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NSDL/NSTA Web Seminar:

Beyond Penguins and Polar Bears
Integrating Science and Literacy
Seminar 1: Polar Geography

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Tuesday, May 27, 2008

Agenda:

1. Introductions
2. Tech-help info
3. Web Seminar tools
4. Presentation
5. Evaluation
6. Chat with the presenters

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Supporting the NSDL Presenting Team is…

For additional Tech-help call:

Elluminate Support,

1-866-388-8674 (Option 2)

Jeff Layman
Tech Support,
NSTA
jlayman@nsta.org
703-312-9384

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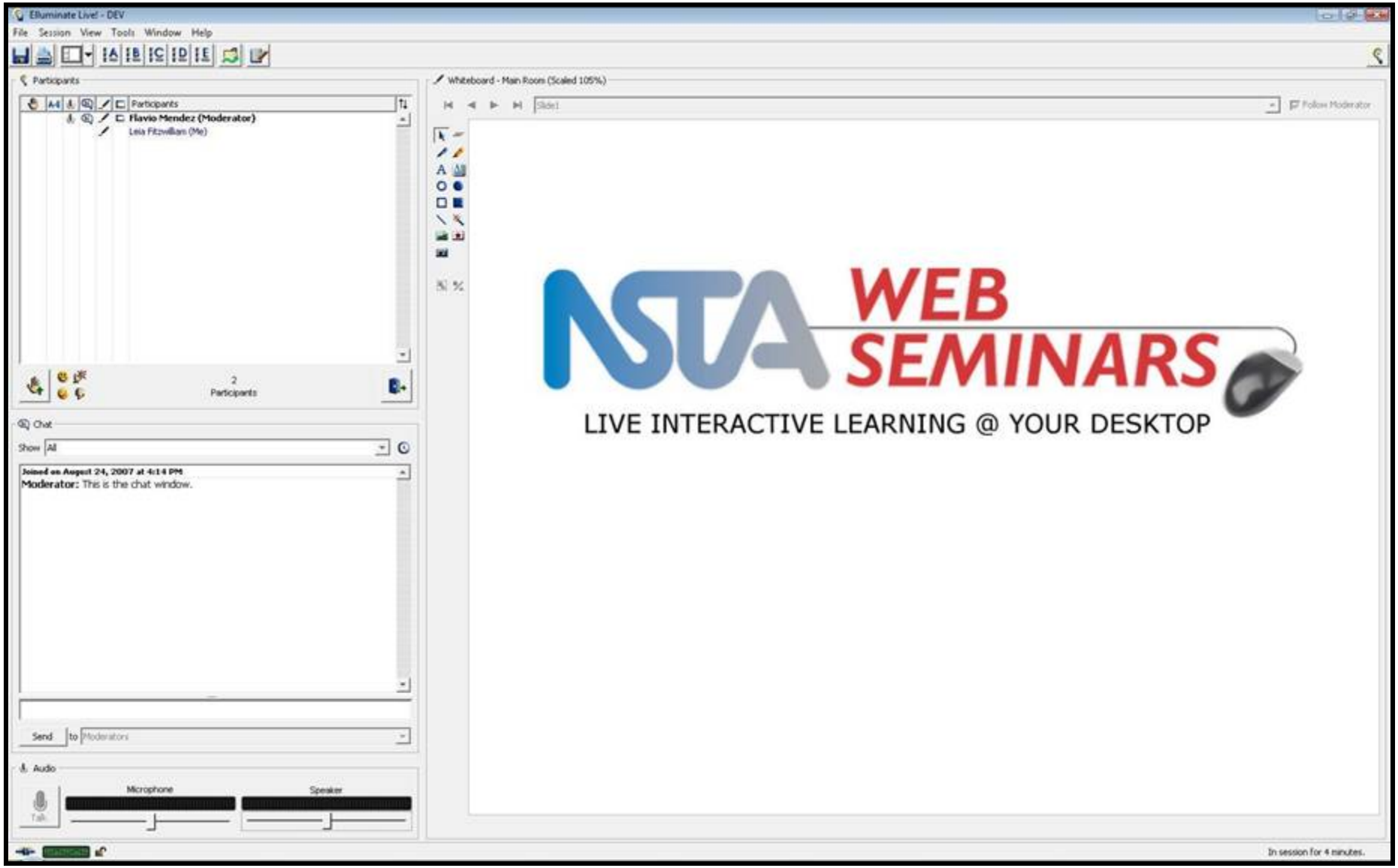
Screenshot


Elluminate Live! - DEV
File Session View Tools Window Help
Participants
Participants
Flavio Mendez (Moderator)
Leia Fitzwilliam (Me)
2
Participants
Chat
Show All
Joined on August 24, 2007 at 4:14 PM
Moderator: This is the chat window.
Send
to Moderators
Audio
Microphone
Speaker
Talk
Whiteboard - Main Room (Scaled 105%)
Slide1
Follow Moderator
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In session for 4 minutes.

We would like to know more about you…

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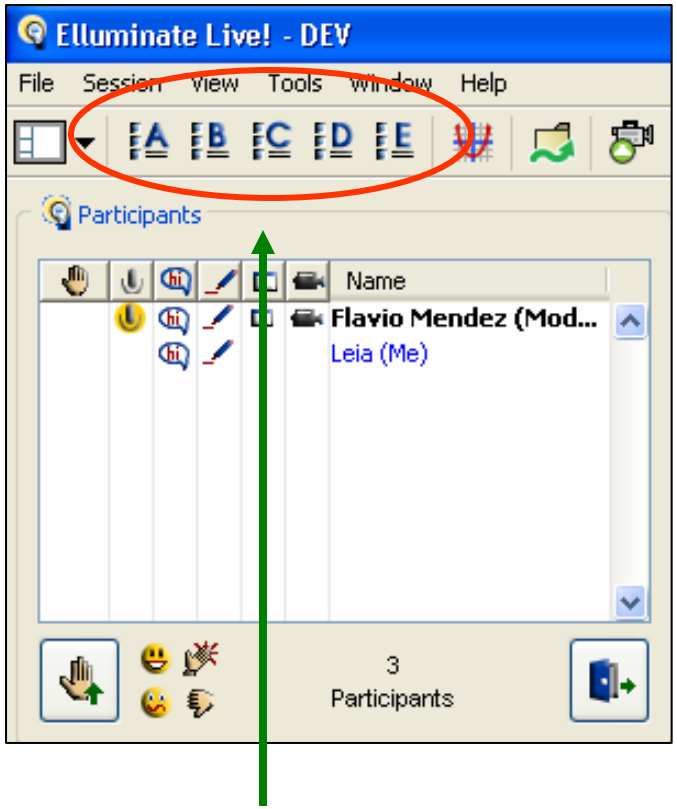
How many NSTA web seminars have you attended?



Use the letters A-E located at the top left of your actual screen to answer the poll

A. 1-3

B. 4-5

C. More than 5

D. More than 10

E. This is my first web seminar

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Where are you now?

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What grade level do you teach?

A. Elementary School, K-5.

B. Middle School, 6-8.

C. High School, 9-12.

D. I teach undergrad and/or grad students.

E. I am an Informal Educator.

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NSDL/NSTA Web Seminar

Beyond Penguins and Polar Bears: Integrating Science and Literacy in the K-5 Classroom-- Polar Geography

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Tuesday, May 27, 2008

Today's NSDL Experts

Jessica Fries-Gaither, *Beyond Penguins and Polar Bears* Project Director and Elementary Resource Specialist, Ohio State University

Dr. Carol Landis, Education Outreach Specialist, Byrd Polar Research Center, Ohio State University

BEYOND PENGUINS AND POLAR BEARS

http://beyondpenguins.nsdl.org

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BEYOND PENGUINS AND POLAR BEARS

Overview of Presentation

1. Characteristics of the Arctic
2. Characteristics of Antarctica
3. Teaching strategies and K-5 resources from *Beyond Penguins and Polar Bears*

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"The first step toward understanding the polar regions is to develop a sense of place about the Arctic and Antarctic that makes them as separate in our minds as Austria and Australia, New York and San Francisco, or the Himalaya and the Adirondacks."

– Galen Rowell, *Poles Apart*

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Poll Question!

Where does the Arctic begin?

A. The Arctic Circle
B. 10 °C isotherm
C. Where treeline begins
D. Geopolitical borders

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Where is the Arctic?

Map courtesy of the National Snow and Ice Data Center
http://nsidc.org/arcticmet/arctic_map.html

Several definitions:

1) Arctic Circle
2) 10 °C isotherm
3) Treeline
4) Political

"Where Does the Arctic Begin? End?"

