



Welcome to Live from IPY! January 6, 2010

Dissolved Organic Matter in the Cotton Glacier, Antarctica

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Heidi Smith, MSU

Collin Ward, OSU

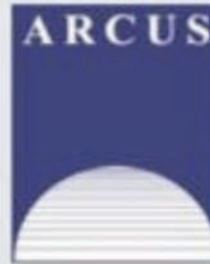


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Expedition: Dissolved Organic Matter in Antarctica



WELCOME TO WIMBA



ARCTIC RESEARCH CONSORTIUM OF THE UNITED STATES

The interface includes a connection strength indicator (a bar graph icon), a 'TALK' button, a chat window with a 'To:' dropdown menu set to 'Main Room', a 'People (3)' list showing participants 'Kristin_Timm', 'kristina_creek', and 'Kristin_Timm', and an 'Exit - Lobby' button. The 'TALK' button and the 'Exit - Lobby' button are circled in red.

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 participating with you in the same location



International Polar Year (IPY)

The International Polar Year (2007-2009) is an exciting scientific campaign focusing on the world's polar regions!

IPY is a time for discovery, science, learning, and awareness about the polar regions with activities for youth, scientists, and the public.

www.ipy.org



What is PolarTREC?

PolarTREC is a professional development experience in which K-12 teachers are paired with researchers in authentic polar research experiences.

In the next three years over 40 teachers from around the United States will join scientists in the Arctic and Antarctica in celebration of the International Polar Year!

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MEET THE TEAM

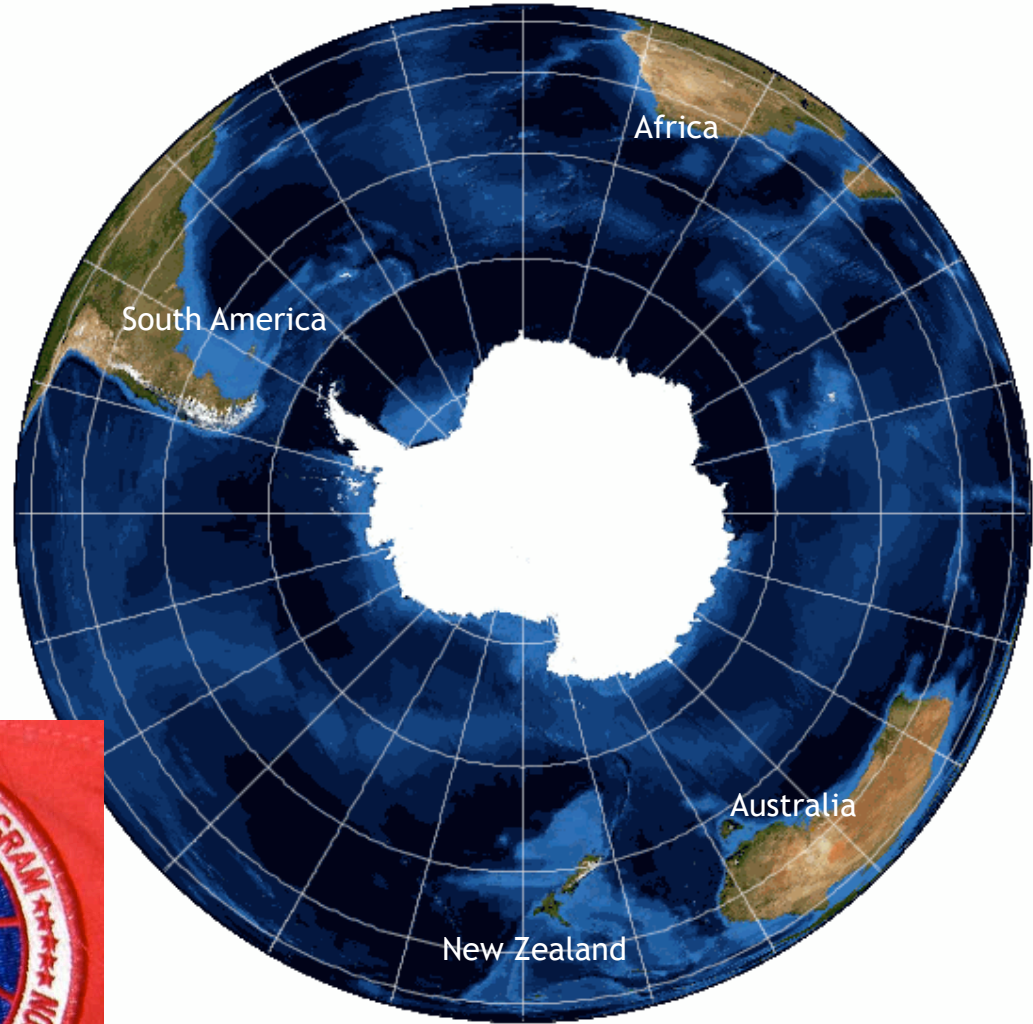
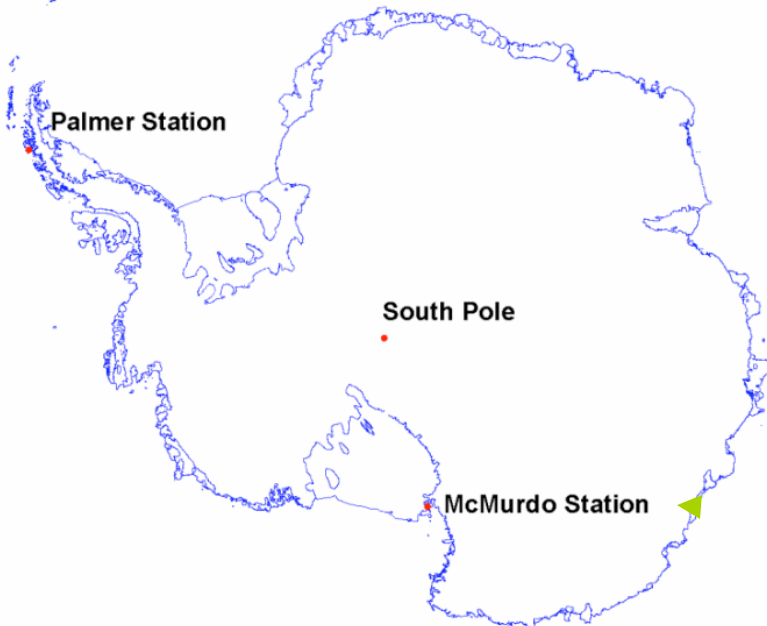


