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Mediterranean-Atlantic exchange at Plio-Pleistocene Transition

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Atlantic-Mediterranean exchange through the Gibraltar Strait exerts a significant control on the heat, salt and freshwater budgets of the two ocean basins. However, the response of the exchange, i.e. the strength of Atlantic Inflow and Mediterranean Outflow Water, in different climate states of the past is still a matter of significant debate. The present study follows the main objectives of the IODP Expedition 339 towards a better understanding of these processes. We aim to reconstruct variations in Mediterranean-Atlantic exchange against the background of increasing Northern Hemisphere Glaciation (NHG) at the Pliocene-Pleistocene transition (2.5–2.8 Myrs). Our proxy data come from two reference locations on either side of the Gibraltar Strait: IODP Hole U1389E in the Gulf of Cadiz, and ODP Hole 978A in the Alboran Sea. Through comparison of [U+F064]18O in the planktic foraminifer Globigerinoides ruber from both sites we aim to reconstruct long- and short-term changes in hydrographic gradients in the studied time interval. These records of Atlantic inflow into the Mediterranean will be compared to proxy data for MOW (benthic isotopes, Zr/Al). The combined records will allow an evaluation of how Mediterranean-Atlantic exchange responds to external changes (e.g., North Atlantic freshwater budget, African Monsoon) during the onset of NHG.