Lake Healthy Food Preserving Our Water Quality Through Positive Food Choices

Every eater affects water quality and human health through the farming practices they support when they purchase food or grow food.

In the Fall 2008 Lake Tides, the article "Groundwater: Are we drinking our land use habits?" discussed a recent study estimating that one out of every three private wells in Wisconsin contains detectable levels of agricultural pesticides. Areas of the state with higher percentages of the land in agriculture generally had greater percentages of wells with

detectable pesticides. In addition to supplying drinking water, groundwater also supplies much of the water to our valuable lakes. Many pesticides and pesticide breakdown products move with water as it runs off the land or seeps

Wisconsin lakes

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Pesticides include herbicides, insecticides and fungicides.

into the groundwater and then moves to our waterways. So, in essence, we drink and swim in our land use habits. In this article, we will look at how our food choices affect the water quality of our lakes and streams. While this article focuses on pesticides from agriculture, and an approach where everyone can be part of the solution, pesticides applied to lawns, gardens, roadsides, golf courses and other lands can also affect our lakes and drinking water.



(Lake Healthy Food, cont.)

Let's start with how food is grown in Wisconsin...

Pesticide Use on Wisconsin Crops

In the 2004 and 2005 growing seasons, farmers in Wisconsin reported using 13 million pounds of pesticides each year. This amounts to over two pounds of pesticides for each person in Wisconsin.¹ Some pesticides have higher toxicity than others, so quantity does not equal toxicity. We can consider pesticide use from a number of perspectives including total amount of pesticides applied to a crop





Table 1: Pesticides applied to major crops in Wisconsin, 2004-2005			
Сгор	Average pounds/	Acres	Total pounds
	acre of applied		of pesticides
	pesticides		applied
Apples	28	5,800	163,300
Potatoes	14	68,000	950,000
Tart cherries	8	1,800	14,700
Carrots for processing	7	4,200	29,400
Snap beans	3	76,000	251,600
Sweet corn	2	88,400	198,000
Field corn	2	3,800,000	6,503,000
Green peas for	1	30,200	33,500
processing			
Soybeans	1	1,610,000	1,770,000
Cucumbers for	1	4,600	3,800
processing			
Cabbage, fresh	1	4,400	2,700
Barley	0.1	55,000	5,000
Oats	0.1	400,000	25,000
Cranberries	?	18,000	?

throughout the state, and amount of pesticides applied per acre. Figure 1 illustrates the average pounds of pesticides farmers reported applying per acre per year in Wisconsin. The crops with the highest average annual pesticide application per acre were potatoes with 14 pounds of pesticides per acre each year, and apples with 28 pounds per acre. In contrast, Table 1 shows that pesticides are applied in the greatest total amounts statewide to field corn and soybeans, Wisconsin's top two crops by acreage. Another interesting point is that while cranberries are grown on about 18,000 acres in our state² and food analysis shows high levels of pesticide residues,³ pesticide application data are not reported for this crop.

Pesticides in Lakes

Given that pesticides are used extensively in Wisconsin agriculture and regularly found in groundwater, it's not surprising that they're also found in lakes. In 2005, 53 Wisconsin lakes were tested for atrazine in late summer. Atrazine was detected in over 90% of the lakes. While most lakes had some level of atrazine, differences in concentrations were found between lakes surrounded by varying degrees of agricultural land use. Lakes where atrazine was low or absent were primarily located in forested areas, whereas lakes higher in atrazine were found where agriculture comprised over 75% of the surrounding land area⁴ – *the same trend found in the groundwater study*.

Atrazine concentrations in lakes ranged from below the detection limit of the test (0.10 ppb) to 0.40 ppb.⁵ To put these numbers in perspective, consider that the drinking water standard for humans for atrazine is currently 3.0 ppb, yet recent research found that male frogs exposed to atrazine at 0.10 ppb as tadpoles develop both male and female sex organs.⁶ Although atrazine and other pesticides are legal to use, little is known about their affects on other wildlife.



Human Health Effects of Agricultural Pesticides

Do we really know how agricultural pesticides affect our health? The short answer is "no." Our society has chosen to allow pesticide use on a large scale across the landscape first, and to study the health effects later. The European Union and certain communities in the U.S. are moving to a precautionary approach toward pesticides and man-made chemicals in general.

We do have some health information about certain agricultural pesticides. For instance, research has found that atrazine may cause cancer in humans, in addition to the effects on sexual development in frogs.⁷

What about other pesticides? Wisconsin has not set standards for pesticide concentrations in lakes or streams. In addition, a large fraction of pesticides used in Wisconsin do not have safe drinking water standards either. For example, in 2004-2005 Wisconsin farmers reported using 17 pesticides on field corn, and 13 of these pesticides do not have safe drinking water standards. For potatoes, farmers reported using 26 pesticides of which 20 do not have safe drinking water standards.⁸ In addition, very few controlled studies have been done regarding the health effects of being exposed to a mixture of pesticides in groundwater.

