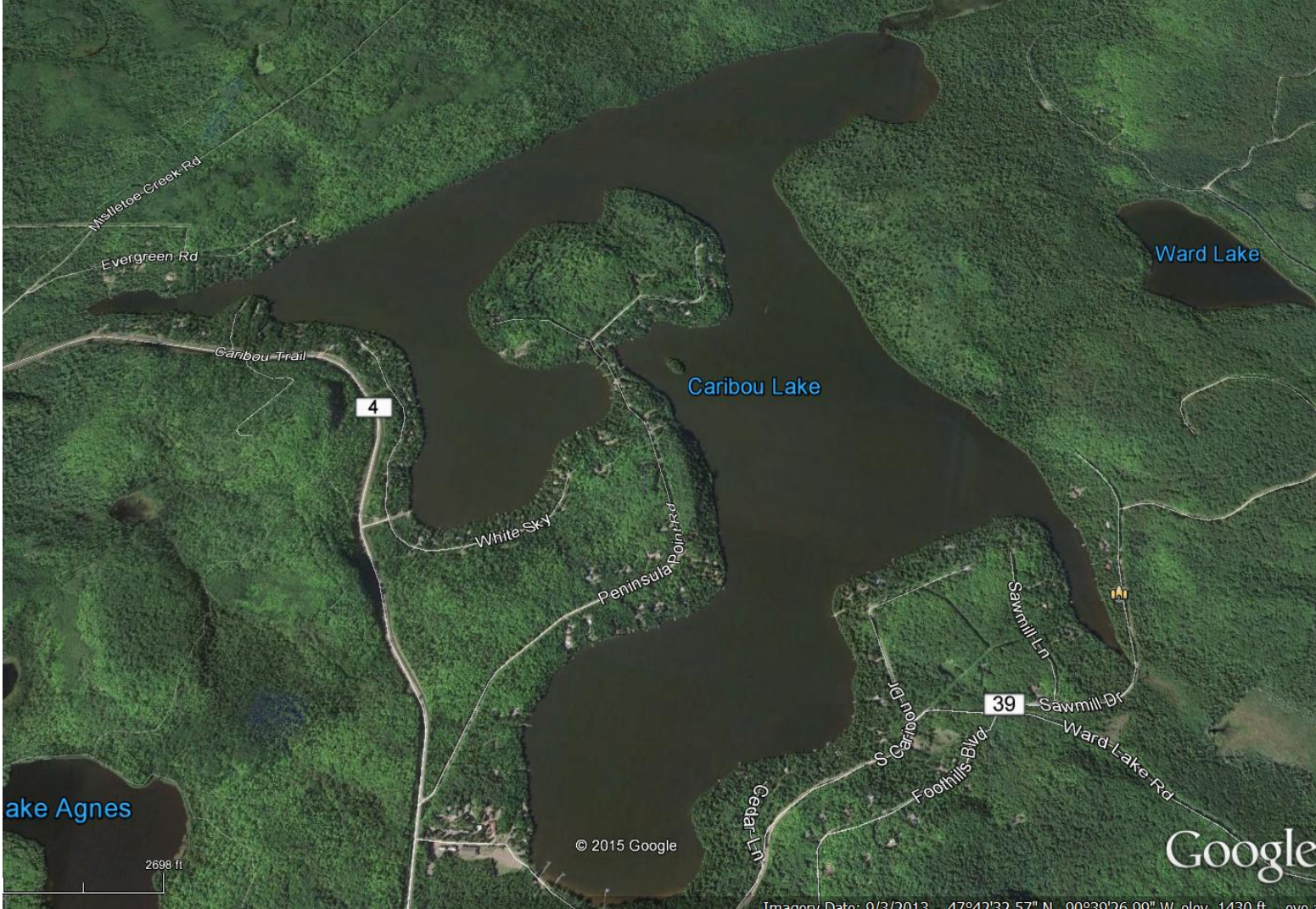


Caribou Lake Property Owners' Association



AGENDA

Introduction of Board Members, attendees, and guests

I. Reports and official business

- A. Approve Minutes of 2015 Annual Meeting
- B. Treasurer's report - Louise Suomi
- C. CCCoLA report - Irene Mullen
- D. Water quality report - Larry Mullen/Bob Reid
- E. Comments from Commissioner Storlie
- F. Firewise – Todd Armbruster
- G. Nomination and election of Board members

