Blending Different Soil Moisture Products over Tibetan Plateau and its Validation

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With the Tibetan Plateau observatory of plateau-scale soil moisture and soil temperature (Tibet-Obs) and the existing coarse satellite products, a blending soil moisture product over the Plateau is presented. The Tibet-Obs consists of three regional scale in-situ reference networks, including the Naqu network in a cold semiarid climate, the Maqu network in a cold humid climate and the Ali network in a cold arid climate. The Tibet-Obs networks provide a representative coverage of the different climate and land surface hydrometeorological conditions on the Plateau. The satellite data used includes the AMSR-E soil moisture products by VUA-NASA and the ASCAT soil moisture products by TU Wien. A simple Bayesian based method is used to blend different satellite-derived (e.g. active & passive) soil moisture data. Before applying the method, the bias in satellite data should be corrected by comparing satellite data with in-situ data. The bias correction is implemented with each (e.g. ground truth) of the three networks. The bias-corrected satellite data are then blended, and compared with the other two networks for validation. In addition, a merged observation data set (e.g. merging the three networks), by considering different weights for different climate and land surface, is generated for bias correcting satellite data, which is subsequently blended and compared with the three networks. The statistics matrices deduced by the four sets of datasets are used to evaluate the blending soil moisture product over Tibetan Plateau.