

SPECIAL REPORT

China's expanding Antarctic interests Implications for Australia

A S P I



Anne-Marie Brady

August 2017

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Cover image: Polar research vessel and cargo ship *Xue Long* docked in Fremantle, Perth, Australia © Louise Heusinkveld/Alamy Stock Photo.

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KEY FINDINGS

- Some of China's interests and activities in the Australian Antarctic Territory (AAT), which include undeclared military activities and mineral exploration, may be at odds with Australian strategic interests and potentially breach international law.
- China is rapidly expanding its presence in a triangle-shaped area within the AAT that it calls the 'East Antarctic Sector' and has stated in policy documents that it reserves the right to make a claim in Antarctica.
- Australia must rethink its assessment of risk in Antarctica and devise a strategy to protect its interests there.

EXECUTIVE SUMMARY

Australia is at a crossroads in its foreign policy, looking north to Asia for its economic prosperity at the same time as identifying that its primary security threats come from Asia.¹ The ‘looking north’ strategy of Australia’s foreign and defence policies assumes that Australia’s south, its 42% territorial claim there and its broader interests in Antarctica and the Southern Ocean are secure and protected by the Antarctic Treaty.² Yet Antarctic geopolitics are shifting rapidly, and the clash between those states that promote environmental protection in Antarctica and those that are focused on accessing available resources there is becoming more acute. China has conducted undeclared military activities in Antarctica, is building up a case for a territorial claim and is engaging in minerals exploration there. The calculation that the Australian Government has long made in short-changing Antarctic affairs in order to boost activities up north is looking increasingly risky.

Australia’s much-heralded 2014 Australian Antarctic Strategy 20-Year Action Plan is a continuance of longstanding policies and strategies. Canberra’s 2016 Defence White Paper devoted only a few sentences to Antarctica, merely repeating statements made in previous white papers. It appears that only the state of Tasmania is looking south to Antarctica to any great extent, and that’s purely with an eye to economic advantages.

The polar regions, the deep seabed and outer space are the ‘new strategic territories’ where China will draw the resources to become a global power.³ Access to resources and opportunities in these regions is essential for China’s continued growth, prosperity and political stability.⁴ Antarctica—rich in resources and, from China’s perspective, with unresolved sovereignty—is extremely important to the Chinese Government. The bulk of China’s Antarctic presence is located within the Australian Antarctic Territory (AAT). Australia has facilitated China’s expansion in Antarctica from the late 1970s on, but the time has come to take a close look at the extent to which Australia’s interests in Antarctica and China’s converge and where they are at odds.

This report focuses on China’s Antarctic interests within the AAT, drawing on Chinese language sources and interviews conducted over 10 years. The findings raise questions about the extent to which China’s position on key aspects of Antarctic governance and its range of interests and activities there are complementary with Australian interests and whether the Australian Government’s strategies for maintaining its broader foreign policy interests in the AAT are adequate to deal with present-day realities in Antarctica and the Southern Ocean.

WHAT SHOULD BE DONE?

Multiple Australian Antarctic analysts have warned their government that Australia's status and leadership role in Antarctica are being eroded due to long-term underinvestment at a time when other states are expanding their presence and influence in the region.⁵ China is continually singled out as the rising Antarctic player Australia should be most worried about.⁶ China has been extremely active in the area of Antarctica claimed by Australia—throughout this expansion—aided and assisted by Australia itself. Canberra must face up to the new strategic environment in Antarctica and the challenges in maintaining its interests in Antarctica, and reassess the risk.⁷ Australia's 2016 Defence White Paper noted that:

It is in our interest to work with like-minded countries to prevent any militarisation of Antarctica which could threaten Australia's sovereignty over the Australian Antarctic Territory and its sovereign rights over its offshore waters. Australia is a strong supporter of the Antarctic Treaty System, which expressly prohibits any mining in Antarctica. Australia also strongly supports the Convention on the Conservation of Antarctic Marine Living Resources, which regulates fishing activity in Antarctic waters.⁸

Australia can respond to the new strategic environment by using a whole-of-government response to expand and deepen its Antarctic capacity and institutional expertise, increasing the brief of government agencies with existing Antarctic capacity, such as Customs and Border Protection and Defence, and investing in targeted deep policy research.

