

Sedimentary mercury deposition in the southern Scotia Sea during the glacial stage

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Polar regions have acted as an important atmospheric mercury (Hg) sink, especially during the cold climatic periods. In this respect, seasonal and glacial-interglacial Hg variations, associated with atmospheric mercury depletion events (AMDEs), were extensively documented in snowpack and ice cores [1, 2], but only a few attempts have been made to study the sedimentary Hg records in these zones. Here we present the first Hg variations in sediment cores from the southern Scotia Sea, Antarctic, covering the last glacial cycle. Sedimentary Hg concentrations in the cores varied considerably during the past climatic cycles (glacial-interglacial cycles); Hg concentrations ranged from 22 to 75 ng/g, which were primarily controlled by total organic carbon (TOC) contents. Interestingly, TOC-normalized enrichment ratio and flux of sedimentary Hg were higher and more variable during the glacial stage, compared with Holocene. Such elevated Hg level may be associated with large input of Hg enriched-saline water resulting from intense polynya formation in the Weddell Sea during the glacial, coupled with enhanced deposition of atmospheric Hg by dusts and sea-salts. Our result provides new insights into the Hg depositional processes in Antarctic environments, especially during the cold, glacial stages.

[1] Steffen *et al.* (2008) *Atmos. Chem. Phys.*, **8**, 1445-1482. [2] Jitaru *et al.* (2009) *Nature Geoscience*, **2**, 505-508.