

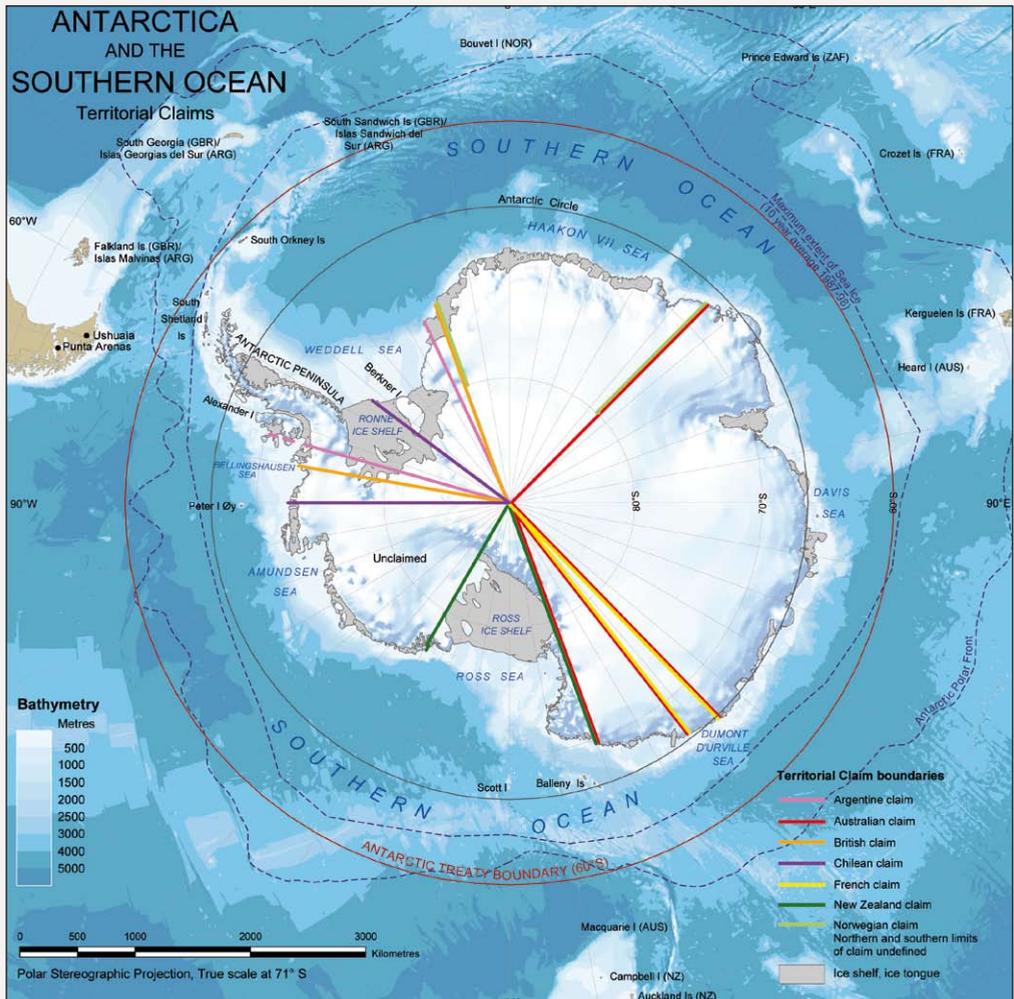


Frozen assets: Securing Australia's Antarctic future

Anthony Bergin and Marcus Haward

Introduction

Australia has one of the longest records of Antarctic engagement. This reflects our geographical proximity to the continent and the regional connections through climate and the Southern Ocean.



We are soon approaching the 100th anniversary of Douglas Mawson's first famous 1911–14 expedition to what is now known as the Australian Antarctic Territory. Later this year there will be an air link between Hobart and Antarctica, a significant milestone in the history of Australia and Antarctica. On the first of March this year the International Polar Year commenced, taking place over 2007/08. It's designed to give a big burst of scientific activity to enhance our understanding of the polar regions and thus our understanding of global processes.

As the effects of climate change become more evident it will be to Antarctica that we must continue to turn for possible answers. Ice cores from Antarctica can tell us about the history of the earth's climate and, more importantly, help us predict the future with greater confidence. Sea level rise, when it comes, will partly have its origins in the continent immediately to our south.

Interests and challenges

Australia has played a significant role in the development of the overall management of Antarctica. We have adopted a position of leadership in various international

bodies and arrangements dealing with Antarctica. Antarctica tends to be viewed by policy makers as a settled policy arena, yet important questions remain. What are Australia's national policy interests in Antarctica? What are the key challenges likely to arise over the next decade that will shape our approach to Antarctica? Are we doing enough in Antarctica?

Australia has played a significant role in the development of the overall management of Antarctica.

Sovereignty

Australia has two Antarctic territories—the Australian Antarctic Territory (AAT) and the territory of Heard and McDonald Islands (HIMI). These are non-self-governing external territories. It's rare for an individual to remain at one of the three Australian Antarctic stations for more than fifteen months. HIMI is essentially uninhabited.¹ But lack of permanent inhabitants does not mean we don't have significant national interests and responsibilities there.



Proclaiming what became Australian Antarctic Territory. Photograph by Frank Hurley 13 January 1930, courtesy Australian Government Antarctic Division

Australia has claimed 42% of Antarctica since 1933—next year we celebrate the AAT's 75th anniversary. The area of the AAT is 5.9 million km². Mainland Australia is 7.7 million km². The AAT is vast—approximately the size of Australia

without Queensland. The AAT coastline length is 7,350km (compared with 35,800km for the Australian mainland) and generates a territorial sea, continental shelf and a huge Exclusive Economic Zone (EEZ).

