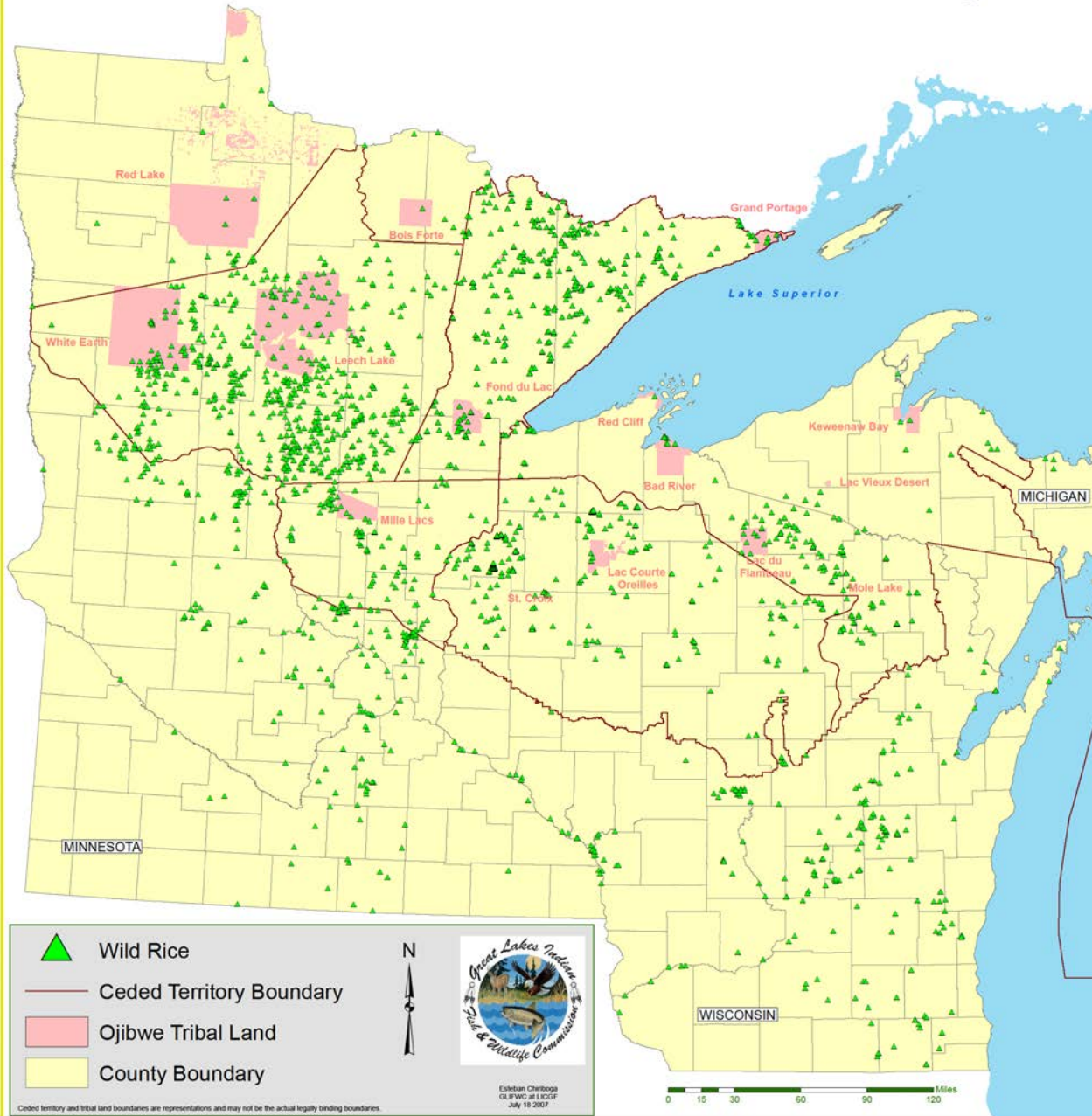


Exchange Network Tribal Consortium for Protecting *Manoomin* (Wild Rice)



Kari Hedin and Nancy Schuldt,
Fond du Lac Reservation

Wild Rice in the Western Great Lakes Region





Vulnerability to Water Level Changes



Project Goals

Single **cloud-based** information system

Provide water quality data to the EPA's Water Quality Exchange (WQX)

Provide insight into how EPA could **incorporate wetland data into WQX**, including plant surveys.

Natural By-Products

Data ends up in the National WQP

Consistent tools

Consistency in methods

Consistency in recording data

Ability to do analysis across the region

Project Partners

(Non-Tribal)

- EPA National Environmental Information Exchange Network
- Gold Systems, Inc.

1854 Treaty Authority

Bad River Band of Lake Superior Chippewa

Bois Fort/Nett Lake Band of Chippewa Indians

Fond du Lac Band of Lake Superior Chippewa

Forest County Potawatomi Community

Grand Portage Band of LSC

Hannahville Indian Community

Ho Chunk Nation of Wisconsin

Keweenaw Bay Indian Community (KBIC)

