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Sediment transport and decadal morphodynamic changes in the Tang Estuary with a Re-Migrating inlet, Iranian Coastline of the Oman Sea

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The Tang Estuary located on the Iranian Coastline of the Oman Sea, The estuary's inlet is a rare re-migrating one which connects the Tang bay/estuary to the Oman Sea. The estuary experiences considerable floods and sediment load during occasional intense rainy periods. The upstream watershed supplies the narrow inlet channel with heavy sediment load twice a year on average. Moreover, a reef acts as a headland/natural offshore breakwater, which results in the formation of a tombolo in front of the estuary inlet. The most important feature of the system is the migration of the channel and the inlet which has occurred at least three times during the past 50 years.
Considering the importance of this dynamic system and corresponding sediment discharge, physiography and watershed analysis of the Tang Estuary is investigated and sediment discharge from the channel and its sand content are estimated in the first step. A numerical model has been utilized to investigate cases of flow and sediment transport behaviour in the coastal Tang area and future migration patterns of the re-migrating inlet is estimated. The morphodynamic changes are investigated by analysing two sets of aerial photos taken in 1967 and 1993, a series of high resolution satellite images from 2008 and 33 series of lower resolution data in the period of 1966 to 2015 in a GIS framework to investigate decadal evolution of the Tang Estuary the past five decades. Eventually, numerical results are compared with field observations and comprehensive GIS based analysis of historic shoreline changes from aerial photos and satellite imagery.
Management guidelines and suggestions are deducted and drawn from the calibration and verification of the results with field observations and satellite image analysis.