MNF Voyage Highlights and Summary

NOTE - The Chief Scientist should send the Voyage Highlights and Summary Report to the MNF Voyage Delivery Coordinator within 40 business days of the completion of the voyage. The Voyage Highlights and Summary needs to be submitted electronically as a Microsoft Word document so we can align formatting across all reports. **All guidance text in blue should be deleted**.

The below details can be copied from the first page of the Voyage Plan:

Voyage #:	IN2025_V05
Voyage title:	Eruption, Destruction and Seafloor Ecosystem Recovery – Tonga 2022 Eruption of the Century
Mobilisation:	Hobart, Wednesday 6th August 2025 – Saturday 9th August 2025
Depart:	Hobart, 10 August 2025 (Time: 1000)
Embarkation of personnel in Nuku'alofa, Tonga	19th August 2025
Mid-voyage transfer	5th September 2025
Disembarkation of personnel in Nuku'alofa, Tonga	23rd September 2025
Return:	Brisbane, Wednesday 1 October 2025 (Time TBC/~1000 given long pilotage for Brisbane)
Demobilisation:	Science Equipment – Wednesday 1st October 2025
	MNF Equipment – Thursday Brisbane, 2 October 2025
Voyage Manager:	Margot Hind
Chief Scientist:	Associate Professor Rebecca Carey
Affiliation:	University of Tasmania
Principal Investigators:	Vanessa Lucieer (UTAS) vanessa.lucieer@utas.edu.au Jodi Fox (UTAS) jodi.fox@utas.edu.au Michael Manga (UC Berkeley) mmanga@berkeley.edu Malcolm Clark (NIWA) malcolm.clark@niwa.co.nz Daniel Leduc (NIWA) daniel.leduc@niwa.co.nz Ryan Portner (San Jose State) ryan.portner@sjsu.edu Marta Ribo (Auckland University of Technology) marta.ribo.gene@aut.ac.nz Adam Soule (U.Rhode Island) adamsoule@uri.edu Sally Watson (NIWA) sally.watson@niwa.co.nz James White (U.Otago) james.white@otago.ac.nz Lejun Zhang (UTAS) lejun.zhang@utas.edu.au

Voyage Highlights

The Chief Scientist

Associate Professor Rebecca Carey, University of Tasmania (Centre for Ore Deposits and Earth Sciences CODES)

Associate Professor Rebecca Carey is a volcanologist and marine geoscientist whose research focuses on eruption dynamics, submarine volcanism, and associated hazards. She has led and participated in numerous international expeditions investigating explosive and lava-forming eruptions and their impacts on the seafloor and marine ecosystems. As Chief Scientist on voyage IN2025_V05, she led a multidisciplinary team exploring how Tonga's 2022 Hunga eruption reshaped the seafloor and how marine life is returning to the region.

Title

Eruption, Destruction and Seafloor Ecosystem Recovery – Tonga 2022 Eruption of the Century

Purpose

The 15 January 2022 eruption of Hunga Tonga–Hunga Ha'apai was the most powerful volcanic event in a century, generating global atmospheric shockwaves, trans-Pacific tsunamis, and widespread ecosystem loss. Voyage IN2025_V05 (10 Aug – 1 Oct 2025) set out to discover how this event transformed the seafloor, formed the 850 m-deep crater, and how life is recovering after such devastation.

Working with the Kingdom of Tonga, Tonga Geological Services, and international partners, the team used multibeam mapping, seismic profiling, coring, dredging, deep camera tows, CTDs and eDNA sampling to document the eruption deposits, post-eruption sediment movement and slope stability, and biological recolonisation.

Contribution to the nation

This voyage strengthens Australia's regional scientific leadership and supports Pacific resilience by:

- Delivering data essential for volcanic, tsunami and global submarine-cable hazard assessment.
- Establishing new biodiversity and ecosystem-recovery baselines for Pacific fisheries.
- Providing frontier knowledge of submarine eruption, crater formation/collapse processes that informs volcanic and tsunami hazards.
- Building capacity and training for Australian, Tongan and Pacific scientists.

As a result of this voyage

1. We have a better understanding of the scale and size of the 2022 Hunga volcanic eruption, the eruption processes, the post-eruption reworking of 2022 volcanic sediment on the seafloor, the impacts of a dynamic seafloor on re-establishment of marine seafloor biological communities.
2. We have mapped the 2022 deposits on the seafloor to more than 70 km from the volcano in most sectors, confirming and expanding the interpretation from previous, much smaller mapping surveys that the volume of the seafloor deposits is significant. Further analysis will quantify this volume.
3. We have found the biological recovery to be very slow, the seafloor sediments are actively being remobilised by bottom currents.
4. We observed weak hydrothermal venting within the summit crater.
5. We have mapped 4871 line-km around the Hunga volcano, providing a high resolution 16 m grid of the seafloor and a 5 m grid of the crater, both of which can be used to compare with future voyages to understand seafloor change.
6. We have collected water samples at 20 sites that will be used to understand hydrothermal venting, and the exchange and flushing of water bodies inside and outside the summit crater.
7. We have trained over 10 students, and 7 early career researchers and Pacific scientists in modern marine-research techniques, fostering future regional expertise.
8. We identified and sampled older eruption deposits from Hunga or surrounding volcanoes
9. We mapped landslides within the summit crater that have occurred after the 2022 eruption.
10. We mapped other submarine edifices in the region around Hunga.
11. We have commenced a program of research in the geological, biological and ocean chemistry disciplines, together with the science team and other collaborators in New Zealand, Australia, Japan, US, UK.
12. We have delivered preliminary survey data to Tonga Geological Services

Next steps

All datasets will be archived through the CSIRO Marine National Facility repositories. Physical specimens are hosted at multiple institutions: rocks and sediments curated at CODES, University of Tasmania. Biological and Coral samples are stored with Earth

Sciences, New Zealand and the Queensland Museum, eDNA samples are curated at the CSIRO Marine National Facility, hydrothermal plume ash samples are at the Auckland University of Technology.

Post-voyage analyses of rock, sediment, biological, and geochemical samples are underway and will underpin forthcoming publications in international peer-reviewed journals and presentations to interest holders.

Key data products and reports will also be delivered to multiple end-users:

- Department of Foreign Affairs and Trade (DFAT) supporting regional hazard and resilience programs.
- Submarine-cable operators and engineering partners, informing cable-route planning and slope-stability risk assessments.
- Tonga Geological Services and Ministries of Lands and Fisheries, to assist national hazard mapping, ecosystem-recovery programs, and community engagement.
- International research collaborators, via open-access datasets and joint data sharing and analysis agreements.

Future datasets and publications will be available through the CSIRO MNF Data Portal and linked university/institute repositories. Further information can be sought from the Chief Scientist.

PART B - Voyage Summary

Executive summary

Voyage IN2025_V05 aboard *RV Investigator* (10 August – 1 October 2025) investigated how the January 2022 eruption of the Hunga Tonga–Hunga Ha'apai (HTHH) reshaped the seafloor and affected marine ecosystems, and regional infrastructure. The voyage formed part of an international collaboration led by the University of Tasmania with partners from the Kingdom of Tonga, New Zealand, the United Kingdom, the United States, and Japan.

The expedition aimed to (1) determine the distribution, thickness, and volume of erupted and remobilised deposits; (2) test mechanisms of caldera/crater formation; (3) characterise the early stages of ecosystem recolonisation; and (4) provide data to inform volcanic, tsunami and submarine-cable hazards across the Southwest Pacific.

Over 35 scientific days, the voyage completed 4861 km of multibeam mapping, 17 seismic lines (457 km), 81 multicores, 16 giant piston cores, 6 rock dredges, 26 deep-towed camera transects concurrent with eDNA bottom water sampled, 16 CTD casts, crater hydrothermal vent sediment sampling, and 3 NIWA sled deployments.

Initial results show remobilisation of eruption products when compared to the 2022 and 2024 bathymetric surveys. Sediment cores reveal complex 2022 eruption deposit stratigraphy, post-eruption reworked deposits and pre-2022 primary eruption deposits. Sub-bottom acoustic data record a range of bedforms in the seabed related to the 2022 eruption-fed and remobilised deposits. There is evidence for large scale collapses of the northern crater wall. Deep-towed camera imagery shows low diversity and abundance of macroscopic biological species on the seafloor, high turbidity in the crater, and seafloor bedforms that varied in orientation both within the field of view, and across sectors. In the top few centimetres of mud there are signs of biological recolonisation including populations of porcelaneous Miliolid foraminifera that thrive in soft, muddy sediment, and agglutinated benthic foraminifera. CTD data reveal hydrothermal signatures consistent with ongoing venting inside the crater, and the exchange and flushing of water bodies inside and outside the crater.

These discoveries provide scientific inputs into submarine-cable resilience models, volcanic and tsunami hazard frameworks for Tonga and the broader Southwest Pacific. Mapping of sediment remobilisation and slope failures contributes to improved geohazard assessments critical for infrastructure placement and risk mitigation. Further, these data define a post-eruption ecological observation that can inform environmental monitoring and support sustainable seabed-resource management.

The voyage delivered extensive capacity-building in both scientific training and leadership, and community outreach. Ten of the 23-member science party were students from undergraduate to PhD level who received training in and exposure to state of the art multidisciplinary marine research. During the Nuku'alofa port call, the

Crown Prince of Tonga, the Minister for Lands and Natural Resources, and the Australian High Commissioner and Deputy Commissioner to Tonga, Mr Brek Batley and Ms Erin Gleeson visited the vessel. Around 50 Year 11 and 12 Tongan students also toured the vessel. At the completion of the voyage there were over 32 different sources of media coverage including SBS News, ABC news24, ABC News, ABC Pacific Beat, and Matangi Tonga. These media highlighted the voyage objectives, initial findings, and highlighted the voyage's outcomes.

All datasets will be archived through the CSIRO Marine National Facility and data products developed from the survey will be made available with metadata on appropriate open data portals depending on the discipline. Physical specimens are curated at CODES (University of Tasmania), Earth Sciences New Zealand, Queensland Museum, Auckland University of Technology, and James Cook University. Ongoing analyses and joint publications will deliver new insights into submarine eruption processes, hazards, and ecosystem recovery in Tonga.

Scientific objectives

The overarching scientific objective is to understand eruption and post-eruption magmatic and volcanic processes associated with submarine volcanoes, and the subsequent impacts on the seafloor biological communities using the 2022 eruption of Hunga volcano as the key case study.

Detailed objectives are:

1. To calculate eruption volume and intensity of this 2022 eruption
2. To understand sediment transport mechanisms of the 2022 eruption products.
3. To test hypotheses for the formation of the summit crater of Hunga volcano.
4. To determine the recovery dynamics of disturbed seafloor biological communities, following a natural disturbance.

Voyage objectives

The voyage objectives were to:

1. Acquire samples and data on the 2022 seafloor eruption products to calculate eruption volume and intensity, distance of dispersal, and to understand the variable sediment transport processes (Research Aim 1).

2. Acquire samples and data of the volcanic architecture of Hunga volcano and surrounding basins to test hypotheses related to the formation of the summit crater on the volcano (Research Aim 2).

3. Acquire observations, data, sediments and biological specimens at Hunga and adjacent seamounts to understand the successional stages, rates of change, and sources of recolonisation in deep-sea benthic communities following a natural disturbance, with a focus on understanding the recovery dynamics (Research Aim 3).

The activities that were required to achieve our scientific and voyage objectives are:

- Multibeam mapping with multiple sensors
- Multichannel seismic system
- Multi coring sediments
- Piston coring sediments
- Rock dredges
- CTD
- CTD-derived eDNA samples
- Deep Towed Camera
- Deep Towed Camera eDNA sampler
- NIWA Sleds

Results

The volume and diversity of data collected during this multidisciplinary voyage are substantial and will require several years for full analysis and synthesis. This section therefore summarises the scope and scale of the datasets acquired, rather than presenting complete interpretations. The principal scientific results will emerge as ongoing analytical and modelling programs progress. Complementary datasets, including the underway gravity measurements and distributed acoustic sensing (DAS) records, will also contribute additional insights as these analyses are completed.

Objective 1 – Calculate eruption volume and intensity

With detailed analysis of the data collected we will be able to refine the calculation of eruption volume and intensity. Multibeam and sub-bottom surveys yielded approximately 4861 linear kilometres of high-resolution bathymetry and acoustic profiling, covering the crater, flanks, and surrounding basins of Hunga Tonga–Hunga Ha'apai. Mapping extended to 75km north, 32km east, 67 km south, and 72km west of the volcano. These areas encompass all major sediment-outflow corridors and all the 2022 and 2024 bathymetry datasets previously acquired. 17 seismic lines (457 km), 81 multicorer stations, and 7 giant piston core locations will provide stratigraphic control across each depositional sector to calculate the eruption volume. Distal basins >80 km from the source were not imaged or sampled due to the limited time available. We will use interpolations of the more proximal data to infer the thickness of those sediments for the calculations of eruption volume. Preliminary interpretation confirms that the volcano remains mantled by thick, coarse 2022 eruption deposits, and thick blankets of volcanic ash blanket extend far (>80 km) into adjacent basins.

Sediment-thickness grids produced from these data will be combined with on-land eruption-deposit volumes and eruption timing constraints to calculate the total erupted mass and intensity (mass-eruption rate) for the event. This approach will enable direct comparison with estimations provided by satellite data and numerical models for the subaerial phase of the eruption. These combined data will provide a measure of eruption power which then enables all subsequent modelling or eruption dynamics to take place. These constraints also provide the key parameters for more detailed investigation of magma storage, ascent and fragmentation, including eruption plume transport dynamics.

Giant piston coring in the proximal region proved technically challenging due to the coarseness of the deposit. Several piston-core barrels bent on impact, despite adjustments to fall height and trigger weight. There was no consistent recipe for success; penetration and recovery were highly dependent on substrate character. Sub-bottom profiles were used extensively to inform core-site selection. Sites were chosen on flat to very gently inclined terrain, and areas showing steep or chaotic internal reflectors were avoided to prevent the equipment being damaged. In several sectors more than 50 km from source, coarse sand- and granule-grade deposits limited penetration, confirming the extensive run-out of high-energy coarse-grained sediment flows. Better recovery was achieved in lee-side positions behind local topographic highs such as seamounts and volcanic ridges. In the finer-grained sedimentary basins we sampled reworked deposits where material was so fine that ash was expelled through the core catcher during recovery. A double-core-catcher configuration was implemented successfully to retain the fine material within the barrels. In the distal basins, primary 2022 eruption deposits were sampled in addition to pre-2022 erupted deposits likely from the greater Tofua volcanic arc and Lau Basin.

Objective 2 – Understand sediment-transport mechanisms

We collected all of the necessary data to address this objective. Deep-towed camera footage, coring, multibeam mapping, sub-bottom profiles and seismic data reveal several distinct sedimentary architectures. Collectively, these records capture a continuum of transport processes such as:

(1) thick (m- to 10s m-scale), massive and coarse 2022 eruption deposits units with sharp basal reflectors that likely represent high-density granular flows,
(2) planar, cross bedded or lenticular 2022 units of fine-coarse sediment indicative of deposition via turbidity currents,
(3) thin (cm) to thick (m) drapes of fine 2022 ash and silt deposited from water column suspension,
(4) coarse intra-crater breccia deposits related to mass wasting, and likely rockfalls,
(5) bottom current sediment tractional transport on the seabed,
(6) sediment hummocks (10s m in amplitude) related to mass wasting and slumping

Mapping and sampling were conducted both in front of and in the lee of major topographic features, including seamounts, ridges, and intervening basins, to evaluate how flow energy, sediment calibre, and run-up height varied with distance and sector.

Sampling from ridge crests and elevated terraces, where 2022 density currents thinned, provides key data to constrain maximum run-up heights and energy dissipation with topographic interaction. Unexpected findings include coarse sand and gravel-sized particles recovered more than 50 km from the crater, demonstrating that flows were powerful enough to maintain high energy over long distances.

We have a comprehensive record of post-eruption sediment distribution and transport pathways. The team successfully surveyed all principal outflow zones around Hunga. These included northern trench-parallel zone, northwest Hunga zone, southwest Hunga zone, and the northern Hunga Zone. Integration of multibeam bathymetry, sub-bottom acoustic imagery, and sediment cores shows that in some sectors material from the 2022 eruption has been remobilised and transported into adjoining basins and troughs. Reworked sediment is accumulating in surrounding basins through mass wasting with transport mechanisms such as rock falls, slumps, debris flows and turbidity currents. Thick ponds of 2022 sediment are present in basins. These zones are important for understanding risk to deep sea cables in the future from low energy sediment transport to mass-wasting sediment transport. The seafloor remains in a dynamic and unstable state.

Data from these areas will be used to model flow thickness, density, and travel distance to reconstruct the dynamics of the 2022 eruption and subsequent resedimentation. These models are also directly relevant to volcanic and tsunami hazard assessments, submarine-cable resilience and slope-stability assessments in the region.

Objective 3 – Test hypotheses for the formation of the summit crater/caldera

This objective was successfully achieved, with new geophysical (17 lines, 457 km) and sampling enabling evaluation of the competing hypotheses for summit crater formation at Hunga volcano. Rock dredges from the crater walls and rim recovered hydrothermal breccias, equigranular igneous rocks, in addition to porphyritic and vesicular glassy volcanic clasts.

The geophysical (seismic and gravity) and acoustic data will be analysed to test hypotheses related to the formation of the summit crater. These results will provide a robust framework to test numerical models of crater formation and tsunami genesis.

No major operational problems were encountered. One seismic line was abruptly halted due to emergency button accidently pushed. Another line had to be paused for a whale sighting following protocol in the cetacean permit. In our survey planning we had permitted enough time in the operational plans to redo those lines. Seismic data quality was high, and the coverage exceeded the original survey plan. Dredging at steep-sided walls was challenging, which resulted in the loss of two dredges (a common occurrence on any voyage) due to the hard and rugose environment of flanks, summits and calderas of submarine volcanoes.

Objective 4 – Determine the recovery dynamics of disturbed biological communities

This objective was successfully achieved. We conducted 26 deep-towed camera (DTC) transects, three NIWA sleds, 22 CTD casts, 26 eDNA deep towed camera samples, and 8 eDNA CTD water-filter deployments across and beyond the crater, targeting a range of seafloor substrates and depths to assess recolonisation dynamics.

Visual and physical sampling show that the seafloor remains dominated by thick, fine-grained volcanic ash deposited during and reworked after the 2022 eruption. The seafloor surface is typically smooth with highly variable bedforms, with areas of reworked or ponded sediment forming low-relief plains described as "mud soup". These deposits form soft, unstable substrates and are being actively remobilised which inhibits recolonisation by most benthic fauna. These areas behave fluidly when disturbed, consistent with unconsolidated fine ash that may be liquefied by currents or seismic shaking.

Despite these challenging conditions, evidence of biological recovery is clear. On hard substrates, particularly boulders and blocks rafted across the seafloor during the eruption support small but diverse colonising assemblages. These include bryozoans, sponges, corals, and echinoderms, forming isolated "islands" of benthic life across the otherwise barren mud plains. These sites represent critical footholds for recolonisation, acting as local refugia generating seed sources for future expansion. A notable finding is that biological density and diversity appear higher within the crater than on its outer flanks. This pattern may reflect local hydrothermal venting supplying nutrients and heat, promoting microbial productivity and creating microhabitats suitable for foundation habitat recolonisation.

Multicorer samples from mud plains contain early-colonising microfauna including porcelaneous Miliolid and agglutinated benthic foraminifera, living in the upper few centimetres of the soft sediment. The presence of these species indicates that initial recolonisation of the substrate surface has begun, even in the most heavily impacted zones.

The planned eDNA analyses will test for the presence of diverse microbial and planktonic communities in both bottom-water and near-surface samples, to aid with the understanding of whether water-column exchange and larval dispersal are re-establishing connectivity between the crater and surrounding ocean The combination of imagery, physical samples, and genetic data will establish baseline conditions for future monitoring of Tonga's marine ecosystems and inform broader models of deep-sea resilience following catastrophic natural disturbances.

No major technical issues occurred during biological and water sampling.

Additional outcomes

In addition to the core scientific and voyage objectives, several planned and unplanned outputs and outcomes were achieved.

