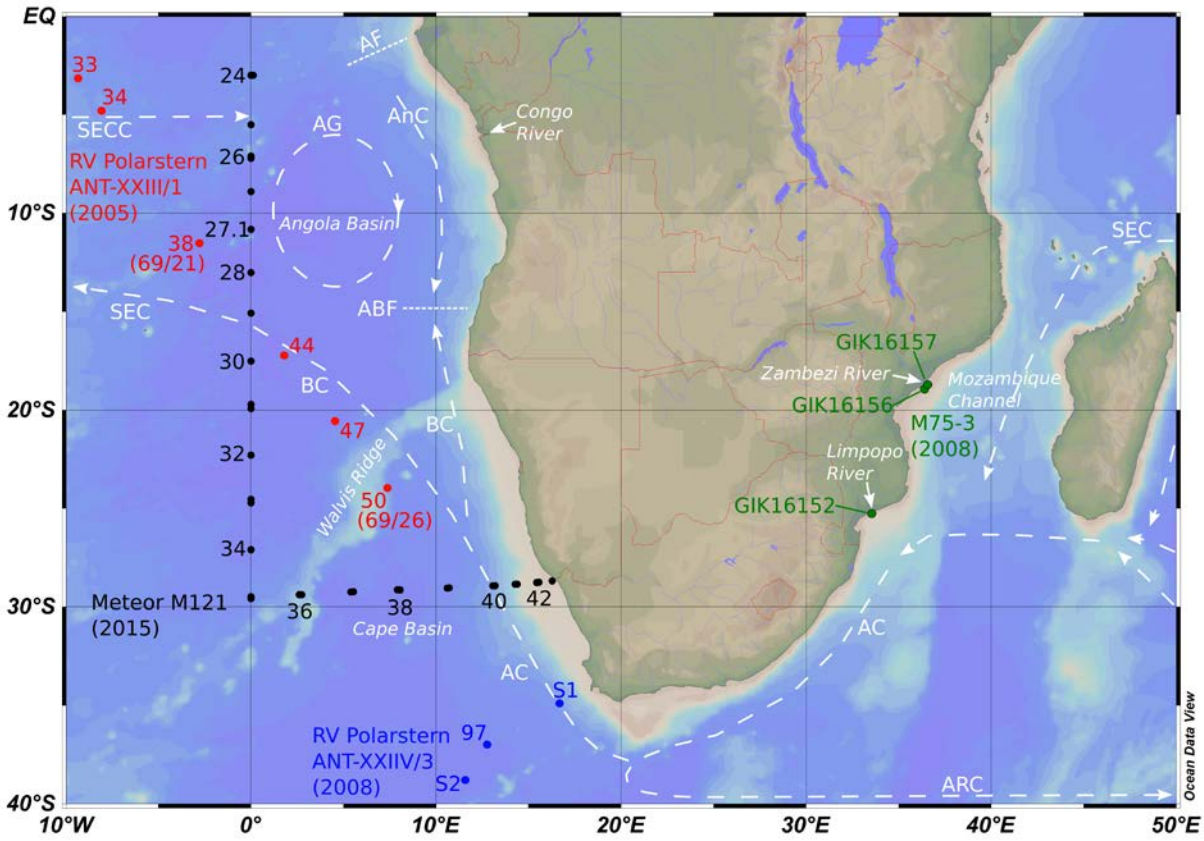

Figure 1: Surface circulation map of the Angola Basin, Cape Basin and Mozambique Channel. Black dots represent stations from this study. Red dots represent stations from cruise RV Polarstern ANT-XXIII/1 (2005) (Rickli et al., 2009, 2010). Blue dots represent stations from cruise RV Polarstern ANT-XXIIV/3 (2008) (Stichel et al., 2012a,b). Green dots represent stations from Cruise M75-3 (2008). White dashed arrows indicate surface currents: AC = Agulhas Current, BC = Benguela Current, SEC = South Equatorial Current, ABF = Angola Benguela Front, AF = Angola Front, SECC = South Equatorial Counter Current, AG = Angola Gyre, AnC = Angola Current. (For interpretation of the colors in the figure(s), the reader is referred to the web version of this article.)

