



## Determination of shoreline change along the Black Sea coast of Istanbul using remote sensing and GIS technology

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Received 12 July 2019; Accepted 27 September 2019

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### ABSTRACT

This study aims to determine the shoreline changes along the Black Sea Coast of Istanbul, which has been occurred in 7 years from 2009 to 2016. For this purpose, remote sensing technology used to detect the shorelines in the study period and geographic information system was established for determining the general and specific changes along the shoreline. In this context, geometric and atmospheric corrections were applied to the data as the preprocessing of Landsat-7 Enhanced Thematic Mapper Plus and Landsat-8 Operational Land Imager images. Then after, the Black Sea Shoreline data of Istanbul was extracted by applying supervised classification using maximum likelihood classification algorithm and normalized difference water index to Landsat images. As the following stage of the study, the changes along Black Sea Shoreline were determined using the digital shoreline analysis system software based on the extracted shoreline data. As a result of the study maximum negative and positive distances were determined similarly for the outputs of both applied methodologies as approximately –438 and 466 m. The study concluded that the most significant change along the shoreline was observed at the European side of the city, at a location close to the construction area of Istanbul Airport.

*Keywords:* Shoreline change; Coastal erosion; Landsat-8; Spectral water index algorithms; Normalized difference water index; DSAS

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