Seven facts on the Australian Antarctic Territory

Australia's highest mountain

The highest mountain on the Australian mainland is Mt Kosciuszko in NSW at 2230 metres. But it is dwarfed by the highest mountain in the AAT, Mt McClintock, which is 3492 metres. Mt McClintock is in the Eastern Sector of the Australian Antarctic Territory and, as far as we know, has never been visited by an Australian. It is also suspected that the mountain has never been climbed, although there may have been a landing on the summit by helicopter.

Mawson Peak on Heard Island is 2475 metres and is Australia's highest point outside the Australian Antarctic Territory.

Australia's highest point

Australia's highest point is not the summit of a mountain at all, but is a point on the Antarctic plateau at a place called Dome A. The highest point of Dome A is at an altitude of around 4270 metres. An Australian Automatic Weather Station is recording temperatures on Dome A and is expected to record the world's lowest surface temperature. The AWS was installed by a Chinese expedition to the site in 2005 because the Australian Antarctic program was unable to do it.

The world's coldest temperature

The world's current record low temperature was -89.2°C , recorded

in July 1983 at Russia's Vostok in the AAT. Vostok is between Casey and the South Pole and at an altitude of 3420 metres (hence the expectation that the significantly higher Dome A will record a lower temperature).

The world's highest surface wind speed

Cape Denison, in the Eastern Sector of the AAT, is known as the windiest place in the world at sea level. Average wind speeds are around 80km/h, and gusts of over 320km/h have been recorded. These extraordinary wind speeds are caused by the local topography which funnels the flow of cold air masses down the Antarctic ice sheet.

The world's greatest glacier

The Lambert Glacier in the AAT is the world's largest glacier. The glacier itself is some 500km long, and up to 80km in width, and it is draining around 20% of the East Antarctic ice sheet.

Deepest ice

The world's thickest ice is found in the AAT. Some parts are estimated at over 4 kilometres deep.

Freshwater store

It has been estimated that the AAT stores some 30% of the world's fresh water reserves.

The Antarctic Treaty

The Antarctic Treaty was signed in 1959 by the twelve nations that had been active in Antarctica during the 1957/58 International Geophysical Year (IGY). The Treaty was negotiated to allow the scientific cooperation enjoyed during IGY to continue indefinitely, without disruption from the territorial tensions which had been emerging at that time. The Treaty, which applies to the area south of 60° South latitude, makes a commitment that Antarctica should not become the scene or object of international discord.

The Treaty:

- stipulates that Antarctica should be used exclusively for peaceful purposes—military activities, such as the establishment of military bases or weapons testing, are specifically prohibited
- guarantees freedom to conduct scientific research
- promotes international scientific cooperation and requires that the results of research be made freely available
- sets aside the potential for sovereignty disputes between Treaty parties by providing that no activities will enhance or diminish previously asserted positions with respect to territorial claims, provides that no new or enlarged claims can be made, and makes rules relating to jurisdiction
- prohibits nuclear explosions and the disposal of radioactive waste
- provides for inspection to ensure compliance with the Treaty—this was a world-first weapons inspection system
- requires advance notice of expeditions
- provides for the parties to discuss measures to further the Treaty.

The Treaty now has forty-six parties—twenty-eight are Consultative Parties on the basis of being original signatories or by conducting substantial Antarctic research.

Since entering into force in 1961, the Treaty has been recognised as one of the most successful international agreements. Differences over territorial claims have been effectively set aside and as a weapon counter-proliferation regime it has been outstandingly successful. The Treaty parties remain firmly committed to a system that is still effective in protecting their essential Antarctic interests. Science proceeds unhindered.

The first Treaty meeting was held in Canberra (in Old Parliament House) in 1961. Parties now meet annually to discuss management of the region. The Antarctic Treaty has evolved into a system which includes the Seals Convention, the Marine Living Resources Convention, the Environmental Protocol and a suite of measures on scientific, environmental measures, legal and operational issues.

The Environmental Protocol, which provides for comprehensive protection of the Antarctic environment:

- designates Antarctica as a 'natural reserve, devoted to peace and science'
- establishes environmental principles to govern all activities
- prohibits mining
- includes annexes on environmental impact assessment, conservation of fauna and flora, waste management, prevention of marine pollution, protected areas and liability for responses to emergencies.

Parties to the Antarctic Treaty:

CONSULTATIVE PARTIES (28)		ACCEDING STATES (18)
Original signatories (12)	Others (16)	
Claimants (7)	Brazil	Austria
Argentina	Bulgaria	Belarus
Australia	China	Canada
Chile	Ecuador	Colombia
France	Finland	Cuba
New Zealand	Germany	Czech Republic
Norway	India	DPR Korea
United Kingdom	Italy	Denmark
Non-claimants (5)	Korea, Republic of	Estonia
Belgium	Netherlands	Greece
Japan	Peru	Guatemala
Russia*	Poland	Hungary
South Africa	Spain	Papua New Guinea
United States*	Sweden	Romania
	Ukraine	Slovak Republic
	Uruguay	Switzerland
		Turkey
		Venezuela

*Russia and US have reserved the right to make their own claims to any or all of Antarctica

Seven states claim territory in the Antarctic (Argentina, Australia, Chile, France, New Zealand, Norway and the UK). Our claim has been recognised by the UK, New Zealand, France and Norway. Some states such as US, Russia, Japan, Germany, Netherlands and India don't recognise the validity of any claims. Most states are silent on the question. While the AAT is not universally recognised, significantly, no state actually disputes Australian sovereignty and, unlike some other claimants, we are not subject to any counter-claims.

