



Late miocene to recent northward migration of Circumpolar Deep Water in the southern and central Scotia Sea

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A seismic stratigraphic analysis in the southern and central abyssal plain of the Scotia Sea has been executed by multichannel reflection seismic profiles (MCS). As a result, five main seismic units were identified (5 to 1 from bottom to top). The units are bounded by regional discontinuities, named d to a, from bottom to top. The three youngest units (3 to 1) are deposited above the Reflector c, which is identified in the entire study area. It constitutes the most remarkable erosive surface, although it may evolve laterally into a non-depositional surface. Seismic Unit (SU) 3 is characterized by stratified configurations, with very high-amplitude and laterally continuous internal reflectors. Reflectors frequently show downlap terminations over Reflector c. SU 2 displays an aggradational configuration and moderate to low amplitude reflectors with variable lateral continuity, although transparent acoustic responses can be locally observed. SU 1 is dominated by reflective acoustic responses, with sub-parallel, high-amplitude reflectors with high lateral continuity, downlapping the basal discontinuity. The tentative age for these units (Maldonado et al., 2003), is middle to late Miocene for SU3, late Miocene to early Pliocene for SU2 and late early Pliocene to Recent for SU1. In the central zone of the Scotia Sea, located to the northeast of Protector

Basin, SU 5 and SU 4 pinch out towards the northeast. In contrast, SU 3, SU 2 and SU 1 show regional occurrence and a variety of sedimentary drifts which resulted from the influence of the Antarctic Circumpolar Current (ACC). Here, SU3, SU2 and SU1 are composed of two depositional elements: a mounded elongated drift located to the south, evolving to sheeted drift towards the north. The top boundary of the sheeted drift represents a very wide moat adjacent to the mounded drift. These two main depositional elements are displaced northward from SU 3 to SU 1. A lateral evolution of the Circumpolar Deep Water (CDW) from the top of SU 3 (Late Miocene) to the present is suggested decoding drifts geometry. A coeval northward CDW migration has been recently reported on the central continental rise of the Antarctic Peninsula Pacific margin (Hernández-Molina et al., 2004). Consequently, a significant palaeoceanographic change of regional significance is supposed to have occurred in this area.

Hernández-Molina, F.J., Larter, R. D., Rebesco, M., Maldonado, A., 2004. Miocene changes in bottom current regime recorded in continental rise sediments on the Pacific margin of the Antarctic Peninsula. *Geophys. Res. Lett.*, 31, L22606, 10.1029/2004GL020298. Maldonado, A., Barnolas, A., Bohoyo, F., Galindo-Zaldivar, J., Hernandez-Molina, F.J., Lobo, F., Rodriguez-Fernandez, J., Somoza, L., Vazquez, J.T. 2003. Bottom deposits in the Central Scotia Sea: the importance of the Antarctic Circumpolar Current and the Weddell Gyre flows. *Palaeogeogra. Palaeoclimatol. Palaeoecol.* 198, 187-221.

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