Top Row (L to R): Sarah Diers, Chip Kilduff, Yo Chin, Collin Ward
Bottom Row (L to R): Mike San Clements, Christine Foreman, Birgit Sattler, Heidi Smith (*not pictured, Diane McKnight*)



WHERE IS ANTARCTICA?

<http://www.usap.gov/USAPgov/sciencesupport/GIS/images/AntarcticPermStations.gif>



http://www.icsm.gov.au/mapping/images/globe_antarctica.gif

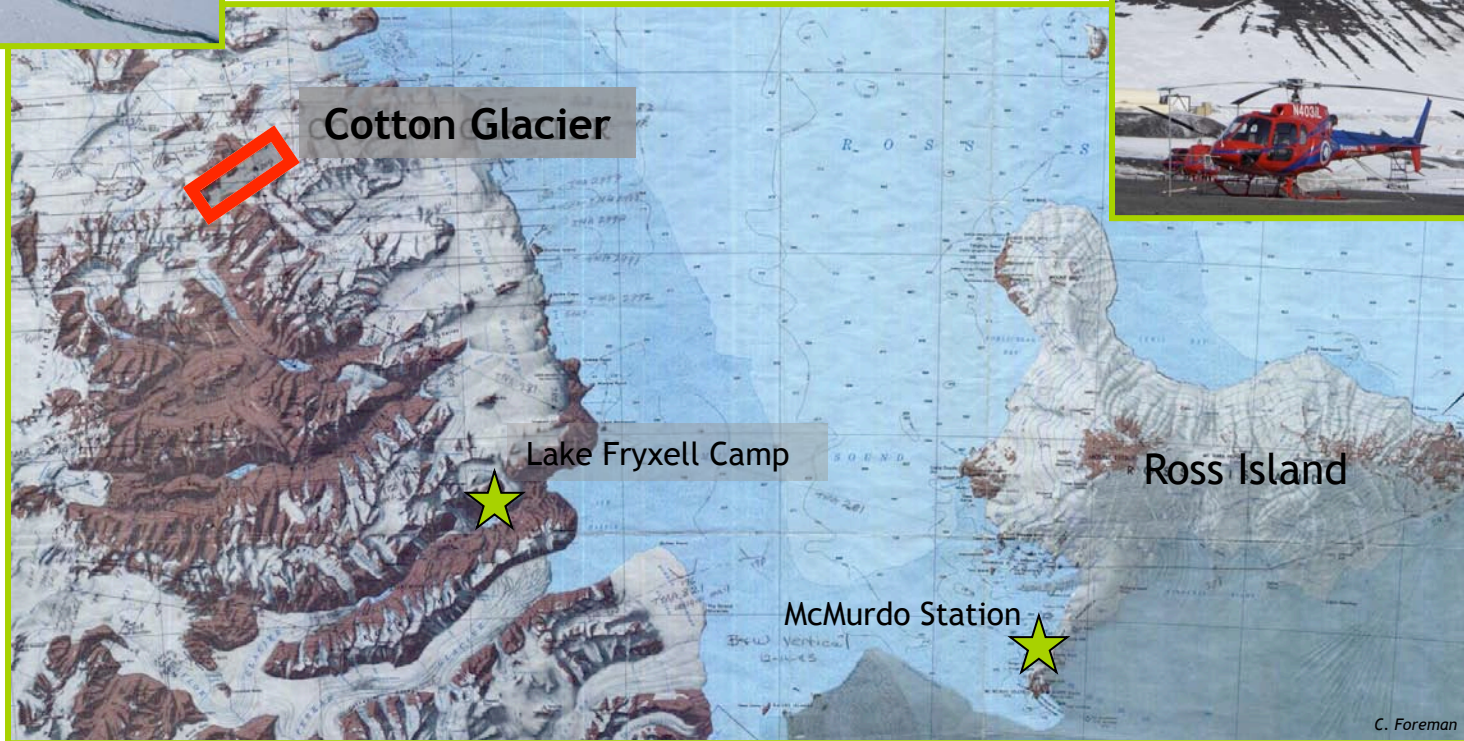


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WHERE ARE WE?



C. Foreman



C. Foreman

To New Zealand



To South Pole



WHAT IS DOM?

- **D**issolved **O**rganic **M**atter
 - The largest known source of organic carbon on the planet
 - Created by the breakdown of organisms to the molecular level.
 - DOM molecules recombine as additions are made to the DOM “pool”
 - Terrestrial DOM joins aquatic DOM as a result of run-off from land.
 - Influences on microbes include:
 - Act as a “screen” against environmental elements, by binding trace metals, absorbing visible and UV-light, and buffering pH