Blog post

http://expertvoices.nsdl.org/polar

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The Arctic: An ocean surrounded by land

Arctic Ocean: approximately 2 miles deep; ice cover ranges from 6 inches to 6 feet

Photo by Chris Linder, Woods Hole Oceanographic Institution

Seasonal variation in Arctic pack ice

Land includes portions of 8 countries and territories

Photo by Jef Maion, www.maion.com

Tundra and permafrost

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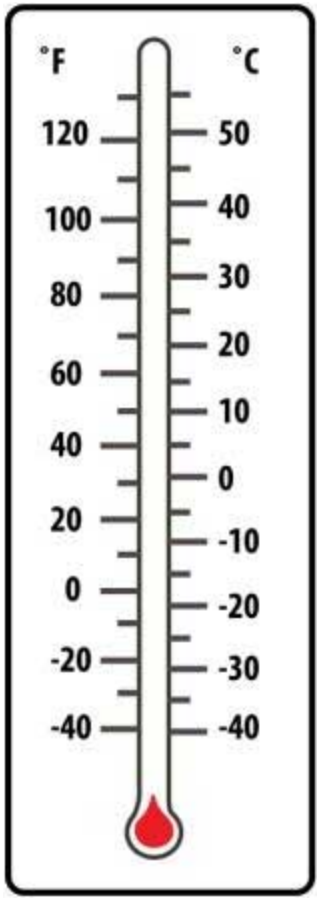
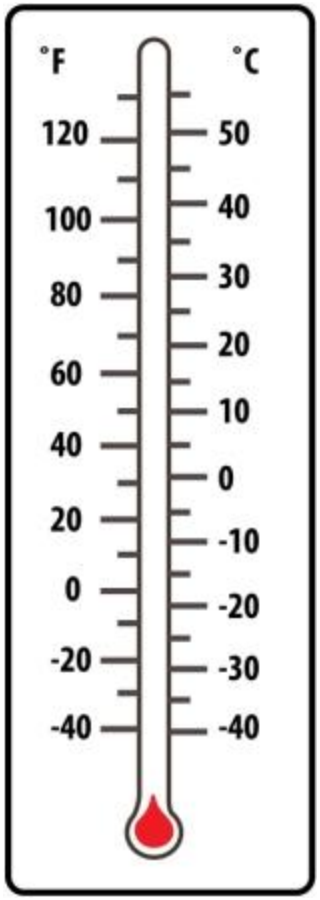
Arctic Weather and Climate

Mean summer temperature (C)



Mean winter temperature (C)



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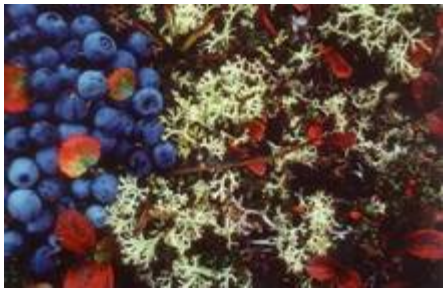
Plants: small shrubs, birch, alder, willow, grasses, mosses, and berries



Animals: terrestrial and marine mammals, birds, & fish

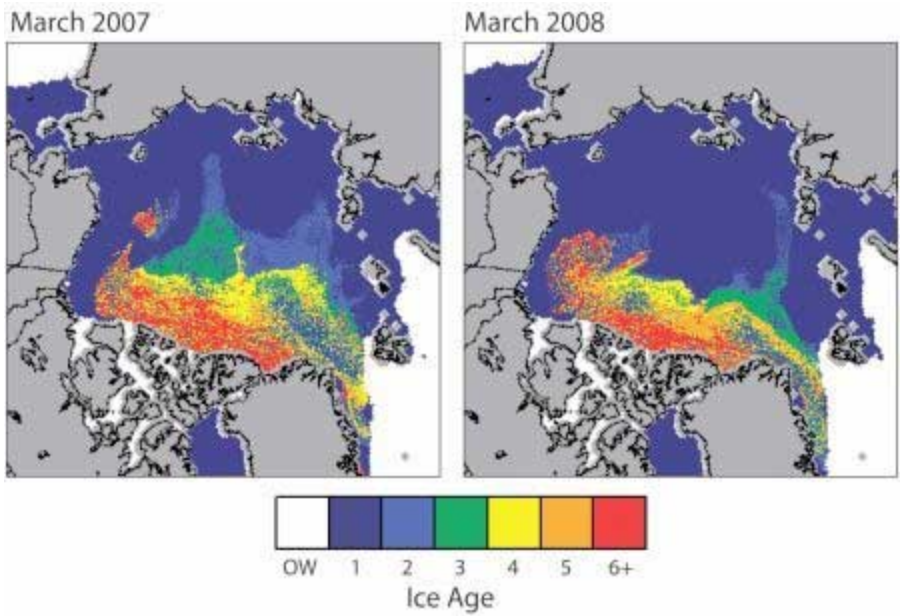





All images courtesy of U.S. Fish and Wildlife Service

Climate Change in the Arctic

Animation: Sea Ice Decline – Sept comparisons
National Snow and Ice Data Center
http://nsidc.org/news/press/2007_seaiceminimum/images/20070917animation.mov



Age of winter sea ice in 2007-2008
Image courtesy of National Snow and Ice Data Center

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Let’s pause for questions from the audience….

Poll Question!

How big is Antarctica

A. Twice as big as Alaska

B. About 1.5 times as big as the continental U.S.

C. About the same size as Africa

D. About half the size of the continental U.S.

Antarctic Digital Coastline: Antarctic Digital Database, 2000
US Digital Outline: ESRI

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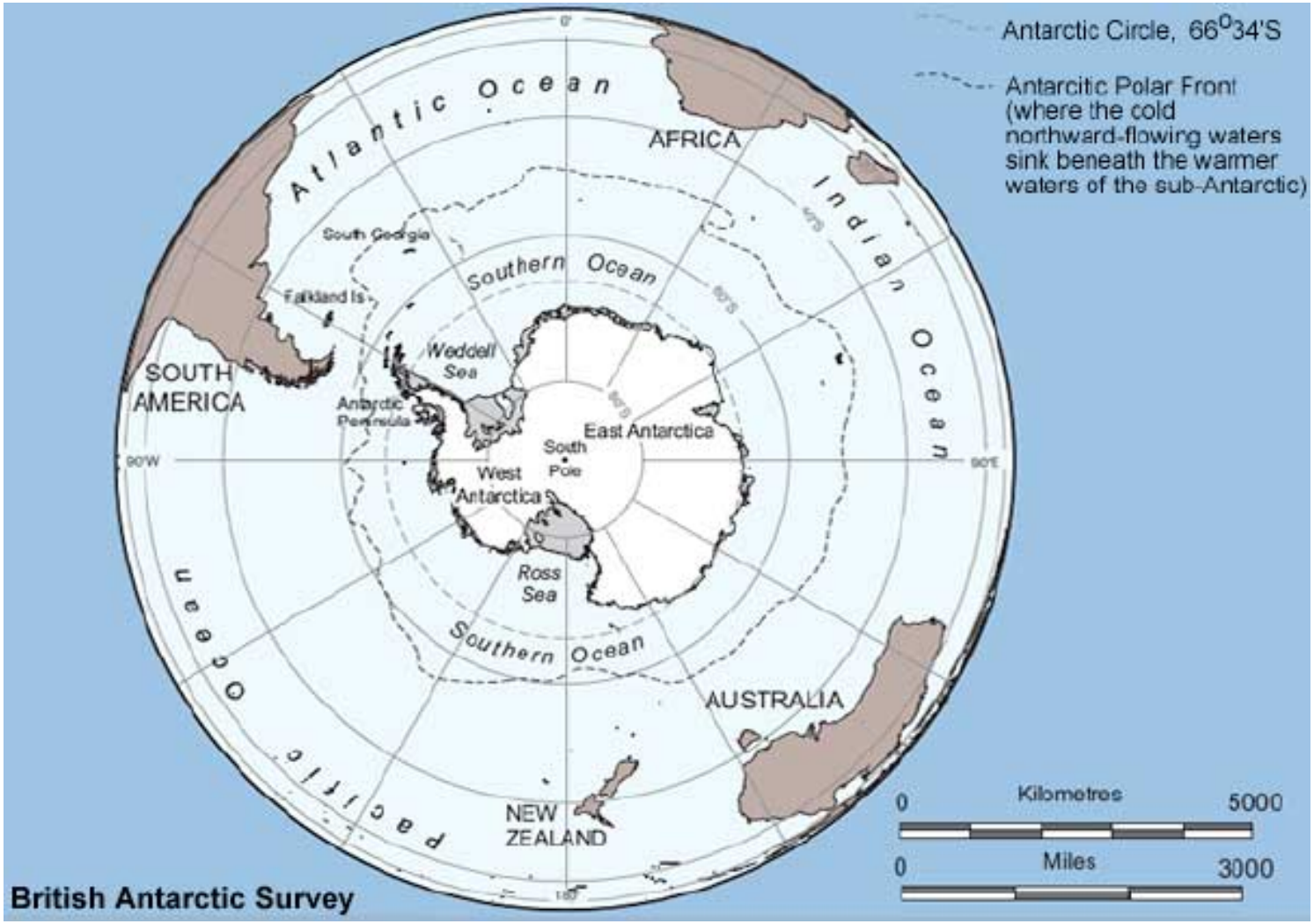

http://lima.usgs.gov/documents/Antarctica_in_context.pdf

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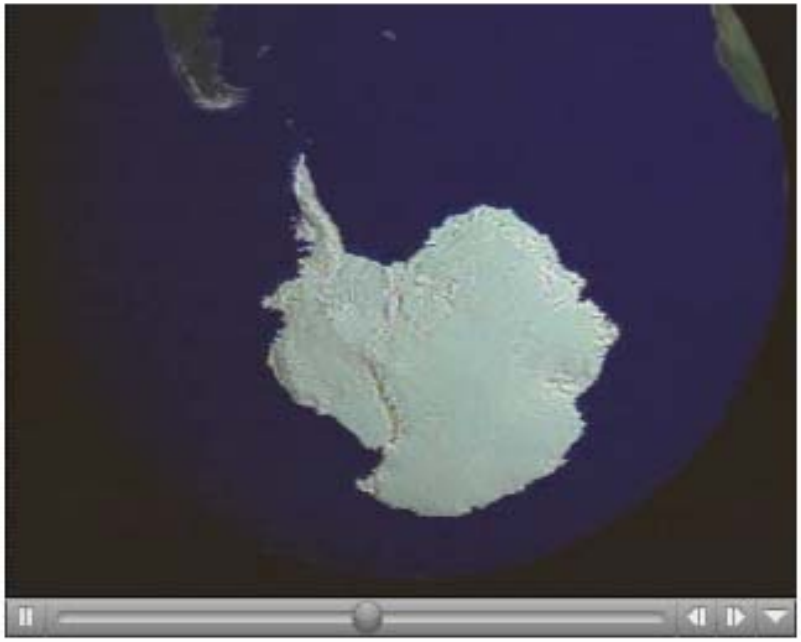
From NIX (NASA Image Exchange)
http://nix.larc.nasa.gov/