Differences over the status of territorial claims and sovereignty in Antarctica were resolved by the Antarctic Treaty. It effectively 'froze' existing claims and prevented any new claims. The Treaty prevents derogation of existing claims. Thus the status quo is preserved. Hence the Antarctic Treaty is a highly effective way of preserving Australia's sovereign position. That said, any sign that Australia's presence was being drawn down would be interpreted by others as reducing our commitment to our sovereign interests.

Suggestions that Australia should consider giving up its claim for the global good should be rejected. The Treaty does not require this. Our claim exists in Australian law, and the existence of the claims is recognised by the Treaty. We can and do use our claimant status to achieve influence within the Treaty governance arrangements. Attempting to act as an environmental 'good citizen' by ceding the claim would suggest that Australia had doubts about the effectiveness of the Treaty. Australia has not suffered any adverse consequences by maintaining our position on sovereignty. Indeed our claim may be Australia's 'lotto ticket'. It could give us more influence in future and protect our options for Antarctic resources. Protecting Australian sovereignty is critical to our national interests and should underpin our Antarctic efforts.

There is the possibility that the validity of Antarctic claims may be challenged in the future. When the Antarctic Treaty entered into force in 1961, Australia was one of seven claimant states amongst the twelve Consultative Parties—a comfortable majority.

Now there are twenty-eight states in this group and even the original signatories are in the minority. There is nothing to stop a non-treaty party establishing a station in the AAT outside the protection of the Antarctic Treaty. There could be increased settlement of stations in our territory. Resources could be discovered in the AAT or in our offshore estate. A non-treaty party state may start commercial prospecting in our area. A Treaty party could also do this, in defiance of Treaty rules and norms or operating through a third party. This has occurred with illegal fishing operations in the Southern Ocean. Japan could leave the International Whaling Commission to commence full scale commercial whaling off our offshore Antarctic territory. Illegal fishing might become uncontrollable in our Antarctic waters. Some states already argue that there are no coastal states in Antarctica and therefore indirectly challenge our Antarctic marine rights.

Australia would be wise not to push too hard on the sovereignty issue internationally.² If we were to do so other states might be forced to take a position on the issue. The status quo protects our interests. There is enormous value in protecting it, but we can't be complacent that this is easy to sustain.

Our territorial claims in Antarctica can't be defended effectively in military terms.

Peaceful Antarctica

Our territorial claims in Antarctica can't be defended effectively in military terms. We don't possess an Antarctic war fighting capability. Fortunately, there has never been a war in Antarctica. Maintaining peace in Antarctica allows our defence and border protection efforts to be focused elsewhere. We have clear interests in maintaining a

demilitarised Antarctica. The Antarctic Treaty prohibits military activities, although logistic support is permitted. Our military deployments have been used for fisheries interception, search and rescue, and logistic support in an earlier period.

The effect of the Treaty is that we don't need to devote military assets to defend the AAT. The Antarctic Treaty has benefited Australia by maintaining Antarctica free of international discord. It is twenty years since any attention has been given to Antarctica in high level Defence and Foreign Affairs strategic and defence papers—successive reviews essentially considered Antarctica as irrelevant.

Antarctica and the Southern Ocean are in Australia's back yard. We have a direct interest in a healthy Antarctic environment.

We can't afford to be complacent. In the future there may be more strategic competition in our southern flank. Resource disputes could emerge. The US, Russia, China and India could decide to step up their activities and withdraw from the Treaty. Other claimants might relinquish their claim, putting more pressure on Australia's claim. The United Nations might become more directly engaged on Antarctic issues. There are 191 UN members but only 46 are parties to the Antarctic Treaty.

Environmental protection

Antarctica and the Southern Ocean are in Australia's back yard. We have a direct interest in a healthy Antarctic environment. Australia led the charge to overturn an earlier minerals convention. It was replaced with a protocol banning mining and imposing binding environmental measures.

Global climate change and Antarctic research

Antarctica, the Southern Ocean, and the atmosphere above, are key components of the global climate system. The continent contains 70% of the world's freshwater, enough to raise sea-level by around sixty metres if the ice sheet collapses.

The annual freezing of the sea-ice more than doubles the ice-covered area. Sea-ice both insulates the relatively warm ocean waters from the cold air and reflects solar radiation to space. It is therefore of major importance in the global energy balance. Meanwhile, the freeze-thaw sea-ice cycle generates deep currents of cold salty water that drive global ocean circulation.

The sea-ice supports a productive but highly specialised marine ecosystem. The Southern Ocean also is a major sink of CO₂ from the atmosphere. Increased CO₂ uptake in the ocean triggers chemical reactions that can make the ocean more acidic and affect the ability of some organisms to form shells. It can also change the chemistry of dissolved nutrients, potentially causing large-scale marine ecosystem changes.

So far, with the exception of the Antarctic Peninsula, warming in Antarctica has been less dramatic than elsewhere, even ambiguous. But the recent warming period is also marked by changes in the atmospheric circulation around Antarctica. The strong westerly winds that ring the Southern Ocean have contracted toward Antarctica. This may be the result of increased CO₂ and the influence of ozone depletion. The southward movement of the westerlies has been linked to reduced winter rainfall in southern Australia.

Thus what happens in the Antarctic has far-reaching consequences. And yet we know less about this than any other region on the planet. High quality climate studies started in 1957–58 but only gave data from

a few sites. Well spread satellite data cover even less time.

The ice sheet provides data on past climate—for example, bubbles of gas trapped in ice reveal the extent to which human emissions have elevated greenhouse gas concentrations above natural levels.

