A

APPENDIX A

Public Participation Materials

Presentation Outline

- Onterra, LLC
- Why Create a Management Plan?
- Elements of a Lake Management Planning Project
  - Data & Information
  - Planning Process

Onterra, LLC

- Founded in 2005
- Staff
  - Four full-time ecologists
  - One part-time ecologist
  - One field technician
  - Two summer interns
- Services
  - Science and planning
- Philosophy
  - Promote realistic planning
  - Assist, not direct

A goal without a plan is just a wish!

Why create a lake management plan?

- To create a better understanding of the lake's positive and negative attributes.
- To discover ways to minimize the negative attributes and maximize the positive attributes.
- To foster realistic expectations and dispel myths.
- To create a snapshot of the lake for future reference and planning.

Elements of an Effective Lake Management Planning Project

Data and Information Gathering

Environmental & Sociological

Planning Process

Brings it all together

Data and information gathering

- Study Components
  - Water Quality Analysis
  - Watershed Assessment
  - Shoreline Assessment
  - Aquatic Plant Surveys
  - Fisheries Data Integration
  - Stakeholder Survey

Water Quality Analysis

- General water chemistry (current & historic)
  - Citizens Lake Monitoring Network
- Nutrient analysis
  - Lake trophic state (Eutrophication)
  - Limiting plant nutrient
- Supporting data for watershed modeling

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Watershed Assessment

- Delineation of drainage basin
- Modeling
  - Land cover
  - Phosphorus loading
  - Scenario development

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Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Early-season AIS Survey
  - Point-intercept survey
  - Aquatic plant community mapping
  - Volunteer survey findings

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Non-native Aquatic Plants

Curly-leaf Pondweed

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Non-native Aquatic Plants

Eurasian Water Milfoil

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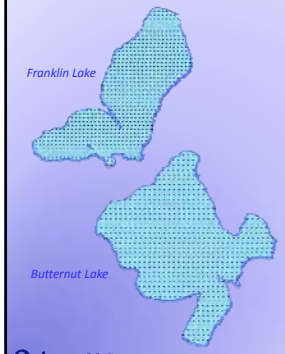

Franklin Lake
70-meter resolution
696 total points

Butternut Lake
87-meter resolution
660 total points

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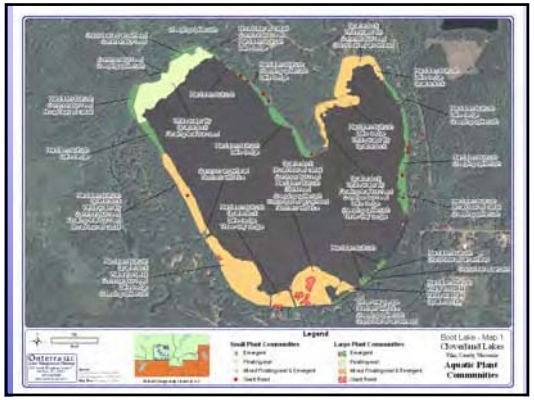


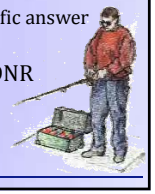
Fisheries Data Integration

- No fish sampling completed
- Assemble data from WDNR, USGS, USFWS, & GLIFWC
- Fish survey results summaries (if available)
- Use information in planning as applicable

Onterra LLC Lake Management Planning

Stakeholder Survey

- Standard survey used as base
  - Planning committee potentially develops additional questions and options
  - Must not lead respondent to specific answer through a "loaded" question
- Survey must be approved by WDNR



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Shoreland Assessment

- Shoreland area is important for buffering runoff and provides valuable habitat for aquatic and terrestrial wildlife.
- It does not look at lake shoreline on a property-by-property basis.
- Assessment ranks shoreland area from shoreline back 35 feet

Urbanized **Natural**

Range

Onterra LLC Lake Management Planning

Planning Process

Planning Committee Meetings

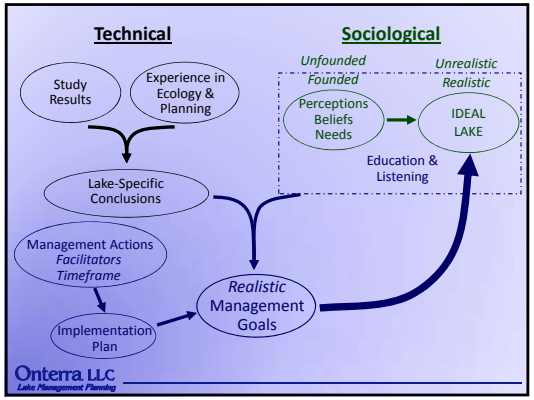
Study Results (including a stakeholder survey)
Conclusions & Initial Recommendations
Management Goals
Management Actions
Timeframe
Facilitator(s)

Implementation Plan

Onterra LLC Lake Management Planning

The Planning Process

…it's not as easy as you may think.


Technical
Sociological
Unfounded
Founded
Unrealistic
Realistic
Study Results
Experience in Ecology & Planning
Perceptions Beliefs Needs
IDEAL LAKE
Education & Listening
Lake-Specific Conclusions
Management Actions
Facilitators
Timeframe
Realistic Management Goals
Implementation Plan
Onterra LLC
Lake Management Planning

Butternut and Franklin Lakes Management Planning Project

November 2012 Update

Submitted by: Dan Cibulka, Onterra, LLC

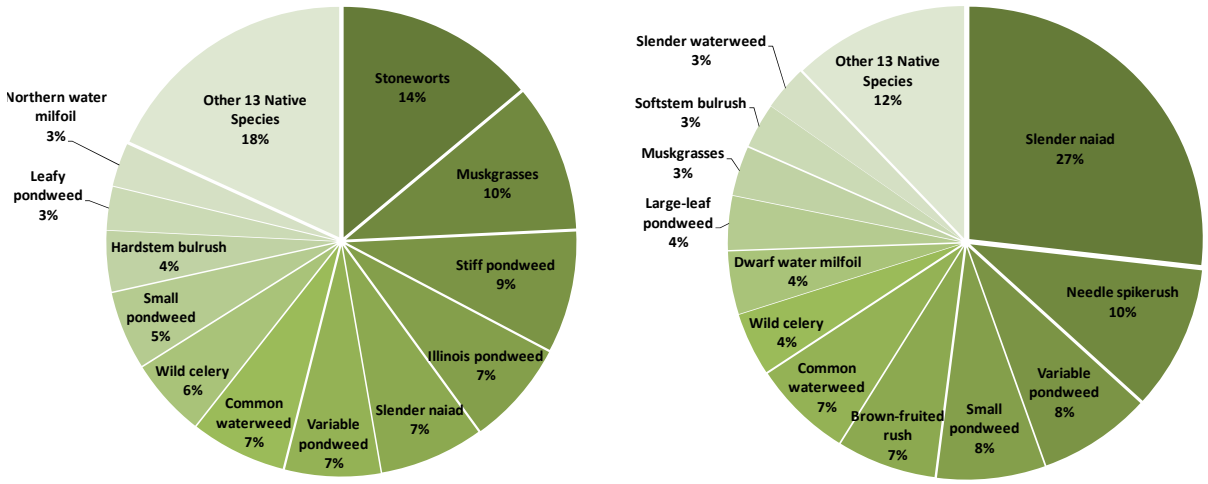
With the help of a Lake Management Planning Grant totaling $25,000 from the Wisconsin Department of Natural Resources (WDNR), a project is underway to create a lake management plan for Butternut and Franklin Lakes. The lake management plan will contain historic and current data from the lake as well as provide guidance for its management by integrating stakeholder perceptions and goals with what is ecologically beneficial for each lake.

As described further below, numerous field studies were carried out upon Butternut and Franklin Lakes during 2012. Because of the wealth of data that was collected just within the past few months, much of the data analysis has yet to be completed. This update intends to bring the Butternut Franklin Lakes Association (BFLA) up-to-date on the scientific studies that have occurred, provide some initial observations on the ecology of Butternut and Franklin Lakes, and project a rough timeline for the remaining actions that will be taken as a part of this project.

In late March of 2012, Onterra staff had their first glimpse of Butternut and Franklin Lakes with a water quality sampling visit. The lake is sampled during the spring and fall to analyze water chemistry during the lake's mixing, or *turnover* events. When a lake turns over, many physical and chemical constituents (temperature, dissolved oxygen, nutrients, etc.) are evenly mixed within the water column. This gives ecologists an idea of what the nutrient balance is within the lake, and supports modeling of the lake's watershed. During the summer months, water quality samples were collected by BFLA volunteers through the Citizen Lake Monitoring Network (CLMN). These results help ecologists understand how the physical and chemical constituents behave when the lake *stratifies*. Stratification occurs when a lake develops two separate layers of water – a warmer, upper layer and a cold lower layer of water. Water samples targeting the larval stage of the invasive zebra mussel were also taken by Onterra staff and sent into the WDNR for analysis as part of efforts to monitor the lake for this invasive species.

All aquatic plant surveys were conducted as scheduled, first by visiting the lake on June 7, 2012 to complete the curly-leaf pondweed (CLP) survey. This survey's purpose is to search the lake for CLP, and is scheduled early in the summer to coincide with this species peak growth. On July 18th and 19th, three crews, (six staff members) visited Butternut and Franklin Lakes to complete the point-intercept survey. This is a grid-based survey designed to sample plants within the lake. Additionally, it provides an opportunity to search the lake for another Wisconsin invasive plant – Eurasian water milfoil. A third aquatic plant survey, the community mapping survey, was completed at this same time. The purpose of this survey is to map the floating-leaf and emergent species that are found within the lake and are typically underestimated in the point intercept survey.

During all surveys, no aquatic invasive species were observed. Many interesting native species were observed however. Aquatic plants were found growing in up to 22 feet of water in Butternut Lake, and 21 feet in Franklin Lake. Several species of macroalgae (stoneworts and muskgrasses) were most commonly found during the point-intercept survey in Butternut Lake, while slender naiad, a small bushy aquatic plant, was the most commonly sampled plant in Franklin Lake (Figure 1).



Butternut Lake *Franklin Lake*

Figure 1. Butternut and Franklin Lakes aquatic plant relative frequency of occurrence. Created using data from a June 2012 aquatic plant point-intercept survey.

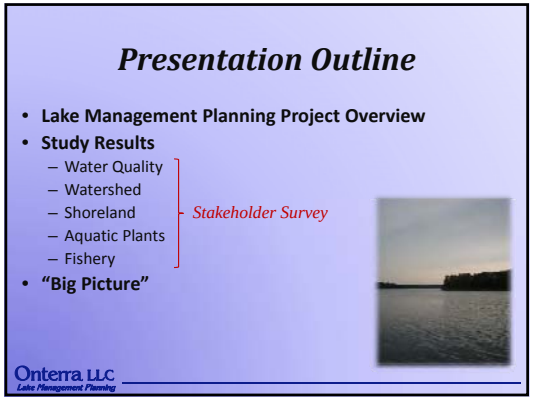
On June 15th and October 2nd, a crew visited Butternut and Franklin Lakes to conduct a shoreline assessment survey. During this survey, the lake's shoreline is examined classified into one of five development categories, based upon its level of human disturbance. The results of this survey may be used to prioritize areas for restoration, if the BFLA wishes to pursue this.

In addition to collected ecological data from Butternut and Franklin Lakes, sociological data was collected from the people who use and care for Butternut and Franklin Lakes. This was approached in the form of an anonymous stakeholder survey, which was developed by Onterra staff and a planning committee comprised of BFLA volunteers. This survey was distributed in October of 2012 to all riparian property owners, both association members and non-members. BFLA volunteers are now kindly tabulating data from the returned surveys and will provide this data to Onterra for analysis.

In the coming months, Onterra will be sorting through the immense amount of water quality, aquatic plant, shoreline assessment and stakeholder survey data that has been collected. Additionally, we will be looking at the watershed surrounding the lake and using a modeling program to estimate the amount of nutrients the lake receives on an annual basis. We will also be working with the WDNR to collect data and report upon the management of the fishery.

In summary, all project components are right on schedule. Following data analysis and report creation, the Butternut and Franklin Lakes Planning Committee and Onterra staff will meet to discuss the project results and begin creation of management goals and actions the BFLA will pursue to manage their lake in both a recreationally enjoyable and ecologically sound manner.


Butternut-Franklin Lakes Association
Butternut and Franklin Lakes
Management Planning Project
Planning Meeting I
June 24, 2013
Dan Cibulka
Onterra LLC


Presentation Outline
Lake Management Planning Project Overview
Study Results
Water Quality
Watershed
Shoreland
Aquatic Plants
Fishery
Stakeholder Survey
"Big Picture"
Onterra LLC


Study and Plan Goals
Collect & Analyze Data
Construct Long-Term & Useable Plan
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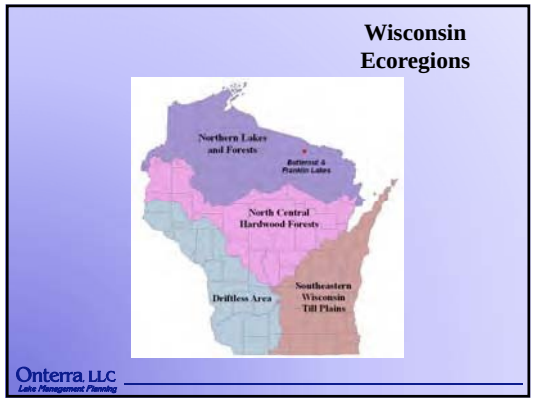
Wisconsin Ecoregions
Northern Lakes and Forests
North Central Hardwood Forests
Driftless Area
Southeastern Wisconsin Till Plains
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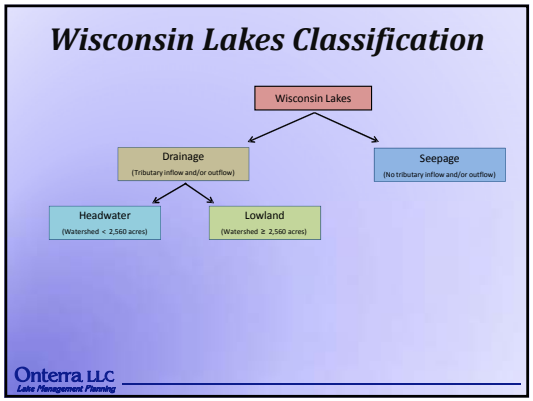
Wisconsin Lakes Classification
Wisconsin Lakes
Drainage
(Tributary inflow and/or outflow)
Seepage
(No tributary inflow and/or outflow)
Headwater
(Watershed < 2,560 acres)
Lowland
(Watershed ≥ 2,560 acres)
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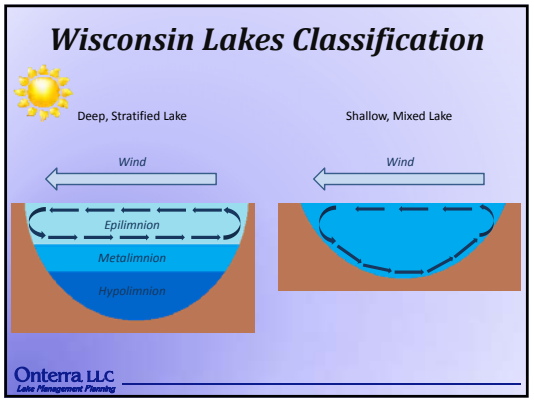
Wisconsin Lakes Classification
Deep, Stratified Lake
Shallow, Mixed Lake
Wind
Wind
Epilimnion
Metalimnion
Hypolimnion
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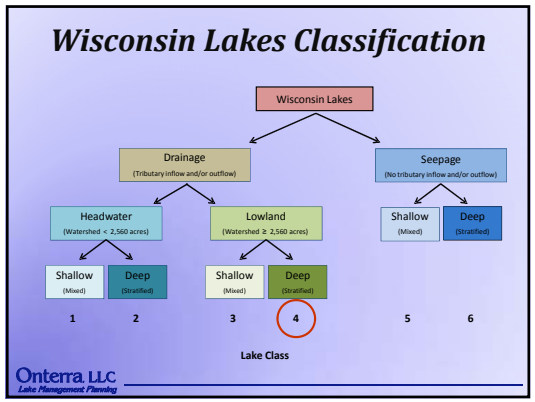
Wisconsin Lakes Classification
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Drainage
(Tributary inflow and/or outflow)
Seepage
(No tributary inflow and/or outflow)
Headwater
(Watershed < 2,560 acres)
Lowland
(Watershed ≥ 2,560 acres)
Shallow
(Mixed)
Deep
(Stratified)
Shallow
(Mixed)
Deep
(Stratified)
Shallow
(Mixed)
Deep
(Stratified)
1
2
3
4
5
6
Lake Class
Onterra LLC
Lake Management Planning


Water Quality
Phosphorus (Limiting Plant Nutrient)
Both lakes are P limited (N:P)
Chlorophyll-a (Algal Abundance)
Low abundance
Water Clarity (Secchi Disk)
Very high water clarity
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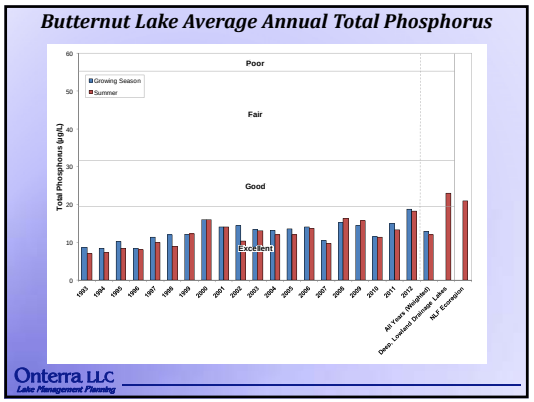
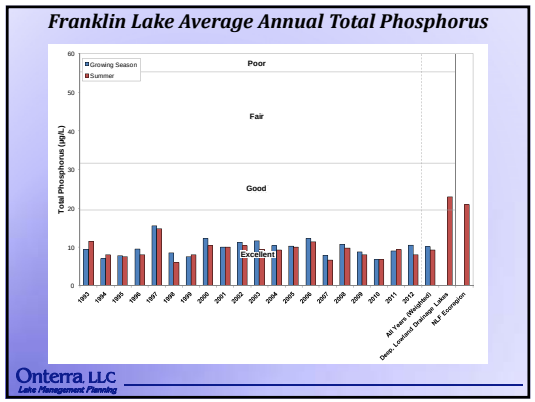
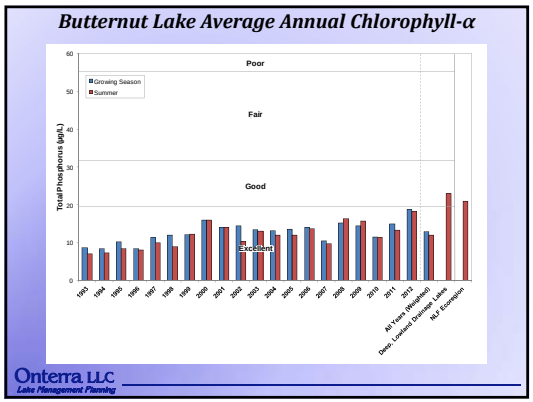
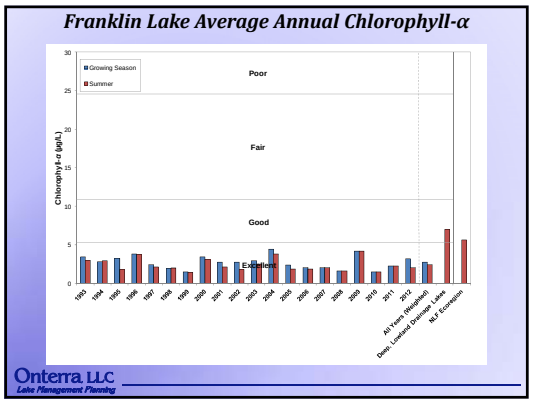
Lake Management Planning

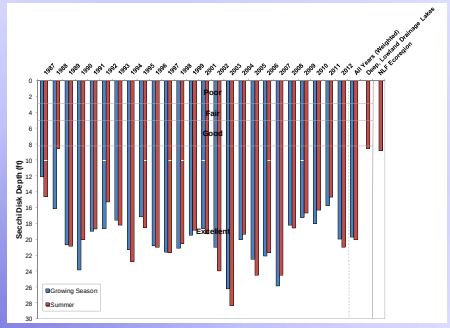

Butternut Lake Average Annual Total Phosphorus
Poor
Fair
Good
Excellent
Growing Season
Summer
Total Phosphorus (µg/L)
Onterra LLC
Lake Management Planning


Franklin Lake Average Annual Total Phosphorus
Poor
Fair
Good
Excellent
Growing Season
Summer
Total Phosphorus (µg/L)
Onterra LLC
Lake Management Planning


Butternut Lake Average Annual Chlorophyll-α
Poor
Fair
Good
Excellent
Growing Season
Summer
Total Phosphorus (µg/L)
Onterra LLC
Lake Management Planning


Franklin Lake Average Annual Chlorophyll-α
Poor
Fair
Good
Excellent
Growing Season
Summer
Chlorophyll-a (µg/L)
Onterra LLC
Lake Management Planning

Butternut Lake Average Annual Secchi Disk Clarity



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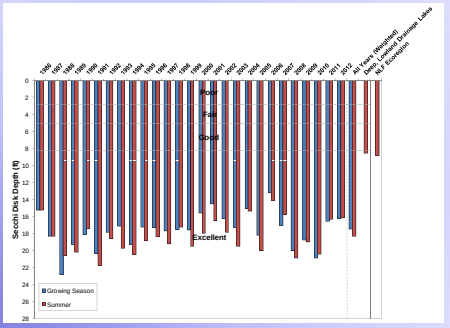
Lake Management Planning

Franklin Lake Average Annual Secchi Disk Clarity



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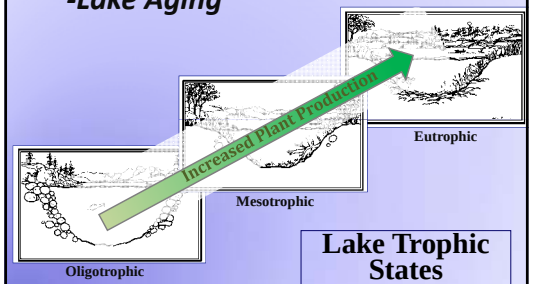
Lake Management Planning

Eutrophication -Lake Aging



Lake Trophic States

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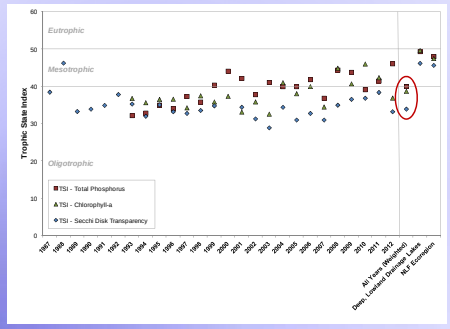
Lake Management Planning

Butternut Lake Trophic State Index



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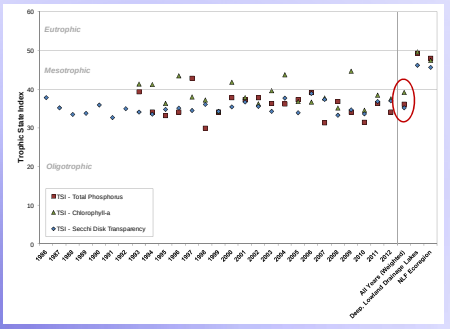
Lake Management Planning

Franklin Lake Trophic State Index



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Other Water Quality Results

- Dissolved oxygen: plenty of oxygen throughout winter months.
- Temperature: lakes stratify during summer months but may mix on occasion.
- pH: 8.0 (Butternut) & 7.4 (Franklin)
- Alkalinity: moderate to high in both lakes
  - Indicates very little sensitivity to acid rain
- Calcium concentrations:
  - 12.5 mg/L in Butternut Lake
    - Low risk for zebra mussel establishment
  - 44.0 mg/L in Franklin Lake
    - Suitable calcium for zebra mussels

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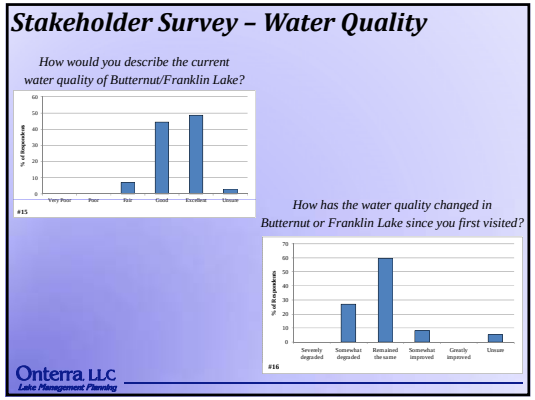
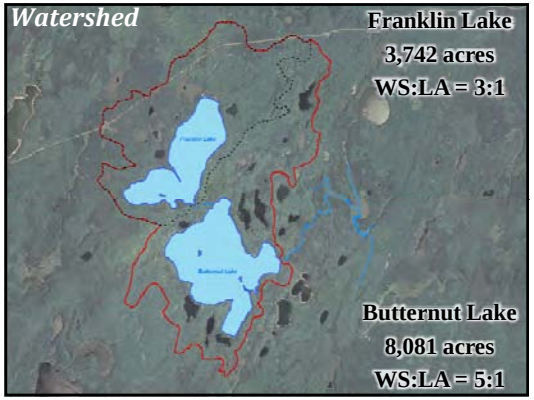
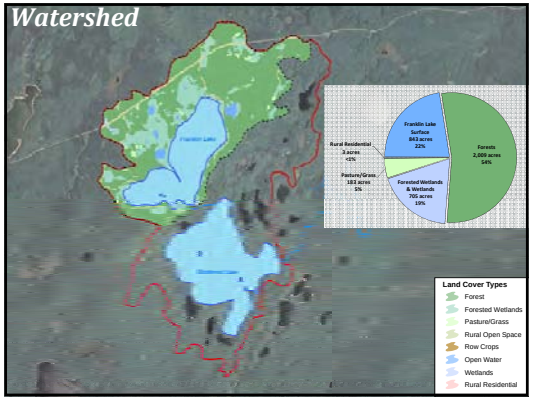
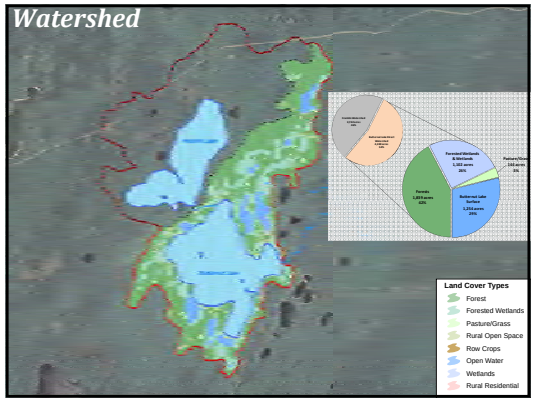
Lake Management Planning


Stakeholder Survey – Water Quality
How would you describe the current water quality of Butternut/Franklin Lake?
Very Poor
Poor
Fair
Good
Excellent
Unsure
#15
How has the water quality changed in Butternut or Franklin Lake since you first visited?
Severely degraded
Somewhat degraded
Remained the same
Somewhat improved
Greatly improved
Unsure
#16
Onterra LLC
Lake Management Planning


Watershed
Franklin Lake
3,742 acres
WS:LA = 3:1
Butternut Lake
8,081 acres
WS:LA = 5:1


Watershed
Land Cover Types
Forest
Forested Wetlands
Pasture/Grass
Rural Open Space
Row Crops
Open Water
Wetlands
Rural Residential


Watershed
Land Cover Types
Forest
Forested Wetlands
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Rural Open Space
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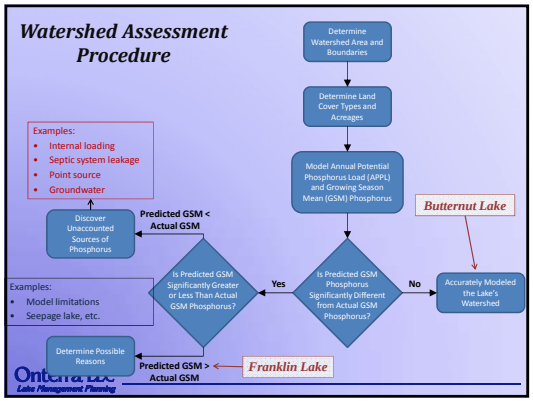
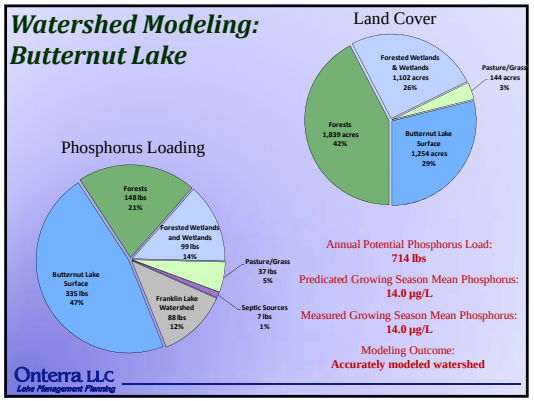
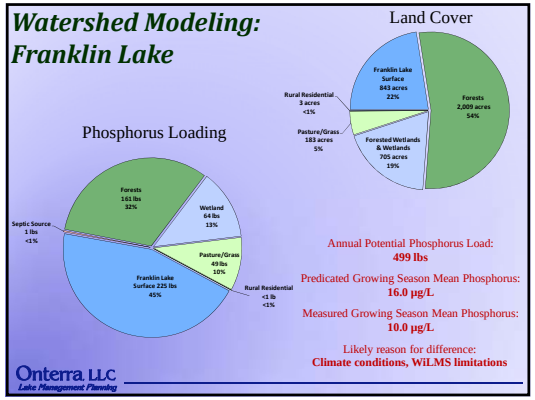
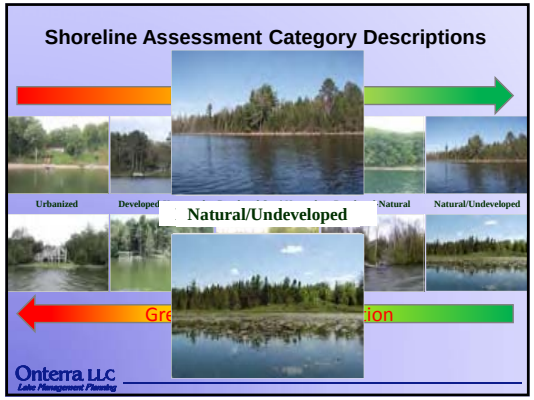
Rural Residential

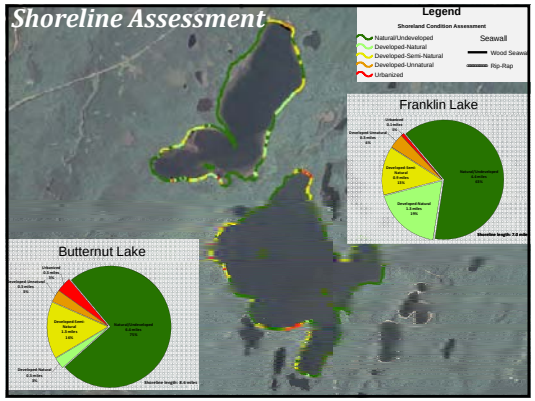

Watershed Assessment Procedure
Determine Watershed Area and Boundaries
Determine Land Cover Types and Acreages
Model Annual Potential Phosphorus Load (APPL) and Growing Season Mean (GSM) Phosphorus
Examples:
Internal loading
Septic system leakage
Point source
Groundwater
Discover Unaccounted Sources of Phosphorus
Predicted GSM < Actual GSM
Is Predicted GSM Significantly Greater or Less Than Actual GSM Phosphorus?
Yes
Is Predicted GSM Phosphorus Significantly Different from Actual GSM Phosphorus?
No
Butternut Lake
Accurately Modeled the Lake's Watershed
Examples:
Model limitations
Seepage lake, etc.
Determine Possible Reasons
Predicted GSM > Actual GSM
Franklin Lake
Onterra LLC
Lake Management Planning

