

Te Puna Pātiotio Antarctic Research Centre Annual Review 2025



VICTORIA UNIVERSITY OF
WELLINGTON
TE HERENGA WAKA

Te Puna Pātiotio
Antarctic
Research Centre

Improving understanding of Antarctic climate and ice sheet processes, and their impact on New Zealand and the Earth system



Iceberg, Adelaide Island, Antarctic Peninsula. February 2008
Photo by Nick Gолledge

Contents

Highlights	4
Director's Summary	6
Research Outcomes	8
Science Drilling Office	20
Significant Events	26
Teaching & Supervision	34
Financial Summary	36
Publications & Presentations	38
Media	42
Our People	44

Design and edit by Anna Bowron.

Cover image by Anthony Powell/Antarctica New Zealand
Scott Base, Antarctica, with Mt Erebus in the distance.



Research

228 m of sediment

recovered from drilling beneath Crary Ice Rise that will transform understanding of West Antarctic Ice Sheet sensitivity to future warming (page 25)

Meltwater emerging from under West Antarctica

is directly observed flowing into the cavity beneath the Ross Ice Shelf providing new insight into subglacial controls on modern ice-sheet dynamics (page 10)

Surface melting on East Antarctica

and widespread ice loss occurred during the Miocene when atmospheric CO₂ concentrations were ~500 ppm (page 11)

Global importance of Antarctic coastal polynyas

is highlighted in a major review in *Nature Reviews Earth & Environment* by our National Modelling Hub team (page 12)



Funding

Tiaki Moana

Prof. Nancy Bertler is lead PI of the seven-year \$11m project for the Antarctic Science Platform to understand how climate change will influence the function, environment and ecosystems of Antarctica's oceans (page 17)

Modelling Capability and Development Hoe

A \$1.7m grant led by Prof. Nick Golledge awarded by the Antarctic Science Platform to undertake research and development work for new modelling capability in New Zealand to understand future climate impacts (page 17)

External research income

A total of \$9.7m research revenue for 2025 to support high impact science led by the ARC (page 36)

Marsden Fund

\$940k awarded to Dr Shaun Eaves to investigate how changes in Atlantic ocean circulation could impact climate in Aotearoa (page 13)



Awards

2025 Eureka Prize for Excellence in Interdisciplinary Scientific Research

Awarded by the Australian Museum to Prof. Nick Golledge and Prof. Tim Naish as members of the Octopus and Ice Sheet team (page 31)

Arnold Heine Award

PhD candidate Aylin de Campo was awarded funds to attend EGU26 in Austria (page 31)

Endowed Development Funding

Two ARC PhD candidates were awarded funding to support their Antarctic studies and research (page 35)

S.T. Lee Travel Award

Early career researchers Dr Jacqui Stuart and Dr Peter Siew were awarded funding to collaborate with scientists at the International Arctic Research Center (IARC) of the University of Alaska Fairbanks (page 35)



Engagement

43 publications

in 2025 with ARC staff and student authorship (pages 38-40)

34 talks

given to scientists, politicians, stakeholders, schools and community groups by ARC staff and students (pages 40-41)

32 media interviews

given by ARC staff and students on Antarctic and climate related issues (pages 42-43)

Mighty Indeed

ARC's AProf. Natalie Robinson and Dr Jacqui Stuart star alongside Otago University's Prof. Pat Langhorne in the award-winning documentary directed by Vanessa Wells, following three generations of women studying Antarctic sea ice change (page 28-29)

Director's Summary



Professor Rob McKay, Director
Te Puna Pātioio - Antarctic Research Centre

For the Antarctic Research Centre, 2025 was a year in which persistence, self-reflection, technical capability, industry, and international partnerships came together in a way that will define us for decades to come. After several difficult drilling seasons, disrupted plans, and the hard lessons that inevitably accompany ambitious research in Antarctica, the success of SWAIS2C at Crary Ice Rise was a moment of enormous significance for us — not only because the drilling succeeded, but because, to my mind, it exemplified best practice in responding to setbacks.

SWAIS2C has always represented the best of what the ARC and the wider Antarctic research community in New Zealand exist to do: recover hard-won archives of past climate change from the most challenging environments on Earth and use them to understand how Antarctica's ice sheets may respond to future warming. This year, the team successfully recovered a 228 m geological core from beneath Crary Ice Rise, deep in the interior of West Antarctica. This success was the culmination of many years of preparation, setbacks, redesign, logistical commitment, and international collaboration involving the ARC, Earth Sciences New Zealand, Webster Drilling and Exploration, Antarctica New Zealand, the United States Antarctic Program, and many other partners. The drilling

team achieved 96% recovery through a diverse range of lithologies and exceeded its target depth of 200 m. The result was a unique geological archive that promises new insights into the sensitivity of the West Antarctic Ice Sheet during past warm periods. And, as a not so humble brag, it also surpassed the previous record for drilling beneath a grounded ice sheet by more than 200 m.

Importantly, while earlier SWAIS2C seasons did not achieve all of their original deep-drilling objectives, publications from 2025 highlight that they were nonetheless highly successful scientifically. The direct-access drilling, oceanographic observations, geophysical investigations, and short-core sediment sampling undertaken at the Kamb Ice Stream site delivered unique datasets that continue to generate important discoveries.

Findings published this year from work done in the seasons preceding SWAIS2C drilling provided the first direct observations of subglacial water emerging from beneath the West Antarctic Ice Sheet into the cavity beneath the Ross Ice Shelf. The study revealed how episodic water flow shapes grounding-zone environments, while also showing that the region has experienced larger meltwater outflow events that may have affected

subglacial hydrology and, consequently, the dynamics of the inland ice sheet. This work also demonstrates the scientific value of the field infrastructure and observations developed through SWAIS2C. Such papers reinforce an important lesson from Antarctic research: success is not measured solely by metres of core recovered. Every season contributes new knowledge, technical capability, and experience that strengthen our future research in Antarctica.

Beyond SWAIS2C, 2025 was a year of remarkable breadth and impact across the ARC. The Antarctic Sea-Ice Switch (ASIS) programme moved into full operation, delivering advances in sea-ice observations, ocean monitoring, climate modelling, and international science-policy engagement. Researchers expanded the Ross Sea observing network, developed new sea-ice drilling and buoy technologies, and contributed expertise to international assessments of Antarctic sea-ice change. At the same time, the ARC-led Our Changing Coast programme continued to develop new tools to support coastal hazard assessment and long-term adaptation planning for communities around Aotearoa New Zealand.

The year also saw a series of significant scientific achievements. The team from the National Modelling

Hub published a major review in *Nature Reviews Earth & Environment* highlighting the critical role of Antarctic coastal polynyas in the global climate system. Research led by our broader team continued to advance understanding of past Antarctic warmth, ice-sheet collapse thresholds, and the long-term consequences of elevated atmospheric CO₂ concentrations.

Equally important is the growing diversity of people, ideas, and approaches that now underpin our research. New staff appointments strengthened our expertise in sea-ice modelling and polar ecology, while programmes such as Girls* on Ice Aotearoa NZ continued to inspire the next generation of scientists and leaders. Our collaborations integrating Mātauranga Māori and Antarctic science made important progress, reflecting our commitment to developing distinctively Aotearoa approaches to understanding environmental change in Antarctica.

I thank everyone who has contributed to our work in 2025, both within the ARC and among our partners, and I particularly look forward to the discoveries that will continue to emerge from the hard-won datasets collected this year.



Clockwise from top left: The Crary Ice Rise cores accompany the team back to Scott Base; Huw Horgan (SWAIS2C Co-Chief Scientist) with driller Jason Wilderink; the 29 members of the SWAIS2C on-ice team; Huw Horgan and Jim Marschalek (Imperial College London) examine the core. Photos by Ana Tovey / SWAIS2C.



RESEARCH OUTCOMES

Our Research Approach

Rationale

We are rapidly heading towards a climate that is 2-4°C warmer than present. Ice sheets and oceans take centuries to millennia to fully adjust to climate forcing, and the fundamental changes that we are observing today may be irreversible on human timescales. In order to provide reliable, policy-relevant projections of future climate and sea level, scientists are increasingly relying on computer models. Our Centre has undergone a numerical revolution over the last few decades, and around half of our staff now routinely carry out physics-based computer simulations of past, present and future climate.

We develop confidence in future climate projections if models show skill at simulating present and past climate. Because direct climate and ice sheet observations span the last century at best, reconstructions of past climate conditions provide the only means to assess climate and ice sheet models on their relevant timescales. Furthermore, past climate observations provide insight into the long term “endgame” (equilibrium response), that we will commit our planet to this century based on current warming scenarios. Past climate records also provide insight into the rates and magnitudes of climate and ice sheet changes that may be possible in the near future,

and allow the fingerprint of human influences to be identified in the context of natural variability in the climate system.

Outcome-based research

Our research approach is policy-relevant and outcome focused. We aim to improve forecasts of future climate change including their global and New Zealand impacts, for the benefit of humanity. By reducing the uncertainties around future climate and sea-level rise predictions, our cutting-edge research is informing the International Panel on Climate Change (IPCC). Improved understanding of climate change impacts including sea-level rise impacts in the Pacific region provide tangible benefits to all New Zealanders. Our research is leveraged by strong national and international collaborations and partnerships, and world-leading in-house polar drilling technology provided by the Science Drilling Office. We are funded and supported through a range of MBIE, Marsden, and Rutherford programmes, Antarctica New Zealand and private donations.

In summary, our approach involves:

a. Improving our physical understanding and observation of modern climate, ocean, glacier and ice sheet systems.

b. Acquiring past observations of surface temperature, precipitation, atmospheric composition (greenhouse gases and aerosols), ice sheet, glacier, and sea-ice variability, and oceanic conditions from terrestrial, marine, lacustrine and ice core archives.

c. Developing and improving numerical models of climate-ocean-glacier and ice sheet systems, by advancing the physics, and then carrying out sound evaluation of models against modern observations and past climate reconstructions.

d. Using our models to improve future climate simulations, and projections of glacier and ice sheet contribution to sea-level rise, river flows and other changes in the Earth System.

e. We disseminate our research findings through publications in the world’s leading scientific journals, and through education, communication and engagement with the public, practitioners and policymakers.

Trickles and floods

Water flow from beneath the West Antarctic Ice Sheet

In May 2025 in *Nature Geoscience*, Huw Horgan and colleagues published the first direct evidence of subglacial water entering the ice shelf cavity in the deep interior of the Ross Ice Shelf.

Beneath the thick ice cover of the West Antarctic Ice Sheet lies a system of rivers and lakes. Water beneath the ice sheets is generated by geothermal heat flux and frictional heating and its distribution varies in space and time. Subglacial lakes fill and drain, and eventually subglacial water crosses from beneath the ice sheet, entering the ocean, often in the cavity beneath ice shelves. This hidden water system is important for how ice sheets flow as it enables the rapid sliding of ice streams. Once water reaches the ice shelf cavity its importance is compounded, as its buoyancy leads to concentrated melt of the ice shelf base.

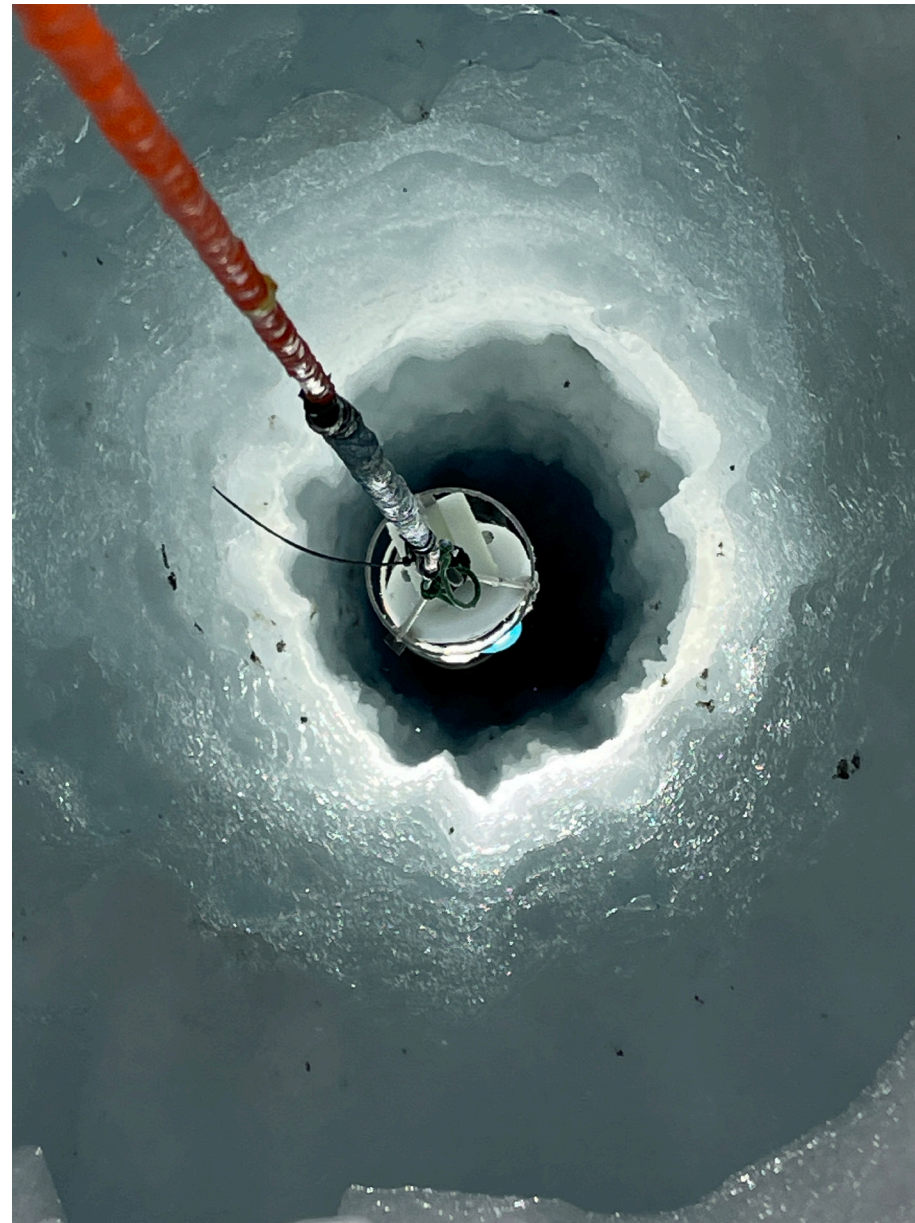
By drilling through the ice at the transition between the grounded ice sheet and floating ice shelf, the team were able to show that subglacial water had melted a narrow 200 m high channel in the base of the ice. Water properties within the channel revealed an inward flow of warm salty water at the base of the channel and a plume of turbid fresher water emerging from beneath the ice sheet. The rate of water output was low, and sediment coring showed that this background trickle of water from beneath the ice is punctuated by the episodic release of large volumes of water and sediment.

