

Deposition Mechanisms and Sources of Marine Sediment in the Weddell Sea, Antarctica

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Granulometric properties of Weddell Sea sediments were studied to determine depositional mechanisms and transport paths of terrigenous detritus from Antarctic sources. The grain size distribution of three sediment gravity cores were examined and classified into two subcategories: fine grained particles with grain sizes smaller than 20 μ m and coarse grained particles with grain sizes bigger than 20 μ m. Grain size analysis yields two distinct sediments compositions in the Northwestern Weddell Sea (PS1575-1 and PS1170-3) versus the Eastern Weddell Sea (PS1388-3). Here we present evidence that sediment deposited at core PS1388-3 exhibits characteristics of ice-rafted debris (IRD) while sediments deposited at core PS1170-3 and PS1575-1 exhibit characteristics of current transported mud. Strong variations in the concentration of the fine grained fraction in PS1388-3 resembling the glacial/interglacial pattern of the $\delta^{18}\text{O}$ stratigraphy was used to infer that the occurrence of ice-rafting events in Antarctica was more frequent during interglacial periods. The warmer temperatures may have triggered discharges of icebergs embedded with sediment from either the West Antarctic Ice Sheet (WAIS) and/or East Antarctic Ice Sheet (EAIS).