A major unanswered question is the stability of the ice sheet itself. The 2007 IPCC report acknowledges the potential for accelerating ice discharge by processes which are poorly understood. Research is urgently needed to better predict the impact of warmer oceans and atmosphere on the ice sheet. The potential for surprises in sea-level rise predictions is significant. While the bulk of the East Antarctic ice sheet is likely cold enough to remain frozen for millennia, the impact of warming at the margins and the potential acceleration of ice discharge are important to study if sea-level change is to be predicted with confidence. Much of the smaller West Antarctic ice sheet, which is already losing mass, could be vulnerable to relatively rapid collapse and release up to six metres of sea-level equivalent over centuries.

Also important is the accumulation of snow to the continent, which may counter sea-level rise—increased snow input to Antarctica is generally predicted, although yet to be seen.

Australian research includes glacier modelling, ice sheet remote sensing, ice drilling and oceanography in the regions of ice discharge. Instruments are recording atmospheric temperatures, composition and circulation. The sea-ice is being monitored for signs of change in extent and thickness, and physical processes are being studied, together with ecosystem connections, so that future climate impacts might be better anticipated.

The future may pose many environmental challenges for our Antarctic policy makers. The Antarctic faces the direct effects of climate change, with potential impacts on sea ice and marine ecosystems as well as on terrestrial Antarctica. There are more tourists and tourist ships visiting more Antarctic locations. Tourism will need careful management. The introduction of an inter-continental airfield at Casey may stimulate tourist interest. Environmental challenges might be posed by an outbreak of animal diseases. Resource exploitation might have serious environmental or political impacts. There would be environmental concerns if states turned to using nuclear energy at stations to reduce their almost complete dependence on oil.

Science

Antarctic climate science is critical to Australia. This covers research into the rate of change and predicting its effects on sea level, agricultural production, primary production in the ocean and the Australian environment.

Australia has direct interests in opportunities provided by Antarctica for scientific research

that can have direct national benefits in relation to weather and climate and to contribute to the understanding of Antarctica's role in global climate.

The most essential Antarctic science is that which provides information that can't be obtained anywhere else.

The most essential science is that which provides information that can't be obtained anywhere else. This includes research that informs crucial environmental protection and resource management decisions. The proximity of Antarctica and its direct links with Australia through the atmosphere and Southern Ocean demand an active research program.

Science is often described as the currency of the Treaty system. It encourages cooperation and gives us influence with other Antarctic players. The Antarctic Treaty provides for freedom of scientific investigation, promotes international cooperation and free exchange of information and personnel. Antarctic



Mawson Station from the fast ice of Horseshoe Harbour, 2004. Photograph by Adrian Young © Commonwealth of Australia

science contributes to a lessening of inter-state tensions.

Australia is not obligated by the Antarctic Treaty to undertake science. But some of the science we do, such as Southern Hemisphere climate research, is so important to Australia that we would do it even if there were no sovereign interests. Antarctic science continues to bring national benefits in terms of the information we obtain. But it also has global value and our science efforts show we are not just in Antarctica for self interest.

Economic benefit

Australians fish for toothfish and icefish in the Southern Ocean. There may be increased benefits for Australia in expanded fishing operations. Southern Ocean krill is the world's largest fishery not fully exploited. The current krill fishery is mainly directed towards providing feed for the aquaculture industry. The demand for marine-based aquaculture feed is projected to grow. The Norwegians are developing new harvesting technology using lights to attract the krill which can then be pumped onboard.

A small number of Australian businesses are involved in Antarctic tourist ventures, but the industry has potential for significant future growth. There are prospects of increased Antarctic adventure tourism. While there are limited ship-borne tourist operations landing tourists within the AAT, Macquarie Island is a stopping-off point for such cruises. The new air link opens up the prospects for tourism.

Antarctica is rich in mineral resources, as well as sizeable hydrocarbon resources offshore. The Madrid Protocol's ban on mineral resource activities in Antarctica could be reviewed after 2048. However, the Protocol only binds the small number of parties to it.

As the world's fossil fuels diminish and technology for mining in polar regions improves, pressure may grow for Antarctic mineral development. It has recently been suggested that Antarctic resources could become viable once oil passes US\$200 per barrel. If oil prices reach such levels, desperate nations may set their sights on Antarctica for continued supply. Under such circumstances there could be calls for the mining prohibition to be reviewed and relaxed.

As the world's fossil fuels diminish and technology for mining in polar regions improves, pressure may grow for Antarctic mineral development.

In the future large oil and gas reserves could be discovered on our Antarctic continental shelf. This could lead to an Antarctic 'cold rush'.

Revenue could be obtained from hotel chains seeking to operate on our territory. We may want to undertake bio-prospecting. Biological resources are effectively there for the taking and it's an unregulated industry. Pharmaceutical and biotechnology companies have already undertaken research on Antarctic genetic resources.

As water concerns grow, Australia may wish to develop an iceberg harvesting industry. The head of the UN's Food and Agriculture Organization says two-thirds of the world's population could be threatened by water shortages by 2025. We could market clean water to the world. Some 30% of the world's fresh water reserves are stored in the AAT as ice. Icebergs are not minerals. They are exempted from the ban on Antarctic mining.

All these economic benefits may not be realised if environmental values emerge that rule out economic activity in Antarctica.

A new connection with Antarctica

Until now, Australia's Antarctic transport system has relied on shipping to transport people and supplies to Antarctica with all the delays, inefficiencies and uncertainties that arise due to weather and ice conditions and the long ocean voyages. Because of the length of the voyages (up to several weeks), ships' visits to the stations are only possible two or three times per summer season.

In 2005 the government funded the Antarctic Division to establish an air link between Hobart and Casey. This will help modernise the Antarctic program by significantly improving access to the AAT. The air link will use a civilian long range Airbus A319 for a regular air connection each summer. The air link will significantly enhance Australia's ability to support research in Antarctica.

