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# Hydrographic variations along the sloping western and eastern boundaries of the ocean basins

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Density variations along the western and eastern boundaries of the ocean play an important role in constraining the meridional overturning circulation an ocean basin. In this paper, maps of hydrographic properties will be presented along the western and eastern boundaries of the Atlantic, Pacific and Indian basins, using only data collected adjacent to the sea floor. In the Atlantic, there is a clear asymmetry between western and eastern boundaries. Along the western boundary a systematic north-south gradient in neutral density is associated with the large-scale overturning circulation. In contrast, along the eastern boundary the netural density surfaces are virtually flat, consistent with classical ideas about the inability of eastern boundaries to support large-scale horizontal pressure gradients. This asymmetry breaks down in the bottom layers where Antarctic Bottom Water spreads northwards as topographic slope currents. Similar pictures are found in the Pacific and Indian basins, except that the western boundary variations in neutral density are much reduced due to the absence of significant meridioinal overturning. The implications of these results for the large-scale meridional ovrturning circulation will be discussed.