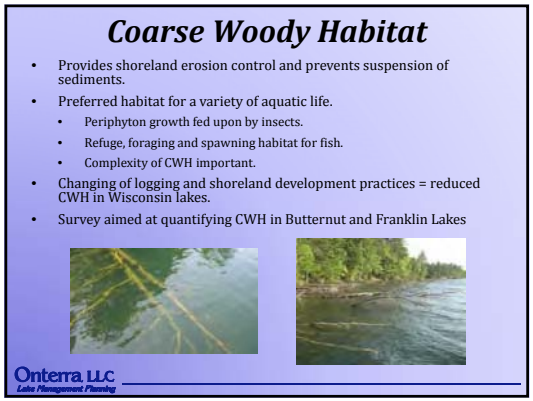

Watershed Modeling:
Butternut Lake
Land Cover
Forested Wetlands & Wetlands 1,102 acres 26%
Pasture/Grass 144 acres 3%
Forests 1,839 acres 42%
Butternut Lake Surface 1,254 acres 29%
Phosphorus Loading
Forests 148 lbs 21%
Forested Wetlands and Wetlands 99 lbs 14%
Pasture/Grass 37 lbs 5%
Septic Sources 7 lbs 1%
Franklin Lake Watershed 88 lbs 12%
Butternut Lake Surface 335 lbs 47%
Annual Potential Phosphorus Load:
714 lbs
Predicated Growing Season Mean Phosphorus:
14.0 µg/L
Measured Growing Season Mean Phosphorus:
14.0 µg/L
Modeling Outcome:
Accurately modeled watershed
Onterra LLC
Lake Management Planning

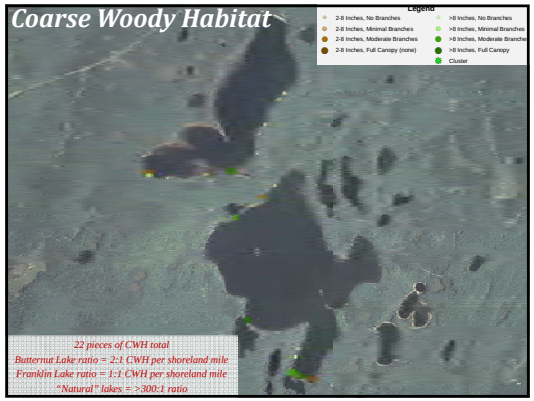

Watershed Modeling:
Franklin Lake
Land Cover
Phosphorus Loading
Annual Potential Phosphorus Load:
499 lbs
Predicated Growing Season Mean Phosphorus:
16.0 µg/L
Measured Growing Season Mean Phosphorus:
10.0 µg/L
Likely reason for difference:
Climate conditions, WiLMS limitations
Onterra LLC

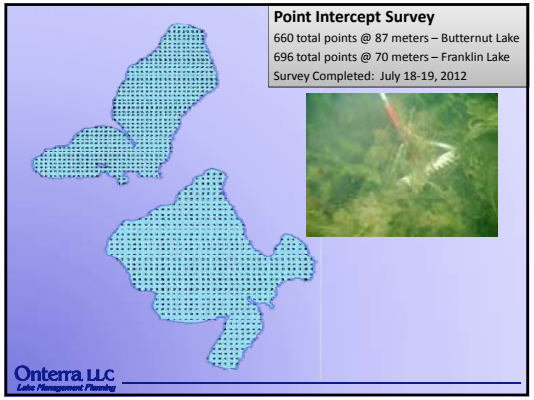

Shoreland Assessment
Shoreland area is important for buffering runoff and provides valuable habitat for aquatic and terrestrial wildlife.
It does not look at lake shoreline on a property-by-property basis.
Assessment ranks shoreland area from shoreline back 35 feet
Urbanized
Natural
Range
Onterra LLC

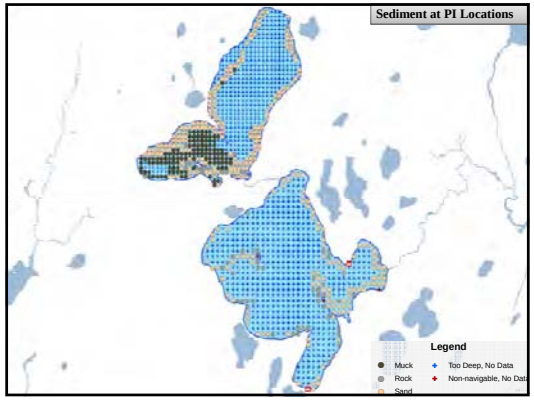

Shoreline Assessment Category Descriptions
Urbanized
Natural
Natural/Undeveloped
Onterra LLC

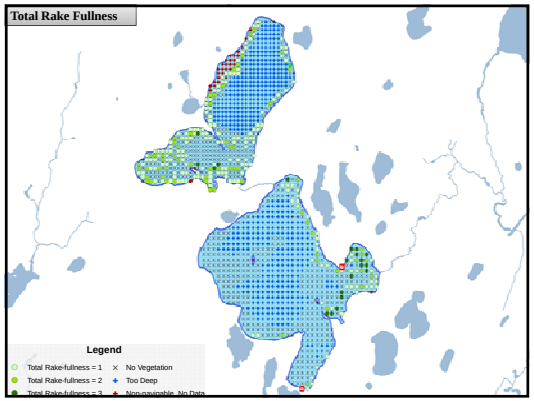

Shoreline Assessment
Legend
Franklin Lake
Butternut Lake


Coarse Woody Habitat
Provides shoreland erosion control and prevents suspension of sediments.
Preferred habitat for a variety of aquatic life.
Periphyton growth fed upon by insects.
Refuge, foraging and spawning habitat for fish.
Complexity of CWH important.
Changing of logging and shoreland development practices = reduced CWH in Wisconsin lakes.
Survey aimed at quantifying CWH in Butternut and Franklin Lakes
Onterra LLC


Coarse Woody Habitat
22 pieces of CWH total
Butternut Lake ratio = 2:1 CWH per shoreland mile
Franklin Lake ratio = 1:1 CWH per shoreland mile
"Natural" lakes = >300:1 ratio







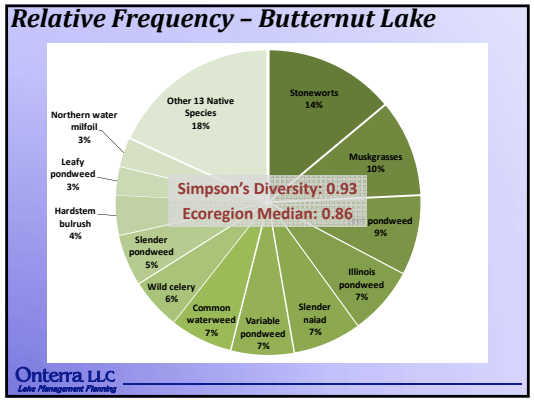
Aquatic Plant Summary

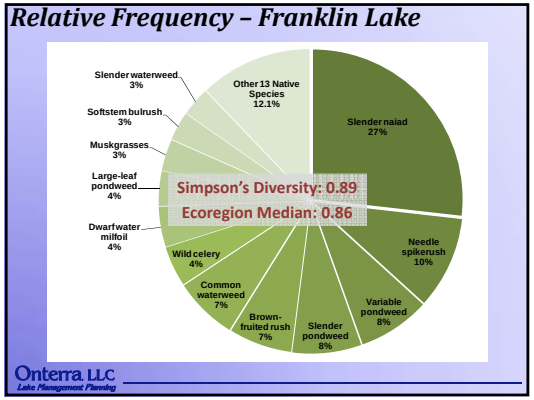
Butternut Lake

- 51 native species
  - 25 on PI survey
  - 26 incidentally
- 1 non-native plant (reed canary grass)
- Plants found out to 22 feet

Franklin Lake

- 41 native species
  - 25 on PI survey
  - 16 incidentally
- No non-native species
- Plants found out to 21 feet




Relative Frequency – Franklin Lake
Slender naiad 27%
Needle spikerush 10%
Variable pondweed 8%
Slender pondweed 8%
Brown-fruited rush 7%
Common waterweed 7%
Wild celery 4%
Dwarf water milfoil 4%
Large-leaf pondweed 4%
Muskgrasses 3%
Softstem bulrush 3%
Slender waterweed 3%
Other 13 Native Species 12.1%
Simpson's Diversity: 0.89
Ecoregion Median: 0.86
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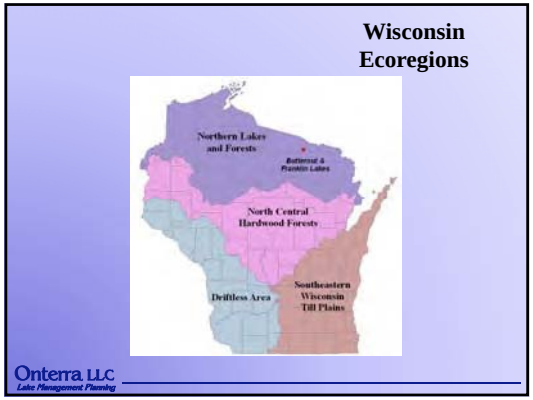
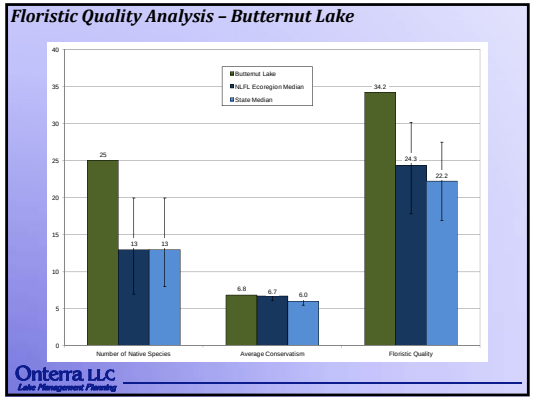

Wisconsin Ecoregions
Northern Lakes and Forests
Butternut & Franklin Lakes
North Central Hardwood Forests
Driftless Area
Southeastern Wisconsin Till Plains
Onterra LLC
Lake Management Planning


Floristic Quality Analysis – Butternut Lake
Butternut Lake
NLFL Ecoregion Median
State Median
25
13
13
6.8
6.7
6.0
34.2
24.3
22.2
Number of Native Species
Average Conservatism
Floristic Quality
Onterra LLC
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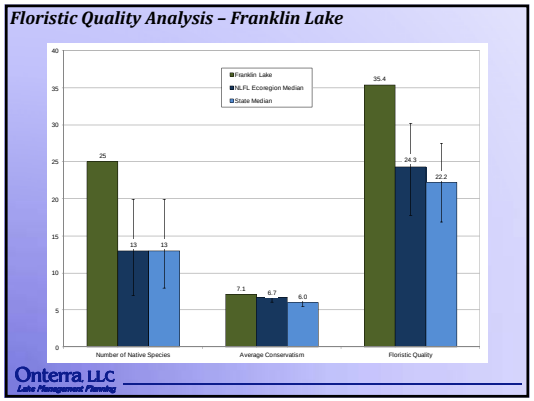
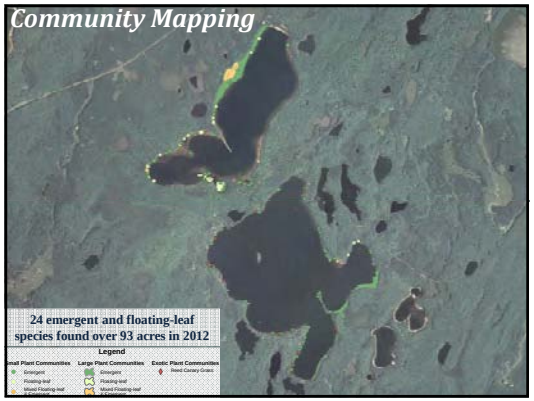
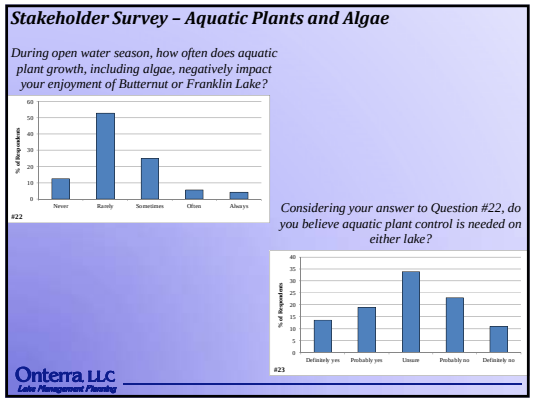

Floristic Quality Analysis – Franklin Lake
Franklin Lake
NLFL Ecoregion Median
State Median
25
13
13
7.1
6.7
6.0
35.4
24.3
22.2
Number of Native Species
Average Conservatism
Floristic Quality
Onterra LLC
Lake Management Planning


Community Mapping
24 emergent and floating-leaf species found over 93 acres in 2012
Legend


Stakeholder Survey – Aquatic Plants and Algae
During open water season, how often does aquatic plant growth, including algae, negatively impact your enjoyment of Butternut or Franklin Lake?
Never
Rarely
Sometimes
Often
Always
#22
Considering your answer to Question #22, do you believe aquatic plant control is needed on either lake?
Definitely yes
Probably yes
Unsure
Probably no
Definitely no
#23
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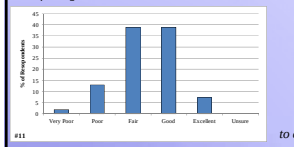
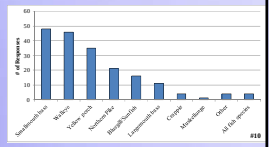
Stakeholder Survey - Fishery

How would you describe the current quality of fishing on Butternut or Franklin Lake?



What species of fish do you like to catch on Butternut Lake or Franklin Lake?



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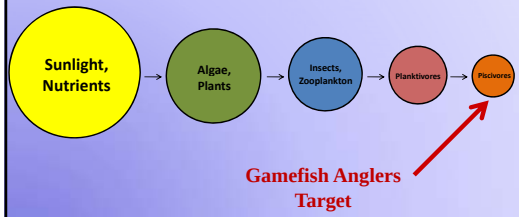
Butternut & Franklin Lakes Fishery



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Butternut & Franklin Lakes Fishery

- **Managed for walleye & smallmouth bass**
  - Butternut Lake
    - Naturally reproducing walleye
    - Excellent walleye and smallmouth bass fishery
  - Franklin Lake
    - Walleye population decline since 2000, little recruitment
    - Stocking efforts to bolster populations
- **WDNR comprehensive survey in 2014**
- **Native American spear harvest occurs**

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Native American Spear Harvest

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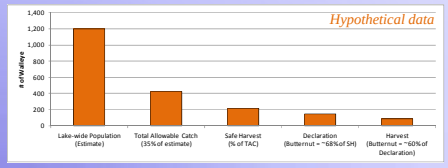
Native American Spear Harvest

Walleye Spear Harvest



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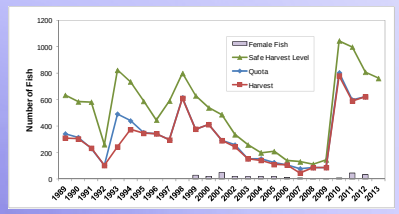
Native American Spear Harvest

Butternut Lake Walleye Spear Harvest



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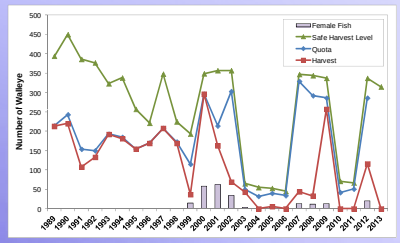
Native American Spear Harvest

Franklin Lake Walleye Spear Harvest



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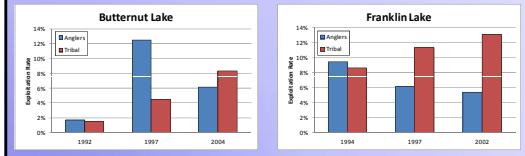
Native American Spear Harvest

Total Walleye Harvest – Anglers and Tribal Spearing



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Conclusions

- Water quality in both lakes is great.
  - Ample historic data – slight trend detected in Butternut Lake phosphorus concentrations.
    - Impacts of slightly higher phosphorus not present.
    - Stakeholder survey – WQ is great, but concern is present to keep it this way.
- Watershed is in good condition.
  - Land cover exports minimal phosphorus.
  - Shoreland zone mostly un-developed.
  - Presence of national forest means there is little concern for development of watershed or shoreland.

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Conclusions continued

- Aquatic plant community
  - Based upon standard analysis, native plant community is of high quality.
    - Highly diverse
    - Sensitive species present
    - Species rich
  - Areas of organic substrate with abundant plant growth offer different habitat than rest of lake (sandy or rocky substrates = less plant growth).
- Fisheries
  - Great walleye and smallmouth bass fishery.
  - Reason for minimal recruitment in Franklin Lake unknown.
  - Minimal coarse woody habitat.

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B

APPENDIX B

Stakeholder Survey Response Charts and Comments

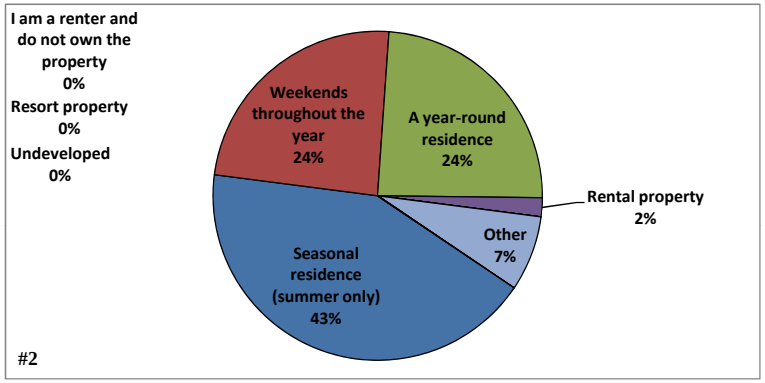
BUTTERNUT LAKE PROPERTY

#1 On what lake is your Butternut Lake property located?

	Total	%
Butternut Lake	49	*100.0*
Franklin Lake	0	*0.0*
I do not live on either lake	0	*0.0*
	49	*100.0*

#2 How is your property on Butternut Lake utilized?

	Total	%
Seasonal residence (summer only)	23	*42.6*
Weekends throughout the year	13	*24.1*
A year-round residence	13	*24.1*
Rental property	1	*1.9*
Resort property	0	*0.0*
Undeveloped	0	*0.0*
Other	4	*7.4*
I am a renter and do not own the property	0	*0.0*
	54	*100.0*

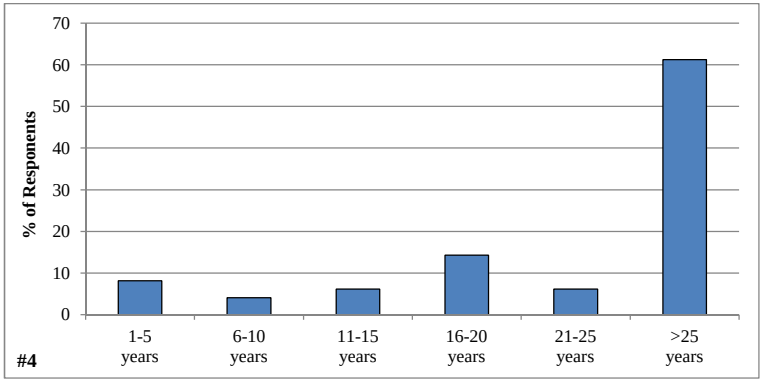


#3 How many days each year is your property used by you or others?

Answered Question	48
Average	149.3
Standard deviation	113.9

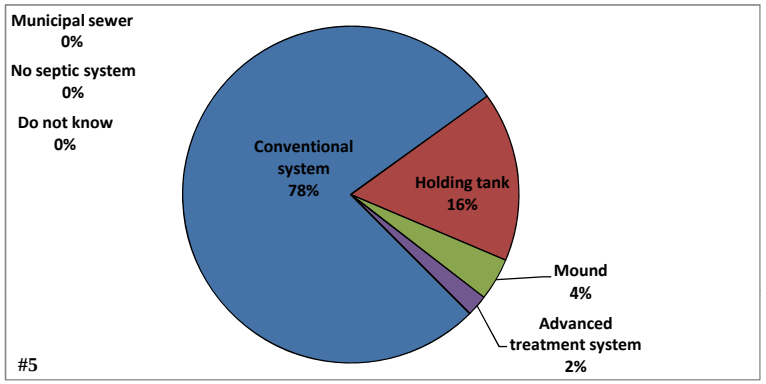
#4 How long have you owned or rented your property on Butternut Lake?

	Total	%
1-5 years	4	*8.2*
6-10 years	2	*4.1*
11-15 years	3	*6.1*
16-20 years	7	*14.3*
21-25 years	3	*6.1*
>25 years	30	*61.2*
	49	*100.0*



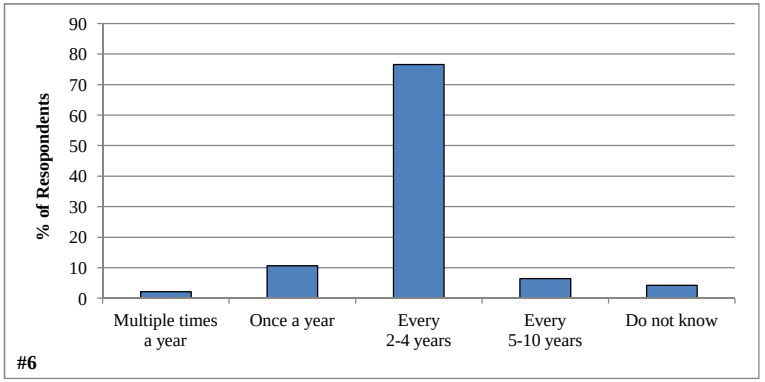
#5 What type of septic system does your property utilize?

	Total	%
Conventional system	38	*77.6*
Holding tank	8	*16.3*
Mound	2	*4.1*
Advanced treatment system	1	*2.0*
Municipal sewer	0	*0.0*
Do not know	0	*0.0*
No septic system	0	*0.0*
	49	*100.0*



#6 How often is the septic tank on your property pumped?

	Total	%
Multiple times a year	1	*2.1*
Once a year	5	*10.6*
Every 2-4 years	36	*76.6*
Every 5-10 years	3	*6.4*
Do not know	2	*4.3*
	47	*100.0*



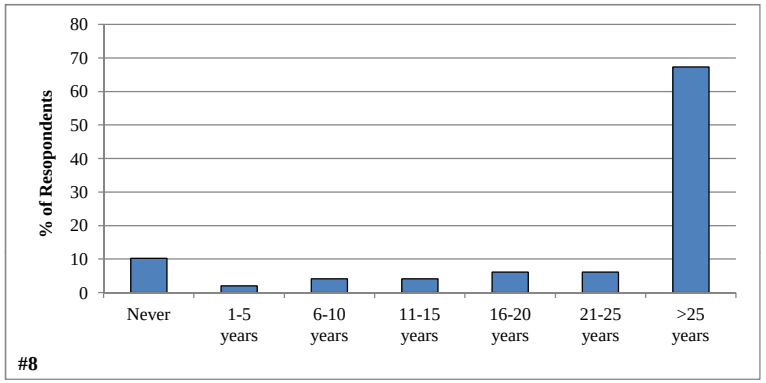
RECREATIONAL ACTIVITY ON BUTTERNUT LAKE

#7 How many years ago did you first visit Butternut Lake?

Answered Question	49
Average	43.0
Standard deviation	16.7

#8 For how many years have you fished Butternut Lake?

	Total	%
Never	5	*10.2*
1-5 years	1	*2.0*
6-10 years	2	*4.1*
11-15 years	2	*4.1*
16-20 years	3	*6.1*
21-25 years	3	*6.1*
>25 years	33	*67.3*
	49	*100.0*

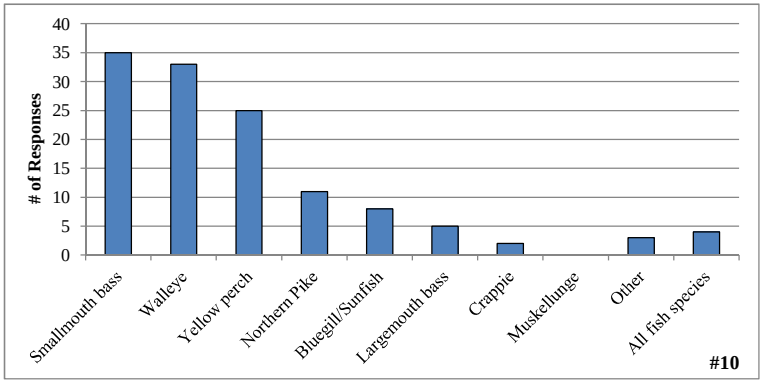


#9 Have you personally fished on Butternut Lake in the past three years?

	Total	%
Yes	39	*84.8*
No	7	*15.2*
	46	*100.0*

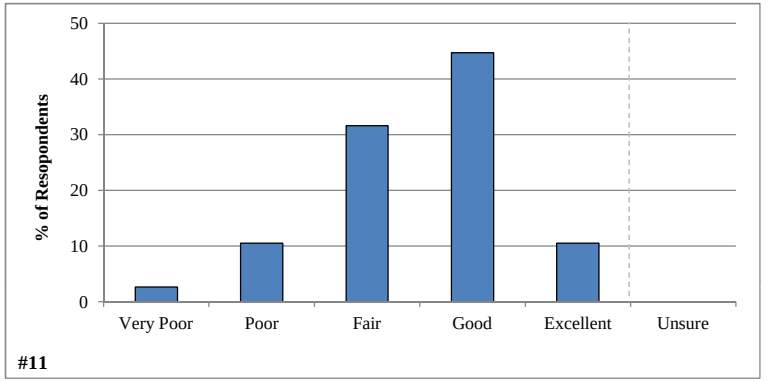
#10 What species of fish do you like to catch on Butternut Lake?

	Total
Smallmouth bass	35
Walleye	33
Yellow perch	25
Northern Pike	11
Bluegill/Sunfish	8
Largemouth bass	5
Crappie	2
Muskellunge	0
Other	3
All fish species	4



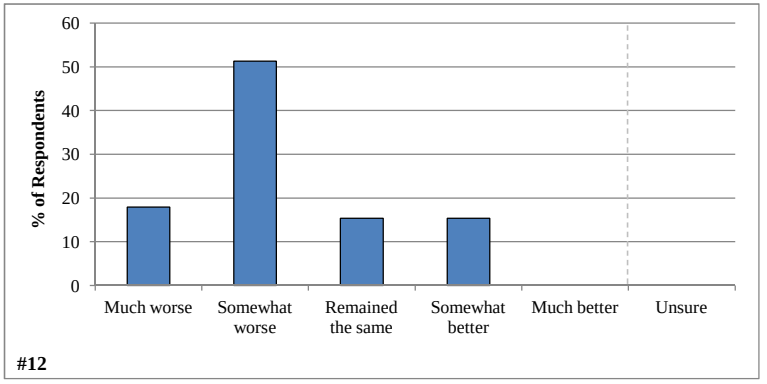
#11 How would you describe the current quality of fishing on Butternut Lake?

	Total	%
Very Poor	1	*2.6*
Poor	4	*10.5*
Fair	12	*31.6*
Good	17	*44.7*
Excellent	4	*10.5*
Unsure	0	*0.0*
	38	*100.0*



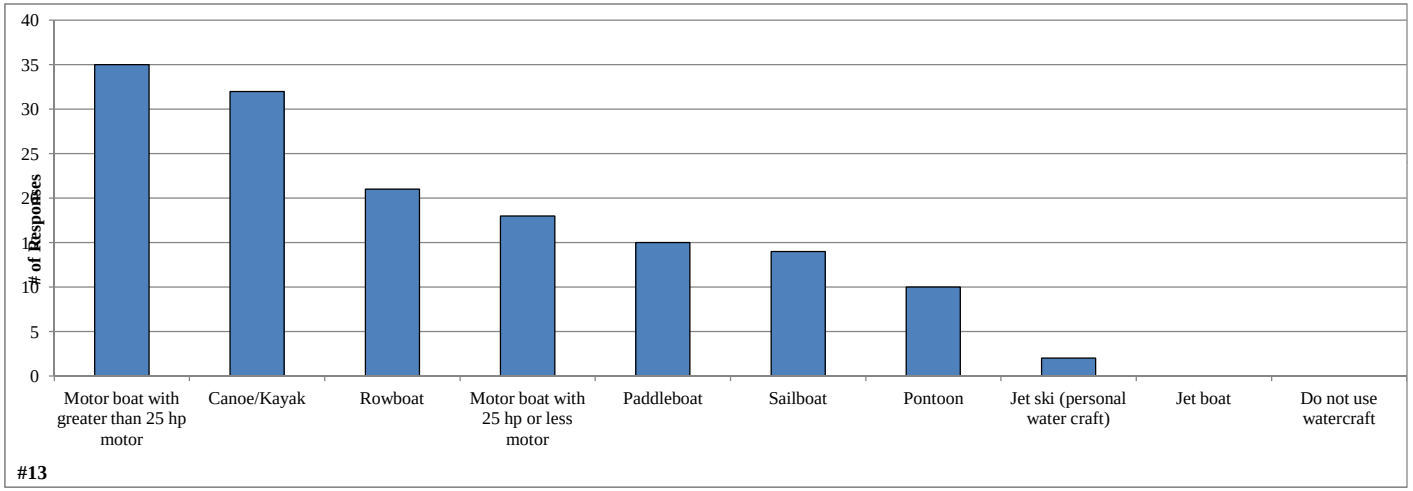
#12 How has the quality of fishing changed on Butternut Lake since you started fishing the lake?

	Total	%
Much worse	7	*17.9*
Somewhat worse	20	*51.3*
Remained the Same	6	*15.4*
Somewhat better	6	*15.4*
Much better	0	*0.0*
Unsure	0	*0.0*
	39	*100.0*



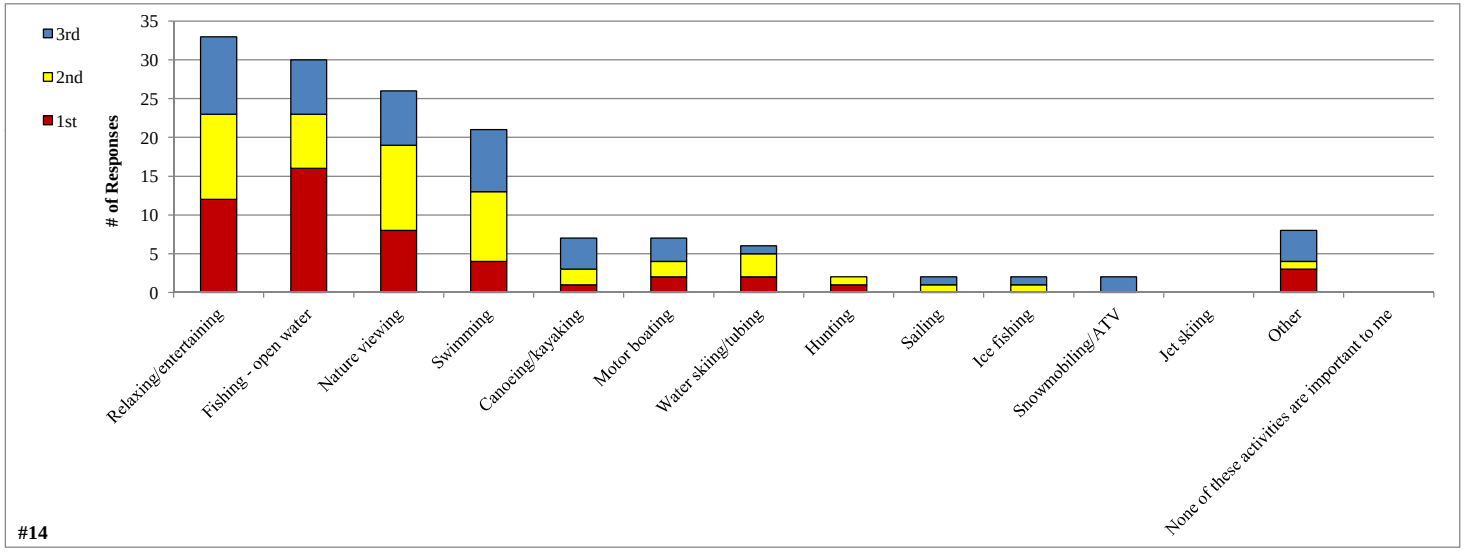
#13 What types of watercraft do you currently use on the lake?

	Total
Motor boat with greater than 25 hp motor	35
Canoe/Kayak	32
Rowboat	21
Motor boat with 25 hp or less motor	18
Paddleboat	15
Sailboat	14
Pontoon	10
Jet ski (personal water craft)	2
Jet boat	0
Do not use watercraft	0



#14 Please rank up to three activities that are important reasons for owning your property on or near the lake.

