IceSked

Issue 27: December 2016

Newsletter of the Antarctic Research Centre
Victoria University of Wellington

A Word From the Deputy Director

In this issue we highlight the prestigious fellowships and grants recently awarded to ARC staff, which provide career-changing opportunities for both established and emerging researchers. We also feature the recognition received by Nancy Bertler and Tim Naish – Nancy, for her decade-long, community effort to build a New Zealand ice core programme, and Tim, for his tremendous contribution to Antarctic science.

Andrew Mackintosh

Tim Naish

Further Recognition for Leading Antarctic Researcher

Tim Naish, Director of the Antarctic Research Centre, is one of three leading New Zealand scientists to be recognised for research excellence with an esteemed James Cook Research Fellowship. Two of the three fellowships for 2016 were awarded to Victoria researchers.

Administered by the Royal Society of New Zealand on behalf of the Government, James Cook Research Fellowships are awarded to researchers who demonstrate that they have achieved national and international recognition in their area of scientific research. The fellowships allow researchers to concentrate on their chosen research for two years, and are worth $110,000 annually.

In this project, Tim will work toward reducing the uncertainty of future sea-level rise on two levels. Firstly, he will work closely with international collaborators to drill a geological record on the West Antarctic Ice Sheet that will help researchers to determine how the ice sheet has reacted to temperature changes in the past and hence provide more accurate predictions of future changes. Secondly, he will improve region-specific projections of sea-level rise in New Zealand by taking into account local influences and hydro-glacio-isostatic (GIA) modelling – the latter referring to the modelling of changes to Southern Ocean sea levels as a consequence of predicted rise of land masses previously depressed by the huge weight of ice sheets. Ultimately, better predictions of future sea-level rise are critically needed for anticipating and managing the socio-economic impacts of sea-level rise in New Zealand.

ARC Researchers Do It Again! A Fourth Rutherford Discovery Fellowship

Huw Horgan

Huw Horgan, a senior lecturer in the ARC and School of Geography, Environment and Earth Sciences is among a small group of emerging New Zealand scientists to receive a highly sought-after Rutherford Discovery Fellowship from the Royal Society of New Zealand. Huw is now the fourth recipient of a Rutherford within the ARC, joining Nancy Bertler, Rob McKay, and Nick Golledge who were awarded their fellowships in 2011, 2013, and 2015 respectively.

Huw is one of three Victoria researchers from the Faculty of Science who have each been awarded funding of $800,000 over five years. All ten fellowships were announced by Science and Innovation Minister Steven Joyce, which are designed to support future leaders in the New Zealand science and innovation system by encouraging their career development and enabling them to establish a solid track record in their field of expertise.

Huw's research will investigate how the conditions beneath the West Antarctic Ice Sheet affect its contribution to sea level over the coming centuries. Using a combination of remote sensing, oversnow geophysics, and direct access, he will examine the properties and processes beneath the West Antarctic that enable the fast flow of ice streams. Of specific interest to this project is the distribution and role of water beneath the ice sheets. At the centre of the project is an initiative to directly access the base of the ice sheet using VUW's newly acquired hot water drill. Such direct access promises to provide the critical observations most needed to constrain the future of the ice sheets.

"I feel immensely privileged to receive this fellowship, and excited about the opportunity to undertake the research." says Huw.

Professor Mike Wilson, Pro-Vice-Chancellor of Victoria's Faculty of Science, says the awards are a significant achievement.

"It is immensely satisfying to see these researchers being supported to reach their potential, and make a contribution to New Zealand. It's also fantastic national recognition of the calibre of scientific research capability at Victoria."

ARC Researcher Receives Blake Leader and Wellingtonian of the Year Awards

Nancy Bertler received a 2016 Blake Leader Award in recognition of her major contribution to exploring climate change in Antarctica and being a role model for young researchers, especially women. Blake Leader Awards are given to six New Zealanders in the middle of their careers who have demonstrated outstanding leadership and the determination to achieve extraordinary things. The 2016 Blake Medal and Blake Leader awards were presented by the Governor-General, Lieutenant General the Rt. Hon Sir Jerry Mateparae at Auckland Museum on 1 July.

