

COLUMBIA UNIVERSITY

IN THE CITY OF NEW YORK

LAMONT-DOHERTY EARTH OBSERVATORY

**DRAFT STANDARD FORM C**

**PRELIMINARY CRUISE REPORT**

OFFICE OF MARINE OPERATIONS

P.O. Box 1000 61 Route 9W Palisades, New York 10964 845-365-8428 Fax 845-365-8424

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Cruise name/number:	North Atlantic Porewater / MGL24-07
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Authorizations:

Coastal State	Authorization Document Number	National Participant(s)
Denmark (Greenland)	JTHAV File No. 23/35010	None
Greenland (NON-EXCLUSIVE LICENCE FOR UTILIZATION OF GREENLAND GENETIC RESOURCES)	NO. G24-116	None
Iceland	UTN24040402	

Scientist in charge of reporting:

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Brief description of scientific objective:

Neodymium (Nd) is one of 14 rare earth elements (REEs) frequently used to investigate environmental processes. In addition to its use as part of the REE series, the isotope ratio of neodymium ( $^{143}\text{Nd}/^{144}\text{Nd}$ ;  $\epsilon\text{Nd}$ ) is arguably the most promising tracer of past ocean circulation, and is also heavily invested in the GEOTRACES project for the modern ocean. Unfortunately, many observational and theoretical studies indicate that our mechanistic understanding of both of these tracers has considerable problems, leading to potentially erroneous interpretations. In essence, the established view on the marine geochemical cycle of neodymium is not entirely consistent with observations. To resolve these inconsistencies, we hypothesize that the sediments at the seafloor are a major source of neodymium to the ocean; a proposal in contrast to existing element budgets which consider the sediments to be primarily a sink removing neodymium from the ocean. To test this idea, we will sample sediments, the pore water they contain, and the overlying ocean water from several sites in the North Atlantic, measuring a suite of elements and isotopes in all these samples. This research will help us better understand the geochemistry of neodymium and its isotopes in the North Atlantic, one of the regions critical to understanding ocean circulation.

Cruise Dates: June 10 to July 29, 2024 – Completed

Update on anticipated dates for delivery of final results:

Metadata:	January, 2025
Raw Data:	September, 2025
Processed Data:	September, 2025
Data Analysis:	January, 2026
WODC Data Registration (if applicable):	

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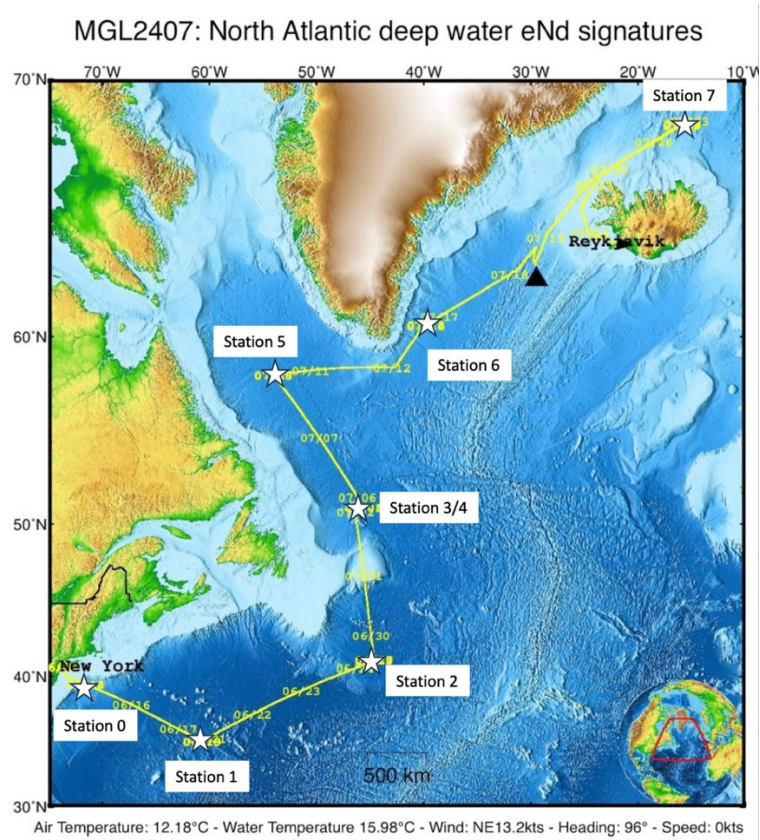
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Append image or URL illustrating the route of the platform, locations where measurements were taken, and actual cruise track:



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