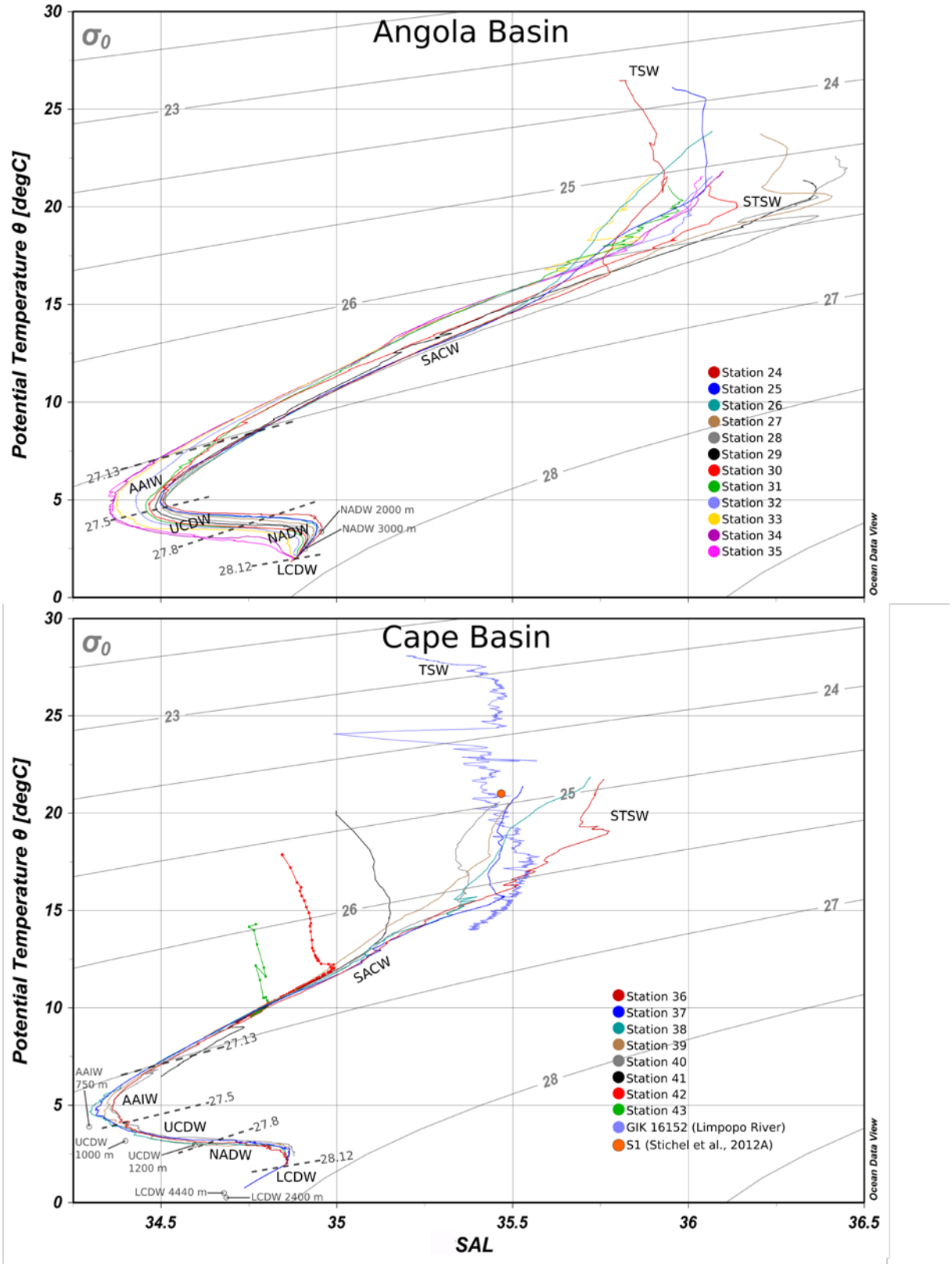

Figure 2: T-S plots with stations from this study. The dashed lines indicate neutral densities (γ^n). The water mass endmembers used for mixing calculations (Fig. 6) are marked with circles. Bottom waters of the Angola Basin mainly consist of North Atlantic Deep Water (NADW), whereas bottom waters of the Cape Basin consist of a significant portion of Lower Circumpolar Deepwater (LCDW). Surface waters of the Cape Basin are South Atlantic Central Water (SACW) and Subtropical Surface Water (STSW), while surface waters of the Angola Basin are mainly Tropical Surface Water (TSW). The TSW from the Limpopo River area mixes with the STSW from the Cape Basin.

