

Polar Professional Development
ED 593: Applied Life Science Concepts for Educators

Where Adventure Meets Seal Science: Weddell Seals in the Ross Sea

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University of Alaska Anchorage

In conjunction with

Alex Eilers

Pink Palace Museum, Tennessee

1 November 2012



Blackboard collaborate

Sides will be shown here

Exit the presentation

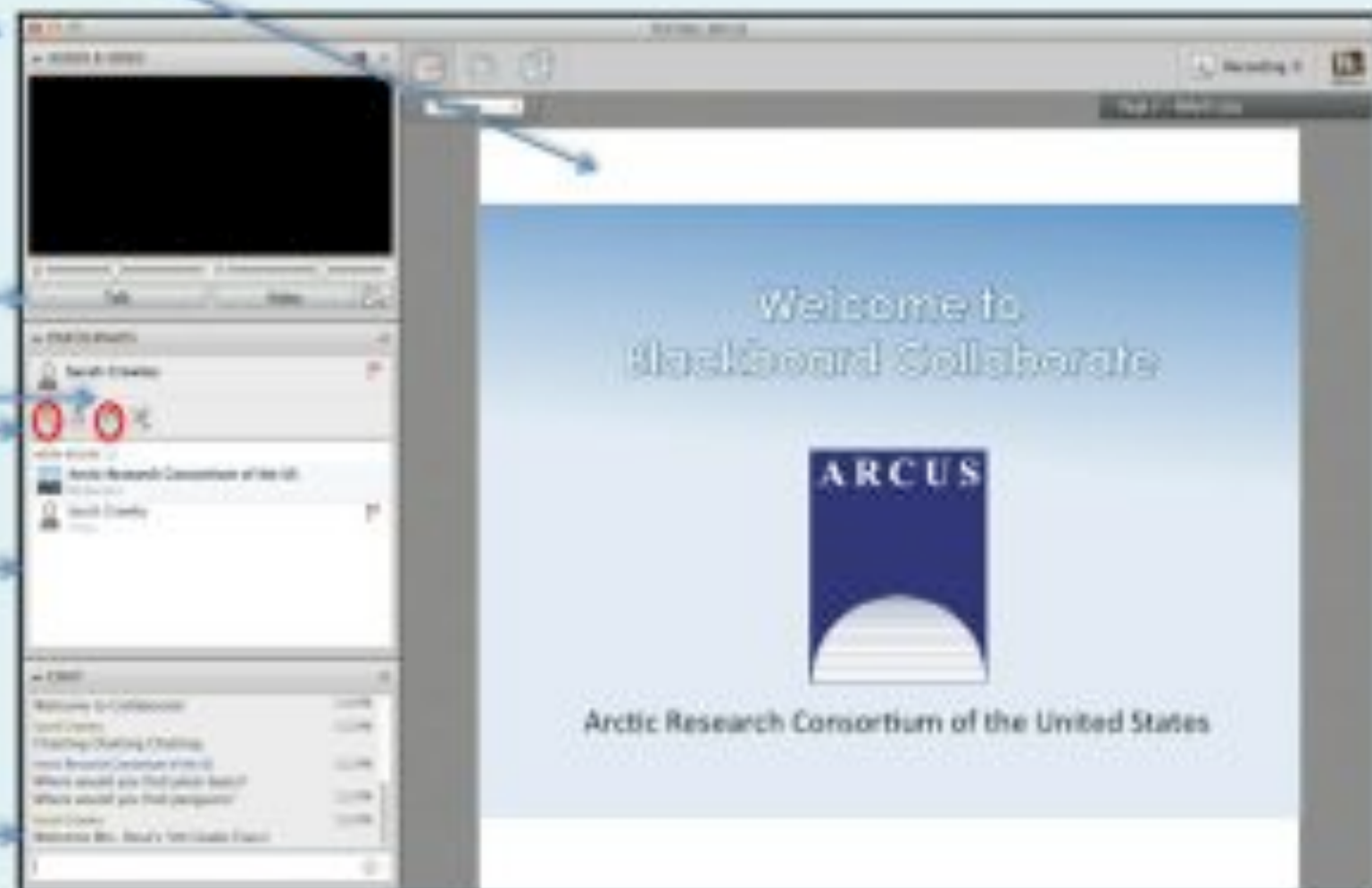
Click to Talk, Unclick to finish talking

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. On the right, a presentation slide displays the text "Welcome to Blackboard Collaborate" and the ARCUS logo (Arctic Research Consortium of the United States). On the left, a sidebar contains various controls: a "Talk" section with a microphone icon, a "Hand" section with two red hand icons, an "Emoticons" section, a "Participants" list, and a "Chat" section with a text input field and a "Send" button. 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.

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.

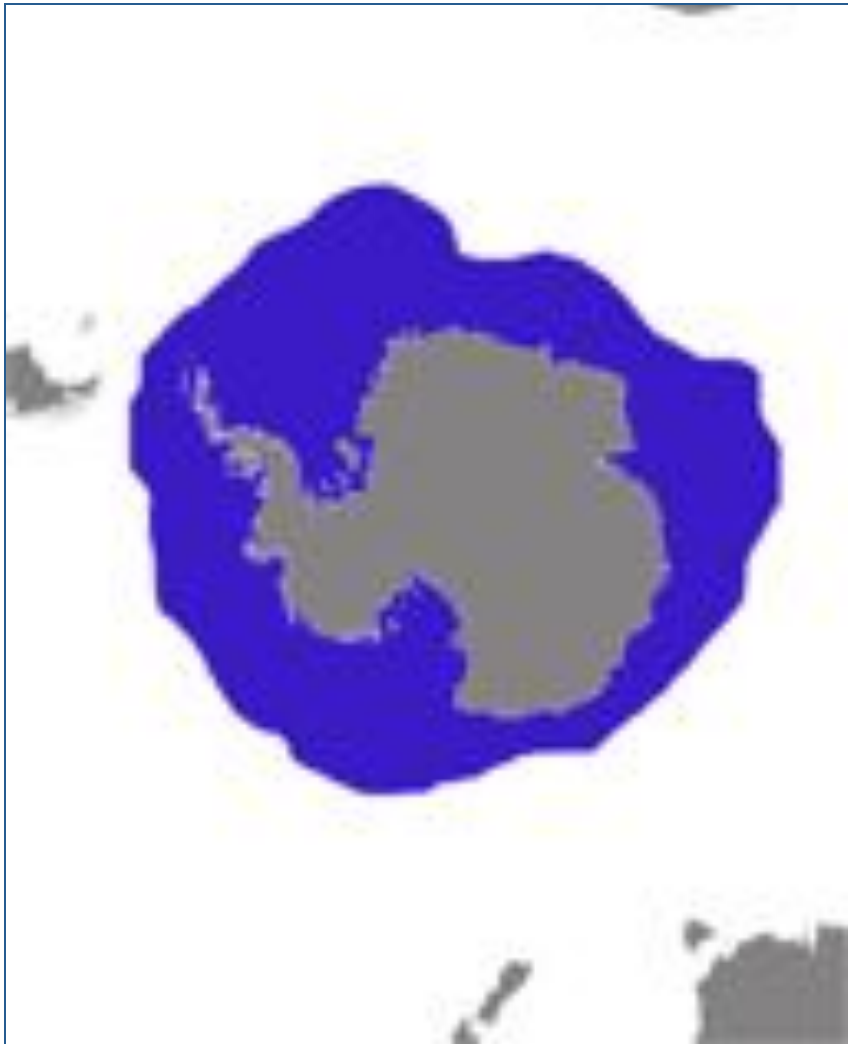
Unclick when you are done.

