

Hubbard County Water Quality and You

Celebrating 20 Years of Water Quality Testing in Hubbard County!

A Collaborative Effort by:

Citizen Volunteers

**Hubbard County Coalition of Lake Associations (HC COLA) &
Hubbard County Soil and Water Conservation District (HC SWCD) &
RMB Environmental Laboratories in Detroit Lakes**

**Julie Kingsley, HC SWCD Manager & Sharon Natzel, HC COLA President
Together Determined the Outline for the Presentation for You Today!
Helping to Highlight Water Quality & You**

Before and After the Presentation – 3 Activities:

- **Hubbard County Map – Please Place A Heart On Your Favorite Lake / River**
- **Blue Heart Name Tag – Write Your Name & Your Favorite Lake or River & Pin It On & Visit with Each Other About The Favorites 😊 ... 😊**
- **Sample Drinking Water from the 3 Major Watersheds in Hubbard County:**
 1. **Mississippi River Headwaters Watershed**
Jacob Brower Visitor Center – Itasca State Park
 2. **Leech Lake River Watershed**
Laporte, MN - Downtown
 3. **Crow Wing River Watershed**
Long Lake Minor Watershed – West Side of Lakeshore in Forest

What We Will Cover in the Presentation: **“Hubbard County Water Quality and You”**

- **Measuring Fresh Water Availability**
- **Hubbard County SWCD “Local Water Plan Projects**
- **How Many Lakes in Hubbard County**
- **20 Years of Water Quality Monitoring Through Collaboration**
 - **What Are The Lakes Communicating Through Trend Charts?**
 - **What Actions Make A Difference To Water Quality?**
 - **How Does Water Sampling Work?**
 - **How Are The Results Classified?**
 - **How Can Citizens Become Involved?**

What We Do on the Land and In Our Lives Can Improve – or Impair – Our Waters!

