

## **Distributions of neodymium isotopes and rare earth elements in the Southwest Atlantic Ocean**

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Neodymium (Nd) isotopic compositions have been suggested to behave “quasi-conservatively” in the intermediate and deep water—they approximate values expected from water mass mixing—in the modern oceans and have been increasingly used to trace global ocean circulation in the present and past. To better understand its reliability as a water mass tracer and its application to trace paleo-ocean circulation, dissolved Nd isotopes were analyzed from 17 seawater stations (272 samples) collected meridionally in the Southwest Atlantic Ocean (GEOTRACES GA02 Leg 3). Dissolved rare earth element (REE) concentrations were also analyzed to better understand the conservative vs. non-conservative behavior of REEs in the ocean. This region includes the major Atlantic water masses and shows potential sources that could add external REEs to seawater. Our results of seawater Nd isotopes show strikingly that the Southwest Atlantic Meridional Transect confirms the “quasi-conservative” behavior of Nd isotopes in the intermediate and deep water masses. The very small Nd isotopic deviations from conservative behavior indicate that the measured Nd isotopes can be effectively predicted by water mass mixing calculations. Although REE concentrations appear to behave like nutrients and increase with depth, the small REE deviations from conservative water mass mixing show that the intermediate and deep water REEs also reflect water mass mixing and conservative behavior within the transect.