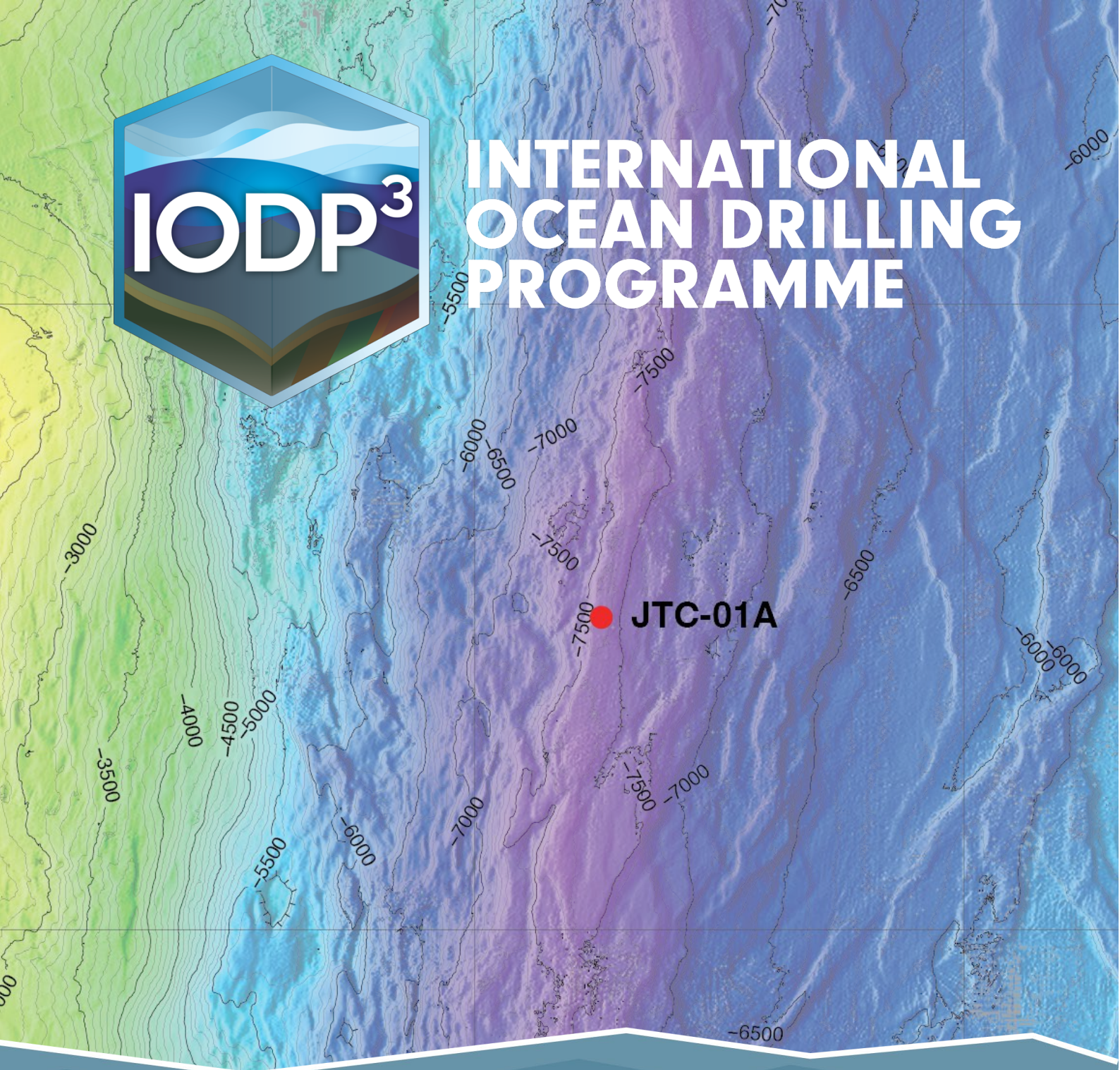




INTERNATIONAL OCEAN DRILLING PROGRAMME



CALL FOR PARTICIPATION

IODP³ Expedition 503:
Hadal Trench Tsunamigenic Slip History
Deadline: 31 January 2025

Call for Participation in IODP³ Expedition 503: Hadal Trench Tsunamigenic Slip History