- The air link will operate during summer from 2007/08. Up to twenty flights per season will be conducted once the system is fully operational. The inter-continental air service will complement the existing use of ski-equipped C212 aircraft within Antarctica.
- The air link meets environmental and Antarctic Treaty requirements. It will operate from a snow capped blue ice runway near Casey station.
- Ships will continue to be used for marine science, station bulk cargo resupply and some passenger movement.
- The air link project has been funded \$46.3m over four years (2005 to 2009).

The air link will:

- significantly increase the efficiency, capacity, and flexibility of Australia's Antarctic science efforts
- facilitate the internationalisation of the Australian Antarctic program
- allow rapid access to Antarctica to respond to emergencies
- enhance Australia's ability to protect its national interests—both directly through aerial surveillance to protect our Southern Ocean fisheries and indirectly through our ability to influence others Antarctic nations, including those operating in the AAT.

Future directions

Given these national interests and challenges, there are ten measures that we should consider taking over the short to medium term that will assist Australia advance its Antarctic interests.

Produce a White Paper

With new resource pressures, the possibility of the Treaty being challenged, climate change now a key international issue and

new non-state actors such as fishermen, tourist operators and bio-prospectors more active in Antarctica, we need to rethink how these activities and pressures might affect Australia's long-term Antarctic interests.

We need a solid foundation for planning Australia's Antarctic policy over the next decade. Are we well enough prepared for new challenges and opportunities in the frozen south? How should we develop our leadership role? What will we be doing in Antarctica in the next ten years and where will we be

operating? How do we best align our strategic objectives in Antarctica within financial resources? How much money should be devoted to Antarctica and what will it deliver? What should we do now to capitalise on our investments over the last fifty years?

Without clear answers to those questions, the government can't make good decisions about the investment we make in the Antarctic region and how we best use our strengths and attributes to ensure our Antarctic future.

A White Paper on Antarctica that informs Australians of our strategies for maintaining and advancing our Antarctic interests is urgently required.

An Antarctic Ambassador would enhance a wide range of bilateral, regional and international measures that form the basis of our Antarctic policy development.

Lift Antarctica's profile: Create an Ambassador for Antarctica

In order to reflect the high priority that should be accorded to Antarctica as a key Australian foreign policy, sovereign and environmental interest there should be created an *Ambassador for Antarctica*. The position would enhance a wide range of bilateral, regional and international measures that form the basis of our Antarctic policy development.

The Ambassador for Antarctica would be a senior serving diplomat and be responsible for the communication of Australia's international Antarctic policy. The Ambassador would play a key role in ensuring a coherent and effective approach to Australia's international Antarctic cooperation efforts. This would entail identifying needs and opportunities for practical action to

serve the interests of Australia's leading role in Antarctic governance and maximise Australia's capacity to respond to the emerging Antarctic policy agenda.

The Ambassador would work closely with an array of Australian agencies to ensure that our considerable national capacities are brought to bear in all aspects of our Antarctic policy. The Ambassador would provide a focal point for coordinating, promoting and intensifying Australia's international efforts to protect Antarctica and enhance international cooperation in Antarctica.

The Ambassador would play a key role in ensuring a comprehensive and integrated policy approach to Antarctic policy and facilitate cooperation between Australian agencies with an interest in Antarctica and other states on Antarctic issues. The Ambassador should visit the AAT on a regular basis.

Strengthen policy capacity

The resources devoted to Antarctic affairs in the Department of Foreign Affairs and Trade are extremely small by any measure. In order to strengthen Australia's Antarctic policy capacity, an *Office for Antarctic and Southern Ocean Affairs* should be created within the Department of Foreign Affairs and Trade. This would give greater focus to our Antarctic efforts. It would support and develop Australia's Antarctic and Southern Ocean diplomacy. To enhance the capacity of this new *Office* it would be critical for it to work closely with the AAD. This would increase the critical mass of Antarctic policy specialists operating at the centre of national Antarctic decision making.

Develop an Antarctic leaders program

In order to enhance our engagement with the international community on Antarctic governance and management a new

Fellowship Program should be established by government to offer Australian Government and non-government organisations the opportunity to deepen and broaden their links with overseas professionals involved in Antarctic issues.

Grant funding for such a Fellowship Program might be offered on a competitive basis to Australian organisations to host overseas leaders or mid-career professionals in Australia for short-term specialised research, leadership, training or professional attachments in areas that relate to Antarctica.

Such a program would assist in building a cadre of leaders and professionals capable of advancing improved international cooperation in Antarctica. It would increase the exchange of Antarctic knowledge and information. It would build understanding between Australia and the international community with respect to Antarctic management.

The program would assist in developing appropriately trained professionals who, in the short-to-medium term, will be in a position to advance key Antarctic policy issues. The scheme would provide mid-career professionals with continuing access to Australians with Antarctic policy ideas or expertise to assist them.

Such a scheme would foster and strengthen links between a wide range of Australian organisations with Antarctic interests and their overseas counterparts. It would provide the Australian government the ability to use such fellowships to build networks around emerging Antarctic policy.

Scope the feasibility of a World Antarctic University

In order to enhance Australia's claims to be a genuine leader in Antarctic governance and to promote further international cooperation in Antarctica, Australia should consider funding

a feasibility study into a World Antarctic University (WAU).

Depending on the findings of such a study, Australia could provide the necessary resources to host the university in Australia with a small campus located at an existing Australian Antarctic station. Australia could provide generous support for the first five years operation of the university. A state government might provide in-kind support to host the WAU.

Australia should consider funding a feasibility study into a World Antarctic University.

