

Mediterranean vegetation-water interactions: a model comparison at different scales

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In Mediterranean ecosystems, the catchment water balance is directly affected by land use. Type, density and structure of vegetation determine important hydrological processes. 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.

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 imagery. 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 temporally; 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.

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.