

Vilas County Lakes and Rivers Association (VCLRA) News

P.O. Box 494 Eagle River, WI 54521-0494

Spring 2014

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Presidential Pebbles and Pearls

When you read this, water will finally be visible on our lakes—a sure sign that summer is around the corner somewhere.

I recently attended the Wisconsin Lake Convention in Stevens Point. This was the most informative lakes convention I have attended in many years. The Wisconsin Lake Convention is jointly planned by the Wisconsin Lakes Partnership. This partnership is composed of the WDNR, the University of Wisconsin Extension and Wisconsin Lakes. The partnership is unique in the United States. Together, the partnership brings up-to-date and relevant lake information to lake associations, lake districts and interested lake property owners. This year, the concurrent sessions were arranged in four topic areas or streams: Lake Science (included watersheds, groundwater and water levels, climate change, and nutrients and our lakes); Aquatic Invasive Species; Native Plants and Animals; People, Policy and Politics (included lake association basics, speaking for lakes, lake district commissioner training and volunteer lake monitoring).

Next year's Lake Convention is planned for April 25-27, 2015 at the Holiday Inn Hotel and Convention Center in Stevens Point. Information about sessions presented at this year's convention can be found at www.uwsp.edu/uwexlakes.

Contained in this newsletter:

A reminder and form to renew your membership in VCLRA for 2015.

Information about the North Central County Lakes Workshop being held at Nicolet College on Friday morning, June 13, 2014. No cost.

Information about the Vilas County Stewardship Covenant being developed by VCLRA via a WDNR grant.

The 2014 Blue Heron Stewardship Award winners.

A review of the Vilas County Lake Classification System.

Finally, the VCLRA Annual Meeting will be held at Nicolet College following the North Central County Lakes Workshop on June 13, 2014 (approximately 11:45 AM). All are invited.

Rollie Alger, President

VCLRA

Blue Heron Shoreline Stewardship Awards – 2013/2014

The 2013 Blue Heron Shoreline Stewardship Awards will be presented at Vilas County Lakes and Rivers Association Annual Meeting, June 13, 2014. This years recipients are Nick and Carol Williams who live on Crab Lake in Presque Isle and the Island Lake Woods Subdivision on Island lake in Boulder Junction/Manitowish Waters.

Nick and Carol Williams

Crab Lake is a large (949 acre) lake with 27 islands. Nick and Carol's house sits on 7.6 acres with 1200 feet of frontage. Blue Heron restricts the area they evaluate around the house to 150 feet of frontage and 300 feet of depth. This restriction makes all properties evaluated more uniform.

Crab Lake is the only lake in Vilas County and possibly Wisconsin with an R5 zoning designation. R5 mandates water front lots to have 400 feet of frontage with 5 acres of land. In 1959 six Crab Lake property owners asked the Presque Isle Town Zoning committee to allow minimum waterfront lot size to be 5 acres with 400 feet of frontage. Presque Isle granted their request and created the R5 zone.

In the same year the minimum frontage on other Presque Isle lakes was set at 250 feet with a 35 foot house set back from the shoreline. (In 1970 the DNR established a minimum house set back from the shore at 75 feet.)

In the 1950's and 1960's development of waterfront lots on Crab Lake was very slow due primarily to lack of access roads. In the late 1950's logging roads were the only way to reach Nick's property.

In 1975-1979 Crab Lake Homeowners Association was formed. Their By-Laws tried to protect R5 zoning by eliminating condos, keyhole lots and commercial development. The By-Laws also stated that the shoreline should stay undeveloped with an intact natural buffer and houses should be painted to blend with nature. Of course Association By-Laws are not enforceable but are effective due to consensus of property owners. In the past and up to the present many families owned large acreage on Crab Lake. Currently Nick's family owns over 130 acres.

As co-chairman of the Presque Isle Town Lakes Committee, Nick keeps an avid interest not only in the health of Crab Lake but in coordinating WDNR grants for Plant Surveys on 29 P.I. Lakes and 2 rivers. As Treasurer of Crab Lake Home Owners Association Nick wrote a plan and reporting method for lake shore owners to "Adopt their Shoreline", monitoring their own frontage for signs of AIS.



Each year the Home Owners Association hires college students, from Ted Ritter's Clean Boats/Clean Waters program, who spend 200 hours per season monitoring Crab Lakes public boat landing.

