Future of work and workforces in the Antarctic and Southern Ocean

Antarctica Day December 1 2022
Conference Report

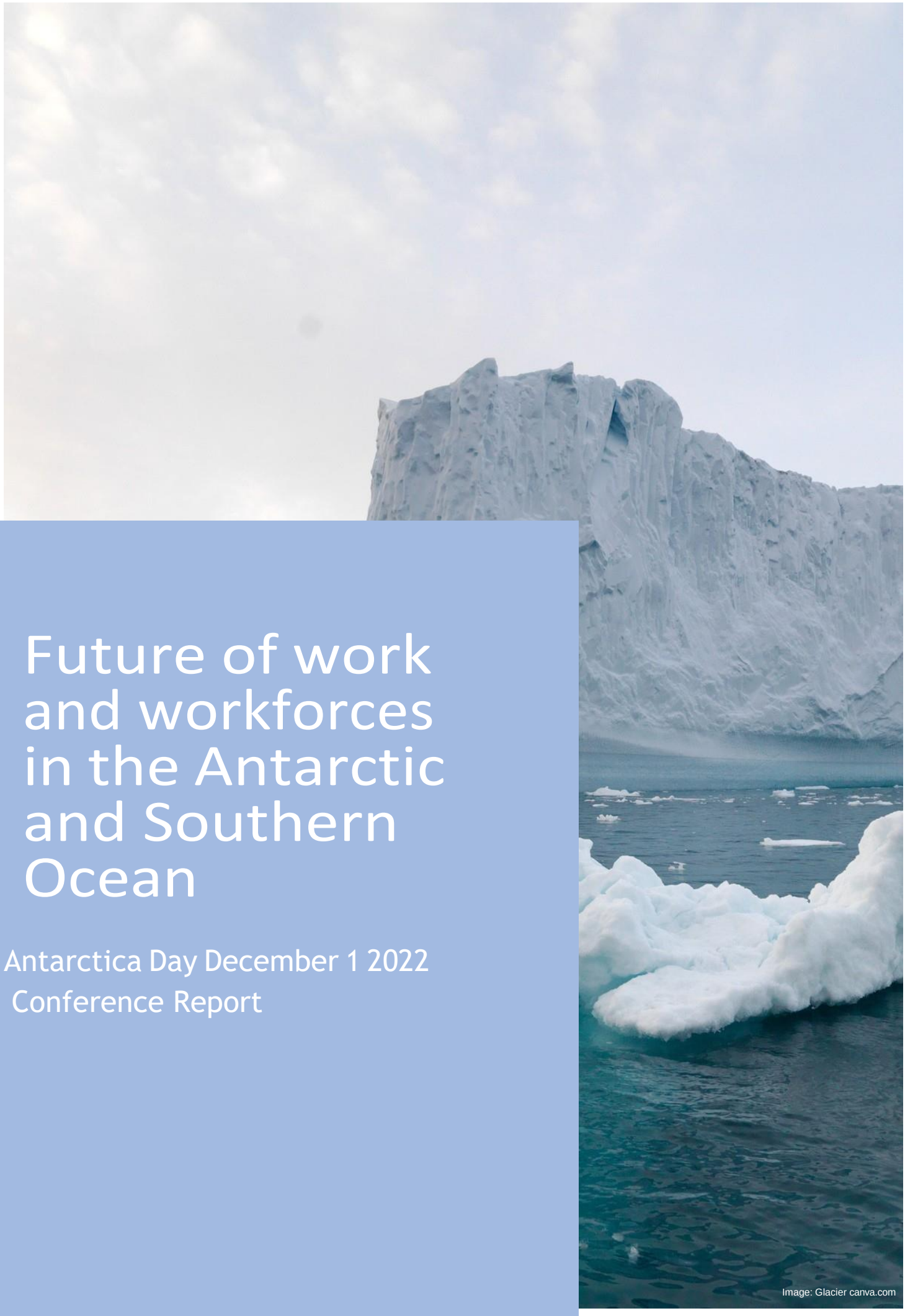

Image: Glacier canva.com

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Image: Zodiac by Hanne Nielsen

Focus and Aims

Co - Hosts: Dr. Hanne Nielsen (IMAS) and Dr. Megan Woods (UTAS)

On Antarctica Day (1 December) 2022, the University of Tasmania hosted a one-day conference on the Future of Work and Workforces in the Antarctic and Southern Ocean. Developed collaboratively by the University's Future Polar Workforce initiative and the Centre for Antarctic and Southern Ocean Technology, the conference focused on 'future thinking' about the science, research, engineering, tourism, policy and artistic work conducted in, or related to, the Antarctic and Southern Ocean, and the workforces that do that work. Presentations and interactive discussions involving participants from government, industry and the University of Tasmania explored factors that could influence what work is done, how it is done, who does that work, and how those workforces may evolve as a result.

Focus Included:

- *The nature of work that done in the Antarctic and Southern Ocean*
- *The changes that might occur over the next 20 years to that work and how it is done*
- *The changes that might occur over the next 20 years to who does that work and the characteristics (who, where, when, how) of that workforce*
- *The factors that might influence those changes to Antarctic work and workforces*
- *How those factors might impact organisations that operate in the Antarctic and Southern Ocean or facilitate operations in the region*

Antarctica Day

On the 1st of December 1959, the Antarctic Treaty was signed, ensuring Antarctica remained a place for peace and science. Antarctica Day is celebrated on 1 December each year to commemorate the signing of the Treaty and to celebrate the international cooperation and collaborative scientific research that has taken place since. In addition to bring peace, science, and cooperation to the fore, Antarctica Day helps promote the continued protection of Antarctica and its associated values and ecosytems.

Statement from Country

by Jamie Graham-Blair (trawlwoolway and plangermairenner pakana)

With the cultural knowledge we Palawa maintain and continue to reclaim we continue to grow into the strong and connected people we were pre-invasion. In returning to ancient roles and responsibilities (in English we could call them jobs) we care for, and are being cared for by, this island and its coastlines. Cared for, in the way we are supposed to. However, land care and governance on the necessary scales are not easy tasks, especially in a rapidly changed world. The impacts of the climate and biodiversity crises paired with the ongoing influences of colonialism often see us denied space in important conversations which directly relate to our Country and Community wellbeing. It is important to be offered space, and resources without strings attached given this colonial context.

Many Elders and Ancestors have dedicated themselves to demanding access to these spaces for our community. Have strived for generations towards respectfully and meaningfully being involved in processes and decisions that impact us. By establishing themselves within industries such as education, the arts, academia, law, and media they have worked to protect and safeguard our culture, our land and our community's future. I am proud to work towards continuing this legacy and use what little platform and power I have to continue to open doors for my people. To forge relationships by writing, education and speaking engagements, conservation work and research I stand as evidence of my people's tenacity and empowerment.

Jamie Graham-Blair (trawlwoolway and plangermairenner pakana)

Photo Credits from Left: Jillian Mundy, Djuker Hart, and Jacob Collings.

Opportunities to engage Tasmanian Aboriginal people, their understanding, and practices related to Antarctic and Southern Ocean work and workforces.

- Aboriginal knowledge systems and land care techniques are tools that could be used to combat the climate and biodiversity crises, if Aboriginal sovereignty is recognised and asserted.
- First Nations people should always be centred in conversations around conservation, sustainability, empowerment, land, and sea management and Indigenous practices.

- Ancient Indigenous knowledge systems and science show how Western science has far to go, This is evident in historical Palawa ecosystem level approaches to land management, something that has only been implemented in Western Science in the last few generations (E.G. CCAMLR) and lore/law explicitly denouncing greed and over-exploitation of key environmental resources and functions

- Palawa showed clear sustainable use of local resources through seasonal and considered migration, trade and treaties, and utilised powerful ecological tools (fire regimes) to shape landscapes and fire cycles across the continent. These shifts are associated with positive ecosystem benefits like productivity, carbon sequestration, water and nutrient cycles, biodiversity, and bushfire intensity reduction.

- Lore/law connection to Southern Ocean ecology, waters and weather systems have existed for Millenia, by connecting with Palawa, and other Southern Ocean linked People's and knowledge holders we can seek to integrate Southern science with Western science – two-way knowledge sharing – for the benefit of all who work in the Southern Ocean and the Antarctic.

I hope I have left you with a few thoughts and inspired you to explore Palawa and other Aboriginal connections to this island and the Southern Ocean. I hope I have inspired you to stand with us and boost our voices in any space you occupy, especially those we are often denied access to but deserve to be included within. This includes the Antarctic and Southern Ocean industries. You may feel guilty or uncomfortable but good and healing conversation are hard to have and without them and without moments of painful introspection we cannot work to undo the ongoing impacts of colonialism and dispossession. In this room are many industries that can collaborate and with powerful allyship we can make some ground-breaking strides towards conciliation.

Commitment to engagement

We warmly thank the Tasmanian Aboriginal community for contributing to the 2022 Antarctica Day conference about the Future of Work and Workforces in the Antarctic and Southern Ocean.

The insights and knowledge that Jamie Graham-Blair and Janet Ross have gifted us have helped to create new appreciation and connections with the Antarctic and Southern Ocean, and new understanding about the ways we can be more inclusive and supportive in our work and our ways of working together. We pledge that the UTAS Future Antarctic and Southern Ocean Workforce initiative will be committed to ensuring that

- we incorporate yarns and linkages with the Tasmanian Aboriginal community into our planning and activities
- significant knowledge of first nations people is incorporated into future events

Jamie Graham-Blair presenting Statement from Country

Executive Summary

The Antarctic and Southern Ocean workforce is diverse, spanning government, industry, academia and non-government organisations. On 1 December 2022 representatives from all sectors came together to celebrate Antarctica Day and discuss the future of polar work in Tasmania and beyond. As one of five so-called Antarctic Gateway cities, Hobart was the ideal location to host these discussions. Hobart has the highest concentration per capita of Antarctic researchers of any place, while the Antarctic sector is worth $160 million annually to the local economy.

This conference aimed to facilitate discussion and ‘future thinking’ about the changes that might occur over the next 20 years to the science, research, engineering, tourism, policy and artistic work conducted in, or related to, the Antarctic and Southern Ocean, and the workforces that do that work. Presentations and interactive discussions involving participants from government, industry and the University of Tasmania explored the factors that could influence what work is done, how it is done, who does that work, and how those workforces may evolve as a result.

Key challenges identified include overcoming seasonal employment and the attendant attrition rates of skilled staff, and the need to provide sustainable, safe and secure employment opportunities to enable growth and diversification of Antarctic-located workforces. Participants noted the importance of ensuring career pathways exist both for recent graduates with Antarctica and Southern Ocean expertise, and for those already engaged in the sector.

Image: Institute of Marine and Antarctic Studies (IMAS) University of Tasmania 2023

Opportunities for greater cooperation between sectors and employers undertaking Antarctic work could allow a range of employers to collaboratively develop entry pathways, pipelines, career mobility that ultimately retain Antarctic knowledge in the region. This report provides an in-depth account of the topics discussed. It is intended to support ingoing discussions about the future of polar work, both in Hobart and beyond.

Specific suggestions – many of which were proposed by early career representatives at the event – included:

- Apprenticeships and collaboration across industry and between industry and government could make it easier for workers to be released to take up Antarctic-related opportunities without compromising continuity of service and employment.
- Providing more internships to create links between a new generation of Antarctic researchers and current experts. Centralising such internships would make these more accessible to those new to Hobart.
- An Antarctic Jobs Fair to inform students which jobs and industries are available and support early-career researchers to network with local government and industry.
- Running more cross-sector social science events that highlight opportunities to use science as a tool for diplomacy, particularly around important meetings such as Convention for the Conservation of Marine Living Resources (CCAMLR).
- Creating stronger links between local Secretariats such as CCAMLR and Agreement for the Conservation for Albatross and Petrels (ACAP), the university, and government to highlight the local capacity in this area.
- Cultivating mentoring relationships between students and local leaders in the field.
- Integrating the Arts into discussions about the future of Antarctica at all levels, recognising that the arts workforce plays an important role in facilitating connections with the far south.
- Consciously supporting people from marginalised groups to participate in polar conversations and employment opportunities (through internships, opportunities on advisory boards).
- Creating a pipeline of apprenticeships/cadetships into trades to assist with skill shortages and help people see the Antarctic-relevant opportunities associated with logistics, infrastructure, and related trades.
- Offering opportunities to develop skills such as second languages, as the Antarctic sector is international (eg. a Spanish-language Antarctic discussion group).

