



Incorporating Sentinel-2-like remote sensing products in the hydrometeorological modelling over an agricultural area in south west France

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The Sentinel-2 mission will enable to monitor the land cover and the vegetation phenology at high-resolution (HR) every 5 days. However, current Land Surface Models (LSM) typically use land cover and vegetation parameters derived from previous low to mid resolution satellite missions. Here we studied the effect of introducing Sentinel-2-like data in the simulation of the land surface energy and water fluxes in a region dominated by cropland. Simulations were performed with the ISBA-SURFEX LSM, which is used in the operational hydrometeorological chain of Meteo-France for hydrological forecasts and drought monitoring. By default, SURFEX vegetation land surface parameters and temporal evolution are from the ECOCLIMAP II European database mostly derived from MODIS products at 1 km resolution. The model was applied to an experimental area of 30 km by 30 km in south west France. In this area the resolution of ECOCLIMAP is coarser than the typical size of a crop field. This means that several crop types can be mixed in a pixel. In addition ECOCLIMAP provides a climatology of the vegetation phenology and thus does not account for the interannual effects of the climate and land management on the crop growth. In this work, we used a series of 26 Formosat-2 images at 8-m resolution acquired in 2006. From this dataset, we derived a land cover map and a leaf area index map (LAI) at each date, which were substituted to the ECOCLIMAP land cover map and the LAI maps. The model output water and energy fluxes were compared to a standard simulation using ECOCLIMAP only and to in situ measurements of soil moisture, latent and sensible heat fluxes. The results show that the introduction of the HR products improved the timing of the evapotranspiration. The impact was the most visible on the crops having a growing season in summer (maize, sunflower), because the growth period is more sensitive to the climate.