

Analysis of Marine Heatwaves in the Bay of Bengal region

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Abstract

In the ocean, temperature extremes have adverse effects on precipitation patterns, sea level change, and migration/damage of ecosystems. It has been found that most species are more sensitive to extreme events like marine heatwaves (MHWs), implying the severe impacts of MHWs on ecology. These events are driven by various atmospheric and oceanic processes. In recent years, these extreme events are more frequent and intense globally and their increasing trend is expected to continue in the upcoming decades. They have the potential to devastate marine habitats, and ecosystems together with ensuing socioeconomic consequences. It recently attracted public interest and scientific researchers, which motivates us to analyze the recent MHW events in the Bay of Bengal region. we have isolated 107 MHW events (above the 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 the average of three MHW events per year in the study region with an increasing linear trend of 1.11 MHW events per decade. In the analysis, we found the most intense event has a 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. Also, an effort has been made to understand the relationship between climate modes, sea surface height, and the difference between evaporation and precipitation with the occurrence of MHW events.