**XXVIII INTERNATIONAL SYMPOSIUM ON
MODERN TECHNOLOGIES, EDUCATION AND PROFESSIONAL PRACTICE
IN GEODESY AND RELATED FIELDS**

Sofia, 08 - 09 November 2018

STUDY ON THE CORRELATION BETWEEN SOIL MOISTURE AND ACTIVE LANDSLIDE PROCESSES IN NORTHWEST BULGARIA BASED ON SAR DATA

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ABSTRACT

The influence of the water level of the Danube River and its tributaries is one of the key factors for the development of landslide processes in the northwestern part of Bulgaria. Beginning with the assessment of the specific geological situation for the region in which the study was carried out, namely from Vidin to Nikopol, where a large number of landslides were located, the perimeter of their distribution was specified. Most of these landslides are active and stabilized, forming an almost continuous line. A characteristic feature of this type of objects in the area is that they are in a fragile balance, which is often lost when increasing the amount of surface and groundwater which is considered the main reason for their activation. Within this study, free-access data from the SAR apparatus on the Sentinel-1 satellite was used to monitor the shape of the water bodies and determine the amount of soil moisture. This information was used as an indicator for the initiation and subsequent monitoring of potential landslide activities. For some of the landslides in the region (Lom, Oryahovo), interferometric maps were created to assess the surface deformation, and for the same period the areas of the water bodies and the soil humidity were evaluated. The complex approach applied in this study required the use of data from different sources that were integrated and processed in GIS environments.

Keywords: InSAR, landslide processes, mapping of water bodies, soil moisture content

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