II. Guest Speakers

- A. Chel Anderson - the geology and ecology of Cook Co & NE MN

III. Issues from the floor

IV. Adjourn

Monthly reports

Cook County SWCD – One Water, One Plan (collaborated with Lake County) shore land grants – Ilena Berg

MPCA, WRAPS,(Water Restoration and Protection Services) Blue Green algae warnings – Karen Evans

AIS – updates about boat inspections, rusty crayfish, spiny water fleas - Amanda Weiberg, CCAIS Coordinator

AIS Task Force - updates on AIS county actions with input - Kate Kelnberger and Dan Fitzgerald

Minnesota Lakes and Rivers & MNCoLA – updates on state wide lake activities and state level projects

Lake Reports – board members share what’s happening at their lake, so we can learn from each other

Speakers

Cook County Climate Change Lobby – Rebecca Winanen- can the county become carbon neutral

Natural Resources US Forest Service – Sarah Poznanovic – North Shore Lake Superior Restoration Project

Lake County SWCD – Dan Schutte – shared the how and why of the development of On Water, One Plan -

MPCA – Karen Evans – shared the WRAPS (Water Restoration and Protection Services) project in conjunction with One Water, One Plan

Cook County Zoning and Planning – Tim Nelson – process, regulation, shore land regulations

CCCOLA

COOK COUNTY COALITION OF LAKE ASSOCIATIONS - SUMMER 2016

Actions

- Letter to USFS – Twin Mine Leases
- Community partner for Cook County Shoreline Grant
- Feedback on AIS plan and implementation
- Spiney Water Fleas monitoring
- Calcium testing
- Fire Departments donations – Maple Hill, Gunflint & Lutsen
- President's Reception – Annual Gathering for lake associations to meet

