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EARLY OLIGOCENE RECORD OF AN ICEBERG ALLEY IN THE WEDDELL SEA FROM QUARTZ SAND MICROTTEXTURAL ANALYSIS AT ODP SITE 696

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The greenhouse to icehouse transition at the Eocene-Oligocene boundary (34 Ma) marks the appearance of continental scale glaciation in Antarctica. The material recovered from the Ocean Drilling Program site 696, located off the South Orkney Microcontinent in the Weddell Sea region, is the most continuous paleoarchive in Antarctica spanning this major climatic shift. The site is located within Iceberg Alley and provides an opportunity to obtain a record of the inception and growth of the ice sheet. An understanding of ice growth at this time interval is important as the region plays a critical role in global ocean circulation through water mass interactions with the ice shelf. Using quartz microtextural analysis, thirteen samples spanning the EOT were analyzed to understand the transportation history of the >150 micron sand fraction. Angular grains with glacial textures are present throughout the entire interval (33.2-34.4 Ma). The frequency of glacial textures shows a decreasing trend into the early Oligocene; however, mass accumulation rates of glacial grains reveal that iceberg transport and deposition of material increased following 33.6 Ma. This increase in iceberg rafted debris (IBRD) is also accompanied by an increase in accumulation rates of eolian and sea-ice rafted grains, suggesting a strong coupling between land ice development and high-latitude atmospheric processes. Geochemical provenance data from bulk samples at the site supports ice expansion in

the Weddell Sea region at this time. In comparison with other Antarctic proxy data sets, the intensification of ice rafting in the Weddell Sea occurs after ice-sheet inception in East Antarctica. This record of IBRD at ODP site 696 provides insight into the intensification of Antarctic glaciation in the early Oligocene. Further work is being completed to determine the provenance of the ice rafted materials.

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