(1) Distributed acoustic sensing (DAS) collaboration

A scientific collaboration was undertaken with the University of Tokyo as part of a five-month Distributed Acoustic Sensing (DAS) experiment aimed at improving the DAS methodology, and scientific questions associated with volcano and arc architecture and magma plumbing systems. The experiment was led by Profs. Mie Ichihara, Masanao Shinohara, and Dr Shunsuke Nakao.

During August the *RV Investigator* seismic program was coordinated with the University of Tokyo and the Tonga Cable Ltd using the domestic fibre-optic network as a passive sensor. Temporary broadband seismometers were installed on nearby islands by University of Tokyo and Tonga Geological Services (TGS) to complement the marine survey.

The domestic fibre optic cable system successfully recorded acoustic signals generated by the Investigator's air-guns.

(2) CTD-derived sediment samples from hydrothermal vents within the Hunga summit crater

Water samples were filtered for sediment samples at 8 sites within the crater. These water samples were filtered onto 0.22, 0.45 and 5 micron filter papers. The sediment will be investigated, likely for sulfur isotopic analysis, particle componentry and composition, size and shape information by Auckland University of Technology scientists.

(3) Gravity underway

Underway gravity was measured during the entire voyage and the data will be processed by the University of California at Berkeley scientists and San Jose State University to determine the structure of the volcanic edifice.

Voyage narrative

Voyage IN2025_V05 was conducted aboard RV Investigator from 10 August to 1 October 2025 and led by the University of Tasmania (UTAS, CODES/IMAS). Tonga Geological Services (TGS) participated as a key partner, together with scientists from Australia, New Zealand, Japan, the United Kingdom, and the United States.

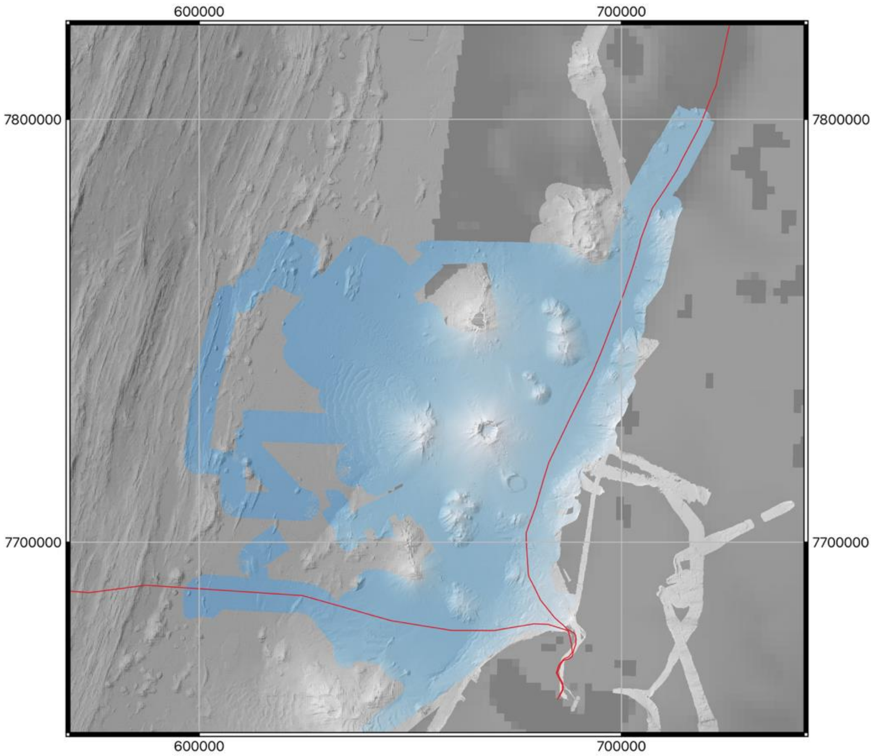
Mobilisation occurred in Hobart and on 10 August the vessel transited to Tonga, embarking the remaining science team and completing customs and operational briefings in Nuku'alofa on 19 August. Following a short transit, underway data collection commenced while preparations were made for commencement of the seismic survey. The seismic survey was conducted during daylight hours and other activities including multicoring, dredging, deep tow camera and CTD casts were conducted at night. The seismic survey was completed and the vessel returned to Nuku'alofa on Friday September 5th to exchange science team members and technical personnel before resuming the voyage. For the remainder of the voyage piston coring and activities within the Hunga crater were prioritised for daylight hours, all other activities were programmed around these priorities. Science activities were completed on 22nd September and following a short transit the vessel arrived in Nuku'alofa in the late afternoon of the 22nd September. The science team departed the voyage in Nuku'alofa on 23rd September, and the ship then transited to the Tonga trench, and then to Brisbane for demobilisation.

Routine underway data collection included continuous EM122 multibeam, EK80 echosounder, gravity, meteorological, navigation, and ADCP records throughout the voyage.
A total of 4861 km of bathymetric lines and 17 seismic lines were acquired around Hunga volcano and broader Tonga region, providing full coverage of the crater, flanks, and adjacent basins. Mapping extended to 75km north, 32km east, 67 km south, and 72km west of the volcano encompassing all major sediment-outflow corridors.

Geological sampling activities included the following operations: 16 giant piston cores, 81 multicores, and 6 rock dredges, targeting eruption and post-eruption deposits. Coring in proximal regions proved challenging due to coarse 2022 eruption deposits, and several barrels bent despite variable drop heights. In fine-grained basins, very soft ash required a double-core-catcher setup to retain material upon recovery.

Biological and hydrographic work comprised 26 deep-towed camera (DTC) transects (each DTC deployment included bottom water eDNA sampling), 3 NIWA sleds, and 16 CTD casts for hydrographic profiling, water and sediment sampling and hydrochemistry analyses. Imagery documented extensive mud plains with isolated recolonised areas of sessile fauna. Weak temperature and redox anomalies in the CTD data indicate minor ongoing hydrothermal venting inside the crater. 24 operations with the deep-towed camera eDNA sampler has provided 22 eDNA samples and 2 blanks.

The voyage achieved complete mapping coverage, broad sediment and biological sampling, and high-quality geophysical and hydrographic datasets. The data will underpin future quantification of eruption volume and intensity, slope-stability and volcanic, tsunami and cable-hazard modelling, and studies of benthic ecosystem recovery. All datasets are archived through the CSIRO Marine National Facility Data Portal, with physical samples curated by UTAS (CODES), Earth Sciences New Zealand, Auckland University of Technology, CSIRO MNF, and James Cook University.



Caption: Surveyed area during IN2025_V05 around Hunga volcano. Tonga seafloor cables shown in red.

Outreach, education and communications activities

The voyage generated strong media, education, and outreach outcomes across Australia, Tonga, and international audiences. Communication activities highlighted both the scientific discoveries and the collaborative nature of the work between the University of Tasmania, Tonga Geological Services, and the Marine National Facility. The campaign successfully raised public awareness of the 2022 Hunga Tonga–Hunga Ha‘apai eruption and its impacts, and of the partnerships that underpin Australia's engagement in Pacific marine science. Two University of the South Pacific students were part of the science team on the voyage. The Vice Chancellor of the Tonga National University, Giulio Masasso Tu'ikolongahau Pāunga was also present for the ship tour. 50 Year 11/12 students from the Tonga National University participated in the ship tour.

Media

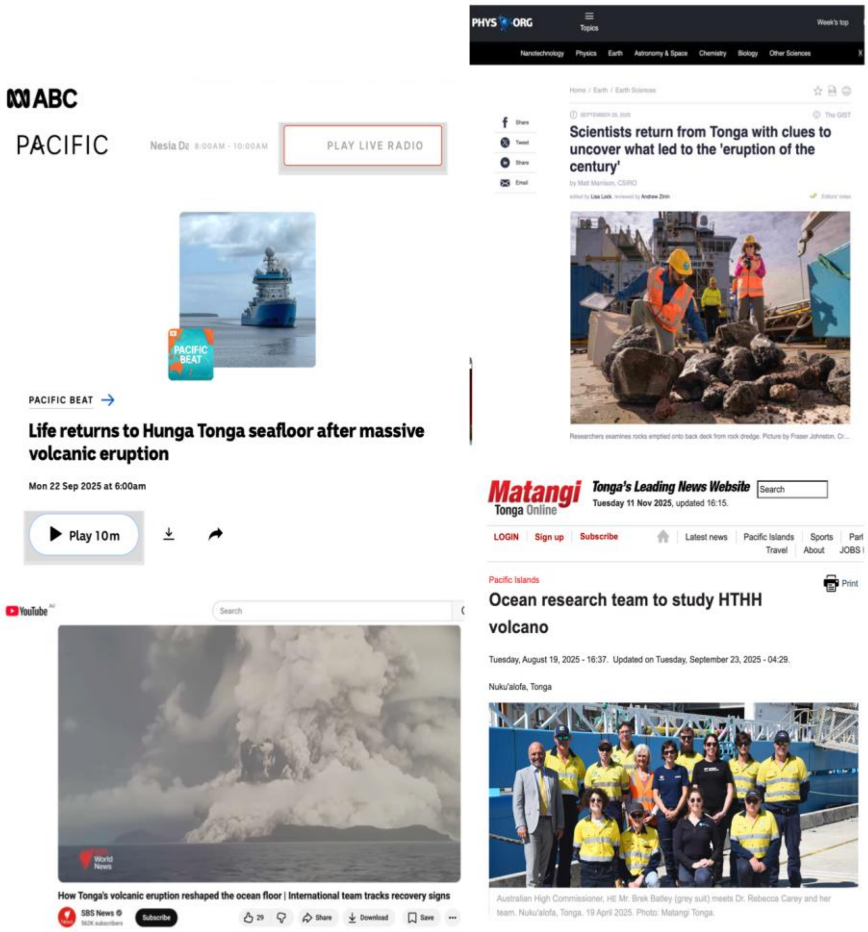
A coordinated media plan was implemented before departure and during the voyage, with content shared through IMAS, CSIRO, and Australian and Tonga Government channels. The science team onboard RVI and CSIRO media teams produced imagery and video for national and international distribution, including short social-media reels and interviews from onboard *Investigator*.

More than 32 media stories were published or broadcast across television, radio, print, and digital platforms. Key features included:

- SBS News (22–29 Sept 2025): *How Tonga's volcanic eruption reshaped the ocean floor - International team tracks recovery signs.* A national TV feature and online article highlighting early signs of ecosystem recovery and Australia–Tonga collaboration.
- ABC News 24 (19 August 2025): Interview with Assoc. Prof. on voyage objectives
- ABC News (29 September 2025): Interview with Assoc. Prof. on voyage findings
- Tanaloa Tonga (22 August 2025): Interview with Assoc. Prof. Rebecca Carey on the voyage science
- ABC Pacific Beat (22 Sept 2025): Interview with Assoc. Prof. Rebecca Carey on eruption mapping and regional hazard resilience.
- Matangi Tonga (16 Sept 2025): *"Life erupting from volcanic mud soup"*, describing post-eruption seafloor conditions, and benthic recolonisation.
- The Mercury (09 September 2025 and 29 September 2025). Feature on UTAS leadership in international volcano research.
- RNZ Pacific: Segments on the voyage discoveries and Tongan student participation.
- Coverage by the Australian High Commission in Tonga, Tonga Broadcasting Commission, and Tonga Geological Services social media pages.

IN2025_V05_Media

Date	Event	Media
09.08.25	Tassie team to seek volcano eruption clues in Survey	The Mercury
10.08.25	Australian voyage to investigate Tonga's eruption of the century	UTAS
12.09.25	IN2025_Voyage_interview	ABC Hobart Afternoons
19.09.25	ABC News 24	ABC News
19.08.25	Scientific voyage probes Tonga's record-breaking volcanic eruption	Xinhua
19.08.25	Scientists probe Tonga's 'volcanic ground zero' in epic 54-day mission	ANewZ
19.08.25	Aussie Team Probes Tonga's Century Eruption	Mirage News
19.08.25	Australian voyage to investigate Tonga's eruption of the century	The national tribune
19.08.25	interview	Triple M Hobart
19.08.25	"Australian voyage to investigate Tonga's eruption of the century" (CSIRO media release)	CSIRO
19.08.25	"Ocean research team to study HTHH volcano	Matangi Tonga
21.08.25	Scientists stydying deep-sea ecosystem recovery from Tonga eruption	RNZ
22.08.25	Tasmanian team sails to study Tonga volcanic recovery	Talanoa Tonga
25.09.25	Slow recovery of HTHH marine ecosystem surprises scientists	Matanga Tonga
25.09.25	Slow recovery of HTHH marine ecosystem surprises scientists	Matangi Tonga
26.08.25	IN2025_Voyage_interview	Tune FM broadcast UNE
26.08.25	Scientific Voyage to study Tonga's "Ground Zero"	Tasmanian Times
01.09.25	How underwater volcanic explosions impact marine species: research	2ser107.3
16.09.25	Life eruptive from Hunga volcanic mud soup	Matangi Tonga
16.09.25	Life eruptive from volcanic mud soup	Mirage News
16.09.25	Life erupting from volcanic mud soup	Matangi Tonga
17.09.25	Scientists track marine life return after 2022 Tonga volcano eruption	Xinhua
22.09.25	Life returns to Hunga Tonga seafloor after smassive volcanic eruption	ABC Pacific
28.09.25	Life slowly returns to Tonga's underwater volcano zone years after devastating eruption	Head Topics Australia
29.09.2025	IN2025_Voyage_interview	ABC TV NEWS
29.09.25	Pacific voyage led by University of Tasmania scientists uncover secrets of Tonga's Hunga Volcano	The Mercury
29.09.25	Scientists return from Tonga with clues to uncover what led to the 'eruption of the century'	Phys Org
29.9.25	Scientists return with clues to uncover what led to the 'eruption of the century'	CSIRO
Sept. 25	How Tonga's volcanic eruption reshaped the ocean floor - International team tracks recovery signs	SBS News Show
Sept. 25	The effects of Tonga's massive volcanic explosion linger, three years on	SBS podcast
01.10.25	Tonga's 2022 eruption of the centuryL eruption destruction and seafloor ecosystem recovery	Deep Sea Life
03.10.25	IN2025_Voyage_interview	ABC Hobart Breakfast



Caption: Examples of the media news stories from the IN2025_V05 voyage.

Training and capacity building

Caption: The voyage also delivered on training and education. Ten of the science party were students (undergraduate to PhD level), and a further 7 as early career researchers participating in hands-on mapping, coring, and sample processing. Onboard training sessions introduced eDNA sampling, sediment-core logging, and multibeam data interpretation.

Photos: Rebecca Carey

Caption: More than 50 Tongan STEM students toured RV *Investigator* and interacted with the Marine National Facility and science team.

Photo: CSIRO–Fraser Johnston

Government and Diplomatic Engagement

Engagement with the Tongan Government and Royal Family was facilitated through the Australian High Commission in Tonga, with the strong support of High Commissioner Bret Batley and Deputy High Commissioner Erin Gleeson. During the Nukuʻalofa port calls, the MNF hosted the Australian High Commissioner, Mr Bret Batley, and Deputy Commissioner Ms Erin Gleeson, His Royal Highness Crown Prince Tupoutoʻa ʻUlukalala, the Honourable Lord Fasi Taimani ʻAfuʻalo Matoto Minister for Lands and Natural Resources, senior representatives from the Tongan Navy, government officials and the Vice Chancellor from the Tonga National University, Mr Giulio Masasso Tu'ikolongahau Pāunga. These visits provided an opportunity to demonstrate Australia's ongoing commitment to Pacific research partnerships, education and marine resilience initiatives

Caption: His Royal Highness Crown Prince Tupoutoʻa ʻUlukalala from the Kingdom of Tonga (centre) is flanked by dignitaries and representatives from Tonga and Australia with the RV Investigator berthed at Nuku'alofa, Tonga. The Honourable Lord Fasi Taimani ʻAfuʻalo Matoto Minister for Lands and Natural Resources, the Vice Chancellor of Tonga National University, Giulio Masasso Tu'ikolongahau Pāunga, is second from right; Associate Professor Rebecca Carey, Chief Scientist on the IN2025_V05 research voyage, is fourth from right; sixth from right is the Captain of the Investigator, Richard Hewson (bearded and wearing civvies). Australia's Deputy High Commissioner to Tonga, Erin Gleeson, is standing between the Captain and the Crown Prince; behind her is Margot Hind (Voyage Manager from MNF CSIRO). Folauhola Saione Helina Latuila from the Tonga Geological Services is third from left in this group. (Photo: CSIRO–Fraser Johnston)

Summary

Voyage IN2025_V05 achieved all major scientific and operational objectives and delivered an exceptional dataset documenting the geological and ecological aftermath of the 2022 Hunga Tonga–Hunga Ha‘apai eruption. The expedition successfully combined detailed seafloor mapping, coring, seismic imaging, water and biological sampling to produce a highly diverse record of this globally significant event.

The voyage provided new insights into eruption volume, transport processes, and crater formation. Multibeam and sub-bottom data revealed extensive erosion and redistribution of volcanic material, with sediment pathways extending tens of kilometres from the volcano and connecting directly to the Tonga Trench. Seismic data highlighted the crater structure, and the architectures of the surrounding basins around Hunga. Biological sampling included Porifer, Cnidaria, Annelid, Mollusca, Echinodermata Phyla. There was slightly higher biodiversity within the crater where weak hydrothermal venting persists.

Operationally, the voyage ran efficiently and safely under generally favourable weather conditions. Coring in coarse proximal deposits was challenging, several core barrels were bent and core recovery was reduced in this very proximal very coarse volcanic material. Coring strategies, including site selection using sub-bottom data and modified core-catcher designs, ensured that we were successful in some challenging locations. Equipment performance of mapping, seismic, and hydrographic systems was excellent, and the dataset completeness exceeded expectations. The input from the highly experienced and skilled ship crew, MNF staff and CSIRO technicians and scientists, their collaboration and problem-solving skills ensured a successful voyage.

The partnership between UTAS and Tonga Geological Services was both a strength and delight of the voyage. TGS scientist Mele Manu participated in all operational phases. Onboard, 17 students and early-career researchers gained hands-on experience, building capacity in marine geology, biology, and data processing.

The voyage was supported by the Australian High Commission in Tonga, whose facilitation by High Commissioner Brek Batley and Deputy High Commissioner Erin Gleeson enabled ministerial and royal engagement.

Voyage IN2025_V05 represents a massive achievement for Australian and Pacific marine science. The results will advance understanding of submarine eruption processes, post-eruption ecosystem recovery, and volcano, tsunami and cable submarine-hazard resilience. The data and samples archived through the CSIRO Marine National Facility Data Portal, CODES (UTAS), AUT, Earth Sciences NZ, and James Cook University form a lasting legacy to support ongoing research, training, and regional collaboration in the Southwest Pacific.