Lac Courtes de Oreilles Band

Lac du Flambeau Band of LSC

Lac Vieux Desert Band of LSC

Little River Band of Ottawa Indians

Little Traverse Bay Band of Odawa Indians

Lower Sioux Indian Community

Menominee Indian Tribe of Wisconsin

Mille Lacs Band of Ojibwe

Nottawaseppi Huron Band of the Potawatomi

Oneida Nation

Prairie Island Indian Community

Red Cliff Band of Lake Superior Chippewa

Red Lake Band of Chippewa

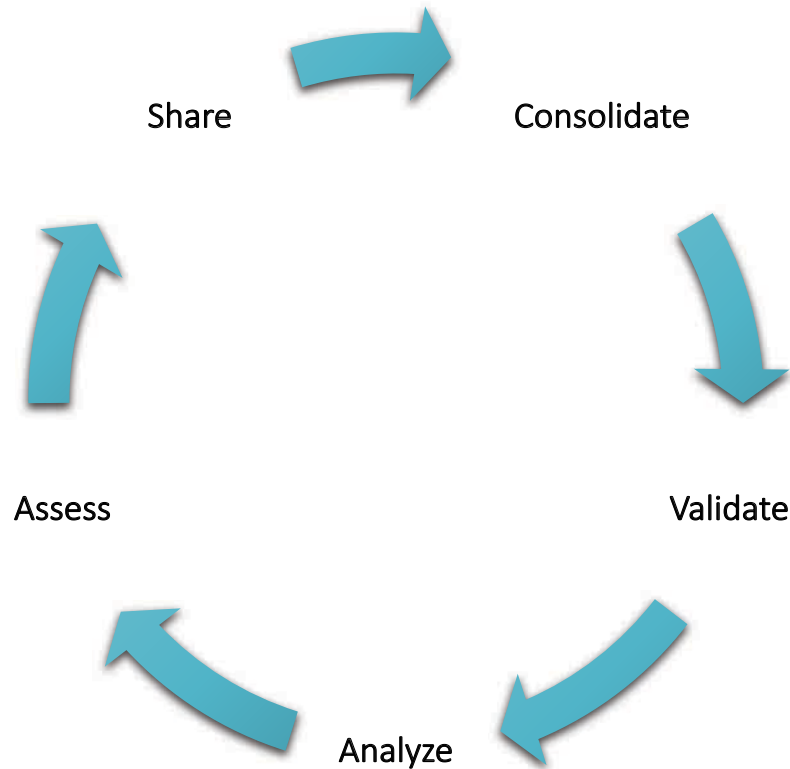
Sault Ste. Marie Tribe of Chippewa Indians

Sokaogon Chippewa Community

St. Croix Chippewa Indians of Wisconsin

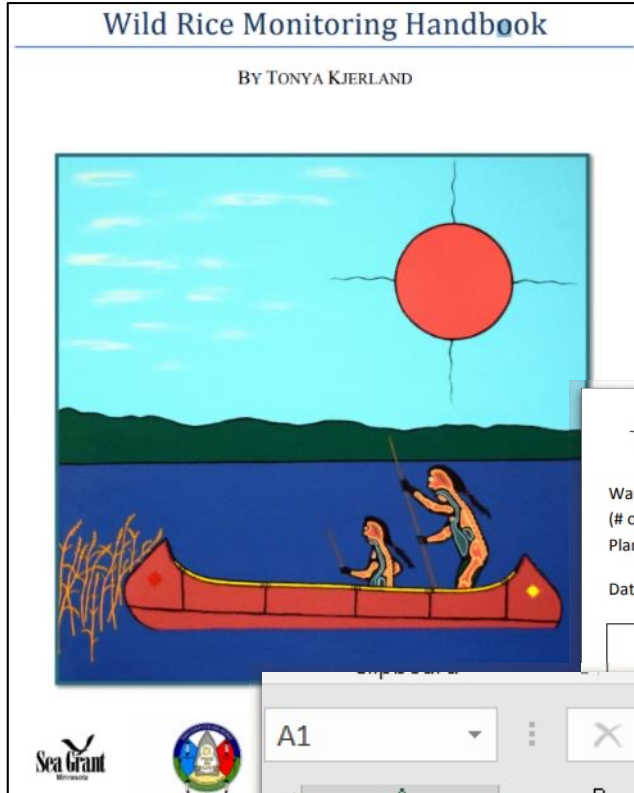
Upper Sioux Community

Why We Chose AWQMS



Wild Rice Monitoring Handbook

Related Resources



Instructions for Collecting Wild Rice Field Data

1. Locate sample points using GPS unit.
2. Collect water quality and sediment samples, if part of sampling plan.

Wild Rice Field Data Sheet

Water body name: _____

County: _____ Township: _____ Range: _____ Sections(s): _____

Date: _____ Crew: _____ Sheet is # _____ of _____ (# of sheets for water body)

Be sure to record the units of measurement you are using!

SAMPLE PLANT	
Water depth cm / in	# of stalks on plant (if collecting whole plants)

Wild Rice Lab Data Sheet

Water body name: _____ Date: _____ Staff initials: _____ Sheet # _____ of _____

(# of sheets for water body)

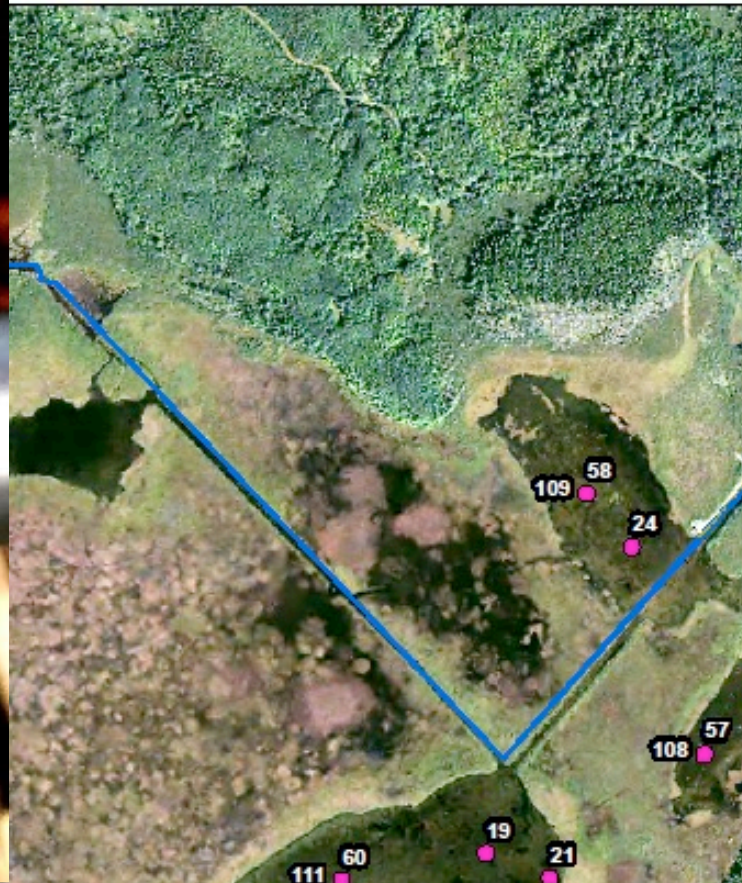
Plant materials dried for _____ hours at _____ degrees Celsius Date plant materials were dried: _____