- Increasing participation and members of CCCoLA

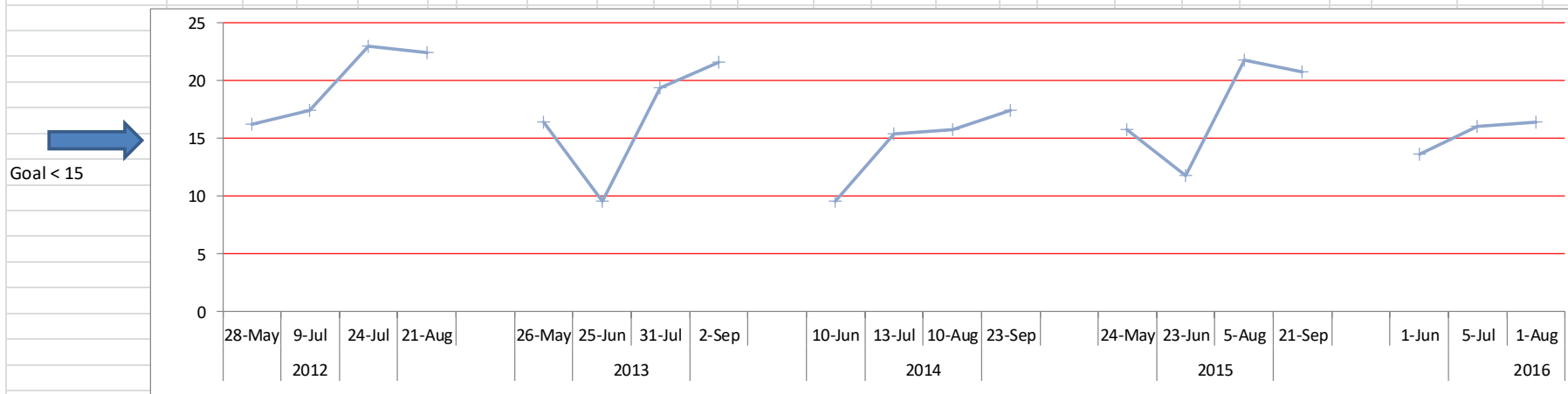


Caribou Lake Sample Results

	2016				
<u>Site</u>	<u>1-Jun</u>	<u>5-Jul</u>	<u>1-Aug</u>	<u>Sep</u>	<u>Ave</u>
Total Phosphorus (PPB) Goal = 15 or less					
203 (Camp)	12	17	15		14.67
100 (Island)	11	18	17		15.33
205 (Fosters)	12	15	18		15.00
103 (Landing)	13	16	17		15.33
201 (Isthmus)	20	14	15		16.33
Average	13.6	16	16.4	0	15.33
Chlorophyll-a (PPB) Goal = 8 or less					
203 (Camp)	1.78	2.22	4		2.67
100 (Island)	1	4.9	6.68		4.19
205 (Fosters)	1.34	5.34	7.12		4.60
103 (Landing)	2.22	2.67	4.9		3.26
201 (Isthmus)	1.78	4.9	4		3.56
Average	1.624	4.006	5.34	0	3.66
Secchi (Feet) Goal is 6 or more					
203 (Camp)	8	7	7		7.33
100 (Island)	8.5	6.5	7		7.33
205 (Fosters)	7.5	7.5	7.5		7.50
103 (Landing)	7.5	7	6		6.83
201 (Isthmus)	7	7.5	6		6.83
Average	7.7	7.1	6.7	0	7.17

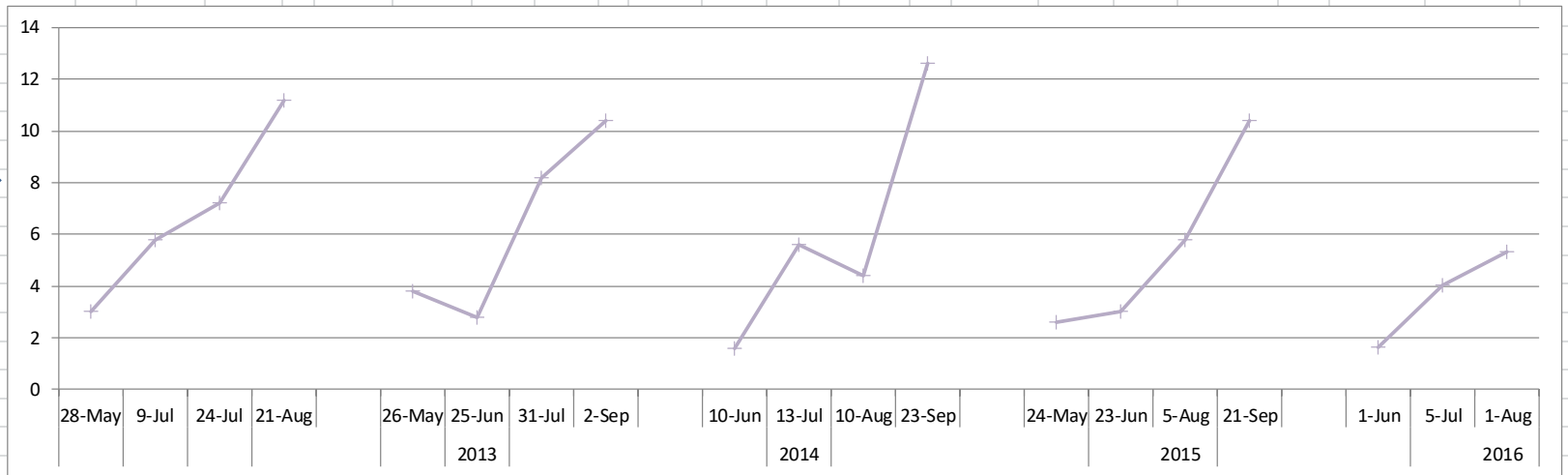
Caribou Lake Sample Results - Phosphorus

	2012				2013				2014				2015				2016		
Site	28-May	9-Jul	24-Jul	21-Aug	26-May	25-Jun	31-Jul	2-Sep	10-Jun	13-Jul	10-Aug	23-Sep	24-May	23-Jun	5-Aug	21-Sep	1-Jun	5-Jul	1-Aug
Average	16.2	17.4	23	22.4	16.4	9.6	19.4	21.6	9.6	15.4	15.8	17.4	15.8	11.8	21.8	20.8	13.6	16	16.4



