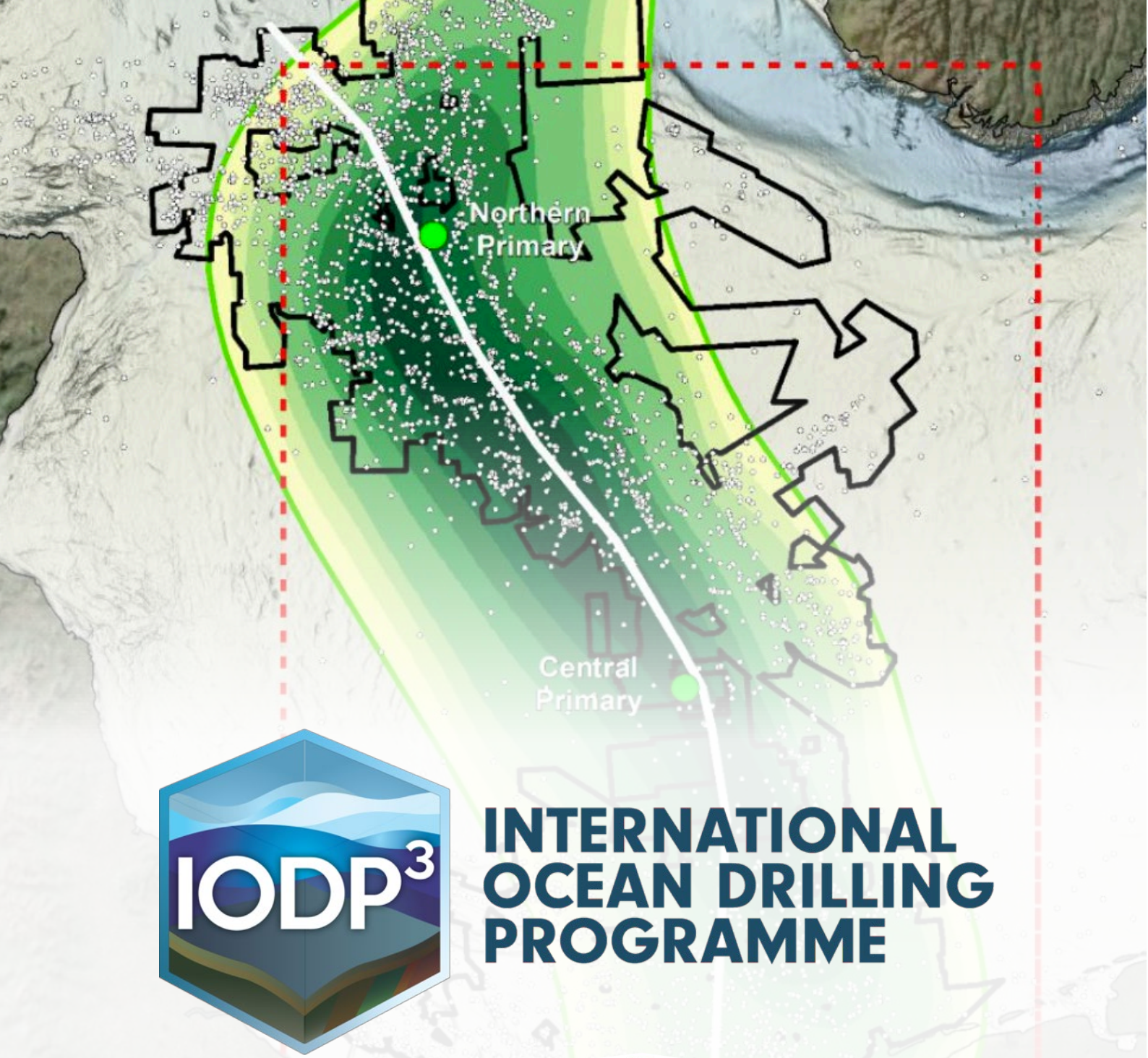

INTERNATIONAL OCEAN DRILLING PROGRAMME

CALL FOR PARTICIPATION

IODP³ Expedition GLACE-NS: Late Cenozoic Glaciers, Landscapes, Climates, and Ecosystems of the North Sea

Deadline: 1 December 2025

30 September 2025

Call for Participation in IODP^3 Expedition GLACE-NS

(Expedition number pending)

Co-Chief Scientists: Andrew Newton, 2nd Co-Chief TBC
Expedition Project Manager: Margaret Stewart

Introduction

Scientists in countries participating in IODP^3 are invited to apply to join the Expedition Science Team for IODP^3 Expedition GLACE-NS. Any scientist from an IODP^3 member country with expertise relevant to the objectives of the proposal may apply.

