

SEDIMENT COMPOSITION CHANGES IN RESPONSE TO GLACIAL SEDIMENTARY REGIMES IN PRYDZ BAY CONTINENTAL MARGIN, ANTARCTICA

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The Antarctic continent and its margins play a central role in the climatic and geodynamic evolution of the Earth. This presentation will discuss the sediment sequence development on the continental shelf and rise settings off Prydz Bay, Antarctica, with reconstruction of the glacial sedimentary regimes in certain time windows, including the Eocene/Oligocene and Miocene/Pliocene periods. During Ocean Drilling Program Leg 188, the sites 1165 and 1166 were drilled on the continental rise and shelf, proximal to the East Antarctic Ice Sheet (EAIS) off Prydz Bay, respectively.

Microtextural analysis of quartz sand grains have been used to verify the transition from East Antarctic preglacial to glacial conditions on the continental shelf, which occurred the Middle-Late Eocene. Thus, the inland ice sheet may have reached sea level as early as ~37 Ma. This is connected to the global Eocene/Oligocene climate evolution, but active tectonism in the East Antarctic interior might also have influenced the initiation of early glaciers. The variabilities in sediment composition e.g. in clay mineral assemblages in the Prydz Bay continental rise seems to record dynamic behaviour of EAIS in the Middle Miocene and Middle Pliocene. In a climate history perspective, the Neogene period represents a time of progressive cooling of the Earth, although there were also global warm periods during that, possible introducing weak but detectable signals in glacial sedimentary regimes proximal to EAIS off Prydz Bay.

Records of the onset of glaciation and glacier sedimentary regimes concerning East Antarctica, however, are still relatively sparse. A closer review of sedimentary facies from the ODP Leg 188 and related sites can be beneficial and new values can be obtained and discussion stimulated by carrying out comparative studies of Circum Antarctic, e.g. the Weddel Sea and Wilkes Land margins which are in focus and active IODP proposals of the Antarctic Climate Evolution (ACE) programme of SCAR.