POLAR TREC

TEACHERS AND RESEARCHERS EXPLORING AND COLLABORATING

Welcome to *PolarConnect*

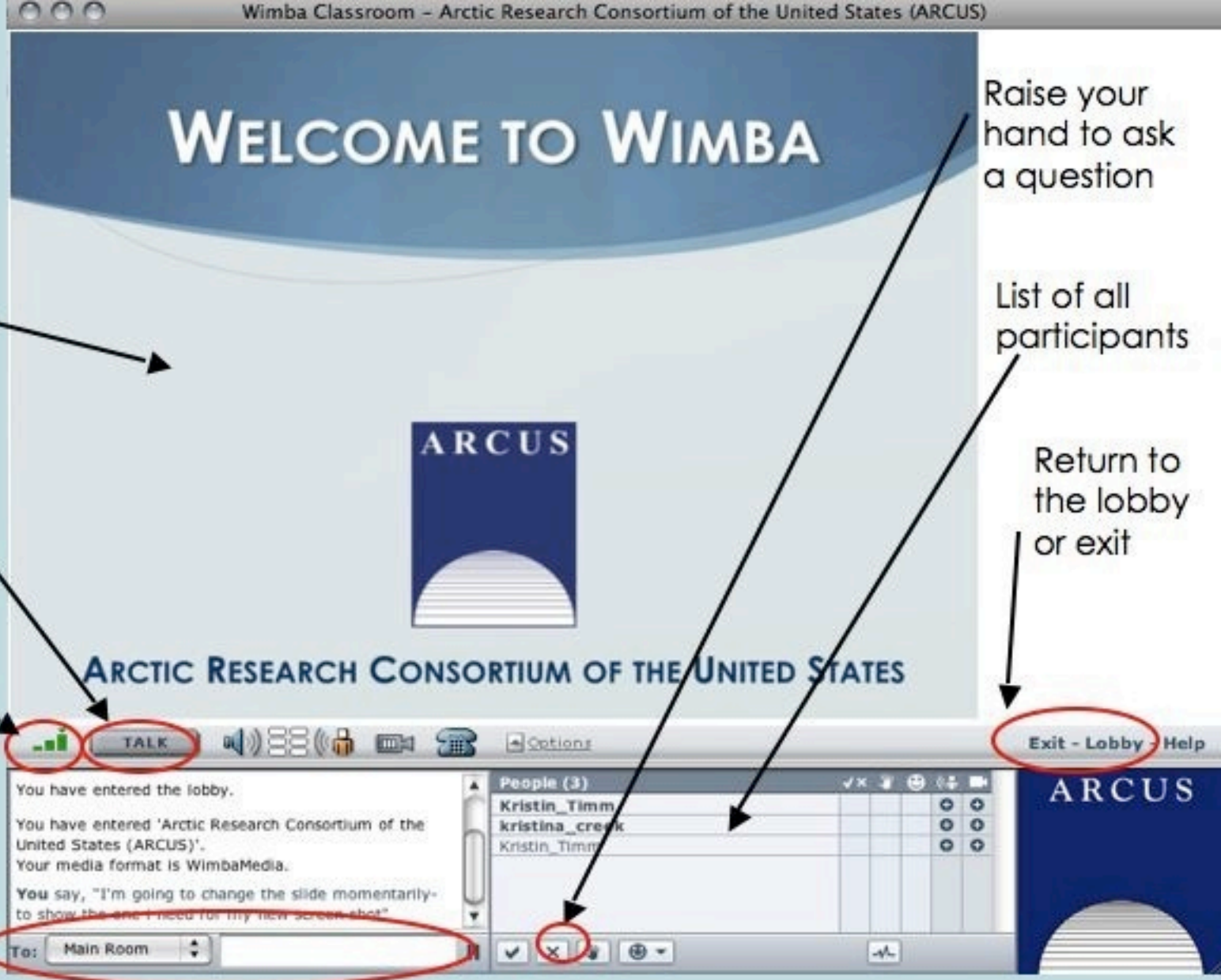
With Mark Goldner and the High Arctic Change 2011 PolarTREC Expedition

