

Monitoring the Dead Sea area changes and its impact to water resources of Jordan using remote sensing data and GIS techniques

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The objectives of this research are to detect the changes of the areas of the Dead Sea (DS) surface water and evaporation ponds during the past 31 years, and to emphasize the effect of DS area changes on the surrounding groundwater body. A subset of each of the Landsat (MSS), Landsat (TM), and ASTER (VNIR), acquired in 1973, 1987 and 2004, respectively, were used in this study. By comparing only the DS area with the evaporation pond area in the last 31 years and with the aid of the GIS tools to represent the changes spatially, the evaporation pond area has increased from 32.5 km² in 1973 to 231.3 km² in 1987, and then reached to 244.6 km² in 2004. On the other hand, the DS area has declined from 922 km² in 1973 to 671.7 km² in 1987, and then to 641.3 km² in 2004. DS is hydraulically connected with the lower aquifer system of the surrounding groundwater basins. Thus, any drops in the DS water level will have a direct effect on the surrounding groundwater body, letting the groundwater to flow toward the DS due to its position at the lowest point on earth, therefore, causing for the shared countries to loose every year millions of cubic meters of water from its groundwater storage, which may create a serious environmental problem in the DS region.