Summary of data and samples collected

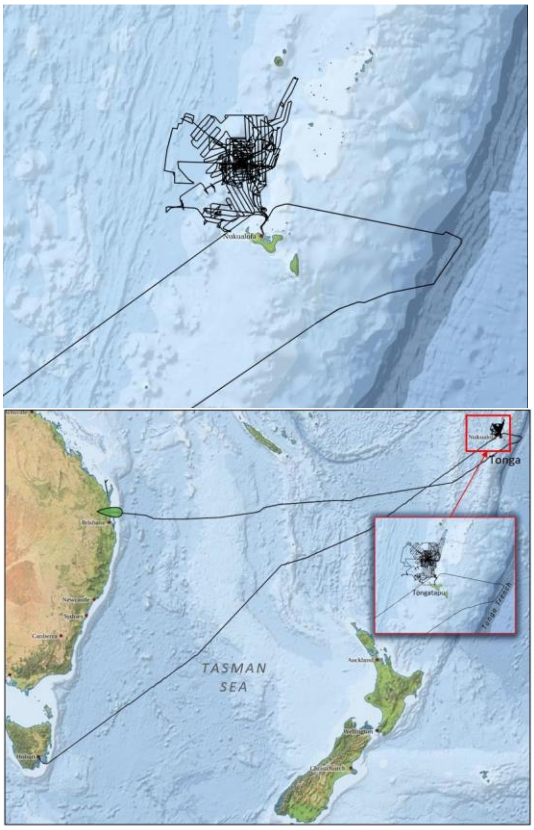
#	Samples & Data collected	Number of deployments	Description	Custodian
1	Multibeam bathymetry	~4861 km line mapped	Completed at 6-6.5 kts for quality. 16 m grid for regional area 5m grid for crater	Chief Scientist University of Tasmania
2	Multichannel Seismic Survey	17 lines (457 km)	Multichannel seismic processed profiles.	Chief Scientist University of Tasmania
3	Sub-bottom profile survey	~4800 km line mapped	Sub-bottom profiles collected in 90% of locations where multibeam surveys were conducted	Chief Scientist University of Tasmania
4	Piston Core	16	Piston core sediments with lengths of between 40cm to 5 metres. Split cores and archived.	Chief Scientist University of Tasmania
5	Rock Dredges	6	Intra-crater dredged samples (1) Extra-crater dredged samples (4)	Chief Scientist University of Tasmania
6	Deep-Towed Camera video surveys	26	19 repeat surveys from TAN 2206 surveys 9 surveys from new locations Data transect information (e.g., start and end points) recorded in excel file. Biological species observed during transect recorded in excel file.	Chief Scientist University of Tasmania and Earth Sciences New Zealand
	Deep-Towed Camera still photo images from surveys	26	Deep towed camera videos and still images	Chief Scientist University of Tasmania
7	NIWA sled (mini-Sherman)	3	NIWA sleds at key locations for biological specimens, adjacent to the deep towed camera lines	Both

8	CTD sites	22	Intra-crater CTD sites (12)	NOAA PMEL
			Extra-crater CTD sites (10)	Auckland University of Technology
	CTD hydrochemistry	20	Hydrochemistry	Auckland University of Technology
	CTD sediment filtration	8	Water filtration for sediment	Auckland University of Technology
	CTD MAPR profiles	14	14 MAPR profiles: **Site01:** CTD02, CTD03, CTD04, CTD05, CTD06, CTD07, CTD08, CTD09, CTD10, CTD11, CTD12 **Site09:**CTD01 **Site 07:** CTD01 **Site11:** CTD01 **Site12:** CTD01 **Site13:** CTD01 **Site06:** CTD01 **Site02:** CTD01 **Stie 24:** CTD01, CTD02 **Site25:** CTD01	NOAA PMEL
	CTD eDNA samples	8	**Eight locations:** S01_CTD01; S01_CTD04; S24_CTD01; S24_CTD02 S25_CTD01; S09_CTD01 S07_CTD01; S02_CTD01	University of Tasmania Earth Sciences New Zealand CSIRO
9	Multicore biological specimens	81	Multicoring for infauna populations. Upper 5 cm of sediment	Earth Sciences New Zealand
10	Deep-Towed Camera eDNA samples	24	eDNA samples with 5 micron, 0.45 micron and 0.22 micron filter paper	University of Tasmania Earth Sciences New Zealand

Curation Report

Item #	Description	Storage	Access	Custodian
1	Rock samples	UTAS CODES	Via Chief Scientist	Assoc. Prof. Rebecca Carey
2	Sieved sediment samples	UTAS CODES	Via Chief Scientist	Assoc. Prof. Rebecca Carey
3	Multicore sediment samples	UTAS CODES	Via Chief Scientist	Assoc. Prof. Rebecca Carey
	Giant Piston core samples	UTAS CODES	Via Chief Scientist	Assoc. Prof. Rebecca Carey
	Biological specimens	Earth Sciences New Zealand Queensland Museum	Via Custodian	Sadie Mills and Daniel Leduc (Earth Sciences New Zealand) Merrick Ekins (Queensland Museum Brisbane) Tom Bridge (Queensland Museum Townsville)
	Coral specimens	Earth Sciences New Zealand and Queensland Museum	Via Custodian	Tom Bridge (Queensland Museum Townsville)
	CTD filtered sediment samples	Auckland University of Technology	Via Custodian	Marta Ribo (Auckland University of Technology)
	eDNA CTD samples	CSIRO Hobart	Via Chief Scientist	Assoc. Prof. Rebecca Carey
	eDNA Deep Towed Camera samples	CSIRO Hobart	Via Chief Scientist	Assoc. Prof. Rebecca Carey

Track Chart



Science Team

PARTICIPANT	ROLE	AFFILIATION
Rebecca Carey	Chief Scientist	CODES, University of Tasmania
Vanessa Lucieer	Alternate Chief Scientist (Leg 1)	IMAS, University of Tasmania
Bronwyn Davies	Seismic/SBP Interpretation	N/A
James White	Volcanology/sedimentology	University of Otago
Mele Manu	TGS Scientist	Tonga Geological Survey
Jodi Fox	Volcanology/sedimentology Alternate Chief Scientist (Leg 2)	IMAS, University of Tasmania
Martin Jutzeler	Volcanology/sedimentology	CODES, University of Tasmania
Shannon Frey	Volcanology/sedimentology	CODES, University of Tasmania
Peter Harris	Marine science/sedimentology	IMAS, University of Tasmania
Fraser Johnston	Videographer	Spectral Media
Lucy Southworth	PhD student Biologist	James Cook University
George Hamaty	Undergraduate student Biologist	University of Tasmania
Marta Ribo	Geomorphology/Ocean Science	Auckland University of Technology
Rachael Baxter	PhD Student Volcanology	University of Otago
Cecilia Tabuavou	Masters student/graduate eDNA/Environmental Science	University of the South Pacific, Fiji
Tomasi Mara	Masters student/graduate eDNA/Environmental Science	Social Empowerment and Education Programme, FIJI
Ellyse Noy	Honours student Volcanology, Geospatial Science	University of Tasmania
Hannah St Louis	PhD student Sedimentology, Ocean science	Auckland University of Technology
Sebastien Forero Escovar	Master's student Volcanology, Sedimentology	San Jose State University
Michael Manga	Volcanologist, Geophysicist	UC Berkeley
Tia Ewen	Undergraduate student	University of Tasmania
Kathleen McKee	Volcanologist, Geophysicist	Vanderbilt University
Martin Crundwell	Micropaleontologist	University of Auckland

Marine National Facility Team

NAME	ROLE
Margot Hind	Voyage Manager
Steve Thomas	Seagoing Instrument Team Support
Karl Forcey	Seagoing Instrument Team Support
Phil Vandenbossche	Geophysical Survey Mapping Support
Chris Yuleridge	Geophysical Survey Mapping Support
Augustin Deplante	Geophysical Survey Mapping Support
Francis Chui	Data Acquisition Processing Support
Christian Cuthbert	Data Acquisition Processing Support
Shanon Palmer	Field Operations Support
Corey Hazelwood	Field Operations Support
Andrew Woodward	Field Operations Support
Jason Fazey	Field Operations Support
Maddy Lahm	Hydrochemistry Support
Cisco Navidad	GSM Support (Transit to Tonga only)
Maria De Deuge	Seismic acquisition
Wayne McKenna	Clinician

Ship's Crew

NAME	ROLE
Master	Richard Hewson
Chief Mate	Kristian Webster
2nd Officer	Alex Madden
3rd Officer	Jaymes Olding
Chief Engineer	Gennadiy Gervasiev
1st Engineer	Mark Ellicott
2nd Engineer	Fletcher Caldwell
3rd Engineer	Joshua Ferguson
Seismic Engineer	Alec Mack
ETO	Andrew Beech
CIR	Darren Capon
Integrated Rating	Paul Petersen
Integrated Rating	Karl Cleary
Integrated Rating	Jonathon Lumb
Integrated Rating	Murray Lord
Integrated Rating	Maurice Doyle
Integrated Rating	Aaron Scott
Chief Cook	Kane Shaw
Cook	Greg Murphy
Chief Steward	Adam Edwards
Steward	Kyra Lade

Links to Further Data and Information

NCMI Information and Data Centre (csiro.au)

Data Trawler (csiro.au) – Data Extraction tools for Voyage Data

MNF Reporting (csiro.au) – Publications and reports from research on vessels run by the Marine National Facilty

Marlin3 - Marlin - CSIRO Oceans and Atmosphere Metadata Catalogue

Open Access to Ocean Data (aodn.org.au)

AusSeabed (ausseabed.gov.au)

CAAB - Codes for Australian Aquatic Biota (csiro.au)

Ocean Biodiversity Information System - Australia (obis.org.au)

Atlas of Living Australia (ala.org.au)

CSIRO Data Access Portal (data.csiro.au)

Global Biodiversity Information Facility (GBIF) (gbif.org)

Acknowledgements

We extend our sincere gratitude to the Kingdom of Tonga for granting permission to conduct this research within Tongan waters and for their support throughout the voyage planning and delivery process. We warmly acknowledge Tonga Geological Services (TGS), particularly Rennie Vaiomo'unga, Mele Manu and Savelinga FaoLiu for their assistance, partnership, expertise, and leadership, which were central to the success of this expedition.

This research was supported by a grant of sea time on RV Investigator from the CSIRO Marine National Facility (MNF). We gratefully acknowledge the MNF for providing the vessel, equipment, technical support, and coordination required for this multidisciplinary voyage. We thank the Master of RV Investigator, Richard Hewson, for his professionalism, steady leadership, and exceptional management of ship operations.

We express our deep appreciation to Margot Hind, Voyage Manager, for her outstanding leadership, facilitation, and support across all scientific and logistical activities. Her capability, calm problem-solving, and expertise was instrumental to the success of the voyage. Sincere thanks to the Marine National Facility teams, DAP, GSM, Field Ops, Seismic, SIT, for their professionalism, adaptability and problem-solving skills while underway. Thank you to Matt Marrison from the MNF, Cassie Harrex and Louise Creely from UTAS for enabling communications before, throughout, and after the voyage. Thank you to the non ship-based MNF team for facilitating the voyage logistics. We thank Fraser Johnstone for joining us for the second half of the voyage and for capturing the incredible science underway. Fraser's work has already enabled broad media coverage and scientific communication during the voyage, and will continue to support future outreach and research outputs as we deliver this science to end- and next-users.

As Chief Scientist, I extend heartfelt thanks to my co-Chief Scientists, Professor Vanessa Lucieer and Dr Jodi Fox, whose scientific leadership, collaboration, and tireless efforts were essential in shaping the voyage program and managing the complex scientific operations at sea. We thank all members of the IN2025_V05 science party for their dedication and teamwork across mapping, seismic acquisition, coring, dredging, camera surveys, CTD and eDNA sampling, and biological and geological processing. The team included researchers and students from the University of Tasmania, Tonga Geological Services, the University of Otago, NIWA, Auckland University of Technology, James Cook University, San José State University, UC Berkeley, the University of the South Pacific, Vanderbilt University, and other partners from Australia, New Zealand, Japan, the United States and the United Kingdom.

We gratefully acknowledge the Australian High Commissioner to Tonga, Mr Brek Batley, and the Deputy High Commissioner, Ms Erin Gleeson, for their interest in and support of the voyage, including their visits to RV Investigator during our two port calls in Nukuʻalofa. Their engagement strengthened the links between the scientific program and broader Australia–Tonga cooperation, and ship tours of Tongan Year 11 and 12 STEM students.

We also acknowledge the contributions of the Distributed Acoustic Sensing (DAS) collaboration with the University of Tokyo, Fiber Sense Pty Ltd, and Tonga Cable Ltd., whose coordination during seismic operations extended the scientific reach of the voyage. We thank the TAN2206 NIWA survey team for foundational 2022 datasets that informed our sampling strategies and will enable meaningful multi-year comparisons.

Finally, we thank the many shore-based collaborators, laboratory teams, data curators, and students who will continue to analyse and integrate these datasets. Their efforts ensure that the outcomes of this voyage will support volcanic and tsunami hazard assessment, ecosystem-recovery science, and resilience planning for Tonga and the wider Southwest Pacific.

Signature

Your name:	Associate Professor Rebecca Carey
Title:	Chief Scientist
Signature:	
Date:	19 December 2025

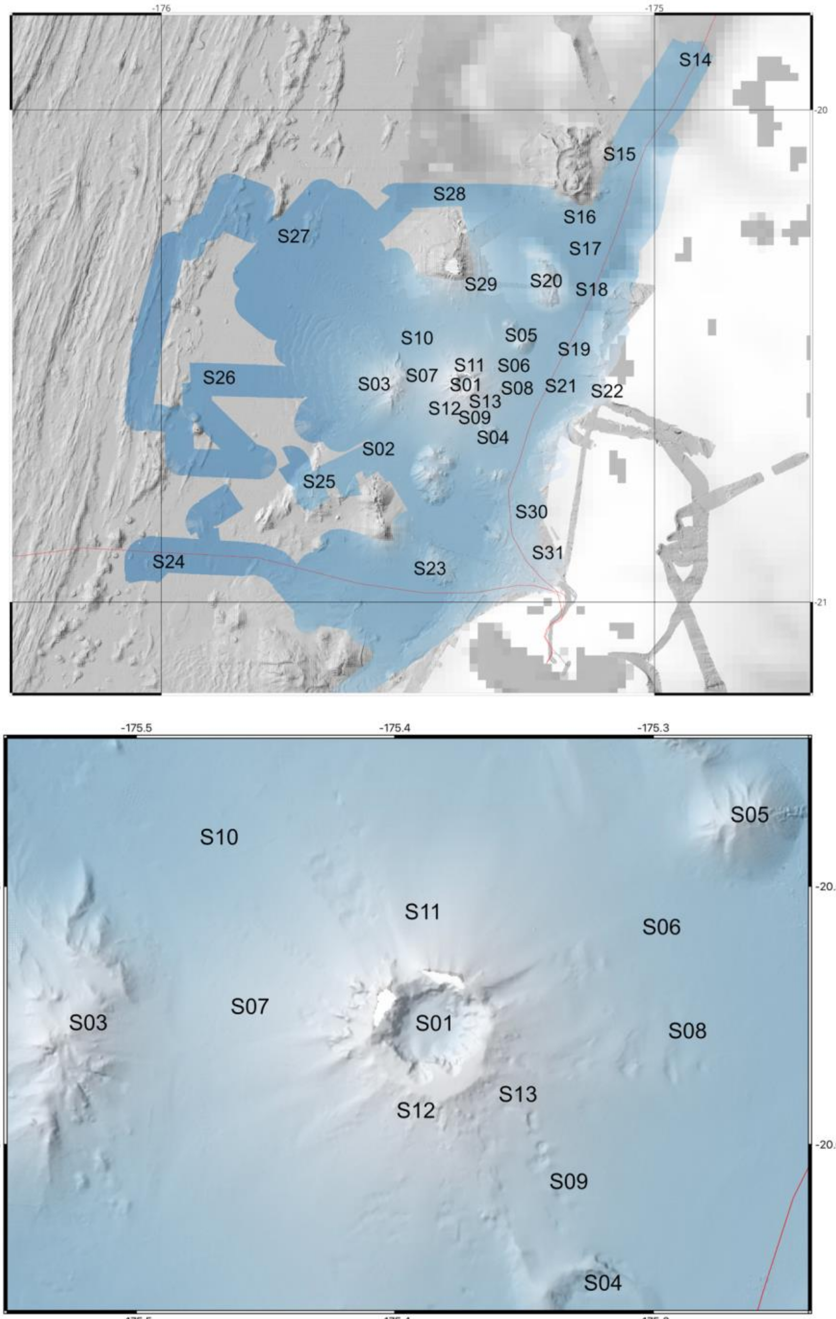
List of Appendices

Appendix A – Photographs

Videographer Fraser Johnston was on board the vessel and has hundreds of images taken on behalf of CSIRO. These are available on request to Chief Scientist.

Appendix B – Sites

The survey area was around Hunga volcano between 32 and 2600 mbsl. Operations were conducted inside and outside the crater. Sites around the volcano were named such that multiple operations in the same location had the same site number.



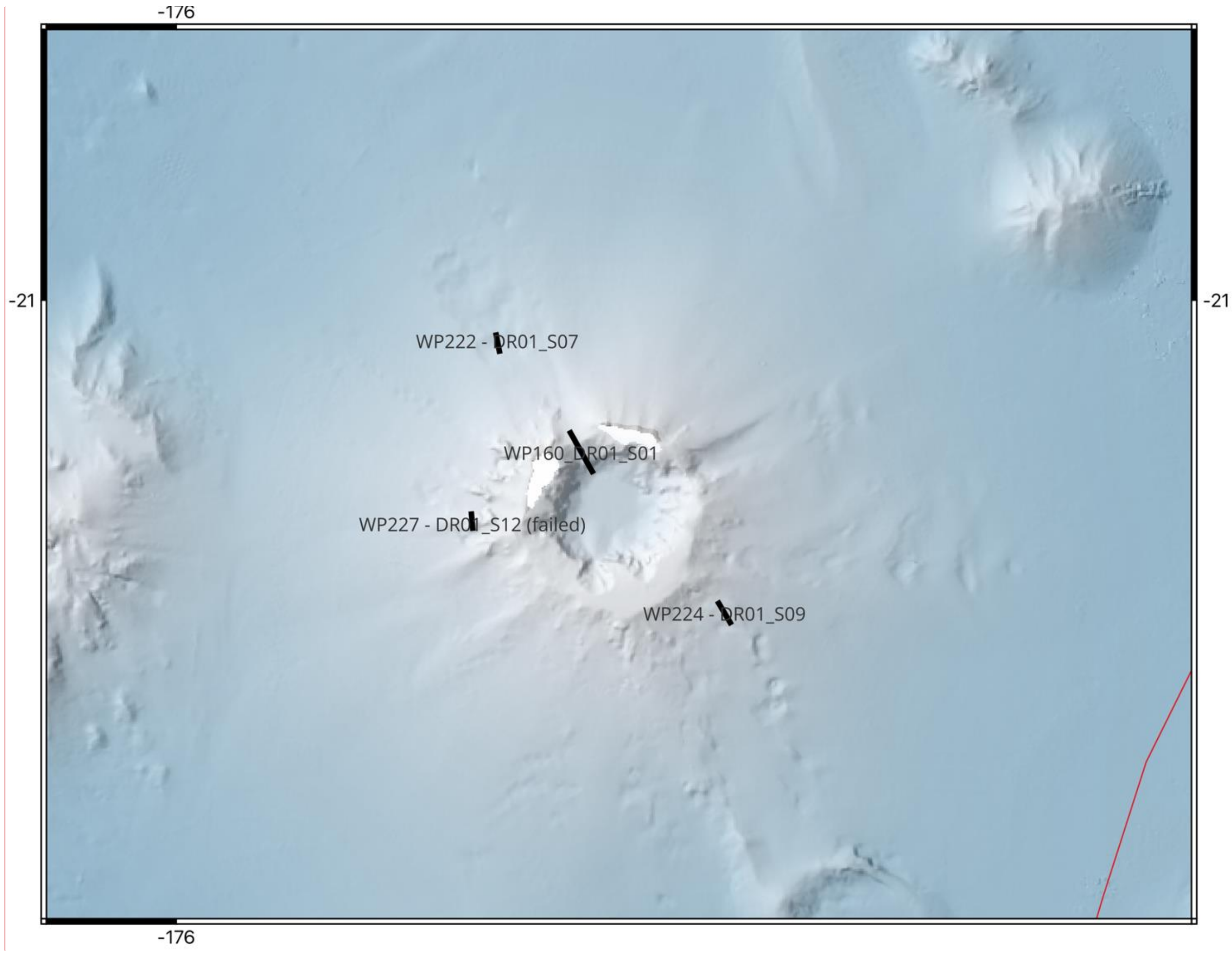
Caption: Site locations within the area surveyed by the IN2025_V05 voyage.