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Expedition Project Manager: Lena Maeda



Introduction

MarE3 intends to implement IODP³ Expedition 503: Hadal Trench Tsunamigenic Slip History, between 22 November 2025 and 11 December 2025. IODP³ Expedition 503 will revisit one site (Proposed Site JTC-A1) located in the central Japan Trench near IODP Expedition 386 Site M0083 at 7630 metre water depth (**Figure 1**). The operational sequence to be completed by D/V *Chikyu* during IODP³ Expedition 503 consists of drilling and coring two adjacent 10-5/8-inch holes with the Hydraulic Piston Coring System (HPCS) at Proposed Site JTC-A1 to 160 metres below seafloor (mbsf) to continuously recover the full trench-fill sediment sequence.

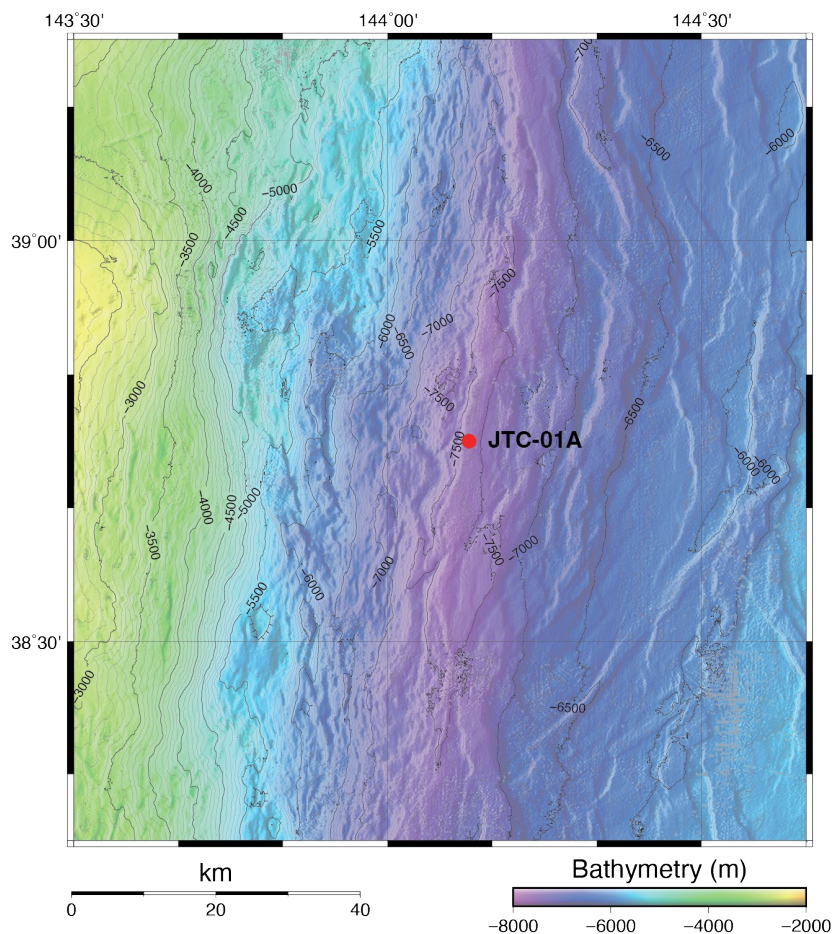


Figure 1. Proposed IODP³ drilling Site JTC-01A.

Scientific Objectives of the Expedition

Hadal oceanic trenches are the deepest places on our planet. They form due to downward bending of subducting ocean crust along subduction zones, act as terminal sinks for sediment, particulate and dissolved organic carbon, and form high-resolution archives to unravel the history of subduction zone processes including subduction megathrust earthquakes and tsunamis. The trench-fill sediment sequence of the targeted trench basin in the central part of the Japan Trench bears high potential of using event-stratigraphy to reconstruct a long history of giant megathrust earthquakes for evaluating their recurrence patterns. Furthermore, dating key-reflectors in seismic profiles suggesting tsunamigenic slip-to-the-trench earthquakes and testing interstitial water geochemical proxies is expected to deliver better understanding how often and when megathrust ruptures have propagated into the shallowest part to reach the trench. To address these overarching goals, the primary scientific objectives are following:

O-1: Identify and explore the temporal distribution of event-deposits and tectonic-driven deformation and tilting events to investigate time-dependent up-dip rupture variability of the megathrust fault.

