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A database of Black Sea beaches

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Beaches are not only one of the most beautiful natural entities the world coasts, they are also habitat for various species of living creatures, barrier against coastal hazards. Their conservation is crucially important, yet the efforts seem deficient. Geographic information systems are great tools towards this aim by incorporating coastal data and visually representing them. In this study, a database for all the beaches along the Black Sea coastline is created to help the efforts on marine conservation and coastal management. 1553 beaches have been digitized as polygons using satellite images between 2013 and 2016 covering the entire Black Sea coast. Geometric properties such as area, perimeter, width, central coordinates, UTM zone, shoreline length, and bound orientation are obtained through different data collection techniques. Information related to natural properties such as estuaries, coastal structures, and settlement densities have been gathered. Results indicated that Black Sea beaches are relatively narrow. Most of them are either experienced erosion or have a vulnerability to erosion. Among all 1553 beaches, only 28 beaches have an average width wider than 100 m. In the basin, the average width of the beaches is 26.04 m, the average beach area is 70384.2 m² and the total beach shoreline length is 2116.12 km, which covers 43% of the Black Sea coastline. The mean slope values of the beaches with a maximum width of greater than 100 m are calculated using ASTER Digital Elevation Model v2. According to this analysis, the mean slope of these 164 beaches is 7.28 degrees. An additional analysis is performed by creating a different layer for the South-western part of the basin, from approximately 5 years older satellite images. This analysis showed that, even in the short-term, beaches can experience significant area loss reaching up to 50% in a relatively high wave climate such as exists in the South-western part.