Summary of Conference Program

Session 1: Key workforces in the Antarctic and Southern Ocean

In this session a panel of scholars from the University of Tasmania each delivered short presentations highlighting contemporary questions and research relevant to the following segments of the Antarctic and Southern Ocean workforce, and workforce related issues.

- Tourism workforce (Assoc. Prof. Anne Hardy)
- Expeditioners and Antarctic Stations (Prof. Kimberley Norris)
- Research and science (Prof. Matt King)
- Artists in Antarctica (Prof. Elizabeth Leane)
- Public Engagement in Media and Education (Katie Marx)
- Geopolitics (Prof. Marcus Haward)

Session 2: Early Career Panel

In this session panel, Katie Marx facilitated a panel discussion by University of Tasmania postgraduate students and early career researchers. The panel examined their experiences of entering the Antarctic and Southern Ocean workforce and their perspectives on how capacity and accessibility could be developed in future. Questions posed included: “Is it accurate that Hobart as a Gateway City is a good place for career opportunities?” and “If you had power and influence, what is the one thing you would do?”

Panel Included:

- Katie Marx – Facilitator
- Dr. Rebecca Hingley
- Bruno Apri
- Mengzhu (Maggie) Zhang
- Anne Boothroyd

Early Career Panelists with Dr. Megan Woods

Summary of Conference Program

Session 3: What factors might influence the future of Antarctic and Southern Ocean work and workforces?

In this session a panel of experts from local and state government and the Antarctic sector each delivered short presentations providing context and perspectives on factors that might/will influence the future of the Antarctic and Southern Ocean workforce, and work-force related issues.

- Hobart City Council (Georgie Branch)
- Antarctica Tasmania (Karen Rees)
- Tasmanian Polar Network (Richard Fader)
- Australian Antarctic Division (Pat Lewis and Ally Browne)
- Hurtigruten (Damian Perry)

Session 4: Which factors will be the most impactful/ influential on the future of work and workforces in the Antarctic and Southern Ocean?

In this session Megan Woods facilitated a workshop examining the implications that key factors might have for workforces contributing to Antarctic and Southern Ocean work. Conference participants formed workshop groups each focused on a different workforce group (Tourism, Arts, Logistics and Infrastructure, Engineering and Technology, Science, and Policy). Each group then engaged in discussions about a) the factors they thought would be most impactful on the future of those workforces in the short and long term, and b) what impact they thought those factors would have. In the latter part of the session, each group reported their key conclusions to the rest of the workshop participants.

Session 5: How might the factors influence key workforces in the Antarctic and Southern Ocean and the organisations which employ and develop those workforces?

In this session Megan Woods facilitated a whole-group discussion of the specific implications of key factors for the current and future management of Antarctic and Southern Ocean workforces. Participants discussed current issues and challenges related to the recruitment, retention and development of ASO workforces, and the factors they thought would present and opportunities and need for change in workforce recruitment, retention and development over future years.

Session 1 - Key workforces in the Antarctic and Southern Ocean

Tourism Workforce (Assoc. Prof. Ann Hardy)

Associate Prof. Anne Hardy opened the presentation by addressing the emerging challenges and opportunities in Antarctica Tourism due to the Covid pause. With tourists now seeking to travel again and an industry that is recovering to meet this pent-up demand, Antarctic tourists and operators play a key role in shaping the possible tourism futures in Antarctica. Addressing the need to understand Antarctic tourists and their experience is critical to understanding the Antarctic tourism workforce and how travel to Antarctica takes place. Key questions include: what is the role of citizen science, and can we use it as a tool to deepen knowledge and create an ethic of care for a place? What makes a tourist want to travel to Antarctica and engage in these programs? What motivates travel to the region? What is an 'authentic tourism experience'? What are transformative experiences and what do they do for people? How do sensory experiences play out in the tourist's minds and what different dimensions are explored? Cross-cultural experiences may differ based on cultural origins, so what is the consequence of this and how does this differ across cultures? Are we able to develop monitoring systems to see if thresholds have been past and detect change over time? What are possible tourism futures, and which do we most want to see happen? Answering these questions will provide insight into the probable, plausible, preserved and possible tourism futures and assess the accompanying positive and negative impacts. For further details on current UTAS tourism research projects see www.antarctictourismresearch.com

Expeditioners and Antarctic Stations (Prof. Kimberley Norris)

Prof. Kimberly Norris presented the experiences of expeditioners working on Antarctic stations. When considering research through the lens of the Antarctic workforce we understand the needs of individuals in their workforce and work environment. If individuals are unable to thrive, our workforce won't exist. By linking with the Antarctic Australian Program we can understand and learn about the experiences of those involved in the AAP workforce and what factors are influencing decision-making in this workforce. We can learn about those experiences and understand the challenges and opportunities of working in Antarctica including how people think about their work and make decisions. Beyond decision-making, we can consider how people adapt, why they adapt, and the factors that influence this process. We can then predict people's behaviour and how well someone will adapt to this extreme environment. This has real implications for the recruitment and retention of workforces in this environment and is not about exclusion but about developing resources not just to survive but to thrive. We need to talk beyond the time ‘on the ice’ and adopt a systems approach that considers before and after time on the ice. Prof. Norris outlined how people who have been to Antarctica - tradespeople, tourists, tourism operators, and scientists - are generous in sharing their knowledge and experiences and show their commitment to moving forward so that we can develop interprofessional, interdisciplinary, collaborative and collegial spaces which maximise outcomes for all Antarctic personnel. In a relatively closed system, there is an opportunity to build interprofessional, interdisciplinary workforces for years, decades and beyond.

Session 1 - Key workforces in the ASO

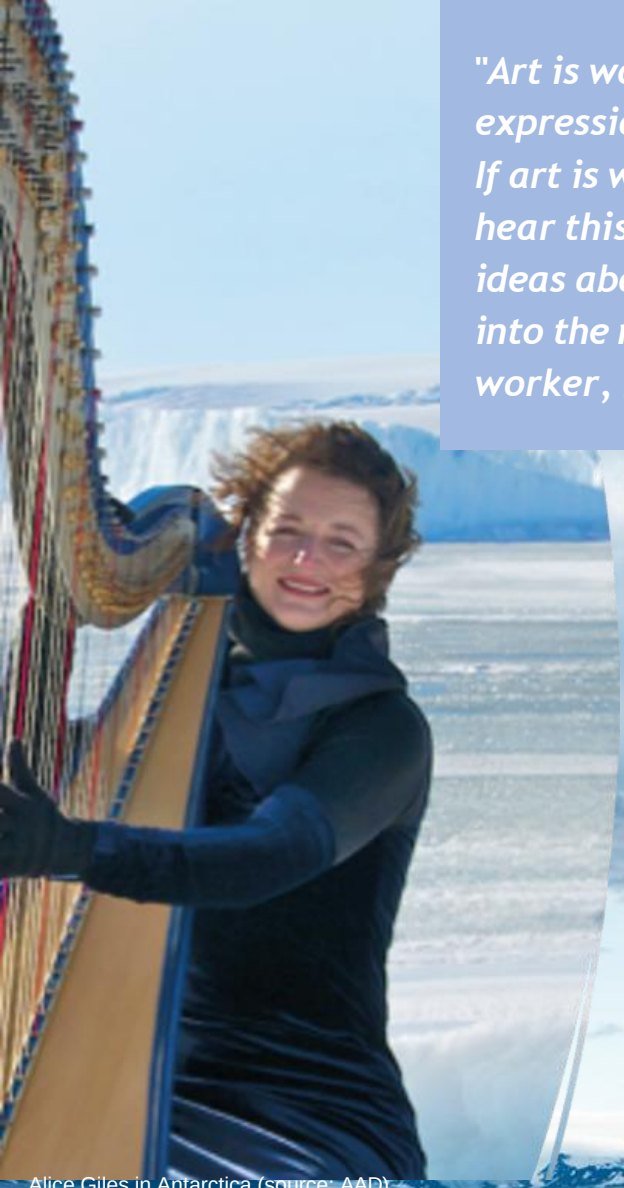
Research and Science (Prof. Matt King)

Prof. Matt King emphasised the ways technological change will drive our experiences of scientific activity in Antarctica into the future. The use of drones (UAVs, AUVs) will dramatically increase as will small satellites. Profound increases in data volumes pose challenges to manually interpreting data and will change as the use of AI, machine learning and data science expands There will be a need for real-time data collection from the field and the number of people who need to go to the continent will change. Prof. King noted that this may change where people work, as remote sensing operations and roles can be done remotely, and the workforce may be able to do this work anywhere. However, there will still be a need to have people in Antarctica. There is an opportunity to lead this space with investment in drone technology potentially positioning us to lead remote sensing applications in the world. Our emerging scientific workforce needs to understand the linkages between science and policy and embed knowledge of the Antarctic Treaty System in Antarctic science education. Prof. King highlighted the need to recognise the pathways many PhD students will take – not only in academia but within government and industry. A priority questions is therefore how do we develop awareness for those students so they can harness specific and general skills and consider pathways with government and industry at the beginning of their PhD journey, not the end? Prof. King suggested partnering with government/industry to provide more internships to PhD students and get students into these local workforces would be a good step towards retaining capacity Antarctic locally within Hobart over the longer term.

Artists in Antarctica (Prof. Elizabeth Leane)

Prof. Elizabeth Leane presented on artists and the arts workforce and changing perceptions of artists over time. Taking examples from Cook's circumnavigation, through the Heroic Era to the mid-20th century and now contemporary perspectives, she outlined how perceptions of artists have shifted from the artist as a 'worker' to more idealised notions as 'guests' and then artists in residence. Prof. Leane noted there is an emerging pattern of National Antarctic Programs shifting away from Artists in Antarctica programs and public outreach being collapsed into larger education-style programs. It is therefore an ideal time to be thinking about this particular workforce in Antarctica and considering Australian artists in the far south. Prof. Leane introduced the ARC Discovery Project “Creative Antarctica,” which examines artists responses to Antarctica in the Australian context. Combining cultural analysis, curatorial response and qualitative interview-based research, the research project will produce the first comprehensive historical analysis of Australians' creative responses to Antarctica across all art forms in the form of an illustrated book and website and an exhibition in Melbourne. It will also collect data to inform best practices for future Antarctic Residency Schemes by asking artists and writers how art 'work' is best supported, thereby addressing questions such as: are residency programs the best models? Are National Programs the best place to facilitate this? What role do tourism operators play and are other options to access and engage with Antarctica available? More on the Creative Antarctica project can be found here: https://www.utas.edu.au/research/projects/creative-antarctica/_nocache

"Art is work, the fact that people do it out of love, or self-expression, or political commitment doesn't make it any less so. If art is work, then artists are workers, most people don't like to hear this. Monarchs don't because it shatters their romantic ideas about the creative life, artists don't either, they also buy into the myth. They also want to think they are special, to be a worker, is to be like everybody else" - William Deresiewicz



Alice Giles in Antarctica (source: AAD)

Session 1 Speakers from left: Prof Matt King, Prof Elizabeth Leane, Prof Kim Norris, Assoc Prof Ann Hardy with Co-Host Dr Hanne Nielsen

