



DES MOINES LAKE MEETING 4 (WATER QUALITY)

Tom Boisvert, Burnett County AIS
Coordinator
Dave Ferris, Burnett County
Conservationist

WHAT IS “WATER QUALITY”

Water quality is almost always measured by the water's clarity.

However, water quality may also be affected beyond clarity.

- AIS (Zebra/Quagga Mussels)
- Bioaccumulants (PFAS, PCB, etc.)
- Pollution

Top to bottom: Zebra Mussels, Algae Bloom, Healthy Aquatic Plant Community



HOW IS WATER QUALITY MEASURED?

Secchi Disk

- Measures water clarity by “depth”

Dissolved Oxygen

- Measures oxygen available throughout the water column – reported in ppm

Phosphorous Measurements

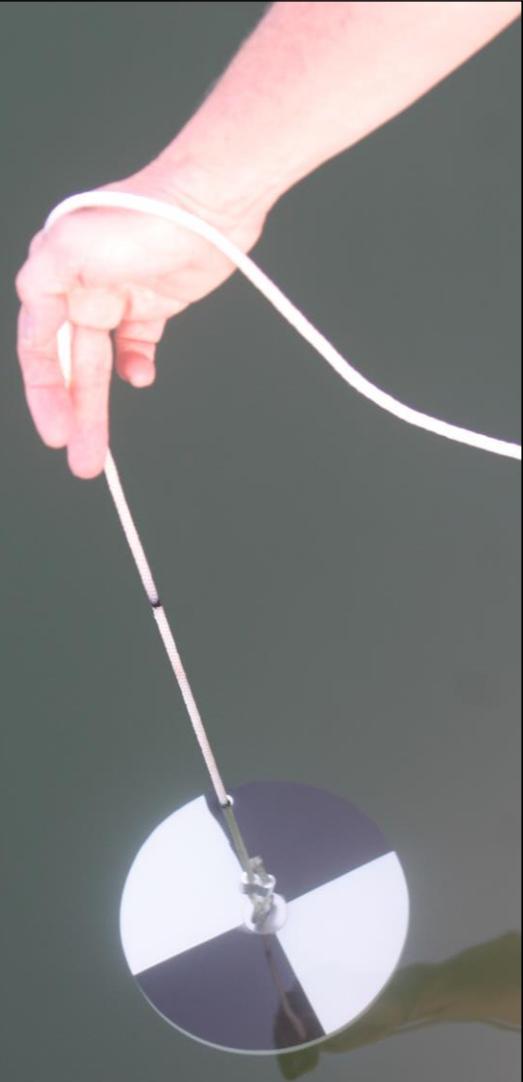
- Needs to be processed by a lab – reported back in mg/L

Chlorophyll Measurements

- Needs to be processed by a lab – reported back $\mu\text{g/L}$

Satellite Imagery

- Used on lakes without regular monitoring
- Essentially tries to predict a secchi disk reading



WHAT DO THESE MEASUREMENTS TELL US?

Secchi disks, phosphorous measurements, chlorophyll measurements, and satellite imagery all give an insight to the waterbody's TSI.

TSI – Trophic State Index

- Oligotrophic
- Mesotrophic
- Eutrophic
- Hypereutrophic

Dissolved Oxygen (DO) gives insight for fish and aquatic life viability.

- DO is often reflective of the TSI

Water Quality Parameter Guide for Selected Fish Species

Adapted from Post 1988. Note that the minimum required dissolved oxygen levels may be less in the winter if the aquatic organisms have acclimated to their environment.

