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ICE SHEET HISTORY FROM SEDIMENTS RECOVERED FROM THE ANTARCTIC WILKES LAND MARGIN: IODP Expedition 318

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Drilling the Antarctic Wilkes Land margin sedimentary archives along an inshore to offshore transect provides insights about the development of the East Antarctic Ice Sheet (EAIS) and its intimate relationships with global climatic, oceanographic and sea level change. Drilling was driven by seismic stratigraphic interpretations indicating that the Wilkes Land sedimentary record included critical periods in Cenozoic Earth climate evolution when the cryosphere formed, likely in step-wise fashion, and subsequently evolved to assume its present-day configuration. In addition, the sedimentary archives lie in front of the Wilkes Subglacial Basin where the EAIS is grounded below sea level and is potentially more sensitive to climate changes in the late Neogene, during times when the EAIS is thought to be more stable (15 Ma–recent). The principal goals of Expedition 318 were to obtain: 1. the timing and nature of the first arrival of ice at the Wilkes Land margin (referred to as the “onset of glaciation”) inferred to have occurred during the earliest Oligocene (Oligocene isotope event-1), 2. the nature and age of the changes in the geometry of the progradational wedge interpreted to correspond with large fluctuations in the extent of the East Antarctic Ice Sheet (EAIS) and possibly coinciding with the transition from a wet-based to a cold-based glacial regime (late Miocene–Pliocene?), 3. a high-resolution record of Antarctic climate variability during the late Neogene and Quaternary; and 4. an unprecedented, ultra-high resolution (annual to decadal) Holocene record of climate variability. Records from the Wilkes Land margin are complementary to some of the time intervals obtained from Prydz Bay during ODP Leg 188 and ANDRILL records from the Ross Sea, which will allow to asses regional variability. Here we present preliminary results from IODP Expedition 318, taken place during January-March 2010. The chronostratigraphic and paleoenvironmental information from Expedition 318 is critical to provide constrains to ice sheet models to guide the forecasting of future Antarctic ice sheet behavior.