Caribou Lake Sample Results - Chlorophyll

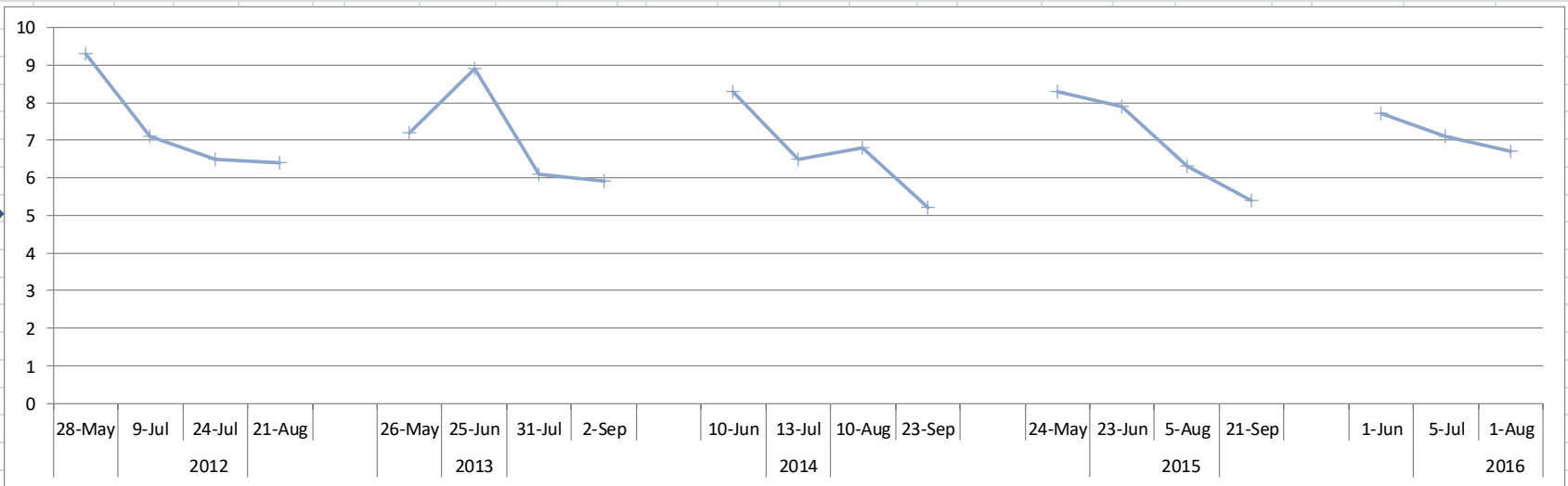
					2013				2014				2015				2016		
Site	<u>28-May</u>	<u>9-Jul</u>	<u>24-Jul</u>	<u>21-Aug</u>	<u>26-May</u>	<u>25-Jun</u>	<u>31-Jul</u>	<u>2-Sep</u>	<u>10-Jun</u>	<u>13-Jul</u>	<u>10-Aug</u>	<u>23-Sep</u>	<u>24-May</u>	<u>23-Jun</u>	<u>5-Aug</u>	<u>21-Sep</u>	<u>1-Jun</u>	<u>5-Jul</u>	<u>1-Aug</u>
Average	3	5.8	7.2	11.2	3.8	2.8	8.2	10.4	1.6	5.6	4.4	12.6	2.6	3	5.8	10.4	1.62	4.01	5.34

