GEOSummit Baseline Measurement Results and Long-Term Plans

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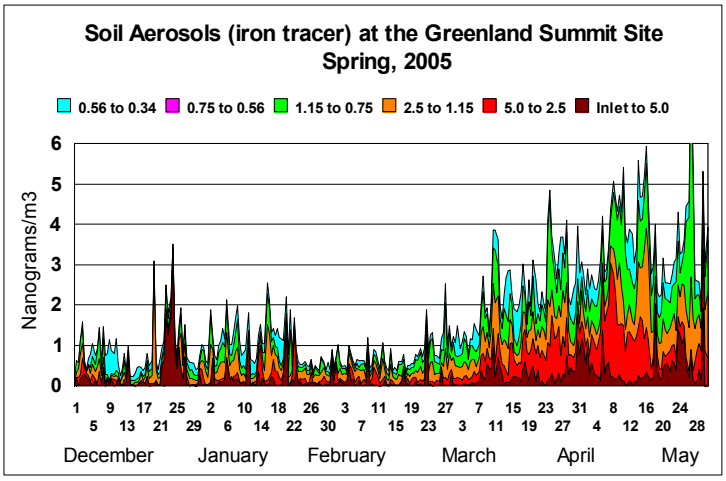
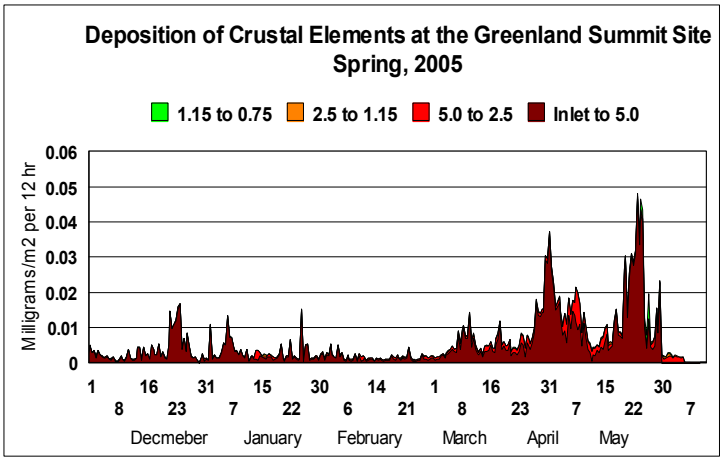
Long-term measurements of the Arctic atmosphere and surface snow allow for evaluation of links between aerosol and snow chemical compositions. Current research activities at the Summit Greenland Environmental Observatory (GEOSummit) include year-round measurements of DRUM aerosol size and S-XRF elemental composition, ICP-MS trace element measurements of surface snow and snow pits, snow accumulation and spatial variability, and other meteorological and snow properties. Preliminary results from the DRUM sampler indicate that while smaller soil aerosols (0.56 to 1.15 um) are the dominant size fraction by mass in the atmosphere, larger aerosols (>2.5 um) significantly contribute to snow pack concentrations. Aerosol concentration measurements vary temporally, reaching a maximum in the spring, as well as exhibit events correlating to unique air mass source regions. Additionally, atmospheric chemical concentrations correlate with surface snow samples, providing a link between chemical deposition and preservation. Future plans for the GEOSummit station include continuing year-round baseline measurements, while utilizing energy efficient facilities to reduce fossil fuel dependence and maintain a clean site. GEOSummit will continue to provide a platform for interdisciplinary collaborative research and will serve as a critical component of the Arctic Observing Network.





Figures 1. and 2. Soil aerosols measured at Summit showing that soil deposition rises appreciably in the spring.