



International Polar Day

Oceans

www.ipy.org

International Polar Oceans Day



25 March 2009

10:00 am Alaska Daylight Time

(8:00 am HST, 11:00 am PDT, 12:00 pm MDT, 1:00 pm CDT, 2:00 pm EDT)



Welcome to HorizonWimba



Arctic Research Consortium of the United States

List of all participants

Raise your hand to ask a question

Return to the lobby or exit

Slides will be shown here

If using VOIP, press here to talk

'Chat' with one person or the entire group

The screenshot shows a Wimba webinar interface. At the top, a slide reads "Welcome to HorizonWimba" with the ARCUS logo and "Arctic Research Consortium of the United States". Below the slide is a control bar with a "TALK" button circled in red. To the left is a chat window with a text input field circled in red. To the right is a "People (3)" list with a dropdown arrow circled in red. At the bottom right is a menu with "Exit - Lobby - Help" circled in red. Arrows from external text labels point to these elements: "Slides will be shown here" points to the slide area; "If using VOIP, press here to talk" points to the TALK button; "'Chat' with one person or the entire group" points to the chat input field; "List of all participants" points to the People list; "Raise your hand to ask a question" points to the dropdown arrow; and "Return to the lobby or exit" points to the Exit - Lobby - Help menu.

Please note: Today's event will be recorded and archived at www.polartrec.com.



International Polar Day

Oceans

www.ipy.org

Roll Call

- **When called, please state your:**
 - Name
 - School / Institution
 - The number of students participating today



International Polar Day

Oceans

www.ipy.org

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*](http://www.ipy.org)



International Polar Day

Oceans

www.ipy.org

Today's Agenda:

- Presenter Introduction
- Oceanic Research in the Arctic
- Oceanic Research in Antarctica
- Question & Answer Session



International Polar Day

Oceans

www.ipy.org

Today's Presenters:



Dr. Lee Cooper

University of Maryland Center
for Environmental Science

LIVE FROM the BERING SEA



Dr. Andy Mahony

University of Otago
New Zealand

LIVE FROM ANTARCTICA

Live From the Bering Sea



Dr. Lee Cooper

University of Maryland Center for Environmental Science
(biogeochemistry and chief scientist)

Dr. Andrew Trites

University of British Columbia (marine mammals)

Dr. Rolf Gradinger

University of Alaska Fairbanks (sea ice)

Dr. Nathalie Morata

University of Tromso (benthos)

Follow the Expedition:

<http://www.polartrec.com/early-spring-plankton-and-benthos>

Northern
Bering Sea





Chukchi Sea

Russia

Bering Strait

Alaska
(USA)

St. Lawrence Island

• Anchorage

St. Matthew Island

Nunivak Island

Bering Sea

Gulf of Alaska

• Dutch Harbor

Aleutian Islands

Pacific Ocean

Map courtesy of
Wikipedia Commons

www.sailwx.info

Anadyrskiy Zaliv

Russia

63 00

62 00

61 00

60 00

59 00

58 00

Prilivniy Chukotskiy

St. Lawrence Island

19-Mar

14-Mar

23-Mar 1200

24-Mar 1200

0300 0900

0000 0300

0300 0900

0000 0300

0900 0000

64 00

63 00

62 00

61 00

60 00

59 00

58 00

Alaska
(USA)

