

# **GEOVIDE: An international GEOTRACES study in the North Atlantic and Labrador Sea**

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GEOVIDE TEAM

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GEOVIDE (GA01 GEOTRACES section) is an international interdisciplinary programme which aims to better disentangle the uncertainties on water masses, heat fluxes and Trace Element and Isotope (TEI) cycles in the North Atlantic and Labrador Sea. To achieve these objectives, a high resolution hydrographical section was carried out, using a multi-proxy approach, during a 47-day oceanographic cruise on the RV “Pourquoi Pas?” (May-June 2014). In total, 78 stations were occupied, including the Iberian, Greenland, and Canadian shelves.

A very sharp front separating the subpolar and the intergyre domains was observed at 49°30'N. This is the first time over the last 15 years that the subarctic front was found so far to the South and the branches of the North Atlantic Current so focussed geographically. Moreover, the central Irminger and Labrador Seas were marked by a recently ventilated water mass down to 1000 m and 1500 m-depth, respectively, capped by a thin fresh layer. The first results on TEI distributions along the cruise transect show that different waters masses (Mediterranean Outflow Water, Labrador Sea Water, North East Atlantic Sea Water) were found to have characteristic signatures for some elements, in particular dissolved aluminium (dAl), dissolved lead (dPb), and particulate iron (pFe). Trace metal inputs from the atmosphere, ice and iceberg melting, coastal runoff, benthic nepheloid layers, as well as potential hydrothermal activity were identified. Atmospheric deposition was very low, reflected by very low concentrations of aerosol Al and Fe. The newly formed deep water was characterized by low dAl concentrations that derive from the surface waters. Very low mercury concentrations were also found in the younger recently ventilated water masses, suggesting that atmospheric mercury deposition to the North Atlantic has decreased in the past decades. This finding shows the efficiency of global anti-pollution policies implemented in Europe and North America.