



TEACHERS AND RESEARCHERS  
EXPLORING AND COLLABORATING

# Welcome to a Special Live Event!

with PhD student Annamarie Pasqualone at  
McMurdo Station, Antarctica

CISE Fall 2011 Professional Development

**9 November 2011**

[www.polarrec.com](http://www.polarrec.com)



# WELCOME TO WIMBA

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

The screenshot shows the Wimba interface with several elements circled in red. On the left toolbar, there is a connection strength icon, a 'TALK' button, and a chat icon. On the right toolbar, there is an 'Exit - Lobby - Help' button. Below the toolbar, there is a chat window with a text input field and a 'To:' dropdown menu. To the right of the chat window is a 'People (3)' list showing participants: Kristin\_Timm, kristina\_creek, and Kristin\_Timm. The background features the ARCUS logo and the text 'ARCTIC RESEARCH CONSORTIUM OF THE UNITED STATES'.

**Please note:**

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

# Participant Introductions

**When called, please state your:**

- ✓ Name
- ✓ School / Institution
- ✓ 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.

# 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.

# Adaptations of Marine Worms in Antarctica



**McMurdo Station, Antarctica**

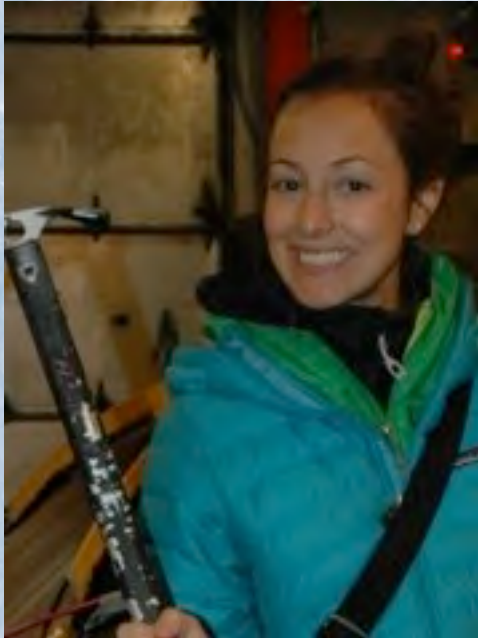
# The Team



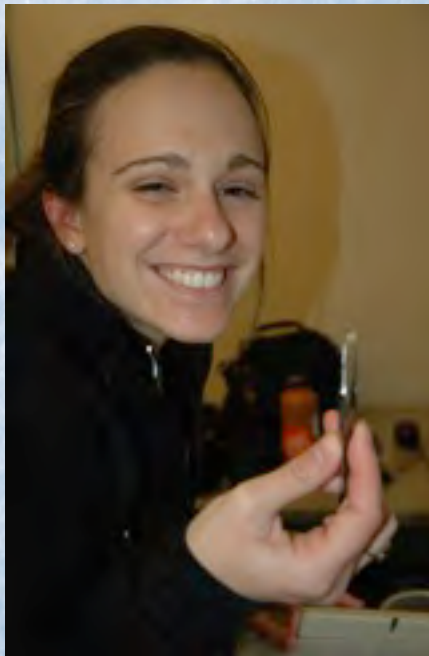
Dr. Adam Marsh



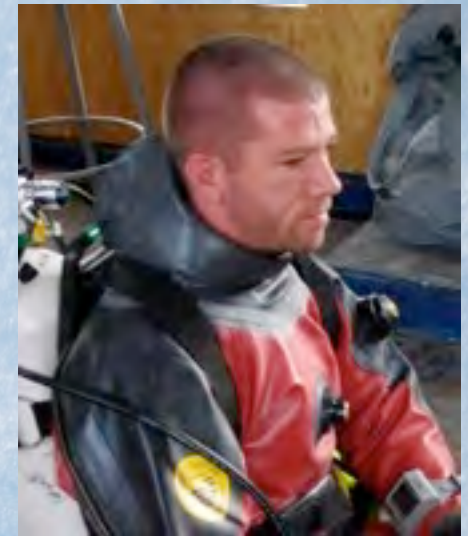
Dr. Stacy Kim



Stephanie Guida



Annamarie Pasqualone



Mike League



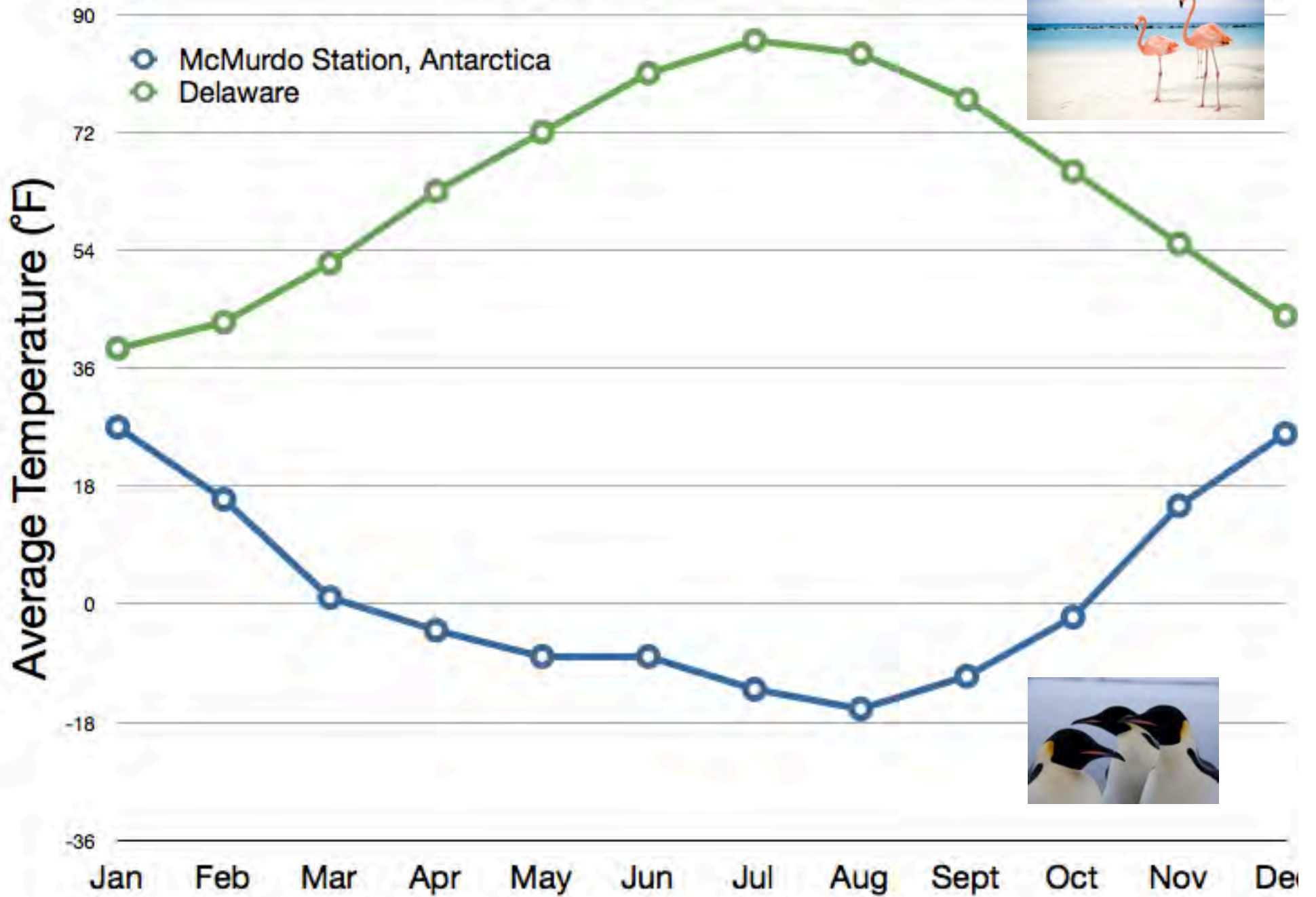




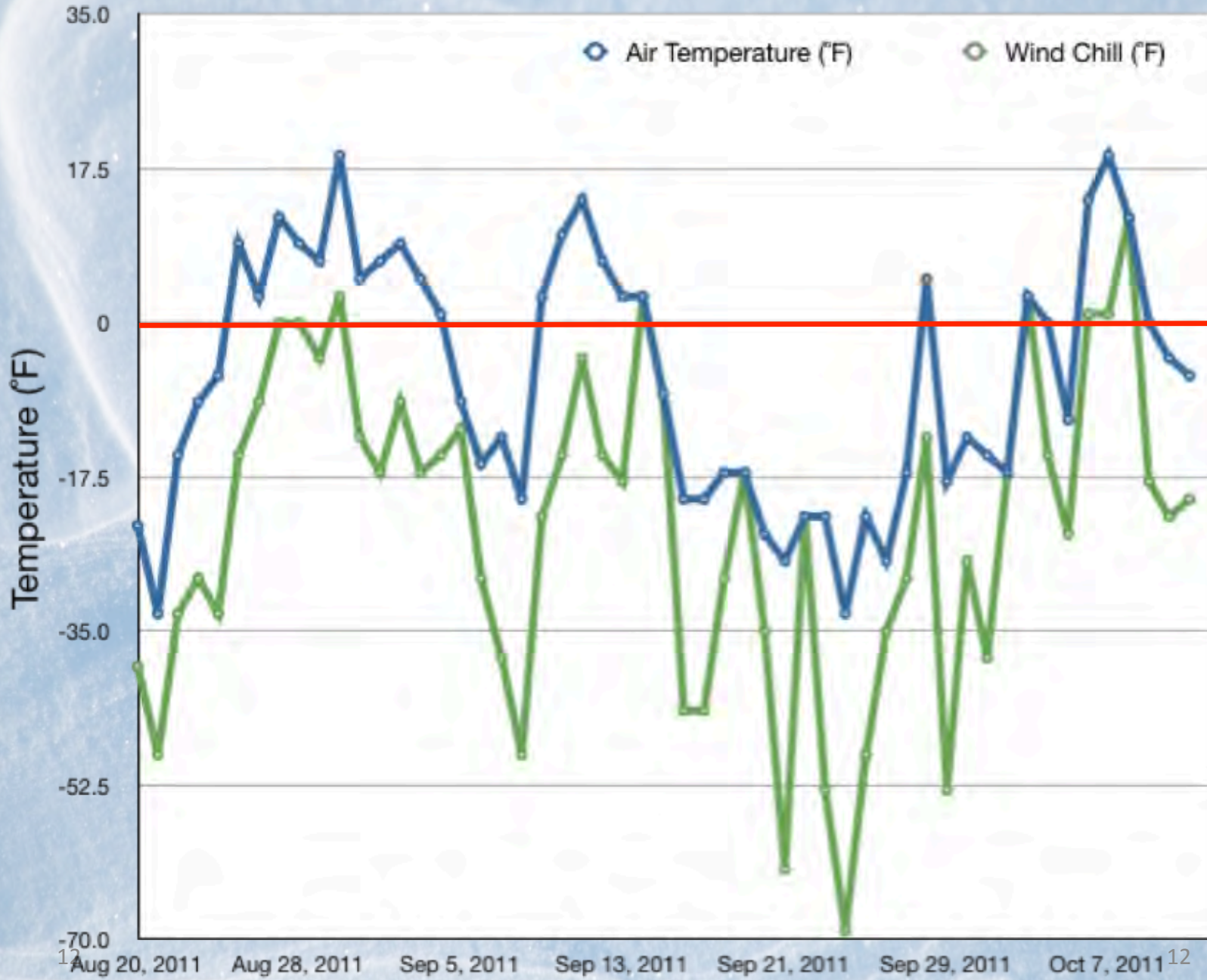
# Where are we?



