1133

Environmental Controls on Laminae Frequency and Biological Productivity in Adélie Land

Katelyn M. Johnson[1,2], Rob M. McKay[2], Anya Albot[2], Rob Dunbar[3], Christina Riesselman[4], Francis Jiménez-Espejo[5], Johan Etourneau[6], Nancy Bertler[1,2]

[1]GNS Science National Ice Core Research Laboratory, Lower Hutt, New Zealand, [2]Antarctic Research Centre, Victoria University of Wellington, Wellington, New Zealand, [3]Department of Earth, Energy, and Environmental Sciences, Stanford University, Stanford, USA, [4]Department of Geology; Department of Marine Science, University of Otago, Dunedin, New Zealand, [5]Andaluz Institute of Earth Sciences, CSIC-Universidad de Granada, , Spain, [6]UMR 5805 EPOC CNRS, University of Bordeaux, Bordeaux, France

Wind driven currents along Antarctica's coastal margins regulate water mass exchange between the Antarctic continental shelf and Southern Ocean. As such, these currents exert control on the delivery of heat, salt, and nutrients to the coastal margins and marine based ice sheets. This exchange affects sea ice extent, primary productivity, and bottom water formation, and may be capable of change at centennial to millennial timescales. However, characterising the long-term climate variability of wind driven currents, and the effect on primary productivity, is difficult due to sparse and temporally limited observational data. Here, we present a new Holocene climate record from Integrated Ocean Drilling Program (IODP) sediment core U1357B in the Adélie Basin, East Antarctica. The sediment core consists of contrasting light and dark centimetre scale laminations through the entire 170 m of core, with light laminations reflecting changes in biological sedimentation. Using X-Ray Computed Tomography, and supported by grain size distributions, XRF data, and other physical core properties, we developed a record of near annual biogenic bloom events and link these bloom events to changing environmental conditions. As primary productivity in many parts of the Antarctica's coastal regions is strongly linked to wind-driven upwelling processes, we investigate how variations in grain size can be used to assess changes in wind-driven currents, which may influence dark and light laminae characteristics through the Holocene. The result is a centennially resolved coastal current reconstruction for the Holocene along the Adélie Land Margin.