



Geographical and Temporal Differences in NOAA Observed Ground-Level Ozone in the Arctic

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The Arctic region is rapidly gaining interest and support for scientific studies to help understand and characterize the processes, sources, and chemical composition of the Arctic environment. In order to understand the Arctic climate system and the changes that are occurring, it is imperative to know the behavior and impact of atmospheric constituents. Surface level ozone in the Arctic is variable in both time and space and plays an essential role on the oxidation capacity of the atmosphere. NOAA Global Monitoring Division (NOAA/GMD) maintains continuous measurements and long-term records of ground-level ozone from Barrow, Alaska (since 1973) and Summit, Greenland (since 2000). Measurements taken by Thermo-Scientific ozone monitors are collected and examined with the NOAA/GMD Aerosol LiveCPD acquisition and software. These quality controlled data are used to develop seasonal climatologies, understand diurnal variation, and analyze differences in stations specific by addressing spatial variability in the Arctic. Once typical ozone behavior is characterized, anomalies in the record are defined and investigated. Increased ozone events associated with transported pollution and photochemical production of ozone, and ozone depletion episodes related to sea-ice halogen release and chemical destruction of ozone are the primary processes which lead to deviations from typical ground-level ozone conditions. The measurements taken from Barrow and Summit are a critical portion of the IASOA network of observations of ground-level ozone and are investigated to ensure proper data management and quality control, as well as provide the fundamental understanding of ground-level ozone behavior in the Arctic.