# Average Temperature by Month



# Air Temperature and Wind Chill versus Time



# McMurdo Station

Sea Ice

Dorms

Cafeteria

Laboratory

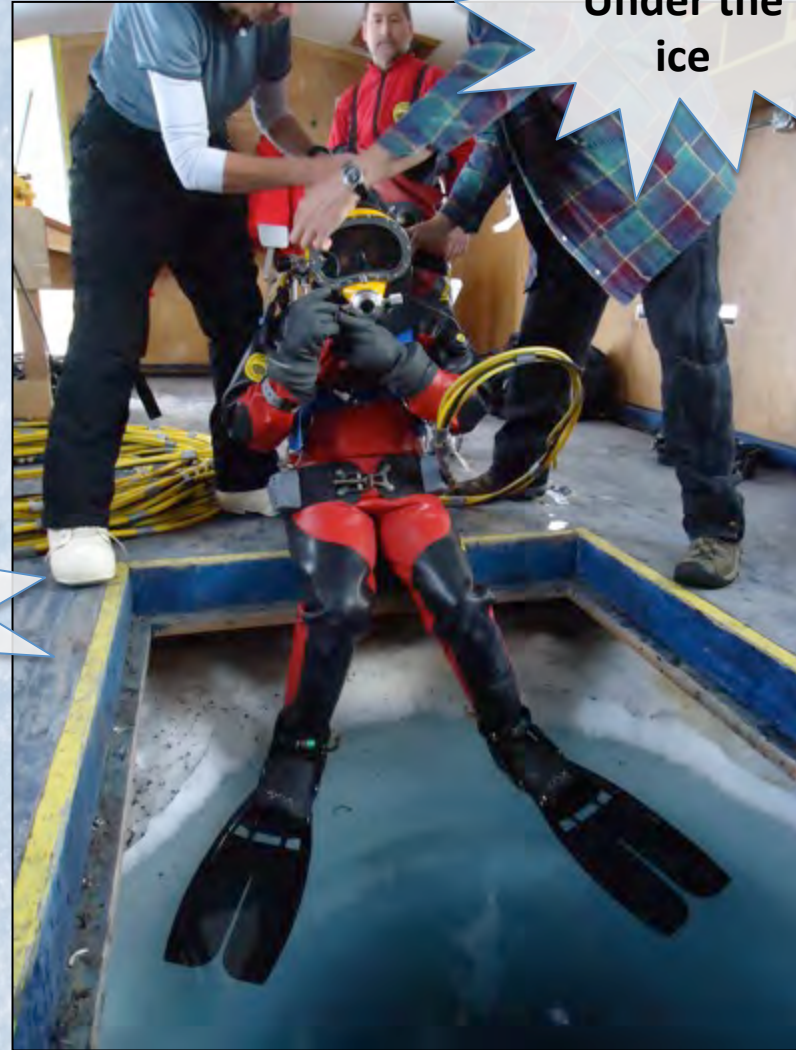


# Science in Antarctica

In the field



Under the ice



In a lab



# Geology and Geography



<http://icestories.exploratorium.edu/>



SCIENCEPHOTOLIBRARY



<http://icestories.exploratorium.edu/>



<http://icestories.exploratorium.edu/>



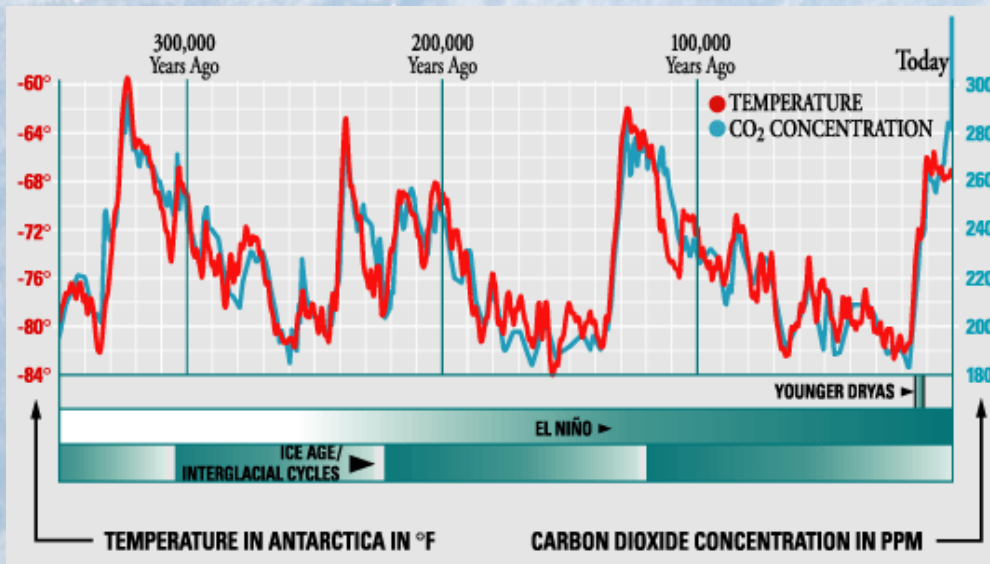
<http://icestories.exploratorium.edu/>

# Astronomy and Meteorology





# Climate Change



# Biology and Ecology



Peter M. Amati, Jr.



