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The use of ASCAT Surface Soil Moisture data in crop growth modelling

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The availability and quality of spatial model input data influence the reliability of spatial crop model applications. Therefore remote sensing data applied to ecosystem models are showing some very encouraging outcomes. Precipitation and soil model input data, which are related to soil water content variations, need to be considered critically, because of its importance for soil water storage and water availability for crops. Since most models work at daily time steps, daily weather input data are needed including maximum and minimum temperature, solar radiation as well as precipitation. Soil water content at different soil layers is a common daily model output as it is a main growth limiting factor.
The performance of soil wetness outputs from the crop growth model DSSAT and satellite based ASCAT soil surface moisture data (ASCAT SM) with field measurements of soil water content were tested in north-east Austria. ASCAT SM delivers satisfying estimations under medium soil wetness conditions, related to low variation of precipitation frequency, as well as during low vegetative stage. Furtherly a new method for rainfall estimation through soil moisture observation (Brocca et al. 2013) were used as a crop model input in comparison to weather stations and INCA (Integrated Now-casting through Comprehensive Analysis) data in three Austrian sites characterized by distinct climatic conditions.