Australia must stop hovering at the crossroads of the changing global order and face up to the new challenges that it poses.

Australia must stop hovering at the crossroads of the changing global order and face up to the new challenges that it poses. As the 2016 Defence White Paper noted, the US-centred hub-and-spokes model of security alliances and one international treaty, from the Aleutians down to Antarctica and the Southern Ocean, may no longer completely protect Australia's interests.⁹ With careful diplomacy and strategic investments in capacity, Australia can better manage its economic and political relationship with China while maintaining its own national interests. Australia can also do a lot more to partner with other like-minded states in the Indo-Pacific and Asia-Pacific, in Oceania as well as in Southeast Asia, to protect its interests, looking both north and south.

CHINA'S EXPANDING ANTARCTIC CAPACITY AND INTERESTS

One of the first points to be made in assessing China's Antarctic interests is on the issue of information management. China adopts one message on Antarctic issues for foreign audiences and another for domestic audiences. An example from Chinese President Xi Jinping's visit to Australia in 2014 illustrates this well. In November 2014, the Chinese media deliberately mistranslated Xi's words. He had just given a speech in Hobart on China's polar agenda, with then Australian Prime Minister Tony Abbott standing beside him. Using standard political phraseology to describe China's Antarctic agenda, as reported in English by the Chinese Foreign Ministry¹⁰ and in Chinese by the *Xinhua* news service, Xi said 'The Chinese side stands ready to continuously work with Australia and the international community to better understand, protect and *exploit* the Antarctic' (emphasis added).¹¹ But the Chinese Communist Party's official English-language newspaper, *China Daily*, reported that Xi had expressed China's continued interest in cooperating with Australia and other nations to 'know, protect and *explore* Antarctica' (emphasis added).¹²

To alter the words of China's senior leader is an extremely serious matter. However, as *China Daily* editors would know, in materials aimed at foreign audiences China's polar officials scrupulously avoid mentioning their government's strong interest in exploiting polar resources, whereas in Chinese-language materials it's continually highlighted as the main reason for China's investment in polar activities. During Xi's 2014 visit to Australia, there had been intense media attention on the question of China's interest in Antarctic mineral resources. *China's Daily's* deliberate mistranslation of Xi's words—which in Chinese political language are merely formulaic—was a means to draw media attention away from the issue.

China's evolving polar strategy is effectively an undeclared foreign policy, and polar policy debates in Chinese language are very different from the materials that are made available to foreign audiences. Qu Tanzhou, Director of the China Arctic and Antarctic Administration, says that the international community needs time to 'make a psychological adjustment' to accept China's new strength in polar affairs.¹³ In the meantime, careful information management is an essential component in achieving this 'adjustment' in global public opinion. China seeks to enhance perceptions of its status in polar affairs because that will help the government obtain the support it needs from other like-minded states, and it will ensure that global public opinion isn't aligned against China's interests in the Arctic and Antarctic.

In the past 10 years, as part of its overall expanding global foreign policy, China has become a leading polar player with wide-ranging and complex interests in both the Arctic and the Antarctic. It has now emerged as a member of the select club of nations that are powerful at both poles. Polar states are global giants, strong in military, scientific and economic terms. China's leaders view their country's expanding polar presence as a way to demonstrate China's growing global power and to achieve international recognition for this new status.¹⁴

Australia has an important part to play in China's polar agenda when it comes to Antarctica and the Southern Ocean. Three out of China's four Antarctic bases and two of its field camps are in the Australian Antarctic Territory (AAT). Hobart is now China's main external Antarctic logistics base. China has designated a significant area of territory within the AAT where its personnel will operate as the 'East Antarctic Sector' and has proposed the world's biggest Antarctic Special Managed Area surrounding Dome Argus (commonly known as Dome A).

