



## **Southern Ocean dynamics and Antarctic glaciation during the Miocene**

**T. Bickert** (1), M. Butzin (1), H. Kuhnert (1), G. Lohmann (2)

(1) MARUM, University Bremen, 28334 Bremen, (2) Alfred Wegener Institute, 27570 Bremerhaven

Abrupt cooling steps and geochemical reorganizations in the circumantarctic realm characterize the the middle to late Miocene glaciation of Antarctica. Here, we report results of current modeling study in which we aim to identify the driving mechanisms for the development and the dynamics of the Southern Ocean frontal system during this cooling phase. Special emphasis is put on the potential climatic effects of ocean gateway changes, such as the constrictions of the Drake Passage and of the eastern Tethys. We employ a global ocean circulation carbon cycle model (MPI-OM) with a curvilinear grid focussing on the Southern hemisphere, which means that the Southern Ocean is investigated at higher resolution than the rest of the world. This modeling approach circumvents some typical problems of common models in regional modeling studies, such as the specification of proper boundary conditions if using stand-alone regional models, or the rather coarse resolution of global circulation models. The results of the modelling experiments are compared to sea-surface temperature and salinity reconstructions from the subantarctic Atlantic using paired measurements of Mg/Ca and oxygen isotopes in selected planktonic foraminifer species.