Goldschmidt 2026 Abstract
https://doi.org/10.46427/gold2026.36475

Orbital-Scale Variability of Iceland–Scotland Overflow Water from Gardar Drift Sediments, IODP Site U1564

HALIMA IBRAHIM AND MOLLY PATTERSON
Binghamton University

North Atlantic Deep Water (NADW) forms a central limb of the Atlantic Meridional Overturning Circulation (AMOC), governing the redistribution of heat and tracers in the subpolar North Atlantic. A principal export route of NADW is Iceland–Scotland Overflow Water (ISOW), which flows along the Gardar Drift on the eastern flank of the Reykjanes Ridge, where high sedimentation rates are maintained by persistent deep-current activity. We reconstruct Plio–Pleistocene bottom-current variability using sediments from IODP Site U1564 recovered from the Gardar Drift. Discrete sortable silt measurements are integrated with high-resolution X-ray fluorescence ln(Zr/Rb) ratios to derive a semi-quantitative record of relative bottom-current velocity. Spectral analyses indicate strong orbital pacing of deep-current variability, implying tight coupling between deep-water export and climate boundary conditions. The resulting near-continuous record documents coherent shifts in ISOW strength across major Plio–Pleistocene climate events and transitions, including intervals of both intensified and weakened flow. These findings provide new constraints on the sensitivity of Nordic Seas overflow and the eastern NADW limb to long-term climate forcing, improving our understanding of deep-water export dynamics and their role in modulating AMOC variability through time.