



TEACHERS AND RESEARCHERS
EXPLORING AND COLLABORATING

Welcome to *PolarConnect*

With Jamie Esler and the Drumlin
Formation Team in Múlajökul, Iceland

Wednesday 7 August 2013

Blackboard collaborate

Slides will be shown here

Exit the presentation

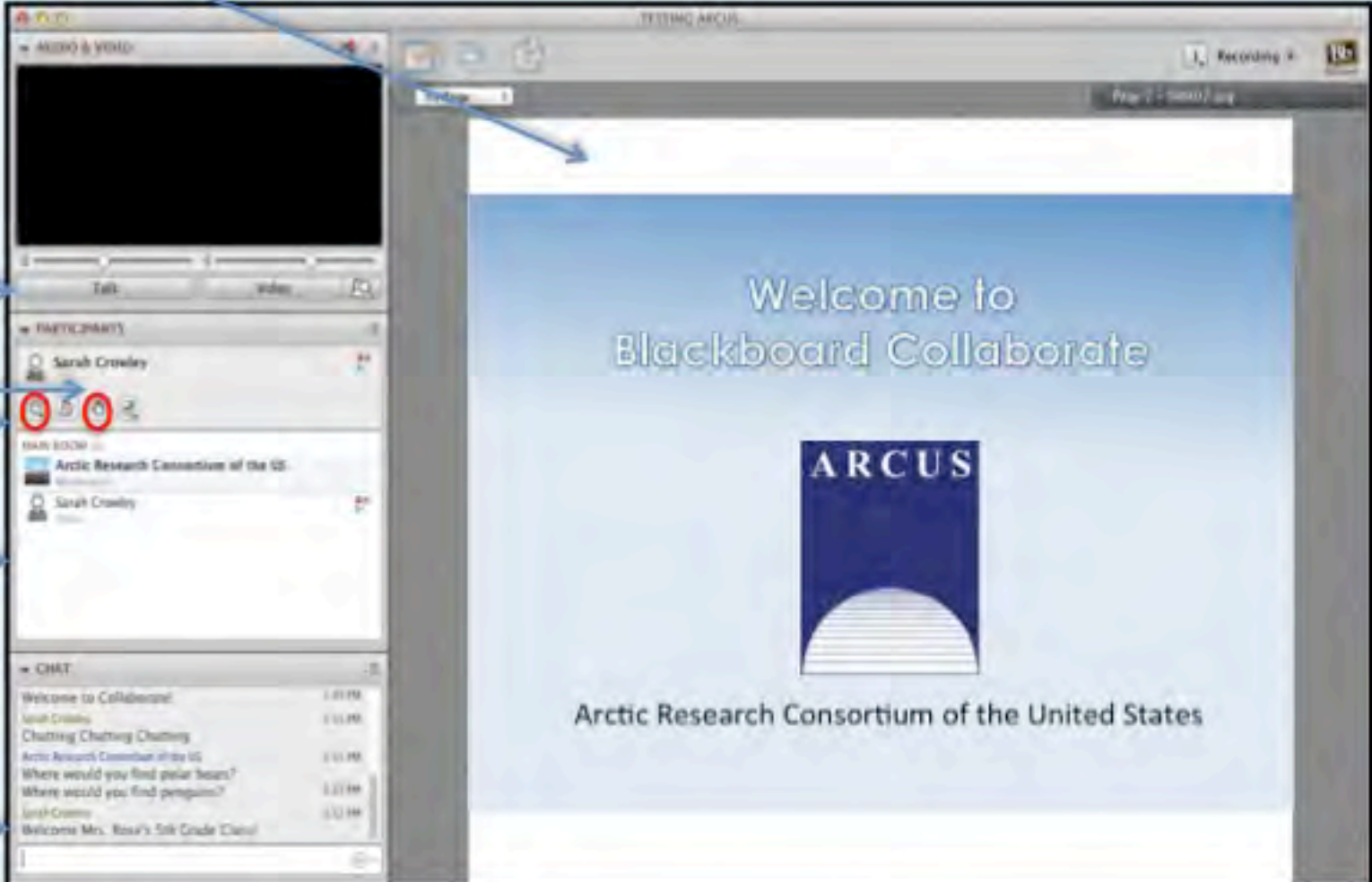
Click to Talk,
Unclick to finish talking

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. The main area displays a presentation slide titled "Welcome to Blackboard Collaborate" with the ARCUS logo and the text "Arctic Research Consortium of the United States". The left sidebar contains several panels: a "Talk" panel with a microphone icon, a "PARTICIPANTS" panel listing "Sarah Crowley" with a hand icon, a "CHAT ROOM" panel with a list of messages, and a "CHAT" panel with a text input field. Arrows from the text labels on the left point to these specific interface elements.

