



TEACHERS AND RESEARCHERS  
EXPLORING AND COLLABORATING

# Welcome to *PolarConnect*

with Glenn Clark and the Totten Glacier  
System PolarTREC Expedition

**Tuesday 11 March 2014**

8:00 a.m. AKDT

(9:00 am PDT, 10:00amMDT, 11:00 am CDT, 12:00 pm EDT)

Slides will be shown here

Exit the presentation

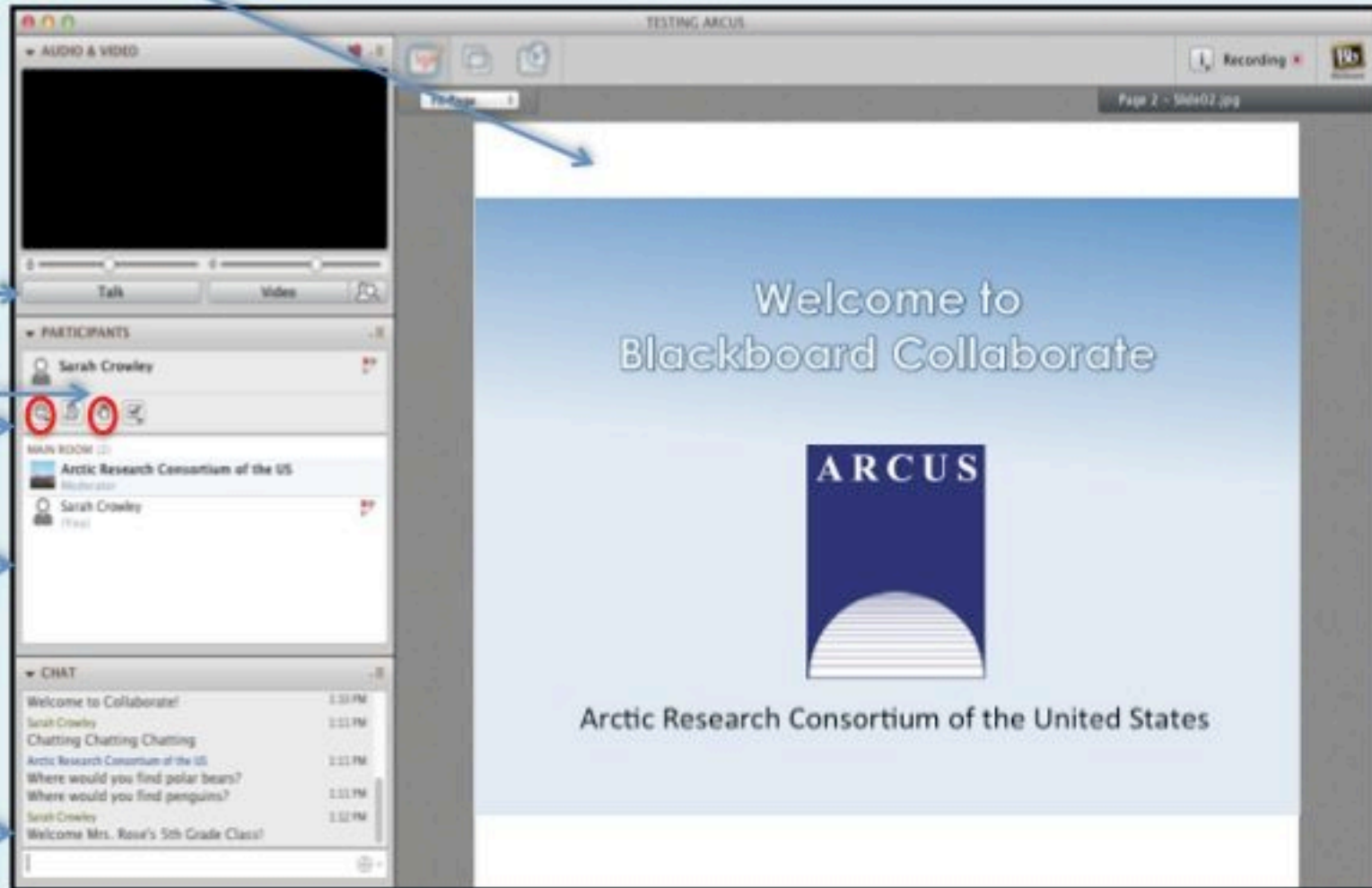
Click to Talk,  
Unclick to finish talking