Nancy is an internationally respected ice core scientist and is jointly appointed by the ARC and GNS Science. She is a pioneer of Antarctic ice core climate science in New Zealand, developed and manages the New Zealand Ice Core Research Laboratory at GNS Science, has led 13 expeditions to Antarctica, and is chief scientist for the Roosevelt Island Climate Evolution (RICE) project, which involves the collaboration of nine nations. In 2011 she received a prestigious Rutherford Discovery Fellowship.

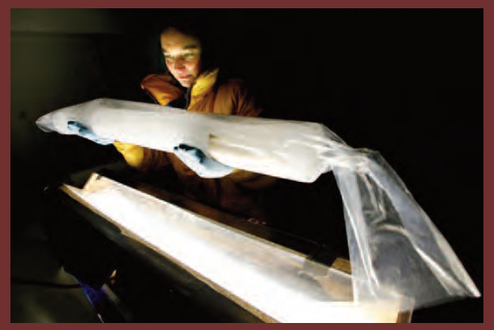
"The award is a huge honour," says Nancy. "It's extremely humbling considering the calibre of previous awardees, their awe inspiring achievements and their dedication. I'm excited to have the opportunity to get to know many of them and to be challenged to stretch further in the spirit of the award."

Pro-Vice-Chancellor, Professor Mike Wilson, says Associate Professor Bertler's award is an outstanding achievement.

"Nancy is a driving figure within the University as well as in the community, establishing a climate change course at Victoria and helping New Zealanders understand the consequences of a warming world. She's a fantastic mentor for students and her colleagues."

Then on 10 November, Nancy won the Science and Technology category in the 2016 Wellingtonian of the Year awards presented at a ceremony at Te Papa. The "Wellys" honour and celebrate the work of outstanding Wellingtonians in nine categories.

Nancy credits her success to support from former director of the ARC Peter Barrett, current director Tim Naish, former GNS Science chief executive Alex Malahoff, as well as colleagues and collaborators nationally and internationally.



Nancy Bertler looks at a 2000-year-old ice core in the Ice Core Research Laboratory at GNS Science (photo credit: Fairfax Group)

Shaun Eaves in front of the retreating Fox Glacier in 2012 (above) and 2016 (below)

A Science Story: New Research Made Possible by Marsden Award

Ongoing retreat of mountain glaciers worldwide is considered to represent a clear signal of anthropogenic global warming. In the Northern Hemisphere this attribution is strengthened by long (>100 yr) records of glacier and climate observations. However, Southern Hemisphere glaciers are less well studied, thus we must turn to the geological record to provide long-term context for understanding present and future change.

In New Zealand, existing geological records suggest that glaciers may have been larger than present for the majority of the Holocene Epoch (the last ~12,000 years). However, these records only represent times of past glacier advance, thus little is currently known about glacier response to previous periods of warming. Recent advances in geological dating techniques now provide the opportunity to address this knowledge gap, by directly quantifying the duration of past glacier retreat periods.

Funded by a Marsden Fast-Start research grant starting in 2017, we will utilise state-of-the-art geological dating techniques to determine how long New Zealand glaciers were smaller than today during the Holocene. Integrating these new geological constraints with computer model simulations of past glacier fluctuations, we aim to answer the question: Is the current retreat of New Zealand glaciers unprecedented for the last 12,000 years?

Shaun Eaves

Presenting 'Naish Peaks'

Staff and students announced the newly named 'Naish Peaks' to a surprised Tim Naish, during the annual send-off for members of the ARC travelling to Antarctica this season.

The Antarctic feature name was approved by the New Zealand Geographic Board Ngā Pou Taunaha o Aotearoa in September 2016, recognising Tim's highly successful Antarctic scientific career, particularly in the area of paleoclimatology.