Date plant materials were weighed: _____ Record weight to the nearest 0.001 grams

				Viable		Non-viable		Non-	
							Number of		
								Number	
								Number of seeds	

Date (MM/DD/YYYY)					
A	B	C	D	E	F
Date (MM/DD/YYYY)	Water body Name of Lake	Sample ID#	Activity ID Name of Lake:RL08:20141015	Number of rice stalks per 0.5 m ²	Taxon Pres (Y)?
10/15/2014		RL08		124	Y

Wild Rice Field and Lab Data Spreadsheet Template





Mobile Forms

Sample ID#*
ID taken from pre-loaded locations in GPS handheld device.

Number of rice stalks per 0.5m²*
Count the number of wild rice stalks in quadrat. Put 0 if no stalks present.

Aquatic vegetation present*
Note other aquatic vegetation present in the quadrat.

<input type="checkbox"/> white water lily	<input type="checkbox"/> yellow water lily	<input type="checkbox"/> pickerelweed	
<input type="checkbox"/> watershield	<input type="checkbox"/> coontail	<input type="checkbox"/> pondweed	<input type="checkbox"/> bulrush
<input type="checkbox"/> lesser duckweed	<input type="checkbox"/> sparganium	<input type="checkbox"/> bladderwort	







AWQMS Pre-Mapped Import Configuration

A1

A	B	C	D	E	F
Date (MM/DD/YYYY)	Water body Name of Lake	Sample ID# RL08	Activity ID Name of Lake:RL08:20141015	Number of rice stalks per 0.5 m ²	Taxon Presence (Y)?
10/15/2014				124	Y

Wild Rice Field and Lab Data Spreadsheet Template

Regular Columns (starting at row 2 of your import file)

Column	Entity	Entity #	Element	Format	When Column...	Then Use These Values	Translations
A	Activity	1	Activity Start Date	MM/DD/YYYY			0 Edit
B	Activity	1	Monitoring Location ID				7 Edit
C	Activity	1	Sampling Component/Quadrat				0 Edit
D	Activity	1	Activity ID				0 Edit
E	Result	1.1	Characteristic Name		Is Not Blank	Count	1 Edit
	Result	1.1	Result Value			[Use value from import file]	
	Result	1.1	Result Unit			count	
	Result	1.1	Result Comment			Number of Rice Stalks per 1/2 square meter of area	
	Result	1.1	Biological Intent			Targeted Sampling	
	Result	1.1	Subject Taxonomic Name			Plantae	

Parameters

Results:

Add

Intent	Taxon	Characteristic	Fraction	Statistic	Value	Unit	Detection Condition
Individual	Lemna minor	<u>Taxon Present (Y/N) (choice list)</u>			Y	None	
Targeted Sampling	Plantae	<u>Count</u>			87	count	
Targeted Sampling	Plantae	<u>Depth, bottom</u>			50.8	cm	
Targeted Sampling	Plantae	<u>Fungi</u>			low	None	
Targeted Sampling	Plantae	<u>Non-viable seed count</u>			13	count	
Targeted Sampling	Plantae	<u>Non-viable seed weight</u>			0.1	g	
Targeted Sampling	Plantae	<u>Number of pedicels per sample plant</u>			52	count	
Targeted Sampling	Plantae	<u>Number of seeds with worm holes</u>			0	count	
Targeted Sampling	Plantae	<u>Number of stalks per sample plant</u>			2	count	
Targeted Sampling	Plantae	<u>Plant height (Total)</u>			139.7	cm	
Targeted Sampling	Plantae	<u>Root weight</u>			0.76	g	
Targeted Sampling	Plantae	<u>Shoot weight</u>			3.19	g	
Targeted Sampling	Plantae	<u>Viable seed count</u>			10	count	
Targeted Sampling	Plantae	<u>Viable seed weight</u>			0.15	g	
Individual	Unknown	<u>Taxon Present (Y/N) (choice list)</u>			N	None	
Individual	Unknown	<u>Taxon Present (Y/N) (choice list)</u>			N	None	
Individual	Unknown	<u>Taxon Present (Y/N) (choice list)</u>			N	None	

Translations

When Column G ...		Then	Subject Taxonomic Name
Equals	manna grass	Use these values	Glyceria
Equals	narrow leaf pondweed	Use these values	Potamogeton
Equals	Pickerelweed	Use these values	Pontederia cordata
Equals	Pondweed	Use these values	Potamogeton
Equals	Pondweed, Curly	Use these values	Potamogeton crispus
Equals	Pondweed, Floating-Leaved	Use these values	Potamogeton natans
Equals	Pondweed, Large-leaved	Use these values	Potamogeton amplifolius
Equals	Pondweed, Leafy	Use these values	Potamogeton foliosus

Our Path to Success

- **Adopted and enhanced** the Ambient Water Quality Monitoring System (AWQMS)
- **Provided proper training**
 - WQX exchange network data flow
 - Use of AWQMS

Our Path to Success

Assist tribes to:

- Import & Enter Data into AWQMS
- Flow data to WQX via the Exchange Network
- Configure and use AWQMS QC Thresholds

Our Path to Success

Gap Analysis:

FDLEP NEIEN GRANT AWQMS Wild Rice Gap Analysis

Introduction

In accordance with contract item 1 for grant goals 4A and 4G, this document is intended to document the 'gap' between the WQX standard and the data being collected for the Wild Rice Data Sharing project and to assist with the preparation of a recommendations document for EPA describing the changes that should be made to the WQX standard to support wild rice-related water quality and wetlands data.

