

Expedition 403: Eastern Fram Strait Paleo-Archive

4 June to 2 August 2024

Special Call for Applications: Micropaleontologist with expertise in diatoms

Suggested deadline for applications: 16 June

Deadline for submitting applications to the JRSO: 30 June

The North Atlantic and Arctic Oceans are major players in the climatic evolution of the Northern Hemisphere and in the history of meridional overturning circulation of the Atlantic Ocean. The establishment of modern North Atlantic water has been identified as one of the main forcing mechanisms for the onset of the Northern Hemisphere glaciation. Many uncertainties remain about the establishment, evolution, and role of the northern North Atlantic-Arctic Ocean circulation in relation to the opening of the Fram Strait, and its impact on the Earth's global climate during major climatic transitions that have occurred since the Late Miocene. Understanding system interactions between ocean currents and the cryosphere under changing insolation and CO₂ conditions of the past is particularly important for ground truthing climate models. The reconstruction of the paleo Svalbard-Barents Sea Ice Sheet (SBSIS) is critical as it is considered the best available analogue to the West Antarctic Ice Sheet, whose loss of stability is presently the major uncertainty in projecting global sea level in response to present-day global climate warming induced by rapidly increasing atmospheric CO₂ content. Reconstructing the dynamic history of the western margin of Svalbard and eastern side of the Fram Strait at the gateway to the Arctic is key to understanding the linkage between atmospheric CO₂ concentration, ocean dynamics, and cryosphere as main drivers of climate changes.

The key scientific objectives of Expedition 403 are:

(1) the development of a high-resolution chronostratigraphic record of the Late Miocene-Quaternary; (2) the generation of multi-proxy data sets to better constrain the forcing mechanisms responsible for Late Miocene to Quaternary climatic transitions; (3) the identification of orbital, sub-orbital, millennial scale climate variations such as Heinrich events and possible associated meltwater; (4) the evaluation of impacts and feedbacks involving past sediment-laden prominent meltwater events on water masses properties, ocean circulation, ice sheet instability, slope stability, and biota; (5) the reconstruction of paleo SBSIS dynamic history in relation to changes in the ocean current pathways and characteristics as mechanisms inducing ice sheet instability and fast retreat; (6) the study of glacial and tectonic stresses and their effect on near-surface deformation and Earth systems dynamics; and (7) the linkages between large-scale environmental changes and microbial population variability. These objectives will be accomplished through coring and borehole logging multiple holes at five sediment drift sites to create a composite stratigraphy.

For more information on the expedition science objectives see

https://iodp.tamu.edu/scienceops/expeditions/eastern_fram_strait_paleo_archive.html. This page includes links to the individual expedition web pages with the original IODP proposals and expedition planning information.

WHO SHOULD APPLY: We encourage applications from all qualified scientists, including graduate students, who specialize in diatom biostratigraphy. The *JOIDES Resolution* Science Operator (JRSO) is committed to a policy of broad participation and inclusion, and to providing a safe, productive, and welcoming environment for all program participants.