Such an institution could potentially have a global impact for a relatively modest outlay. The WAU would be a graduate school aiming to produce highly trained experts covering the key aspects of Antarctic science, environment, law and policy.

It would also carry out a wide range of applied research, involving partners from around the world in the critical issues of global importance such as climate and ecosystem research. It would be an institution at the centre of the global network of Antarctic institutions, experts and practitioners.

The goals of global environmental protection would be served because the WAU would educate Antarctic managers to undertake sustainable development. International co-operation would be strengthened by a network of managers and researchers who share values, priorities and training.

The WAU could be funded largely by voluntary financial contributions from various external donors. It might be expected over time to generate an income stream derived from research, consultancy and other activities.

The demand for highly qualified Antarctic scientists and policy experts is likely to grow in the future, as more attention turns to climate change and Antarctic ecosystems. Qualified personnel will be essential to manage the different facets of Antarctic affairs and ensure effective international co-operation.

The WAU would serve the global community as the Antarctic Treaty parties apex institution for high-level Antarctic education and research. The WAU's mission statement might be captured by the words *Antarctic Sentinel*—focusing on the importance of Antarctica's role in determining the rate, processes and consequences of global climate change.

Prepare a study of Australia's Antarctic mineral resources

Because of the size of the AAT, our large offshore zone and a coastline less bound by sea ice than many other parts of the continent, the AAT and its waters may become a target for mineral or hydrocarbon prospecting before any other part of Antarctica.

Geoscience Australia should undertake an assessment of the extent, accessibility and value of Antarctic mineral resources and identify where further research work might be required to improve assessments of the resource potential.

Geoscience Australia should undertake an assessment of the extent, accessibility and value of Antarctic mineral resources and identify where further research work might be required to improve assessments of the resource potential. With regard to offshore assessments, Australia has collected

considerable seismic data for our continental shelf claim. This offshore seismic grid could be used to assess offshore basins. Such a desktop study would not breach the Madrid Protocol.

Australia should be in the best position possible to respond to any prospecting proposal from other states. We need to make informed judgments on Antarctic resource exploitation issues and on ways to manage any interest that may emerge.

Australia has precluded the exploration of Antarctic minerals consistent with the Madrid Protocol. But over the next ten years attitudes may change. For example, a proposal for Australian mineral exploitation in our Antarctic territory, before we were beaten to these resources by other states, has already been canvassed. We can't assume such issues will not be raised from time to time and that at some stage serious proposals will emerge. We need to be prepared for this.

Link Antarctic policy makers with the national security community

Defence has had historic links with Antarctica and the Southern Ocean. Today there is little Defence engagement on Antarctic issues.

There would appear to be a Defence view that because Antarctica has been on the security back burner, not much will change. There appears little thought given, for example, to how Defence assets with their reach and deployment capability may be able to contribute to our Antarctic logistic efforts. Defence might be engaged in the longer term use of one of its four C-17 *Globemasters* for Antarctic logistics. These flexible cargo aircraft, purchased for \$2.2 billion, will enter Australian service between now and the first quarter of 2008. They should be regarded as *national* assets. The United States uses its *Globemasters* from Christchurch and lands them on the ice runway at McMurdo in Antarctica.

Our intelligence community has little contact with those responsible for Antarctic policy making, apart from matters related to illegal fishing. The federal police, who in the event of security challenges in the AAT may be called upon to undertake enforcement action, have not been drawn into discussions on possible Antarctic contingencies.

The national security community should engage Antarctic policy makers much more in terms of what may be required in the Southern Ocean and Antarctica in the future.

The national security community should engage Antarctic policy makers much more in terms of what may be required in the Southern Ocean and Antarctica in the future. Defence should be represented on any high level interdepartmental forum on Antarctica. Defence personnel could be included in Antarctic operations for familiarisation and

training or for operational support. Short term secondments by Defence to AAD might be possible. This would give Defence personnel a greater feel for what might be required under particular circumstances.

Undertake a feasibility study into a multi-role vessel

A wide range of government agencies have policy or operational interests in Antarctica for logistic support, marine research, environmental protection, fisheries management and enforcement, search and rescue, quarantine and border protection. Australia has only the *Auroa Australis* capable of operating in the Antarctic sea ice. Its capacity to support the breadth of Australian Government interests is severely limited by its primary obligations to support marine research and transport personnel and supplies. A decision on its long-term replacement will need to be made over the next decade. A civilian fisheries patrol vessel *Oceanic Viking* operates in sub-Antarctic waters.



Aurora Australis leading Polar Bird out of the pack after Polar Bird had been beset for three weeks. Photograph by Wayne Papps © Commonwealth of Australia

Although the forthcoming air link will relieve *Auroa Australis* of some of its personnel transport functions it will need to support marine research and some passenger movements. Our Antarctic marine capacity is therefore limited and the dependence on one vessel makes the system vulnerable in the case of accidents.

Given the wide range and continuing interests of many government agencies in operational activities in the Southern Ocean, a feasibility study should be undertaken on the case for one or more national flagged vessels to serve Australian interests in the Southern Ocean.

Given the wide range and continuing interests of many government agencies in operational activities in the Southern Ocean, a feasibility study should be undertaken on the case for one or more national flagged vessels to serve Australian interests in the Southern Ocean. Such a vessel would operate as a national facility.

Its tasks would be as diverse as scientific research, search and rescue, environmental pollution control, fisheries patrols (with boarding parties embarked) and resupply of Antarctic bases. Australia has international search and rescue obligations in a vast part of the Southern Ocean from south of India to south of New Zealand, but we have scant capacity to service that obligation. Apart from the practical benefits, such a vessel(s) would symbolise Australia's status and commitment as a serious Antarctic nation. A number of other leading Antarctic states have low temperature environment national vessels. Such a vessel might cost in the order of

\$200 million, with running costs in the order of \$30 million a year.

