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# Linking the hydrological regime and the vegetation cover evolution in a mountainous region in southern Spain from Landsat TM data for long term assessment.

Cristina Aguilar (1), Rafael Pimentel (2), Julie C. Zinnert (3), María José Pérez-Palazón (1), Laura Wood (3), and María José Polo (1)

(1) University of Cordoba, Andalusian Institute for Earth System Research, Cordoba, Spain (ag1pogom@uco.es), (2) Swedish Meterology and Hydrology Institute, SMHI, Norrköping, Sweden, (3) Virginia Commonwealth University, Dept. Biology, Richmond, U.S.A.

Vegetation covers play a key role in the energy and water balance in semiarid areas. Their distribution and their local evolution are generally related to the long and short term hydrological regime on a local basis. Remote sensing provides an efficient means to monitor vegetation evolution on different time scales, and hydrological signatures can be derived when a significant relationship can be found between vegetation cover descriptors and some target hydrological variable.

This work shows the relationship between the evolution of the vegetation cover fraction and the hydrological regime on different time scales throughout a catchment in a semiarid mountain area influenced by the snow regime on an annual basis, and the estimated trend during the reference period 1960-2000 and to the current date. For this, the seasonal relationship found between the vegetation fraction cover on different time scales from a 15-yr series of Landsat TM data, together with the available historical vegetation and soil use cartography, and selected weather variables was used to estimate vegetation cover fraction since 1960 in the Sierra Nevada area, southern Spain, with altitudes ranging from 1000 to 3479 m a.s.l. From the results, two groups of data were retrieved i) vegetation cover fraction for months with cloudy conditions (unavailable satellite data), b) averaged vegetation cover time series over sub-basins in the study area on both the seasonal and annual scales since 1960.

The work shows the potential of remote sensing data to retrieve complementary information to ground measurements and relationships on significant spatial scales to assess long term shifts of both hydrological and vegetation descriptors. The results are of application for projecting one the major components of vegetation shifts on future climate scenarios.