

Variations in the $^{143}\text{Nd}/^{144}\text{Nd}$ ratio of Early Pliocene to Late Miocene glacially derived sediments in Prydz Bay, East Antarctica

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Sediments that have been deposited by glaciers in the Prydz Bay sector of East Antarctica can be traced to their provenance source on land by analyzing their $^{143}\text{Nd}/^{144}\text{Nd}$ ratio. By studying down-core at a site, distinct layers as well as epoch events can be mapped out. This work is part of a larger study of East Antarctic Ice Sheet (EAIS) dynamics in the past, led by Trevor Williams at LDEO and by Tina van de Flierdt at Imperial College London. Recently Williams et al. (2010) published evidence for dramatic changes in the sources of glacially derived sediments in Ocean Drilling Program (ODP) core 1165. Their interpretation was based on the Ar-Ar ages of detrital hornblende grains, but a set of four samples across an event at 4.8 Ma showed an intriguing variation of the $^{143}\text{Nd}/^{144}\text{Nd}$. The older part of the event includes a significant fraction of exotic Ar-Ar ages, but epsilon Nd similar to the background values, while the younger part of the event shows a significant decrease in epsilon Nd but Ar-Ar of exclusively local origin. The specific goal of this study is to test the hypothesis that the shift to lower epsilon Nd in the 4.8 Ma ice rafting event is due to dynamical changes in the Prydz Bay sector of the East Antarctic ice sheet. There is evidence for a range of epsilon Nd in the terrains surrounding Prydz Bay (van de Flierdt et al., 2009). The core that was studied by van de Flierdt et al. (2008), ODP 1166 has an unconformity that spans ~30-3 Ma. The down-core record we are investigating in this study is located off of Prydz Bay in East Antarctica at ODP site 739, located about 200 km from the coastline. Because of its location we conclude that the sediment deposited into this area is derived from the Lambert Glacier.