New!

To enable the IODP^3 Science Office to provide support to scientists interested in applying for this expedition, we are asking potential applicants to complete our new Expression of Interest Google Form (available **here** [1]). This is not compulsory, does not commit you to apply, and not completing the form does not influence the evaluation of any application you make in any way. However, we strongly encourage completion of this form to ensure that we can best support you if you proceed to apply… completion will take less than two minutes!

This form will close on 31 October 2025 (one month prior to the application deadline of 1 December 2025)

Science Team applications can be one of the following types: (a) Offshore and Onshore; (b) Onshore only; or (c) Research plan only. Please consult the "**Guide for Applicants for IODP^3 Expedition Science Team or Panel/Board membership**" [2] at **iodp3.org** for details of the various participation routes on IODP^3 Expeditions.

At a minimum, successful scientists will be granted access to expedition samples and data during the moratorium period, which starts during Offshore Operations (summer 2026), and ends 1-year after the conclusion of Onshore Operations (late 2027 or early 2028). Additionally, successful

[1] **https://forms.gle/5bmaZtXmuPizZzLc9**
[2] **https://iodp3.org/documents/guide-for-applicants/**

scientists can also be considered for participation in the Expedition's Offshore and/or Onshore Operations.

Interested scientists should review the Expedition background and objectives below and are strongly advised to contact the Co-Chief Scientists with an outline of their proposed research before submitting a full application.

The confirmed Co-Chief Scientist for this Expedition is **Dr Andrew Newton**[1] (Queen's University, Belfast), who will joined by a second Co-Chief Scientist in due course.

The proposal upon which this expedition is based was submitted as IODP[3] Proposal #1012 'Late Cenozoic Glaciers, Landscapes, Climates, and Ecosystems of the North Sea'. The proposal describing the primary drill sites, as well as up-to-date expedition information, can be found on the Expedition GLACE-NS webpage[2]. You may also find it useful to consult Newton *et al*. (2024)[3].

Background and Objectives

The 600-km long North Sea Basin (NSB) transitioned through ~50 glacial-interglacial cycles – of varying lengths between the 41-kyr and 100-kyr worlds – as it was infilled by an offset-stacked succession of largely muddy, deep-to-shallow marine and terrestrial sediments. Ample accommodation and high sediment fluxes combined to preserve a unique ~1.2-km-thick late Plio-Pleistocene succession that captures the co-evolution of glaciation and Europe's largest river systems in a shallow marine basin. Importantly, depocentre architecture is structured such that northward progradation of the depocentre through the 3.3-1.7 Ma interval can be captured by two cores through a dominantly muddy, high-sedimentation rate (>0.6 m/kyr) setting in the central and southern NSB. The 0.5 Ma-Recent sequence is 250-300 m thick in both areas, yielding ice proximal and distal records of overlapping ages. These sediments record palaeo-environment signatures from all over northwest Europe as they were sourced by multiple rivers and ice sheets connecting mid- and high-latitudes

The NSB mid-latitude location, latitudinal range, complete 3D-seismic stratigraphic framework (architecture, facies, morphology), and the multiple catchments and processes feeding materials into a subsiding basin at different times with high sedimentation rates, provide a unique opportunity to unravel the palaeo-climatic and oceanographic evolution of northwest Europe in unprecedented detail. The NSB is, therefore, extremely well-suited for IODP[3] drilling. This

[1] **https://www.qub.ac.uk/about/sustainability/climate-change-experts/DrAndrewNewton.html**
[2] **https://iodp3.org/expedition/glace-ns/**
[3] Newton et al. (2024), Glacial seismic geomorphology and Plio-Pleistocene ice sheet history offshore NW Europe, Geological Society, London, Special Publications, Volume 525, Pages 111 – 140, **https://doi.org/10.1144/SP525-2023-117**.

expedition aims to investigate the NSB late Plio-Pleistocene succession and the environmental-ecological information it contains. This will help elucidate how glaciers, landscapes, climates, and shallow marine and coastal ecosystems evolved through a period of high-amplitude climate variability. The current North Sea has warmed at twice the global average and, therefore, has a non-linear response to climate forcing that needs quantification. The regional climatic state cascades into nutrient cycling, ecosystem evolution, sediment transport, and carbon cycling in the North Sea and requires a greater knowledge on how these systems evolved through time periods of variable baseline characteristics (i.e. orbital parameters, ice sheets, climate, tipping points). This will improve knowledge on the fundamental mechanisms governing these processes, with strong relevance to contemporary and future change.