Bering Sea

St. Matthew Island

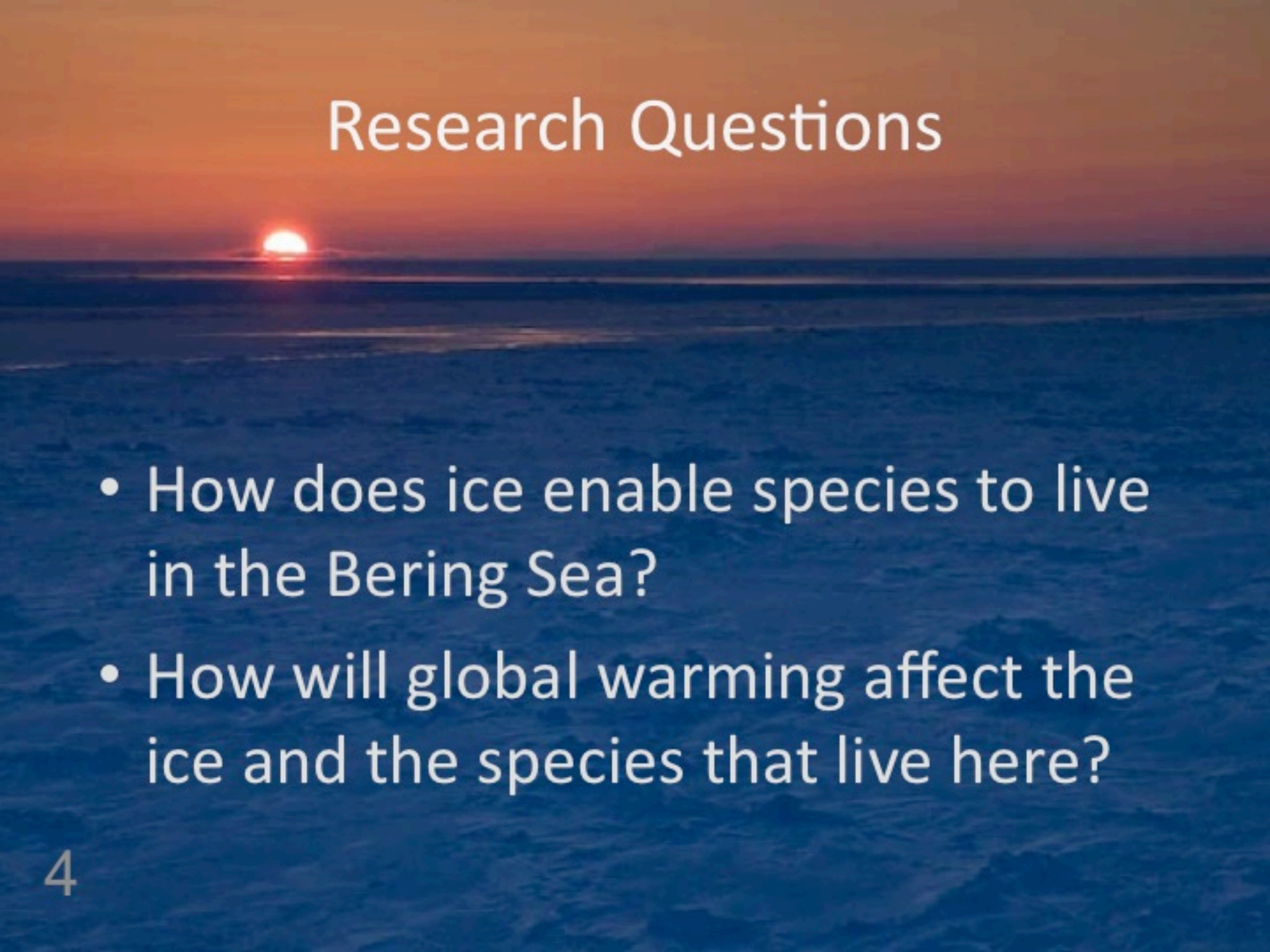
Nunivak Island

0 37 74 111 148 mi

Satellite image of ice cover

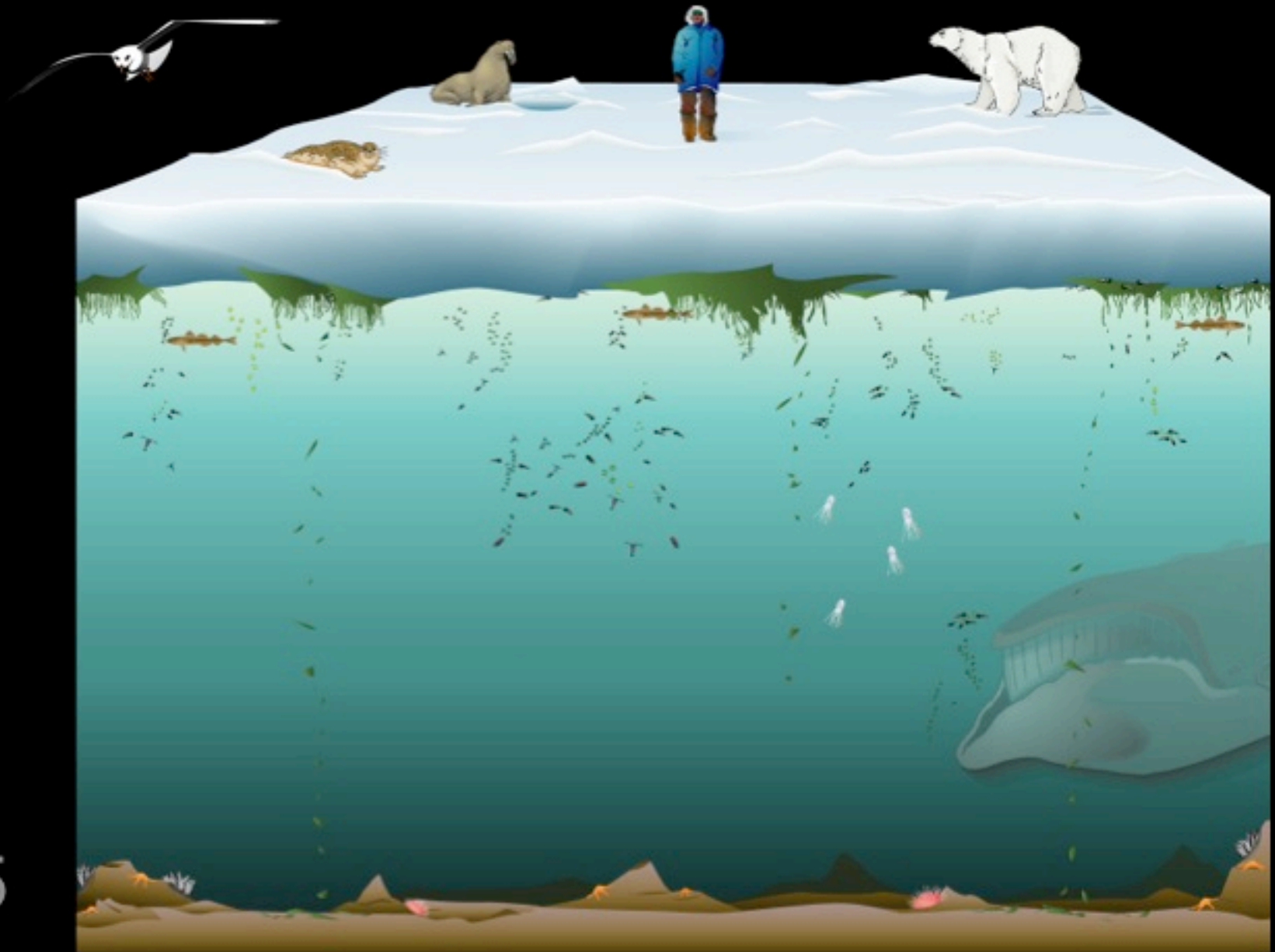


Research Questions

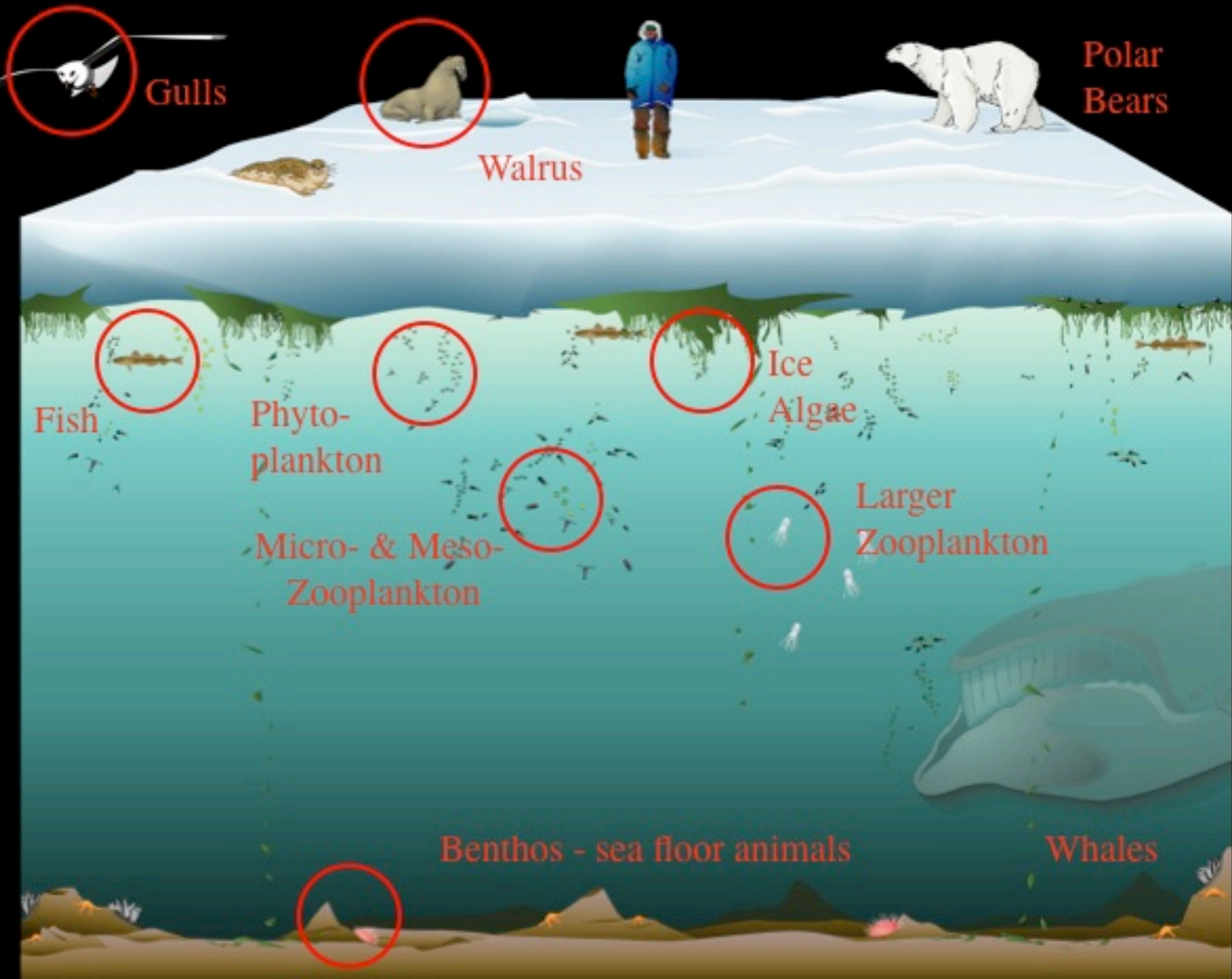
A sunset over a vast, dark blue ocean. The sun is a bright orange-red circle on the horizon, casting a long, thin reflection across the water. The sky is a gradient of orange and red, fading into a dark blue at the top. The water is dark blue with some whitecaps.

- How does ice enable species to live in the Bering Sea?
- How will global warming affect the ice and the species that live here?

