



NOAA/ESRL Physical Sciences Division Science in the Arctic

Providing scientific leadership for topic-driven pan-Arctic research



NOAA/ESRL conducts observations and monitoring at several Arctic observatories and participates in high-profile Arctic field programs. Here we highlight current and future observations.



Cherskii

A collaboration between the University of Alaska Fairbanks (UAF) and NOAA/ESRL led to tower measurements of CO₂ and CH₄ at Cherskii, helping us to understand more about permafrost in a warming Arctic.



Tiksi

After years of intense collaborations among US, Russian and Finnish agencies, this summer the Tiksi Hydrometeorological Observatory will come on-line as an international climate observatory. New instrumentation includes a Baseline Surface Radiation Network station, a Climate Reference Network station (the first one outside of N. America), a flux tower, and black carbon and greenhouse gas measurements. NOAA/ESRL played a major role in these efforts.



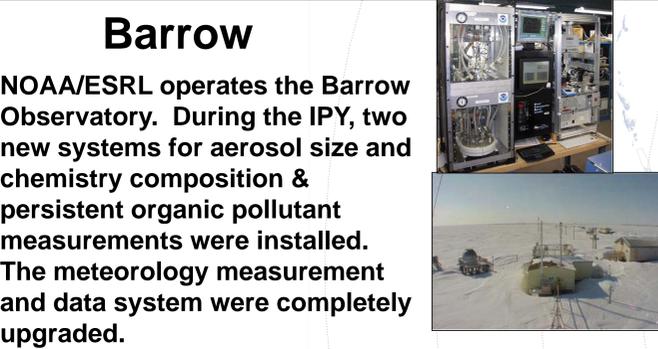
Russian Drifting Station NP35 & NP36

NOAA/ESRL provided a ceilometer to enhance cloud studies in the Arctic.



Pallas & Sodankylä

NOAA/ESRL loaned a cloud radar to the Finnish Meteorological Institute for one year to take cloud measurements at Sodankylä. NOAA/ESRL collects greenhouse gas measurements at the pristine Pallas site.



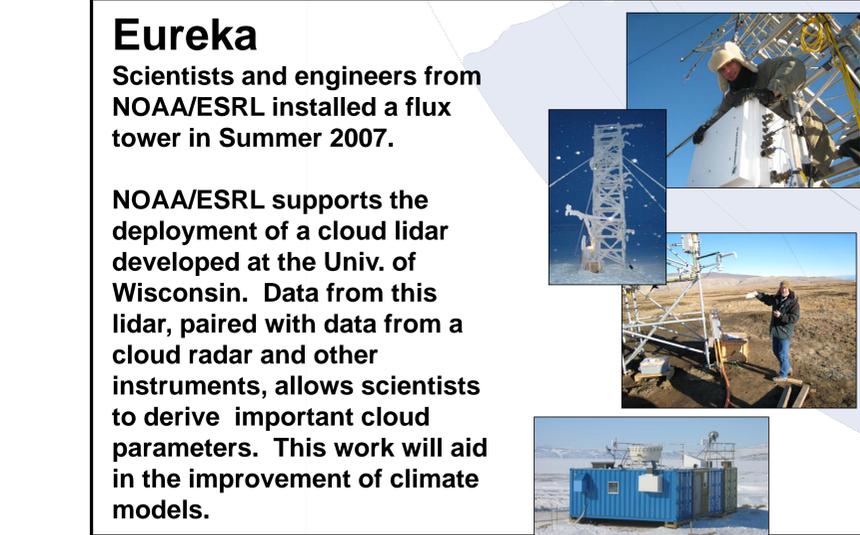
Barrow

NOAA/ESRL operates the Barrow Observatory. During the IPY, two new systems for aerosol size and chemistry composition & persistent organic pollutant measurements were installed. The meteorology measurement and data system were completely upgraded.