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 window displays a presentation slide titled "Welcome to Blackboard Collaborate" with the ARCUS logo and the text "Arctic Research Consortium of the United States". The sidebar on the left contains several sections: "AUDIO & VIDEO" with a black video feed and "Talk" and "Video" buttons; "PARTICIPANTS" with a list of users including Sarah Crowley and Arctic Research Consortium of the US; "MAIN ROOM" with a list of users; and "CHAT" with a list of messages. Blue arrows point from the text labels on the left to the corresponding elements in the interface.

## Please Note:

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

# Participant Introductions

**Please type in the chat box:**

- ✓ Name
- ✓ Affiliation (School, Institution, Etc.)
- ✓ 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

## 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.**

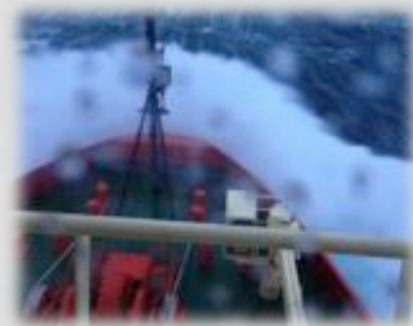
# WELCOME TO THE TOTTEN CRUISE.

**NBP-14-02**

January 29<sup>th</sup> to March 16<sup>th</sup>, 2014



DEPARTED FROM HOBART, TASMANIA .  
OUR DESTINATION: THE MERTZ AND TOTTEN GLACIER SYSTEMS.  
THROUGH THE FURIOUS FIFTIES AND SCREAMING SIXTIES



# THE GOVERNORS RECEPTION IN HOBART



His Excellency  
the Honorable  
Peter  
Underwood

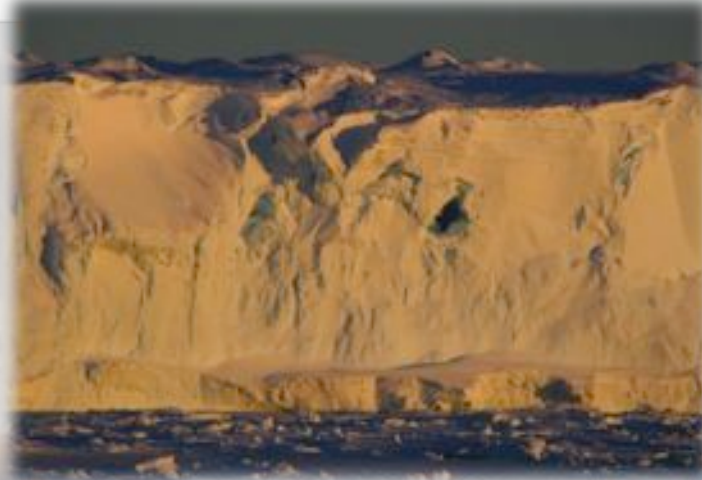
We were graciously received at the Government House prior to our departure.



