

Welcome to *PolarConnect*



Carbon Balance in Warming and Drying Tundra 2016

With PolarTREC Teacher Karen Temple-Beamish &
Arctic Researcher Dr. Marguerite Maurtiz

11 August 2016

Getting to Know Adobe Connect

Slides will be shown here

Exit presentation

Mute your speakers

Raise your hand

List of all participants

Follow the chat

Find out more about the presentation

Chat here



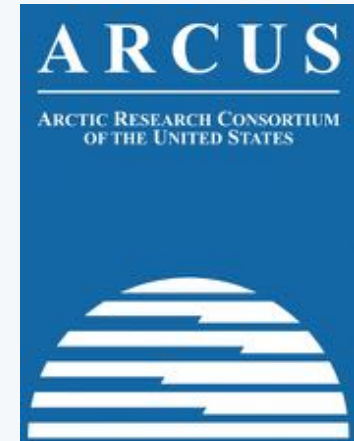
Participant Introductions

**In the Chat box, please introduce yourself
by typing in your:**

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

What is PolarTREC?

- Since 2004, the Arctic Research Consortium of the United States (ARCUS), a non-profit organization, has been administering the PolarTREC Program.
- PolarTREC is professional development for K-12 teachers. They are paired with researchers for 2-6 week research experiences in the polar regions.
- Over 150 teachers from around the United States have joined 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.



25 Years of Connecting Arctic Research
www.arcus.org

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 and activate your microphone.
- Speak loud and clear, directly into the computer microphone or the phone to ask your question.



CARBON CYCLING IN THE ARCTIC

Understanding the Effects of Permafrost Thaw

Marguerite Mauritz – Schuur Lab
Center for Ecosystem Science and Society
Northern Arizona University

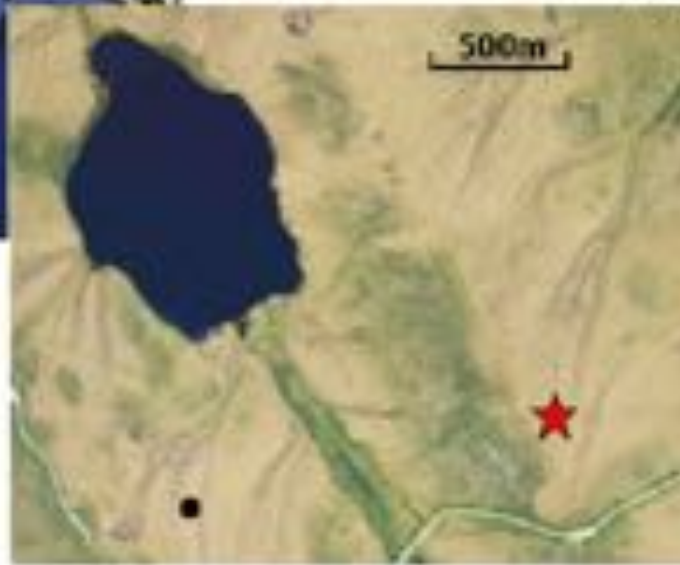
Meghan Taylor – Schuur Lab
Center for Ecosystem Science and Society
Northern Arizona University

