



Abstract View

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On the Flow of Water Through the Samoan Passage

Joseph L. Reid and Peter F. Lonsdale

Scripps Institution of Oceanography, La Jolla, Calif. 92037

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ABSTRACT

The Samoan Passage at about 10S, 169W appears to be the major channel through which the deep and abyssal waters flow northward from the South Pacific. The northward flow, Postulated from the distribution of characteristics, is confirmed by direct measurements of the currents. The density field and the water characteristics are consonant with an intensified deep western boundary current, whose quasi-geostrophic balance requires the densest water to lie shallowest on the western side of the Samoan Basin, and from which it appears to cascade suddenly into the deeper waters of the North Tokelau Basin. The density field and the water characteristics are also consonant with a southward flowing western boundary current lying immediately above the abyssal flow. It is proposed that this shallower flow, at depths somewhere between about 2000 and 3500 m, represents a return flow of water from the deep North Pacific, with high nutrient and low oxygen content.

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