Walleye and Small Mouth Bass are common in Crab Lake and every other year the lake is stocked with Musky. Rusty Crayfish are the only invasive specie and their numbers remain low due to the appetites of the bass and otters.

Blue Heron Shoreline Stewardship Awards – 2013/2014

Island Lake Woods Subdivision

Island Lake, 1023 acres, lies in both Manitowish Waters and Boulder Junction on the Manitowish chain. Island Lake Woods Home Owners Association (ILWHA) was established in January 1966 when the developer registered deed restrictions on all lots. These restrictions passed with the deed to new property owners. The purpose of the restrictions or covenants was to, “preserve the beauty of the natural setting to the maximum extent consistent with the development of homes.” The ILWHA has an Architectural Control Committee which encourages all property owners to build well designed and attractive homes that protect their privacy and uphold property values.

All lots are zoned R1, single family residential. Building plans, whether for a new home or to remodel an existing home must be submitted to the Committee and the property owner must have written consent from the Committee before starting construction.

Other deed restrictions are as follows:

1. A 25 foot set back from the shoreline or street. 20 foot set back from adjoining lots. (In 1970 Vilas Zoning required a 75 foot set back from the shore and 15 from the lot line.)

2. One pier extending up to 30 feet from shore and one boathouse.

3. No live trees removed within 40 feet of the shoreline.

4. R1 only, no business or commercial activity.

5. No filling or dredging of the lake.



The covenants remain in effect 25 years from January 1966 and are automatically renewed every 10 years unless 75% of property owners wish to change or modify parts. Covenants can be changed by written declaration if 75% of lot owners agree to the change. Any change must be recorded in the office of the Register of Deeds in Vilas County.

The ILWHome Owners Association collects annual dues and holds one annual meeting plus a picnic. The only enforcement of the covenants is by Association members. So far no one has contested the rules. Most subdivision residents are willing to put up with isolation from the near by towns of Boulder and Manitowish waters because they like the quiet wooded location. Residents buy into a collective vision of how shorelands should look to provide the lake maximum protection.

The Vilas County Lake Classification System classifies Island Lake as medium sensitivity and medium development. This restricts lot size to 200 feet of frontage and total lot area of 40,000 ft² or one acre.

Homes built before County Zoning and Lake Classification have received a variance.

Janie Russell is Treasurer for the ILWHA. VCLRA evaluated Janie and Dan's property according to

How Vilas County Lake Classification System Protects Shoreline Habitat

There are only two other places in the world that have as many fresh water lakes as Vilas County. Therefore it was far sighted and essential that in 1999 , using a WDNR grant, Vilas County developed a Lake Classification System. Under this system all lakes over 50 acres are zoned according to two major criteria, degree of 1999 Development and degree of lake Sensitivity. Each lake had either low, medium or high levels of Development, and low medium or high Sensitivity. Lakes with intact shoreline and relatively undisturbed ecosystems were ranked as “High Sensitivity” and when combined with “Low Development” they had to have a minimum of 300 feet of frontage with a lot area of 60,000 ft². This was the most strict category. The most lenient category was “Low Sensitivity with low, medium or high development and required 150 feet of frontage with a 30,000 sq. foot lot. The classification of every lake in Vilas can be found in Vilas County Zoning Ordinance, Amendment #135, May 01. 1999, Article 3-5 to 3-7.

Prior to 1965 there were no zoning ordinances in Vilas County. By 1965 it was obvious that the unregulated development of shorelines would quickly result in pollution of Wisconsin water bodies.

In 1965 the Wisconsin legislature required all counties to pass zoning ordinances for all shore lands in unincorporated areas. NR 115, the Administrative Code to this Wisconsin Statue, set minimum standards for lake front parcels at 100 feet of frontage with an area of 20,000 sq. ft. (½ acre).

Prior to statewide zoning, the town of Presque Isle in Vilas County created zoning ordinances in 1959, that proved more strict than the states. Every lake lot required 200 feet of frontage and 40,000 sq. ft. lot. One lake in Presque Isle, Crab Lake, was allowed to have 400 feet of frontage

and 5 acres of land.

This became a special category, R5, the only regulation of its kind in the state. By 1990 seven Vilas towns required 200 feet of frontage compared to the states 100 feet of frontage.

When Vilas Lake Classification System became effective in 1999, it finally protected the most pristine or sensitive lakes and allowed more liberal standards on lakes already heavily developed.