CHINA'S EXPANDING ANTARCTIC PRESENCE

China's official definition of Antarctic sovereignty is that the Antarctic is 'a continent with no attribution of sovereignty' (zhuquan meiyou guishu de dalü) and asserts that the interpretation of the issue of sovereignty in Antarctica is 'frozen' (bingjie) under the terms of the Antarctic Treaty. China's official position on Antarctic sovereignty states that the treaty guarantees three rights of sovereignty: the right of claimant states to claim they have sovereignty in Antarctica; the rights [of the claimants] to the basis to those claims; and the right to not recognise any sovereign rights in Antarctica. China's view is that the Antarctic Treaty will continue to suit its interests for the next 20 to 30 years, giving the government plenty of time to prepare its capacity to assess what minerals exist there and the challenges involved in extracting them.

China interprets Antarctic sovereignty as undetermined. In an area of undetermined sovereignty, a state may construct a case to argue for sovereignty rights by means of discovery, by naming geographical sites and mapping, and by continual presence and occupation. In just over a decade, as a result of a massive budget increase for polar capacity projects, China has ceased being a minor player in the polar regions and is becoming a major actor. It has expanded and deepened its physical presence in Antarctica through new bases, made significant geographical discoveries and named hundreds of sites. China now has more money than any other polar state to spend on new infrastructure, such as bases, planes and icebreakers. Since 2015, it has had fully self-sufficient air, land and sea capabilities in Antarctica. China now has two ice-capable vessels operating in Antarctica, as well as another under construction. Its icebreaker has circumnavigated the continent twice and is mapping the Southern Ocean (Figure 1). Expanding China's presence in Antarctica is understood by the government as a means to establish the necessary physical foundations for China's Antarctic resource rights, Antarctic governance rights and the future opening up of resources. As stated by a senior Chinese polar official, 'one of the key goals' of China's Antarctic scientific activities is to extend China's presence.

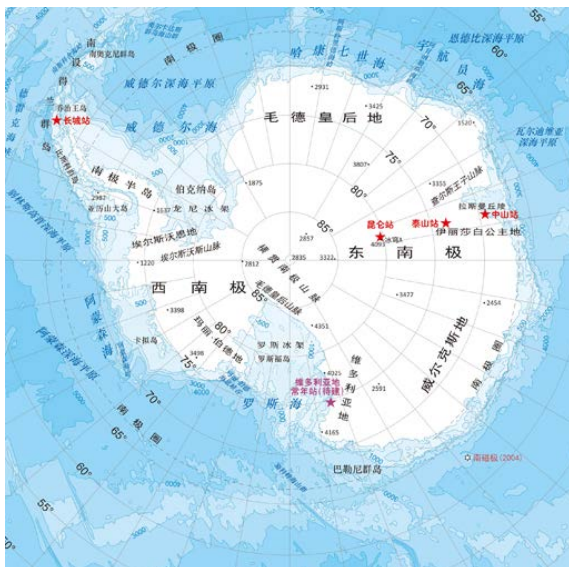
Figure 1: The Chinese icebreaker Xue Long's 2014–2015 Antarctic voyage



Despite the restrictions in the Antarctic Treaty on making any further sovereignty claims, China reserves the right to make a claim in Antarctica; however, it doesn't publicise this. Article IV(2) of the treaty precludes any party from making a new claim or enlarging an existing claim but doesn't expressly preclude a state from reserving the right to make a claim. China's claim of potential sovereign rights in Antarctica is based on Chinese exploration and occupation of sites in Antarctica since the 1980s. Article IV(2) further stipulates that activities undertaken in Antarctica while the treaty is in force can't be used to support a claim or basis of claim. In theory, therefore, China's activities in Antarctica can't be used as a basis of claim so long as China remains a party to the treaty. Even if China's activities don't lead to it acquiring sovereignty, interested states in contested regions can protect their rights to have a say in new norm-setting and to secure a share in any spoils by having identified, legitimate interests. Thus, acquiring more presence in Antarctica is a win-win, no-brainer situation for the Chinese Government.