http://library01.gsfc.nasa.gov/svs/a000987.mpg

NASA/Goddard Space Flight Center
Scientific Visualization Studio

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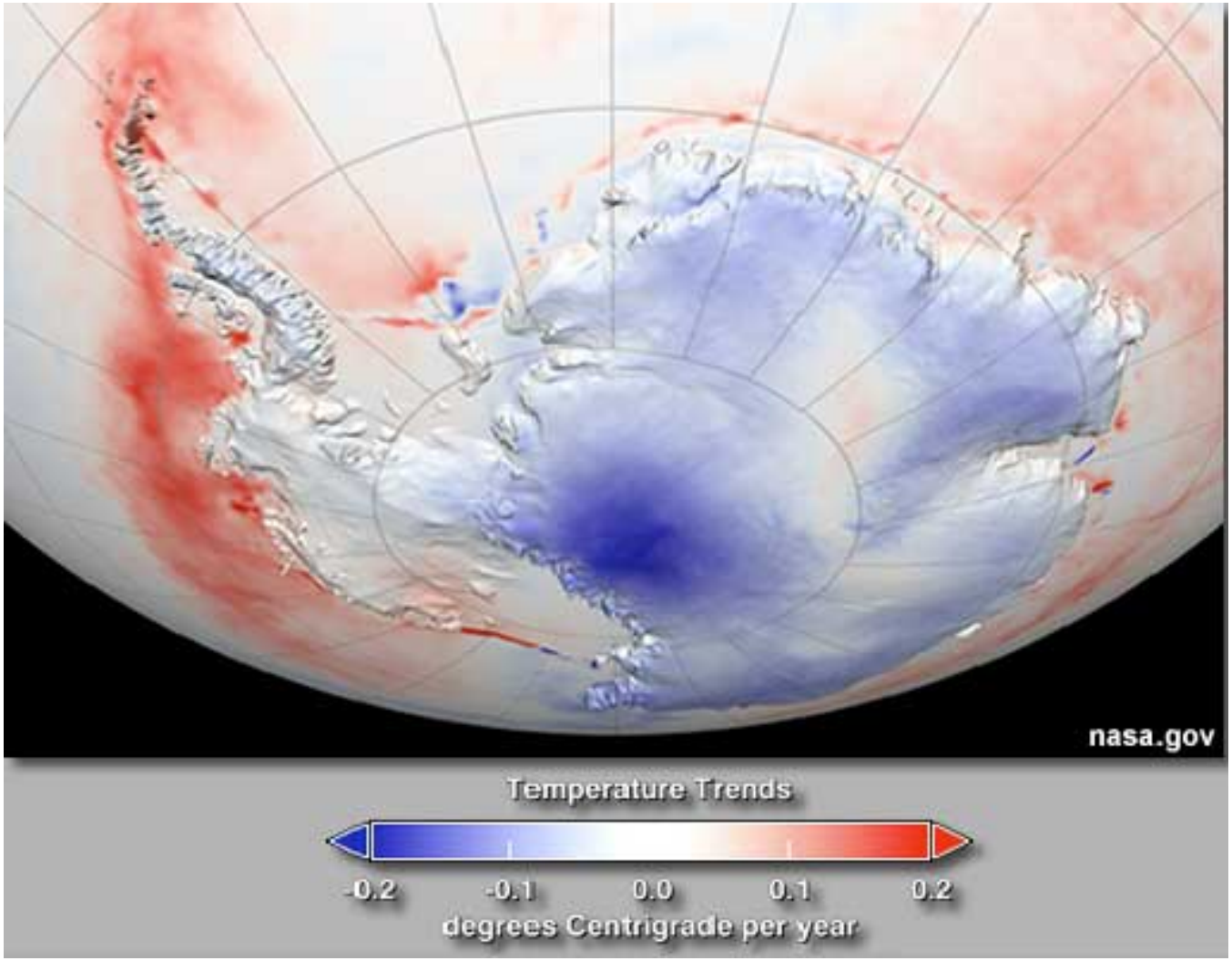
Temperature trends in the last 50 years



Red = + 0.2 degrees C per year

Blue = - 0.2 degrees C per year

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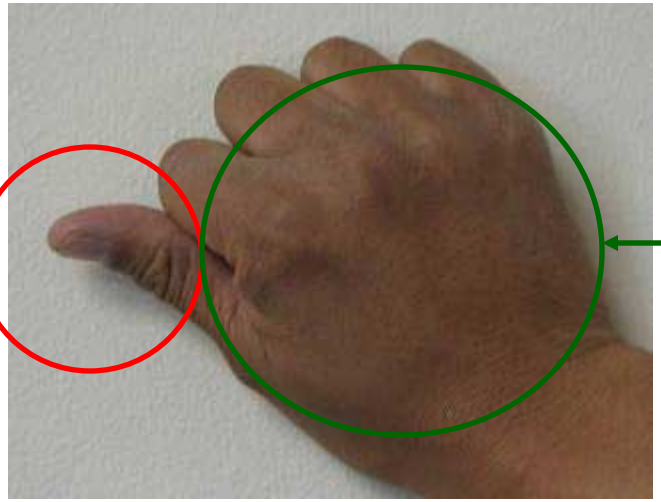
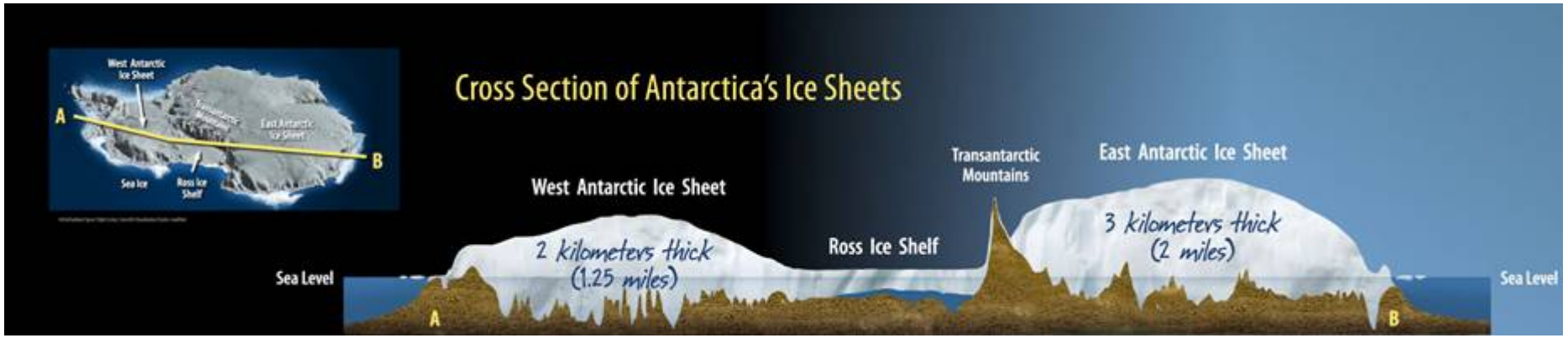
West vs. East

Make a fist with your right hand, but leave your thumb out. This resembles the shape of Antarctica.

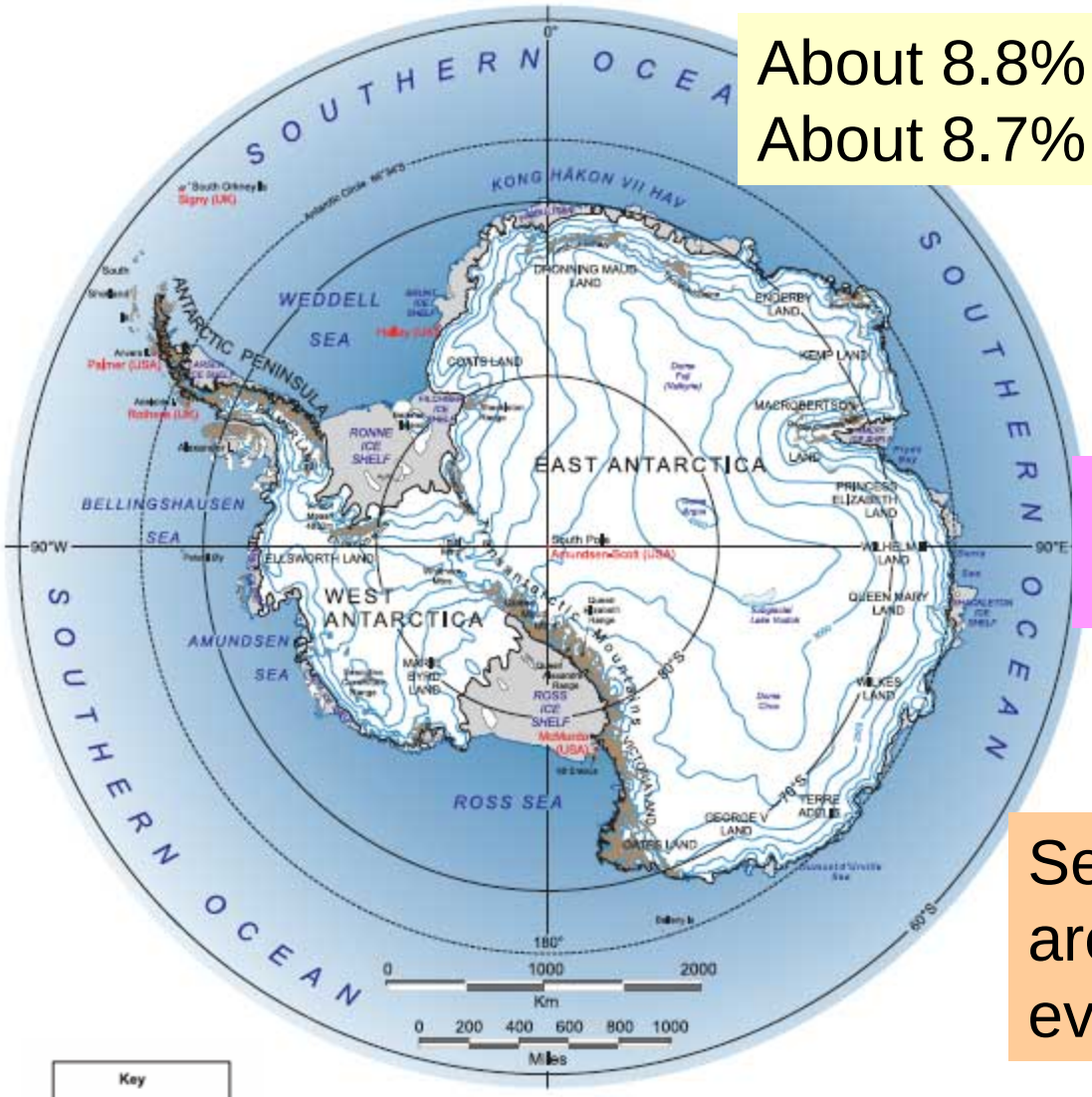
West Antarctic Ice Sheets



East Antarctic Ice Sheet



Land surrounded by water... the Southern Ocean



About 8.8% of Earth's ocean area
About 8.7% of Earth ocean volume

Ocean moderates coastal temperatures

Sea ice extends the solid area around Antarctica every winter.

