



## **Analysing spatio-temporal land degradation dynamics in dry rangelands using landscape metrics and satellite time series data**

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Many of the dry rangelands of Southern Europe are threatened by land degradation. This process not only reduces the land's ecological functioning, but also its capacity to provide ecosystem goods and services for local land users. In rangelands, one important aspect is vegetation degradation, which reduces the land's capacity to support livestock. Thus, there is an urgent need to understand the complex dynamics and drivers of land degradation. In the past, both have been difficult to study due to the extensive spatial and temporal scales involved. In the last decade, a large number of remotely sensed imageries has become available for free, which enables a new approach to this topic.

The aim of this research is to study land degradation as a multidimensional process incorporating its spatial and temporal components. We developed a methodological approach that makes use of long-term satellite Landsat data. Here, we use imagery of a typical degraded Mediterranean rangeland in Southern Cyprus (Randi Forest) for the years 1998-2015. We have chosen the NDVI as a proxy for vegetation greenness and applied different spatial landscape metrics to calculate changes in vegetation patterns over time. Further, we applied a time-series based approach (BFAST) on selected pixels, to look for sudden changes and trends in the vegetation dynamics.

The results promoted our knowledge on how land degradation dynamics in Mediterranean rangelands can be captured through spatio-temporal vegetation dynamics and allowed us to select the most suitable metrics for further analysis. In the long-term, we aim at using Landsat satellite data covering 30 years. To gain a functional understanding of land degradation, we want to overlay our results from the remotely sensed data with results of an eco-hydrological model (SWAT).