China has three stations, three airfields and two field camps in the AAT, plus a fourth station on King George Island and plans a fifth station for the Ross Sea region (Figure 2). China's first station built in the AAT, Zhongshan, was set up in 1989. In summer, this base can house up to 60 personnel; in winter, it can support 25. During the 11th Five-Year Plan (2006–2010), the station was upgraded and fitted with new research facilities and living quarters, doubling in size from its original 2,700 square metres to 5,800 square metres. In 2014, an ice airfield was built at Zhongshan.

Figure 2: China's current Antarctic bases and planned fifth base in the Ross Sea



Source: 'Woguo Nanji ke kao jiang xingcheng wangluo xing liti kaocha geju' [Our Antarctic expedition will study the formation of network-based three-dimensional pattern], Haiyang bao [Oceanic Daily], 12 February 2014, [online](#).

Kunlun Station on Dome A was opened in February 2009. Dome A is a strategically important site for an airfield. It's useful for alternative flight paths to avoid choke-points and, unlike coastal airfields located on ice floes, it won't be affected by melting ice. The station has a floor space of 500 square metres and can accommodate 15–20 personnel. A 600-metre landing strip was built at Kunlun in 2010, and hundreds of barrels of aviation fuel are stored there.²⁴ In early 2016, the first return flight from Zhongshan to Kunlun was made by China's new polar plane.²⁵ Chinese scientists can now get to Kunlun from Zhongshan in four hours. China plans to expand Kunlun to an all-seasons station by 2020.²⁶

China's third station in the AAT, Taishan, was set up in 2014. It's inland from Zhongshan Station at a crossroad point en route to Kunlun Station and the Grove Mountains, where China has a field camp. Taishan Station helps to consolidate China's presence in eastern Antarctica, particularly its ability to operate in the Antarctic hinterland. It's a summer-only station with a total area of 1,000 square metres and can house a maximum of 20 personnel.

A 2013 report highlighted the strategic significance of the region surrounding the base for the future 'development and utilization of Antarctic resources'.²⁷ A key asset of the new base is an ice runway, which became operational at the end of the 2015–16 season.

In 2007, a team of Chinese geographers mapped the Grove Mountains, identifying the distribution of mineral resources in the area.²⁸ China's field camp in the Grove Mountains has been in continuous use since 2007, so the mountains are a further site of continual occupation for which China can claim property and access rights. Chinese scientists are also exploring the Gamburtsev Mountains and have a field camp there.

China's establishment of Taishan Station has consolidated its presence in a triangle-shaped area of territory in East Antarctica (Figure 3).