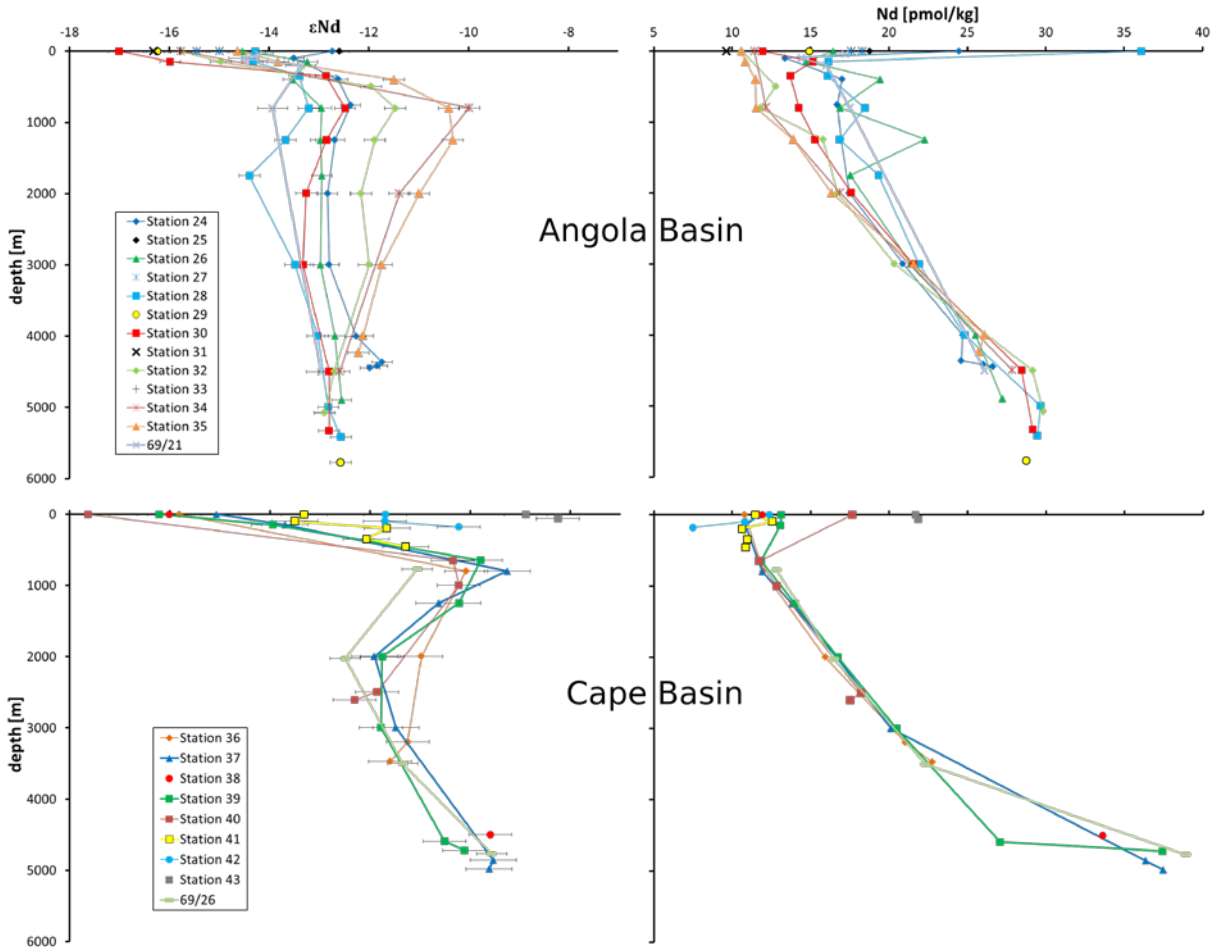

Figure 3: Profiles of the Nd isotopic compositions (ε_{Nd}) and concentrations from the Angola and Cape Basins. Surface waters of both basins have highly unradiogenic ε_{Nd} values of up to -17.6, whereas intermediate waters have ε_{Nd} values between -10 and -14. Bottom waters of the Cape Basin are more radiogenic (ε_{Nd} -10) than those of the Angola Basin (ε_{Nd} -13). Surface water concentrations of the basins are between 10 and 20 pmol/kg but have a peak concentration of 36 pmol/kg in the Angola Basin at station 28. Isotope compositions and concentrations of stations 69/21 and 69/26 (Rickli et al., 2009) are similar to the values we measured.