Appendix C – Dredged Rock Sample Information

Date UTC	Dredge / Sled	Sample number	Lithology	Rock Name	No Pieces	(Kg)	Lat.	Long.
Dredge Site 09								
28/08/25	Dredge	IN2025_V05_S09_DR01_01	Andesite	Glassy Andesite	4	6.0	-20.584	-175.355
28/08/25	Dredge	IN2025_V05_S09_DR01_02	Andesite	Glassy Andesite	2	2.0	-20.584	-175.355
28/08/25	Dredge	IN2025_V05_S09_DR01_03	Andesite	Glassy Vesicular Andesite	5	2.5	-20.584	-175.355
28/08/25	Dredge	IN2025_V05_S09_DR01_04	Andesite	Porphyritic Andesite	6	4.8	-20.584	-175.355
28/08/25	Dredge	IN2025_V05_S09_DR01_05	Andesite	Amygadaloidal porphyritic Andesite	10	3.0	-20.584	-175.355
28/08/25	Dredge	IN2025_V05_S09_DR01_06	Andesite	Glassy Andesite	6	2.0	-20.584	-175.355
28/08/25	Dredge	IN2025_V05_S09_DR01_07	Breccia, Lava	Altered Breccia Rocks	4	1.0	-20.584	-175.355
Dredge Site 07								
29/08/25	Dredge	IN2025_V05_S07_DR01_01	Breccia	Polymictic matrix-supported volcanoclastic breccia	8	3.4	-20.509	-175.416
29/08/25	Dredge	IN2025_V05_S07_DR01_02	Andesite-Basalt	Mixed group of altered and/or rounded volcanic rocks	9	3.4	-20.509	-175.416
29/08/25	Dredge	IN2025_V05_S07_DR01_03	Andesite	Altered porphyritic Andesite	1	0.4	-20.509	-175.416
29/08/25	Dredge	IN2025_V05_S07_DR01_04	Andesite	Glassy Andesite	6	3.6	-20.509	-175.416
29/08/25	Dredge	IN2025_V05_S07_DR01_05	Andesite	Glassy vesicular porphyritic andesite	4	3.0	-20.509	-175.416
29/08/25	Dredge	IN2025_V05_S07_DR01_06	Andesite	Porphyritic Andesite	4	1.8	-20.509	-175.416
29/08/25	Dredge	IN2025_V05_S07_DR01_07	Andesite	Porphyritic Andesite	1	3.0	-20.509	-175.416

29/08/25	Dredge	IN2025_V05_S07_DR01_08	Andesite	Vesicular porphyritic Andesite	1	1.4	-20.509	-175.416
29/08/25	Dredge	IN2025_V05_S07_DR01_09	Breccia	Volcanic breccia	1	0.7	-20.509	-175.416
NIWA sled 20								
3/09/25	NIWA Sled	IN2025_V05_S20_NS01_01	Rhyolite/Dacite	Light grey rhyolite/dacite pumice fragments	20	0.3	-20.372	-175.224
3/09/25	NIWA Sled	IN2025_V05_S20_NS01_02	unknown	Dark, altered pumice	20	0.2	-20.372	-175.224
3/09/25	NIWA Sled	IN2025_V05_S20_NS01_03	Rhyolite/Dacite	Light grey rhyolite/dacite pumice clasts	15	3.5	-20.372	-175.224
3/09/25	NIWA Sled	IN2025_V05_S20_NS01_04	Rhyolite/Dacite	Light grey rhyolite/dacite pumice clasts	2	4.5	-20.372	-175.224
Dredge Site 01								
14/09/25	Dredge	IN2025_V05_S01_DR02_01a	Andesite	Coarse Andesitic sediment	n/a	15.0	-20.550	-175.386
14/09/25	Dredge	IN2025_V05_S01_DR02_01b	Andesite	Andesitic sediment	n/a	15.0	-20.550	-175.386
14/09/25	Dredge	IN2025_V05_S01_DR02_02	Andesite	Glassy Porphyritic Andesite	1	2.5	-20.550	-175.386
14/09/25	Dredge	IN2025_V05_S01_DR02_03	Andesite	Vesicular glassy andesite	1	1.4	-20.550	-175.386
14/09/25	Dredge	IN2025_V05_S01_DR02_04	Andesite	Weakly to moderately oxidised vesicular porphyritic andesite	2	2.4	-20.550	-175.386
14/09/25	Dredge	IN2025_V05_S01_DR02_05	Andesite	Glassy Andesite	2	4.7	-20.550	-175.386
14/09/25	Dredge	IN2025_V05_S01_DR02_06	Breccia	Altered, matrix-supported monomictic andesitic breccia	7	0.9	-20.550	-175.386
14/09/25	Dredge	IN2025_V05_S01_DR02_07	Breccia	Red Altered polymictic breccia	6	1.5	-20.550	-175.386

14/09/25	Dredge	IN2025_V05_S01_DR02_08	Andesite	Magnetic, oxidised Andesite	2	4.0	-20.550	-175.386
14/09/25	Dredge	IN2025_V05_S01_DR02_09	Andesite	Greymagentic Andesite	2	1.9	-20.550	-175.386
14/09/25	Dredge	IN2025_V05_S01_DR02_10	Andesite	Vesicular porphyritic Andesite	1	2.7	-20.550	-175.386
Dredge Site 08								
14/09/25	Dredge	IN2025_V05_S08_DR01_01	Andesite	Porphyritic Andesite with feldspar phenocrysts	1	1.5	-20.570	-175.299
14/09/25	Dredge	IN2025_V05_S08_DR01_02	Andesite	Vesicular glassy Andesite	6	0.5	-20.570	-175.299
14/09/25	Dredge	IN2025_V05_S08_DR01_03	Andesite	Vesicular glassy to aphanitic Andesite	2	3.9	-20.570	-175.299
14/09/25	Dredge	IN2025_V05_S08_DR01_04	Andesite	Glassy, weakly porphyritic Andesite	2	1.6	-20.570	-175.299
14/09/25	Dredge	IN2025_V05_S08_DR01_05	Andesite	Mixed pebble-sized angular andesite and pumice	>50	1.5	-20.570	-175.299
14/09/25	Dredge	IN2025_V05_S08_DR01_06	Andesite	Mixed andesitic gravel-sized fragments	1000	2.0	-20.570	-175.299



Caption: IN2025_V05 Dredge locations

Commented [RC1]: DR02 S01 isn't there.

Appendix D – Multicore Sediment Sample Information

Voyage	Site No	Multicore No	Activity	Core length (cm)	Lat.	Long.
Site No. 1						
IN2025_V05	01	01	Sedimentology	47.5	-20.558	-175.382
IN2025_V05	01	01	ITRAX	49	-20.558	-175.382
IN2025_V05	01	01	Volcanology	53	-20.558	-175.382
IN2025_V05	01	02	Volcanology	13	-20.535	-175.396
IN2025_V05	01	03	Volcanology	47	-20.552	-175.385
IN2025_V05	01	03	ITRAX	52	-20.552	-175.385
IN2025_V05	01	03	Sedimentology	48	-20.552	-175.385
Site No. 2						
IN2025_V05	02	01	CTs	30.5	-20.677	-175.533
IN2025_V05	02	01	Tom	30	-20.677	-175.533
IN2025_V05	02	01	Sedimentology	32.5	-20.677	-175.533
IN2025_V05	02	01	Epoxy	34.7	-20.677	-175.533
IN2025_V05	02	02	ITRAX	34	-20.702	-175.448
IN2025_V05	02	02	Volcanology	38	-20.702	-175.448
IN2025_V05	02	02	Sedimentology	37	-20.702	-175.448
IN2025_V05	02	02	Epoxy	30	-20.702	-175.448
Site No. 3						
IN2025_V05	03	01	Epoxy	35	-20.557	-175.572
IN2025_V05	03	01	Sedimentology	29	-20.557	-175.572
IN2025_V05	03	01	ITRAX	29.5	-20.557	-175.572
IN2025_V05	03	01	Volcanology	31.5	-20.557	-175.572
IN2025_V05	03	02	Epoxy	0	-20.557	-175.591
IN2025_V05	03	02	Sedimentology	0	-20.557	-175.591
IN2025_V05	03	02	ITRAX	40	-20.557	-175.591
IN2025_V05	03	02	Volcanology	30	-20.557	-175.591
IN2025_V05	03	03	Epoxy	0	-20.557	-175.600
IN2025_V05	03	03	Sedimentology	0	-20.557	-175.600
IN2025_V05	03	03	ITRAX	36	-20.557	-175.600
IN2025_V05	03	03	Volcanology	24	-20.557	-175.600
IN2025_V05	03	05	Sedimentology	26	-20.567	-175.519
IN2025_V05	03	05	ITRAX	35	-20.567	-175.519
IN2025_V05	03	05	Extra	35	-20.567	-175.519
IN2025_V05	03	05	Volcanology	28	-20.567	-175.519
IN2025_V05	03	06	ITRAX	42	-20.538	-175.507
IN2025_V05	03	06	Bonus	29	-20.538	-175.507
IN2025_V05	03	06	Volcanology	27	-20.538	-175.507
IN2025_V05	03	06	Sedimentology	28	-20.538	-175.507
Site No. 4						

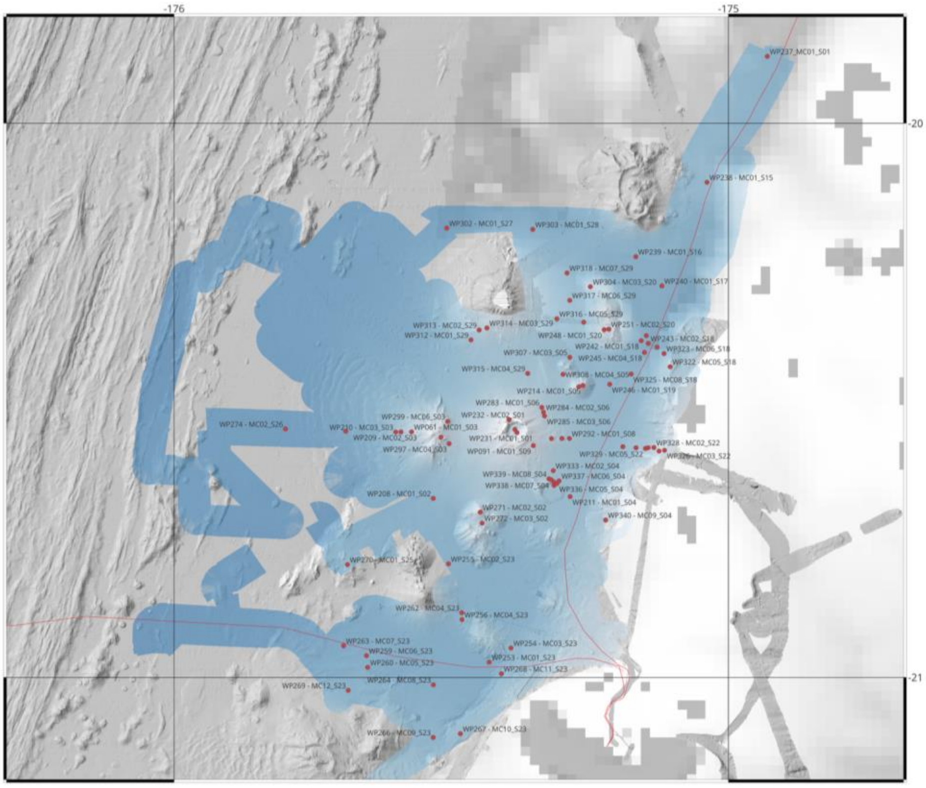
IN2025_V05	04	01	Sedimentology	57	-20.674	-175.286
IN2025_V05	04	01	ITRAX	57	-20.538	-175.507
IN2025_V05	04	01	Volcanology	57	-20.538	-175.507
IN2025_V05	04	02	Epoxy	21	-20.627	-175.316
IN2025_V05	04	02	ITRAX	23	-20.627	-175.316
IN2025_V05	04	02	Volcanology	24	-20.627	-175.316
IN2025_V05	04	02	Sedimentology	22	-20.627	-175.316
IN2025_V05	04	03	ITRAX	20	-20.648	-175.314
IN2025_V05	04	03	Sedimentology	21	-20.648	-175.314
IN2025_V05	04	03	Volcanology	17	-20.648	-175.314
IN2025_V05	04	03	Epoxy	19	-20.648	-175.314
IN2025_V05	04	05	ITRAX	38	-20.650	-175.310
IN2025_V05	04	05	Volcanology	35	-20.650	-175.310
IN2025_V05	04	05	Sedimentology	29	-20.650	-175.310
IN2025_V05	04	05	Epoxy	50	-20.650	-175.310
IN2025_V05	04	06	Volcanology	33	-20.645	-175.306
IN2025_V05	04	06	Sedimentology	37	-20.645	-175.306
IN2025_V05	04	06	ITRAX	31	-20.645	-175.306
IN2025_V05	04	06	Epoxy	33	-20.645	-175.306
IN2025_V05	04	07	ITRAX	30	-20.643	-175.319
IN2025_V05	04	07	Volcanology	31	-20.643	-175.319
IN2025_V05	04	07	Sedimentology	20	-20.643	-175.319
IN2025_V05	04	08	Epoxy	31	-20.642	-175.324
IN2025_V05	04	08	Sedimentology	28	-20.642	-175.324
IN2025_V05	04	08	ITRAX	27	-20.642	-175.324
IN2025_V05	04	08	Volcanology	30	-20.642	-175.324
Site No. 5						
IN2025_V05	05	01	ITRAX	32	-20.473	-175.262
IN2025_V05	05	01	Sedimentology	25.5	-20.473	-175.262
IN2025_V05	05	01	Volcanology	31.5	-20.473	-175.262
IN2025_V05	05	03	Sedimentology	25	-20.422	-175.286
IN2025_V05	05	03	Volcanology	22	-20.422	-175.286
IN2025_V05	05	03	ITRAX	29	-20.422	-175.286
IN2025_V05	05	04	Sedimentology	20	-20.453	-175.298
IN2025_V05	05	04	Volcanology	16	-20.453	-175.298
IN2025_V05	05	04	ITRAX	22	-20.453	-175.298
Site No. 6						
IN2025_V05	06	01	Volcanology	12	-20.521	-175.334
IN2025_V05	06	01	ITRAX	16	-20.521	-175.334
IN2025_V05	06	01	Bonus	11	-20.521	-175.334
IN2025_V05	06	01	Sedimentology	12	-20.521	-175.334
IN2025_V05	06	02	Bonus	14	-20.521	-175.334
IN2025_V05	06	02	ITRAX	20	-20.521	-175.334
IN2025_V05	06	02	Volcanology	20	-20.521	-175.334
IN2025_V05	06	02	Bonus	18	-20.521	-175.334
IN2025_V05	06	03	Sedimentology	32	-20.528	-175.332

IN2025_V05	06	03	Bonus	22	-20.528	-175.332
IN2025_V05	06	03	Volcanology	23	-20.528	-175.332
IN2025_V05	06	03	ITRAX	32	-20.528	-175.332
Site No. 8						
IN2025_V05	08	01	Epoxy	24	-20.569	-175.287
IN2025_V05	08	01	Sedimentology	25	-20.569	-175.287
IN2025_V05	08	01	Volcanology	30	-20.569	-175.287
IN2025_V05	08	02	Sedimentology	33	-20.569	-175.300
IN2025_V05	08	02	ITRAX	38	-20.569	-175.300
IN2025_V05	08	02	Volcanology	38	-20.569	-175.300
IN2025_V05	08	02	Epoxy	35.5	-20.569	-175.300
IN2025_V05	08	03	ITRAX	31	-20.569	-175.319
IN2025_V05	08	03	Sedimentology	30	-20.569	-175.319
IN2025_V05	08	03	Volcanology	26.5	-20.569	-175.319
IN2025_V05	08	03	Epoxy	24	-20.569	-175.319
Site No. 9						
IN2025_V05	09	01	Sedimentology	30	-20.580	-175.353
IN2025_V05	09	01	ITRAX	29	-20.580	-175.353
IN2025_V05	09	01	Volcanology	28	-20.580	-175.353
IN2025_V05	09	01	Extra	19	-20.580	-175.353
Site No. 14						
IN2025_V05	14	01	Sedimentology	34	-19.879	-174.930
IN2025_V05	14	01	ITRAX	34	-19.879	-174.930
IN2025_V05	14	01	Volcanology	33.5	-19.879	-174.930
Site No. 15						
IN2025_V05	15	01	Sedimentology	25	-20.107	-175.039
IN2025_V05	15	01	Epoxy	26	-20.107	-175.039
IN2025_V05	15	01	Volcanology	25	-20.107	-175.039
IN2025_V05	15	01	ITRAX	27	-20.107	-175.039
Site No. 17						
IN2025_V05	17	01	Extra	40	-20.294	-175.120
IN2025_V05	17	01	Sedimentology	29	-20.294	-175.120
IN2025_V05	17	01	ITRAX	40	-20.294	-175.120
IN2025_V05	17	01	Volcanology	46.5	-20.294	-175.120
Site No. 18						
IN2025_V05	18	04	Sedimentology	32	-20.414	-175.151
IN2025_V05	18	04	ITRAX	32	-20.414	-175.151
IN2025_V05	18	04	Volcanology	34	-20.414	-175.151
IN2025_V05	18	04	Epoxy	28	-20.414	-175.151
IN2025_V05	18	05	Volcanology	31	-20.439	-175.105
IN2025_V05	18	05	ITRAX	34	-20.439	-175.105
IN2025_V05	18	05	Bonus	31	-20.439	-175.105
IN2025_V05	18	05	Sedimentologys	28	-20.439	-175.105
IN2025_V05	18	06	ITRAX	53	-20.416	-175.116
IN2025_V05	18	06	Sedimentology	45	-20.416	-175.116
IN2025_V05	18	06	Volcanology	43	-20.416	-175.116
IN2025_V05	18	07	ITRAX	44	-20.383	-175.148
IN2025_V05	18	07	Volcanology	44	-20.383	-175.148

IN2025_V05	18	07	Epoxy	44	-20.383	-175.148
IN2025_V05	18	07	Sedimentology	42	-20.383	-175.148
IN2025_V05	18	08	Bonus	38.5	-20.453	-175.176
IN2025_V05	18	08	ITRAX	40.5	-20.453	-175.176
IN2025_V05	18	08	Volcanology	53	-20.453	-175.176
IN2025_V05	18	08	Sedimentology	29	-20.453	-175.176
Site No. 19						
IN2025_V05	19	01	ITRAX	55	-20.471	-175.214
IN2025_V05	19	01	Sedimentology	55	-20.471	-175.214
IN2025_V05	19	01	Volcanology	72	-20.471	-175.214
Site No. 20						
IN2025_V05	20	04	ITRAX	41	-20.359	-175.261
IN2025_V05	20	04	Volcanology	38	-20.359	-175.261
IN2025_V05	20	04	Sedimentology	36	-20.359	-175.261
IN2025_V05	20	04	Epoxy	33	-20.359	-175.261
Site No. 22						
IN2025_V05	22	01	Epoxy	26	-20.584	-175.191
IN2025_V05	22	01	ITRAX	30	-20.584	-175.191
IN2025_V05	22	01	Sedimentology	31	-20.584	-175.191
IN2025_V05	22	01	Volcanology	27	-20.584	-175.191
IN2025_V05	22	02	Epoxy	36	-20.585	-175.135
IN2025_V05	22	02	ITRAX	37.5	-20.585	-175.135
IN2025_V05	22	02	Sedimentology	36	-20.585	-175.135
IN2025_V05	22	02	Volcanology	34	-20.585	-175.135
IN2025_V05	22	03	ITRAX	31	-20.586	-175.167
IN2025_V05	22	03	Volcanology	32.5	-20.586	-175.167
IN2025_V05	22	03	Sedimentology	32	-20.586	-175.167
IN2025_V05	22	03	Bonus	29	-20.586	-175.167
IN2025_V05	22	04	ITRAX	33	-20.587	-175.150
IN2025_V05	22	04	Volcanology	34	-20.587	-175.150
IN2025_V05	22	04	Sedimentology	33.5	-20.587	-175.150
IN2025_V05	22	04	Extra	35	-20.587	-175.150
IN2025_V05	22	05	ITRAX	43	-20.592	-175.125
IN2025_V05	22	05	Volcanology	39	-20.592	-175.125
IN2025_V05	22	05	Sedimentology	43	-20.592	-175.125
IN2025_V05	22	05	Epoxy	38	-20.592	-175.125
IN2025_V05	22	07	ITRAX	34	-20.586	-175.145
IN2025_V05	22	07	Sedimentology	32.5	-20.586	-175.145
Site No. 23						
IN2025_V05	23	01	Sedimentology	35.5	-20.973	-175.432
IN2025_V05	23	01	Volcanology	29	-20.973	-175.432
IN2025_V05	23	01	ITRAX	47	-20.973	-175.432
IN2025_V05	23	02	Sedimentology	23	-20.795	-175.500
IN2025_V05	23	02	Volcanology	21	-20.795	-175.500
IN2025_V05	23	02	ITRAX	22	-20.795	-175.500
IN2025_V05	23	03	Sedimentology	46	-20.947	-175.392
IN2025_V05	23	03	ITRAX	40	-20.947	-175.392
IN2025_V05	23	03	Volcanology	35	-20.947	-175.392

