



Responses of Riparian Vegetation NDVI to changes in water availability in heterogenous ecosystems

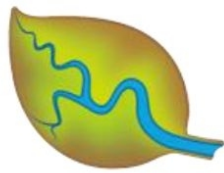
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Riparian areas include a diverse array of plant and animal species ensuring several ecosystem services (e.g. storing and purifying water, preventing erosion, providing habitat). However, these areas have been deteriorating their health condition as a result of anthropogenic alterations and increasing frequencies and intensities of climate extremes, such as drought. In this study, we combined historical climate data (precipitation and temperature) with time series (from 2016 to 2019) of Normalised Difference Vegetation Index (Sentinel 2 - NDVI) to investigate seasonal and phenological responses of riparian vegetation during periods of droughts and across naturally and managed vegetation types: Coniferous, Broadleaved forest and Grassland. Our study area was the Cávado river basin (NE Portugal). We analysed the attributes of the NDVI seasonal dynamics (e.g. annual mean, relative range, coefficient of variation, and their inter-annual variabilities) in 20 squared plots (of 1 ha per plot) randomly selected in each vegetation type. Results suggest that the use of NDVI represents a promising method to obtain spatial distribution data for evergreen and deciduous trees, to estimate species diversity, based on the spectral variation hypothesis, and to investigate their relationship with climatic variables. Our findings show the importance of remote sensing data in providing useful cost-effective estimates of diversity and distribution patterns over space and time. From an ecological and operational point of view, the approach presented herein could improve our ability to map vulnerable areas within the river basin and to implement more efficient conservation practices.



limnología
2020

Preferred Session: RS9. Monitorização, gestão e restauração de ecossistemas aquáticos

Type of communication: Oral: X