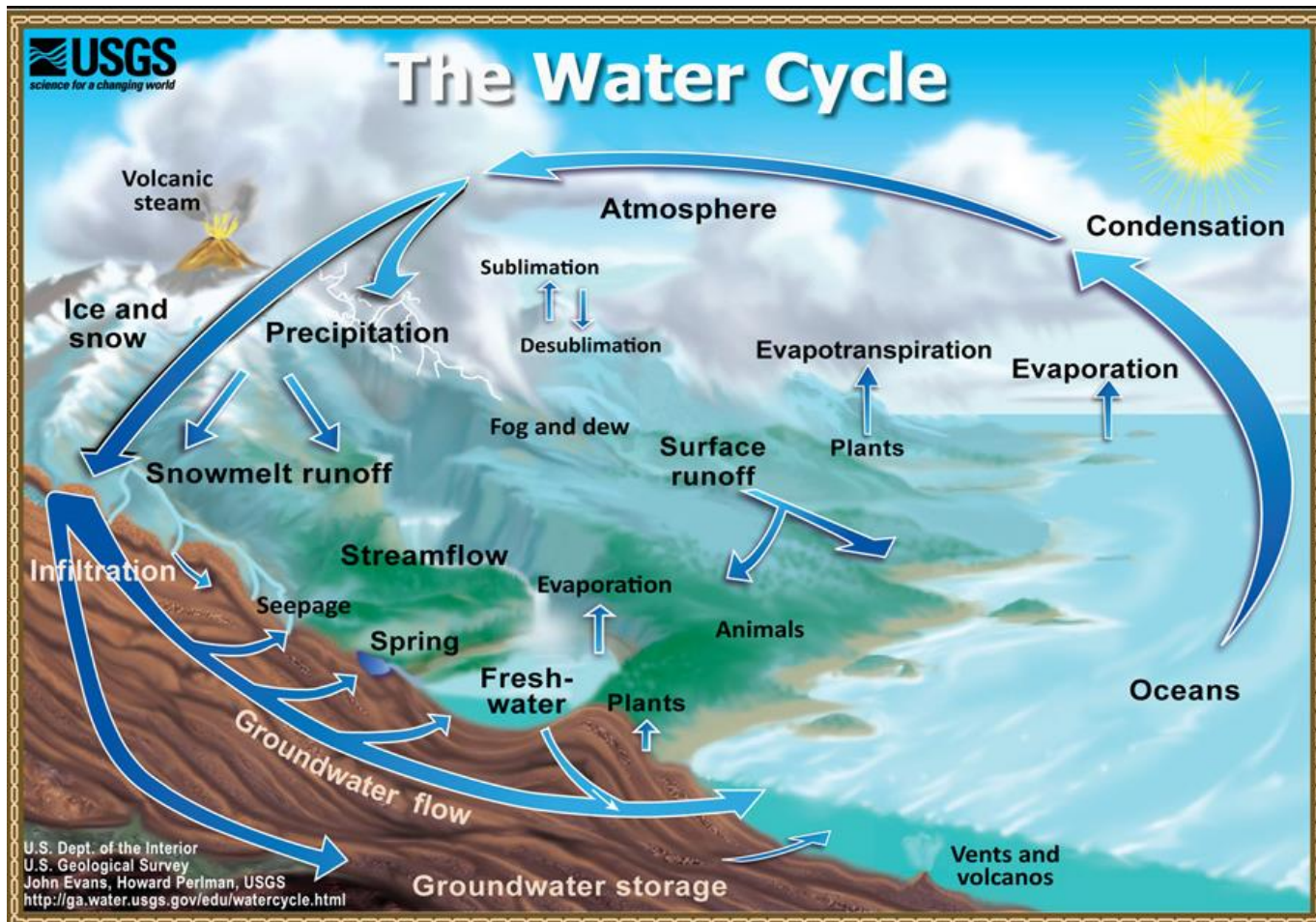
Measuring Fresh Water Availability

- **5 Gallon Bucket = All the Water on Earth**
 - **Oceans, Lakes, Rivers, Wetlands, Groundwater, Ice Caps, Water Vapor & Water Held in Soil, and Water Held in Plants & Animals**
- **Remove 2 Cups = All the Fresh Water on Earth**
 - **Remove ½ Cup from the 2 Cups – Set Aside**
 - **The 1-1/2 Cups = Polar Ice Caps which are Frozen & Unavailable**
- **What is Left in the Bucket is Saltwater**
- **The ½ Cup of Water That Was Set Aside = Groundwater, Lakes, Rivers, Wetlands and Water Vapor**
- **Using Eye Dropper, One Drop of That ½ Cup of Water Represents the Water Available for Us and Other Animals to Drink**

**Let's Each of Us Take Care of The
Fresh Water in Hubbard County!**



The Total Amount of Water on the Planet is Not Going to Change. Even Though Water Moves Around on the Planet and Changes from One Kind to Another, We Will Never Have More Than We Have Right Now!



Hubbard County SWCD

Local Water Plan Projects

- **Free Nitrate Water Testing in Office**
 - 1st Fri Each Month, 9 to 2 PM
- **Water Quality Education**
 - Drinking Water – Can Explain Test Process Available Through RMB Environmental Labs in Detroit Lakes
 - Sample Bottles, Form, Costs You Pay
 - Shoreland Brochure with Erosion Prevention Ideas
- **6th Grade Freshwater Festival – Volunteers?**
- **Lake and River Monitoring**



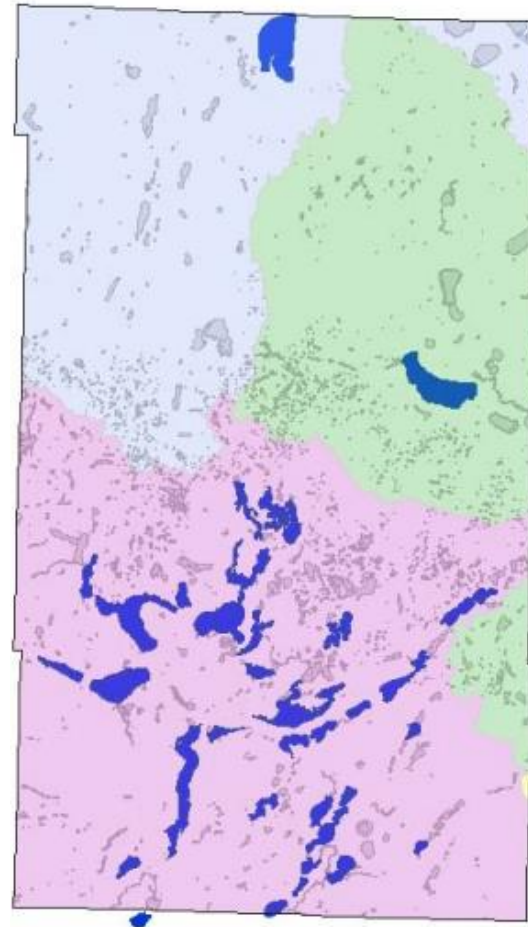
How Many Lakes in Hubbard County

- **4 Major Watersheds**
- **89 Minor Watersheds**
- **Open Water Covers 7% of Surface Area**
- **Additional 12.5% Covered by Wetlands**
- **Approximately 728 Lakes**
- **333 Lakes – Online Info - MN DNR Lake Finder**
- **39 Lakes - 30 Lake Assocs in Large Lakes Assessment '12**
- **9 Lakes – Indiv 15-Year Rpts**
- **2017:**
 - **75 HC Lake Reports**
 - **44 with 10 Years or More Seasonal Data**
 - **21 with 20 Years of Data**
 - **All HC COLA Lakes Participated at Least 2 Years so Continue Conversation**
 - **Opportunity to Start Water Quality Monitoring on More HC Lakes**
 - **Compare 10 & 15 Year Reports to 20-Year Charts for Trend Analysis**
 - **Engage Citizens**