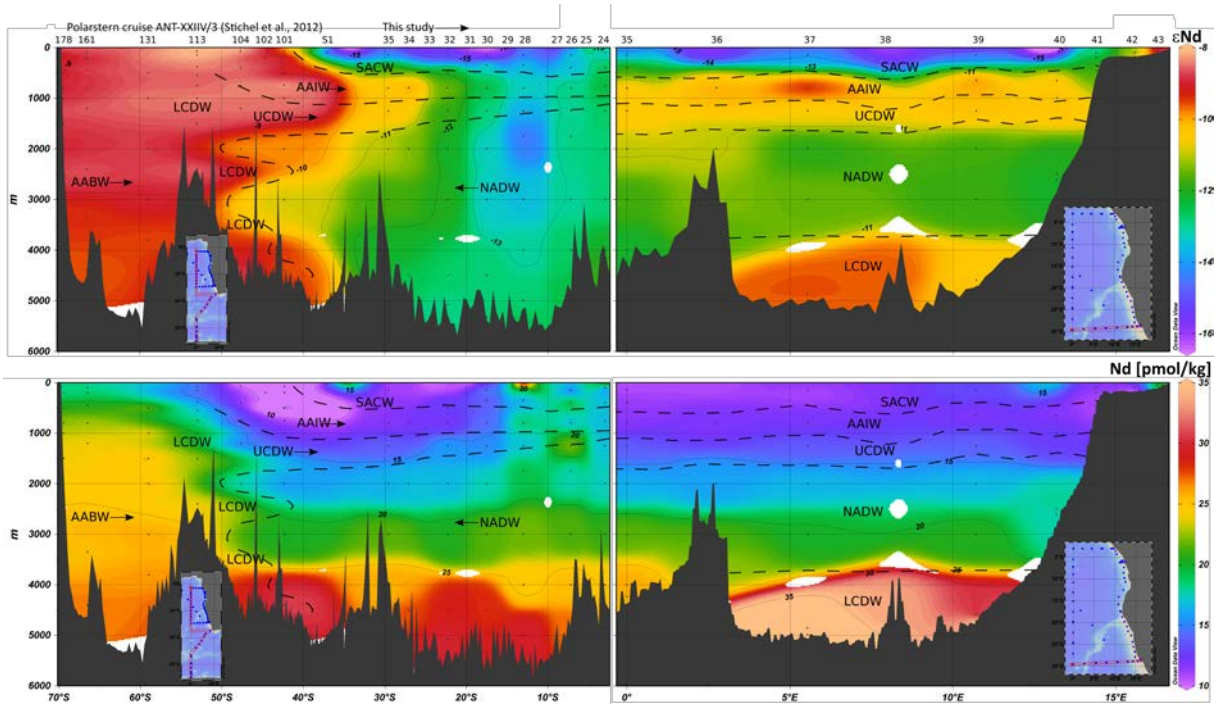

Figure 4: Nd isotopic compositions and Nd concentrations of the Angola Basin and Cape Basin from this study, together with data from cruise ANT-XXIIV/3 (Stichel et al., 2012 a,b). Dashed lines indicate approximate boundaries of the prevailing water masses. Sections were produced using Ocean Data View (Schlitzer, 2019) and modified manually.

