

Passport to the Arctic:

 Education & Outreach

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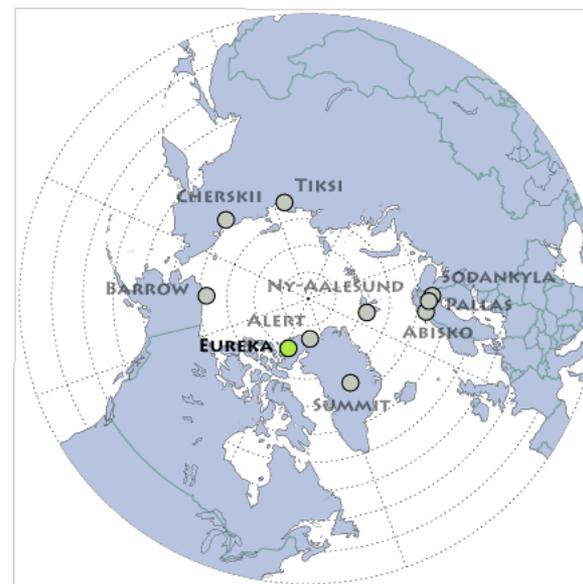
2014



Arctic Climate Connection

Passport to the Arctic

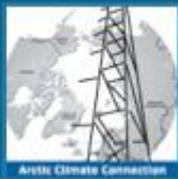
Exploring the Arctic Background Reading



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Created by CIRES Education
Outreach



Passport to the Arctic:



Unlike Antarctica, there is no landmass surrounding the North Pole only the ice covered Arctic Ocean. Expeditions that reach the North Pole either cross the sea ice on skis or use ice breaker ships.



Fig. 6: Peary Arctic Expedition Photograph by Admiral Robert E. Peary After several failed attempts, 23 years of effort, and a lifetime of obsession with the Arctic, Admiral Robert Peary led in April 1909 what was then believed to be the first successful expedition to the North Pole. His stalwart crew, pictured here, included Inuits Ooqeah, Ootah, Eainawah, and Seeglo and fellow American Matthew Henson. Later studies found that Peary was actually 30 to 60 miles (50 to 100 kilometers) short of the Pole. (source: National Geographic)

Passport to the Arctic:



The Arctic:

Polar bears, northern lights, sea ice, inuits, permafrost, North-West passage... many associations come up in people's mind's when they think about the Arctic.

The Arctic consists of the large, ice-covered Arctic Ocean surrounding the North Pole and parts of Canada, Russia, the United States (Alaska), Iceland and Scandinavia (Norway, Sweden, Finland, Denmark with Greenland).

Multiple definitions of the Arctic exist. The Arctic can be defined as:

- i) the polar region located north of the **Arctic Circle**, an imaginary line that circles the globe at 66.5° N (Fig.1).
- ii) the area north of the polar treeline, the northernmost limit of tree growth, where the landscape is frozen and only shrubs and lichens grow (Fig. 2).
- iii) high latitude areas where the average daily summer **temperature** of the warmest month does not exceed 10°C/ 50°F (Fig. 3).
- iv) the area within **political boundaries** set by the eight nations with territory in the region. (Fig. 4)

The Arctic Circle marks the latitude above which the sun does not set on the summer solstice (June 21) and does not rise on the winter solstice (December 22). At the North Pole, the sun rises once each year and sets once each year. There are six months of continuous daylight and six month of continuous night at the North Pole. In the latitudes between 66.5°N and 90°N (north pole) polar days and shorter but than at mid



nights are much longer latitudes.

Passport to the Arctic:



The Arctic region is a unique and extreme environment and a challenging ecosystem for life to adapt to. Indigenous people have lived in the Arctic for thousands of years and adapted their lifestyle. In the winter, cold Arctic temperatures and strong winds make it dangerous to be outside without proper clothing and gear. Life in the Arctic also includes birds, land animals like polar bear, arctic fox, reindeer, and fish and marine mammals like walrus and seals.



Indigenous people have observed the weather and sea ice conditions for thousands of years. Today, scientists study the Arctic to learn more about how weather and climate are changing in the Arctic and how Arctic climatic changes affect the global climate. To study the Arctic, scientists travel to the field to conduct experiments and make observations. Other scientists set up measurement equipment and download it remotely via satellites or they use satellite imagery of the Arctic for their research.



Credit: R. Forbes / NSIDC



Credit: A. Slater / NSIDC

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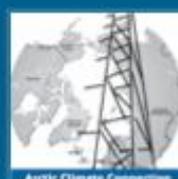


Fig. 1: The Arctic can be defined by the Arctic Circle, an imaginary line at 66°33' North Latitude. (credit: The M Factory @ Smithsonian Institution)



Passport to the Arctic:

Now explore the Arctic:



Passport to the Arctic:

The Arctic:



Fig. 5: This map shows three definitions of the Arctic: the tree line; the 10 degrees Celsius isotherm, and the Arctic Circle at 66° 32" North. (Credit: NSIDC - Map courtesy The Perry-Castañeda Library Map Collection. Tree line added at NSIDC based on information from National Geographic 1983, Armstrong et al. 1978, and Young 1989.)

