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WATER CYCLE SEMINAR

Land-Surface Modeling Takes Root in NCEP Operational Weather and Climate Models: The multi-disciplinary development of land-surface/ hydrology modeling and land data assimilation at NCEP via multi-institution partnerships.

by

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NCEP/NOAA, *Wednesday, 14 April 2004*
Foothills Lab, Building 2, Room 1001
10:00 a.m.

This talk will present the development, testing and operational impacts of NCEP's Noah Land Surface Model (Noah LSM) over the past 5-10 years in NCEP weather and climate models. During this period, the advancement of the Noah LSM at NCEP has benefited from a number multi-institution partnerships in various disciplines, including hydrology, satellite remote sensing, and agricultural meteorology, as well as from participation in several components of the Global Energy and Water Cycle Experiment (GEWEX). These partnerships have included NWS Office of Hydrology, NESDIS, NOAA labs, NASA, NCAR, the Air Force Weather Agency (AFWA), and 5-6 universities, which have resulted in NCEP supporting a community version of the Noah LSM. Within the WRF model community, NCEP, NCAR and AFWA have joined to provide a "Unified Noah LSM", for use in common in their implementations of the WRF model.

The aforementioned partnerships also have provided an array of LSM validation tools, including streamflow, satellite derived snow cover and skin temperature, and surface station networks including ARM/CART (DOE), OASIS (OU Mesonet), SURFRAD (NOAA), and SNOTEL. Beside ongoing refinements to physics, present NCEP thrusts to improve Noah LSM performance include formalized parameter-calibration and development of regional and global land data assimilation systems (LDAS). The talk will end with some insights from the LDAS development. One insight is that despite a number of soil moisture databases emerging for widespread use from such initiatives as global or regional reanalysis or the GEWEX Global Soil Wetness Project, the optimum initial land states for your given land model are obtained by long-term cycling (at least 2 years) of your land model using your given model's parameter sets and gridded fields of terrain height, soil type and vegetation class.