4 Major Watersheds in Hubbard County with the Lakes Evaluated in “Blue” in 2012 Large Lakes Assessment

Mississippi River
Headwaters Watershed

Crow Wing River
Watershed



Leech Lake River
Watershed

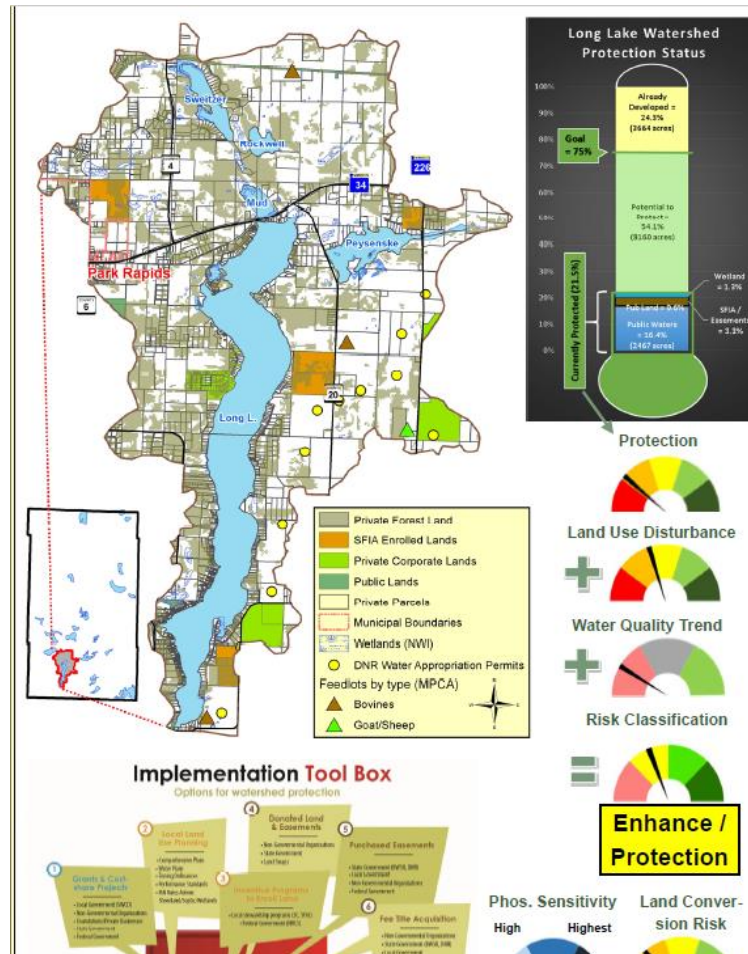
Very Tiny Sliver of
Pine River Watershed

Example of One of the 89 Minor Watersheds

Long Lake Minor Watershed

Shows Enhance / Protection is Key!

We All Live in a Watershed! What We Do On The Land – We Do To The Water!



Measuring Water Quality

2012 Hubbard County Large Lakes Assessment

Based on 39 Lakes with 30 Lake Associations – Some Improving

Table 4. Hubbard COLA Lakes with improving water quality trends (TP=Total phosphorus, CHLA= Chlorophyll a, Secchi=Transparency).

Lake	Parameter	Date Range	Trend	Probability
Little Sand	Secchi	1987-2011	Improving	99.9%
	TP	1997-2011	Improving	99%
	CHLA	1997-2011	No trend	-
Big Sand	Secchi	1994-2011	Improving	99%
	TP	1998-2011	Improving	95%
	CHLA	1998-2011	No trend	-
Emma	TP	1999-2011	Improving	90%
	CHLA	1999-2011	No trend	-
	Secchi	Insufficient data	-	-
Eagle	Secchi	1997-2011	Improving	95%
	TP, CHLA	1997-2011	No trend	-
Hinds	Secchi	1994-2003, 2006-2011	Improving	95%
	TP, CHLA	1997-2000, 2002-2004, 2006-2011	No trend	-
Kabekona	Secchi	2000-2011	Improving	95%
	Secchi	1995-2011	No trend	-
	TP, CHLA	1994,1997-2010	No trend	-
Potato	Secchi	1990-2011	Improving	95%
	TP, CHLA	1997-2011	No trend	-
Stocking	Secchi	1995-2011	Improving	99%
	TP, CHLA	1997-2011	No trend	-

Measuring Water Quality

2012 Hubbard County Large Lakes Assessment

Based on 39 Lakes with 30 Lake Associations

Some Lakes Declined & Others Showed No Trend Then

Table 6. Hubbard COLA Lakes with declining water quality trends. For chlorophyll a and phosphorus parameters, a declining trend means that their concentrations are increasing. For transparency, a declining trend means that the clarity is decreasing (TP=Total phosphorus, CHLA= Chlorophyll a, Secchi=Transparency).