The existing AWQMS system has excellent support for collection and analysis of chemistry and basic field observations. However, as of the beginning of the Wild Rice project, no organization has yet attempted to import or enter vegetation stand counts and other related individual stalk measurements such as what is needed for wild rice and similar studies. It is anticipated that changes both in system configuration and in software capability will be needed in order to allow for importing and manual entry of vegetation stand count data. Additionally, it is anticipated that changes will be needed to support the analysis of such data.

Approach

An initial project kickoff meeting with associated analysis sessions was held. These included discussions of how we might be able to have some level of AWQMS integration with the GIS tools the tribes will be using. We then clarified regarding some of the requirements/analysis from the initial kickoff analysis sessions and reviewed example data files provided by the Fond du Lac Environmental Program. Initial evaluation of the files determined that there shouldn't be major problems with importing such files into AWQMS.

We contacted Shannon Kesner, Fond du Lac Wetland Specialist, regarding a wetlands database she has developed in MS Access. After reviewing the database and discussing what appears to be a fairly

Our Path to Success

Tweaks/Modifications EXAMPLES:

- **Coordinated new characteristics w/WQX** (e.g. Number of stalks per sample plant)
- Ability to capture the quadrat and specific coordinates where the activity occurred (**spatial aspect to data**)
- **Report/Analyze data** by Media, Biological Intent, Taxon, quadrat

Added Online Shared Resources Library Capability

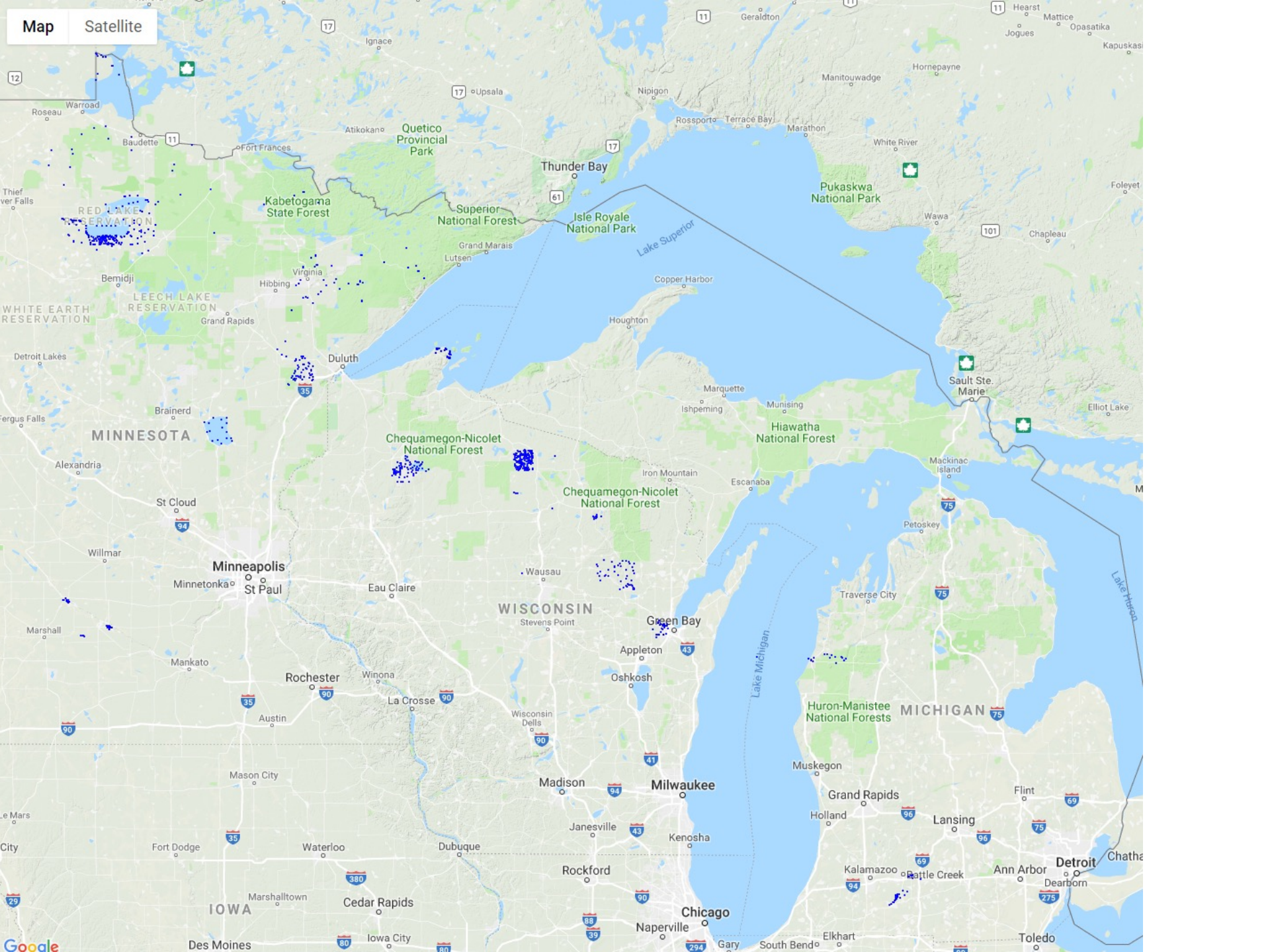
Region 5 AWQMS Tribal Consortium Wild Rice Data Sharing Participant Online Shared Resources Library Standard Operating Procedure

Introduction

The Region 5 AWQMS Tribal Consortium wild rice data sharing participants have needed an online library for storing and sharing electronic documents and other electronic media files; including references with links to available resources available from other web sites. AWQMS version 6.5 includes a new documents management feature that the consortium can leverage to achieve this goal. Examples might include but are not limited to:

- PDF files of peer reviewed literature;
- The Wild Rice Monitoring Handbook;
- QAPPS and other technical documents;
- Links to public radio podcasts about wild rice;
- Other online resources, such as YouTube videos