IN2025_V05	23	04	Volcanology	31.5	-20.896	-175.481
IN2025_V05	23	04	Epoxy	34	-20.896	-175.481
IN2025_V05	23	04	ITRAX	33	-20.896	-175.481
IN2025_V05	23	04	Sedimentology	29	-20.896	-175.481
IN2025_V05	23	05	Sedimentology	37.5	-20.982	-175.651
IN2025_V05	23	05	Volcanology	39	-20.982	-175.651
IN2025_V05	23	05	ITRAX	35	-20.982	-175.651
IN2025_V05	23	06	Epoxy	29	-20.961	-175.653
IN2025_V05	23	06	ITRAX	53	-20.961	-175.653
IN2025_V05	23	06	Volcanology	53	-20.961	-175.653
IN2025_V05	23	07	Sedimentology	42.5	-20.943	-175.694
IN2025_V05	23	07	Volcanology	47	-20.943	-175.694
IN2025_V05	23	07	ITRAX	44.5	-20.943	-175.694
IN2025_V05	23	07	Extra	40	-20.943	-175.694
IN2025_V05	23	08	Sedimentology	48	-21.013	-175.532
IN2025_V05	23	08	ITRAX	43.5	-21.013	-175.532
IN2025_V05	23	11	ITRAX/Volcanology	5	-20.993	-175.410
IN2025_V05	23	12	Bonus	32	-21.023	-175.686
IN2025_V05	23	12	Sedimentology	31	-21.023	-175.686
IN2025_V05	23	12	ITRAX	30.5	-21.023	-175.686
IN2025_V05	23	12	Volcanology	30	-21.023	-175.686
Site No. 25						
IN2025_V05	25	01	Sedimentology	26.5	-20.796	-175.687
IN2025_V05	25	01	Epoxy	25	-20.796	-175.687
IN2025_V05	25	01	ITRAX	25	-20.796	-175.687
IN2025_V05	25	01	Volcanology	25.5	-20.796	-175.687
Site No. 26						
IN2025_V05	26	01	Bonus	42	-20.556	-175.690
IN2025_V05	26	01	ITRAX	42.5	-20.556	-175.690
IN2025_V05	26	01	Volcanology	39.5	-20.556	-175.690
IN2025_V05	26	01	Sedimentology	42	-20.556	-175.690
IN2025_V05	26	02	Bio/Sedimentology	40	-20.552	-175.799
IN2025_V05	26	02	ITRAX	58	-20.552	-175.799
IN2025_V05	26	02	Volcanology	49	-20.552	-175.799
Site No. 27						
IN2025_V05	27	01	ITRAX	41	-20.556	-175.690
IN2025_V05	27	01	Sedimentology	42.5	-20.556	-175.690
IN2025_V05	27	01	Volcanology	39	-20.556	-175.690
Site No. 28						
IN2025_V05	28	01	ITRAX	38	-20.191	-175.353
IN2025_V05	28	01	Sedimentology	36	-20.191	-175.353
IN2025_V05	28	01	Bonus	37.5	-20.191	-175.353
IN2025_V05	28	01	Volcanology	36	-20.191	-175.353
Site No. 29						
IN2025_V05	29	01	ITRAX	31	-20.391	-175.465
IN2025_V05	29	01	Sedimentology	28	-20.391	-175.465
IN2025_V05	29	01	Volcanology	30	-20.391	-175.465

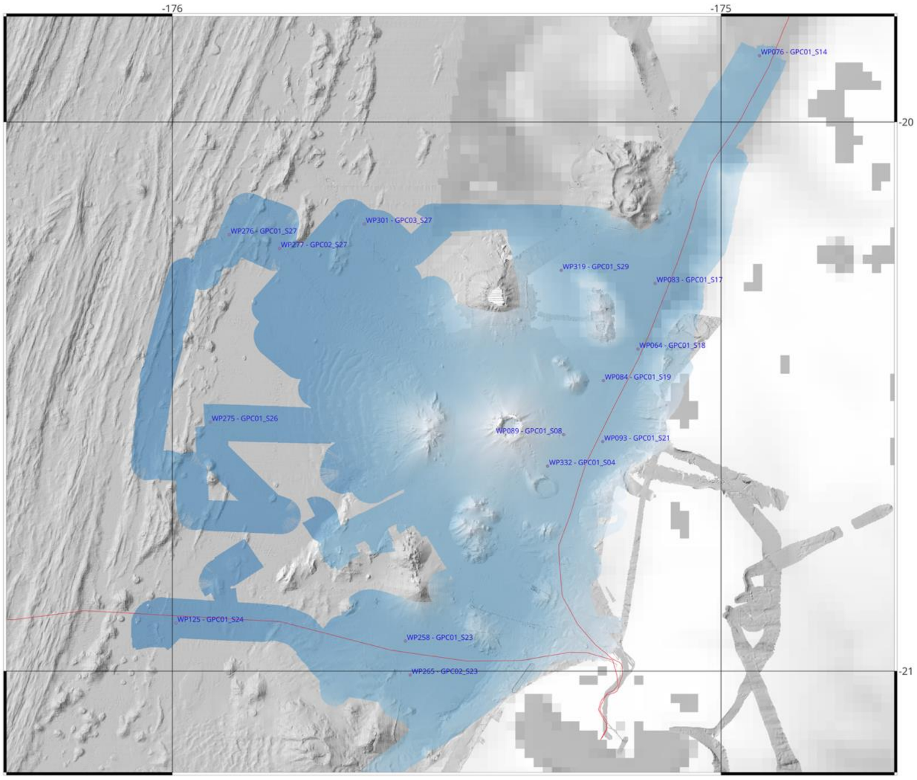
IN2025_V05	29	02	ITRAX	34	-20.373	-175.450
IN2025_V05	29	02	Sedimentology	34	-20.373	-175.450
IN2025_V05	29	02	Epoxy	36	-20.373	-175.450
IN2025_V05	29	03	Epoxy	32	-20.369	-175.436
IN2025_V05	29	03	Volcanology	27	-20.369	-175.436
IN2025_V05	29	03	Sedimentology	32	-20.369	-175.436
IN2025_V05	29	03	ITRAX	31	-20.369	-175.436
IN2025_V05	29	04	Epoxy	0	-20.451	-175.362
IN2025_V05	29	04	Volcanology	52	-20.451	-175.362
IN2025_V05	29	04	ITRAX	54.5	-20.451	-175.362
IN2025_V05	29	04	Sedimentology	43	-20.451	-175.362
IN2025_V05	29	05	Volcanology	22	-20.353	-175.309
IN2025_V05	29	05	ITRAX	22	-20.353	-175.309
IN2025_V05	29	05	Sedimentology	23	-20.353	-175.309
IN2025_V05	29	07	Sedimentology	33	-20.270	-175.291
IN2025_V05	29	07	Epoxy	35	-20.270	-175.291
IN2025_V05	29	07	Volcanology	38.5	-20.270	-175.291
IN2025_V05	29	07	ITRAX	41	-20.270	-175.291



Caption: IN2025_V05 Multicore location

Appendix E – Giant Piston Core Sample Information

Voyage	Site No	Piston Core No	Core length	Location		Water Depth (m)
				Lat.	Long.	
Successful coring sites						
IN2025_V05	04	1	200 cm	-20.626	-175.316	-1367
IN2025_V05	08	1	35 cm	-20.569	-175.287	-1374
IN2025_V05	14	1	44 cm	-19.879	-174.930	-1763
IN2025_V05	18	1	400 cm	-20.414	-175.151	-1775
IN2025_V05	19	1	300 cm	-20.471	-175.214	-1686
IN2025_V05	21	1	200 cm	-20.582	-175.216	-1621
IN2025_V05	26	1	250 cm	-20.547	-175.931	-2281
IN2025_V05	27	1	100 cm	-20.205	-175.896	-2234
IN2025_V05	27	2	532 cm	-20.230	-175.805	-2285
IN2025_V05	27	3	400 cm	-20.186	-175.649	-2187
IN2025_V05	29	1	400 cm	-20.271	-175.291	-1639
Unsuccessful coring sites						
IN2025_V05	17	1	no recovery	-20.294	-175.120	-1841
IN2025_V05	17	2	no recovery	-20.293	-175.120	-1840
IN2025_V05	23	1	no recovery	-20.945	-175.575	-1945
IN2025_V05	23	2	no recovery	-21.007	-175.567	-1886
IN2025_V05	24	1	no recovery	-20.913	-175.993	-2374



Caption: IN2025_V05 Piston core locations

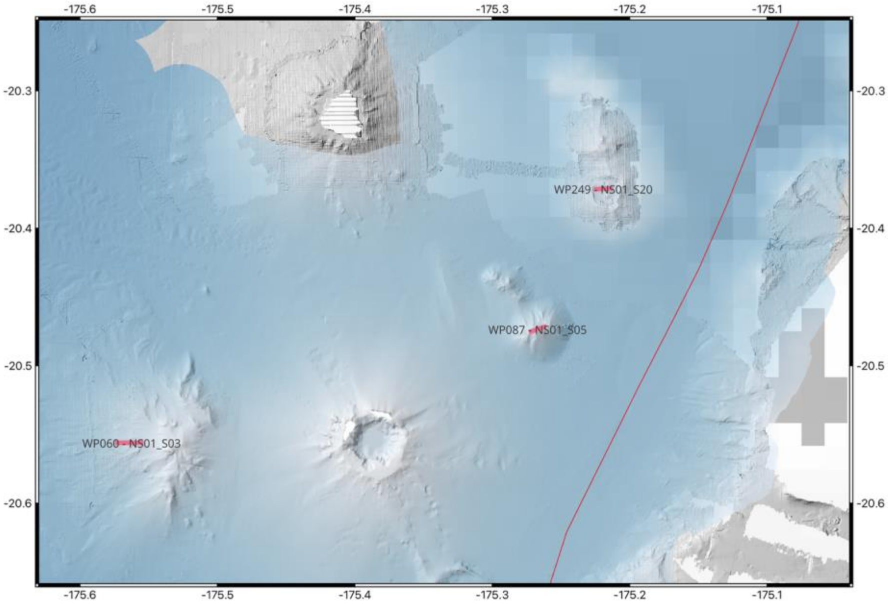
Appendix F – Sieved Multi/Piston Core Sediment Sample Information

Site	PC/MC/DR#	Sample Name
Site No. 2		
S02	MC02	IN2025_V05_S02_MC02_lithics
S02	MC02	IN2025_V05_S02_MC02_20-25cmMicropal_>4mmCoarseAshLapilli
S02	MC02	IN2025_V05_S02_MC02_Acc.Lap
Site No. 3		
S03	MC01	IN2025_V05_S03_01MC_Acc.Lapp.dry.epoxy
S03	MC01	IN2025_V05_S03_01MC_Acc.Lapp
S03	MC02	IN2025_V05_S03_MC02_clasts
S03	MC03	IN2025_V05_S03_MC03_clasts
S03	MC05	IN2025_V05_S03_MC05_clasts
S03	MC06	IN2025_V05_S03_MC06_clasts
S03		IN2025_V05_S03_ >4mm
Site No. 4		
S04	MC02	IN2025_V05_S04_MC02_ >4mm
S04	MC02	IN2025_V05_S04_MC02_1-4mm
S04	MC03	IN2025_V05_S04_MC03_1-4mm
S04	MC03	IN2025_V05_S04_MC03_big.pum.bx
S04	MC03	IN2025_V05_S04_MC03_>4mm (pumice)
S04	MC05	IN2025_V05_S04_MC05_1-4mm
S04	MC05	IN2025_V05_S04_MC05_>4mm
S04	MC06	IN2025_V05_S04_MC06_>4mm
S04	MC06	IN2025_V05_S04_MC06_1-4mm
S04	MC07	IN2025_V05_S04_MC07_Pumice Breccia
S04	MC07	IN2025_V05_S04_MC07_1-4mm (pumice)
S04	MC07	IN2025_V05_S04_MC07_>4mm (pumice)
S04	MC08	IN2025_V05_S04_MC08_>4mm
S04	MC08	IN2025_V05_S04_MC08_1-4mm
S04	MC09	IN2025_V05_S04_MC09
S04	PC01	IN2025_V05_S04_PC01
S04	PC01	IN2025_V05_S04_PC01_Disturbed top
S04	PC01	IN2025_V05_S04_PC01_Corecatcher
S04	PC01	IN2025_V05_S04_PC01_Disturbed top
Site No. 5		
S05	MC04	IN2025_V05_S05_MC04_coarse.ash
S05	MC04	IN2025_V05_S05_MC04_>8mm
Site No. 6		
S06	MC01	IN2025_V05_S06_MC01
S06	MC01	IN2025_V05_S06_MC01_coarse.ash
S06	MC01	IN2025_V05_S06_MC01_Acc. Lap
S06	MC02	IN2025_V05_S06_MC02_Acc. Lap
S06	MC02	IN2025_V05_S06_MC02
S06	MC02	IN2025_V05_S06_MC02_coarse.ash

S06	MC03	IN2025_V05_S06_MC03_>1mm
Site No. 8		
S08	DR01	IN2025_V05_S08_DR01_05
S08	DR01	IN2025_V05_S08_DR01_06
S08	MC01	IN2025_V05_S08_MC01_>1mm
S08	MC01	IN2025_V05_S08_MC01_>4mm
S08	MC02	IN2025_V05_S08_MC02_>4mm
S08	MC03	IN2025_V05_S08_MC03_>4mm
Site No. 17		
S17	PC01	IN2025_V05_S17_PC01_core.catcher.recovery
S17	PC01	IN2025_V05_S17_PC01_cc
S17	MC01	IN2025_V05_S17_MC01_0-20_ash
S17	MC01	IN2025_V05_S17_MC01_20-40_ash
S17	MC01	IN2025_V05_S17_MC01_40-60_ash
S17	MC01	IN2025_V05_S17_MC01_mixed depths_ash
Site No. 18		
S18	MC05	IN2025_V05_S18_MC05_1-4mm
S18	MC05	IN2025_V05_S18_MC05_>4mm
S18	MC06	IN2025_V05_S18_MC06
S18	MC07	IN2025_V05_S18_MC07_1-4mm
S18	MC07	IN2025_V05_S18_MC07_>4mm
Site No. 22		
S22	MC02	IN2025_V05_S22_MC02_1-4mm
S22	MC02	IN2025_V05_S22_MC02_>4mm
S22	MC03	IN2025_V05_S22_MC03_1-4mm
S22	MC03	IN2025_V05_S22_MC03_>4mm
S22	MC04	IN2025_V05_S22_MC04_1-4mm
S22	MC04	IN2025_V05_S22_MC04_>4mm
S22	MC05	IN2025_V05_S22_MC05_1-4mm
S22	MC05	IN2025_V05_S22_MC05_>4mm
Site No. 23		
S23	MC06	IN2025_V05_S23_MC06_>1mm
Site No. 29		
S29	MC01	IN2025_V05_S29_MC01_1-4mm
S29	MC01	IN2025_V05_S29_MC01_>4mm
S29	MC02	IN2025_V05_S29_MC02_1-4mm
S29	MC02	IN2025_V05_S29_MC02_>4mm
S29	MC03	IN2025_V05_S29_MC03_1-4mm
S29	MC03	IN2025_V05_S29_MC03_>4mm (Big Pumice Breccia)
S29	MC05	IN2025_V05_S29_MC05_1-4mm
S29	MC05	IN2025_V05_S29_MC05_>4mm
S29	MC07	IN2025_V05_S29_MC07_>4mm
S29	MC07	IN2025_V05_S29_MC07_Acc.Lap
S29	MC07	IN2025_V05_S29_MC07

Appendix G– NIWA sled locations

Voyage	Site	Sled	lattitude	longitude	Depth	line length (m)
IN2025_V05	Site 3	NS01	-20.557	-175.550	1090-894 mbsl	1857
IN2025_V05	Site 5	NS01	-20.475	-175.272	888 to 730 mbsl	1047
IN2025_V05	Site 20	NS01	-20.372	-175.224	890 to 741 mbsl	1046



Caption: IN2025_V05 'NIWA sled' locations

Appendix H– Biological Sample Information

Date	Sample name	Site	Phylum	Class	Order	No.	wt (g)	preservation	DNA samples
Site 3 NIWA Sled 1									
24/08/25	NS1_L1	3	Porifera	Hexactinellida		1	10	ethanol	2
24/08/25	NS1_L3	3	Cnidaria	Hydrozoa	Leptothecata	1	2	ethanol	1
24/08/25	NS1_L4	3	Cnidaria	Hydrozoa	Leptothecata	1	5	ethanol	1
24/08/25	NS1_L7	3	Annelid	Polychaeta		1	5	ethanol	1
24/08/25	NS1_L8	3	Cnidaria	Hydrozoa	Leptothecata	1	1	ethanol	1
24/08/25	NS1_L9	3	Mollusca (eggsack)			1	5	ethanol	1
24/08/25	NS1_L12	3	Mollusca	Bivalvia		1	5	ethanol	0
24/08/25	NS1_L13	3	Mollusca	Bivalvia		1	5	ethanol	0
24/08/25	NS1_L14	3	Mollusca	Gastropoda		1	3	ethanol	0
24/08/25	NS1_L2	3	Cnidaria	Octocorallia		1	15	ethanol	1
24/08/25	NS1_L5	3	Cnidaria	Octocorallia		3	5	ethanol	3
24/08/25	NS1_L6	3	Cnidaria	Anthozoa	Scleractinia	1	10	ethanol	1
24/08/25	NS1_L10	3	Cnidaria	Anthozoa	Scleractinia	1	15	bleached and dried	0
24/08/25	NS1_L11	3	Cnidaria	Anthozoa	Scleractinia	2	80	bleached and dried	2
Site 7 Dredge 01									
29/08/25	DR01_L1	7	Cnidaria	Anthozoa		5	5	ethanol	6
Site 12 Dredge 01									
29/08/25	DR01_L1	12	Cnidaria	Anthozoa	Antipatharia	1	2	ethanol	1
Site 1 Multicore 02									
30/08/25	MC02_BIO	1	Annelid	Polychaete		1	5	ethanol	0
Site 5 NIWA Sled 01									
31/08/25	NS1_L1	5	Annelid	Polychaete		2	4	ethanol	2
31/08/25	NS1_L2	5	Mollusca	Gastropoda	Nudibranchia	1	3	ethanol	1
31/08/25	NS1_L3	5	Mollusca	Pteropoda		9	4	ethanol	5
31/08/25	NS1_L4	5	Echinodermata	Echinoidea		12	3	ethanol	0
31/08/25	NS1_L5		Mollusca	Pteropoda		7	1	ethanol	0
31/08/25	NS1_L6	5	Echinoderm	Ophiuroidea		1	0.2	ethanol	1
31/08/25	NS1_L7	5	Chordate or cnidaria			1	2	ethanol	0
31/08/25	NS1_L8	5	Mollusca	Gastropoda		4	2	ethanol	0
Site 20 NIWA Sled 01									
04/09/25	NS1_L1a	20	Annelida	Polychaeta		1	2	ethanol	1
04/09/25	NS1_L3	20	Cnidaria	Anthozoa		1	2	ethanol	1
04/09/25	NS1_L5	20	Annelida	Polychaeta		5	3	ethanol	4
04/09/25	NS1_L6	20	Annelida	Polychaeta		1	1	ethanol	1

04/09/25	NS1_L7	20	Arthropoda			1	1	ethanol	0
04/09/25	NS1_L8	20	Mollusca	Gastropoda		1	2	ethanol	0
04/09/25	NS1_L13	20	Annelida	Polychaeta		1	2	ethanol	0
04/09/25	NS1_L14	20	Annelida	Polychaeta		2	1	ethanol	2
04/09/25	NS1_L2	20	Cnidaria?	Anthozoa?		1	0.5	ethanol	2
04/09/25	NS1_L9	20	Cnidaria	Anthozoa	scleractinia	1	15	bleached and dried	1
04/09/25	NS1_L10	20	Cnidaria	Anthozoa	scleractinia	1	7	bleached and dried	0
04/09/25	NS1_L11	20	Cnidaria	Anthozoa		2	1	ethanol	2
04/09/25	NS1_L12	20	Cnidaria	Anthozoa		1	6	ethanol	1
Site 2 Multicore 02									
10/09/25	MC02	2	Annelida	Polychaete		1	5	ethanol	0
Site 26 Multicore 01									
10/09/25	MC01	26	Annelida	Polychaete		1	5	ethanol	0
Site 08 Dredge 02									
14/09/25	DR02_L1	8	Cnidaria	Anthozoa		1	2	bleached and dried	0