Participant Introductions

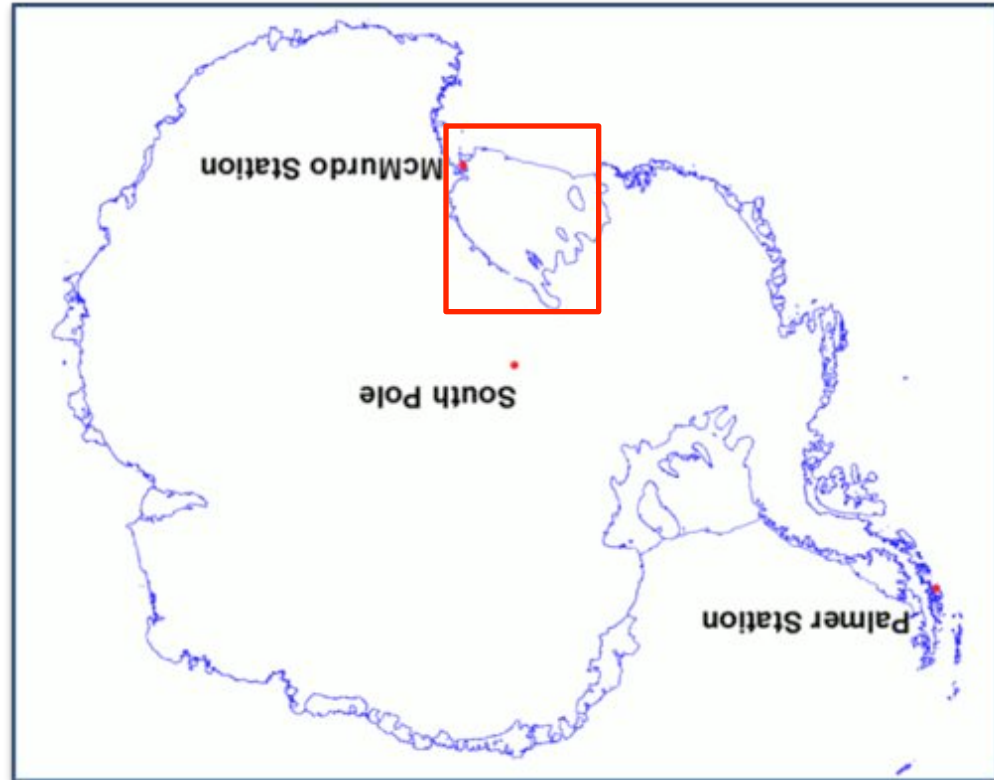
Please type in the chat box:

- ✓ Name
- ✓ Affiliation (School, Institution, Etc.)
- ✓ The number of students and adults participating with you in the same location

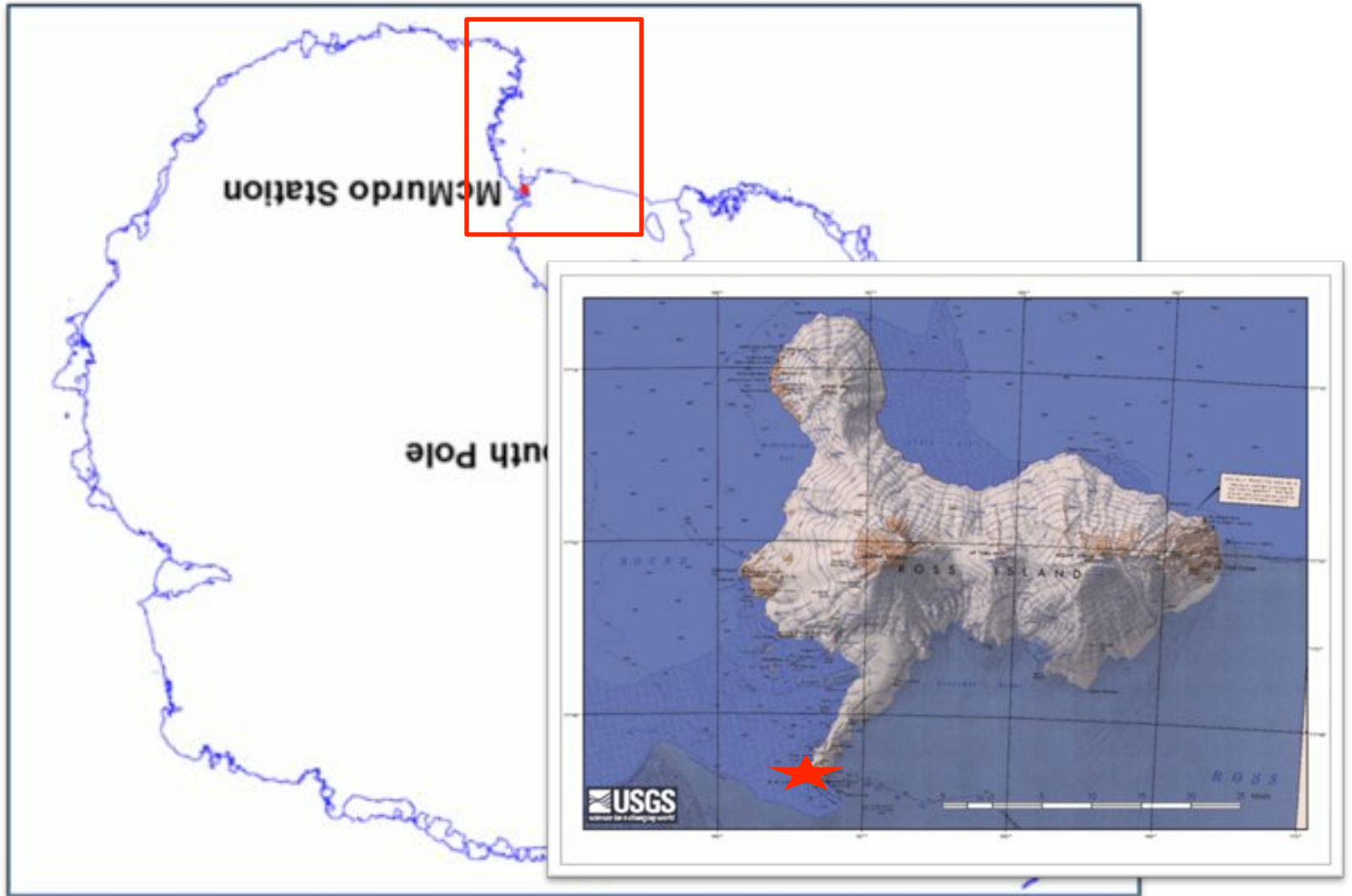
Location: Antarctica



Location: Ross Sea



Location: Ross Island



What do we know about Weddell seals?