Organization ID	Organization Name	Total Activities	Total Results	Last WQX Submission
1854TREATYORG	1854 Treaty Authority	4,615	22,640	10-15-2018
21BRBCH	Bad River Band of Lake Superior Chippewa			
BOISNETT_WQX	Bois Forte/Nett Lake Band of Chippewa Indians	2,661	9,616	01-30-2018
FONDULAC_WQX	Fond du Lac Band of Chippewa (MN)	29,853	247,560	08-25-2018
FCPOTAWATOMI_WQX	Forest County Potawatomi Community	7,610	46,091	
21GPBCH	Grand Portage	1,557	1,557	
GPC5_WQX	Grand Portage Reservation	43,219	43,374	01-14-2015
HANNAHWQ_WQX	Hannahville Indian Community			
HO_CHUNK_WQX	Ho-Chunk Nation of Wisconsin	1,834	17,704	
KBICNRD_WQX	Keweenaw Bay Indian Community (KBIC)	438	8,195	
LCOWIS_WQX	Lac Courte Oreilles	18,938	85,822	09-27-2017
	Lac Du Flambeau Band of Lake Superior Chippewa			
LDFWATER2007	Indians Water Program	14,860	32,414	03-07-2018
STORLVD_WQX	Lac Vieux Desert Band of Lake Superior Chippewa	1,161	7,052	
LRBOI_WQX	Little River Band of Ottawa Indians	4,793	22,733	10-07-2015
LTBBWATR_WQX	Little Traverse Bay Bands of Odawa Indians			
LSIOUX_WQX	Lower Sioux Indian Community	352	3,544	03-03-2017
	MENOMINEE INDIAN TRIBE OF WISCONSIN			
MENOM_WQX	(Wisconsin)	7,732	37,868	10-03-2018
MLBO_DNR_WQX	Mille Lacs Band of Ojibwe DNR/Environment	340	2,712	03-15-2018
NOTTAWHURON_WQX	Nottawaseppi Huron Band of the Potawatomi	299	2,042	03-30-2017
ONEIDA_WQX	Oneida Nation	2,046	12,116	10-16-2018
PIIC_WQX	Prairie Island Indian Community	1,475	15,050	
REDCLIFF_WQX	Red Cliff Band of Lake Superior Chippewa (WI)	864	5,055	06-20-2018
REDLAKE_WQX	Red Lake DNR	50,193	318,012	02-14-2018
SAULTSTEMARIE	Sault Ste. Marie Tribe of Chippewa Indians	590	3,731	
SOKAOGON_WQX	Sokaogon Chippewa Community	1,128	40,240	03-30-2017
STCROIX_WQX	St. Croix Chippewa Indians of Wisconsin			
USIOUX_WQX	Upper Sioux Community	6,906	24,956	03-04-2018
		203,464	1,010,084	



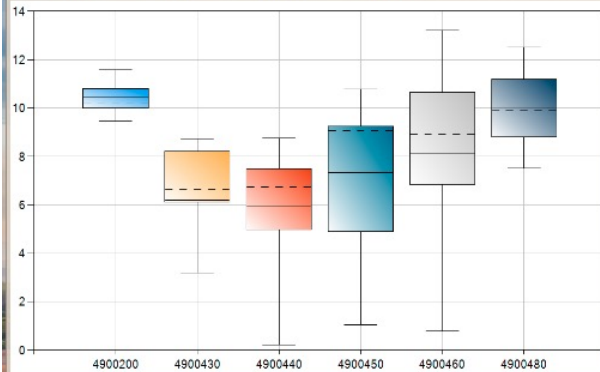
Data Analysis

Ambient Water Quality Monitoring System

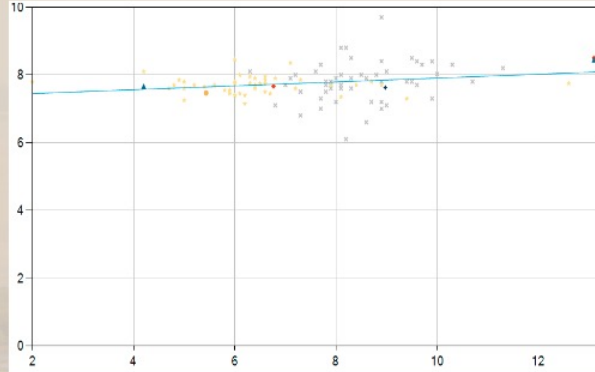
Setup ▾ Metadata ▾ Import ▾ Enter ▾ Review ▾ Batch ▾ Analyze ▾ Publish ▾ Help ▾