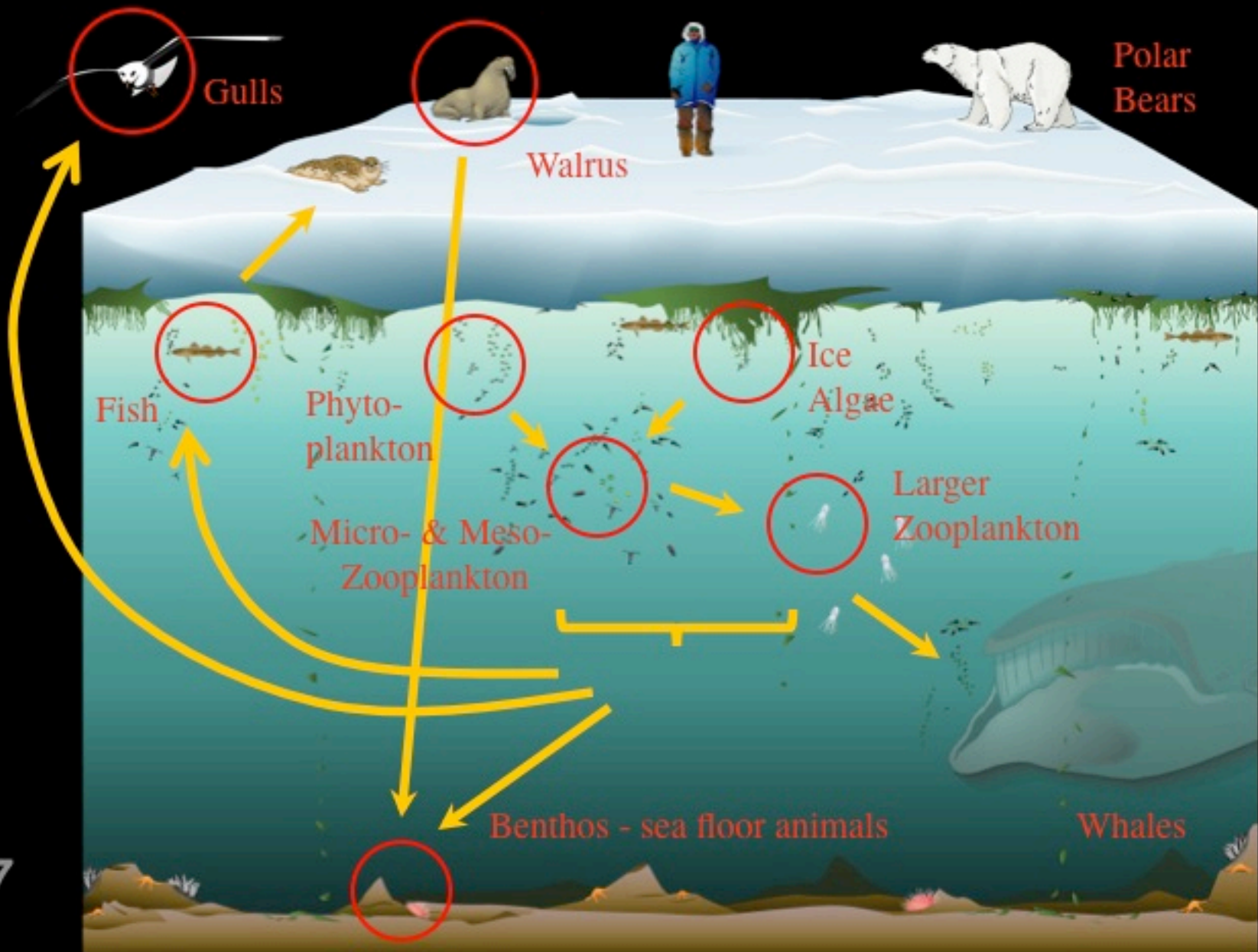
Connections in the ecosystem



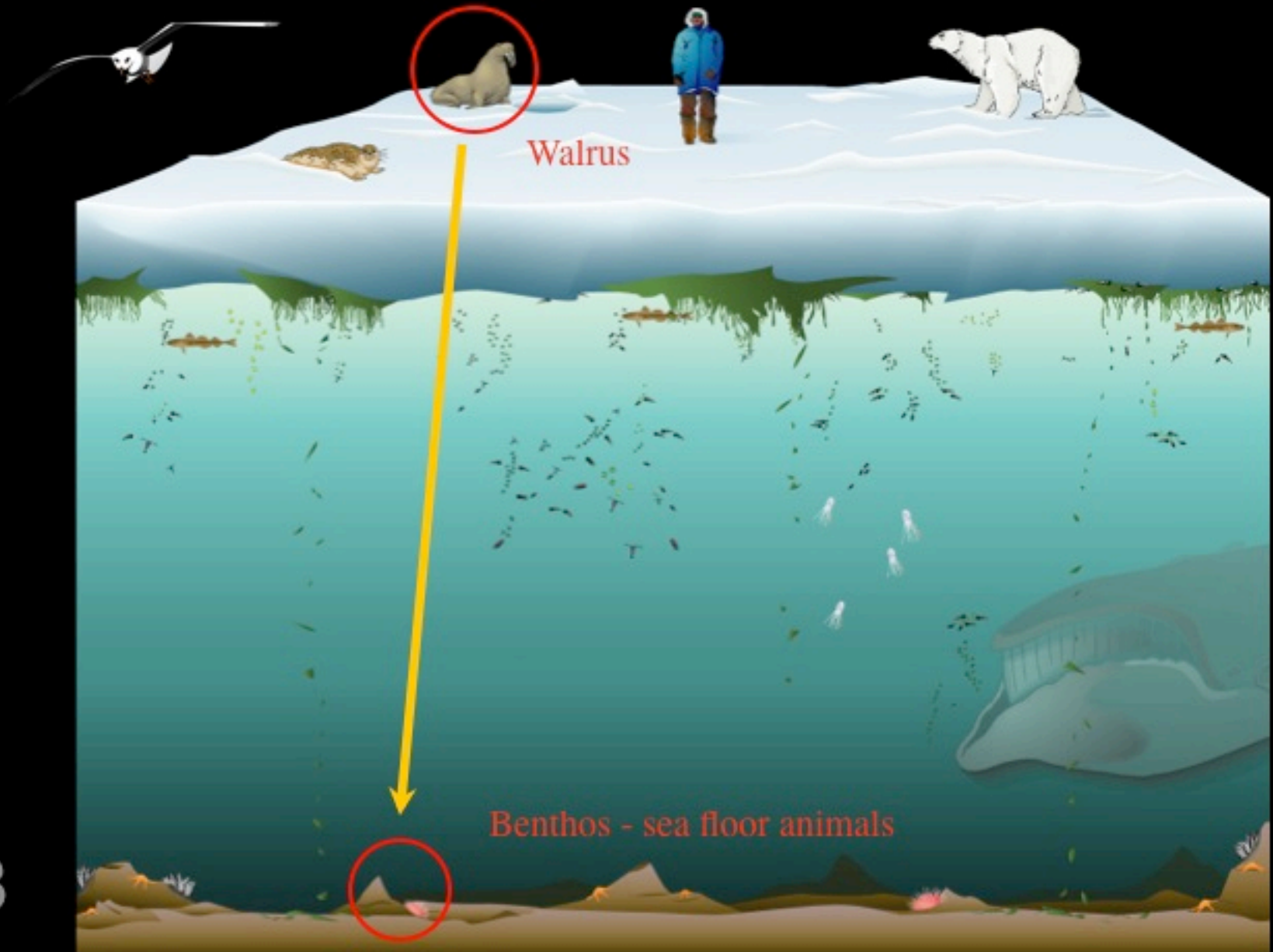
Connections in the ecosystem



Connections in the ecosystem



Walrus & Benthic Species



Pacific Walrus



- Where do they feed?
- What are they eating?
- How will they survive without ice?