 - Provide nutrition for heterotrophic microbes



HOW DO WE FIND DOM? PART 1

Step 1: Go to Antarctica!



Step 3: Collect 240 liters of stream water



M. SanClements



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HOW DO WE FIND DOM? PART 2



Step 6: Freeze water to -40°C

Step 7: Dehydrate in freeze dryers



Step 5: Run water through Reverse Osmosis



Step 8: Collect remaining DOM and salts



Step 4: Fly the water
back to McMurdo Station

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A LITTLE PERSPECTIVE...

Imagine the 14- 20 liter carboys of water contain Peanut M&M's instead...

Every time the DOM team collects water it is the equivalent of 96,000 Peanut M&M's!

When we filter the water through the Reverse Osmosis system, we are left with 4,000 Peanut M&M's, or 10 liters of water.

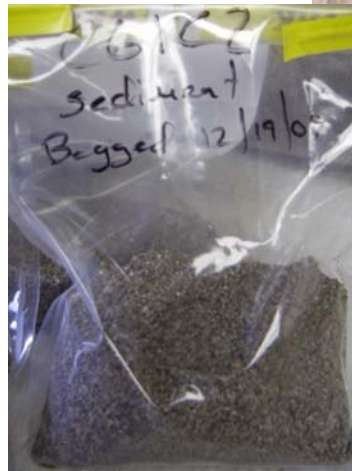
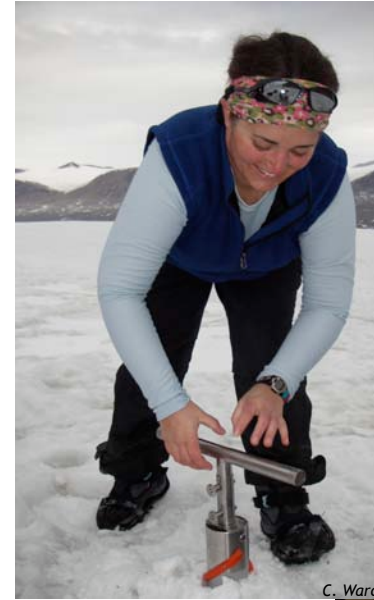
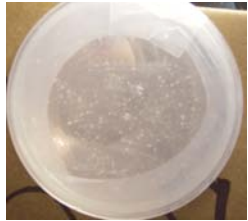
That is 92,000 fewer M&M's than when we started!

