

Welcome to *PolarConnect*

with Lucy Coleman and the
Microbialites in Lake Joyce
PolarTREC Expedition

Friday, 12 December 2014

9:00 a.m. AKST

(10:00 am PST, 11:00 am MST, 12:00 pm CST, 1:00 pm EST)

Blackboard collaborate

Slides will be shown here

Exit the presentation

Click to Talk, Unclick to finish talking

Raise your hand to ask a question

Share with emoticons

List of all participants

Chat with one person or the entire group

The screenshot shows the Blackboard Collaborate interface. On the right, a presentation slide is displayed with the text "Welcome to Blackboard Collaborate" and the ARCUS logo (Arctic Research Consortium of the United States). On the left, a control panel is visible with various icons and a list of participants. Blue arrows point from text labels on the left to specific icons in the control panel: "Slides will be shown here" points to the top-left icon; "Exit the presentation" points to the top-right icon; "Click to Talk, Unclick to finish talking" points to the microphone icon; "Raise your hand to ask a question" points to the hand icon; "Share with emoticons" points to the emoticon icon; "List of all participants" points to the list icon; and "Chat with one person or the entire group" points to the chat icon.

Please Note:

- Participants using the telephone can mute/unmute by **pressing *6** on the phone.
- Today's event will be recorded and archived.

Participant Introductions

Please type in the chat box:

- ✓ Name
- ✓ Affiliation (School, Institution, Etc.)
- ✓ The number of students and adults participating with you in the same location



TEACHERS AND RESEARCHERS
EXPLORING AND COLLABORATING

What is PolarTREC?

PolarTREC is a professional development experience in which K-12 teachers are paired with researchers for 2-6 week research experiences in the polar regions.

From 2010-2015, nearly 70 teachers from around the United States will join scientists in the Arctic and Antarctica to learn about science, the polar regions, and to share what they have learned with their students and communities.

Questions

During the Presentation:

- Type your question in the text chat box

At the End of the Presentation:

- Raise your hand with the “hand button”.
- PolarTREC staff will call on you.
- Speak loud and clear and directly into the phone to ask your question.

Click on the Talk button to speak.

Unclick when you are done.