# AN INTERDISCIPLINARY PROJECT

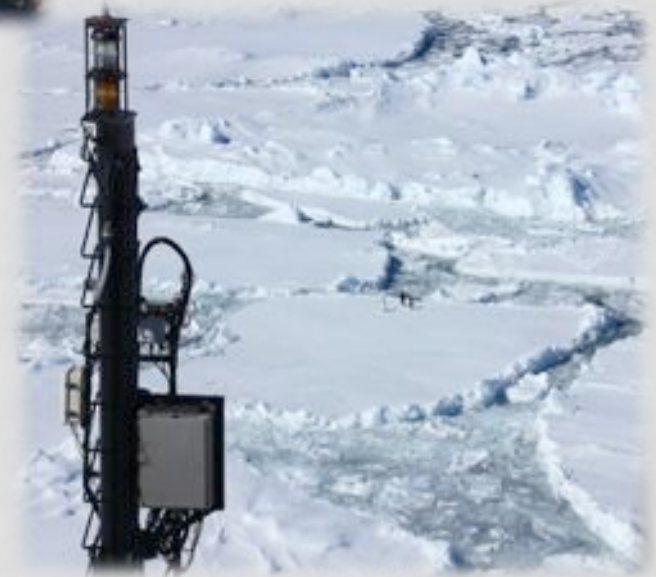
GEOPHYSICS  
MARINE GEOLOGY  
PHYSICAL OCEANOGRAPHY

CONDUCTING RECONNAISSANCE OF THE SABRINA COAST , EAST ANTARCTICA



An International  
endeavor

Multi Institutional



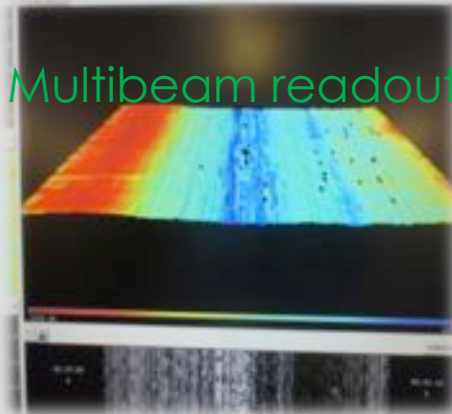
Funded by the National Science  
Foundation

# GEOPHYSICS IS THE STUDY OF THE EARTH THROUGH ITS PHYSICAL PROPERTIES.

IT IS OFTEN THE PROPERTIES YOU CANNOT SEE !

Using: Magnetometer, Knudsen (Chirp), Multi beam , Gravimeter , Seismic Streamer

Streaming and Beaming !



# MARINE GEOLOGY GATHERS AND ANALYZES SAMPLES OF THE SEA BOTTOM

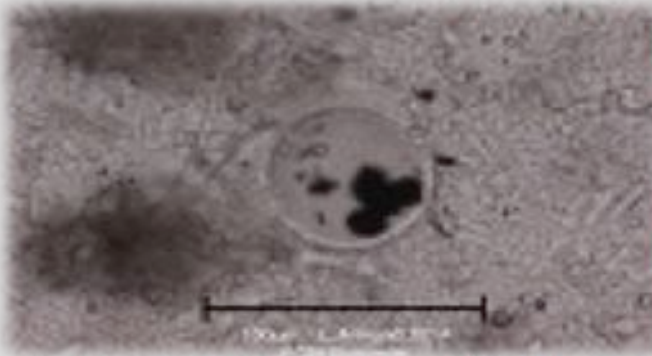
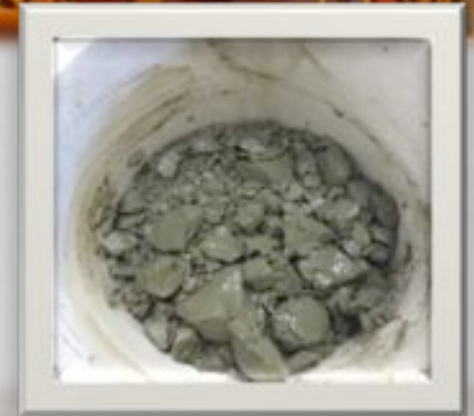
- Sediment
- Rocks
- Images



