

Geographic Information System and Dynamic Segmentation of Very High Resolution Images for the Semi-Automatic Extraction of Sandy Accumulation

Authors : A. Bensaid, T. Mostephaoui, R. Nedjai

Abstract : A considerable area of Algerian lands is threatened by the phenomenon of wind erosion. For a long time, wind erosion and its associated harmful effects on the natural environment have posed a serious threat, especially in the arid regions of the country. In recent years, as a result of increases in the irrational exploitation of natural resources (fodder) and extensive land clearing, wind erosion has particularly accentuated. The extent of degradation in the arid region of the Algerian Mecheria department generated a new situation characterized by the reduction of vegetation cover, the decrease of land productivity, as well as sand encroachment on urban development zones. In this study, we attempt to investigate the potential of remote sensing and geographic information systems for detecting the spatial dynamics of the ancient dune cords based on the numerical processing of LANDSAT images (5, 7, and 8) of three scenes 197/37, 198/36 and 198/37 for the year 2020. As a second step, we prospect the use of geospatial techniques to monitor the progression of sand dunes on developed (urban) lands as well as on the formation of sandy accumulations (dune, dunes fields, nebkha, barkhane, etc.). For this purpose, this study made use of the semi-automatic processing method for the dynamic segmentation of images with very high spatial resolution (SENTINEL-2 and Google Earth). This study was able to demonstrate that urban lands under current conditions are located in sand transit zones that are mobilized by the winds from the northwest and southwest directions.

Keywords : land development, GIS, segmentation, remote sensing

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