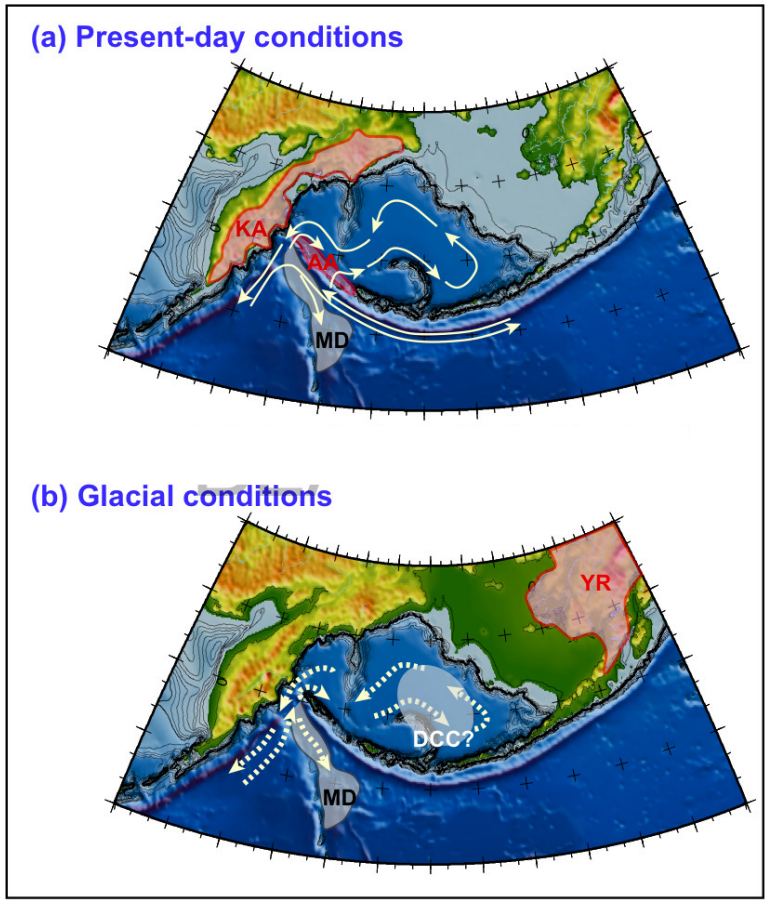
PI:
Cecile L. Blanchet (Post-doc), Martin Frank,
Timo Hohmann (Diplom)
Funding:
Deutsche Forschungsgemeinschaft
Start of project:
September 2011

Variability of deep-water sources in the Bering Sea since the Late Pliocene: Insights from radiogenic isotopes

Changes in North Pacific Deep Water ventilation are prone to greatly affect global climate through storage/release of CO_2. However, past dynamics of this water mass are not well–resolved to date and paleorecords provide contradictory results. Marginal seas in the North Pacific have been proposed as potential areas for deep convection, especially at times of intense sea-ice formation and higher sea-surface salinity. In particular, the Bering Sea bears such a potential and has been shown to provide large amounts of water and sediment to the North Pacific during the warm Pliocene and during the glacial stages of the Pleistocene. Recently, formation of intermediate water was demonstrated in the southern Bering Sea, but the bathymetric and lateral extent of this convection is still unknown. During IODP Campaign 323, continuous and undisturbed sedimentary sequences have been drilled on Bowers Ridge (southern Bering Sea), which cover the past 4 Ma.

Goals:
-To gain new insights into Bering Sea Deep Water (BSDW) ventilation dynamics and sediment transport and to relate those to regional paleo-environmental changes and global climatic changes. We will investigate the deep-water radiogenic neodymium (Nd), strontium (Sr) and lead (Pb) isotopic composition of the past from authigenic seawater-derived ferromanganese coatings and foraminifera.
-Together with other scientific teams involved in the IODP Campaign 323, we also aim at contributing data for a spatio-temporal reconstruction of intermediate and deep water changes in the whole Bering Sea during the past 4 Million Years.



(a) Present-day and b) glacial deep oceanic circulation patterns with potential zones of deep convection during the glacial time (gray shading in b).