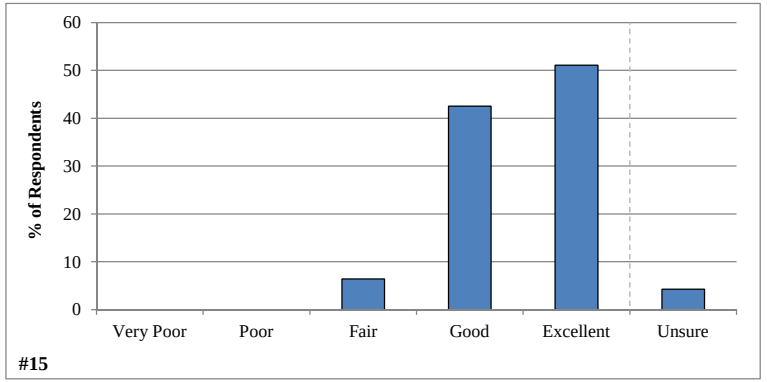
	1st	2nd	3rd	*% ranked*
Relaxing/entertaining	12	11	10	*22.6*
Fishing - open water	16	7	7	*20.5*
Nature viewing	8	11	7	*17.8*
Swimming	4	9	8	*14.4*
Canoeing/kayaking	1	2	4	*4.8*
Motor boating	2	2	3	*4.8*
Water skiing/tubing	2	3	1	*4.1*
Hunting	1	1	0	*1.4*
Sailing	0	1	1	*1.4*
Ice fishing	0	1	1	*1.4*
Snowmobiling/ATV	0	0	2	*1.4*
Jet skiing	0	0	0	*0.0*
Other	3	1	4	*5.5*
None of these activities are important to me	0	0	0	*0.0*
	49	49	48	*100.0*



BUTTERNUT LAKE CURRENT AND HISTORIC CONDITION, HEALTH AND MANAGEMENT

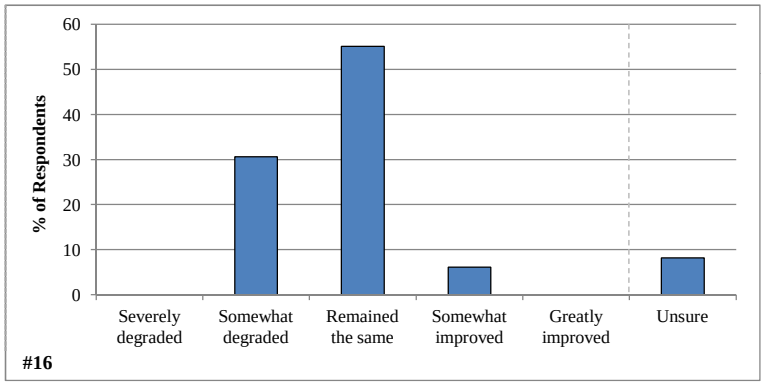
#15 How would you describe the current water quality of Butternut Lake?

	Total	%
Very Poor	0	*0.0*
Poor	0	*0.0*
Fair	3	*6.4*
Good	20	*42.6*
Excellent	24	*51.1*
Unsure	2	*4.3*
	47	*100.0*



#16 How has the water quality changed in Butternut Lake since you first visited the lake?

	Total	%
Severely degraded	0	*0.0*
Somewhat degraded	15	*30.6*
Remained the same	27	*55.1*
Somewhat improved	3	*6.1*
Greatly improved	0	*0.0*
Unsure	4	*8.2*
	49	*100.0*



#17 Have you ever heard of aquatic invasive species?

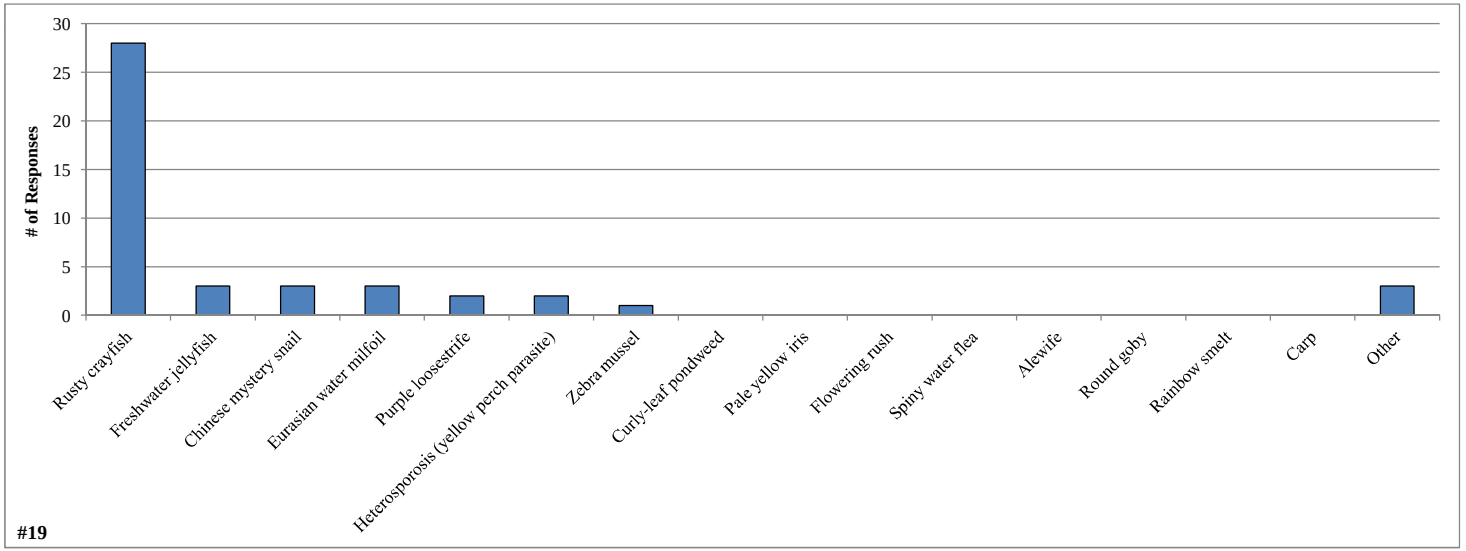
	Total	%
Yes	47	*95.9*
No	2	*4.1*
	49	*100.0*

#18 Are you aware of aquatic invasive species in the lake?

	Total	%
Yes	34	*72.3*
No	13	*27.7*
	47	*100.0*

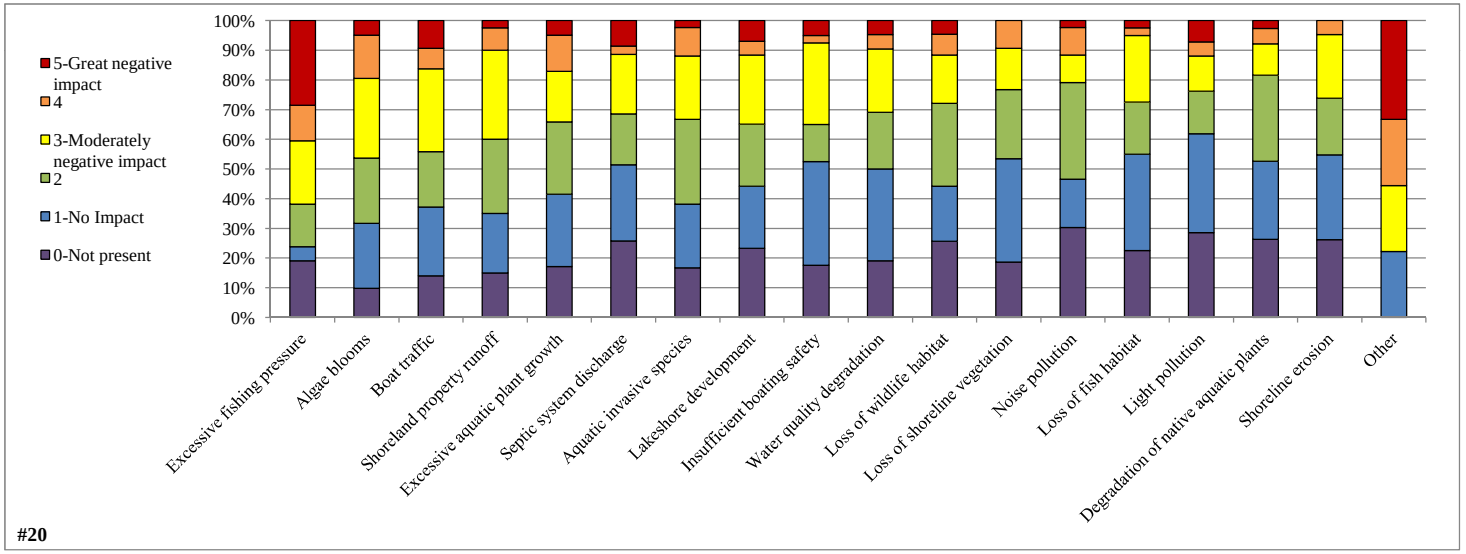
#19 Which aquatic invasive species are you aware of in Butternut Lake?

	Total
Rusty crayfish	28
Freshwater jellyfish	3
Chinese mystery snail	3
Eurasian water milfoil	3
Purple loosestrife	2
Heterosporosis (yellow perch parasite)	2
Zebra mussel	1
Curly-leaf pondweed	0
Pale yellow iris	0
Flowering rush	0
Spiny water flea	0
Alewife	0
Round goby	0
Rainbow smelt	0
Carp	0
Other	3



#20 To what level do you believe each of the following factors may be negatively impacting Butternut Lake?

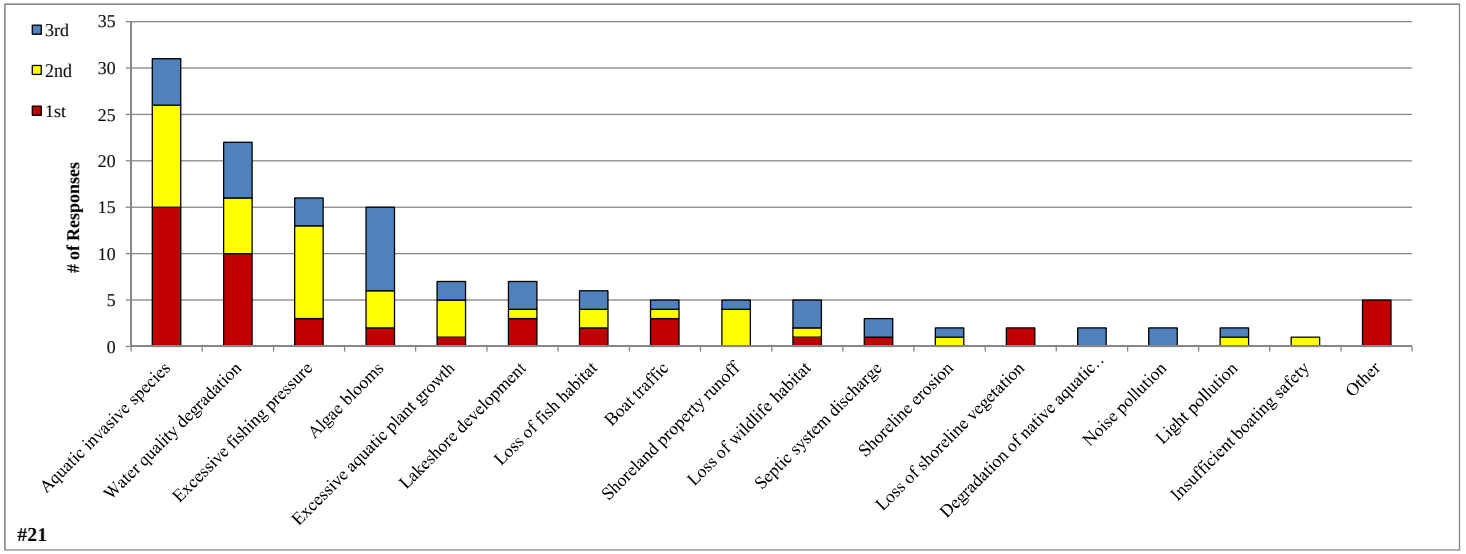
	0-Not present	1-No Impact	2	3-Moderately negative impact	4	5-Great negative impact	Unsure	*Total*	*Average*
Excessive fishing pressure	8	2	6	9	5	12	1	*34*	*2.9*
Algae blooms	4	9	9	11	6	2	3	*37*	*2.3*
Boat traffic	6	10	8	12	3	4	0	*37*	*2.2*
Shoreland property runoff	6	8	10	12	3	1	3	*34*	*2.0*
Excessive aquatic plant growth	7	10	10	7	5	2	1	*34*	*2.0*
Septic system discharge	9	9	6	7	1	3	7	*26*	*1.9*
Aquatic invasive species	7	9	12	9	4	1	1	*35*	*1.9*
Lakeshore development	10	9	9	10	2	3	0	*33*	*1.9*
Insufficient boating safety	7	14	5	11	1	2	2	*33*	*1.8*
Water quality degradation	8	13	8	9	2	2	1	*34*	*1.8*
Loss of wildlife habitat	11	8	12	7	3	2	0	*32*	*1.7*
Loss of shoreline vegetation	8	15	10	6	4	0	0	*35*	*1.6*
Noise pollution	13	7	14	4	4	1	0	*30*	*1.6*
Loss of fish habitat	9	13	7	9	1	1	4	*31*	*1.6*
Light pollution	12	14	6	5	2	3	1	*30*	*1.5*
Degradation of native aquatic plants	10	10	11	4	2	1	4	*28*	*1.5*
Shoreline erosion	11	12	8	9	2	0	0	*31*	*1.5*
Other	0	2	0	2	2	3	0	*9*	*3.4*



#20

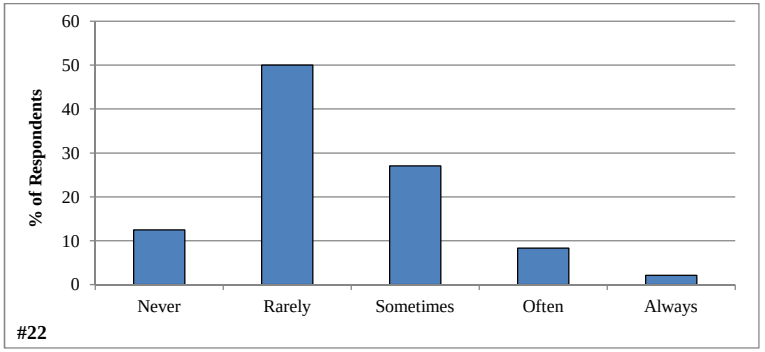
#21 From the list below, please rank your top three concerns regarding Butternut Lake.

	1st	2nd	3rd	*% Ranked*
Aquatic invasive species	15	11	5	*22.5*
Water quality degradation	10	6	6	*15.9*
Excessive fishing pressure	3	10	3	*11.6*
Algae blooms	2	4	9	*10.9*
Excessive aquatic plant growth	1	4	2	*5.1*
Lakeshore development	3	1	3	*5.1*
Loss of fish habitat	2	2	2	*4.3*
Boat traffic	3	1	1	*3.6*
Shoreland property runoff	0	4	1	*3.6*
Loss of wildlife habitat	1	1	3	*3.6*
Septic system discharge	1	0	2	*2.2*
Shoreline erosion	0	1	1	*1.4*
Loss of shoreline vegetation	2	0	0	*1.4*
Degradation of native aquatic plants	0	0	2	*1.4*
Noise pollution	0	0	2	*1.4*
Light pollution	0	1	1	*1.4*
Insufficient boating safety	0	1	0	*0.7*
Other	5	0	0	*3.6*
	48	47	43	*100.0*



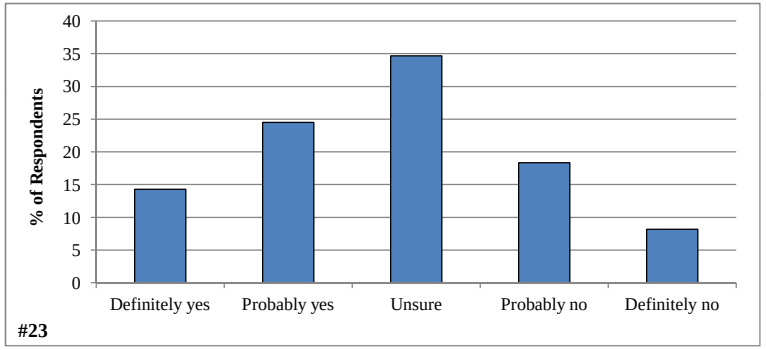
#22 During open water season how often does aquatic plant growth, including algae, negatively impact your enjoyment of Butternut Lake?

	Total	%
Never	6	*12.5*
Rarely	24	*50.0*
Sometimes	13	*27.1*
Often	4	*8.3*
Always	1	*2.1*
	48	*100.0*



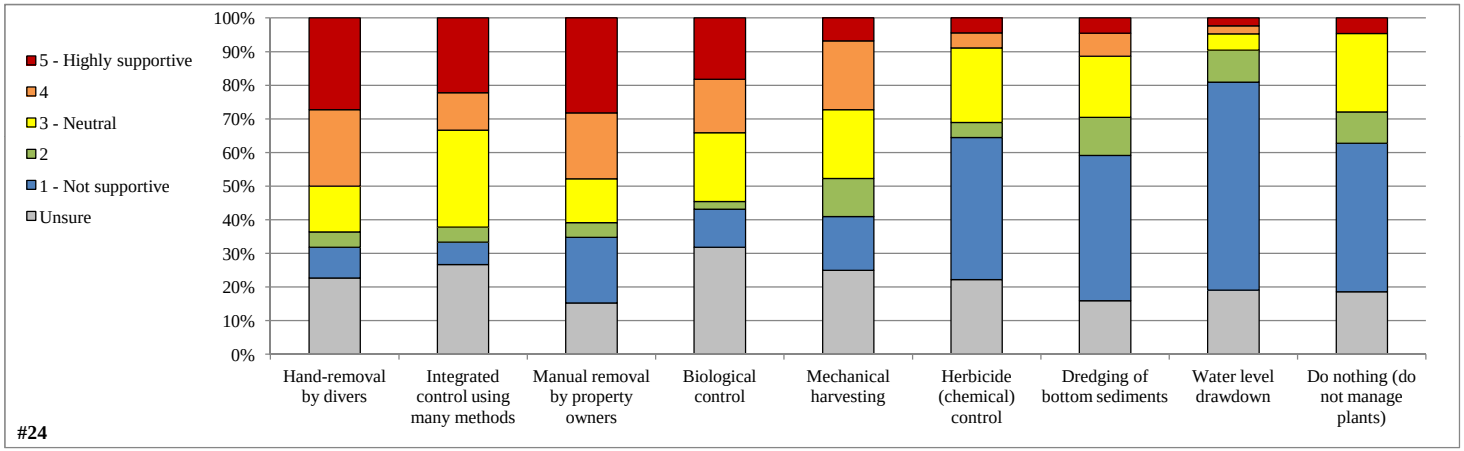
#23 Considering your answer to the question #22, do you believe aquatic plant control is needed on Butternut Lake?

	Total	%
Definitely yes	7	*14.3*
Probably yes	12	*24.5*
Unsure	17	*34.7*
Probably no	9	*18.4*
Definitely no	4	*8.2*
	49	*100.0*



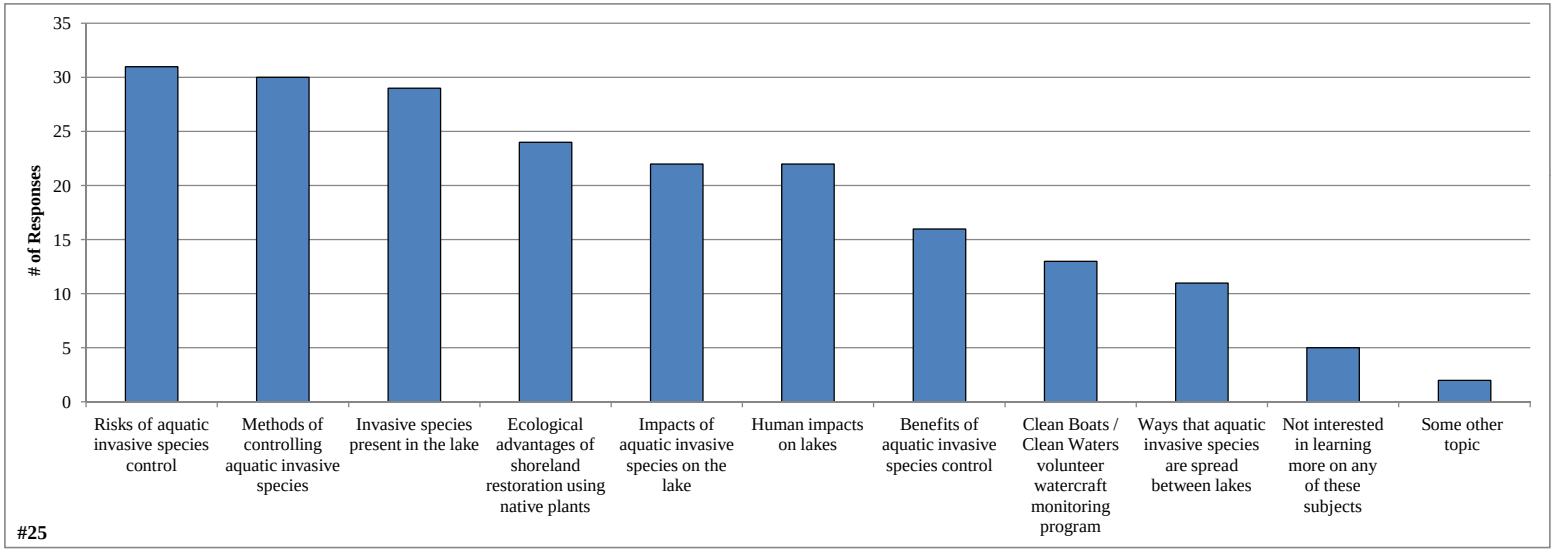
#24 Aquatic plants can be professionally managed using many techniques. What is your level of support for the responsible use of the following techniques on Butternut Lake?

	1 - Not supportive	2	3 - Neutral	4	5 - Highly supportive	Unsure	Total	Average
Hand-removal by divers	4	2	6	10	12	10	*34*	*3.5*
Integrated control using many methods	3	2	13	5	10	12	*33*	*3.4*
Manual removal by property owners	9	2	6	9	13	7	*39*	*3.3*
Biological control	5	1	9	7	8	14	*30*	*3.2*
Mechanical harvesting	7	5	9	9	3	11	*33*	*2.8*
Herbicide (chemical) control	19	2	10	2	2	10	*35*	*2.0*
Dredging of bottom sediments	19	5	8	3	2	7	*37*	*1.9*
Water level drawdown	26	4	2	1	1	8	*34*	*1.4*
Do nothing (do not manage plants)	19	4	10	0	2	8	*35*	*1.9*



#25 Which of these subjects would you like to learn more about?

	Total
Risks of aquatic invasive species control	31
Methods of controlling aquatic invasive species	30
Invasive species present in the lake	29
Ecological advantages of shoreland restoration using native plants	24
Impacts of aquatic invasive species on the lake	22
Human impacts on lakes	22
Benefits of aquatic invasive species control	16
Clean Boats / Clean Waters volunteer watercraft monitoring program	13
Ways that aquatic invasive species are spread between lakes	11
Not interested in learning more on any of these subjects	5
Some other topic	2



BUTTERNUT-FRANKLIN LAKES ASSOCIATION, INC.

#26 Before receiving this mailing, have you ever heard of the Butternut-Franklin Lakes Association?

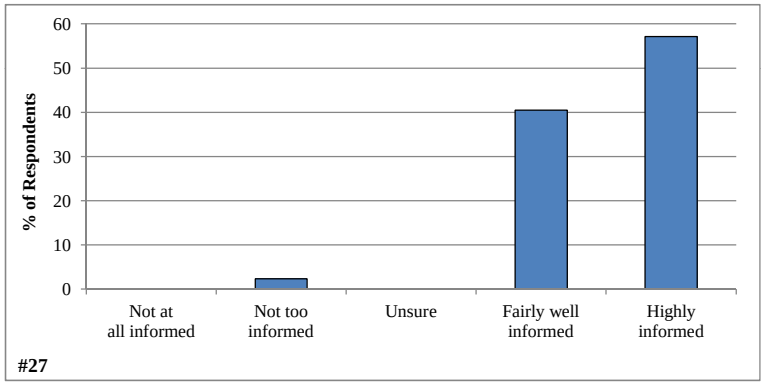
	Total	%
Yes	46	*100.0*
No	0	*0.0*
	46	*100.0*

#27 What is your membership status with the Butternut-Franklin Lakes Association?

	Total	%
Current member	40	*88.9*
Former member	2	*4.4*
Never been a member	3	*6.7*
	45	*100.0*

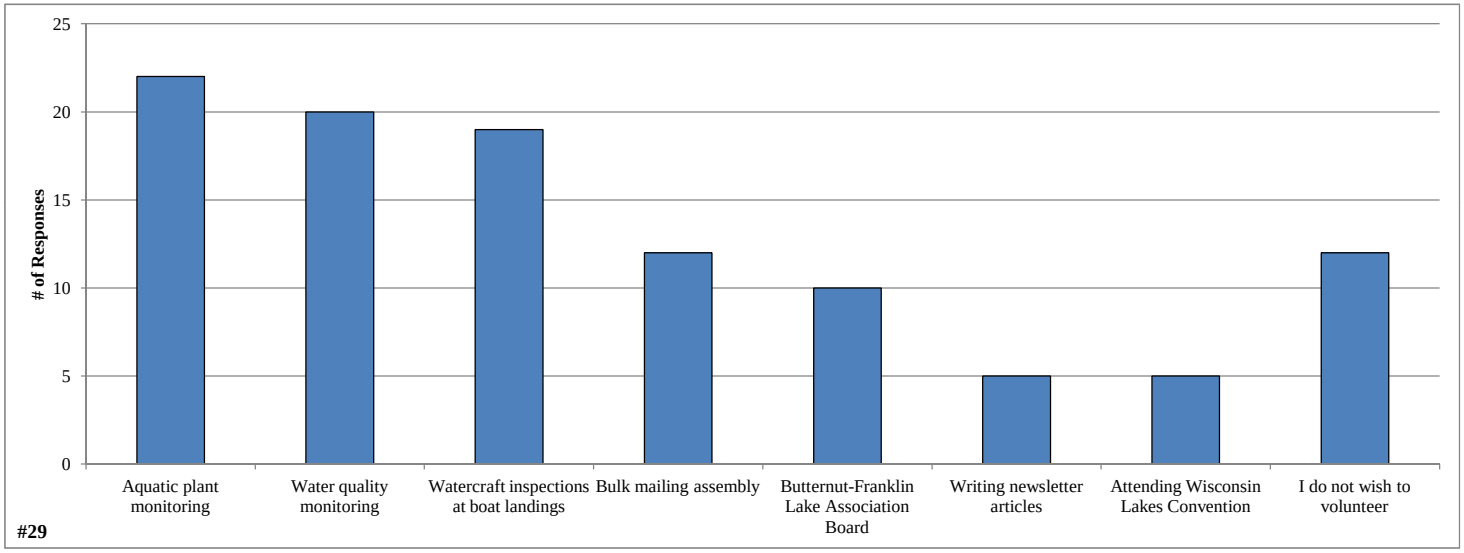
#28 How informed has the Butternut-Franklin Lakes Association kept you regarding issues with the lake and its management?

	Total	%
Not at all informed	0	*0.0*
Not too informed	1	*2.4*
Unsure	0	*0.0*
Fairly well informed	17	*40.5*
Highly informed	24	*57.1*
	42	*100.0*



#29 Please circle the activities you would be willing to participate in if the Butternut-Franklin Lakes Association requires additional assistance.

	Total
Aquatic plant monitoring	22
Water quality monitoring	20
Watercraft inspections at boat landings	19
Bulk mailing assembly	12
Butternut-Franklin Lake Association Board	10
Writing newsletter articles	5
Attending Wisconsin Lakes Convention	5
I do not wish to volunteer	12



Survey Number	2g Comment	10i Comment	14m Comment	19p Comment	20r Comment	21r Comment	25k Comment	Other Comments (and Question 30)
1								
2						Fishing Regs!		
3		Rock Bass						
6								
9								
10								
11					Jet Skis too close to shore; noise, erosion, boat traffic		Butternut used to be clearer. I'd like to know what has happened, and what we can do about it	
13								
18				Bullheads	Fish Spearing			
20	Week or two in winter							
21								
22						Spearing		
24								
25								
27			Xcountry Skiing, Mt. Bike riding				Septic tanks, lawn fertilizer	
28								
31			Pontooning					
32				Tall weeds by boat landing				
33	Also weekends in winter		Hiking					
35								
36			Hiking					
37		Weekends in winter			People throw dead fish in water and on shore		Aquatic plants in Franklin Lake - are they a concern or self correcting	
39								
40						Fish spearing		
42			Hiking and skiing					
43								
44								
45					Spear fishing and DNR Regs			
47					Duck-Merganzer poop	Fish spearing		
48		Rock bass						
49	Under construction				Water skiing after hours			
52			Cycling					
53						Water level fluctuation		
55					Need crayfish back; kept weeds in check, and are fish food			
56								
57								
58								
59				Bullheads	Swimmers' itch			
60					Large wakes causing damage			
61			Friendships					
62								
64								
65								
66					Fish spearing			
68					Fish spearing			
69		Rock bass						
70								
71								
72			Mushrooming					
73								
74								

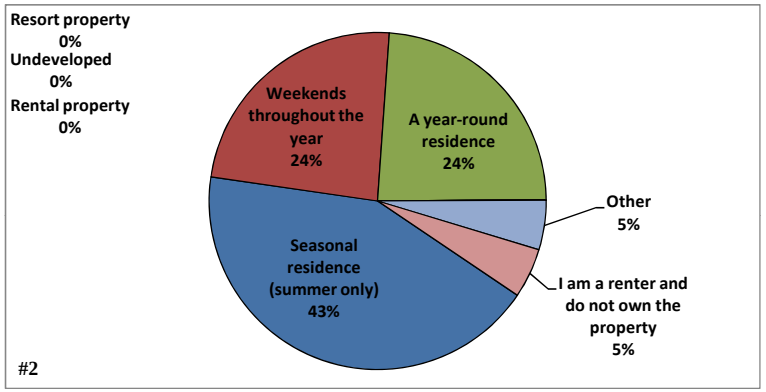
FRANKLIN LAKE PROPERTY

#1 On what lake is your Franklin Lake property located?

	Total	%
Butternut Lake	0	*0.0*
Franklin Lake	20	*100.0*
I do not live on either lake	0	*0.0*
	20	*100.0*

#2 How is your property on Franklin Lake utilized?

	Total	%
Seasonal residence (summer only)	9	*42.9*
Weekends throughout the year	5	*23.8*
A year-round residence	5	*23.8*
Rental property	0	*0.0*
Resort property	0	*0.0*
Undeveloped	0	*0.0*
Other	1	*4.8*
I am a renter and do not own the property	1	*4.8*
	21	*100.0*

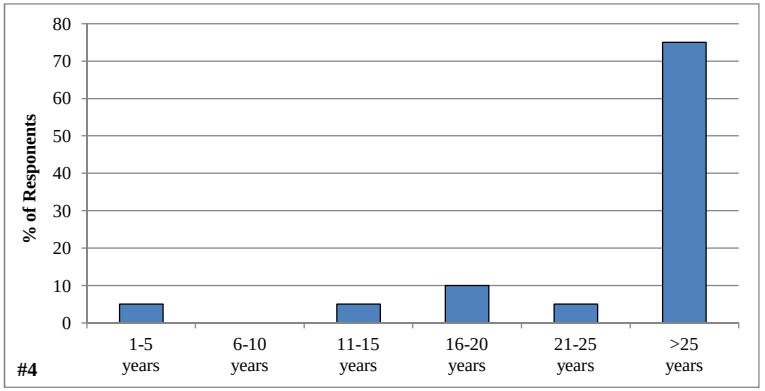


#3 How many days each year is your property used by you or others?

Answered Question	19
Average	161.1
Standard deviation	135.7

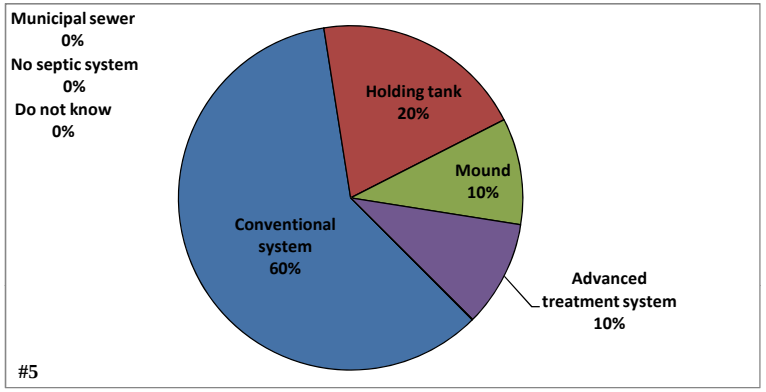
#4 How long have you owned or rented your property on Franklin Lake?