Jumbo Piston Corer

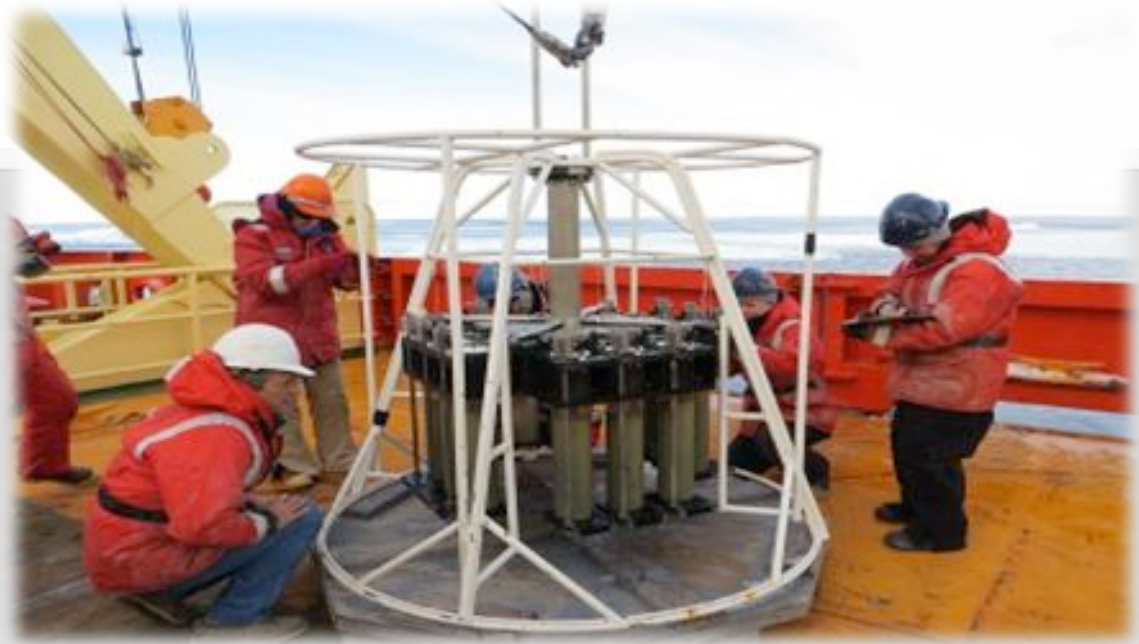


The sea bottom from the yo yo camera



# PHYSICAL OCEANOGRAPHY TESTS THE OCEAN WATER FOR ITS ABIOTIC FACTORS.

- Temperature
- Currents
- Salinity
- Oxygen



UCTD



Rosette CTD



The Incredible Shrinking Cup!



Mooring



# THE RVIB NATHANIEL B. PALMER

## **Our Home away from home**

Commissioned in 1992

12,720 Horsepower  
from 4 Caterpillar  
Diesels

Length 308 ft./width 60  
ft.

Endurance 75 days

Lab Space; 7 labs,  
5600 sq. ft.

Accommodations 70

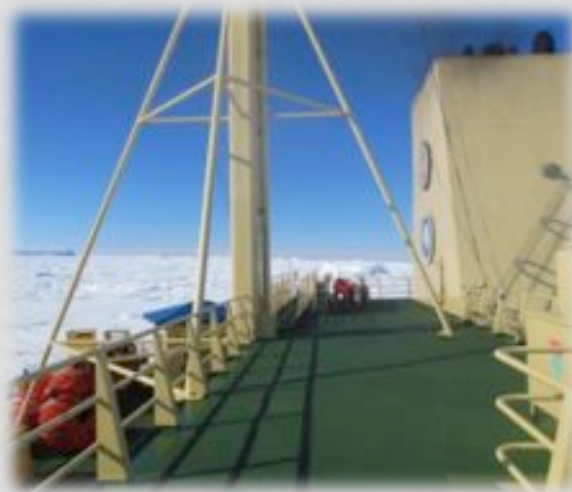
Over 3000 steel plates  
(10'x40") to build.

Fuel capacity 460,000  
gallons

Daily fuel consumption  
5000-10,000

Capable of making  
3000 gallons of water a  
day from waste heat.

