



Sedimentary and glacial processes of the Amundsen Sea Embayment, West Antarctica

Karsten Gohl (1), Gabriele Uenzelmann-Neben (1), Estella Weigelt (1), Ansa Lindeque (1), Thomas Kalberg (1), Gerhard Kuhn (1), Claus-Dieter Hillenbrand (2), and Robert D. Larter (2)

(1) Alfred Wegener Institute for Polar and Marine Research, Department of Geosciences, Bremerhaven, Germany
(karsten.gohl@awi.de), (2) British Antarctic Survey, Cambridge, UK

Recent melt and retreat rates of glacier systems in the Amundsen Sea Embayment and, in particular, Pine Island Bay have placed this region into focus for predicting the dynamics of the West Antarctic Ice Sheet and sea-level rise. The architecture of continental shelf and slope sediments represents stages of the glacial history from early glaciation to the last glacial period. A new large dataset of seismic profiles collected on the shelf, slope and rise provides new insight into the glacio-marine processes. The data reveal an heterogeneous outer shelf with areas of pronounced progradation while other areas lack this deposition type almost entirely. In some parts, sediments deposited across the shelf break enlarged the outer shelf by up to 60 km oceanward. Major glacial troughs – systems of ice streams flow – have repeatedly shifted position, width and direction since early glaciation. These deep troughs are significant for incursions of Circum-Polar Deep Water onto the shelf. Observed grounding zone wedges indicate stages when grounding zones were stationary for some time. These observations show that ice sheet advances on the shelf have constantly altered throughout glacial cycles. Although chronological control of the strata is still missing, we will present a first seismic horizon-stratigraphic model for the Amundsen Sea Embayment, which will serve as a base for understanding processes of glacial advance and retreat.