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Changes in sea-ice cover and temperature in the Western Ross Sea during the Holocene

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Although changes in sea-ice cover contribute to global climatic variations, they are poorly constrained for periods earlier than the last decades. More records are especially required around Antarctica, where the formation of Antarctic Bottom Waters participates to global thermohaline circulation. However, this region provided only a few marine sediment cores spanning the entire Holocene, especially because of generally low sedimentation rates. This study focuses on marine sediment core ANTA99-CJ5 (73°49'S; 175°39'E), located in the open sea ice zone (OSIZ) of the western Ross Sea. We analyzed several lipid biomarkers: highly branched isoprenoids (HBIs), sterols, diols and GDGTs. The combination of several biomarkers and the comparison of these results with a diatom record previously published on the same core enabled us to trace past changes in temperatures as well as in sea-ice condition over the last 11,600 years.