Data Analysis

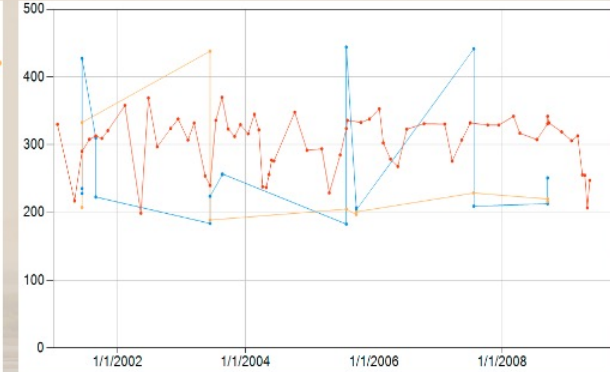
Graphs Maps Reports Exports



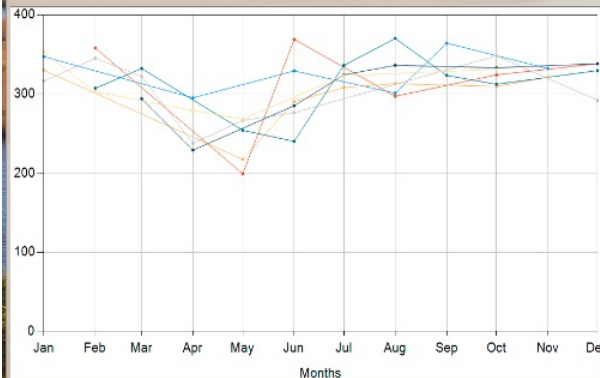
Box and Whiskers Plot



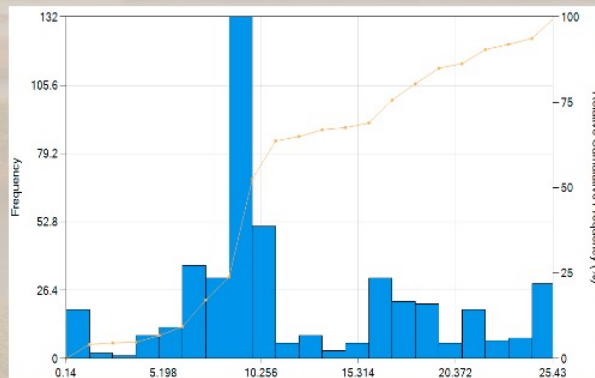
Bivariate Scatter Plot



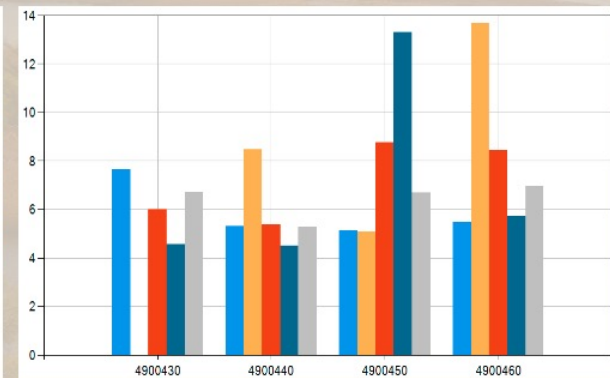
Single Parameter Line Graph



Single Parameter Yearly Comparison Line Graph

