

5A.4 A comprehensive evaluation of the Noah LSM with multi-parameterization options (Noah-MP) within WRF

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The Weather Research and Forecasting (WRF) model is a state-of-the-art numerical weather prediction system used in both research and operational forecasting applications. The model is highly configurable to the users' requirements and suitable for a broad spectrum of weather regimes. Rigorously testing select configurations and evaluating the performance for specific applications is necessary due to the flexibility offered by the model. The Developmental Testbed Center (DTC) performed extensive testing and evaluation with the Advanced Research WRF (ARW) dynamic core for two physics suite configurations with a goal of assessing the impact the Noah Land Surface Model (LSM) with multi-parameterizations options (Noah-MP) had on the forecast performance. The baseline configuration was based on the Air Force Weather Agency's operational configuration, while the second configuration substituted AFWA's operational LSM (Noah) with Noah-MP.

This presentation will focus on assessing the forecast performance of the two configurations; both configurations were run over the same set of cases, allowing for a direct comparison of performance between the two. The evaluation was performed over a CONUS domain for a testing period from July 2011 through June 2012, with simulations being initialized every 36 hours and run out to 48 hours; a 6-hour "warm start" spin-up, including data assimilation preceded each simulation. The yearlong test period allows for robust results as well as the ability to investigate seasonal and regional differences between the two configurations. Results will focus on the evaluation of traditional verification metrics for surface variables as well as assessing other model output fields (e.g., snow water equivalent and soil moisture). A case study will also be presented to highlight similarities and differences between the two configurations' forecast performance.