Cooperative China-U.S. Greenhouse Gases and Related Tracers Measurements Program

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In the past decade, China Meteorological Administration (CMA) has been participating actively in the GAW supporting global networks for ozone, UV, greenhouse gases, aerosols, selected reactive gases and precipitation chemistry. Sixteen years of flask sampling data from the cooperative China-U.S. greenhouse gases measurements program at Mt. Waliguan (36°17'N, 100°54'E, 3816m asl) in Western China are used effectively to help produce 3D annual global carbon cycle greenhouse gases pictures and to contribute the GlobalView-CO_2, CH_4 data products. CAMS and ESRL will enhance collaboration to set-up air sample analyzing system, to make in-situ and discrete measurements (CO_2, CH_4, N_2O, SF_6, CO, H_2, halo compounds, $\delta^{13}C$ & $\delta^{18}O$ in CO_2) from the GAW stations in China under the GAW framework. The measurements will be carefully calibrated on internationally agreed reference gas scales, and quality controlled, so that the measurements in China are an integral part of the global international effort to make continuous measurements of greenhouse gases. The results will be studied for trends in space and time, and for relationships between trace gases and with environmental variables. With the help of atmospheric transport models the observed spatial and temporal patterns will be "translated" into patterns of sources and sinks that are optimally consistent with the observations. The objectives of the long-term cooperation between CAMS and ESRL is to provide high quality data from typical background regions of China to permit climate and carbon cycle modelers to improve our understanding of the carbon cycle and predict how the atmosphere and climate will evolve in the future as a result of human's activities.
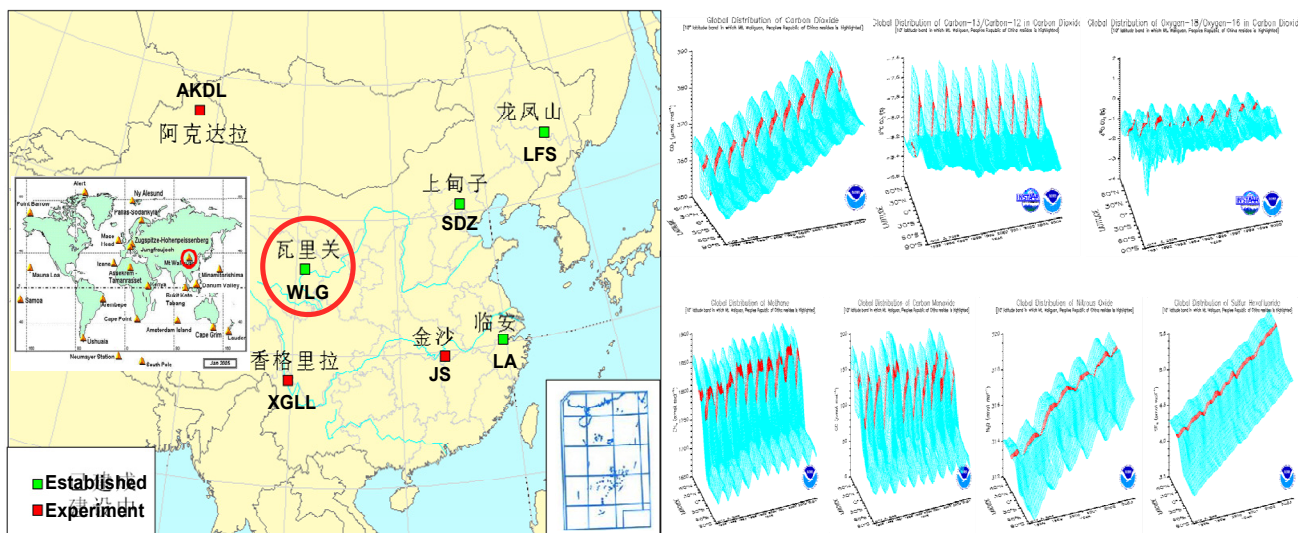
Figure 1. The seven GAW stations in China and the 3D annual global carbon cycle greenhouse gases pictures showing atmospheric CO_2, $\delta^{13}C$ & $\delta^{18}O$ in CO_2, CH_4, CO, N_2O, SF_6. Red lines indicate measurement data from Mt. Waliguan (36°17'N, 100°54'E, 3816m asl), western China.