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Magneto-biostratigraphic integration of Neogene sequences from the subantarctic Pacific Ocean: Initial results from IODP Exp. 383

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Excellent chronostratigraphic control is essential for the development and comparison of paleoceanographic reconstructions across key climate transitions of the Neogene. However, the calibration of Miocene and Pliocene biostratigraphic datums in the Southern Ocean has historically been hampered by the presence of hiatuses in many existing records and the limited distribution of sediment cores with suitable lithologies to support the development of high-fidelity magnetostratigraphies.

From May-July, 2019, IODP Exp. 383 collected sediment cores from four pelagic and hemipelagic sites comprising a zonal transect along the northern flank of the Pacific Antarctic Circumpolar Current, from 76°41' W to 125°26' W. Diatoms, radiolarians, calcareous nannofossils, and planktonic foraminifers provide excellent primary biostratigraphic control for these four sites (U1539, U1540, U1541, and U1543), all of which record continuous accumulation. The oldest, central South Pacific Site U1541 (54°13' S, ~3600 m water depth), spans >8.2 Myr, constrained by 74 biostratigraphic events, anchored by 27 well-defined polarity reversals observed within cores. Eastern South Pacific Site U1543, situated on an elevated ridge west of the Chile Trench (54°35' S, ~3860 m water depth) spans >7.2 Myr and is constrained by 54 biostratigraphic events, anchored by 29 well-defined polarity reversals observed within cores. While shipboard biostratigraphic age assignments from all sites are generally in good agreement with the paleomagnetic reversal stratigraphy throughout the Pleistocene, systematic offsets and increasing age uncertainties were identified in the Pliocene and Miocene. Here, we use the exceptional shipboard paleomagnetic records from U1541 and U1543 to recalibrate select

biostratigraphic datums, a first step towards providing a new Southern Ocean reference section for key intervals of the geologic timescale.

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