Please Note:

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



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Participant Introductions

In the chat box, tell us more about you! Please type in your:

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



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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.



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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.

Testing Drumlin Formation Hypotheses in the Central Highlands of Iceland



Who We Are



Dr. Luke Zoet



Dr. Tom Hooyer

Reba McCracken



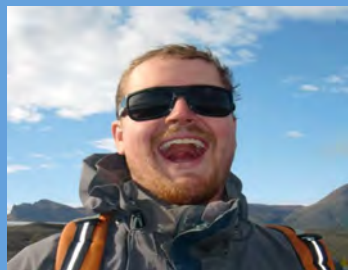
**Dr. Neal
Iverson**



Sandy Tomer



Jamie Esler



Geoff Gadd



Libby Woodford



James Amato

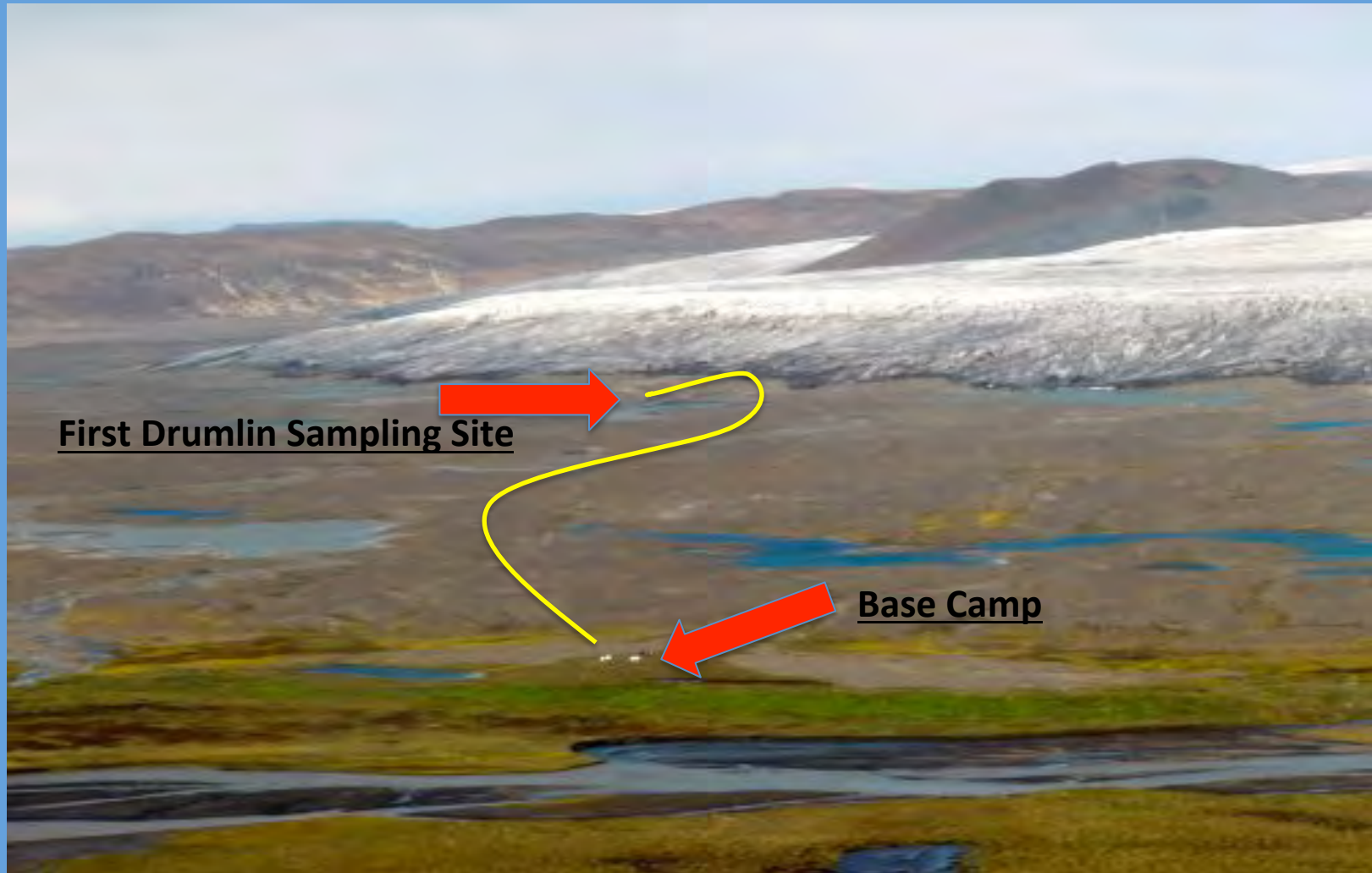
Where We Are



Base Camp:
N 64°38.570'
W 18°38.597'

First Drumlin
Sampling
Site:
N 64°38.735'
W 18°38.627'

Where We Are



How We Got Here



How We Got Here



Why We Are Here



Dr. Iverson and Dr. Hooyer are testing two competing hypotheses for how drumlins are created by glaciers.