The investigation demonstrated what can be learnt using Antarctica New Zealand's deep field traverse, the ARC's hot water drilling direct access system and the Antarctic Science Platform's integration of glaciology, oceanography and sedimentology.

Horgan, H.J., Stewart, C., Stevens, C. et al. A West Antarctic grounding-zone environment shaped by episodic water flow. *Nat. Geosci.* 18, 389–395 (2025). <https://doi.org/10.1038/s41561-025-01687-3>

Huw Horgan is an Associate Professor of Glaciology at the Antarctic Research Centre.

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Borehole. Photo by Craig Stevens

Widespread Antarctic ice sheet surface melt during the Miocene

A study led by Rob McKay in the *Bulletin of the Geological Society of America*, as part of the International Ocean Discovery Program's Expedition 374 to the Ross Sea, sheds new light on how Antarctica's ice sheets behaved during the Miocene epoch (23–5 million years ago).

The Miocene contains periods of global warmth strikingly similar to what we may face in the future. Sediment cores from this period in the study reveal dramatic cycles of ice sheet advance and retreat, showing that Antarctic ice responded to climate change in surprisingly complex and non-linear ways.

During the Miocene Climate Optimum, when atmospheric CO₂ soared above 500 ppm, vast areas of East Antarctica's terrestrial ice sheets experienced surface melt, sending large volumes of turbid meltwater into the ocean. The research also delivers the first direct evidence of grounded ice sheets reaching the outer continental shelf during the Middle Miocene Climate Transition (~14 million years ago), driven by cooling when CO₂ declined below 300 ppm, and shallowing of the seafloor due to high levels of sediment input that reduced ocean heat influences on the ice sheet margin.

Why does this matter today? Because current CO₂ levels are rapidly approaching those same Miocene thresholds — levels linked not only to destabilization of West Antarctica's marine-based ice but also to widespread surface melt across East Antarctica. The observation of complex geological feedbacks in the study make the risk even

greater: as millions of years of glacial erosion have carved the inner continental shelf deep below sea level, leaving today's ice sheets far more vulnerable to runaway marine ice sheet instability than they were in the Miocene — a process that accelerates ice loss under warming.

This research is a stark reminder: cutting greenhouse gas emissions is urgent to avoid a sudden shift in the drivers of ice sheet loss. Antarctic geological records remain a powerful tool for predicting tipping points and shaping strategies to protect our coastlines from future sea-level rise.

McKay, R.M. et al. Miocene ice sheet dynamics and sediment deposition in the central Ross Sea, Antarctica. *GSA Bulletin* 2025;; 137 (3-4): 1267–1291. doi: <https://doi-org.helicon.vuw.ac.nz/10.1130/B37613.1>

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The JOIDES Resolution drilling in calm and ice free waters of the central Ross Sea during IODP Expedition 374. (Credit: William Crawford, IODP JRSO)

Antarctic coastal polynyas in the global climate system

In February 2025, researchers in the National Modelling Hub, together with Dr Dirk Notz from the University of Hamburg, published a major new review paper on Antarctic coastal polynyas in *Nature Reviews Earth & Environment*.

Bringing together atmospheric and ocean modellers, ice sheet scientists and palaeoenvironmental proxy experts, the Review summarizes the state of knowledge of these poorly studied, but hugely important, ocean phenomena.

But what are polynyas, and why are they important? Polynyas occur in both polar regions and are areas of persistent open water within the sea-ice pack than can be classified into: (1) open water (or sensible heat) polynyas, formed through the upwelling of comparatively warm water that melts pre-existing sea ice and prevents new sea ice formation, as seen in the Weddell Sea; and (2) coastal (or latent heat) polynyas, formed by offshore winds pushing newly created sea-ice away from its source area, as seen in the Ross Sea.

Over 1998–2014, there were 46 identifiable Antarctic coastal polynyas, covering a total area of over 600,000 km², representing 1% of the maximum sea-ice area of the Southern Ocean. Collectively, these coastal polynyas serve vital climatic and ecological functions and are often referred to as sea-ice factories contributing ~10% of total Antarctic sea-ice growth. Strong wind events within the polynya act to strip heat from the ocean surface leading to early stage (frazil) sea ice formation in the upper parts of the water column.

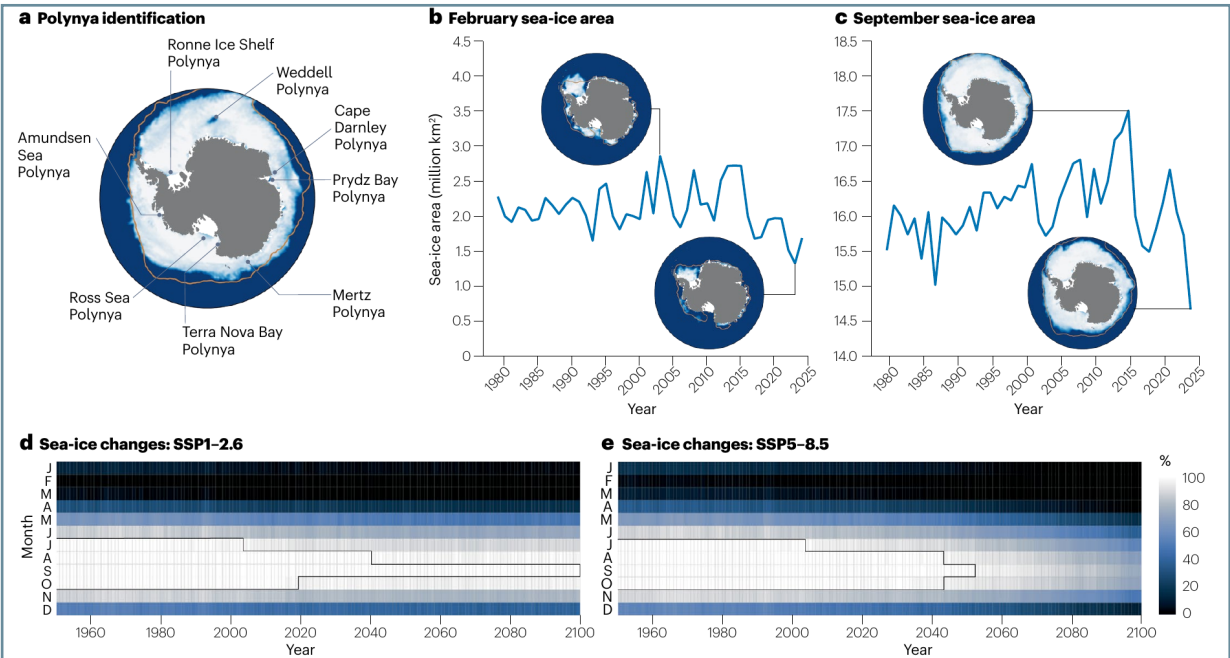
Consequently, any changes to Antarctic coastal polynyas will affect sea ice production. Sea ice reflects solar radiation and insulates the surface ocean, and is also critical for the formation of dense Antarctic Bottom Water (AABW), the lower limb of the global meridional overturning

circulation – all of which influence global energy balances and heat redistribution. Coastal polynyas are also focal locations for biological activity and gas and nutrient exchange, allowing enhanced carbon sequestration. Variability in coastal polynyas can also directly impact food availability for penguins, albatross and seals.

The outlook, however, is not good. As a result of the declining number, extent and efficiency of active coastal polynyas, Antarctic sea ice hit an all-time low in February 2023 (Fig. b) that persisted into the winter months (Fig. c). Such sea-ice losses are projected to continue under stringent (Fig. d) and absent (Fig. e) mitigation scenarios. The review is a timely reminder of the need to better understand Antarctic coastal polynyas – and the global consequences of losing them in a warming world.

Nick Golledge is a Professor of Glaciology and leader of the National Modelling Hub, funded by the Antarctic Science Platform and hosted by the Antarctic Research Centre. Contact Nick: nick.golledge@vuw.ac.nz

Golledge, N.R., Keller, E.D., Gossart, A., Malyarenko, A., Bahamondes-Dominguez, A., Krapp, M., Jendersie, S., Lowry, D.P., Alevropoulos-Borrill, A., Notz, D., 2025. Antarctic coastal polynyas in the global climate system. *Nature Reviews Earth and Environment* 6, 126–139. <https://doi.org/10.1038/s43017-024-00634-x>



Observed and projected changes in Antarctic sea ice. a) Location of the major Antarctic coastal polynyas (pale blue areas). Antarctic sea ice (1979 to 2023) during b) February; and c) September. Historical and projected monthly sea ice concentration under d) SSP1-2.6 and e) SSP5-8.5 emissions scenarios.

Global ocean circulation impact on Southern Hemisphere climate and the Antarctic ice sheet

In the 2025 Marsden Fund, an international team of researchers led by Dr Shaun Eaves was awarded funding to better constrain the impacts of weakening of the Atlantic Meridional Overturning Circulation (AMOC) on the climate and cryosphere of the Southern Hemisphere.

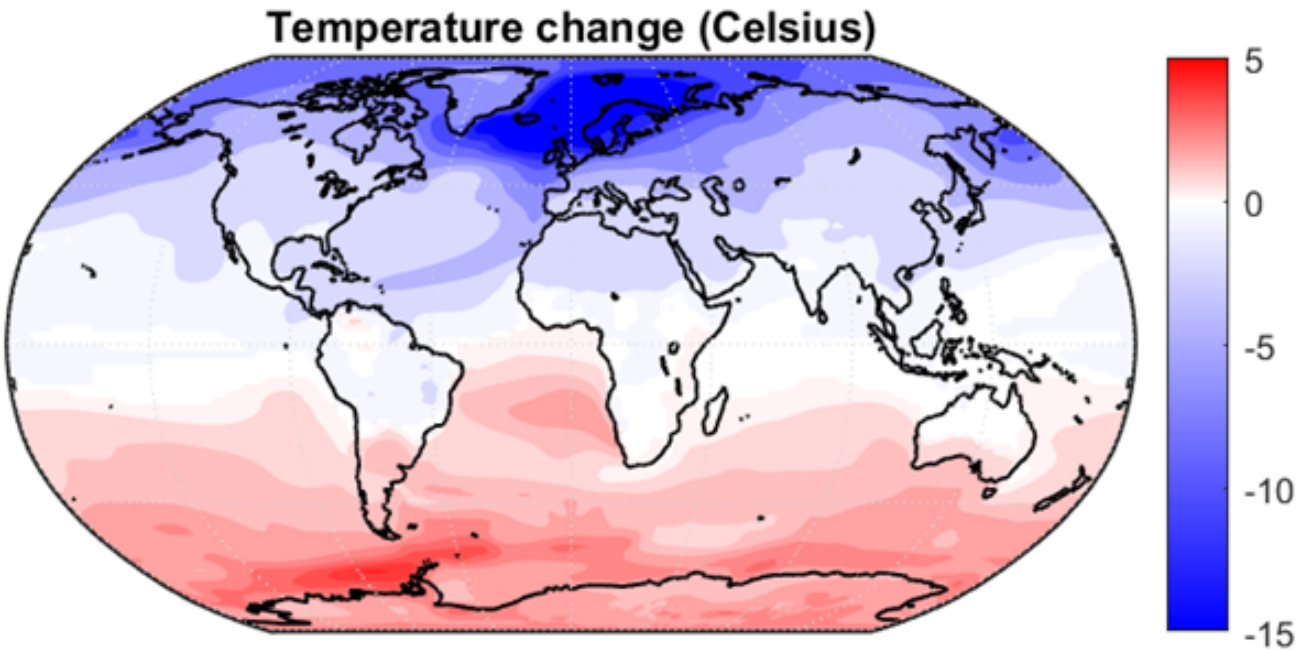
The AMOC is a major component of global ocean circulation that moves warm, salty surface waters from the Southern Hemisphere and tropics to the sub-polar North Atlantic, where they then cool, sink, and return southwards at depth. There is strong evidence in the recent geological record that the AMOC has previously flipped abruptly between strong and weak states, with severe impacts on global climate.

