

# SANCOR Webinar

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Date: Monday, 31 January 2022

Time: 1pm SAST

## Contribution of ocean current changes to the warming of the Indian Ocean over 2000-2020

Since 2000, the Indian Ocean has warmed more rapidly than the Atlantic or Pacific. Air-sea fluxes alone cannot explain the rapid Indian Ocean warming. We investigate the role that the heat transport out of the basin near 36°S plays in the warming. Adding the heat transport out of the basin to the Indonesian Throughflow temperature transport into the basin, we calculate the decadal mean Indian Ocean heat budget over the 2010s. We find that heat convergence increased within the Indian Ocean during 2010-2019, as compared to 2002 and 2009. A two-year timeseries over 2016-2018 confirms that seasonal aliasing does not play a role. The heat convergence over the 2010s is the same order as the warming rate, and thus the net air-sea fluxes are near zero. This is a significant change from previous estimates in 1987, 2002, and 2009, which all found divergences of heat, implying that air-sea fluxes were into the Indian Ocean. The anomalous ocean heat convergence over the 2010s compared to the 2000s is due to changes in ocean currents at both the southern boundary (33%) and the Indonesian Throughflow (67%). We hypothesize that the changes at the southern boundary are linked to the broadening of the Agulhas Current.

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