O-2: Develop a long-term earthquake record for tsunamigenic giant earthquakes.

O-3: Evaluate the influence of earthquake-induced fluid migration (discharge) in trench-fill sediments.

The cores from the proposed site will be used for multi-method applications to characterise and date event-deposits, stratigraphically-correlative trench-fill deformation events and transient geochemical profiles. Drilling the entire trench fill will also provide samples and data for characterising rates and states of remineralisation and transformation of organic carbon and related element cycles and deep subsurface hadal microbial activity, which is the fourth emerging objective (**O-4**) of this Expedition.

Secondary science objectives include carrying out other geological, geochemical, and microbiological observations to the greatest extent possible during drilling in accordance with the **IODP³ Standard Measurements Policy**. Please read the Expedition 503 Scientific Prospectus available on the **IODP³ Expedition page** for further details.

Operation Plan

The general operations plan and time estimates are provided in **Table 1** and **Figure 1**. The operational sequence to be completed during IODP³ Expedition 503 consists of drilling two 10-5/8-inch holes with the Hydraulic Piston Coring System (HPCS) to 160 mbsf.

Expedition Schedule

Current plans have the expedition beginning after crew change at the end of IODP³ Expedition 502 in Sendai Japan on 22 November 2025, and finishing upon return to port on 11 December 2025. This schedule is subject to change. Updates and the latest information can be found on the [MarE3 website](#) when available.

Table 1. Operations schedule for IODP³ Expedition 503.

Operation	Hole Size (inch)	Depth (m)	Day(s)	Subtotal (days)	Total (days)
Portcall			1	1	1
Site JTC-1A: HPCS	10-5/8	160	6	6	
Site JTC-1A: HPCS	10-5/8	160	6	12	
Transit			3	15	16
Offload in Shimizu			2	2	18
Contingency Time			3.5	3.5	21.5

A total of 16 offshore operational days are planned. The offshore Expedition Science Team will be ~25 scientists and will be onboard just over two weeks. The onshore Expedition Science Team will additionally include scientists who are not part of the offshore team.

Expedition Science Team

Scientists with interest and expertise in: (i) litho-, magneto-, bio-, tephra-, chemo-, mechanical-, and event-stratigraphy in hadal trenches; (ii) sediment transport, depositional and post-depositional processes in ultra-deep water environments; (iii) deformation and faulting of trench-fill basins at the up-dip portion of the shallow-most part of subduction plate-boundary systems; (iv) subduction zone earthquake processes and their activity and evolution over time; (v) hadal trench element cycles, biogeochemistry and deep subsurface biology; and/or (vi) other related topics or fields are invited to apply. Shipboard duties will likely include sedimentology, structural geology, physical properties, paleomagnetism, microbiology, micropaleontology, geochemistry (organic and inorganic) and stratigraphic correlation. We also welcome applications with a research plan that contributes to achieving the expedition objectives without involvement in the offshore operations.

NOTE: All expedition schedules are subject to change based on Fiscal Year budgetary situation and site conditions.

How to Apply

Applications must be submitted to the IODP³ Science Office by the deadline of **Friday 31 January 2025** using the **IODP³ Gateway** system, accessed via “Apply to Participate” on the **IODP³ website**.

At the time of release of this call, the IODP³ Gateway is in the final stages of development and is not currently active – it will be ready in mid-late December 2024 and its opening will be announced on the IODP³ website homepage.

Information on the content required in applications to this call, however, is available in the IODP³ **Guide for Applicants** (Note that the applicant roles for this call are **Offshore and Onshore, Onshore only**, and **Research plan only**; see Section 3.1 in the guide).

Application materials may therefore be prepared before the opening of the Gateway using this guide, in readiness for submission once the system becomes active.

Applications received by the deadline will be evaluated by the Programme Member Offices and shortlisted candidates will be considered for selection by MarE3 and the Co-Chief Scientists in March 2025.

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- For further scientific details, please contact:
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- For enquiries about the application process and IODP³ Gateway, please contact:
Jodie Fisher, IODP³ Science Office, applications@iodp3.org