Recently, a prominent oceanographer elegantly summed up the fragility of the system: “The AMOC flows because the northern Atlantic is salty, and it is salty because the AMOC flows”. In other words, the AMOC is self-dependent and thus highly sensitive to external salinity perturbations. Today, human-caused climate change is disturbing the salinity of the North Atlantic via freshwater inputs from increasing melt of the Greenland Ice Sheet and enhanced precipitation rates, which may force the AMOC across a critical threshold once again.

A future weakening of the AMOC would likely warm the Southern Hemisphere. However, the rates and spatial distribution of warming, as well as the attendant impacts on regional atmospheric and oceanic circulation, are uncertain. Furthermore, the potential impacts on the Antarctic Ice Sheet, and thus global sea level, are largely unknown.

In this new \$940k Marsden Fund project, Dr Eaves and the team will deploy state-of-the-art climate and ice sheet models to address these questions and better quantify the potential impacts of this critical tipping point in the Earth system.

Dr Shaun Eaves is a Senior Lecturer in Physical Geography at the Antarctic Research Centre. Contact Shaun: shaun.eaves@vuw.ac.nz



Global surface temperature change from AMOC collapse under near-modern boundary conditions as simulated by project member René van Westen.

Antarctic Science Platform ‘Sense of Place’

Pursuing Mātauranga Māori in Antarctica

Four members of the Antarctic Science Platform’s leadership team, led by the ARC’s Natalie Robinson, spent two weeks in Antarctica during the 2025/26 field season – an experienced-based deployment to initiate the Platform’s Phase 2 Mātauranga Māori programme.

This work has been designed to facilitate the effective enactment of the ASP’s Vision Mātauranga strategy, by building capability and confidence of the ASP’s Mātauranga Māori leadership in the physical Antarctic environment and in the systems required to devise, plan, and manage future Māori-led or Māori-initiated field events.

During their time on ice, the team visited several key locations in the vicinity of Scott Base and participated in all aspects of base life, experiencing these through Mātauranga and tikanga lenses. They also enriched Scott Base life with several acts of Manaakitanga, or cultural service. This included sending the traverse team of the SWAIS2C programme (Sensitivity of the West Antarctic Ice Sheet to 2 Degrees Celsius of Warming) off from Scott Base with a blessing ceremony; leading a whakaeke and site blessing to support the Scott Base Redevelopment; blessing a fleet of sea ice trackers prior to their deployment; and contributing karakia and karanga for the Armistice Day service. These gifts were all received with warmth, admiration, and gratitude by all members of the Scott Base population.

The team are now working on several outputs from the field season including a guidance document for all researchers seeking to apply a Mātauranga Māori lens to future Antarctic research; a module for Antarctica

NZ’s pre-deployment e-learning programme on areas and items of Māori cultural significance around Scott Base; a guidance document for Māori researchers on what to expect, and how to navigate the systems, when planning future Māori-led expeditions; and wānanga with the Antarctic research community to offer reflections and discuss practical opportunities for embedding tikanga and securing culturally-safe operations for all work within the NZ Antarctic programme.

“It has been a humbling experience to see the teams reach out for support and karakia throughout their mahi and haerenga. This is a strong sign that Antarctica – and its science community – are ready for Mātauranga Māori to play a meaningful role in enhancing their research and understanding of this place. From waerea to takutaku, these karakia serve as the first steps toward understanding how we as Māori fit within this landscape, as we find our feet, our place, and our pūrakau here on the ice.”
Delane Luke, Kaiārahi for the ASP.

Natalie Robinson is Associate Professor in Sea Ice Science and Oceanography at the ARC.

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Right: The K878 team (L to R: Delane Luke, Sandy Morrison, Aimee Kaio, Natalie Robinson) visit and offer a karakia to the Scott Base pouwhenua, ‘Te Kaiwhakatiri ō Te Raki – the Navigator of the Heavens’, as part of initiating a ‘Sense of Place’ for the Antarctic Science Platform’s Phase 2 mātauranga Māori programme.

Tirotiro tohu ki Te Tiri o Te Moana: Observing environmental change through a Māori lens at Scott Base, Antarctica

PhD candidate Alyssa Thomas spent a month at Scott Base at the end of 2025, alongside Dr Holly Winton and Prof. Ocean Mercier, practicing tirotiro (Māori method of observation, attuning to rhythms of the natural environment) of tohu (signs and indicators; environmental in this context) to better understand the changing Antarctic environment through a Māori perspective.

The observations were guided by cyclical patterns of the sun, moon, and tides, and their influence on sea ice dynamics, weather patterns and local fauna. This research seeks to establish baseline tohu data of these observations and explore the application of maramataka (Māori ecological calendar system) in Antarctica. Maramataka and tohu are knowledge repositories of environmental patterns, which we are using to help understand where patterns are shifting due to human-induced pressure.

Our team had a successful season practicing tirotiro from different vantage points of Scott Base, Observation Hill and Crater Hill, including a daily loop walk of the pressure ridges, to see tohu rangi (of the sky), tohu moana (of the ocean), and tohu whenua (of the land). Scott Base is the ideal location for this research because it is Aotearoa New Zealand's home in Antarctica where we consider ourselves kaitiaki (guardians).

In addition, there are long-term data records to

support connections between tohu and natural cycles. Mātauranga Māori is equally important alongside Western science there. A team of Scott Base winter staff were recruited to continue observing tohu throughout the winter season to build a more comprehensive picture of seasonal cycles at Scott Base.

Initial analysis of the tohu observations suggest a cycle is emerging between seal behaviour and tide height, due to the interrelationship of the moon phases and gravitational pull influencing tidal extent and sea ice movement.

Alyssa Thomas is a PhD candidate at the Antarctic Research Centre and Te Kawa a Māui (School of Māori Studies). Alyssa is supervised by Dr Holly Winton, a Senior Research Fellow at the ARC, and Prof. Ocean Mercier of Te Kawa a Māui.

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Contact Holly: holly.winton@vuw.ac.nz



Alyssa Thomas observing tohu at the Pou in front of Scott Base and using the telescope for a closer view of the moon. Photo by Ocean Mercier.

ARC selected to host major research programmes within the Antarctic Science Platform

In 2025, the ARC strengthened its role as a national leader in climate and Antarctic research through its leadership and involvement in the second phase of the Antarctic Science Platform (ASP), a seven-year, \$49m Strategic Science Investment Fund programme.

The ARC was selected as hosts of the flagship \$11m Tiaki Moana programme in the ASP — a programme co-led by Professor Nancy Bertler, alongside Earth Science NZ colleagues Dr Leigh Tait and Dr Denise Fernandez.

This programme brings together researchers from across NZ universities, Crown Research Institutes, and government agencies to investigate the drivers and implications of rapid environmental change in the Ross Sea and Southern Ocean. The programme focuses on understanding interactions between Antarctica, the Southern Ocean, sea ice, ice shelves, and marine ecosystems, generating the knowledge needed to support policy and decision-making in a rapidly changing climate.

The ARC was also selected to host the \$1.7m Antarctic Science Platform Modelling Capability and Development Hoe, led by Professor Nicholas Golledge. Building on the success of the National Modelling Hub established during the first phase of the Platform, this initiative strengthens New Zealand's capability in Earth system, ice-sheet, ocean, atmosphere, and climate modelling.

The Hoe will support the research and development of next-generation computational tools, research software engineering expertise, and national modelling infrastructure, ultimately enabling researchers within the ASP programme to deliver more robust projections of Antarctic and climate change. Together, these programmes highlight the ARC's continuing role as a national coordinator and project leader for NZ's Antarctic research community as a whole.

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**Antarctic
Science Platform**

Picture taken from within the McMurdo Under Sea-Ice Observation Tube. Image by Nancy Bertler.

A clearer view of debris-covered ice

Dr Alex Winter-Billington’s Ngā Puanga Pātaiao research, funded by Te Apārangi Royal Society of New Zealand, is revealing complexities of an understudied aspect of glacier science: how debris cover influences melt rates under changing weather conditions.

Focusing on Aotearoa’s Haupapa Tasman Glacier and Nepal’s Changri Nup, Alex is establishing new field monitoring stations to capture high-resolution data on surface melt, debris thickness, and local meteorology.

Debris-covered glaciers, blanketed in landslide sediment, are melting as rapidly as debris-free glaciers — but through different mechanisms. Thin debris can accelerate melt, while thicker layers insulate the ice beneath. How this relationship holds under variable weather conditions remains poorly understood and difficult to predict.

Fieldwork began in May 2025 with the installation of a new station on Haupapa. The two-week campaign highlighted the system’s complexity: dry debris under patchy snow cover was rapidly saturated by warm rain and snowmelt during a storm. As conditions cleared, cold winds dried the surface but froze pore water in the fine sediments adjacent to the ice. With high-resolution observations, Alex aims to quantify how passing meteorological conditions influence heat transfer within the debris layer and, ultimately, affect melt rates.

Another new station will be installed on Changri Nup by the end of 2026. Once monitoring is underway, Alex will begin exploring how Mātauranga Māori of the

cryosphere might further illuminate the links between sub-debris melt and weather patterns.

Dr Alex Winter-Billington holds a Te Apārangi Royal Society of New Zealand Ngā Puanga Pūtaiao Fellowship for research entitled *Integrating physically based modelling of debris-covered glacier melt and mātauranga Māori to improve the accuracy of projections of glacier change*.

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Nepal’s Changri Nup glacier flows from Mt Everest, marked in red.



Panoramic collage showing kahukura (rainbows) arching over the new field site on the debris cover of Haupapa Tasman Glacier, Aoraki Mt Cook National Park. Photo by Alex Winter-Billington

Girls* on Ice Aotearoa New Zealand

Girls* on Ice Aotearoa NZ is part of Inspiring Girls* Expeditions — an international tuition-free programme running expeditions empowering young women through science, art, and outdoor exploration. It began with the aim of creating space for girls and women to grow and thrive in historically male-dominated fields such as earth sciences.



The 2026 expedition team out and about on Mt Ruapehu. Photo by Maria O’Toole.

Girls* on Ice Aotearoa NZ continues to grow in interest, leadership, and partnerships. Student and school awareness of the programme reached a new high in 2025, with 195 applicants for our third expedition, reflecting strong demand for outdoor-based STEM programmes for girls* in Aotearoa.

The 10 selected participants came from across Aotearoa, bringing a range of interests and skills. The expedition team was led by instructors specialising in Earth sciences, outdoor education, and creative practice: Julia Martin, Programme Manager for the 2026 expedition (snow science), Ashley Davis (oceanography), Jenny Hopkins (volcanology), Mel Harris (outdoor guide), and Maria O’Toole (fine arts).

The 11-day expedition included seven nights of immersive field learning in Tongariro National Park. Despite some cold and rainy days, the group showed wonderful teamwork, and embraced the challenges of

learning and living on the maunga. They undertook group research projects, identifying research questions and making scientific and artistic observations to answer the questions. The programme concluded back in Wellington with student presentations, reflection, and celebration.

The Antarctic Research Centre, Hutt Valley Tramping Club, and many generous private donors continue to support the programme, and in 2025 we were thrilled to establish new sponsorships from Macpac and the Antarctic Science Platform. These contributions enable us to offer tuition-free expeditions. We are already looking forward to our January 2027 expedition!

Dr Lauren Vargo is the Director of Girls* on Ice Aotearoa NZ. Contact Lauren: lauren.vargo@vuw.ac.nz

* Girls* on Ice Aotearoa NZ welcomes cisgender girls and transgender, agender, nonbinary, intersex, and genderqueer youth.

Responses to our 2026 post-expedition survey:

“My personal highlight ...was making life long friendships with the girls. This trip has been very inspiring ...and made me understand more about the STEM world which has been an amazing experience to actually get outside to learn.”

“I’ve learned that there are so many different options for my life after high school, I have also learnt to be confident in myself and ask questions.”

“Honestly I have so many highlights it’s hard to just pick one. I think my biggest highlight was swimming in the waterfall on peak physical day.”

From Prof. Margaret Hyland, former Deputy Vice-Chancellor, Research, Te Herenga Waka—Victoria University of Wellington:

“To our generous donors: your backing is pivotal in supporting our future female scientists to realise their dreams and I sincerely thank you for your support.

Opportunities to do science and art individually, let alone in combination, is something that we don’t get often enough. Your support for this programme is helping to shape a more inclusive future.”

Science Drilling Office

Blood, sweat and gears

2025 was another busy year for the Science Drilling Office. Engineers James MacPhail, Darcy Mandeno, and Alex Pyne supported the third SWAIS2C field season after the project relocated to Crary Ice Rise. While the previous two seasons highlighted the practical challenges of Antarctic operations, sustained effort led to a major milestone – recovery of a record subglacial sediment core.