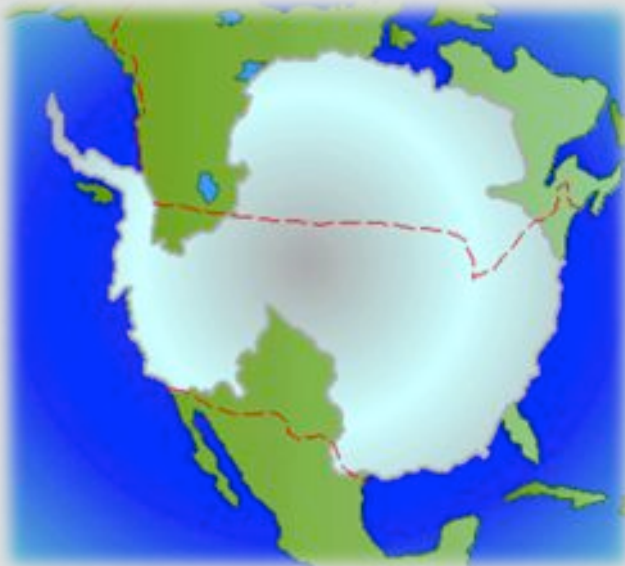
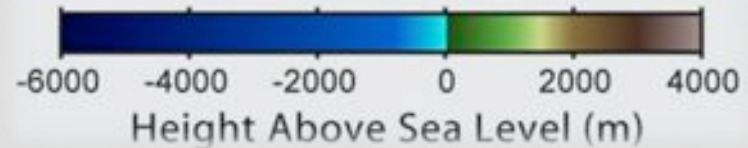
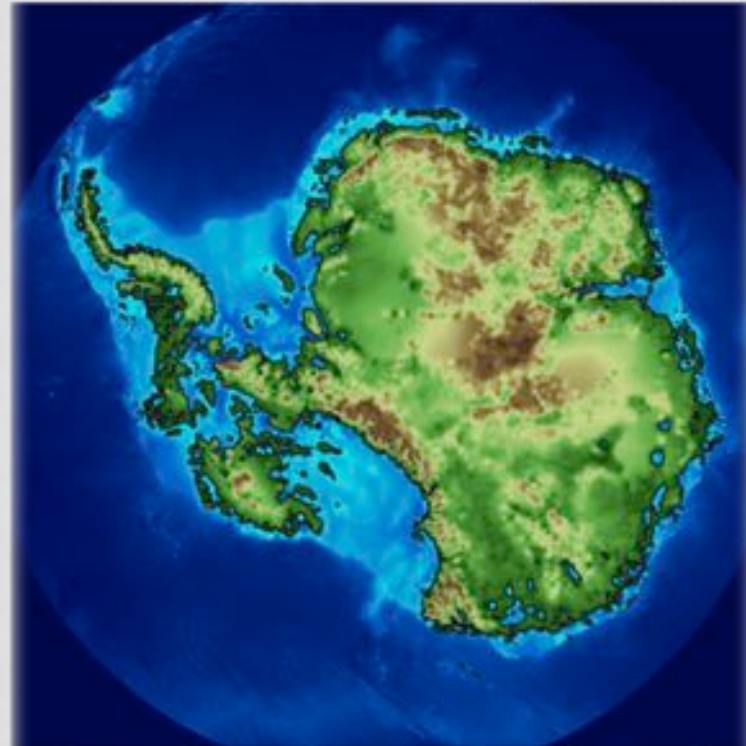
Capable of breaking 3  
feet of ice at 3 knots.



# EAST VS. WEST ANTARCTICA



Deglaciated Antarctic Topography



# Global Warming Impacts in Antarctica ?

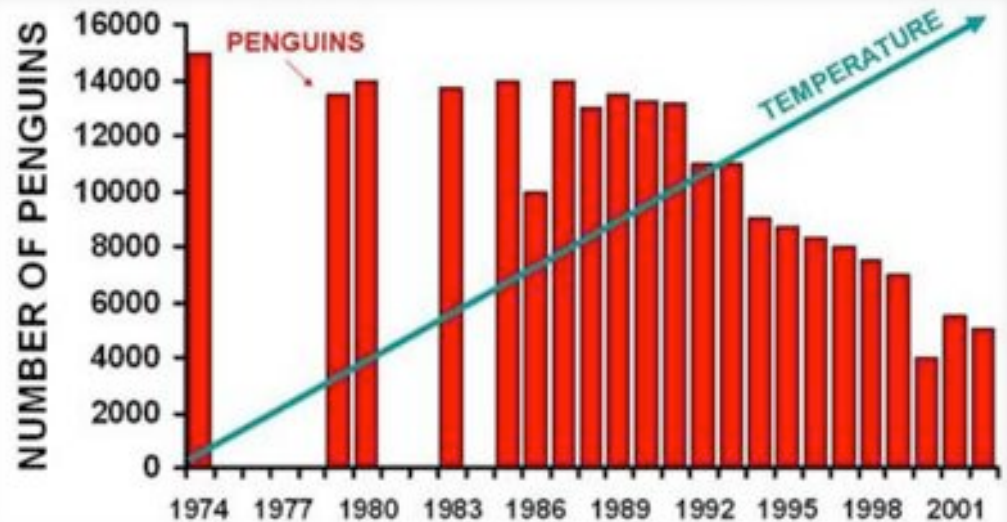


- Warmer air temperature
- Less sea ice (less “frozen ocean” )
- Penguin populations changing
- A “greener” Antarctica – small plants move in
- Ice shelves melt and sea level rises