Monday 1 August 2011

10:00 a.m. AKDT

(11:00 am PDT, 12:00 pm MDT, 1:00 pm CDT, 2:00 pm EDT)

Wimba
people teach people



Slides will be shown here

If using VOIP, press and hold here to talk

Your connection strength

'Chat' with one person or the entire group

Raise your hand to ask a question

List of all participants

Return to the lobby or exit

Please note:

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

Roll Call

When called, please state your:

- ✓Name
- ✓School / Institution
- ✓The number of students and adults participating with you in the same location

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 2010-2013, nearly 50 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

To Ask a Question:

- ✓Raise your hand with the "hand button"
- ✓Type your question in the text chat box
- ✓Speak loud and clear and directly into the phone to ask your question.

High Arctic Change 2011
PolarTREC and REU

Dr. Ross Powell
N. Illinois University

Dr. Julie Brigham-Grette
UMASS Amherst

Daren McGregor
Colby College

Mark Goldner, Heath School

George Roth
Univ. of Washington

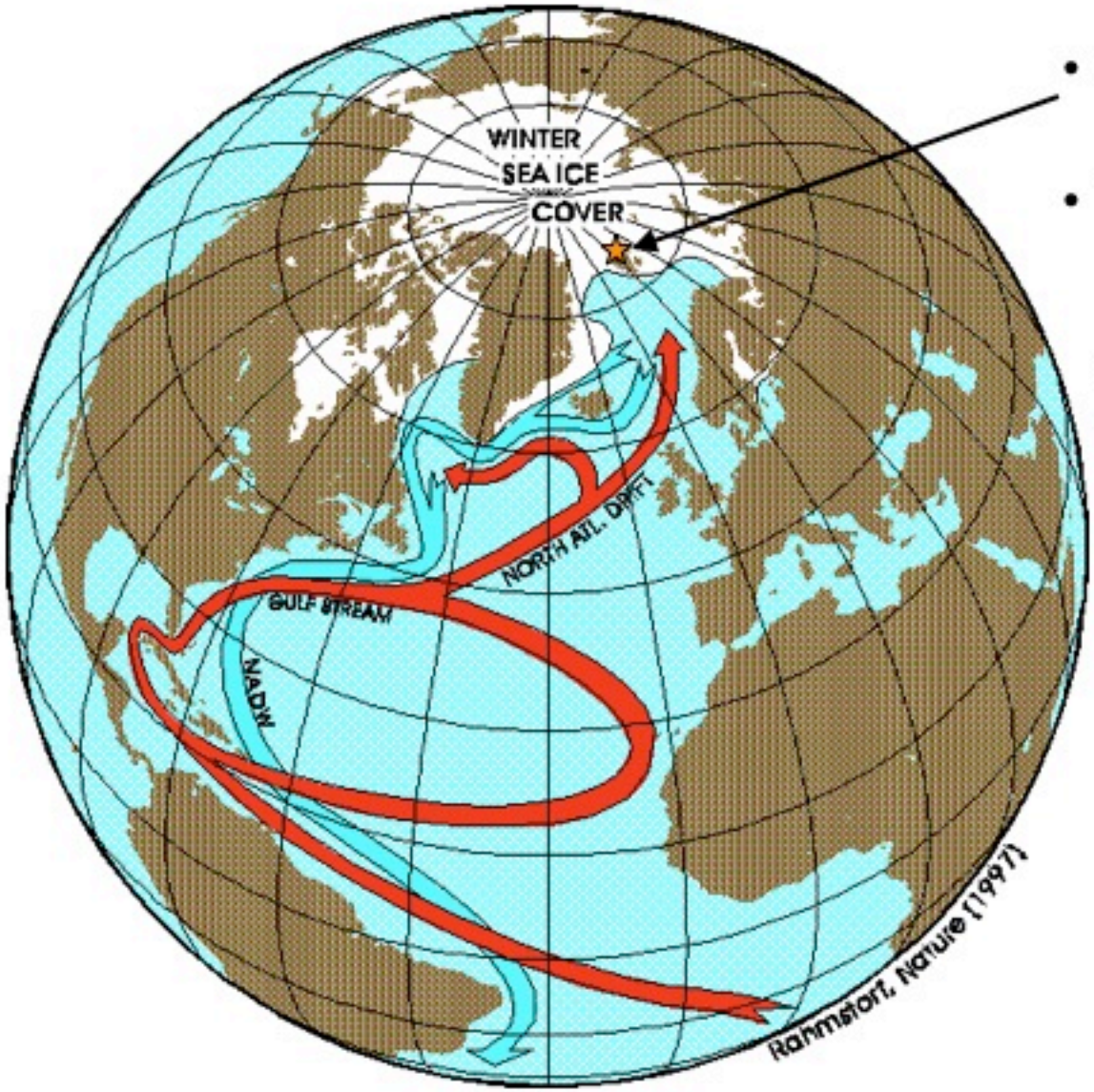
Daksha Rajagopalan
Yale University

Rebecca Siegel
Hampshire College

Rachel Valletta
Syracuse University

Liz Ceperley
Beloit College

Why Svalbard?



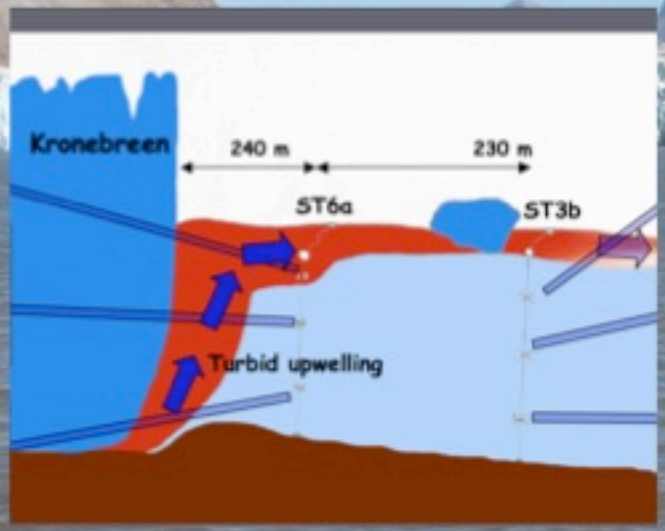
- Northern Extent of Gulf Stream
- Very Strong Effects of Climate Change: <u>Rising Temperatures</u> and <u>Melting Glacier Ice</u>

