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## Arctic Atmospheric Observatories

**N**OAA's Arctic atmospheric observatories support long-term, intensive measurements of Arctic clouds, radiation, aerosols, surface energy fluxes and chemistry. The observatories are a cooperative effort with partners in Canada, Russia and Scandinavia to enhance and coordinate measurements throughout the Arctic region. NOAA currently contributes to observatory operations in Barrow (Alaska), Eureka and Alert (Canada), Tiksi and Cherskii, (Russia), and Summit (Greenland). The emphasis is on collecting measurements to understand the processes driving Arctic climate change.

### Why the Arctic Atmosphere?

- The Arctic is a critical region that significantly affects and is affected by global climate. Without understanding mechanisms of the Arctic atmosphere, it is impossible to accurately project the future path of global climate change. It is an under-observed region because of the operational difficulties of taking measurements in remote, sparsely populated areas with harsh environmental conditions. NOAA's Arctic observatories contribute to the Arctic atmosphere component of the Global Earth Observation System of Systems ([www.noaa.gov/eos.html](http://www.noaa.gov/eos.html)) by developing partnerships to serve mutual monitoring and research observational needs.

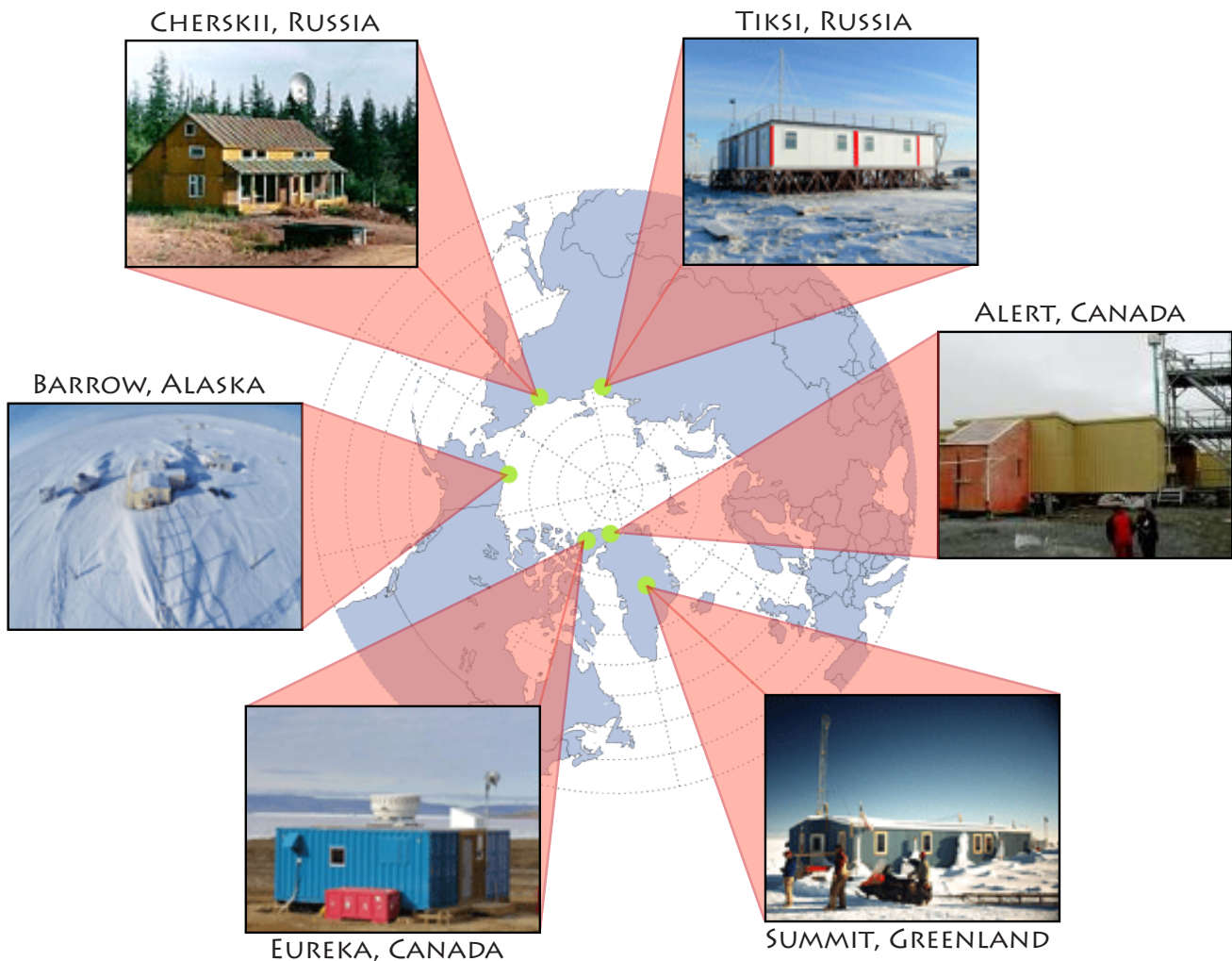
### What is the Goal?

- To develop an integrated Arctic network that will contribute data to studies of attribution, not just trends, of Arctic and resulting global climate change. This initiative responds to evidence that the Earth system may be approaching environmentally critical thresholds within decadal time scales. This program includes developing analyses and predictive capabilities to substantively support societal decisions regarding mitigation and adaptation.

### What are the Benefits and Impacts?

- Observational and predictive tools for anticipating, detecting, and responding to sudden climate change in the Arctic allow for informed governments equipped to determine policy on new issues such as seasonal shipping routes, mineral management, fisheries, and environmental and societal changes.
- This program promotes understanding of critical systems, predictions, and early-warning in a changing Arctic environment.

# Earth System Research Laboratory



Examples of environmental changes in the Arctic include:

- Sea ice retreat
- Permafrost melt
- Increasing carbon dioxide and methane release at high latitudes
- Impacts on mid-latitude weather systems
- Changes in the state of the Arctic atmosphere
- Marine mammal and fisheries ecosystem impacts
- Changes in snow cover, vegetation & precipitation
- Contaminant pathways in the Arctic
- Coastal erosion

## Research Partners

- Canadian Network for Detection of Atmospheric Change
- National Science Foundation
- Russian Federal Service for Hydrometeorology and Environmental Monitoring
- Meteorological Services Canada
- U.S. Department of Energy
- Finnish Meteorological Institute
- Norwegian Institute for Air Research

## On the Web

[www.esrl.noaa.gov/psd/arctic/observatories/](http://www.esrl.noaa.gov/psd/arctic/observatories/)