

Evaluation of the ROMS-SWAN Coupled Model in the Southern Caspian Basin Circulation

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Abstract

A coupled ocean-waves COAWST model was employed for simulating the waves and currents along the southern basin of the Caspian Sea. Simulating were carried out using mixed reanalysis/forecast ECMWF ERA-Interim dataset over two layer refined nested grids during 2007-2011. The results were evaluated in coastal area of Guilan province for 2011. Two Komen's formulation for growth of waves due to wind and energy depreciation with whitecapping, JONSWAP formulation for the bed friction, general-length method for vertical mixing and atmospheric bulk forcing were involved in the configuration of the coupled system. The results were implied the agreement of 87% and 73% in deep water and 68% and 78% in shallow area for the significant wave height and wave period and 53% for current speed at the inner shelf. The waves' simulation results from the deep and coastal waters zones indicated the underestimation of the profile only occurred at the beginning of July. The regional and local eddies were found at the SBC. The western alongshore were dominated along the coastal area of SBC, however the local transitional currents were established.

Keywords: Coastal circulation, Nested grid system, COAWST, ECMWF ERA-Interim, S-coordinate, Caspian Sea.