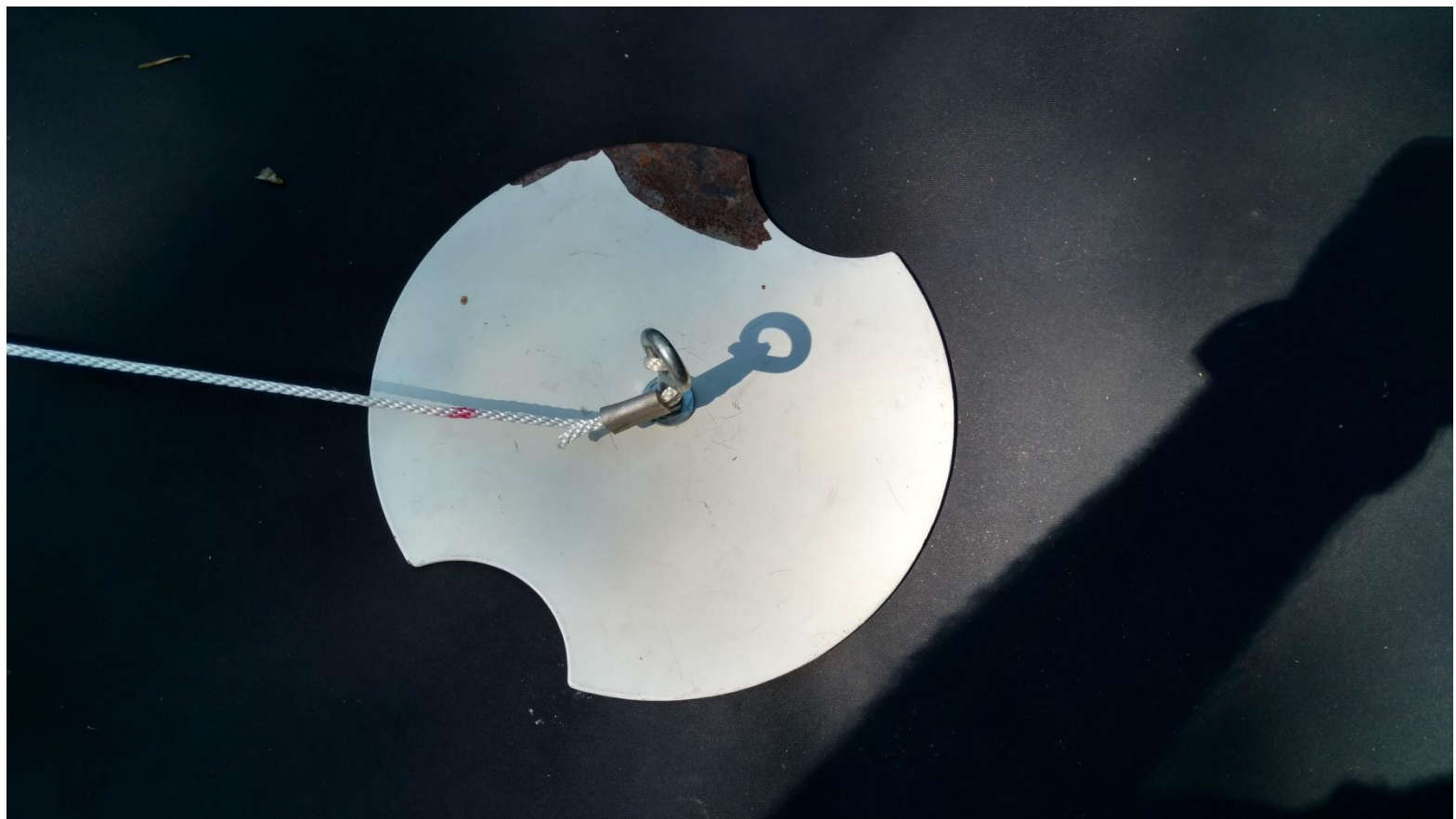






Secchi Disk																			
	2012				2013				2014				2015				2016		
Site	28-May	9-Jul	24-Jul	21-Aug	26-May	25-Jun	31-Jul	2-Sep	10-Jun	13-Jul	10-Aug	23-Sep	24-May	23-Jun	5-Aug	21-Sep	1-Jun	5-Jul	1-Aug
Average	9.3	7.1	6.5	6.396	7.2	8.9	6.1	5.9	8.3	6.5	6.8	5.2	8.3	7.9	6.3	5.4	7.7	7.1	6.7







Spiny Water Flea



Adult size of the spiny water flea is 3/8 inch.



On a fishing line, spiny water fleas look like bristly gobs of jelly with black spots.