Alert

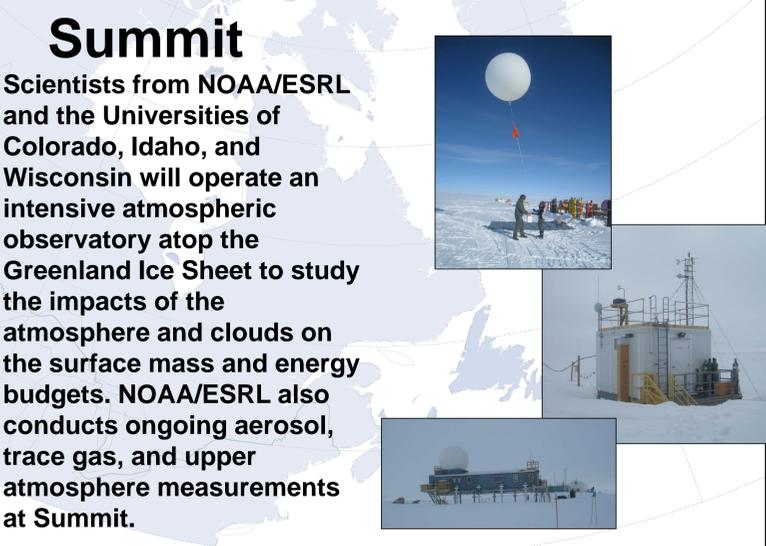
NOAA/ESRL scientists and engineers have obtained several years of coincident surface energy budget and soil temperature measurements at the globe's northernmost inhabited site. These provide the opportunity to link atmospheric forcing with permafrost temperatures and soil active-layer depths. Alert is also a Global Atmosphere Watch station with long-term chemistry and aerosol measurements.



Eureka

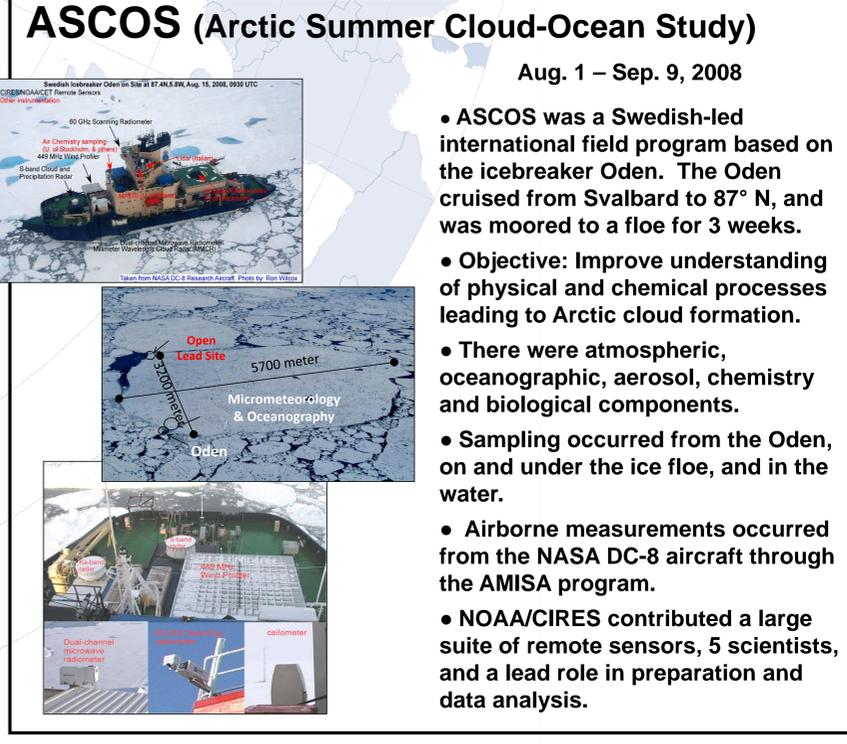
Scientists and engineers from NOAA/ESRL installed a flux tower in Summer 2007.

NOAA/ESRL supports the deployment of a cloud lidar developed at the Univ. of Wisconsin. Data from this lidar, paired with data from a cloud radar and other instruments, allows scientists to derive important cloud parameters. This work will aid in the improvement of climate models.



Summit

Scientists from NOAA/ESRL and the Universities of Colorado, Idaho, and Wisconsin will operate an intensive atmospheric observatory atop the Greenland Ice Sheet to study the impacts of the atmosphere and clouds on the surface mass and energy budgets. NOAA/ESRL also conducts ongoing aerosol, trace gas, and upper atmosphere measurements at Summit.



ASCOS (Arctic Summer Cloud-Ocean Study)

Aug. 1 – Sep. 9, 2008

- ASCOS was a Swedish-led international field program based on the icebreaker Oden. The Oden cruised from Svalbard to 87° N, and was moored to a floe for 3 weeks.
- Objective: Improve understanding of physical and chemical processes leading to Arctic cloud formation.
- There were atmospheric, oceanographic, aerosol, chemistry and biological components.
- Sampling occurred from the Oden, on and under the ice floe, and in the water.
- Airborne measurements occurred from the NASA DC-8 aircraft through the AMISA program.
- NOAA/CIRES contributed a large suite of remote sensors, 5 scientists, and a lead role in preparation and data analysis.