IceSked

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Newsletter of Te Puna Pātiotio—Antarctic Research Centre
Te Herenga Waka—Victoria University of Wellington

A word from our Director

The Scientific Committee on Antarctic Research INSTANT conference in Italy brought much of the Antarctic committee together in person for the first time since Covid. While senior scientists with established connections can meet and collaborate online, it was watching a cohort of students from all over the world building new collaborations that really brought home to me the opportunities that our next generation of researchers have been missing over the past few years. The importance of these early career years was also highlighted by reunions and visits from alumni who reflected on past expeditions, and how these truly were pivotal moments that formed friendships and collaborations for the rest of their lives. In this issue, we profile collaborations both past and present. *Rob McKay*

VUWAE 15 (1970-71) returns

by Peter Barrett

In June 2023, the Antarctic Research Centre hosted a reunion for VUWAE 15, the first VUW expedition led by a foreigner (me), originally from Auckland but at that time based at Ohio State University in Columbus, Ohio. Fortunately, the expedition had been well planned before I arrived. Barry Kohn, a geochemistry PhD student, undertook a season two years previously with Barrie McKelvey and Peter Webb in the mountains surrounding the Skelton Neve. Their mission had been to extend knowledge of the Beacon Sandstone in that area, and they discovered beds of remarkable Devonian fish skeletons.

Consequently, VUWAE 15 planned for more detailed work in logging the ~1000 m of Beacon strata in the area, with Barry and two prospective PhD students, and fossil fish collecting from the lower part by experts from the Australian Museum in Sydney. The party also included petrologist, Rodney Grapes, and a prospective MSc student, to study the spectacular 1000m-thick dolerite sill in the nearby Warren Range.

I arrived in January 1970 on my first appointment for a two year trial, after my new PhD and two seasons in the central Transantarctic Mountains. Prof Bob Clark's Geology Department, where staff debated among themselves and engaged with the students on the big issues of the day, was an enjoyable challenge.

The expedition left for the ice in early November 1970, and returned in early February 1971, after great success with 5000 m of strata measured, 1 ½ tons of fish fossils collected, and a few years later two PhDs awarded, along with a number of reports and papers. There were mishaps involving both the leader and deputy leader, and a number of toboggan failures, but these were all overcome. The expedition was a very positive experience for its members and ensured the continuation of similar expeditions in following years.

VUWAE 15 Returns in June 2023 was an event involving four of the original party, with comments from a fifth. The reunion hosted a series of 5 talks for the ARC, as well as two videos, and each party member reflected on their experiences at the time, and thoughts since. Videos of the event are available as a playlist on: www.youtube.com/@newzealandantarcticsociety4100

Sadly, Alex Ritchie (1935-2023), palaeontologist on this 1970-71 expedition, passed away last month. Alex's extraordinary achievements are summarized in an extended obituary published online by the Sydney Morning Herald.

VICTORIA UNIVERSITY OF WELLINGTON TE HERENGA WAKA
Te Puna Pātiotio
Antarctic Research Centre

SCAR INSTANT conference

by Tim Naish

The Scientific Committee on Antarctic Research INSTANT (Instabilities and Thresholds in Antarctica) Strategic Research Programme held its first international conference in Trieste, Italy this September. 280 participants from 35 countries including 60% early to mid-career researchers enjoyed 4 days of interdisciplinary presentations and discussions on Antarctic Ice Sheet changes and their contribution to global sea-level rise as well as the related coastal impacts and challenges for adaptation. The conference was held in a single room with talks in the morning followed by posters and more focussed workshops in the afternoon. Each day had a theme: 1) Climate-ice sheet interactions; 2) solid Earth - ice sheet interactions; 3) Improving ice sheet mass loss and sea-level rise projections and 4) implications for coastal hazard and risk management and the communication of risk and uncertainty.

It was great to see data and observational communities interacting with modellers working across and connecting the ice sheets, sea-ice, solid earth, ocean and atmospheric systems and talking with social scientists about why ice sheet loss and sea-level rise matter to the 2 billion people living on the worlds coastline and why this matters, and the information and services they need. On Day 4 in the "Melting ice Rising Seas Symposium" we heard from invited speakers representing Intergovernmental Panel on Climate Change, World Climate Research Programme, UNFCCC COP, NGOs, coastal planners, practitioners and policy decision-makers, journal editors (e.g. Nature), indigenous communities, story-tellers and writers. The rich discussions focussed on how all these stakeholder groups can work to more effectively to link science enterprise with policy and solutions communities need.