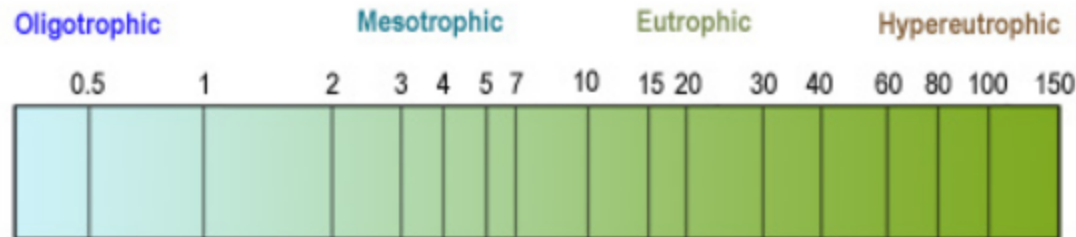


Impacts: Spiny waterfleas eat small animals (zooplankton), including Daphnia, which are an important food for native fishes. In some lakes, they caused the decline or elimination of some species of native zooplankton. They can clog eyelets of fishing rods and prevent fish from being landed.

Phosphorus is a nutrient important for plant growth. In most lakes, phosphorus is the limiting nutrient, which means that everything that plants and algae need to grow is available in excess (sunlight, warmth, water, nitrogen, etc.) except phosphorus. This means that phosphorus has a direct effect on plant and algal growth in lakes – the more phosphorus is available, the more plants and algae there are in the lake. Phosphorus originates from a variety of sources, many of which are related to human activities. Major sources include human and animal wastes, soil erosion, detergents, septic systems and runoff from farmland or fertilized lawns.

Chlorophyll-a is the pigment that makes plants and algae green. This pigment is what allows plants and algae to photosynthesize. In photosynthesis, plants use the sun's energy to convert carbon dioxide and water into oxygen and cellular material.

Chlorophyll-a (ppb) related to Lake Trophic State



Chlorophyll-a is tested in lakes to determine how much algae is in the lake. Algae is important in lakes because it adds oxygen to the water as a by-product of photosynthesis. On the other hand, if there is too much algae in a lake it can produce a foul odor and be unpleasant for swimming. Chlorophyll-a concentration can tell you a lot about the lake's water quality and trophic state as shown below (Figure 1). We can compare annual mean chlorophyll-a values to see if the amount of algae in the lake per year is increasing, decreasing, or staying the same.

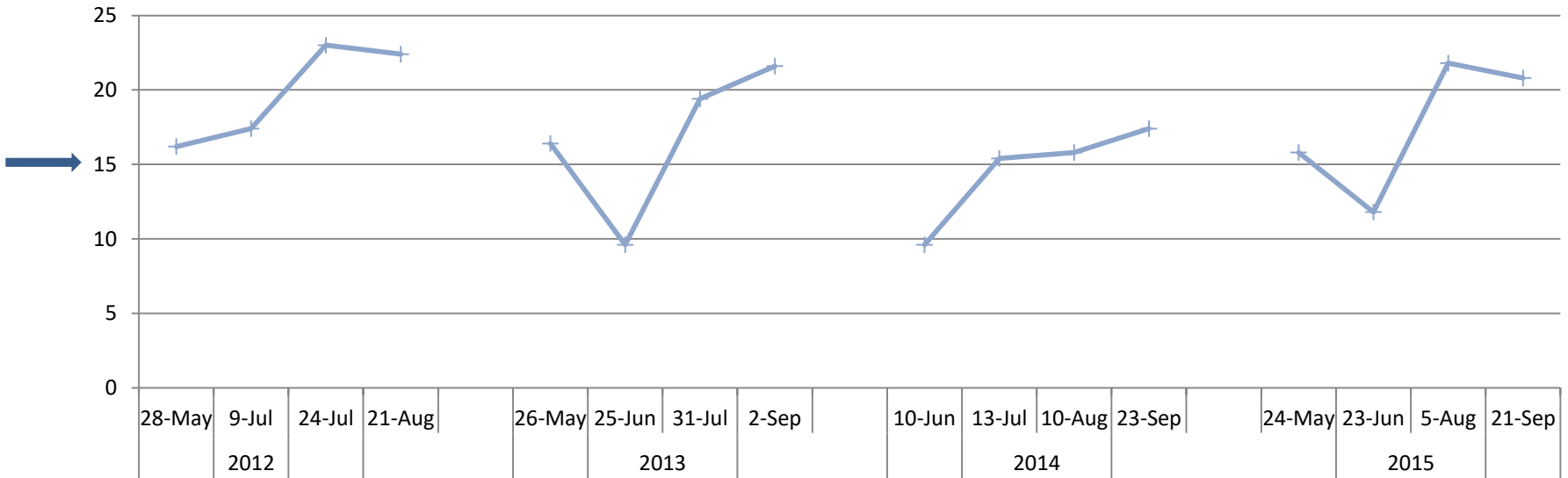
Dissolved Oxygen (DO) is the amount of oxygen dissolved in lake water. Oxygen is necessary for all living organisms to survive except for some bacteria. Living organisms breathe in oxygen that is dissolved in the water. The amount of oxygen lake water can hold is directly related to temperature. The colder the water, the more dissolved oxygen it can hold.

