DIVERSITY OF MICROBIAL POPULATIONS IN STUCKBERRY VALLEY LAKES (NUNAVUT, CANADA) IN A CONTEXT OF CLIMATE CHANGE

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Microorganisms

Why are they so important?

In aquatic environments, they :

Participate in biogeochemical cycles
Account for most of the biomass
Control microbial populations
Contribute to biodegradation
Exchange genetic material
Could cause diseases

Figure 1 : Aerial photograph of Top Lake and Y Lake in Stuckberry Valley

Stuckberry Valley

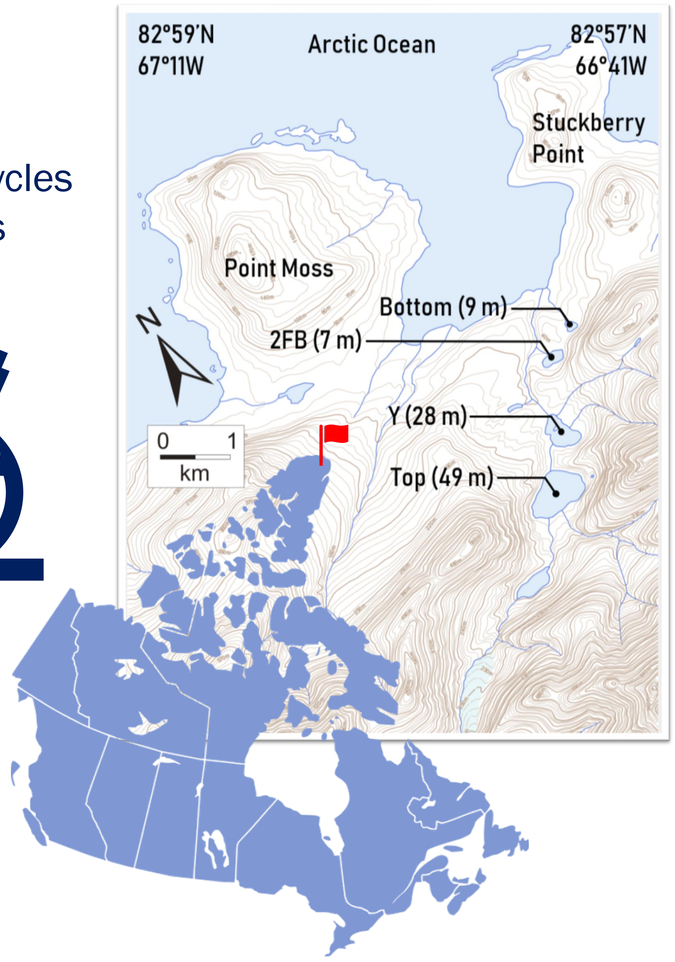

Figure 2 : Map of Stuckberry Valley lakes and their deepest depths

Once upon a time...

Stuckberry Valley, an unstudied region, is located on the north coast of Ellesmere Island (Nunavut, Canada).

During the Holocene, the ice sheet gradually retreated ~ 11 400 years ago.

Due to postglacial rebound, four lakes formed and sequentially separated from the Arctic Ocean. They represent a opportunity to elucidate climate change effects on microbial populations.