Karen Temple-Beamish
Science Teacher
Albuquerque Academy

Meet the Research Team

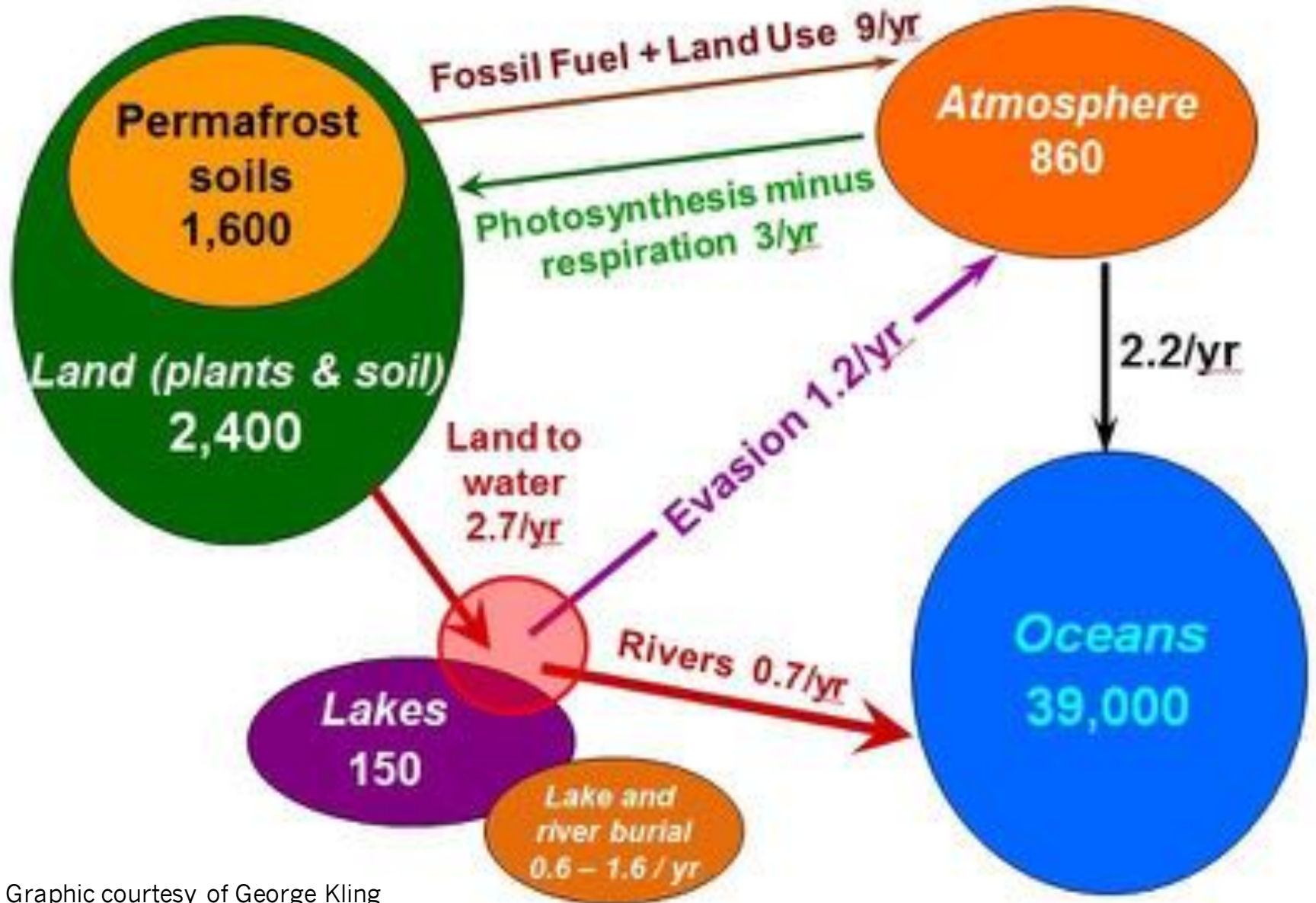


Where are we? Near Healy, AK



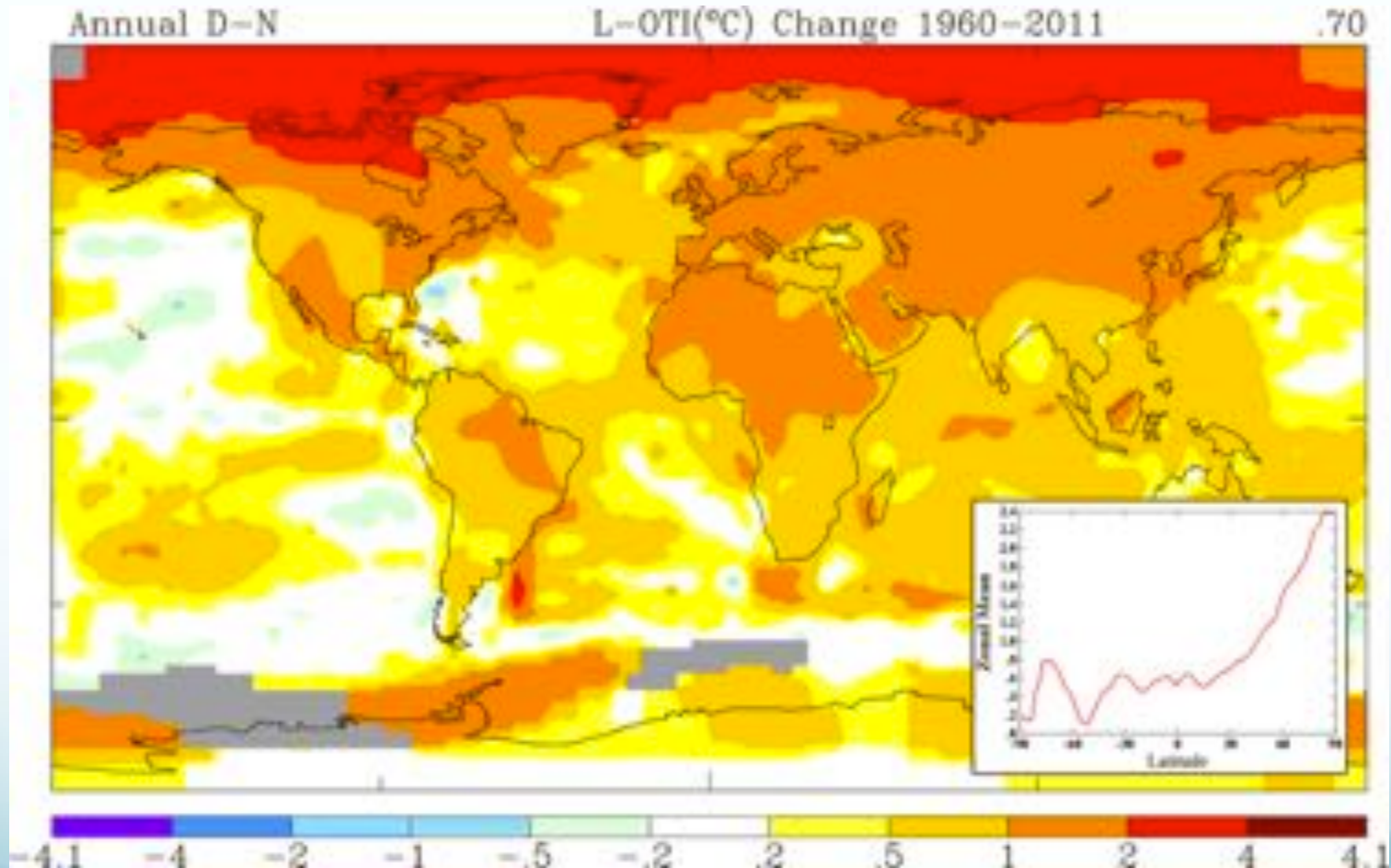
Global Carbon Cycle

Numbers are in billions of tons of C



Graphic courtesy of George Kling

The Arctic is warming really quickly.



https://nsidc.org/cryosphere/arctic-meteorology/climate_change.html

Why We're Worried

- The Arctic stores a lot of carbon!
- Mainly frozen in permafrost soils
- Warmer temperatures could release carbon
- But, the arctic is also getting greener



What is permafrost?