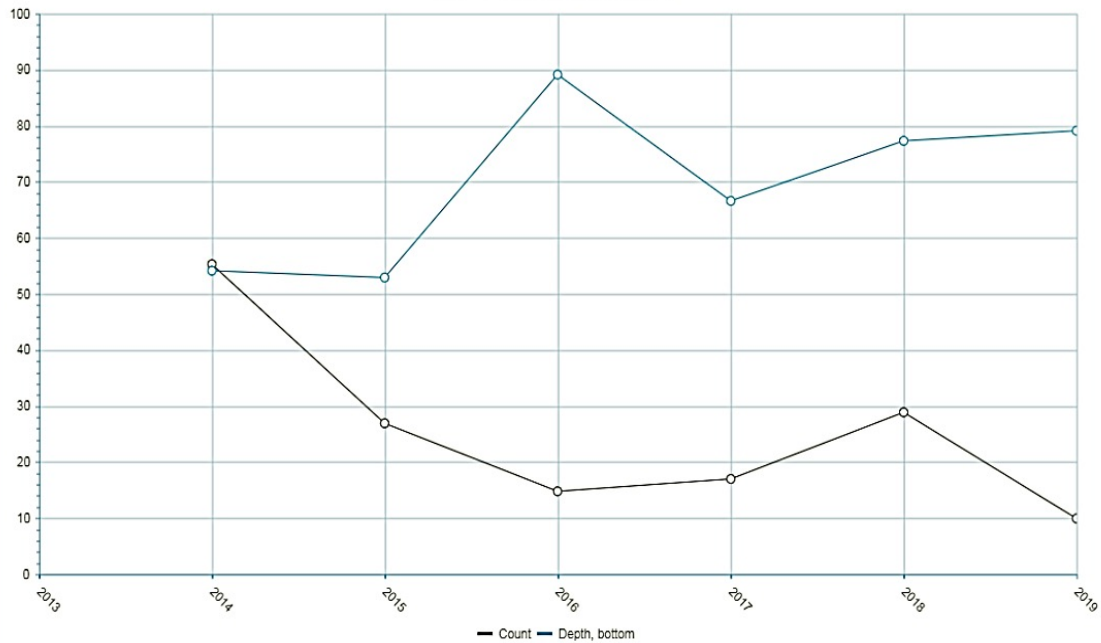


Single Parameter Cumulative Frequency Graph



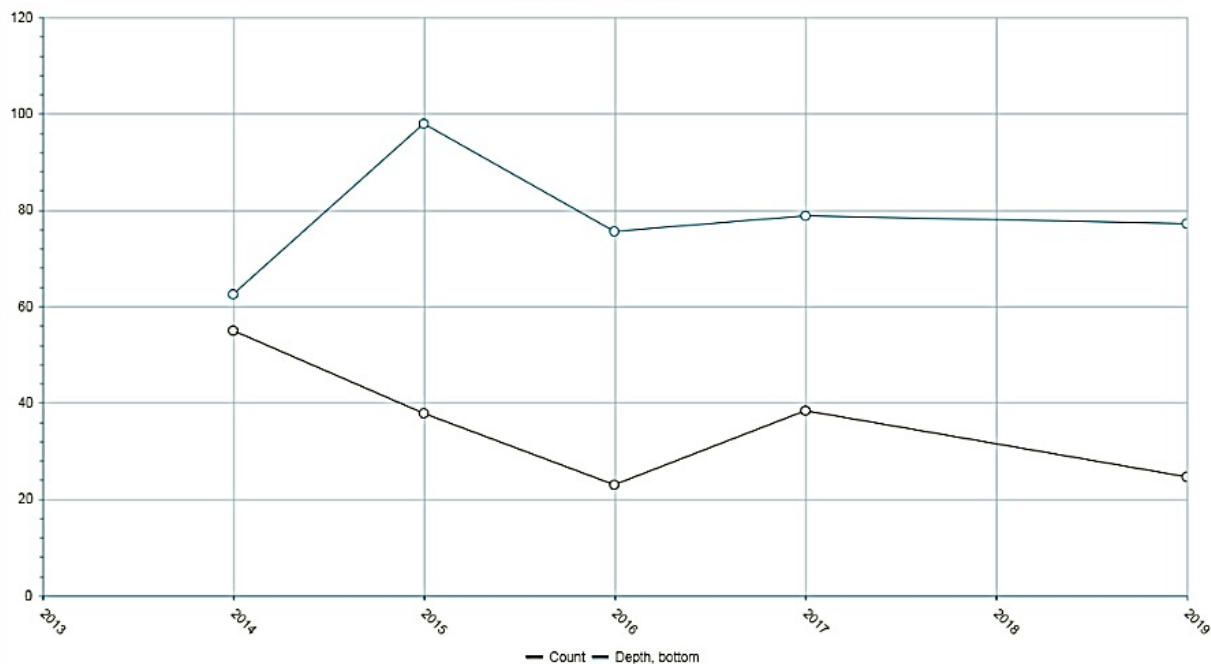
Single Parameter Mean Value Bar Graph

114B ~ Perch Lake (South Basin)~



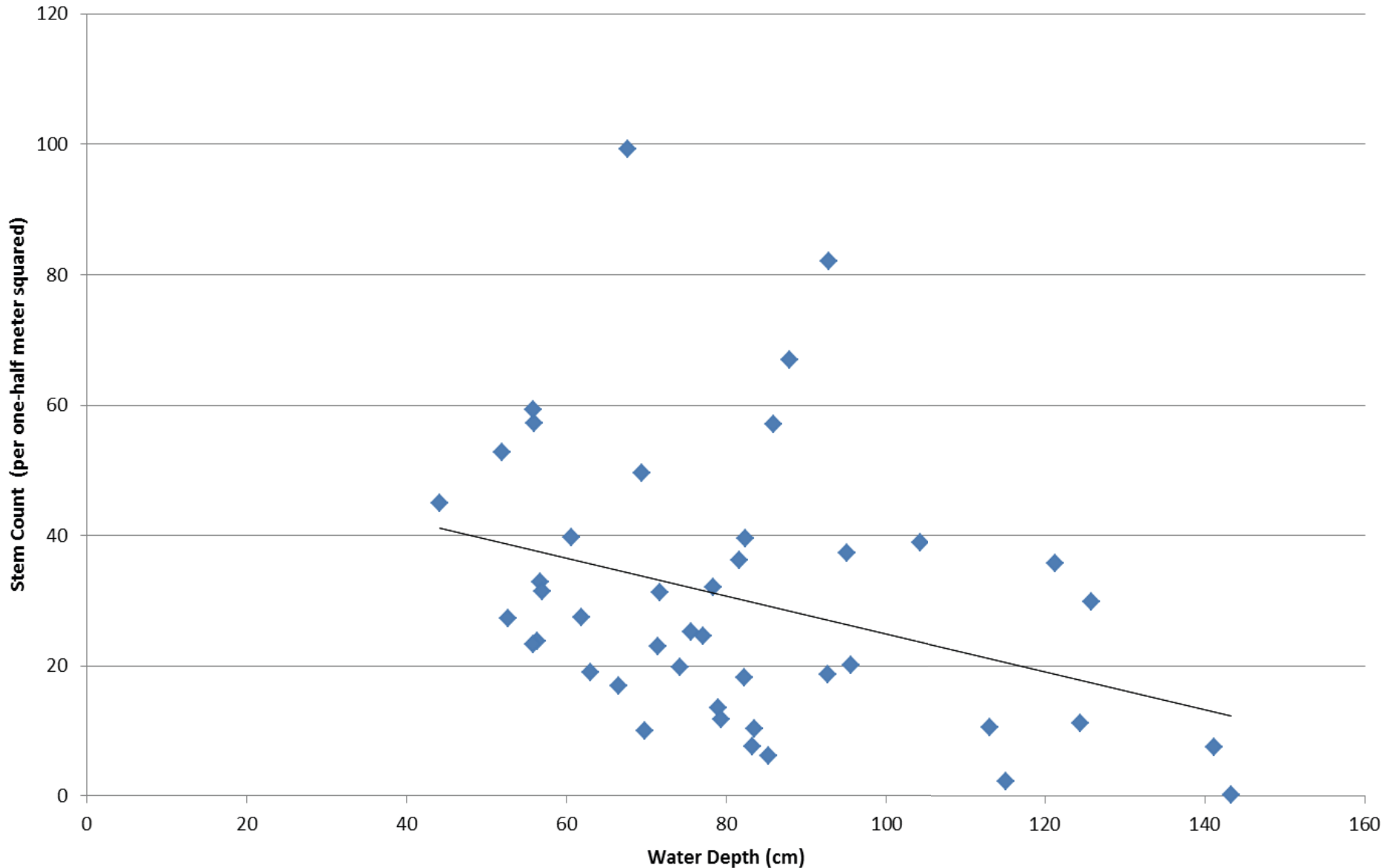
Comparing Stem Count and Water Depth

115 ~ Rice Portage Lake~

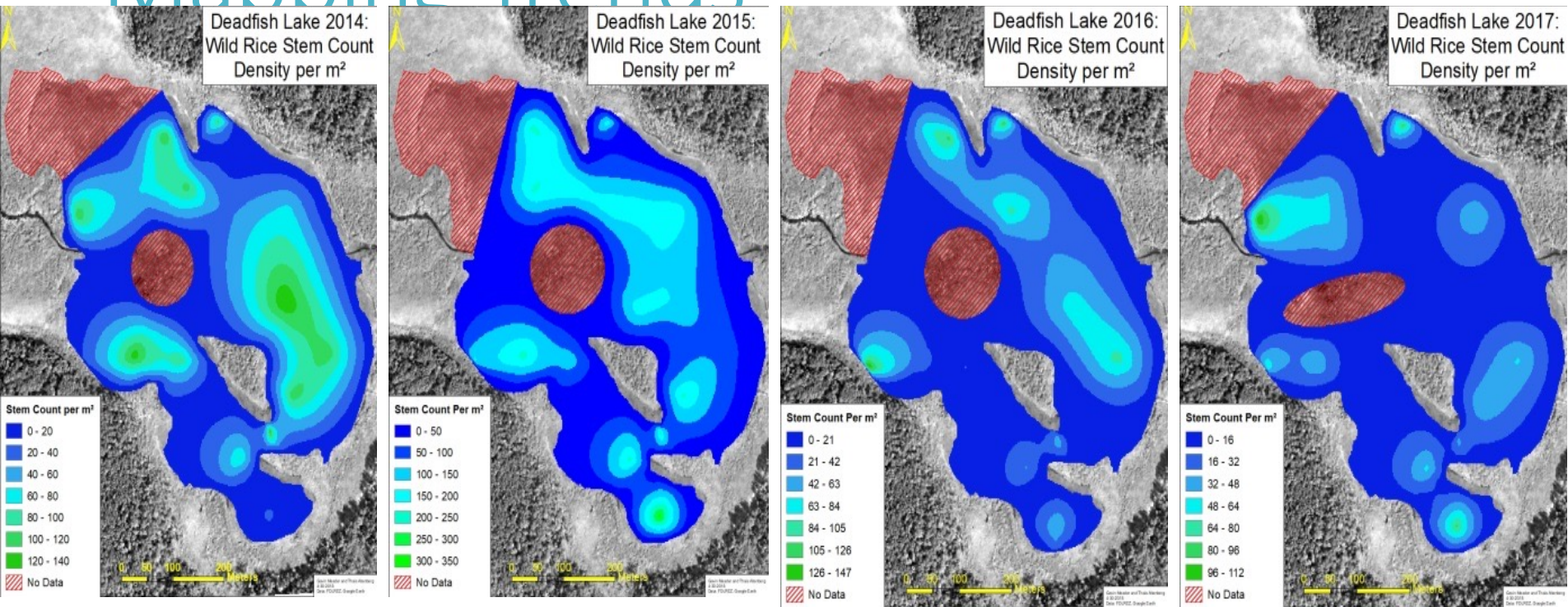