Session 1 - Key workforces in the ASO

Katie Marx – Public Engagement

Katie Marx provided insights into the public engagement of Antarctica. The work of the Australian Antarctic Program is taxpayer-funded, so we want the public to know what is being done. As most people will never go to Antarctica, they rely on their own opinions and those of others who have been. Future-proofing is a problem, as those who have visited are not likely representative of the general population and the experience of being in Antarctica is fundamentally difficult to communicate, which creates a barrier to engaging the public. To address this, a strategic approach is needed and we must understand: who is the public? Where do they get their information from and what do people do with this information? Collaboration and co-design are key, as is working on this together in an inclusive way. Ms Marx highlighted that evaluation is also critical so that we know what we're doing is working. Key research themes that can help address these questions of public engagement include those related to the role of gateway cities; Antarctica in the media; Australian knowledge and attitudes; and Public engagement with Antarctic Research. For more on research about public engagement in Antarctica, see https://www.scar.org/science/pear/home/

Geopolitics (Prof. Marcus Haward)

Prof. Marcus Harward presented on international geopolitics in Antarctica and noted Antarctica Day is a good way to start to think about the geopolitics of who is the Antarctic and Southern Ocean workforce. The Antarctic Treaty System shapes all of our work, as geopolitics is all about who is involved in Antarctica and how they engage in it. Intergovernmental regimes and arrangements are an example of one of the greatest successes of global collaborations. The ATS was created to deal with the Antarctic problem (territorial claims, military use) focusing on international collaboration and Antarctica should not be used for international discord. There is a need to safeguard those norms and principles and UTAS through its deep connections needs to look at ways we build knowledge dispelling the myths that the ATS will end (and mining will start). How we look at the communication of these themes on Antarctica day is a good way to ensure this communication happens. Prof. Haward highlighted that we have the opportunity to build skills and capabilities. Previous programs run by UTAS and AAP developed a generation of practitioners who are now leading Australian Antarctic Division programs. As ATS grows we can build and embed sustainability into the workforce. How can we offer capacity building, knowledge and skill transfer in collaboration with international colleagues connected to Antarctica and help grow this space? Prof. Haward outlined how the workforce needs an academy to be receptive to the needs of industry and government and develop programs that build capacity. Partnership is therefore important. Prof. Haward noted that an opportunity now exists within UTAS's work-integrated learning frame to partner with government, international regimes and industry to include small-scale internships. This collaborative approach will ensure the key norms and principles of collaboration and science-based decision-making will remain continuing and ongoing in the spirit of peace, science and collaboration which underpins the Antarctic Treaty System.

Session 2: Early Career Panel

Early Career Panel

Panellists agreed Hobart is a great place for the opportunity to have an Antarctic career. It is an easy place to find, and make connections with people face to face, through workshops, conferences and events. However, panelists noted that these are predominantly focused on physical and life sciences and there are limited social science and humanities events. Connections are important and some panellists found networking easy, yet it was noted that this is not everyone's experience and more opportunities that remove the onus from HDR students to network themselves would benefit others. Mentors are important and provide opportunities and connections but not everyone has this opportunity and it's important to acknowledge this and create frameworks to support strong mentor connections. International students also face particular barriers, which include cost and access to accommodation, cost of living, being away from home and from support networks. Visa status is a particular barrier as most roles in the sector are for Australian citizens so students on visa are excluded from these opportunities. The panel noted that connecting science to policy was important and having two-way communication was useful, with policymakers letting scientists know their needs and communicating the issues they are facing as policy-makers. Hobart is an ideal location to foster such communication, given the co-location of researchers and policy organisations.

Practical actions that would support early career Antarctic researchers and professionals include:

- Providing more internships to create links between a new generation of Antarctic researchers and current experts. Centralising such internships would make these more accessible to those new to Hobart.
- An Antarctic Jobs Fair would inform students which jobs and industries are available and support early career researchers to network with local government and industry
- Running more cross-sector social science events and events that highlight opportunities to use science as a tool for diplomacy
- Creating stronger links with local Secretariats such as Convention for the Conservation of Marine and Living Resources (CCAMLR) and the Agreement on the Conservation of Albatross and Petrels (ACAP) to highlight the local capacity in this area
- Cultivating mentoring relationships between students and local leaders in the field
- Offering opportunities to develop skills such as second languages, as the Antarctic sector is international (eg. a Spanish-language Antarctic discussion group)

Panelists Bruno Arpi, Maggie Zhang and Dr Rebecca Hingley

Session 3: What factors might influence the future of Antarctic and Southern Ocean work and workforces?

Hobart City Council – Georgie Branch (on behalf of Lord Mayor Anna Reynolds)

Georgie outlined how the Hobart City Council, recognising the critical role of the Antarctic sector, aims to advocate for the sector's growth through both local work and international engagement. As one of just 5 Gateway Cities, Hobart's identity is intrinsically linked to Antarctica. Hobart boasts the highest concentration of Antarctic and Southern Ocean experts in the world, while historic connections between Hobart and Antarctica are reflected throughout the city, with Mawson's Place and the Mawson's Huts Replica Museum reminders of Australia's broader Antarctic cultural heritage.

Georgie highlighted:

- The Hobart City Council takes pride in fostering social responsibility for the Antarctic continent with cultural and social events such as the Antarctic Festival and the civic receptions during the Antarctic season opening.
- The economic aspects of Hobart as an Antarctic Gateway are significant; the Antarctic Sector is supported by 950+ jobs and worth $160m to our local economy.
- The City of Hobart will support the redevelopment of the Macquarie Point and science precinct by the State Government as such projects are critical in enabling Hobart to continue to lead the world in areas of Antarctic and maritime education, advance manufacturing and governance. This will further strengthen Australia's Antarctic reputation while supporting local jobs and its global status as the world's preferred Antarctic Gateway.
- Referencing the 2021 "Antarctic Cities" report, Branch explained how the City of Hobart will work to continue to strengthen its relationships with other Gateway Cities to promote collaboration and transition our cities from gateway cities to Custodian cities of Antarctica (Salazar et al 2021, Leane at al 2021).

Antarctica Tasmania – Karen Rees (on behalf of Antarctica Tasmania)

Two of the goals of the State Government's Antarctic strategy are to 1) build Antarctic community awareness, brand and workforce by connecting Tasmanian training organisations with workforce needs and to 2) grow polar innovation, technical expertise and experience. Karen explained that there are 17 Antarctic employers within a 1km radius of the Hobart CBD and approximately 129 private sector jobs in the 950+ full-time jobs in this sector. On average workers in the research sector of Antarctica work earn 171% of the average Tasmania wage, providing an attractive incentive to join the Antarctic workforce.

Karen highlighted:

- One challenge is how we connect Tasmanian training organisations with workforce needs.
- The education and training sector provides many opportunities for Antarctica jobs along with the Construction industry with station renewal over the coming decades presenting exciting opportunities.
- Hospitality is another important sector influenced by Antarctic and Southern Ocean work as due to its important role in supporting Antarctic conferences and conventions.
- An Antarctic jobs fair and Antarctic jobs portal could provide great opportunities to centralise and promote Antarctic-related job opportunities.

- The emerging Antarctic Women's Network is another future opportunity and the Tasmanian government's contribution to this conversation and our strategy will look to support the role of women and underrepresented groups in this sector.
- Real-world experience and skills are important for future workforces and internships and work experience provide those. We need to encourage employers to engage with young people and provide opportunities to gain these real-world experiences.
- The future of work and workforces in Antarctica and the Southern Ocean is our children – we must ensure that primary school students have a long-term interest in Antarctica and working there.

Tasmanian Polar Network - Richard Fader (on behalf of TPN)

Richard introduced the Tasmania Polar Network (TPN) as having a 30-year history and consisting of 75+ members and worth $229 million in economic value. TPN has a diverse range of members from polar operations, transport and logistics, equipment and services, government sectors, research and education, fisheries and tourism and conference facilities that collaborate to support the Australian Antarctic Program and other National Programs that use Hobart as a gateway. Richard identified the most pressing challenges in the polar work sphere as science funding, infrastructure development and workforce development.

Richard noted:

- There are significant challenges to building workforce capabilities within trade and logistics, manufacturing and science.
- Seasonal work poses a challenge as the Antarctic season is generally short and there is a need to find compatible industries that can take up that capability for the rest of the year and provide secure annual employment to retain this specialised workforce.
- While higher salaries once attracted workers to Antarctica, the sector is now competing with large infrastructure projects and the oil and gas sector, and the Covid pandemic has also shifted peoples' priorities back home.
- An historical disconnect between the commercial sectors and science, noting that the current shift towards greater engagement is a further opportunity for industry to deliver what science needs and vice versa.

Australian Antarctic Division - Pat Lewis and Ally Browne (on behalf of Australian Antarctic Division)

Pat Lewis - Technology and Innovation

Pat noted the importance of having a diverse group at the table to discuss the different drivers of workforce requirements in Antarctica – it is not just about science, but the technology and industry to support that science as well. The Australian Antarctic Division workforce (500 staff across 6 branches) includes scientists, policy experts, data managers, engineers, technicians, acousticians and much more. The department manages core technical functions and facilities such as the icebreaker Nuyina, designing bespoke technology solutions and trialling innovative technology to improve an increasingly important element for great scientific outcomes.

Pat noted:

- Science and our workforce are increasingly being driven by technology. This introduction of Nuyina has employed a wide range of skilled technicians, data officers and engineers that are needed to support its operation.
- As Australian Antarctic science continues to mature we are developing a technological decadal plan to ensure the AAP stays at the forefront of science and innovation. The types of technology that are emerging such as drones and satellites will require us to rethink the nature of our workforce due to automation and data management.
- Science in Antarctica is hard and expensive and good technological capability and engineering are essential to ensuring that we get to Antarctica successfully, do the science, and bring that data back to better understand both the far south and broader planetary processes.

Ally Browne - Australian Antarctic Program Workforce

Challenges to the AAD workforce include the remote and isolated nature of work in Antarctica, which means there is a need to create an excellent environment for not just work but also lifestyle and enjoyment while living in Antarctica. Our traditional models of work will no longer service us, and we face increased competition from other industries - we must therefore make life and work in Antarctica better and more attractive for our expeditioners.

Ally noted priorities as:

- Early career initiatives, streamlining our programs and processes, and casting the net to see how we can tap into the workforce early on and look for opportunities to develop our talent internally and externally are important strategies to consider.
- Working towards a safer, more inclusive and diverse workforce is also key.
- Looking at the seasonal nature of Antarctic work and how we can provide opportunities year-round to ensure they have security.

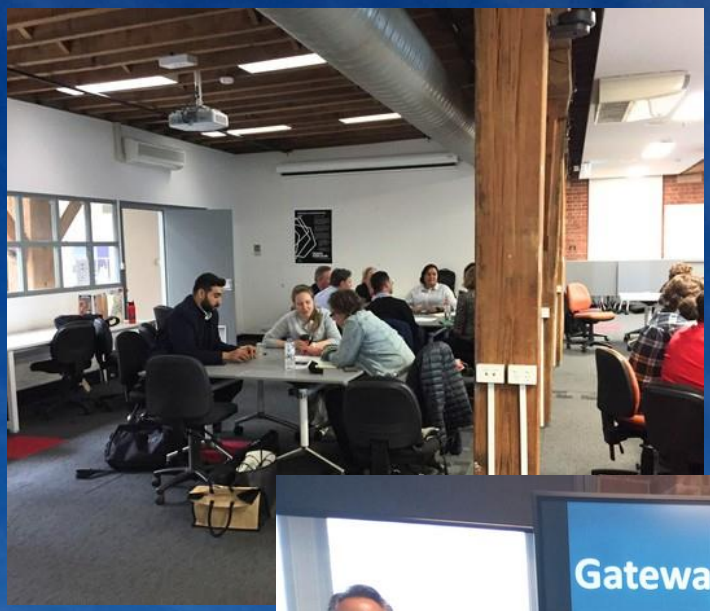
Hurtigruten - Damian Perry (on behalf of Hurtigruten)

Damian outlined that over 100,000 tourists were forecast to visit Antarctica in the 2022/23 season. 52 tourism operators are working in the Antarctic with many operators having more than one ship and over 350+ expedition teams. There are approximately 60 ships that travel there and 20 more under commission presently on the building register leaving 80+ ships with the potential to sail into Antarctica in years to come. Damian highlighted the importance of sustainability for Hurtigruten, in terms of environment and also workforce.