Lake	Parameter	Date Range	Trend	Probability
1st Crow Wing	Secchi	1997-2011	Declining	90%
	TP, CHLA	1997-1999,2001-2011	No trend	-
9th Crow Wing	Secchi	1999-2001, 2004-2011	Declining	95%
	TP, CHLA	Insufficient data		-
Gilmore	Secchi	1991-2011	Declining	90%
	TP, CHLA	1997-2011	No trend	-
Long	Secchi	1990-2011	Declining	95%
	TP, CHLA	1997-2011	No trend	-
Lower Bottle	Secchi	2000-2011	Declining	90%
	CHLA	2000-2011	Declining	90%
	TP	2000-2011	No trend	-
Palmer	Secchi	1997-2011	Declining	95%
	CHLA	1997-2011	Declining	90%
Plantagenet	Secchi	2003-2011	Declining	90%
	TP, CHLA	2003-2011	No trend	-

20 Years of Water Quality Monitoring Through Collaboration

- **Hubbard County Coalition of Lake Associations (HC COLA) Coordinates**
 - **Sampling Procedures Training Wed 5/10/17 at 6:30 PM – Light Supper 6 PM**
 - **Citizen Volunteers Sample – May Thru Sept - 3rd Sunday / Mon AM**
 - **Lake Associations Each Pay \$220 Total for Season**
- **Charlie's Boats & Marine in Park Rapids – Cooler Distribution Point**
- **HC COLA Volunteers Shuttle: Water & Zebra Mussel Veliger Samples**
- **RMB Environmental Laboratories in Detroit Lakes Does Analysis**
- **Hubbard County Soil and Water Conservation District (HC SWCD) Subsidy**
- **Citizens on Lakes Without Lake Assocs Can Do Water Quality Monitoring**

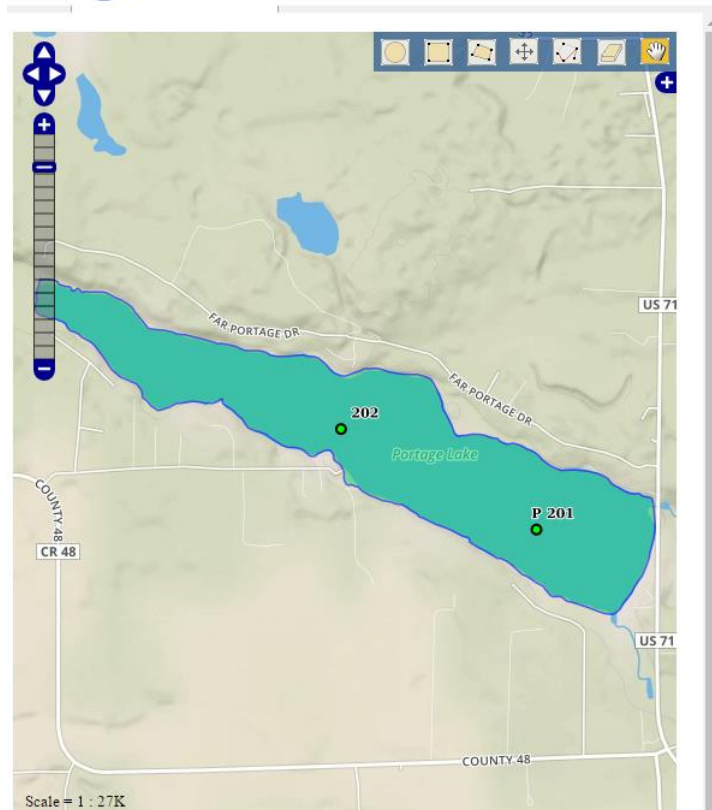
What Are Our Hubbard County Lakes Communicating Through Trend Charts?

We'll Use Portage As Our Example

Water Clarity Has Been Increasing Potentially Due To Treatment/ Management of Non-Native Aquatic Invasive Curley-Leaf Pondweed (AIS) and Required Septic Checks around 2009ish or so... CLP produces dense mats at the water's surface and can interfere with recreational and other uses of the lakes. It dies off in mid-summer.

CLP spreads to other lakes by fragments on boats.

Prevent the Spread of AIS! Clean – Drain – Dry & Think Decon!