In 2005, Dr. Bill Provencher from the University of Wisconsin – Madison, released an in depth

study of Vilas Counties Lake Classification System. The study showed that the System raised the value of shoreline lots, even for unde-

“The System raised the value of shoreline lots, even for undeveloped lots, compared to the 100 foot frontage required by state statue”

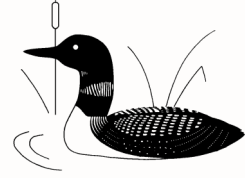
veloped lots, compared to the 100 foot frontage required by state statue. For example a 200 feet of frontage on an undeveloped parcel was priced \$12,070 higher than the price of a similar 100 foot frontage lot. Dr. Provencher concluded, “ I know of no study indicating that stricter zoning has ever reduced lake shore property values on average.”

Since zoning varies among Vilas lakes people sort themselves according to preference. Those who enjoy a relatively undisturbed lake shore environment are willing to pay more for large parcels on lightly developed lakes. Others seek out small parcels on heavily developed lakes. This shows that people differ in how they value water. Some see a lake's surface as an inviting playground while others see lakes as a diverse ecosystem and enjoy watching varied wildlife.

Vilas has used thoughtful zoning regulations to balance reasonable use of our shore lands with long term protection of a unique collection of water resources.

Vilas County Lakes & Rivers Association

Agenda for North Central County Lakes Association Workshop



Friday, June 13, 2014; Nicolet College

Celebrating Lakes & Rivers Day

- | | |
|----------------|---|
| 8:30 – 9:00 | Registration, socializing and visiting vendor tables |
| 9:00 – 9:30 | Welcome and Keynote presentation “The Economics of Lakes” by Bob Martini, Tim Brown and Rick Foral. |
| 9:30 – 9:45 | Rate Your Lake--Lake Survey Tool by Norris Ross |
| 9:45 --10:00 | Break to visit vendors and network |
| 10:00 – 10:45 | Burnett County Lake Property Covenants by Dave Ferris |
| 10:45 -- 11:15 | Vilas County Lake Property Covenants by Sandy Gillum |
| 11:15 – 11:30 | Q & A |
| 11:30 – noon | County-wide Lake Association Meetings (locations TBA at meeting) |

****Tables are set up by Wisconsin Lakes, OCLRA, VCLRA, Oneida County Invasive Species Coordinator, LoonWatch, WDNR, Northwoods Land Trust, North Lakeland Discovery Center, Vilas County Land and Water Conservation Dept.**

****Thank you to the Oneida County Lakes & Rivers Association and Vilas County Lakes & Rivers Association for the coffee and snacks.**

****Thank you to Wisconsin Lakes for coordinating and publicizing this workshop.**

****Together, we can make a difference. Join your lake association, county association and Wisconsin Lakes.**

Nicolet Area Technical College Location: 5364 College Drive, Rhinelander, WI 54501

VCLRA MEMBERSHIP APPLICATION OR RENEWAL - 2014

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To apply for membership in **Vilas County Lakes & Rivers Association**, please submit **annual dues payment before June 1st**. Every individual, family, supporting, or lake organization board member will receive the VCLRA newsletter. Please make checks payable to **VILAS COUNTY LAKES and RIVERS ASSOCIATION (VCLRA)** and return, with completed form, to **VCLRA; P. O. Box 494; Eagle River, WI 54521-0494**.

Please check which type of membership you are applying or renewing:

___ **Individual/Family \$25** ___ **Lake Organization \$50** ___ **Associate/Supporting \$75**

Provide permanent mailing address of Individual, Family or Supporting Memberships. Individual members will automatically be Key Contacts, if they have email. Lake associations and districts please indicate the name/address of a **Key Contact person, an officer or board member with email**. **Key Contacts are used for quickly transmitting pertinent or time sensitive information such as legislative updates or call-to-actions.**

For **Individual, Family and Associate/Supporting Memberships**, please complete Section A only and note your lake of residence and indicate if a lake association is established and its number of members. If you do not have email or do not wish to receive occasional Key Contact information, check here [].

For **Lake Organization Memberships**, complete Sections A & B below.

Section A: PLEASE PRINT LEGIBLY—Thank you. * If you wish to receive our newsletter via email, Check (x) in the box after email address.

