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Quantifying benthic fluxes of neodymium off the southwest coast of Greenland and examining their role in setting the isotopic composition of North Atlantic Deep Water

SOPHIA HINES[1], VICTORIA SILVERMAN[1], CHANDRANATH BASAK[2], JUREK BLUSZTAJN[1], GRETCHEN SWARR[1], CASSANDRA BARTELS[3], ANTHONY RATHBURN[4] AND LISA HERBERT[5]

[1]Woods Hole Oceanographic Institution
[2]Department of Earth Sciences,
[3]MIT-WHOI Joint Program in Oceanography and Applied Ocean Sciences and Engineering
[4]California State University, Bakersfield
[5]Florida State University

Neodymium (Nd) isotopes are a key paleoceanographic tracer with the potential to provide information about ocean circulation and its connections to climate over a range of timescales, but lingering uncertainty about the dominant sources of Nd to the ocean limit the widespread use of this tracer. In particular, some recent studies have suggested that benthic fluxes of Nd may be the main source of Nd to seawater. This would complicate the interpretation of the Nd isotope proxy, which is typically thought to reflect quasi-conservative mixing of Nd isotopes between North Atlantic and Pacific endmembers. However, there are only ~15 places across the global ocean where benthic Nd fluxes have been directly quantified. The Labrador Sea is an important region for setting the Nd isotopic composition of North Atlantic Deep Water (NADW), one of the global Nd isotopic endmembers. Here, we present new benthic flux measurements from the Labrador Sea along two depth transects off the southwestern Greenland coast. With these new data we quantify the magnitude of the benthic flux with depth, the isotopic signature associated with this flux, and how it varies spatially. These results will be used to determine the role of benthic Nd fluxes in setting the isotopic composition of NADW.