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Late Holocene diatom-based sea-surface temperature reconstruction from the Conrad Rise, Southern Ocean

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The Southern Ocean plays an important role in the global climate system. The temperature and sea ice extent alter the latitudinal temperature gradient of the Southern Ocean, which can be transferred to the atmosphere resulting in changes in the southern westerly winds. The temperature, sea ice and wind variations are also factors influencing Antarctic Bottom Water formation, which is a control on the strength of the Atlantic Meridional Overturning Circulation. Therefore conditions in the Southern Ocean may influence the climate in the northern and southern hemispheres. The Southern Ocean and North Atlantic were connected during the Last Glacial during Dansgaard-Oeschger events, when variations in ocean circulation caused a bipolar seesaw of temperatures. For the Holocene there is less evidence for a bipolar seesaw, although recent research shows concurrent, opposite trends in ocean circulation in the North Atlantic and in the Southern Ocean. Further reconstructions are required from the Southern Ocean in particular to enable greater understanding of how the temperature and sea ice varied during the Holocene.

The OCTEL project (Ocean-sea-ice-atmosphere teleconnections between the Southern Ocean and North Atlantic during the Holocene) aims to investigate the ocean, atmosphere and sea-ice teleconnections for the Holocene using new, high resolution records from both the Southern Ocean and North Atlantic. We here present initial results from diatom analysis conducted on a sediment core from the Southern Ocean, sampled from the Conrad Rise (54˚16.04'S, 39˚45.98'W). The preliminary results highlight a dominance of diatom species *Fragilariopsis kerguelensis* and *Thalassiosira lentiginosa*, with lower abundances of *Thalassiothrix antarctica* and *Thalassiosira gracilis* among others, which suggests an open ocean setting close to the polar front. The diatom data will be converted to quantitative reconstructions of summer sea surface temperature and sea ice presence using the Modern Analogue Technique. It is hoped that the new reconstructions in combination with existing records and modelling will enable improved understanding of the patterns and causes of interhemispheric ocean and climate variability.