Use a helicopter to find and land near walrus



...or walk if within 2 km



11

Use a crossbow to attach satellite tracking tag

Will record location and time in water for
2-3 months until the tags fall off



Prey Samples

- bottom grab
- back of ship
- >100 stations
- ~80 m depth

Sampling Sediments



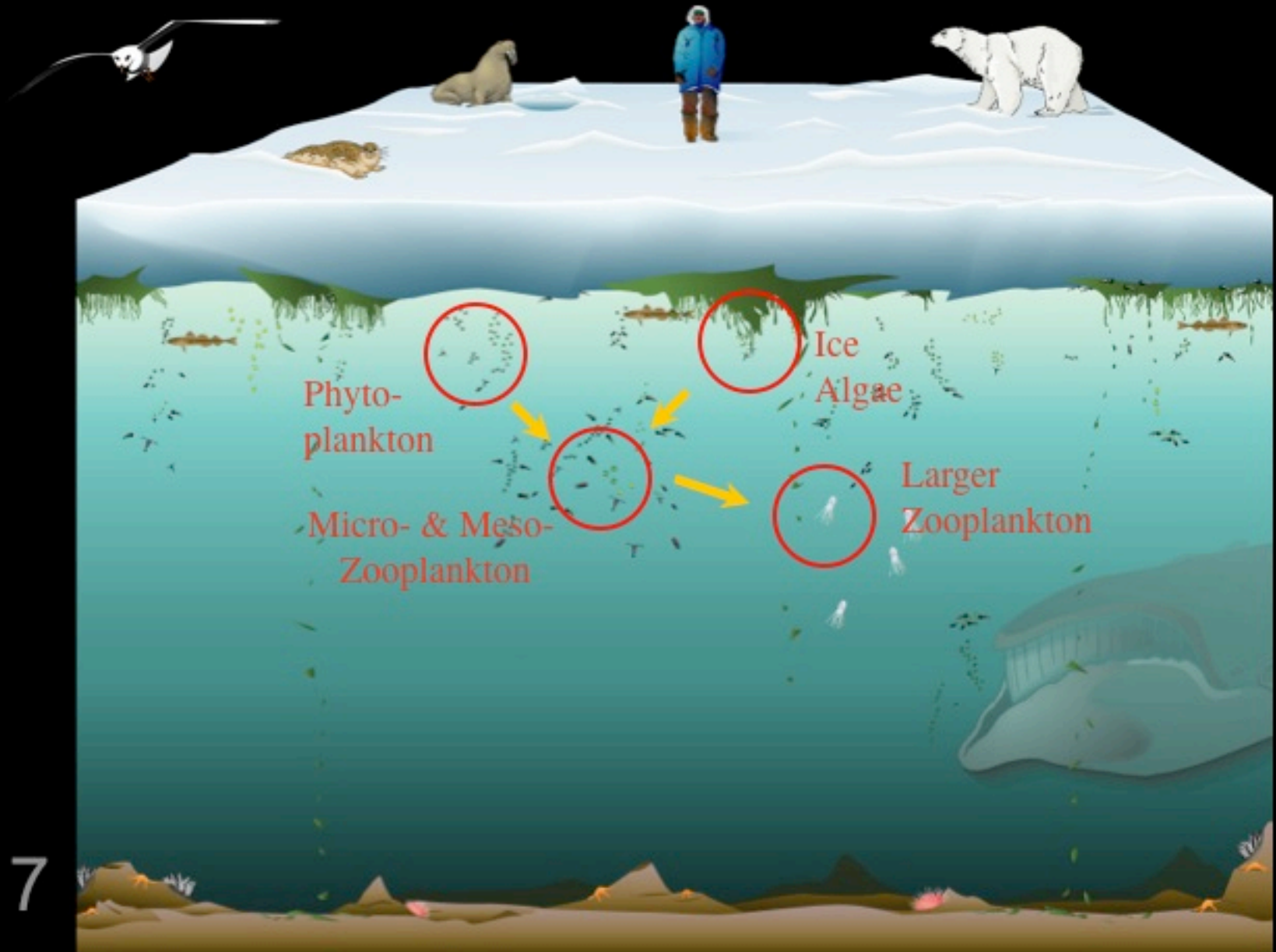
Sediment Sample



Cleaned & Sorted Species from the Sediment



Plankton & Algae



Sampling Ice



-30°C

We take an
ice core with
an electric
drill



19

First Year Ice — 40-80 cm Thick

Sectioning the ice core

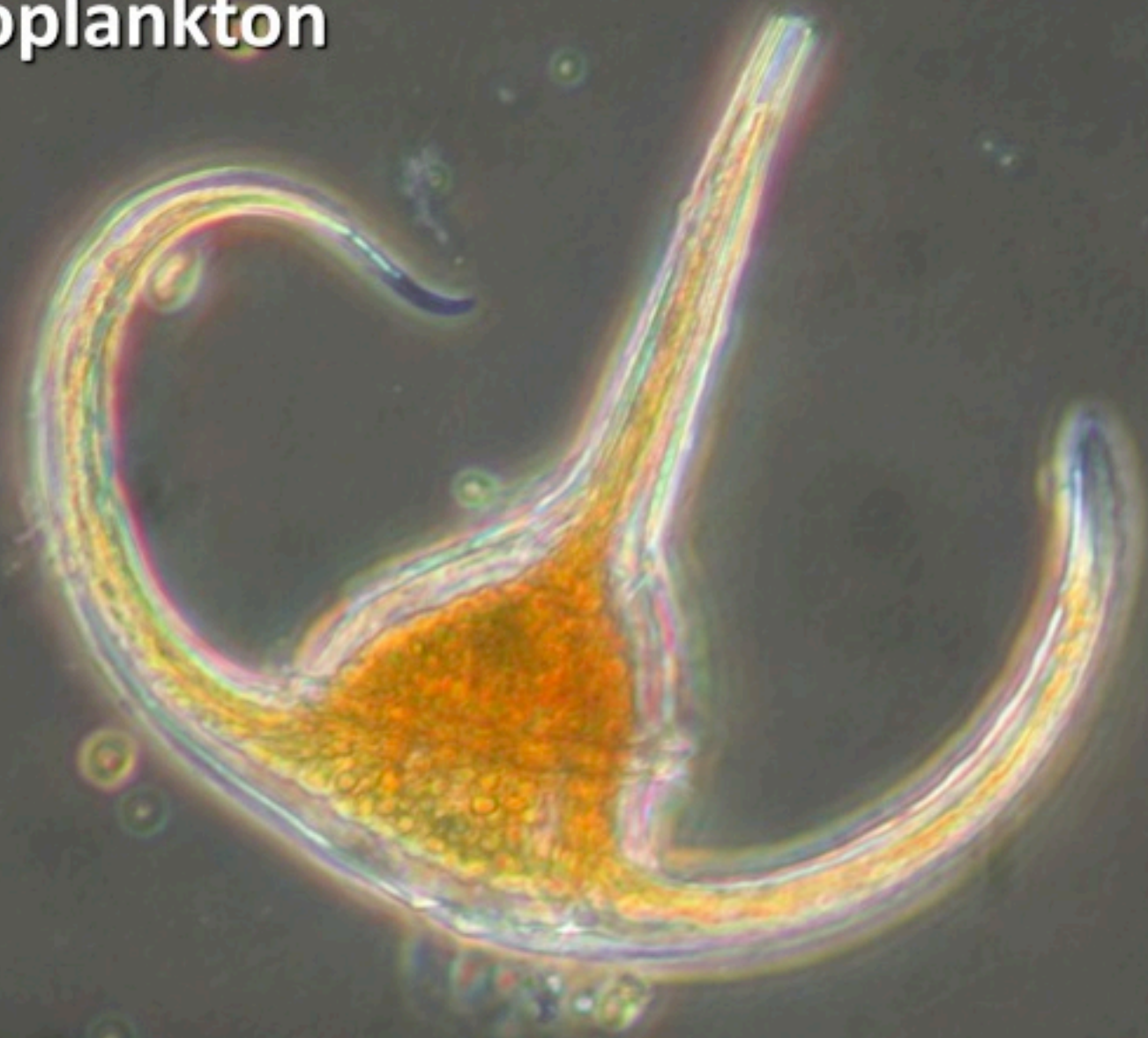




overturned ice

>450 Species live in or on the ice

Phytoplankton



Zooplankton

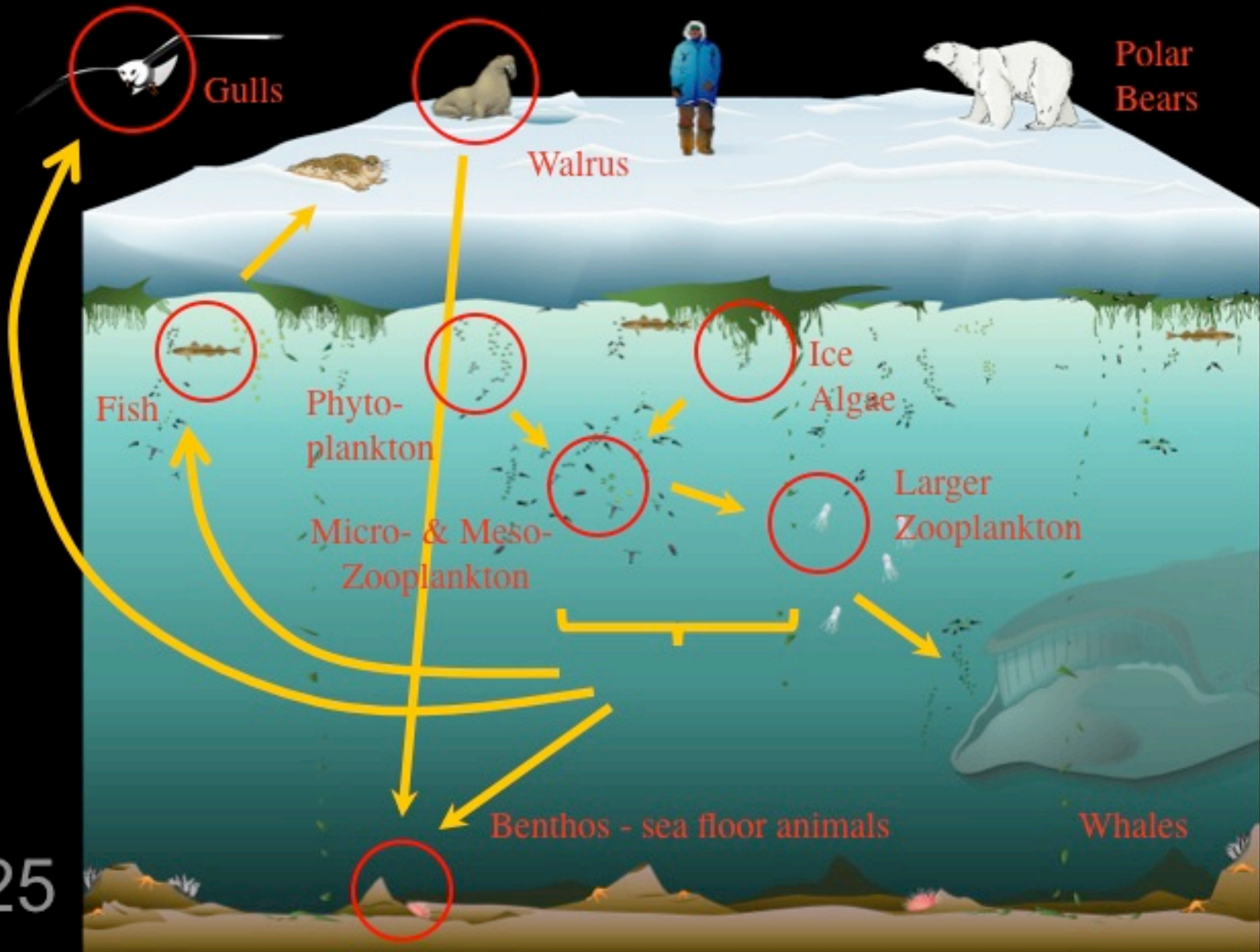




24

Ice Productivity > Water Productivity

Connections in the ecosystem



USCGC Healy

- 85 crew
- 40 scientists
- 21 days



26



Questions?