SWAIS2C Drilling Season Three

2025 started with a season at Kamb Ice Stream that was cut short by significant challenges. The team was unable to recover the planned 200 m of sediment core from beneath the Ross Ice Shelf near the grounding line. This set up the remainder of 2025 as a critical period to ensure the viability of the upcoming season at Crary Ice Rise.

Upon return from Antarctica, James and Paddy Power (ESNZ) led an in-depth season review with industry partner Webster Drilling and Exploration (WD&E), supported by external reviewers from the United States and Germany. The review informed detailed planning to improve drill performance in difficult subglacial conditions through system refinement, careful selection of critical components, targeted upgrades, and a refined team structure.

Working closely with WD&E's engineering team, James completed a reconfiguration of the Antarctic Intermediate Depth Drill (AIDD) system, with most work finished by June 2025. Validation and commissioning tests included a 10-day deployment to a Wairarapa farm, where the on-ice team (with logistics support from Webster Drilling) drilled a 200 m test hole. The test core will be used by Victoria University of Wellington's School of Geography, Environment and Earth Sciences (SGEES) for investigation and teaching.

Engineering work continued through to September's southbound shipping deadline. Eleven tonnes of AIDD, Hot Water Drill (HWD), and support equipment were flown to Scott Base via the Antarctic New Zealand/USAP air bridge. Darcy reviewed operating procedures, with support from Paddy and external industry experts, for the core-drilling and hot-water drilling systems to bring the health and safety process up to date with engineering and process changes. James also revisited the spares inventory. Safety improvements trialled during the Wairarapa rebuild test were incorporated into on-ice planning and documentation.

The end of 2025 saw the team at Crary Ice Rise successfully drill a subglacial core, the culmination of many years of work by people across ARC, WD&E, ESNZ, and international partner organisations. The project wrapped up in mid-January 2026, setting a world record for subglacial sediment core recovery at 228 m from under 520 m of ice.

Tony Kingan (Webster Drilling, at left) and driller Jason Wilderink (at right) point to the 200m depth marked on the outer core barrel, while Sean McKeown (centre back) drills on. Photo by Ana Tovey, ESNZ.



ASIS Drilling Season Planning

Alongside SWAIS2C work, 2025 marked the start of the Antarctic Sea-Ice Switch (ASIS) ice core drilling programme (see page 24). Work focused on getting a field-ready drilling system and test plan in place ahead of a Whitehall Glacier season in the next two years, with a target recovery of up to 300 m of ice core.

Darcy worked closely with ASIS Principal Investigator Nancy Bertler to procure a new shallow ice core drilling system. Early scoping considered re-tooling the intermediate-depth drill built by Darcy for the RICE project (Roosevelt Island Climate Evolution, 2011–2012), but this option was constrained by personnel availability and would have required investment for modifications comparable to purchasing an off-the-shelf system.

ASIS elected to purchase a shallow drill (Eclipse) manufactured by Icefield Instruments (Canada). The Eclipse design has direct lineage to the field-proven Danish Hans Tausen drill. Darcy also has prior experience with this drill type from work in Greenland, and it shares similarities with the RICE ice drill used in 2011–2012.

The system arrived in New Zealand and was shipped to Scott Base, ahead of planned commissioning and training in early 2026.

Collaboration and Engagement

Darcy and James also continued international connections throughout 2025 through technical meetings, workshops, and conferences, supporting knowledge exchange and keeping New Zealand closely linked to global best practice in polar drilling.

In March, Darcy travelled to Madison, Wisconsin (USA) for the biennial Technical Assistance Board meeting supporting the NSF (National Science Foundation, USA) Ice Drilling Program (IDP). He joined the Board following Alex Pyne's retirement from the role. The meeting provided a valuable link to polar drilling experts and a forum to share New Zealand's experience with other groups using similar drilling technologies in polar field settings.

Mid-year, Darcy and Rob McKay attended a workshop in Bologna, Italy, hosted by the Institute of Polar Sciences (IPS), to scope a project to recover a ~150 m core from Edisto Inlet, Ross Sea, Antarctica.

James and Darcy also attended the 9th International Drillers Conference in Potsdam, Germany, which brought together international experts working on drilling across Earth's cryosphere – and increasingly, on icy bodies elsewhere in the solar system.

Overall, 2025 combined hard-won field lessons with practical engineering progress. This was achieved in no small part with support from Webster Drilling and Exploration – the management, manufacturing, and field support we received reaffirmed the importance of maintaining close relationships with industry partners. This relationship helped SWAIS2C move beyond earlier post-season challenges, and ultimately positioned the team for a successful Crary Ice Rise field season, 2025–2026.



ARC engineers Darcy Mandeno and James MacPhail begin assembly and testing of the new ASIS Eclipse ice core drill in front of Scott Base, late January 2026. Behind them the sea-ice break out from McMurdo Sound is underway. Photo by Matt Harris.

The Science Drilling Office of the Antarctic Research Centre comprises two full-time engineers – Darcy Mandeno and James MacPhail. Alex Pyne continues in his role as part-time Antarctic Drilling Advisor. Contact Darcy: darcy.mandeno@vuw.ac.nz

Our Changing Coast

Building long-term coastal resilience

During 2025, the Our Changing Coast (OCC) team were hard at work in the research phase and close to delivering some of the first outputs and products that will provide improved information for coastal hazard risk assessment.

These will include an update of the NZ SeaRise web portal hosted by Takiwa (<https://searise.nz/maps/>) with rates of vertical land movement (VLM) at 50 m spacing around the coast of Aotearoa and a strip inland to the 20 m contour. The new data use the latest satellite and GPS time series and include the areas affected by Christchurch and Kaikoura earthquakes.

With our partners at Earth Sciences New Zealand, relative sea-level (global sea-level + VLM) projections to the year 2150 will be made available for locations spaced every 200 m. While progressive sea-level rise is important, it is extreme sea-levels associated with storm events and king tides that drive acute coastal hazards.

With our partners at University of Auckland and Oceanum we will also be providing projections of extreme sea-levels. The new web-based visualisation tool is currently being tested with stakeholders and users and will allow the VLM to be adjusted for areas affected by post-earthquake land changes, compaction from urbanisation, and longer term inter-seismic land surface changes. The maps will also show historical shoreline retreat since 1950 and shoreline projections to 2100 provided by our University of Auckland partners.

The ARC is hosting a number of postgraduate students working on OCC projects.

MSc candidate Jorja Mullholland, supervised by Prof. Tim Naish and Associate Prof. Gavin Dunbar, is working on the evolution of the coastline of western North Island between Hawera and Kapiti by developing a sediment budget of erosion and deposition since 1950.

We have two marae-based, kaupapa-led, wāhine toa undertaking PhD projects on community resilience in Tauranga Harbour. Tumanako McLeod from Ōpopoti marae (Maungatapu, Tauranga) is focusing on Taitamariki Ki te Taiao (Children in their natural world) from the perspective of their intergenerational knowledge, tāhuna (coastal environment), hapū (community), and kura (learning) using earth science data, experiments and opportunities to deliver future adaptation for their tāhuna, marae and mokopuna.

Awhina Ngatuere, from Whareroa marae (Mount Maunganui), is focusing on how ancestral knowledge and western science can support her marae's future in the face of climate change and sea-level rise. Awhina has already taken sediment cores from Tauranga Harbour to baseline historical human-driven influences



The NZ SeaRise: Te Tai Pari O Aotearoa sea-level projection tool

on her hapu's taiao (environment). Both are supervised by the inspirational Mawera Keretai (Te Whare Wānanga o Awanuiārangi) and Prof. Richard Levy.

PhD candidate Matthew Hardcastle is using national and regional climate risk datasets to inform the development of a nationally usable dynamic adaptive plan for building long-term resilience to coastal hazards and risks. He also aims to establish a process for communities to effectively harness available data in crafting their own dynamic adaptive plans. Matt is supervised by Adjunct Prof. Judy Lawrence and Prof. Tim Naish.

Timothée Lebrat's PhD thesis uses machine learning models to enhance the accuracy and efficiency of surface mass balance calculations for ice sheets, which is critical for improving sea-level projections. He is supervised by Prof. Nick Golledge and Dr Peter Siew.

Tim Naish is Professor of Earth Sciences at VUW.
Contact Tim: tim.naish@vuw.ac.nz

PhD student Awhina Ngatuere coring a salt marsh in rohe, Tauranga Harbour. She is being assisted by Marcus Vandergoes from Earth Sciences New Zealand.
Photo by R.Levy.



Antarctic Sea-Ice Switch

Preparing for new futures

The Antarctic Sea-Ice Switch (ASIS) Programme, funded by Ministry of Business, Innovation and Employment, is now fully underway, and we are excited by the significant progress achieved over the past year.

The 2025/26 Antarctic field season was highly successful, made possible by the outstanding logistical support of Antarctica New Zealand. The ecosystem research team collected marine phytoplankton samples across the Ross Sea, integrating in situ observations with satellite data to better assess ecosystem responses to changing sea ice conditions.

Substantial methodological and technical advances were achieved across ASIS research streams. A newly developed lightweight ice core drilling system was successfully tested in Antarctica, delivering a major reduction in logistical demands and carbon footprint. This lightweight system is scheduled for deployment in Northern Victoria Land to support baseline assessments of sea ice and environmental conditions (read more on page 21).

Oceanographic collaborations with Fisheries and Oceans Canada and the Italian National Antarctic Programme further expanded the Ross Sea ARGO float network, strengthening long term ocean observations in the region. A new generation sea ice buoy is being developed for deployment in the Ross Sea polynya to collect for the first time real-time data throughout the entire year, during sea ice growth and decay. Modelling breakthroughs included the first successful coupling of a sea ice model with an atmosphere–ocean model focused on the Ross Sea, significantly enhancing future climate scenario capability. Data analysis innovation was achieved through the application of machine learning approaches to the assessment of diatom samples of marine sediment cores.

Beyond research delivery, ASIS contributed scientific expertise at the international policy interface during 2025 through engagement with the Scientific Committee on Antarctic Research (SCAR). Members of the ASIS team were invited to serve as subject matter experts contributing to a SCAR Working Paper for the 48th Antarctic Treaty Consultative Meeting (ATCM), to be held in May 2026 in Hiroshima, Japan. The paper addresses the drivers, observed changes, and impacts of Antarctic sea ice change. Furthermore, we accompanied the New Zealand Delegation to the 2025 Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) Meeting in Hobart, Australia, 20-31 Oct 2025 offering ASIS valuable insight into policy priorities and a meaningful opportunity to engage at the science–policy interface.

For further information, please visit www.seaice.aq.

Nancy Bertler is Professor of Earth Sciences at VUW. Contact Nancy: nancy.bertler@vuw.ac.nz



ARC engineers Darcy Mandeno and James MacPhail begin the assembly and testing of the ASIS Eclipse ice core drill in front of Scott Base, late January 2026. Behind them, facing south-east, is White Island. Photo by Matt Harris.

SWAIS2C

Science operations at Crary Ice Rise

The third drilling season for Sensitivity of the West Antarctic Ice Sheet to 2 Degrees Celsius of Warming (SWAIS2C) saw the successful recovery of a 228 m long geological core from beneath Crary Ice Rise in the deep interior of West Antarctica. This great success was due to hard work and commitment alongside our numerous on- and off-ice partners including Webster Drilling and Exploration, Antarctica New Zealand and Earth Sciences NZ.

The 2025/2026 season started with excellent support from Antarctica New Zealand's traverse and planning teams and the United States Antarctic Program's fixed-wing team which meant some terrible flying weather did not jeopardise the programme. Once on site, the hot water team quickly accessed the base of the ice, then smoothly integrated with the Antarctic Intermediate Depth Drill (AIDD). The AIDD team led by Tony Kingan from Webster Drilling and Exploration then started bringing core to the surface during 24-hour operations. Drilling into permafrost conditions, the team achieved 96% recovery through a diverse range of lithologies. The on-ice science team was on hand to log, photograph, x-ray, and curate every core. This included smear slides of key lithologies with on-ice and off-ice analysis informing initial age estimates of the recovered core.

After 9 days of coring beneath the ice rise, the team exceeded its target depth and pushed on to drill beneath a seismic reflector identified during site survey work. At 228 m beneath the ice base, drilling operations ceased. One disappointment was a curtailed borehole logging programme due to premature detachment of the bottom hole assembly, but this was overshadowed by the overwhelming success of the drilling programme.

The season's end saw the recovery of geophysical equipment from across the ice rise and deployment of a fibre-optic observatory in a hot water drilled hole to the ice sheet base. Returning to Scott Base, the team experienced more flight delays, but with the core in hand these passed relatively easily. Once the final flight departed, the Antarctica New Zealand traverse team finalised the camp pullout and began the two-week drive home to Scott Base.

Analysis of this unique core will begin in June 2026 at the Otago Repository for Core Analysis (ORCA) facility in Dunedin. The co-chiefs (Molly Patterson, Tina van de Flierdt, Huw Horgan, and Richard Levy) want to thank all SWAIS2C's supporters. The team looks forward to the science to come, returning to Antarctica, and drilling more of the critical climate records that are needed to predict Antarctica's future in a warming world.

