

## **The Holocene deglaciation of the East Antarctic margin: High resolution multiproxy record from Site U1357 (Adélie Land)**

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### **Abstract**

Recent studies demonstrate that marine-based West Antarctic Ice Sheet (WAIS), as well as parts of the East Antarctic Ice Sheet (EAIS), are more vulnerable than expected (Cook et al., 2013). During IODP Expedition 318 a unique ~200 m sequence of likely annually layered sediments spanning the Holocene (ca. the last 11,700 yrs BP) was recovered from the Terre Adélie margin (East Antarctica, Site U1357). The laminated sediments consist predominantly of diatom and radiolarian remains and reveal cyclic coarse detrital layers in the lowermost part. Despite clear lamination develop a robust age model has been a challenging task. Site U1357 sedimentary Unit II, associated with deglaciation, is enriched in detrital sediment and probably affected by relict carbon input. Counting lamina and compound-specific <sup>14</sup>C dating have been used to construct a precise age model for this interval. Geochemical studies have been conducted on cores from holes U1357A and B at ultra-high (seasonal to decadal) resolution using X-Ray Fluorescence scanning. The ratio of the concentrations of highly branched isoprenoid (HBI) diene/triene, a diatom-specific biomarker, has also been used as a proxy for relative inputs of sea-ice algae and open water phytoplankton, which provide a record of past sea-ice cover. Organic and inorganic geochemical proxies can be related to major fluctuations in local deep-water formation, sea ice presence, and detrital inputs from the continent. In this sense, the Zr/Al ratio is a useful proxy for glacial distal reconstruction in agreement with previous studies (Bertran et al., 2012). The data indicates rapid collapse of stratified water column conditions and periodic retreat of the ice grounding line probably due to intrusion of warm intermediate waters.

**Keywords:** Holocene, Terre Adélie, Last Deglaciation

### **References**

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