Figure 3: China's area of operation in the Australian Antarctic Territory

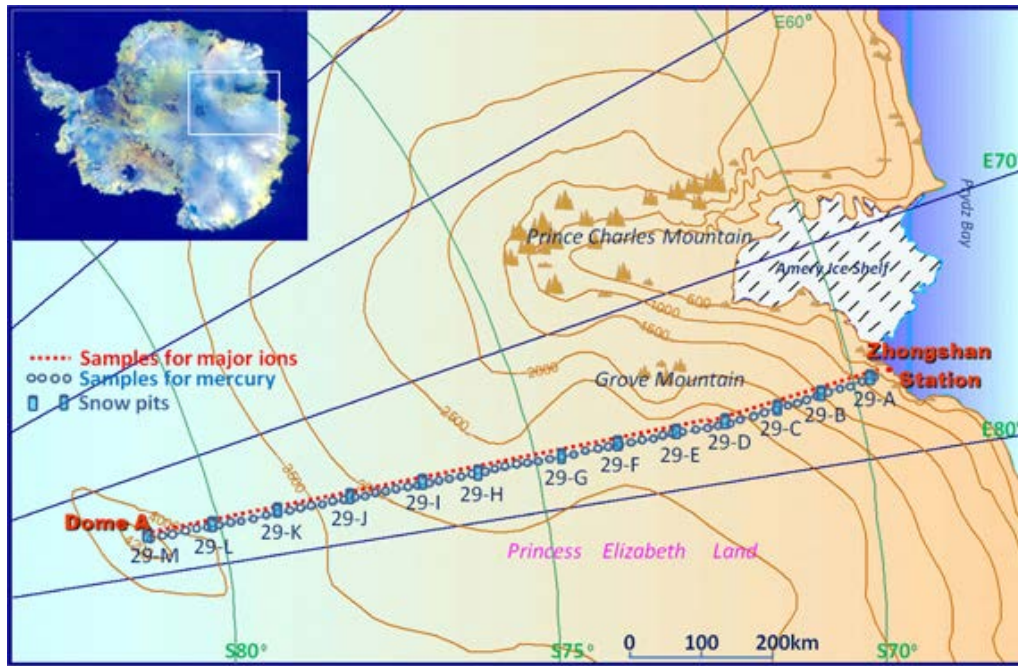


Source: International Polar Foundation, 'Zhongshan Station: hub of Chinese scientific research in East Antarctica', International Polar Year 2007–2008, 10 December 2008, [online](#). (link discontinued)

China first decided to focus on this area of Antarctica in 1998, as part of the 'East Antarctic Sector Strategic Research Vision' (*Dong Nanji da duanmian yanjiu zhanlüe*).²⁹ A rare public image of China's East Antarctic Sector was revealed in the documents associated with China's participation in the International Polar Year 2008–09. China also refers to the sector as 'PANDA', standing for Prydz Bay, Amery Ice Shelf and Dome A. In 2017, a public statement from the China Oceanic Forecasting Center confirmed this sector as China's 'main area of operation in Antarctica'.³⁰ In the austral summer of 2015, a team of Chinese and foreign scientists conducted extensive remote sensing, zigzagging back and forth via airplane within the precise boundaries of the East Antarctic Sector and recording its physical features.³¹

China's prominence in this region is further strengthened by a dedicated traverse route from Zhongshan to Dome A via Taishan (Figure 4). Chinese scientists have nicknamed this route 'China Boulevard' (*Zhonghua dadao*).³² The US is the only other Antarctic state to have established a dedicated long-distance snow road: the 1,601 kilometre McMurdo – South Pole Highway. In 2013, China put in a proposal to have the area surrounding Dome A designated as an Antarctic Specially Managed Area (ASMA).³³ The proposed area had been identified in 2008, as shown on the circled area in Figure 3. Chinese polar scientists and officials commonly (and proudly³⁴) refer to this massive territory as 'China's Management District' (*Zhongguo guanli qu*) and 'China's Great Wall' (*Zhongguo qiang*).³⁵

Figure 4: China's Antarctic hinterland expedition route, showing 'China Boulevard' and side transit to Grove Mountains



Source: Liu Xiaohan, Zhongguo kaipi Nanji Geluofu Shan kexue kaocha [China to open Antarctic Grove Mountain expedition], Chinese Academy of Science, 1 September 2013, [online](#).

China's Dome A ASMA proposal has been turned down by the other ATCPs at the 2013, 2014, 2015, 2016 and now 2017 Antarctica Treaty Consultative Meetings, as it doesn't meet the required criteria.