Associate Prof. Huw Horgan was Co-Chief Scientist on the 2025-2026 SWAIS2C drilling expedition. Contact Huw: huw.horgan@vuw.ac.nz

Co-chief scientists Molly Patterson and Huw Horgan alongside a portion of the 228 m core from Crary Ice Rise. Photo by Ana Tovey, SWAIS2C



Significant Events



SWAIS2C Co-chief scientist (and ARC alumnus) Molly Patterson prepares a packaged Crary Ice Rise core for transportation back to Scott Base and New Zealand. Photo by Ana Tovey / SWAIS2C.

2025 S.T. Lee Lecture in Antarctic Studies

The S.T. Lee Lecture in Antarctic Studies is presented annually by the Victoria University Foundation and Te Puna Pātiotio—Antarctic Research Centre in honour of Dr Lee Seng Tee, whose philanthropic support for scholarship helped establish distinguished lecture series at academic institutions throughout the world.



Prof. Edwards presenting the 2025 S.T. Lee Lecture. Copyright: Victoria University of Wellington, photo by Colin McDiarmid, VUW Image Services.

The 22nd S.T. Lee public lecture was presented by internationally recognised climate scientist Prof. Tamsin Edwards of King's College, London. Tamsin's talk entitled *Antarctic update 2025: evolving uncertainty in the future of the ice sheet*, took a deep dive into developments in climate change research since the 2021 Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report, and the complexities around predicting potential outcomes of Antarctic instability and sea-level rise. You can listen to Prof. Edwards' S.T. Lee lecture on our website: <https://www.wgtn.ac.nz/antarctic/about/events/s-t-lee-lecture>

In her role as expert advisor on climate science to the public, policymakers, media and businesses, Tamsin acknowledges uncertainty in the face of continually evolving science, but is proud to offer tangible solutions to help the planet, and ease the sense of dread and helplessness experienced by so many facing this topic.

Following her time in New Zealand, Tamsin returned to Europe for the first Lead Author Meeting of the IPCC Seventh Assessment Report, taking place in Paris in December. As a Coordinating Lead Author for the Global Projections chapter, Tamsin will help shape the assessment of likely future changes to our climate as simulated by computer models. The Working Group I report (Physical Science basis) is expected to be completed by 2028.

Read Tamsin's interview with RNZ: *Sea level rise 'a very complicated area of science', renowned climate scientist says*, 11 Nov 2025

Below from left: Prof. Nick Golledge, Prof. Tamsin Edwards, VUW DVC Research Margaret Hyland, Prof. Rob McKay. Copyright: Victoria University of Wellington, photo by Colin McDiarmid, VUW Image Services.



Mighty Indeed

Two of the ARC's researchers star in the 2025 award-winning documentary film *Mighty Indeed*, produced and directed by filmmaker Vanessa Wells. Vanessa joined Associate Professor Natalie Robinson and Dr Jacqui Stuart for their 2022 Antarctic fieldwork, taking viewers on a journey to their field camp, through the highs and lows of a particularly challenging season on the ice.



From left, Natalie Robinson, Pat Langhorne, Vanessa Wells, Jacqui Stuart. Photo by Elanti Media.

The third star of *Mighty Indeed* is veteran sea ice physicist and Natalie's PhD supervisor, Professor Pat Langhorne (Otago University). Pat joined NZ's Antarctic programme in the 1980s because other nations were not taking women to the ice at that time. Over the ensuing years, she has helped make Antarctic research a welcoming space for female scientists, and in the film shares reflections from her life-long 'love affair' with Antarctic sea ice.

Mighty Indeed is an intimate and deeply human portrait of life set against the immense scale of Antarctica, told with grit, wit and surprising warmth. Director Vanessa Wells (Elanti Media) says from an artistic perspective she is fascinated by what drives people in extreme environments. "I'm intrigued by human/non-human interactions and drawn to those who challenge preconceptions of what a scientist or explorer should be." The film weaves ground-breaking science with the personal stories of these three women to gain an intimate understanding of how practicing scientists approach the hefty subject of climate change in their everyday lives.

The film premiered at the 2025 NZ DocEdge Film Festival where it won awards for Best Documentary Feature and Best Director. Since then, the film has toured to several NZ centres, including Q&A sessions with the film's lead protagonists. More screenings are planned, including bringing the film into NZ classrooms, community groups and marae.

Internationally, *Mighty Indeed* featured in Singapore's DocEdge festival in March 2026 and enjoyed sell-out audiences at San Francisco's Sebastopol Festival in April 2026. More international festivals are on the cards and there will be a screening at the major Scientific Committee on Antarctic Research (SCAR) Open Science Conference in Oslo, August 2026.



As of April 2026, *Mighty Indeed* can be viewed by New Zealand audiences for free via RNZ's streaming platform. You can access via this QR code or at <https://www.rnz.co.nz/video/mighty-indeed>

THREE WOMEN

FOUR DECADES

ONE MELTING CONTINENT

MIGHTY INDEED



★★★★★

"A rare documentary"
"unflinching"
"jaw-dropping"

- Paul Marshall - Red Raven



ELANTI MEDIA in association with RNZ PRESENTS "MIGHTY INDEED" FEATURING PATRICIA LANGHORNE, NATALIE ROBINSON & JACQUI STUART
PRODUCED & DIRECTED BY VANESSA WELLS PRODUCED BY POLLY FRYER EXECUTIVE PRODUCER JILL MACNAB DIRECTOR OF PHOTOGRAPHY ADAM JONES
EDITED BY EMMA SMART CONSULTING EDITOR MAYA DAISY HAWKE WRITER & RESEARCHER REBECCA PRIESTLEY
ANIMATION NED WENLOCK & JACQUI STUART MUSICAL COMPOSER BROOKE SINGER & ELLIOT VAUGHAN SOUND DESIGNER CHRIS SINCLAIR



ARC new staff appointments

The ARC welcomed three new staff in 2025, building capability in sea-ice modelling and ecology of microalgae, and adding further expertise to our professional team.



Dr Andrew Pauling

The Antarctic Research Centre is delighted to welcome Dr Andrew Pauling as a Research Fellow in Sea Ice Modelling, joining the National Modelling Hub. Formerly a Research Fellow at the University of Otago, Andrew brings extensive expertise in coupled climate modelling and polar climate research. His appointment through the Antarctic Sea-Ice Switch (ASIS) programme adds critical capabilities to our growing strength in Earth system modelling (see page 24).

The recent, unexpected, and sharp decline in Antarctic sea-ice extent may be one of the most significant warning signs of rapid change on the white continent—change with far-reaching global consequences. As Antarctic sea ice retreats, the ocean absorbs more heat, accelerating surface warming and destabilising ice shelves. This process could trigger rapid and potentially irreversible loss of vulnerable sectors of the Antarctic ice sheet, driving multi-metre global sea-level rise. Beyond sea-level impacts, diminishing sea ice weakens global ocean circulation, redistributes heat, reduces carbon storage, and limits nutrient supply to marine ecosystems.

Andrew's research uses state-of-the-art coupled climate models to investigate how Antarctic sea ice, the Southern Ocean, and polar climate respond to changes in the global Earth system. In his new role within ASIS, he will integrate an improved sea ice model into a high-resolution ocean-atmosphere model of the Ross Sea region, enabling more realistic simulations of sea-ice responses to climate variability and extremes. This work will advance our understanding of how Antarctica and the Southern Ocean may respond to unprecedented conditions—scenarios beyond anything observed to date—providing critical insights for future projections.

Dr Jacqui Stuart

Jacqui Stuart is an ecologist who recently completed her PhD at the Cawthron Institute and Victoria University of Wellington. Her focus is on the ice-associated, tiny but mighty microalgae and what changing sea ice conditions in McMurdo Sound, Antarctica mean for them.

She is interested in how changes at the base of the food web (microalgae) influence all the things that rely on the nutrients they provide to other organisms, directly or indirectly. A part of her research also looks at similar things a little closer to home, investigating the impact of changing climate on coastal microalgal communities in New Zealand.

Jacqui is one of three women profiled in the documentary feature film *Mighty Indeed* (see page 28). You can also read about laboratory research she undertook in Finland during 2025, at the University of Jyväskylä (see page 32).



Isobel Mebus



Isobel Mebus is a project manager who has spent the last five years working on Antarctic science research projects at Earth Sciences New Zealand, including working closely with the ARC on SWAIS2C. She is currently Associate Project Manager on the Antarctic Science Platform (ASP) Tiaki Moana project, led by Professor Nancy Bertler.

Prior to this she worked in the arts and is fascinated by the many correlations she finds between the creative arc of both arts and science projects and the structures required to successfully execute them.

She is also passionate about helping to strengthen the connection between science and policy so that evidence informs how we understand and respond to climate change.

ARC staff and student awards



Octopus and Ice Sheet team: (L-R) Nick Golledge, Nerida Wilson, Sally Lau, Tim Naish, Jan Strugnell

Prof. Tim Naish and Prof. Nick Golledge 2025 Eureka Prize for Excellence in Interdisciplinary Scientific Research

ARC's Nick Golledge and Tim Naish were members of the Octopus and Ice Sheet team which was awarded the 2025 Aspire Scholarship Eureka Prize for Excellence in Interdisciplinary Scientific Research in interdisciplinary science. The team included Professor Jan Strugnell (James Cook University), Dr Sally Lau (James Cook University / SAEF) and Dr Nerida Wilson (CSIRO & Western Australian Museum).

The team uncovered genetic links between octopus populations now separated by the West Antarctic Ice Sheet — a pattern that can be explained only if seaways opened when the ice sheet fully retreated. The team's research provided the strongest evidence yet that sustained warming of about 1.5 degrees Celsius could trigger an irreversible West Antarctic Ice Sheet collapse, with profound sea-level consequences.

<https://scar.org/community-news/eureka-prize>

<https://australian.museum/get-involved/eureka-prizes/2025-eureka-prize-winners/>



Aylin in front of Fláajökull in Iceland, 2023

Arnold Heine Antarctic Award Aylin de Campo

ARC PhD candidate Aylin de Campo was awarded the 2025 Arnold Heine Antarctic Award, receiving support to attend EGU26 – the European Geosciences Union conference held annually in Austria, Aylin's home country. One of over 20,000 conference delegates, Aylin presented her research in a climate session, and reports:

This winter was a particularly special chapter of my PhD, as I got to combine three fantastic things in one journey: a break from Wellington's winter weather, a visit home, and the opportunity to present my research at the European Geoscience Union General Assembly (EGU), one of the biggest geoscience conferences in the world.

And, of course, when you're already in Europe, you have to make the most of it. I visited my supervisor Prof. Kevin Norton (previously based at VUW) in Tübingen, Germany, where we had intensive discussions about my research and I was able to visit his new Cosmogenic Laboratory. I then headed to Aarhus, Denmark, for another conference.

Meeting so many people whose work I had previously only encountered through papers was incredibly inspiring and gave me plenty of new ideas and directions to explore in my own work. As an added bonus, I was also able to make up for my deficit of vegan schnitzel and indulge in some amazing Danish pastries along the way.

PhD candidate Alyssa Thomas The Scott Base "Good Bugger" award

The Scott Base "Good Bugger" award is an informal, peer-voted accolade given to team members at New Zealand's Antarctica base.

The award recognizes individuals for their mateship, loyalty, and willingness to lend a hand, celebrating the unsung heroes who keep base morale high. Awarded 18 October 2025.

Read more about Alyssa's Antarctica research on page 16.

Alyssa practicing tiroiro near Scott Base
Photo credit: Ocean Mercier



ARC student and early career researcher travel

For postgraduate students and early career researchers, international travel offers invaluable opportunities to progress research, to collaborate with international colleagues, to extend knowledge and to develop future partnerships in their field of expertise.

Dr Jacqui Stuart
Antarctica to Finland, in search of microalgal amino acids

Microalgae living beneath the sea ice in McMurdo Sound are an essential food source for many Antarctic organisms. During the 2024 Antarctic field season, and as part of a larger field team, ARC’s resident marine ecologist Dr Jacqui Stuart sampled microalgal communities from the sub-ice platelet layer under different depths of snow. These samples form the basis of a new collaboration with Professor Sami Taipale at the University of Jyväskylä in Finland.

In November 2025, Jacqui travelled to Finland to work with Professor Taipale’s laboratory. She presented a seminar on her previous Antarctic microalgae research, which explored how community composition changes under different sea-ice conditions. This earlier work helped shape the questions now being addressed through the collaboration. The laboratory team were friendly, supportive and generous with their time and expertise. Jacqui learned new biochemical techniques to extract and quantify amino acids in the Antarctic microalgal samples. These methods are widely used in lake-ice studies but had not previously been applied to platelet-ice microalgal communities. With help from the team, she processed all her samples and completed preliminary data analysis during her month-long stay.

Life outside the lab added to the experience. Daylight hours shortened from eight to six over the month. The first snow arrived, and Lake Jyväsjärvi began to freeze. Weekends were spent trail running, exploring Christmas markets and wandering through the surrounding forests, which provided a refreshing contrast to focused days in the laboratory.