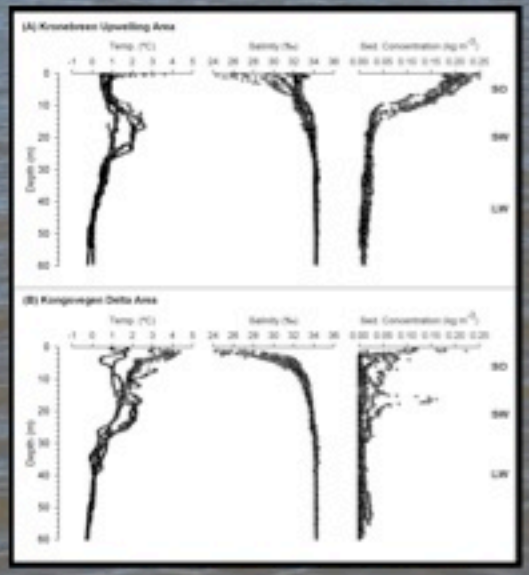
Ny Ålesund, Svalbard

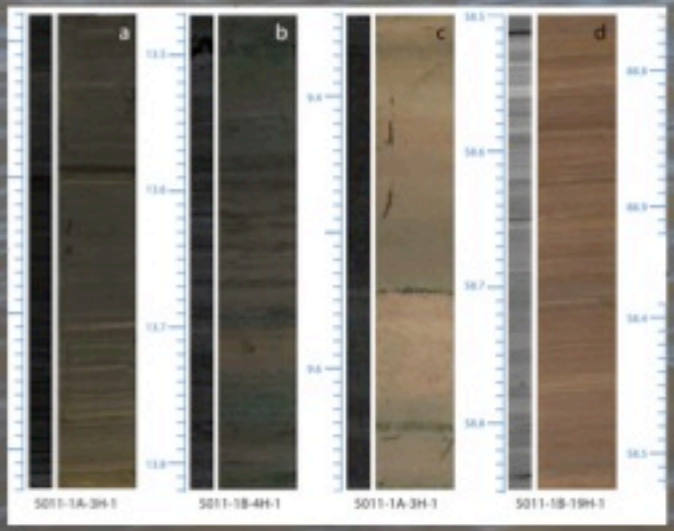
International Research Base at 79° North

Ny Ålesund, Svalbard

Svalbard Research Experience Objectives:







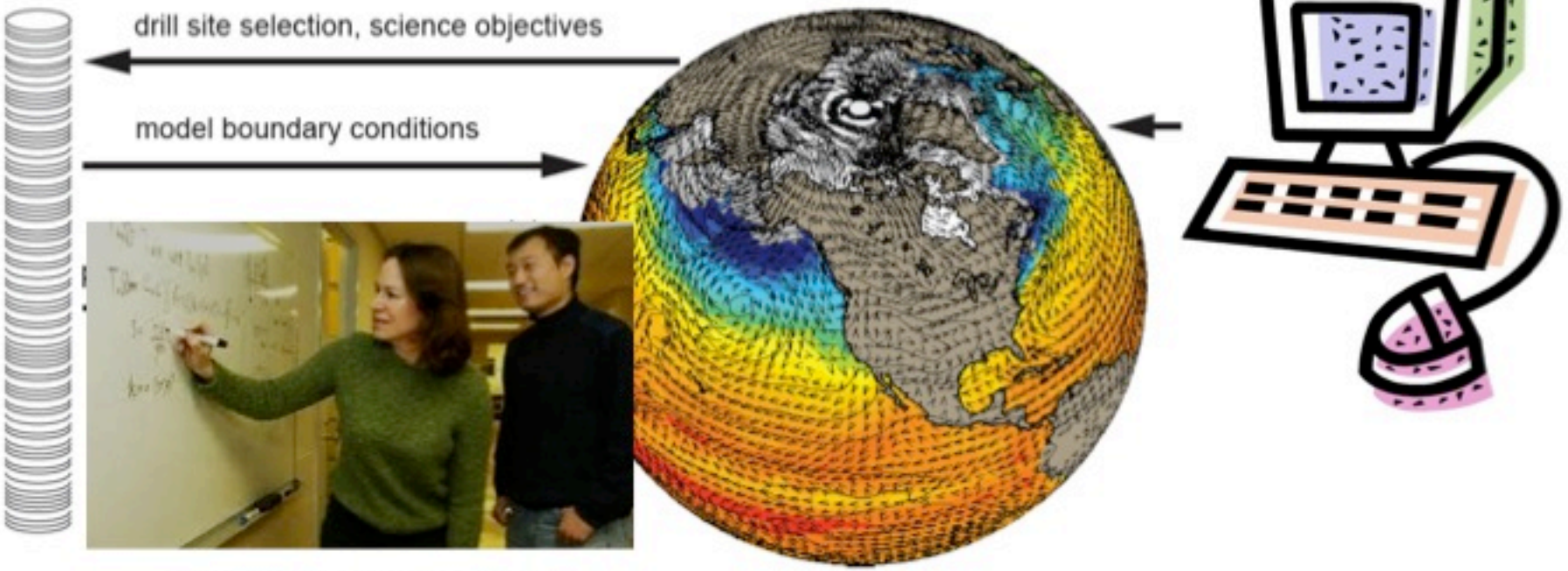
Understand modern geologic and oceanic processes of tide water glaciers

- ✓Calving rates
- ✓Ocean melting
- ✓Sediment rates
- ✓What controls ice margin stability

Modern processes to understand geologic record → Modeling and prediction of future change

Sediment core

Numerical models of climate



Geologists at work!