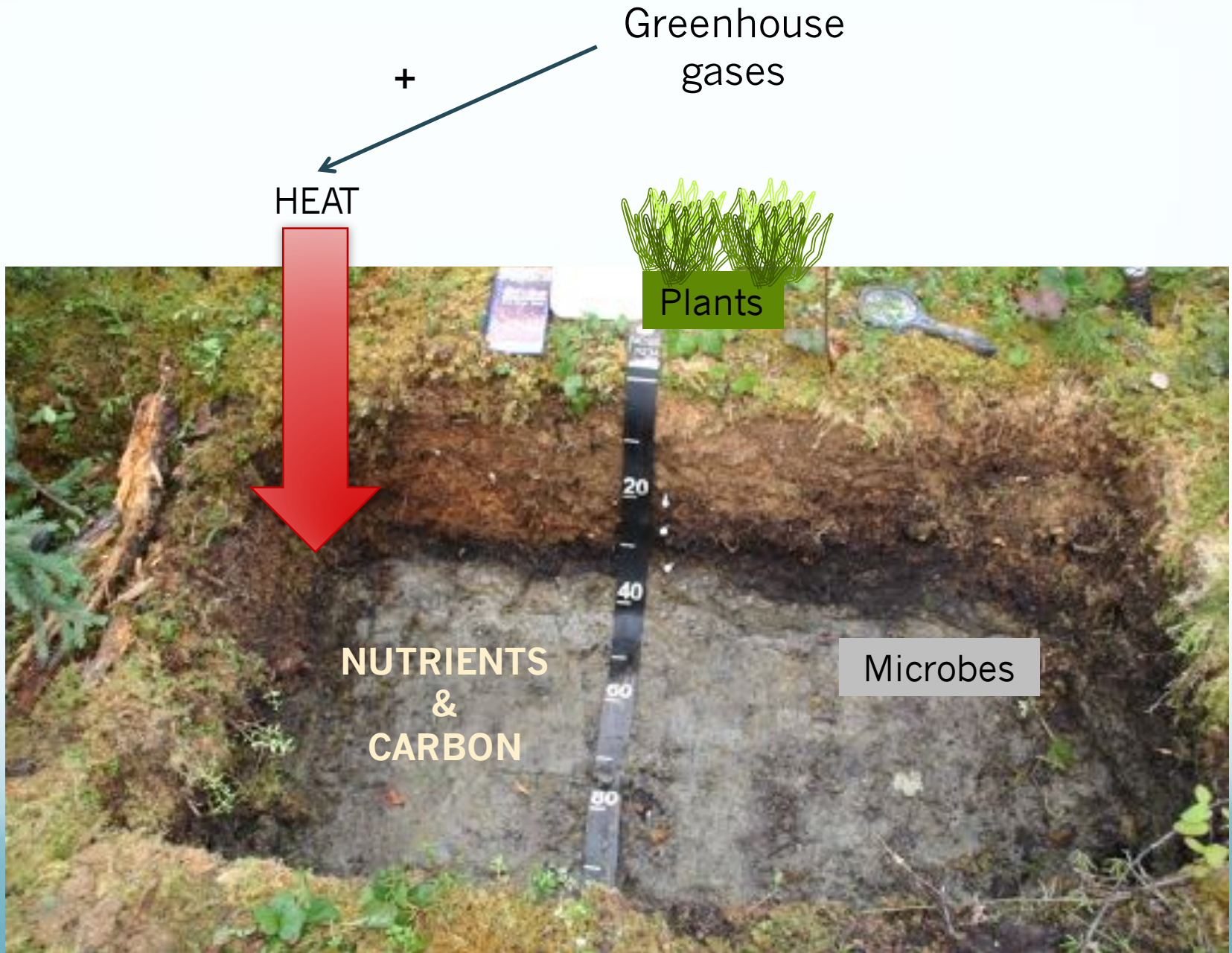


<http://www.physicalgeography.net/fundamentals/10ag.html>

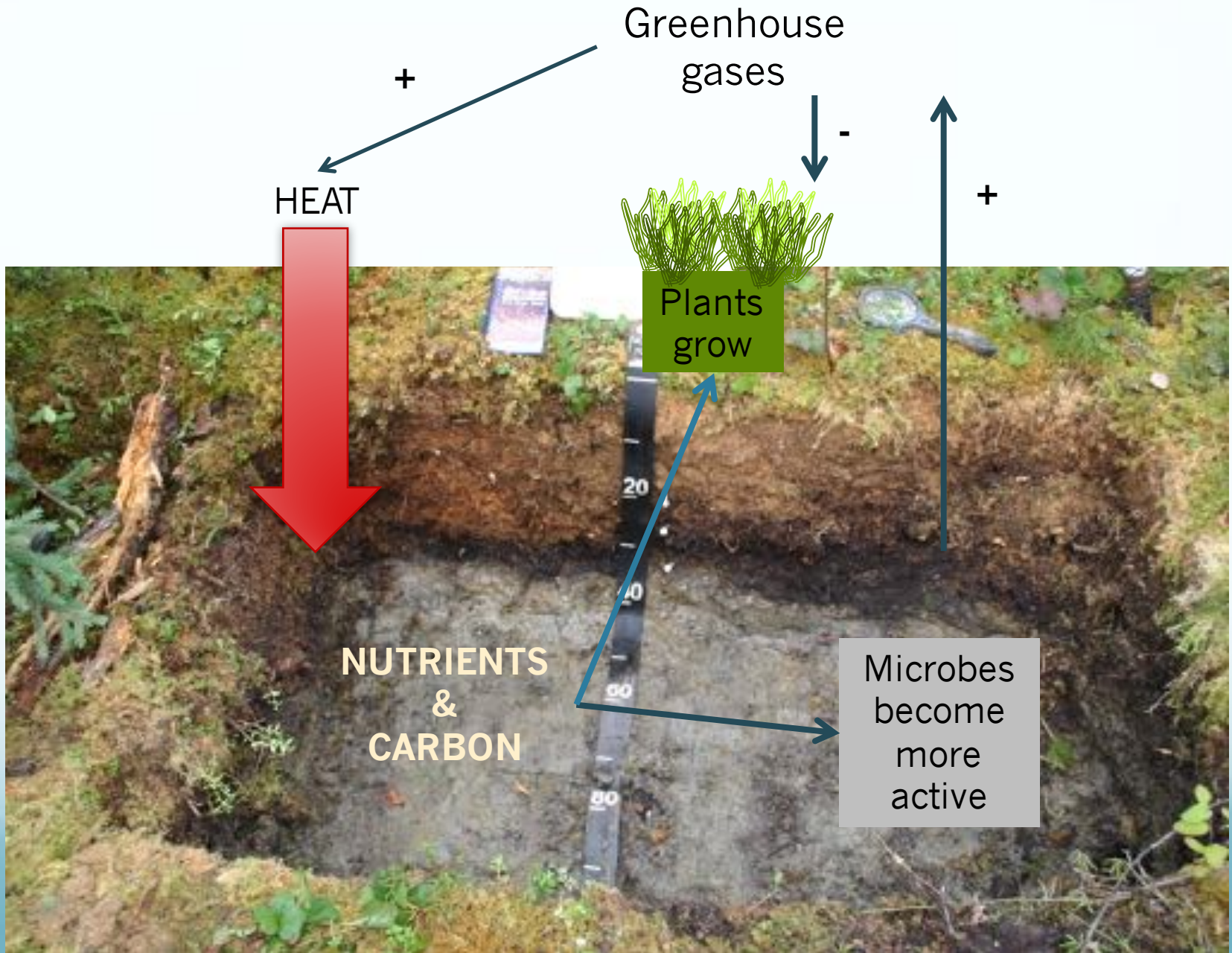
A permafrost core



What happens as permafrost thaws?



What happens as permafrost thaws?



We want to know:
How **much** carbon, and how **quickly**?



Measuring Carbon flux: Carbon in Permafrost Experimental Heating Research (CiPEHR)



How does a snow fence work?



Spring



Now that summer is here,
what do we do?



What are the plants doing?

Measure Green: NDVI



Phenology:
Count Berries and Flowers

What is the carbon source?

