

### **P33 Enhancements in RUC Land-Surface Model implemented in the 3.7 release of the WRF model and Land Information System (LIS)**

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RUC land-surface model (RUCLSM) has been more and more extensively utilized by the Weather Research and Forecast (WRF) community in different parts of the world and for different applications. It is also implemented in the operational Rapid Refresh (RAP) and High-resolution Rapid Refresh (HRRR) running at the NOAA National Centers for Environmental Prediction (NCEP). Very valuable feedback from the WRF community and National Weather Service forecast offices has motivated recent modifications to the RUC LSM that will be presented at the WRF Workshop. Many of these modifications are already included into the 20 April 2015 3.7 version of the WRF model, and others are still being tested in the experimental version of the RAP at the Earth System Research Lab in Boulder and will be implemented in the WRF 3.7.1 release in summer 2015. Work is also underway to add the 3.7 version of RUC LSM to the land-surface model suite available in NASA Land Information System (LIS). The RUC LSM modifications include further refinements to the snow model aimed at reducing cold biases over snow cover, especially during low-level warm advection situations. Significant reduction of cold biases has been achieved by the “mosaic” treatment of snow-covered and snow-free portions of the grid cell, which has removed the constraint of keeping skin temperature of the snow surface at or below the freezing point. Results from experiments with the “mosaic” and old approaches to the snow model will be presented at the Workshop. Also, other important aspects of the new version of RUC LSM include ensured conservation of moisture and energy budgets, modification to the direct evaporation algorithm, and a simple approach to take into account irrigation in cropland regions.