Long Term Tagging Study



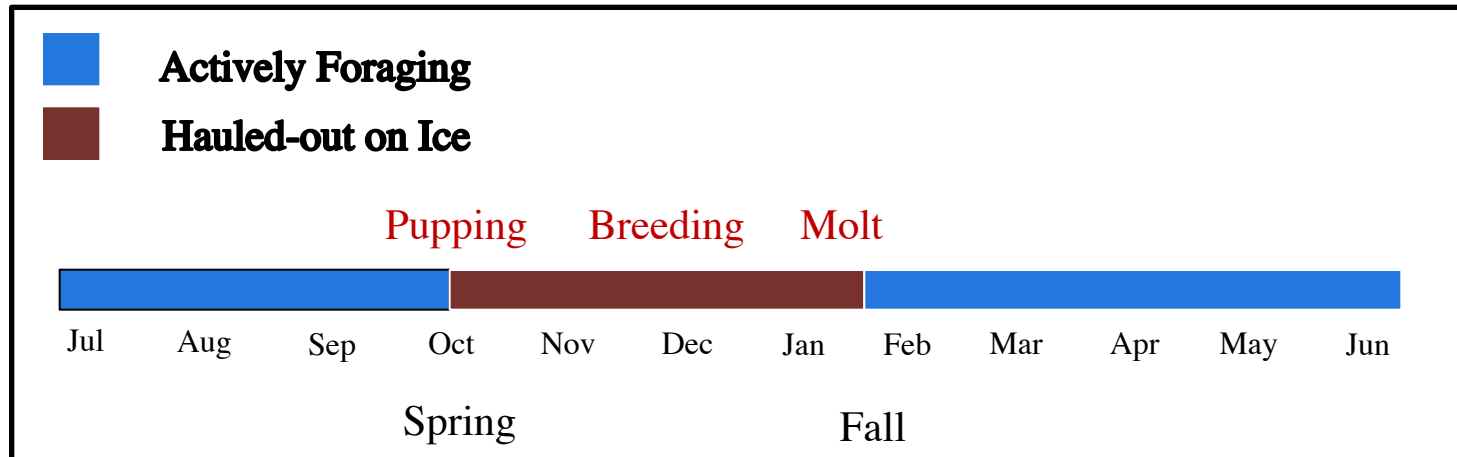
The Basics



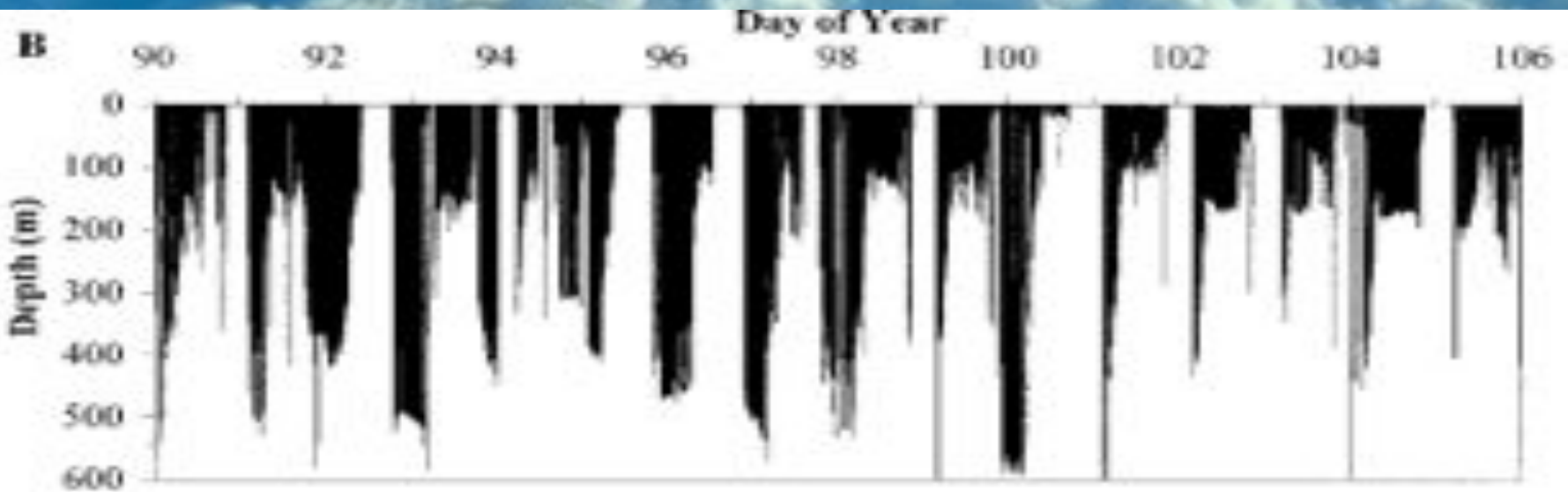





Weddell Seal Ecology



Diving Studies

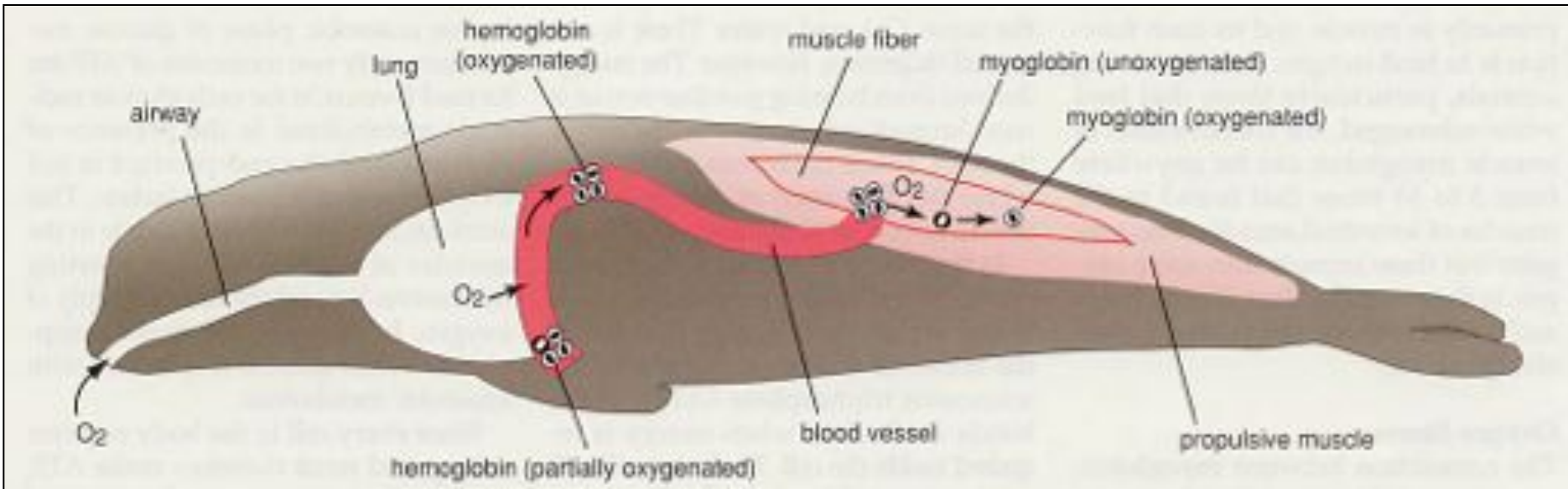


Diving Physiology

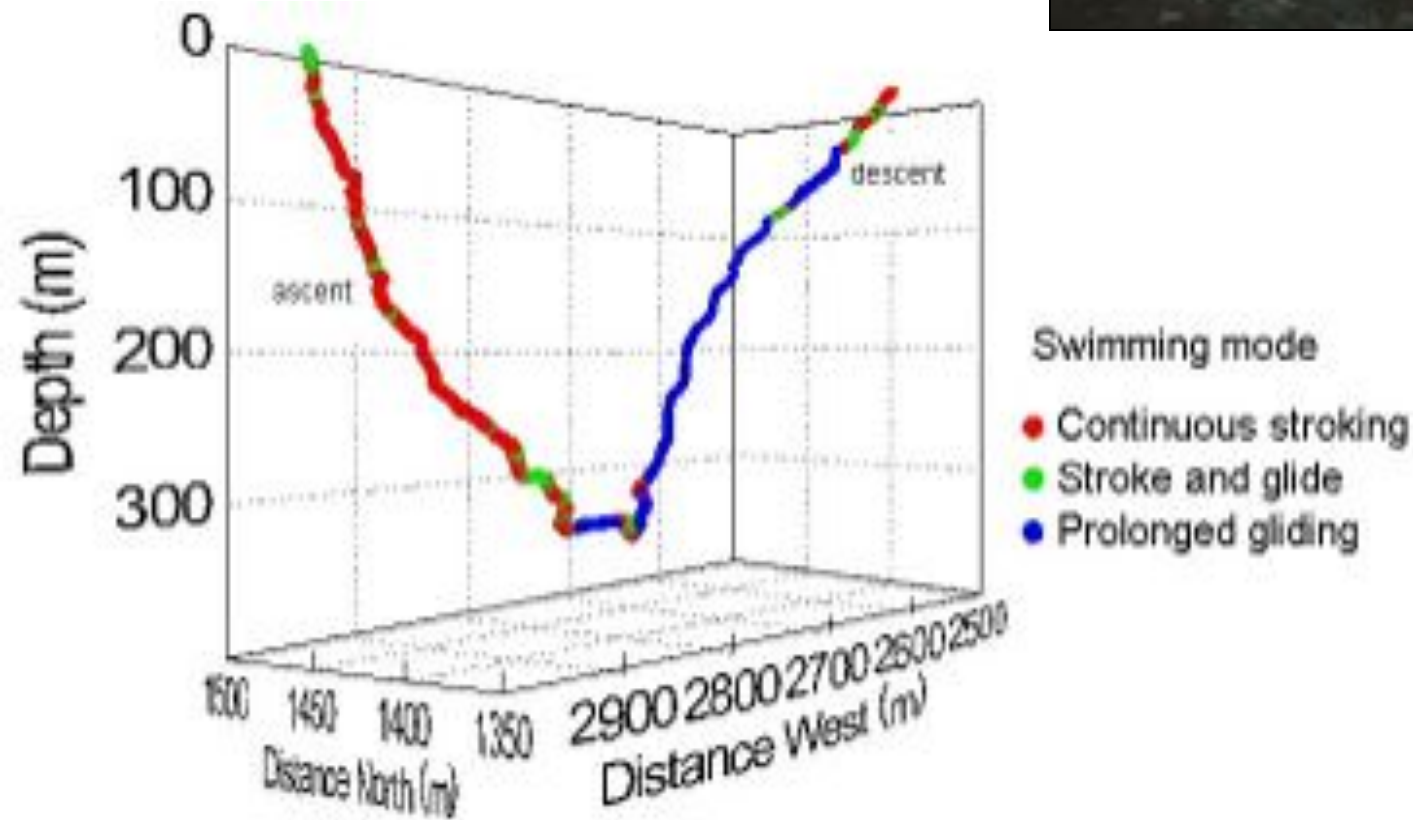
A photograph of a seal diving underwater. The seal is captured in a graceful, curved posture, moving from the upper right towards the lower left. Its body is dark with lighter, mottled spots. The water is a clear, deep blue, and the lighting creates a sense of depth and movement. The seal's head is tucked forward, and its tail is visible at the bottom right.

