


**Summer Field School [Online] on
 MOUNTAIN ECOSYSTEMS AND RESOURCE MANAGEMENT
 Ivano-Frankivsk Region :: 19-28 September, 2021**

DELEGATE PARTICIPANT'S PROFILE

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Highest Education	Ph.D. (Forestry)
Personal Statement	<p>Dear colleagues! Further I would like to say a few words in order to present myself as the delegate participant for the forthcoming Summer School on 'Mountain Ecosystems and Resource Management'. The activity so far has focused on the study of soil and forest formations. I have used photogrammetric methods in various studies, as well as the development of new methods for vegetation analysis using GIS means. So far we have used images provided by ESA, Sentinel 2. For future detailed studies I will use multispectral images provided with the help of drones to acquire data. I use QGIS and ArcMap programs, and for image processing - Agisoft Metashape. The acquired knowledge helped me to carry out both scientific studies and research contracts with third parties. I was involved either as a member of the research team or as a project manager in various pedological studies.</p>
Paper/Presentation Title (Unpublished Research or Review or Field Work)	<i>Climate change in Carpathian forests: natural logging in Sibiu area Romania case study</i>
Keywords	Forest; Climate changes; GIS; remote sensing
Abstract (100-300 words)	Climate change is becoming more acute, including in terms of individual perception. Forest, as an ecosystem, has a special role to play in mitigating climate change, protecting the soil, water and air. One of the challenges of sustainable

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management is the identification of high-risk areas, at least in the case of spruce forests, such that wind and snow breaks can be identified with the highest precision in time and space. Current IT solutions based on remote sensing technologies, offers the possibility of identifying areas affected by abiotic and biotic factors even in hard-to-reach areas: blocking the communication paths in winter due to snow, reducing the metabolism due to infestation with phytopathogenic agents that are hardly identifiable in the early stages of evolution. The area of study is Romania, Sibiu county, Rasinari Forest District. For monitoring changes in forest vegetation due to abiotic factors, especially wind or snow breaks, the present study was based on Sentinel-2 images having the RGB-visible bandwidth as well as NIR (near infrared) to determine the NDVI vegetation index, with a pixel size of 10 m: the three classical RGB bands Blue, Green and Red and a Near Infra-Red band. The AOI is delimited by the forest areas for which the forest management of Rasinari county is ensured. Management plans present a spatial component organized in a GIS database. The satellite images were downloaded using the QGIS Semi-Automatic Classification Plugin. Monitoring of vegetation status is achieved with determined NDVI (normalized differential vegetation index), applying the algorithm for bands 4 and 8, what it quantifies vegetation by measuring the difference between near-infrared (which vegetation strongly reflects) and red light (which vegetation absorbs). Healthy vegetation (chlorophyll) reflects more near-infrared (NIR) and green light compared to other wavelengths. But it absorbs more red and blue light. This is why our eyes see vegetation as the color green. The NDVI value is between -1 and +1. Low reflectance (or low values) in the red channel and high reflectance in the NIR channel, will yield a high NDVI value. This is characteristic for a good health of vegetation. In this regard, the area covered with forest was monitored, for which Sentinel 2 multispectral images were collected during 2015-2018, and then the NDVI vegetation index was determined. Using GIS technologies, areas affected by abiotic destabilizing factors were identified.

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	Forest management has been able to make the most suitable decisions in this case and, as we can see, especially using NDVI, the affected area is regenerated. We used as inputs 4 spectral bands of S2 resampled to 10 m pixel size.
More Information (weblinks)	https://web.ulbsibiu.ro/iulian.bratu/ Google Scholar https://orcid.org/0000-0002-8557-4008