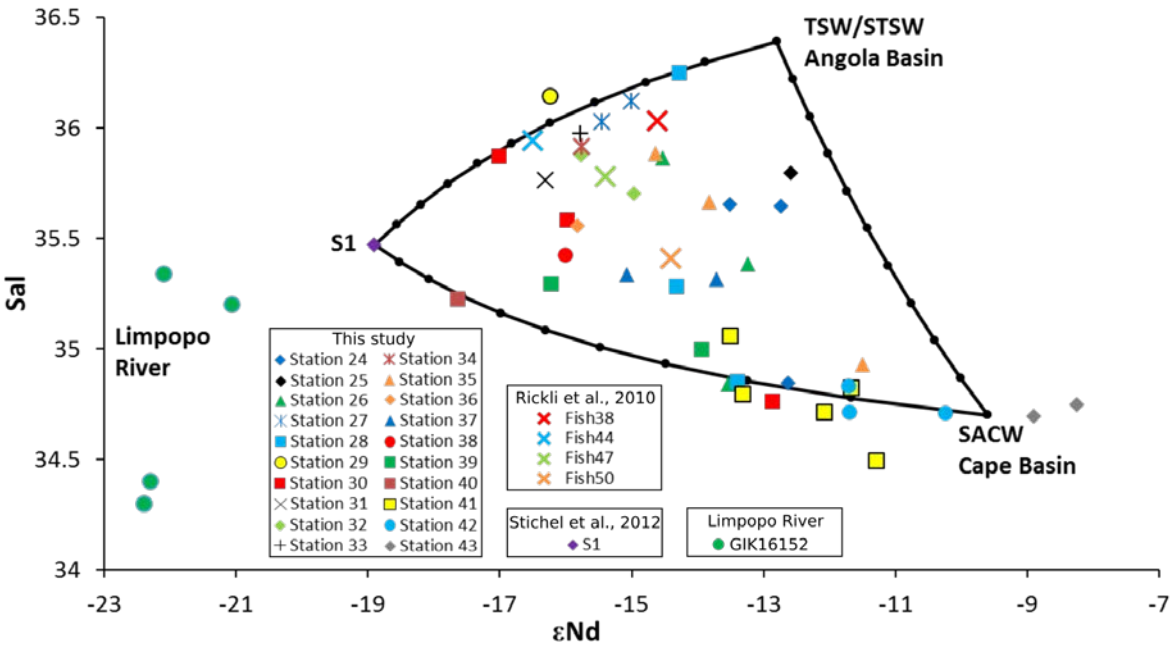

Figure 5: Salinity versus ε_{Nd} for shallow waters between 0 and 400 m water depth, showing mixing relationships between regional endmembers S1 (Stichel et al., 2012a), SACW of the Cape Basin and TSW/STSW of the Angola Basin. For the Agulhas Current endmember represented by station S1 (Stichel et al., 2012a) we chose an ε_{Nd} signature of -18.9 and a salinity of 35.47. For SACW, an ε_{Nd} value of -9.6 and a salinity of 34.79 were adopted (Jeandel, 1993). For TSW/STSW an ε_{Nd} of -12.8 and a salinity of 36.29 was used (Zieringer et al., 2019). The plot indicates that near surface waters of the Cape Basin and Angola Basin are a mixture of SACW, TSW/STSW and unradiogenic waters from the Mozambique Channel.