	Total	%
1-5 years	1	*5.0*
6-10 years	0	*0.0*
11-15 years	1	*5.0*
16-20 years	2	*10.0*
21-25 years	1	*5.0*
>25 years	15	*75.0*
	20	*100.0*



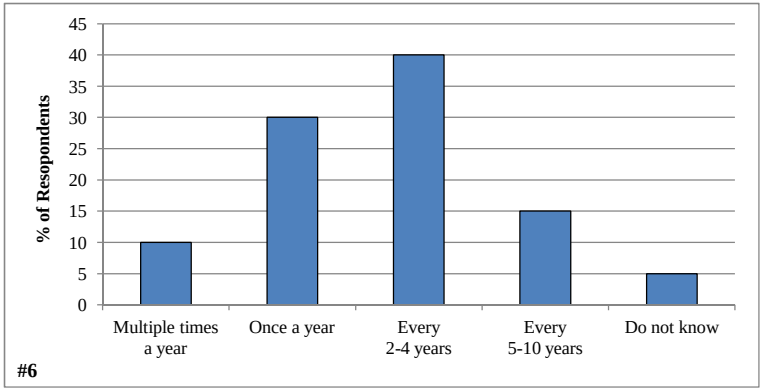
#5 What type of septic system does your property utilize?

	Total	%
Conventional system	12	*60.0*
Holding tank	4	*20.0*
Mound	2	*10.0*
Advanced treatment system	2	*10.0*
Municipal sewer	0	*0.0*
Do not know	0	*0.0*
No septic system	0	*0.0*
	20	*100.0*



#6 How often is the septic tank on your property pumped?

	Total	%
Multiple times a year	2	*10.0*
Once a year	6	*30.0*
Every 2-4 years	8	*40.0*
Every 5-10 years	3	*15.0*
Do not know	1	*5.0*
	20	*100.0*



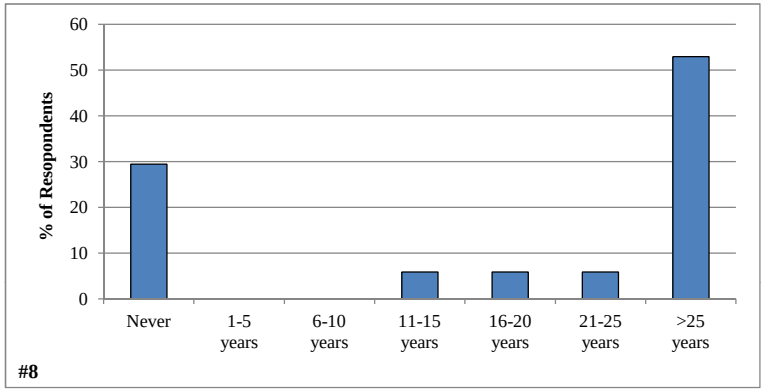
RECREATIONAL ACTIVITY ON FRANKLIN LAKE

#7 How many years ago did you first visit Franklin Lake?

Answered Question	18
Average	46.1
Standard deviation	13.1

#8 For how many years have you fished Franklin Lake?

	Total	%
Never	5	*29.4*
1-5 years	0	*0.0*
6-10 years	0	*0.0*
11-15 years	1	*5.9*
16-20 years	1	*5.9*
21-25 years	1	*5.9*
>25 years	9	*52.9*
	17	*100.0*

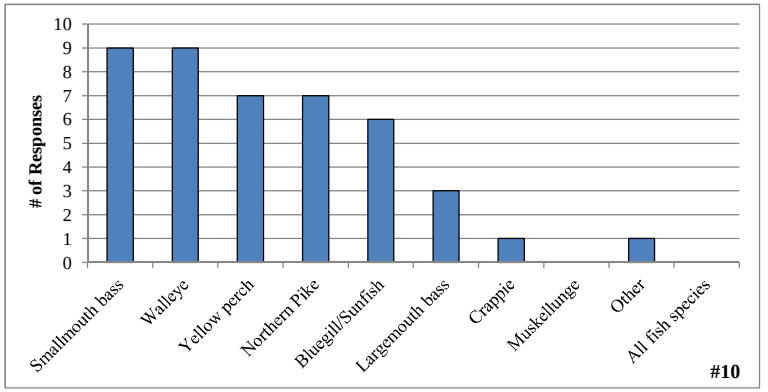


#9 Have you personally fished on Franklin Lake in the past three years?

	Total	%
Yes	11	*68.8*
No	5	*31.3*
	16	*100.0*

#10 What species of fish do you like to catch on Franklin Lake?

	Total
Smallmouth bass	9
Walleye	9
Yellow perch	7
Northern Pike	7
Bluegill/Sunfish	6
Largemouth bass	3
Crappie	1
Muskellunge	0
Other	1
All fish species	0

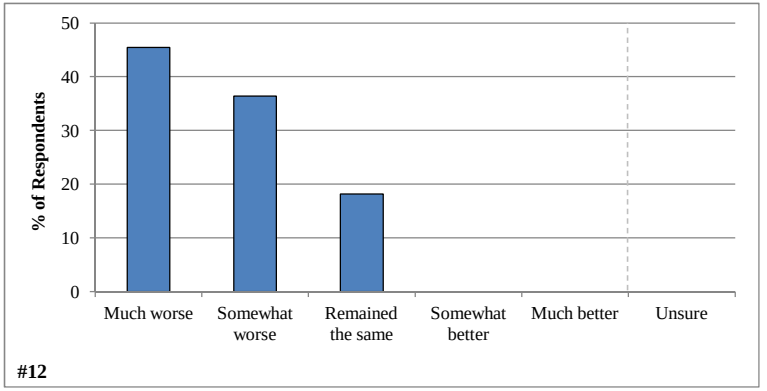


#11 How would you describe the current quality of fishing on Franklin Lake?

	Total	%
Very Poor	0	*0.0*
Poor	2	*18.2*
Fair	7	*63.6*
Good	2	*18.2*
Excellent	0	*0.0*
Unsure	0	*0.0*
	11	*100.0*

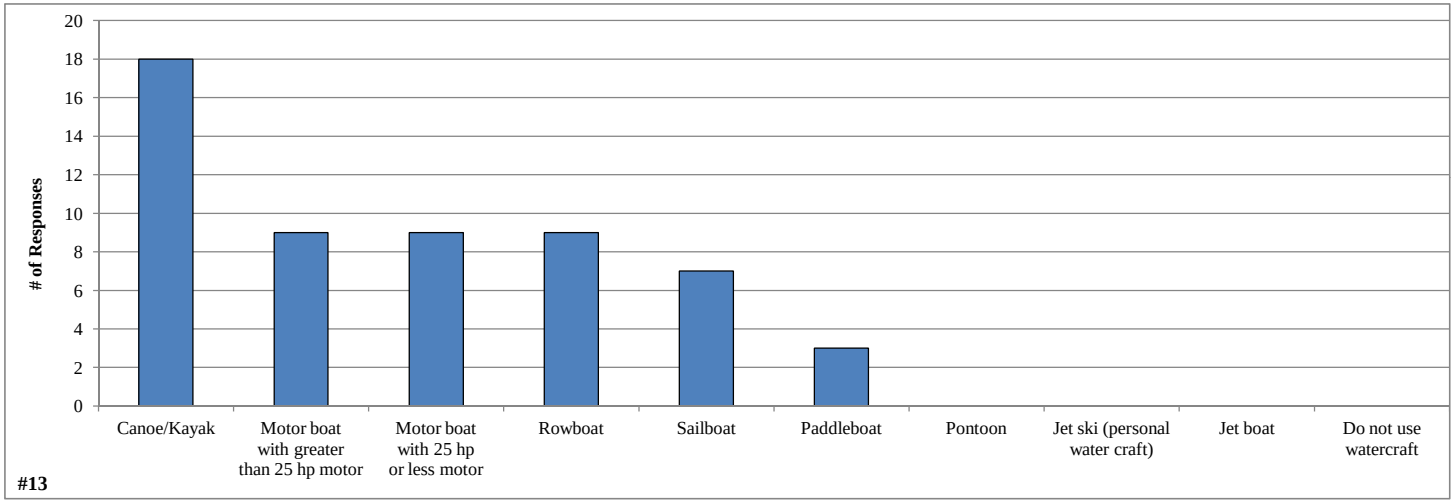
#12 How has the quality of fishing changed on Franklin Lake since you started fishing the lake?

	Total	%
Much worse	5	*45.5*
Somewhat worse	4	*36.4*
Remained the Same	2	*18.2*
Somewhat better	0	*0.0*
Much better	0	*0.0*
Unsure	0	*0.0*
	11	*100.0*



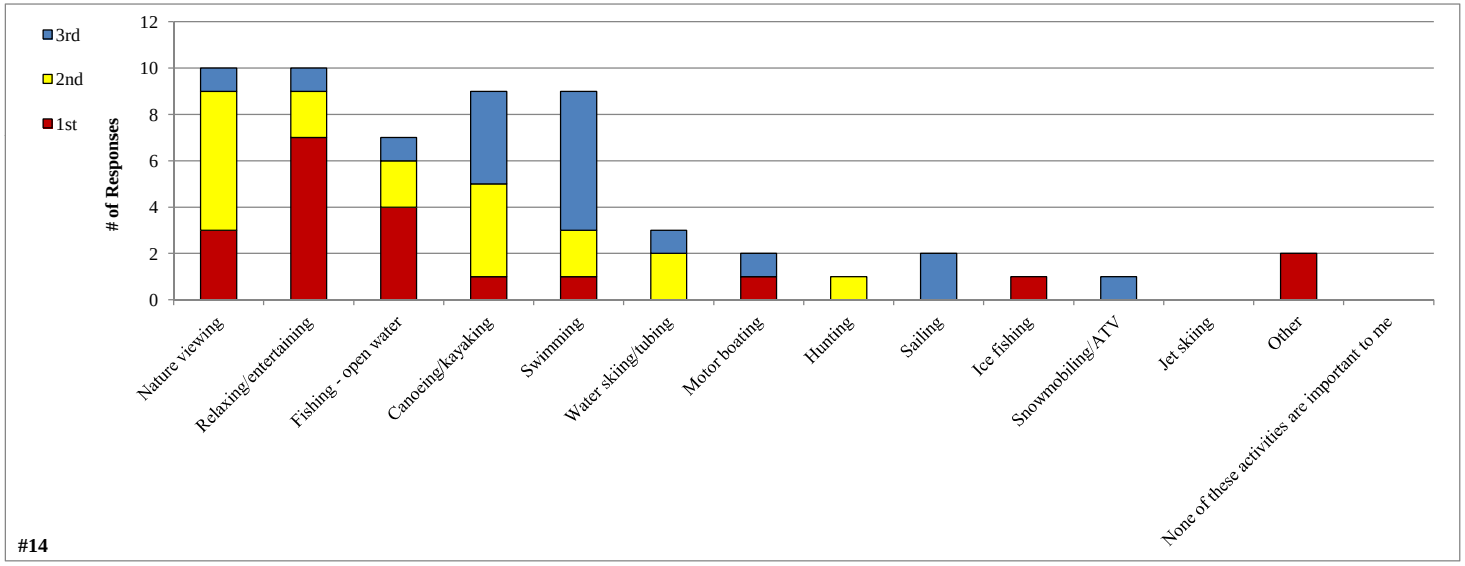
#13 What types of watercraft do you currently use on the lake?

	Total
Canoe/Kayak	18
Motor boat with greater than 25 hp motor	9
Motor boat with 25 hp or less motor	9
Rowboat	9
Sailboat	7
Paddleboat	3
Pontoon	0
Jet ski (personal water craft)	0
Jet boat	0
Do not use watercraft	0



#14 Please rank up to three activities that are important reasons for owning your property on or near the lake.

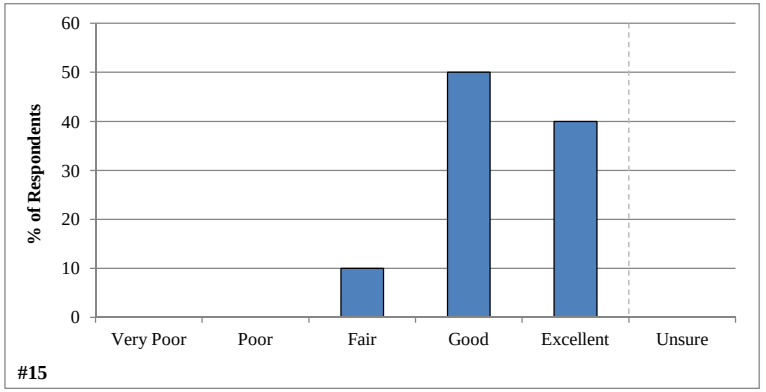
	1st	2nd	3rd	*% ranked*
Nature viewing	3	6	1	*17.5*
Relaxing/entertaining	7	2	1	*17.5*
Fishing - open water	4	2	1	*12.3*
Canoeing/kayaking	1	4	4	*15.8*
Swimming	1	2	6	*15.8*
Water skiing/tubing	0	2	1	*5.3*
Motor boating	1	0	1	*3.5*
Hunting	0	1	0	*1.8*
Sailing	0	0	2	*3.5*
Ice fishing	1	0	0	*1.8*
Snowmobiling/ATV	0	0	1	*1.8*
Jet skiing	0	0	0	*0.0*
Other	2	0	0	*3.5*
None of these activities are important to me	0	0	0	*0.0*
	20	19	18	*100.0*



FRANKLIN LAKE CURRENT AND HISTORIC CONDITION, HEALTH AND MANAGEMENT

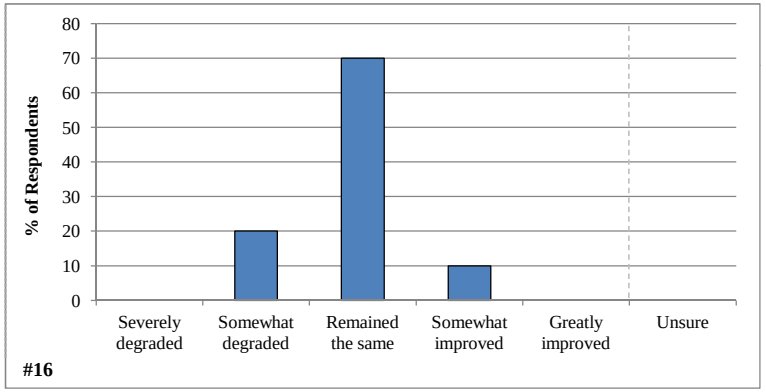
#15 How would you describe the current water quality of Franklin Lake?

	Total	%
Very Poor	0	*0.0*
Poor	0	*0.0*
Fair	2	*10.0*
Good	10	*50.0*
Excellent	8	*40.0*
Unsure	0	*0.0*
	20	*100.0*



#16 How has the water quality changed in Franklin Lake since you first visited the lake?

	Total	%
Severely degraded	0	*0.0*
Somewhat degraded	4	*20.0*
Remained the same	14	*70.0*
Somewhat improved	2	*10.0*
Greatly improved	0	*0.0*
Unsure	0	*0.0*
	20	*100.0*



#17 Have you ever heard of aquatic invasive species?

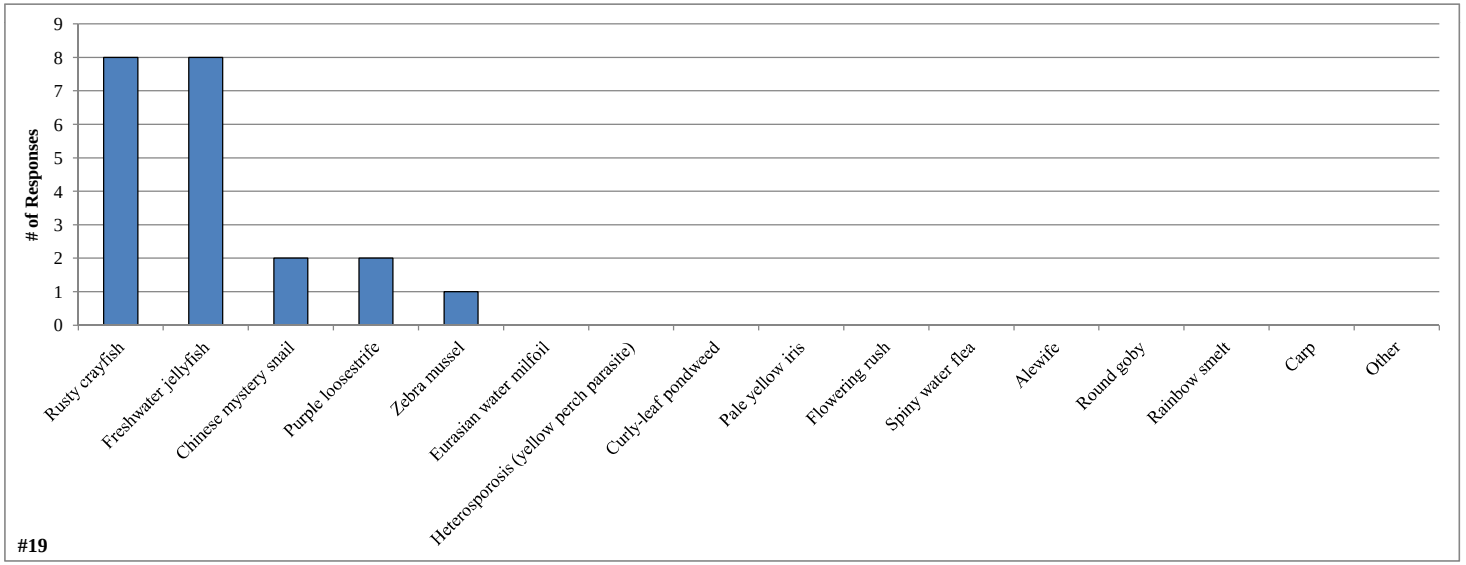
	Total	%
Yes	20	*100.0*
No	0	*0.0*
	20	*100.0*

#18 Are you aware of aquatic invasive species in the lake?

	Total	%
Yes	12	*63.2*
No	7	*36.8*
	19	*100.0*

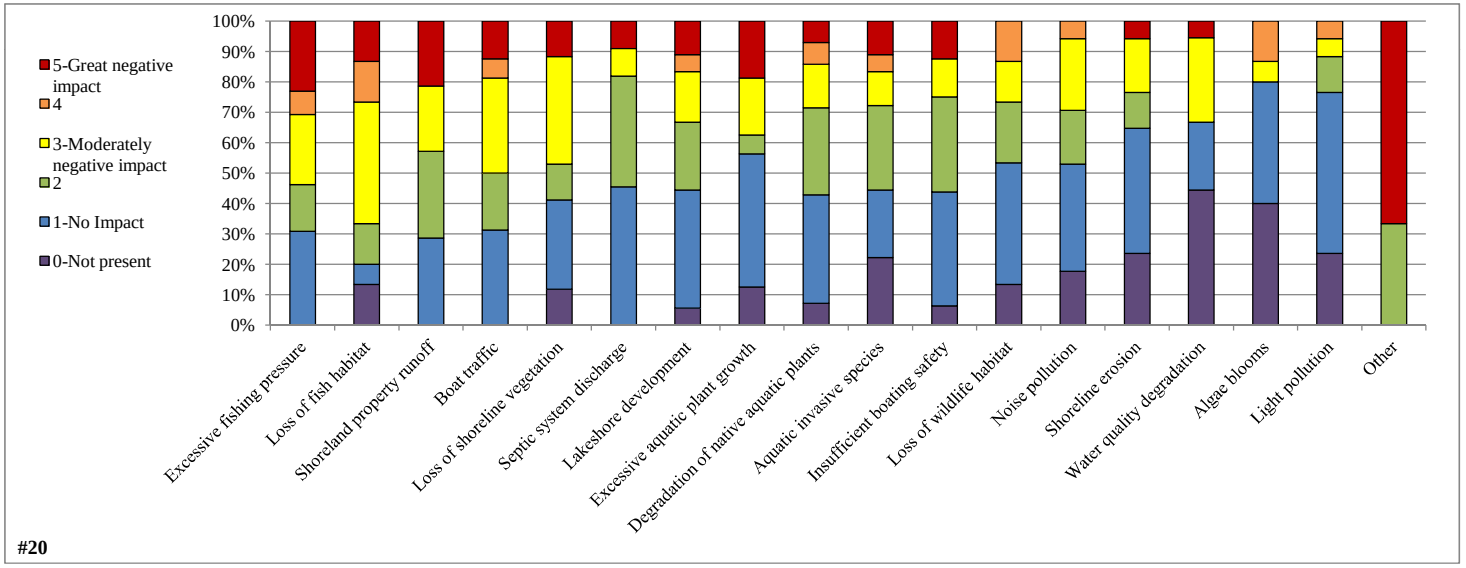
#19 Which aquatic invasive species are you aware of in Franklin Lake?

	Total
Rusty crayfish	8
Freshwater jellyfish	8
Chinese mystery snail	2
Purple loosestrife	2
Zebra mussel	1
Eurasian water milfoil	0
Heterosporosis (yellow perch parasite)	0
Curly-leaf pondweed	0
Pale yellow iris	0
Flowering rush	0
Spiny water flea	0
Alewife	0
Round goby	0
Rainbow smelt	0
Carp	0
Other	0



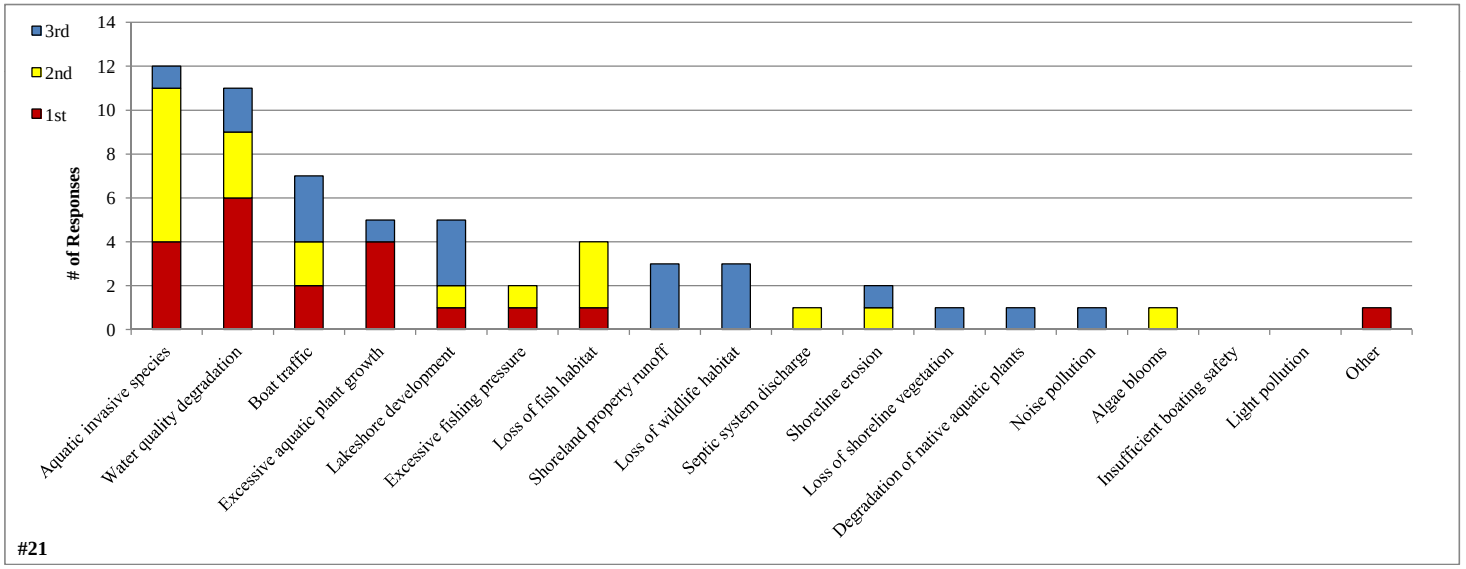
#20 To what level do you believe each of the following factors may be negatively impacting Franklin Lake?

	0-Not present	1-No Impact	2	3-Moderately negative impact	4	5-Great negative impact	Unsure	*Total*	*Average*
Excessive fishing pressure	0	4	2	3	1	3	3	*13*	*2.8*
Loss of fish habitat	2	1	2	6	2	2	3	*13*	*2.7*
Shoreland property runoff	0	4	4	3	0	3	4	*14*	*2.6*
Boat traffic	0	5	3	5	1	2	1	*16*	*2.5*
Loss of shoreline vegetation	2	5	2	6	0	2	0	*15*	*2.2*
Septic system discharge	0	5	4	1	0	1	6	*11*	*1.9*
Lakeshore development	1	7	4	3	1	2	0	*17*	*2.1*
Excessive aquatic plant growth	2	7	1	3	0	3	1	*14*	*2.1*
Degradation of native aquatic plants	1	5	4	2	1	1	4	*13*	*2.0*
Aquatic invasive species	4	4	5	2	1	2	0	*14*	*1.9*
Insufficient boating safety	1	6	5	2	0	2	2	*15*	*2.0*
Loss of wildlife habitat	2	6	3	2	2	0	2	*13*	*1.7*
Noise pollution	3	6	3	4	1	0	0	*14*	*1.6*
Shoreline erosion	4	7	2	3	0	1	1	*13*	*1.5*
Water quality degradation	8	4	0	5	0	1	0	*10*	*1.3*
Algae blooms	6	6	0	1	2	0	2	*9*	*1.1*
Light pollution	4	9	2	1	1	0	0	*13*	*1.2*
Other	0	0	1	0	0	2	0	*3*	*4.0*



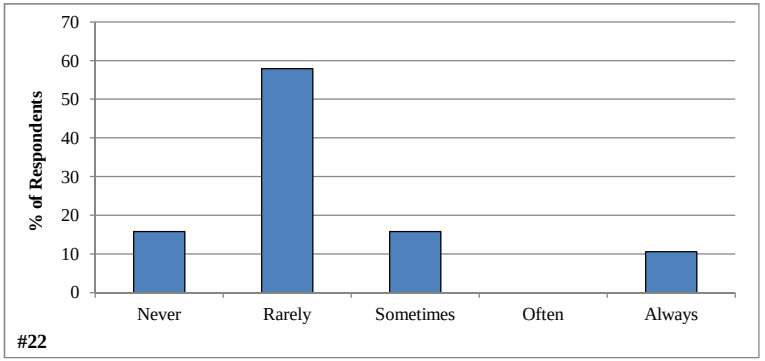
#21 From the list below, please rank your top three concerns regarding Franklin Lake.

	1st	2nd	3rd	*% Ranked*
Aquatic invasive species	4	7	1	*20.0*
Water quality degradation	6	3	2	*18.3*
Boat traffic	2	2	3	*11.7*
Excessive aquatic plant growth	4	0	1	*8.3*
Lakeshore development	1	1	3	*8.3*
Excessive fishing pressure	1	1	0	*3.3*
Loss of fish habitat	1	3	0	*6.7*
Shoreland property runoff	0	0	3	*5.0*
Loss of wildlife habitat	0	0	3	*5.0*
Septic system discharge	0	1	0	*1.7*
Shoreline erosion	0	1	1	*3.3*
Loss of shoreline vegetation	0	0	1	*1.7*
Degradation of native aquatic plants	0	0	1	*1.7*
Noise pollution	0	0	1	*1.7*
Algae blooms	0	1	0	*1.7*
Insufficient boating safety	0	0	0	*0.0*
Light pollution	0	0	0	*0.0*
Other	1	0	0	*1.7*
	20	20	20	*100.0*



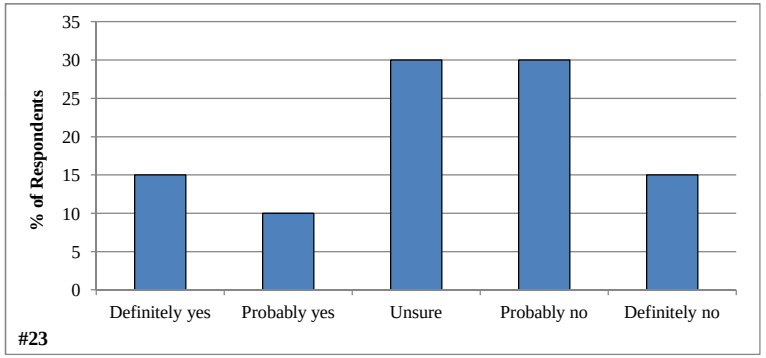
#22 During open water season how often does aquatic plant growth, including algae, negatively impact your enjoyment of Franklin Lake?

	Total	%
Never	3	*15.8*
Rarely	11	*57.9*
Sometimes	3	*15.8*
Often	0	*0.0*
Always	2	*10.5*
	19	*100.0*



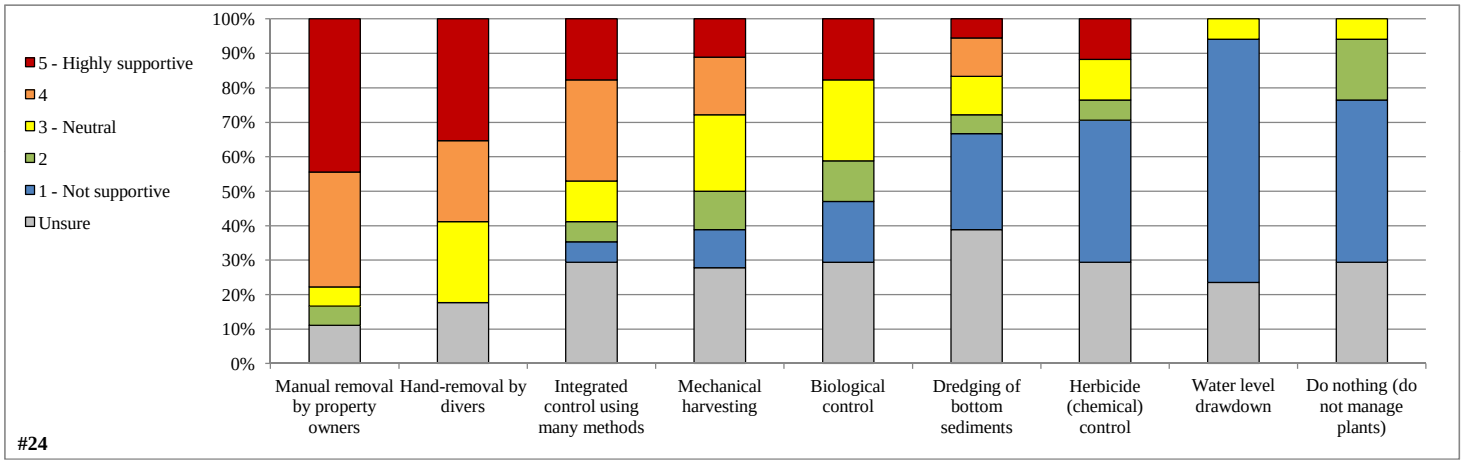
#23 Considering your answer to the question #22, do you believe aquatic plant control is needed on Franklin Lake?

	Total	%
Definitely yes	3	*15.0*
Probably yes	2	*10.0*
Unsure	6	*30.0*
Probably no	6	*30.0*
Definitely no	3	*15.0*
	20	*100.0*



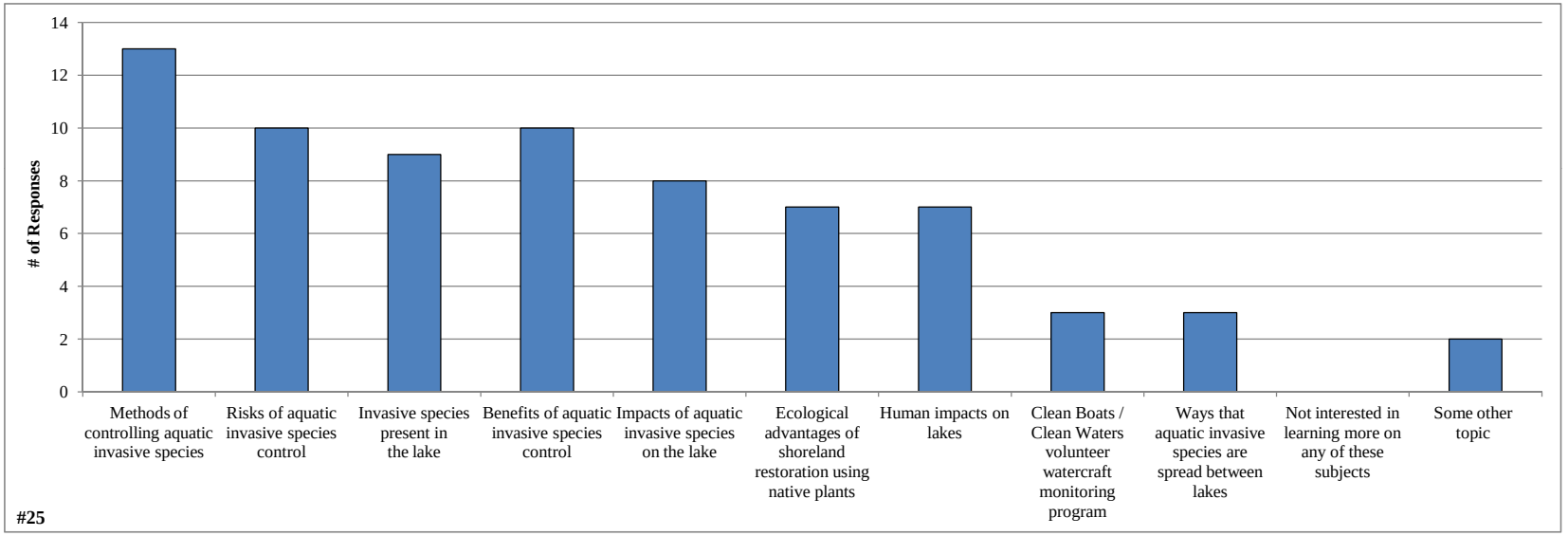
#24 Aquatic plants can be professionally managed using many techniques. What is your level of support for the responsible use of the following techniques on Franklin Lake?