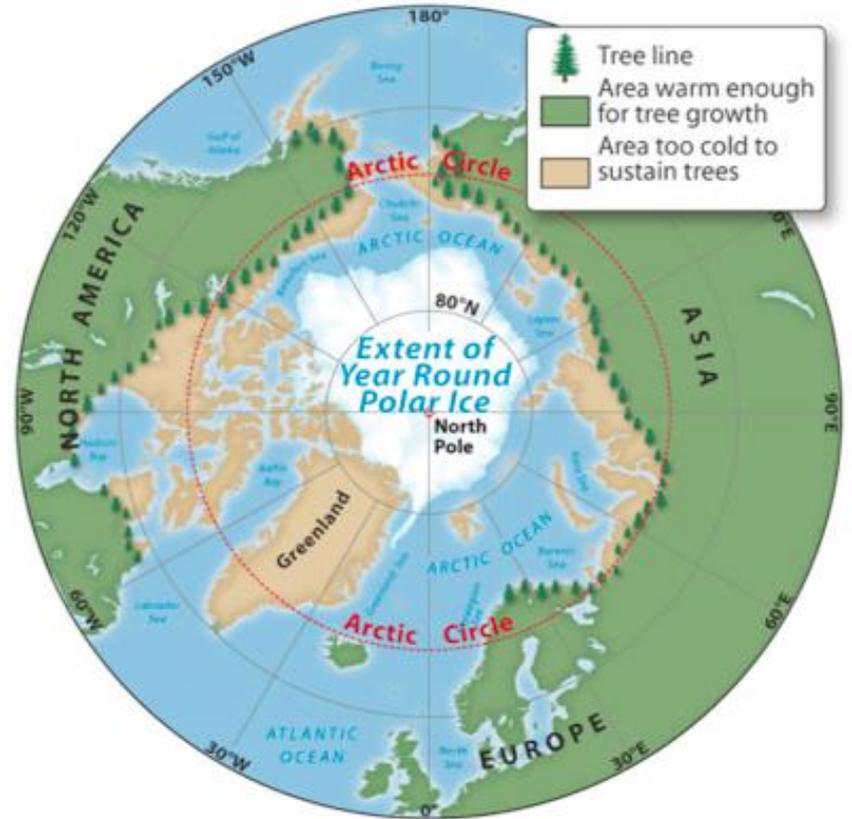


Fig. 2: The Arctic can be defined by the polar treeline, the northernmost limit of tree growth. (credit: The M Factory © Smithsonian Institution)

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Fig. 4: The Arctic can be defined by the **political boundaries** set by the eight nations with territory in the region. (credit: The M Factory @ Smithsonian Institution)

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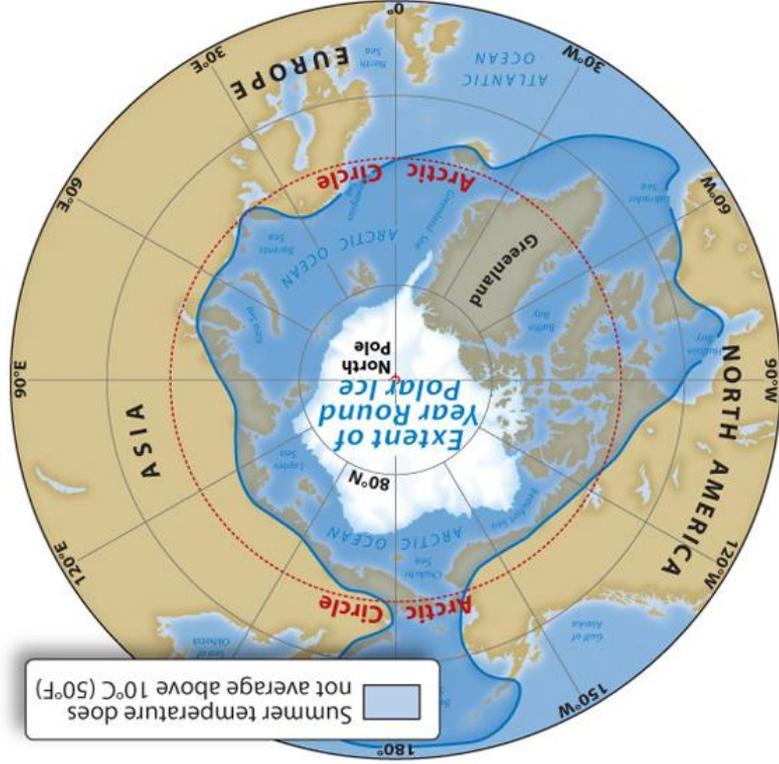


Fig. 3: The Arctic can be defined by high latitude areas where the average summer **temperature** does not exceed 10°C (50°F). (credit: The M Factory @ Smithsonian Institution)