Live From Antarctica

Dr. Andy Mahony

University of Otago, New Zealand

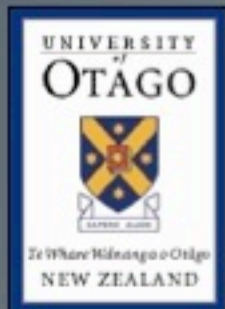
Alex Gough

University of Otago, New Zealand

Brian Staite

Blogging in Antarctica:

<http://www.ipy.org/index.php?/ipy/author/uotago/>



Wintering in Antarctica

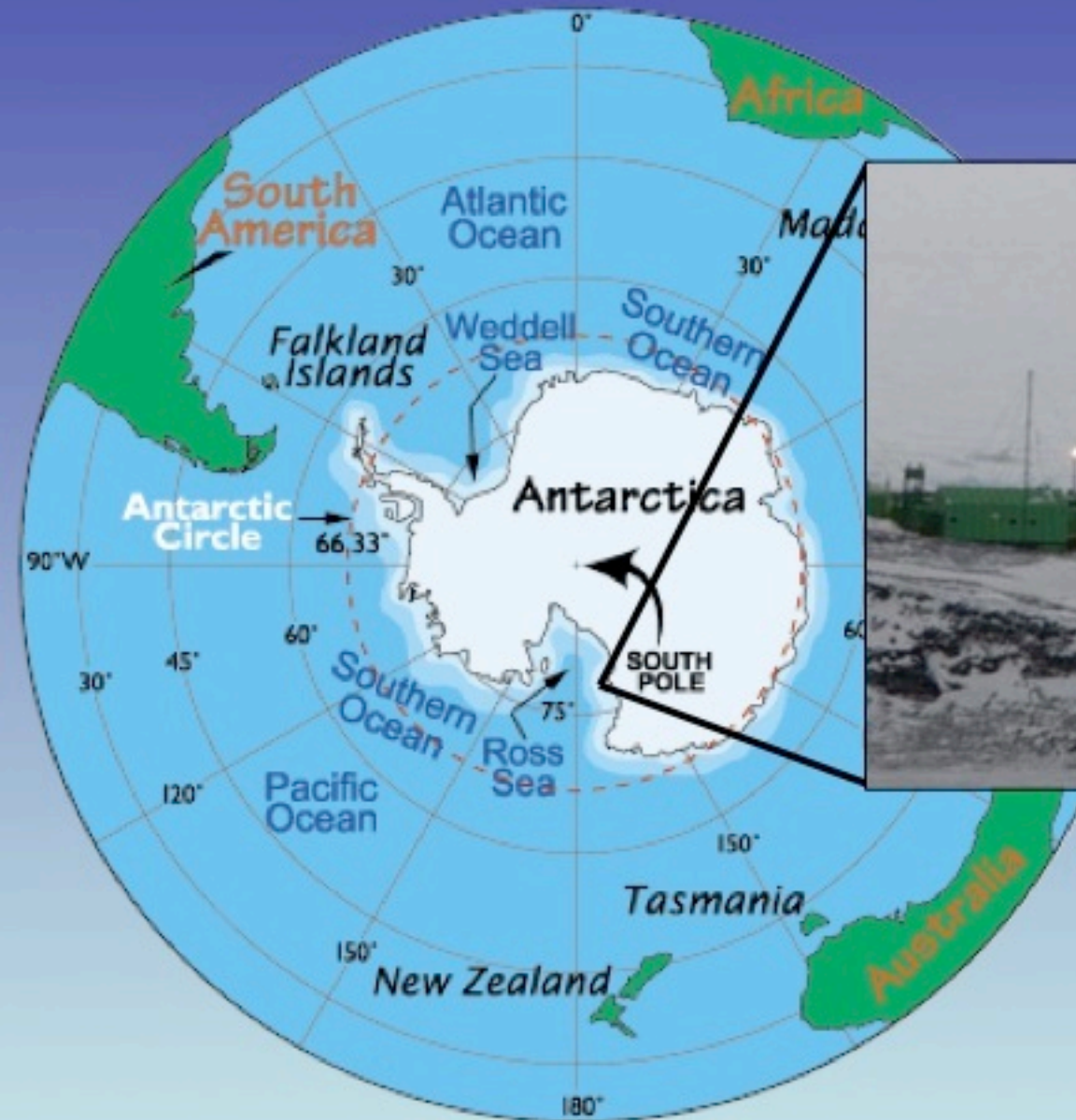


Andy Mahoney

Alex Gough

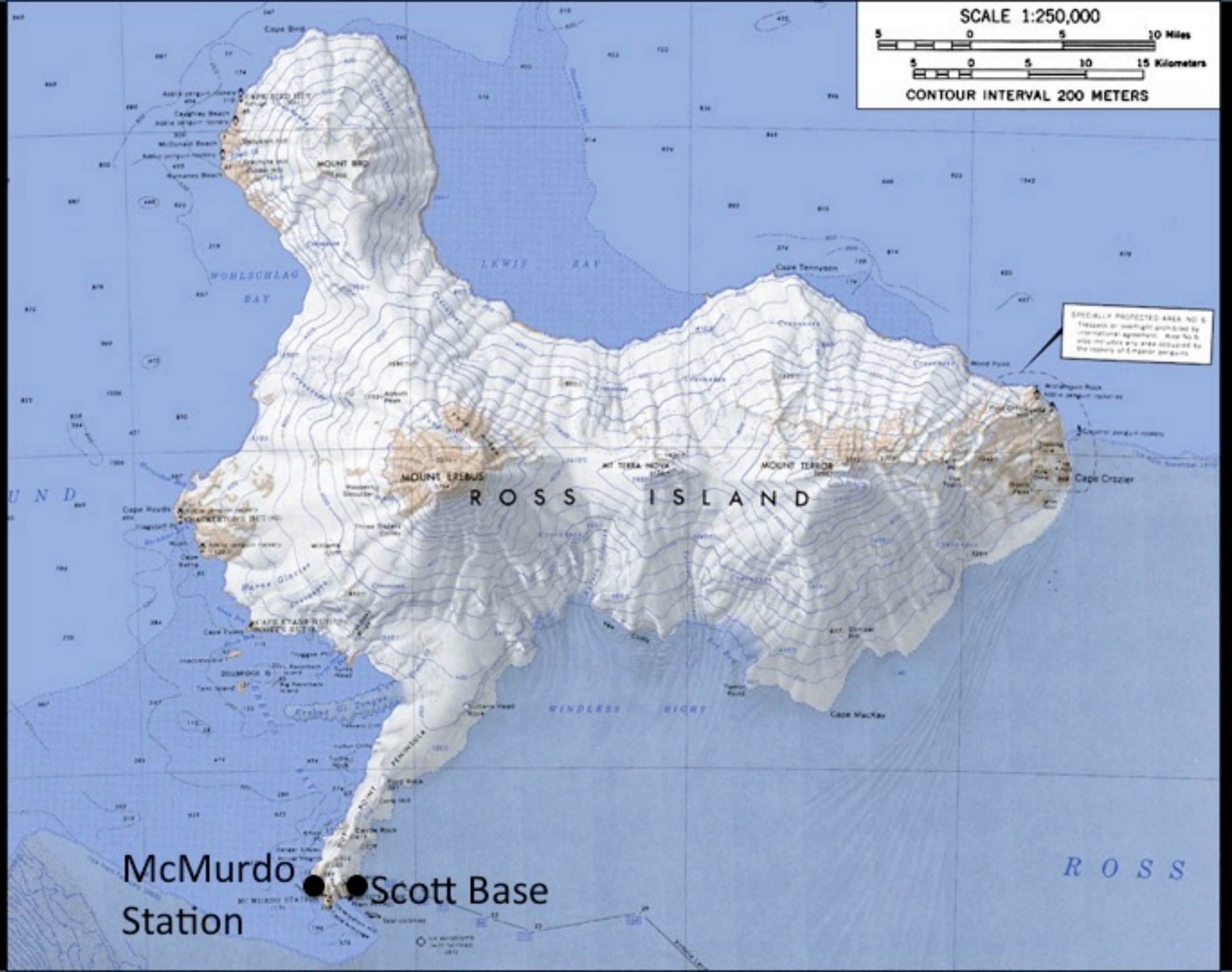
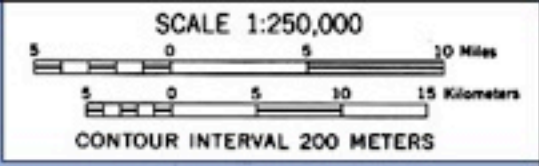
Brian Staite

Where are we?



