

New sedimentary records of Eastern Ross Ice Shelf retreat since the Last Glacial Maximum

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Abstract

During the Last Glacial Maximum (LGM) the Ross Ice Shelf was a large, grounded, ice sheet that extended to the Antarctic continental shelf edge. Numerical Simulations imply that its retreat since the LGM was initiated in the central Ross Embayment. However, the retreat is poorly or unconstrained in the central and eastern portion from empirical data therefore simulations cannot be verified. Our project aimed to use existing sediment cores from the eastern Ross Sea to reconstruct the retreat history of the Ross Ice Shelf. Here we present new sedimentary logs and sedimentological, diatom, paleomagnetic and rock magnetic data. Paleomagnetic analyses revealed that sediments, and sedimentation rates around the Ross embayment are variable with a c. 6 m long core from the central Ross embayment (NBP03-01A-20PC) having a basal age that may exceed 1 Ma. On the contrary the 4.65 m long core, NBP96-01-17JPC from the eastern sector appears to have high sedimentation rates and an intact record of the retreat of the Ross Ice Shelf and transition modern conditions. Ramped temperature pyrolysis ¹⁴C indicates that the grounding line retreated from this location between 8 and 7 kyr, which 5-6 kyr later the current generation models

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