MEDITERRANEAN VEGETATION-WATER INTERACTIONS: A MODEL COMPARISON AT DIFFERENT COMPLEXITY LEVELS

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Type, density and structure of vegetation determine important hydrological processes. In fact, it is well known that the vegetation plays a key role in the catchment's water balance particularly for semi-arid areas that generally are water-controlled ecosystems. In recent years, considerable efforts have been made to adequately reproduce and predict the interaction between the vegetation and the water cycle under different scales. For this reason, the number of hydrological models which include vegetation as a state variable has increased substantially in the last decade.

The present study compares the capability of two models in reproducing the interaction between vegetation and water of a Mediterranean catchment. The models are BIOME-BGC and LUE, and both are validated using field data and satellite imaginary. The comparison shows a better performance of BIOME-BGC reproducing vegetation dynamics. However, BIOME-BGC shows also limitations: the scale, which can be too detailed for watershed studies; the initial physiological parameters, which can be difficult to estimate spatially and temporary; and the lack of a proper hydrological representation. On the contrary, LUE performs better under watershed scale and it needs less information, but since it is a parsimonious and conceptual model, some vegetation processes could be neglected. In this point, the research question is: is the proposed parsimonious model capable to reproduce properly the vegetation dynamics or, contrarily, a more complex model is needed?

According to the models comparison, the best model can be selected depending on the scale and the objective of the study. A proper combination of both models would lead to a more suitable model that reproduces accurately vegetation-water interaction.