



10th August 2017

Committee Secretary
Joint Standing Committee on the National Capital and External Territories
PO Box 6021
Parliament House
Canberra ACT 2600

The Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC) welcomes the opportunity to make a submission to the Joint Standing Committee's Inquiry into Australia's Infrastructure Assets and Capability in Antarctica.

The ACE CRC conducts multidisciplinary research in Antarctica and the Southern Ocean that delivers directly against Australia's national research priorities and Australia's Antarctic Science Strategy (2011-20). The Centre is an Unincorporated Joint Venture, with 21 national and international partners, that leverages well over \$10M per annum of international investment into Australia's Antarctic science program. Much of this investment is in the form of ship and aircraft time that complements Australian infrastructure capability and drives better research outcomes through collaboration.

The ACE CRC relies heavily on the infrastructure assets of the Australian Antarctic program to deliver on our commitments to the Commonwealth under our funding agreement. The CRC is one of the primary mechanisms by which Australia delivers on its Antarctic Science Strategy, in particular in areas of Antarctic and Southern Ocean climate science. As such, the CRC is well placed to contribute to this inquiry and we offer the following detailed comments against each of the terms of reference.

1. *Maintaining national interests*

- Australia's presence in Antarctica underpins our territorial claim to 42% of Antarctica and the Exclusive Economic Zone adjacent to it. Australia is not able to reach all parts of the Australian Antarctic Territory (AAT) with existing assets, although this may be addressed in future with greater shipping and aircraft capacity, and a planned investment in over-snow traverse capability.
- A strong and long-standing scientific research program in the Australian Antarctic Territory (AAT) underpins Australia's influence in the Antarctic Treaty System, and the infrastructure at Mawson, Davis and Casey stations is crucial for enabling science programs. A peaceful and stable Antarctic region is central to Australia's national interests and the value of science in Australian soft diplomacy must not be under-valued.
- Many of the countries active in Antarctica have strategic and geopolitical interests that intersect with our own. Both established and emerging players, including China, could

quickly fill any gaps in capability and influence if Australian investment in Antarctica is not maintained.

- Antarctic and Southern Ocean research underpins Australia's regional security, with climate change acknowledged as a 'threat multiplier' in the Australian Defence White Paper¹. The assets of the Australian Antarctic program are critical for underpinning this research, and security of research funding is central to maintaining critical science capability. This is presently at risk, as outlined in more detail below.
- The impacts of climate change will be felt most by Australians on land, but it is what is happening in the oceans and Antarctica that will determine the timing and extent of those impacts. Food and water security will become critical issues for Australia and the rest of the world in coming decades, and active research programs, observing networks and access to satellite data through international partnerships will all be crucial to Australia's national security and economic prosperity.

2. *Serving the scientific program into the future*

- Australia's recent investments in research infrastructure (both underway and planned) are crucial for the delivery of Australia's Antarctic Science Program, and support the Whole-of-Government plan for Antarctic research outlined in the Australian Antarctic Strategy and 20 Year Action Plan². In particular, the new icebreaker and improved inter-continental air services represent step-improvements in existing capability, and the planned modernisation of Antarctic stations together with over-snow traverse capability are welcome and necessary for delivering a modern, world-class Antarctic program. However, **the research capability to utilise these assets is at great risk** given the high level of uncertainty around future science funding. Approx. 70 research and technical positions are at risk through 2018 and 2019 as funding for the ACE CRC and Antarctic Gateway Special Research Initiative ends. The Australian Antarctic Division has also lost approx. 30% of its scientists over the past three years due to budget cuts. Presently, there is no signal from government as to how this situation will be resolved.
- Antarctic science is expensive and time consuming. It often takes years to plan, especially at a scale that involves international collaboration, and requires research proposals to be assessed through competitive, peer-reviewed processes. The planning and approval processes alone can often take 2-3 years with a similar amount of time then required to undertake the research, especially if pre-positioning of assets is required, or if instruments must be deployed for one or more years. It is therefore impossible to undertake strategic, well-planned, impactful Antarctic science on funding horizons less than 5 years, and preferably much longer, and this must be a primary consideration in future discussions around Antarctic science funding.
- Any loss of research capability will detract significantly from recent government investments in infrastructure, most notably the new icebreaker. Under planned operating arrangements the new vessel will have the capacity to undertake 60 days of marine science per year, yet the backbone of national research capability to utilise this asset may be severely depleted.

¹ Australian Defence White Paper (2016)

² Australian Antarctic Strategy and 20 Year Action Plan (2016)

The impact is not only a lack of return on the investment in infrastructure but the loss of capability to undertake urgent research in Australia's national interest.

- Many priority research activities require access to deep field sites or to the Southern Ocean, and the infrastructure to facilitate this work includes inter- and intra-continental flight links, over-snow traverse capability, and icebreaking research vessels. Australia's commitment, for example, to drilling a 1 million year old ice core can only be delivered with new infrastructure assets.
- Australia's Integrated Marine Observing System and National Computing Infrastructure (both funded through NCRIS), together with Australia's national climate modelling capability (ACCESS) are all essential assets that underpin the science effort in Antarctica and the Southern Ocean. They deliver tangible benefits to all Australians through improved forecasting of weather, extreme events and future climate scenarios. All three are well managed, but none have secure, long-term funding at a level appropriate to the national benefit they deliver. IMOS, for example, risks losing its deep-water mooring program without the application of NCRIS contingency funding, and this would significantly damage Australia's Southern Ocean research program and understanding of the impacts of ocean acidification on marine ecosystems.

