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Preliminary results of IODP Expedition 401, the first element of the Miocene Mediterranean-Atlantic Gateway (IMMAGE) Land-2-Sea drilling project

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Warm and saline Mediterranean overflow today is an important driver of thermohaline circulation in the North Atlantic. In the latest Miocene, Mediterranean salinity varied dramatically as the Messinian salt giant formed. The precipitation of a ~1.5 km thick evaporite layer across the Mediterranean seafloor requires substantial changes both to the geometry of the Atlantic-Mediterranean gateway and the nature of exchange between the two basins. This salinity crisis was the consequence of on-going Africa-Eurasia collision, which formed, narrowed, and ultimately closed the two ancestral marine connections that pre-date the Gibraltar Strait. One of these connections is now preserved on land in southern Spain, the other in northern Morocco. Both the initiation of Mediterranean overflow, variations in its size and salinity, and the establishment of the present-day overflow pattern in the early Pliocene are likely to have impacted thermohaline circulation, climatic change and deep water sedimentation during the late Miocene and Pliocene.

IMMAGE (Investigating Miocene Mediterranean-Atlantic Gateway Exchange) is a land-2-sea drilling project designed to recover a complete record of Late Miocene-Pliocene exchange (8-4Ma) offshore with International Ocean Discovery Program (IODP) in both the Atlantic and Mediterranean and onshore with International Continental Scientific Drilling Program (ICDP) in Morocco and Spain. IODP Expedition 401 is the first element of the land-2-sea drilling to take place. At the time of abstract submission, Expedition 401 is at sea (December 2023-February 2024) in the process of recovering these critical records. We propose to present an overview of the sediments recovered during the expedition and initial shipboard analytical results.

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