*Image courtesy of British Antarctic Survey

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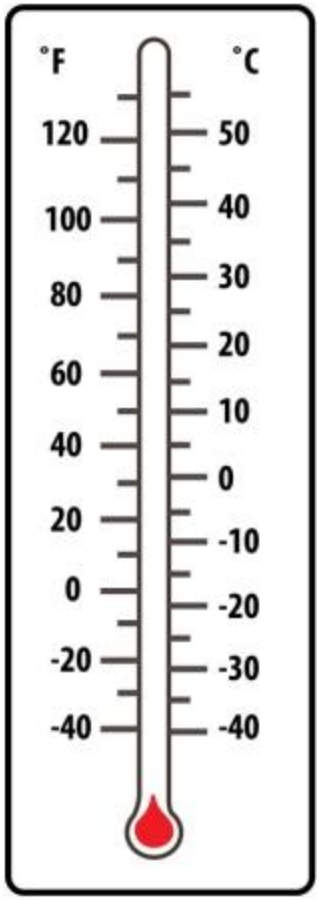
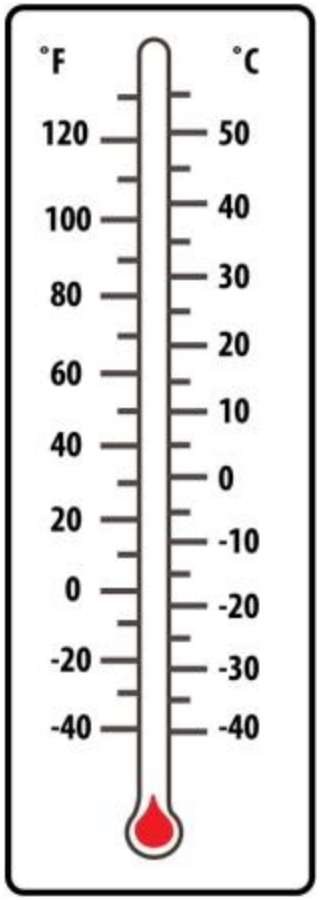
Antarctic Weather and Climate

Mean summer temperature (C)

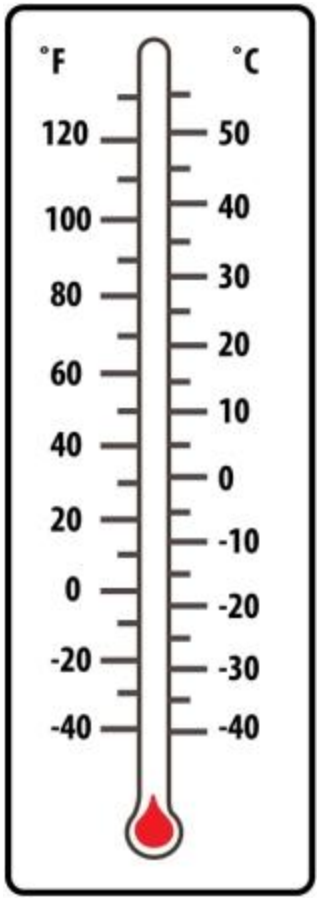


Coastal

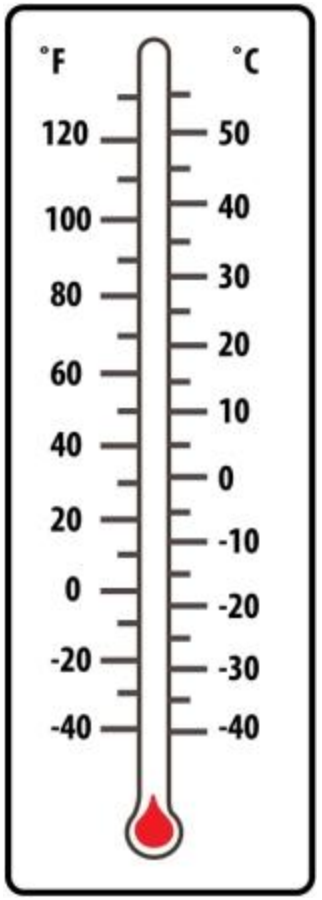


Inland

Mean winter temperature (C)



Coastal



Inland

Seasonal Variation in Daylight

Polar day – period in summer in which sun doesn't set

Polar night – period in winter in which sun doesn't rise

Stamp the month marking the middle of winter in Antarctica:

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.

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Living things on land

Adelie penguins

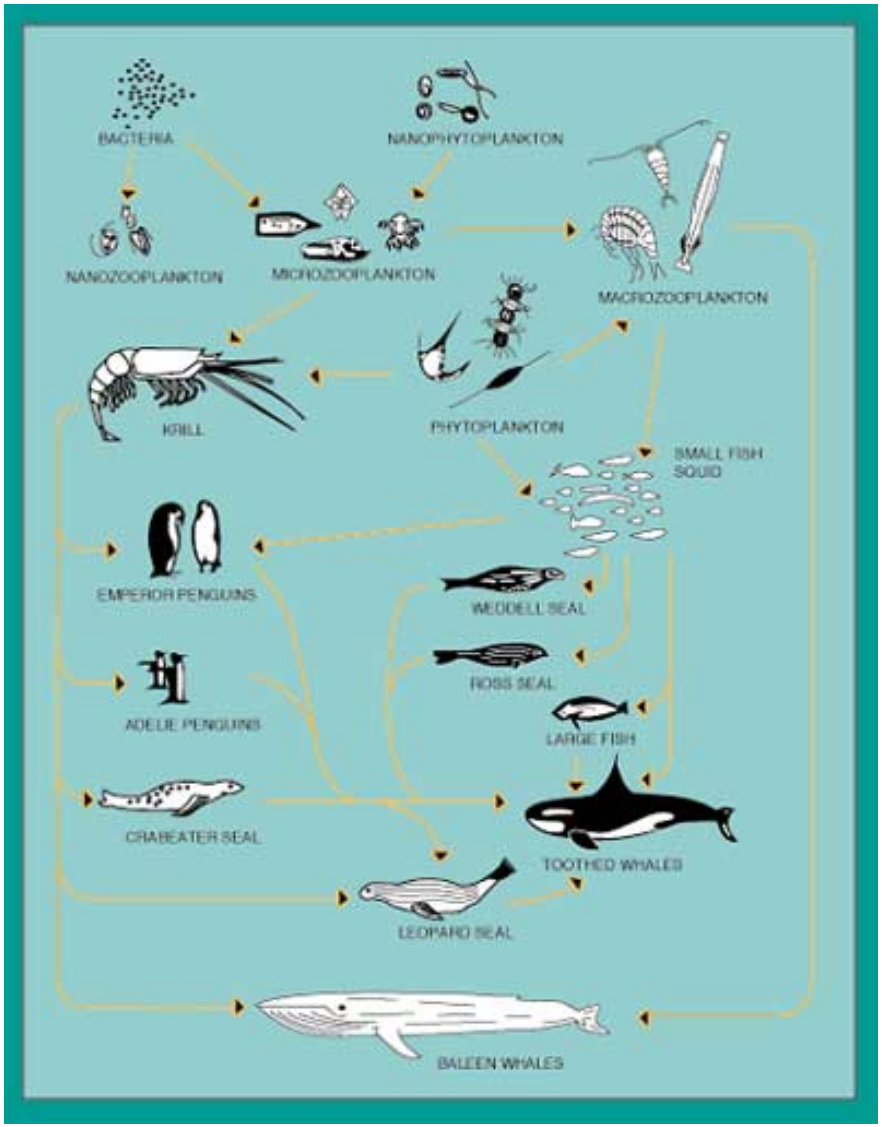
Wandering albatross

Emperor penguins

Skua
(like a large gull)

Weddell seals on ice shelf

Living things in the ocean



Physical Geography

Continental-scale features:

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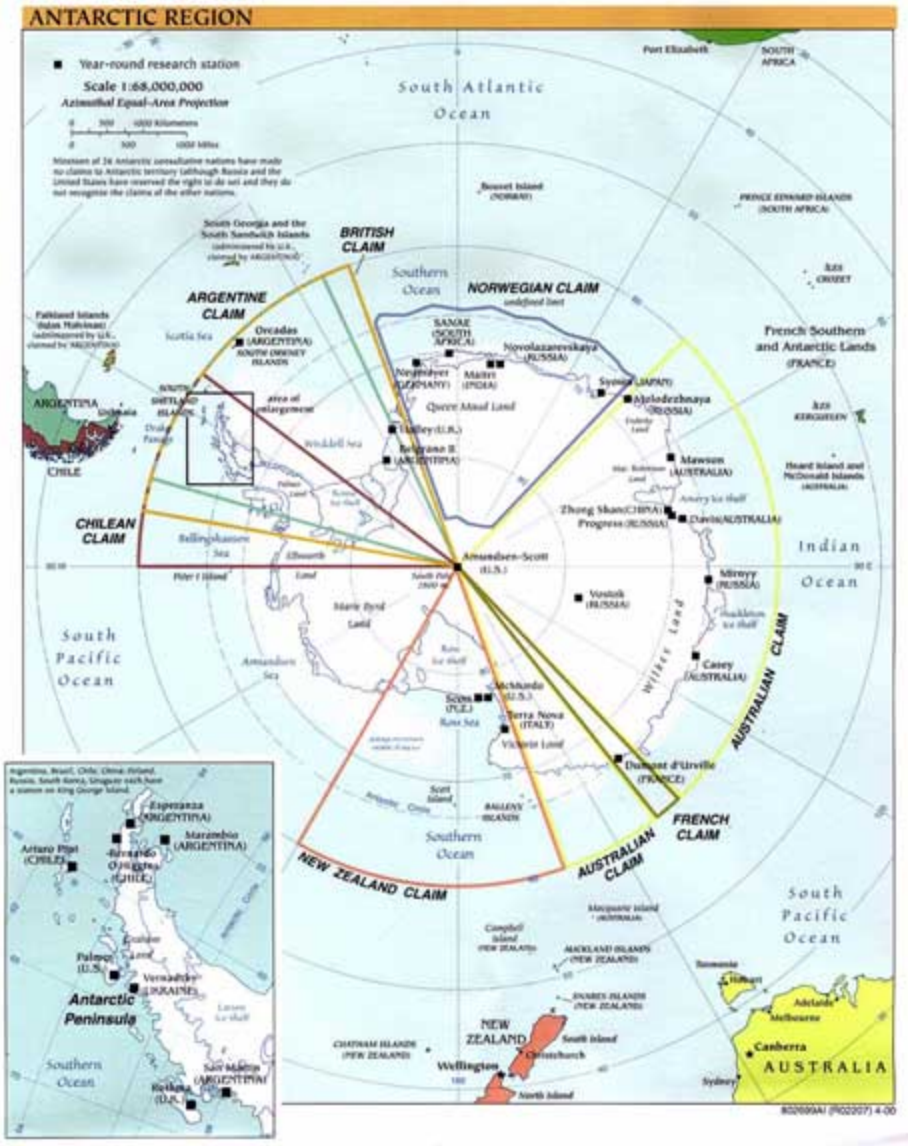
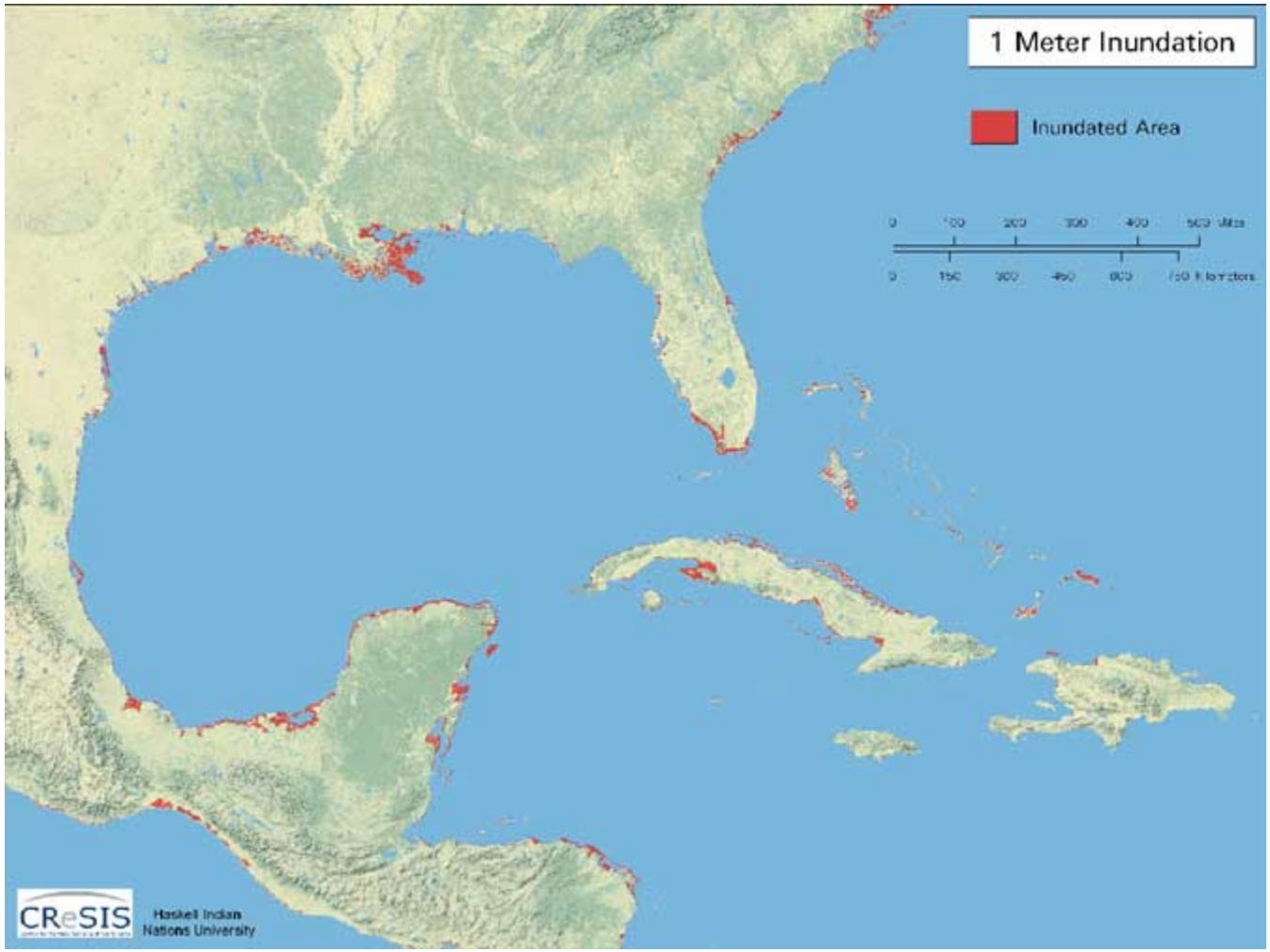


http://www.lib.utexas.edu/maps/islands_oceans_poles/antarctic_region_2000.jpg

Potential for sea level rise

https://www.cresis.ku.edu/research/data/sea_level_rise/index.html



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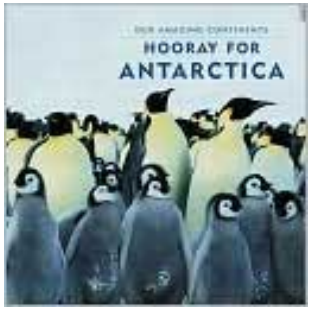
Let’s pause for questions from the audience….

Strategies for introducing the polar regions to elementary students:

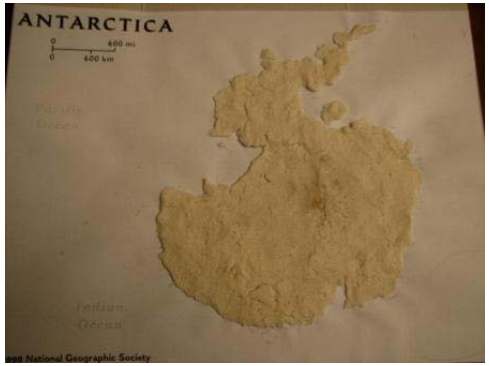
Content area reading



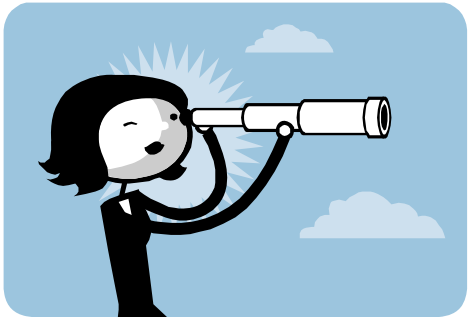
Graphic organizers

Reading, writing, and speaking

read·write·think
International Reading Association
NCTE

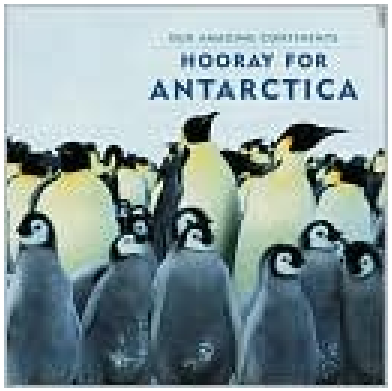


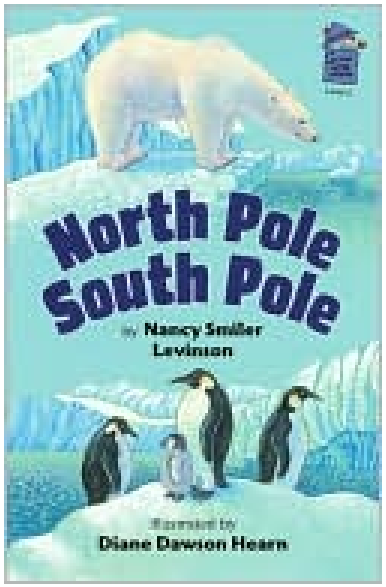
Nonlinguistic representations and kinesthetic experiences