Biological Implications

All organisms, except some bacteria, need oxygen to survive. If the bottom of the lake becomes anoxic, the organisms either die or move up from the bottom to where there is oxygen. For example, in late summer fish usually move closer to the surface because there is no oxygen available at the bottom of the lake. In shallow lakes in the summer and winter, the entire lake can become anoxic, causing a fish kill.

Caribou Lake Sample Results

	2012					2013					2014					2015					
Site	28-May	9-Jul	24-Jul	21-Aug	Ave	26-May	25-Jun	31-Jul	2-Sep	Ave	10-Jun	13-Jul	10-Aug	23-Sep	Ave	24-May	23-Jun	5-Aug	21-Sep	Ave	
Total Phosphorus (PPB) Goal = 15 or less																					
203 (Camp)	21	17	23	21	20.50	17	11	15	22	16.25	9	12	21	17	14.75	12	12	25	16	16.25	
100 (Island)	22	17	28	23	22.50	16	9	42	26	23.25	10	24	14	16	16.00	12	11	21	22	16.50	
205 (Fosters)	13	21	22	26	20.50	19	10	15	21	16.25	10	14	14	18	14.00	16	11	24	31	20.50	
103 (Landing)	12	17	21	23	18.25	13	9	13	20	13.75	9	14	16	16	13.75	18	12	17	18	16.25	
201 (W.of Penn)	13	15	21	19	17.00	17	9	12	19	14.25	10	13	14	20	14.25	21	13	22	17	18.25	
Average	16.2	17.4	23	22.4	19.75	16.4	9.6	19.4	21.6	16.75	9.6	15.4	15.8	17.4	14.55	15.8	11.8	21.8	20.8	17.55	



Caribou Lake Sample Results

2012

2013

2014

2015

Site

28-May 9-Jul 24-Jul 21-Aug Ave

26-May 25-Jun 31-Jul 2-Sep Ave

10-Jun 13-Jul 10-Aug 23-Sep Ave

24-May 23-Jun 5-Aug 21-Sep Ave

Chlorophyll-a (PPB) Goal = 8 or less

Site	28-May	9-Jul	24-Jul	21-Aug	Ave	26-May	25-Jun	31-Jul	2-Sep	Ave	10-Jun	13-Jul	10-Aug	23-Sep	Ave	24-May	23-Jun	5-Aug	21-Sep	Ave
203 (Camp)	3	5	6	10	6.00	3	4	10	11	7.00	1	4	5	9	4.75	3	4	5	10	5.50
100 (Island)	2	6	10	12	7.50	4	3	9	9	6.25	3	5	5	12	6.25	4	2	7	11	6.00
205 (Fosters)	2	7	8	14	7.75	4	2	8	8	5.50	1	5	3	16	6.25	2	4	7	10	5.75
103 (Landing)	4	5	6	10	6.25	4	3	7	12	6.50	1	8	4	12	6.25	2	2	6	12	5.50
201 (W. of Penn)	4	6	6	10	6.50	4	2	7	12	6.25	2	6	5	14	6.75	2	3	4	9	4.50
Average	3	5.8	7.2	11.2	6.80	3.8	2.8	8.2	10.4	6.30	1.6	5.6	4.4	12.6	6.05	2.6	3	5.8	10.4	5.45

