 Tom & Peg Comfort  
 Lewis Cooper III  
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