INTERNATIONAL 2007 2008
POLAR YEAR

International Polar Day - Land & Life

18 June 2008

Who: Anyone interested in the Polar Regions (Students, Teachers, Scientists, Artists, Travelers…).

What: A global community event as part of the International Polar Year (IPY), on Land and Life.

Why: During the IPY, tens of thousands of scientists, engineers and technicians from around the world study the Polar Regions. Polar Days provide an interactive hands-on way to learn and to get involved.

Where: Schools, communities, and education centres around the world.

When: Wednesday, 18 June, and throughout the week.

How:

1. Do the activity on the reverse side, or visit www.ipy.org for more activity ideas.
2. Launch a Virtual Balloon showing your location at www.ipy.org.
3. Check back frequently and see balloons go up around the world.
4. Talk with scientists during a live event.
5. Learn about polar science, become a polar ambassador, participate in future IPY Polar Days.

Learn more about polar Land & Life at www.ipy.org

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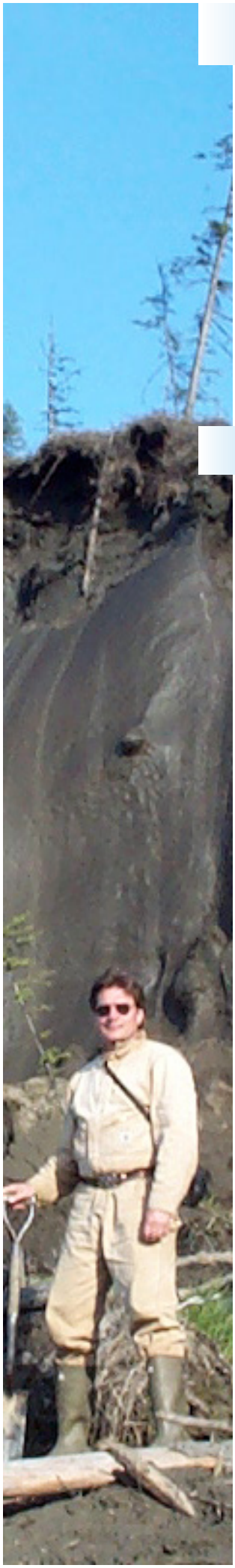

Layers of perennially frozen ground known as permafrost exist under about 20% of the Earth's surface. Permafrost occurs on land in both the Arctic and Antarctic, as well as beneath the ocean around the Arctic coast and in many high mountain areas. Seasonal thawing and freezing of the soil forms a shallow active layer that overlies the permafrost. In contrast, deep permafrost, frozen to depths of 500 to 1000 meters, may have existed in a frozen state for thousands of years. Frozen soils have greater mechanical stability than unfrozen soils. Permafrost degradation can cause problems for roads, pipelines or buildings on the surface.

Permafrost Demonstration

Materials:

- Two clear, wide-mouthed plastic containers or jars (approximately 500 mL each)
- Ice cubes
- Sand and local soil (enough to fill one jar with each)
- Toothpicks and modelling clay
- Water

Preparing the permafrost:

1. Put layers of wet sand in one jar and of wet soil in the other, filling each 1/3 full.
2. Place 3-5 ice cubes on top of the sand or soil, filling the jar to the 2/3 mark. This represents 'ice wedges' that form in cracks in the frozen soil as the permafrost expands and contracts with seasonal temperature changes. (See http://arctic.fws.gov/permcycl.htm for more.)
3. Cover the ice with a second layer of sand or soil.
4. Moisten the entire sample with water and freeze for at least 24 hours.

Activity:

1. Construct two small structures from clay and toothpicks and place them on top of the frozen samples. Use the toothpicks to hold the structures in place.
2. Predict what you think will happen as the frozen soil and ice thaws? What will happen to the ice? …the soil? …the structures?
3. Allow the samples to thaw and note what happens.

Discussion questions:

1. How did the thawing of the permafrost affect your structures? Did the type of soil make a difference?
2. What happened to the surface of the ground when the permafrost thawed? How might this affect vegetation or animals in permafrost regions?
3. Permafrost contains large quantities of stored organic carbon. How might the thawing of permafrost affect levels of atmospheric greenhouse gases such as carbon dioxide and methane?

Produced by the IPY International Programme Office
www.ipy.org
Images: Front - Norwegian Research Council; Back - V. Romanovsky, Univ. Alaska, Fairbanks