# Adelie Penguins and Global Change Antarctic Peninsula

*Work of Bill Fraser, Polar Oceans Research Group,  
Dept. Biology, Montana State University, Bozeman, MT*





Wildlife is everywhere, from the bottom of the ocean to the skies above. From the microscopic, the bizarre and the beautiful.

# WILDLIFE ABOUNDS!



Adelie Penguins



Leopard seal



Crab Eater Seal



Minke Whale



# ICEBERGS

*Icebergs are massive pieces of ice sheets or glaciers that have broken free, a process called calving.*

*Only about 10% of the ice berg is above the water.*

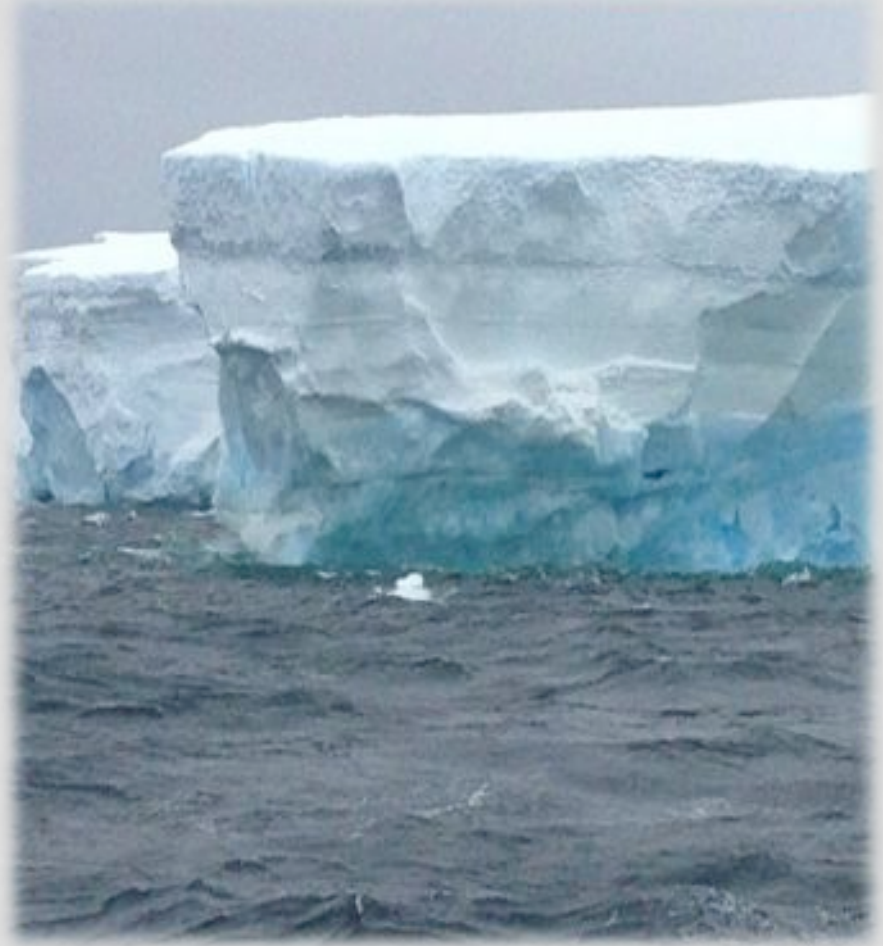
*Ice bergs hold a massive amount of freshwater.*

*A flat topped iceberg is one that has not flipped.*



# GLACIERS

- Glaciers are slow moving extensions of the continental Ice Sheet
- It is thought that the warmer water is undermining them.
- This results in ice loss and sea level rise.