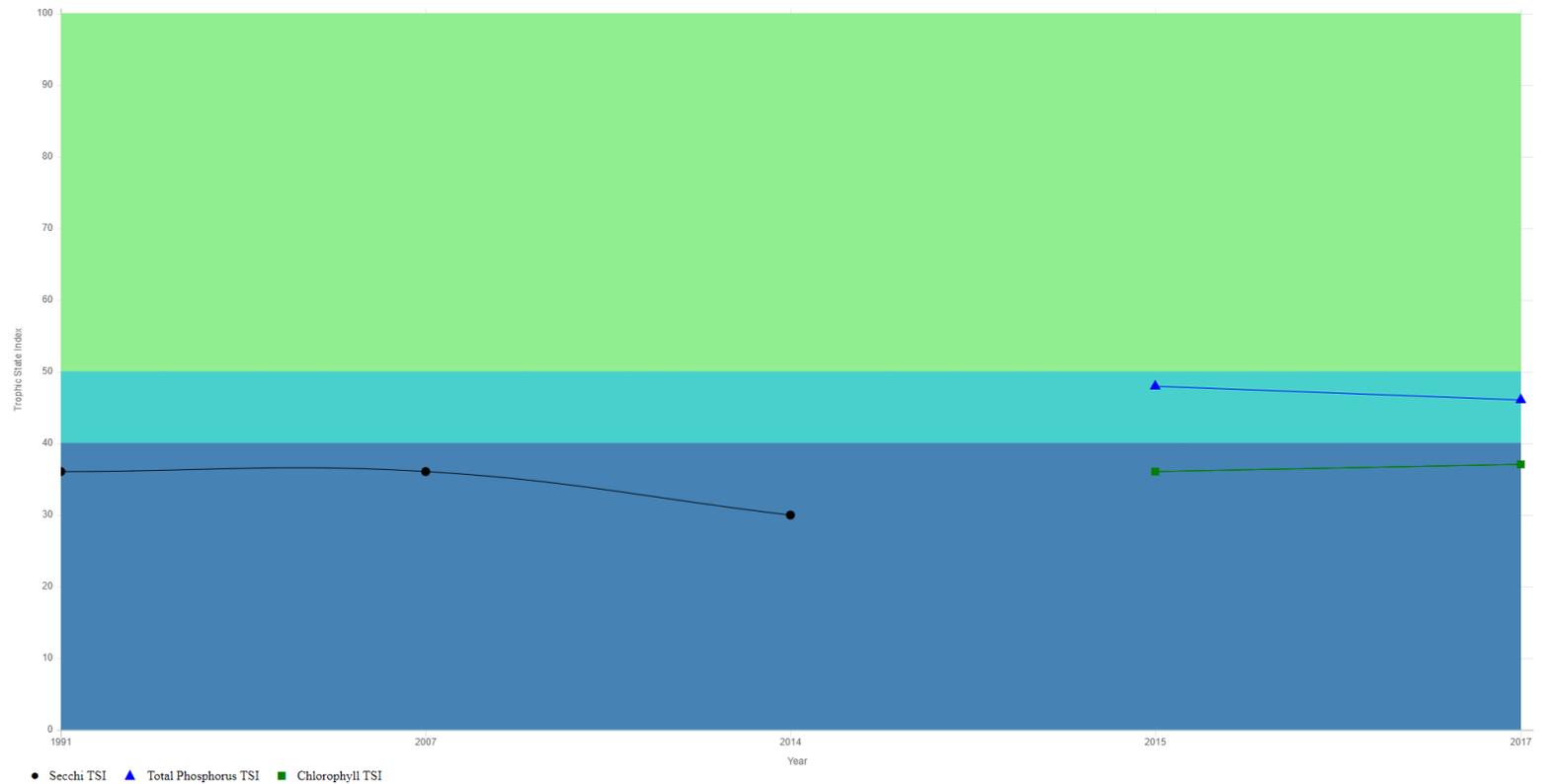
Fish Species	Water Temperature Range(°F)	Water Type	Water Clarity	Minimum Oxygen Requirement (ppm)	pH
Bluegill	65 - 80	Eutrophic to Mesotrophic. Warmwater streams, rivers, and ponds.	Less turbid waters.	3.0 - 5.0	5.5 - 9.0
Channel catfish	75 - 85	Eutrophic. Warmwater streams, rivers, and ponds.	Clear to turbid; can adapt to waters most fish can't tolerate.	3.0	4.5 - 9.0
Common carp	55 - 80	Eutrophic. Warmwater streams, rivers, and ponds.	Clear to turbid; can adapt to waters most fish can't tolerate.	0.8	4.0 - 9.5
Freshwater drum	55 - 75	Eutrophic. Warmwater rivers.	Clear to turbid.	3.0 - 5.0	4.5 - 9.0
Northern pike	45 - 75	Mesotrophic to Oligotrophic. Coolwater lakes, large rivers, and reservoirs.	Clear with moderate amounts of aquatic vegetation.	4.0	6.0 - 9.0
Rainbow trout	40 - 60	Mesotrophic to Oligotrophic. Coldwater streams, rivers, and deep lakes.	Clear with some to very little fertility and moderate vegetation.	6.0	6.5 - 8.5
Walleye	35 - 80	Mesotrophic. Large coolwater lakes and streams.	Clear, sometimes turbid waters with good fertility.	5.0	6.0 - 9.0
White bass	55 - 78	Eutrophic to Mesotrophic. Warmwater rivers and lakes.	Clear, sometimes turbid waters.	5	5.5 - 9.0
White sucker	40 - 65	Oligotrophic. Coolwater lakes and streams.	Clear with scant fertility and aquatic vegetation.	4.0	6.5 - 8.5