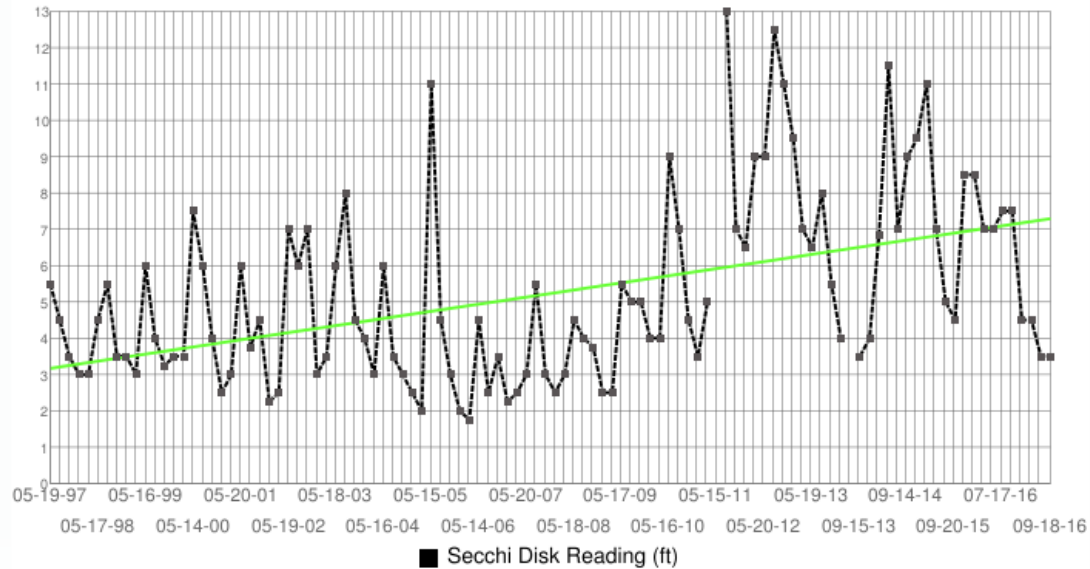
Portage: Secchi Disk Depth is Increasing. The Water Is Becoming Clearer & More Transparent Indicating Improving Water Quality

Trend Analysis Report

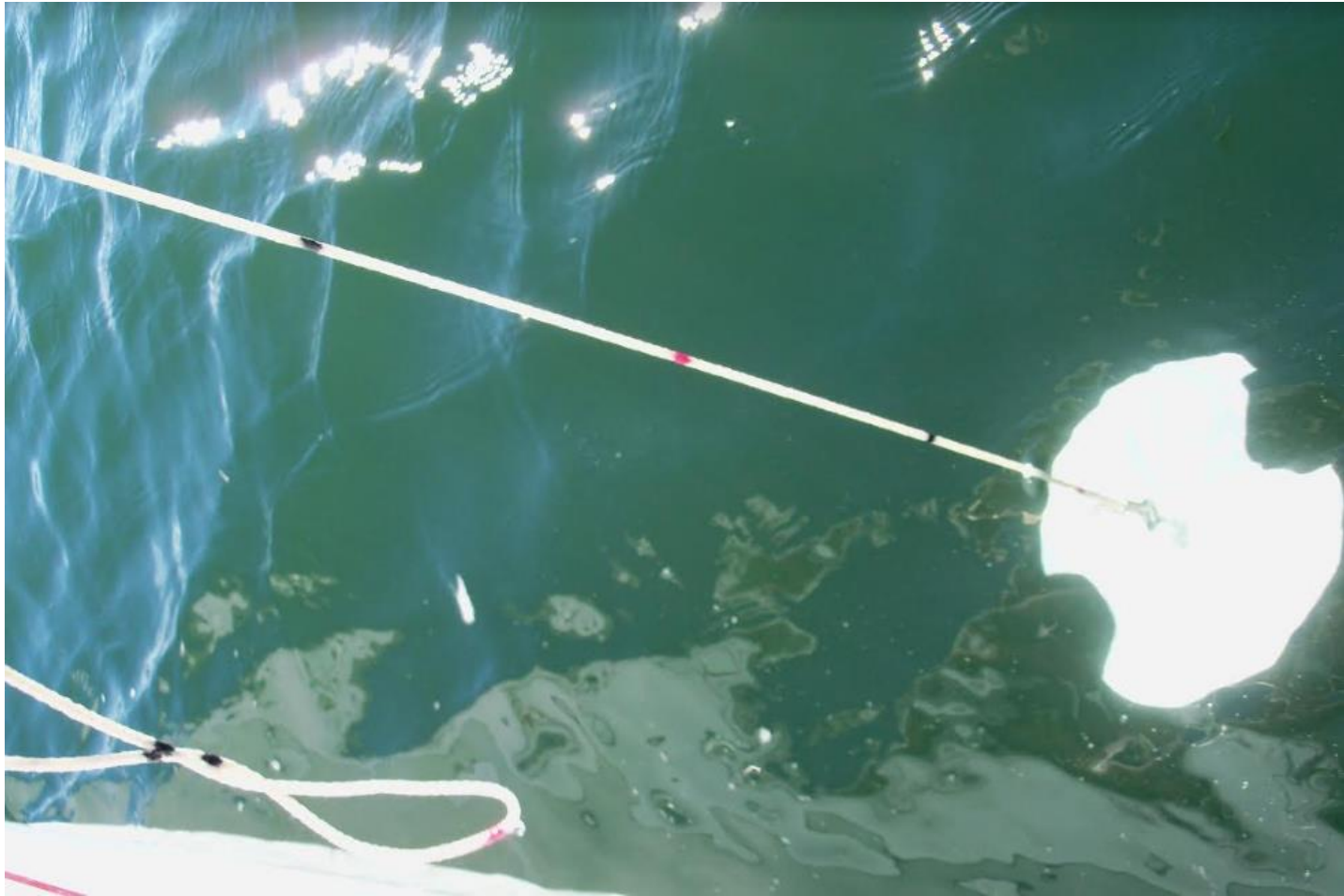
County	MN Lake ID	Lake	Site	Data Evaluated	Date Range	Data Source
Hubbard	29-0250-00	Portage	201	Secchi Disk	05-19-1997 - 09-18-2016	RMB

Secchi depth is increasing, which indicates improving water quality (99.9% confidence)

Portage (ID#29-0250-00) Secchi Disk Values



The Secchi Disk is lowered into the water on the shaded side of the boat until disk just disappears completely. Note depth. Do this Multiple Times following test protocol. Record.



