Paleoenvironmental changes related to ice sheet and ice shelf developments in the Ross Sea since 15 kyr B.P.

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Abstract

A gravity core JB04 (172°22′21″E, 75°18′04″S, water depth 510 m), dredged from the Joides Basin in the central-western Ross Sea, was used to reconstruct paleovironmental changes related to ice sheet and ice shelf retreats since 15 kyr BP based on radiocarbon chronology, facies, sedimentological and geochemical analyses. A total of four facies were identified in the core from the bottom up that suggest the subglacial (314~249 cm, 15.0~11.7 kyr B.P.), sub-ice shelf (249~195 cm, 11.7~9.5 kyr B.P.), ice shelf-proximal (195~115 cm, 9.5~7.0 kyr B.P.) and modern central continental shelf environments (115~0 cm, 7.0~2.5 kyr B.P.), respectively. The grounding line retreated to the site was ca. 11.7 kyr B.P., open-marine conditions occurred at 9.5 kyr B.P. while the oceanographic and climatic settings became stable since ca. 7.0 kyr B.P. in the central-western Ross Sea.

Keywords: paleoenvironmental changes; ice sheet and ice shelf retreat; the Ross Sea; since 15 kyr B.P.