Geophysical Research Abstracts,
Vol. 11, EGU2009-2600, 2009
EGU General Assembly 2009

Optical Properties and Climate Impacts of Tropospheric Aerosols that Undergo Long-Range Transport to the Arctic

P. Quinn (1), T. Bates (1), D. Coffman (1), K. Schulz (1), L. Shank (1), A. Jefferson (2), J. Ogren (2), J. Burkhart (3), and G. Shaw (4)

(1) NOAA, PMEL, Seattle, United States (patricia.k.quinn@noaa.gov), (2) NOAA, ESRL, Boulder, United States, (3) NILU, Kjeller, Norway, (4) University of Alaska, Fairbanks, United States

Tropospheric aerosol particles undergo long range transport from the mid-latitudes to the Arctic each winter and spring. Once in the Arctic, aerosols may impact regional climate in several ways. Aerosols can affect climate directly by scattering and absorbing incoming solar radiation and indirectly by acting as cloud condensation nuclei and altering cloud properties. In addition, absorbing aerosol that is deposited onto ice and snow can lower the surface albedo and enhance the ice-albedo feedback mechanism. Measurements of aerosol properties relevant to climate forcing (chemical composition, light scattering, and light absorption) have been made by NOAA at Barrow, AK for over a decade. Measurements of aerosol chemical composition have been made over the same time period at the three more southern Alaskan sites of Poker Flat, Denali National Park, and Homer. In addition, in March and April of 2008, aerosol measurements were made during a NOAA research cruise (ICEALOT) to the Greenland, Norwegian and Barents Seas. Onboard the ship, measurements were made of aerosol optical and cloud nucleating properties. Results from the long-term measurements and ICEALOT will be presented in order to describe trends and climate-relevant properties of aerosol particles transported to the Arctic.