

Warming of Indian Ocean set to accelerate: study

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From 1950 to 2020, the Indian Ocean had become warmer by 1.2 degrees Celsius, and climate models expect it to heat up a further 1.7 degrees Celsius to 3.8 degrees Celsius from 2020 to 2100. While we are familiar with heatwaves on land, “marine heatwaves”, their counterparts in the sea and linked to the rapid formation of cyclones, are expected to increase ten-fold from the current average of 20 days per year to 220-250 days per year.

Mostly attributable to global warming, the tropical Indian Ocean will likely be in a “near-permanent heatwave state” and accelerate coral bleaching, sea-grass destruction, and loss of kelp forests, affecting the fisheries sector adversely, said an analysis led by scientists at the Indian Institute of Tropical Meteorology (IITM), Pune.



The tropical Indian Ocean will likely be in a ‘near-permanent heatwave state’. FILE PHOTO

rology (IITM), Pune.

‘One Hiroshima bomb’

The heating of the ocean was not merely restricted to the surface but went deeper and increased the overall “heat content” of the ocean. The heat content of the Indian Ocean, when measured from surface to a depth of 2,000 metres, is currently increasing at the rate of 4.5 zetta-joules per decade, and is predicted to increase at a rate of 16-22 zet-

ta-joules per decade in the future. Joule is a unit of energy and one zetta-joule is equal to one billion-trillion joules (10^{21}). “The future increase in heat content is comparable to adding the energy equivalent of one Hiroshima atomic bomb detonation every second, all day, every day, for a decade,” said Roxy Mathew-Koll, scientist at IITM and lead author of the study.

The study constitutes a chapter in a forthcoming publication *The Indian Ocean and its role in the global climate system* by Elsevier.

Rising heat content contributes to sea-level rise also. Heat causes the volume of water to increase, called the thermal expansion of water, and this is responsible for more than half of the sea-level rise in the Indian Ocean – larger than the changes arising from glacier and sea-ice melting.