Average Yearly Water Depth (cm) vs. Average Yearly Stem Count (per one-half meter square) for Fond du Lac Reservation Wild Rice Lakes, 2014 to 2019

$R^2 = 0.1122$

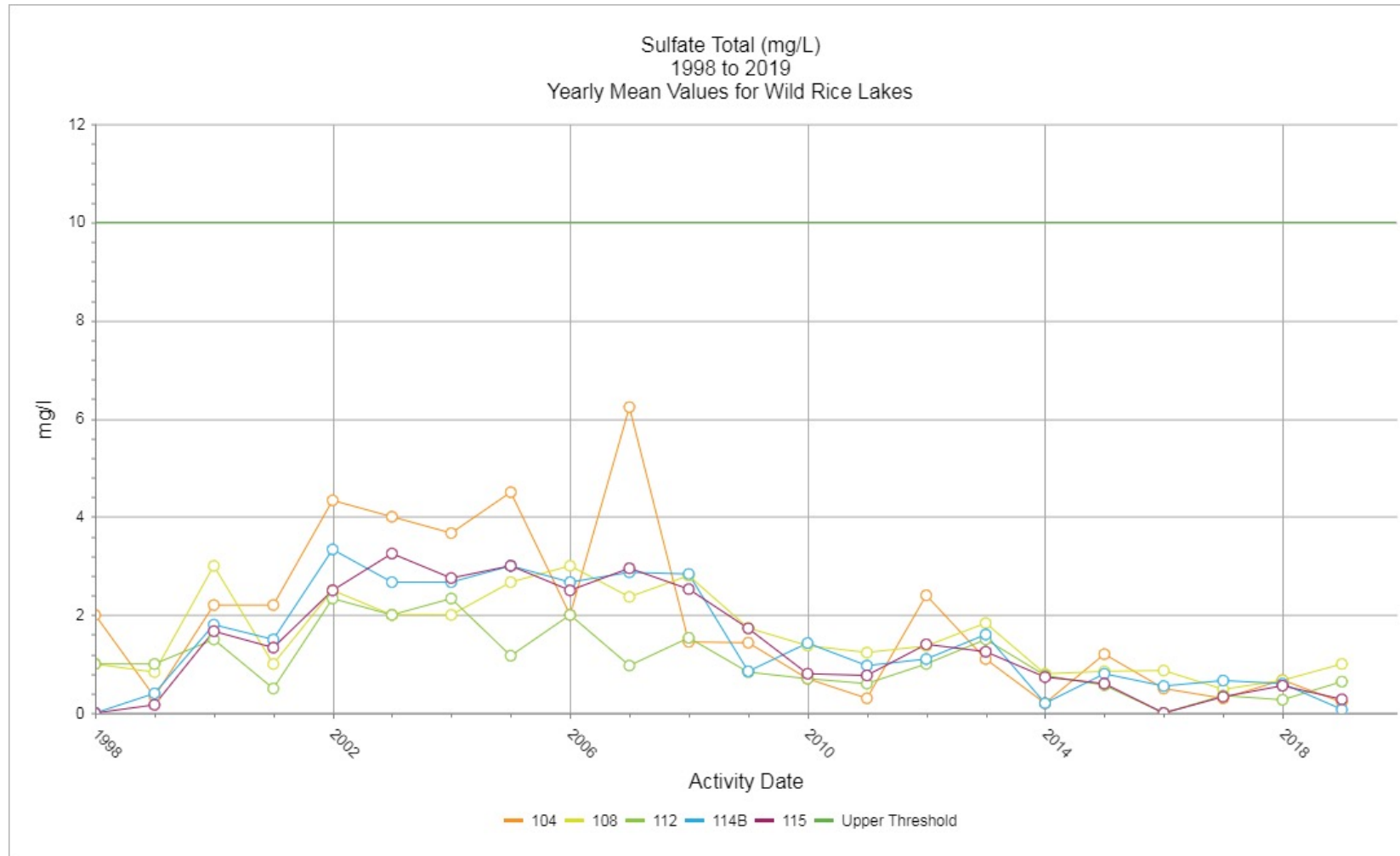


Mapping Trends



Changes in wild rice stem count density in Deadfish Lake, 2014-2017.

Water Quality Assessments Using Thresholds



Questions?