	1 - Not supportive	2	3 - Neutral	4	5 - Highly supportive	Unsure	Total	Average
Manual removal by property owners	0	1	1	6	8	2	*16*	*4.3*
Hand-removal by divers	0	0	4	4	6	3	*14*	*4.1*
Integrated control using many methods	1	1	2	5	3	5	*12*	*3.7*
Mechanical harvesting	2	2	4	3	2	5	*13*	*3.1*
Biological control	3	2	4	0	3	5	*12*	*2.8*
Dredging of bottom sediments	5	1	2	2	1	7	*11*	*2.4*
Herbicide (chemical) control	7	1	2	0	2	5	*12*	*2.1*
Water level drawdown	12	0	1	0	0	4	*13*	*1.2*
Do nothing (do not manage plants)	8	3	1	0	0	5	*12*	*1.4*



#25 Which of these subjects would you like to learn more about?

	Total
Methods of controlling aquatic invasive species	13
Risks of aquatic invasive species control	10
Invasive species present in the lake	9
Benefits of aquatic invasive species control	10
Impacts of aquatic invasive species on the lake	8
Ecological advantages of shoreland restoration using native plants	7
Human impacts on lakes	7
Clean Boats / Clean Waters volunteer watercraft monitoring program	3
Ways that aquatic invasive species are spread between lakes	3
Not interested in learning more on any of these subjects	0
Some other topic	2



BUTTERNUT-FRANKLIN LAKES ASSOCIATION, INC.

#26 Before receiving this mailing, have you ever heard of the Butternut-Franklin Lakes Association?

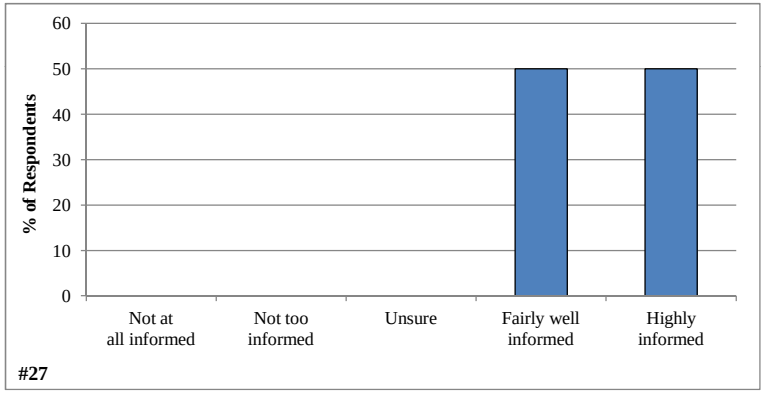
	Total	%
Yes	20	*100.0*
No	0	*0.0*
	20	*100.0*

#27 What is your membership status with the Butternut-Franklin Lakes Association?

	Total	%
Current member	20	*100.0*
Former member	0	*0.0*
Never been a member	0	*0.0*
	20	*100.0*

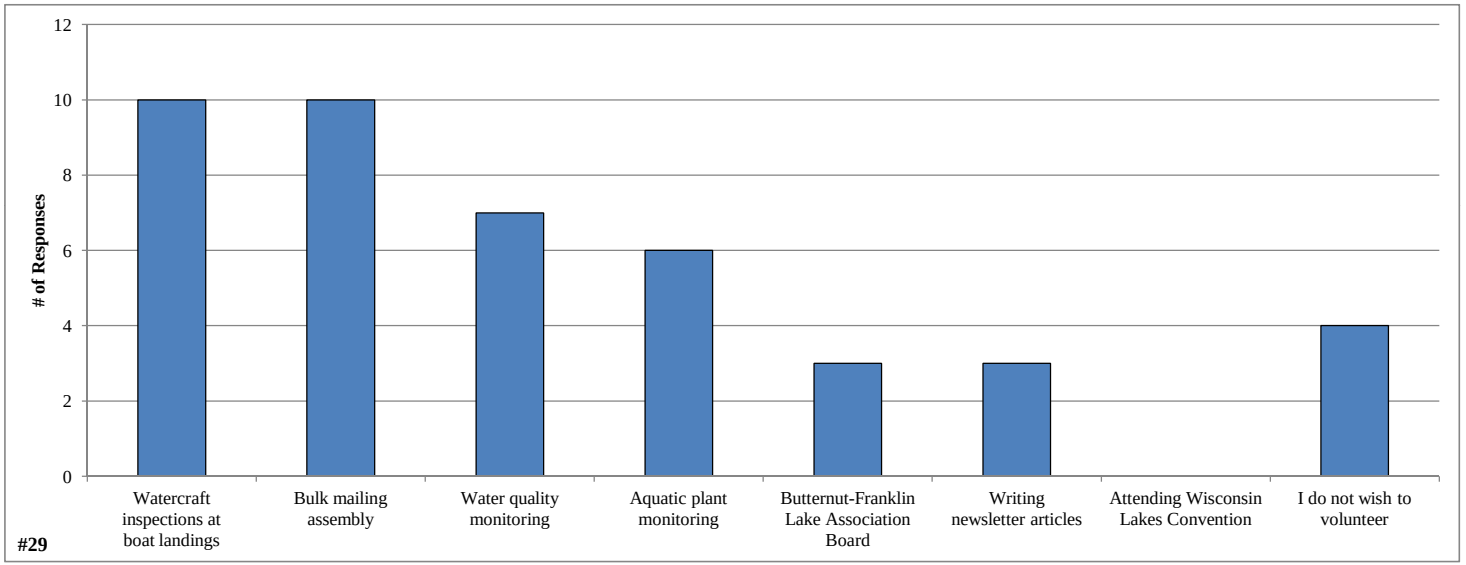
#28 How informed has the Butternut-Franklin Lakes Association kept you regarding issues with the lake and its management?

	Total	%
Not at all informed	0	*0.0*
Not too informed	0	*0.0*
Unsure	0	*0.0*
Fairly well informed	10	*50.0*
Highly informed	10	*50.0*
	20	*100.0*



#29 Please circle the activities you would be willing to participate in if the Butternut-Franklin Lakes Association requires additional assistance.

	Total
Watercraft inspections at boat landings	10
Bulk mailing assembly	10
Water quality monitoring	7
Aquatic plant monitoring	6
Butternut-Franklin Lake Association Board	3
Writing newsletter articles	3
Attending Wisconsin Lakes Convention	0
I do not wish to volunteer	4



Survey Number	2g Comment	10i Comment	14m Comment	19p Comment	20r Comment	21r Comment	25k Comment	Other Comments (and Question 31)
4								
5			Xcountry Skiing, Mt. Bike riding			If Girls Camp (on Franklin) is sold to developers		
7								
8								
12								
14					Respect for Wildlife		Mystery Snails and Rusty Crayfish	
15								
16			Business					
17								
19	Parents year around; visit throughout year							
23								
26								
29						Slot size walleyes being kept due to underststaffed wardens		
30								
34								
38								
41						Fish spearing		
46								
50					Fish spearing	Fish spearing		
51								
54		Rock bass						
63								
67								
73					Inconsiderate water skiers			
74								

C

APPENDIX C

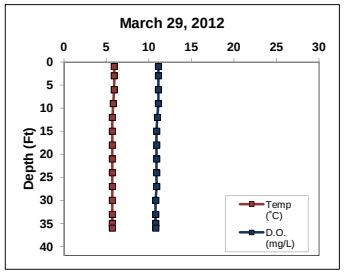
Water Quality Data

Butternut Lake

Date: 3/29/2012
Time: 13:30
Weather: 10% clouds, light breeze, 38°F
Entry: TWH

Max Depth: 36.9
BLS Depth (ft): 3.0
BLB Depth (ft): 34.0
Secchi Depth (ft): 15.0

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	5.9	11.1	8.6	98.0
3	5.9	11.1	8.6	97.0
6	5.9	11.1	8.6	97.0
9	5.8	11.1	8.5	97.0
12	5.7	11.0	8.5	97.0
15	5.7	10.9	8.5	97.0
18	5.7	10.9	8.5	97.0
21	5.7	10.9	8.5	97.0
24	5.7	10.9	8.5	97.0
27	5.7	10.9	8.5	97.0
30	5.7	10.8	8.4	97.0
33	5.7	10.8	8.4	98.0
35	5.7	10.8	8.4	97.0
36	5.7	10.8	8.4	97.0



Parameter	BLS	BLB
Total P (µg/L)	13.00	13.00
Dissolved P (µg/L)	ND	ND
Chl-*a* (µg/L)	3.71	NA
TKN (µg/L)	410.00	300.00
$NO_3 + NO_2$-N (µg/L)	49.00	49.00
NH_3-N (µg/L)	ND	18.00
Total N (µg/L)	459.00	349.00
Lab Cond. (µS/cm)	119.00	110.00
Lab pH	7.96	7.85
Alkalinity (mg/L $CaCO_3$)	52.30	49.90
Total Susp. Solids (mg/L)	ND	ND
Calcium (mg/L)	12.50	NA
Magnesium (mg/L)	5.40	NA
Hardness (mg/L)	53.60	NA
Color (SU)	<5	NA
Turbidity (NTU)	NA	NA

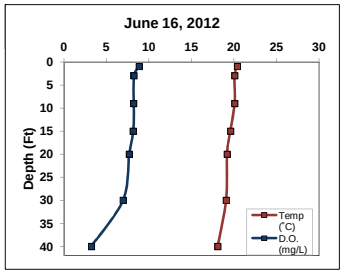
Data collected by TWH and EEC (Onterra)

Butternut Lake

Date: 6/16/2012
Time:
Weather:
Entry: TWH

Max Depth:
BLS Depth (ft): 6.0
BLB Depth (ft):
Secchi Depth (ft): 24.0

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	20.4	8.9		
3	20.1	8.2		
9	20.1	8.2		
15	19.6	8.2		
20	19.2	7.7		
30	19.1	7.0		
40	18.1	3.2		



Parameter	BLS	BLB
Total P (µg/L)	15.00	NA
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	1.72	NA
TKN (µg/L)	490.00	NA
$NO_3 + NO_2$-N (µg/L)	ND	NA
NH_3-N (µg/L)	ND	NA
Total N (µg/L)	490.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

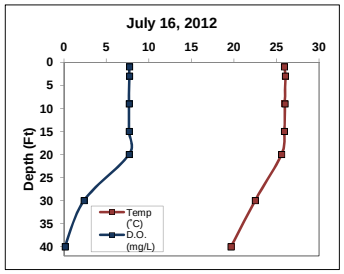
Data collected by Dolph Pfefferkorn, Mike Klinnert (Citizens Lake Monitoring Network)

Butternut Lake

Date: 7/16/2012
Time:
Weather:
Entry: TWH

Max Depth:
BLS Depth (ft): 6.0
BLB Depth (ft):
Secchi Depth (ft): 25.0

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	25.9	7.7		
3	26.1	7.7		
9	26.0	7.7		
15	25.9	7.7		
20	25.6	7.7		
30	22.5	2.4		
40	19.7	0.1		



Parameter	BLS	BLB
Total P (µg/L)	15.00	NA
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	1.57	NA
TKN (µg/L)	350.00	NA
$NO_3 + NO_2$-N (µg/L)	24.00	NA
NH_3-N (µg/L)	ND	NA
Total N (µg/L)	374.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

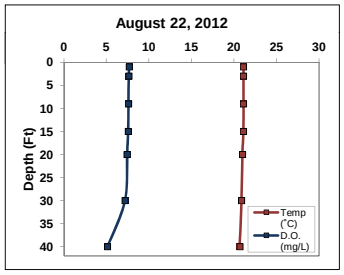
Data collected by Dolph Pfefferkorn, Mike Klinnert, Ken Gignac (Citizens Lake Monitoring Network)

Butternut Lake

Date: 8/22/2012
Time:
Weather:
Entry: TWH

Max Depth:
BLS Depth (ft): 6
BLB Depth (ft):
Secchi Depth (ft): 14

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	21.1	7.69		
3	21.1	7.64		
9	21.1	7.59		
15	21.1	7.56		
20	21	7.43		
30	20.9	7.19		
40	20.7	5.12		



Parameter	BLS	BLB
Total P (µg/L)	25.00	NA
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	2.43	NA
TKN (µg/L)	300.00	NA
$NO_3 + NO_2$-N (µg/L)	ND	NA
NH_3-N (µg/L)	ND	NA
Total N (µg/L)	300.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

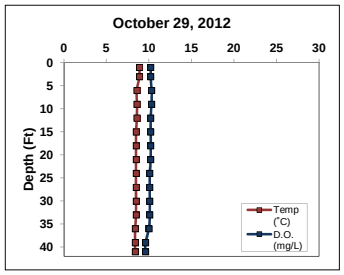
Data collected by Dolph Pfefferkorn, Mike Klinnert, Ken Gignac (Citizens Lake Monitoring Network)

Butternut Lake

Date: 10/29/2012
Time: 13:40
Weather: 100% sun 40F, calm
Entry: EEC

Max Depth: 42
BLS Depth (ft): 3
BLB Depth (ft): 39
Secchi Depth (ft): 13.7

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	8.9	10.2	8.4	
3	8.9	10.2	8.5	99
6	8.6	10.3	8.6	100
9	8.6	10.3	8.7	100
12	8.6	10.2	8.7	100
15	8.5	10.2	8.7	100
18	8.5	10.2	8.7	100
21	8.5	10.2	8.7	100
24	8.5	10.1	8.8	100
27	8.5	10.1	8.8	100
30	8.5	10.1	8.8	100
33	8.5	10.1	8.8	100
36	8.4	10	8.8	100
39	8.4	9.6	8.8	100
41	8.4	9.6	8.7	100



Parameter	BLS	BLB
Total P (µg/L)	24.00	25.00
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	3.05	NA
TKN (µg/L)	NA	NA
$NO_3 + NO_2$-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	ND	ND
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

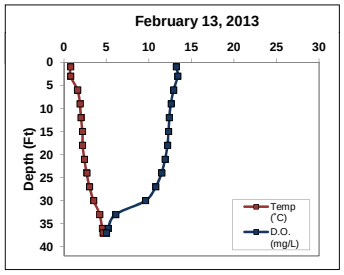
Data collected by TWH (Onterra)

Butternut Lake

Date: 2/13/2013
Time: 11:00
Weather: 95% clouds, calm, 22°F
Entry: TWH

Max Depth: 40.3
BLS Depth (ft): 3
BLB Depth (ft): 37
Secchi Depth (ft): 10.7

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	0.8	13.2		
3	0.8	13.4		
6	1.6	12.9		
9	1.9	12.6		
12	2	12.4		
15	2.2	12.3		
18	2.2	12.2		
21	2.4	11.9		
24	2.7	11.5		
27	3	10.8		
30	3.5	9.6		
33	4.2	6.1		
36	4.5	5.2		
37	4.6	5		



Parameter	BLS	BLB
Total P (µg/L)	14.00	26.00
Dissolved P (µg/L)	3.00	14.00
Chl-*a* (µg/L)	NA	NA
TKN (µg/L)	350.00	220.00
$NO_3 + NO_2$-N (µg/L)	ND	101.00
NH_3-N (µg/L)	18.00	141.00
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH and EJG (Onterra) Ice thickness: 1.8'

Water Quality Data

Parameter	Surface Count	Surface Mean	Bottom Count	Bottom Mean
Secchi Depth (feet)	6	17.1	NA	NA
Total P (µg/L)	6	17.7	3	21.3
Dissolved P (µg/L)	2	3.0	2	14.0
Chl a (µg/L)	5	2.5	0	NA
TKN (µg/L	5	380.0	2	260.0
NO3+NO2-N (µg/L)	5	36.5	2	75.0
NH3-N (µg/L)	5	18.0	2	79.5
Total N (µg/L)	4	405.8	1	349.0
Lab Cond. (µS/cm)	1	119.0	1	110.0
Lab pH	1	8.0	1	7.9
Alkal (mg/l CaCO3)	1	52.3	1	49.9
Total Susp. Solids (mg/l)	2	ND	2	ND
Calcium (µg/L)	1	12.5	0	NA
Magnesium (mg/L)	1	5.4	0	NA
Hardness (mg/L)	1	53.6	0	NA
Color (SU)	0	NA	0	NA
Turbidity (NTU)	0	NA	0	NA

Trophic State Index (TSI)

Year	TP	Chl-a	Secchi
1987			38.5
1988			46.3
1989			33.3
1990			34.0
1991			34.9
1992			37.9
1993	32.2	36.8	35.3
1994	32.9	35.7	32.0
1995	35.0	36.6	35.1
1996	34.1	36.6	33.2
1997	37.4	34.3	32.8
1998	35.8	37.5	33.6
1999	40.4	35.9	34.8
2000	44.1	37.4	
2001	42.2	33.2	34.5
2002	37.8	35.9	31.3
2003	41.1	32.6	28.9
2004	40.0	41.0	34.4
2005	40.0	38.1	31.0
2006	41.9	40.0	32.8
2007	36.9	34.5	31.0
2008	44.4	44.9	35.0
2009	43.8	40.7	36.6
2010	39.2	46.1	36.9
2011	41.5	42.4	38.4
2012	46.1	36.9	33.2
All Years (Weighted)	40.0	38.7	34.0
Deep, Lowland Drainage Lakes	49.4	49.7	46.2
NLF Ecoregion	48.1	47.5	45.7

	Secchi (feet)				Chlorophyll-*a* (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
Year	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1987	6	12.1	3	14.6								
1988	5	16.1	1	8.5								
1989	6	20.7	5	20.9								
1990	4	23.9	3	20.0								
1991	4	19.0	3	18.7								
1992	4	18.6	2	15.3								
1993	7	17.6	5	18.2	3	2.2	2	1.9	3	8.7	2.0	7.0
1994	9	21.3	6	22.8	5	2.2	4	1.7	4	8.5	3.0	7.3
1995	7	17.1	4	18.5	4	3.3	2	1.8	4	10.3	2.0	8.5
1996	5	20.8	3	21.0	5	1.4	3	1.9	4	8.5	2.0	8.0
1997	5	21.6	3	21.7	5	1.6	3	1.5	5	11.4	3.0	10.0
1998	5	21.1	3	20.5	4	2.5	3	2.0	5	12.0	3.0	9.0
1999	5	19.5	3	18.8	4	2.5	3	1.7	5	12.2	3.0	12.3
2000					3	3.3	2	2.0	5	16.0	3.0	16.0
2001	7	18.6	5	19.3	2	3.7	1	1.3	1	14.0	1.0	14.0
2002	5	21.0	3	24.0	4	2.8	3	1.7	5	14.4	3.0	10.3
2003	5	26.2	3	28.3	4	2.4	3	1.2	5	13.4	3.0	13.0
2004	5	20.0	3	19.3	4	4.2	3	2.9	5	13.2	3.0	12.0
2005	5	22.5	3	24.5	4	2.7	3	2.1	5	13.6	3.0	12.0
2006	5	22.1	3	21.7	4	3.3	3	2.6	4	14.0	3.0	13.7
2007	4	25.9	3	24.5	3	1.5	3	1.5	4	10.5	3.0	9.7
2008	4	18.2	3	18.6	3	4.3	3	4.3	4	15.3	3.0	16.3
2009	4	17.3	3	16.7	3	2.8	3	2.8	4	14.5	3.0	15.7
2010	4	18.0	3	16.3	3	4.8	3	4.8	4	11.5	3.0	11.3
2011	4	15.8	3	14.7	3	3.3	3	3.3	4	15.0	3.0	13.3
2012	8	20.0	6	21.0	4	2.2	3	1.9	5	18.8	3.0	18.3
All Years (Weighted)		19.7		20.0		2.7		2.3		12.9		12.0
Deep, Lowland Drainage Lakes				8.5				7.0				23.0
NLF Ecoregion				8.9				5.6				21.0

July 2012 N: 374.0
July 2012 P: 15.0

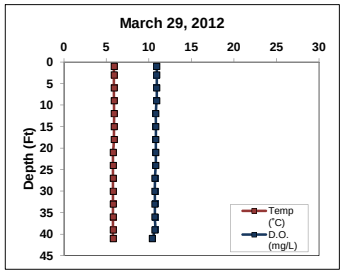
Summer 2012 N:P 25 :1

Franklin Lake

Date: 3/29/2012
Time: 12:00
Weather: 90% clouds, light breeze, 38°F
Entry: TWH

Max Depth: 43.7
FLS Depth (ft): 3.0
FLB Depth (ft): 40.0
Secchi Depth (ft): 13.7

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	5.9	10.9	8.5	36.0
3	5.9	10.9	8.4	36.0
6	5.9	10.9	8.3	36.0
9	5.9	10.9	8.3	36.0
12	5.9	10.8	8.2	36.0
15	5.9	10.8	8.2	36.0
18	5.9	10.8	8.2	36.0
21	5.8	10.8	8.2	36.0
24	5.8	10.8	8.1	36.0
27	5.8	10.7	8.1	36.0
30	5.8	10.7	8.1	36.0
33	5.8	10.7	8.1	36.0
36	5.8	10.7	8.0	36.0
39	5.8	10.7	8.0	36.0
41	5.8	10.4	8.0	36.0



Parameter	FLS	FLB
Total P (µg/L)	9.00	9.00
Dissolved P (µg/L)	ND	ND
Chl-*a* (µg/L)	1.80	NA
TKN (µg/L)	390.00	450.00
$NO_3 + NO_2$-N (µg/L)	53.00	54.00
NH_3-N (µg/L)	25.00	28.00
Total N (µg/L)	443.00	504.00
Lab Cond. (µS/cm)	52.00	52.00
Lab pH	7.43	7.64
Alkalinity (mg/L $CaCO_3$)	21.00	21.90
Total Susp. Solids (mg/L)	ND	2.20
Calcium (mg/L)	44.00	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	<5	NA
Turbidity (NTU)	NA	NA

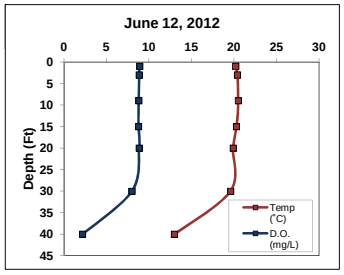
Data collected by TWH and EEC (Onterra)

Franklin Lake

Date: 6/12/2012
Time:
Weather:
Entry: TWH

Max Depth:
FLS Depth (ft): 6.0
FLB Depth (ft):
Secchi Depth (ft): 15.0

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	20.2	8.9		
3	20.4	8.8		
9	20.5	8.8		
15	20.3	8.8		
20	19.9	8.9		
30	19.6	8.0		
40	13.0	2.2		



Parameter	FLS	FLB
Total P (µg/L)	9.00	NA
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	1.91	NA
TKN (µg/L)	540.00	NA
$NO_3 + NO_2$-N (µg/L)	ND	NA
NH_3-N (µg/L)	ND	NA
Total N (µg/L)	540.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

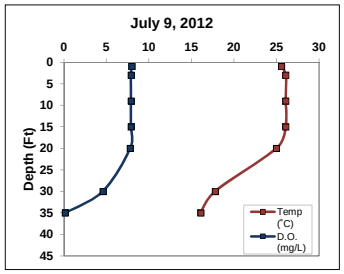
Data collected by Kay Scharpf (Citizen Lake Monitoring Network)

Franklin Lake

Date: 7/9/2012
Time:
Weather:
Entry: TWH

Max Depth:
FLS Depth (ft): 6.0
FLB Depth (ft):
Secchi Depth (ft): 17.0

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	25.6	8.0		
3	26.1	7.9		
9	26.1	7.9		
15	26.1	7.9		
20	25.0	7.8		
30	17.8	4.6		
35	16.1	0.2		



Parameter	FLS	FLB
Total P (µg/L)	7.00	NA
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	1.76	NA
TKN (µg/L)	370.00	NA
$NO_3 + NO_2$-N (µg/L)	ND	NA
NH_3-N (µg/L)	ND	NA
Total N (µg/L)	370.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

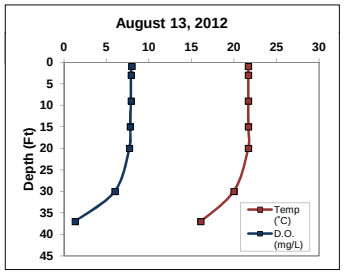
Data collected by Kay Scharpf (Citizen Lake Monitoring Network)

Franklin Lake

Date: 8/13/2012
Time:
Weather:
Entry: TWH

Max Depth:
FLS Depth (ft): 6
FLB Depth (ft):
Secchi Depth (ft): 16

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	21.7	8		
3	21.7	7.9		
9	21.7	7.9		
15	21.7	7.8		
20	21.7	7.7		
30	20	6		
37	16.1	1.3		



Parameter	FLS	FLB
Total P (µg/L)	8.00	NA
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	2.42	NA
TKN (µg/L)	220.00	NA
$NO_3 + NO_2$-N (µg/L)	ND	NA
NH_3-N (µg/L)	ND	NA
Total N (µg/L)	220.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

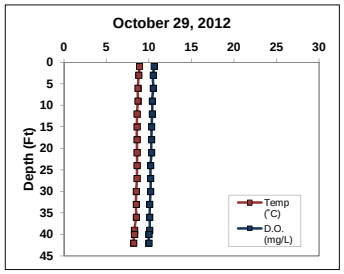
Data collected by Kay Scharpf (Citizen Lake Monitoring Network)

Franklin Lake

Date: 10/29/2012
Time: 12:00
Weather: 100% sun, calm 37F
Entry: EEC

Max Depth: 43.7
FLS Depth (ft): 3
FLB Depth (ft): 40
Secchi Depth (ft): 13.3

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	8.9	10.6		
3	8.8	10.5	7	
6	8.7	10.5		
9	8.7	10.4		
12	8.6	10.4		
15	8.6	10.3		
18	8.6	10.3		
21	8.6	10.3	7.2	
24	8.6	10.2		
27	8.6	10.2		
30	8.5	10.2		
33	8.5	10.1		
36	8.5	10.1		
39	8.3	10.1		
40	8.3	10	7.3	
42	8.2	10		



Parameter	FLS	FLB
Total P (µg/L)	15.00	15.00
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	6.74	NA
TKN (µg/L)	NA	NA
$NO_3 + NO_2$-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

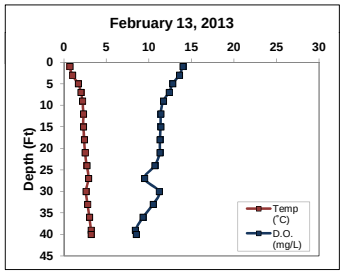
Data collected by TWH (Onterra)

Franklin Lake

Date: 2/13/2013
Time: 13:05
Weather: 95 % clouds, calm, 22°F
Entry: TWH

Max Depth: 41.8
FLS Depth (ft): 3
FLB Depth (ft): 39
Secchi Depth (ft): 16.4

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	0.7	14		
3	1	13.6		
5	1.7	12.8		
7	2	12.4		
9	2.2	11.7		
12	2.3	11.4		
15	2.3	11.4		
18	2.4	11.3		
21	2.5	11.3		
24	2.7	10.7		
27	2.9	9.5		
30	2.6	11.2		
33	2.8	10.5		
36	3	9.3		
39	3.2	8.4		
40	3.2	8.5		



Parameter	FLS	FLB
Total P (µg/L)	17.00	11.00
Dissolved P (µg/L)	ND	ND
Chl-*a* (µg/L)	NA	NA
TKN (µg/L)	480.00	480.00
$NO_3 + NO_2$-N (µg/L)	ND	112.00
NH_3-N (µg/L)	30.00	192.00
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH and EJG (Onterra) Ice thickness: 1.6'

Water Quality Data

	Surface		Bottom	
Parameter	Count	Mean	Count	Mean
Secchi Depth (feet)	6	15.2	NA	NA
Total P (µg/L)	6	10.8	3	11.7
Dissolved P (µg/L)	2	ND	2	ND
Chl a (µg/L)	5	2.9	0	NA
TKN (µg/L	5	400.0	2	465.0
NO3+NO2-N (µg/L)	5	53.0	2	83.0
NH3-N (µg/L)	5	27.5	2	110.0
Total N (µg/L)	4	393.3	1	504.0
Lab Cond. (µS/cm)	1	52.0	1	52.0
Lab pH	1	7.4	1	7.6
Alkal (mg/l CaCO3)	1	21.0	1	21.9
Total Susp. Solids (mg/l)	1	ND	1	2.2
Calcium (µg/L)	1	44.0	0	NA
Magnesium (mg/L)	0	NA	0	NA
Hardness (mg/L)	0	NA	0	NA
Color (SU)	0	NA	0	NA
Turbidity (NTU)	0	NA	0	NA

Trophic State Index (TSI)

Year	TP	Chl-a	Secchi
1986			37.9
1987			35.2
1988			33.5
1989			33.8
1990			36.0
1991			32.7
1992			35.0
1993	39.4	41.4	34.1
1994	34.1	41.3	33.6
1995	33.2	36.4	34.8
1996	34.1	43.5	35.2
1997	42.9	38.0	34.5
1998	30.0	37.3	36.1
1999	34.1	34.3	34.3
2000	37.8	41.9	35.5
2001	37.4	37.9	36.7
2002	37.8	36.3	35.6
2003	36.4	39.6	34.3
2004	36.2	43.8	37.7
2005	37.4	36.8	34.0
2006	39.2	36.7	38.9
2007	31.4	37.8	37.4
2008	36.9	35.2	33.3
2009	34.1	44.7	34.7
2010	31.5	34.6	33.7
2011	36.4	38.5	36.9
2012	34.1	37.5	37.0
All Years (Weighted)	36.2	39.2	35.2
Deep, Lowland Drainage Lakes	49.4	49.7	46.2
NLF Ecoregion	48.1	47.5	45.7

	Secchi (feet)				Chlorophyll-*a* (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
Year	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1986	3	15.3	3	15.3								
1987	9	18.3	9	18.3								
1988	6	22.8	5	20.6								
1989	7	19.3	5	20.2								
1990	7	18.1	5	17.4								
1991	9	20.3	5	21.8								
1992	8	17.9	5	18.6								
1993	7	17.1	4	19.8	3	3.4	2	3.0	3	9.3	2.0	11.5
1994	14	19.3	6	20.5	4	2.8	2	3.0	4	7.0	2.0	8.0
1995	14	17.2	6	18.8	3	3.2	1	1.8	3	7.7	2.0	7.5
1996	13	17.3	10	18.4	5	3.8	4	3.7	2	9.5	1.0	8.0
1997	10	17.7	5	19.2	4	2.5	3	2.1	5	15.4	3.0	14.7
1998	11	17.5	7	17.2	4	1.9	3	2.0	4	8.5	2.0	6.0
1999	10	17.6	6	19.5	4	1.5	3	1.5	4	7.5	2.0	8.0
2000	15	15.6	8	18.0	3	3.4	2	3.2	8	12.3	6.0	10.3
2001	10	14.5	6	16.5	3	2.7	2	2.1	5	10.0	3.0	10.0
2002	10	16.3	6	17.8	3	2.8	2	1.8	5	11.2	3.0	10.3
2003	14	17.3	8	19.5	4	2.9	3	2.5	5	11.6	3.0	9.3
2004	13	15.1	8	15.4	4	4.4	3	3.8	7	10.3	4.0	9.3
2005	11	18.2	7	20.0	4	2.4	3	1.9	5	10.2	3.0	10.0
2006	13	13.2	7	14.1	4	2.1	3	1.9	5	12.2	3.0	11.3
2007	11	17.1	8	15.8	5	2.1	5	2.1	6	7.8	5.0	6.6
2008	10	20.0	9	20.9	3	1.6	3	1.6	4	10.8	3.0	9.7
2009	8	18.8	6	19.0	3	4.2	3	4.2	4	8.8	3.0	8.0
2010	8	20.9	5	20.4	3	1.5	3	1.5	4	6.8	3.0	6.7
2011	7	16.6	6	16.3	3	2.2	3	2.2	4	9.0	3.0	9.3
2012	8	16.3	6	16.2	4	3.2	3	2.0	5	10.4	3.0	8.0
All Years (Weighted)		17.4		18.3		2.7		2.4		10.1		9.2
Deep, Lowland Drainage Lakes				8.5				7.0				23.0
NLF Ecoregion				8.9				5.6				21.0

