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Modern foraminifera assemblages in the Amundsen Sea Embayment

Patrycja Ewa Jernas (1), Gerhard Kuhn (2), Claus-Dieter Hillenbrand (3), Tine Lander Rasmussen (1), Matthias Forwick (1), Andreas Mackensen (2), Michael Schröder (2), James Smith (3), and Johann Philipp Klages (2)

(1) Department of Geology, CAGE, UiT, The Arctic University of Norway - Norway, (2) Alfred Wegener Institute for Polar and Marine Research - Germany, (3) British Antarctic Survey - United Kingdom

The West Antarctic Ice Sheet (WAIS) is considered the most unstable part of the Antarctic Ice Sheet. As the WAIS is mostly grounded below sea level, its stability is of great concern. A collapse of large parts of the WAIS would result in a significant global sea-level rise. At present, the WAIS shows dramatic ice loss in its Amundsen Sea sector, especially in Pine Island Bay. Pine Island Glacier (PIG) is characterised by fast flow, major thinning and rapid grounding-line retreat. Its mass los over recent decades is generally attributed to melting caused by the inflow of warm Circumpolar Deep Water (CDW). Future melting of PIG may result in a sea level tipping point, because it could trigger widespread collapse of the WAIS, especially when considering ongoing climate change.

Our research project aims to establish proxies (integration of foraminifera, sediment properties and oceanographic data) for modern environmental conditions by analysing seafloor surface sediments along a transect from the glacier proximal settings to the middle-outer shelf in the eastern Amundsen Sea Embayment. These proxies will then be applied on sediment records spanning the Holocene back to the Last Glacial Maximum for reconstructing spatial and temporal variations of CDW upwelling and ice-ocean interactions during the past c. 23,000 years. We will present preliminary results from the analyses of ten short marine sediment cores (multi and box cores) collected during expeditions JR179 (2008) and ANT-XXVI/3 (2010) along a transect from inner Pine Island Bay to the middle-outer shelf part of the Abbot Palaeo-Ice Stream Trough at water depths ranging from 458 m (middle shelf) to 1444 m (inner shelf). The sediment cores are currently investigated for distribution patterns of planktonic and benthic foraminifera and grain-size distribution at 1 cm resolution. Core tops (0-10 cm) were stained with Rose Bengal for living benthic foraminifera investigations. The chronology of the cores will be based on 210Pb and calibrated 14C dates. First results reveal the presence of living benthic foraminifera in surface sediments of all investigated cores suggesting that modern seabed surfaces were recovered. Moreover, a core retrieved from a water depth of 793 m in the Abbot Palaeo-Ice Stream Trough shows particularly high abundances of planktonic foraminifera *Neogloboquadrina pachyderma.*