



Clustering Rangelands Based on NDVI Annual Patterns with different aridity grades

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Soil-vegetation-atmosphere transfer (SVAT) schemes explicitly consider the role of vegetation in affecting water and energy balance by considering its physiological properties. However, most current SVAT schemes and hydrological models do not consider vegetation a dynamic component. The seasonal and monthly evolution of the physiological parameters is kept constant year after year. This fact is likely crucial in transient climate simulations for hydrological models used to study climate change impact. Therefore, the analysis of vegetation dynamics became crucial to study these scenarios.

Vegetation dynamics, especially over large scales, can be monitored using remote sensing. The Normalised Difference Vegetation Index (NDVI) is still the most well-known and frequently used spectral indices derived from remote sensing, identifying vegetated areas and their condition. NDVI is based on plants' differential reflectance for different parts of the solar radiation spectrum.

In this work, we present a classification of rangelands in Spain based on the NDVI time series using them, like the result of SVAT and defining metrics and the Hurst Exponent from detrended fluctuation analysis. These areas are located in different precipitation and temperature regimen but with a Mediterranean climate with different aridity grades: Huescar, Castuera and Lozoya. K-means and unsupervised random forest were used to cluster the pixels using time series metrics and Hurst exponents. The clustering results will be discussed by comparing them to climate and topographical data.

References

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