

P4 Coupling CASA CO2 with NASA Unified WRF (NU-WRF)

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The magnitude, location, and mechanism of CO₂ terrestrial biosphere sinks are not well characterized and remain among the leading sources of uncertainty in carbon-climate interactions. One important reason for this is that key processes controlling CO₂ fluxes, e.g., photosynthesis, respiration, and boundary layer transport, occur at relatively small spatial/temporal scales. Taking advantage of NU-WRF's fine resolution capability, this on-going effort will integrate the observation-constrained CASA CO₂ vegetation flux model into the NU-WRF framework to study CO₂ spatial-temporal distribution at higher resolution (1~10 km). The resulting fluxes and transported CO₂ field will then be used to investigate the impact of small-scale variability in global analysis. This presentation will report the model development and initial comparison with global model simulations, followed by comparison with various tower and satellite observations.