Introduction to Trace Gases Measurement in Mongolia

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The National Agency for Meteorology and Hydrology (NAMHEM) is responsible for air quality monitoring in Mongolia. There are 22 air quality monitoring stations (SO_2 and NO_2) in the residential areas of the country. In addition, the Russian Mongolian Center of Upper Atmospheric Research has measured total column ozone amounts using the M-124 ozone spectrometer from 1988 to 1992 at Sainshand, Mongolia. In 1992, NOAA ESRL started Greenhouse Gas (GHG) sampling with the Institute of Meteorology and Hydrology (under NAMHEM) of Mongolia in the southern desert area of Mongolia at Ulaan Uul. Since 2005, the Russian–Mongolian Expedition (BSC-IHM) has measured surface ozone concentrations in the desert region of Mongolia during summer periods. Also in 2005, NOAA ESRL (with Institute of Meteorology and Hydrology) started measurement of GHG and tropospheric ozone (vertical profiles) at Ulaanbaatar using light aircraft. The main focus of the Environmental Research Section of the Institute of Meteorology and Hydrology is air quality and GHG data analyses. Our monitoring results show that in the last 10 years SO_2 and NO_2 concentrations have increased 3 times in the capital city, and in the last 15 years GHG (data from NOAA) concentrations have increased 7 percent (20 ppm) in the Mongolian desert region.

Figure 1. NOAA ESRL pump and automated flask sampling pack prior to a sampling flight to collect air samples in flasks and measure the ozone profile upwind of Ulaanbaatar, Mongolia.