

Comparison of AGRMET Model Results with In Situ Soil Moisture Data

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Abstract. The U.S. Army has operational requirements for soil moisture profiling capabilities using advanced satellite data assimilations techniques. Colorado State University is using a four dimensional variational (4DVAR) data assimilation system that requires quantitative knowledge of the first-guess background covariance fields. To evaluate the accuracy of the first-guess soil moisture fields, a statistical analysis of the output from the United States Air Force's Agricultural Meteorology model (AGRMET) was performed. The AGRMET model soil moisture outputs were compared with in situ soil moisture data from three different sources for the month of September 2003. In situ data used included the U.S. Army Engineer Research and Development Center (ERDC) Mud Lake, LA site, USDA's Little Washita watershed and the Oklahoma Mesonet. Volumetric water content measurements at various levels and precipitation were compared for quality control purposes. AGRMET's performance on soil moisture was shown to be tied to how well the precipitation was characterized within the model. Uncertainty in the quality of the in situ data was also noted. These results will be used to estimate the background error covariances of the 4DVAR data assimilation system and will allow for more accurate use of the available first-guess soil moisture data information (both from in situ and model output fields).

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