Connecting the Plio-Pleistocene Climate Records of the Pacific and Atlantic Sides of the Antarctic Peninsula by Cycle to Cycle Correlation

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Ocean Drilling Program (ODP) Leg 178 recovered Plio-Pleistocene records from drift deposits on the Pacific margin of the Antarctic Peninsula. Site 1101 consists of a single hole, with APC (advanced piston corer) coring to 142.7 mbsf, and XCB (extended core barrel) coring to 217.7 m. The sediments are beautifully cyclic with alternations of biosilica rich (warm) and terrigenous rich (cool) intervals. All of the magnetic reversals of the last 3.04 Myr were documented in the Leg 178 Scientific Reports. International Ocean Discovery Program Expedition (IODP) 382 recovered among the most continuous and highest resolution stratigraphic records in the Southern Ocean near Antarctica and Reilly, Tauxe, et al. (in review for Paleoceanography and Paleoclimate) have created composite records from Sites U1536 and U1537, in the Dove Basin, of the physical properties that contain all of the magnetic reversals of the last 3.3 Myr. In order to expand the geographic range of climate and ice sheet history of Antarctica in the last 3.3 Myr, including the Plio-Pleistocene transition, we take advantage of the documented magnetic reversals in site 1101, and the clear cyclicity of the Site 1101 records to make a cycle to cycle correlation with the Dove Basin composite using GRA density (Gamma ray attenuation). Although the amplitudes of the cycles are not equal, the ability to connect the records at cycle-scale resolution allows us to compare trends between the two regions. Drill Site 1101 is more terrigenous rich than Dove Basin due to the sites more proximal location and placement on a large sediment drift landform. However, the climate cycles can be correlated to each other broadly and prominent glacials and interglacials can be recognized in Site 1101. The Dove Basin record and Site 1101 have several cycles that have good correlation including the super interglacial MIS 11 and MIS 19 which aligns with the Bruhns-Matuyama magnetic boundary. Correlation of climate cycles at both locations would further strengthen Antarctic's climate variability record and will contribute to a comprehensive overview of the changes occurring in the Antarctic ice sheets.