Scott Base, Antarctica
(New Zealand)





SPECIALLY PROTECTED AREA NO. 6
Research or monitoring prohibited by international agreements. Area No. 6 also includes any area adjacent to the rookery of 5 major penguins.

Why spend the winter?



That's when the sea ice grows!

Two types of ice in the ocean:

Sea ice

Ice shelves &
ice bergs



Frozen
seawater

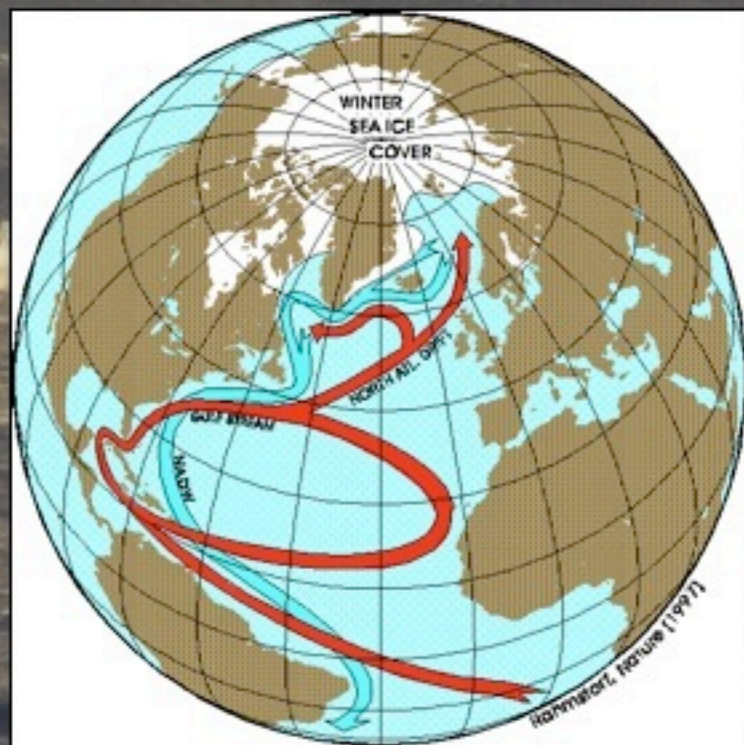
Contains
salt

Snow falling
on land

Fresh
(no salt)

Importance of Sea Ice

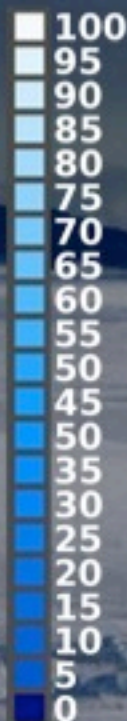
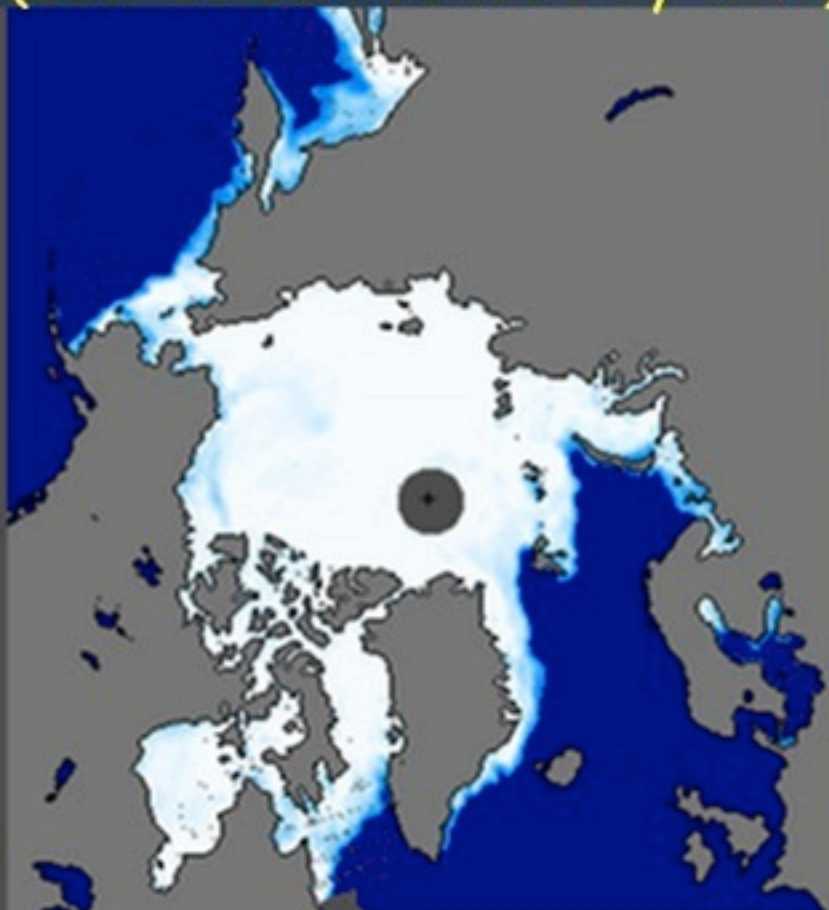
- Climate
- Ecology
- People



Sea ice at both poles

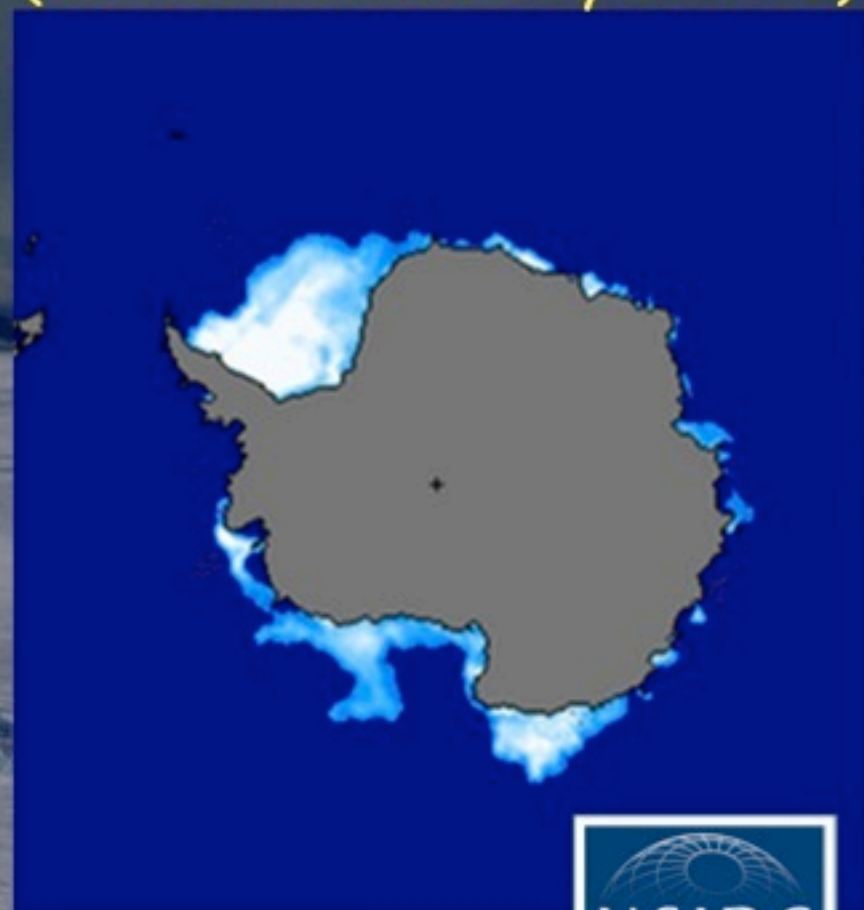
Arctic

(sea ice surrounded by land)