Name _____ ph _____
Address _____ fax _____
City _____ State _____ Zip _____ e-mail* _____ ()
Name of Lake Organization: _____
Number of individuals represented by your lake organization: _____

If you are applying or renewing a Lake Organization Membership, please submit the names and addresses of your organization officers and board of directors/commissioners. Each officer, director/commissioner will receive the newsletter. **If an officer/director/commissioner is the same as last year, and has no information changes, please enter "NC" for no change after their name. Please return by June 1st.**

Section B: PLEASE PRINT LEGIBLY—Thank you.

President/Chairman

Name _____
Address _____
City _____
State _____ Zip _____
e-mail _____ ()

Vice-President

Name _____
Address _____
City _____
State _____ Zip _____
e-mail _____ ()

Secretary

Name _____
Address _____
City _____
State _____ Zip _____
e-mail _____ ()

Treasurer

Name _____
Address _____
City _____
State _____ Zip _____
e-mail _____ ()

Director/Commissioner

Name _____
Address _____
City _____
State _____ Zip _____
e-mail _____ ()

Director/Commissioner

Name _____
Address _____
City _____
State _____ Zip _____
e-mail _____ ()

Place the names of additional Directors/Commissioners on a separate sheet. Thank you.

VCLRA Annual meeting: June 13, Election of Board of Directors

Karen Dixon

After buying a home on the Manitowish Chain of Lakes in 2001, Karen became involved in the Manitowish Waters Lakes Association, first serving as secretary for a few years, and then serving as president since 2007. Currently, she serves on the boards of the Manitowish Waters Alliance, the Manitowish Waters Economic Development Association, and the North Lakeland Discovery. She is also involved in the CBCW Program, AIS monitoring activities, and Citizen Lake Monitoring (Secchi Disc).

Karen received a B.S. and M.S. degree in Communicative Disorders from the University of Wisconsin – Whitewater and was a Speech and Language Pathologist for the School District of Janesville from 1974 to 2012. She was active in the Janesville Education Association and the Wisconsin Education Association; served as chairperson of the City of Janesville Board of Appeals and president of the Board of the Janesville Community Day Care Center.

Karen grew up in Oconomowoc enjoying swimming, boating and water skiing on Lac La Belle. Her childhood experiences on the water helped develop a love for nature and an interest in protecting the water quality of Wisconsin lakes and rivers. She enjoys reading, walking, biking, kayaking, and spending time with her husband, Mike. They have one son, Morgan, who lives in Madison.

Steve Budnik

After B.S. and M.S. Degrees from UW-LaCrosse, Steve worked as a manufacturing real estate appraiser for the WI Dept. of Revenue for 30 plus years prior to retirement in 2007. Since that time, Steve and his wife Kay have lived fulltime on Rock Lake in Winchester/Vilas County. Steve has been an active member of the Winchester Town Lakes Committee for three years and serves as a Vilas County delegate on the Wisconsin Conservation Congress. He also serves as a Rock Lake representative to the Turtle Lakes Chain Association. As an avid muskie fisherman, Steve is a past national president of Muskies, Inc. Steve is a lake monitor for the Citizen Lake Monitoring Network and is very much looking forward to his participation as a member of crew 9 for this year's Lake Leader Institute. In his spare time he is an outdoor writer-photographer; is learning to trap shoot; and manages to run 25 miles a week.

Dennis Burg

I practiced Corporate Law in Milwaukee and Waukesha County for 35 years. I retired in 2010 and moved to Eagle River where I presently reside. Since I moved here I served as a member of the Board of Directors of the Rhinelander and Eagle River YMCA until 2013.

In 2012 I attended and successfully completed the Wisconsin Lake Leaders Institute. I am a member of the Board of Directors of the Eagle River Chain of Lakes Association, serve as a volunteer for the Citizen Lake Monitoring Network and am a member of Trout Unlimited and the Ruffed Grouse Society. I am also on the Board of Directors of the Tri-County Council on Domestic Violence and Sexual Assault and serve as chairperson of the St Peter the Fisherman Parish Finance Council. In my leisure time I enjoy fishing, hunting, snowshoeing, canoeing, swimming, biking and reading.

Jeff Currie

Jeff and his wife, Ann, have lived on Nelson Lake since 2005 when he retired from teaching journalism and English at Oak Park and River Forest (IL) High School. He has been the communications volunteer for the Cloverland Town Lakes Committee since 2008, and is president of the Nelson Lake Homeowners Association. Jeff is secretary of the Vilas Area Silent Sports Association. Both Jeff and Ann are also officers of Great Headwaters Trails, a 501(c)(3) foundation developing a 40-mile family-friendly bike-ped trail system connecting Eagle River to St. Germain. Conover, Phelps, and Land O' Lakes.

