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Causes and Impacts of Marine Heatwaves in the Bay of Bengal Region in the Recent Period

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Abstract : In the ocean, the temperature extremes have the potential to devastate marine habitats, ecosystems together with ensuing socioeconomic consequences. In recent years, these extreme events are more frequent and intense globally and their increasing trend is expected to continue in the upcoming decades. It recently attracted public interest, as well as scientific researchers, which motivates us to analyze the current marine heatwave (MHW) events in the Bay of Bengal region. we have isolated 107 MHW events (above 90th percentile threshold) in this region of the Indian Ocean and investigated the variation in duration, intensity, and frequency of MHW events during our test period (1982-2021). Our study reveals that in the study region the average of three MHW events per year with an increasing linear trend of 1.11 MHW events per decade. In the analysis, we found the longest MHW event which lasted about 99 days, which is far greater than an average MHW event duration. The maximum intensity was 5.29°C (above the climatology-mean), while the mean intensity was 2.03°C. In addition, we observed net heat flux accompanied by anticyclonic eddies to be the primary cause of these events. Moreover, we concluded that these events affect sea surface height and oceanic productivity, highlighting the adverse impact of MHWs on marine ecosystems.

Keywords : marine heatwaves, global warming, climate change, sea surface temperature, marine ecosystem
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