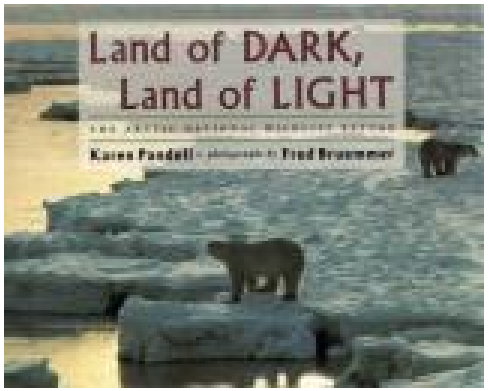


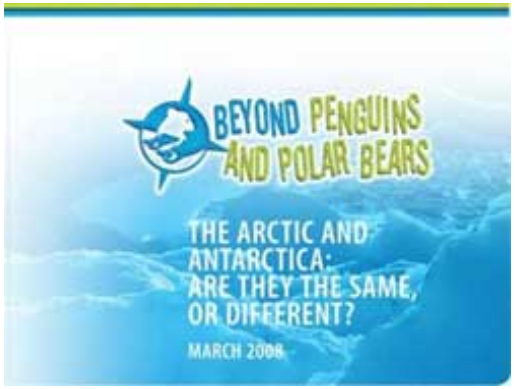
Open inquiry and research

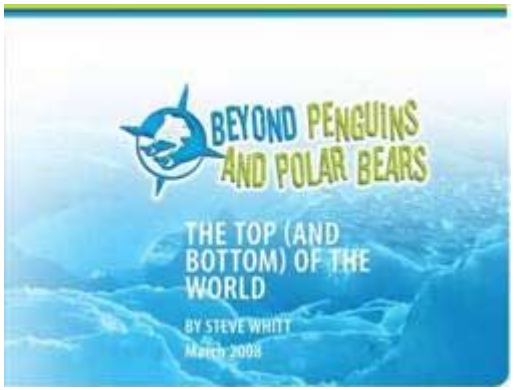
Develop student content knowledge through children's literature and expository text











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Our **Virtual Bookshelf** lists children's literature and suggestions for use.

BEYOND PENGUINS AND POLAR BEARS

an online magazine for k-5 teachers

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A Sense of Place - Issue 1, March 2008 » Science and Literacy » Virtual Bookshelf

A Sense of Place: Virtual Bookshelf

by Kimberly Lightle, Jessica Fries-Gaither, and Nancy Brannon

The Virtual Bookshelf provides a list of recommended children's books that reflect the th the issue and offers ideas on how to integrate them across the curriculum.

Linking science instruction to children's literature has become increasingly popular in recen for a variety of reasons: the literature connection motivates students, provokes interest, students connect scientific ideas to their personal experiences, accommodates children wit different learning styles, and promotes critical thinking. Whatever the reason, we know tha books about science can capture even the most reluctant readers and writers. Students a naturally drawn to the colorful photographs and layouts of nonfiction science texts.

Using science books allow teachers to meet their reading and writing goals while filling a ne teach more science. Teachers can use books as a starting point for meaningful classroom discussions; some teachers even begin class by reading a poem or a picture book aloud, s for the enjoyment of the literature. Some teachers project the book onto a screen so the can read the text together. Picture books make wonderful writing prompts and can provok journal writing. Interdisciplinary thematic units can be broadened by use of children's litera

The titles listed in this month's bookshelf reflect our focus on a sense of place about the p regions. We've divided the titles into five categories. The first category, Going Places, inclu books where animals and people are going on a journey. The next section provides books will help students Compare and Contrast the two polar regions. The third and fourth categ provide general reference books on the Arctic Region and Antarctica. And because the nam the project is *Beyond Penguins and Polar Bears*, we had to highlight two of our favorite bo Penguins and Polar Bears.

ANTARCTICA - GENERAL REFERENCE

The four titles highlighted in this section examine Antarctica in more depth. Use these titles to complete the Antarctica column of this graphic organizer. (pdf file)

***Our Amazing Continents: Hooray for Antarctica!* April Pulley Sayre. 2003. Picture book. Recommended ages: K-2.**

This book uses wonderful photographs to introduce the continent of Antarctica, looking at its geography, plant and animal life, weather, and human exploration. While the simple, concise main ideas make this appealing to primary graders, the additional detail found on most pages makes this book appropriate for students in upper elementary as well.

***Antarctica: Geography of the World.* Dana Meachen Rau. 2004. Nonfiction chapter book. Recommended ages: grades 3-5.**

This chapter book introduces the geography, topography, climate, flora, and fauna of the continent of Antarctica. The expository text is similar in style to what is found in an elementary textbook, but the pictures and spacing of text make this more engaging. Each chapter begins with a question, making this book an excellent opportunity to practice questioning strategies such as SQ3R.

***Antarctica: The Atlas of the Seven Continents.* Wendy Vierow. 2004. Nonfiction book. Recommended ages: grades 3-5.**

Each two-page spread of this nonfiction book discusses a discrete topic about Antarctica. The book contains a large number of maps and atlas projections with explanations of the history of the continent, the climate, plants and animals, the natural resources, and the history of exploration. Also included are a glossary and index. The paragraphed, expository style text could provide an introduction to research projects, organizing information, and expository writing. The ability to project text on a screen could make this book more accessible for whole-class use.

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Graphic organizers assess prior knowledge and help students organize information

What do you know about the Arctic?	What do you know about Antarctica?
What questions do you have?	

Prior Knowledge

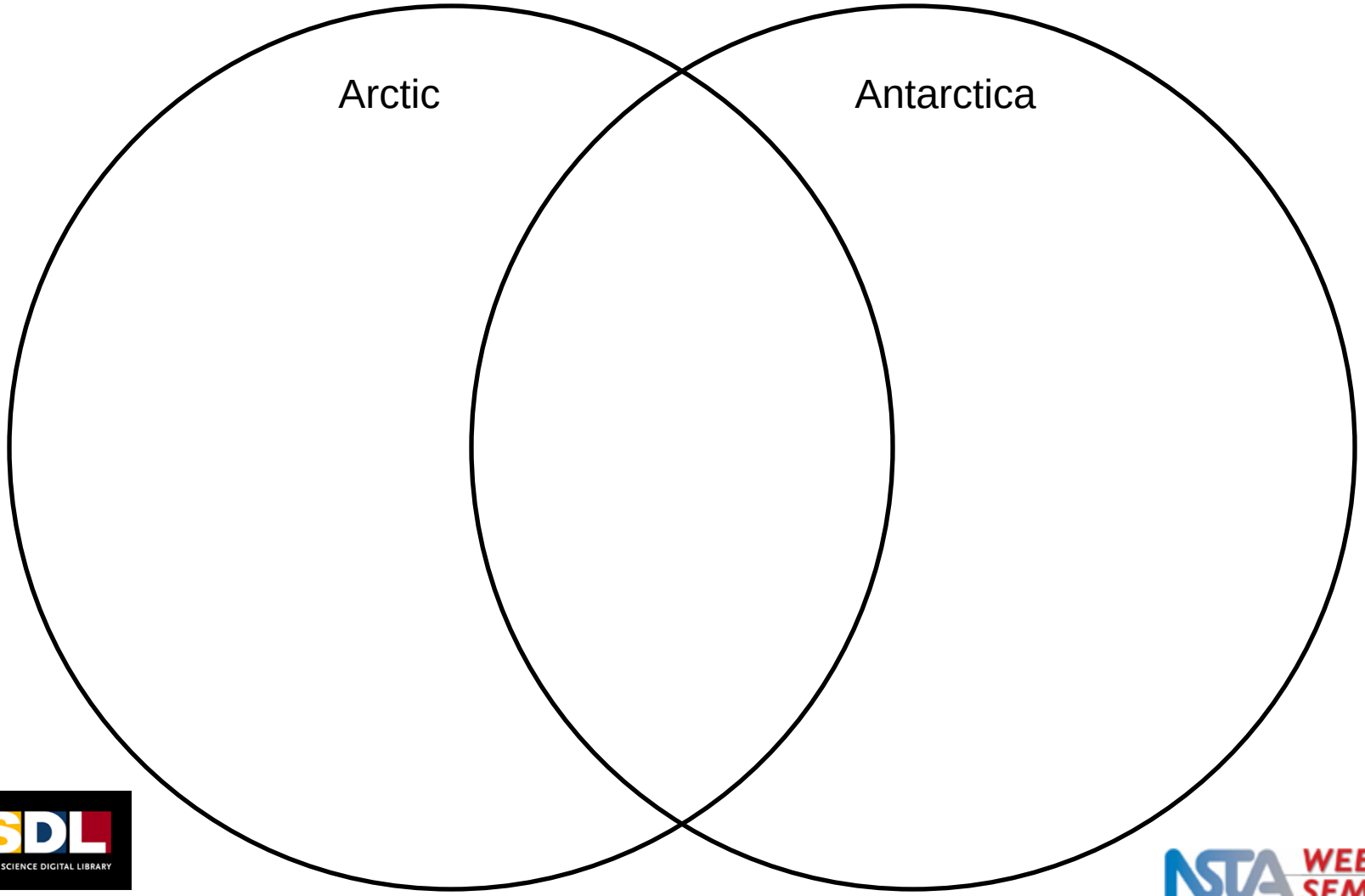
BEYOND PENGUINS AND POLAR BEARS

Integrating Science and Literacy in the K-5 Classroom

	Arctic	Antarctica	My hometown
Location			
Geography & Landforms			
Political			
Climate			

Note-taking and organizing information

3 volunteers: Compare and contrast the Arctic and Antarctica



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We highlight integrated **science and literacy** lessons and activities.

BEYOND PENGUINS AND POLAR BEARS
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A Sense of Place - Issue 1, March 2008 » Science and Literacy » Lessons and Activities

Science and Literacy Lessons to Develop a Polar Sense of Place

by Jessica Fries-Gaither

The lessons highlighted in this article integrate science knowledge with geog
skills. Students view images and webcams, read stories and articles, and us
content knowledge about the polar regions. They demonstrate their knowle
stories, paragraphs, and essays. You can further integrate literacy skills int
adding activities that ask students to compare and to use Venn diagrams a
students, introduce the compare and contrast structure of expository text
write a compare and contrast essay.