Damian highlighted:

- One of the major challenges to this industry at present is the workforce shortage. There are simply not enough people to sustain this growth - finding the highly specialised, trained people we need that are also suitable to engage with tourists and enhance their experience is difficult.
- To address these issues, Hurtigruten have created cadet programs that create pathways to the industry and implemented permanent contracts that retain a year-round workforce.
- Technology is also a challenge to the industry - Hurtigruten is the first company to implement hybrid power expedition, and has just introduced Starlink to keep customers and staff connected. Drone technology and submersibles offer tourists new experiences, and these platforms can also be used by our research scientists.

Some of the Day's Highlights



Clockwise from left: Session 3 & 4 Participants in roundtable workshop, Damian Perry presenting in Session 3 (Hurtigruten), Expert Speakers: Damian Perry (Hurtigruten), Ally Browne (Australian Antarctic Division), Richard Fader (TPN), Karen Rees (Antarctica Tasmania),Dr Megan Woods (UTAS), Dr Hanne Nielsen (IMAS), Dr Megan Woods presenting in Session 3, Assoc Prof Anne Hardy presenting in Session 1, Ally Browne (AAD) presenting in Session 3

Issues, Implications, Challenges and Opportunities for Antarctic and Southern Ocean workforces

The following section summarises the conference discussions about key factors that do and could affect workforces doing Antarctic and Southern Ocean work, the issues and implications they present, and opportunities to address and leverage these factors to improve the workforces, workforce management, and work-related experiences of people doing work related to Antarctica and the Southern Ocean. The first section presents the issues and opportunities specific to particular workforces. The second section presents the issues and opportunities related to Antarctic and Southern Ocean workforces in general.

Workforce Specific Issues & Opportunities

Arts-related workforces

Issue: the Arts workforce is 'tendency to be an afterthought and brought in at the end of things'.

People equate 'working in Antarctica' with science work. There's not a social license for artists in Antarctica, and recent work led by Prof. Leane found surprisingly low support for artists as people 'who should be able to go to Antarctica'. This is reinforced/perpetuated by artists who do Antarctic work lacking visibility, and limited access to Antarctica and opportunities to do Antarctic-related artistic work. The two main ways that artists get to work in Antarctica are via National Antarctic Programs or tourist operators. Tourist operators like taking artists to Antarctica because art classes are a popular tourist activity on cruises, but this limits the time and opportunity artists have to do their own art and the parts of Antarctica they get to experience. National programs often don't have the room to accommodate/ support artist visits, and usually only enable short stays.

There are also complexities associated with selecting which artists should have access to opportunities, such as whether selection should be competitive or a 'shoulder tapping exercise', whether selection should handled by National Antarctic Programs, and if so, whether that should be done in collaboration with arts bodies, and whether there is a risk or perception that they choose artists that support the NAP.

Opportunities:

- Link artistic work and programs to educational awareness of Antarctica and Antarctic work, as with the Bonjour Expeditioner program.
- Opportunities for artistic work and artistic Antarctic opportunities as mechanisms for cultural diplomacy. For instance, artists hosted / located in Antarctic stations of other countries' National Antarctic Programs could create opportunities for cross-cultural communication and learning.
- Artistic expression could be incorporated into the expeditioner experience eg using artistic endeavours to create a different way of connecting with the experience and with country, and of processing and conveying those connections.

- Development of best practice future Antarctic Arts Residency Schemes, informed by research exploring how is art 'work' best supported, whether residencies are the best way and whether National Antarctic Programs are the best way to facilitate this.

- Greater exploration of other options, including other models to support artistic work, the role that tourism operators do and could play.

Antarctic cruise-related tourism workforces

Issue: Creating the talent pool for the level needed to operate safely and sustainably as tourism operators.

This is considered an urgent need as the size and quality of the talent pool directly impacts the growth of the industry and whether that can occur at safe and sustainable levels. The Antarctic season over summer 2023 will have about 100 000 visitors and 52 different ships. As tourism in Antarctic continues to rapidly increase, the introduction of larger international ships that have previously not entered the Antarctic and Southern Ocean market pose potential risk to safety in the region and increasing pressure on physical environments. The tourism industry, and tourism operators, face large and complex demands in addressing demand for travel, increasing recognition of the impact of travel on ecosystems especially in Antarctica, and the need to rebuild tourism workforces after the Covid pause.

Currently, the Antarctic cruise tourism workforce is characterised by a lack of diversity and a reduced talent pool post-pandemic has potentially led to lower standards of safety and customer service. This creates a need to grow the talent pool to certain standards and levels. There is currently a relatively low level of employment of locals from Gateway cities, but as tourism expands and cruise-related activity increases, this will create both a pressure and an opportunity for Gateway cities to become a greater source of cruise-related tourism workforces.

Attraction and recruitment of people into Antarctic cruise-related tourism needs to provide people with requisite levels of skills and capabilities so as to support the level/ volume of operation needed to address post-Covid demand and industry recovery, and deliver the kinds of experience that tourist operators are trying to provide. There is lots of interest and willingness to undertake Antarctic-related tourism work. However, attraction and recruitment is undermined by reputational issues of labour hire organisations, and large ships having bad reputations (eg flags in international water to avoid tax and labour laws). It is also complicated by competition between operators to have more 'toys' and experiences (which creates need for new and different skills such as helicopter pilots) and for talent, which creates risks of diluting the talent pool.

Retention of workers in Antarctic cruise-related tourism is also complicated by the seasonal nature of the work (as people cannot be employed year-round), casualisation and short-term employment contracts, all of which make the retention of quality, expert people difficult. The emotional labour of tourism industry is also a factor, as the work is highly demanding. Creating more sustainable workforce and work arrangements including year-round employment opportunities for a long-term workforce is a critical priority for this sector now and into the future.

Opportunities:

- Cooperation between tourism industry and other sectors to source people who have developed Antarctic-related expertise in other forms of work/other workforces (eg science, policy, research, trades and infrastructure) they could use as Antarctic tour guides. This would help to provide employment opportunities that complement seasonality of other Antarctic work, and create interim or bridging employment opportunities eg employment for PhD students as they source post-doctoral opportunities. Engagement with operators such as Hurtigruten to develop joint solutions would enable tailored responses to issues faced by tourism and other sectors, and opportunities to draw on processes and practices developed for other tourism markets.

- Reframe tourists as a volunteer scientific workforce and create greater linkages between tourism operators and scientific organisations. Engaging in citizen science (eg collecting data about whales, seals, algae) provides opportunities for tourists to address guilt associated with going to Antarctica, create social good, and 'get their hands dirty' having an authentic tourism experience. These opportunities could be expanded to leverage additional support for scientific work, and to create tourism- related work opportunities for scientists and postgraduates.

- Expand and reframe perceptions of 'what Hobart can be as a gateway to the industry beyond our traditional thinking of gateways being just access.' This could include access to people with Antarctic knowledge or experience who could join cruise-related tourism workforces, provision of Hobart-based training opportunities for people joining that workforce (eg safety training), and providing Antarctic tourism-related experiences in Hobart that dovetail with and extend cruise-related activities, such as the use of Macquarie Point as a site for Antarctic tourism.

Image: Cruise ship at anchor by cascoly canva.com

Logistics and Infrastructure Including Construction, Trades And Manufacturing workforces

Issue: Need to provide sustainable, safe and secure employment opportunities to enable growth and diversification of Antarctic-related logistics and infrastructure workforce.

The current and proposed expansions of the Australian Antarctic Division's scientific and infrastructure-related activities create a need to grow the size, skills mix and quality of this workforce. Upgrades to Antarctic stations over the next 10 years will require quality tradespeople, and the ratio of staff needed to support scientific work in Antarctica is approximately 10:1 (10 AAD staff to 1 scientist), meaning the current skills shortage presents a major challenge to the sector. Additionally, advancements in technology will change workforce requirements over next 5 or 10 years which will impact both current and future workforce.

Currently, most Antarctic-related logistics and infrastructure work is done on the Antarctic continent during the Antarctic summer season (October to April). This makes it crucial to provide sustainable, safe and secure employment opportunities, including ones which identify and address risk factors for psychological safety posed by working remotely in an isolated and extreme environment. Because the work and workforce is largely seasonal, attracting people is complicated by both competition and constraints. Due to Australian public sector hiring constraints the Australian Antarctic Division can only employ Australian citizens. This means it must source its trades and logistics workforce from local/ Australian labour pools and cannot recruit from overseas.

Traditionally, Antarctic work was well-paid and provided good opportunities to build experience. Now, competing sectors such as mining, oil and gas, a vibrant local construction industry and major projects such as the upgrades to the Bridgewater Bridge and Hobart Port present lucrative opportunities to be self-employed, casually employed and or flexibly employed, and to work from or close to home. By comparison, the current short-term contracts in the Antarctic and Southern Ocean sector are less appealing to the current and prospective workforce especially when, in the wake of COVID, people are prioritising family and working closer to home rather than working remotely. Additionally, short-term contracts limited to one Antarctic season mean that when the season is finished, so is the employment opportunity. Workers then have to find employment elsewhere, meaning no further return on investments in training and preparing them, and lost access to their knowledge and experience. It also makes it difficult to attract them back to Antarctic work for subsequent seasons, especially if they have to give up more stable/ secure/ year-long employment to do so.

The current workforce is also very homogeneous, and diversification creates a need to explore and better understand what is stopping people from under-represented categories from joining this workforce, and how employment value propositions might need to be redeveloped to attract them. This includes changes to working arrangements and work experience, and changes to messaging to help people understand what the employment experience could entail and what they will get from it.

Opportunities:

- Identify and build linkages to compatible opportunities field and industries to provide work opportunities that complement the Antarctic season so people can utilise their capabilities and skills year-round.

- Build more connection and collaboration between the scientific community and industry/ the commercial sector. “it is the industry that will deliver the infrastructure and capability to delivery science, but in return industry need to know what science want”. Previously there was a disconnect between what science wanted and what industry provided but recently, greater engagement of AAD with industry / the commercial sector to articulate their requirements for the scientists in Antarctica has enhanced the capacity of the commercial sector to deliver on these requirements. Continuing to expand that engagement and communication “it will give opportunities for industry to deliver exactly what is required to deliver the science”.

- Leverage expansion of AAD activities to enable scaling up of Antarctic-related manufacturing and construction work. Antarctic work is currently a small and niche manufacturing sector but government investment and AAD's expansion are creating more opportunities and need to expand capacity and capability. This creates opportunities to develop scale so businesses and the sector can employ more people. The Antarctic station renewal initiative is a 10 year program so offers the scale and time frames for businesses to invest in growth and people, and hence develop capacity to employ more people and have an ongoing role.

- Foster more collaboration between industry (eg Tasmanian Polar Network members) to provide scale and flexibility to support Antarctic work. Collaboration enables co-specialisation and collective scale to pursue opportunities. For example, the AAD’s overland traverse project was delivered through half a dozen organisations in the Tasmanian Polar Network. Likewise, collaboration could help both individual businesses and the sector as a whole to better support workers to go to Antarctica and accommodate seasonality. For example, a business whose workers are going to Antarctica for a season could source workers from other firms (eg other TPN members) to backfill those positions. This would build capacity both for individual businesses and for the workers who develop greater knowledge, skills, expertise and opportunities.

