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Three Dimensional Numerical Modeling of Circulation in the Strait of Hormuz

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Abstract

The Persian Gulf is one of the busiest waterways in the world. This area contains about 65% of the world's oil reserves. This Gulf is connected to the Indian Ocean via the Strait of Hormuz. Circulation of water in the Persian Gulf and the Strait of Hormuz is vital for shipping line, fisheries and contaminant tracking. Since 1918, many studies have been done on the circulation of this area. Approximately one ship in every six minutes passes through the Strait of Hormuz (Alhajiri 1991). Due to arid climate, surface evaporation in the Persian Gulf is very high. To compensate the evaporation in the Persian Gulf, water is displaced from the Gulf of Oman. Its circulation is counterclockwise from the Strait of Hormuz to the northern coasts of the Persian Gulf and discharging the saltier water to the Oman Gulf. A three-dimensional hydrodynamic model (COHERENS) has been employed to study the circulation of the Strait of Hormuz. This model is forced by climatologic monthly mean atmospheric forcing derived from 54 years of NOAA data. Tidal boundary forcing is included using the four major constituents: M2, S2, O1, and K1. Findings of the model contribute to an understanding of circulation patterns in the Strait of Hormuz as an aid to ship traffic and management of pollution spill events. The results of the model are in close agreement with the previous observations.

Keywords: *Numerical Modeling, Strait of Hormuz, Circulation, Persian Gulf*