Pristine  
Unpredictable  
Challenging  
beautiful

## WHAT IS THE ANTARCTIC COAST LIKE?



# WORKING OUTSIDE

“There is no bad weather  
only bad clothing”

The Marine Technicians  
rule !

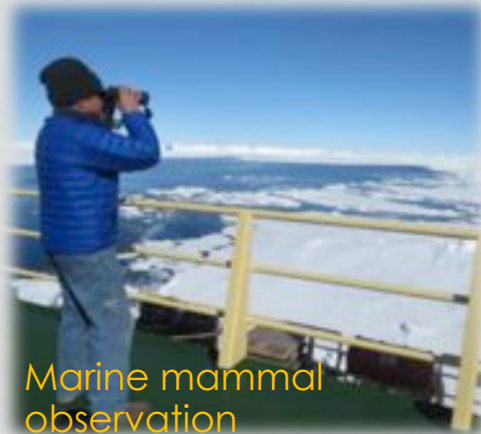


# PLENTY OF ROOM FOR SCIENCE

7 labs with 5600 sq. ft.

- Oceanography
- Marine Geology
- Geophysics
- Biology

Marine Geology



Marine mammal observation

Biology



Baltic room



Big Antarctica



Physical Oceanography



Mission Control



# INSTITUTIONS INVOLVED



Lamont-Doherty Earth Observatory  
COLUMBIA UNIVERSITY | EARTH INSTITUTE



ANTARCTIC CLIMATE & ECOSYSTEMS  
COOPERATIVE RESEARCH CENTRE



Australian Government  
Geoscience Australia



# THE SCIENTISTS

Some of the most influential individuals in Antarctic science from around the World !



Bruce Huber



Bruce Frederick



Caroline



Sean Gulick



Gene Domack



Rodrigo Fernandez



Alex Orsi



Alix Post



Jamin Greenbaum



Leanne Armand



Steffen Saustrup



Andrea Walters



Amelia Shevenell



Mark Rosenberg



Paul Clark



Amy Leventer



# LEADING BY EXAMPLE



# UNDERGRADUATE AND GRADUATE SCHOOL UNMATCHED EDUCATIONAL OPPORTUNITY

- Left to right
- **Kelsey Winsor**
- U Wisconsin Madison
- **Kara Vadman**
- Colgate
- **Mikhaila Redovian**
- Colgate
- **Tasha Snow**
- U South Florida
- **Catherine Smith**
- U South Florida
- **Natalie Zielinski**
- Texas A&M Univ
- **David Morgan**
- Hamilton
- **Michelle Guitard**
- U South Florida



# WHAT DO WE DO ON DUTY?

- Science is conducted around the clock
- We work with both the scientists and crew
- Work is done both in the lab and outside on deck
- You need to learn quickly!
- You must be able to multi task



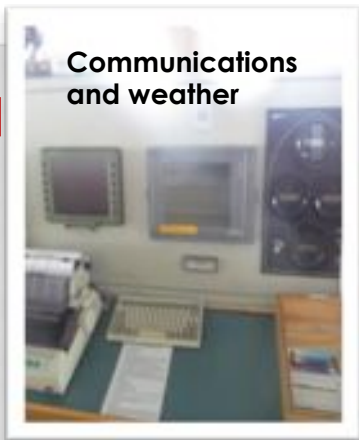
# LIFE ON BOARD

Lots to do  
when free time  
comes !