Forced Diffusion Sensors



Dissolved Organic Carbon



Radiocarbon Dating



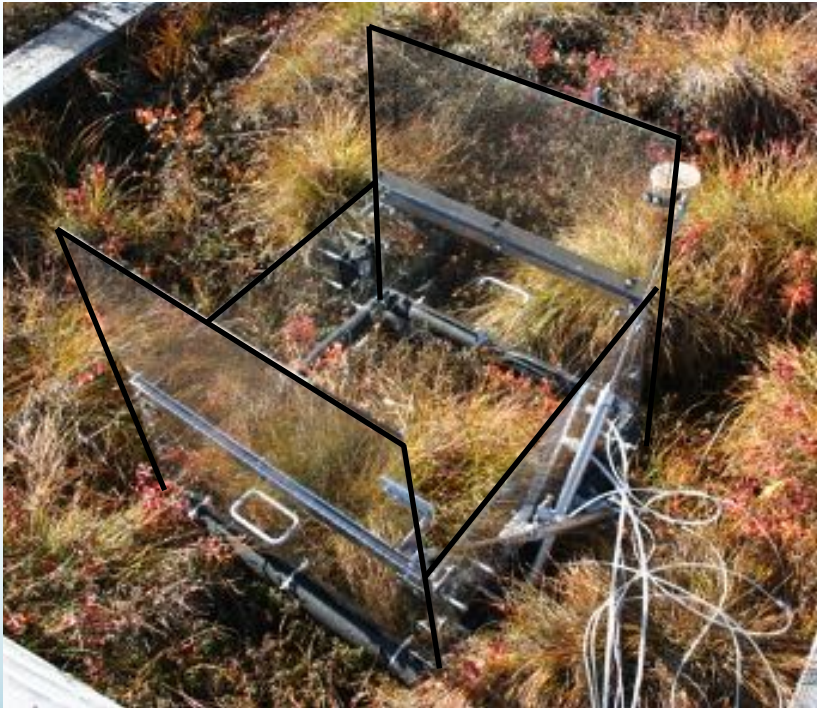
Where is the water table?



Where is the permafrost?

Measuring Carbon fluxes

Open chamber sits on a plot



Closed chamber measures CO_2 exchange



Measuring Carbon fluxes

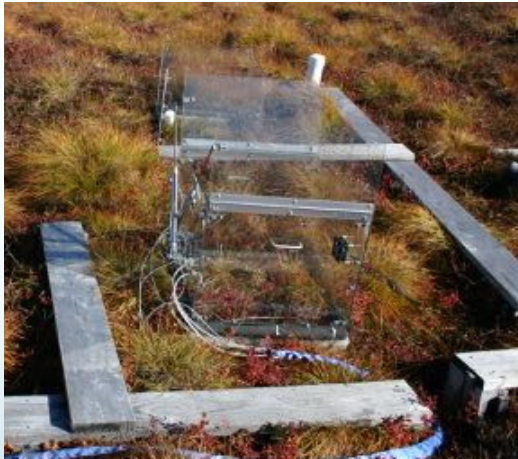
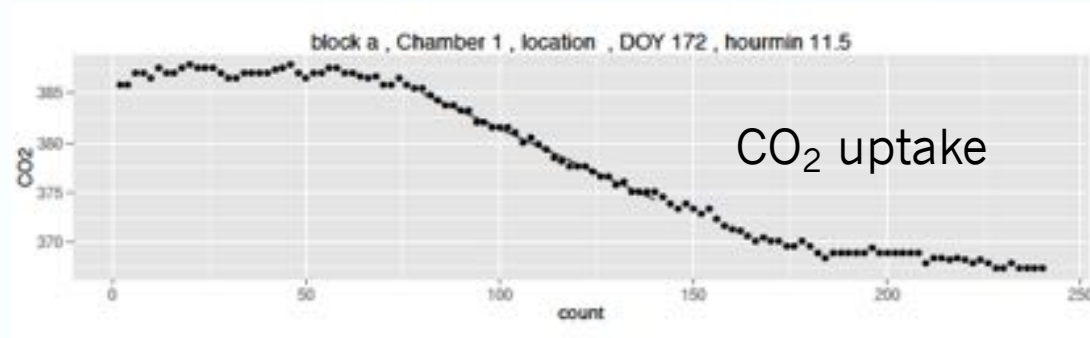


