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ANALYSIS OF ICE-RAFTED DEBRIS FROM OCEAN DRILLING PROGRAM SITE 1165, HOLE B INDICATES OCCASIONAL WARM-WATER INTRUSIONS DURING THE LAST 5 MILLION YEARS

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ODP (Ocean Drilling Program) Site 1165, is situated on the continental rise approximately 400 kilometres northwest of northwest of Pryds Bay, Antarctica (64° 22.77'S, 67° 13.14'E) in 3537 meters of water over mixed pelagic and hemipelagic sediments of the central Wild Drift. The samples used in this study were taken from Hole B. The first 50 meters below sea floor (mbsf) were of special interest to some members of the shipboard scientific party, and consisted of Pliocene-Pleistocene sediments. Ice-rafted debris (IRD, mainly quartz grains), radiolarians, and foraminifera were counted to provide graphical representations of their percentages versus depth. The percent-foraminifera and the percent-IRD quartz graphs display a distinctive inverse relationship to their abundances at several key intervals in the core sample. This inverse correlation is most notably seen at 7-12 mbsf in the core sample where IRD quartz percentages almost completely drop off and are coincident with high percentages of foraminifera (about 90 percent). These high percentages of foraminifera suggest relatively warm water, and lack of sea-ice. We suggest that this 7-12 mbsf interval corresponds to Marine Isotope Stage 31 (and 32 and 33?), based on published magnetostratigraphy. Below 34 mbsf (early Pliocene) radiolarians tend to dominate the coarse fraction (as much as 74 percent) perhaps also suggesting more open, warmer water than today, in agreement with Whitehead et al. (2005). Interestingly, at no point in the 0-50 mbsf interval does the IRD quartz completely disappear, even when foraminifera dominated, indicating that ice rafting never ceased. In samples rich in biogenic components, the IRD was simply "drowned out" by the increase in the deposition of biogenic components due to pulses of warm water (reduction of sea ice). Conclusions: Findings suggest significant environmental changes throughout the Pliocene and Pleistocene, but also indicate that ice-rafting continued and that the Antarctic ice sheets still extended to the ocean.