Anne Kretschmann

Anne is the Water Specialist and Aquatic Invasive Species Coordinator at the North Lakeland Discovery Center in Manitowish Waters. Anne holds a bachelors' degree in Conservation Biology from Prescott College in Prescott, AZ. Her dedication to the conservation of natural resources led Anne to work with a myriad of species nationwide through a variety of organizations. Following graduate studies in Fisheries and Wildlife Management; and Geographic Information Systems at the University of Arizona in Tucson; Anne moved to the Northwoods, joining the Discovery Center staff in 2011 where she is responsible for water and aquatic invasive species related programming including coordinating the Vilas County lake level monitoring program.

Board of Directors continued

Carol Warden

I hold an M.S. in Water Resource Management for UW-Madison's, Nelson Institute. Since 2007, I've worked with UW Center for Limnology. From 2007-2010 I collected and analyzed water, plant and fish samples from the Madison area lakes to determine long-term trends and effects from human and natural impacts. Starting in 2010, I took a position as Aquatic Invasive Species (AIS) Specialist with the Center for Limnology at their Trout Lake research station in Vilas County. Over the last two years I've been researching the impacts AIS are having on our northern lakes and the rate at which they are spreading across our region. Another large component to my position is education and outreach. I regularly meet with the public and with students to teach them about the origin of AIS, how they got here, their impacts and management strategies for controlling these impacts.

Prior to my days as a limnologist I spent my youth swimming and boating around Wisconsin lakes. I then served in the U.S. Navy for five years as a photographer. Following that, I studied geography at UW-Madison, which all led me to here.

Gretchen Watkins

Gretchen is currently employed as the Water Resource Specialist/Hydrologist for the Lac du Flambeau Band of Lake Superior Indians. The Reservation encompasses one of the premiere chains of lakes in Vilas County. Reservation waters are also the headwaters to the Manitowish chain and the Turtle Flambeau Flowage. Gretchen develops sound scientific investigations to support management decisions to protect Lac du Flambeau water resources for the coming seven generations. Gretchen received her B.S. in Biology from Rensselaer Polytechnic Institute and her M.S. in Environmental Engineering from Michigan Technological University to improve her understanding and management capabilities of surface waters. She also enjoys water skiing, canoeing, kayaking, sailing, swimming, bird watching, and just sitting by the edge of the water letting the hours pass by with her daughter Lena (8), son Norris (6), and husband Radley. Gretchen hopes to bring VCLA enthusiasm and a strong scientific background to help in the preservation of our water resources.

Shoreland Stewardship Covenant

VCLRA has received a grant from the Wisconsin DNR to develop a Vilas County Shoreland Stewardship Covenant program. The purpose of this program is to provide lake property owners of less than 500' of frontage the opportunity to voluntarily place their shoreland in a covenant for a period of thirty years. The criteria for this covenant are based on present Vilas County shoreline zoning and NR 115, whichever is more protective of the shoreland area and the lake.

The grant provides for the writing of a covenant specific for Vilas County shoreland property, by an attorney, who specializes in Wisconsin environmental topics. Interested property owners may want to have their personal attorney review the covenant prior to introducing it into their deed. The grant will cover the cost of recording the change in the property's deed. The grant will also provide for a small recognition plaque that the property owner may place on their property indicating that their property is a Vilas County Shoreland Covenant Property.

In 2014, the first year of the program, letters will be sent out to past Blue Heron Stewardship Award recipients and others, inviting them to attend a meeting where this program will be explained and questions answered. Owners interested in this program will have their property inspected by members of the VCLRA Blue Heron team. Upon successful completion of the inspection, the property owner(s) may proceed in having the covenant reviewed, should they wish. Arrangements will be made for recording the covenant with the Vilas County Register of Deeds and payment of the fee. Each property owner will be provided with a recognition plaque and recognition in the local media.

Know Your Lake, Submitted by Tim Hoyman, CLM

Wisconsin is home to over 15,000 lakes. We have big lakes and small lakes, deep lakes and shallow lakes; we have seepage lakes, drained lakes, spring lakes, drainage lakes, and even man-made lakes. And like people, our lakes have definite similarities among them, but each is unique in its own way. In the same way that knowing yourself leads to a better quality of life, knowing your lake leads to maximum appreciation and enjoyment of it.

