

Neodymium isotopes and rare earth elements in the tropical Atlantic Ocean: results from the GEOTRACES GA06 cruise

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Neodymium (Nd) isotopes and rare earth elements (REEs) patterns in seawater are widely used to study lithogenic particle provenance and aeolian input as well as past changes in ocean circulation and their relationship to global climate. However, the modern database for such reconstructions, as well as our understanding of the underlying marine biogeochemical processes, is still sparse. The international GEOTRACES programme represents an invaluable effort to close this gap in knowledge. Indeed, the number of seawater Nd isotope observations has increased from 880 individual measurements reported until 2011 to more than twice this number in 2016.

In this study we focus on the tropical northern Atlantic Ocean, where Saharan dust constitutes an important source of Nd to the surface ocean, and where a pronounced oxygen minimum zone has been described to alter vertical Nd cycling. We will present Nd isotope data from seawater depth profiles and marine aerosols, as well as dissolved and dust-bound REEs concentrations, collected in February-March 2011 during the UK GEOTRACES GA06 cruise in the tropical Atlantic Ocean. Integrating the Nd isotopic composition of seawater and aerosols (bulk digests and ammonium - acetate leachates), with REEs patterns will allow us to better constrain mineral dust solubility in this area of the Atlantic Ocean in winter. Comparison with literature data collected in the same region, but during other months of the year, will aid to unravel the influence of dust load and wind regime on the Nd fingerprint in the tropical Atlantic Ocean.