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Stable isotope values of North Atlantic water masses

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A comprehensive study of seawater stable isotope properties in the mid-latitude North Atlantic is still missing, especially for the intermediate and deep-water masses. To fill this gap seawater samples were collected since 2006 along various transects in the Northeast Atlantic. During the Atlantic Meridional Transect (AMT) 18 expedition the upper 300 m were sampled between 46.6 and 24.7°N. RV Poseidon cruises POS334, POS349, POS377, and POS383 to the Azores Front region (38.3–30°N; 22–20°W) generally yielded samples down to 2000 m. High-resolution sampling over the whole water column was performed during the OVIDE 2010 (Portugal to Reykjanes ridge) and KN199-4 cruises. Cruise KN199-4 implemented the section from Lisbon to the Cape Verde Islands of the US GEOTRACES North Atlantic transect. Additional stations collected samples along the Iberian margin during the EUROFLEETS Iberia-Forams cruise on RV Garcia del Cid in September 2012. The isotope results clearly indicate the different water masses and hydrographic fronts, although variability in some regions is higher than expected, potentially an affect of the different years and seasons sampled and/ or meandering of the Azores Current. Higher isotope values are observed in the surface waters of the central subtropical gyre and on the southern side of the Azores Front, i.e. within the Azores Current. Lower isotope values are observed in the North Atlantic Deep Water and the Antarctic Intermediate Water upwelled off NW Africa. Mediterranean Outflow Water is best depicted in the Deuterium values because the salinity signal is less rapidly diluted than temperature. Combining the isotope with the respective station's CTD data will allow establishing regional relationships between isotope and temperature/ salinity.