Antarctic

(land surrounded by sea ice)



Images from National Snow and Ice Data Center

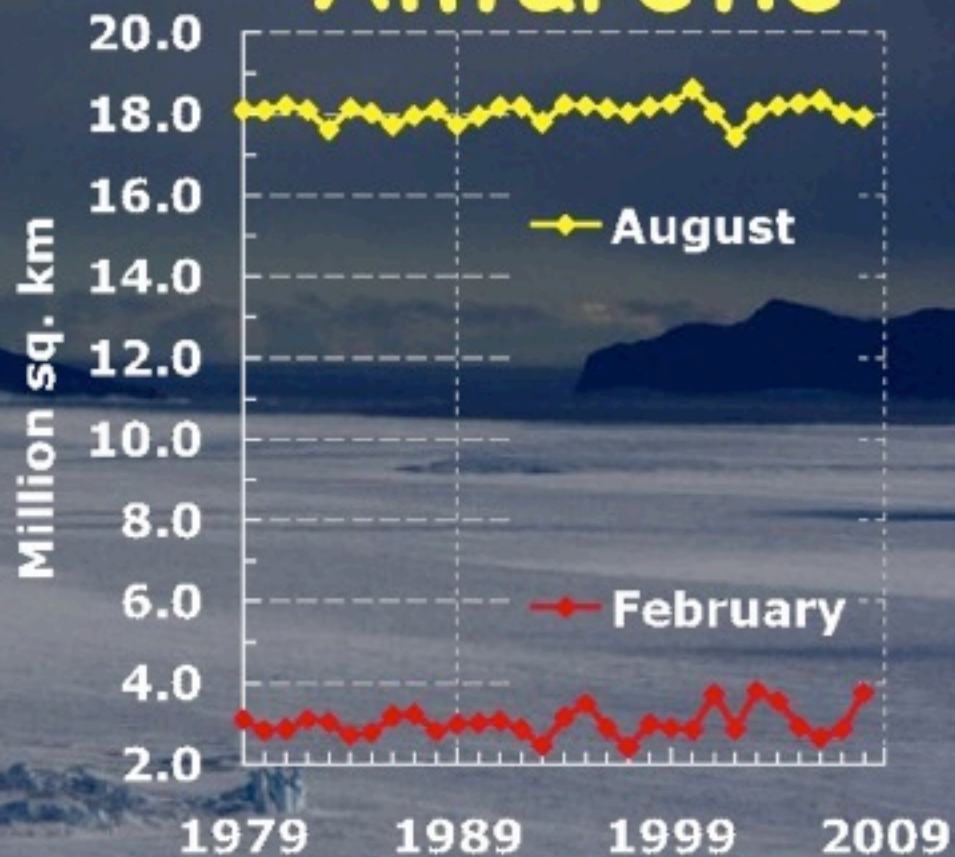


Trends in sea ice extent

Arctic



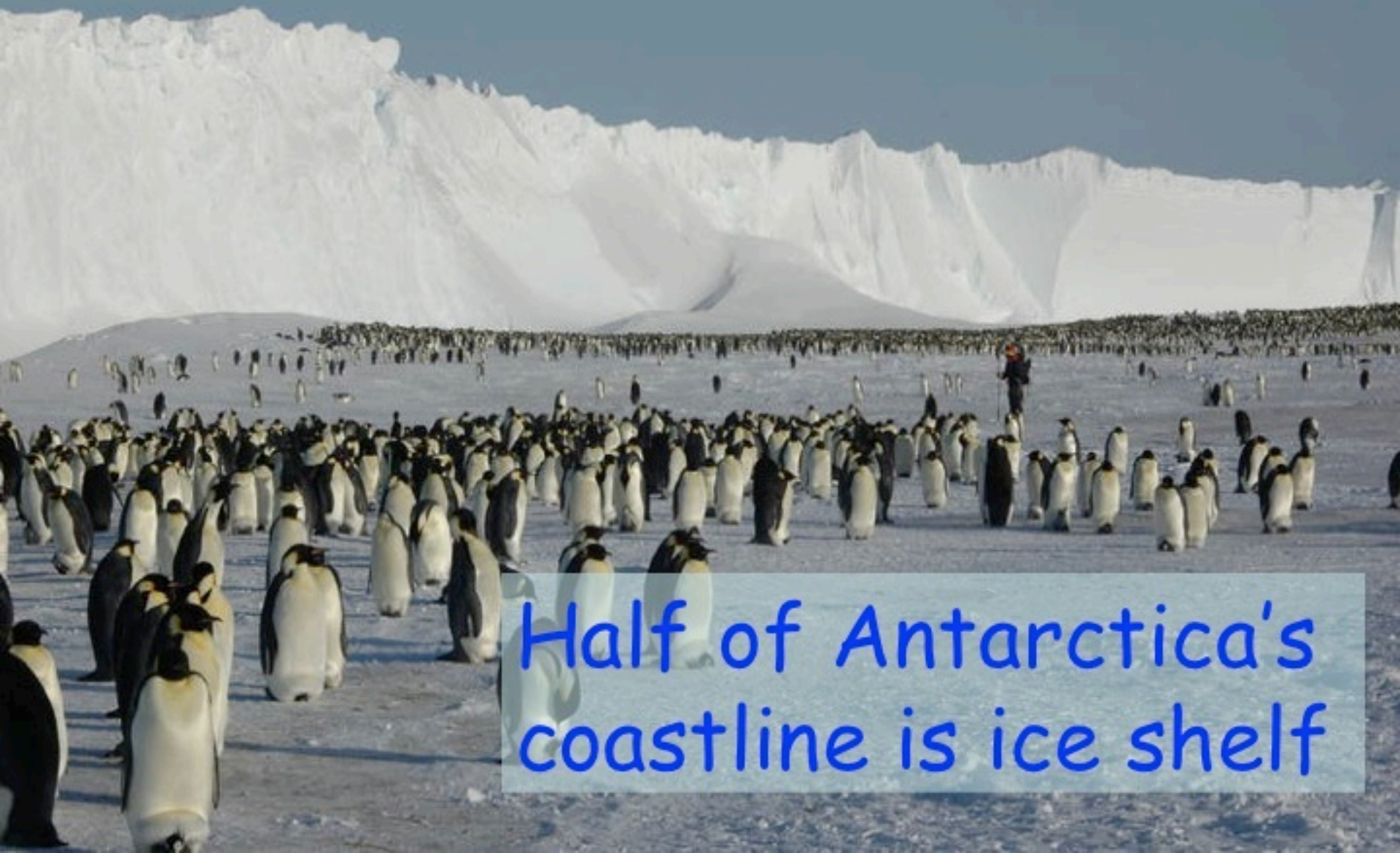
Antarctic



Data from National Snow and Ice Data Center



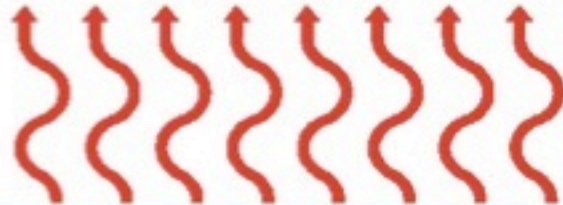
Ice Shelves



Half of Antarctica's
coastline is ice shelf

Typical sea ice growth

Heat lost from ocean to air



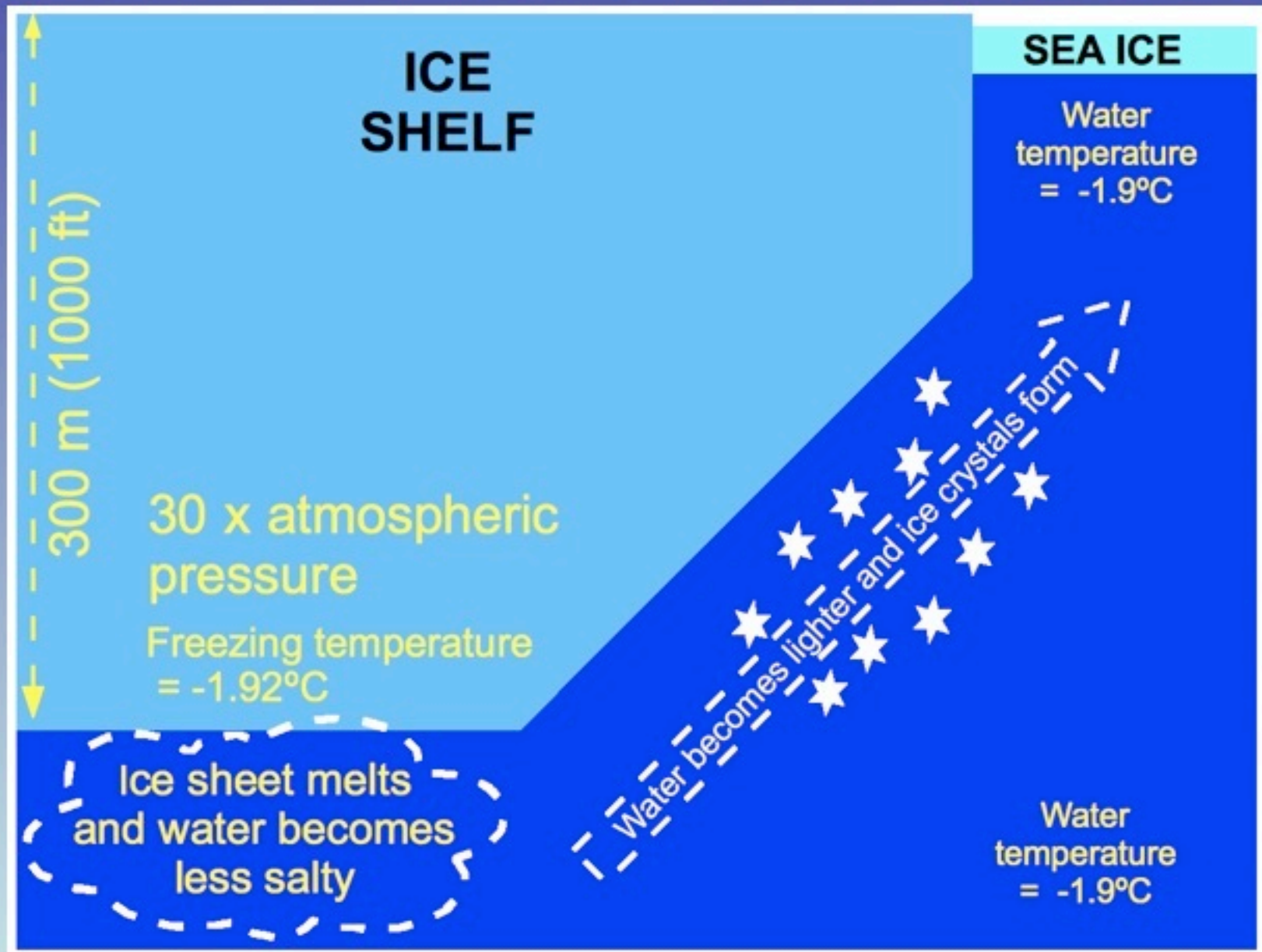
Sea ice (growing)

**Salt
rejection**

**sinks to
bottom**

**Cold, salty
water at
freezing
temperature
-1.9 °C
(28.6 °F)**