China's proposed Dome A ASMA has five zones and sectors, adding up to 19,764 square kilometres.³⁶ The ASMA would encircle Kunlun Station at a radius of 120 kilometres (for the clean air sector), 10 kilometres (for the buffer zone) and 30 kilometres (for two scientific zones). The operational zone is a rectangular area and is located between the buffer zone and the scientific zones. The ASMA was first fully mapped out in 2009. If the 'China Management District' proposal were to be accepted, it would put the territory around Dome A under Chinese management, making it difficult for other national programs to operate there, other than as partners with China. Depending on the management plan, which is proposed by China but must be agreed to by all Antarctic Treaty Consultative Parties (ATCPs), it could close off the possibility of any other state operating an airfield or a base in this strategically significant zone. So far, China's Dome A ASMA proposal has been turned down by the other ATCPs at the 2013, 2014, 2015, 2016 and now 2017 Antarctica Treaty Consultative Meetings, as it doesn't meet the required criteria.

CHINA'S STRATEGIC INTERESTS IN ANTARCTICA

China's strategic interests in the polar regions can be divided into three core categories, ranked as follows:

- **Security (traditional and non-traditional):** China has economic, political, military and strategic interests in the polar regions.
- **Resources:** China wants access to Arctic and Antarctic minerals, hydrocarbons, fishing, tourism, transport routes, water and bioprospecting.
- **Science and technology:** Access to the polar regions is essential for the rollout of the BeiDou navigational system, China's space science program, and accurate weather forecasting in China.

CHINA'S MILITARY ACTIVITIES IN ANTARCTICA

Ensuring that Antarctica remains 'free from military competition or cooperation' is essential to Australia's national security.³⁷ Article I(2) of the Antarctic Treaty states that 'military personnel and equipment may be used for scientific research or any other peaceful purpose,' and Article VII(5) (c) requires countries to report details of any military personnel or equipment to be introduced into Antarctica. However, over a number of years China has frequently failed to accurately report the extent of its military's activities in Antarctica and the military use of some of its scientific projects there. Chinese polar analysts have highlighted the military-strategic importance of Antarctica for China:

- due to its key strategic transport routes.
- as a strategically vital territory with unresolved sovereignty and rich resources.
- as an ideal site for military-related research and strategic satellite installations.³⁸

China's military activities in Antarctica—along with those of the other major nuclear powers that use their Antarctic bases to control offensive weapons systems³⁹—have the potential to shift the strategic balance that has maintained peace in the Asia-Pacific, as well as in Antarctica, for nearly 70 years.

The Antarctic Treaty is a Cold War instrument originally aimed at managing rivalry between the US and the Soviet Union and tensions over territorial claims among the seven Antarctic claimant nations. As part of regional security architecture, the treaty completes the southernmost reach of USPACOM, the US's largest area of unified combat command. Since the early 1950s, a series of 'hub and spokes' security pacts and one international agreement (the Antarctic Treaty) have enabled US armed forces in the Asia-Pacific to dominate key choke-points leading to the Arctic Ocean, the Indian Ocean and the Southern Ocean. US naval dominance in the Asia-Pacific was set up in the 1950s to defend a series of island chains against the spread of communism.

The island chain concept links the North Pole to the South Pole, extending US strategic control over the gateways to the seas and skies of the Asia-Pacific region from the entrance to the Arctic at the Bering Sea choke-point all the way down to Antarctica and as far as the South Pole, where the US Scott-Amundsen Base is located. Breaking the US military's strategic dominance in the Asia-Pacific would greatly enhance China's security and enable it to gain the upper hand in multiple maritime territorial disputes. International attention has focused on China's military interests in the South and East China seas and Indian Ocean, but the People's Liberation Army (PLA) has longstanding involvement and interests in the Southern Ocean and Antarctica.

