

**ASSIMILATION OF NEAR-SURFACE SOIL MOISTURE INTO THE THREE LAYER VARIABLE INFILTRATION CAPACITY LAND-SURFACE MODEL**

Laura M. Parada\* and Xu Liang

Civil and Environmental Engineering Department  
University of California, Berkeley

This work presents a variational scheme for assimilation of near surface soil moisture into the Three Layer Variable Infiltration Capacity (VIC-3L) hydrologically based land surface model. The assimilation framework provides an explicit and realistic representation of the uncertainties involved in the observations and model predictions of soil moisture states. It also assures that optimal states are appropriately constrained so that energy and mass are conserved within VIC-3L and corrections propagate throughout the model. The soil moisture images derived from electronically scanned thin array radiometer (ESTAR) during the Southern Great Plains Hydrology Experiment of 1997 (SGP97) are utilized. A comprehensive evaluation of the improvements in predictive ability of the VIC-3L model due to the assimilation of near-surface soil moisture is also provided.

---

\* *Corresponding author address:* Laura M. Parada, Univ. of California, Civil and Environmental Engineering Dept., 631 Davis Hall, Berkeley CA 94720;  
E-mail: lparada@uclink.berkeley.edu