A number of scientific studies have looked at large populations and found pesticide-related health risks for children based on what they eat, where they live, or their parents' pesticide exposure. Here are a few of the research findings:

- When children ate <u>organic</u> fruits, vegetables and juices, they had much lower pesticide levels in their urine.⁹
- A Minnesota study found the highest rates of birth defects in western Minnesota, a major wheat, sugar beet and potatogrowing region, which also had the highest frequency of use of chlorophenoxy herbicides and fungicides. Intermediate birth defect rates were found in corn and soybean areas, while the lowest birth defect rates occurred in non-crop regions.¹⁰
- Children living in a valley with frequent use of agricultural pesticides had reduced eye-hand coordination, 30-minute memory,

and the ability to draw a person, as shown in Figure $2.^{11}$

The children of pesticide applicators had significantly higher birth defect rates.¹²



Reducing Pesticides in Our Lakes

So, what can we do to reduce pesticides in our drinking water and lakes? Perhaps too often the approach has been to blame the farmers. I suggest an alternative approach where everyone can be part of the solution. Given that we all eat food, I suggest we use our food dollars to support local farmers who protect our lakes and groundwater by growing food without using pesticides, or grow some of our own food without pesticides. If pesticides aren't applied in the garden or field, they won't end up in our drinking water and lakes.

Fortunately, Wisconsin has a strong and growing network of farmers providing locally grown food. You may already know of some nearby roadside farm stands or a farmers market. Take a few minutes to get to know these farmers and ask them about how they control weeds and insects. Another option is to check out the regional food guides in Wisconsin, known as Farm Fresh Atlases, at <u>www.farmfreshatlas.org</u> that include farms, farmers' markets, restaurants, stores and typically list whether the food is produced without synthetic pesticides – known as "organic."

(Continued on page 14)

Figure 2 shows representative drawings of children exposed to pesticides (valley) and those that were not (foothills).¹¹

> Organic means produced without synthetic pesticides.



Low Water Levels in the North Are they driven by precipitation or evaporation?

Lake Level Trends

Although Sparkling Lake is just one lake of thousands in the Northwoods, lakes often respond very similarly to variations in climate. In recent years, the lakes of northern Wisconsin have undergone a pronounced drop in water level. An example of this is shown in Figure 1, which graphs the water level of Sparkling Lake (in Vilas County) from 1984-2007. Over this time period, the lake level typically varied over a range of about 60 cm (2 feet), with high lake levels in the mid 1980s and 1990s and low levels at other times. On top of this variation is a long-term trend toward lower water levels, with an average downward trend of about 16 cm per decade (the straight line in Figure 1). Much of this downward trend began after 1997, when



Figure 1. Annual average water levels of Sparkling Lake (Vilas County, WI) and Lake Superior in meters above sea level (ASL) for 1984-2007. Black lines indicate the long-term trend. Data courtesy of the North Temperate Lakes LTER Program and National Ocean Service.



lake levels dropped by 107 cm (42 inches) to their current record low level in 2007. This dramatic 10-year drop is probably what stands out most in the eyes of northern Wisconsin residents. A natural question to ask is "Why?" Have we simply been receiving less rain? Less runoff from snow? More evaporation from the lakes? There are many possible contributing factors, and we will examine two of them in this article, namely precipitation and evaporation.

Although Sparkling Lake is just one lake of thousands in the Northwoods, lakes often respond very similarly to variations in climate. This is again illustrated in Figure 1, which shows the water levels of Lake Superior sideby-side with those of Sparkling Lake. It can be seen from this figure that Sparkling Lake and Lake Superior behave very similarly, despite their vast difference in size (surface area of 0.64 km2 for Sparkling Lake, compared to 82,000 km2 for Lake Superior). So although our discussion will focus on Sparkling Lake, it is important to know that this lake is fairly representative of a much broader region.

Lake Water Budget

In order to understand the cause of lake level variations, one must calculate the "water budget" of a lake. Similar to balancing your checkbook, a water budget does an accounting of all the inputs and outputs of water to a lake. Any imbalance results in a change in lake level. For Sparkling Lake, the water budget equation looks like this: $\Delta L = P - E + G$, where P is precipitation over the lake, E is lake evaporation, and G is the net flow of groundwater into or out of the lake. (Sparkling Lake is a seepage lake, so there is no need to account for inputs or outputs of water from streams.) ΔL is the change in lake level over the given time period (usually a month, year, etc.). Although groundwater inputs and outputs to Sparkling Lake are important, they are difficult to measure and are not routinely monitored. Therefore, we will focus our attention on P, E, and ΔL , each of which has been measured since at least 1989 as part of the North Temperate Lakes Long-term Ecological Research (LTER) Program at the University of Wisconsin-Madison.