It was great to catch up with many old friends and colleagues and to make new connections and collaborations and awesome to see so many younger researchers making connections face to face after many years disrupted by COVID. Our community is alive and well, with many exciting opportunities developing to solve the Antarctic ice sheet sea-level rise problem. New Zealand and ARC researchers were well represented at the conference and sponsorship and support by GNS Science, Victoria University of Wellington and SCAR enabled most ECMRs to receive travel support. Aimee Kaio from Awarua Runaka and the Antarctic Science Platform presented a Te Ao Moari perspective on Antarctica and climate change impacts. Rebecca Priestley from the School of Science in Society gave a great talk on history and challenges of communicating climate change and sea-level science. Some important priorities were identified which will help shape the strategic direction of future research including improved collaboration between ice sheet modelling and sea-level projection communities guided by the needs of the user community.

The student experience at INSTANT

by Julianne Burns, Frank Mackenzie, Hana Ishii, & Huiling Zou

Four ARC PhD students also attended the INSTANT conference this September in Trieste, Italy - for most of us our first international meeting. We left winter in Wellington and arrived for summer in Italy, which was a very welcome environment for such an exciting conference. We had the privilege to attend talks from leading and emerging scientists in our fields, as well as gain exposure to research outside of our specializations. We each presented posters of our research and made a number of connections through the poster session and networking events.

The conference workshops were very engaging, fostering passionate discussion about future collaborations between universities and disciplines. Prior to the conference, Frank and Huiling attended the MARICE workshop, discussing the integration of marine sediment and ice core records and setting a path for ongoing interdisciplinary, international research. Hana and Julianne participated in the post-conference workshops on International Ocean Discovery Program Expedition 374 post cruise science meeting, which involved all of the leading scientists from the expedition discussing what they have discovered from the recovered sediment cores and exploring future collaborations. Hana and Julianne are both using sediment cores from this expedition for their PhDs and they found it invaluable to see the scope of research that has come from this expedition, and to develop important collaborative opportunities with scientists all around the world.

A highlight for all was the ECR lunchtime sessions, where a panel of leading scientists and professionals shared knowledge and answered our questions relating both to their specializations and to navigating the career paths ahead of us. We are very grateful to the Endowment fund for sponsoring our travel, accommodation and attendance at INSTANT. The experience, connections, and friendships cultivated during the conference will undoubtedly stay with us throughout our careers.

S.T. Lee Lecture in Antarctic Studies

by Rob McKay

The 20th Annual S.T. Lee Lecture was presented by the long-time ARC collaborator Tina van de Flierdt, a Professor of Isotope Geochemistry and Head of the Department of Earth Science and Engineering at Imperial College London. Her lecture was entitled "Drilling for our future in Antarctica's past" and took us on a personal journey of asking questions, finding answers, and uncovering more questions.

Her academic journey so far has been incredibly diverse and spans a variety of fields, from understanding chemical cycles of trace elements and pollutants in the ocean, to reconstruction of ocean circulation and its relationship to climate, and understanding the history of the polar ice sheets and their vulnerability to future climate change. In all of these fields, she is a true world leader, but her talk primarily focused on her pioneering work in using trace element tracers to identify the geochemical "fingerprints" of past ice sheet collapse events, as recently as the last interglacial period 120,000 years ago – and how these results have been fundamental to improving models to project future change.

Tina also highlighted the important role of the Ross Ice Shelf in protecting the West Antarctic Ice Sheet from warmer oceanic temperatures, and the implications of its stability for future sea-level rise around the world. She noted that the scale of this future response remains in our hands, and that she is a stubborn optimist who believes we still have time to overcome many of the challenges that climate change will bring for our ice sheets.

Tina's schedule of events was deliberately short compared to most ST Lee Lecturers, as she deployed to Antarctica in the following week for two months. There she will be Co-chief Scientist, alongside Richard Levy (ARC and GNS Science), on the international SWAIS-2C project, which seeks to understand in more detail the history of the Ross Ice Shelf and West Antarctic Ice Sheet. We eagerly wait to see how the next phase of her personal scientific journey plays out in this project.

Prof Richard Levy, Prof Tina van de Flierdt, ARC Director Prof Rob McKay

Fostering current and future collaborations with Australia

by Alexandra Gossart and Rob McKay

Over the course of its history, the Antarctic Research Centre has a long, but perhaps underutilised history of formal collaborations with Australia, despite a lot of complimentary capabilities. However, in recent years we have seen significant developments in developing enduring collaborations. Our longest running partnership is through the International Ocean Discovery Program, which the ARC forms part of a consortium of Australian and New Zealand institutes.