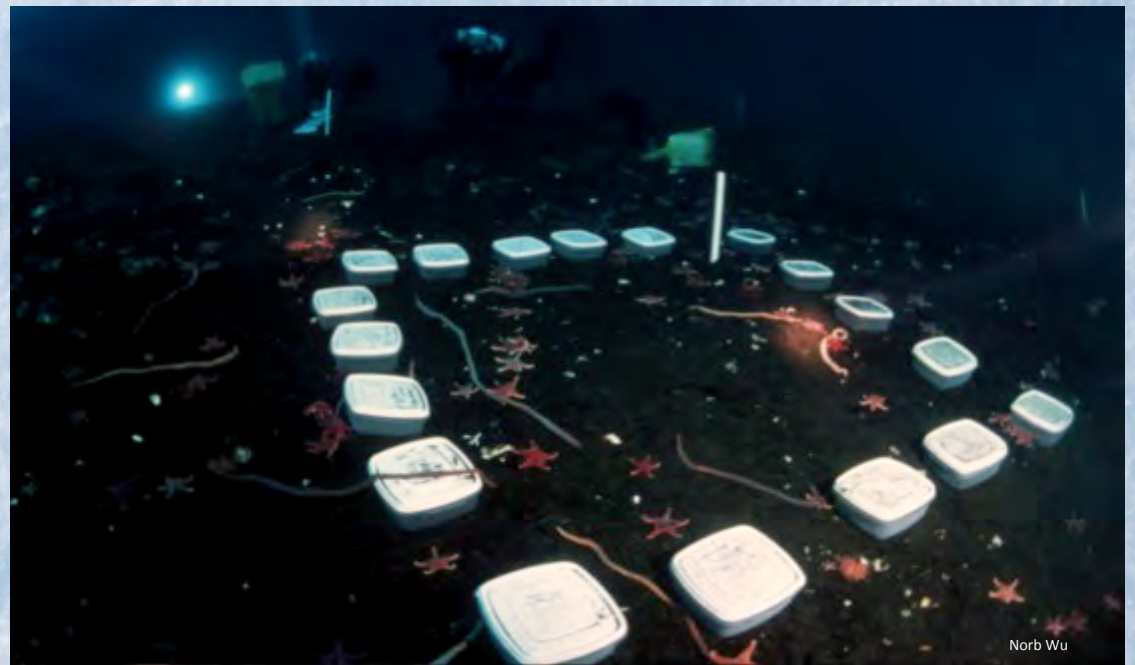
<http://icestories.exploratorium.edu/>



<http://icestories.exploratorium.edu/>



Terrie Williams



Norb Wu

# Temperature Adaptation

*Capitella teleta*



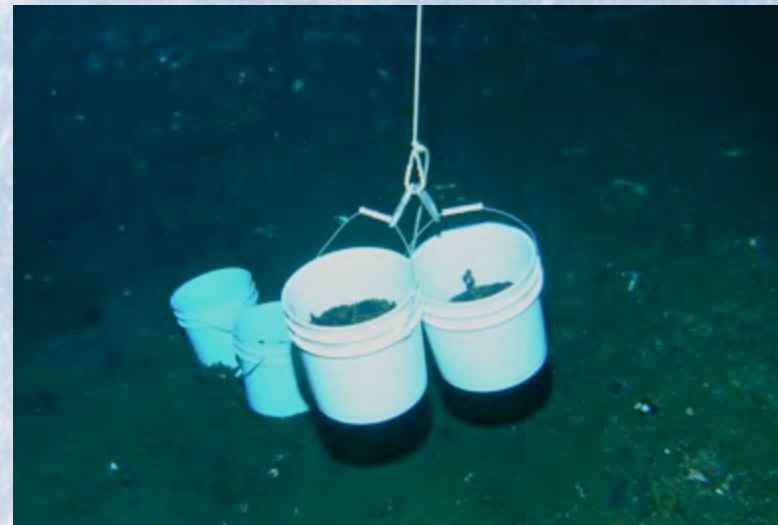
*Capitella perarmata*



# Drilling a Dive Hole

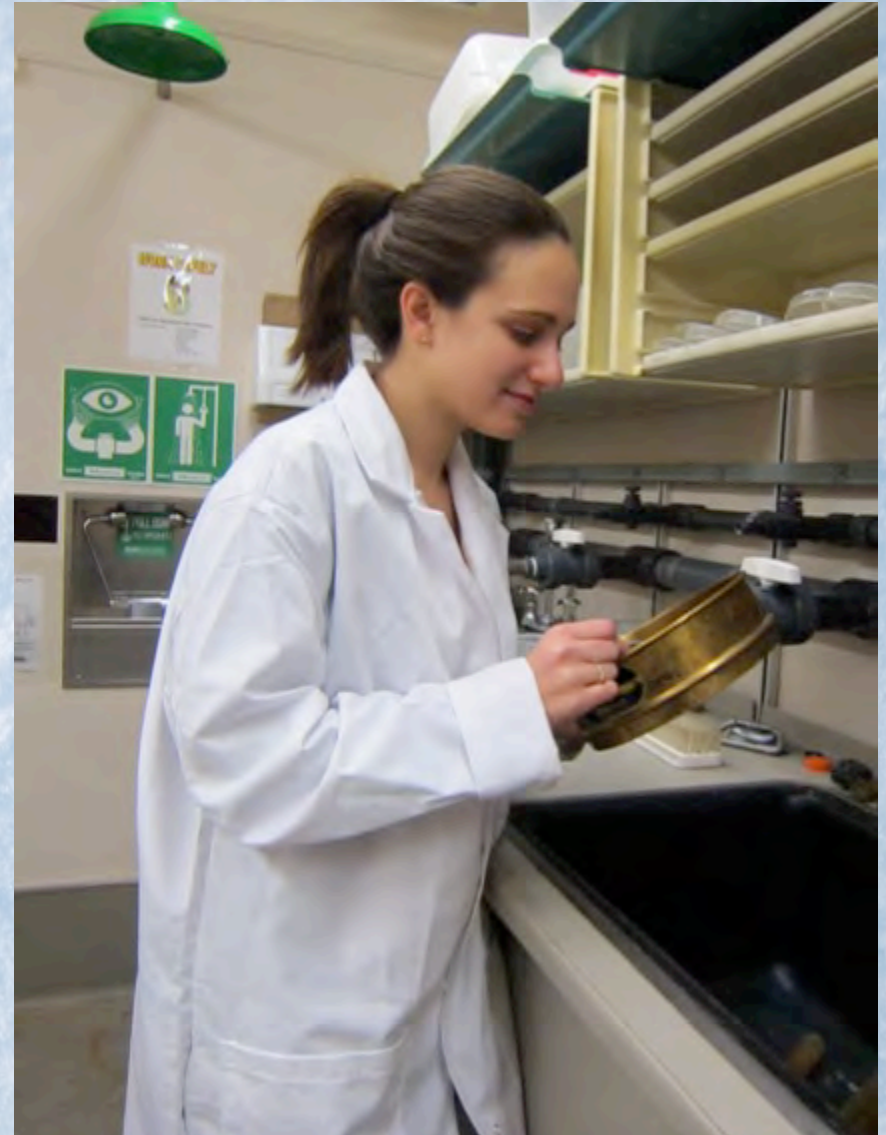


# Collection





# Worm Pickin'



# Culturing





# Experimental Setup



-1.5°C



Acclimation to Culture (~2 weeks)

Control

-1.5°C

-1.5°C

Experimental

-1.5°C

+4°C

-1.5°C

+4°C

# What's happening?

## Adaptation...



- **Physiological**
  - Body Volume
