



## Abstract View

[Volume 18, Issue 11 \(November 1988\)](#)

### Journal of Physical Oceanography

Article: pp. 1535–1545 | [Abstract](#) | [PDF \(877K\)](#)

## Currents through Torres Strait

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(Manuscript received November 16, 1987, in final form April 19, 1988)

DOI: 10.1175/1520-0485(1988)018<1535:CTTS>2.0.CO;2

### ABSTRACT

A five-month field study of the circulation in the Torres Strait was carried out. Baroclinic effects were negligible. The Arafura Sea and the Coral Sea forced a different tide on either side of Torres Strait, resulting in fluctuations of sea level difference of up to 6 m on either side of the Strait. The tidal dynamics in the Strait were controlled by a local balance between the acceleration, the sea level slope, and the bottom friction. Only 30% of the semidiurnal tidal wave was transmitted through Torres Strait. There were also fluctuations of the high-frequency sea level residuals (up to 0.8 m peak to trough) which appeared to be related to complex flows both through the Strait and across the Strait. Low-frequency sea level fluctuations were incoherent on either side of the Strait, and resulted in fluctuations of the low-frequency sea level differences on either side of the Strait of typically 0.3 m. These sea level gradients and the local wind forcing generated low-frequency current fluctuations through the Strait. These currents were small, being  $\leq 0.1 \text{ m s}^{-1}$ , because of the effect of friction which, at low-frequencies, was greatly enhanced by the nonlinear interaction between tidal and low-frequency currents. As a result, the Strait was also fairly impervious to long waves and there was only a negligible (for oceanic budget calculations) low-frequency transport through the Strait. The net current was only  $0.01 \text{ m s}^{-1}$  during the 5 months of observations, corresponding to a through-strait current of  $10^{-2}$  sverdrups.

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