How do they stay down
for so long?

Large Oxygen Stores



Oxygen Saving



Diet Studies



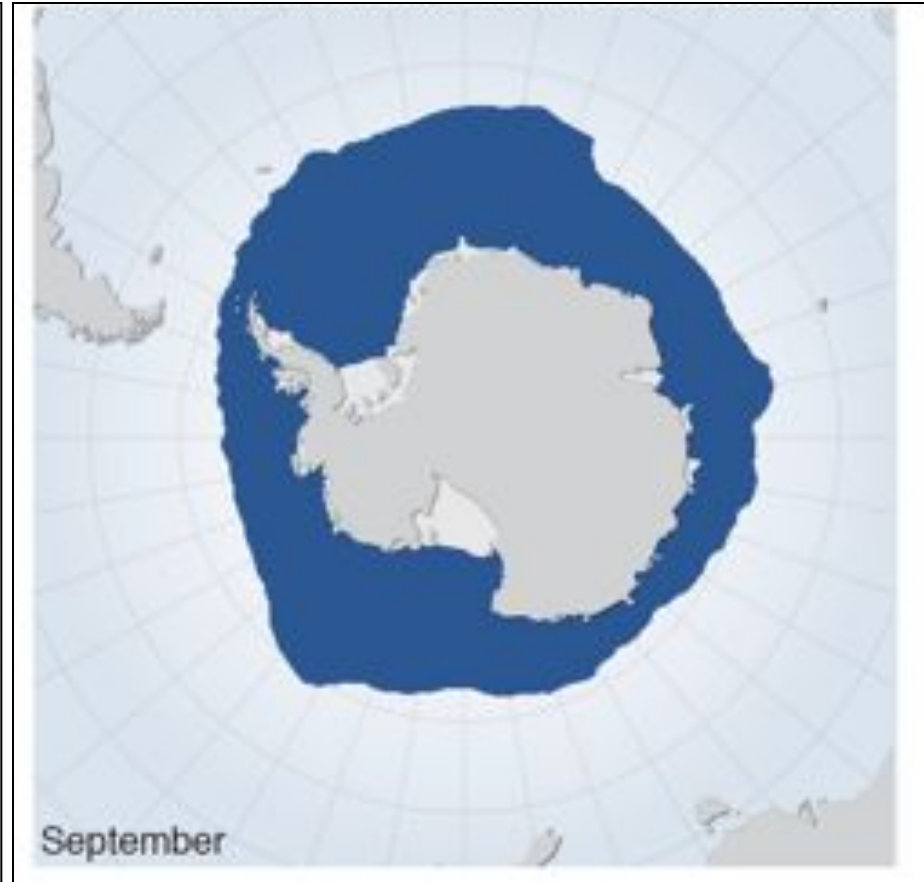
What we don't know



How seals make a living during the long, dark, Antarctic winter



Natural Changes: Summer vs. Winter



Summer: Open Water

Off Hut Point Jan 25, 2010



Early Fall: Freezing Up

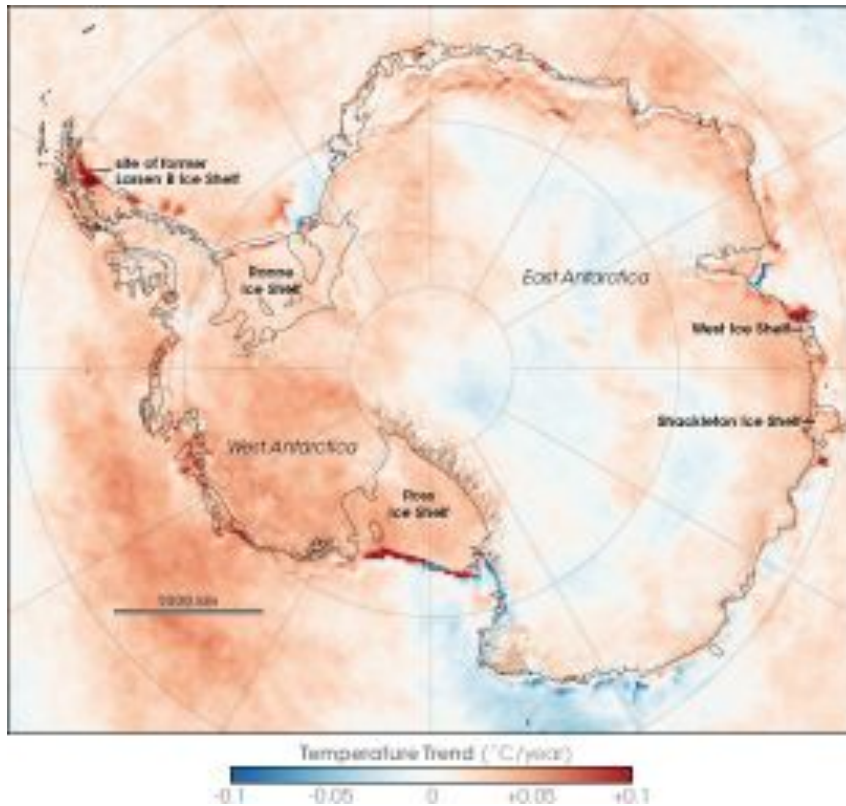


Late Fall: Frozen Over



Other Changes

Climate Change



Human Impacts



How do and will seals deal with these changes?

Weddell seals as autonomous sensors of the winter oceanography of the Ross Sea



Large collaborative study

1. Examine foraging behavior and habitat utilization of Weddell Seals across seasons
2. Link foraging behavior and habitat selection to physiological condition at start and end of winter
3. Use ocean salinity and temperature data collected by seals to refine Ross Sea oceanographic models



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SANTA CRUZ



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of ALASKA
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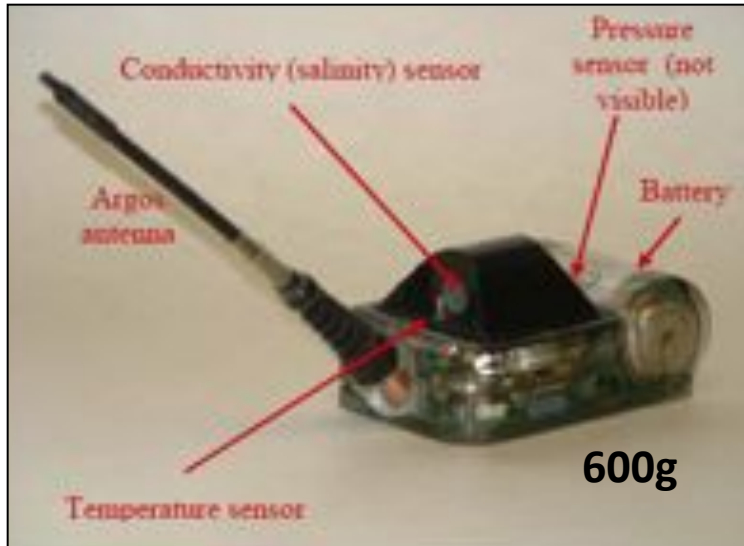


A white whale is swimming in deep blue water. On its back, there is a white tracking device with a black antenna. The whale's head and part of its back are visible above the water. The water has a textured, wavy surface. In the top right corner, there is a small portion of a white, ice-like structure.

