

Ensuring High-quality Data from NOAA's Cooperative Global Air Sampling Network

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The GMD Carbon Cycle Greenhouse Gases (CCGG) group Cooperative Global Air Sampling Network collects weekly air samples from ~60 sites. This global network spans in latitude from the South Pole (90°S) to Alert, Canada (82.45°N). Nearly all studies of global budgets of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), and carbonyl sulfide (COS) include observations from this network. To be most effective, the data must be spatially and temporally consistent.

In 2015, more than 6,000 discrete air samples collected in flasks were measured for atmospheric CO₂, CH₄, CO, hydrogen (H₂), N₂O, and SF₆. Data quality assurance (QA) and quality control (QC) are a fundamental part of our long-term data records. QA is performed in the CCGG measurement lab with daily control flasks, weekly field samples, short-term target tanks analyzed every two weeks, and long-term target tanks analyzed twice per year. QC is completed with software developed in CCGG to look at raw analysis files, time series plots, and trend plots. These tools, and other plotting routines, help us identify sample collection problems (Fig. 1).

Following QC, statistical methods are used to ensure data are representative of large well-mixed volumes of the atmosphere. This presentation will discuss our QA/QC strategies and findings.

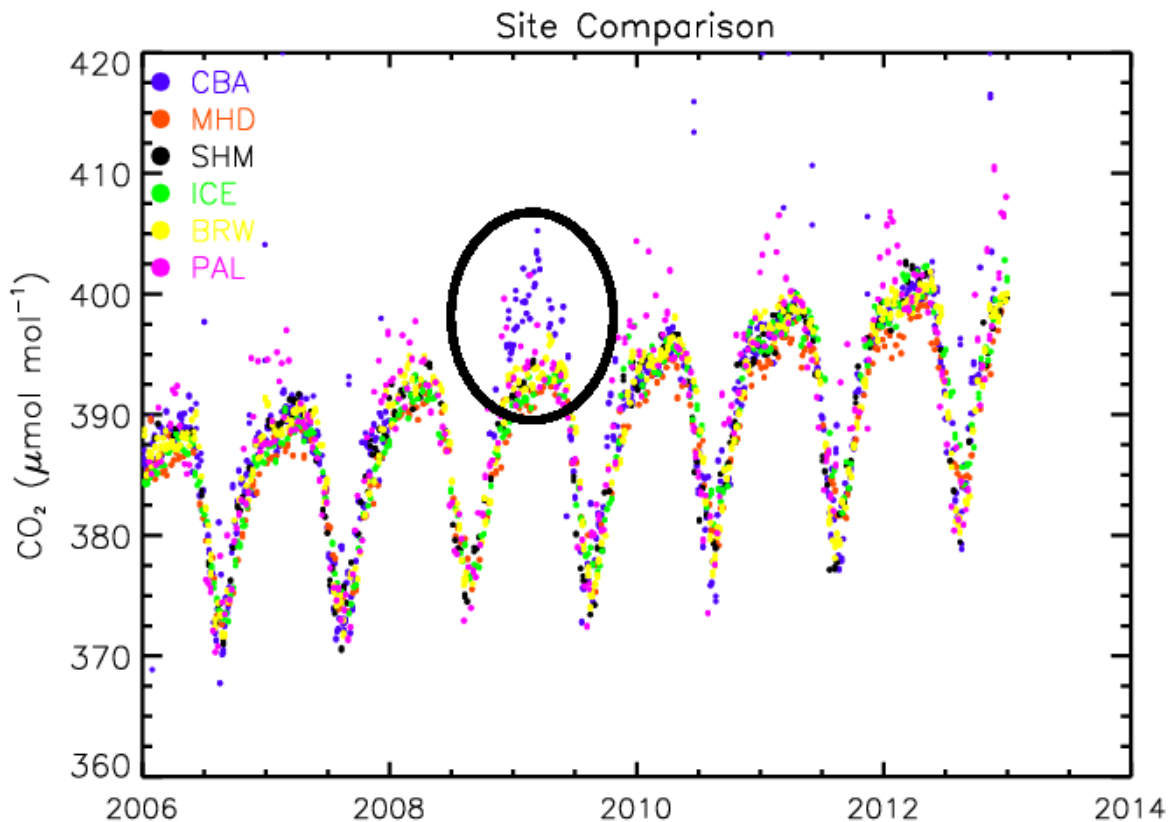


Figure 1. GMD measurements of CO₂ at Cold Bay, Alaska (CBA), Mace Head, Ireland (MHD), Shemya Island, Alaska (SHM), Storhofdi, Iceland (ICE), Barrow, Alaska (BRW), and Pallas-Sammaltunturi, Finland (PAL). Sample collection problem at CBA is circled in black.