Influence of Precipitation

Figure 2 shows the annual average precipitation measured at Minocqua Dam for the water years 1985-2007. (A "water year" is the 12-month period from October to the following September, with the calendar year referring to the latter 9 months January-September). The 23-year average precipitation at this location is around 81 cm (32 inches). Also shown in Figure 2 is the annual change in water level for Sparkling Lake, ΔL (typically measured in late September). In most cases, years that have above-average precipitation are accompanied by an increase in lake level (i.e., a positive ΔL in the water budget equation). This occurs, for example, in 1991, 1996, and 2002. Similarly, drops in lake level occur during years in which the precipitation rate is below average (e.g., 1987, 1998, 2005, and 2007). The recent decline in lake levels (Figure 1) is at least partially explained by the fact that precipitation rates have been below normal for each of the past 5 years (Figure 2). It is interesting to note that the two driest years of the record (1987 and 1998) both occurred in conjunction with an El Niño event. These periodic warming events in the eastern Pacific Ocean are usually accompanied by warm, dry winters in the Upper Midwest. The El Niño winters of 1986/87 and 1997/98 were good examples of this.

One can conclude from this initial analysis that year-to-year variations in lake level are strongly controlled by the amount of precipitation that falls during that year. In fact, Figure 2 reveals that the effects of precipitation on lake level are actually amplified (by about 60%). This reflects the influence of the larger watershed surrounding Sparkling Lake, since high precipitation leads to increased inputs of groundwater to the lake, thereby enhancing the effect of precipitation on lake level.

In addition to the year-to-year variations in precipitation, there is an overall downward trend in annual precipitation from about 87 cm at the beginning of the record to 75 cm at the end (the straight line in Figure 2). Sparkling Lake has undergone a similar downward trend in its annual change in water level. At the beginning of the 23-year period, Sparkling Lake water levels were roughly in balance (i.e., $\Delta L = 0$). By the end of the record, however, the annual change in water level had become negative, dropping to a value of $\Delta L = -9.5$ cm. This is similar to the 12-cm drop in annual precipitation. One can conclude, therefore, that the observed changes in water level for Sparkling Lake, including the recent low-water period, can be almost entirely explained by changes in precipitation.

Effects of precipitation on Sparkling Lake water levels



Climate Change and Evaporation

Northern Wisconsin, like other regions throughout the world, is getting warmer as a result of global climate change. The effects of this are beginning to be noticed in our lakes – from reduced ice cover, to warmer water temperatures, to earlier and reduced runoff from snowmelt. An example of this for Sparkling Lake is illustrated in Figure 3, which shows the average surface water temperature during the summertime (July-September) from 1989-2005. In addition to the year-to-year variability, there is a pronounced upward trend in water temperature of about 1.5°C (2.8°F) per decade. Given the fact that warm water tends to evaporate more readily than cold water, it is natural to wonder whether these temperature changes are leading to higher evaporation rates in the Northwoods.

Figure 3 shows the summertime evaporation (July-September) for Sparkling Lake from 1989-2005. Values range from a low of 27 cm in 1994 to 41 cm in 2005, with an average value of 35 cm. In fact, there is a distinct trend toward higher evaporation rates since 1994, with 6 of the last 8 summers showing above-normal evaporation. This may be related, in part, to the general trend toward warmer water temperatures. Warm summers, for example, tend to be associated with aboveaverage evaporation (e.g., 1991, 1998, 2002, and 2005). Conversely, cold summers (e.g., 1992, 1996, 2000) tend to have below-normal evaporation rates. Given the likelihood that

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Figure 2. Annual water-year (Oct-Sep) precipitation for Minocqua, WI (in cm) and change in water level for Sparkling Lake (in cm) for 1985-2007. Data courtesy of the North Temperate Lakes LTER Program.

Year-to-year variations in lake level are strongly controlled by the amount of precipitation that falls during that year.



Sparkling Lake summertime water temperature and evaporation

46 24 water temperature 42 21 Water temperature (°C) Evaporation (cm) 38 18 15 34 evaporation 12 30 9 26 992 995 966 999 2003 1989 990 991 993 994 997 998 2000 2001 2002 2004 2005

lake temperatures will continue to increase in the coming years, it is more likely than not that lake evaporation will continue to rise as well. In fact, the increase may be even greater than what is shown here, given the ongoing lengthening of the ice-free season. It should also be noted, however, that changes in lake temperature do not tell the entire story when it comes to evaporation. Incoming solar and infrared radiation are two of the most significant drivers of lake evaporation, especially on interannual timescales. Changes in cloud cover, therefore, can play as large a role as changes in water temperature. This explains why some cloudy years (such as 1994) had very low evaporation rates, in spite of near-normal

lake temperatures, while sunny years (such as 1989) had higher evaporation rates than would be expected from water temperature alone (Figure 3).

<u>Summary</u>

Variations in lake levels in northern Wisconsin are primarily driven by changes in precipitation. For example, the recent trend toward lower water levels is largely the result of a downward trend in annual precipitation of about 0.5 cm per year. Although this may seem small, when each year's precipitation deficit is added up over the 23-year period, this leads to a 1.3-m drop in accumulated water input to Sparkling Lake. On top of this, northern Wisconsin lakes are getting warmer, and summertime evaporation has been increasing since 1994. This can only exacerbate the ongoing trend toward drier conditions. Unless we see a reversal in one or both of these trends in the coming years, we can expect low lake levels to be the "norm" for quite some time.

