



Abstract

Keep an Eye on Mediterranean Vegetation: A Phenocam Approach [†]

Ludovica Oddi ^{1,*} , Chiara Maggi ¹, Paolo Fiorucci ², Edoardo Cremonese ³, Gianluca Filippa ³, Marta Galvagno ³, Consolata Siniscalco ¹ and Umberto Morra di Cella ²

¹ Department of Life Sciences and Systems Biology, University of Torino, 10124 Torino, Italy

² CIMA Research Foundation, 17100 Savona, Italy

³ Environmental Protection Agency of Aosta Valley, 11020 Aosta, Italy

* Correspondence: ludovica.odd@unito.it

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Plant phenology reveals important information about the physiological status of plants, especially in relation to water availability. In many seasonally dry regions, such as the Mediterranean region, low water availability not only affects plant phenology, but also increases plant flammability and, thus, the likelihood of wildfire occurrence, suggesting that the phenological status of living vegetation can be used as an effective proxy to estimate fire risk for management purposes.

In the present study, we applied a phenocam approach to monitor the phenology of three different Mediterranean sites of the Liguria region: the Portofino Regional Natural Park, the Capo Mortola Site of Community Importance, and the Cinque Terre National Park. In early 2020, a Stardot NetCam XL was installed in each site at a height ranging from 8 to 15 m, to collect hourly images from 6 a.m. to 6 p.m. Based on field campaigns, all species occurring in the phenocam field of view were identified and mapped to define specific regions of interest (ROIs). Afterwards, we extracted the mean greenness index of all the ROIs for each image and the seasonal trajectories of each species were analyzed.

Results showed that phenocams are an effective tool for phenological studies even in areas dominated by evergreen species and characterized by complex mosaics. We were able to detect phenological events at the species level, e.g., the flowering of evergreen species, such as *Erica arborea* and *Arbutus unedo*, and the leaf senescence of deciduous trees, such as *Fraxinus ornus*.

Our study represents a successful preliminary investigation of phenological monitoring through phenocam in Mediterranean areas, which are often considered wildfire hotspots. Moreover, this technique is very useful in areas which are difficult to access for in situ observations due to their dense vegetation, and it allows the assessment of the phenodiversity at very high spatial and temporal resolution.

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