BRAINS:
measure CO₂ in chamber air

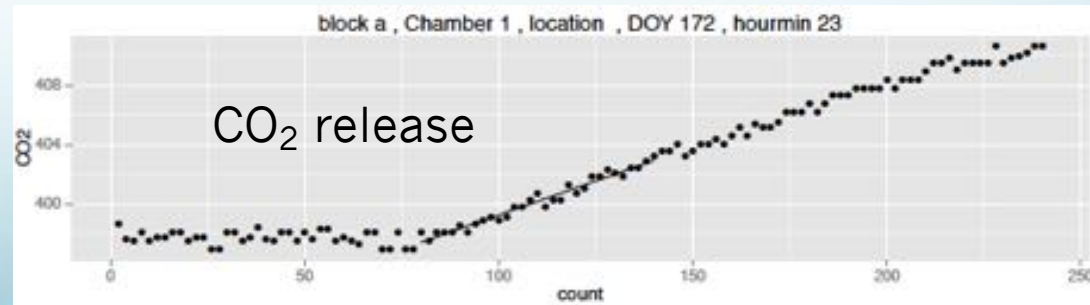


What does a carbon flux measurement look like?

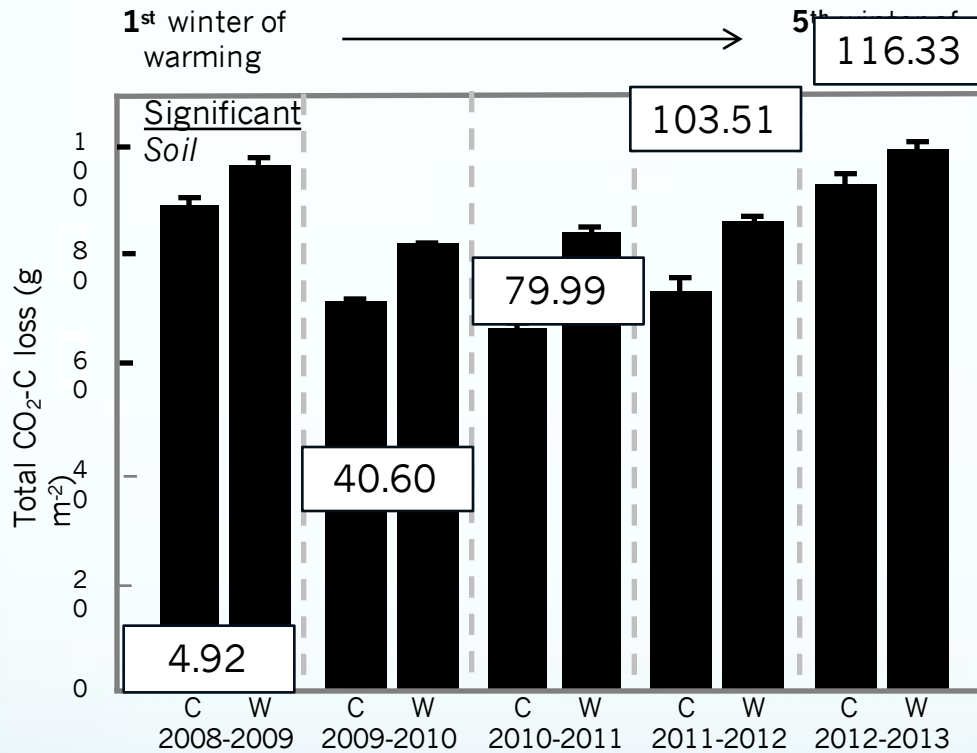
Plants more active



Microbes more active



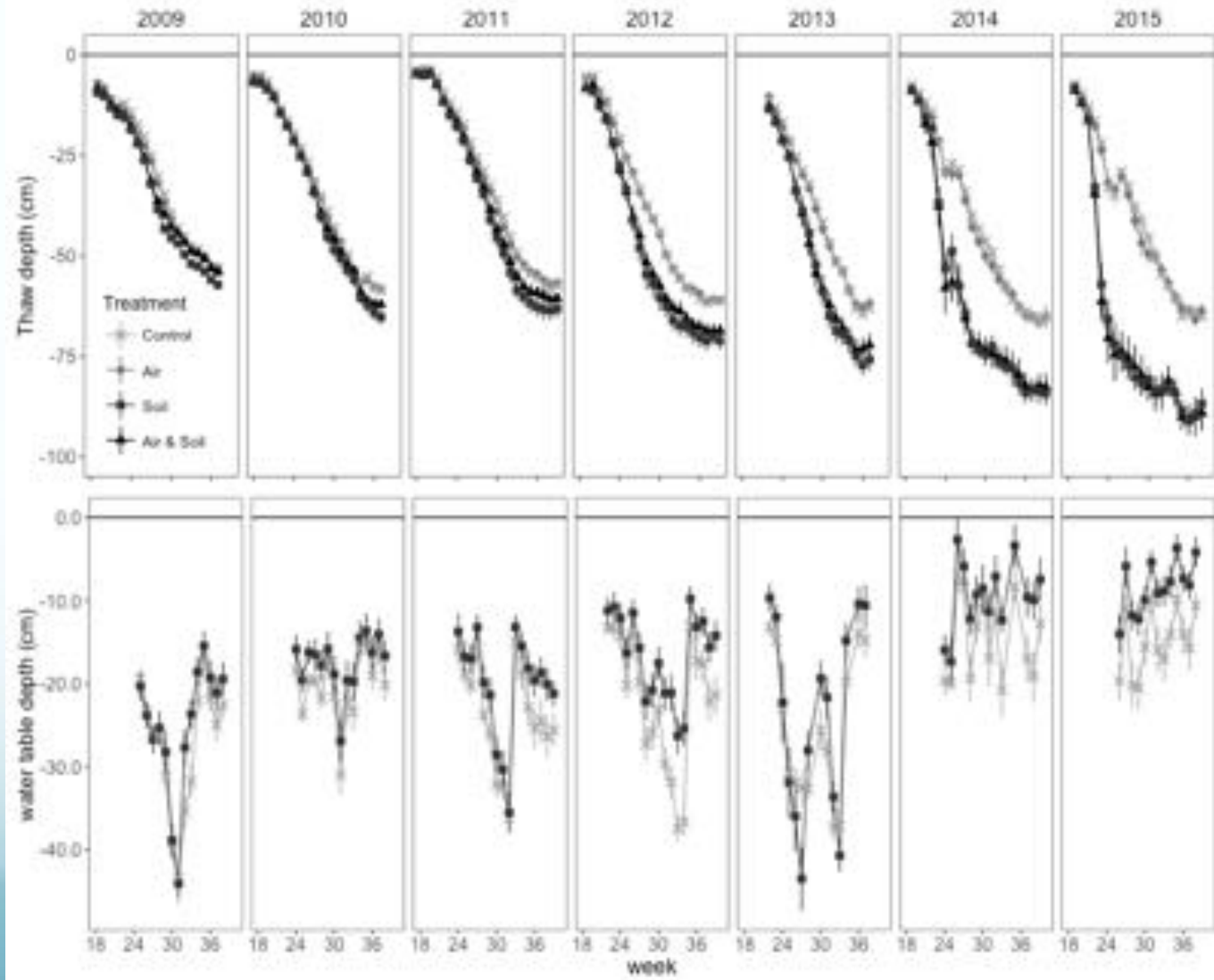
Was the system a net annual source or sink?



Webb et al 2016



What impact to depth to water table and permafrost?



All work and no play makes a dull scientist!



Questions

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Join PolarTREC!

www.polartrec.com/about/join

Everyone can participate in different ways:

- **Follow Expeditions**
- **Participate in PolarConnect Events**
- **Join the Polar Education Email List**
- **Check out the great resources**
- **Become a PolarTREC Teacher or Researcher**
- **Become a member of ARCUS**

Thank You!

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



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