Sedimentation Mapping in Shallow Shoreline of Arid Environments Using Active Remote Sensing Data

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Abstract

The applications of remote sensing in monitoring land cover features became an essential tool of natural resources management schemes. The sedimentation mapping of shallow shorelines is insufficient using passive remote sensing images do you to several images corrections that need to be considered and the weather implications. While active remote sensing data can overcome the difficulties of the weather interference and reach to more reliable results. The current research work took place in the shoreline on Umluj city West of Saudi Arabia to represent one of the most sensitive wetland habitats within the country. Sentinel -1 images were downloaded and analyzed to delineate the sedimentation process from the European Space Agency. The archive image was acquired in August 2018 while the crisis emerged was acquired in March 2019 after unusual rainfall event took place in the vicinity of the study area. Remote sensing techniques of sedimentation mapping end change detection were implemented in the study area to estimate the sedimentation process and its influences on the coexisted wetlands. The wetland habitats were decreased nearly 87% throughout the period of flashfloods cooccurred between November 2018 until March 2019. Meanwhile, sediment deposits along the shoreline of the study area increased by nearly 171% where the sedimentation deposits are remarkably noticed along the investigated shoreline. Therefore, monitoring of the shorelines sedimentation and the wetland habitats using temporal remote sensing data are decision making priorities to conserve the natural resources within similar arid environments.

Keywords: Change Detection, Sedimentation Deposits, Sentinel-1, Wetlands Habitats.