

North Atlantic drilling for climate dynamics – Filling the Oligo-Mio-Pliocene Gap in the North Atlantic

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Workshop Rationale

The Oligo-Miocene to Pliocene interval of Cenozoic time is thought to record the imprint of dynamic ice sheets on Antarctica, the intensification of the cryosphere in the Northern Hemisphere and the evolution of the modern Nordic seas. Our understanding of the feedbacks and function of the Earth system in this interval of time, however, is severely hampered by a lack of high quality deep-sea sedimentary sections with high rates of deposition and robust age control particularly from the North Atlantic Ocean, the region best suited, perhaps, to evaluating some of these key events.

This workshop seeks to develop new drilling proposals to fill this “Oligo-Miocene to Pliocene Gap”. We will target the acquisition of the new sedimentary sections that are needed to establish a sophisticated orbital age model and to enhance our knowledge of Oligo- to Pliocene ocean-ice-climate dynamics. A particular focus of the workshop will be to develop proposals that exploit what we have learned by employing new drilling strategies during the most recent phase of scientific drilling such as IODP Exp. 342, which targeted clay-rich sediment drifts of Eocene age on the Newfoundland Margin or IODP Exp. 320 and 321 which employed a systematic Cenozoic age transect drilling method in the equatorial Pacific.

In this way the workshop aims to tackle the following major themes: (1) filling the Oligo-Miocene to Pliocene gap in the North Atlantic with high quality sections that will provide a continuous record for the last 35 Ma of Earth’s history, (2) the evolution of Northern Hemisphere cryosphere, (3) the development of the Oligo-Miocene to Pliocene CCD and how its comparison to the equatorial Pacific record, (4) the overturning history of the North Atlantic including its underlying dynamics and timing, (5) the timing of the initiation of massive drift sedimentation in the Neogene, and (6) the interplay between climate and ecosystem change in the North Atlantic.

We seek to bring together specialists from various fields (e.g., paleoclimatology, paleoecology, geochemistry, bio- cyclo- magnetostratigraphy, geophysics) to lead at least one competitive IODP pre-proposal supported by existing seismic stratigraphy to tackle the above-mentioned themes and (where necessary) a site-survey proposal to collect new seismic datasets.

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Further information

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