



BOOK OF ABSTRACTS

*XII International Scientific
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UNDERSTANDING THE RELATIONSHIP AMONG GEOMORPHOMETRY, SPECTRAL INDICES, AND SOME SOIL PROPERTIES IN A WATERSHED SCALE

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Abstract

This research aims to provide an understanding of the complex ecological relationships with geomorphometry, remote sensing (RS) indexes and some soil features in watershed scale. The study was carried out in an area of 9950 ha watershed in Erzurum, Turkey. Sentinel-2 MSI data were used for mapping spectral indices such as; NDVI, NDWI, NDMI, soil bare index (SBI). Digital elevation model (DEM) was used to mapping transportation capacity index (TCI), stream power index (SPI), compound topographic index (CTI), curvature, slope, and altitude. Some soil physical and chemical properties were analyzed using 120 topsoils (0-30 cm). According to the results, the highest correlation ($p < 0.01$) was found between slope and NDVI (-0.410), NDWI (0.386), NDMI (-0.372), SBI (0.384), pH (0.163) and, Na (0.174). The highest correlation ($p < 0.05$) was found between CTI and NDVI (0.358), NDWI (-0.336), NDMI (0.372), SBI (-0.298), pH (-0.165), and phosphorus (0.164). The highest correlation ($p < 0.01$) was found between SPI, and Phosphorus (0.301). The highest correlation was found between altitude and CTI. In this study, the most important variable was the altitude effected on morphometric characteristics, spectral indices, and soil properties. In previous studies, CTI had been used to model the spatial model of potential soil moisture and to identify areas susceptible to erosion and landslides. In this study, especially the effect of topography on hydrological processes on nutrients was determined.

Keywords: *Geomorphometry, GIS, RS, Soil ecology, Watershed.*