Research Approach

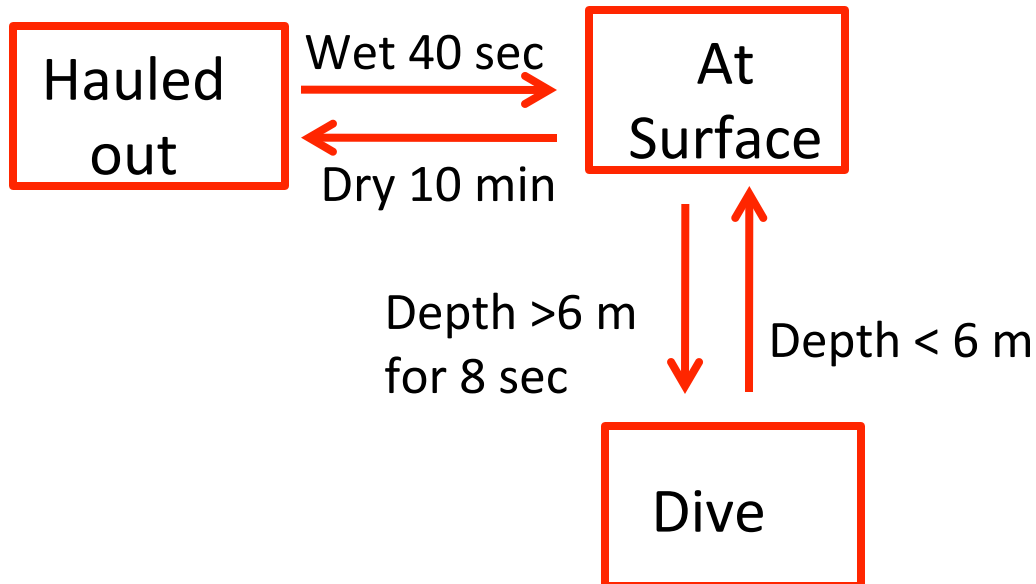
Let the animals collect the data for us

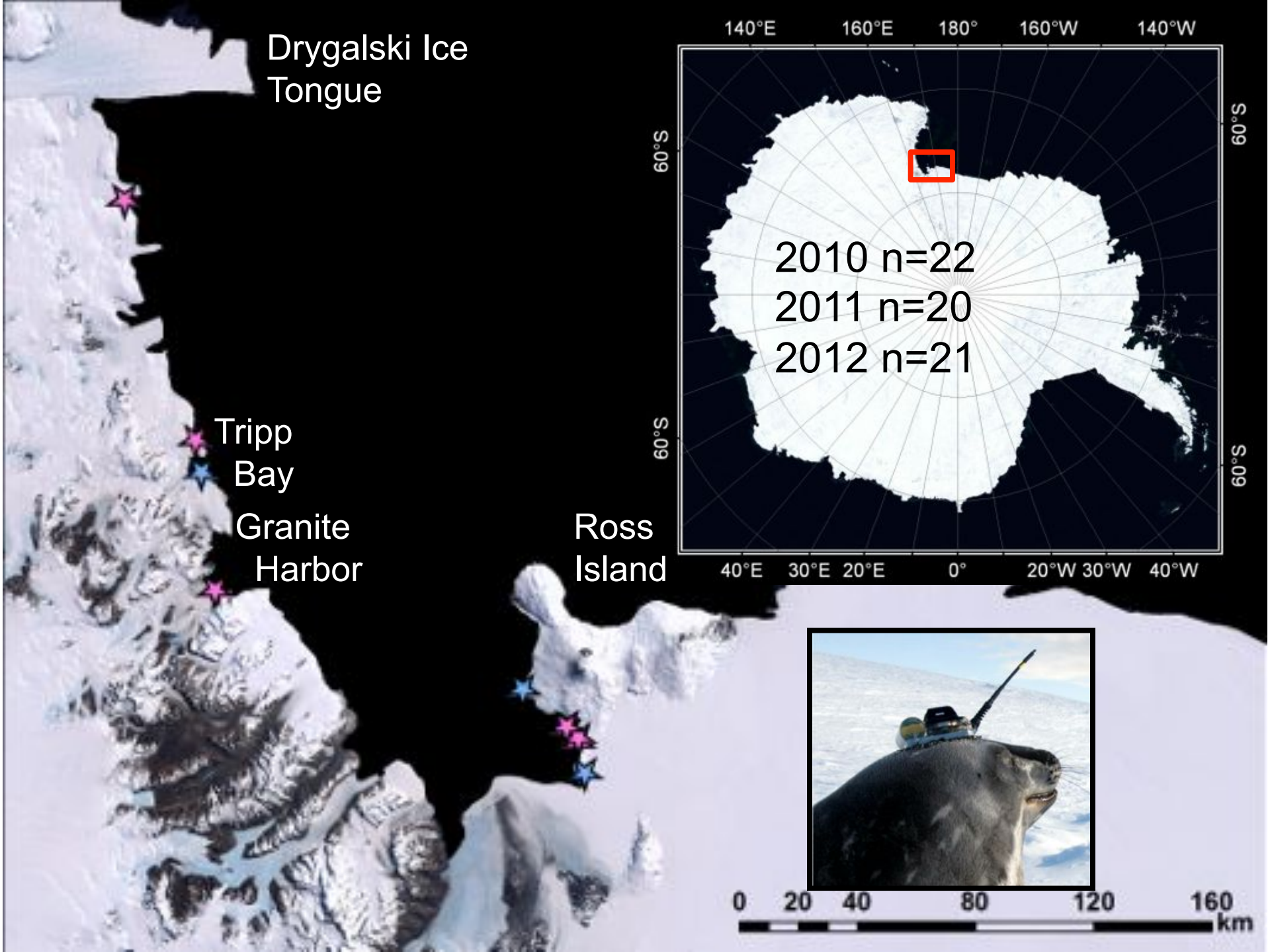
Satellite-Linked Dive Recorders



Measures environmental parameters:

- Dive Duration
- Hauled out / Diving
- Depth
- Water temperature
- Salinity





Drygalski Ice
Tongue

Tripp
Bay

Granite
Harbor

Ross
Island

140°E 160°E 180° 160°W 140°W

60°S

60°S

2010 n=22
2011 n=20
2012 n=21

60°S

60°S

40°E 30°E 20°E 0° 20°W 30°W 40°W

0 20 40 80 120 160 km

How to tag a seal 101



First: Locate a group of seals



Find a suitable seal



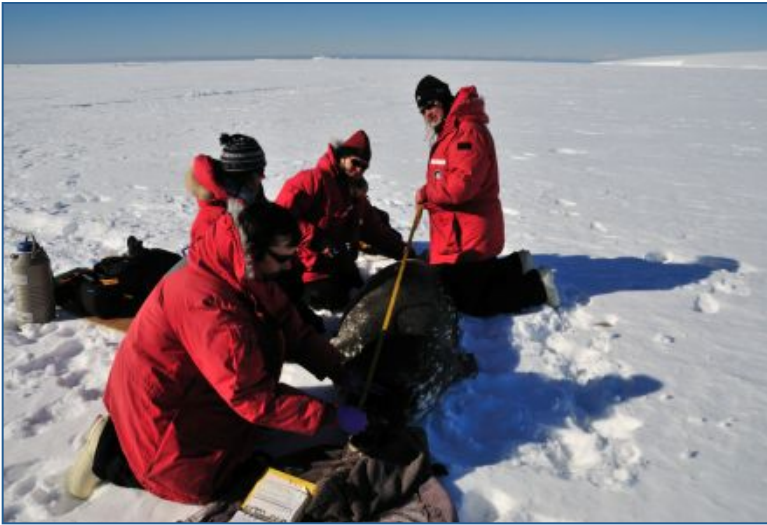
Unload and cart our gear...