Early results indicate that snow load does influence the amino acid composition of these microalgal communities, our favourite single-celled snacks beneath the ice. Moving forward, this dataset will be combined with community composition and fatty-acid profiles to help us understand how the nutritional value of these communities may shift as sea-ice conditions change. The visit was an exciting first step in building a valuable international collaboration and equipped an early-career researcher with new skills that will support future work on how Antarctic ecosystems respond to a changing environment.

Jacqui is a Research Fellow in Sea Ice Biology
Contact Jacqui: jacqui.stuart@vuw.ac.nz



Left: Mid extraction Antarctic microalgae: one green, one yellow, quietly revealing just how different these tiny communities really are.
Centre: Jacqui in full lab-day mode at JYU. White coat, safety goggles, and the kind of concentration only Finnish winter can inspire.
Right: Late afternoon on the Jyväskylä campus: snow, shadows, and that “is it 3pm or midnight” winter energy.
Photos by Jacqui Stuart.

Nina Quinn, ARC Master of Science candidate
International Ocean Discovery Program (IODP) post-cruise science meeting

Last September, I was fortunate enough to attend the IODP *Expedition 400* post-cruise science meeting in Copenhagen. In 2023, *Expedition 400* recovered sediments from six drill sites on the continental margin of the Greenland Ice Sheet in Baffin Bay, with the broad aim of constraining the development of the northern Greenland Ice Sheet through the Cenozoic (past 65 million years).

At the meeting, I presented a (at that point, very preliminary) sediment model for one of the lower continental slope sites — work that eventually formed the basis of my MSc thesis. It felt particularly valuable to share and discuss this with a wider group of researchers working towards similar aims, and to see where my work fit amongst the other ongoing science.

As a first foray into research, where all my previous exposure has been limited to reading the end product of a published paper, seeing the behind-the-scenes of science in motion was particularly interesting. It was awesome to appreciate the breadth of work being done on the same material — how much opportunity and scope is encompassed within sedimentary cores.

The highlights of the meeting have to be the field trip to Stevns Klint where we ambled along a beach next to the Cretaceous-Paleogene boundary (and where I forgot my raincoat - never again), as well as meeting the other lucky young scientists attending.

Nina is a Master of Science candidate at the ARC. Her thesis title is *Glacial Evolution of the Greenland Ice Sheet through the last 1.2 million-years*.



Above: We visited this famous site at the start of the meeting with the Exp. 400 Science Party. The UNESCO site of Stevns Klint, Denmark holds the K-T (or K-Pg) boundary halfway up the cliff face, marking the mass extinction 66 million years ago, now fondly referred to as the ‘Apocolith’.



Right: Nina (centre) in Copenhagen with other young scientists attending the event. Photos by Georgia Grant.

Teaching and Supervision



ARC PhD candidate Aylin de Campo collects GPS data and records a description for a glacial erratic on Mt Tadpole, East Antarctica, during the K861 field campaign, late 2023. Photo by Lottie Stevenson.

ARC teaching

ARC staff support a wide range of courses taught within the School of Geography, Environment and Earth Sciences, as well as provide postgraduate student thesis supervision. In 2025, our staff supervised 28 PhD and 2 MSc candidates.

ESCI111	The Earth System: An Introduction to Physical Geography and Earth Sciences
ESCI201	Climate Change and New Zealand’s Future
ESCI412	Paleoclimatology
GEOS209	Solid Earth Materials
GEOS309	Solid Earth Materials
ENSC301	Topics in Environmental Science
ENSC402	Perspectives in Environmental Science in Aotearoa New Zealand
GEOG321	Ice and Climate
GEOS206/306	Past, Present and Future Environmental Change
PHYG414	Climate Change: Lessons from the past

ARC postgraduate candidates

Postgraduate and early career awards

PhD Candidates

- Olya Albot*** : Coastal modelling
- Faezeh Bahmani** : Geophysics
- Linda Balfourt** : Sedimentology and Paleoclimatology
- Lisy Boucheron** : Biogenic Aerosols and Sea Ice
- Julianne Burns** : Antarctic Paleoclimatology
- Aylin de Campo** : Paleoclimatology and Glaciology
- Vincent Charnay** : Climate Modelling
- Béatrice Désy** : Information Systems
- Kirstin Gerrand** : Atmospheric Modelling
- Matthew Hardcastle** : National data sets and models for dynamic adaptive pathways planning
- Zoe Heine#** : Sea-level rise
- Hana Ishii** : Antarctic Paleoclimatology
- Daemon Kennett** : Atmospheric Modelling
- Timothée Lebrat** : Climate Modelling
- Karsten Lorentz** : Geochronology and Erosion Mechanics
- Tumanako McLeod** : Physical Geography
- Erika Macapagal-Taluban** : Environmental Studies
- Frank Mackenzie** : Paleoclimate Modelling
- Alexander Mattin** : Paleoclimatology and Volcanism
- Julia Martin** : Sea Ice Evolution
- Vanessa Monteiro#** : Environmental Studies
- Ruby Muir** : Physical Geography
- Awhina Ngatuere** : Geology
- Harrison O’Sullivan-Moffat** : Atmospheric Science
- Alyssa Thomas** : Mātauranga Māori
- Ihanshu Rane** : Antarctic foehn winds
- Prasad Shelke*** : Geophysics
- Xingyu Wang** : Physical Geography

MSc Candidates

- Nina Quinn** : Sedimentology and Paleoclimatology
- Felix Silva Levio** : Physical Geography

Graduated in 2025
*Thesis submitted for examination in 2025

Endowed Development Fund

The ARC Endowed Development Fund comprises endowments and donations from alumni and friends. Financial support scholarships are awarded annually to Te Herenga Waka—Victoria University of Wellington postgraduate students studying a topic relating to the Antarctic region or Antarctica’s influence on New Zealand. Funding supports international travel to work with collaborators, summer school attendance, conference presentations, research paper writing etc. <https://www.wgtn.ac.nz/antarctic/about/endowments/endowed-development-fund-donors>

2025 recipients
Olya Albot
Ruby Muir

Arnold Heine Antarctic Award

New Zealand and Antarctic glaciologist Arnold Heine has generously donated to the Antarctic Research Centre to establish the Arnold Heine Antarctic Research Award to support future generations of Antarctic researchers.

2025 recipient
Aylin de Campo (see page 31)

S.T. Lee Travel Award Young Scientist Exchange

Graduate exchange between the ARC of Te Herenga Waka—Victoria University of Wellington and the International Arctic Research Center (IARC) of the University of Alaska Fairbanks to promote polar research. Awarded annually to PhD students or early career scientists.

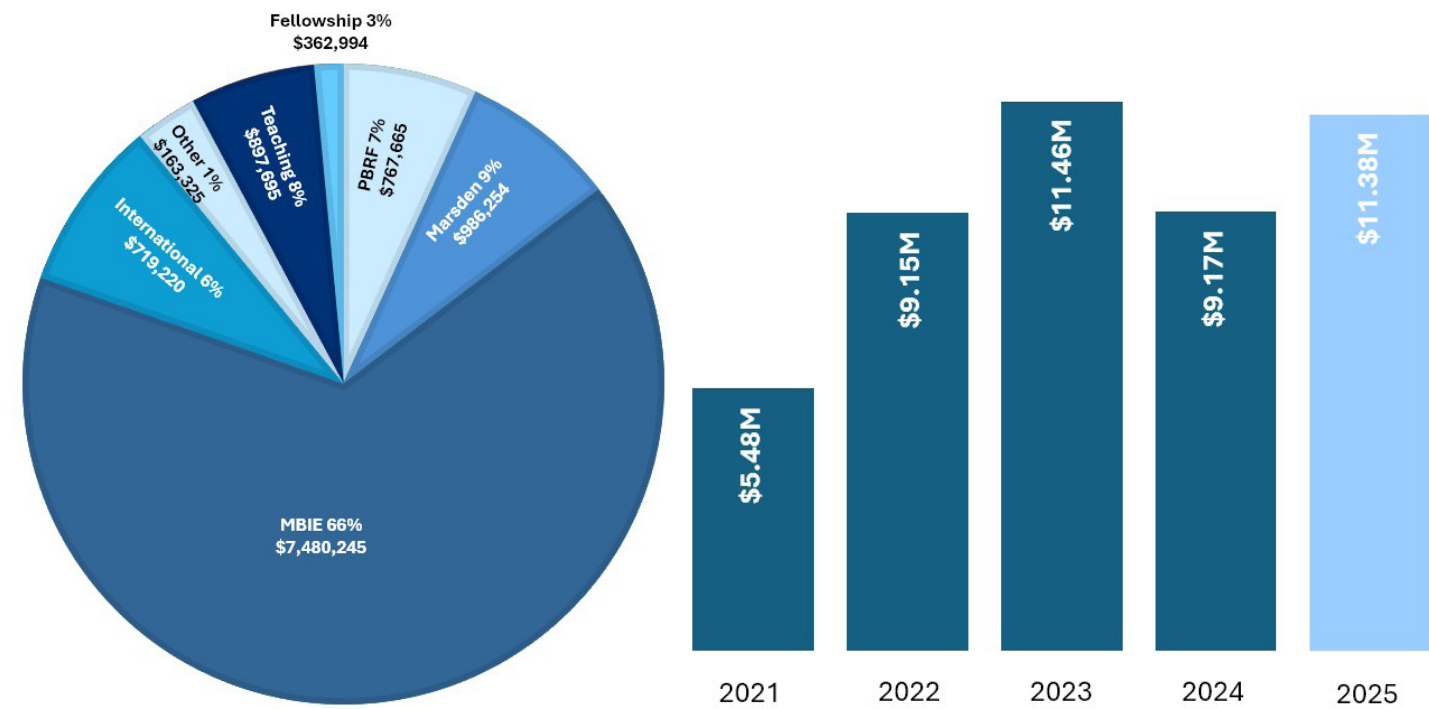
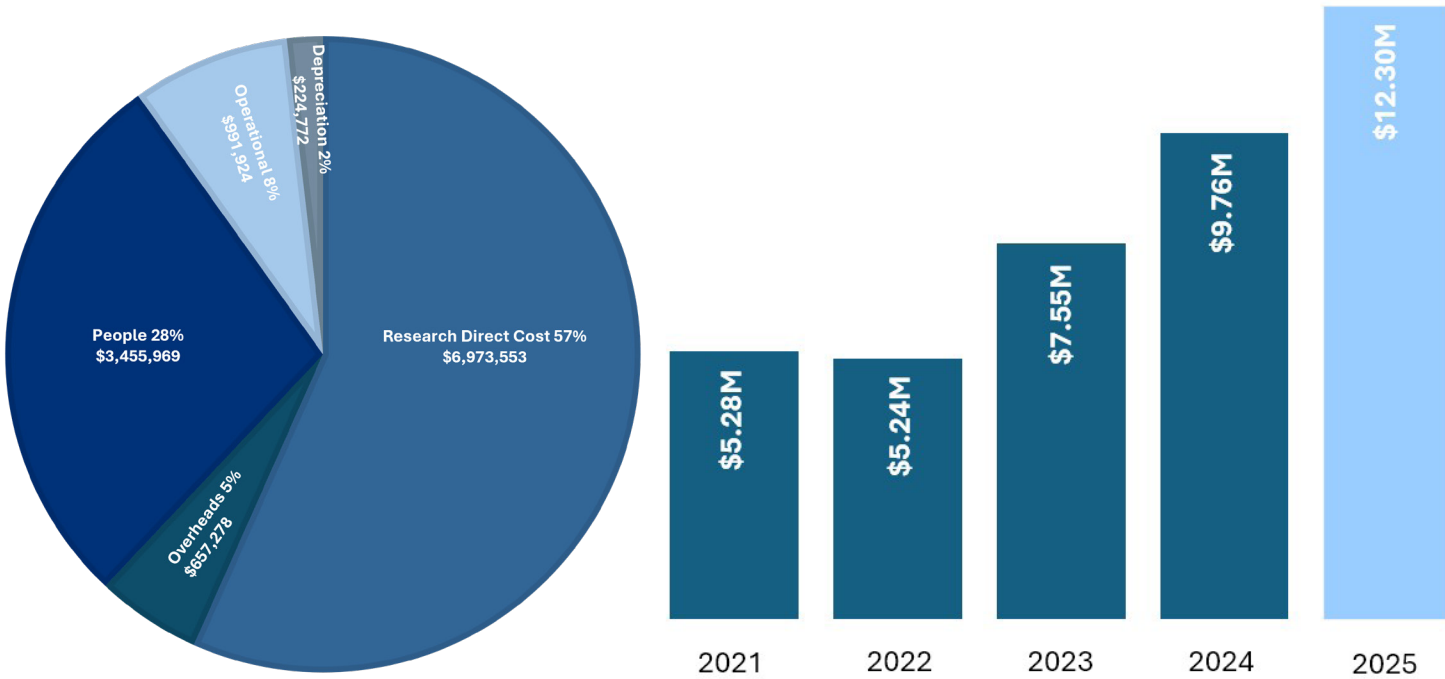
2025 recipients (travelling in 2026)
Dr Peter Siew - Antarctic Research Centre, VUW
Dr Jacqui Stuart - Antarctic Research Centre, VUW

Financial Summary

The ARC finances include both a Centre budget and 49 grants held by the Research Trust of Victoria University of Wellington (RTV). Our consolidated revenue sources and expenditure areas, as well as five year summaries, are summarized in the charts below (all figures are exclusive

of GST). These charts combine the Centre budget that operates over the University financial year (January-December) and the annual invoiced revenue from RTV budgets. As such, the year-end balances for revenue versus expenditure are often out-of-phase.