Method

Water sampling
↓
Filtration
↓
DNA and RNA extraction
↓
Sequencing
↓
Analyses

Figure 4 : Filtration set-up

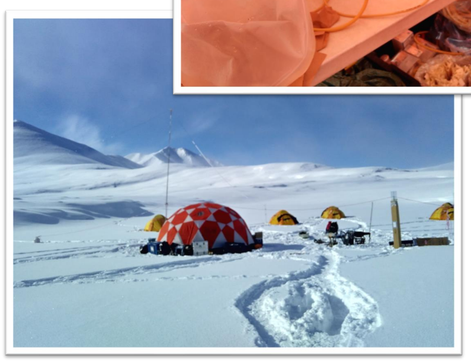

Figure 3 : Research camp

Preliminary results - Water column profiles

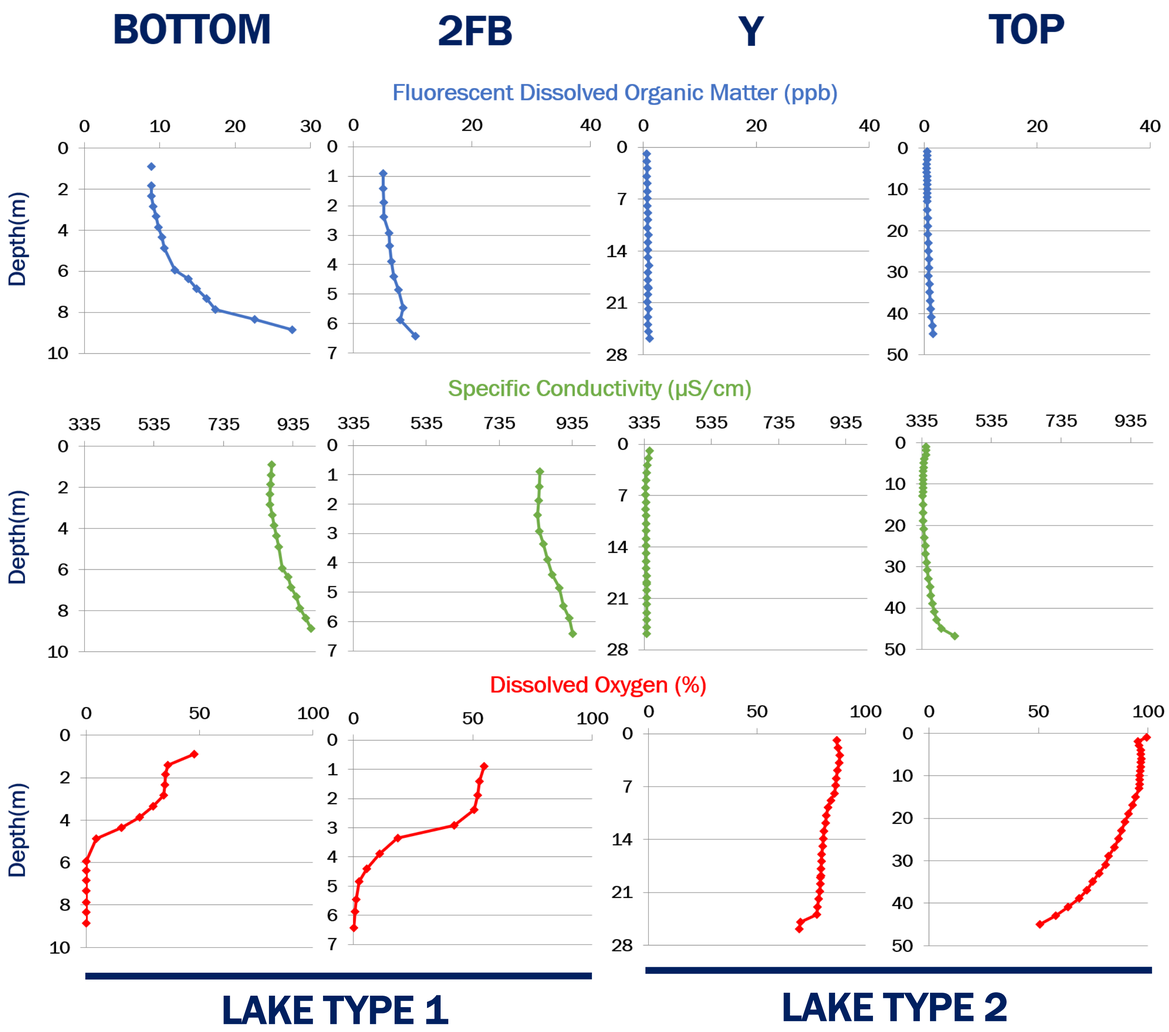

Figure 5 : Water column profiles of the four lakes

What assumptions can we make?

Surface : phototrophs | Anoxic zones : green sulfur bacteria

Objectives and hypothesis

1. Characterize the microbial diversity of four lakes in terms of :
   - Water column characteristics
   - Lake type
2. Compare to known regions at similar latitudes
3. Identify the biogeochemical factors that drive microbial diversity

Hypothesis : The microbial diversity will vary according to the depth and the type of lake.

What's next?

Sequencing | Quality-filtering | OTU tables | Phylogeny analysis | Alpha and beta biodiversity studies | Microbial populations description | Comparison to known regions at similar latitudes

REFERENCES

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