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International Arctic Systems for Observing the Atmosphere (IASOA): Recent and planned observatory upgrades in Canada, Greenland, Russia and the United States

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International Arctic Systems for Observing the Atmosphere (IASOA) is a dynamic organization developed to enhance Arctic atmospheric research by fostering collaborations among researchers during the International Polar Year (IPY) and beyond. The member stations are Abisko, Sweden; Alert and Eureka, Canada; Barrow, USA; Cherskii and Tiksi, Russia; Ny-Ålesund, Norway; Pallas and Sodankylä, Finland; and Summit, Greenland. All of these observatories operate year-round, with at least minimal staffing in the winter months, are intensive and permanent. Measurement and building upgrades took place in 2007 at the Tiksi, Eureka, Summit and Barrow observatories. Instrumentation upgrades will continue in Tiksi and begin in Cherskii during 2008.

A new weather station building has been completed in Tiksi and is currently available for installation of instruments. A second Clean Air Facility that will be suitable for aerosol, chemistry, pollutant, greenhouse gases, fluxes and radiation measurements is expected to be completed in the spring of 2008. Equipment for real-time continuous

measurements of ozone and black carbon cycle gases are waiting to be installed at the new Tiksi station.

At the Eureka site many instruments were installed in summer 2007. These include, but are not limited to, a flux tower, a tropospheric ozone lidar and instrumentation that allows Eureka to become a part of the Baseline Surface Radiation Network (BSRN). With IPY funding the level of technical support at the site has been increased to provide an enhanced level of operations and greater operational flexibility, both necessary to pursue measurements of events that are rapidly evolving or have fallen outside normal operational constraints.

The Summit, Greenland observatory has recently released a Strategic Plan highlighting climate sensitive year-round observations, innovative research platforms and operational plans to increase renewable energy to maintain the pristine platform. Summit contributes to numerous international monitoring activities including the BSRN, the Global Atmospheric Watch (GAW) program, and the National Oceanic and Atmospheric Administration (NOAA) baseline measurement activities of the Global Monitoring Division (GMD). An upwind 'Atmospheric Watch Observatory' has been designed and a temporary one constructed to house GMD instrumentation. With the development of this facility, a new multi-channel gas chromatograph for continuous measurement of trace halocarbon gas concentrations was deployed. All NOAA/ESRL instruments have been moved to this new structure. In addition, NOAA now provides a science technician to the 9-month winter team of four.

The Barrow observatory has two new systems for aerosol size and chemistry composition, as well as new Persistent Organic Pollutants (POPs) measurements. The meteorology measurement and data system has been completely upgraded.

The University of Alaska Fairbanks (UAF) and NOAA are collaborating on measurements of CO_2 and CH_4 from three levels on a tower located near Cherskii. The CH_4measurements will be combined with new modeling methods developed at NOAA to infer regional-scale CH_4fluxes. These estimates will complement CH_4fluxes determined by UAF using a flux gradient method.