In 2025, the ARC generated \$11.38m in total revenue. Our expenditure was \$12.30m, which included \$657k of overheads returned to the University from grants, and we generated an operational surplus of \$60k.



Revenue

Overall, 85% of ARC’s revenue was from external funding sources. Funding from the Ministry of Business, Innovation and Employment (MBIE) makes up 66% of total revenue.

The ARC received \$11.38m revenue in 2025, an increase compared to last year due to additional SWAIS2C international project funds being received by the Research Trust of Victoria University of Wellington in 2025. We had six active Marsden grants, a Rutherford Discovery Fellowship and a Ngā Puanga Pūtaiao Fellowship.

The remaining sources of revenue are from internal sources. The \$768k PBRF (Performance-Based Research Fund) accounted for 7% of income, and has continued to increase every year over the last six years. Our teaching revenue of \$898k was from EFTS (Equivalent Full-time Student) for teaching and co-ordinating undergraduate classes and tuition fees for supervising postgraduate students. The increase in teaching revenue from last year was due to increased postgraduate supervision.

Expenditure

Overall, our expenditure was up on the previous year. ARC expenditure is divided between costs incurred directly within grants held in the Research Trust of Victoria University of Wellington, and those incurred directly from the Centre’s budget.

Our ‘People’ costs accounted for 28% (\$3.5m) and covered salaries, annual leave and superannuation for permanent and fixed term staff including research assistants paid from grants.

The Centre’s ‘Operational’ costs include \$369k for occupancy charges for office and workshop space, \$161k to support students through scholarships and grants, \$45k for the Geodiscovery NZ consortium membership, \$120k for consultancy fees, \$15k for IT related charges,

and \$9k for small equipment purchases, maintenance and consumables. The remaining \$317k covered general operational costs such as office supplies, catering, printing, and domestic and international travel costs.

The Centre budget also included \$225k of expenditure for the depreciation of CAPEX equipment.

The almost \$6.9m of Research Direct Costs includes \$4.3m of subcontracts to our research partners. The remaining \$2.6m supported costs such as fieldwork, consumables and travel costs.

The ARC’s \$657k overhead contribution included \$239k to the Research Office and \$418k to the University.

Publications and Presentations

Peer-reviewed publications

Baldacchino, F., Golledge, N.R., Morlighem, M., Horgan, H., Alevropoulos-Borrill, A.V., Malyarenko, A., Gossart, A., Lowry, D.P., Van Haastrecht, L., 2025. Modelling GNSS-observed seasonal velocity changes of the Ross Ice Shelf, Antarctica, using the Ice-sheet and Sea-level System Model (ISSM). *Cryosphere* 19, 107–127. <https://doi.org/10.5194/tc-19-107-2025>

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Reports and Policy

Natalie Robinson, Report, Steering Group | Antarctic Science Platform, Transition to Phase 2, 4 April 2025

Natalie Robinson, Report, Steering Group | Antarctic Science Platform, Transition to Phase 2 (Phase 2 Update), 16 June 2025

Natalie Robinson, Expert Opinion, Science Media Centre, <https://www.pnas.org/doi/full/10.1073/pnas.2500440122>, Response: Southern Ocean salinity & SMOC reversal paper, <https://www.sciencemediacentre.co.nz/2025/07/07/sea-ice-loss-linked-to-salty-southern-ocean-surface-expert-reaction/>, 7 July 2025

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Tim Naish led team that produced first of a new World Climate Research Programme series of Status Briefs for policy and decision makers – “Current status of global sea-level rise”. <https://www.wcrp-climate.org/resources/status-brief> 26 September

Tim Naish provided evidence to the Treaty of Waitangi Climate Change Priority Enquiry https://www.waitangitribunal.govt.nz/en/reports-and-documents?Query=naish&action_search=Search&WaiNumber=&Roi=&PublishedFrom=&PublishedTo=&Type=evidence 14 October 2025

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Conference, workshops, invited presentations

Dickinson, W., Verret, M.*, Lacelle, D., Fisher, Lauren Vargo, oral presentation, 2025 Snow and Ice Research Group Meeting, Wellington, Impacts of Australian dust on snow albedo and snow melt in New Zealand, 10-12 February 2025.

Rob McKay, Invited Keynote, Ulster University, Belfast, UK. Tectonic influences on ice sheet evolution and dynamics. Magellan Plus workshop on Northern Hemisphere Ice Sheets, 4 Feb 2025.

Natalie Robinson, Oral Presentation, Planned NZ research in the Ross Sea region, German delegation hosted at NIWA, ASP Phase 2 Directorship, NIWA, Wellington, 10 February 2025.

Natalie Robinson, Oral Presentation, New Zealand Snow and Ice Research Group (SIRG) 2025 Workshop and New Zealand Sea Ice Symposium 2025, Was 2019 so anomalous after all? How winter storms impacted landfast sea ice in McMurdo Sound, Antarctica over the period 2019 – 2024, Lyall Bay Surf Lifesaving Club, Wellington, 10 - 12 February 2025

Natalie Robinson, Poster Presentation, New Zealand Snow and Ice Research Group (SIRG) 2025 Workshop and New Zealand Sea Ice Symposium 2025, Frazil ice, currents and supercooling in front of the McMurdo Ice Shelf. Lyall Bay Surf Lifesaving Club, Wellington,10 - 12 February 2025

Natalie Robinson, Online oral Presentation, Snow & Ice Research Group (NZ), Progress to date on ASP Phase 2 planning, Lyall Bay Surf Club, Wellington, 10 - 12 February

Natalie Robinson, Oral Presentation, Polynyas research in the ASP workshop, An unprecedented season for sea ice | The view from the ocean, Victoria University, Wellington, 12 February 2025

Natalie Robinson, Phytoplankton in the Antarctic Science Platform, Summary of Sea Ice Research in ASP Phase 1, NIWA, Wellington, 31 March 2025

Natalie Robinson, Oral Presentation, Navigating the Ice: Antarctica in a Changing Climate: Antarctic Science Platform Hui, ASP Phase 1 Project 4 - Introduction and overview Te Papa, Wellington, 1 April 2025

Natalie Robinson, Poster Presentation, Navigating the Ice: Antarctica in a Changing Climate: Antarctic Science Platform Hui, McMurdo Sound’s “Unprecedented” Sea Ice Events: Causes and Consequences, Te Papa, Wellington, 2 April 2025

Natalie Robinson, Oral Presentation, Navigating the Ice: Antarctica in a Changing Climate: Antarctic Science Platform Hui, Introduction to ASP Phase 2, Te Papa, Wellington, 23 April 2025

Warren W. Dickinson, Hartstein, N.D., Davidson, R.J., Poster presentation, IRC2025 - The

International Rock Coast Conference 2025, Low-energy boulder-cobble beaches, eastern Tasman Bay, New Zealand, Trieste, Italy. June 2025

Alex Gossart, Frisp Southern Hemisphere conference 2025, Brisbane, Australia, P-SKRIPS can do it all: polynyas and sea ice representation in a coupled model for the Ross Sea, 8 July 2025

Natalie Robinson, Oral Presentation, FRISP (Forum for Research Into Ice Shelf Processes) - Southern Hemisphere, Sampling Platelet Ice in McMurdo Sound, <https://frisp.w.uib.no/2024/10/21/frisp-south-7-10-july-2025/>, Moreton Bay Research Centre, Queensland, Australia, 8 July 2025

Natalie Robinson, Workshop Contribution, FRISP (Forum for Research Into Ice Shelf Processes) - Southern Hemisphere, Introduction to the ASP Phase 2, <https://frisp.w.uib.no/2024/10/21/frisp-south-7-10-july-2025/>, Moreton Bay Research Station, Queensland, Australia, 9 July 2025

Alyssa Thomas (PhD Student), AusSTS 2025 conference, ‘Signals and Noises’ Melbourne, Australia, Interpreting Tohu (signals) and heihei (noise) between Aotearoa New Zealand and Antarctica in relation to environmental changes. 11 July

Rob Mckay, Invited talk, Core-2-Core Symposium Japan, A-SPICE: Antarctic-Subantarctic Paleo-oceanography, Ice, Climate and Ecosystems, 22 October 2025

Rob McKay, Invited talk, Current knowledge on the Holocene and post-LGM evolution of the Southern Ocean and Antarctica Magellan Plus HIGHLAND (Antarctic drilling) workshop, Bologna, Italy. 25 June 2025

Holly Winton, Invited oral presentation, Utilising Aerosol, Cloud, and Precipitation Data to enhance Model Predictions workshop, Biogenic aerosol in the Southern Ocean and Antarctica, Christchurch, 19 November

Alexandra Gossart, REANNZ meeting, How the partnership with REANNZ supports our Climate Research Group, 27 November

Vargo, Lauren, Invited Oral Presentation, 2025 American Geophysical Union Fall Meeting, New Orleans, USA, Attribution of Glacier Change: An Overview of Existing Work and New Insights from Extreme Mass Loss Years, 15-19 December 2025

Talks to policymakers, schools & community groups

Lauren Vargo, talk to GEWEX Scientific Steering Group meeting on New Zealand frozen water resources, 12 Feb 2025

Tim Naish, online seminar for a Sustainable Business Network Seminar “Antarctic to Aotearoa: Climate risks and your business”. <https://www.youtube.com/watch?v=HWZINN52SnQ>, 27 February

Jacqui Stuart, Guest Lecture at University of Otago - National School of Surveying, March 2025

Natalie Robinson, Oral Presentation, Ryman Village, Havelock North Antarctica’s Role and Response in Global Climate, 16 March

Natalie Robinson, Oral Presentation, Hastings Host Lions Club, Havelock North Community Centre, The most inhospitable oceanography on Earth, 17 March 2025

Natalie Robinson, Oral Presentation, Hasting U3A (University of the 3rd Age), Havelock North, The Layers of Antarctica, 18 March

Natalie Robinson, Oral Presentation, Hastings Ladies Dinner Club, Havelock North, Home away from home | Living and working in Antarctica 18 March 2025

Jacqui Stuart, The NZ Antarctic Society’s Wellington Branch, Fresh off the Ice public lecture, Platelet ice as a habitat, 27 March

Holly Winton, The NZ Antarctic Society’s Wellington Branch, Fresh off the Ice public lecture, Origin of increasing soil gas emissions in Taylor Valley, 27 March 2025

Alex Mattin (PhD Student), Alfred Wegener Institute, Bremerhaven, Germany, Antarctic ice core insights into Earth’s youngest supereruption [Visiting seminar presentation]. May 22 2025

Natalie Robinson, Jacqui Stuart, P. Langhorne, Wells, V. J., World premier of documentary film Mighty Indeed with Q&A, Capitol Theatre, Auckland, 30 June 2025

Natalie Robinson, Jacqui Stuart, P. Langhorne, Wells, V. J., Christchurch premier of documentary film Mighty Indeed with Q&A, Hoyts EntX, Christchurch, 16 July 2025

Natalie Robinson, Jacqui Stuart, P. Langhorne, Wells, V. J., Wellington premier of documentary film Mighty Indeed with Q&A, Roxy Theatre, Wellington, 18 July 2025

Natalie Robinson, Jacqui Stuart, P. Langhorne, Wells, V. J., Schools screening of documentary film Mighty Indeed with Q&A, Roxy Theatre, Wellington, 18 July 2025

Tim Naish as part of a panel with Rob Campbell and Michael Baker on “Dealing to the Evidence” around the disregard for knowledge and scientific evidence, hosted by the Fabian Society. <https://www.youtube.com/watch?v=gcpmnzAQ65s>, 23 July 2025

Alex Mattin (PhD Student), University of Cambridge, UK (Visiting seminar presentation), Antarctic ice core insights into Earth’s youngest super-eruption. 2 July

Natalie Robinson, Introducing Antarctica – Session for visiting class from Mt Maunganui High School, 21 August 2025

Darcy Mandeno, Presentation to the Wellington Vintage Car Club about Antarctica engineering, 19 August 2025

Rob McKay, Invited talk at Eastern Hutt Ladies Probus, How to melt an ice sheet, 13 August 2025

Natalie Robinson, School visit, Mt Maunganui College, Victoria University of Wellington, Presentation with Q&A session, 21 August

Nick Golledge, Parliamentary Science Forum, Royal Society Te Aparangi, On the up: Global sea level rise and its socio-economic impact on Aotearoa New Zealand, <https://www.royalsociety.org.nz/what-we-do/our-expert-advice/parliamentary-science-forum/parliamentary-science-forum-2025/climate-change-when-the-seas-rise>, 9 Sept

Alexandra Gossart, Invited lightening talk at NZRSE 2025, Birds of a Feather Session: Making space: Celebrating People and Diversity in Research Software, 24 Sept

