

عنوان مقاله:

Impact of Climate change and Caspian Sea level fall on decline of Gorgan Bay

محل انتشار:

دومین کنفرانس بین المللی کوآترنری (سال: 1400)

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خلاصه مقاله:

The Caspian Sea coastal wetlands currently encountering drastic shrinking and desiccation due to rapid sea level fall and mismanagement of water resources. The Caspian coastal wetlands that located on the Caspian Sea shores benefits from the Caspian Sea waters. They are mainly coastal lagoons and bays extent of which strongly depended on the CS level (Kroonenberg et al., ۲۰۰۰; Lahijani et al., ۲۰۰۹; Kakroodi et al., ۲۰۱۲; Naderi et al., ۲۰۱۳) that fell around ۱.۶ m during the past decade. The Caspian coastal lagoons have experienced restriction during sea level fall of ۱۹۶۰s and ۱۹۷۰s, however the current anthropogenic pressure and climate change superimposed on the impact of sea level fall and exacerbated the ecosystem decline. Using comprehensive measurements and investigation, here the main focus is on the way of remediation or restoration of the Gorgan Bay. Field campaigns have been conducted in the Gorgan Bay for measurements and sampling in ۲۰۱۸, ۲۰۱۹ and ۲۰۲۰ (Fig. ۱). In situ measurement of water column properties including temperature, conductivity, pressure, dissolved oxygen, and pH were done using an Ocean Seven ۳۱۶ CTD probe. Five current meter RCM۹ have been installed in the main inlet of the Gorgan Bay for ۱۵ days and short term measurement conducted in two bifurcated inlets. FVCOM hydrodynamic model has been used in the Gorgan Bay, which is a general volume water circulation model with a finite volume method. Here, FVCOM hydrodynamic model and WRF-Chem model have been used to simulate the Gorgan Bay water circulation and dust emission respectively. Current measurements demonstrated that mean velocity is around ۳ cm/s and dominant current is toward the Gorgan Bay. Current frequency analysis displays they fall into three groups of wind driven, tidal and

density currents. The CTD data show that salinity of the Gorgan Bay waters is greater than that of the Caspian waters and reached up to ۲۰ PSU in the eastern part of the bay in summer ۲۰۲۰. The Gorgan Bay water is well mixed and did not show significant stratification. In case more water level decline and desiccation of the Gorgan Bay the bottom sediments are exposed for wind transport which based on the WRF-Chem model they can play role of local dust source and travel up to ۵۰ km in Mazandaran and Golestan provinces. The FVCOM current simulations revealed that general circulation in the Gorgan Bay is cyclonic during warm period of the year and anticyclonic during cold period with dominant wind forcing, where in the westernmost due to narrowing the basin an anticyclonic eddy is developing.

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