Appendix I– Coral Sample Information

Date	Sample name	Site	Phylum	Class	Order	No.	wt (g)	preservation	DNA samples
Site 3 NIWA Sled 1									
24/08/25	NS1_L2	3	Cnidaria	Octocorallia		1	15	ethanol	1
24/08/25	NS1_L5	3	Cnidaria	Octocorallia		3	5	ethanol	3
24/08/25	NS1_L6	3	Cnidaria	Anthozoa	Scleractinia	1	10	ethanol	1
24/08/25	NS1_L10	3	Cnidaria	Anthozoa	Scleractinia	1	15	bleached and dried	None
24/08/25	NS1_L11	3	Cnidaria	Anthozoa	Scleractinia	2	80	bleached and dried	2
Site 12 Dredge 01									
29/08/25	RD01_L1	12	Cnidaria	Anthozoa	Antipatharia	1	2	ethanol	1
Site 20 NIWA Sled 01									
04/09/25	NS1_L2	20	Cnidaria	Anthozoa		1	0.5	ethanol	2
04/09/25	NS1_L9	20	Cnidaria	Anthozoa	scleractinia	1	15	bleached and dried	1
04/09/25	NS1_L10	20	Cnidaria	Anthozoa	scleractinia	1	7	bleached and dried	None
04/09/25	NS1_L11	20	Cnidaria	Anthozoa		2	1	ethanol	2
04/09/25	NS1_L12	2	Cnidaria	Anthozoa		1	6	ethanol	1
Site 08 Dredge 02									
14/09/25	DR02_L1	8	Cnidaria	Anthozoa		1	2	bleached and dried	None

Appendix J– Deep Towed Camera eDNA samples

Name	Date	time on bot	time off bot	lat on bot	long on bot	lat off bot	long off bot	filter size um	water depth start	water depth end	transect length metres	sample type
S03_DTC01_EDNA_5u	23.8.25	9:34	10:15	-20.556	-175.562	-20.557	-175.586	5	816	1331	1820	frozen -80c
S03_DTC01_EDNA_5u	23.8.25	9:34	10:15	-20.556	-175.562	-20.557	-175.586	5	816	1331	1820	frozen -80c
S03_DTC01_EDNA_45u	23.8.25	9:34	10:15	-20.556	-175.562	-20.557	-175.586	0.45	816	1331	1820	frozen -80c
S03_DTC01_EDNA_45u	23.8.25	9:34	10:15	-20.556	-175.562	-20.557	-175.586	0.45	816	1331	1820	frozen -80c
S03_DTC01_EDNA_22u	23.8.25	9:34	10:15	-20.556	-175.562	-20.557	-175.586	0.22	816	1331	1820	frozen -80c
S03_DTC01_EDNA_22u	23.8.25	9:34	10:15	-20.556	-175.562	-20.557	-175.586	0.22	816	1331	1820	frozen -80c
S03_DTC01_EDNA_22u	23.8.25	9:34	10:15	-20.556	-175.562	-20.557	-175.586	0.22	816	1331	1820	frozen -80c
S04_DTC01_EDNA_5u	25.8.25	9:50	10:10	-20.646	-175.341	-20.636	-175.340	5	1004	1187	1195	frozen -80c
S04_DTC01_EDNA_5u	25.8.25	9:50	10:10	-20.646	-175.341	-20.636	-175.340	5	1004	1187	1195	frozen -80c
S04_DTC01_EDNA_45u	25.8.25	9:50	10:10	-20.646	-175.341	-20.636	-175.340	0.45	1004	1187	1195	frozen -80c
S04_DTC01_EDNA_45u	25.8.25	9:50	10:10	-20.646	-175.341	-20.636	-175.340	0.45	1004	1187	1195	frozen -80c
S04_DTC01_EDNA_22u	25.8.25	9:50	10:10	-20.646	-175.341	-20.636	-175.340	0.22	1004	1187	1195	frozen -80c
S04_DTC01_EDNA_22u	25.8.25	9:50	10:10	-20.646	-175.341	-20.636	-175.340	0.22	1004	1187	1195	frozen -80c
S04_DTC01_EDNA_22u	25.8.25	9:50	10:10	-20.646	-175.341	-20.636	-175.340	0.22	1004	1187	1195	frozen -80c
S04_DTC02_EDNA_5u	25.8.25	13:05	14:04	-20.704	-175.297	-20.699	-175.285	5	1571	1572	1378	frozen -80c

S04_DTC02_EDNA_5u	25.8.25	13:05	14:04	-20.704	-175.297	-20.699	-175.285	5	1571	1572	1378	frozen -80c
S04_DTC02_EDNA_45u	25.8.25	13:05	14:04	-20.704	-175.297	-20.699	-175.285	0.45	1571	1572	1378	frozen -80c
S04_DTC02_EDNA_45u	25.8.25	13:05	14:04	-20.704	-175.297	-20.699	-175.285	0.45	1571	1572	1378	frozen -80c
S04_DTC02_EDNA_22u	25.8.25	13:05	14:04	-20.704	-175.297	-20.699	-175.285	0.22	1571	1572	1378	frozen -80c
S04_DTC02_EDNA_22u	25.8.25	13:05	14:04	-20.704	-175.297	-20.699	-175.285	0.22	1571	1572	1378	frozen -80c
S04_DTC02_EDNA_22u	25.8.25	13:05	14:04	-20.704	-175.297	-20.699	-175.285	0.22	1571	1572	1378	frozen -80c
S04_DTC02_EDNA_22u	25.8.25	13:05	14:04	-20.704	-175.297	-20.699	-175.285	0.22	1571	1572	1378	frozen -80c
S05_DT01_EDNA_5u	26.8.25	6:10	6:40	-20.474	-175.268	-20.470	-175.253	5	721.1	902	1654	frozen -80c
S05_DT01_EDNA_5u	26.8.25	6:10	6:40	-20.474	-175.268	-20.470	-175.253	5	721.1	902	1654	frozen -80c
S05_DTC01_EDNA_45u	26.8.25	6:10	6:40	-20.474	-175.268	-20.470	-175.253	0.45	721.1	902	1654	frozen -80c
S05_DTC01_EDNA_45u	26.8.25	6:10	6:40	-20.474	-175.268	-20.470	-175.253	0.45	721.1	902	1654	frozen -80c
S05_DTC01_EDNA_22u	26.8.25	6:10	6:40	-20.474	-175.268	-20.470	-175.253	0.22	721.1	902	1654	frozen -80c
S05_DTC01_EDNA_22u	26.8.25	6:10	6:40	-20.474	-175.268	-20.470	-175.253	0.22	721.1	902	1654	frozen -80c
S05_DTC01_EDNA_22u_ew	26.8.25	6:10	6:40	-20.474	-175.268	-20.470	-175.253	0.22	721.1	902	1654	frozen -80c
S06_DTC01_EDNA_5u	26.8.25	13:25	13:58	-20.524	-175.320	-20.518	-175.301	5	1095	1257	2017	frozen -80c
S06_DTC01_EDNA_5u	26.8.25	13:25	13:58	-20.524	-175.320	-20.518	-175.301	5	1095	1257	2017	frozen -80c
S06_DTC01_EDNA_45u	26.8.25	13:25	13:58	-20.524	-175.320	-20.518	-175.301	0.45	1095	1257	2017	frozen -80c
S06_DTC01_EDNA_45u	26.8.25	13:25	13:58	-20.524	-175.320	-20.518	-175.301	0.45	1095	1257	2017	frozen -80c
S06_DTC01_EDNA_22u	26.8.25	13:25	13:58	-20.524	-175.320	-20.518	-175.301	0.22	1095	1257	2017	frozen -80c

S06_DTC01_EDNA_22u	26.8.25	13:25	13:58	-20.524	-175.320	-20.518	-175.301	0.22	1095	1257	2017	frozen -80c
S06_DTC01_EDNA_22u_ew	26.8.25	13:25	13:58	-20.524	-175.320	-20.518	-175.301	0.22	1095	1257	2017	frozen -80c
S07_DTC01_EDNA_5u	26.8.25	16:29	17:15	-20.517	-175.421	-20.497	-175.408	5	873	1032	2520	frozen -80c
S07_DTC01_EDNA_5u	26.8.25	16:29	17:15	-20.517	-175.421	-20.497	-175.408	5	873	1032	2520	frozen -80c
S07_DTC01_EDNA_45u	26.8.25	16:29	17:15	-20.517	-175.421	-20.497	-175.408	0.45	873	1032	2520	frozen -80c
S07_DTC01_EDNA_45u	26.8.25	16:29	17:15	-20.517	-175.421	-20.497	-175.408	0.45	873	1032	2520	frozen -80c
S07_DTC01_EDNA_22u	26.8.25	16:29	17:15	-20.517	-175.421	-20.497	-175.408	0.22	873	1032	2520	frozen -80c
S07_DTC01_EDNA_22u	26.8.25	16:29	17:15	-20.517	-175.421	-20.497	-175.408	0.22	873	1032	2520	frozen -80c
S07_DTC01_EDNA_22u_ew	26.8.25	16:29	17:15	-20.517	-175.421	-20.497	-175.408	0.22	873	1032	2520	frozen -80c
S08_DTC01_EDNA_5u	27.8.25	12:08	13:50	-20.569	-175.327	-20.572	-175.259	5	1011	1439	7056	frozen -80c
S08_DTC01_EDNA_5u	27.8.25	12:08	13:50	-20.569	-175.327	-20.572	-175.259	5	1011	1439	7056	frozen -80c
S08_DTC01_EDNA_45u	27.8.25	12:08	13:50	-20.569	-175.327	-20.572	-175.259	0.45	1011	1439	7056	frozen -80c
S08_DTC01_EDNA_45u	27.8.25	12:08	13:50	-20.569	-175.327	-20.572	-175.259	0.45	1011	1439	7056	frozen -80c
S08_DTC01_EDNA_22u	27.8.25	12:08	13:50	-20.569	-175.327	-20.572	-175.259	0.22	1011	1439	7056	frozen -80c
S08_DTC01_EDNA_22u	27.8.25	12:08	13:50	-20.569	-175.327	-20.572	-175.259	0.22	1011	1439	7056	frozen -80c
S08_DTC01_EDNA_22u_ew	27.8.25	12:08	13:50	-20.569	-175.327	-20.572	-175.259	0.22	1011	1439	7056	frozen -80c
S09_DTC01_EDNA_5u	28.8.25	11:49	12:08	-20.577	-175.355	-20.585	-175.351	5	497.6	610.1	939	frozen -80c
S09_DTC01_EDNA_5u	28.8.25	11:49	12:08	-20.577	-175.355	-20.585	-175.351	5	497.6	610.1	939	frozen -80c
S09_DTC01_EDNA_45u	28.8.25	11:49	12:08	-20.577	-175.355	-20.585	-175.351	0.45	497.6	610.1	939	frozen -80c

S09_DTC01_EDNA_45u	28.8.25	11:49	12:08	-20.577	-175.355	-20.585	-175.351	0.45	497.6	610.1	939	frozen -80c
S09_DTC01_EDNA_22u	28.8.25	11:49	12:08	-20.577	-175.355	-20.585	-175.351	0.22	497.6	610.1	939	frozen -80c
S09_DTC01_EDNA_22u	28.8.25	11:49	12:08	-20.577	-175.355	-20.585	-175.351	0.22	497.6	610.1	939	frozen -80c
S09_DTC01_EDNA_22u_ew	28.8.25	11:49	12:08	-20.577	-175.355	-20.585	-175.351	0.22	497.6	610.1	939	frozen -80c
S09_DTC01_EDNA_22u_ew	28.8.25	11:49	12:08	-20.577	-175.355	-20.585	-175.351	0.22	497.6	610.1	939	frozen -80c
S10_DTC01_EDNA_5u	29.8.25	5:10	5:51	-20.476	-175.455	-20.464	-175.452	5	1464	1433	1357	frozen -80c
S10_DTC01_EDNA_5u	29.8.25	5:10	5:51	-20.476	-175.455	-20.464	-175.452	5	1464	1433	1357	frozen -80c
S10_DTC01_EDNA_45u	29.8.25	5:10	5:51	-20.476	-175.455	-20.464	-175.452	0.45	1464	1433	1357	frozen -80c
S10_DTC01_EDNA_45u	29.8.25	5:10	5:51	-20.476	-175.455	-20.464	-175.452	0.45	1464	1433	1357	frozen -80c
S10_DTC01_EDNA_22u	29.8.25	5:10	5:51	-20.476	-175.455	-20.464	-175.452	0.22	1464	1433	1357	frozen -80c
S10_DTC01_EDNA_22u	29.8.25	5:10	5:51	-20.476	-175.455	-20.464	-175.452	0.22	1464	1433	1357	frozen -80c
S10_DTC01_EDNA_22u_ew	29.8.25	5:10	5:51	-20.476	-175.455	-20.464	-175.452	0.22	1464	1433	1357	frozen -80c
S01_DTC01_EDNA_5u	29.8.25	20:28	21:31	-20.544	-175.390	-20.559	-175.381	5	663.6	836.1	1945	frozen -80c
S01_DTC01_EDNA_5u	29.8.25	20:28	21:31	-20.544	-175.390	-20.559	-175.381	5	663.6	836.1	1945	frozen -80c
S01_DTC01_EDNA_45u	29.8.25	20:28	21:31	-20.544	-175.390	-20.559	-175.381	0.45	663.6	836.1	1945	frozen -80c
S01_DTC01_EDNA_45u	29.8.25	20:28	21:31	-20.544	-175.390	-20.559	-175.381	0.45	663.6	836.1	1945	frozen -80c
S01_DTC01_EDNA_22u	29.8.25	20:28	21:31	-20.544	-175.390	-20.559	-175.381	0.22	663.6	836.1	1945	frozen -80c
S01_DTC01_EDNA_22u	29.8.25	20:28	21:31	-20.544	-175.390	-20.559	-175.381	0.22	663.6	836.1	1945	frozen -80c
S01_DTC01_EDNA_22u_ew	29.8.25	20:28	21:31	-20.544	-175.390	-20.559	-175.381	0.22	663.6	836.1	1945	frozen -80c

S01_DTC01_EDNA_22u_ew	29.8.25	20:28	21:31	-20.544	-175.390	-20.559	-175.381	0.22	663.6	836.1	1945	frozen - 80c
S03_DTC02_EDNA_5u	30.8.25	12:32	13:02	-20.558	-175.524	-20.549	-175.534	5	254.9	437.3	1485	frozen - 80c
S03_DTC02_EDNA_5u	30.8.25	12:32	13:02	-20.558	-175.524	-20.549	-175.534	5	254.9	437.3	1485	frozen - 80c
S03_DTC02_EDNA_45u	30.8.25	12:32	13:02	-20.558	-175.524	-20.549	-175.534	0.45	254.9	437.3	1485	frozen - 80c
S03_DTC02_EDNA_45u	30.8.25	12:32	13:02	-20.558	-175.524	-20.549	-175.534	0.45	254.9	437.3	1485	frozen - 80c
S03_DTC02_EDNA_22u	30.8.25	12:32	13:02	-20.558	-175.524	-20.549	-175.534	0.22	254.9	437.3	1485	frozen - 80c
S03_DTC02_EDNA_22u	30.8.25	12:32	13:02	-20.558	-175.524	-20.549	-175.534	0.22	254.9	437.3	1485	frozen - 80c
S03_DTC02_EDNA_22u_ew	30.8.25	12:32	13:02	-20.558	-175.524	-20.549	-175.534	0.22	254.9	437.3	1485	frozen - 80c
S03_DTC02_EDNA_22u_ew	30.8.25	12:32	13:02	-20.558	-175.524	-20.549	-175.534	0.22	254.9	437.3	1485	frozen - 80c
S18_DTC01_EDNA_5u	2.9.25	5:08	7:56	-20.378	-175.192	-20.398	-175.142	5	1117	1770	5723	frozen - 80c
S18_DTC01_EDNA_5u	2.9.25	5:08	7:56	-20.378	-175.192	-20.398	-175.142	5	1117	1770	5723	frozen - 80c
S18_DTC01_EDNA_45u	2.9.25	5:08	7:56	-20.378	-175.192	-20.398	-175.142	0.45	1117	1770	5723	frozen - 80c
S18_DTC01_EDNA_45u	2.9.25	5:08	7:56	-20.378	-175.192	-20.398	-175.142	0.45	1117	1770	5723	frozen - 80c
S18_DTC01_EDNA_22u	2.9.25	5:08	7:56	-20.378	-175.192	-20.398	-175.142	0.22	1117	1770	5723	frozen - 80c
S18_DTC01_EDNA_22u	2.9.25	5:08	7:56	-20.378	-175.192	-20.398	-175.142	0.22	1117	1770	5723	frozen - 80c
S18_DTC01_EDNA_22u_ew	2.9.25	5:08	7:56	-20.378	-175.192	-20.398	-175.142	0.22	1117	1770	5723	frozen - 80c
S20_DTC01_EDNA_5u	3.9.25	8:33	8:56	-20.372	-175.216	-20.372	-175.224	5	757.4	885.6	910	frozen - 80c
S20_DTC01_EDNA_5u	3.9.25	8:33	8:56	-20.372	-175.216	-20.372	-175.224	5	757.4	885.6	910	frozen - 80c
S20_DTC01_EDNA_45u	3.9.25	8:33	8:56	-20.372	-175.216	-20.372	-175.224	0.45	757.4	885.6	910	frozen - 80c

