



First appearance of the Deep Western Boundary Current in the Bounty Trough region, east of New Zealand

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The Bounty Trough lies east of the Tasmanian Gateway, passage of the main deep inflow to the Pacific Ocean manifested as the Deep Western Boundary Current (DWBC). In the Bounty Trough Region tranquil flow conditions allow sediment deposition that records changes in the DWBC flow. It has been the target of ODP Leg 181 Site 1122 in 1999. Using five new high-resolution seismic profiles to incorporate Site 1122 into the present seismic stratigraphy of the Bounty Trough contour current deposits could be observed on seismic data and are confirmed by lithological extrapolation. The new dataset allows us to decipher the first appearance of a branch of the DWBC meandering into the Bounty Trough at 16.7 to 20 Ma. East of the trough in the Bounty Fan area, we have identified four different drift deposits of the DWBC. The deepest two drifts are older than the opening of the Tasmanian Gateway. They are the first direct observations of a pre-Oligocene deep circulation at the eastern New Zealand margin. Additionally, migration of the drifts crests are interpreted to indicate modifications in core flowpath of the DWBC due to changes in environmental conditions. The oldest modification is linked to the Palaeocene/Eocene warming while the later three are related to the onset of the Antarctic Circumpolar Current, its intensification after the Miocene Climatic Optimum and the increased sediment load of the DWBC due to onset of the Bounty Channel turbidity currents.