Finding Ocean Depth near a Changing Glacier
George Roth, University of Washington

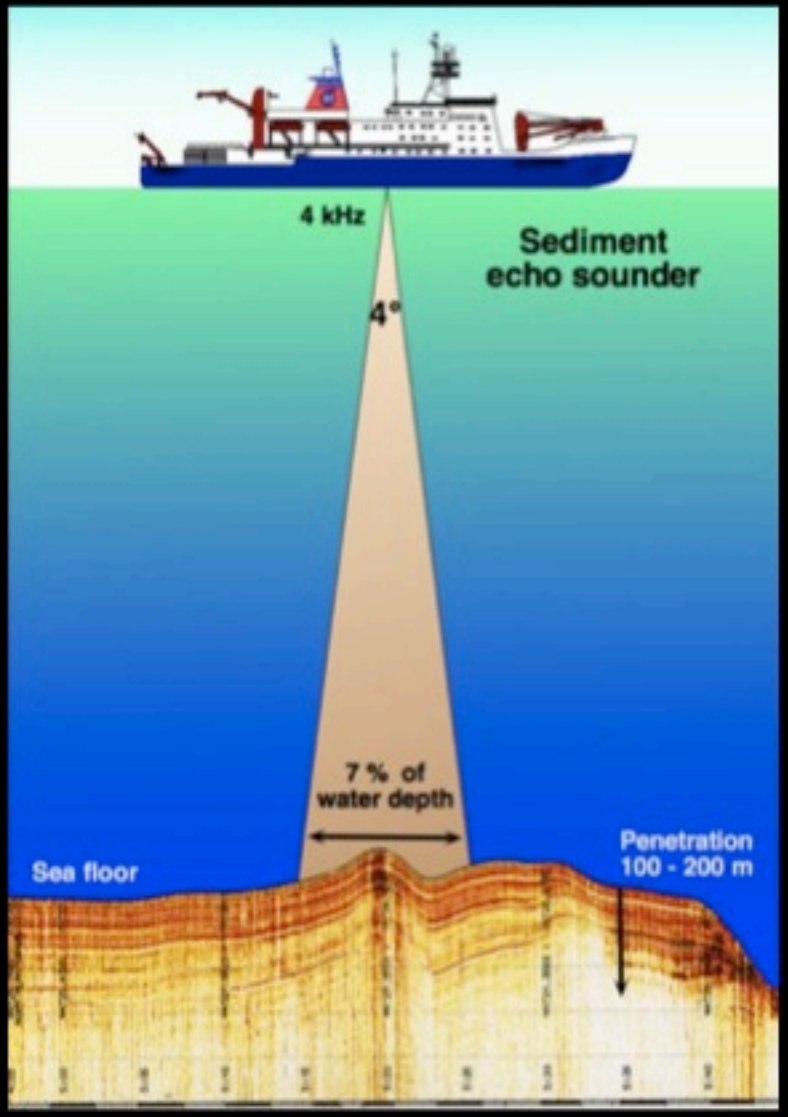
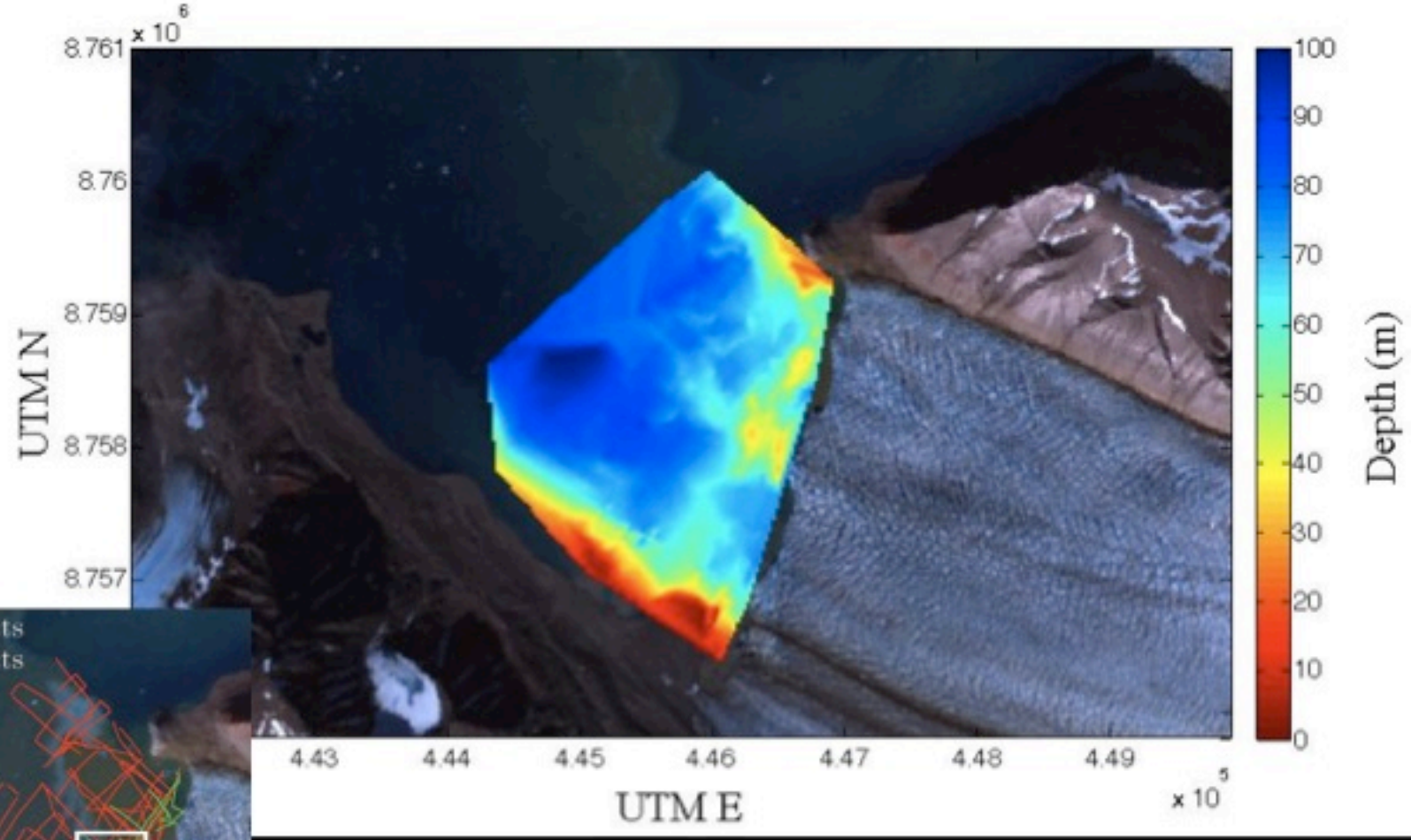


