



## **Miocene glacial dynamics recorded by variations in magnetic properties in the ANDRILL-2A drill core**

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During the 2007 ANDRILL campaign in the Ross Sea, Antarctica, the AND-2A core was recovered through a stratigraphic succession spanning 1138.54 m of Neogene sedimentary rocks that include an expanded Early to Middle Miocene sequence. The study reported here focuses on the magnetic properties of the interval from 778.63 meters below sea floor (mbsf) to 1138.54 mbsf, which comprises a time interval spanning 1.5 Myr, from ~18.7 to ~20.2 Ma. We recognise three main pulses of increased input of magnetic materials to the drill site between 778.34 – 903.06, 950.55 – 995.78 and 1040 – 1103.96 mbsf. Trends in magnetic mineral concentration dependent parameters mirror changes in the proportion of sediments derived from McMurdo Volcanic Group rocks. We suggest these pulses in magnetic mineral concentration reflect changes in sediment transport processes associated with changing glacial conditions at the drill site that included (1) subglacial and grounding zone proximal settings, (2) hemipelagic and neritic conditions with abundant sediment-rich icebergs, (3) grounding zone-distal environment that was covered by land-fast multi-year sea-ice or a fringing ice shelf. The magnetic minerals record preserved in the AND-2A core supports other data that indicate a highly dynamic and variable coastal environment during the Early Miocene, where glaciers retreated inland under warm climatic conditions and advanced beyond the drill site across the continental shelf when cold climate prevailed.