Tim says it is a real honour. "I'm humbled and have to say I was a little lost for words—it isn't just one mountain, but a whole range. My children seem to think they will get one peak each!"

"I have been very fortunate to have had the opportunity to work with such a talented team of researchers in the 'coolest' place on the planet, doing science that matters for our future."

"In 2010 our group camped in the Beardmore Glacier, which is only 700 kilometres from the South Pole under the then unnamed Naish Peaks, finding fossil evidence of where beech trees once grew under a warmer climate. It is also near where Captain Scott's team took time to relax on their ill-fated return from the South Pole in January 1912."

Tim Naish holds the plaque presented to him showing the location and geographical information on Naish Peaks (photo credit: Veronika Meduna)

Pro-Vice-Chancellor, Professor Mike Wilson, says "the naming of Naish Peaks is a fitting recognition of Tim's outstanding contribution to Antarctic science."

Naish Peaks, a line of small peaks that sit between Antarctica's Meyer Desert and Dominion Range valleys, reach up to 2,874 metres high, on a ridge trending east-west and spanning seven kilometres.

Lauren Vargo on the via delle Bocchette, in the Brenta Dolomites

Karthaus Summer School

In September, myself and 33 other students from around the world travelled to northern Italy for two weeks to attend the Karthaus Glaciology Summer School.

While the course was quite intensive, learning about topics including numerical modelling, glacial hydrology, and glacial geomorphology, we found time to go for group trail runs in the surrounding mountains, eat delicious food, and discuss our own research projects. One day was spent hiking through the Ötztal Alps, close to where Ötzi the Iceman was found, to service a weather station on Hochjochferner glacier.

The course culminated with the presentations of group research projects. My group used a new two-dimensional ice sheet model to investigate ice loss and resulting sea-level rise for different warming scenarios. Our results showed that by the year 3000, if present warming continues at a similar rate, 10% of the Antarctic ice sheet will have melted and resulted in 3 m of sea-level rise. While trying not to damper the last day of the course, we hoped that these results would remind our classmates the importance of Antarctic research and why we had all travelled to Karthaus.

Lauren Vargo

OTHER ACTIVITIES

New IODP Antarctic Drilling Scheduled

The International Ocean Discovery Program recently scheduled two new expeditions in the Ross and Amundsen seas. These projects will conduct a drilling transect along the Pacific Ocean coastline of West Antarctica in order to provide a more complete understanding of oceanic interactions with the marine-based West Antarctic Ice Sheet. The two projects will be drilled in back-to-back years, and ARC's Rob McKay was selected co-chief scientist of the Ross Sea expedition.

"We're investigating past ice sheet behaviour in the Ross Sea," Rob says. "By recovering geological data from beneath the seafloor off the Ross Ice Shelf, we want to understand how the West Antarctic Ice Sheet behaved during the past 20 million years, and how changes in the ocean next to this massive ice sheet may have driven ice sheet collapses resulting in several metres of sea-level rise."

Joides Resolution docked at Wellington Harbour in 2009

Other Awards

On 6 October, the Wellington branch of the NZGS hosted the New Zealand Geographical Society's annual awards ceremony. Congratulations to former ARC student and postdoctoral fellow Richard Jones for the President's Award for Best Doctoral Thesis. In October, Richard headed back to his homeland of England to take up a postdoctoral position at Durham University. We wish him a successful career.

Gavin Dunbar has also received Victoria's 2016 Individual Health and Safety Excellence Award for his leadership of the School's (SGEES) Health and Safety Committee and his role as the School's Radiation Safety Officer. Congratulations Gav!

