

Regional and Local Carbon Flux Information from a Continuous Atmospheric CO₂ Network in the Rocky Mountains and Southwest

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In order to improve the understanding of regional carbon fluxes in the Rocky Mountain West, autonomous, inexpensive, and robust CO₂ analyzers (AIRCOA) have been deployed at six sites throughout Colorado, Utah and Arizona including one monitor on the Navajo Nation. An analysis of the diurnal cycles in CO₂ concentration from several sites will be presented. Sites near major population centers reflect the influence of industrial CO₂ sources in afternoon upslope flows, with CO₂ concentration increasing and variable in the mid to late afternoon. Other more remote sites show more consistent and decreasing CO₂ concentrations throughout the afternoon. These measurements provide insights as to when and under what conditions mountaintop CO₂ signals are regionally representative. It is also hoped these measurements will improve our current understanding of the influence of forests on global CO₂ levels. Our measurements will be included in future CarbonTracker assimilation runs and other planned model-data fusion efforts. However, questions still exist concerning the ability of these models to accurately represent the various influences on CO₂ concentrations in continental boundary layers, and at mountaintop sites in particular. Preliminary analyses of a CarbonTracker and RACCOON (Regional Atmospheric Continuous CO₂ Network) diurnal cycle and Mauna Loa, Cold Bay Alaska (NOAA ESRL/GMD) and RACCOON background CO₂ concentration comparisons will be presented. We plan to add a 7th AIRCOA observing site in Africa in order to supply essential CO₂ measurements and provide science outreach to the local populace. These data are available to the public on the internet in near real-time to support quality control, local science, and larger scale synthesis efforts. (<http://raccoon.ucar.edu>). Currently Native American students are helping maintain the detector on Navajo Nation (Roof Butte) and creating their own experiments using the available data sets.

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