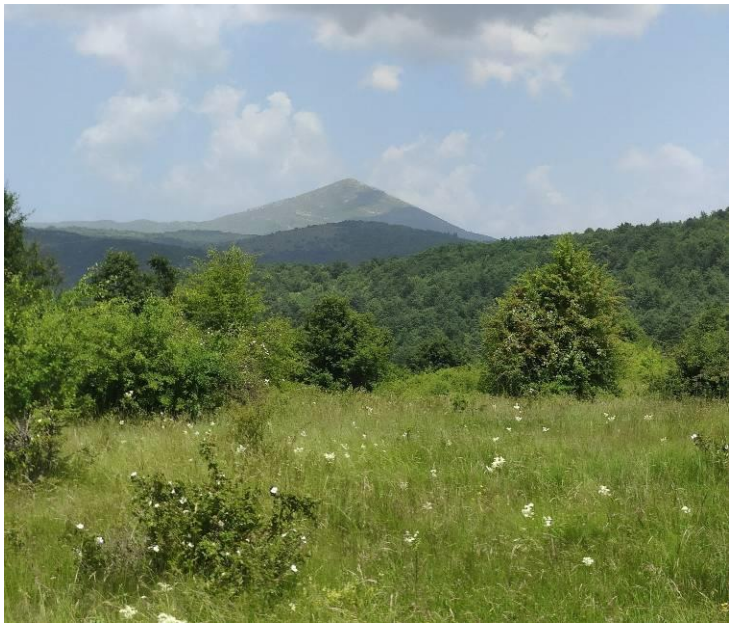
Serbian Society of Soil Science

University of Belgrade, Faculty of Agriculture

BOOK OF ABSTRACTS

3rd International and 15th National Congress

SOILS FOR FUTURE UNDER GLOBAL CHALLENGES



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COMPARISON OF NDVI AND ARVI VEGETATION INDICES: CASE STUDY IN THE CITY OF BELGRADE, SERBIA

Darko Jaramaz*, Vesna Mrvić, Radmila Pivić, Sonja Tošić, Biljana Sikirić, Aleksandra Stanojković-Sebić, Jelena Maksimović

Institute of Soil Science, Teodora Drajzera 7, 11000 Belgrade, Serbia
*Corresponding author: soils.jaramaz@gmail.com

Abstract

Global climate changes affects plant growth, in the same perspective, rapid and accurate vegetation mapping has gradually become of key importance for monitoring and assessing environmental conditions. Remote sensing includes analysis and interpretation of Earth's surface digital images, that can be obtained from the airspace and aerospace, as well as from the terrain surface. In the last few decades, the possibility of obtaining spatially oriented information by applying remote sensing has drastically increased. Remote detection enables the analysis of plant cover without physical contact with the examined objects and can be applied to large-scale areas. Vegetation indices obtained from the satellite images are simple and efficient algorithms for quantitative and qualitative assessments of vegetation cover, as well as monitoring of plants condition. NDVI (Normalized Difference Vegetation Index) is an indicator of vegetation distribution on a given area, that measures the amount of vegetation through differences between spectral reflections. ARVI (Atmospherically Resistant Vegetation Index) is a vegetation index whose values are prone to changes under the influence of atmospheric factors (rain, fog, smoke, dust, air pollution, etc), and represents corrected NDVI index for the effects of atmospheric scattering in the red reflection spectrum, using measurements in blue wavelengths. Previous researches have determined that in areas with high atmospheric pollution the ARVI index provides better results than the NDVI index. The European Space Agency (ESA) in 2015 has launched a Sentinel-2 mission as part of the Copernicus program, the mission consists of two satellites: A (launched on June 23, 2015) and B (launched on March 7, 2017), which are both equipped with multispectral sensors resolutions from 10 to 60 m that obtaining 13 bands. The data from the Sentinel-2 mission in the non-vegetation and vegetation period were used in this study, for the determination of the NDVI and ARVI indices suitability in urban and rural areas. The study area was the City of Belgrade, the capital of the Republic of Serbia which has a moderate continental climate, that covers 322.268 ha, and includes 10 urban and 7 suburban municipalities. The result obtained with this research displays differences in values between NDVI and ARVI indexes, and their comparison.

Keywords: remote sensing, vegetation indices, NDVI, ARVI, Sentinel-2