

Marine heatwaves

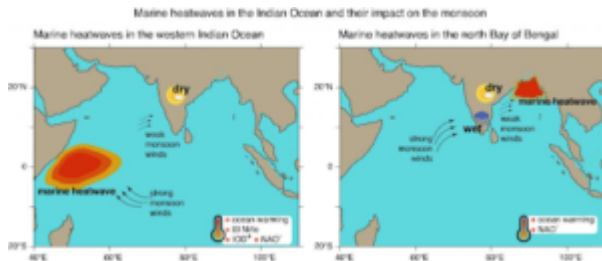
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In news— A new study has found that marine heatwaves have been on the rise in the waters around India and are impacting the Indian monsoon.

Key findings—

- An underwater survey showed that **85% of the corals in the Gulf of Mannar near the Tamil Nadu coast got bleached after the marine heatwave in May 2020.**
- The **Western Indian Ocean region experienced the largest increase in marine heatwaves** at a rate of about 1.5 events per decade, **followed by the north Bay of Bengal** at a rate of 0.5 events per decade.
- From 1982 to 2018, the Western Indian Ocean had a total of 66 events, while the Bay of Bengal had 94 events.
- The marine heatwaves in the Western Indian Ocean and the Bay of Bengal **increased drying conditions over the central Indian subcontinent.**
- Correspondingly, **there is a significant increase in the rainfall over south peninsular India in response to the heatwaves** in the north Bay of Bengal.
- These changes are in response to the modulation of the monsoon winds by the heatwaves.
- This is the **first time that a study has demonstrated a close link between marine heatwaves and atmospheric circulation and rainfall.**
- Climate model projections suggest further **warming of the Indian Ocean in the future, which will very likely intensify the marine heatwaves and their impact on the monsoon rainfall.**
- According to the National Oceanic and Atmospheric Administration of the United States, **around 90 per cent of the warming caused by greenhouse gas emissions is absorbed by the oceans.**

- The increase in marine heat waves was due to rapid warming in the Indian Ocean and strong El Nino events.
- **This study was conducted by researchers and scientists from the Indian Institute of Tropical Meteorology, Pune, Kerala Agriculture University and Cochin University of Science and Technology.**



What are marine heatwaves (MHW)?

- Marine heatwaves are **periods of extremely high temperatures in the ocean.**
- **These events are linked to coral bleaching, seagrass destruction, and loss of kelp forests, affecting the fisheries sector adversely.**
- Such heat waves are **caused by an increase in the heat content of oceans**, especially in the upper layers.
- Worldwide, they are one of the major results of human-induced global warming.
- Marine heatwaves are also associated with severe biodiversity changes such as sea star wasting disease, toxic algal blooms, and mass mortality of benthic communities.
- **During an MHW, the average temperatures** of the ocean surface (up to a depth of 300 feet) goes **5-7 degrees Celsius above normal.**
- MHWs can **cause extreme weather events such as tropical storms and hurricanes, and disrupt the water cycle;** making floods, droughts and wildfires on land more likely.
- MHWs have been **associated with the mass mortality of marine invertebrates,** and may force species to change

behavior in a way that puts wildlife at increased risk of harm. E.g. MHWs have been linked to whale entanglements in fishing gear, for example.