The natural lakes in Vilas County are about 11,000 years old and were formed during the recession of the last glacier. Ever since their creation, each lake has slowly changed in many ways. Prior to European settlement, the changes were natural, but then anthropogenic impacts accelerated the changes. Still, the changes were slow and in general remain, at that pace today. Frequently, lake users become concerned with an issue on their lake and whether it is poor water clarity, algae blooms, or increased aquatic plant growth, they tend to pin that change on a single cause, such as stirring of bottom sediments by boating, failing septic systems, or invasion by exotic species. When it comes to lakes, there is typically no single reason as to why a change has occurred.

Also, in many cases, the change may be temporary or maybe there really has not been a change, but the lake user only perceives there to be one. Above all, knowing your lake and understanding why changes occur is the best way to enjoy it.

Kentuck Lake, a large, shallow waterbody of about a thousand acres, has experienced intense algae blooms two out of the last three summers. During the summer of 2011, algae were unusually dense, but in 2012, algal content had settled down to just above normal levels. However, in 2013 the dense algae were back, and lake user displeasure was exacerbated when the late summer season was capped-off with a severe blue-green algae bloom. The blue-green bloom prompted the Vilas County Health Department to post the lake's boat landing with a sign warning the public of the danger. Needless to say, this brought about a great deal of concern among lake users and riparian property owners. In fact, it was just the icing on the cake as many riparians were highly concerned about water quality degradation on Kentuck – especially in recent years.

Results from a 2013 written stakeholder survey conducted as a part of Kentuck Lake's management planning project, indicated that algae

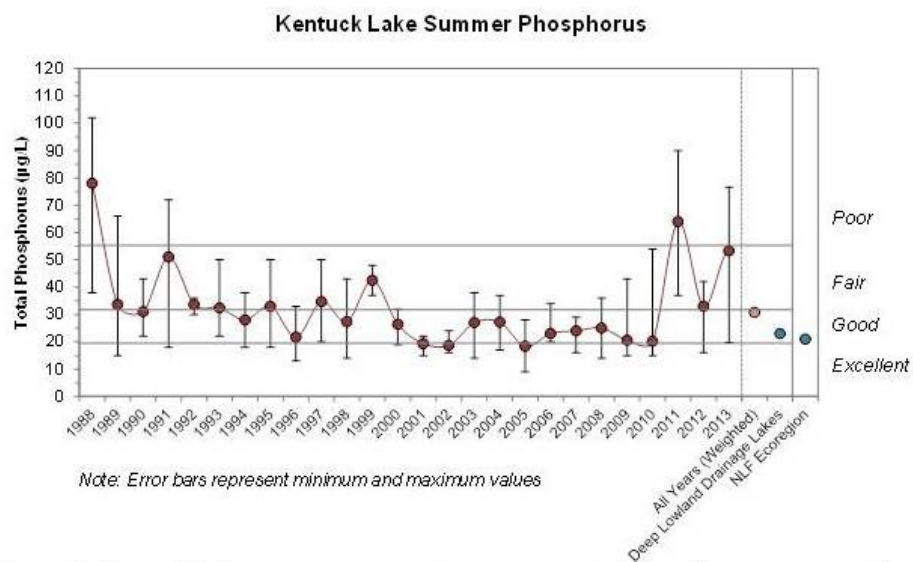


Figure 1. Kentuck Lake summer near-surface average total phosphorus concentrations, and state-wide deep lowland drainage lakes and NLF Ecoregion median total phosphorus concentrations. Water Quality Index values adapted from Garrison et. al (2008). NLF = Northern Lakes and Forests.