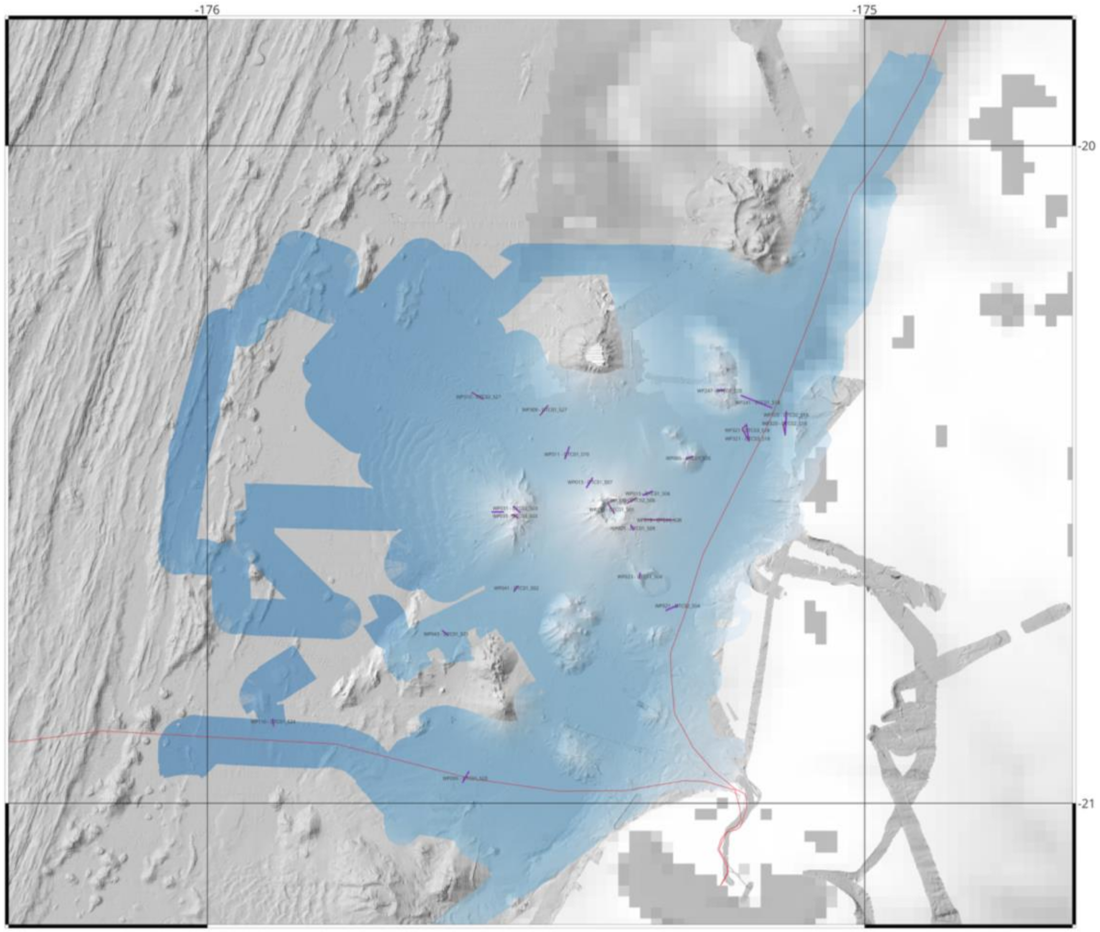
S20_DTC01_EDNA_45u	3.9.25	8:33	8:56	-20.372	-175.216	-20.372	-175.224	0.45	757.4	885.6	910	frozen - 80c
S20_DTC01_EDNA_22u	3.9.25	8:33	8:56	-20.372	-175.216	-20.372	-175.224	0.22	757.4	885.6	910	frozen - 80c
S20_DTC01_EDNA_22u	3.9.25	8:33	8:56	-20.372	-175.216	-20.372	-175.224	0.22	757.4	885.6	910	frozen - 80c
S20_DTC01_EDNA_22u_ew	3.9.25	8:33	8:56	-20.372	-175.216	-20.372	-175.224	0.22	757.4	885.6	910	frozen - 80c
S23_DTC01_EDNA_5u	7.9.25	4:54	5:44	-20.969	-175.612	-20.960	-175.610	5	1932	1939	1057	frozen - 80c
S23_DTC01_EDNA_5u	7.9.25	4:54	5:44	-20.969	-175.612	-20.960	-175.610	5	1932	1939	1057	frozen - 80c
S23_DTC01_EDNA_45u	7.9.25	4:54	5:44	-20.969	-175.612	-20.960	-175.610	0.45	1932	1939	1057	frozen - 80c
S23_DTC01_EDNA_45u	7.9.25	4:54	5:44	-20.969	-175.612	-20.960	-175.610	0.45	1932	1939	1057	frozen - 80c
S23_DTC01_EDNA_22u	7.9.25	4:54	5:44	-20.969	-175.612	-20.960	-175.610	0.22	1932	1939	1057	frozen - 80c
S23_DTC01_EDNA_22u	7.9.25	4:54	5:44	-20.969	-175.612	-20.960	-175.610	0.22	1932	1939	1057	frozen - 80c
S23_DTC01_EDNA_22u_ew	7.9.25	4:54	5:44	-20.969	-175.612	-20.960	-175.610	0.22	1932	1939	1057	frozen - 80c
S24_DTC01_EDNA_5u	9.9.25	7:37	8:21	-20.866	-175.901	-20.882	-175.900	5	2347	2362	1804	frozen - 80c
S24_DTC01_EDNA_5u	9.9.25	7:37	8:21	-20.866	-175.901	-20.882	-175.900	5	2347	2362	1804	frozen - 80c
S24_DTC01_EDNA_45u	9.9.25	7:37	8:21	-20.866	-175.901	-20.882	-175.900	0.45	2347	2362	1804	frozen - 80c
S24_DTC01_EDNA_45u	9.9.25	7:37	8:21	-20.866	-175.901	-20.882	-175.900	0.45	2347	2362	1804	frozen - 80c
S24_DTC01_EDNA_22u	9.9.25	7:37	8:21	-20.866	-175.901	-20.882	-175.900	0.22	2347	2362	1804	frozen - 80c
S24_DTC01_EDNA_22u	9.9.25	7:37	8:21	-20.866	-175.901	-20.882	-175.900	0.22	2347	2362	1804	frozen - 80c
S24_DTC01_EDNA_22u_ew	9.9.25	7:37	8:21	-20.866	-175.901	-20.882	-175.900	0.22	2347	2362	1804	frozen - 80c
S25_DTC01_EDNA_5u	9.9.25	22:44	23:16	-20.737	-175.642	-20.744	-175.634	5	1859	1833	1169	frozen - 80c

S25_DTC01_EDNA_5u	9.9.25	22:44	23:16	-20.737	-175.642	-20.744	-175.634	5	1859	1833	1169	frozen - 80c
S25_DTC01_EDNA_45u	9.9.25	22:44	23:16	-20.737	-175.642	-20.744	-175.634	0.45	1859	1833	1169	frozen - 80c
S25_DTC01_EDNA_45u	9.9.25	22:44	23:16	-20.737	-175.642	-20.744	-175.634	0.45	1859	1833	1169	frozen - 80c
S25_DTC01_EDNA_22u	9.9.25	22:44	23:16	-20.737	-175.642	-20.744	-175.634	0.22	1859	1833	1169	frozen - 80c
S25_DTC01_EDNA_22u	9.9.25	22:44	23:16	-20.737	-175.642	-20.744	-175.634	0.22	1859	1833	1169	frozen - 80c
S25_DTC01_EDNA_22u_ew	9.9.25	22:44	23:16	-20.737	-175.642	-20.744	-175.634	0.22	1859	1833	1169	frozen - 80c
S02_DTC01_EDNA_5u	10.9.25	4:58	6:24	-20.656	-175.520	-20.678	-175.533	5	1690	1760	2852	frozen - 80c
S02_DTC01_EDNA_5u	10.9.25	4:58	6:24	-20.656	-175.520	-20.678	-175.533	5	1690	1760	2852	frozen - 80c
S02_DTC01_EDNA_45u	10.9.25	4:58	6:24	-20.656	-175.520	-20.678	-175.533	0.45	1690	1760	2852	frozen - 80c
S02_DTC01_EDNA_45u	10.9.25	4:58	6:24	-20.656	-175.520	-20.678	-175.533	0.45	1690	1760	2852	frozen - 80c
S02_DTC01_EDNA_22u	10.9.25	4:58	6:24	-20.656	-175.520	-20.678	-175.533	0.22	1690	1760	2852	frozen - 80c
S02_DTC01_EDNA_22u	10.9.25	4:58	6:24	-20.656	-175.520	-20.678	-175.533	0.22	1690	1760	2852	frozen - 80c
S02_DTC01_EDNA_22u_ew	10.9.25	4:58	6:24	-20.656	-175.520	-20.678	-175.533	0.22	1690	1760	2852	frozen - 80c
S01_DROPCAM2+3_EDNA_control_5u	14.9.25	3:53	5:51	-20.559	-175.410	-20.560	-175.411	5	42.6	41.8	126	frozen - 80c
S01_DROPCAM2+3_EDNA_control_5u	14.9.25	3:53	5:51	-20.559	-175.410	-20.560	-175.411	5	42.6	41.8	126	frozen - 80c
S01_DROPCAM2+3_EDNA_control_45u	14.9.25	3:53	5:51	-20.559	-175.410	-20.560	-175.411	0.45	42.6	41.8	126	frozen - 80c
S01_DROPCAM2+3_EDNA_control_45u	14.9.25	3:53	5:51	-20.559	-175.410	-20.560	-175.411	0.45	42.6	41.8	126	frozen - 80c
S01_DROPCAM2+3_EDNA_control_22u	14.9.25	3:53	5:51	-20.559	-175.410	-20.560	-175.411	0.22	42.6	41.8	126	frozen - 80c
S01_DROPCAM2+3_EDNA_control_22u	14.9.25	3:53	5:51	-20.559	-175.410	-20.560	-175.411	0.22	42.6	41.8	126	frozen - 80c

S01_DROPCAM2+3_EDNA_control_22u_ew	14.9.25	3:53	5:51	-20.559	-175.410	-20.560	-175.411	0.22	42.6	41.8	126	frozen - 80c
S03_DTC03_EDNA_5u	14.9.25	8:16	8:45	-20.561	-175.538	-20.567	-175.527	5	207.3	433.9	1233	frozen - 80c
S03_DTC03_EDNA_5u	14.9.25	8:16	8:45	-20.561	-175.538	-20.567	-175.527	5	207.3	433.9	1233	frozen - 80c
S03_DTC03_EDNA_45u	14.9.25	8:16	8:45	-20.561	-175.538	-20.567	-175.527	0.45	207.3	433.9	1233	frozen - 80c
S03_DTC03_EDNA_45u	14.9.25	8:16	8:45	-20.561	-175.538	-20.567	-175.527	0.45	207.3	433.9	1233	frozen - 80c
S03_DTC03_EDNA_22u	14.9.25	8:16	8:45	-20.561	-175.538	-20.567	-175.527	0.22	207.3	433.9	1233	frozen - 80c
S03_DTC03_EDNA_22u	14.9.25	8:16	8:45	-20.561	-175.538	-20.567	-175.527	0.22	207.3	433.9	1233	frozen - 80c
S03_DTC03_EDNA_22u_ew	14.9.25	8:16	8:45	-20.561	-175.538	-20.567	-175.527	0.22	207.3	433.9	1233	frozen - 80c
S06_DTC02_EDNA_5u	15.9.25	0:59	1:45	-20.544	-175.361	-20.535	-175.347	5	501.5	811.1	1720	frozen - 80c
S06_DTC02_EDNA_5u	15.9.25	0:59	1:45	-20.544	-175.361	-20.535	-175.347	5	501.5	811.1	1720	frozen - 80c
S06_DTC02_EDNA_45u	15.9.25	0:59	1:45	-20.544	-175.361	-20.535	-175.347	0.45	501.5	811.1	1720	frozen - 80c
S06_DTC02_EDNA_45u	15.9.25	0:59	1:45	-20.544	-175.361	-20.535	-175.347	0.45	501.5	811.1	1720	frozen - 80c
S06_DTC02_EDNA_22u	15.9.25	0:59	1:45	-20.544	-175.361	-20.535	-175.347	0.22	501.5	811.1	1720	frozen - 80c
S06_DTC02_EDNA_22u	15.9.25	0:59	1:45	-20.544	-175.361	-20.535	-175.347	0.22	501.5	811.1	1720	frozen - 80c
S06_DTC02_EDNA_22u_ew	15.9.25	0:59	1:45	-20.544	-175.361	-20.535	-175.347	0.22	501.5	811.1	1720	frozen - 80c
S27_DTC01_EDNA_5u	17.9.25	8:50	9:23	-20.392	-175.481	-20.400	-175.492	5	1511	1619	1411	frozen - 80c
S27_DTC01_EDNA_5u	17.9.25	8:50	9:23	-20.392	-175.481	-20.400	-175.492	5	1511	1619	1411	frozen - 80c
S27_DTC01_EDNA_45u	17.9.25	8:50	9:23	-20.392	-175.481	-20.400	-175.492	0.45	1511	1619	1411	frozen - 80c
S27_DTC01_EDNA_45u	17.9.25	8:50	9:23	-20.392	-175.481	-20.400	-175.492	0.45	1511	1619	1411	frozen - 80c

S27_DTC01_EDNA_22u	17.9.25	8:50	9:23	-20.392	-175.481	-20.400	-175.492	0.22	1511	1619	1411	frozen -80c
S27_DTC01_EDNA_22u	17.9.25	8:50	9:23	-20.392	-175.481	-20.400	-175.492	0.22	1511	1619	1411	frozen -80c
S27_DTC01_EDNA_22u_ew	17.9.25	8:50	9:23	-20.392	-175.481	-20.400	-175.492	0.22	1511	1619	1411	frozen -80c
S27_DTC02_EDNA	17.9.25	11:32	12:13	-20.386	-175.581	-20.376	-175.598	na	2036	2114	2089	frozen -80c
S27_DTC03_EDNA_5u_CONTROL	17.9.25	17:56	18:45	-20.393	-175.599	-20.404	-175.579	5	2054	1935	2391	frozen -80c
S27_DTC03_EDNA_5u_CONTROL	17.9.25	17:56	18:45	-20.393	-175.599	-20.404	-175.579	5	2054	1935	2391	frozen -80c
S27_DTC03_EDNA_45u_CONTROL	17.9.25	17:56	18:45	-20.393	-175.599	-20.404	-175.579	0.45	2054	1935	2391	frozen -80c
S27_DTC03_EDNA_45u_CONTROL	17.9.25	17:56	18:45	-20.393	-175.599	-20.404	-175.579	0.45	2054	1935	2391	frozen -80c
S27_DTC03_EDNA_22u_CONTROL	17.9.25	17:56	18:45	-20.393	-175.599	-20.404	-175.579	0.22	2054	1935	2391	frozen -80c
S27_DTC03_EDNA_22u_CONTROL	17.9.25	17:56	18:45	-20.393	-175.599	-20.404	-175.579	0.22	2054	1935	2391	frozen -80c
S27_DTC03_EDNA_22u_ew_CONTROL	17.9.25	17:56	18:45	-20.393	-175.599	-20.404	-175.579	0.22	2054	1935	2391	frozen -80c
S18_DTC02_EDNA_5u	19.9.25	7:45	8:29	-20.430	-175.123	-20.407	-175.121	5	1582	1823	2663	frozen -80c
S18_DTC02_EDNA_5u	19.9.25	7:45	8:29	-20.430	-175.123	-20.407	-175.121	5	1582	1823	2663	frozen -80c
S18_DTC02_EDNA_45u	19.9.25	7:45	8:29	-20.430	-175.123	-20.407	-175.121	0.45	1582	1823	2663	frozen -80c
S18_DTC02_EDNA_45u	19.9.25	7:45	8:29	-20.430	-175.123	-20.407	-175.121	0.45	1582	1823	2663	frozen -80c
S18_DTC02_EDNA_22u	19.9.25	7:45	8:29	-20.430	-175.123	-20.407	-175.121	0.22	1582	1823	2663	frozen -80c
S18_DTC02_EDNA_22u	19.9.25	7:45	8:29	-20.430	-175.123	-20.407	-175.121	0.22	1582	1823	2663	frozen -80c
S18_DTC02_EDNA_22u_ew	19.9.25	7:45	8:29	-20.430	-175.123	-20.407	-175.121	0.22	1582	1823	2663	frozen -80c
S18_DTC03_EDNA_5u	19.9.25	11:47	13:33	-20.415	-175.171	-20.449	-175.177	5	1768	1717	3855	frozen -80c

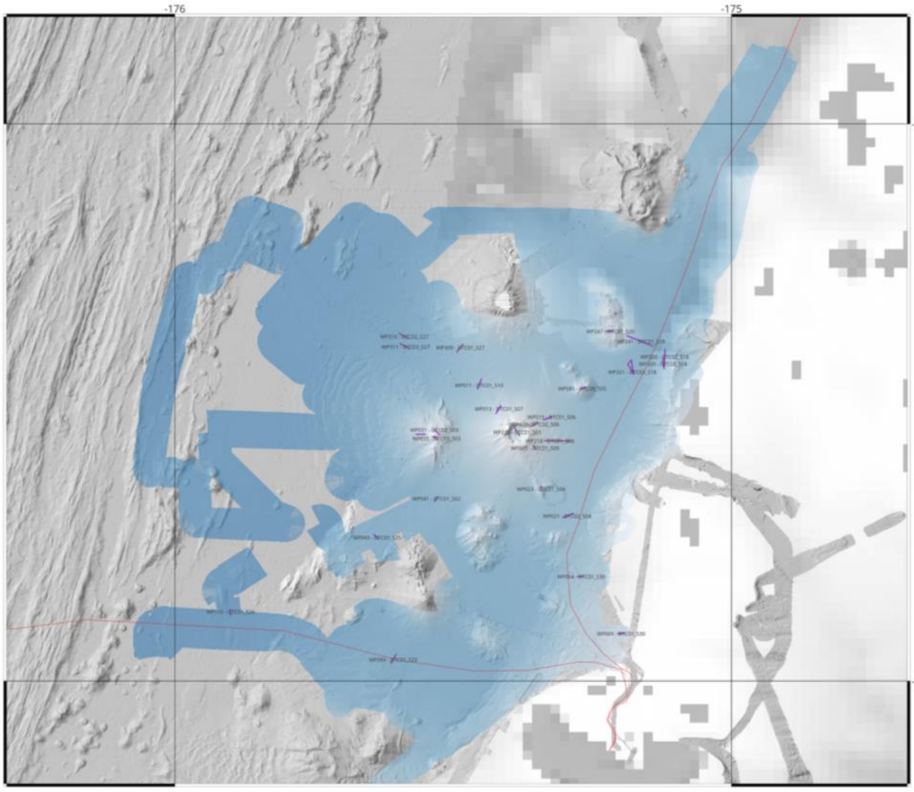
S18_DTC03_EDNA_5u	19.9.26	11:47	13:33	-20.415	-175.171	-20.449	-175.177	5	1768	1717	3855	frozen - 80c
S18_DTC03_EDNA_45u	19.9.27	11:47	13:33	-20.415	-175.171	-20.449	-175.177	0.45	1768	1717	3855	frozen - 80c
S18_DTC03_EDNA_45u	19.9.28	11:47	13:33	-20.415	-175.171	-20.449	-175.177	0.45	1768	1717	3855	frozen - 80c
S18_DTC03_EDNA_22u	19.9.29	11:47	13:33	-20.415	-175.171	-20.449	-175.177	0.22	1768	1717	3855	frozen - 80c
S18_DTC03_EDNA_22u	19.9.30	11:47	13:33	-20.415	-175.171	-20.449	-175.177	0.22	1768	1717	3855	frozen - 80c
S18_DTC03_EDNA_22u_ew	19.9.31	11:47	13:33	-20.415	-175.171	-20.449	-175.177	0.22	1768	1717	3855	frozen - 80c