In terms of the ship characteristics needed, clearly such a vessel would need to operate in extreme weather conditions. By the nature of the distances involved, ships operating in the Southern Ocean are isolated. A greater degree of redundancy in systems and/or the ability to rectify defects would be critical.

There is a clear need for a robust ship construction that will cater for the severe stresses that will inevitably result on the hull and superstructure from operating in ice and heavy seas. Any such ship must be equipped with substantial medical facilities. The utility of a vessel would be significantly enhanced by the ability to operate helicopters. It would be essential that some form of assisted launch and recovery system be fitted to increase the availability of the aircraft. Without such a system helicopter operations are restricted to low sea states and generally fair weather conditions. The ability to launch and recover boats in high sea states is essential. The actual payload of the vessel can be very flexible depending on the mission. All that's really required in the ship itself is sufficient space to be available and equipment to serve the key roles.

A national flag ship for the Southern Ocean would complement the introduction of the new air link. It would demonstrate our commitment to the region. And there is no reason why such a vessel could not be deployed to other regions as well to support marine science, border protection and search and rescue when required.

Raise our leadership role through Antarctic climate science

To lift our global leadership role in Antarctica we should strengthen the extent and quality of our Antarctic climate research.

The current program is modest. Given the urgency of the climate issue greater effort is needed. The payoff in timely information as a basis for sound adaptation and mitigation strategies makes this research a valuable insurance premium. Several projects warrant immediate attention.

First, retrieving an ice core a million or more years old. For old ice Antarctica is the place to go. The reason for this old-ice hunt is simple. It would be a time capsule of global climate information and critically give us information about past climatic cycles and atmospheric

CO₂ to help in prediction of future climate. The best place to retrieve this buried treasure is inland from Casey station in the AAT. Getting to the 'core of climate' would cost around \$19 million over ten years.

Second, more resources need to be devoted to oceanography for climate studies. More work is needed in Antarctic waters on the problem of ocean acidification, which could devastate ocean life with planet wide consequences.³ Acid seas would have a devastating effect on corals and shellfish and on plankton. Plankton are the base of the planetary food web.



Blizzard near Mawson. Photograph © Frederique Olivier, courtesy Australian Antarctic Division

We need more research on how the Southern Ocean provides a critical link in the global overturning ocean circulation that controls global climate.

We need more research on how the Southern Ocean provides a critical link in the global overturning ocean circulation that controls global climate.⁴ A collapse of the overturning circulation would likely have profound impacts on global climate and marine ecosystems. The scale of our effort devoted to understanding these issues is a drop in the ocean of what it ought to be.

Demonstrate nation building in Antarctica

Australia should undertake activities that underpin Antarctica's value to the nation. Such activities also demonstrate our leading international Antarctic role.

First, we should double our intra-continental aircraft capability. Australia's three year round stations are built on rare rocky outcrops along the coast, essentially at the same latitude. Our Antarctic real estate gives us useful stopping off points for other coastal locations. It poses problems, however, in terms of reaching areas throughout the AAT.

Australia needs the logistics capacity to visit any part of the AAT for science, environmental or policy purposes. It is our territory—we should be able to cover it, but we can't. Currently other nations such as the US, Russia, China, France and Italy have far superior capacity to penetrate the AAT, and they do. Doubling our intra-continental aircraft capacity will give us greater deep field reach throughout the AAT and elsewhere in Antarctica as appropriate.⁵ It would also allow Australia to build the long sought air network in eastern Antarctica. Australia

should aim to be the preferred provider of air logistics in eastern Antarctica. This would drive international collaboration. It would strengthen Australia's inter-station capability. It would capitalise on the investment that the government made to establish the Antarctic air link. It would allow us access, through Casey, to almost anywhere in the AAT—in a dramatic break from the past we would no longer be confined to three spots on the coast. The vast parts of the AAT never seen by Australians could be visited.

Australia needs the logistics capacity to visit any part of the AAT for science, environmental or policy purposes.

Second, consideration should be given to providing another air link entry point. Building another inter-continental ice runway, possibly in conjunction with another Party, would significantly improve flexibility and provide an alternative landing field in emergencies. Building another runway would make it easier for more researchers to work in Antarctica.

Third, we need to re-engineer our stations for greater operational flexibility. Australia's current three permanent bases requires them to be operated year round. The stations, or even parts of the station, can't be turned off. This forces the stations to be maintained. They need annual resupply. This can only be undertaken at certain times. If our stations could be re-engineered to be turned off or on as required savings could flow to our science efforts and allow the Antarctic program to better respond to government research priorities or free up the Antarctic program to allow for greater international collaboration. Our Antarctic infrastructure needs to be made portable or removable in order to undertake more science and demonstrate a capability for a national presence wherever we want to be in the AAT.



CASA 212 in flight between Mawson and Davis. Photograph by Frederique Olivier © Commonwealth of Australia

Concluding remarks

The importance of Antarctica to the stability of our planet's climate and ecosystems is now widely acknowledged. It possesses the capacity to impact on weather, both responding to, and contributing to, climate change and rising sea levels. Climate change continues to be the most pressing global environmental priority. Antarctic science will be critical to understanding our global future. Antarctica can allow us to unlock the secrets of the planet's climate from former ages.

Respected analysts now argue that climate change is a significant *international security* issue, potentially causing mega deaths and contributing to state failure, forced population movements, food and water scarcity and the spread of infectious diseases. Antarctica is crucial to understanding the change processes and predicting the rate and consequences of change. It's for this reason that Antarctica should be considered

as an Australian *national security* issue in our back yard.