A.) ***The Boulton Hypothesis*** states that drumlins are depositional landforms.

B.) ***Alternative Hypothesis*** states that drumlins are erosional landforms.

Why We Are Here



Why We Are Here

The question: **are drumlins formed by erosion and removal of glacial sediments around them, or are they formed in zones where rigid till has caused additional till to accumulate?**



Why We Are Here



To test these hypotheses, Iverson and Hooyer are making field and laboratory measurements to try to determine:

1. How the till has been molded into these shapes/locations.
2. What stress/pressures has been put on the till.

What We Are Doing



What We Are Doing

- Before any data can be collected though, we first must dig and excavate our sampling pits!



What We Are Doing

- Our two-stroke jackhammers make the job quite a bit more efficient!







AMS: Anisotropy of Magnetic Susceptibility

- Traces the fabric and alignment of tiny magnetic mineral particles in the till. This fabric identifies the patterns of how till has moved into place.







Ideally, AMS samples are marked, extracted, cleaned, capped, and stored.

This particular till contains abundant pebble and cobble sized pieces of till (called clasts). So, usually AMS samples come out looking like...





Pre-Consolidation Testing and Bulk Density

- Gives information about the total effective stress on the till. This identifies potential pressure gradients, where till could move from high to low pressure .





GPR: Ground Penetrating Radar

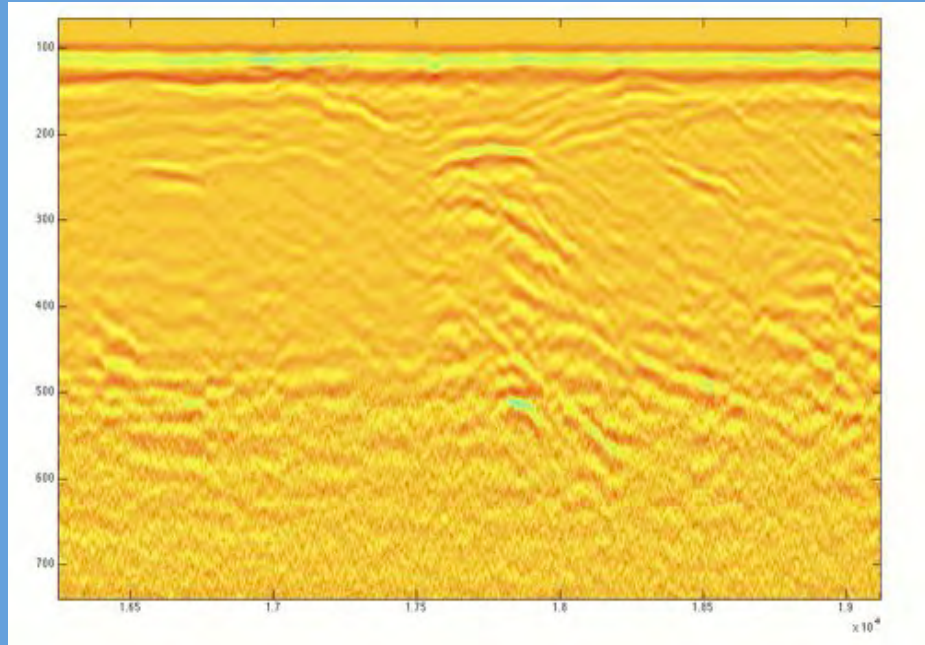
- Utilizes electromagnetic waves to identify macroscopic structures in the subsurface of the drumlin. Helps to describe the shapes and extents of till layers.





The GPR identifies subsurface till layers by detecting differences in electrical transmissivity: how easily electricity moves through microscopic particles in the sediment.

The more red in the line, the higher the electrical transmissivity. The y-axis represents depth.



Why This Is Valuable Research

- The more that is known about how glaciers move and behave, the more accurately scientists can predict future movements of glaciers. This is significant for computer models predicting future climate change and associated sea level rise due to glacial recession.



Why This Is Valuable Research

- In a broader sense, the research is designed to facilitate our species' intrinsic drive to understand the workings of the planet and natural world. Drumlins and glaciers are only one tiny, yet valuable, facet of this endeavor.



Question and Answer





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Join PolarTREC!

www.polartrec.com/about/join

Teachers can participate in different ways:

- **Following Expeditions**
- **Participate in PolarConnect Events**
- **Join the Polar Education Email List**
- **Take Online Professional Development Courses**
- **Become a PolarTREC Teacher! Applications will be available in late August 2013.**



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Thank You!

An archive of the event will be available shortly.
<http://www.polartrec.com/polar-connect/archive>