Microbialites in Lake Joyce, Antarctica Life Under Ice



The Team



Tyler Mackey
Geologist, UCD
Team Leader



Dr. Anne Jungblut
Microbiologist



Megan Krusor
Microbiologist, UCD



Justin Lawrence
Research Technican



Dr. Ian Hawes
Aquatic Ecologist



Sasha Leidman
Research Assistant

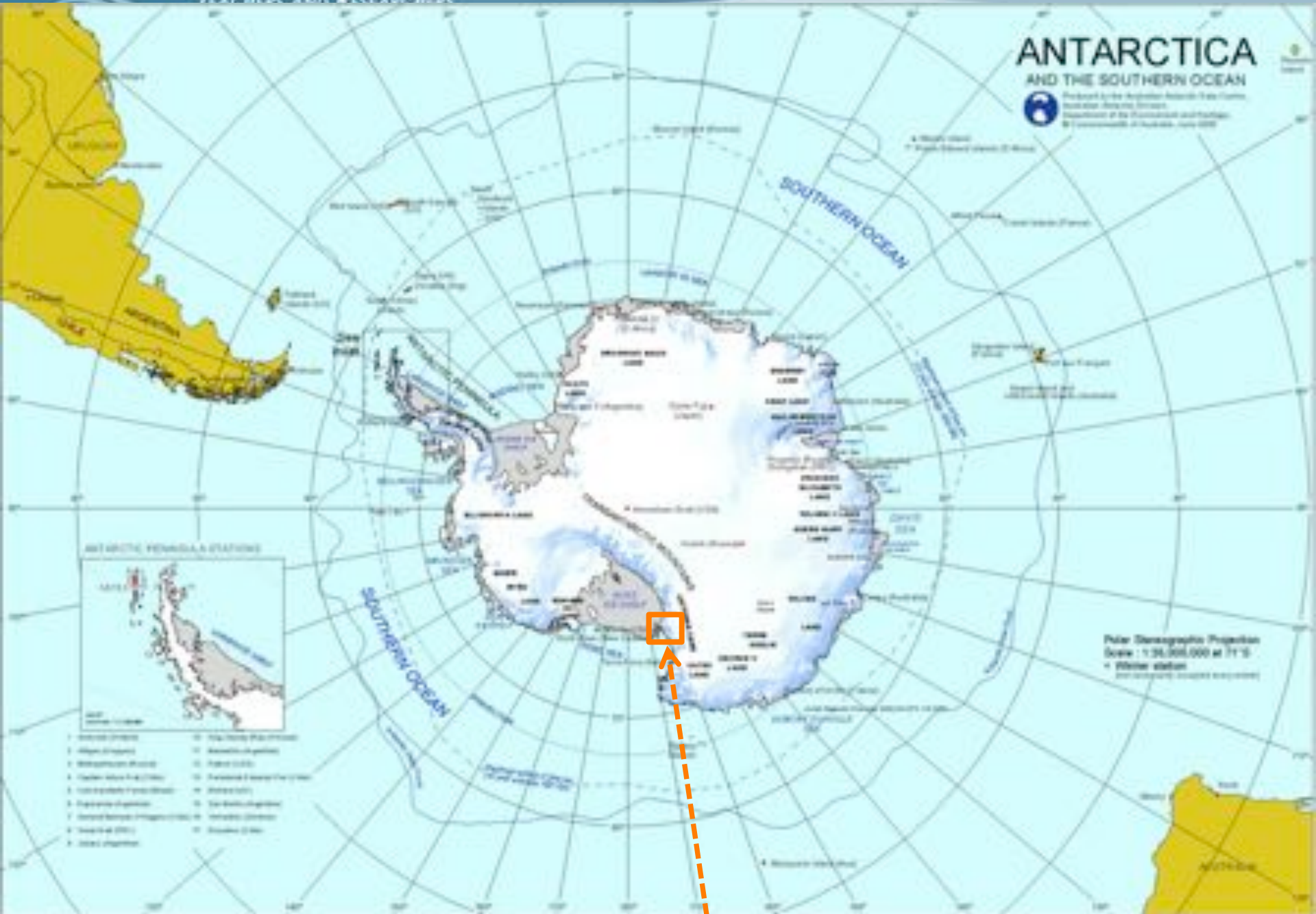


Lucy Coleman
Teacher

ANTARCTICA AND THE SOUTHERN OCEAN



Produced by the Australian Antarctic Data Centre
Antarctic Research Service
Department of the Environment and Heritage
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ANTARCTIC PENINSULA & STATIONS



- 1. Antarctic Peninsula
- 2. Adelia Land
- 3. Wilkes Land
- 4. Eastern Ross Sea (1950s)
- 5. Icebergs (1950s-1980s)
- 6. East Antarctic Ice Sheet
- 7. Antarctic Peninsula
- 8. Eastern Ross Sea (1950s-1980s)
- 9. Ross Sea (1950s)
- 10. Ross Sea (1980s)
- 11. Ross Sea (1990s)
- 12. Ross Sea (2000s)
- 13. Ross Sea (2010s)
- 14. Ross Sea (2020s)
- 15. Ross Sea (2030s)
- 16. Ross Sea (2040s)
- 17. Ross Sea (2050s)
- 18. Ross Sea (2060s)
- 19. Ross Sea (2070s)
- 20. Ross Sea (2080s)
- 21. Ross Sea (2090s)
- 22. Ross Sea (2100s)

Polar Stereographic Projection
Scale: 1:25,000,000 at 71°S
+ White station
+ Yellow station

McMurdo Station to Lake Joyce



Life at Lake Joyce



Lake Joyce



Life on the Lake



Working on the Lake



Why We're Here: Microbial Mats!



Cyanobacteria

- First oxygen-producing photosynthetic organisms, 3.5 billion years ago
- Led to the rise of oxygen levels on Early Earth

