On the importance of remote sensing data to implement a dynamic vegetation model applied to a semi-arid experimental plot

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Efforts to better understand the components of catchments' water balance have traditionally been one of the objectives of the hydrological community. Very few hydrological models incorporate vegetation development as state variable. This is beginning to change with the recognition by the hydrological community that biological processes play a key role in catchment's water balance. In addition, some studies confirm that vegetation density controls most of hydrological processes in semi-arid regions.

However, the most of the dynamic vegetation models are too complex to be coupled with hydrological models and they incorporate variables and inputs which are difficult to be estimated across space and through time. For this reason, we have focused on a parsimonious and robust dynamic vegetation model based on the Light Use Efficiency index (LUE), to be coupled with a hydrological model in a semi-arid basin (La Hunde, East of Spain) predominantly covered by Aleppo pine (*Pinus halepensis*).

This model needs to be implemented, i.e. calibrated and validated. Satellite-based remote sensing data are the main source of information employed for this task. In this work, vegetation-related satellite products are analyzed in order to assess their relation with vegetation state at catchment scale. NDVI shows a strong dependence on soil moisture and leaf water content, explainable by the impact of water-stress on chlorophyll content in Aleppo Pine leaves. The EVI proves to be strongly related to biomass dynamics and to LAI in particular.