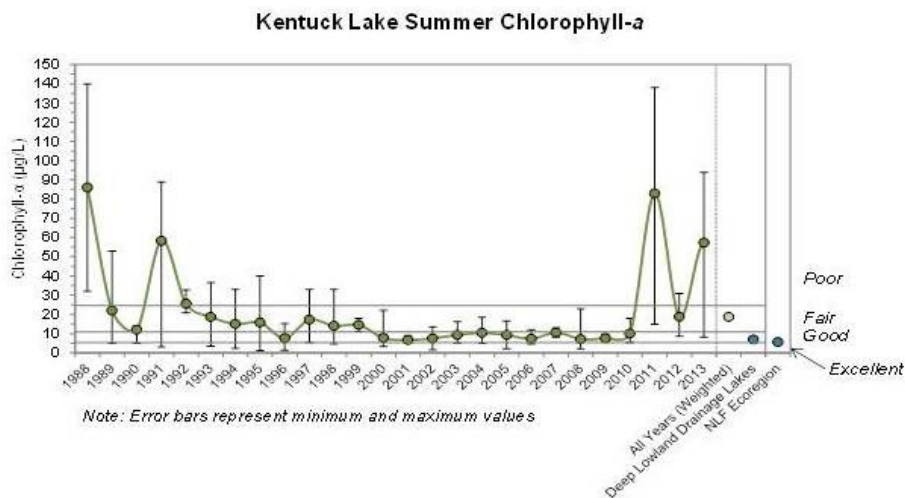


Figure 2. Kentuck Lake summer chlorophyll-a concentrations, and state-wide deep lowland drainage lakes and NLF Ecoregion median chlorophyll-a concentrations. Water Quality Index values adapted from Garrison et. al (2008). NLF = Northern Lakes and Forests.

Know Your Lake, Continued

blooms and water quality degradation are the top two concerns of respondents. Further, 62.5% of respondents believe the lake's water quality to be "Poor" or "Very Poor" and 91% believe that the water quality has "Somewhat Degraded" or "Severely Degraded" since they first visited the lake. These results, along with the written comments received as a part of the survey, indicate that the vast majority of riparians believe that the recent algae problems were a new development on the lake, were likely going to continue if something was not done to curtail them, and that one likely culprit may be lakeshore septic systems.

Fortunately, in 2013, the Kentuck Lake P & R District began a project, that is partially funded through state grants, aimed at creating a comprehensive management plan for Kentuck Lake. The project includes assessments of the lake's water quality, aquatic plants, shoreland condition, and surface watershed; as well as an intense stakeholder participation component. The water quality assessment includes the use of historical data for trend analysis. Kentuck Lake is part of Wisconsin's Long-term Trend Monitoring Program, so there are plenty of data to analyze. The watershed portion includes the development of a phosphorus loading model based upon land cover types within the lake's surface watershed. Phosphorus is important because in Kentuck Lake, like most other Wisconsin lake's, it is the nutrient that controls algal growth. While all the questions have not been answered, these two assessments resulted in three interesting findings; 1) the recent algae blooms are not unique in the lakes history, 2) the primary source of phosphorus driving the algae blooms is likely not from the watershed or lakeshore septic systems, but most likely from within the lake, and 3) it takes a special set of circumstances to increase the phosphorus concentrations to sufficient levels to fuel the intense blooms.

Figures 1 and 2 display total phosphorus and chlorophyll-*a* data for Kentuck Lake beginning in the late 1980's and extending through 2013. Having all these data to work with is the exception and not the rule with Wisconsin Lakes. In general, the ups and downs in both charts match very well, indicating that phosphorus concentrations control the level of chlorophyll-*a* in the lake. Chlorophyll-*a*, the green pigment used by plants during photosynthesis, is directly related to algae levels. So, years with higher phosphorus exhibit higher algae levels as demonstrated by higher chlorophyll-*a* concentrations.

The charts also indicate that the high levels of algae noted by Kentuck Lake stakeholders during 2011 and 2013 were nearly matched in 1991 and exceeded in 1988. Precipitation data collected during the same timeframe did not indicate high periods of runoff that would be responsible for the high levels of phosphorus that fueled the algae blooms. Modeling of septic system discharges, even at a worse-case-scenario level, showed that septic systems were likely not responsible either. So where did the phosphorus come from? The answer lies within the sediment of the lake.

Many Wisconsin lakes stratify during the summer and winter months. In the summer, the warm upper layer, or epilimnion, tends to mix continuously and is the layer in which most algae live. The metalimnion (often called the thermocline) is the middle layer and exhibits the greatest change in temperature with depth. The bottom layer, or hypolimnion, is the coldest layer. In the winter, the hypolimnion is the warmest layer and the epilimnion the coldest. The stratification occurs due to differences in water density with temperature. The difference in density between the layers nearly eliminates the transfer of chemicals between them. In many Wisconsin lakes, the decomposition of organic material in the lake's bottom sediments leads to anoxic conditions in the hypolimnion. In other words, all of the oxygen in the bottom layer is used up by bacteria as they consume dead plants and animals. The oxygen in the deepest part of the lake is not replenished until the lake mixes.