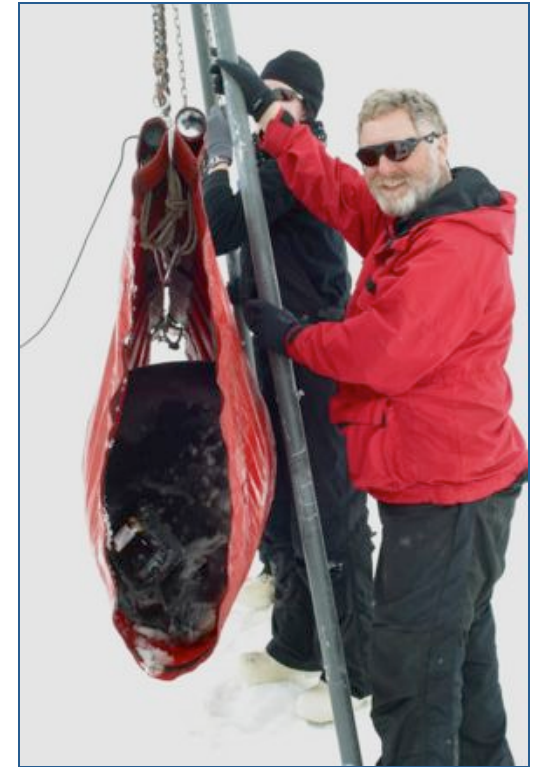
Approach, drug, and capture the seal



Measure the seal



Weigh the seal



Collect blood and tissue samples



Attach the satellite tag



Double check the data book



Release the seal



Pack up and go home



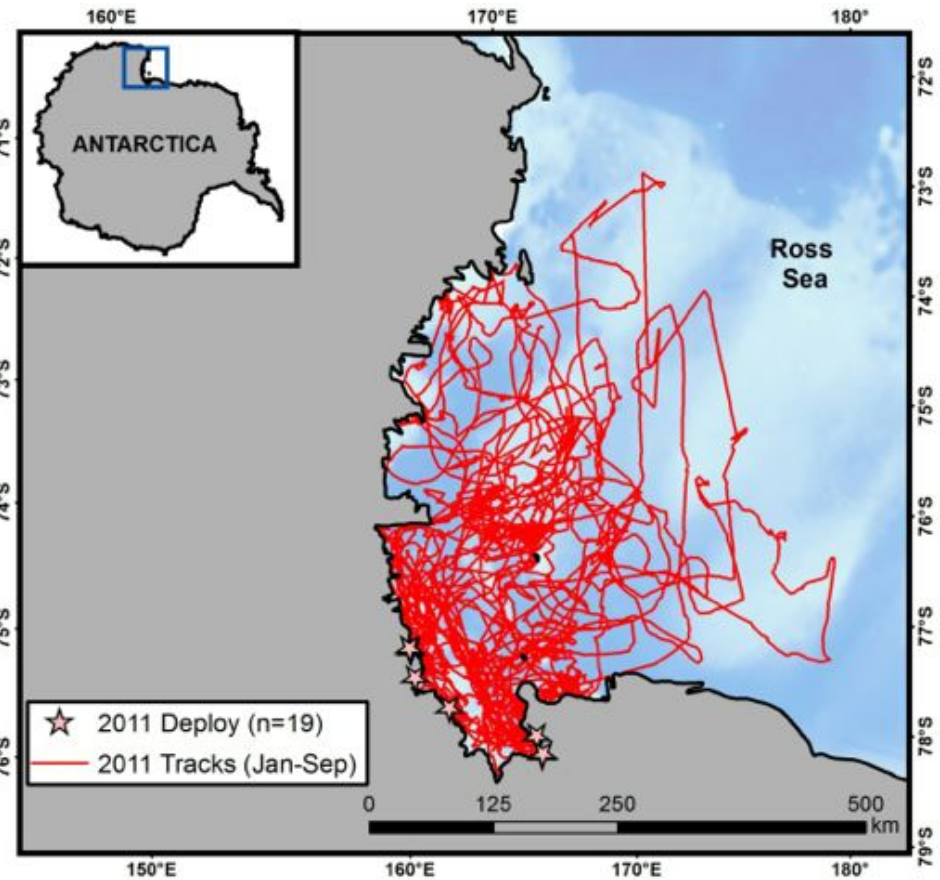
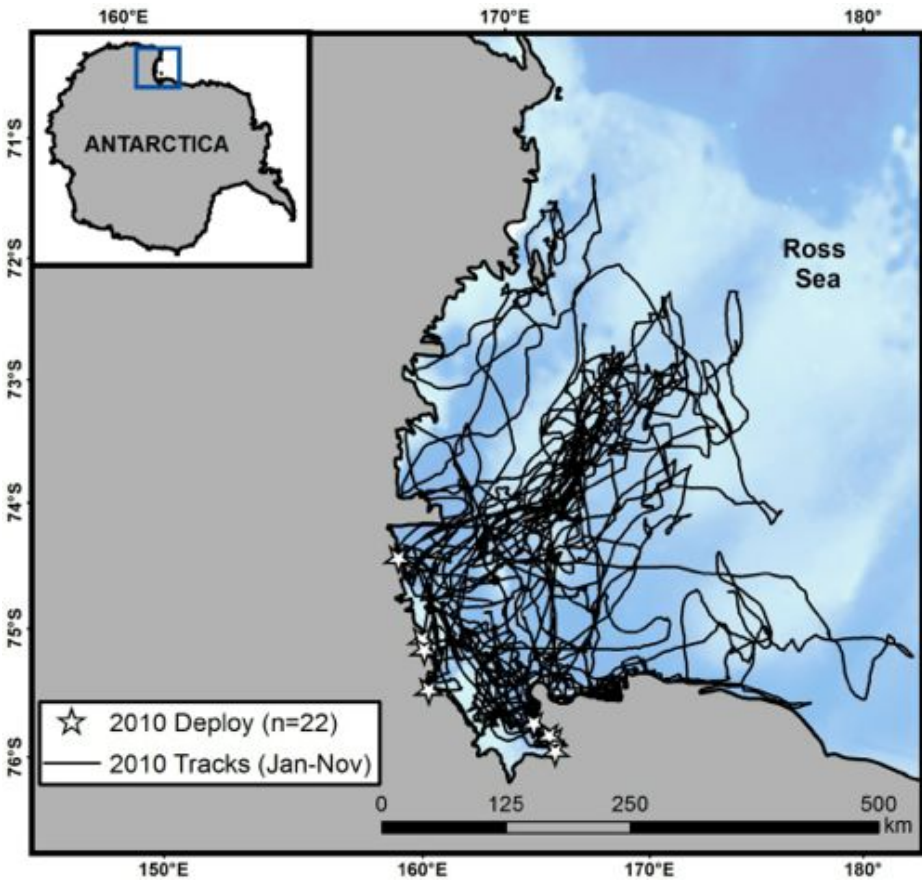
Relocate the seal 9 months later



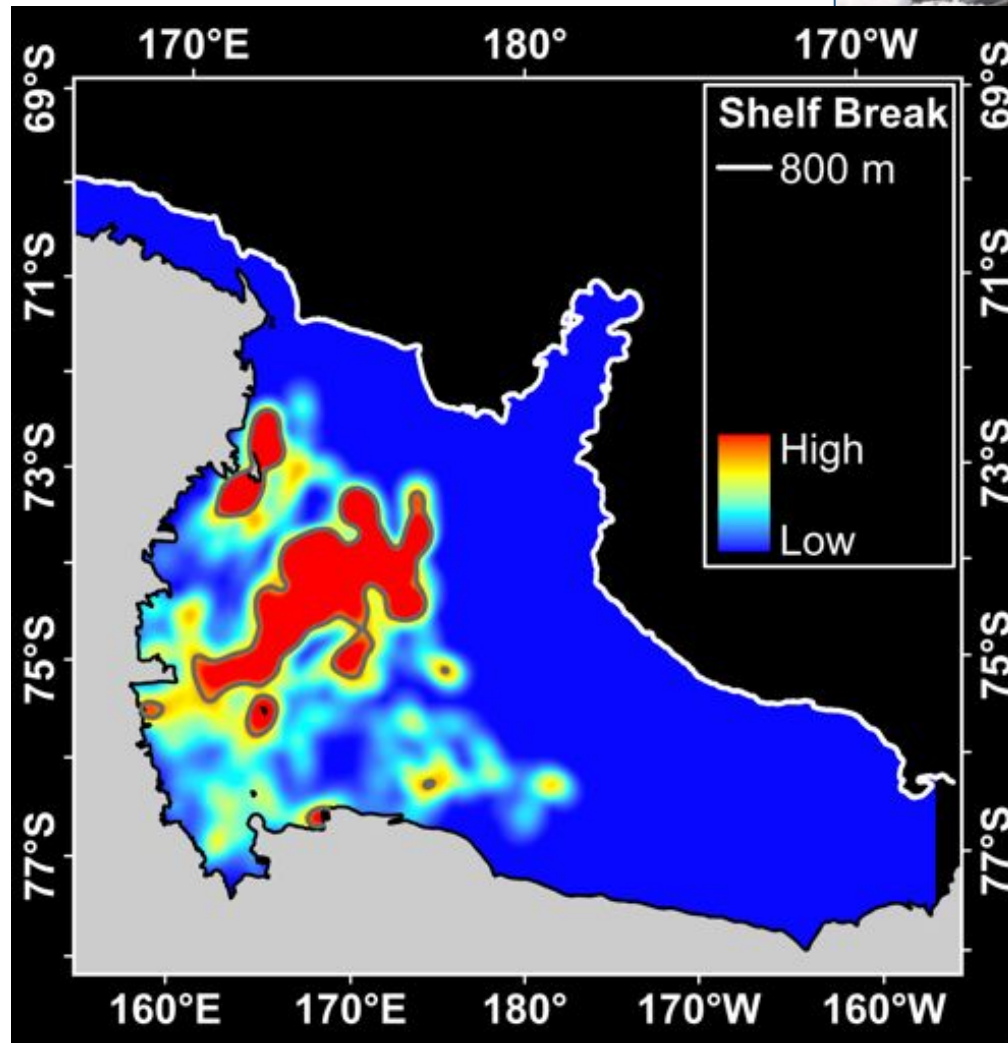
What Happened?