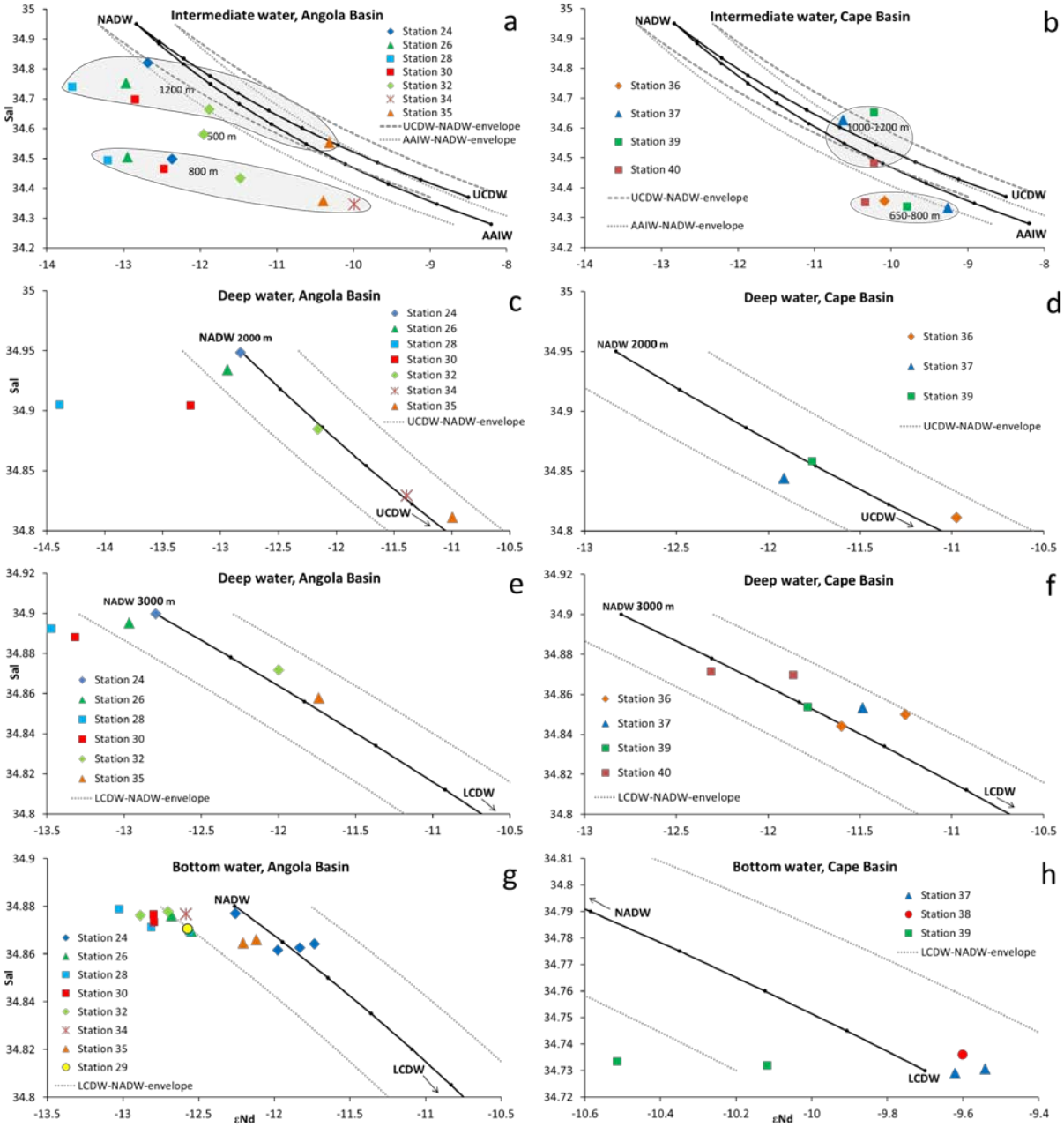

Figure 6: Salinity versus ε_{Nd} diagrams for all water masses of the Angola and Cape Basin.