DES MOINES LAKE — A MESOTROPHIC LAKE

The clearer the water the less algae are present. This can give insight to the lake's productivity.

More consistent secchi disk monitoring will show this relationship clearer.

Trophic State Index Graph: Des Moines Lake - Deep Hole - Burnett County



WHERE TO FIND DES MOINES LAKE DATA

WDNR Find a Lake Page

1. Search Des Moines Lake
2. Click the “more” tab
3. Go to “water quality reports and data”
4. Click the “ Des Moines Lake – Deep Hole” option

Or just use this link: <https://dnr.wi.gov/lakes/waterquality/Station.aspx?id=073118>

HOW TO PROTECT WATER QUALITY

Maintain shoreline buffers and limit excess runoff.

- 90% of all lake life is born, raised, and fed in the area where land and water meet.
- 1 lb of phosphorous can equal 500 lbs of aquatic plant growth.

Keep your wake to the center of the lake to avoid lake bottom disturbance.

- Wake boats especially need to be in the deepest part of the lake, or not recommended at all.
- A boat's wake can reach just as far **downward** as what is seen on the surface (15-20 ft).

Avoid fertilizers and excess salting.

- Runoff with fertilizers can lead to nutrient problems (phosphorous and nitrogen)
- Once salt is in a freshwater lake it is there permanently.



HOW TO PROTECT WATER QUALITY

Prevent AIS from entering Des Moines Lake.

