



Rialtas na hÉireann
Government of Ireland



Geological Survey
Suirbhéireacht Gheolaíochta
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GSI Targeted Projects - IODP

Project title: Assessing the trigger for the Paleocene–Eocene Thermal Maximum

Leader: Dr. Weimu Xu, University College Dublin

Abstract:

The Paleocene–Eocene Thermal Maximum (PETM) was a period of extreme warmth (~56 million years ago) that lasted for ~200,000 years and had profound influence on the global climate and ecosystems. The mean annual global temperature rose by 5–6 °C over a few thousand years at the onset of the PETM resulting from massive carbon release into the ocean and atmosphere.

The North Atlantic Igneous Province (NAIP), and the associated emplacement of voluminous extrusive basaltic successions and intrusion of magma into the surrounding sedimentary basins, was most active or productive at across the Paleocene–Eocene boundary, suggesting a possible causal relationship.

A transect of five holes at Sites U1567 and U1568 that sample the upper part of the Modgunn hydrothermal vent complex on the mid-Norwegian Margin were recently drilled during the International Ocean Discovery Program (IODP) Expedition 396. Stable carbon isotope stratigraphy and dinoflagellate cyst biostratigraphy confirm a PETM age for the vent infill. The proposed research will apply sedimentary geochemical proxies to assess the role of sill intrusions into organic-rich sediments and/or continental flood basalt volcanism as the main trigger of the PETM hyperthermal.

Budget: €24,998

Start date: 1st September 2022