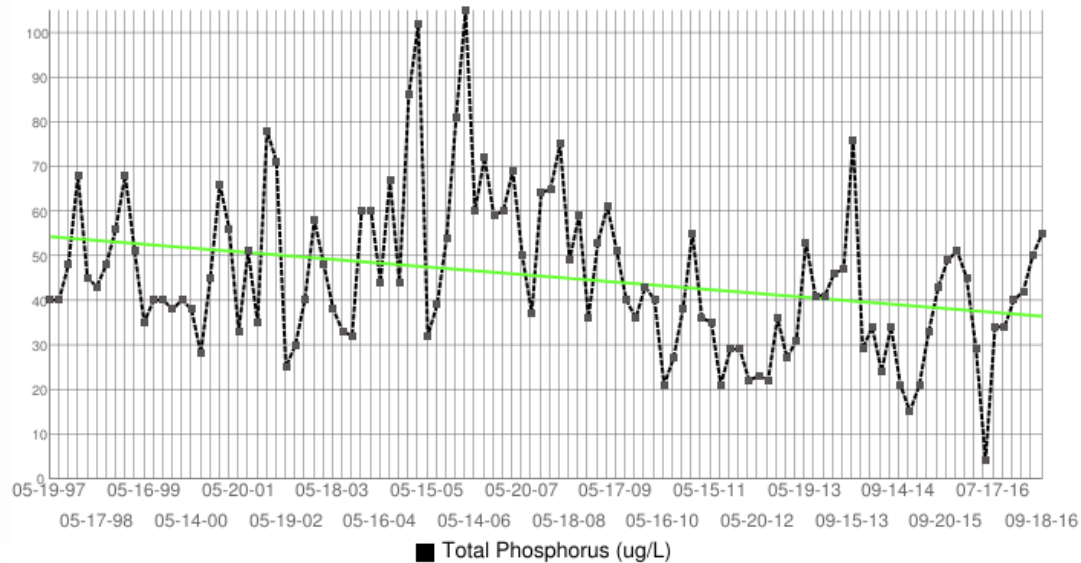
Portage: Phosphorus is Decreasing. Phosphorus is a nutrient for plant growth. The more phosphorus, the more plants and algae there are in the lake. Phosphorus sources include human and animal wastes, soil erosion, detergents, septic systems, and runoff from fertilized lawns or farmland. Phosphorus can also come from fertilized sediment at the bottom of the lake.

Trend Analysis Report

County	MN Lake ID	Lake	Site	Data Evaluated	Date Range	Data Source
Hubbard	29-0250-00	Portage	201	Phosphorus	05-19-1997 - 09-18-2016	RMB

Total Phosphorus concentration is decreasing, which indicates improving water quality (99% confidence)

Portage (ID#29-0250-00) Phosphorus Values



The Integrated Sampler is Used To Go Down 2 Meters In the Water Column to Avoid Sampling Just The Top Surface of the Water. There is Test Protocol To Follow...



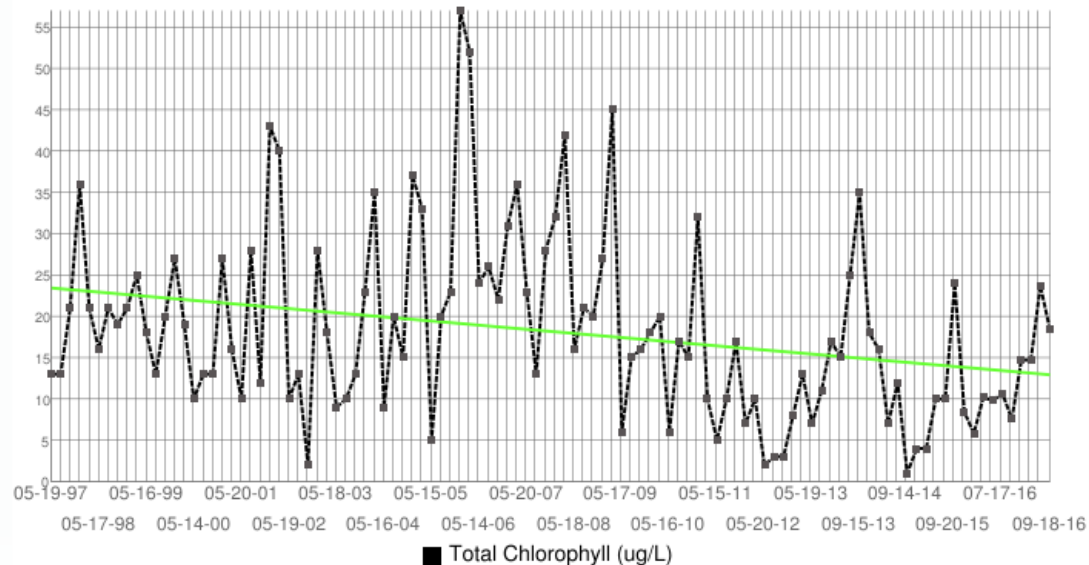
Portage: Chlorophyll_a is Decreasing so Algae Concentration is Less.
This pigment is what allows plants and algae to photosynthesize. If there is too much algae, it can produce a foul odor and be unpleasant for swimming. Algae growth depends on many factors including the availability of nutrients like phosphorus and nitrogen and water temperature....