  - Respiration Rate
  - Citrate Synthase Activity
  - Mitochondrial Density
- **Biochemical**
  - Methylation

# Environmental Epigenetics

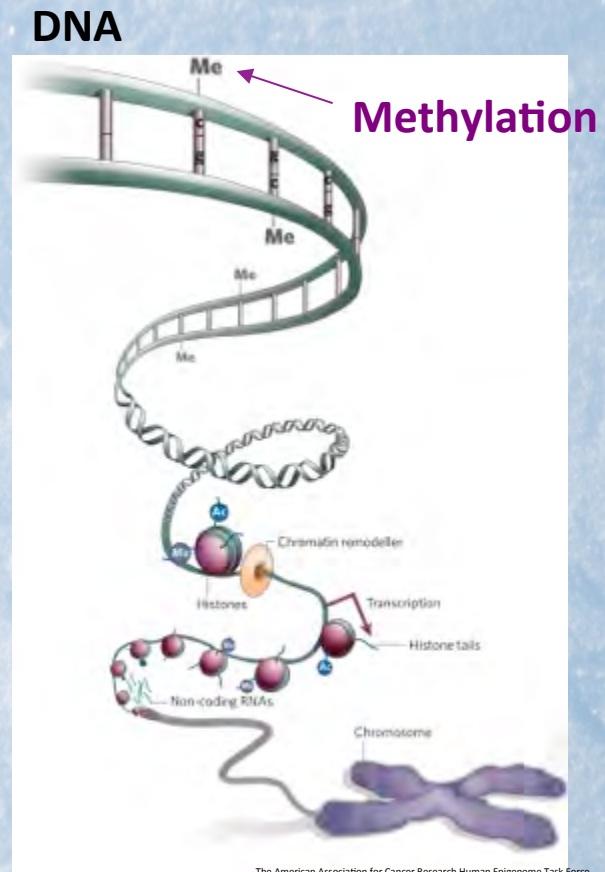
**Epigenetics:** the interplay between environment, genotype, & phenotype

## Epigenome

- Chemical information surrounding genome
- Influences gene transcription

## Adaptation

- What's in the gene
- What's on the gene



# Worms and beyond!

We've got the tools...

DNA sequence is DNA sequence regardless of the source of biological materials

## **Societal Benefits:** Human Health

- Early onset Parkinson's Disease
- Latent/persistent Lyme's Disease Infections

# Bringing Our Work into the Classroom

70 journals

22 online sessions





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# Teachers: Join PolarTREC!

[www.polartrec.com/about/join](http://www.polartrec.com/about/join)

Every teacher 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!**



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# Upcoming Events

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



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# Thank You!

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

