



Study of land-use changes impacts on surface hydrology over the Niger super site using a spatialized SVAT model.

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This paper will show how a regionalized SVAT model validated over present day climate and land use, may be used to understand the role of land use on surface hydrology at the regional scale. For this purpose, the SEtHyS_Savannah model (Saux-Picart et al., 2007) was developed to simulate the water and energy fluxes over savannah landscapes. It has been validated at different time and space scales.

In this model, the vegetation cover is represented by a two layer model and a mulch approach is used for the soil description. The model was first regionalized over the Niger super site (about 50kmx40km), with the help of remote sensing data. The model uses a regular 1km grid and each cell is divided in sub-grid patches in order to represent land cover and soil heterogeneities (tile approach). The vegetation cover parameters were prescribed according to the land cover map and the seasonal evolution of the Leaf Area Index (LAI), both derived from SPOT-HRV data imagery. The atmospheric forcing was taken homogeneous over the area and provided by a meteorological station installed at Wankama instrumented site. The surface water and energy budgets were simulated for a one-year period (2005) and validated against MSG-SEVIRI land surface temperature product (Saux-Picart et al., 2007). The results show realistic surface

fluxes and good agreement with the temperature observations. They gave us confidence in the representation of soil-vegetation processes and permitted us to conduct sensitivity studies with different land use changes scenarios.

The results of various simulations forced with realistic land cover maps representing recent past, present and future vegetation will be presented. The resulting water and energy budgets will be discussed.