By Dr. John D. Lenters

School of Natural Resources and Department of Geosciences University of Nebraska-Lincoln

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No More Phosphorus in Fertilizer

Governor Doyle signed the "Clean Lakes" bill (2009 Wisconsin Act 9) into law on April 14th. Wisconsin now has a statewide law which prohibits the display, sale, and use of lawn fertilizer containing phosphorus, with certain exceptions. Citizens, conservation groups, natural resource professionals, elected officials, businesses and other partnered on this bill. The law will take effect in 2010, which gives retailers time to order phosphorus-free lawn fertilizer for next year.

To read the statute, go to <u>http://nxt.legis.state.wi.us</u> and click the "2009-10 Session Related" folder, then open "2009 Wisconsin Acts".

Figure 3. July-September

Variations in lake levels in northern Wisconsin are primarily driven by changes in precipitation.



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(Low Water Levels in the North, cont.)

Meet Wisconsin's AIS Staff

Robert Ruleau is the new Aquatic Invasive Species (AIS) Coordinator in Marinette County. Working out of the Marinette County Land and Water Conservation Division (LWCD), he will help to prevent the spread of AIS in our lakes and waterways. Some of Robert's duties will include assisting and educating the public about AIS issues, coordinating volunteer efforts, conducting the CBCW and CLMN programs, writing grants for AIS related projects, collecting and researching data and helping to more rapidly respond and control existing AIS infestations.

What's new with invasive species in Marinette County?

Fortunately, there were relatively few new (reported) incidents of AIS for waters in Marinette County last year. We hope to keep the AIS introduction and spread down again this season. Some important projects we will be working on this summer include the control and eradication of the aggressive and non-native phragmites grass along the shoreline of Green Bay. We will also be focusing on preventing the spread of various AIS from infested lakes to those that are free of invasives. This will include building an important base of dedicated volunteers to help educate lake users, and to perform boat checks at landings. It should be a productive and fun summer.

In your opinion, what is currently the most prominent AIS issue in Marinette County?

Eurasian water-milfoil (EWM) is the most prevalent AIS in our waters. Last year the county LWCD and lakefront property owners conducted control efforts on a few different lakes through the DNR's rapid response grant. If necessary, we will monitor for and control EWM on those lakes again this spring. Other AIS suspects such as, rusty crayfish, zebra mussels and curly-leaf pondweed are also present in some of our inland lakes, rivers and flowages, so we will work hard to prevent their spread to waters with no invasives.

Why is AIS prevention important to you?

I like to fish, boat and swim, so helping to keep the water resources I use clean and



free of AIS is something that motivates me. Benjamin Franklin's famous quote, "an ounce of prevention is worth a pound of cure," is quite applicable here. If done correctly, AIS prevention will save time and money for the county, state and country over the long term.

How do you think preventing the introduction and spread of AIS should be addressed?

Education and enhanced awareness about the detrimental impacts of AIS are key elements in prevention. If people are in the know about the harm aquatic invasives have had and potentially will have in our waters, they will likely be more willing to act upon the situation. We need to try and get lake users to become environmental stewards for the water resources they enjoy.

What is your favorite part of being an AIS Coordinator?

Well, I have only been on the job for a few weeks now, but I look forward to education efforts. I'm sure once I get that first group of kids, or adults hooked and interested in AIS issues and water conservation efforts it will be a good feeling. Getting out in the field with volunteers and doing monitoring and control activities on warm, sunny summer afternoons won't be bad either.

To learn more about AIS in Marinette County, and how can get involved, contact Robert at 715-732-7642 or <u>rruleau@marinettecounty</u>. com. To find out who is working on AIS issues in your area, see <u>www.uwsp.edu/cnr/uwexlakes/</u> <u>CBCW/AIScontacts.pdf</u>. Photo provided by Robert Ruleau



If done correctly, AIS prevention will save time and money for the county, state and country over the long term.



Call O[°] the Loon "Stop Using Lead, Please!"



This loon pair resided on High Lake in the summer of 2006. It would be hard to imagine a northern Wisconsin lake without them. Their haunting calls and timid nature make them an icon for almost any lake. Loons are one of the most enchanting birds in Wisconsin and it's no surprise that they capture so much attention. The loon is an important symbol of our state and a high public interest in loons has lead to increased conservation efforts.

> Loons are considered one of the most primitive birds

Research since 1987 on loons from six New England states has shown 44% of dead and dying adult loons had lead poisoning, with virtually all cases pointing to lead tackle as the culprit. on earth because they have not changed from their current form for the last one million years. There are only five species of loons in the world, with the Common Loon being the only breed to reside in the lower

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48 states. These birds call Wisconsin lakes home from April until they depart in late August and September for the warmer climates of the Atlantic Coast and Gulf of Mexico.

Loons are a very particular bird and not just any lake will do when selecting a nesting site.



