



Estimation of SST extremes in the Arabian Sea and their link to the cyclogenesis

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Understanding the behavior of sea surface temperature (SST) extremes in the ocean is important for many aspects of the marine climate system. Even the changes of a few degrees in SST can influence large-scale weather phenomena, such as tropical cyclones or El Niño. The robust warming over Arabian Sea is evident in the recent decades, hence increasing the risk of frequent cyclonic activity in the pre-monsoon (May-June) and post-monsoon (Oct-Dec) periods. Here, we use SST data of the Hadley Center UK Met office, and the annual frequency of the tropical depressions, cyclonic storms, and severe cyclonic storms of the Indian Meteorological Department from 1871 to 2015. Firstly, we have investigated the SST extremes in the Arabian Sea during pre and post monsoon by applying block maxima method, in the stationary and non-stationary climate. The results show that the return levels of SST extremes in the pre-monsoon are slightly higher than the post-monsoon for shorter (2, 5, 10, 20) and longer return periods (50, 100, 200). Secondly, we use Poisson regression model to do the probabilistic prediction of tropical depressions, cyclonic storms and severe cyclonic storms using SST as a predictor. We have observed that the SST and cyclogenesis are positively correlated, and the probability of the severe cyclonic storm is higher during the pre-monsoon period in the Arabian Sea.