After we freeze the concentrated water and dehydrate it, we are left with just one, single, but still delicious Peanut M&M, or just a couple grams of DOM!



<http://www.brightandearlyblog.com/wp-content/uploads/2007/12/mm.jpg>

MICROBES & THE ENVIRONMENT



Biologically and chemically test samples from entire cryosphere-

- Sediment
- Frozen & liquid water
- Aeolian



COTTON GLACIER DOM

Why did the DOM team choose the Cotton Glacier?

- Transient supra-glacial streams form yearly
- A relatively simple physical and biological system
- DOM is from microbial organisms- no higher order organisms on or around glacier

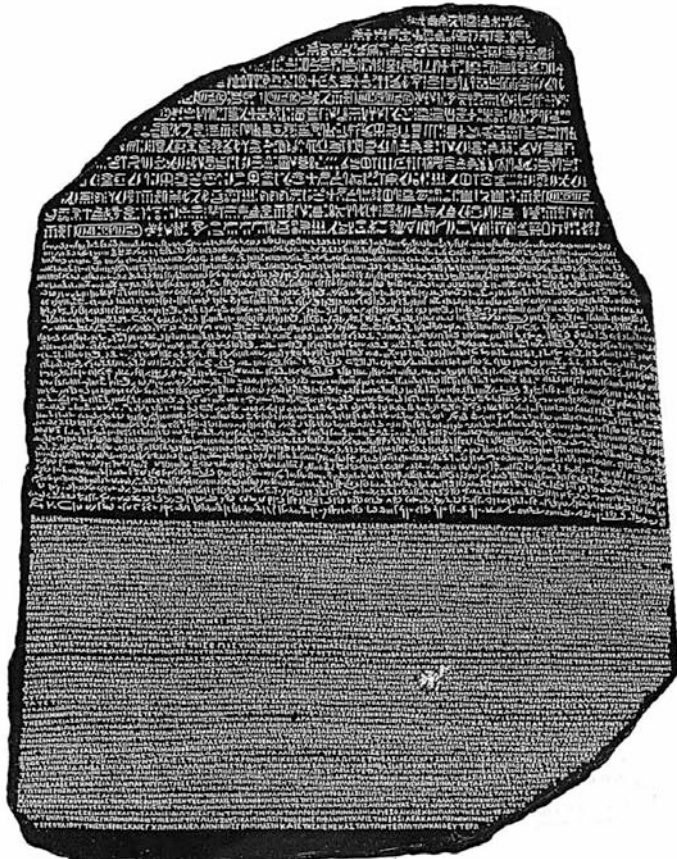
The Cotton Glacier is like a chalkboard scrubbed clean every year...

www.oldereducator.com/chalkboard.gif



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WHAT MIGHT WE GAIN?



http://www.uncp.edu/home/rwb/Rosetta_Stone_BW.jpeg

- The Rosetta Stone was instrumental in helping researchers translate Egyptian hieroglyphics.
- Similarly, there is a likelihood that understanding Cotton Glacier DOM will help researchers understand more complex DOM systems.



WE WELCOME YOUR QUESTIONS!

Feel free to ask them now
or post a question to “Ask The Team”
on the DOM PolarTREC website!

www.polartrec.com/dissolved-organic-matter-in-antarctica

Thank you for joining our webinar and for
following the adventures of the DOM team!



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Register for Upcoming Live Events at :
www.polarartrec.com!

Thank You!

The archive of this event will be available shortly at: www.polartrec.com!

If you have further questions, please contact us at:
info@polartrec.com or call 1-907-474-1600