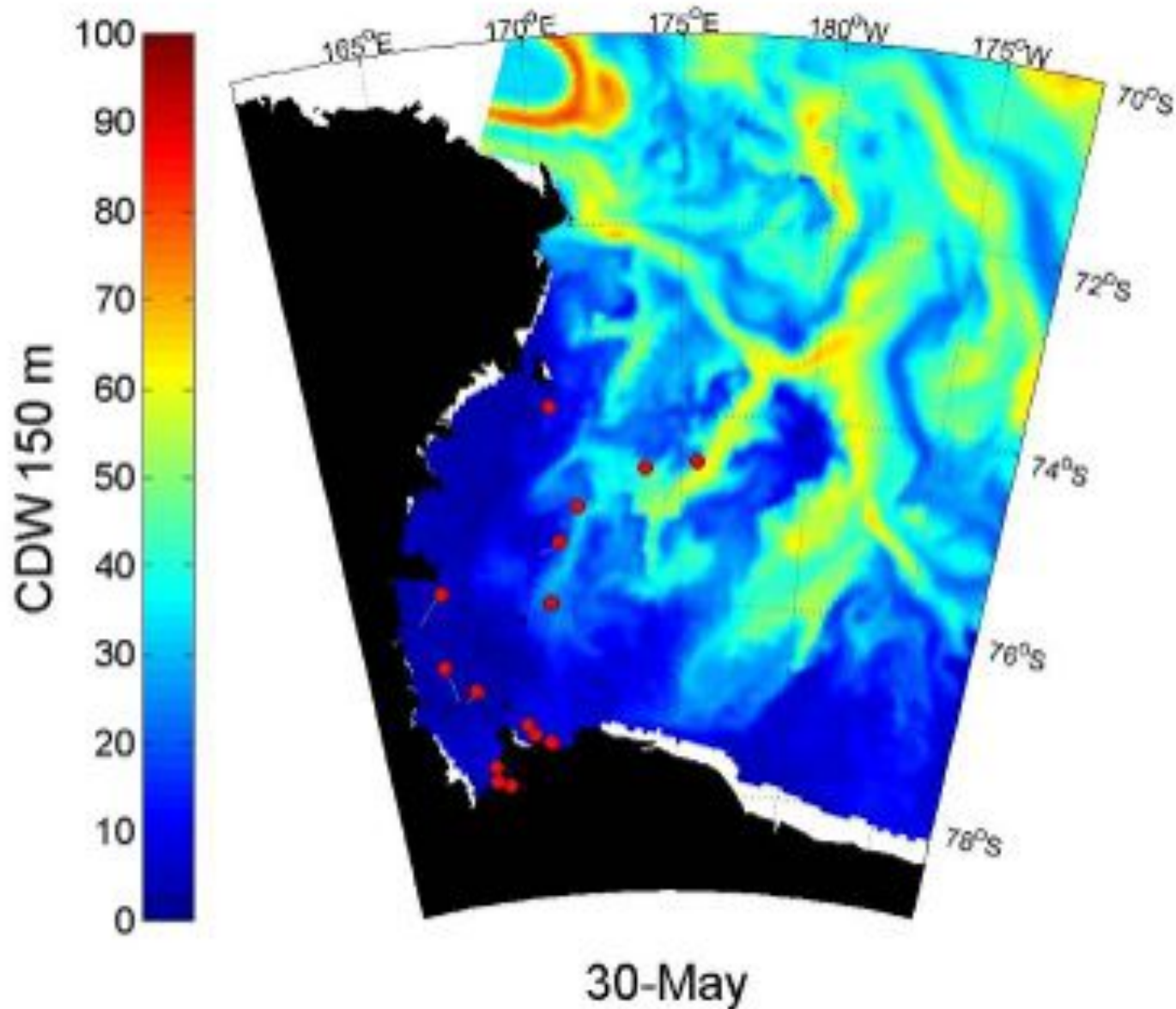
Tracking the Seals



Preferred Areas

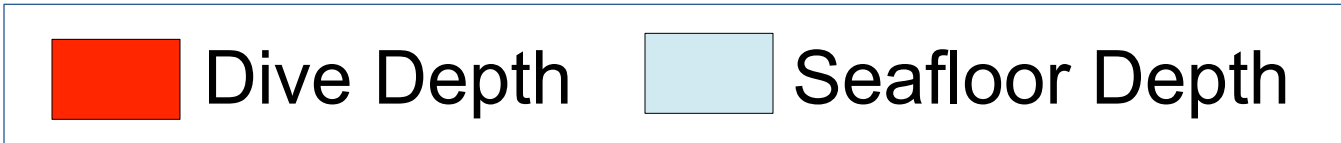
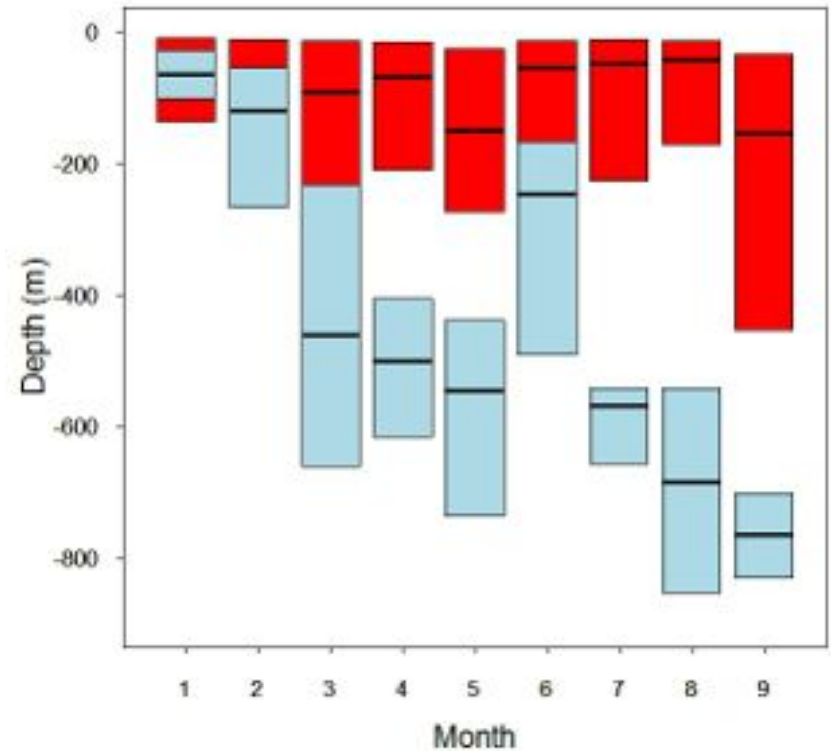
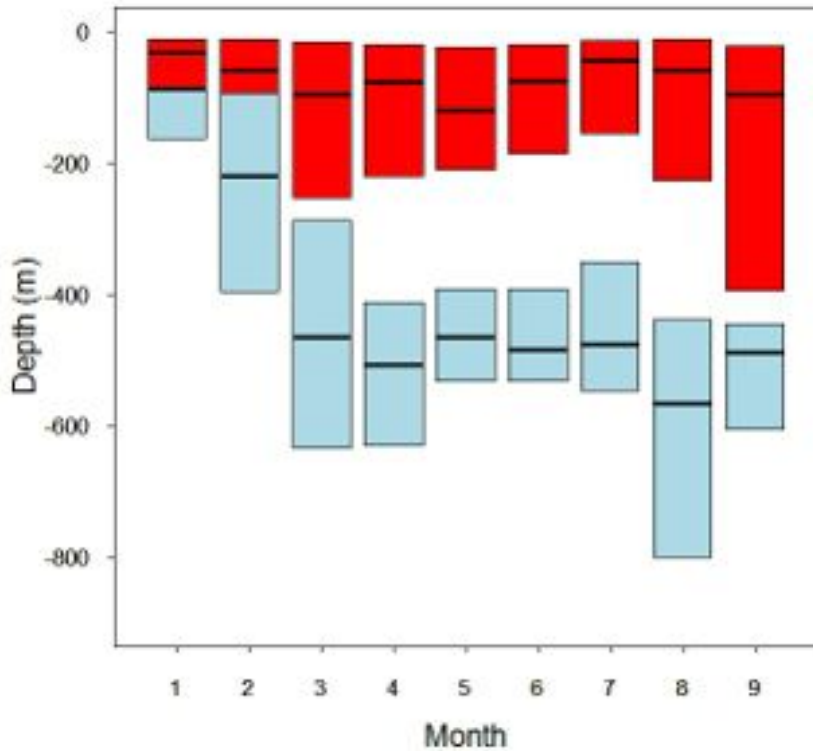


