



Sensitivity of soil moisture analyses to contrasting background and observation error scenarios

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Soil moisture is a crucial variable for numerical weather prediction. Accurate, global initialization of soil moisture is obtained through data assimilation systems. However analyses depend largely on the way observations and background errors are defined. In this paper a wide range of short experiments with contrasted specification of the observation error and soil moisture background were conducted. As observations, screen-level variables and brightness temperatures from the Soil Moisture and Ocean Salinity (SMOS) mission were used. The region of interest was North America given the good availability of in-situ observations. The impact of these experiments on soil moisture and the atmospheric layer near the surface were evaluated. The results highlighted the importance of assimilating sensitive observations to soil moisture for air temperature and humidity forecasts. The benefits on the soil water content were more noticeable with increasing the SMOS observation error and with the introduction of soil texture dependency in the soil moisture background error.