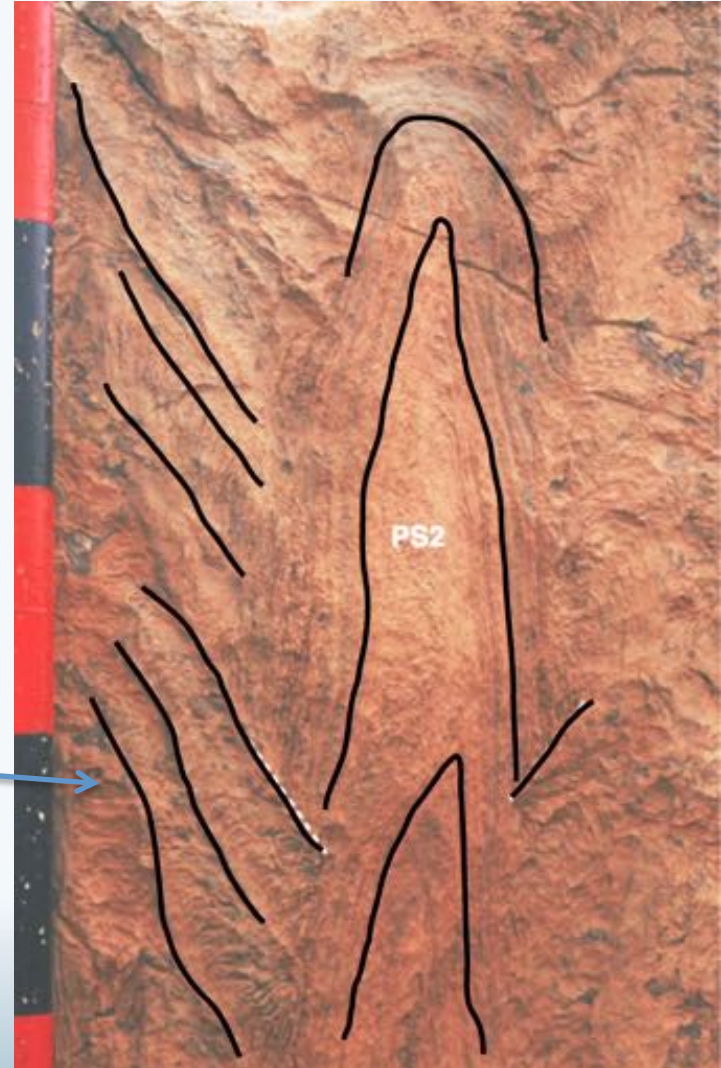


We study modern communities in order to understand early life on Earth

Modern mat



Mat preserved in rock
record



Our Big Question: How is the shape of webbed pinnacles influenced by sedimentation?



Evidence of Erosion



Why is this Important?

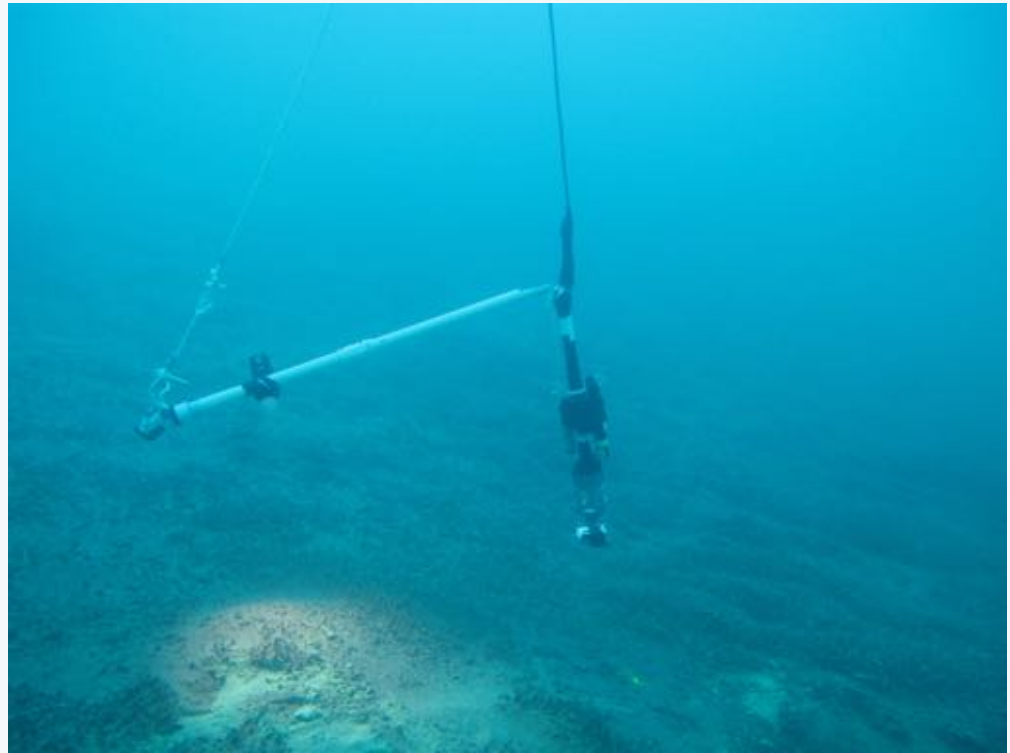
- shapes resemble those in rock record from early Earth
- helps us understand what environment was like on early Earth



