

A Web-based Application to Manage Carbon Cycle Network Operations

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The GMD Carbon Cycle program has expanded considerably in the past few years. Since 2004, the surface network has added 4 fixed sites and 3 ocean crossings. The aircraft network has doubled in size with the addition of 12 sampling locations in North America. In 2005, more than 16,000 discrete samples were collected and analyzed for CO₂, CH₄, CO, H₂, N₂O, SF₆, and the stable isotopes of CO₂ and CH₄. Approximately 2500 aircraft samples were also analyzed for an additional 28 compounds by the GMD HATS group. VOCs were also measured by INSTAAR, University of Colorado (CU) in nearly 1300 surface samples.

Operating a discrete measurement program that includes 62 surface sites, 26 aircraft sites, 5000 network flasks, 100 surface samplers, and 150 aircraft samplers is increasingly difficult. Logistics are further complicated as the number of laboratories measuring the air samples and the number of compounds measured increases. A high degree of organization and automation is essential to ensure that field sites have a steady supply of flasks and reliable equipment; and in Boulder, that samples are routed to the appropriate analytical systems and critical operational information is readily accessible to researchers.

To help manage the logistical and operational tasks of the carbon cycle observing network, we developed a web-based “Operations Manager”. From any location, GMD and CU researchers have web-based access to the carbon cycle measurement and meta database. We will demonstrate several key features with emphasis on tasks which are likely relevant to other measurement programs.

The screenshot shows a web browser window titled "NOAA CMDL CCGG - Flask Manager - Mozilla". The page header includes the NOAA logo, "Global Monitoring Division", "Carbon Cycle Greenhouse Gases", and "Operations Manager Flask". The main content area is titled "Event Description" and contains a form for entering sample collection details. The form is organized into several sections:

- Available - 2**: A list of available flasks, including "NWR 1059-99" and "NWR 1060-99".
- Selected - 1**: A list of selected flasks, including "NWR 1059-99".
- Notes**: A section containing instructions for measurement and flask handling. The text reads: "** MEASUREMENT ** If 2 pair of flasks have the same sample date, one pair is analyzed using the default measurement path, the other pair is routed to MAGICC2 (CO2 only) and CO2C14. Stamp the MAGICC CO2, CO2C14 sample sheets MAGICC2-CO2 and CO2C14." and "** FLASK ** [1059-99] Mon Aug 1 09:20:23 2005: Please Pull for a 24Hr test. SS".
- Measurement Path**: A list of 10 steps for the measurement path, with the first three being "MAGICC", "co2c13", and "ch4c13".
- Form Fields**: A series of input fields for entering sample collection details, including Date (09Feb2004), Time (1630), Method (N), Wind Speed (5.9 m/s), Wind Direction (270 Degrees), Latitude (40 2N), Longitude (105 34W), and Altitude (3526 masl).

At the bottom of the form, there are buttons for "Accept", "Discard", "Clear", "Recall", "Defaults", and "Cancel".

Figure 1. Entering sample collection details and the analysis path in Operations Manager.