

Abstract

NDVI Analysis for Monitoring the Spatial and Temporal Variability of the Vegetation Cover in Sardinia: A Proposal to Support Natural Hazard Management [†]

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Abstract: In Sardinia, the high inter-annual variability of rainfall, increase in average temperatures, and anthropic activities are determining factors for the detectable variations in the vegetation cover. Therefore, it is essential to build an integrated assessment system for monitoring the aforementioned factors. From this point of view, the NDVI (normalized difference vegetation index) is one of the most widespread tools for dynamic and qualitative analysis of the vegetation conditions. The condition of the vegetation and the seasonal meteorological trend are strongly correlated and constitute important information in support of environmental emergency monitoring. Monitoring this kind of information, with an adequate temporal and spatial scale, is essential for fire protection. From 2004 to 2021, the NDVI has been studied with different spatial resolutions in the framework of the activity of the Regional Agency for the Protection of the Environment of Sardinia (ARPAS). The processed data are used by the Local Functional Center of the Civil Protection of Sardinia. Although ARPAS uses the highest resolution available with the Modis sensor, specifically the Terra and Aqua sensors made available by NASA, the purpose of this work is to analyze the production activity of the NDVI maps during the period of 2011–2021, to evaluate its effectiveness as a monitoring tool to support fire prevention. Therefore, in the INTERREG Medstar project, we proceeded to analyze the Moderate-resolution Imaging Spectroradiometer (MODIS) data, with a focus on the NDVI data, with a spatial resolution of 250 m and a temporal resolution of 16 days. The statistical relationships between the spatial database obtained and a set of environmental parameters and climatic indicators describe the trend vegetation conditions over the year. The identification of the vegetative stress scenarios makes it possible to program the activities of land protection with greater accuracy.

Keywords: NDVI; fire prevention; land cover



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