Caption: IN2025_V05 Deep-Towed camera eDNA sample locations

Appendix K– Deep Towed Camera locations

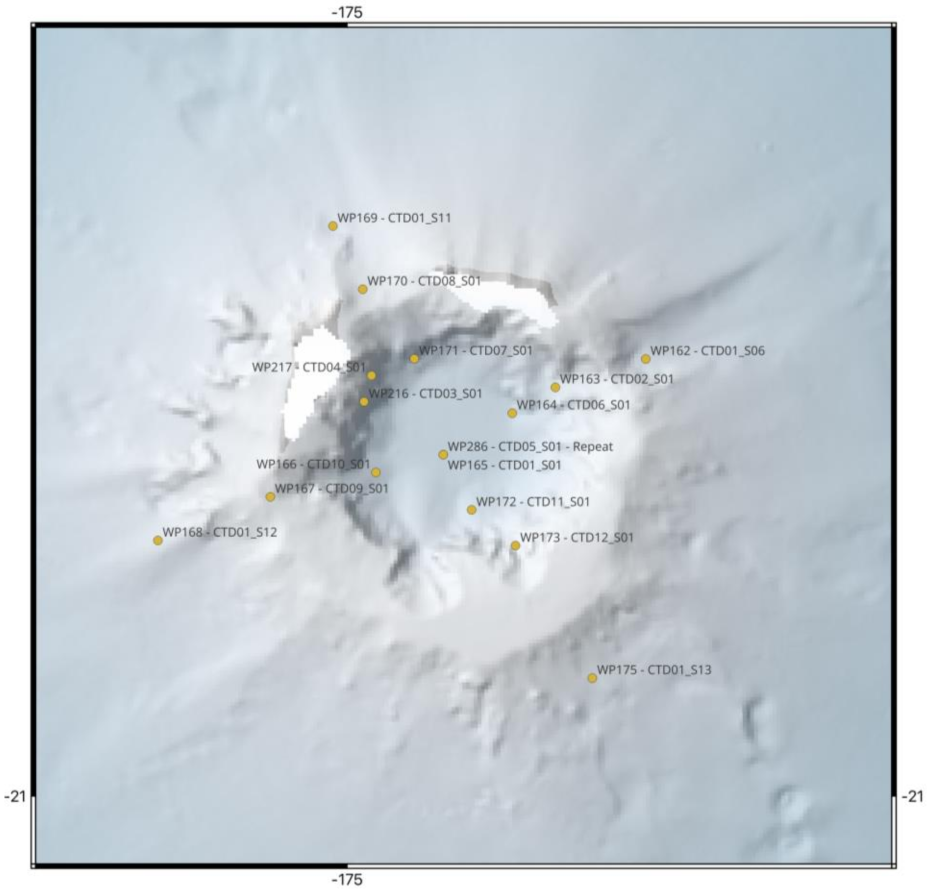
Science Number	Date	Time (UTC)	On Bottom Latitude	On Bottom Longitude	Depth (m) m	Off Bottom Latitude	Off Bottom Longitude	Depth Off m	time
IN2025_V05_S01_DTC01	29-08-2025	20:28–21:31	-20.54371	-175.390181	663.6	-20.558825	-175.380774	836.1	01:03:56
IN2025_V05_S02_DTC01	10-09-2025	05:35–06:24	-20.67184	-175.528703	1783.9	-20.693603	-175.543073	1725.1	00:49:29
IN2025_V05_S03_DTC01	23-08-2025	09:23–10:17	-20.55692	-175.556177	807	-20.556521	-175.587327	1101	00:54:04
IN2025_V05_S03_DTC02	30-08-2025	12:32–13:02	-20.55769	-175.523571	254.9	-20.54868	-175.534093	437.3	00:30:46
IN2025_V05_S03_DTC03	14-09-2025	08:16–08:45	-20.56145	-175.535402	191.2	-20.568697	-175.52739	499.9	00:28:39
IN2025_V05_S04_DTC01	25-08-2025	09:50–10:10	-20.64647	-175.341038	1004	-20.635738	-175.339864	1187	00:19:55
IN2025_V05_S04_DTC02	25-08-2025	13:05–14:04	-20.70421	-175.296756	1568	-20.698788	-175.284846	1576	01:01:45
IN2025_V05_S05_DTC01	26-08-2025	06:10–06:40	-20.47435	-175.267647	721.1	-20.469829	-175.252518	902	00:29:37
IN2025_V05_S06_DTC01	26-08-2025	13:25–13:58	-20.52415	-175.319649	1095	-20.51831	-175.301315	1249	00:32:31
IN2025_V05_S06_DTC02	15-09-2025	10:36–11:24	-20.5052	-175.299875	1530	-20.509384	-175.278681	1406	00:48:23
IN2025_V05_S07_DTC01	26-08-2025	16:29–17:15	-20.51674	-175.421269	873	-20.497499	-175.408495	1030	00:45:51
IN2025_V05_S08_DTC01	27-08-2025	12:08–13:50	-20.56903	-175.326797	1011	-20.569159	-175.277376	1439	01:41:51
IN2025_V05_S09_DTC01	28-08-2025	11:49–12:08	-20.58167	-175.353094	565	-20.591001	-175.347915	818.2	00:19:13
IN2025_V05_S10_DTC01	29-08-2025	05:10–05:51	-20.47556	-175.455484	1464	-20.463885	-175.45167	1433	00:41:12
IN2025_V05_S18_DTC01	02-09-2025	05:08–07:56	-20.38012	-175.187821	1201	-20.405859	-175.128112	1781.9	02:47:21
IN2025_V05_S18_DTC02	19-09-2025	07:45–08:29	-20.43045	-175.122789	1582	-20.40657	-175.120912	1823	00:43:59
IN2025_V05_S18_DTC03	19-09-2025	11:47–13:33	-20.41503	-175.171209	1768	-20.44931	-175.176751	1717	01:46:00
IN2025_V05_S20_DTC01	03-09-2025	08:33–08:56	-20.37222	-175.221825	886	-20.373523	-175.232337	912.5	00:22:25
IN2025_V05_S23_DTC01	07-09-2025	04:54–05:44	-20.95176	-175.602482	1932.4	-20.928114	-175.592348	1939.4	00:50:37
IN2025_V05_S24_DTC01	09-09-2025	07:37–08:21	-20.88332	-175.899476	2361.5	-20.904534	-175.898017	2345.7	00:44:19
IN2025_V05_S25_DTC01	09-09-2025	22:44–23:16	-20.73715	-175.641932	1859	-20.744217	-175.633603	1833	00:32:14
IN2025_V05_S27_DTC01	17-09-2025	06:00–09:05	-20.39248	-175.481477	-1527.2	-20.40987	-175.493823	1666.4	03:00:00
IN2025_V05_S27_DTC02	18-09-2025	11:32–12:13	-20.38559	-175.581334	2036	-20.375734	-175.598389	2114	00:41:00
IN2025_V05_S27_DTC03	17-09-2025	17:56–18:45	-20.39337	-175.598546	2054	-20.40449	-175.578899	1935	00:49:00
IN2025_V05_S30_DTC01	21-09-2025	17:11–17:51	-20.81217	-175.282	1456	-20.811846	-175.266832	1399	00:40:00
IN2025_V05_S31_DTC01	21-09-2025	20:34–21:02	-20.91498	-175.212103	795	-20.926939	-175.179061	451	00:28:00



Caption: IN2025_V05 Deep-Towed Camera operations

Appendix L– CTD hydrochemistry, eDNA, MAPR, Sediment Filters

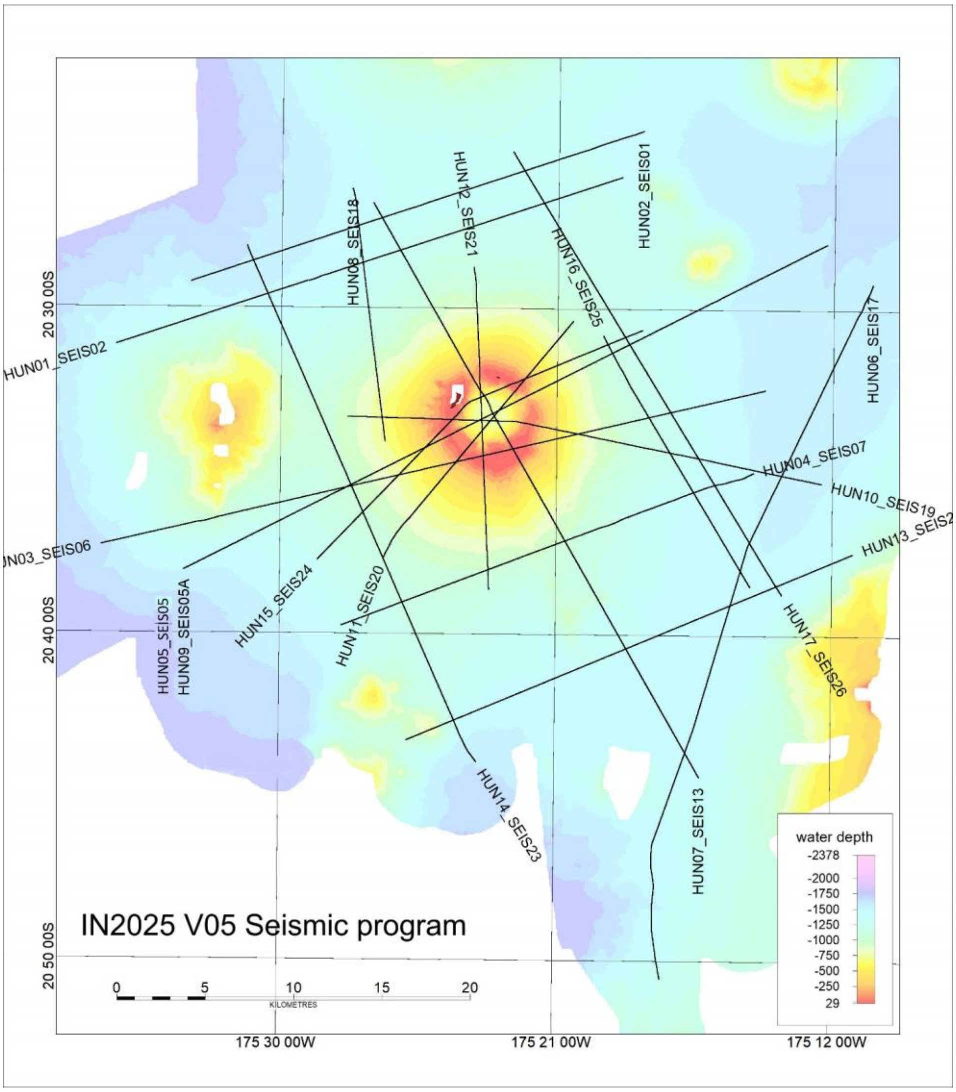
Voyage	Site No	Cast Name	Location (Degrees)		Water Depth (m)	Date	Hydro chemistry	eDNA	MAPR	Sediment Filter
			Lat (Deg N)	Long (Deg E)						
IN2025_V05	1	CTD01	-20.555	-175.388	837	21/8/25	yes	yes	no	no
IN2025_V05	1	CTD02	-20.547	-175.373	5256	26/8/25	yes	no	yes	yes
IN2025_V05	1	CTD03	-20.549	-175.397	511	27/8/25	no	no	yes	no
IN2025_V05	9	CTD01	-20.583	-175.350	608	28/8/25	yes	yes	yes	yes
IN2025_V05	7	CTD01	-20.515	-175.430	1050	29/8/25	yes	yes	yes	no
IN2025_V05	11	CTD01	-20.526	-175.401	537	29/8/25	yes	no	yes	yes
IN2025_V05	12	CTD01	-20.566	-175.424	439	29/8/25	yes	no	yes	no
IN2025_V05	13	CTD01	-20.584	-175.368	416	29/8/25	yes	no	yes	no
IN2025_V05	6	CTD01	-20.544	-175.362	495	29/8/25	yes	no	yes	yes
IN2025_V05	1	CTD04	-20.545	-175.396	489	30/8/25	yes	yes	yes	yes
IN2025_V05	2	CTD01	-20.677	-175.532	1745	30/8/25	yes	yes	yes	yes
IN2025_V05	24	CTD01	-20.954	-176.034	2314	08/9/25	yes	yes	yes	no
IN2025_V05	24	CTD02	-20.878	-175.898	2356	09/9/25	no	yes	yes	no
IN2025_V05	25	CTD01	-20.737	-175.638	1844	10/9/25	yes	yes	yes	no
IN2025_V05	1	CTD05	-20.556	-175.387	840	12/9/25	yes	no	yes	yes
IN2025_V05	1	CTD06	–20.550	–175.378	840	13/925	yes	no	yes	no
IN2025_V05	1	CTD07	-20.543	-175.391	690	13/9/225	yes	no	yes	yes
IN2025_V05	1	CTD08	-20.534	-175.398	254	09/13/25	yes	no	yes	no
IN2025_V05	1	CTD09	-20.561	-175.409	55	13/9/25	yes	no	yes	no
IN2025_V05	1	CTD10	-20.558	-175.396	730	13/9/25	yes	no	yes	no
IN2025_V05	1	CTD11	-20.563	-175.383	694	13/9/25	yes	no	yes	no
IN2025_V05	1	CTD12	-20.567	-175.378	316	13/9/25	yes	no	yes	no



Caption: IN2025_V05 CTD locations

Appendix M– Seismic

Day#	Local date	Seq	Line name	line km	nm	Shot spacing	Record length	water depth	ground speed	strmr depth	Dir
1	22/8/2025	1	SEIS02	26.3	14.2	6.25	2.5	~1500	4-4.3	4-5	71
1	22/8/2025	2	SEIS01	27.4	14.8	12.5	5	~1500	4.3	5	251
2	23/8/2025	3	SEIS06A	35.2	19	6.25	2.4	40-1700	3.8-4.2	5	77
2	23/8/2025	4	SEIS07	25.5	13.8	6.25	2.4	1000-1500	3.6-4	5-5.5	249
3	25/8/2025	5	SEIS05	37.5	20.2	12.5	5	85-1500	4.2	5-5.5	63
3	25/8/2025	6	SEIS17	41.1	22.2	12.5	5	1680	4.2	5	205/196
4	26/8/2025	7	SEIS13	33.9	18.3	12.5	5	40-1500	4.2	5	330
4	26/8/2025	8	SEIS18	14.4	7.79	12.5	5	1500	4.2	5	172
4	26/8/2025	9	SEIS05A	8.95	4.83	12.5	4.5	85-1500	4	5	63
5	28/8/2025	10	SEIS19	23.8	12.8	6.25	2.4	35-1600	4.2	6	281 / 271
5	28/8/2025	11	SEIS20	15.6	8.43	12.5	4.5	30-1200	4.2-4.8	6	39
5	28/8/2025	12	SEIS21	16.6	8.97	12.5	4.5	40-1200	4.3-4.5	6	177
6	29/8/2025	13	SEIS22	24.2	13.1	12.5	4.5	900-1500	4.4	5	247
6	29/8/2025	14	SEIS23	31	16.7	12.5	4.5	1100-1700	4.5	5	336
7	31/8/2025	15	SEIS24	19.3	10.4	12.5	4.5	1200-35	4.4	5	44 / 67
7	31/8/2025	16	SEIS25	13.3	7.19	12.5	4.5	1200-1600	4.5	5	149
7	31/8/2025	17	SEIS26	29.4	15.9	12.5	4.5	1600	4.5	5	328

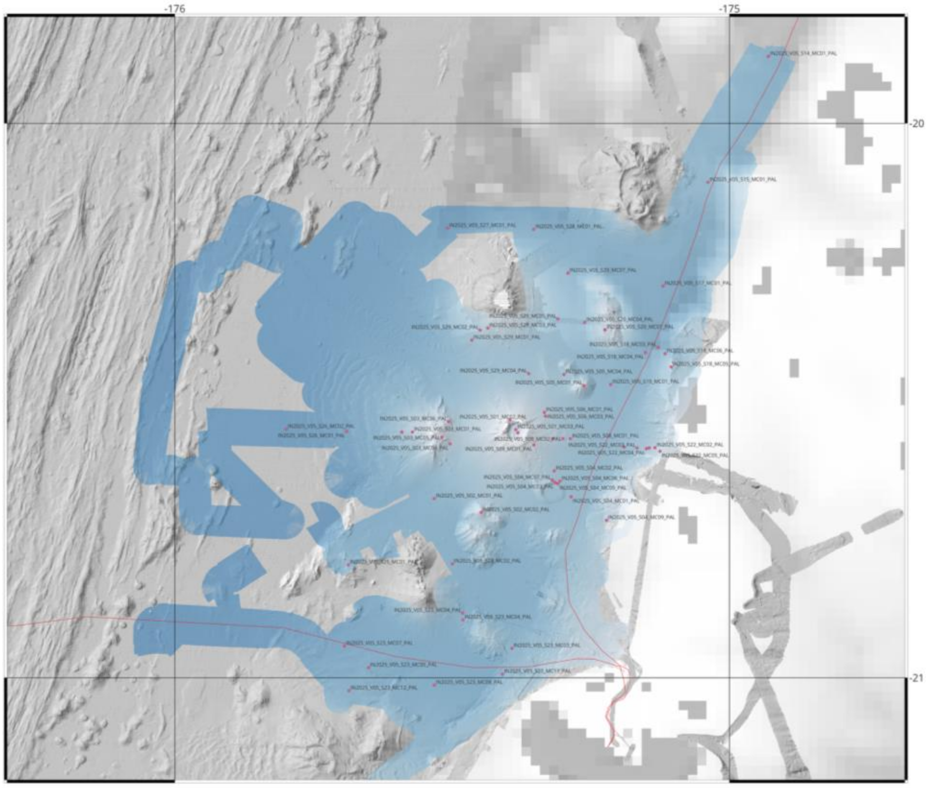


Caption: IN2025_V05 Seismic Operations

Appendix N– Micropaleontology Samples

Sample name	Latitude	Longitude
IN2025_V05_S02_MC01_PAL	-20.67700	-175.53250
IN2025_V05_S03_MC01_PAL	-20.55690	-175.57166
IN2025_V05_S03_MC02_PAL	-20.55705	-175.59080
IN2025_V05_S03_MC03_PAL	-20.55705	-175.59080
IN2025_V05_S05_MC01_PAL	-20.47300	-175.26247
IN2025_V05_S09_MC01_PAL	-20.58002	-175.35283
IN2025_V05_S01_MC01_PAL	-20.55826	-175.38151
IN2025_V05_S01_MC02_PAL	-20.53484	-175.39576
IN2025_V05_S01_MC03_PAL	-20.55235	-175.38524
IN2025_V05_S14_MC01_PAL	-19.87922	-174.92988
IN2025_V05_S15_MC01_PAL	-20.10651	-175.03872
IN2025_V05_S17_MC01_PAL	-20.29352	-175.12003
IN2025_V05_S18_MC03_PAL	-20.40416	-175.12873
IN2025_V05_S18_MC04_PAL	-20.41358	-175.15145
IN2025_V05_S19_MC01_PAL	-20.47106	-175.21424
IN2025_V05_S20_MC01_PAL	-20.37249	-175.22409
IN2025_V05_S22_MC01_PAL	-20.58364	-175.19050
IN2025_V05_S04_MC01_PAL	-20.67379	-175.28563
IN2025_V05_S23_MC02_PAL	-20.79452	-175.49952
IN2025_V05_S23_MC03_PAL	-20.94703	-175.39231
IN2025_V05_S23_MC04_PAL	-20.89575	-175.48062
IN2025_V05_S23_MC04_PAL	-20.88344	-175.48111
IN2025_V05_S23_MC05_PAL	-20.98187	-175.65085
IN2025_V05_S23_MC07_PAL	-20.94290	-175.69435
IN2025_V05_S23_MC08_PAL	-21.01339	-175.53232
IN2025_V05_S23_MC11_PAL	-20.99335	-175.40962
IN2025_V05_S23_MC12_PAL	-21.02347	-175.68594
IN2025_V05_S25_MC01_PAL	-20.79643	-175.68731
IN2025_V05_S02_MC02_PAL	-20.70187	-175.44779
IN2025_V05_S26_MC01_PAL	-20.55575	-175.69033
IN2025_V05_S26_MC02_PAL	-20.55167	-175.79911
IN2025_V05_S06_MC01_PAL	-20.52131	-175.33366
IN2025_V05_S06_MC02_PAL	-20.52131	-175.33366
IN2025_V05_S06_MC03_PAL	-20.52820	-175.33179
IN2025_V05_S08_MC01_PAL	-20.56883	-175.28699
IN2025_V05_S08_MC02_PAL	-20.56878	-175.30039
IN2025_V05_S08_MC03_PAL	-20.56900	-175.31920
IN2025_V05_S03_MC04_PAL	-20.57821	-175.50387
IN2025_V05_S03_MC05_PAL	-20.56654	-175.51868
IN2025_V05_S03_MC06_PAL	-20.53813	-175.50660
IN2025_V05_S27_MC01_PAL	-20.18929	-175.50820
IN2025_V05_S28_MC01_PAL	-20.19149	-175.35297
IN2025_V05_S20_MC04_PAL	-20.35903	-175.26104
IN2025_V05_S05_MC04_PAL	-20.45305	-175.29846
IN2025_V05_S29_MC01_PAL	-20.39091	-175.46453

IN2025_V05_S29_MC02_PAL	-20.37314	-175.44968
IN2025_V05_S29_MC03_PAL	-20.36940	-175.43566
IN2025_V05_S29_MC04_PAL	-20.45149	-175.36210
IN2025_V05_S29_MC05_PAL	-20.35279	-175.30941
IN2025_V05_S29_MC07_PAL	-20.27019	-175.29122
IN2025_V05_S18_MC05_PAL	-20.43938	-175.10525
IN2025_V05_S18_MC06_PAL	-20.41552	-175.11615
IN2025_V05_S22_MC02_PAL	-20.58517	-175.13451
IN2025_V05_S22_MC03_PAL	-20.58565	-175.16670
IN2025_V05_S22_MC04_PAL	-20.58687	-175.14974
IN2025_V05_S22_MC05_PAL	-20.59162	-175.12524
IN2025_V05_S22_MC07_PAL	-20.58552	-175.14474
IN2025_V05_S04_MC02_PAL	-20.62691	-175.31605
IN2025_V05_S04_MC03_PAL	-20.64785	-175.31443
IN2025_V05_S04_MC05_PAL	-20.65008	-175.30950
IN2025_V05_S04_MC06_PAL	-20.64540	-175.30552
IN2025_V05_S04_MC07_PAL	-20.64348	-175.31944
IN2025_V05_S04_MC09_PAL	-20.71607	-175.22163



Caption: IN2025_V05 Micropaleontology sample locations