Prediction the thermal adaptability of coral Persian Gulf reefs to survive in climate change condition of 2099

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Received date: 2018/06/03
Reception date: 2019/01/09

Abstract

The climate change that lead to increasing sea surface temperature in Persian Gulf, is one of the main cause of coral reef bleaching events in Persian Gulf. The main aime of this study is to predict the requiered adaptability of Perasian Gulf coral reefs in climate change condition of 2099. The future climate condition including air temperature but not sea surface temperature of year 2099 were obtiand from HADCM3 global circulation model in senario A2 and downscaled using SDSM model to study area. Using correlation analysis and regression model the relationship between air temperature and SST were quantified based on current climate periode (1982-2017). Base on developed regression model we simulate the SST of Persian Gulf in climate change periode (2018-2099). The results indicated that in simulated future climate under senario A2 the maximum of sea surface temperature rising occured in Aught and September months. In 2 mentiond months corals reefs in the Persian Gulf faced to the maximum thermal stress. The sea surface temperature will rising about 2 degree centigrade untill 2060 which is not criticaly lead to corals death. But after 2060 the SST will rising significantly and lead to critical bleaching and real risk to corals reefs in the Persian Gulf. The sea surface tempearature before 2060 will rising less than 2 degree centigrade but in after 2060 the HADCM3 model indicated that SST posetive anomaly will increase and therfore the corals reefs in the Persian Gulf will needed about 2 to 3 degree centirade thermal adaptability to survive afted 2060 climate condition.

Keywords: Coral Reef, Climate Change, Sea Surface temperature, Pearsian Gulf.