July 2012 N: 370.0
July 2012 P: 7.0

Summer 2012 N:P 53 :1

D

APPENDIX D

Watershed Analysis WiLMS Results

Date: 3/13/2013 Direct WS_Model without Franklin Lake input

Lake Id: Butternut
Watershed Id: 0

Hydrologic and Morphometric Data

Tributary Drainage Area: 3085.0 acre
Total Unit Runoff: 13.1 in.
Annual Runoff Volume: 3367.8 acre-ft
Lake Surface Area <As>: 1254 acre
Lake Volume <V>: 25169 acre-ft
Lake Mean Depth <z>: 20.1 ft
Precipitation - Evaporation: 5.3 in.
Hydraulic Loading: 3921.6 acre-ft/year
Areal Water Load <qs>: 3.1 ft/year
Lake Flushing Rate <p>: 0.16 1/year
Water Residence Time: 6.42 year
Observed spring overturn total phosphorus (SPO): 13 mg/m^3
Observed growing season mean phosphorus (GSM): 14 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre	Low	Most Likely	High	Loading %	Low	Most Likely	High
	(ac)	Loading (kg/ha-year)				Loading (kg/year)		
Row Crop AG	0.0	0.50	1.00	3.00	0.0	0	0	0
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	144	0.10	0.30	0.50	6.1	6	17	29
HD Urban (1/8 Ac)	0.0	1.00	1.50	2.00	0.0	0	0	0
MD Urban (1/4 Ac)	0.0	0.30	0.50	0.80	0.0	0	0	0
Rural Res (>1 Ac)	0.0	0.05	0.10	0.25	0.0	0	0	0
Wetlands	1102	0.10	0.10	0.10	15.7	45	45	45
Forest	1839	0.05	0.09	0.18	23.5	37	67	134
Lake Surface	1254.0	0.10	0.30	1.00	53.5	51	152	507

POINT SOURCE DATA

Point Sources	Water Load	Low	Most Likely	High	Loading %
	(m^3/year)	(kg/year)	(kg/year)	(kg/year)	

SEPTIC TANK DATA

Description	Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)	0.3	0.5	0.8	
# capita-years	66			

% Phosphorus Retained by Soil	98	90	80	
Septic Tank Loading (kg/year)	0.40	3.30	10.56	1.2

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	306.0	627.5	1600.0	100.0
Total Loading (kg)	138.8	284.6	725.8	100.0
Areal Loading (lb/ac-year)	0.24	0.50	1.28	0.0
Areal Loading (mg/m^2-year)	27.35	56.08	143.01	0.0
Total PS Loading (lb)	0.0	0.0	0.0	0.0
Total PS Loading (kg)	0.0	0.0	0.0	0.0
Total NPS Loading (lb)	193.2	284.5	457.9	98.8
Total NPS Loading (kg)	87.6	129.1	207.7	98.8

Phosphorus Prediction and Uncertainty Analysis Module

Date: 3/13/2013 Scenario: 5
Observed spring overturn total phosphorus (SPO): 13.0 mg/m^3
Observed growing season mean phosphorus (GSM): 14.0 mg/m^3
Back calculation for SPO total phosphorus: 0.0 mg/m^3
Back calculation GSM phosphorus: 0.0 mg/m^3
% Confidence Range: 70%
Nurenberg Model Input - Est. Gross Int. Loading: 0 kg

Lake Phosphorus Model	Low Total P (mg/m^3)	Most Likely Total P (mg/m^3)	High Total P (mg/m^3)	Predicted -Observed (mg/m^3)	% Dif.
Walker, 1987 Reservoir	11	22	57	8	57
Canfield-Bachmann, 1981 Natural Lake	9	15	28	1	7
Canfield-Bachmann, 1981 Artificial Lake	10	16	26	2	14
Rechow, 1979 General	2	4	11	-10	-71
Rechow, 1977 Anoxic	13	26	68	12	86
Rechow, 1977 water load<50m/year	3	7	18	-7	-50
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	10	20	51	7	54
Vollenweider, 1982 Combined OECD	9	16	34	3	22
Dillon-Rigler-Kirchner	7	14	36	1	8
Vollenweider, 1982 Shallow Lake/Res.	6	12	28	-2	-15
Larsen-Mercier, 1976	8	17	42	4	31
Nurnberg, 1984 Oxic	6	12	31	-2	-14

Lake Phosphorus Model	Confidence	Confidence	Parameter	Back	Model

	Lower Bound	Upper Bound	Fit?	Calculation (kg/year)	Type
Walker, 1987 Reservoir	13	45	Tw	0	GSM
Canfield-Bachmann, 1981 Natural Lake	5	43	FIT	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	5	46	FIT	1	GSM
Rechow, 1979 General	2	9	L	0	GSM
Rechow, 1977 Anoxic	16	53	FIT	0	GSM
Rechow, 1977 water load<50m/year	4	14	FIT	0	GSM
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	10	42	FIT	0	SPO
Vollenweider, 1982 Combined OECD	8	31	FIT	0	ANN
Dillon-Rigler-Kirchner	8	28	L qs p	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	6	24	FIT	0	ANN
Larsen-Mercier, 1976	10	33	P Pin	0	SPO
Nurnberg, 1984 Oxic	6	25	FIT	0	ANN

Water and Nutrient Outflow Module

Date: 3/13/2013 Scenario: 4
Average Annual Surface Total Phosphorus: 13.5mg/m^3
Annual Discharge: 3.92E+003 AF => 4.84E+006 m^3
Annual Outflow Loading: 137.8 LB => 62.5 kg

Date: 3/11/2013 Scenario: Direct WS including Franklin Lake Point Source

Lake Id: Butternut Lake
Watershed Id: 0

Hydrologic and Morphometric Data

Tributary Drainage Area: 3084.5 acre This is the direct WS acreage.
Total Unit Runoff: 13.1 in.
Annual Runoff Volume: 3367.2 acre-ft
Lake Surface Area <As>: 1254 acre
Lake Volume <V>: 25169 acre-ft
Lake Mean Depth <z>: 20.1 ft
Precipitation - Evaporation: 5.3 in.
Hydraulic Loading: 7455.8 acre-ft/year
Areal Water Load <qs>: 5.9 ft/year
Lake Flushing Rate <p>: 0.30 1/year
Water Residence Time: 3.38 year
Observed spring overturn total phosphorus (SPO): 13.0 mg/m^3
Observed growing season mean phosphorus (GSM): 14.0 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre (ac)	Low Loading (kg/ha-year)	Most Likely Loading (kg/ha-year)	High Loading (kg/ha-year)	Loading %	Low Loading (kg/year)	Most Likely Loading (kg/year)	High Loading (kg/year)
Row Crop AG	0.0	0.50	1.00	3.00	0.0	0	0	0
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	143.8	0.10	0.30	0.50	5.4	6	17	29
HD Urban (1/8 Ac)	0.0	1.00	1.50	2.00	0.0	0	0	0
MD Urban (1/4 Ac)	0.0	0.30	0.50	0.80	0.0	0	0	0
Rural Res (>1 Ac)	0.0	0.05	0.10	0.25	0.0	0	0	0
Wetlands	1102	0.10	0.10	0.10	13.7	45	45	45
Forest	1838.7	0.05	0.09	0.18	20.6	37	67	134
Lake Surface	1254.0	0.10	0.30	1.00	46.9	51	152	507

POINT SOURCE DATA

Point Sources	Water Load (m^3/year)	Low (kg/year)	Most Likely (kg/year)	High (kg/year)	Loading %
Franklin Lake	4360000.0	0.0	39.8	0.0	12.3

SEPTIC TANK DATA

Description		Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)		0.3	0.5	0.8	
# capita-years	66				
% Phosphorus Retained by Soil		98	90	80	
Septic Tank Loading (kg/year)		0.40	3.30	10.56	1.0

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	305.9	715.1	1599.9	100.0
Total Loading (kg)	138.8	324.4	725.7	100.0
Areal Loading (lb/ac-year)	0.24	0.57	1.28	0.0
Areal Loading (mg/m^2-year)	27.34	63.92	143.00	0.0
Total PS Loading (lb)	0.0	87.7	0.0	12.3
Total PS Loading (kg)	0.0	39.8	0.0	12.3
Total NPS Loading (lb)	193.2	284.5	457.8	86.7
Total NPS Loading (kg)	87.6	129.0	207.6	86.7

Phosphorus Prediction and Uncertainty Analysis Module

Date: 3/11/2013 Scenario: 2
Observed spring overturn total phosphorus (SPO): 13.0 mg/m^3
Observed growing season mean phosphorus (GSM): 14.0 mg/m^3
Back calculation for SPO total phosphorus: 0.0 mg/m^3
Back calculation GSM phosphorus: 0.0 mg/m^3
% Confidence Range: 70%
Nurenberg Model Input - Est. Gross Int. Loading: 0 kg

Lake Phosphorus Model	Low Total P (mg/m^3)	Most Likely Total P (mg/m^3)	High Total P (mg/m^3)	Predicted -Observed (mg/m^3)	% Dif.
Walker, 1987 Reservoir	7	17	37	3	21
Canfield-Bachmann, 1981 Natural Lake	7	14	24	0	0
Canfield-Bachmann, 1981 Artificial Lake	8	14	23	0	0
Rechow, 1979 General	2	5	10	-9	-64
Rechow, 1977 Anoxic	9	21	46	7	50
Rechow, 1977 water load<50m/year	3	7	16	-7	-50
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	6	15	32	2	15
Vollenweider, 1982 Combined OECD	6	12	24	-2	-15
Dillon-Rigler-Kirchner	4	9	20	-4	-31
Vollenweider, 1982 Shallow Lake/Res.	4	9	19	-5	-37

Larsen-Mercier, 1976	5	12	28	-1	-8
Nurnberg, 1984 Oxic	4	9	19	-5	-36

Lake Phosphorus Model	**Confidence** Lower Bound	**Confidence** Upper Bound	**Parameter** Fit?	**Back** Calculation (kg/year)	**Model** Type
Walker, 1987 Reservoir	9	31	Tw	0	GSM
Canfield-Bachmann, 1981 Natural Lake	4	40	FIT	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	4	40	FIT	1	GSM
Rechow, 1979 General	3	9	L	0	GSM
Rechow, 1977 Anoxic	12	38	FIT	0	GSM
Rechow, 1977 water load<50m/year	4	13	FIT	0	GSM
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	7	29	FIT	0	SPO
Vollenweider, 1982 Combined OECD	6	23	FIT	0	ANN
Dillon-Rigler-Kirchner	5	16	L	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	4	17	FIT	0	ANN
Larsen-Mercier, 1976	7	22	Pin	0	SPO
Nurnberg, 1984 Oxic	5	17	FIT	0	ANN

Water and Nutrient Outflow Module

Date: 3/11/2013 Scenario: 2
Average Annual Surface Total Phosphorus: 13.5mg/m^3
Annual Discharge: 7.46E+003 AF => 9.20E+006 m^3
Annual Outflow Loading: 261.7 LB => 118.7 kg

Date: 3/8/2013 Current

Lake Id: Franklin Lake
Watershed Id: 0

Hydrologic and Morphometric Data

Tributary Drainage Area: 2900.0 acre
Total Unit Runoff: 13.1 in.
Annual Runoff Volume: 3165.8 acre-ft
Lake Surface Area <As>: 843 acre
Lake Volume <V>: 16865 acre-ft
Lake Mean Depth <z>: 20.0 ft
Precipitation - Evaporation: 5.3 in.
Hydraulic Loading: 3538.2 acre-ft/year
Areal Water Load <qs>: 4.2 ft/year
Lake Flushing Rate <p>: 0.21 1/year
Water Residence Time: 4.77 year
Observed spring overturn total phosphorus (SPO): 9 mg/m^3
Observed growing season mean phosphorus (GSM): 10.1 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre	Low	Most Likely	High	Loading %	Low	Most Likely	High
	(ac)	Loading (kg/ha-year)				Loading (kg/year)		
Row Crop AG	0.0	0.50	1.00	3.00	0.0	0	0	0
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	183	0.10	0.30	0.50	9.7	7	22	37
HD Urban (1/8 Ac)	0.0	1.00	1.50	2.00	0.0	0	0	0
MD Urban (1/4 Ac)	0.0	0.30	0.50	0.80	0.0	0	0	0
Rural Res (>1 Ac)	3	0.05	0.10	0.25	0.1	0	0	0
Wetlands	705	0.10	0.10	0.10	12.5	29	29	29
Forest	2009	0.05	0.09	0.18	32.1	41	73	146
Lake Surface	843.0	0.10	0.30	1.00	44.9	34	102	341

POINT SOURCE DATA

Point Sources	Water Load	Low	Most Likely	High	Loading %
	(m^3/year)	(kg/year)	(kg/year)	(kg/year)	

SEPTIC TANK DATA

Description		Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)		0.3	0.5	0.8	
# capita-years	32				
% Phosphorus Retained by Soil		98	90	80	
Septic Tank Loading (kg/year)		0.19	1.60	5.12	0.7

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	244.6	502.6	1231.3	100.0
Total Loading (kg)	111.0	228.0	558.5	100.0
Areal Loading (lb/ac-year)	0.29	0.60	1.46	0.0
Areal Loading (mg/m^2-year)	32.52	66.83	163.71	0.0
Total PS Loading (lb)	0.0	0.0	0.0	0.0
Total PS Loading (kg)	0.0	0.0	0.0	0.0
Total NPS Loading (lb)	169.0	273.5	467.8	99.3
Total NPS Loading (kg)	76.7	124.0	212.2	99.3

Phosphorus Prediction and Uncertainty Analysis Module

Date: 3/8/2013 Scenario: 1
Observed spring overturn total phosphorus (SPO): 9.0 mg/m^3
Observed growing season mean phosphorus (GSM): 10.1 mg/m^3
Back calculation for SPO total phosphorus: 0.0 mg/m^3
Back calculation GSM phosphorus: 0.0 mg/m^3
% Confidence Range: 70%
Nurenberg Model Input - Est. Gross Int. Loading: 0 kg

Lake Phosphorus Model	Low Total P (mg/m^3)	Most Likely Total P (mg/m^3)	High Total P (mg/m^3)	Predicted -Observed (mg/m^3)	% Dif.
Walker, 1987 Reservoir	10	21	51	11	109
Canfield-Bachmann, 1981 Natural Lake	10	16	29	6	59
Canfield-Bachmann, 1981 Artificial Lake	10	16	27	6	59
Rechow, 1979 General	2	5	12	-5	-50
Rechow, 1977 Anoxic	13	27	66	17	168
Rechow, 1977 water load<50m/year	4	8	20	-2	-20
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	10	20	48	11	122
Vollenweider, 1982 Combined OECD	9	15	32	5	52
Dillon-Rigler-Kirchner	6	13	31	4	44

Vollenweider, 1982 Shallow Lake/Res.	6	12	26	2	21
Larsen-Mercier, 1976	8	16	40	7	78
Nurnberg, 1984 Oxic	6	12	28	2	20

Lake Phosphorus Model	**Confidence** Lower Bound	**Confidence** Upper Bound	**Parameter** Fit?	**Back** Calculation (kg/year)	**Model** Type
Walker, 1987 Reservoir	12	41	Tw	0	GSM
Canfield-Bachmann, 1981 Natural Lake	5	46	FIT	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	5	46	FIT	1	GSM
Rechow, 1979 General	3	10	L	0	GSM
Rechow, 1977 Anoxic	16	52	FIT	0	GSM
Rechow, 1977 water load<50m/year	5	16	FIT	0	GSM
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	10	41	FIT	0	SPO
Vollenweider, 1982 Combined OECD	8	29	FIT	0	ANN
Dillon-Rigler-Kirchner	7	25	L qs p	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	6	24	FIT	0	ANN
Larsen-Mercier, 1976	10	31	P Pin	0	SPO
Nurnberg, 1984 Oxic	6	24	FIT	0	ANN

Water and Nutrient Outflow Module

Date: 3/8/2013 Scenario: 1
Average Annual Surface Total Phosphorus: 9.55mg/m^3
Annual Discharge: 3.54E+003 AF => 4.36E+006 m^3
Annual Outflow Loading: 87.7 LB => 39.8 kg

E

APPENDIX E

Aquatic Plant Survey Data

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P); Rake (R)	Comments	Total Rake Fullness	CHARA	ELEAC	ELEPA	ELOCA	HETDU	ISO_SP	JUNPE	MYRAL	MYRSI	MYRTE	NAJFL	NITELLA	POTEP	POTFO	POTGR	POTIL	POTBE	POTRI	POTRO	POTST	POTZO	SAGCR	SCHAC	VALAM	F_AGLAE
1	45.9159	-89.007426	10	Sand	Pole																												
2	45.915117	-89.00744	16		Rope																												
3	45.914334	-89.007454	16		Rope																												
4	45.913552	-89.007468	7	Sand	Pole																												
5	45.917456	-89.006276	6	Sand	Pole																												
6	45.916673	-89.00629	13	Sand	Pole																												1
7	45.915891	-89.006304	21		Rope																												
8	45.915108	-89.006318	21		Rope																												
9	45.914325	-89.006332	19		Rope																												
10	45.913542	-89.006346	17		Rope																												
11	45.912759	-89.00636	3	Sand	Pole																												
12	45.91823	-89.005141	9	Sand	Pole																												1
13	45.917447	-89.005155	13		Rope																												
14	45.916664	-89.005169	15		Rope																												
15	45.915881	-89.005183	25		Rope																												
16	45.915098	-89.005197	23		Rope																												
17	45.914315	-89.005211	21		Rope																												
18	45.913532	-89.005225	17		Rope																												
19	45.912749	-89.005239	12	Sand	Pole																												
20	45.91822	-89.004019	15		Rope																												
21	45.917437	-89.004033	19		Rope																												
22	45.916654	-89.004047	24		Rope																												
23	45.915871	-89.004061				DEEP																											
24	45.915088	-89.004075	24		Rope																												
25	45.914305	-89.004089	20		Rope																												
26	45.913522	-89.004103	16		Rope																												
27	45.912739	-89.004117	12	Rock	Pole																												
28	45.911956	-89.004131	15		Rope																												
29	45.911173	-89.004145	11	Sand	Pole																												
30	45.91821	-89.002897	14	Sand	Pole																												1
31	45.917427	-89.002911	24		Rope																												
32	45.916644	-89.002925	26			DEEP																											
33	45.915861	-89.002939				DEEP																											
34	45.915078	-89.002953	24		Rope																												
35	45.914295	-89.002967	17		Rope																												
36	45.913512	-89.002981	6	Rock	Pole																												
37	45.91273	-89.002995	13	Sand	Pole																												
38	45.911947	-89.003009	16		Rope																												
39	45.911164	-89.003023	18		Rope																												
40	45.910381	-89.003037	20		Rope																												
41	45.909598	-89.003051	20		Rope																												
42	45.908815	-89.003065	11	Sand	Pole																												
43	45.918983	-89.001761	18		Rope																												
44	45.9182	-89.001775	24		Rope																												
45	45.917417	-89.00179	27			DEEP																											
46	45.916634	-89.001804	30			DEEP																											
47	45.915851	-89.001818				DEEP																											
48	45.915069	-89.001832	24		Rope																												
49	45.914286	-89.001846	4	Rock	Pole																												1
50	45.913503	-89.00186	12	Sand	Pole																												1
51	45.91272	-89.001874	14		Rope																												
52	45.911937	-89.001888	14	Rock	Pole																												
53	45.911154	-89.001902	21		Rope																												
54	45.910371	-89.001916	22		Rope																												
55	45.909588	-89.00193	21		Rope																												
56	45.908805	-89.001944	19		Rope																												
57	45.908022	-89.001958	4	Sand	Pole																												
58	45.918973	-89.00064				DEEP																											
59	45.91819	-89.000654				DEEP																											
60	45.917407	-89.000668				DEEP																											
61	45.916625	-89.000682				DEEP																											
62	45.915842	-89.000696				DEEP																											
63	45.915059	-89.00071				DEEP																											
64	45.914276	-89.000724	11	Sand	Pole																												
65	45.913493	-89.000738	14		Rope																												
66	45.91271	-89.000752	18		Rope																												
67	45.911927	-89.000766	21		Rope																												
68	45.911144	-89.00078	24		Rope																												
69	45.910361	-89.000794	24		Rope																												
70	45.909578	-89.000808	23		Rope																												
71	45.908795	-89.000822	20		Rope																												
72	45.908012	-89.000836	6	Rock	Pole																												
73	45.919746	-88.999504	15		Rope																												
74	45.918964	-88.999518				DEEP																											
75	45.918181	-88.999532				DEEP																											
76	45.917398	-88.999546				DEEP																											
77	45.916615	-88.99956				DEEP																											
78	45.915832	-88.999574				DEEP																											
79	45.915049	-88.999588	5	Rock	Pole																												
80	45.914266	-88.999602	10	Sand	Pole																												1
81	45.913483	-88.999616	17		Rope																												
82	45.9127	-88.99963	20		Rope																												
83	45.911917	-88.999645	22		Rope																												
84	45.911134	-88.999659	25		Rope																												
85	45.910351	-88.999673				DEEP																											
86	45.909568	-88.999687	25		Rope																												
87	45.908786	-88.999701	18		Rope																												
88	45.908003	-88.999715	7	Rock	Pole																												
89	45.92052	-88.998368	8	Rock	Pole																												
90	45.919737	-88.998382				DEEP																											
91	45.918954	-88.998396				DEEP																											
92	45.918171	-88.99841				DEEP																											
93	45.917388	-88.998424				DEEP																											
94	45.916605	-88.998438				DEEP																											
95	45.915822	-88.998453				DEEP																											
96	45.915039	-88.998467	14		Rope																												1
97	45.914256	-88.998481	10	Sand	Pole																												1
98	45.913473	-88.998495	13		Rope																												
99	45.91269	-88.998509	19		Rope																												
100	45.911907	-88.998523	23		Rope																												
101	45.911124	-88.998537	24		Rope																												
102	45.910342	-88.998551				DEEP																											
103	45.909559	-88.998565				DEEP																											
104	45.908776	-88.998579	17		Rope																												
105	45.907993	-88.998593	8	Rock	Pole																												
106	45.90721	-88.998607	6	Rock	Pole																												
107	45.906427	-88.998622	10	Sand	Pole																												1
108	45.905644	-88.998636	12	Sand	Pole																												1
109	45.904861	-88.99865	8	Sand	Pole																												
110	45.92051	-88.997246	20		Rope																												
111	45.919727	-88.99726				DEEP																											
112	45.918944	-88.997274				DEEP																											
113	45.918161	-88.997289				DEEP																											
114	45.917378	-88.997303				DEEP																											
115	45.916595	-88.997317				DEEP																											
116	45.915812	-88.997331				DEEP																											
117	45.915029	-88.997345	10	Rock	Pole																												
118	45.914246	-88.997359	7	Sand	Pole																												
119	45.913463	-88.997373	13	Sand	Pole																												1
120	45.91268	-88.997387	16		Rope																												
121	45.911898	-88.997401	22		Rope																												
122	45.911115	-88.997415				DEEP																											
123	45.910332	-88.99743				DEEP																											
124	45.909549	-88.997444																															
125	45.908766	-88.997458	24		Rope																												
126	45.907983	-88.997472	11	Rock	Pole																												
127	45.9072	-88.997486				DEEP																											
128	45.906417	-88.9975	19		Rope																												
129	45.905634	-88.997514	26		Rope																												
130	45.904851	-88.997528	24		Rope																												
131	45.904068	-88.997542	14		Rope																												
132	45.9205	-88.996124				DEEP																											
133	45.919717	-88.996139				DEEP																											
134	45.918934	-88.996153				DEEP																											
135	45.918151	-88.996167				DEEP																											
136	45.917368	-88.996181				DEEP																											
137	45.916585	-88.996195				DEEP																											
138	45.915802	-88.996209	20		Rope																												
139	45.915019	-88.996223	8	Rock	Pole																												
140	45.914236	-88.996237				TERRESTRIAL																											
141	45.913454	-88.996251	1	Rock	Pole																												
142	45.912671	-88.996266	10	Rock	Pole																												
143	45.911888	-88.99628	21		Rope																												
144	45.911105	-88.996294				DEEP																											
145	45.910322	-88.996308				DEEP																											
146	45.909539	-88.996322				DEEP																											
147	45.908756	-88.996336				DEEP																											
148	45.907973	-88.99635				DEEP																											
149	45.90719	-88.996364				DEEP																											
150	45.906407	-88.996379				DEEP																											
151	45.905624	-88.996393	30		Rope																												
152	45.904841	-88.996407	27		Rope																												
153	45.904058	-88.996421	23		Rope																												
154	45.903276	-88.996435	12	Sand	Pole		1																				1					
155	45.921273	-88.994989	16		Rope																												
156	45.92049	-88.995003				DEEP																											
157	45.919707	-88.995017				DEEP																											
158	45.918924	-88.995031				DEEP																											
159	45.918141	-88.995045				DEEP																											
160	45.917358	-88.995059				DEEP																											
161	45.916575	-88.995073				DEEP																											
162	45.915792	-88.995087	17		Rope																												
163	45.91501	-88.995102	18		Rope																												
164	45.914227	-88.995116	18		Rope																												
165	45.913444	-88.99513	20		Rope																												
166	45.912661	-88.995144	13	Rock	Pole																												
167	45.911878	-88.995158	15		Rope																												
168	45.911095	-88.995172				DEEP																											
169	45.910312	-88.995186				DEEP																											
170	45.909529	-88.9952				DEEP																											
171	45.908746	-88.995215				DEEP																											
172	45.907963	-88.995229				DEEP																											
173	45.90718	-88.995243				DEEP																											
174	45.906397	-88.995257				DEEP																											
175	45.905614	-88.995271				DEEP																											
176	45.904832	-88.995285	29		Rope																												
177	45.904049	-88.995299	22		Rope																												
178	45.903266	-88.995314	12	Sand	Pole		1				1																					
179	45.922829	-88.993838	5	Rock	Pole																												
180	45.922046	-88.993853	23		Rope																												
181	45.921263	-88.993867	28			DEEP																											
182	45.92048	-88.993881				DEEP																											
183	45.919697	-88.993895				DEEP																											
184	45.918914	-88.993909				DEEP																											
185	45.918131	-88.993923				DEEP																											
186	45.917348	-88.993937				DEEP																											
187	45.916565	-88.993952				DEEP																											
188	45.915783	-88.993966	15		Rope																												
189	45.915	-88.99398	19		Rope																												
190	45.914217	-88.993994	24		Rope																												
191	45.913434	-88.994008				DEEP																											

