CONNECTING THE DOTS / WHY DO HARMFUL BLUE-GREEN ALGAE GROW UNDER LAKE ICE?

Tasnim Anjum Mou, Miguel Montoro Girona, Guillaume Grosbois

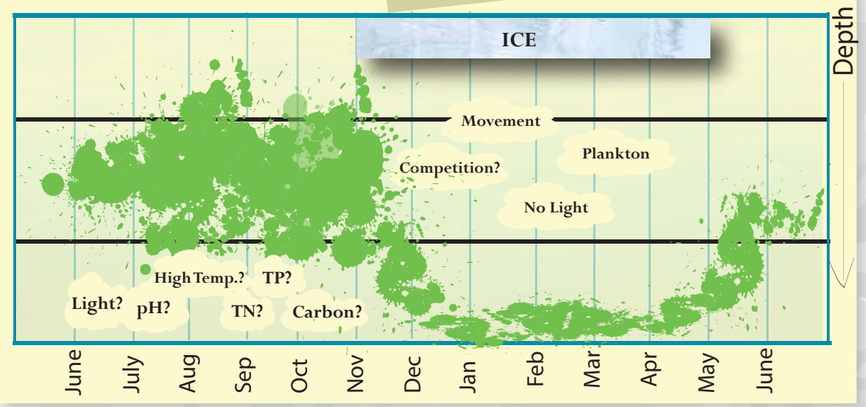
Groupe de Recherche en Écologie de la MRC-Abitibi (GREMA), Université du Québec en Abitibi-Témiscamingue (UQAT)

Problematic

- Cyanobacteria are the Earth's oldest photoautotrophs and produced the oxygen we breathe today.
- However, when they overgrow and form cyanobacterial bloom, they become life threatening.
- Recenty, occurences of cyanobacteria have been observed under the ice cover which contradicts usual drivers of cyanobacterial blooms.

Organs affected by cyanobacterial toxins

1. Brain
2. Lungs
3. Liver
4. Kidneys
5. Immune System
6. Stomach
7. Intestine
8. Colon



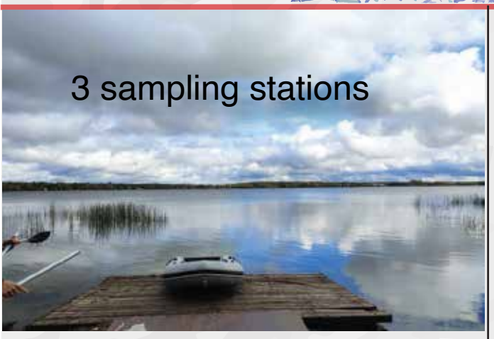
Why?

Objectives

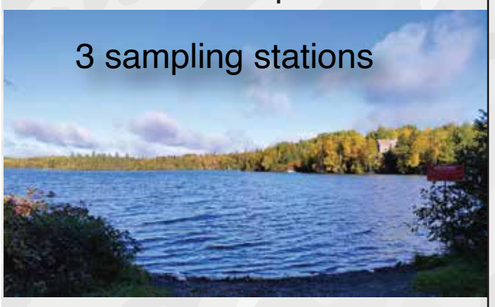
1. Characterize algal community composition including cyanobacteria species and measure the toxicity in water over one year in different climatic conditions such as under lake ice in winter.

2. Determine the driving environmental and physicochemical factors responsible for causing cyanobacterial bloom and toxicity in lake water.

Method



Lake Beauchamp

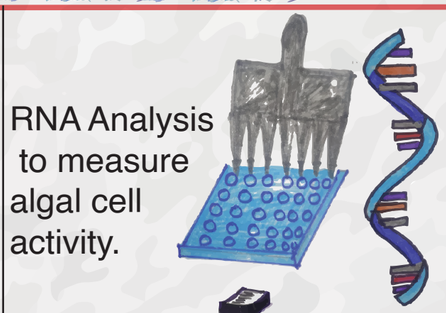


Lake Fortune

Field survey Timeline
June 2021 to May 2022

1. Water collection from different water layer using Van Dorn sampling bottle
2. Zooplankton collection
3. Light measurement with LI-COR
4. Water profile with multiparameter sonde (RBR)
5. Water depth measure
6. Water Filtration for Chorophyll-a, phosphorus and nitrogen concentrations
7. Secchi disk to measure transparency of water

RNA Analysis to measure algal cell activity.



Species Identification

Hypothesis

1. Toxicity produced by cyanobacterial community will be detected all over the year, even under the ice in winter in lake Fortune but only in summer in lake Beauchamp.

2. Sufficient nutrient availability allows cyanobacterial blooms in lake Fortune all year long and high summer temperatures drive cyanobacterial bloom in lake Beauchamp.

Contribution

The outcomes of the project will contribute to the goal of controlling toxicity from harmful blue-green algae blooms.

Acknowledgement: Association de riverains du lac Beauchamp et du lac Fortune

Reference ResearchGate
Tasnim.AnjumMou@uqat.ca