Round table Particpants during Session 3 & 4

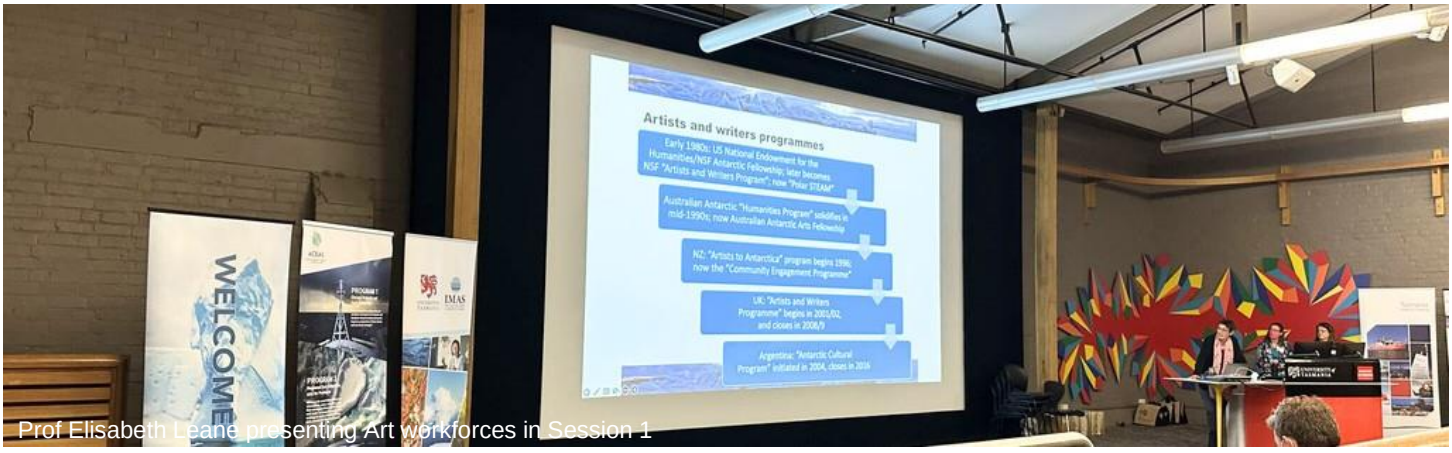
Opportunities Continued :

- Foster greater collaboration between industry and AAD to address and overcome seasonal impact on construction and trade work and workforce. This could include incorporating clever construction approaches into the Antarctic station rejuvenation initiative to create more continuous work flows and opportunities. For example, taking modular approaches to design and construction would enable employment and deployment of trades people who could build components in Tasmania or Australia, go to Antarctica to install and erect them, fit them out, and return to Tasmania and continue working on the next part of that project. This could potentially result in continuity and job security for several years while also enabling continuous building of expertise as knowledge developed from time in Antarctica can feed into improving build and install processes for next season.

- Creating a pipeline of apprenticeships/cadetships into trades is critical because this will assist to with skill shortages, help people see logistics and infrastructure (and related trades) as businesses they could be excited to be part of, and encourage people to consider Antarctic-related opportunities for themselves and their future.

- Apprenticeships and collaboration across industry (eg opportunities to leave and come back that are offered for Defence Force personnel) and between industry and AAD could also make it easier for workers to be released to take up Ant-related opportunities without compromising continuity of service and employment.

- Generate and leverage a passion for the Antarctic and provide work opportunities to foster that passion. Traditionally, tradespeople haven't been perceived as focused on passion.



Prof Elisabeth Leane presenting Art workforces in Session 1

Science workforces

Issue: Creating and maintaining the scientific workforce

The unpredictable and remote nature of Antarctica and the Southern Ocean means that processes and logistics to undertake scientific work are costly, require detailed planning which begins well in advance, and very tightly scheduled of scientific activity. There are no opportunities for opportunistic science and scientific work can be unexpectedly interrupted and even de-railed by emergent issues and events. Supporting scientific work and workforces is further complicated by the challenges and funding time frames for Antarctic work. Short term funding necessitates contract-based and casualised employment and few opportunities for permanent employment which results in staff retention issues. Sustainable long-term funding is needed to create more opportunities in and for scientific workforces. This includes expanding opportunities to do scientific work.

Developing people to undertake highly skilled scientific roles can be a ten-year journey by the time they do a science-related undergraduate degree, then Honours and PhD, then postdoctoral work. This requires commitment by students and support from organisations otherwise the pipeline falters. Attracting and recruiting domestic students to undertake postgraduate work is complicated by the high demand and strong labour market for data science and coding skills, and the high wages being offered as a result. Meanwhile, opportunities and options for recruiting students and scientists from overseas face other constraints. International staff and students can't get employment with the AAD in science unless they are or become Australian citizens. Getting visas to bring students and staff to Australia is also complicated by the current 12 to 18 month timeframes for visa processing, which mean recruitment processes can't be used to address immediate/ short term needs, and also means some recruits never arrive as they take up other opportunities elsewhere while waiting for visas. Tasmanian job offerings are also not always attractive due to the high cost and low availability of housing, limited job opportunities for spouses, and low wages compared to other parts of Australia. These issues are making people less willing and able to come to Tasmania, and less able to stay.

At the same time, turnover and succession is crucial to refreshing ideas and perspectives in scientific work, and to creating career pathways and progressions. Too little turnover means fresh ideas aren't coming into the community and can create perceptions and expectations about having a 'job for life' which means, when people's contracts end, there can be resentment that they can't stay on. Effective succession planning is also needed to better support role transition, especially when handovers can only occur in short time frames because staff are leaving. This includes effective development of succession plans, recruitment of new people and then managing turnover and transition into new roles.

Supporting scientific work and career mobility across Tasmanian-based scientific organisations is also complicated by boundaries between scientific organisations and professional groups. Boundaries between organisations such as the Australian Centre for Antarctic Science, the Australian Antarctic Program Partnership, AAD and CSIRO hinders data sharing and there is a need to foster more collaboration between these organisations. Overcoming these boundaries and fostering more collaboration would enhance the capacity of work that can be undertaken, and the opportunities and processes for staff to transition between different organisations.

However, perceptions and tensions between different workforces need to be overcome. For example, AAD staff are perceived as non-academic so this complicates and potentially undermines career transitions such as a scientist moving from an academic role to work for the AAD and then moving back into an academic position.

In the longer term, the implementation of the Decadal Science plan will build both the scientific and public profile of organisations that do scientific work in the Antarctic and Southern Ocean, and public perception continues to play an important factor in Australian Antarctic science and how it is funded. It may also provide a forum to better align and integrate the work done by different scientific organisations.

Technological advances will change the work that is done, how it can be done and what can be produced. This in turn will influence both the nature of scientific activity and the experience of doing the science. Use of remotely piloted aircraft systems, an autonomous unmanned vehicles will dramatically increase as will small satellites (cube sats). Technological advances and capability development are needed to make the drone technology and the sensors and to develop 'things that can't be measured at the moment' to do science in the ocean or the air much more effectively than presently. These changes will make the need and demands on the workforce doing field work in Antarctica and the Southern Ocean even more critical. However, they will also change the skill sets needed to establish, operate and maintain those new technologies.

Technological developments will also increase the volume and types of data that can be produced (eg data streams coming from remote sensing technology, satellites, drones and underwater vehicles, and the volume, detail and resolution of images that can be produced). Data volumes will increase to the point of producing petabytes of data. This will challenge capacities to manually interpret data and likely necessitate the use of AI and machine learning to do so. Data accessibility and system inter- operability will be critical to enabling this growth and the opportunities it may offer, as will access to the skills needed to support, analyse and interpret the data. This is likely to see significant growth in the scientific workforce working outside Antarctica, both because more people will be able to access data streams generated in Antarctica, and because scientists who currently have to travel to Antarctica to obtain the data they need may not have to do so in future. Additionally, as data is released under the Antarctic treaty and made more widely available, opportunities to access data streams and participate in the scientific workforce may become more open/ less geographically defined, and create a downstream effect / impact on who can do Antarctic science.

These developments have implications for Hobart as a centre of excellence and expertise for Antarctic and Southern Ocean science and as an Antarctica Gateway City. On the one hand, people working on remote sensing technology will need to be placed in or near Antarctica which creates an opportunity for Australia (and Hobart) to be leaders in this space. On the other hand, if the number of people or proportion of the scientific workforce that needs to do fieldwork in the Antarctic and Southern Ocean changes, then this may change how Hobart is placed as a Gateway City as then anyone anywhere may do Antarctic science.

Funding will also impact how these developments play out. AAD's $109m investment in drone technology positions Australia to be the lead in autonomous remote sensing in the world (at present), with flow-through implications for Hobart-based scientific organisations to contribute to that work and develop their workforce capabilities around it. Funding for and availability of a second sustainable icebreaker will also be relevant, as logistical issues influence the type and volume of science that can be undertaken and increasing that capacity will then increase in turn the types and volume of scientific work that can occur.

Opportunities:

- Embed governance and policy in Antarctic Science and training of Antarctic scientists. Embed knowledge of the Antarctic Treaty System into training and education and connect scientists with policy. This will enhance their understanding of the context for scientific work and also broaden career opportunities.

- Make students aware of the potential pathways and diversity in Antarctic work during their studies. Only 5% of PhD students working in Antarctic Science will remain/ have long term career in academia. Most will end up in government and industry. This creates a need to plan for and prepare for that from the beginning, and help them be aware of and consider these potential pathways from the beginning of their PhD journeys.

- Utilise training programs to develop awareness of opportunities to develop and deploy both specific and general skills.

- Develop more partnerships with government/industry to provide more internships and get PhD students into these areas. Building more pathways and opportunities will also help to broaden career opportunities, retain valuable knowledge and skills in the broader Antarctic workforce and bring broader and multi-disciplinary perspectives to various types of Antarctic work.

- Develop mentoring programs and opportunities so that science students can connect with experienced scientists. This will create professional development opportunities for both mentors and mentees, and could also assist with success planning and processes by enabling talent development and easing transitions into new roles and organisations.

Round table Particpants during Session 3 & 4

Engineering and Technology workforces

Technology and engineering capability is crucial (even defining) for supporting scientific work in the Antarctic and Southern Ocean, and the workforce needed to so that. Science as the core of AAD activities is increasingly being driven by technology, which in turn is driving workforce needs. For example, the Nuyina has highlighted the need for a wide range of skilled technicians, data officers and engineers to support its operation. Additionally, the AAD has created a standalone Technology and Innovation organisational unit specifically focused on developing new capabilities and emerging technologies to support operations of the AAD and the Australian Antarctic program. This includes designing and developing bespoke technology solutions, trialling new technologies, managing core technical functions and facilities. It also includes curating the produced with such technologies to support its transport back to Australia, make it accessible for interpretation and analysis, and incorporate it into mapping and information collections. All of these changes, and the complexity of emerging technology, create new workforce needs now and into the future.

Workforce planning and development are complicated by the need to determine and address both short term and long term goals. This requires identification, and balance of the skills and capabilities required to support the work being done and needed now, and to support work needed in the future. This is further complicated by the potential for developments in automation and data management to create new ways of working, and needs for new skill sets, far beyond what is currently available.

Attracting people to this work is further complicated by the need to build better understandings and appreciation of the interrelationships between engineering, technology and Antarctic science. This includes better communication and understanding of all the types of infrastructure, cost and logistics needed to do science in Antarctica, and the importance of engineering to supporting the challenges.

Policy workforces

The Antarctic Treaty System (ATS) shapes all of the work done in Antarctica and the management of the Antarctic and Southern Ocean. By extension, the provisions and management of the ATS also influences the Antarctic workforce by influencing who is involved in Antarctica and how engagement - with Antarctica and Antarctic-related matters – occurs. One implication is that the terms of the ATS prescribe what forms of activity in the Antarctic and Southern Ocean can be undertaken and how. This influences, in turn the workforces used to do that work, the work conditions in which they do so, and the work experiences that result.

