Title
Estimation of Regional Net CO2 Exchange over the Southern Great Plains

Authors
Biraud, S.C.
Riley, W.J.
Fischer, M.L.
et al.

Publication Date
2004-09-07

Estimation of Regional Net CO_2 Exchange over the Southern Great Plains

SC Biraud, WJ Riley, ML Fischer, MS Torn, HS Cooley

Estimating spatially distributed ecosystem CO_2 exchange is an important component of the North American Carbon Program. We describe here a methodology to estimate Net Ecosystem Exchange (NEE) over the Southern Great Plains, using: (1) data from the Department Of Energy's Atmospheric Radiation Measurement (ARM) sites in Oklahoma and Kansas; (2) meteorological forcing data from the Mesonet facilities; (3) soil and vegetation types from 1 km resolution USGS databases; (4) vegetation status (e.g., LAI) from 1 km satellite measurements of surface reflectance (MODIS); (5) a tested land-surface model; and (6) a coupled land-surface and meteorological model (MM5/ISOLSM). This framework allows us to simulate regional surface fluxes in addition to ABL and free troposphere concentrations of CO_2 at a continental scale with fine-scale nested grids centered on the ARM central facility. We use the offline land-surface and coupled models to estimate regional NEE, and compare predictions to measurements from the 9 Extended Facility sites with eddy correlation measurements. Site level comparisons to portable ECOR measurements in several crop types are also presented. Our approach also allows us to extend bottom-up estimates to periods and areas where meteorological forcing data are unavailable.