Lakes that are fifty acres or smaller (slow, no wake lakes) are most often chosen, with

most loons needing at least a ten acre lake, for room to take off. They tend to live on lakes of all different shapes, but usually a lake with an irregular shoreline is best because it provides peninsulas, coves, and islands that can protect a pair of nesting loons. Water quality is also a main concern for loons since they need clean, clear water as they peer underwater to search for fish. Lakes that have limited water clarity due to pollution, algae blooms, or the stirring up of bottom sediments can drive loons away from nesting there.

Loons, like many other water birds, do not have teeth and have to swallow their food whole. With the average loon eating approximately two pounds of fish each day, they need to ingest small pebbles from the bottom of a lake or river, which enables their gizzard to break down fish bones. Loons can have as many as 20-30 pebbles in their gizzard at one time. This act of swallowing pebbles is, ironically, necessary for the bird's survival, but it also poses a significant risk for them. When lead fishing sinkers and jig heads are lost through broken lines or other means, loons can inadvertently consume them when they are scooping up pebbles.

Lead is a toxic metal that attacks the nervous and reproductive systems of

loons and other water birds. A poisoned bird will exhibit signs of being disoriented, skinny, or lethargic. Loons that ingest lead often die within two to three weeks. In addition to direct ingestion, loons can suffer from lead poisoning after eating fish that have ingested lead.

A study done by the Department of Natural Resources in Minnesota discovered that even though individual fishermen lose only small amounts of tackle on each fishing trip, it does add up to a large amount of lead being left behind in lakes. It is estimated that more than one ton of lead was deposited in five Minnesota lakes during the summer of 2004!

In addition, research since 1987 on loons from six New England states has shown 44% of dead and dying adult loons had lead poisoning, with virtually all cases pointing to lead tackle as the culprit. Another 15-year study in Michigan revealed that lead poisoning, primarily

from lead jigs, was the number one cause of loon death at 24% of overall mortality. Here in Wisconsin, the Department of Natural Resources Health Program reports an even higher rate of

30% of dead loons submitted having lost their lives from lead poisoning.

Stopping the deadly effects of lead poisoning for some of Wisconsin's most treasured feathered friends is surprisingly simple. First, anglers can stop using lead sinkers, jigs, split shot, and other fishing equipment that is made from lead. There are a number of lead-free alternatives that are not very costly, which include steel, tin, tungsten, bismuth, pewter, ceramic, densified plastic, and glass materials. Second, when disposing of your lead tackle, do it properly. Do not throw lead tackle away in a lake or trash can. Instead, take it to your local household hazardous waste collection site or scrap metal collector. Third, spread the word! Contact your local bait and tackle shops and encourage them to stock lead-free tackle. Let your fishing friends know about the negative impact that lead tackle has on not only loons, but the entire lakes ecosystem.

Get the Lead Out!

1. Stop using lead tackle!

- 2. Dispose of lead tackle properly!
- 3. Spread the word!

Loons are an icon of northern Wisconsin and

deserve a safe home on our treasured lakes. With the help of Wisconsin's angler's, lake owners, and citizens, the loon will remain on Wisconsin lakes for years to come.

By Katie Boseo, UW-Stevens Point undergraduate student

Reviewed by Stacy Craig, LoonWatch Program, Northland College

For more information, or to see the research behind the statistics referenced in this article, please visit www.northland.edu/loonwatch or contact Stacy at 715-682-1220 or loonwatch@northland.edu. For more information on the Raptor Education Group, go to <u>www.</u> <u>raptoreducationgroup.</u> <u>org</u>)

Loons Leaving on a Jet Plane

A juvenile female loon had luck on her side last November when she was rescued from the ice on Muskellunge Lake in Lincoln County. Concerned citizens, Tom and Ruth Cerull

and Bob and Susan Hodkiewicz, tried using an aerator to create an opening for her to take off, but when the aerator kept shutting down, they called in the authorities. The Pickerl Fire and Rescue responded quickly, pulled the loon from her ice trap, and called in Marge Gibson of the Raptor Education Group, Inc., who brought the bird back to the rehabilitation center in Antigo. It turns out this 9 lb. loon had swallowed a large lead sinker (shown on

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this x-ray) and had a high level of lead in her blood. Because of the tremendous efforts of all involved, this young loon was fully recovered a week later and on a plane with two other lucky loons for a short, 3-hour migration to Texas. Data Entry Critical to CLMN

Citizen Lake Monitoring Network Secchi and Chemistry volunteers are very familiar with data entry needs when it comes to tracking the water quality health of our lakes. But did you know it is important to enter your Aquatic Invasive Species (AIS) monitoring data to track the ecological health of your lake?

Raw data (presence and absence of AIS) as well as densities of the population data for the AIS are necessary pieces onitoring Netw when working to control or prevent the spread of AIS. What would all the work that goes into gathering accurate information be worth if others could not read, review and act on it? Reporting is one of the most important parts of monitoring for invasive species. Knowing where species have not been found, as well as where they have been, is extremely important in being able to track, understand and contain their spread. Knowing how often monitors are looking for species and what they are finding is very important information. The DNR, lake managers, researchers, and others use the information that is reported through CLMN to study lakes and better understand aquatic invasive species.