Sea Ice Growth Near Ice Shelves



Looking for platelet ice



A lot of digging ...



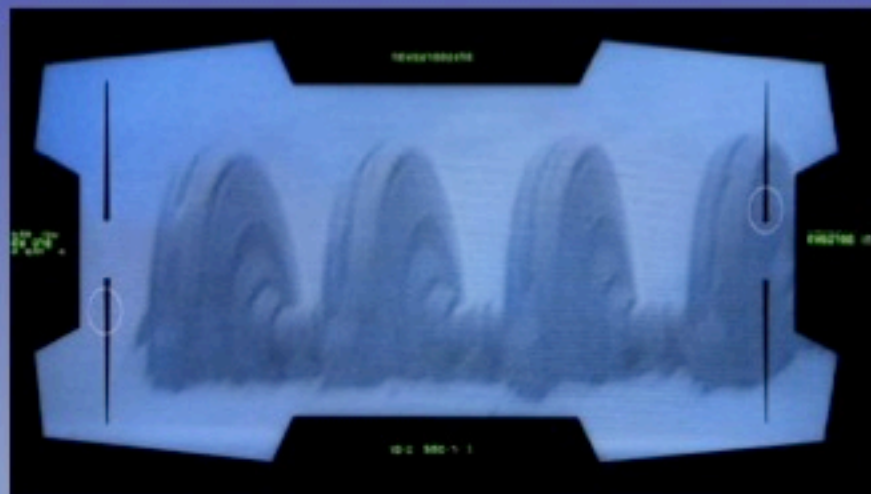
Taking ice cores ...



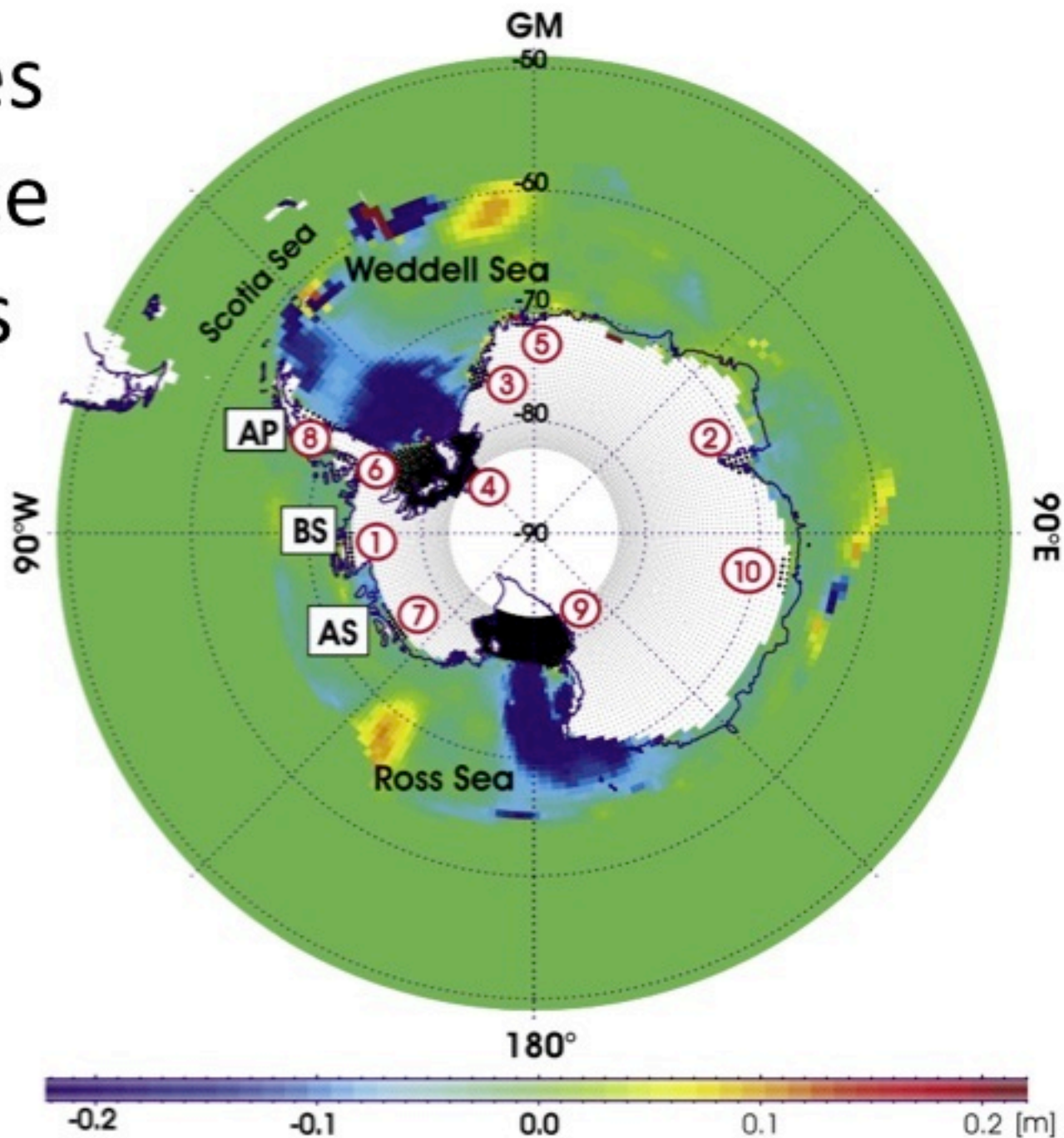
Instruments under the ice ...



Any questions?



Ice shelves and sea ice thickness



Questions

When asking a question, speak slow, loud, and clear and state your:

- Name
- School
- Question



Register for Upcoming Live Events at :
[www.polartrec.com!](http://www.polartrec.com)

Thank You!



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

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

