

Characterizing the Niwot Ridge, Colorado C1 Site: Local and Regional Pollution

G.S. Dutton^{1,2}, B.D. Hall², S. Montzka², A. McClure-Begley^{1,2}, J. Morse³ and J.W. Elkins²

¹Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, CO 80309; 303-497-6086, E-mail: Geoff.Dutton@noaa.gov

²NOAA Earth System Research Laboratory, Global Monitoring Division, Boulder, CO 80305

³Institute of Arctic and Alpine Research (INSTAAR), University of Colorado, Boulder, CO 80309

The University of Colorado (CU) Institute of Arctic and Alpine Research (INSTAAR) maintains an alpine research station in the Rocky Mountains west of Boulder, Colorado called Niwot Ridge. There are numerous ecological, biological, hydrological, and atmospheric science research programs conducted at several locations on Niwot Ridge. The NOAA/GMD Halocarbons group collects samples and makes *in situ* measurements at two separate locations; Saddle and C1. The C1 site is situated in an alpine forest at 3021-m and has been an important location for NOAA/GMD measurements; from continental background estimates to a clean location to fill cylinders for subsequent use as calibrated air samples. However, occasional pollution events require care in interpreting *in situ* measurements from C1.

Though the events are not a daily feature they occur in about 1-2% of the C1 air samples depending on the compound. Hourly measurements by gas chromatographs have characterized pollution events as well as daily, monthly, seasonal and annual variations of several trace gases including chlorofluorocarbons (CFCs), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), bromochlorodifluoromethane (halon-1211), carbon tetrachloride (CCl_4), and methylchloroform (CH_3CCl_3). Complimenting these measurements, continuous meteorological and ozone data are acquired by CU and NOAA/GMD respectively. Further investigation into pollution frequency, timing, and wind direction may help constrain clean continental background conditions and provide a better understanding of local and regional pollution.

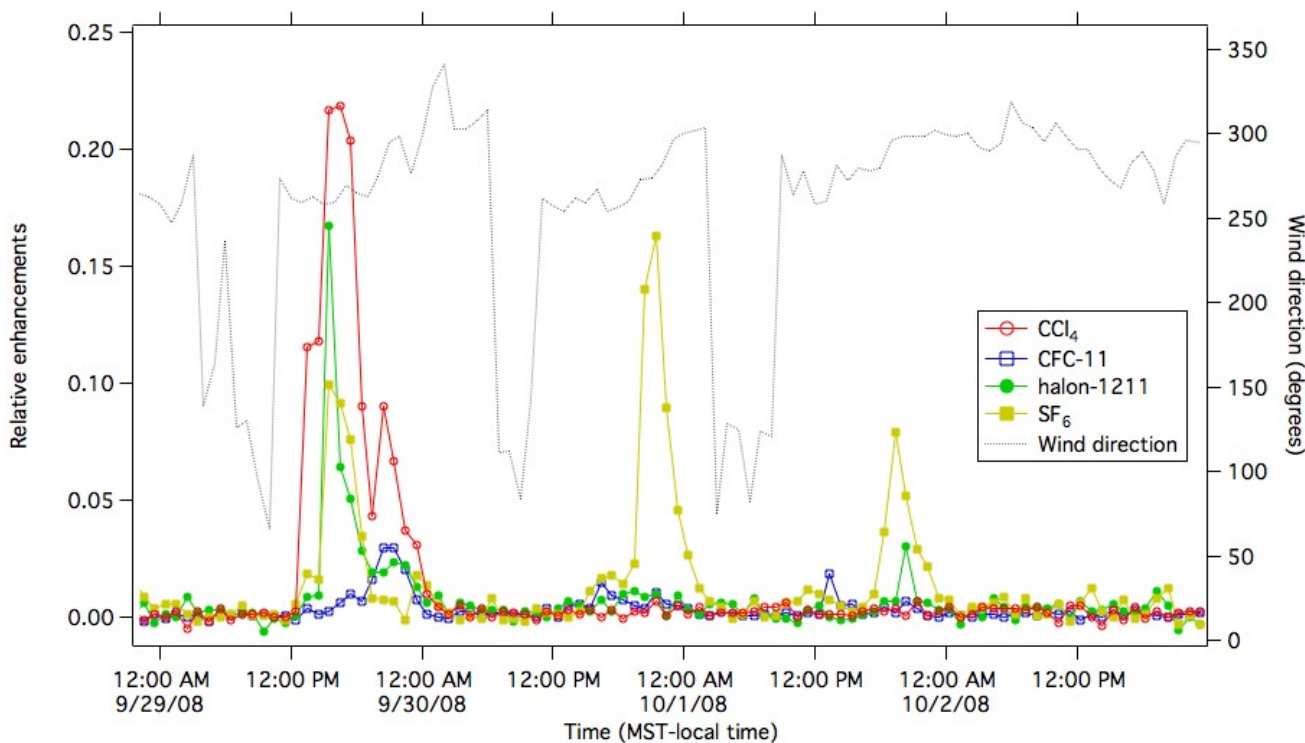


Figure 1. Pollution events sampled at the Niwot Ridge C1 site in the autumn of 2008 show enhancements of a few to 20 percent over the background levels depending on the compound. These particular events occurred in the afternoon during local westerly winds.