Who are some of the folks monitoring for invasive species?

- DNR Lake and State AIS staff
- Sea Grant staff
- Research staff
- DNR Research
- Universities (Stevens Point, Notre Dame)
- Trout Lake Research Station
- Great Lakes Indian Fish and Wildlife Commission
- Lake Associations and Districts (some on their own and some through grants)
- Contractors
- County AIS staff
- And, of course, volunteers.

Unless we do a better job of sharing our data, we run the risk of having multiple agencies and volunteers monitoring the same lake. You might ask, "So what difference does it make if several groups monitor a lake?" It does not impact the lake monitored, but it is a waste of energy. Those duplicate monitoring efforts could be used more efficiently to investigate other lakes that may not be recognized as possessing AIS until an established population is noticed by a lake resident or user. With limited resources, we really need volunteers to let us know where they monitored and what they found. DNR staff is working on new ways to report and track AIS. By late summer or early fall, we plan to offer downloadable AIS data in the same format as the secchi and chemistry data is available. We anticipate being able to make county and state summaries of lakes monitored by agency personnel and volunteers show where AIS have, or have not, been found. There will also be maps showing presence of aquatic invasive species and monitoring locations.

Think how robust these reports will be when all volunteers enter their data - even if they do not find AIS. Please go to http://dnr.wi.gov/ lakes/forms/ to find out more about the new AIS forms, and don't forget to visit http://dnr. wi.gov/invasives/ to learn more about aquatic invasive species in general.

By Laura Herman, CLMN Coordinator

Get Involved

Want to become a Citizen Lake Monitor, or just find out more about the network? Go to the Lakes Calendar for upcoming Citizen Lake Monitoring Network workshops at <u>www.uwsp.edu/cnr/</u> <u>uwexlakes/Calendar</u>. If you want to see what workshops are available in your area (by county), go to the CLMN page at <u>www.uwsp.edu/cnr/uwexlakes/CLMN</u> and click on the map.

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Clean Boats, Clean Waters Workshops

- May 12 9:00 am 12:00 pm at Oneida County UW-Extension building, Oneida Co. Land & Water Conservation Dept., 715-369-7835 or jhansen@co.oneida.wi.us
- May 16 9:00 am 5:00 pm at Sherwood Lodge in Nekoosa Reesa Evans, Lake Specialist, 608-339-4275
- May 29 9:00 am 12:00 pm at Minocqua Municipal Building, Oneida Co. Land & Water Conservation Dept., 715-369-7835 or jhansen@co.oneida.wi.us
- May 30 9:00 am 1:00 pm at Mercer Community Building in Iron County Heather Palmquist, AIS Coordinator, Iron County, 715-561-2234
- May 30 9:00 am 5:00 pm at Parker Lake Lodge in Oxford Reesa Evans, Lake Specialist, 608-339-4275
- May 30 9:00 am 12:00 pm at Stephenson Town Hall in Crivitz Robert Ruleau, AIS Coordinator, Marinette County, 715-732-7642
- June 6 1:00 4:00 pm at Spooner Agricultural Research Station Lisa Gabriel, AIS Coordinator, Washburn County, 715-468-4654 or Dave Ferris, County Conservationist, Burnett County, 715-349-2186
- May 29 9:00 am 12:00 pm at Three Lakes Community Center, Oneida Co. Land & Water Conservation Dept., 715-369-7835 or jhansen@co.oneida.wi.us
- June 13 9:00 am 1:00 pm at Mercer Community Building in Iron County Heather Palmquist, AIS Coordinator, Iron County, 715-561-2234
- June 25 6:00 9:00 pm at Iron River Community Center in Bayfield County Stefania Strzalkowska, AIS Coordinator, Bayfield County, 715-373-6167
- July 11 12:30 4:00 pm at Solon Springs Community Center in Douglas County Amy Eliot, AIS Coordinator, Douglas County, 715-394-8525 Josh Horky, Botanist, Lake Superior Research Institute, 218-464-2914

Encouraging Compliance

Hello everyone! Our open water season is finally back, along with Wisconsin's Water Guards. This summer you will again see us at landings, fishing tournaments, lake association meetings, and many other functions. With 2008 polls showing a 90% awareness of the aquatic invasive species laws, there will be a shift towards more enforcement of these laws this year. As we enjoy and respect our waterways, there are a few actions to keep in mind.

Plain and simple, make sure all water is drained, and all aquatic plants and animals are removed from your boat and equipment. Recent research has shown that taking these measures does make a difference in stopping the spread of invasives. Let's continue to keep Wisconsin's waterways clean and enjoyable. Thank you for your help!

Chris Hamerla, Water Guard, WI Department of Natural Resources Serving the Northeast Region





Photo provided by Wisconsin DNF





So, what did we learn?

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We gained insights from much of the research that is already being conducted, yet realized there is a long road in front of us. We viewed the AIS symposium at the 2009 convention as the beginning of a conversation, and are actively working with researchers to incorporate their findings into Wisconsin's aquatic invasive species prevention and management work.