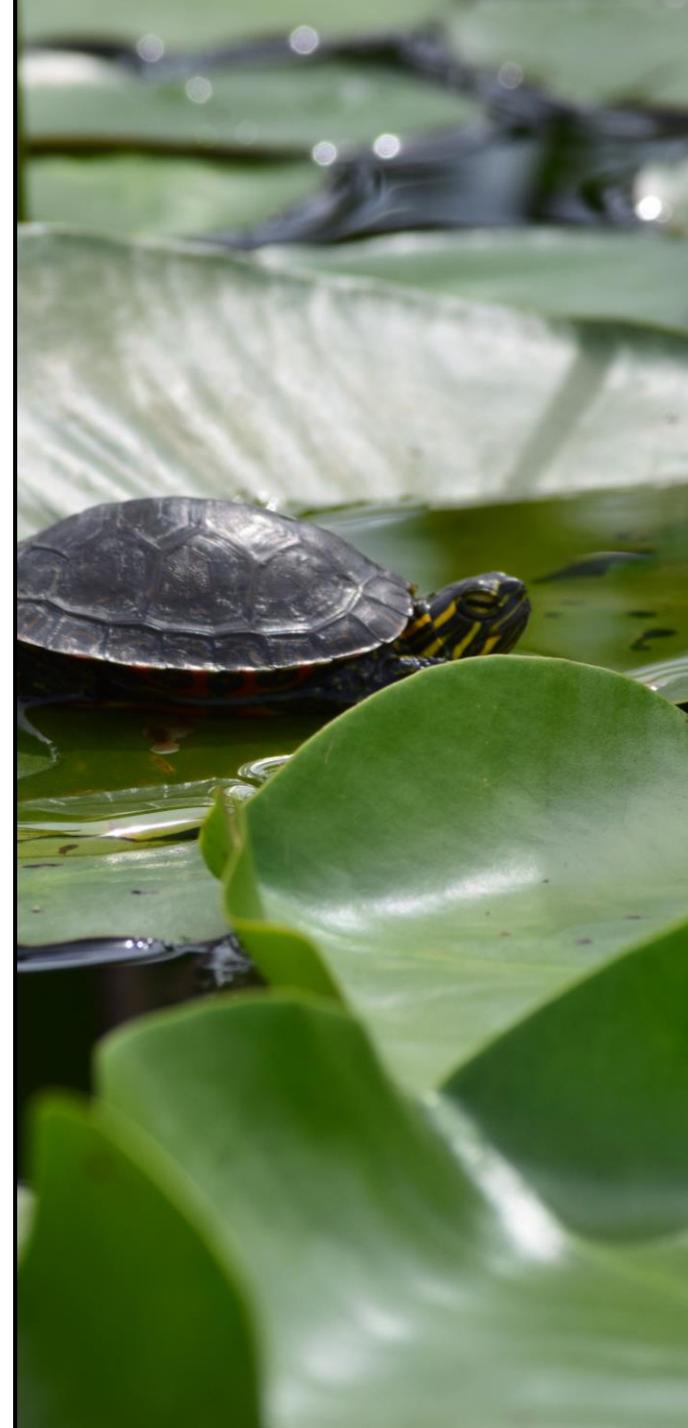
- Zebra and quagga mussels can “sterilize” the water leaving little food for the bottom of the food web.
- Zebra and quagga mussels can promote blue-green algae blooms.
- Curly-leaf pondweed can promote algae blooms due to a massive “die off” mid summer.

Maintain a healthy and diverse native aquatic plant community.

- Aquatic plants help slow erosion by reducing wave action.
- Aquatic plants are the “lifeblood” of a lake by providing habitat for all levels of the food web.

Monitor Des Moines Lake regularly.

