Plan Overview

A Data Management Plan created using DMPTool

Title: Atmospheric CO2 Concentrations, Mauna Loa Observatory, Hawaii, 2011-2013

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Air samples at Mauna Loa Observatory will be collected continuously from air intakes located at five towers – a central tower and four towers located at compass quadrants. Raw data files will contain continuously measured CO2 concentrations, calibration standards, references standards, daily check standards, and blanks. The sample lines located at compass quadrants were used to examine the influence of source effects associated with wind directions [3,4]. In addition to the CO2 data, we will record weather data (wind speed and direction, temperature, humidity, precipitation, and cloud cover). Site conditions at Mauna Loa Observatory will also be noted and retained. The final data product will consist of 5-minute, 15-minute, hourly, daily, and monthly average atmospheric concentration of CO2, in mole fraction in water-vapor-free air measured at the Mauna Loa Observatory, Hawaii. Data are reported as a dry mole fraction defined as the number of molecules of CO2 divided by the number of molecules of dry air multiplied by one million (ppm). The final data product has been thoroughly documented in the open literature [2] and in Scripps Institution of Oceanography Internal Reports [1].

The data generated (raw CO2 measurements, meteorological data, calibration and reference standards) will be placed in comma-separated-values in plain ASCII format, which are readable over long time periods. The final data file will contain dates for each observation (time, day, month and year) and the average CO2 concentration. The final data product distributed to most users will occupy less than 500 KB; raw and ancillary data, which will be distributed on request, will occupy less than 10 MB. Metadata will be comprised of two formats—contextual information about the data in a text based document and ISO 19115 standard metadata in an xml file. These two formats for metadata were chosen to provide a full explanation of the data (text format) and to ensure compatibility with international standards (xml format). The standard XML file will be more complete; the document file will be a umanreadable summary of the XML file.

The data product will be updated monthly due to updates to the record, revisions due to recalibration of standard gases, and due to errors. The date of the update will be included in the data file and will be part of the data file name. Versions of the data product that have been revised due to errors / updates (other than new data) will be retained in an archive system. A revision history document will describe the revisions made. Daily and monthly backups of the data files will be retained at the Keeling Group Lab (http://scrippsco2.ucsd.edu , accessed 05/2011), at the Scripps Institution of Oceanography Computer Center, and at the Woods Hole Oceanographic Institution's Computer Center.

The final data product will be release to the public as soon as the recalibration of standard gasses has been completed and the data have been prepared, typically within six months of collection. There is no period of exclusive use by the data collectors. Users can access documentation and final monthly CO2 data files via the Scripps CO2 Program website (http://scrippsco2.ucsd.edu). The data will be made available via ftp download from the Scripps Institution of Oceanography Computer Center. Raw data (continuous concentration measurements, weather data, etc.) will be maintained on an internally accessible server and made available on request at no charge to the user.

Our intent is that the long-term high quality final data product generated by this project will be available for use by the research and policy communities in perpetuity. The raw supporting data will be available in perpetuity as

well, for use by researchers to confirm the quality of the Mauna Loa Record. The investigators have made arrangements for long-term stewardship and curation at the Carbon Dioxide Information and Analysis Center (CDIAC), Oak Ridge National Laboratory (see letter of support). The standardized metadata record for the Mauna Loa CO2 data will be added to the metadata record database at CDIAC, so that interested users can discover the Mauna Loa CO2 record along with other related Earth science data. CDIAC has a standardize data product citation [5] including DOI, that indicates the version of the Mauna Loa Data Product and how to obtain a copy of that product.