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P); Rake (R)	Comments	Total Rake Fullness	CHARA	ELEAC	ELEPA	ELOCA	HETDU	ISO_SP	JUNPE	MYRAL	MYRSI	MYRTE	NAJFL	NITELLA	POTEP	POTFO	POTGR	POTIL	POTBE	POTRI	POTRO	POTST	POTZO	SAGCR	SCHAC	VALAM	F_AGLAE
192	45.912651	-88.994022				DEEP																										
193	45.911868	-88.994037				DEEP																										
194	45.911085	-88.994051				DEEP																										
195	45.910302	-88.994065				DEEP																										
196	45.909519	-88.994079				DEEP																										
197	45.908736	-88.994093				DEEP																										
198	45.907953	-88.994107				DEEP																										
199	45.90717	-88.994121				DEEP																										
200	45.906388	-88.994136				DEEP																										
201	45.905605	-88.99415				DEEP																										
202	45.904822	-88.994164	30		Rope																											
203	45.904039	-88.994178	25		Rope																											
204	45.903256	-88.994192	12	Sand	Pole																											
205	45.923602	-88.992702	5	Sand	Pole																											
206	45.922819	-88.992717	22		Rope																											
207	45.922036	-88.992731	27			DEEP																										
208	45.921253	-88.992745	29			DEEP																										
209	45.92047	-88.992759				DEEP																										
210	45.919687	-88.992773				DEEP																										
211	45.918904	-88.992787				DEEP																										
212	45.918121	-88.992802				DEEP																										
213	45.917339	-88.992816				DEEP																										
214	45.916556	-88.99283				DEEP																										
215	45.915773	-88.992844	20		Rope																											
216	45.91499	-88.992858	22		Rope																											
217	45.914207	-88.992872	25		Rope																											
218	45.913424	-88.992887				DEEP																										
219	45.912641	-88.992901				DEEP																										
220	45.911858	-88.992915				DEEP																										
221	45.911075	-88.992929				DEEP																										
222	45.910292	-88.992943				DEEP																										
223	45.909509	-88.992957				DEEP																										
224	45.908726	-88.992972				DEEP																										
225	45.907943	-88.992986				DEEP																										
226	45.907161	-88.993				DEEP																										
227	45.906378	-88.993014				DEEP																										
228	45.905595	-88.993028				DEEP																										
229	45.904812	-88.993042	30		Rope																											
230	45.904029	-88.993056	28		Rope																											
231	45.903246	-88.993071	9	Rock	Pole																											
232	45.923592	-88.991581	16		Rope																											
233	45.922809	-88.991595	27			DEEP																										
234	45.922026	-88.991609	30			DEEP																										
235	45.921243	-88.991623	31			DEEP																										
236	45.92046	-88.991637				DEEP																										
237	45.919677	-88.991651				DEEP																										
238	45.918894	-88.991666				DEEP																										
239	45.918112	-88.99168				DEEP																										
240	45.917329	-88.991694	24		Rope																											
241	45.916546	-88.991708	24		Rope																											
242	45.915763	-88.991722	24		Rope																											
243	45.91498	-88.991737				DEEP																										
244	45.914197	-88.991751				DEEP																										
245	45.913414	-88.991765				DEEP																										
246	45.912631	-88.991779				DEEP																										
247	45.911848	-88.991793				DEEP																										
248	45.911065	-88.991807				DEEP																										
249	45.910282	-88.991822				DEEP																										
250	45.909499	-88.991836				DEEP																										
251	45.908717	-88.99185				DEEP																										
252	45.907934	-88.991864				DEEP																										
253	45.907151	-88.991878				DEEP																										
254	45.906368	-88.991893				DEEP																										
255	45.905585	-88.991907				DEEP																										
256	45.904802	-88.991921				DEEP																										
257	45.904019	-88.991935	30		Rope																											1
258	45.903236	-88.991949	20		Rope																											
259	45.925148	-88.99043	3	Sand	Pole																											
260	45.924365	-88.990445	13	Sand	Pole																											
261	45.923582	-88.990459	25		Rope																											
262	45.922799	-88.990473				DEEP																										
263	45.922016	-88.990487				DEEP																										
264	45.921233	-88.990501				DEEP																										
265	45.92045	-88.990516				DEEP																										
266	45.919668	-88.99053				DEEP																										
267	45.918885	-88.990544				DEEP																										
268	45.918102	-88.990558				DEEP																										
269	45.917319	-88.990572	21		Rope																											
270	45.916536	-88.990587	19		Rope																											
271	45.915753	-88.990601				DEEP																										
272	45.91497	-88.990615				DEEP																										
273	45.914187	-88.990629				DEEP																										
274	45.913404	-88.990643				DEEP																										
275	45.912621	-88.990657				DEEP																										
276	45.911838	-88.990672				DEEP																										
277	45.911055	-88.990686				DEEP																										
278	45.910272	-88.9907				DEEP																										
279	45.90949	-88.990714				DEEP																										
280	45.908707	-88.990728				DEEP																										
281	45.907924	-88.990743				DEEP																										
282	45.907141	-88.990757				DEEP																										
283	45.906358	-88.990771				DEEP																										
284	45.905575	-88.990785				DEEP																										
285	45.904792	-88.990799				DEEP																										
286	45.904009	-88.990814	30		Rope																											
287	45.903226	-88.990828	17		Rope																											
288	45.925138	-88.989308	11	Sand	Pole		1																				1					
289	45.924355	-88.989323	21		Rope																											
290	45.923572	-88.989337	25		Rope																											
291	45.922789	-88.989351				DEEP																										
292	45.922006	-88.989365				DEEP																										
293	45.921223	-88.98938				DEEP																										
294	45.920441	-88.989394				DEEP																										
295	45.919658	-88.989408				DEEP																										
296	45.918875	-88.989422				DEEP																										
297	45.918092	-88.989436				DEEP																										
298	45.917309	-88.989451	15		Rope																											
299	45.916526	-88.989465	23		Rope																											
300	45.915743	-88.989479				DEEP																										
301	45.91496	-88.989493				DEEP																										
302	45.914177	-88.989507				DEEP																										
303	45.913394	-88.989522				DEEP																										
304	45.912611	-88.989536				DEEP																										
305	45.911828	-88.98955				DEEP																										
306	45.911045	-88.989564				DEEP																										
307	45.910263	-88.989578				DEEP																										
308	45.90948	-88.989593				DEEP																										
309	45.908697	-88.989607				DEEP																										
310	45.907914	-88.989621				DEEP																										
311	45.907131	-88.989635				DEEP																										
312	45.906348	-88.98965				DEEP																										
313	45.905565	-88.989664				DEEP																										
314	45.904782	-88.989678				DEEP																										
315	45.903999	-88.989692	29		Rope																											
316	45.903216	-88.989706	11	Sand	Pole		2				1																2					
317	45.925911	-88.988172	7	Sand	Pole		3														1	3										
318	45.925128	-88.988187	18		Rope		1												1													1
319	45.924345	-88.988201	22		Rope		1												1													1
320	45.923562	-88.988215	26			DEEP																										
321	45.922779	-88.988229	28			DEEP																										
322	45.921996	-88.988243	32			DEEP																										
323	45.921214	-88.988258				DEEP																										
324	45.920431	-88.988272				DEEP																										
325	45.919648	-88.988286				DEEP																										
326	45.918865	-88.9883				DEEP																										
327	45.918082	-88.988315				DEEP																										
328	45.917299	-88.988329				DEEP																										
329	45.916516	-88.988343				DEEP																										
330	45.915733	-88.988357				DEEP																										
331	45.91495	-88.988372				DEEP																										
332	45.914167	-88.988386				DEEP																										
333	45.913384	-88.9884				DEEP																										
334	45.912601	-88.988414				DEEP																										
335	45.911818	-88.988428				DEEP																										
336	45.911036	-88.988443				DEEP																										
337	45.910253	-88.988457				DEEP																										
338	45.90947	-88.988471				DEEP																										
339	45.908687	-88.988485				DEEP																										
340	45.907904	-88.9885				DEEP																										
341	45.907121	-88.988514				DEEP																										
342	45.906338	-88.988528				DEEP																										
343	45.905555	-88.988542				DEEP																										
344	45.904772	-88.988556				DEEP																										
345	45.903989	-88.988571	27		Rope																											
346	45.903206	-88.988585	3	Rock	Pole																											
347	45.896943	-88.988699	1	Rock	Pole																											
348	45.925901	-88.98705	13	Sand	Pole																											1
349	45.925118	-88.987065	19		Rope		1												1													
350	45.924335	-88.987079	22		Rope																											
351	45.923552	-88.987093	23		Rope																											1
352	45.922769	-88.987107	17		Rope		1														1											
353	45.921986	-88.987122	19		Rope																											
354	45.921204	-88.987136	33			DEEP																										
355	45.920421	-88.98715	35																													
356	45.919638	-88.987164				DEEP																										
357	45.918855	-88.987179				DEEP																										
358	45.918072	-88.987193				DEEP																										
359	45.917289	-88.987207				DEEP																										
360	45.916506	-88.987221				DEEP																										
361	45.915723	-88.987236				DEEP																										
362	45.91494	-88.98725				DEEP																										
363	45.914157	-88.987264				DEEP																										
364	45.913374	-88.987278				DEEP																										
365	45.912591	-88.987293				DEEP																										
366	45.911809	-88.987307				DEEP																										
367	45.911026	-88.987321				DEEP																										
368	45.910243	-88.987335				DEEP																										
369	45.90946	-88.98735				DEEP																										
370	45.908677	-88.987364				DEEP																										
371	45.907894	-88.987378				DEEP																										
372	45.907111	-88.987392				DEEP																										
373	45.906328	-88.987407				DEEP																										
374	45.905545	-88.987421				DEEP																										
375	45.904762	-88.987435	29		Rope																											
376	45.903979	-88.987449	10	Rock	Pole																											
377	45.903196	-88.987463		Rock	Pole																											
378	45.898499	-88.987549	26		Rope																											
379	45.897716	-88.987563	26		Rope																											
380	45.896933	-88.987577	26		Rope																											
381	45.89615	-88.987592	12	Sand	Pole																											
382	45.925891	-88.985929	10	Sand	Pole		2				1							1									1				1	
383	45.925108	-88.985943	18		Rope																											
384	45.924325	-88.985957	16		Rope		1											1														
385	45.923542	-88.985971	3	Sand	Pole		1											1														
386	45.922759	-88.985986	3	Sand	Pole		1										1															
387	45.921977	-88.986	6	Sand	Pole		1	1										1					1									
388	45.921194	-88.986014	14		Rope																											
389	45.920411	-88.986028	32			DEEP																										
390	45.919628	-88.986043				DEEP																										
391	45.918845	-88.986057				DEEP																										
392	45.918062	-88.986071				DEEP																										
393	45.917279	-88.986085				DEEP																										
394	45.916496	-88.9861				DEEP																										
395	45.915713	-88.986114				DEEP																										
396	45.91493	-88.986128				DEEP																										
397	45.914147	-88.986142				DEEP																										
398	45.913364	-88.986157				DEEP																										
399	45.912582	-88.986171				DEEP																										
400	45.911799	-88.986185	33			DEEP																										
401	45.911016	-88.9862	34			DEEP																										

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P); Rake (R)	Comments	Total Rake Fullness	CHARA	ELEAC	ELEPA	ELOCA	HETDU	ISO_SP	JUNPE	MYRAL	MYRSI	MYRTE	NAJFL	NITELLA	POTEP	POTFO	POTGR	POTIL	POTBE	POTRI	POTRO	POTST	POTZO	SAGCR	SCHAC	VALAM	F_AGLAE
402	45.910233	-88.986214	33			DEEP																										
403	45.90945	-88.986228	33			DEEP																										
404	45.908667	-88.986242	32			DEEP																										
405	45.907884	-88.986257				DEEP																										
406	45.907101	-88.986271				DEEP																										
407	45.906318	-88.986285				DEEP																										
408	45.905535	-88.986299				DEEP																										
409	45.904752	-88.986314	30		Rope																											
410	45.903969	-88.986328	2	Rock	Pole																											
411	45.900055	-88.986399	16		Rope																											
412	45.899272	-88.986413	29		Rope																											1
413	45.898489	-88.986428	28		Rope																											
414	45.897706	-88.986442	27		Rope																											
415	45.896923	-88.986456	27		Rope																											
416	45.89614	-88.98647	24		Rope																											
417	45.921967	-88.984878	2	Sand	Pole																											
418	45.921184	-88.984892	5	Sand	Pole		2	1															1						1			
419	45.920401	-88.984907	14		Rope																											
420	45.919618	-88.984921	30			DEEP																										
421	45.918835	-88.984935	37			DEEP																										
422	45.918052	-88.984949				DEEP																										
423	45.917269	-88.984964				DEEP																										
424	45.916486	-88.984978				DEEP																										
425	45.915703	-88.984992				DEEP																										
426	45.91492	-88.985007				DEEP																										
427	45.914137	-88.985021				DEEP																										
428	45.913354	-88.985035	36			DEEP																										
429	45.912572	-88.985049	29			DEEP																										
430	45.911789	-88.985064	29		Rope																											
431	45.911006	-88.985078	27		Rope																											
432	45.910223	-88.985092	24		Rope																											
433	45.90944	-88.985106	30		Rope																											
434	45.908657	-88.985121	31			DEEP																										
435	45.907874	-88.985135				DEEP																										
436	45.907091	-88.985149				DEEP																										
437	45.906308	-88.985164	21		Rope																											
438	45.905525	-88.985178	23		Rope																											
439	45.904742	-88.985192	26		Rope																											
440	45.903959	-88.985206	2	Rock	Pole																											
441	45.902394	-88.985235	1	Sand	Pole																											
442	45.901611	-88.985249	9	Sand	Pole																											
443	45.900828	-88.985263	31		Rope																											
444	45.900045	-88.985278	30		Rope																											
445	45.899262	-88.985292	29		Rope																											
446	45.898479	-88.985306	28		Rope																											1
447	45.897696	-88.98532	26		Rope																											
448	45.896913	-88.985335	26		Rope																											
449	45.89613	-88.985349	24		Rope																											1
450	45.920391	-88.983785	2	Sand	Pole		1																								1	
451	45.919608	-88.983799	6	Sand	Pole		2	1										2				2										
452	45.918825	-88.983813	22		Rope																											
453	45.918042	-88.983828	36			DEEP																										
454	45.917259	-88.983842				DEEP																										
455	45.916476	-88.983856				DEEP																										
456	45.915693	-88.983871				DEEP																										
457	45.91491	-88.983885	39			DEEP																										
458	45.914127	-88.983899	32			DEEP																										
459	45.913345	-88.983913	29			DEEP																										
460	45.912562	-88.983928	21		Rope																											
461	45.911779	-88.983942	14	Sand	Pole																											
462	45.910996	-88.983956	7	Rock	Pole																											
463	45.910213	-88.983971	10	Sand	Pole																											
464	45.90943	-88.983985	11	Rock	Pole																											
465	45.908647	-88.983999	31			DEEP																										
466	45.907864	-88.984013				DEEP																										
467	45.907081	-88.984028	21		Rope																											
468	45.906298	-88.984042	24		Rope																											
469	45.905515	-88.984056	27		Rope																											
470	45.904732	-88.984071	27		Rope																											
471	45.903949	-88.984085	20		Rope																											
472	45.903167	-88.984099	22		Rope																											
473	45.902384	-88.984113	29		Rope																											1
474	45.901601	-88.984128				DEEP																										
475	45.900818	-88.984142	30		Rope																											
476	45.900035	-88.984156	29		Rope																											
477	45.899252	-88.984171	28		Rope																											1
478	45.898469	-88.984185	28		Rope																											
479	45.897686	-88.984199	26		Rope																											
480	45.896903	-88.984213	24		Rope																											1
481	45.89612	-88.984228	8	Sand	Pole		2	1			1					1																
482	45.895337	-88.984242		Sand	Pole		1											1														
483	45.918815	-88.982692	3	Sand	Pole																											
484	45.918032	-88.982706	7	Sand	Pole		2									1						1			1							
485	45.917249	-88.98272	24		Rope																											
486	45.916466	-88.982735	32			DEEP																										
487	45.915683	-88.982749	30			DEEP																										
488	45.9149	-88.982763	31			DEEP																										
489	45.914117	-88.982778	22		Rope		1												1													
490	45.913335	-88.982792	15		Rope																											
491	45.912552	-88.982806	14		Rope																											
492	45.911769	-88.98282	6	Sand	Pole																											
493	45.910986	-88.982835	6	Sand	Pole																											
494	45.910203	-88.982849	11	Sand	Pole																											
495	45.90942	-88.982863	7	Rock	Pole																											
496	45.908637	-88.982878	9	Rock	Pole																											
497	45.907854	-88.982892	10	Rock	Pole																											
498	45.907071	-88.982906	18		Rope																											
499	45.906288	-88.982921	23		Rope																											
500	45.905505	-88.982935	27		Rope																											
501	45.904722	-88.982949	29		Rope																											
502	45.903939	-88.982963	29		Rope																											
503	45.903157	-88.982978	30		Rope																											
504	45.902374	-88.982992	30		Rope																											
505	45.901591	-88.983006				DEEP																										
506	45.900808	-88.983021	30		Rope																											
507	45.900025	-88.983035	30		Rope																											
508	45.899242	-88.983049	30		Rope																											
509	45.898459	-88.983064	27		Rope																											
510	45.897676	-88.983078	20		Rope																											
511	45.896893	-88.983092	7	Sand	Pole		1																									
512	45.89611	-88.983106		Sand	Pole		1		1	1			1	1																1		
513	45.918022	-88.981584	1	Sand	Pole		1			1				1															1			
514	45.917239	-88.981599	1	Rock	Pole		1			1																						
515	45.916456	-88.981613	4	Sand	Pole		1	1														1							1			
516	45.915673	-88.981627	6	Sand	Pole		1					1						1													1	
517	45.91489	-88.981642	6	Rock	Pole		2											1	1			2	1				1					
518	45.914107	-88.981656	7	Sand	Pole		2															2	1				1					1
519	45.913325	-88.98167	18		Rope																											1
520	45.912542	-88.981685	23		Rope																											
521	45.911759	-88.981699	14		Rope																											
522	45.910976	-88.981713	11	Sand	Pole																											
523	45.910193	-88.981727	3	Rock	Pole																											
524	45.90941	-88.981742	10	Sand	Pole																											
525	45.908627	-88.981756	1	Rock	Pole																											

Sample point #	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (Muck, S=Sand, R=Rock)	Pole (P)- Rake (R)	Comments	Total Rake Fullness	CHARA	ELEAC	ELEPA	ELICA	NITEU	ISO_SP	JUNPE	MYRPA	MYRSI	MYRTE	NAJFL	NYBELLA	POTEP	POTPU	POTPP	POTZ_L	POTRE	POTRI	POTRO	POTST	POTZO	SAGGR	SCHAC	TYLAM	P_ACLAE
526	45.907844	-88.98177				TERRESTRIAL																										
527	45.907061	-88.981785	9	Rock	Pole																											
528	45.906728	-88.981799	18		Rope																											
529	45.905485	-88.981813	22		Rope																											
530	45.904712	-88.981828	27		Rope																											
531	45.903939	-88.981843	30		Rope																											
532	45.903147	-88.981856	30		Rope																											
533	45.902364	-88.981871	29		Rope																											
534	45.901581	-88.981885	30		Rope																											
535	45.900798	-88.981899				DEEP																										
536	45.900015	-88.981914				DEEP																										
537	45.899232	-88.981928	26		Rope																											
538	45.898449	-88.981942	4	Sand	Pole		1																									
539	45.91488	-88.98082	2	Rock	Pole																											
540	45.914057	-88.980534	3	Rock	Pole																											
541	45.913313	-88.980549	11	Sand	Pole		1															1										
542	45.912532	-88.980563	26			DEEP																										
543	45.911749	-88.980577	27		Rope																											
544	45.910966	-88.980592	20		Rope																											
545	45.910183	-88.980606	22		Rope																											
546	45.9094	-88.98062	13	Sand	Pole																											
547	45.908617	-88.980635	9	Sand	Pole																											
548	45.907834	-88.980649	12	Sand	Pole		1				1					1			1						1							
549	45.907051	-88.980663	6	Sand	Pole																											
550	45.906269	-88.980692	7	Rock	Pole																											
551	45.904703	-88.980706	26		Rope																											
552	45.90392	-88.980721	30		Rope																											
553	45.903137	-88.980735	30		Rope																											
554	45.902354	-88.980749	30		Rope																											
555	45.901571	-88.980764				DEEP																										
556	45.900788	-88.980778				DEEP																										
557	45.900005	-88.980792	28		Rope																											
558	45.899222	-88.980807	4	Rock	Pole																											
559	45.913305	-88.979427	4	Sand	Pole		1	1								1																
560	45.912522	-88.979441	23		Rope																											
561	45.911739	-88.979456	30		Rope																											
562	45.910956	-88.97947	34			DEEP																										
563	45.910173	-88.979484	33			DEEP																										
564	45.90939	-88.979499	23		Rope																											
565	45.908607	-88.979513	14		Rope																											
566	45.907824	-88.979527	9	Sand	Pole																											
567	45.907041	-88.979542	9	Sand	Pole		2				2											1										
568	45.906258	-88.979556	9	Sand	Pole		3				3																					
569	45.905475	-88.97957	4	Sand	Pole																											
570	45.904693	-88.979585	20		Rope																											
571	45.903909	-88.979599	25		Rope																											
572	45.903127	-88.979613	29		Rope																											
573	45.902344	-88.979628	30		Rope																											
574	45.901561	-88.979642				DEEP																										
575	45.900778	-88.979656	28		Rope																											
576	45.899995	-88.979671	2	Rock	Pole		1																							1		
577	45.913264	-88.978306	3	Sand	Pole																											
578	45.912517	-88.97833	6	Sand	Pole																											
579	45.911729	-88.978334	26		Rope																											
580	45.910946	-88.978348	34			DEEP																										
581	45.910163	-88.978363	38			DEEP																										
582	45.90938	-88.978377	26		Rope																											
583	45.908597	-88.978392	18		Rope																											
584	45.907814	-88.978406	8	Rock	Pole																											
585	45.907031	-88.97842	11	Sand	Pole		1				1								1													
586	45.906248	-88.978435	10	Sand	Pole		3	1											1			2	3									
587	45.905859	-88.978478	1	Rock	Pole																											
588	45.905117	-88.978492	5	Rock	Pole																											
589	45.904334	-88.978506	6	Sand	Pole																											
590	45.903551	-88.978521	5	Rock	Pole																											
591	45.912502	-88.977198	1	Sand	Pole		2	1	1						1				1										2			
592	45.911719	-88.977212	5	Rock	Pole																											
593	45.910936	-88.977227	30		Rope																											
594	45.910153	-88.977241	34			DEEP																										
595	45.90937	-88.977256	23		Rope																											1
596	45.908587	-88.97727	15		Rope																											
597	45.907804	-88.977284	10	Sand	Pole																											
598	45.907021	-88.977299	11	Sand	Pole		3				3								1								1					
599	45.906238	-88.977313	4	Sand	Pole																											
600	45.91493	-88.976076	19		Rope		1												1													
601	45.911709	-88.976091	20		Rope																											
602	45.910486	-88.976105	21		Rope																											
603	45.910143	-88.97612	22		Rope																											1
604	45.90938	-88.976134	12	Sand	Pole		3																		3							
605	45.908577	-88.976148	10	Sand	Pole		3																		3							
606	45.907784	-88.976163	8	Sand	Pole																											
607	45.907011	-88.976177	5	Sand	Pole																											
608	45.906228	-88.976192	1	Sand	Pole		1																							1		
609	45.914397	-88.974926	5	Sand	Pole		3	2											1				3	1			1				1	
610	45.913364	-88.97494	24		Rope																											
611	45.912481	-88.974955	23		Rope																											
612	45.911659	-88.974969	21		Rope																											
613	45.910916	-88.974984	20		Rope																											1
614	45.910133	-88.974998	14		Rope		1																				1					1
615	45.90935	-88.975012	7	Sand	Pole																											
616	45.908567	-88.975027	6	Rock	Pole		3				1										2		2				1					1
617	45.914923	-88.973775	6	Sand	Pole		3				1										2		2				1					
618	45.91482	-88.97376	16		Rope		1												1													1
619	45.914037	-88.973804	21		Rope		1												1													
620	45.913254	-88.973819	28			DEEP																										
621	45.912471	-88.973833	22		Rope		1				1								1													
622	45.911688	-88.973848	20		Rope		3												3													
623	45.910906	-88.973862	21		Rope																											1
624	45.910123	-88.973876	20		Rope		1																				1					1
625	45.90934	-88.973891	6	Sand	Pole																											
626	45.915561	-88.972854	13	Sand	Pole		3																		3							
627	45.9148	-88.972868	17		Rope		3												3								1					
628	45.914037	-88.972883	19		Rope		2												2													
629	45.913244	-88.972897	21		Rope																											1
630	45.912461	-88.972712	20		Rope		1												1													1
631	45.911678	-88.972726	20		Rope																											
632	45.910895	-88.97274	21		Rope																											
633	45.910113	-88.972755	8	Sand	Pole		1																				1					
634	45.90933	-88.972769	3	Sand	Pole		3																						3			
635	45.915081	-88.971332	14	Sand	Pole		2														2					1		1				
636	45.9148	-88.971347	17		Rope		2														2											
637	45.914017	-88.971361	19		Rope		3														3											
638	45.913234	-88.971376	16		Rope		3														3				1							1
639	45.912451	-88.97139	18		Rope		2														2											
640	45.911668	-88.971404	20		Rope																											1
641	45.910885	-88.971419	19		Rope																											1
642	45.910102	-88.971433	6	Sand	Pole		2																		2							
643	45.9148	-88.970425	10	Sand	Pole		3																		3				1			
644	45.914007	-88.970439	14	Sand	Pole		2																		2							
645	45.913224	-88.970454	8	Sand	Pole		3	2																	1		1					
646	45.912441	-88.970468	12	Sand	Pole		3									1			1						3		1					
647	45.911659	-88.970483	18		Rope																											1
648	45.910876	-88.970497	18	Sand	Pole																											
649	45.910092	-88.970512	5	Sand	Pole		1	1	1																							
650	45.913997	-88.969318	3	Rock	Pole		1	1											1						1						1	
651	45.913214	-88.969332	4	Rock	Pole																											
652	45.912431	-88.969347	5	Sand	Pole		1	1											1				1	1								
653	45.911648	-88.969361	5	Sand	Pole		2	1															1	2			1				1	
654	45.910865	-88.969376	5	Sand	Pole		1	1																1								
655	45.910082	-88.96939	4	Sand	Pole		1	1						1										1							1	
656	45.909299	-88.969405				NONNAVIGABLE (PLANTS)																											
657	45.912421	-88.968226	2	Sand	Pole																											
658	45.911639	-88.96824	3	Sand	Pole		1	1	1					1																1		
659	45.910855	-88.968254	3	Sand	Pole		1		1					1																1	1	
660	45.910072	-88.968269	1	Sand	Pole		1																									

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P); Rake (R)	Comments	Total Rake Fullness	CHARA	DULAR	ELEAC	ELEPA	ELOCA	ELONU	ERIAQ	GLYCA	ISO_SP	JUNPE	LOBDO	MYRTE	NAJFL	NITELLA	NYMOD	POTAM	POTGR	POTBE	POTRO	RANPM	SCHAC	SCHTA	UTRIN	UTRVU	VALAM	F_AGLAE
1	45.928474	-89.021929	5	Muck	Pole		2			2										2													
2	45.927844	-89.02194	7	Muck	Pole		2					1								1			2										
3	45.927214	-89.021951	7	Muck	Pole		1													1													
4	45.926584	-89.021962	5	Muck	Pole																												
5	45.929096	-89.021015	1	Sand	Pole									1																			
6	45.928466	-89.021026	7	Muck	Pole		1																									1	
7	45.927836	-89.021037	14		Rope																												
8	45.927207	-89.021048	14		Rope		1													1					1								
9	45.926577	-89.021059	7	Muck	Pole		1																1										
10	45.925947	-89.02107	3	Rock	Pole																												
11	45.929719	-89.020101	2	Sand	Pole		1			1										1													
12	45.929089	-89.020112	3	Sand	Pole		1													1													
13	45.928459	-89.020123	8	Muck	Pole																												
14	45.927829	-89.020134	14	Muck	Pole		2					2																					
15	45.927199	-89.020146	17		Rope																												
16	45.926569	-89.020157	11	Muck	Pole		2					2								1													
17	45.925939	-89.020168	7	Muck	Pole		2													2													
18	45.929711	-89.019198	4	Sand	Pole		2			2										1													
19	45.929081	-89.01921	4	Sand	Pole		1										1																
20	45.928451	-89.019221	7	Muck	Pole																												
21	45.927821	-89.019232	12	Muck	Pole		1					1																					
22	45.927191	-89.019243	17		Rope																												
23	45.926561	-89.019254	14		Rope																												1
24	45.925931	-89.019265	7	Muck	Pole		2													2			1										
25	45.930333	-89.018285	2	Sand	Pole		1							1						1													
26	45.929703	-89.018296	4	Sand	Pole		2													2													
27	45.929073	-89.018307	4	Sand	Pole		1													1													
28	45.928443	-89.018318	8	Muck	Pole																												
29	45.927813	-89.018329	13	Muck	Pole		1					1																					
30	45.927183	-89.01834	17		Rope																												
31	45.926553	-89.018351	14		Rope																												
32	45.925923	-89.018362	8	Muck	Pole		1													1			1										
33	45.930325	-89.017382	3	Sand	Pole		1													1													
34	45.929695	-89.017353	4	Sand	Pole		1													1													
35	45.929065	-89.017404	6	Sand	Pole																												
36	45.928435	-89.017415	8	Muck	Pole																												
37	45.927805	-89.017426	13	Muck	Pole		2					2																					
38	45.927176	-89.017437	18		Rope																												
39	45.926546	-89.017449	17		Rope																												
40	45.925916	-89.01746	8	Muck	Pole																												
41	45.930317	-89.016479	3	Sand	Pole		1													1													
42	45.929688	-89.01649	6	Sand	Pole		2					2								2													
43	45.929058	-89.016501	7	Muck	Pole		2					2								1			1										
44	45.928428	-89.016513	8	Muck	Pole		1													1					1								
45	45.927798	-89.016524	10	Muck	Pole																												
46	45.927168	-89.016535	18		Rope																												
47	45.926538	-89.016546	15		Rope		2							2									1										1
48	45.925908	-89.016557	7	Muck	Pole		1													1													
49	45.93031	-89.015576	4	Sand	Pole		1													1													
50	45.92968	-89.015588	6	Sand	Pole		1			1										1													
51	45.92905	-89.015599	7	Muck	Pole		1					1								1													
52	45.92842	-89.01561	8	Muck	Pole		1													1													
53	45.92779	-89.015621	7	Muck	Pole		2					2																					
54	45.92716	-89.015632	12	Muck	Pole																												
55	45.92653	-89.015643	8	Muck	Pole																												
56	45.9259	-89.015654	5	Sand	Pole		2										1			2													
57	45.931562	-89.014651	1	Sand	Pole		1			1										1													
58	45.930932	-89.014662	2	Sand	Pole		1													1													
59	45.930302	-89.014674	3	Sand	Pole		1										1																
60	45.929672	-89.014685	7	Muck	Pole																												
61	45.929042	-89.014696	7	Muck	Pole		1					1								1													
62	45.928412	-89.014707	8	Muck	Pole																												
63	45.927782	-89.014718	7	Muck	Pole																												
64	45.927152	-89.014729	7	Muck	Pole																												
65	45.926522	-89.014741	7	Muck	Pole																												
66	45.925892	-89.014752	5	Sand	Pole		1													1													
67	45.932184	-89.013737	2	Sand	Pole		2			1							2																
68	45.931554	-89.013749	3	Sand	Pole		2			1							1																
69	45.930924	-89.01376	3	Sand	Pole																												

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P); Rake (R)	Comments	Total Rake Fullness	CHARA	DULAR	ELEAC	ELEPA	ELOCA	ELONU	ERIAQ	GLYCA	ISO_SP	JUNPE	LOBDO	MYRTE	NAJFL	NITELLA	NYMOD	POTAM	POTGR	POTBE	POTRO	RANPM	SCHAC	SCHTA	UTRIN	UTRVU	VALAM	F_AGLAE
70	45.930294	-89.013771	3	Sand	Pole																												
71	45.929664	-89.013782	6	Muck	Pole		2			1													2										
72	45.929034	-89.013793	8	Muck	Pole																												
73	45.928404	-89.013804	9	Muck	Pole		1													1													
74	45.927774	-89.013816	9	Muck	Pole																												
75	45.927144	-89.013827	8	Muck	Pole		1					1																					
76	45.926515	-89.013838	7	Muck	Pole		1					1													1								
77	45.925885	-89.013849	5	Sand	Pole		2													2													
78	45.932806	-89.012823	2	Sand	Pole		1			1							1																
79	45.932176	-89.012835	3	Sand	Pole																												
80	45.931546	-89.012846	3	Sand	Pole																												
81	45.930916	-89.012857	3	Sand	Pole		2													2													
82	45.930286	-89.012868	3	Sand	Pole		1										1			1													
83	45.929656	-89.012879	4	Sand	Pole		1										1			1													
84	45.929026	-89.01289	8	Muck	Pole		2					1											2										
85	45.928397	-89.012902	8	Muck	Pole																												
86	45.927767	-89.012913	7	Sand	Pole																												
87	45.927137	-89.012924	6	Sand	Pole																												
88	45.926507	-89.012935	5	Muck	Pole																												
89	45.925877	-89.012946	4	Muck	Pole		1					1																					
90	45.932798	-89.011921	2	Sand	Pole																												
91	45.932168	-89.011932	5	Sand	Pole		1			1										1													
92	45.931538	-89.011943	6	Sand	Pole																												
93	45.930908	-89.011954	6	Sand	Pole																												
94	45.930279	-89.011965	1	Rock	Pole		1			1	1			1																1			
95	45.929649	-89.011977	4	Sand	Pole		1												1														
96	45.929019	-89.011988	10	Muck	Pole		1					1																					
97	45.928389	-89.011999	7	Muck	Pole																												
98	45.927759	-89.01201	5	Rock	Pole																												
99	45.927129	-89.012021	5	Rock	Pole		1													1													
100	45.926499	-89.012032	5	Muck	Pole																												
101	45.925869	-89.012044	4	Muck	Pole		1													1													
102	45.93279	-89.011018	4	Sand	Pole		1												1														
103	45.932161	-89.011029	6	Muck	Pole		1													1												1	
104	45.931531	-89.01104	6	Muck	Pole		1																	1								1	
105	45.930901	-89.011051	7	Muck	Pole																												
106	45.930271	-89.011063	7	Muck	Pole																												
107	45.929641	-89.011074	7	Sand	Pole		1																		1								
108	45.929011	-89.011085	9	Muck	Pole																												
109	45.928381	-89.011096	6	Sand	Pole		1						1							1					1								
110	45.927751	-89.011107	3	Rock	Pole																												
111	45.927121	-89.011119	5	Sand	Pole		1																		1								
112	45.926491	-89.01113	5	Sand	Pole																												
113	45.925861	-89.011141	3	Sand	Pole		1													1													
114	45.933413	-89.010104	2	Sand	Pole		1												1								1						
115	45.932783	-89.010115	4	Sand	Pole		2			1							1																
116	45.932153	-89.010126	6	Muck	Pole		1						1																				
117	45.931523	-89.010137	6	Muck	Pole																												
118	45.930893	-89.010149	8	Muck	Pole																												
119	45.930263	-89.01016	7	Muck	Pole																												
120	45.929633	-89.010171	8	Muck	Pole																												
121	45.929003	-89.010182	9	Muck	Pole																												
122	45.928373	-89.010194	6	Muck	Pole		2						1											1									
123	45.927743	-89.010205		Rock	Pole																												
124	45.927113	-89.010216	4	Muck	Pole																												
125	45.926483	-89.010227	4	Sand	Pole																												
126	45.925853	-89.010238				TERRESTRIAL																											
127	45.933405	-89.009201	1	Sand	Pole		1													1													
128	45.932775	-89.009212	4	Sand	Pole		1			1							1							1									
129	45.932145	-89.009223	6	Muck	Pole																												
130	45.931515	-89.009235	7	Muck	Pole																												
131	45.930885	-89.009246	7	Muck	Pole																												
132	45.930255	-89.009257	10	Muck	Pole																												
133	45.929625	-89.009268	10	Muck	Pole																												
134	45.928995	-89.00928	7	Muck	Pole																												
135	45.928365	-89.009291	6	Sand	Pole																												
136	45.927735	-89.009302				TERRESTRIAL																											
137	45.927105	-89.009313	2	Rock	Pole																												
138	45.926475	-89.009324	2	Sand	Pole		1										1			1													
139	45.933397	-89.008298	1	Sand	Pole		1										1										1						
140	45.932767	-89.008309	5	Sand	Pole		3			1							3																
141	45.932137	-89.008321	6	Muck	Pole																												
142	45.931507	-89.008332	7	Muck	Pole																												
143	45.930877	-89.008343	7	Muck	Pole																												
144	45.930247	-89.008354	8	Muck	Pole																												1
145	45.929617	-89.008366	9	Muck	Pole																												
146	45.928987	-89.008377	10	Muck	Pole																												
147	45.928357	-89.008388	6	Sand	Pole		3													3													
148	45.927728	-89.008399	3	Sand	Pole																												
149	45.927098	-89.008411		Rock	Pole		1		1		1																						
150	45.926468	-89.008422	1	Rock	Pole		1							1			1																
151	45.933389	-89.007395		Sand	Pole		1							1			1										1						
152	45.932759	-89.007407	4	Sand	Pole		1			1						1																1	

