Estimating root-layer soil moisture for north China from multiple data sources

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Abstract Knowledge of the spatial and temporal patterns of root zone soil moisture is crucial for agronomical and water resources management. In this study, multiple data sources, including remotely sensed surface soil moisture retrieved from the European Remote Sensing Satellite-1/2 scatterometer (SCAT), soil moisture simulated by the VIP (Vegetation Interface Processes) eco-hydrological dynamical model, and *in situ* soil profile measurements were employed to assess root zone soil moisture over the Baiyang Lake Basin, north China. Correlation coefficients between the SCAT surface soil moisture dataset and VIP simulation in four seasons varied from 0.47 to 0.66 ($p < 0.01$). General agreement among remotely sensed retrieval, the eco-hydrological model prediction and *in situ* measurements shows the potential of the scatterometer for routine acquirement of surface soil moisture patterns in the study area. In addition, the overall agreement between VIP predicted root-layer soil moisture and *in situ* measurements confirms the reliability of using the VIP model for root-layer soil moisture monitoring at seasonal scales.

Key words root zone soil moisture; scatterometer; VIP model; north China