The PLA's first-ever international expedition was to the furthest end of the third island chain: Antarctica. In 1984, during China's first Antarctic expedition, armed PLA Navy (PLAN) personnel helped set up China's first Antarctic station—a fact that was not properly acknowledged in China's report to the Scientific Committee on Antarctic Research at the time.⁴⁰ In recent years, PLA personnel have repeatedly participated in China's Antarctic program without their presence being noted in China's annual report under the Antarctic Treaty. For example, in the 2013–14 season, China's Antarctic expedition included a PLA logistics expert who was there to set up the BeiDou-2 global positioning system.⁴¹ Yet in China's 2013–14 annual Antarctic Treaty report, the section of the report in which a nation active in Antarctica should report any military activity on the continent was removed altogether from the

form.⁴² In the 2007–08 season, six PLA experts were sent to work on China's Zhongshan Station to help to build a new pier and a high-frequency radar station. Chinese and international reports commented that the new radar station would be capable of blocking the US's polar satellites—an important military consideration.⁴³ The PLA's involvement in this activity was widely—and proudly—reported in the Chinese media. However, China also failed to report the presence of those military personnel in its 2007–08 annual Antarctic Treaty report, leaving that section of the form blank.⁴⁴

The PLAN works in close partnership with the State Oceanic Administration (SOA) to coordinate China's evolving polar strategy. It's represented on China's Polar Advisory Committee, which coordinates interagency polar activities, by the General Staff Operations Office. This is the PLAN's most senior office, responsible for all naval military orders. PLA analysts of all forces frequently publish on polar strategic issues in military open-source journals. PLA personnel took part in the Chinese Government's multiagency 2012–16 project to assess polar governance and resources.⁴⁵

The SOA and the PLAN rotate some of their leading personnel, so polar expertise overlaps between the two agencies.⁴⁶ SOA vessels can serve PLAN military-strategic interests while attracting less political controversy than a PLAN vessel operating in the same waters might. In time of war, China's polar scientific vessels and bases would fall under PLAN command. In the next five years, we can expect to see an ever-increasing level of involvement of the Chinese military in the Antarctic program.⁴⁷ This will greatly enhance China's Antarctic operating capacity and enable PLA personnel to gain experience operating in polar conditions, both of which will be useful for China's long-term strategic interests.

Chinese analysis comes to the surprising conclusion that from the security perspective, the transit via Tasmania's South East Cape is a 'golden route', as it's completely under the control of the Royal Australian Navy.

The PLAN is rapidly expanding its capabilities and reach, and China's significant global shipping interests are the official justification for this.⁴⁸ As the world's largest shipping nation with the world's second-largest economy, China is looking for ways to reduce its dependence on maritime choke-points. The Southern Ocean offers three potential alternative shipping routes linking China with the Indian and Atlantic oceans: via South Africa's Cape of Good Hope, via Chile's Cape Horn, and via Australia's South East Cape in Tasmania. As Chinese naval analysts note, these three capes would provide useful alternative routes for Chinese shipping in a time of military conflict in the vicinity of China's main sea lines of communication.⁴⁹ Although the areas suffer from extreme weather, all three are free of conflict. Chinese analysis comes to the surprising conclusion that from the security perspective, the transit via Tasmania's South East Cape is a 'golden route', as it's completely under the control of the Royal Australian Navy.⁵⁰

The Antarctic transpolar air route is less commercially significant than the Arctic transpolar route, but Chinese military analysts noted its strategic significance as early as the 1960s. Any state that dominates the airspace of Antarctica—currently, only the US can do so—could potentially control air access to all Oceania, South America and Africa. China is setting up an intercontinental Antarctic air route and can be expected to use PLA Air Force planes in due course to expand capacity and build polar experience.⁵¹

Polar equipment and support are another venue for Chinese military involvement. China's Antarctic expeditions' helicopter support is contracted to Ha Air, a subsidiary of one of China's top 10 military companies.⁵² The small fleet of amphibian and all-terrain vehicles that China uses in Antarctica was specially designed by PLA engineers. The manufacturers boast that the vehicles are also useful for 'airdrop operations, border patrol, forest protection,

antiriot security, disaster relief, maritime rescue, and other special operations'—which makes them useful for both peaceful and military applications.⁵³

