LONG LAKE ASSOCIATION

SIERRA PORTER, WMU INTERN AND AUTUMN COTTRELL, NMC INTERN LEN KLEIN AND BARRY LISHAWA







- Water Quality Monitoring and Testing
- Update Lake Studies Reports 1993 2018
- Monitor the Lakes and Shores for invasive species
- Rate Your Shoreline—>Check the Long Lake Association Website



MICORP'S COOPERATIVE LAKES MONITORING PROGRAM

- Technical Assistance
- Training
- Support from MSU Limnologists
- Volunteer lake monitors in MI- to ensure collection & interpretation of reliable, highquality data



WATER QUALITY MONITORING AND TESTING Total Phosphorus

- Essential nutrients for plants & animals in aquatic ecosystem
- Primarily occurs in organic compounds
- 2017 report shows higher concentrations of near bottom phosphorus
- Recommended levels set below 10 micrograms/liter
 - Higher levels stimulate the growth of plankton & aquatic plants
 - Mean values for 2017 were 3.95 ug/L at surface and 9.9 ug/L near bottom.



TOTAL PHOSPHORUS

TREND





WATER QUALITY MONITORING AND TESTING Chlorophyll a

- Primary photosynthetic pigment that absorbs energy from blue & red light wavelengths
- Good values below 1.5 micrograms/liter
- Mean 2017 value: 1.2 ug/L
- Levels are slightly up, but not significantly enough to raise question.
 - may be indicative of a normal increase in the algal community as the lake temperature increases

Long Lake Spring/Summer Chlorophyll a (µg/L)





Physical and technical work done by interns, Autumn, Kathy, and Chelsea

WATER QUALITY MONITORING AND TESTING Secchi Depth

- Secchi disk depth X 1.4 = Compensation Level (light available for photosynthesis)
- Level that Photosynthesis = Respiration
 Depth that Aquatic Vegetation can survive
- Current mean secchi value: 28.6 ft (8.0m)
- Mean secchi value 2017: 26.3 ft (8.0m)



WATER QUALITY MONITORING AND TESTING Secchi Depth Data







WATER QUALITY MONITORING AND TESTING Nitrate/ Nitrite

- Naturally occurring in ground water
 - Essential component for living organisms
- Good values below 200 micrograms/liter in spring & below 40 micrograms in summer
- Tested this year but not enough data to establish trend

Long Lake Nitrate/Nitrite (µg/L) Spring/Summer



WATER QUALITY MONITORING AND TESTING pH, Dissolved Oxygen, and water temperature

<u>5/7/2018</u>			<u>8/13/2018</u>			
Long Lake Site #2				Long Lake Site #2		
Depth (meters)	H2O temp (C)	D.O mg/L		Depth (meters)	H2O temp (C)	D.O mg/L
0	12.2	11.1		0	26.1	8.1
3	9.6	11.55		3	25.4	7.9
6	8.5	11.8		6	25.1	8.1
9	7.1	11.94		9	23.3	7.8
12	6.3	11.61		12	12.5	6.8
13	6.2	11.52		13	~	~
15	6.1	11.38		15	11.5	3.7
18	6	11.34		18	11	2.9
21	6	11.23		21	10.9	2.6
24	6	11.13		24	10.8	2.6

INVASIVE AQUATIC PLANT IDENTIFICATION





- Began testing summer 2018-
- Eurasion Watermilfoil
- Starry Stonewart
- Hydrilla
- Curly-leaf pondweed
- European Frog-bit

HEALTHY LONG LAKE?

•	Variable	Oligotrophic	Mesotrophic	Eutrophic	
•	Total Phosphorus (µg/L)	<10	10-20		>2(
•	Chlorophyll a (µg/L)	<4	4-10	>10	
•	Secchi depth (ft)	>13	6.6-13	>6.6	

 All other water quality data fell within healthy parameters and oligotrophic conditions are highly observable.

Long Lake total mean Values for 2017:

- Total Phosphorus Surface <u>3.95 ug/L</u>
- Total Phosphorus Near Bottom <u>9.9ug/L</u>
- Chlorophyll a <u>1.2 ug/L</u>
- Secchi depth <u>26.25 ft</u>

MAINTAINING A HEALTHY LONG LAKE



- Create/ maintain a buffer zone along the shoreline
- Do not use fertilizer, or switch to zero phosphate & low nitrate fertilizer
- Prevent the spread of invasive species via watercraft
- Read full report on Long Lake & contact the association for any inquiries
- Share stewardship with our friends and families!

THANK YOU!

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