- 1. **Protection through containment.** Protecting a lake by inspecting incoming boats can provide a shield against invaders, but research shows that it can be more effective and efficient to contain those invaders at the source. We are focusing our staff and contract watercraft inspection efforts on high-traffic landings at invaded lakes. We encourage volunteers to consider this model as well—sometimes the best way to protect your lake may be to keep invasive species from leaving the lake down the road.
- 2. No lake is an island. Wisconsin's inland lakes are connected, via the Great Lakes, to ports all over the world. Wisconsin is working with partners nationwide to eliminate ballast water as a vector for invasive species. We are also working with researchers to understand recreational boater movements and predict species spread.

3. Look to the Great Lakes. There are over 180 non-native species in the Great Lakes, most of which are not found in our inland waters, so when predicting the next likely invader, this is a good place to look. We are working with partners to track the movement of several troublesome Great Lakes invaders: quagga mussels, New Zealand mud snails, and round gobies to ensure that they do not pass our borders.

Visconsin Lakes

ntion Wrap-

4. **One problem, many solutions.** As always, we were impressed and humbled by the many creative prevention and control projects underway across Wisconsin. As we all learned at the symposium, aquatic invasive species are a complex problem with no easy answers. But through innovation, dedication and partnership, we will protect our lakes for future generations. Thank you again for all you do!

For more information about Wisconsin's work to slow the spread of aquatic invasive species, please see <u>http://dnr.wi.gov/lakes/aisreport2008/</u>.

Join us next year for the annual Wisconsin Lakes Convention in Green Bay, March 30 - April 1, 2010.

For additional information from the 2009 Wisconsin Lakes Convention, go to <u>www.</u> <u>uwsp.edu/cnr/uwexlakes</u> and click on "2009 Wisconsin Lakes Convention Archive".

For additional information from the 2009 Wisconsin Lakes Convention, go to <u>www.uwsp.edu/cnr/</u> <u>uwexlakes</u>.



2009 Wisconsin Stewardship Award Winners



Citizen Les Schramm



Public Service Marinette County Land and Water Conservation Division



Youth University Lake School Students



Group Town of Barnes Eurasian water-milfoil committee & town clerk

2009 Wisconsin Lakes Partnership Photography Contest Winners

Natural Features Around and In Lakes and Underwater

1st - *Snapping Turtle* - Brian Wolf, Kenosha, WI

2nd - It's a Big, Big World - Steven Lepak, DePere, WI

3rd - Hey, got any more of those minnows?? - Paul Skawinski, Plover, WI

People Enjoying Lakes

1st - *Lady of the Lake* - Steven Lepak, DePere, WI 2nd - *Daybreak* - James Brakken, Cable, WI

3rd - Girls Just Want to Have Fun - Paul Skawinski, Plover, WI

Check them out on the 2009 WI Lakes Convention archive area of the website <u>www.uwsp.edu/cnr/</u> <u>uwexlakes</u>



"Lady of the Lake"

Harmful Algae Surveillance Program

The Wisconsin Division of Public Health (DPH) is working with the Centers for Disease Control and Prevention (CDC) to collect information about human and animal illness and death resulting from exposure to blue-green algae (also known as cyanobacteria). By studying this information, DPH staff will be able to better understand and quantify the public health problem posed by harmful algal blooms (HABs), raise awareness of these problems, and inform efforts to prevent exposures from occurring.

The HAB program is partnering with many organizations across the state, including Wisconsin DNR and Wisconsin Association of Lakes, to collect case information about human and animal illnesses or deaths. DPH staff are asking the public to notify them of any known or suspected human or animal exposures to cyanobacteria that may have resulted in illness or death. Animal illnesses can include pets, livestock or wildlife such as birds and fish.

The HAB program will be collecting information about symptoms and any treatment received or provided. They may also collect exposure information and environmental samples. Any individuals experiencing symptoms of blue-green algae exposure should seek medical attention.



For more information or to report a case, visit: <u>www.dhs.wisconsin.gov/eh/bluegreenalgae</u> or call 608-266-1120.



(Lake Healthy Food, cont.)

In Wisconsin we have 90 Community Supported Agriculture (CSA) farms, with over 50 of them producing crops without the use of synthetic pesticides.¹³ In a CSA, local households and farmers work together to share the responsibility of producing and delivering fresh food. Households support the farm by paying an annual fee that entitles them to a "share" of the season's harvest. Once harvesting begins, CSA members pickup their farm share of fresh foods at a regular interval. Shares may include produce, fruits, cheeses, eggs, meats, poultry, flowers, herbs or preserves. The typical CSA season in Wisconsin runs from the end of May through mid-October but many farms offer early spring shares or winter shares.¹⁴

Or consider growing some food yourself. Strawberries and sweet crunchy sugar peas in June, ripe juicy tomatoes and melons in August...mmmm. They all taste wonderful

Check for CSAs near you from these resources:

- m Local Harvest www.localharvest.org
- **H** Farm Fresh Atlases <u>www.farmfreshatlas.org</u>
- Madison Area Community Supported Agriculture Coalition (southern WI) <u>www.macsac.org</u>
- Image: Urban Ecology Center (Milwaukee)

 www.urbanecologycenter.org
- **the Central Rivers Farmshed** (central WI) <u>www.farmshed.org</u>

straight from the garden. You can get transplants at your local nursery or farmers market, or pick up a few packets of seeds for shorter season veggies to get started.