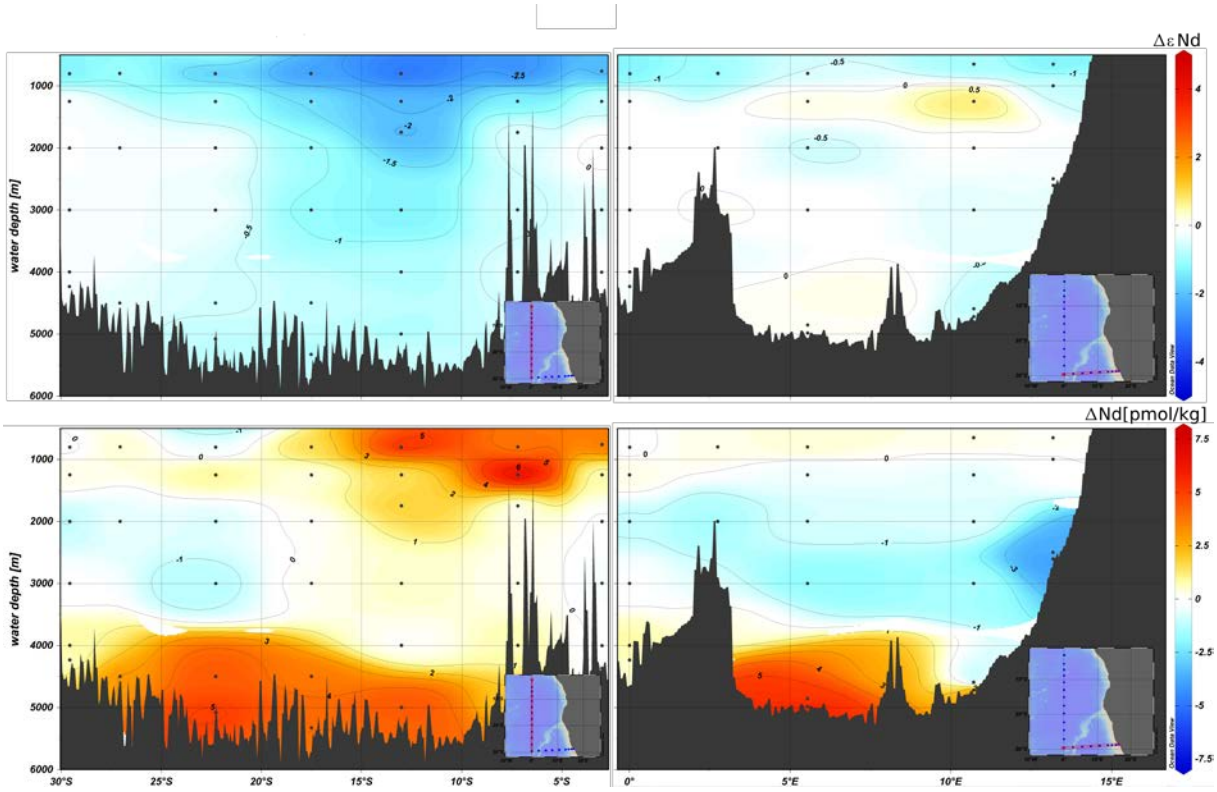

Figure 7: $\Delta\varepsilon_{Nd}$ and ΔNd values mark the differences between measured ε_{Nd} values and Nd concentrations and those calculated based on conservative water mass mixing. White areas reflect conservative mixing within the uncertainty ranges of $\Delta\varepsilon_{Nd}$ ±0.5 ε_{Nd} and ΔNd ±0.8 pmol/kg, respectively. Red colors indicate an excess of radiogenic Nd and of Nd concentrations. Blue colors indicate an excess of unradiogenic Nd and removal of Nd.

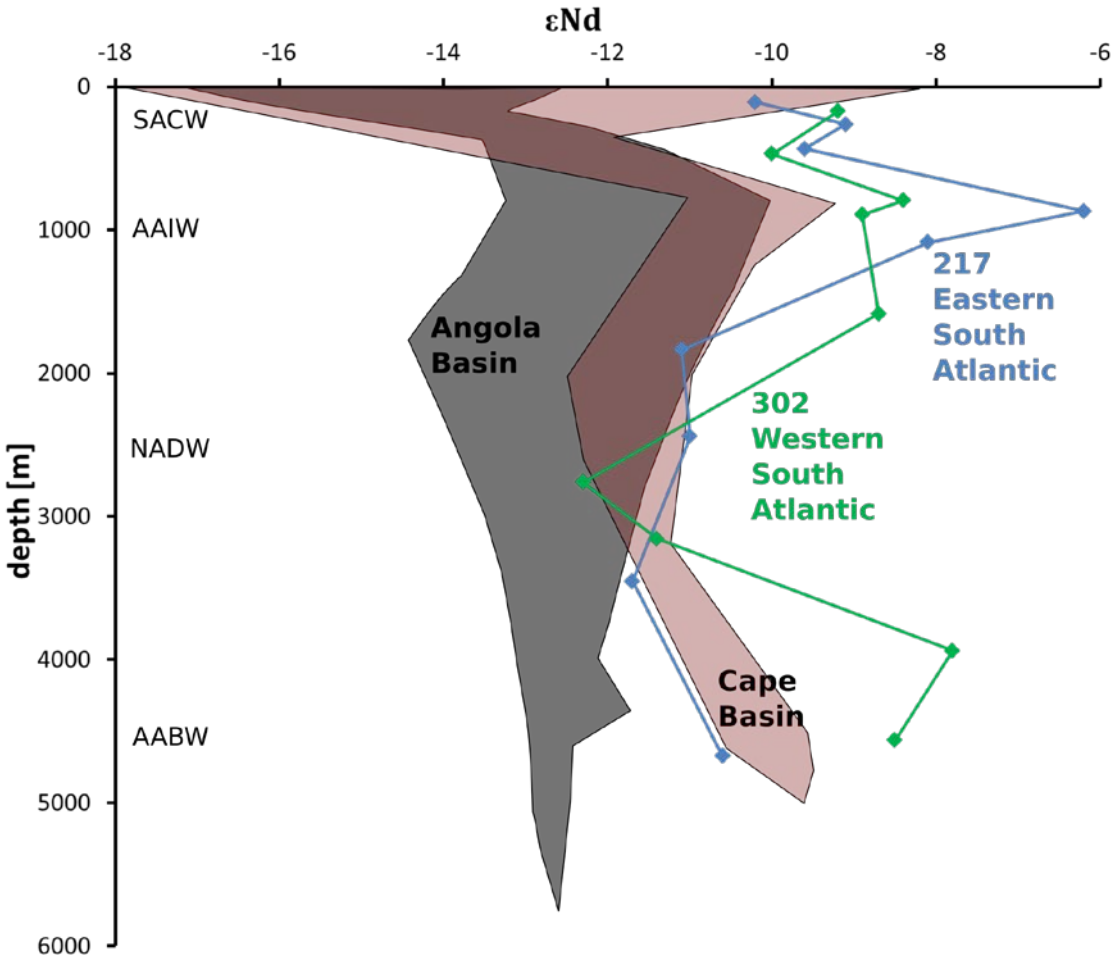

Figure 8: Range of Nd isotope compositions in the Angola and Cape basins from our study compared with two water column profiles of the eastern and western South Atlantic (Jeandel 1993).