Trend Analysis Report

County	MN Lake ID	Lake	Site	Data Evaluated	Date Range	Data Source
Hubbard	29-0250-00	Portage	201	Chlorophyll_a	05-19-1997 - 09-18-2016	RMB

Total Chlorophyll-a concentration is decreasing, which indicates improving water quality (99.9% confidence)

Portage (ID#29-0250-00) Chlorophyll_a Values



**Large Labeled Amber Bottle is Provided by RMB Environmental Labs.
The Integrated Sampler is Used to Fill the Bottle.**



What Actions Make A Difference To Water Quality?

- Keep Leaves & Grass Clippings Out of the Street. They Can Carry Phosphorus Through Storm Sewers and into Lakes and Rivers.
- Limit Stormwater Runoff - Use Rain Gardens to Keep the Water on Land
- Limit Your Use of Lawn Fertilizers (0 Phosphorous)
- If You Live On a Lake or Stream, Grow a Buffer of Native Plants or Try “No Mow” for a Section of Shoreland
- Plant Deep-Rooted Grass, Trees, Shrubs in Bare Areas
- Put Trash in its Place & Recycle
- Dispose of Paint, Motor Oil, Household Chemicals Properly
- Regular Septic Maintenance
- Limit Your Use of Pesticides
- Don't Flush Old Medicines Down the Toilet
- SWCD Has Grant Programs for Streambank, Lakeshore, and Roadside Erosion, Shoreland Brochures, Tree Program, and much more!

How Does Water Sampling Work?




How Are The Results Classified?

Lake Trophic States Used By Scientists to give Names to Lake Types.

Lakes are Classified based on the Amount of Available Nutrients (Phosphorous and Nitrogen) for organisms. More Fertile Lakes Have More Nutrients and Therefore More Plants and Algae.

Portage was considered Eutrophic in 2012. Today it is Mesotrophic. Walleye fishing?

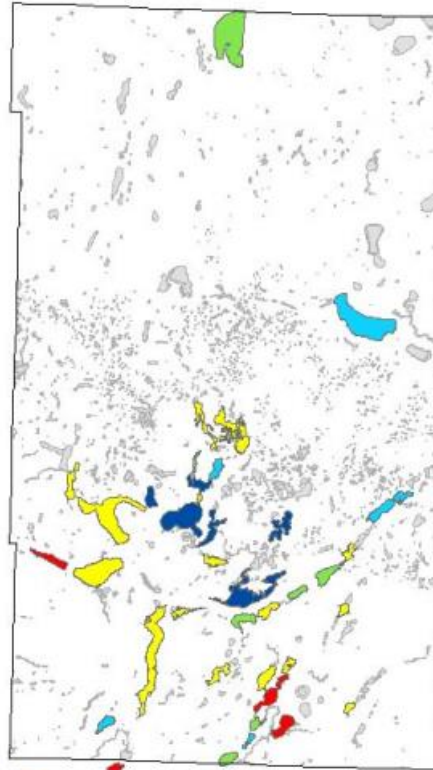


TSI	Attributes	Fisheries & Recreation
<30	Oligotrophy: Clear water, oxygen throughout the year at the bottom of the lake, very deep cold water.	Trout fisheries dominate.
30-40	Bottom of shallower lakes may become anoxic (no oxygen).	Trout fisheries in deep lakes only. Walleye, Tullibee present.
40-50	Mesotrophy: Water moderately clear most of the summer. May be "greener" in late summer.	No oxygen at the bottom of the lake results in loss of trout. Walleye may predominate.
50-60	Eutrophy: Algae and aquatic plant problems possible. "Green" water most of the year.	Warm-water fisheries only. Bass may dominate.
60-70	Blue-green algae dominate, algal scums and aquatic plant problems.	Dense algae and aquatic plants. Low water clarity may discourage swimming and boating.
70-80	Hypereutrophy: Dense algae and aquatic plants.	Water is not suitable for recreation.
>80	Algal scums, few aquatic plants.	Rough fish (carp) dominate; summer fish kills possible.

Source: Carlson, R.E. 1997. A trophic state index for lakes. *Limnology and Oceanography*. 22:361-369.

