1035-92-1372 **John M Zobitz*** (zobitz@augsburg.edu), 2211 Riverside Avenue, CB 93, Minneapolis, MN, and **David Moore**, **William Sacks**, **Russell Monson**, **David Schimel** and **David Bowling**.

Process based modeling of soil respiration fluxes in a subalpine forest.

We integrated ecosystem process models with measurements of CO_2 exchange to investigate the explicit inclusion of different soil processes on modeled values of respiratory soil CO_2 fluxes (R_{Soil}). Model parameters were determined from a Markov Chain Monte Carlo data assimilation routine that utilized a seven-year record of the net ecosystem exchange of CO_2 and environmental variables collected at a high-elevation subalpine forest located in the Rocky Mountains of Colorado. These soil models were subsequently evaluated in how they estimated the seasonal contribution of R_{Soil} to total ecosystem respiration (TER) and the seasonal contribution of root respiration (R_{Root}) to R_{Soil}. When soil heterotrophic respiration was dependent on simplistic functions of temperature and moisture independent of soil carbon pool size, model-data fits were poor. We conclude that modeling of root biomass dynamics is critically important to determine the contribution of soil respiration to total ecosystem respiration. This justifies the choice of biological, rather than empirical, models of soil processes. (Received September 20, 2007)