It can be difficult to find suitable expository text for your students to use.
sites and children's literature listed in our virtual bookshelf, we've included a
The Top (and Bottom) of the World and informational articles (separate ver
and 3-5) comparing the polar regions. You can use these resources and as
help your students gain content knowledge and strengthen their comprehe

A Vacation to the Polar Regions (Grades K-2)

http://www.nationalgeographic.com/xpeditions/lessons/05/gk2/polar.html
Students will learn about the characteristics of the Arctic and Antarctic by
at pictures of the polar landscape and animals. They will plan a vacation to
and draw pictures or write stories depicting themselves on the trip. Studen
to compare the regions by drawing pictures of both the Arctic and Antarct
the similarities and differences.

The National Oceanic and Atmospheric Administration (NOAA) has an online
For pictures of Antarctica, try the National Science Foundation's Antarctic P

This lesson meets the National Geography Standards: Four and Five and th
Education Standards: Science in Personal and Social Perspectives content s

Expedition to the Poles (Grades 3-5)

http://www.nationalgeographic.com/xpeditions/lessons/05/g35/expedition.html
Students will pretend they have just returned from a year in the Arctic or Antarctic. They will look at web sites about these regions and expeditions to them, and they will create posters illustrating their experiences. Students will conclude by writing paragraphs explaining what it would be like to visit the polar region that they did not focus on in this lesson. Use the feature story, virtual bookshelf, and downloadable informational articles (found in the virtual bookshelf) for student reading and research. Students can use a graphic organizer, such as this table, to record information.

This lesson meets the National Geography Standards: Four and Five and the National Science Education Standards: Science in Personal and Social Perspectives content standard for grades K-4 and 5-8.

To further integrate literacy skills into this lesson, try the following:

Exploring Compare and Contrast Structure in Expository Texts

http://www.readwritethink.org/lessons/lesson_view.asp?id=54

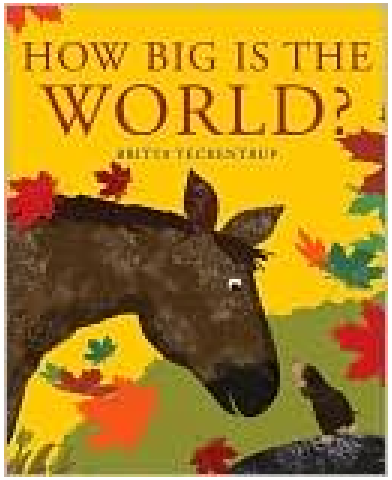
This lesson focuses on identifying and analyzing the compare and contrast text structure within expository texts. First, students are introduced to the terms compare and contrast and asked to find similarities and differences between two common items. Next, students work in small groups to identify texts that are comparing and contrasting information. Students are then introduced to the Venn diagram as a tool that demonstrates similarities and differences and aids in learning new material.

This lesson meets NCTE/IRA Standards: 1, 3, 6, 12.

An example of science/literacy integration for grades K-2:

NATIONAL GEOGRAPHIC marcopolo
XPEDITIONS
GEOGRAPHY STANDARDS IN YOUR CLASSROOM

A Vacation to the Polar Regions



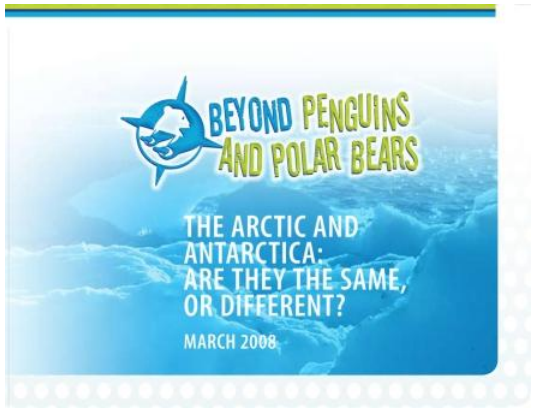
Students learn about the polar regions and draw pictures or write stories depicting themselves on a vacation to one of them.

read·write·think
International Reading Association NCTE

Draw a Story: Stepping from Pictures to Writing

Students draw a series of pictures to tell a story. They ‘read’ their story to others, transcribe their oral story into writing, and create an accordion book with drawings on the front and writing on the back.

An example of science/literacy integration for grades 3-5:



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GEOGRAPHY STANDARDS IN YOUR CLASSROOM

What Do People Know About the Arctic and Antarctic?

Students research the polar regions, interview people about the areas, and write compare/contrast paragraphs.

read·write·think
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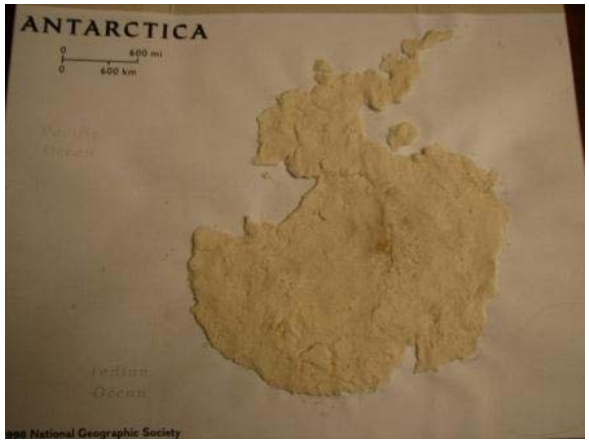
Exploring Compare and Contrast Structure in Expository Texts

Students learn to identify and analyze the compare and contrast text structure within expository texts.

Create nonlinguistic representations and provide kinesthetic experiences



Salt Dough Recipe:
2 cups flour
1 cup table salt
1 cup water

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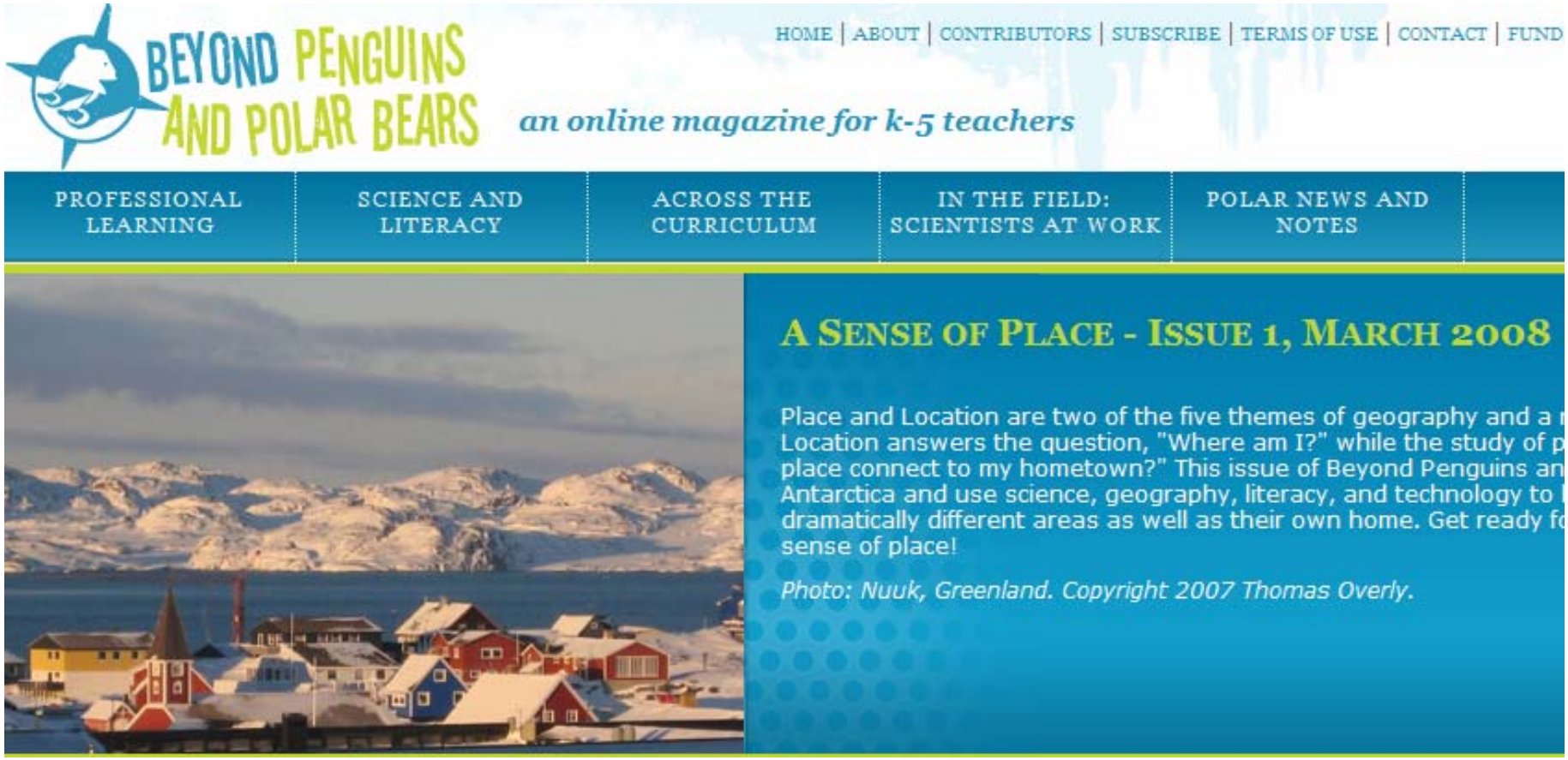
NSTA WEB SEMINARS



http://beyondpenguins.nsdl.org

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NSTA WEB SEMINARS

Open inquiry and research allows students to explore topics of interest

Task: Explore the Beyond Penguins and Bears magazine and find one interesting article/idea/strategy to share with the group.

How could you incorporate this into your classroom?

Write your responses in the chat

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NSTA WEB SEMINARS

Interested in learning more about the polar regions?