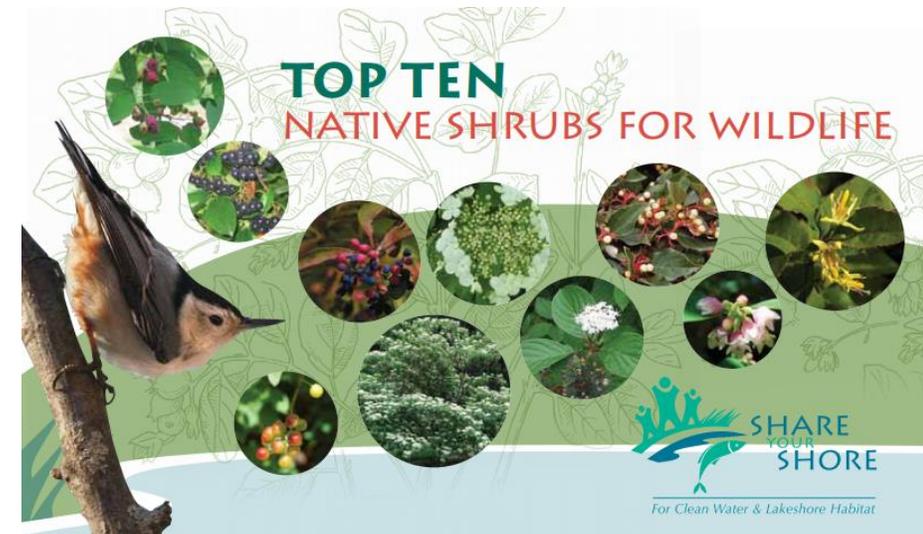
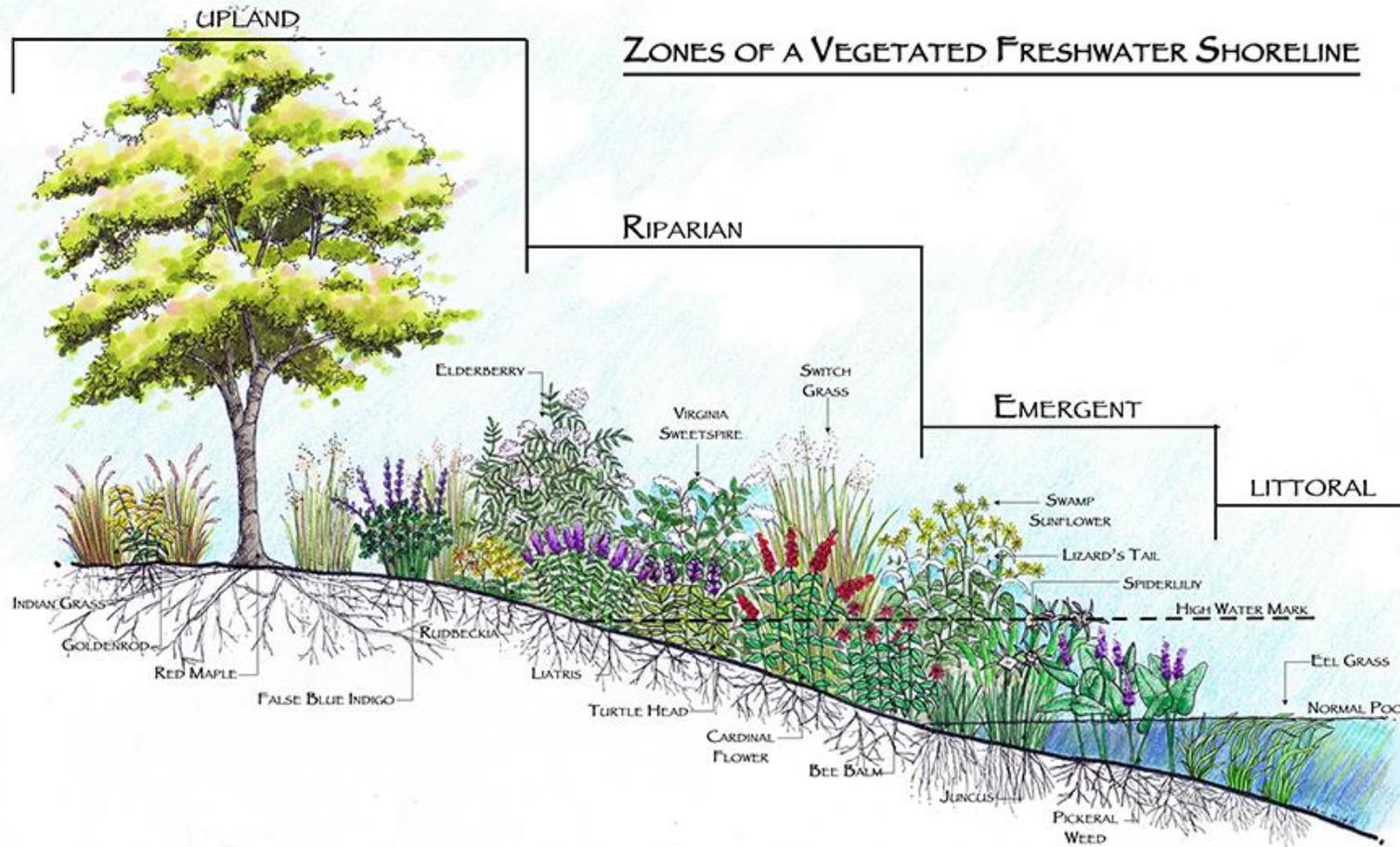
- Increased monitoring will help show trends – both good and bad.