Relatedly, as the ATS evolves, so do the range and nature of opportunities for Antarctic-related work. As the ATS grows this creates opportunities for new collaborations and the development of workforce capability. For example, new states such as Costa Rica joining the ATS presents opportunities to deploy Australian expertise to help new states build capacity and embed sustainability into the workforce.

The changing composition of the workforces involved in the ATS and other related policy work, also presents new opportunities for knowledge-sharing, networking, communication and capacity building. For example, as the ATS-related workforce has grown and increased its cultural, gender and functional diversity, this has diversified the range of perspectives which inform the ATS and expanded opportunities for participation in such work. Continuing to diversify this workforce is crucial to Antarctica being, and being seen to be, the continent for all. In recent decades, the functional specialties of people employed in Antarctic-related programs have also changed, bringing different skill and capability sets into policy-related work. For example, environmental management programs previously run by academics or members of AAD are now being led by practitioners.

Opportunities:

- Offer capacity building and knowledge and skill transfer in collaboration with international colleagues connected to Antarctica to help grow capabilities – for those who are learning and those who are sharing knowledge and skills.

- Develop more connections and communication between the academy, industry and government, particularly opportunities to learn by partnering.

- Develop training programs and linked learning opportunities, eg develop small scale internships through IMAS, and then broaden with new UTAS work integrated learning framework.

- Build capacity and connections by learning from participation in delegations.

- Create and enable more active engagement between all levels of government to come together and actively talk together about Antarctic-related issues and opportunities, to engage with geopolitical issues, and to create and maintain engagement with other National Antarctic programs whose staff transition to Antarctica through Hobart and their governments. Leverage Hobart being a Gateway City and centre of expertise as a location to bring policy makers together.

Round table Participants during Session 3 & 4

Opportunities Continued :

- Continue to build relationships with other national programs and integrate/ align support from Australian units (eg Border Force, Department of State Growth etc). This will assist to buffer geopolitical issues should they arise so that Hobart remains the premier Gateway City of choice.

- Foster a more collaborative workforce between Australia and other National Antarctic programs, and between Hobart and other Gateway Cities, to enable greater knowledge sharing, and dispel perception that NZ is a competitor.

- Use policy to build capacity and the future workforce by developing policy and policy support:

  - To engage primary and high school children with Antarctic work and workforces so they see those opportunities for their future:

  - To engage young people doing apprenticeships, studying at TAFE and undertaking trades to create pathways into Antarctic work, help them see a pathway to that for themselves, and support workforce diversification.

  - To support education, innovation and integrating capacity building within those sectors from Academic Institutes through to those more technical industries.

  - To address the lack of diversity in the sector and influence the policy workforce to identify who is missing from the current and future Antarctic and Southern Ocean workforce and develop strategies to engage with them.

  - To address psychosocial risk factors in the workspace to address how we can support members of the Antarctic and Southern Ocean workforce (and their families) at home and on expedition.

Round table Particpants during Session 3 & 4

Overarching Challenges and Opportunities related to Antarctic and Southern Ocean workforces

The following section summarises the conference discussions about the overarching challenges and opportunities to improve the workforces, workforce management, and work-related experiences of people doing work related to Antarctica and the Southern Ocean in general. It first presents challenges and opportunities relating to attracting, recruiting and enabling entry into Antarctic and Southern Ocean workforces. It then details challenges and opportunities relating to supporting and developing current and future Antarctic and Southern Ocean workforces.

Attracting, Recruiting and Enabling entry into Antarctic and Southern Ocean workforces

Opportunity: Make Antarctic-related work, jobs and opportunities more visible, transparent, 'findable' and accessible

The Antarctic workforce is not one unified workforce, it is a labour market for which employers and forms of work compete. Additionally, Antarctic-related work and jobs are 'hidden' to the extent that workers are often employed and categorised by other sectors (e.g. construction) but their work is Antarctic-linked or Antarctic-focused. For example, seven of nine workforce plans on the Skills Tasmania website all include Antarctic-related work and workers. This means the 'true' size, scope and diversity of Antarctic-related work which is and can be done is also hidden. Making this more visible would help to build community understanding about the breadth and importance of Antarctic- related work for Hobart and Tasmania, and to create new awareness, interest and engagement with Antarctic-related work and career options.

Opportunity: Create more mechanisms and information repositories about Antarctic work and workforces.

This would help people outside or newly joining the Antarctic community find out more about the sector and community, understand relevant issues and learn how to connect into networks and access people's knowledge. It could also help employers connect with people in ways and places that help generate new interest and opportunities, develop and share knowledge about what people want and are looking for regarding Antarctic work opportunities, and better understand what makes people want to come back (or not come back) to Antarctic-related work.

Specific initiatives could include:

Antarctic Job Fair

Host an Antarctic job fair for students, to promote and enable connection to job opportunities, including in related industries such as fisheries and tourism. This could potentially be linked to other events related to Hobart's City status, such as the annual civic reception to launch the Antarctic season, and the biannual Antarctic festival.

Antarctic Job Portal

Create an Antarctic job portal for posting and finding opportunities. This could provide greater scale and reach for recruitment (beyond employers only promoting opportunities on their own websites) and make the diversity of Antarctic-related jobs, professions, employers and industries more visible. This, in turn, would more accurately represent the diversity and forms of work available, demonstrate where and how different forms of work use related/linked skills and expertise, and highlight career pathways and progressions. Additionally, it could help new employers and entrants to the sector understand which organisations engage in and offer Antarctic-related work,and have relevant skills and capabilities. It could also facilitate better connection of Antarctic-related work opportunities and employers with Tasmanian training organisations.

Antarctic Internships

Provide internships as a pathway and opportunity to develop work experience that is relevant and real, both as an entre into Antarctic work and into other forms of professional work. Internships could potentially be offered with and through any organisation involved in Antarctic or Southern Ocean work, including the AAD, Antarctic Tasmania, and members of the Tasmanian Polar Network. Internships give future members of the workforce a chance to work, earn money, and have a 'real job' on their CV but to ensure equitable opportunities, internships should be more institutionalised and centralised than current ad hoc and opportunistic arrangements which may only be accessible to people who have connections.

Early Career Researcher Participants from left : Katie Marx, Naomi Forrest, Vicki Heinrich, Rebecca Kaiser, Kimberly Aiken, Chelsea Long, Mengzhu (Maggie) Zhang, Farhad Azimi Yancheshmeh

Opportunity: Create specific opportunities and supports for students moving into postdoctoral employment

For students moving into postdoctoral employment in the ASO workforce, Hobart can be a great place to build a career due to the access to expertise, mentors, key employers and opportunities. This can, and has, provided very positive opportunities for students to connect with people in the sector, especially connecting in person/face to face. Creating and maintaining connections and networks is crucial both for transitioning from study to employment and to building other career opportunities. This includes maintaining connection to the university and academic community once people move into employment and other sectors such as government, policy work. Supportive academic mentors and supervisors are valuable, but other opportunities need to be provided to equalise and broaden access opportunities, both during and after postdoctoral study.

For example, social scientists currently have fewer opportunities to attend conferences and workshops compared to other fields of science which limits network building opportunities. Students receiving PhD stipends can only take on limited amounts of additional work during their studies without losing their scholarship support. This limits opportunities to build experience and employment track record and hence undermines competitiveness for paid positions. At the same time, students are forced to trade off income security for income sustainability. Stipends also only last for 3.5 – 4 years so students then lose stipend income and need to find employment but may not have been able to engage in substantive paid work for several years. stipends alone are often insufficient to afford rental properties or mortgages, so housing insecurity can also limit professional opportunities.

There are also relatively few positions for postgraduate students especially in AAD and policy related work and access to postdoctoral opportunities sometimes depend on luck, timing and which networks people are connected into. International students face additional barriers to gaining employment in policy work or with the AAD because both those employment and career pathways require Australian citizenship. This has required / forced some international students to look for opportunities in broader scientific fields and policy fields than just Antarctic-related opportunities.

Specific mechanisms for better supporting postdoctoral employment into Antarctic and Southern Ocean workforces could include :

- Increase social science-related events and workshops
- Organise more collaborative international projects around Antarctica to enhance mutual understanding, trust and use of science as a tool for diplomacy
- Support students in making connections and building networks throughout their studies. Shifting the onus from the student to make connections would enhance both career and study-related support and supportiveness. For example, students in the final stages of their PhD-related studies are completing dissertation and needing to meet work-related goals which limits their capacity to build connections and network. Spreading opportunities provides more capacity and flexibility to build networks over time.

Opportunity: Enhance the conditions and value proposition of Antarctic and Southern Ocean work to improve attractiveness and capacity for people to take up opportunities

The emphasis on the unique challenges and opportunities offered by work located in Antarctica helps to attract people to the workforce and becomes a key part of the employment value proposition. However, the emphasis in existing messaging on ‘hero’ elements and perspectives of working in Antarctica generates and reinforces perceptions that such work is and only can be done by people who are elite: “You can be a plumber anywhere in the world but there are only a few who can be a plumber in the Antarctic”. Building more awareness about the diversity of people who work in Antarctica and of the roles they perform would help to make these opportunities more accessible and relatable.

Specific initiatives to adapt messaging:

Diversity, Inclusion & Equity

Diversity of People & Roles

Target Messaging

- Intentionally shifting messaging and imaging such as AAD has made in its recent recruitment campaign targeting female tradespeople to highlight the gender and cultural diversity of workforces operating in the Antarctic and Southern Ocean
- highlighting the functional diversity of Antarctic and Southern Ocean workforces. Scientists are the high-profile workforce but emphasizing the other workforces such as trades, chefs, builders, engineers would help people to identify with those workforces, work locations and types of work as a potential future pathway / opportunity for themselves.

Opportunity: Utilise current and former members of the Antarctic workforce to become:

Antarctic Ambassadors

For the Place

For the Opportunities

For the Experience

Images: Adelie Penguin by Tom Brakefield via canva.com, Sachi Yasuda Australian Antarctic Division, Weddell Seal by Vassil Tzvetanov CC2.0

A proportion of people who go to Antarctica only ever intend to go once e.g. to get it off their bucket list. Finding new opportunities to retain and leverage their expertise and experience could improve return on investment for the high costs of training and supporting people to go to the Antarctic continent, build positive understandings of what Antarctic work entails potentially generate referrals of new people into the Antarctic and Southern Ocean workforce. However, while working in Antarctica and the Southern Ocean can be a transformative and powerful experience, it can also be an experience that people struggle to convey and describe. When audience members lack context to understand what is being conveyed and those who convey can't be understood by those they are communicating with, this exacerbates challenges in making these types of work experiences seem accessible to others. Diversity considerations are especially relevant here, as the homogeneity of existing Antarctic and Southern Ocean workforces results in certain types of experience and perspective being over- or under-represented. This then creates additional complexity in making those experiences be understood by, and resonate with, people who have different frames of reference.

Nonetheless, utilising members of the Antarctic community as ambassadors, especially if a diverse network of ambassadors was created, may further help to create and reinforce new ideas that 'everyday people' can and do go to Antarctica – and that those back home can also care about and speak for the place.

Opportunity: Provide continuity of work and employment for people working on the Antarctic continent.

The seasonal nature of Antarctic-located work creates ongoing challenges for both employer and workers. Employers - particularly the Australian Antarctic Division - need to get a multi-skilled workforce to support work needing to be done during the Antarctic season. Offering seasonal/ short term work opportunities and contracts provide employers with flexibility to do this but create other challenges for employers and workers. For employers, this creates continuous demand to attract and select seasonal workforces, or to find ways to provide work and job satisfaction outside and between seasons. For workers, the use of seasonal short-term contracts for Antarctic-located work means workers don't have permanent full-time employment that would provide income security needed to secure mortgages or rental accommodation.