How Are The Results Classified?

Portage – Eutrophic in
2012 Report →



- Oligotrophic (TSI 0-38)
- Oligotrophic/Mesotrophic (TSI 39-41)
- Mesotrophic (TSI 42-48)
- Mesotrophic/Eutrophic (TSI 49-51)
- Eutrophic (TSI 52-60)

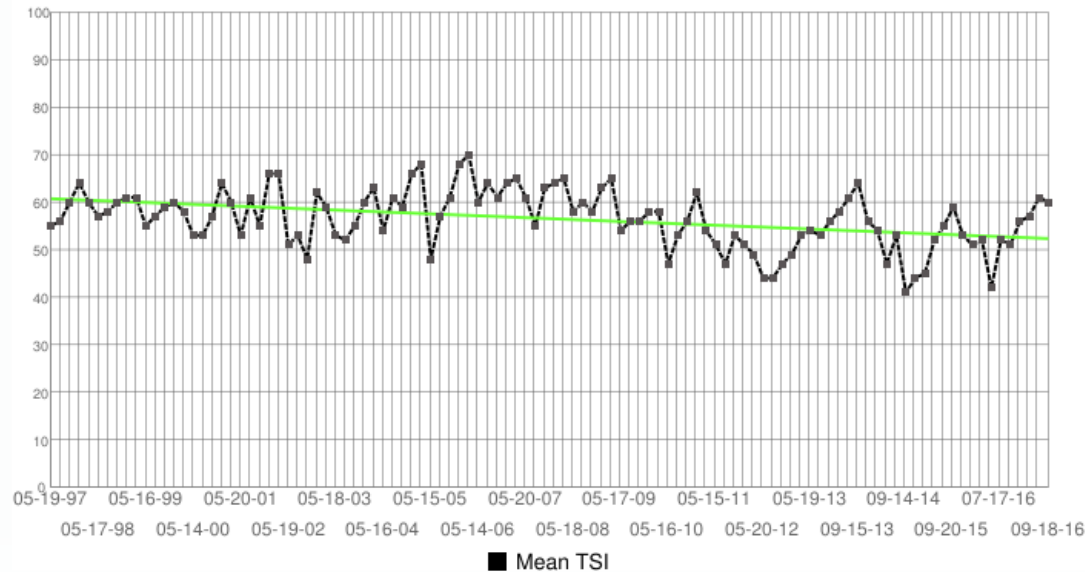
On Portage: Tropic State Index Declining Nutrients (Phosphorous & Nitrogen) are Decreasing

Trend Analysis Report

County	MN Lake ID	Lake	Site	Data Evaluated	Date Range	Data Source
Hubbard	29-0250-00	Portage	201	Mean TSI	05-19-1997 - 09-18-2016	RMB

Mean TSI is decreasing,
which indicates improving water quality (99.9% confidence)

Portage (ID#29-0250-00) Mean TSI Values



How Can Citizens Become Involved?

- **View the Reports Available for Your Favorite Lake or River**
- **Provide Your Contact Information for Us To Follow Up With You if You Have Questions or May Be Considering Being**
- **Flyer – Want To Start Water Quality Monitoring & Additional Resources**
- **Become a MPCA Citizen Volunteer Monitor – Free - Do Secchi**
- **Prevent The Spread of Aquatic Invasive Species By Your Actions & Educate Your Visiting Guests & Family Members**
 - **Clean – Drain – Dry**
 - **Use the Free Decon Station**
 - **Dispose of Unwanted Bait in Trash**
 - **Protect Our Valuable Fresh Water**
- **Learn Lake Monitoring Techniques - Online - HC COLA Website**
- **Learn to Identify Aquatic Vegetation & Notice Lake / River Changes**
- **Participate In Your Lake / River Association**

Resources To Learn More

- Be sure to catch the Minnesota Tour of “We Are Water” which will be in Detroit Lakes Feb 25 – April 9; www.mnhum.org/waterways
- Participate in the “Year of Water Action” in Minnesota! This website has info on many actions we can each take
<http://mn.gov/governor/issues/wateraction/>
- RMB Environmental Lab Lakes Program - <http://rmbel.info/lakes/>
- Hubbard County SWCD <http://www.hubbardswcd.org/>
- Hubbard County Coalition of Lake Associations – www.hubbardcolamn.org
- MN Pollution Control Agency – Citizen Lake & Stream Monitoring Programs
<https://www.pca.state.mn.us/water/citizen-lake-monitoring-program>
- MN DNR Lake Finder <http://www.dnr.state.mn.us/lakefind/index.html>
- MN DNR Aquatic Invasive Species
<http://www.dnr.state.mn.us/invasives/aquatic/index.html>
- Hubbard County Local Water Plan
<http://www.co.hubbard.mn.us/Environmental/Forms/2016%20Hubbard%20County%20LWMP.pdf>

**What We EACH Do on the Land
and in Our Lives
Can Improve – or Impair –
Our Waters!**