VEGETATED SHORELINE BUFFER

<https://www.burnettcounty.com/index.aspx?NID=1121>





Impervious surfaces increase runoff
and decrease infiltration

Materials like cement, asphalt, roofing, and compacted soil
prevent percolation of runoff into the ground.

Runoff Volume
Phosphorus Inputs
Sediment Inputs



Adapted From: Wisconsin DNR



COST SHARING ASSISTANCE

Cost sharing is available to landowners that are experiencing erosion problems or would like to pursue shoreline restoration.

- Rain Gardens
- Rock Infiltration Trenches
- Native Plantings
- More

Technical assistance is available through Burnett County for project design and implementation.

The WDNR Healthy Lakes Program and Burnett County can provide financial help.

SHORELINE INCENTIVE PROGRAM (SIP)

A Burnett County program that promotes natural shorelines, and provides tax incentives and cost sharing assistance to landowners.

Over 800 parcels have been enrolled in the Burnett County Shoreline Incentive Program since it began in 2000. Owners of these parcels receive an annual payment in return for ensuring permanent protection of the shoreline.

For more information please contact the Burnett County Land Services Department at 715-349-2109, email dferris@burnettcounty.org, or use the link below.

<https://www.burnettcounty.com/index.aspx?NID=1123>

CLEAN BOATS, CLEAN WATERS (CBCW)

The Clean Boats, Clean Waters watercraft inspection program is an opportunity to take a front line defense against the spread of aquatic invasive species.

Through the Clean Boats, Clean Waters program, inspectors are trained to organize and conduct a boater education program in their community.

Inspectors perform boat and trailer checks for invasive species, distribute informational brochures and collect and report any new water body infestations.



CITIZEN LAKE MONITORING NETWORK (CLMN)

The Citizen Lake Monitoring Network (CLMN) creates a bond between 1000+ citizen volunteers statewide and the Wisconsin Lakes Partnership. The CLMN goal is to collect high-quality lake monitoring data, educate and empower our volunteers, and share our data to inform lake management.

Volunteers monitor have the option to monitor the following:

- Water clarity
- Water chemistry
- Ice on/off data
- Aquatic Invasive Species
- Native Aquatic Plants



LOON WATCH PROGRAM

Since 1978, LoonWatch's Annual Lakes Monitoring Program has engaged an active volunteer network of Loon Rangers as its primary tool to collect critical long-term data on loons in northern Wisconsin.

Volunteers attend a [Loon Ranger workshop](#) in the spring to learn how to monitor loons. Throughout summer, Loon Rangers record when loons arrive, if they nested, how many chicks were produced, and any potential threats to the nest site.

In fall, data is sent to LoonWatch where it is entered into their database and shared with the WDNR for management decision-making.

<https://www.northland.edu/centers/soei/loonwatch/loons-get-involved/#annual-lake-monitoring-forms>

TRAININGS

Burnett County can offer trainings to individuals interested in joining the CBCW and CLMN programs.

Burnett County can also offer additional AIS and native plant identification trainings.

It is best if the lake association gathers enough interest before a training is pursued.

QUESTIONS?

Tom Boisvert

AIS Coordinator

tboisvert@burnettcounty.org

715-349-22109 Ext. 2613

Dave Ferris

County Conservationist

dferris@burnettcounty.org

715-349-2109 Ext. 2615