Alex Mattin (PhD Student), SGEES School superseminar presentation, Victoria University of Wellington, Antarctic ice core insights into the climatic and oceanic impacts of the Ōruanui supereruption, September 17 2025

Alyssa Thomas (PhD Student), School visit to Te Ahi Kaikōmako/Rolleston Primary School, Christchurch, What’s in your bag? Preparing for Antarctic fieldwork, October 17, 2025

Tim Naish, Richard Levy, Facilitators for panel discussion following public lecture by visiting Professor Marjolijn Haasnoot, Accelerating climate adaptation in an uncertain world, 21 Oct 2025

Alyssa Thomas (PhD student) and Holly Winton, Scott Base Bar Talk, Antarctica, Observing tohu and maramataka in Antarctica, 29 October 2025

Alyssa Thomas, Zoom call to Rolleston Primary School from Scott Base, 4 November 2025

Peter Siew, Seminar in School of Earth Sciences at Zhejiang University, China, Has Arctic warming influenced midlatitude climate over the past decade? (online), 17 November 2025

Jacqui Stuart, Seminar at University of Jyväskylä, Finland, Food For Thought; Potential impacts of thinning sea ice on microalgae in McMurdo Sound, Antarctica, 13 November 2025

Holly Winton, Invited oral presentation, Utilising Aerosol, Cloud, and Precipitation Data to enhance Model Predictions workshop, Biogenic aerosol in the Southern Ocean and Antarctica, Christchurch, 19 November

Alyssa Thomas, School visit to Rolleston Primary School, Reflections of fieldwork in Antarctica, 20 November 2025

Alyssa Thomas, Oral presentation at MAI ki Hui ā Tau: MAI, Ōtepoti, Dunedin, Tohu and Maramataka in Antarctica, 27-29 November 2025

Natalie Robinson, School visit, Nga Tawa College, Marton, Guest Speaker, school prizegiving, 4 December

Alyssa Thomas, Holly Winton and Ocean Mercier, New Zealand Geosciences Society, online webinar, Tohu and Maramataka in Antarctica, 11 December 2025

Convened workshops

Lauren Vargo, Organized the 2025 Snow and Ice Research Group Meeting, Wellington, 10-12 February 2025

Natalie Robinson, ASP Phase 2 Planning Workshop Facilitation, Antarctica NZ, Christchurch, 21 - 22 January 2025

Richard Levy, Tim Naish & Dao Polsiri convened Our Changing Coast Annual Hui, Rutherford House, Victoria University of Wellington, 13-14 March 2025

Natalie Robinson, Workshop Facilitation, K892 Platelet Ice Workshop, NIWA, Wellington, 31 March 2025

Natalie Robinson, Workshop Facilitation, Navigating the Ice: Antarctica in a Changing Climate: Antarctic Science Platform Hui, Topic-based syntheses publications, Te Papa Tongarewa, Wellington, 3 April 2025

Tim Naish hosted Town Hall Meeting on World Climate Research Programme: Research Highlights and Future Directions, European Geophysical Union Meeting, Vienna, Austria. <https://meetingorganizer.copernicus.org/EGU25/session/55056>. 29 April 2025

Tim Naish convened as Chair the 46th Session of the World Climate Research Programme Joint Scientific Committee at UNESCO, Paris, France. <https://www.wcrp-climate.org/jsc46> 12-16 May 2025

Tim Naish co-convened and presented the WCRP fundraising event during New York Climate Week - “Reality Check - The Future of Global Climate Science” The University Club of New York, 1 W 54th St, New York, NY 10019, United States. 23 September

Tim Naish and Richard Levy co-led a masterclass at the AF2025 conference. The session, titled “SLR (Sea-Level Rise) Challenges for Adaptation”, 8th International Adaptation Futures Conference (AF2025), Te Pae Convention Centre, Christchurch, New Zealand. 13-16 October 2025

Tim Naish and Robert Vautard co-convened the World Climate Research Programme (WCRP) and Intergovernmental Panel on Climate Change (IPCC) Co-Sponsored Workshop on: “Earth system high impact events, tipping points and their consequences” at Sorbonne University, Paris, France. <https://apps.ipcc.ch/eventmanager/documents/97/210320260844-INF.%202.%20Rev.%201-%20Progress%20Report%20WGI.pdf> 26-28 November 2025

TV/Radio/Film

Natalie Robinson, Jacqui Stuart, Wells, V. J., P. J. Langhorne, Full-length documentary feature film, *Mighty Indeed*, NZ DocEdge Film Festival, <https://www.elantimedia.com/> 30 June 2025

Natalie Robinson, Jacqui Stuart, Radio Interview, RNZ | Voice of the Sea Ice, Life! (Episode 03), <https://www.rnz.co.nz/podcast/voice-of-the-sea-ice>, 3 April 2025

Natalie Robinson, Jacqui Stuart, Radio Interview, RNZ | Voice of the Sea Ice, Changing times (Episode 05), <https://www.rnz.co.nz/podcast/voice-of-the-sea-ice>, 3 April 2025

Natalie Robinson, Radio Interview, Access Radio | Conversations with Wāhine, <https://open.spotify.com/episode/20nRHKnPBUOp2jT62UIIKC?si=NJI3IEEqTmCkhjQBg-eyLQ>, 2 July 2025.

Natalie Robinson, Radio Interview, RNZ | Saturday Morning, Mighty Indeed - Life on Ice, <https://www.rnz.co.nz/national/programmes/saturday/audio/2018994323/mighty-indeed-life-on-the-ice> 5 July 2025

Rob McKay, Radio Interview, US cuts on Antarctic research could be a major blow for NZ, <https://www.rnz.co.nz/news/thedetail/558166/us-cuts-on-antarctic-research-could-be-a-major-blow-for-nz>, 15 April 2025

Rob McKay, Huw Horgan, Radio Interview, RNZ, The elusive Antarctic ice and sediment core that could answer sea level rise questions, <https://www.rnz.co.nz/news/national/581612/the-elusive-antarctic-ice-and-sediment-core-that-could-answer-sea-level-rise-questions>, 12 December 2025

Online and printed articles

Tim Naish and Nick Golledge, 25 January 2025, quoted for an article in New Zealand Geographic magazine on “Antarctic octopus sounds a warning over sea-level rise. <https://www.nzgeo.com/stories/antarctic-octopus-sounds-a-warning-over-sea-level-rise/>

Shaun Eaves, Lorrey, D., Brian Anderson, Purdie, H., and Lauren Vargo, 10 March 2025, The Conversation, NZ’s glaciers have already lost nearly a third of their ice – as more vanishes, landscapes and lives change, <https://theconversation.com/nzs-glaciers-have-already-lost-nearly-a-third-of-their-ice-as-more-vanishes-landscapes-and-lives-change-250617>

Lauren Vargo, 12 April 2025, RNZ National, A recent report by Stats NZ reveals an alarming 42% decline in NZ’s glacier ice volumes between 2005 and 2023, equivalent to a loss of more than a third of Lake Taupo’s volume

Lauren Vargo,12 April 2025, MSN New Zealand, Glaciers have lost volume equivalent to a third of Lake Taupo since 2005.

Lauren Vargo, 12 April 2025, 1News, Glaciers have lost volume equivalent to a third of Lake Taupo since 2005

Lauren Vargo, 12 April 2025, Otago Daily Times, Glaciers have lost volume equivalent to a third of Lake Taupo since 2005, <https://www.odt.co.nz/news/national/glaciers-lose-equivalent-third-lake-taupo%C5%8D-2005>

Lauren Vargo, 12 April 2025, Radio New Zealand, Glaciers have lost volume equivalent to a third of Lake Taupo since 2005, <https://www.rnz.co.nz/news/national/557949/glaciers-have-lost-volume-equivalent-to-a-third-of-lake-taupo-since-2005>

Lauren Vargo, 12 April 2025, Greymouth Star, Glaciers lost equivalent to third of Lake Taupo, https://readnow.isentia.com/Temp/206599-1179377626/1076422948_20260413.pdf

Lauren Vargo, 14 April 2025, Northern Advocate, Stark warning on melting glaciers, https://readnow.isentia.com/Temp/206599-1179801061/1076766794_20260415.pdf

Lauren Vargo, 14 April 2025, Whanganui Chronicle, Stark warning on melting glaciers https://readnow.isentia.com/Temp/206599-1179807832/1076771858_20260415.pdf

Lauren Vargo, 14 April 2025, New Zealand Herald, Stark warning on

melting glaciers https://readnow.isentia.com/Temp/206599-1179807832/1076771858_20260415.pdf

Natalie Robinson, Jacqui Stuart, 15 April 2025, Published Article, iScience, 28, 5, A glimpse into the future: How the timing of sea ice formation influences associated microalgal communities, <https://doi.org/10.1016/j.isci.2025.112417>

Natalie Robinson, Jacqui Stuart, 29 May 2025, Self-authored Newspaper Article, The Conversation, Antarctica’s sea ice is changing, and so is a vital part of the marine food web that lives within it, <https://theconversation.com/antarcticas-sea-ice-is-changing-and-so-is-a-vital-part-of-the-marine-food-web-that-lives-within-it-255606>

Tim Naish, 12 June 2025, The Listener, NZ scientists feel the heat from US budget cuts <https://www.nzherald.co.nz/the-listener/new-zealand/nz-scientists-feel-the-heat-from-us-budget-cuts/A5E36ADGZVFJDGD42RH52ACJIA/>

Judy Lawrence, 3 July 2025, Science Media Centre NZ, More rain for flood-stricken Nelson Tasman – Expert Reaction, <https://www.sciencemediacentre.co.nz/2025/07/01/more-rain-for-flood-stricken-nelson-tasman-expert-reaction/>

Natalie Robinson, 8 July 2025, MSN New Zealand, Southern Ocean getting warmer and saltier, will ‘change the way the planet works’ (response) <https://www.msn.com/en-nz/news/national/southern-ocean-getting-warmer-and-saltier-will-change-the-way-the-planet-works/ar-AA1I9UM3>

Holly Winton & Ayla Hoeta, 16 July 2025, Printed article, The Conversation, We travelled to Antarctica to see if a Māori lunar calendar might help track environmental change. <https://theconversation.com/we-travelled-to-antarctica-to-see-if-a-maori-lunar-calendar-might-help-track-environmental-change-239583>

Holly Winton, 16 July 2025, Evening Report NZ, We travelled to Antarctica to see if a Māori lunar calendar might help track environmental change, <https://eveningreport.nz/2025/07/16/we-travelled-to-antarctica-to-see-if-a-maori-lunar-calendar-might-help-track-environmental-change-239583/>

Holly Winton, 17 July 2025, VUW News, We travelled to Antarctica to see if a Māori lunar calendar might help track environmental change, <https://www.wgtn.ac.nz/news/2025/07/we-travelled-to-antarctica-to-see-if-a-maori-lunar-calendar-might-help-track-environmental-change>

Tim Naish, 10 September 2025, SMC Expert Reaction “Polar Engineering Ideas Are Dangerous”. <https://www.scimex.org/newsfeed/polar-geoengineering-projects-a-dangerous-distraction>

Tim Naish, 11 September 2025, Science Media Centre NZ, Polar geoengineering ideas “dangerous” - Expert Reaction, <https://www.sciencemediacentre.co.nz/2025/09/10/polar-geoengineering-ideas-dangerous-expert-reaction/>

Shaun Eaves, 18 September 2025, The Listener, Running Amoc: An ocean current that regulates the climate is in peril, <https://www.nzherald.co.nz/the-listener/new-zealand/running-amoc-an-ocean-current-that-regulates-the-climate-is-in-peril/4CMDJZ2PRRBUXMZ4OAX7UNIIVU/>

Natalie Robinson, J Stuart, 24 September 2025, Published Journal Article, Molecular Ecology 1-18, Tropics to the Poles: A Snapshot of Coastal Eukaryotic Marine Microalgal Diversity Across Five Ecoregions <https://doi.org/10.1111/mec.70136>,

Lauren Vargo and Tim Naish, 30 September 2025, The Listener, Slash & burn: How Trump’s health and science cuts are hitting home in NZ, <https://www.nzherald.co.nz/the-listener/new-zealand/slash-burn-how-trumps-health-and-science-cuts-are-hitting-home-in-nz/54RAWDMA05E6JPPX3YQDJI6WUI/>

Tim Naish, 5 November 2025, SMC Expert Reaction “NZ’s climate law to change – Expert Reaction. <https://www.sciencemediacentre.co.nz/2025/11/05/nzs-climate-law-to-change-expert-reaction/>

Tim Naish, 7 November 2025, Spinoff article “The updates to climate law, explained”.<https://thespinoff.co.nz/politics/07-11-2025/the-updates-to-climate-law-explained>

A waddle of emperor penguins hide from lurking orcas on an ice floe off Scott Base. Photo by Matt Harris.



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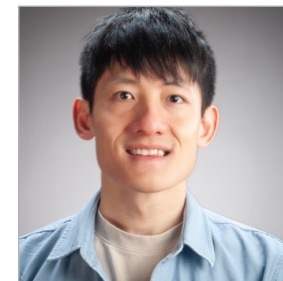
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Oceanum	

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Type-C orcas surface amidst the sea-ice breakout off Scott Base.
Photo by Matt Harris.



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