Congratulations to Our 2016 Graduate Completions

The ARC congratulates the following students on completing their degrees:

Jesse-Lee Dimech (PhD) *"Seismic investigations of the lithosphere in an amagmatic back-arc region: North Island, New Zealand"*

Pablo Iribarren Anacona (PhD) *"Hazardous geomorphic processes in the extratropical Andes with a focus on glacial lake outburst floods"*

Kristina Pascher (PhD) *"Paleobiogeography of Eocene radiolarians in the Southwest Pacific"*

Matt Ryan (PhD) *"Mid-Late Quaternary vegetation and climate change reconstructed from palynology of marine cores offsouthwestern New Zealand"*

Anya Albot (MSc) *"Holocene sediment transport and climate variability offshore Adélie Land, East Antarctica"*

Harry Greenfield (MSc) "*Seismic attributes to constrain the distribution of Rakopi Formation coaly facies in the southwest offshore Taranaki Basin, New Zealand*"

Christoph Kraus (MSc) *"Oligocene to early Miocene glacimarine sedimentation of the central Ross Sea, and implications for the evolution of the West Antarctic Ice Sheet"*

Edmond Lui (MSc) "*Ice dynamics of the Haupapa/Tasman Glacier measured at high spatial and temporal resolution, Aoraki/Mt Cook, New Zealand*"

Bryn Taiapa (MSc) "*Millennial scale events from marine sediment cores in the SW Pacific during Marine Isotope Stage 3*"

And Welcome to Our New PhD Students

The ARC welcomes:

Rachel Corran supervised by Nancy Bertler and Jocelyn Turnbull (GNS Science);

Lukas Eling supervised by Nancy Bertler and Rob McKay;

William Gonzalez supervised by Rewi Newnham (SGEES) and Gavin Dunbar;

Katelyn Johnson supervised by Nancy Bertler and Rob McKay;

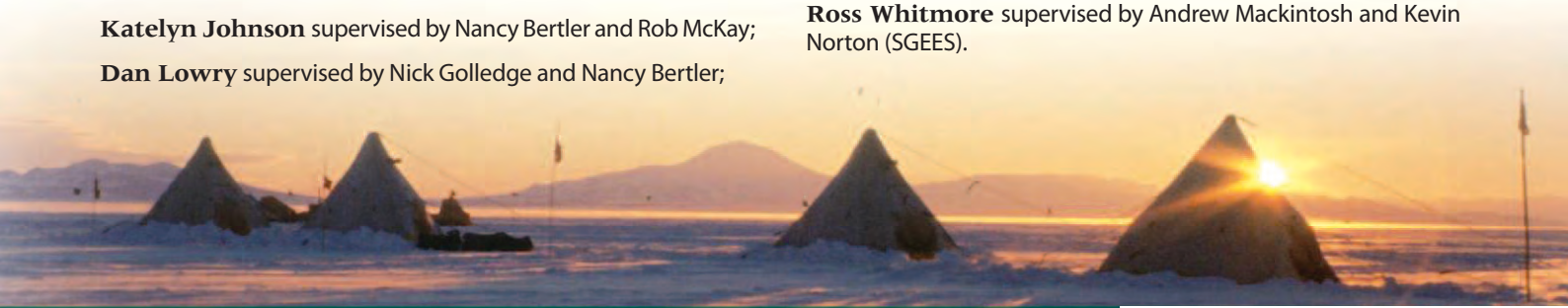
Dan Lowry supervised by Nick Golledge and Nancy Bertler;

Jamey Stutz supervised by Andrew Mackintosh and Kevin Norton (SGEES);

Abhijith U.V. supervised by Nancy Bertler and Peppe Cortese (GNS Science);

Laurine van Haastrecht supervised by Nick Golledge and Huw Horgan;

Ross Whitmore supervised by Andrew Mackintosh and Kevin Norton (SGEES).



Antarctic Research Centre, Victoria University of Wellington, PO Box 600, Wellington 6140, New Zealand
Ph +64-4-463 6587 • Antarctic-Research@vuw.ac.nz • www.victoria.ac.nz/antarctic

TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA UNIVERSITY OF WELLINGTON