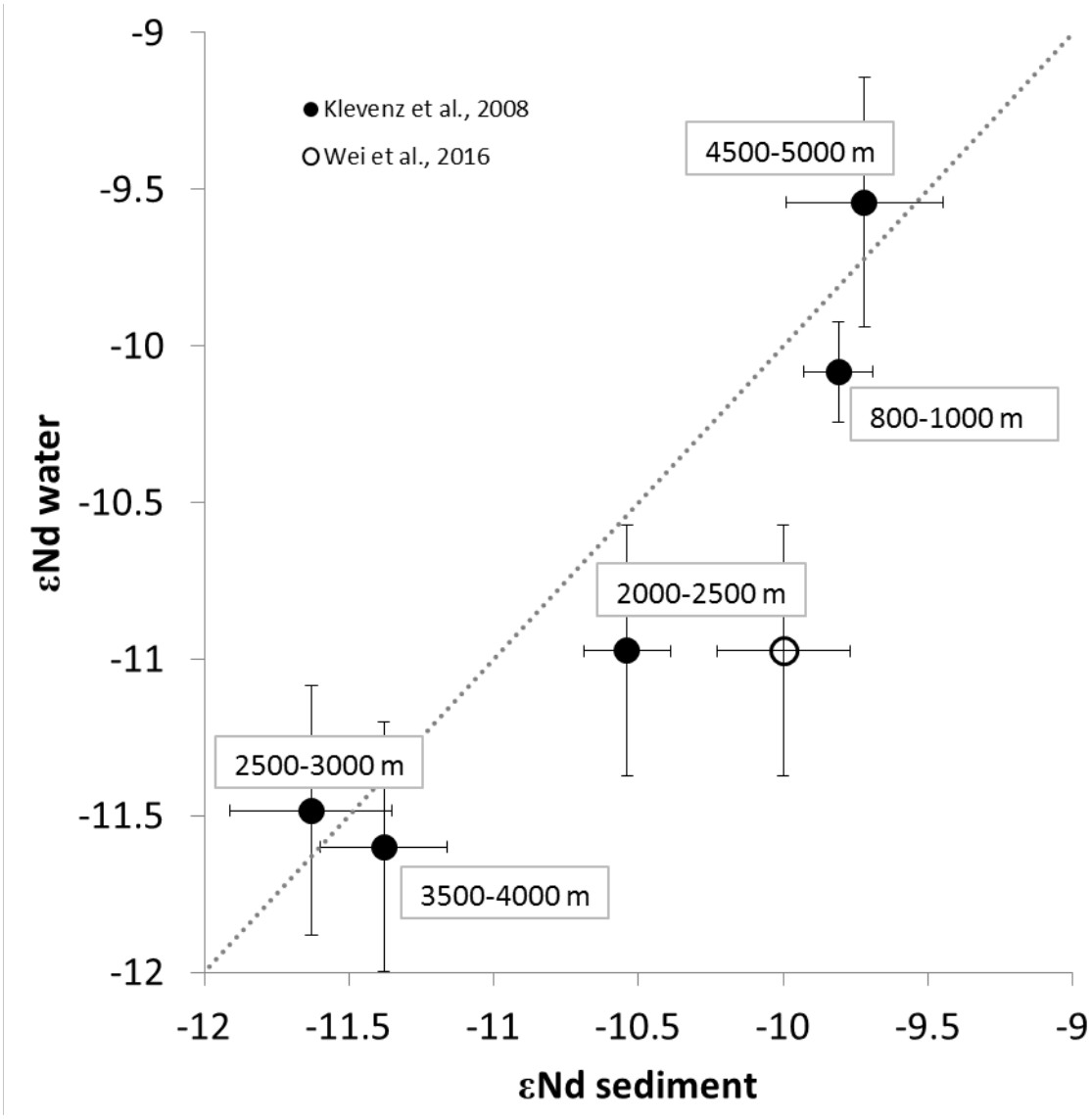

Figure 9: Comparison of Nd isotope compositions of water masses in the Cape Basin and core top sediments of the Walvis Ridge (Klevenz et al., 2008) and of the southern Cape Basin (Wei et al., 2016) reveals good agreement for the corresponding water depths.