

SESSION: From Physics to Top Predators at islands and seamounts in the Southern Ocean

MARS Themes:

Oceans and marine ecosystems under global change

Earth systems observations

Ecosystems, biodiversity and biodiscovery

Title:

From Physics to Top Predators at islands and seamounts in the Southern Ocean

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Abstract:

Marine heatwaves (MHW) are extreme oceanic warm water events. They have been shown to have major negative impacts on marine ecosystems, for example, causing mass coral bleaching, loss of kelp forests and declines in surface chlorophyll-*a* levels as a result of increased stratification. These negative impacts of MHW have potential implications for the economies and livelihoods of the countries dependent on the ocean. MHW have been observed to be increasing in both frequency and intensity throughout the global oceans as a result of anthropogenic climate change. As a result, it is imperative to understand the characteristics of MHW for better adaptation and mitigation of the effects of these extreme events. While many studies have been conducted in the global oceans, MHW characteristics in the oceans around southern Africa have yet to be studied in depth. This study compared the characteristics of MHW in the South Atlantic and South Indian Ocean basins in order to better understand how they may change in the future. It was found that, on average, MHW lasted longer in the South Atlantic (~30 days) than in the South Indian Ocean (~25 days). MHW were also found to have a higher frequency and mean intensity in the region of current systems such as the Agulhas Retroflexion region (3.5 MHW per year and 4.5°C, respectively) and the Brazil-Malvinas Confluence (3.5 MHW per year and 3.5°C, respectively) than in the Atlantic and Indian Ocean basin interiors (1 to 2.5 MHW per year and 0.5 °C to 1.5°C, and 1 to 2.5 MHW per year and 0.5. °C to 2 °C, respectively). When a smaller region in the Agulhas Retroflexion was investigated, the longest and most intense MHW lasted 87 days and had a maximum intensity of 4.6°C above the threshold. The second- and third-longest MHW, lasting 71 days and 70 days respectively, occurred within 15 days of each other.

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Oral presentation

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Marine heatwaves; heatwaves.