The four main objectives of this expedition are:

1) **Glaciers – when, where, and how did ice sheets develop around the NSB?** Beyond the fact that icebergs and grounded ice occasionally entered the NSB, we know little about timing, origin, and characteristics. This uncertainty is important because ice sheet volumes impact global sea level reconstructions, our understanding of NSB connectivity with the North Atlantic, and how sensitive ice sheets were to different orbital and landscape settings. These are existential gaps in our knowledge of European palaeo-glaciology that profoundly impact our understanding of global Pleistocene glaciation. The first objective of a successful drilling campaign will be to provide knowledge on when Pleistocene ice sheet glaciations occurred in northwest Europe, where the ice sheets were centred, and how these ice sheets and their associated feedbacks evolved.
2) **Landscapes – how did the landscapes around the NSB evolve?** The scale of the drainage networks flowing into the NSB from across northwest Europe, coupled with repeated glaciation, means that a coring campaign will provide insight on landscape evolution and its links with climatic changes across the European continent. The results will feed into conceptual discussions of global significance on topics such as the role of regolith in ice sheet development, the influence of ice sheets on tectonic movements, and the characteristics of the Mid-Pleistocene Transition (MPT). The second objective of a successful drilling campaign in the NSB will be to provide knowledge on how landscapes around the NSB evolved and impacted other parts of the Earth system through the late Plio-Pleistocene
3) **Climate – how did climate evolve across different times?** Insights on climate variability and vulnerability to perturbations, the large-scale structure of atmospheric-oceanographic circulation systems, rates/magnitudes of change, and how different Earth spheres

interacted across different timescales, are all relevant to contextualising contemporary climate change and are of regional and global significance. The third objective of a successful drilling campaign in the NSB will be to provide knowledge on northwest European climate evolution over different climatological timescales, from within and across glacial-interglacial cycles and major global transitions like the MPT.

4) **Ecosystems – how did ecosystems respond to climate changes and what can this tell us about thresholds relevant for contemporary and future biodiversity?** Documenting the timing, duration, and nature of ecosystem turnover events and understanding the role which climatic change plays in triggering the crossing of thresholds in biosphere responses. Climate records derived from proxies such as dust, pollen, leaf waxes, and micropalaeontology – which have been effective in the NSB – all provide information that links with other parts of the Earth-system (e.g., Objectives 1-3). This has direct implications for our understanding on the habitability of life on Earth and how this may relate to future ecosystem changes. The fourth objective of a successful drilling campaign in the NSB will be to provide knowledge on how ecosystems responded to past climatic tipping points and longer-term climatic changes.

Timing

Until the platform and drilling services are confirmed (estimated end 2025) all timings are provisional. It is envisaged that the offshore phase of the expedition will last for approximately 30 days within a window from start of June to end of September 2026. Offshore activities will focus on core recovery, curation, sampling for ephemeral properties, microbiology, biostratigraphy, physical properties, preliminary lithostratigraphy (whole core observed at core ends and through plastic liners), and downhole logging. The cores will not be split at sea.

Subsequently, an Onshore Operation will be held at the MARUM - Center for Marine Environmental Sciences, University of Bremen, Germany, in late 2026 or early 2027 (exact dates to be confirmed), where the cores will be split. The Onshore Operation will be a maximum of 4-weeks long, the exact duration dependent on core recovery.

Expertise sought

Opportunities exist for researchers in all specialties. While other expertise may be considered, specialists in the following fields are required: downhole logging, geophysics, inorganic geochemistry, microbiology, organic geochemistry, paleomagnetics, paleontology, palynology, physical properties, palaeogenomics and provenance, sedimentology, stratigraphic correlation, and structural geology.

How to Apply

⭐⭐⭐ Reminder ⭐⭐⭐

Please consider completing our Expression of Interest form (available **here**) to ensure that we can best support you if you proceed to apply… completion will take less than two minutes!

This form will close on 31 October 2025.

Applications must be submitted to the IODP^3 Science Office by the deadline of:

23:59 GMT on Monday 1 December 2025

using the **IODP^3 Gateway** system, accessed via the **Apply to Participate** link on the **IODP^3 website**.

Information on the content required in applications to this call is available in the IODP^3 **Guide for Applicants**.

Applications received by the deadline will be evaluated by the Programme Member Offices and shortlisted candidates will be considered for selection by ESO and the Co-Chief Scientists.

- For further expedition details from ESO, please contact:
  Margaret Stewart, Expedition Project Manager, ECORD Science Operator, **mstewart@bgs.ac.uk**
- For further scientific details, please contact:
  Andrew Newton, Expedition GLACE-NS Co-Chief Scientist, **a.newton@qub.ac.uk**
- For enquiries about the application process and IODP^3 Gateway, please contact:
  Jodie Fisher, IODP^3 Science Office, **applications@iodp3.org**