Image: Hannes Grobe, Alfred Wegener Institute for Polar and Marine Research



We know the glacier is getting smaller.

- Where is the water depth changing?
- How much is it changing?
- Using what we know about the depth in front of the glacier, what can we say about the glacier this year and in the future?

Images from 2009 REU member Laura Kehrl

Liz Ceperley
Beloit College

Mud in Kongsfjorden

Muddy water

Fjord floor

Icebergs

Where does the mud come from??

The bedrock

Rivers bring rocks and sediment to the fjord

Chocolate milk or water?

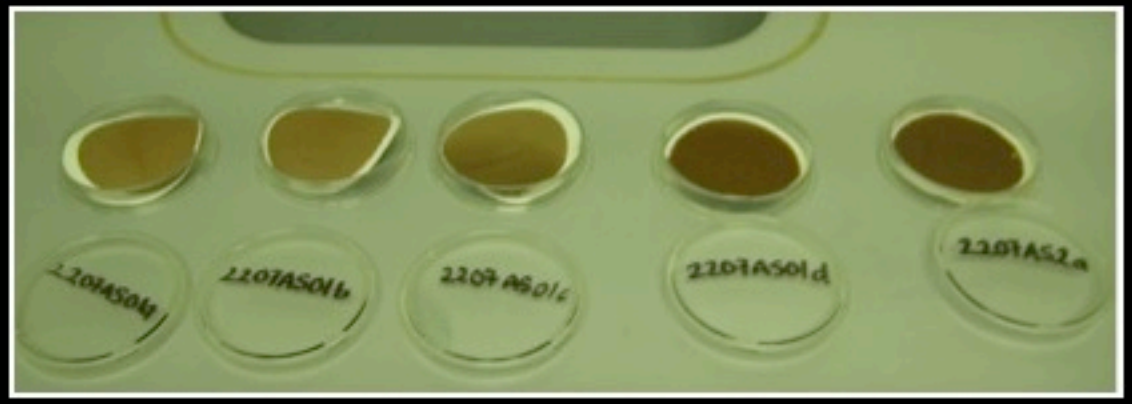
Where does it go?

Not mixing

Mixing

Looking at the samples

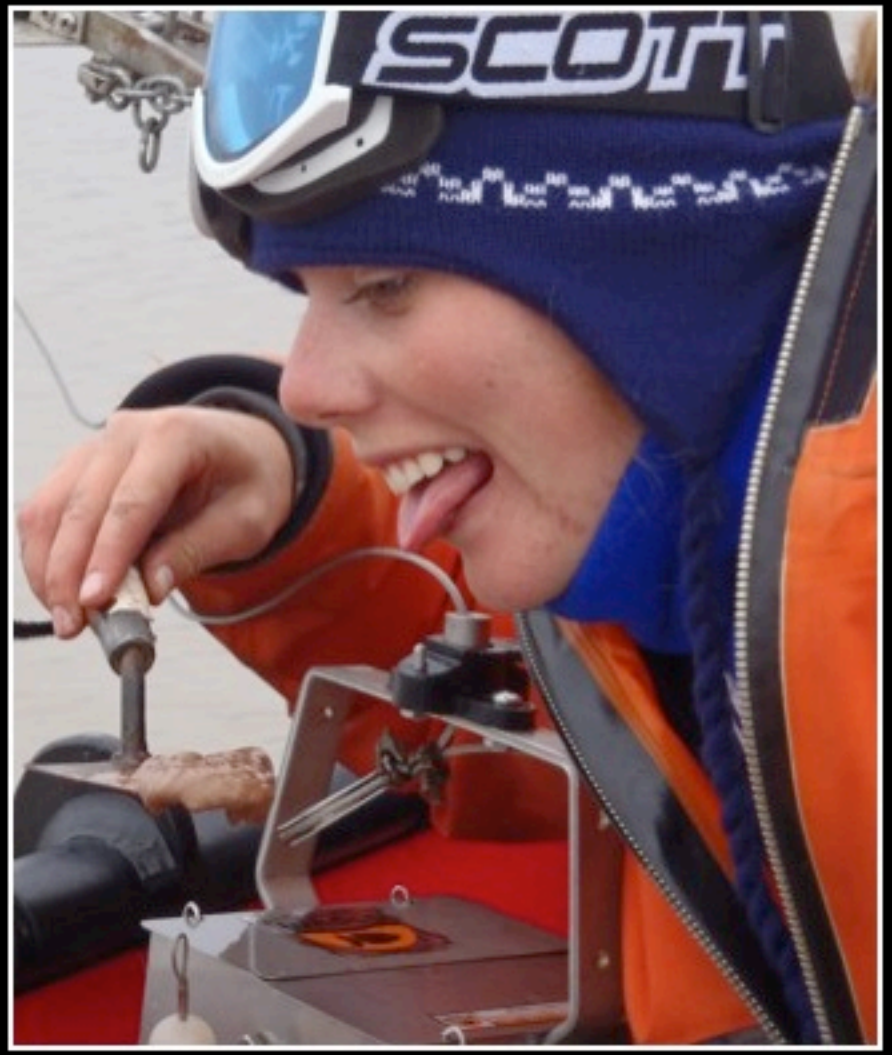
Use XRD to look at what minerals are in each sample



Look at the different rocks in the mud to find where they came from

Look at the minerals in the mud

Yummy!