# SAFETY AT SEA

The ship is equipped for all types of emergencies



# THE CAPTAIN, THE MATES, AND THE AB'S



Captain Paoni



Chief mate Bell



2nd mate Potter



3rd Mate Kaple



Sam Villanueva



Fernando Naraga



Louie Andrada



Ronnie Carpio



Working in tough conditions making sure the science moves forward

# TECHNICIANS



Dan Powers



Ross Hein



Hanna Grey



Jeremy Lucke



Julie Jackson



Eric Hutt

Project Coordinator

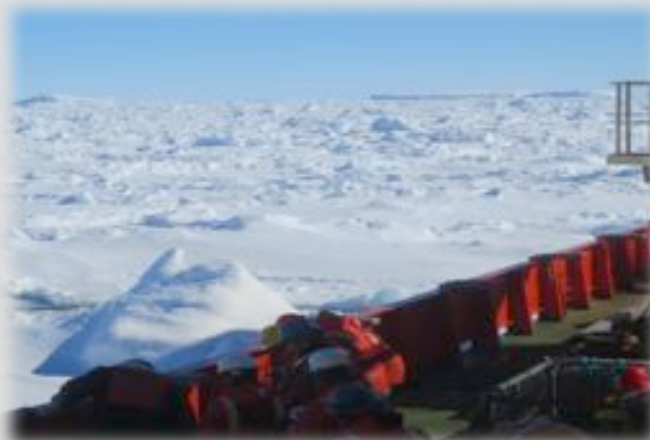
## Marine



Sheldon Blackman



Barry Bjork



Kathleen Gavahan



Scott Walker

## Information

## Electrical



Amy Westman

## Lab



# ENGINEERS AND OILERS . KEEPING THE LIGHTS BURNING AND THE SCREWS TURNING



Kaleb  
Smith



Rob  
Morris



JP  
Pierce



Fredor  
Delacruz



Danilo  
Plaza



Ric  
Tamayo



JP has been with the ship since  
1992





# THE CHEFS

Home cooking at sea.



Serving 4 meals a day. Breakfast, lunch, dinner and mid rats.

# NEW SHELL BACKS

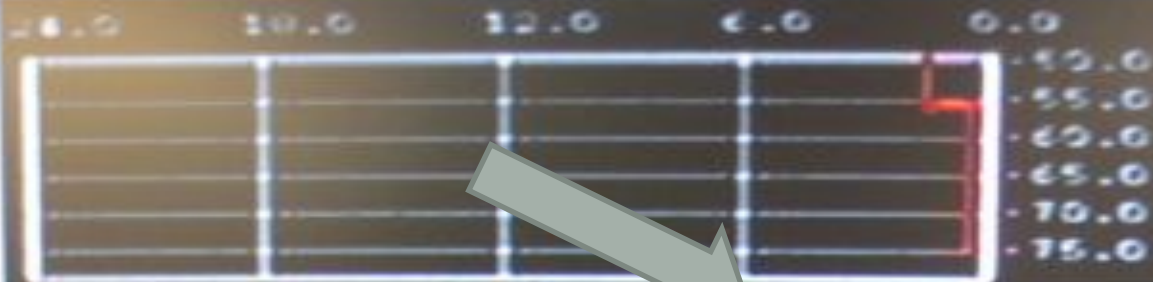
Those who have sailed across the Antarctic circle



GMT  
Date

13 Feb 2014

GMT  
Julian Day



Temperature

-75.0 C



Barometer

998.6 mBar

Rel. Humidity

-25.0 %

Wind Chill

-84.1 C

Port  
Relat



True



PSP  
PIR  
PAR

Sometimes even the technology makes a mistake!

IS THAT ALL THERE IS ?



**NO. THERE IS ALSO  
ANTARCTICA.**



A man wearing a bright red puffy jacket, a fur-lined hat with a blue patch, sunglasses, and yellow gloves is standing on the deck of a ship. He is waving with his right hand. The background shows a blue sea with white-capped waves under an overcast sky. The ship's deck has yellow railings and some equipment.

Photo  
Acknowledgements:  
Kaleb Smith, Amelia  
Shevenell, Tasha  
Snow, David Gwyther,  
David Morgan, Alix  
Post, Steffen Saustrup,  
Andrea Walter,  
Leanne Armand, Alex  
Orsi, Michelle Guitard  
and Rodrigo  
Fernandez

Thanks to  
everybody from the N.B  
Palmer, NSF and  
Polartrec for an  
experience of a lifetime.  
A special Thank  
you to Dr. Amy  
Leventer for  
sticking with me . I  
will never forget  
this opportunity.

I'll miss everybody  
from the N.B Palmer

Any Questions??



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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!**



# Upcoming Events

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

# Thank You!

*An archive of the event will be available shortly.*

<http://www.polartrac.com/polar-connect/archive>

