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Usage of ASTER Level 3A Data in Landslide Inventory Mapping: Visual Interpretation versus Fieldwork

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ABSTRACT

Investigations related to natural hazards have become an extremely important issue among the geoscientists for the last few decades. Particularly after the mid 1980's, developments in computer technology, GIS (Geographic Information Systems), and RS (Remote Sensing) have provided rapid and detailed analysis of different natural hazards such as landslides, earthquakes, floods, and so on, in larger areas. Combined with the field observations, these analyses may provide important knowledge in assessing natural hazards. Among the damages and losses sourced from the natural hazards, landslides constitute one of the most destructive parts. Similar to many countries in the world, Turkey, a landslide suffering country, faces this problem. In Turkey, landslides are of great importance among the natural hazards, and the Western Black Sea region is one of the major landslide prone areas. For this reason, in this study, we selected a landslide prone area in the Western Black Sea region, and it is aimed to investigate the usage of ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) satellite image in preparing landslide inventory maps. For this purpose, two and three dimensional visual image interpretations were performed in different scales varying from 1/15000 to 1/50000. VNIR (Visible Near Infrared) bands of the ASTER image were used in the analyses. Field studies were also carried out in the study area to map landslides and to compare different landslide inventories. Based on the analyses, it was revealed that the best result related to landslide inventory maps was found as stereoscopic (three dimensional) image analysis at 1/15000 scale. The smallest mapped landslide was determined as 58885 m2, covering approximately 262 pixels. As a result of the assessments, it is considered that ASTER satellite image can successfully be used in regional and medium scale landslide inventory studies.

Keywords: ASTER, landslide, landslide inventory, satellite image.