Initiatives to address this could include:

- Create ways for people to pursue Antarctic opportunities so they maintain continuity of service with existing employer so the maintain eligibility and benefits (e.g leave entitlements) and continuity of employment and income for mortgage and rental housing.
- Take longer term, including year-long, approaches to planning and executing work which balances time in Antarctica and time in Hobart. For example, people who do work involving remote sensing technologies could go down to Antarctica, install the sensors, do sensing work in the field, come back to Hobart and continue the work.
- Offer opportunities for work in other locations outside the Antarctic season, such as work in Svalbard and other Gateway Cities.
- Utilise learning and examples from the Industrial capability network to generate some approaches to collaborative workforce management and growth.

Opportunity: Adopt more collaborative approaches to enabling workforce mobility to undertake Antarctic and Southern Ocean-located work

The need to release people to undertake work in Antarctica creates both challenges and opportunities for employers. On the one hand, it can create challenges when it creates skills gaps or heightens existing workforce shortages. For example, a Bureau of Meteorology forecaster who wants or needs to go to Antarctica has to be released from their home location in order to go and managers won't release them if that will exacerbate forecaster supply issues in their location. On the other, workforce changes created when people are working in Antarctica can be leveraged to provide additional employment and developmental opportunities, and more opportunities for collaborative solutions.

One key opportunity to create more workforce mobility is to increase knowledge sharing amongst employers about opportunities for Antarctic work and related opportunities to backfill position. For example, when CSIRO workers go on the icebreaker Nuyina to support AAD work, this potentially creates opportunities for University of Tasmania employees or others to cover their absence. Alternatively, members of the Tasmanian Polar Network could send/ support employees going to Antarctica and then source workers from other network member companies to cover their absence. Such arrangements would generate the double benefit that both workers who go to Antarctica, and those who cover their positions, get developmental opportunities from new challenges and new inspirations, develop new skills and experience and get refreshed from the experience and the change.

Opportunity: Address inequities in value proposition for people who go to Antarctica

The employment arrangements and relationships that apply to working in Antarctica currently produce inequities in remuneration. These in turn, affect the value proposition of going to Antarctica and can produce conflict within and between workforces. For example, AAD employees have to be paid according to public service pay framework, whereas private contractors get paid very differently.

Image: Australian Antarctic Division Expeditioners making bread (Matthew Spencer AAD 2023)

Supporting Current and Developing Future Antarctic and Southern Ocean Workforces

Opportunity: Use locational advantages such as Hobart's status as a Gateway City and leading hub of Antarctic-related work to increase access to international opportunities and workforces

Hobart is a leading hub of science, research and logistics to support activity in Southern Ocean and Antarctica, by Australian programs and those of other countries. The Antarctic sector directly employs nearly 1000 people and is worth $160m to local economy. Beyond that, Antarctic and Southern Ocean – focused work creates flow-through opportunities and benefits for other related sectors and workforces. For example, Hobart hotels provide 7000+ nights per year to support expeditioners, and an additional 4000 nights per year to support conferences. Hobart is also one of only 5 Gateway Cities around the world (including Christchurch in New Zealand, Cape Town in South Africa, Ushuaia and Punta Arenas in Argentina).

The concentration of employers in Hobart, and the connections to other Gateway Cities, present opportunities to develop deeper dialogue and knowledge and resource sharing to support the growth of sectors and more connection and collaboration

Specific Initiatives could include:

- Exchange programs with other Gateway Cities
- Language linkages and training, especially Spanish classes to connect with South American Gateway Cities
- Strengthen links between UTAS and Antarctic Community with CCAMLR and ACAP, especially the secretariats
- Create more two-way linkages between conservation science and policy. Two-way communication not just scientists presenting research and findings to policy makers but policy makers also letting scientists know their needs and communicating the issues in policy.

Opportunity: Leverage Centre for Antarctic and Southern Ocean Technology (CAST) to enable better coordination of workforces between AAD, CSIRO and the University of Tasmania and enable greater utilisation of skills sets available in Hobart

The co-location of the University of Tasmania, CSIRO and AAD in Hobart and Tasmania presents opportunities to link and leverage the large, specialised workforces of these three organisations. Their joint establishment of the Centre for Antarctic and Southern Ocean Technology (CAST) provides a dedicated fora both for identifying opportunities to collaborate and link members of those organisations, and to collaboratively develop mechanisms for leveraging the complementarity of the member organisations and their workforces.

Specific Initiatives could include:

- Link and leverage capability sets across the CAST member organisations to address capability gaps within them
- Cross-promotion of employment and developmental opportunities that arise from workforce gaps
- Promotion of co-location, proximity and access to other CAST members as part of the employment value proposition for taking up employment with a CAST member organisation, enhancing attraction of people to Hobart and Tasmania.
- Create career pathways that link across CAST members including opportunities for people to cycle back to previous employers having developed more skills and expertise.

Opportunity: Address systemic inequities which perpetuate homogeneity of Antarctic workforce and prevent greater racial, ethnic and gender diversity

Antarctica is referred to as 'the continent that belongs to everyone' but access is limited and there is a lack of diversity and representation in both National Antarctic Programs and related educational programs. This presents both opportunities and imperatives to open and broaden discussions about how to build interest in Antarctic-related work with underrepresented groups and communities, and how to recruit people in Antarctic-related educational programs and workforces, and why existing approaches are not generating more diverse applicant pools.

Specific Initiatives could include:

- Creation of advisory groups to build representation and overcome indirect discrimination. For example, Hurtigruten has created a black travel advisory board to provide input into policy, direction setting, board participation.
- Leverage of existing initiatives such as the Antarctic Women's Network (antarcticwomensnetwork@outlook.com) formed in Hobart in November 2022 to build more connection and involvement.
- Undertake more exploration of unique issues associated with attracting and retaining women into the Antarctic workforce. There is lots of work exploring this now, which is helping to recognise and enable greater learning from the history of women's experiences in remote workplaces, even when that is confronting and uncomfortable. Additionally, there are lessons to draw from other industries which utilise remote and male-dominated workforces (eg fly-in-fly out workforces in mining sector).

Opportunity: Deepen understanding of the experiences and challenges people encounter when working in Antarctica and the Southern Ocean and the support needs these create.

Understanding the support needs individuals have when working in Antarctica and the Southern Ocean is crucial to helping people adapt and thrive. This includes support needs before people go, while they are there and after they return, because research has shown that the best predictors of how well someone will adapt are what happens before and after they go. Better understanding of the opportunities and challenges people encounter in those work environments will generate new insights about the supports they need. More understanding of how people adapt, and the factors that influence their successful adaptation, will enable provision of targeted, tailored, evidence-based supports pre-departure, while they are there, and after they return. As these supports help people adapt, thrive and have positive experiences of working in Antarctica and the Southern Ocean, they may also enhance workforce retention and sustainability by promoting repeat experiences, and generating positive word of mouth.

Opportunity: Improve support for mental health and wellbeing

Attractive employment propositions that address the challenges to health and wellbeing of remote work will be pivotal to attracting and retaining a workforce in this sector. Opportunities exist to draw from the lessons of the Covid pandemic about building and maintaining community when physically isolated and disconnected, and apply these lessons to build connection both with people from whom Antarctic-located people are distanced, and with people with whom they are co-located. Technological solutions may be able to assist with building/ maintaining connectivity with family back home but could then cause disconnection with community in Antarctic stations “if everyone's in their room on their tech talking to home and we don't bring the community together”. This suggests changes to practices that enable communication with home need to be met with changes to leadership practices on stations to support community building in place.

Priorities Identified:

- Support for the mental health of people working in Antarctica and the Southern Ocean, including support for the mental health impacts of working in isolated, confined and stressful conditions and contexts (eg impacts on loneliness, depression).
- Consideration and support for impacts on worker families, and impacts of separation from family. This includes impacts on the family (eg when parent/ family member cannot be consulted about family matters and developments, impact on family of separation) and impact on worker of being disconnected from family who may know best/ first when a person’s mental health is suffering.
- Proactive engagement with identification, minimisation and management of psychosocial risk factors to align with new legislation and regulation relating to employer duty of care for psychosocial health
- Innovations and interventions to support mental health which incorporate preventative measures, support while issues are being experienced, and support for recovery and to minimise recurrence.

Opportunity: Create more opportunities for professional development and career mobility within and across broader Antarctic workforce.

Retaining people who have incredibly specialised knowledge, skills and experience related to working in Antarctica and the Southern Ocean can generate more return on the investments made to develop that knowledge and expertise but also help the people who have it feel (and continue to feel) valued and valuable. Utilising the experience and expertise of workforce members enables provision of mentoring and advice, sharing of experiences with new people, and provides a chance to give back to Antarctic community. Creating mentoring connections while both parties are still active in such work is particularly important as not everyone will want to engage in the same way when they leave the sector or career. Additionally, employers need to consider and create structures to engage with people who are ending their careers or moving on to different careers and making the most of these people while they are still employed.

Specific Initiatives could include:

- Creating and leveraging 'alumni networks' to create and maintain connection with people so as to maintain access to their knowledge and expertise even if they have moved on to other sectors or locations. For example, the ANARE club have the data and the framework to provide an alumni network.

- Encouraging and supporting people to 'cycle back' into Antarctic workforces in the future and potentially bring even more knowledge and expertise back with them

Opportunity: Foster more systems-level approaches to understanding and building the Antarctic and Southern Ocean workforce.

Developing interprofessional, interdisciplinary, collaborative and collegial forums and initiatives for sharing expertise and insights will help to broaden perspectives, deepen understanding and help maximises outcomes for both current and future workforces. This would also create greater opportunities for transferring and leveraging insights from different fields and workforces to and from, the management of Antarctic and Southern Ocean workforces. Thinking and work about Antarctic workforces and environments provide an analogue for many other work environments in which people are working in isolated, contained and extreme conditions. These include but are not limited to, fly-in fly out workforces operating in remote locations, mining and natural resource sectors, other forms of maritime work, and space. Additionally, ongoing inter-disciplinary and multi-sector knowledge sharing and collaboration could also generate new contexts for developing and trialling cross-sector solutions such as complementary employment opportunities, professional and career development pathways, and cross-sectoral training initiatives.

Opportunity: Build better and different connections between the Antarctic community and the broader community.

For example build engagement with school children such as through the postcard project with Lansdowne Crescent Primary school so students share what they are learning with siblings, family members, friends.

Moving forward into the future of Antarctic and Southern Ocean work and workforces

The discussions, knowledge-sharing and connections enabled by the conference have, for our participants, already translated into tangible outcomes that include:

- New connections and collaboration related to citizen science
- New discussions and ideas about how to support people to work in Antarctica and the Southern Ocean, such as by addressing inequities in sea-pay and fieldwork pay provided by relevant employers and by providing needs-based payments to support additional childcare need by people undertaking fieldwork at sea or on the Antarctic continent
- Opening up discussions about Antarctica and the Southern Ocean work to include additional workforces, such as involving different trades
- New discussions about the barriers to work and workforce participation created by using BMI as a medical check for working in Antarctica
- Developing new initiatives to implement the Antarctic Cities 'Principles of Antarctic Connectivity'

We hope that by sharing the ideas and opportunities generated by the conference discussions we will continue to inspire and enable new ways of thinking, engaging in and supporting work in the Antarctic and Southern Ocean, and create even better environments, engagement and experiences of that work for those who do it now, and those who will do it in the future.

