Geophysical Research Abstracts,
Vol. 11, EGU2009-3897, 2009
EGU General Assembly 2009

EKF assimilation of near-surface soil moisture into ISBA: A comparison of error covariance evolution approaches.

C. Draper (1), J-F Mahfouf (2), and J Walker (1)

(1) Department of Civil and Environmental Engineering, University of Melbourne, Melbourne, Australia, (2) Meteo-France/CNRS, CNRM/GAME, GMME/TURBAU , Toulouse, France., (3) Department of Civil and Environmental Engineering, University of Melbourne, Melbourne, Australia

An implementation of the Extended Kalman Filter (EKF) for assimilation of remotely sensed near-surface soil moisture into the Interactions between Surface, Biosphere, and Atmosphere (ISBA) model is described, and the role of error covariance evolution in the assimilation is examined. ISBA is the land surface scheme in Météo-France's Aire Limitée Adaptation Dynamique développement InterNational (ALADIN) numerical weather prediction (NWP) model, and this work is directed towards providing accurate land surface initial conditions for NWP. In an experiment over July 2006, the EKF is used to assimilate near-surface soil moisture observations retrieved from C-band Advanced Microwave Scanning Radiometer (AMSR-E) data, using the VUA-NASA algorithm. First it is shown that with approximately correct error covariance information the EKF can translate near-surface soil moisture increments into useful analysis increments for the total root-zone soil moisture. Second, the benefit of using evolved background errors is tested, by comparing the EKF to a Simplified EKF (SEKF), in which background errors at the time of each analysis are static. The Kalman gain terms for the EKF and the SEKF are different since they are determined by different physical processes, and yet the resultant soil moisture analyses generated in this experiment were found to be similar.