3. International engagement, including collaboration and resource sharing with other countries

- A key strength of the Australian Antarctic science program is our ability to collaborate with other national programs and to leverage and share resources, including ships, aircraft, personnel and scientific equipment. Central to these *quid pro quo* arrangements is an ongoing commitment to investments in our own assets and capability, and to excellence in science. All scientists recognise that Antarctic science is logistically intensive, complex and expensive and seek to leverage their effort through international collaboration. The ACE CRC leverages significant ship and aircraft time into our program, as well as in kind contributions from international scientists and access to satellite data from international space agencies, totalling well over \$10M pa³.
- Australia co-invests in international observing programs such as the ARGO float program, which improves ocean forecasting for the Navy and weather forecasting for the Australian community. In our region of the Indian and Pacific Oceans, international co-investment in ARGO is only possible if Australia maintains its commitment. Currently, Australia under-invests in the ARGO array in our region.
- Australia does not have a space program; however we gain access to a vast array of satellite data through partnerships with those countries that do. In return, Australia invests in ground-based observations and observing systems that help with the interpretation and validation of satellite data, and it is crucial that we maintain these investments as part of these partnership agreements. Satellite data helps Australia identify and respond to natural disasters such as floods and bushfires; identifies external threats such as tracking illegal ship movements; and improves weather forecasts on land and in our surrounding oceans. Every Australian benefits every day from satellite data that Australia receives from other countries.

³ Figure quoted is from the ACE CRC Commonwealth Agreement (2014)

4. Fostering economic opportunities consistent with the ATS obligations

- Australia's blue economy is currently valued at \$74 billion dollars per year and employs approx. 400,000 Australians⁴. It is projected to grow to \$100 billion by 2050, yet our national marine facility, the *RV Investigator*, which is essential for conducting research in support of the sustainable development of our blue economy only operates for 6 months of the year. While recognising the tight fiscal environment, this is a missed opportunity that must be addressed as a matter of urgency. For \$8M per annum – or less than 0.01% of the value of Australia's blue economy – the vessel could be put to sea for the full 300 days per year for which it was designed, and deliver a greatly enhanced return on investment to the Australian public.
- A key deliverable in the Australian Antarctic Strategy and Action Plan (2016 -26)⁵ is to build Hobart's status as the premier East Antarctic Gateway City for science and operations. As the home of Australia's Antarctic program, Hobart is central to the planning, coordination and management of the infrastructure that underpins research and other activities in Antarctica. The presence in Hobart includes the head office of approx. 300 staff, the home port of the *RSV Aurora Australis* (and her replacement which is due to arrive in 2020), and the base of intercontinental flights in/out of Hobart airport. The value of the Antarctic sector to the Tasmanian economy now represents approx. \$180M of the State Gross Product, according to a 2016 study commissioned by the Tasmanian Polar Network⁶. The Polar Network represents a consortium of more than 70 local businesses that engage directly with, and deliver services to, the Antarctic community from accommodation to waste management, to port and victualing services, to the servicing of heavy machinery. The \$50M modernisation of infrastructure at Macquarie Island represents a significant opportunity for this network of businesses, as does the ongoing modernisation of other Antarctic infrastructure.
- Beyond the AAD, the Antarctic and marine research institutions, including the ACE CRC, employ a further 450 staff in Tasmania, mostly in Hobart. This drives year-round economic activity and attracts thousands of visitors each year for conferences and study visits. The physical presence of assets from other national programs, including the French vessel, also drives economic and scientific activity in Tasmania.

5. Environmental considerations

- Australia has made international commitments under the Paris Agreement to limit global warming to +2C above pre-industrial levels, and to curb the effects of climate change. To inform policy decisions, and track progress, research in Antarctica and the Southern Ocean is of the highest priority, and the necessary infrastructure must be in place to support this. This includes reliable access to Antarctica and the Southern Ocean, dedicated ship, aircraft and station time in support of science operations, and appropriate investment in national research infrastructure – and capability – in Antarctica and Australia. As mentioned above, the effects of climate change will be felt mostly on land – through changing rainfall patterns,

⁴ The AIMS Index of Marine Industry (2016), Australian Institute of Marine Science

⁵ Australian Antarctic Strategy and Action Plan (2016)

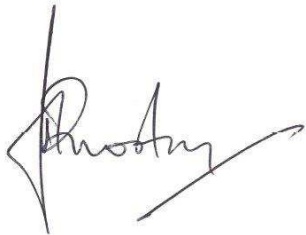
⁶ Wells Report: "Tasmania's Antarctic Sector and Contribution to the Tasmanian Economy 2015-16" (2016)

water scarcity, extreme events and the impacts of sea level rise on coastal communities, but it is what is happening in our oceans and in Antarctica that will determine the impact and speed with which impacts are felt. Australia is one of nations most vulnerable to climate change, with our economy heavily reliant on industries with high exposure to climate risk, and with large populations and most of our national infrastructure concentrated at the coast.

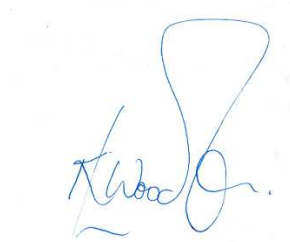
- Australian operations in Antarctica are some of the most environmentally sensitive of any nation operating in Antarctica, and this record gives us significant influence in the Antarctic Treaty System and in particular the Committee on Environmental Protection. The strength of our science program underpins much of this influence, and the infrastructure assets of Australia's program are central to achieving science outcomes.

We would be pleased to provide further details to the Joint Standing Committee on request.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Tony Worby', with a large, sweeping flourish extending to the right.

Professor Tony Worby
Chief Executive Officer

A handwritten signature in blue ink, appearing to read 'Katherine Woodthorpe', with a large, stylized loop at the top.

Dr Katherine Woodthorpe
Chair