Buying and growing local food can be a joy. You can watch seedlings grow, pick that perfectly ripe berry, get to know local farmers with their stories and specialties, and gather with other CSA members for a day on the farm. Choosing locally-grown and pesticide-free food that protects our lakes and groundwater can be a great summer and fall activity– followed by a dip in the lake, of course!

By Lynn Markham, Land Use Specialist, Center for Land Use Education at UW-Stevens Point. 715-346-3879 or <u>Imarkham@uwsp.edu</u>

To see the references sited in this article, go to <u>www.uwsp.edu/cnr/uwexlakes/laketides</u> and click on the "text-only version."



June is Invasive Species Awareness Month

Slow the Spread by Sole and Tread

Over 200 invasive species impact Wisconsin, costing residents millions of dollars every year. These organisms can clog water intake pipes, kill native trees, devastate fisheries, and destroy ecosystems. Everyone in Wisconsin is impacted by invasive species whether they are aware of it or not. During Invasive Species Awareness Month, numerous field trips, workshops, presentations and work parties will be held throughout the state. This year's theme, "Slow the Spread by Sole and Tread," promotes the best management practices for preventing the spread of invasive species. Simple steps, such as using native plant species in gardens or removing plants and mud from boats and equipment before leaving the boat landing, are actions that all Wisconsin citizens can put into practice to help protect our natural world.

To learn more and find out what events are occurring near you, visit: <u>http://invasivespecies.wi.gov/awareness</u>.

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Wondering how to

See www.macsac.org/

choose a CSA?

consider.html

Lake Leaders Institute Wins National Award

Our very own Kim Becken, Outreach Specialist for the UW-Extension Lakes team, was in Washington D.C. last month to accept the 2009 National Oceanic and Atmospheric Administration (NOAA) National Fish Habitat Action Plan Outreach and Education Award, on behalf of the Lake Leaders Institute.

Find out more about the Lake Leaders Institute at <u>www.uwsp.edu/cnr/uwexlakes/lakeleaders</u>.

Fishing for Your Thoughts

Check out a new feature on the UWEX Lakes website - an online poll that shows real-time responses. Give your opinion and then find out what others are saying about this Spring's topic: aquatic plant management. The Summer 2009 *Lake Tides* will include the results from this Web poll.

cnr/uwexlakes



June 1-2: Wisconsin Nonprofits Association Summit, WI Dells

There will be workshops covering management, development, accountability, technology, governance, advocacy, and marketing. http://www.wisconsinnonprofits.org/content/summit2009-workshops



June 6: Project Red Training, Florence County **August 15:** Project Red Training, Milwaukee County

Become a project RED (riverine early detectors) volunteer. Registration is required for this free training. For more information: Laura MacFarland <u>lmacfarland@wisconsinrivers.org</u> or 608-257-2424 ext. 110



June 6: Legend "Lake Faire" 2009, Legend Lake Lodge, Keshena Free and open to the public from 8:00a.m. - Noon. Learn more about issues that comprise successful lake management.

For more information: www.uwsp.edu/cnr/uwexlakes/calendar

June 13: Rock River Basin Snapshot

This one-day monitoring event is designed to have previously trained volunteers monitor as many stream sites within the Rock River Basin as possible from 8:00a.m. to 2:00p.m. For more information: Ed Grunden 920-253-9673 or egrunden@hotmail.com



June 14: WAV Training, McMurtie Preserve, Star Lake

Held on Cedar Lake from 1:00p.m. to 5:00p.m., this stream monitoring training will teach you how to monitor dissolved oxygen, temperature, flow, biotic index, habitat, and transparency using Water Action Volunteer (WAV) methods. These trainings are free but you must pre-register. Contact Aleisha Miller to sign up: 715-684-2874x125 or <u>AleishaM@co.saint-croix.wi.us</u>.

June 19: Northwest Lakes Conference, Cable

General lake information and heightened awareness to anyone who enjoys the public waters of northern Wisconsin. For more information: <u>http://www.wisconsinlakes.org/events/09nwlc.html</u>



June 20: Lac du Flambeau "Lakesfest"

This free event from 10:00a.m. to 3:00p.m. will be fun for the whole family, with activities, entertainment, canoe races and great raffle prizes. For more information contact Bryan Hoover at 715-588-7214 or email lakesfest@yahoo.com.

June 24-25: Aquatic Plant Management Training, Kemp Station For more information: Carroll Schaal at <u>Carroll.Schaal@wisconsin.gov</u>



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Reflections

I love spring anywhere, but if I could choose I would always greet it in a garden.

 \sim Ruth Stout