

INTERNATIONAL POLAR YEAR

What Happens at the Poles Affects Us All

Weather and Climate

Our climate represents a balance between heat gained in the tropics and heat lost at the poles. The equator-to-pole gradients of temperature determine atmospheric patterns of wind and moisture. Ocean currents carry vast amounts of heat toward the poles, and ice on land and oceans plays a crucial role in planetary cooling. Cold water formed at the poles drives deep ocean circulation. As our planet warms, changes in these systems will affect agriculture, forestry, industry, transportation and recreation.

Ice and Sea Level

Signs of global warming appear where sea ice, ice sheets, mountain glaciers, and permafrost meet warming air or ocean. Mountain glaciers have receded and lost mass; in many locations these changes portend disruptions to water supplies. Sea ice heated from above or below quickly disappears, exposing a darker ocean that reflects less sunlight and absorbs more heat. Permafrost exposed to warmer air thaws from the surface downward; thawing permafrost beneath the Arctic Ocean may release potent greenhouse gases. The enormous ice sheets of Greenland and Antarctica already lose mass and raise global sea level.

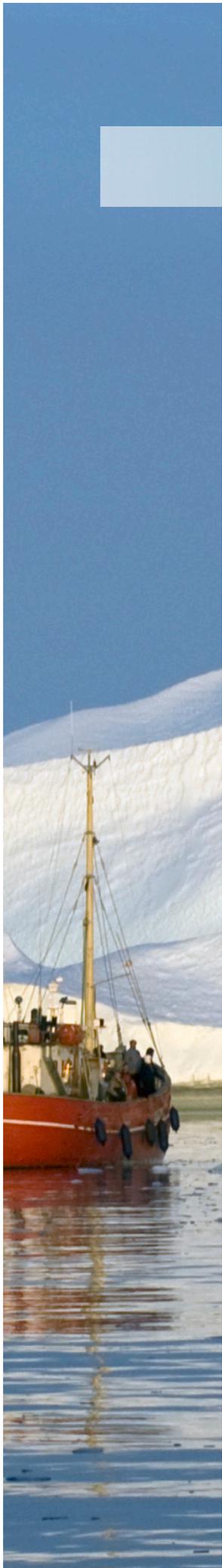
Polar Biodiversity

Polar life includes bears in the Arctic and penguins in the Antarctic, but also exquisite tundra plants, marvelous ocean crustaceans, and migratory populations that breed in polar regions. These biological systems, remarkably adapted to cold temperatures, ice, and long periods of darkness, will retreat as their preferred habitat disappears. The disappearance of ice-adapted species will represent a biodiversity failure as serious as that of rainforests or coral reefs.

Polar Communities

Humans in the Arctic confront environmental, social and political changes. Polar natural resources, including fish, forests, and wilderness, face increasing pressure as their value to the rest of the world increases. Arctic residents use traditional knowledge, education, technology, and their global neighbors to help answer difficult questions. Can Arctic communities sustain local economies in the face of imported goods and services? How can polar residents work with local and national governments to establish appropriate patterns of development? How can traditional cultures adapt to economic and social pressures? Who should shape the values and protections for Arctic ecosystems?

Learn more about IPY at www.ipy.org



International Polar Week

Although most of us will never encounter sea ice or permafrost, see mountain glaciers, or meet a free-living penguin, we can recognize the impacts of polar changes on our global systems, on our weather and climate, and on our neighbors in many parts of the world. This Polar Week will provide you with the opportunity to explore the many changes in polar regions.

Activities for the International Polar Week

15 to 19 March 2010

Please join us as we explore connections to polar regions. Find links to all of these activities, and more, on the Polar Week pages of www.ipy.org.

- Contribute to a worldwide **public lecture series**: Show your polar enthusiasm by organizing a presentation about polar environments for your local Rotary, 4-H, Boy Scout/ Girl Scout troop, church group, school association, city council, university, or wherever your community gathers!
- Watch real-time web-streaming of a wide range of **Arctic science** from the State of the Arctic Conference (16 to 19 March 2010). Find the program and follow the presentations at <http://soa.arcus.org/program>.
- **A Spin On Ozone**: Try this activity to learn about the polar vortex and what effect it has on destruction of the ozone layer above Antarctica. Do the same processes occur in the Arctic?
- **Penguin Reunion**: Have you ever wondered how penguin parents and chicks manage to find each other in large loud colonies? Try this fun activity to see how penguins reunite in harsh Antarctic conditions.
- **When Ice Melts...**: What happens to sea level when icebergs and sea-ice melt? What happens when ice sheets and ice caps melt? Discover causes and consequences of sea level rise.
- **Up The Food Chain - Pollution In The Arctic**: Learn about bioaccumulation, bioconcentration, biomagnification and global distillation. Investigate how contaminants accumulate within an ecosystem. What impacts do these contaminants have on the environment and on human health in the Arctic?

Activities listed here come from the IPY book 'Polar Science and Global Climate, An International Resource for Education and Outreach', B. Kaiser, ed., Pearson, 2010.



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