Drilling to Access the Mats

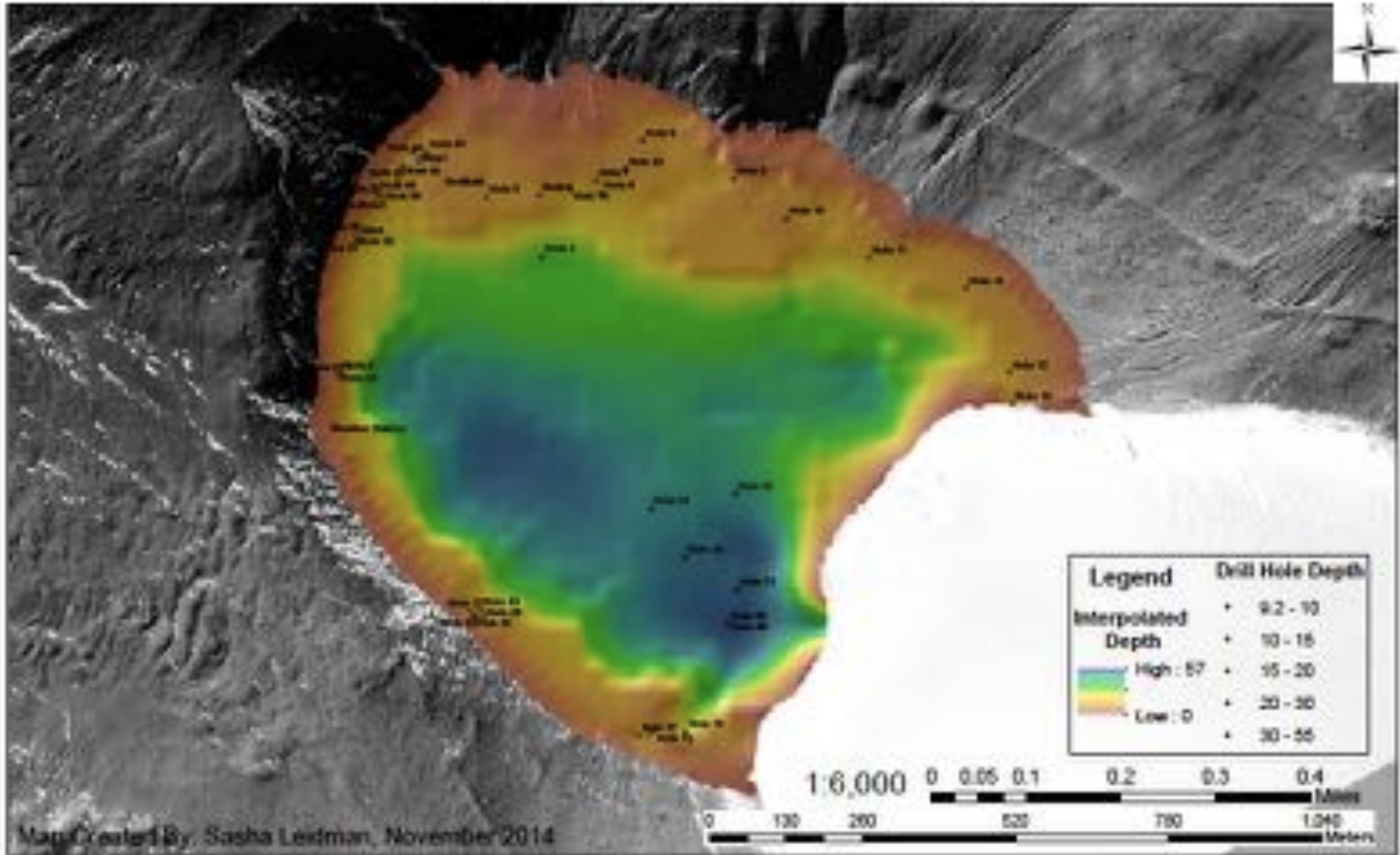


Eyes on the Mats: the Drop Camera



57 Drill Sites and an Improved Map!

Bathymetric Map of Lake Joyce, Antarctica



The Sediment Traps

Goals:

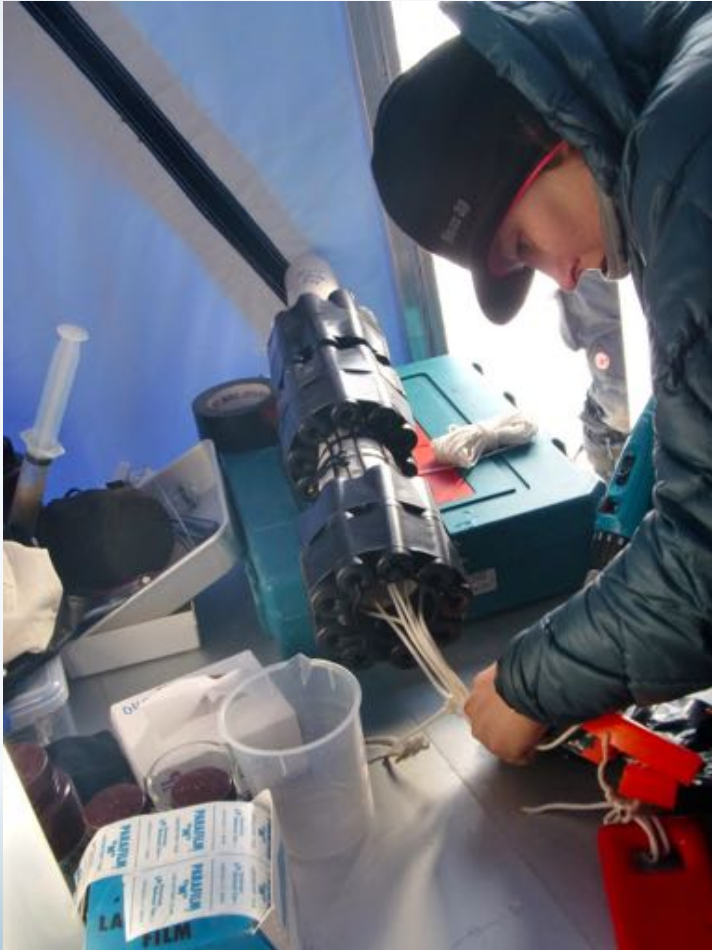
- 4 traps, 4 locations
- At depth of 12 meters
- Leave in place for a year
- Extract them without causing unnatural amounts of sediment to fall into lake



The Sediment Traps



Troubleshooting



Firsthand Mat Observations by Divers

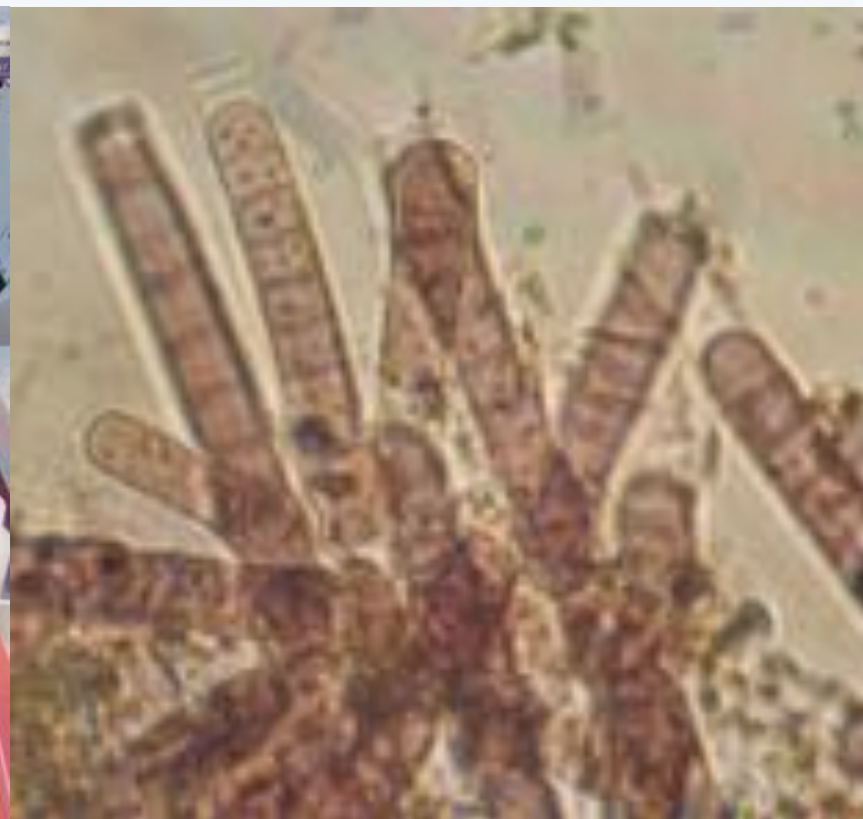


Collecting Samples While Diving



Studying the Mats: Microbial work

- Filter microbes from water samples
- Analyze DNA to determine which microbes are present
- Which microbes cause which community shapes?



Questions?





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Upcoming Events

Watch for and register for upcoming events at [www.polartrec.com!](http://www.polartrec.com)

Thank You!

An archive of the event will be available shortly.

<http://www.polartrac.com/polar-connect/archive>