Australia faces a particular challenge in responding to this issue. Its Antarctic territory is right at the frontline. Australia is one of the closest Antarctic Treaty parties and we have the largest territorial claim. We also have the longest continuous presence on the continent. This should direct us to continue to take a leading custodial role in Antarctica. Douglas Mawson was an early leader in Antarctic science. We should restore Australia's place at the front of Antarctic research. The resources to do this should be significantly lifted. The budget for the Antarctic Division—by far the main Australian Antarctic player—has remained static for many years at around \$100 million.⁶ Our overall national Antarctic efforts are run on a shoe-string relative to other nationally significant activities that impact on our future security.

International interest in Antarctica will grow. It's becoming more accessible. Policy challenges are emerging for the Antarctic Treaty system. If we don't remain a foremost Antarctic power and undertake concerted efforts at Antarctic diplomacy, we risk losing international prestige in an area where Australia is one of the undisputed leaders.

The Australian Antarctic story should not just be built around international diplomacy. It should also be a *nation building* story. Antarctica provides powerful and evocative images. The highest mountain on the Australian mainland is dwarfed by our highest mountain in the AAT, Mt McClintock—yet we never go there. Mt McClintock is in the eastern sector of the Australian Antarctic Territory and, as far as we know, has *never* been visited by an Australian. It's suspected that the mountain has never been climbed. Australia's Antarctic is a part of our nation that needs our attention. We should rethink our Antarctic effort in terms of its nation-building value. We need a visionary *Look South* policy to secure our Antarctic future.

Acknowledgement

For helpful advice on the issue of climate change and Antarctica the authors wish to thank Dr Tas van Ommen, Australian Antarctic Division, Department of the Environment and Water Resources and the Antarctic Climate and Ecosystems CRC.

Endnotes

- 1 The modern Antarctic program commenced in 1947 with the establishment of a station on Heard Island, and one on Tasmania's Macquarie Island in 1948. Australia established Mawson in 1954 and Davis in 1957. Australia took control of the US station Wilkes in 1959, and replaced it in 1969 with Casey. Mawson is the oldest continuously occupied station on the Antarctic continent.
- 2 A good example of this kind of careful approach occurred in 2004. Australia lodged information relating to Australia's extended continental shelf beyond 200 nautical miles to the UN Commission on the Limits of the Continental Shelf. To avoid upsetting the status quo, Australia requested that, for the time being, the body not examine the data associated with our wide shelf claim off Antarctica.
- 3 As the 750 gigatonnes of carbon in the atmosphere increases, it could reduce ocean pH from 8 to 7.4 or lower. There are signs this is happening.
- 4 The overturning circulation controls how much heat and carbon is stored in the ocean. It provides the nutrients that fuel Southern Ocean and Antarctic ecosystems and supplies oxygen to the deep ocean. Southern Ocean overturning is sensitive to climate change.
- 5 Currently there are two small planes and three helicopters used.
- 6 AAD were given an additional \$46.3 million for the air link for four years.

Further reading

Australian Antarctic Division, Antarctic International Law available at <http://www.aad.gov.au/default.asp?casid=76>

Australian Antarctic Division, The Australian Antarctic Program available at <http://www.aad.gov.au/default.asp?casid=2415>

Bowden, Tim 1997. *The Silence Calling: Australians in Antarctica 1947–1997* Sydney: Allen and Unwin.

Martin, Stephen 1996. *A History of Antarctica*, State Library of New South Wales Press.

Acronyms and Abbreviations

AAD	Australian Antarctic Division
AAT	Australian Antarctic Territory
EEZ	Exclusive Economic Zone
HIMI	Heard and McDonald Islands
IGY	International Geophysical Year
WAU	World Antarctic University

Important disclaimer

This publication is designed to provide accurate and authoritative information in relation to the subject matter covered. It is provided with the understanding that the publisher is not engaged in rendering any form of professional or other advice or services. No person should rely on the contents of this publication without first obtaining advice from a qualified professional person.

About the Author

Dr Anthony Bergin is the Director of Research Programs for ASPI. He is responsible for the Institute's research and publications programs on Defence and international security issues. Prior to joining ASPI, he was Associate Professor, University NSW at the Australian Defence Force Academy, where he lectured on Australian maritime affairs. He has published widely on national security and oceans policy and was previously the Director of the Australian Defence Studies Centre.

Dr Marcus Haward is Program Leader, Policy Program, Antarctic Climate and Ecosystems Cooperative Research Centre. He is an Associate Professor, School of Government, University of Tasmania, Hobart. He has held visiting academic appointments at the Australian National University, Australian Maritime College and at Dalhousie University,

Canada, and been a consultant and advisor on marine policy issues to the Australian and several state governments. Dr Haward has been a member of Australian delegations to meetings of the Commission for the Conservation of Antarctic Marine Living Resources and the APEC Fisheries and Marine Resources Conservation Working Group.

About Strategic Insights

Strategic Insights are shorter studies intended to provide expert perspectives on topical policy issues. They reflect the personal views of the author(s), and do not in any way express or reflect the views of the Australian Government or represent the formal position of ASPI on any particular issue.

ASPI

Tel +61 2 6270 5100
 Fax + 61 2 6273 9566
 Email enquiries@aspi.org.au
 Web www.aspi.org.au

© The Australian Strategic Policy Institute Limited 2007

This publication is subject to copyright. Except as permitted under the *Copyright Act* 1968, no part of it may in any form or by any means (electronic, mechanical, microcopying, photocopying, recording or otherwise) be reproduced, stored in a retrieval system or transmitted without prior written permission. Enquiries should be addressed to the publishers.