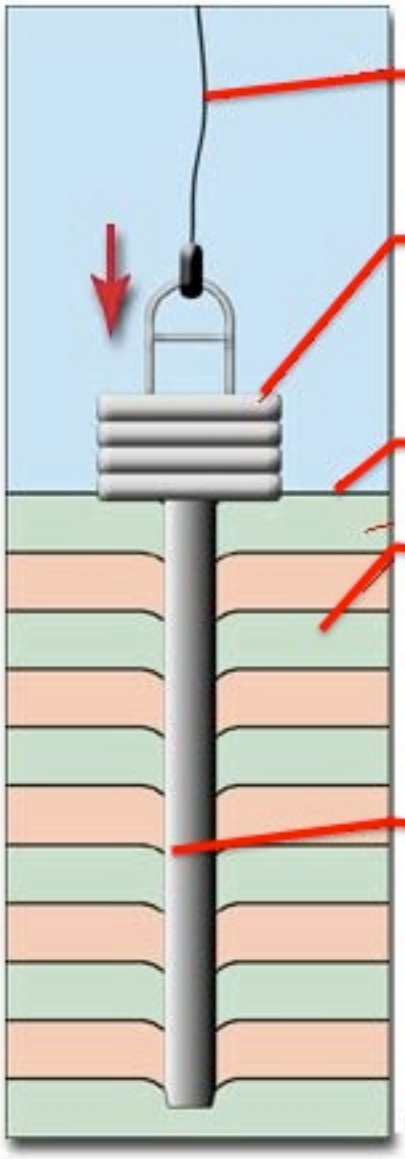


Rachel Valletta, Syracuse University

Project Goal:

Are effects of a warming climate (& thus rapid tidewater glacial recession) exhibited in fjord floor sedimentology over a decadal time scale?

Sediment cores



The corer is attached to a heavy steel cable that drops off our boat's winch

Heavy weights help the corer penetrate the seafloor

The seafloor may preserve micro layers, or "laminations"

We lower the 'gravity corer' to ~10m above seafloor, then let it freefall (hopefully!) up to 1m deep

This is the core barrel; inside is a plastic core liner that keeps the sediment layers preserved and safe for travel

http://www.classroomatsea.net/

http://www.iaea.org/nael/page.php?page=2142

Core collection

^{210}Pb & ^{137}Cs dating

3) Confine core dates

4) Define sediment accumulation rates

Elemental Analysis

1)Compare results with older core data ('01, '06, ' 09)

2)Identify contaminant spikes

Learning Science Together is Fun!

- ✓ Hands on inquiry based learning and science planning
- ✓ Individual ownership of a research project

- ✓Team effort with use of jointly collected data sets
- ✓ Self reliance and problem solving.






As a Teacher, What am I bringing home?

- Experience of Polar Field Research
- Deeper understanding of glacial processes and climate change
- How and why scientific data is collected and what we do with it

Funding provided by

US National Science Foundation
Office of Polar Programs

Who support

REU – Research Experience for Undergraduates

Polar TREC – Teachers & Researchers Experiencing and Collaborating

NIU Northern Illinois University

UMASS AMHERST

POLAR TREC

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Teachers: Join PolarTREC!

Information Webinar:

Thursday, 11 August 2011, at 3:00 p.m. Alaska Daylight Time (1:00 p.m. HST, 4:00 p.m. PDT; 5:00 p.m. MDT; 6:00 p.m. CDT; 7:00 p.m. EDT)

Application Period: Monday, 1 August 2011 through Friday, 30 September 2011

www.polartrec.com/teachers

Upcoming Events

Watch for and register for upcoming events at **www.polartrec.com!**

Thank You!

An archive of the event will be available shortly.

http://www.polartrec.com/polar-connect/archive