In April, Rob Mckay visited Tasmania to discuss the future of ocean drilling in the Australian region, and how our Australia and New Zealand partnership could take a global lead in key aspects of a future IODP, as it retires its flagship drilling ship the JOIDES Resolution – potentially using infrastructure built by the ARC and GNS Science. At the end of July, the *Latitudes of Changes* - 2023 New Zealand - Australia Antarctic Science Conference in Christchurch brought over 200 people together, including many ARC staff and student. This meeting was a great opportunity to discuss challenges and opportunities for collaborations with Australian researchers. However, another highlight of this conference was also when our PhD student Nikhil Hale was awarded the Ella Yelich-O'Connor Antarctic Doctoral Scholarship.

Two weeks later, Alexandra Gossart attended the 2023 Southern Ocean Observing Systems Symposium (14-18 of August) in Hobart, that was attended by 300 scientists from 25 different countries and focussed on the recent changes in the Southern Ocean. The workshop highlighted the pressing need to expand our observational networks to understand current conditions in order to prepare for future changes in southern climates.

Meanwhile, Nancy Bertler serves as the Chair of the International Science Advisory Panel (ISAP) of Securing Antarctica's Environmental Future (SAEF), a research program through the Australian Research Council's Special Research Initiative in Excellence in Antarctic Science. In this role, she advises on the science strategic direction of SAEF to help it achieve its research aims and aspirations for impact. TIm Naish has also had active engagement with the Australian Centre for Excellence in Antarctic Science (ACEAS), regarding coastal sea-level projections and impacts in Antarctica. We are looking forward to meetings in 2024 to continue to build these collaborations with our Australian partners in these programs.

Ray Hoare donation

The ARC is very thankful to Ray Hoare, who made a generous donation to the ARC Endowed Development Fund this year. Ray is a former Te Herenga Waka – Victoria University of Wellington student who visited the Dry Valleys McMurdo region in the early 1960s on VUW Antarctic Expeditions (VUWAE) 8 and 9. On these expeditions he employed his physics skills to explain the existence of warm water in the lakes in this ice-free area of Antarctica.

Lake Hoare is named after Ray.

His contributions were published in four journal articles shortly after these expeditions, including a 1964 article in *Nature*. In that paper, Ray and his colleagues showed that a quantitative solar heating model of density stratified Lake Bonney could explain the warm water, peaking at a temperature of 7˚C, 13 m below the surface.

In the last three years he has reviewed his archives and finally published material from two minor lakes from almost 60 years ago, in the NZ Journal of Hydrology!

In October, the ARC hosted Ray and his partner Patricia, and we were captivated by his stories of the University's early Antarctic history and how our Geology, Chemistry, and Physics departments all worked together to investigate this frontier of Antarctic scientific exploration.

Like most of our VUWAE alumni, Ray described his Antarctic field work as being a pivotal turning point in his life, and felt a strong desire to provide the next generation of students with a similar life-changing opportunity. Accordingly, Ray's Gold Level support of the ARC Endowed Development Fund will provide an enduring legacy for our emerging scientists. This substantial gift to the Fund is being recognised by the ARC via matched funding to establish a Master's Scholarship named after Ray.

We are truly grateful for Ray's support of our students.

Girls* on Ice update

by Lauren Vargo and Julia Martin

We're gearing up for our first Girls* on Ice expedition, buzzing with activity! Around 230 applications poured in by September, and by mid-October, we excitedly notified the 10 chosen participants, aged 15 and 16, hailing from various corners of Aotearoa. They will explore nature through art, Earth Sciences, and outdoor adventures at Mount Ruapehu for seven days. Post-expedition, we'll delve into career paths at Victoria University of Wellington, ending with presentations to friends and whanau.

Another recent success was a generous grant from the US Embassy Grants Program, strengthening ties between the US and New Zealand while addressing global issues like climate change's impact on snow and glaciers. We're thrilled about co-developing an exchange with Girls* on Ice Alaska. The collaboration involves an artist from their team joining our 2024 expedition and an alum from ours heading to Alaska in 2024 or 2025 as an assistant instructor!

Winter School

by Mario Krapp

In late September, 20 participants from across New Zealand universities and CRIs came together to develop their skills in numerical climate modelling research, as part of a three-day workshop run by the Antarctic Science Platform's National Modelling Hub.

The Hub runs the annual Winter School to guide interested students and researchers through the scientific basis of numerical climate modelling, offering lectures and interactive training. This year's event, Introduction to Climate Modelling and Data Analysis, was run in partnership with NeSI, the New Zealand eScience Infrastructure.

With a great turnout, lots of discussions and networking, the event was deemed a great success. It serves as an example of how to provide advanced, high-quality training opportunities for Aotearoa's growing numerical climate modelling research community.

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