In the presence of oxygen, iron binds phosphorus in the bottom sediments, but during anoxic conditions, like those often found in the hypolimnion of Kentuck Lake, iron releases phosphorus to the overlying water. The phosphorus concentrations can become exceeding high, but as long as the hypolimnetic water is not mixed into the epilimnion, there will be no ill effects, such as an algae bloom. During most years, this is the case on Kentuck Lake because the hypolimnion forms only in the lake's small, deep hole, near its north end. However, in some years, the hypolimnion forms early and in shallow water of 15 to 18 feet. If it remains at those depths, it can include hundreds of acres of lake bottom. If the hypolimnion becomes anox-

then hundreds of acres of lake bottom are releasing phosphorus into the hypolimnion. During those years, the epilimnion steadily erodes the hypolimnion bringing the phosphorus rich waters to the surface where they can be utilized by algae. In some years, the phosphorus-laden bottom waters may be mixed with surface waters by a single storm event; also resulting in algae blooms.

However, as alluded to above, historical data indicate that this shallow stratification may only occur during years that have an extended hot period with low winds. When these conditions occur, surface waters are quickly heated and the stratification is set. During most years, the mixing continues through much of the spring with the stratification setting up later and deeper.

Kentuck Lake's management plan is nearly complete and a major component of it will be to conduct a 3-year water quality study beginning this spring. The first year of the study includes frequent temperature and dissolved oxygen testing by district volunteers at seven of the deepest locations in the lake to discover the frequency of stratification and mixing throughout the summer. The results of the first year's studies will be used to select specific locations for further water quality monitoring, including total phosphorus and chlorophyll-a. Depending on the results of the three-year study, there may be options for reducing the frequencies of the intense blooms.

So, the folks that enjoy and care for Kentuck Lake, know their lake and they know it well. What was touched upon here is only a small part of what Kentuck Lake stakeholders are learning as a part of their management planning project. Kentuck Lake riparians now understand that the recent blooms are not new and are not necessarily the start of a trend towards poorer water quality. They also know the likely source of phosphorus that is driving the blooms and the next steps that will be used to determine if that source can be minimized.

Tim Hoyman, CLM, is the founder of Onterra, LLC, a lake management planning firm based in De Pere, WI. As the company's lead aquatic ecologist, Tim is involved with all of the firm's projects, but his specialty is water quality monitoring and assessment. Tim, one of four Certified Lake Managers by the North American Lake Management Society in WI, holds a Bachelor of Science in Biology and Chemistry from UW-Whitewater and a Master of Science in Limnology from Iowa State University.

Trout Lake Research Station Open House

Just north of Minocqua, scientists from across Wisconsin, the nation and the world are hard at work, exploring issues like invasive species, sportfish populations and water quality.

On **Friday, August 1st, from 1pm to 5pm**, UW-Madison's Center for Limnology will open the doors to its Trout Lake Research Station to the public and explain what, exactly, all those research boats are doing around Vilas County and how what researchers learn may help keep Wisconsin's lakes healthy.

Visitors can spend half an hour or the whole afternoon taking guided tours of the station, meeting the plants and animals that call Vilas County lakes home, and talking to our scientists about anything and everything to do with Wisconsin's freshwater ecosystems.

Boat trips out on Trout Lake will let visitors try their hand at using lake research tools. Exhibits

will feature rare plants and common fish from Northwoods lakes. Kids can catch their own plankton and aquatic bugs and then get an up close look under microscopes, or create lake-themed crafts to take home as souvenirs.

Refreshments are provided and the event is free and open to visitors of all ages.

Please join us for this "behind the scenes" tour of Trout Lake Station, where University of Wisconsin researchers are doing world-class research on Vilas County lakes.

Trout Lake Station is located at 3110 Trout Lake Station Drive, just off County Hwy N (between 51 and Hwy M)

Phone # is - 715-356-9494

http://limnology.wisc.edu/Trout_Lake_Station.php

Mark your Calendar

North Central County Lakes Association Workshop

Friday, June 13, 2014 at Nicolet College

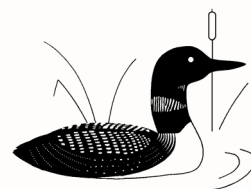
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Please find form on page 6 of this newsletter or go to our website and print the membership form at:

<http://www.vclra.us/home/membership>

and send in your membership:

Individual/Family \$25 Lake Organization \$50 Associate/Supporting \$100



Your support helps protect lakes!

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