Speaker Profiles

Dr. Hanne Nielsen: *Dr. Hanne Nielsen is a Senior Lecturer in Antarctic Law and Governance at the Institute for Marine and Antarctic Studies, University of Tasmania. Her research focusses on representations of Antarctica in popular media, including in theatre and advertising material; polar tourism; Antarctica as a workplace; and the "Antarctic imaginaries" that manifest in cultural production. Hanne was recognised as an emerging research leader as the first HASS-based researcher to be awarded a Scientific Committee on Antarctic Research (SCAR) Fellowship in 2017. She currently serves as Chief Officer of the SCAR Standing Committee on Humanities and Social Sciences (SC-HASS), and was a past President (2017-18) of the Association of Polar Early Career Scientists (APECS). Originally from New Zealand, Hanne first visited Antarctica with the University of Canterbury in 2011 and has been involved in Antarctic research ever since. Having spent 5 seasons working as a tour guide in the Southern Ocean, Hanne has a particular interest in the contemporary practices of polar tourism. She has also attended several Antarctic Treaty Consultative Meetings as a rapporteur. Her research has appeared in a range of peer-reviewed journals and edited book collections while her frequent media appearances have helped raise the profile of Antarctic humanities and social sciences research*

Dr. Megan Woods: *Dr.Megan Woods is a Senior Lecturer in Management with the Tasmanian School of Business and Economics. She teaches and researches in the areas of strategic human resource management and workplace mental health, with a particular interest in optimising the workforces, work environments and work experiences of people working in the Antarctic and Southern Ocean. She leads the University of Tasmania's Future Antarctic and Southern Ocean Workforce initiative and the People program for the Centre for Antarctic and Southern Ocean Technology, a collaboration between Utas, the Australian Antarctic Division and CSIRO. She is currently researching psychosocial work environments on research vessels, and optimisation of work experiences in isolated, contained and / or extreme work environments. She co-hosted the Future of Work and Workforces in the Antarctic and Southern Ocean conference in Hobart on 1 December 2022.*

Jamie Graham-Blair: *Jamie is a muttonbirder, writer, photographer, conservation ecologist, tour guide, a ceremony holder, educator, activist and dancer. A loud, proud and very active trawlwoolway and plengarmairenner pakana with ancestral connections to the Northeast of lutruwita as well as the tayaritja, Jam has dedicated many years of life to healthy country, as well as community, and culture. Nearing the end of his Bachelor of Marine and Antarctic Studies at the University of Tasmania his growing understanding of climate science, environment and the relationship between land, sea and sky has been driven by a deep innate need to protect and heal his ancestral island and coastlands in the wake of devastating colonialism. Bringing both pakana tunapri and western understanding of ecology, seasons, movement and communication, he hopes to use both these systems of thought to share stories of resilience and healing in the goal of a healthier and more deeply understood island for all those who live here.*

Assoc. Prof. Anne Hardy: *Associate Professor Anne Hardy is a researcher with a keen interest in tourist behaviour and sustainable tourism and is based at the University of Tasmania in the School of Social Sciences. Her research has been cited over 2200 times and she is the author of over 30 journal articles and three books, the most recent of which is titled Tourist Tracking and Mobility. Some of Anne's most well-known research is the multiple award-winning project, Tourism Tracer. This project was the first to track tourists, with their consent, for the duration of their holiday throughout entire destinations. Tourism Tracer's success resulted in changes in the way that destinations such as Tasmania collect visitor information. Since its development, it has been used in many other national and international jurisdictions and has since been commercialised. Anne's international and national reputation for innovative, engaged and impact driven tourism research has led to a variety of national and international academic invitations to deliver keynote speeches to both industry and academic audiences. Anne is the co-founder of the Iso-CHATS seminar series. This series is dedicated to sharing the work of tourism researchers across the globe during the COVID pandemic. It rapidly gained a reputation of being a collaborative, social and supportive space for new, emerging and experienced researchers from across the world.*

Prof. Kimberly Norris: *Professor Kimberley Norris is a psychological scientist and clinical psychologist who works across academic, research and clinical practice settings. Her overarching research and academic interests are focused on maximising human health, wellbeing and performance in both normal and extreme environments. Her research interests include adaptation and resilience in both extreme (e.g., Antarctica, space and FIFO) and more normative (e.g., academic, life events) environments. Through her work, Kimberley develops new and innovative ways to provide psychological support for individuals in remote, rural, maritime and extreme environments at an individual, organisational and relationship level.*

Prof. Elizabeth Leane: *Prof Elizabeth Leane (Elle) is Professor of English and Associate Dean (Research Performance) in the College of Arts, Law and Education, University of Tasmania. Her early research was in science communication, but for many years she has focussed on cultural aspects of human engagement with Antarctic, past and present. She is interested in how people form their ideas of Antarctica both through cultural texts and lived experience of the environment, and how these two ways of knowing the region interact. She has visited Antarctica as a writer-in-residence, an educator and a researcher, with the Australian, New Zealand and Chilean national programs, and is currently collaborating with tour operators. Elle has published seven books, including South Pole: Nature and Culture (2016) and the collection Performing Ice (2020)***.**

Prof. Matt King: *Prof Matt King is Director of the Australian Centre for Excellence in Antarctic Science (ACEAS), an eight-university partnership focused on climate risks emerging from East Antarctica and the Southern Ocean. ACEAS will shortly be a team of about 150 people across Australia, including half early career researchers. His PhD focused on applying his surveying skills to understanding change of the Amery Ice Shelf and since then his research has focused heavily on the behaviour and change of the Antarctic and Greenland ice sheets. He was part of the international team to arrive at the first agreed estimate of ice sheet contribution to sea level. He has received medals for his research from the Royal Society of London and the Australian Academy of Sciences.*

Katie Marx: *Katie Marx is a PhD candidate and research fellow in the College of Arts, Law, and Education at UTAS. She has a professional background in organisational strategy and community development, and her research focuses on understanding public engagement and place attachment in the Antarctic gateway cities. Katie is interested in what it means for people to feel a connection with a place they will never visit and, given half the chance, will happily talk your leg off about ice swimming and civic participation.*

Anne Boothroyd: *Anne is a PhD candidate at UTas in the school of Geography, Planning and Spatial Sciences, researching conservation planning and marine protection in the CCAMLR Area of the Southern Ocean. Outside of PhD time, Anne works with a small team to provide expert technical support and advice to government and non-government stakeholders for a variety of conservation projects.*

Bruno Apri: *Bruno Arpi is a PhD candidate at the Faculty of Law and the Institute for Marine and Antarctic Studies (IMAS) at the University of Tasmania. He holds a Master of Law (LL.M) degree from the University of Copenhagen (Denmark) and graduated as a Lawyer at the Universidad Nacional de Rosario (Argentina). Bruno is a sessional lecturer in public international law, law of the sea, and Antarctic Law at the University of Tasmania and the Universidad Nacional de Rosario. He is also a member of the Council of the Australian Institute of International Affairs (AIIA) Tasmania and co-chair of the Australian and New Zealand Society of International Law (ANZSIL) Oceans and International Environmental Law Interest Group.*

Kimberly Aitken: *Kimberly Aiken is a Ph.D. candidate at the University of Tasmania, Australia Institute for Marine and Antarctic Studies. Her research focuses on diversity and inclusion in the Antarctic workforce and extreme and remote workplaces. Kimberly's academic interests include Arctic policy and governance, Antarctic environmental protection, intersectionality, diversity, equity, inclusion and belonging, and extreme and remote environments. When not working for Antarctica or participating in Arctic engagements she enjoys exposure to different parts of the world, cultures and foods, and a wide range of outdoor activities***.**

Mengzhu Zhang: *Mengzhu Zhang is a PhD student at IMAS, UTAS. Mengzhu's PhD project is studying China's engagement within the Antarctic Treaty System (ATS). Her research aims to address the link between China's Antarctic Science and its engagement with the ATS, and to help improve understanding of how China fulfils its commitment to the ATS. Mengzhu is interested in the field of developing science and technology policy and promoting cooperation between nations through science diplomacy***.**

Dr. Rebecca Hingley: *Dr Rebecca Hingley is an honorary associate at IMAS with a research background in Political Geography and Heritage Studies. Her thesis focused on the geopolitics of cultural heritage management in Antarctica with an aim to expose how and why the governance of Antarctic heritage concerns more than the preservation and conservation of historic remains, and what effects these alternative agendas have on multilateral relations. Following the completion of her thesis, Rebecca worked for a not-for-profit conserving, commemorating, and celebrating Australia's Antarctic heritage, and she now works for the Australian Antarctic Division in protected areas management.*

Georgie Branch: *Georgie is responsible for City of Hobart's international and strategic relationships with a larger focus on supporting our Antarctic sector. Before joining local government, Georgie has spent nearly a decade in state government in the international relations and trade sector and in political offices. She holds a BA in Public Policy and Political Science from the University of Tasmania.*

Karen Rees: *Karen is the Director, Antarctic Tasmania in the Department of State Growth and responsible for the development and implementation of the State Government's Tasmanian Antarctic Gateway Strategy. She is also the immediate past Chair of the Tasmanian Polar Network. She is a former tourism operator and former board director of the Tourism Industry Council of Tasmania and current management group member of the Australia Antarctic Partnership Program (AAPP). Karen has worked as a Marketing and Commercial Manager for Tasports and led an infrastructure project for Hobart International Airport to build a freight and Antarctic logistics facility. More recently she has been working with Tasmania's Antarctic stakeholders to grow the Tasmanian Antarctic Gateway as well as being the Tasmanian Government representative on the Australian delegation to the Antarctic Treaty Consultative Meeting (ATCM), the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), and the Council of Managers of National Antarctic Programs (COMNAP). Karen has an extensive international network in the Antarctic sector.*

Richard Fader:
Richard Fader is Managing Director of Tasmanian Shipping Supplies and Director of Offshore Unlimited, businesses working in the marine and Antarctic sectors. He has thirty years of successful business development built upon strong leadership skills and a record of performance and integrity. He is committed to supporting business in Tasmania using Tasmanian suppliers and boat builders and the employment of skilled Tasmanian seafarers and support staff in his businesses. Richard is Chairman of the Tasmanian Polar Network, Past Chairman and current Deputy Chairman of the Australian Ship Suppliers & Services Association, member of the Australian Maritime Safety Authority domestic commercial vessel advisory committee, Tasmanian Joint Defence Industries Steering Committee, and the Tasmanian Antarctic Gateway Group.

Pat Lewis: *Dr Patrick Lewis has a diverse background encompassing Antarctic science, governance, polar conservation, tourism and the maritime commercial sector. Patrick's perspectives on Antarctic workforce challenges are shaped by time spent in remote Antarctic field settings and his experience working across professional divides. Working in the Technology and Innovation Branch of the Australian Antarctic Division Patrick's role is focused on supporting internal and external science programs and trialling new technologies to enable world-leading research.*

Ally Browne: *Ally Browne is a People Partner for the Australian Antarctic Division partnering with all SES across the department. Her background spans multinational organisations and commercial industries including Fintech, Mining, and Health Services contributing to people, profit, and performance outcomes. Often her stakeholders describe her as a 'People Engineer' because she likes to design and build sustainable solutions from strategy to implementation. Ally's remit includes the development of a workforce strategy and action plan where she is keen to explore our future work and workforces as part of the CAST.*

Damian Perry: *Damian Perry is the Marketing Director for Asia Pacific representing a core market of travellers for Hurtigruten. The role covers commercial and project-based responsibilities with a strong focus on innovation and sustainability. Hurtigruten Expeditions has been sailing polar waters since 1893 - over 128 years and over 20 years in the southern oceans and Antarctic peninsula. We want the Arctic, Antarctica, and everywhere in between to remain places of pristine nature, pure water and clean air. Sustainability is therefore at the heart of who we are and what we do. From the beautiful natural world to remote communities, we want to ensure our expedition cruises protect them both.*

Further reading

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Event chaired by **Dr Hanne Nielsen and Dr Megan Woods**
Event Assistant: **Mengzhu Zhang**
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