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	CHARA	DULAR	ELEAC	ELEPA	ELOCA	ELONU	ERIAQ	GLYCA	ISO_SP	JUNPE	LOBDO	MYRPE	NAJFL	NITELLA	NYMOD	POTAM	POTGR	POTBE	POTRO	RANPM	SCHAC	SCHTA	UTRIN	UTRVU	VALAM	F_AGLAE
153	45.932129	-89.007418	7	Muck	Pole																												
154	45.931499	-89.007429	8	Muck	Pole																												
155	45.930869	-89.00744	9	Muck	Pole																												
156	45.930239	-89.007452	9	Muck	Pole																												
157	45.929609	-89.007463	10	Muck	Pole																												
158	45.92898	-89.007474	9	Muck	Pole																												
159	45.92835	-89.007485	8	Muck	Pole																												
160	45.92772	-89.007497	6	Sand	Pole		1						1							1													
161	45.92709	-89.007508	3	Rock	Pole																												
162	45.92646	-89.007519	3	Sand	Pole		1															1											
163	45.937791	-89.006414	1	Sand	Pole		1				11																		1				1
164	45.937161	-89.006425	1	Sand	Pole		1				1																		1				
165	45.936531	-89.006436	2	Sand	Pole		1				1			1																			
166	45.935901	-89.006448	3	Sand	Pole		1				1																						
167	45.935271	-89.006459	3	Sand	Pole																												
168	45.934641	-89.00647	2	Sand	Pole																												
169	45.932751	-89.006504	4	Sand	Pole		1			1										1				1							1		
170	45.932121	-89.006515	7	Muck	Pole		1						1												1								
171	45.931491	-89.006526	10	Muck	Pole																												
172	45.930862	-89.006538	10	Muck	Pole																												1
173	45.930232	-89.006549	11	Muck	Pole																												1
174	45.929602	-89.00656	10	Muck	Pole																												
175	45.928972	-89.006571	10	Muck	Pole																												
176	45.928342	-89.006583	10	Muck	Pole																												
177	45.927712	-89.006594	8	Muck	Pole																												
178	45.927082	-89.006605	3	Rock	Pole																												
179	45.926452	-89.006616	5	Sand	Pole		2			2										1													
180	45.925822	-89.006628	4	Muck	Pole		2													2											1		
181	45.939673	-89.005477				NONNAVIGABLE (PLANTS)																											
182	45.939043	-89.005488				NONNAVIGABLE (PLANTS)																											
183	45.938413	-89.0055	3	Sand	Pole		2			1							1		1	1										1			
184	45.937783	-89.005511	5	Sand	Pole		1													1													
185	45.937153	-89.005522	7	Sand	Pole		2																	2									
186	45.936523	-89.005534	8	Sand	Pole		1													1													
187	45.935893	-89.005545	14	Sand	Pole																												
188	45.935263	-89.005556	10	Sand	Pole		1													1													
189	45.934633	-89.005567	8	Sand	Pole		1													1													
190	45.934003	-89.005579	3	Sand	Pole		1				1																						
191	45.932743	-89.005601	2	Sand	Pole																												
192	45.932114	-89.005612	5	Sand	Pole		1			1										1													
193	45.931484	-89.005624	10	Muck	Pole																												
194	45.930854	-89.005635	12	Muck	Pole																												
195	45.930224	-89.005646	12	Muck	Pole																												
196	45.929594	-89.005657	11	Muck	Pole																												
197	45.928964	-89.005669	10	Muck	Pole																												
198	45.928334	-89.00568	10	Muck	Pole																												
199	45.927704	-89.005691	9	Muck	Pole		2						1												2								
200	45.927074	-89.005702	7	Sand	Pole		1													1													
201	45.926444	-89.005714	3	Sand	Pole		1													1													
202	45.925814	-89.005725	3	Sand	Pole		1												1														
203	45.925184	-89.005736	3	Muck	Pole		1															1											
204	45.924554	-89.005747	1	Muck	Pole		2										1			1					1								
205	45.940256	-89.004563				NONNAVIGABLE (PLANTS)																											
206	45.939665	-89.004574				NONNAVIGABLE (PLANTS)																											
207	45.939035	-89.004586	4	Sand	Pole		1																									1	
208	45.938405	-89.004597	6	Sand	Pole		2													1				2									
209	45.937775	-89.004608	20		Pole																												
210	45.937145	-89.004619				DEEP																											
211	45.936515	-89.004631				DEEP																											
212	45.935885	-89.004642				DEEP																											
213	45.935255	-89.004653				DEEP																											
214	45.934625	-89.004665				DEEP																											
215	45.933995	-89.004676	7	Sand	Pole		1													1													
216	45.933366	-89.004687	4	Sand	Pole																												
217	45.932106	-89.00471	4	Sand	Pole																												
218	45.931476	-89.004721	11	Muck	Pole																												
219	45.930846	-89.004732	14		Rope																												
220	45.930216	-89.004743	14		Rope																												
221	45.929586	-89.004755	12	Muck	Pole																												
222	45.928956	-89.004766	11	Muck	Pole																												
223	45.928326	-89.004777	10	Muck	Pole		1						1																				
224	45.927696	-89.004788	9	Muck	Pole		3						1												3								
225	45.927066	-89.0048	8	Muck	Pole																												
226	45.926436	-89.004811	3	Sand	Pole																												
227	45.925176	-89.004834	4	Muck	Pole																												
228	45.924546	-89.004845		Sand	Pole		2						1		1									1	1					1	1		
229	45.942177	-89.003626				NONNAVIGABLE (PLANTS)																											
230	45.941547	-89.003638				NONNAVIGABLE (PLANTS)																											

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	CHARA	DULAR	ELEAC	ELEPA	ELOCA	ELONU	ERIAQ	GLYCA	ISO_SP	JUNPE	LOBDO	MYRTE	NAJFL	NITELLA	NYMOD	POTAM	POTGR	POTBE	POTRO	RANPM	SCHAC	SCHTA	UTRIN	UTRVU	VALAM	F_AGLAE
231	45.940917	-89.003649				NONNAVIGABLE (PLANTS)																											
232	45.940287	-89.00366				NONNAVIGABLE (PLANTS)																											
233	45.939657	-89.003671	4	Sand	Pole		1													1			1									1	
234	45.939027	-89.003683	6	Muck	Pole		1	1																1									
235	45.938397	-89.003694	16		Rope																												
236	45.937767	-89.003705				DEEP																											
237	45.937137	-89.003717				DEEP																											
238	45.936507	-89.003728				DEEP																											
239	45.935877	-89.003739				DEEP																											
240	45.935247	-89.00375				DEEP																											
241	45.934618	-89.003762				DEEP																											
242	45.933988	-89.003773	23		Rope																												
243	45.933358	-89.003784	12	Sand	Pole																												
244	45.932728	-89.003796	8	Sand	Pole		1	1				1													1							1	
245	45.932098	-89.003807	5	Sand	Pole																												
246	45.931468	-89.003818	1	Sand	Pole		1			1							1																
247	45.930838	-89.003829	16		Rope																												
248	45.930208	-89.003841	15		Rope																												
249	45.929578	-89.003852	12	Muck	Pole																												
250	45.928948	-89.003863	11	Muck	Pole																												
251	45.928318	-89.003874	9	Muck	Pole		3																		3								
252	45.927688	-89.003886	10	Muck	Pole		2					2													1								
253	45.927058	-89.003897	8	Muck	Pole		1					1								1													
254	45.926428	-89.003908	1	Rock	Pole																												
255	45.942799	-89.002712				NONNAVIGABLE (PLANTS)																											
256	45.942169	-89.002723				NONNAVIGABLE (PLANTS)																											
257	45.941539	-89.002735				NONNAVIGABLE (PLANTS)																											
258	45.940909	-89.002746	3	Sand	Pole		1																1	1					1				
259	45.940279	-89.002757	4	Sand	Pole		1			1																							
260	45.939649	-89.002769	8	Sand	Pole		2					1												2									
261	45.939019	-89.00278	13		Rope																												
262	45.938389	-89.002791	23		Rope																												
263	45.937759	-89.002802				DEEP																											
264	45.937129	-89.002814				DEEP																											
265	45.936499	-89.002825				DEEP																											
266	45.93587	-89.002836				DEEP																											
267	45.93524	-89.002848				DEEP																											
268	45.93461	-89.002859				DEEP																											
269	45.93398	-89.00287				DEEP																											
270	45.93335	-89.002881	23		Rope																												
271	45.93272	-89.002893	17		Rope																												
272	45.93209	-89.002904	16		Rope																												
273	45.93146	-89.002915	13		Rope		1																		1								
274	45.9302	-89.002938	19		Rope																												
275	45.92957	-89.002949	14		Rope																												
276	45.92894	-89.00296	12	Muck	Pole																												
277	45.92831	-89.002972	11	Muck	Pole																												
278	45.92768	-89.002983	9	Muck	Pole		1																		1								
279	45.92705	-89.002994	7	Muck	Pole		1			1										1													
280	45.92642	-89.003006	3	Rock	Pole																												
281	45.943421	-89.001798				NONNAVIGABLE (PLANTS)																											
282	45.942791	-89.001809				NONNAVIGABLE (PLANTS)																											
283	45.942161	-89.00182				NONNAVIGABLE (PLANTS)																											
284	45.941531	-89.001832	2	Sand	Pole		1											1											1				
285	45.940901	-89.001843	5	Sand	Pole															1													
286	45.940271	-89.001854	7	Sand	Pole		1													1												1	
287	45.939641	-89.001866	24		Rope																												
288	45.939011	-89.001877				DEEP																											
289	45.938381	-89.001888				DEEP																											
290	45.937751	-89.0019				DEEP																											
291	45.937122	-89.001911				DEEP																											
292	45.936492	-89.001922				DEEP																											
293	45.935862	-89.001933				DEEP																											
294	45.935232	-89.001945				DEEP																											
295	45.934602	-89.001956				DEEP																											
296	45.933972	-89.001967				DEEP																											
297	45.933342	-89.001979	27		Rope																												
298	45.932712	-89.00199	21		Rope																												
299	45.932082	-89.002001	19		Rope																												
300	45.931452	-89.002013	15		Rope		2																		2								
301	45.930822	-89.002024	19		Rope																												1
302	45.930192	-89.002035	20		Rope																												
303	45.929562	-89.002046	17		Rope																												
304	45.928932	-89.002058	12	Sand	Pole																												
305	45.928302	-89.002069	10	Muck	Pole																												
306	45.927672	-89.00208	10	Muck	Pole		1																		1								
307	45.927043	-89.002092	7	Sand	Pole		1																										
308	45.926413	-89.002103	2	Sand	Pole		1											1															
309	45.944043	-89.000884				NONNAVIGABLE (PLANTS)																											
310	45.943413	-89.000895				NONNAVIGABLE (PLANTS)																											
311	45.942783	-89.000906				NONNAVIGABLE (PLANTS)																											

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P); Rake (R)	Comments	Total Rake Fullness	CHARA	DULAR	ELEAC	ELEPA	ELOCA	ELONU	ERIAQ	GLYCA	ISO_SP	JUNPE	LOBDO	MYRTE	NAJFL	NITELLA	NYMOD	POTAM	POTGR	POTBE	POTRO	RANPM	SCHAC	SCHTA	UTRIN	UTRVU	VALAM	F_AGLAE
312	45.942153	-89.000917				NONNAVIGABLE (PLANTS)																											
313	45.941523	-89.000929	3	Sand	Pole		1																						1				
314	45.940893	-89.00094	12	Muck	Pole																												
315	45.940263	-89.000951	30			DEEP																											
316	45.939633	-89.000963				DEEP																											
317	45.939003	-89.000974				DEEP																											
318	45.938374	-89.000985				DEEP																											
319	45.937744	-89.000997				DEEP																											
320	45.937114	-89.001008				DEEP																											
321	45.936484	-89.001019				DEEP																											
322	45.935854	-89.001031				DEEP																											
323	45.935224	-89.001042				DEEP																											
324	45.934594	-89.001053				DEEP																											
325	45.933964	-89.001065				DEEP																											
326	45.933334	-89.001076				DEEP																											
327	45.932704	-89.001087	24		Rope																												
328	45.932074	-89.001098	22		Rope																												
329	45.931444	-89.00111	19		Rope																												
330	45.930814	-89.001121	19		Rope		2	2																									1
331	45.930184	-89.001132	20		Rope																												
332	45.929554	-89.001144	17		Rope																												
333	45.928924	-89.001155	8	Rock	Pole		1																		1								
334	45.928295	-89.001166	13	Sand	Pole																												
335	45.927665	-89.001178	11	Sand	Pole		2	1																	2								
336	45.927035	-89.001189	6	Sand	Pole																												
337	45.926405	-89.0012	3	Sand	Pole																												
338	45.925775	-89.001212	1	Rock	Pole		1												1														
339	45.944035	-88.999981				NONNAVIGABLE (PLANTS)																											
340	45.943405	-88.999992				NONNAVIGABLE (PLANTS)																											
341	45.942775	-89.000003				NONNAVIGABLE (PLANTS)																											
342	45.942145	-89.000015	4	Sand	Pole		2	1		1																			2				
343	45.941515	-89.000026	6	Sand	Pole		1														1											1	
344	45.940885	-89.000037				DEEP																											
345	45.940255	-89.000049				DEEP																											
346	45.939625	-89.00006				DEEP																											
347	45.938996	-89.000071				DEEP																											
348	45.938366	-89.000083				DEEP																											
349	45.937736	-89.000094				DEEP																											
350	45.937106	-89.000105				DEEP																											
351	45.936476	-89.000116				DEEP																											
352	45.935846	-89.000128				DEEP																											
353	45.935216	-89.000139				DEEP																											
354	45.934586	-89.00015				DEEP																											
355	45.933956	-89.000162				DEEP																											
356	45.933326	-89.000173				DEEP																											
357	45.932696	-89.000184	22		Rope																												
358	45.932066	-89.000196	20		Rope		1															1											
359	45.931436	-89.000207	21		Rope		1															1											
360	45.930806	-89.000218	20		Rope		2	1				1										1											
361	45.930176	-89.00023	21		Rope																												
362	45.929547	-89.000241	17		Rope																												
363	45.928917	-89.000252	14		Rope																												
364	45.928287	-89.000264	15		Rope																												
365	45.927657	-89.000275	9	Sand	Pole		2																	2									
366	45.927027	-89.000286	5	Sand	Pole																												
367	45.926397	-89.000298	3	Sand	Pole																												
368	45.925767	-89.000309	1	Sand	Pole		1														1												
369	45.944657	-88.999066				NONNAVIGABLE (PLANTS)																											
370	45.944027	-88.999078				NONNAVIGABLE (PLANTS)																											
371	45.943397	-88.999089	4	Sand	Pole		1			1														1							1		
372	45.942767	-88.9991	5	Sand	Pole		2	1		2													1	1									
373	45.942137	-88.999112	6	Sand	Pole		1																	1									
374	45.941507	-88.999123	14		Rope		1																	1									
375	45.940877	-88.999134				DEEP																											
376	45.940248	-88.999146				DEEP																											
377	45.939618	-88.999157				DEEP																											
378	45.938988	-88.999168				DEEP																											
379	45.938358	-88.99918				DEEP																											
380	45.937728	-88.999191				DEEP																											
381	45.937098	-88.999202				DEEP																											
382	45.936468	-88.999214				DEEP																											
383	45.935838	-88.999225				DEEP																											
384	45.935208	-88.999236				DEEP																											
385	45.934578	-88.999248				DEEP																											
386	45.933948	-88.999259				DEEP																											
387	45.933318	-88.99927				DEEP																											
388	45.932688	-88.999282	24		Rope																												
389	45.932058	-88.999293	20		Rope		1																										
390	45.931428	-88.999304	21		Rope																												
391	45.930798	-88.999316	22		Rope																												
392	45.930169	-88.999327	21		Rope																												
393	45.929539	-88.999338	19		Rope																												
394	45.928909	-88.99935	18		Rope		1															1											
395	45.928279	-88.999361	15		Rope																												

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	CHARA	DULAR	ELEAC	ELEPA	ELOCA	ELONU	ERIAQ	GLYCA	ISO_SP	JUNPE	LOBDO	MYRTE	NAJFL	NITELLA	NYMOD	POTAM	POTGR	POTBE	POTRO	RANPM	SCHAC	SCHTA	UTRIN	UTRVU	VALAM	F_AGLAE
396	45.927649	-88.999372	8	Sand	Pole		2													1				2									
397	45.927019	-88.999384	4	Sand	Pole																												
398	45.926389	-88.999395	1	Rock	Pole																												
399	45.925759	-88.999406	3	Sand	Pole		1			1																							
400	45.945279	-88.998152				NONNAVIGABLE (PLANTS)																											
401	45.944649	-88.998163	5	Sand	Pole		1			1														1								1	
402	45.944019	-88.998175	13		Rope		2													1				2	1	1							
403	45.943389	-88.998186	25			DEEP																											
404	45.942759	-88.998197	27			DEEP																											
405	45.942129	-88.998209	19		Rope																												
406	45.941499	-88.99822				DEEP																											
407	45.94087	-88.998231				DEEP																											
408	45.94024	-88.998243				DEEP																											
409	45.93961	-88.998254				DEEP																											
410	45.93898	-88.998265				DEEP																											
411	45.93835	-88.998277				DEEP																											
412	45.93772	-88.998288				DEEP																											
413	45.93709	-88.998299				DEEP																											
414	45.93646	-88.998311				DEEP																											
415	45.93583	-88.998322				DEEP																											
416	45.9352	-88.998333				DEEP																											
417	45.93457	-88.998345				DEEP																											
418	45.93394	-88.998356				DEEP																											
419	45.93331	-88.998368				DEEP																											
420	45.93268	-88.998379	28			DEEP																											
421	45.93205	-88.99839	17		Rope																												
422	45.931421	-88.998402	19		Rope																												
423	45.930791	-88.998413	20		Rope																												
424	45.930161	-88.998424	21		Rope																												
425	45.929531	-88.998436	21		Rope																												
426	45.928901	-88.998447	19		Rope																												
427	45.928271	-88.998458	9	Sand	Pole		1					1																					
428	45.927641	-88.99847	5	Sand	Pole																												
429	45.927011	-88.998481	3	Sand	Pole		1										1																
430	45.926381	-88.998492		Rock	Pole																												
431	45.925751	-88.998504	3	Sand	Pole		2			2																							
432	45.946531	-88.997226				NONNAVIGABLE (PLANTS)																											
433	45.945901	-88.997238	3	Sand	Pole		1																							1			
434	45.945271	-88.997249	5	Sand	Pole		1			1																							
435	45.944641	-88.99726	17		Rope																												
436	45.944011	-88.997272				DEEP																											
437	45.943381	-88.997283				DEEP																											
438	45.942751	-88.997294	29			DEEP																											
439	45.942121	-88.997306	27			DEEP																											
440	45.941492	-88.997317				DEEP																											
441	45.940862	-88.997328				DEEP																											
442	45.940232	-88.99734				DEEP																											
443	45.939602	-88.997351				DEEP																											
444	45.938972	-88.997363				DEEP																											
445	45.938342	-88.997374				DEEP																											
446	45.937712	-88.997385				DEEP																											
447	45.937082	-88.997397				DEEP																											
448	45.936452	-88.997408				DEEP																											
449	45.935822	-88.997419				DEEP																											
450	45.935192	-88.997431				DEEP																											
451	45.934562	-88.997442				DEEP																											
452	45.933932	-88.997453				DEEP																											
453	45.933302	-88.997465				DEEP																											
454	45.932672	-88.997476	18		Rope																1												
455	45.932043	-88.997487	6	Sand	Pole		1	1																									
456	45.931413	-88.997499	7	Sand	Pole		1	1																1									
457	45.930783	-88.99751	13		Rope		1																		1								
458	45.930153	-88.997521	14		Rope																												
459	45.929523	-88.997533	17		Rope																												
460	45.928893	-88.997544	12	Sand	Pole		1													1					1								
461	45.928263	-88.997556	5	Sand	Pole		1																	1									
462	45.927633	-88.997567	3	Sand	Pole		1											1															
463	45.947783	-88.9963				NONNAVIGABLE (PLANTS)																											
464	45.947153	-88.996312	2	Sand	Pole		2																							2			
465	45.946523	-88.996323	3	Sand	Pole		1																	1									
466	45.945893	-88.996335	11	Sand	Pole																												
467	45.945263	-88.996346	25			DEEP																											
468	45.944633	-88.996357	28			DEEP																											
469	45.944003	-88.996369				DEEP																											
470	45.943373	-88.99638				DEEP																											
471	45.942743	-88.996391				DEEP																											
472	45.942114	-88.996403				DEEP																											
473	45.941484	-88.996414				DEEP																											
474	45.940854	-88.996426				DEEP																											
475	45.940224	-88.996437				DEEP																											
476	45.939594	-88.996448				DEEP																											
477	45.938964	-88.99646				DEEP																											
478	45.938334	-88.996471				DEEP																											
479	45.937704	-88.996482				DEEP																											
480	45.937074	-88.996494				DEEP																											
481	45.936444	-88.996505				DEEP																											
482	45.935814	-88.996516				DEEP																											
483	45.935184	-88.996528				DEEP																											
484	45.934554	-88.996539				DEEP																											
485	45.933924	-88.996551				DEEP																											
486	45.933294	-88.996562				DEEP																											

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	CHARA	DULAR	ELEAC	ELEPA	ELOCA	ELONU	ERIAQ	GLYCA	ISO_SP	JUNPE	LOBDO	MYRTE	NAJFL	NITELLA	NYMOD	POTAM	POTGR	POTBE	POTRO	RANPM	SCHAC	SCHTA	UTRIN	UTRVU	VALAM	F_AGLAE
487	45.932665	-88.996573	9	Sand	Pole		1													1	1												
488	45.932035	-88.996585	4	Sand	Pole		1												1															
489	45.931405	-88.996596	4	Sand	Pole																													
490	45.930775	-88.996607	4	Sand	Pole																													
491	45.930145	-88.996619	5	Sand	Pole																													
492	45.929515	-88.99663	5	Sand	Pole																													
493	45.928885	-88.996641	4	Sand	Pole																													
494	45.928255	-88.996653		Sand	Pole		1										1			1													
495	45.948405	-88.995386	2	Sand	Pole		1																						1					
496	45.947775	-88.995397	5	Sand	Pole		2			2										1				1								1	
497	45.947145	-88.995409	12	Sand	Pole		1																	1									
498	45.946515	-88.99542	19		Rope																													
499	45.945885	-88.995432				DEEP																												
500	45.945255	-88.995443				DEEP																												
501	45.944625	-88.995454				DEEP																												
502	45.943995	-88.995466				DEEP																												
503	45.943365	-88.995477				DEEP																												
504	45.942736	-88.995488				DEEP																												
505	45.942106	-88.9955				DEEP																												
506	45.941476	-88.995511				DEEP																												
507	45.940846	-88.995523				DEEP																												
508	45.940216	-88.995534				DEEP																												
509	45.939586	-88.995545				DEEP																												
510	45.938956	-88.995557				DEEP																												
511	45.938326	-88.995568				DEEP																												
512	45.937696	-88.99558				DEEP																												
513	45.937066	-88.995591				DEEP																												
514	45.936436	-88.995602				DEEP																												
515	45.935806	-88.995614				DEEP																												
516	45.935176	-88.995625				DEEP																												
517	45.934546	-88.995636				DEEP																												
518	45.933916	-88.995648				DEEP																												
519	45.932287	-88.995659	14		Rope		1													1													
520	45.932657	-88.99567	5	Sand	Pole																													
521	45.932027	-88.995682	2	Sand	Pole		1												1															
522	45.931397	-88.995693	1	Sand	Pole		1												1															
523	45.930767	-88.995705	1	Sand	Pole																													
524	45.930137	-88.995716		Sand	Pole																													
525	45.929507	-88.995727		Sand	Pole		1																	1									
526	45.949027	-88.994472	3	Sand	Pole		1													1				1				1					
527	45.948397	-88.994483	6	Sand	Pole		1																	1									
528	45.947767	-88.994494	18		Rope																													
529	45.947137	-88.994506	26			DEEP																												
530	45.946507	-88.994517	25			DEEP																												
531	45.945877	-88.994529				DEEP																												
532	45.945247	-88.99454				DEEP																												
533	45.944617	-88.994551				DEEP																												
534	45.943987	-88.994563				DEEP																												
535	45.943358	-88.994574				DEEP																												
536	45.942728	-88.994586				DEEP																												
537	45.942098	-88.994597				DEEP																												
538	45.941468	-88.994608				DEEP																												
539	45.940838	-88.99462				DEEP																												
540	45.940208	-88.994631				DEEP																												
541	45.939578	-88.994642				DEEP																												
542	45.938948	-88.994654				DEEP																												
543	45.938318	-88.994665				DEEP																												
544	45.937688	-88.994677				DEEP																												
545	45.937058	-88.994688				DEEP																												
546	45.936428	-88.994699				DEEP																												
547	45.935798	-88.994711				DEEP																												
548	45.935168	-88.994722				DEEP																												
549	45.934538	-88.994734				DEEP																												
550	45.933909	-88.994745	12		Rope		1																		1									
551	45.933279	-88.994756	3	Sand	Pole		1													1													
552	45.932649	-88.994768		Sand	Pole																													
553	45.949019	-88.993569	6	Sand	Pole																													
554	45.948389	-88.99358				DEEP																												
555	45.947759	-88.993591				DEEP																												
556	45.947129	-88.993603				DEEP																												
557	45.946499	-88.993614				DEEP																												
558	45.945869	-88.993626				DEEP																												
559	45.945239	-88.993637				DEEP																												
560	45.944609	-88.993648				DEEP																												
561	45.94398	-88.99366				DEEP																												
562	45.94335	-88.993671				DEEP																												
563	45.94272	-88.993683				DEEP																												
564	45.94209	-88.993694				DEEP																												
565	45.94146	-88.993705				DEEP																												
566	45.94083	-88.993717				DEEP																												
567	45.9402	-88.993728				DEEP																												
568	45.93957	-88.99374				DEEP																												
569	45.93894	-88.993751				DEEP																												
570	45.93831	-88.993762				DEEP																												
571	45.93768	-88.993774				DEEP																												
572	45.93705	-88.993785				DEEP																												
573	45.93642	-88.993797				DEEP																												
574	45.93579	-88.993808	20		Rope		1													1													
575	45.93516	-88.993819	6	Sand	Pole																													
576	45.934531	-88.993831	4	Sand	Pole																													
577	45.933901	-88.993842	2	Sand	Pole		1												1	1														
578	45.949011	-88.992666				DEEP																												
579	45.948381	-88.992677				DEEP																												
580	45.947751	-88.992688				DEEP																												
581	45.947121	-88.9927				DEEP																												
582	45.946491	-88.992711				DEEP																												
583	45.945861	-88.992723				DEEP																												
584	45.945231	-88.992734				DEEP																												
585	45.944602	-88.992745				DEEP																												
586	45.943972	-88.992757				DEEP																												
587	45.943342	-88.992768				DEEP																												
588	45.942712	-88.99278				DEEP																												
589	45.942082	-88.992791				DEEP																												
590	45.941452	-88.992802				DEEP																												
591	45.940822	-88.992814				DEEP																												
592	45.940192	-88.992825				DEEP																												
593	45.939562	-88.992837				DEEP																												
594	45.938932	-88.992848				DEEP																												
595	45.938302	-88.99286				DEEP																												
596	45.937672	-88.992871				DEEP																												
597	45.937042	-88.992882				DEEP																												

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	CHARA	DULAR	ELEAC	ELEPA	ELOCA	ELONU	ERIAQ	GLYCA	ISO_SP	JUNPE	LOBDO	MYRTE	NAJFL	NITELLA	NYMOD	POTAM	POTGR	POTBE	POTRO	RANPM	SCHAC	SCHTA	UTRIN	UTRVU	VALAM	F_AGLAE
598	45.936412	-88.992894	13		Rope																												
599	45.935782	-88.992905	4	Sand	Pole																												
600	45.949003	-88.991763	20		Rope																												
601	45.948373	-88.991774				DEEP																											
602	45.947743	-88.991785				DEEP																											
603	45.947113	-88.991797				DEEP																											
604	45.946483	-88.991808				DEEP																											
605	45.945853	-88.99182				DEEP																											
606	45.945223	-88.991831				DEEP																											
607	45.944594	-88.991842				DEEP																											
608	45.943964	-88.991854				DEEP																											
609	45.943334	-88.991865				DEEP																											
610	45.942704	-88.991877				DEEP																											
611	45.942074	-88.991888				DEEP																											
612	45.941444	-88.9919				DEEP																											
613	45.940814	-88.991911				DEEP																											
614	45.940184	-88.991922				DEEP																											
615	45.939554	-88.991934				DEEP																											
616	45.938924	-88.991945				DEEP																											
617	45.938294	-88.991957				DEEP																											
618	45.937664	-88.991968				DEEP																											
619	45.937034	-88.991979	10	Sand	Pole		2													2													
620	45.936404	-88.991991	4	Sand	Pole																												
621	45.948995	-88.990859				SWIM AREA																											
622	45.948365	-88.990871				DEEP																											
623	45.947735	-88.990882				DEEP																											
624	45.947105	-88.990894				DEEP																											
625	45.946475	-88.990905				DEEP																											
626	45.945845	-88.990917				DEEP																											
627	45.945216	-88.990928				DEEP																											
628	45.944586	-88.990939				DEEP																											
629	45.943956	-88.990951				DEEP																											
630	45.943326	-88.990962				DEEP																											
631	45.942696	-88.990974				DEEP																											
632	45.942066	-88.990985				DEEP																											
633	45.941436	-88.990997				DEEP																											
634	45.940806	-88.991008				DEEP																											
635	45.940176	-88.991019				DEEP																											
636	45.939546	-88.991031				DEEP																											
637	45.938916	-88.991042				DEEP																											
638	45.938286	-88.991054				DEEP																											
639	45.937656	-88.991065	10	Sand	Pole		1													1													
640	45.937026	-88.991077	4	Sand	Pole																												
641	45.948357	-88.989968				DEEP																											
642	45.947727	-88.989979				DEEP																											
643	45.947097	-88.989991				DEEP																											
644	45.946467	-88.990002				DEEP																											
645	45.945837	-88.990014				DEEP																											
646	45.945208	-88.990025				DEEP																											
647	45.944578	-88.990037				DEEP																											
648	45.943948	-88.990048				DEEP																											
649	45.943318	-88.990059				DEEP																											
650	45.942688	-88.990071				DEEP																											
651	45.942058	-88.990082				DEEP																											
652	45.941428	-88.990094				DEEP																											
653	45.940798	-88.990105				DEEP																											
654	45.940168	-88.990117				DEEP																											
655	45.939538	-88.990128				DEEP																											
656	45.938908	-88.990139				DEEP																											
657	45.938278	-88.990151	8	Sand	Pole		1													1													
658	45.937648	-88.990162	4	Sand	Pole																												
659	45.948349	-88.989065	1	Sand	Pole																												
660	45.947719	-88.989076	22		Rope																												
661	45.947089	-88.989088	3	Rock	Pole																												
662	45.946459	-88.989099	3	Sand	Pole		1										1	1	1														
663	45.945829	-88.989111	5	Sand	Pole																												
664	45.9452	-88.989122	6	Sand	Pole		1	1		1										1													
665	45.94457	-88.989134	8	Sand	Pole		2	1		1										1													
666	45.94394	-88.989145	13	Sand	Pole		1													1													
667	45.94331	-88.989156				DEEP																											
668	45.94268	-88.989168				DEEP																											
669	45.94205	-88.989179				DEEP																											
670	45.94142	-88.989191				DEEP																											
671	45.94079	-88.989202				DEEP																											
672	45.94016	-88.989214				DEEP																											
673	45.93953	-88.989225				DEEP																											
674	45.9389	-88.989237	15		Rope																												
675	45.93827	-88.989248	4	Sand	Pole																												
676	45.945192	-88.988219	2	Sand	Pole		1												1														
677	45.944562	-88.988231	3	Sand	Pole		1												1														
678	45.943932	-88.988242	6	Sand	Pole																												
679	45.943302	-88.988253	10	Sand	Pole		1													1	1												
680	45.942672	-88.988265				DEEP																											
681	45.942042	-88.988276				DEEP																											
682	45.941412	-88.988288				DEEP																											
683	45.940782	-88.988299				DEEP																											
684	45.940152	-88.988311				DEEP																											
685	45.939522	-88.988322				DEEP																											
686	45.938892	-88.988334	7	Sand	Pole		1													1													
687	45.943294	-88.987351	2	Rock	Pole																												
688	45.942664	-88.987362	7	Sand	Pole		o																										
689	45.942034	-88.987373	10	Sand	Pole		2													2													
690	45.941404	-88.987385	18		Rope																												
691	45.940774	-88.987396				DEEP																											
692	45.940144	-88.987408	18		Rope																												
693	45.939514	-88.987419	7	Sand	Pole																												
694	45.941396	-88.986482				TEMPORARY OBSTACLE																											
695	45.940766	-88.986494	3	Sand	Pole																												
696	45.940136	-88.986505	3	Sand	Pole		1										1	1	1														