In order to understand the role of the Atlantic for climate variability in the Atlantic region, this subproject aims at investigating the variability of the western boundary current (WBC) system off Brazil as well as the Atlantic Meridional Overturning Circulation (AMOC) at 11°S.

**Results from RACE I**

- On longer timescales the variability of the NBUC and DWBC is reduced.
- On average moored observations do not show significant changes between the two observational periods.
- Interannual NBUC variability as assessed from moored observations between 2000-2004 is consistently found in the output of a forced ocean model (INALT01).
- Decadal variability is similar in INALT01 and geostrophic transport estimates from Zhang et al. (2011).
- The observed decadal salinity increase in the central water range (100-600m) is consistent with previous estimates (Fig. a).
- The inferred vertical structure of salinity and oxygen trends (Fig. c, d) can be related to changes in water mass formation regions as well as circulation changes in remote regions of the Atlantic.

**Plans for RACE II**

1. Determine the mean, and seasonal to interannual variability of the AMOC at 11°S by constructing a transport time series. The AMOC is calculated by the sum of four meridional flow components (Kanzow et al., 2010; Chidichimo et al., 2010): T_{AMOC}(t) = T_{WB}(t) + T_{EW}(t) + T_{EK}(t) + T_{EB}(t).

2. Use the INALT01 model configuration for comparison and completion of the resulting AMOC transport time series at 11°S.

3. Synthesize the results with other transport time series for an consistent picture of the tropical Atlantic circulation and for the investigation of meridional coherence in AMOC transport fluctuations.

**Aims RACE II**

- Assessment of the transport variability of NBUC, DWBC und the AMOC at 11°S on intraseasonal to decadal time scales.
- Investigation of the relation between transport variability at the western boundary at 11°S (warm and cold water route) and the variability in the subpolar North Atlantic with respect to signal propagation within the AMOC.
- Analysis of the spreading of water mass anomalies within the AMOC, which can e.g. originate from the variability in the inflow of saline waters from the Indian to the Atlantic ocean.
- Investigation of the relation between NBUC variability at 11°S and EUC variability at 23°W and its impact on the heat and freshwater balance of the mixed layer, the resulting ocean-atmosphere interactions and rainfall variability over West Africa.