Seals & Oceanography

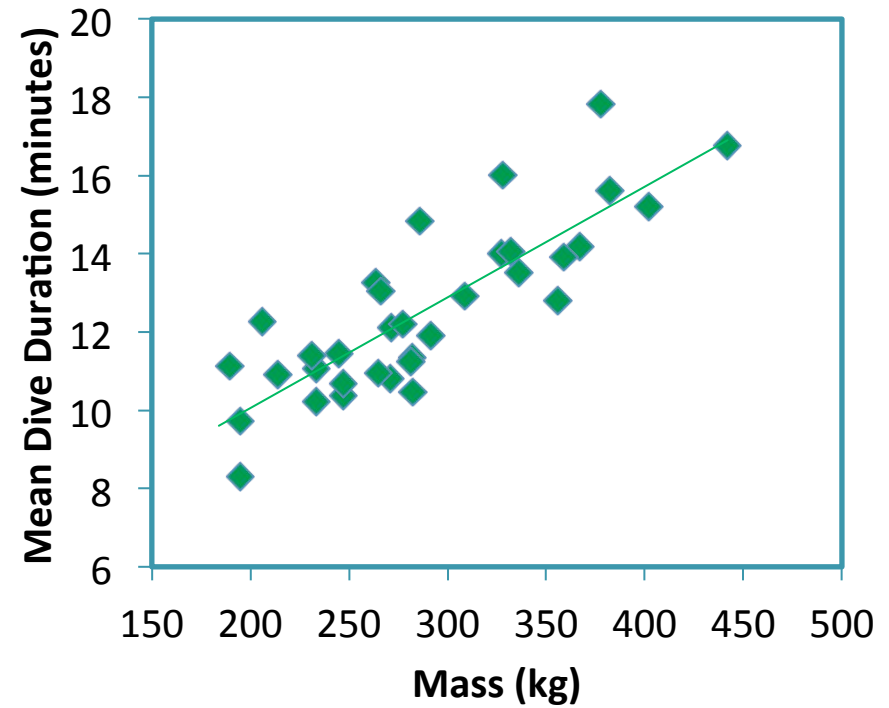
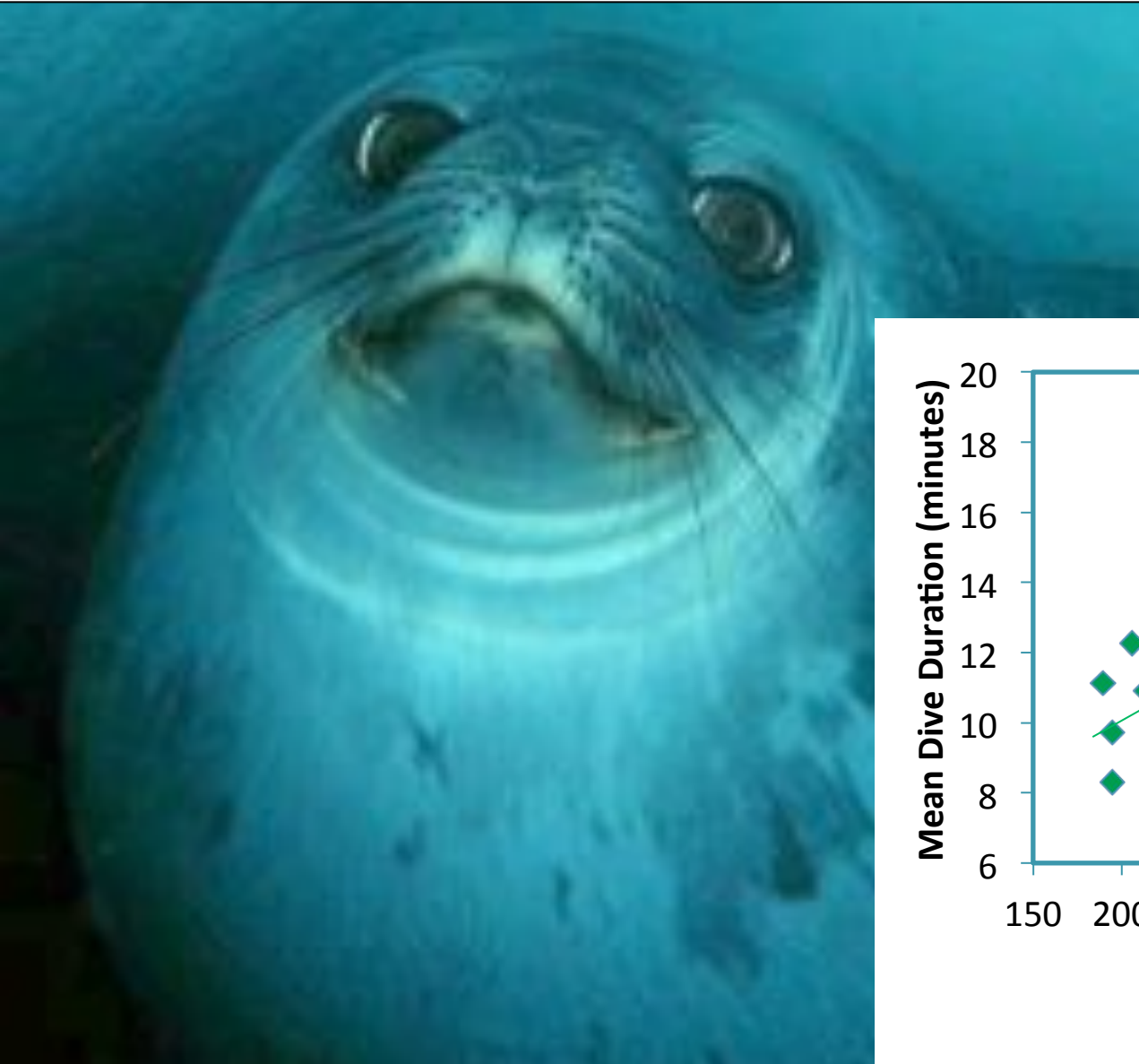


Diving Behavior

2010 2011



Diving Behavior





Questions?

Teachers: Join PolarTREC!

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!**

Thank You!

An archive of the event will be available shortly.

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

