

The Holloway Current along North-West Australia

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Abstract

The Holloway Current is a surface current postulated to flow towards the south-west, parallel to the coastline, along the north-west shelf and provides a conduit to transport warmer, lower salinity water from northern Australia into the Leeuwin Current. During the summer months, strong south-westerly winds (Australian monsoon), pile up water in the Arafura Sea and Gulf of Carpentaria and as the wind relaxes, the water flows south-westward. Seasonal heating may also have an influence on the mean sea level which would enhance the alongshore pressure gradient, the driving force of the current. Evidence for the presence of the current, to date, has been from numerical models and current meter data from the north-west shelf, including the North Rankin location. These studies indicated that the current was well established during the autumn months when the winds relaxed. In February 2012, as a result of co-investment in IMOS by the WA State Government, two mooring transects were established off the Kimberley and Pilbara with 4 and 3 stations across the continental shelf, respectively. Analysis of 24 months of the data (February 2012 - February 2014) indicate that the south-westerly flow is a consistent feature of the current field on the continental shelf inshore of the 200m isobath transporting ~2 Sv of water towards the south-west. These estimates correspond with similar values predicted using OzROMS model in the region.