More Beyond Penguins web seminars in fall 2008 and spring 2009

Beyond Penguins Tapped In Group:
June 4, 2008 at 7 pm Eastern
http://www.tappedin.org

Beyond Penguins and Polar Bears:
http://beyondpenguins.nsdl.org

http://nsdl.org

http://beyondpenguins.nsdl.org

Jessica Fries-Gaither
fries-gaither.1@osu.edu

Dr. Carol Landis
landis.83@osu.edu

THANK YOU!

http://nsdl.org

Go to http://nsdl.org and click on the K-12 audience page to:

- Download our Seminar Resource List
- Utilize our blog featuring our presenters for the Seminar Series sharing their insights on careers in science and science education:

  http://expertvoices.nsdl.org/2007fall-nsta-sems/

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http://learningcenter.nsta.org

National Science Teachers Association

Francis Eberle, Executive Director

Frank Owens, Associate Executive Director
Conferences and Programs

Al Byers, Assistant Executive Director e-Learning

NSTA Web Seminars

Flavio Mendez, Director

Jeff Layman, Technical Coordinator

- **NASA JPL: Mars Exploration Rovers: Where Are They Now?**
  June 5, 2008

- **NSDL: Enlightening Experiences with Energy**
  June 12, 2008

http://learningcenter.nsta.org

Web Seminar Evaluation:

Click on the URL located on the Chat Window

McMurdo Dry Valleys LTER site

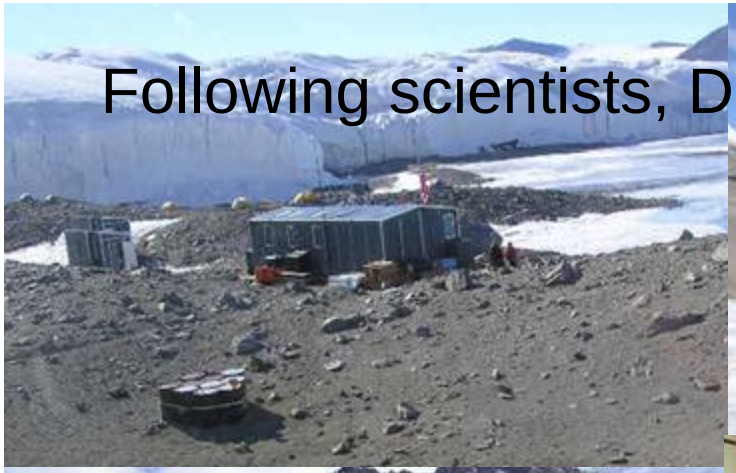
Outlet glaciers flow into the valley floor. In the spring & summer, melt water forms streams, which feed the lakes in the lowest part of the valley. The food webs are simple.

Long-Term Ecological Research Network

(http://www.LTERnet.edu)

There are now 26 LTER sites in the U.S., plus 2 associated with the U.S. stations in Antarctica: Palmer Research Station on the Peninsula and McMurdo Dry Valleys region in the Transantarctic Mountains, near Ross Island.

Following scientists, December 2003:



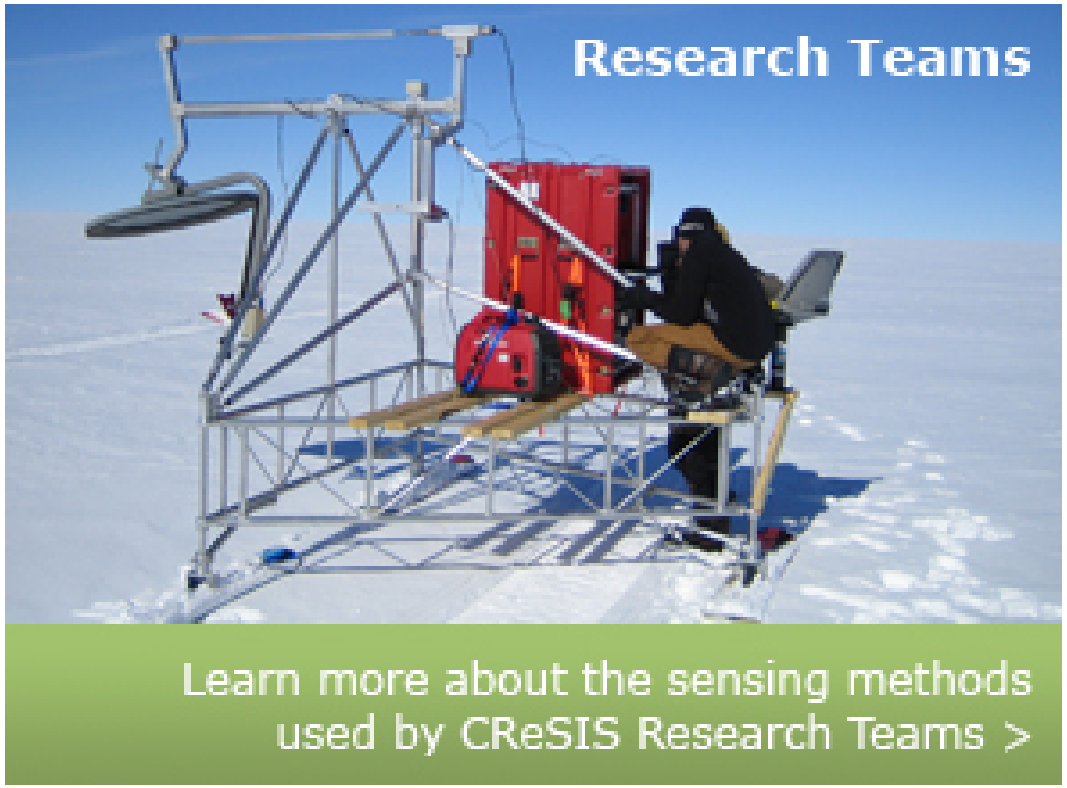






The Center for Remote Sensing of Ice Sheets (CReSIS):
https://www.cresis.ku.edu/

UAV



Several research areas

Developing improved models for prediction

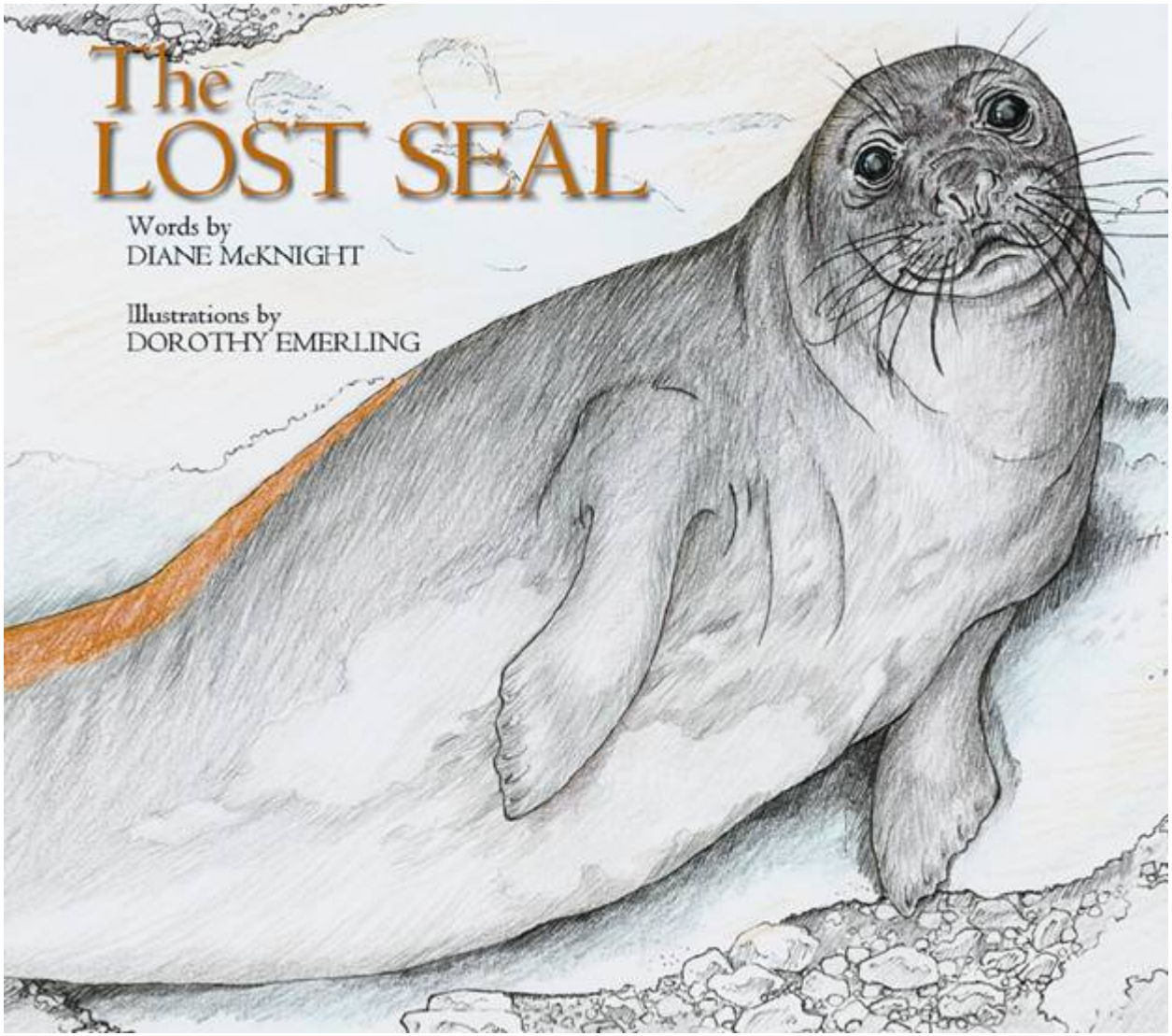
Developing better sensors to put onboard satellites and aircraft

Developing an uncrewed aerial vehicle (UAV)

(like a computer-controlled plane)

Systems to collect and transfer data

Analysis & synthesis of the data



http://www.mcmlter.org/lostseal/