

EGU21-14964

<https://doi.org/10.5194/egusphere-egu21-14964>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Patterns in woody vegetation cover across forests of a main Mediterranean island in relation to precipitation regime.

Sara Simona Cipolla and Nicola Montaldo

ITALY, UNIVERSITY OF CAGLIARI, DICAAR, CAGLIARI, Italy (saras.cipolla@unica.it)

In water-limited ecosystems such as those encountered on Mediterranean mountainous areas of shallow soil, climate-induced changes in precipitation regime are expected to influence the ability of remnants of native forests to resist or adapt to predicted reduced precipitation scenarios. The objective of this work was to understand the role of precipitation and physiographic ecosystem properties in woody cover spatial variability of Mediterranean sclerophyllous forests located within main protected areas of the Sardinia Island (Italy), an excellent reference condition for Mediterranean hydrologic studies due to the relatively low urbanization and human activities. Analyzed forests differ in altitude (0-1500 slm.), mean annual precipitation (450-1200 mm) over 95 years of daily data, exposition, dominant species, density, and soil thickness. Forests have been broken down into 30 * 30 m plots based on their type. Using data from the Landsat satellite sensors, temporal trends in the NDVI (Normalized Difference Vegetation Index) were quantified. We related these trends with different environmental variables to understand the effects of the variation of precipitation regimes and forest type on woody cover density. A significant direct effect of drought has been observed in the dry 2017 in all forests resulting in a significantly reduced NDVI values especially on south facing slopes plots and low soil thickness plots. On the contrary forest canopy were more stable on mesic habitats demonstrating that the availability of soil humidity is more important than solar radiation. Finally, the lowest values of NDVI were observed in semi-arid sclerophyllous forest dominated by species tolerant to drought and very thin stony soil layers. The identification of the factors that contribute the most to the increase in the vulnerability and the decrease of tree cover density of forests will allow to optimize planning and management strategies also under further drier climate changes prospective.