The Antarctic Treaty privileges science as the core legitimate activity in Antarctica and the primary resource to be extracted from the continent. China's polar research stations play a crucial role in helping the PLA enhance its command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) system capabilities, missile timing, and missile positioning via the BeiDou satellite system. China's 2012–13 annual report on polar policy highlighted the role of the polar regions in C4ISR and observed that China's Antarctic ground receiving stations were invaluable for 'preparing for the facilitation or interference of precision missile strikes and for targeting and communicating with various satellite systems'.⁵⁴ C4ISR is a crucial capacity of the modern military: it enhances situational awareness in the tactical environment, improves interoperability and provides surveillance and intelligence capacity. BeiDou is a dual civil–military technology and is China's equivalent of GPS. The polar regions are crucial for expanding its reach to global coverage.⁵⁵

China, like a number of other polar states, is able to make use of the unresolved sovereignty of Antarctica to establish space tracking and ground receiving stations for polar satellites, with global coverage, that would be unwelcome on the sovereign territory of other states. Russia and India also have ground receiving stations in the AAT. China's first polar ground receiving station was established at its Antarctic Great Wall Station on King George Island in 1993. The data collected there also had dual civil–military use for improving weather predictions and enhancing China's coastal defence.⁵⁶

A BeiDou satellite capable of being received in the polar regions was launched in 2007. In January 2014, the BeiDou system was put to the test when the icebreaker *Xue Long* was itself trapped while attempting to rescue the Russian research vessel *Akademik Shokalskiy*. A polar-orbiting Chinese military satellite, part of the BeiDou system, was used to identify ice conditions to guide the *Xue Long*'s passage through the ice floes. The SOA and PLA jointly coordinated the ship's escape from its ice trap. The same military polar satellite has been used to help look for Malaysia Airlines Flight 370, which vanished in March 2014.⁵⁷

China installed ground satellite receiving and processing stations at both Changcheng and Zhongshan stations in 2010⁵⁸ and at Kunlun Station in early 2013,⁵⁹ and completed upgrades to the Zhongshan Station facilities in early 2015. Installing ground receiving stations at these locations greatly increases the positioning accuracy of Chinese satellites as well as China's Antarctic mapping capacity, both of which are useful for mineral exploration. In 2020, BeiDou will achieve full global coverage by using more than 30 orbiting spacecraft.⁶⁰ BeiDou-1 had full Asia–Pacific coverage in 2003, while BeiDou-2 rolled out in 2012 with improved capabilities. BeiDou-2 has five open channels and five closed military channels, which makes jamming impossible.⁶¹ Chinese commentators say the dual-use capacity of the BeiDou satellite receiving station in Antarctica means that in a future US–China conflict China's Antarctic bases could be targeted in order to disrupt the BeiDou system.⁶²

A further aspect of China's military-related Antarctic scientific interests is upper atmosphere physics and satellite remote sensing. Remote sensing is used for mineral and oil exploration, marine surveys, military reconnaissance and mapping. China's Antarctic upper atmosphere physics is also useful for the PLAN's submarine-related research on sea-ice noise.⁶³

China regards Antarctica as a useful laboratory for preparing for an advanced space program. The engineering needed to build a modern research station in Antarctica can be applied in many other extreme environments, including space. During the 12th Five-Year Plan (2011–2015), China set up a polar engineering research network to strengthen and develop the research links between polar and space engineering.⁶⁴ China's Lunar Expedition Program has already sent several robotic missions to the Moon and plans a manned mission between 2025 and 2030. Meteorite research is also useful for comparative planetology and geochemistry—that is, comparing the geology of the Earth, the Moon and Mars, and assessing what mineral resources are there.⁶⁵ China has not yet signed the Lunar Treaty, which treats mineral resources on the Moon and the other planets as part of the common heritage of humankind and therefore unable to be colonised.⁶⁶

China has a strong polar geomagnetics, ionosphere and auroras research program that benefits from Arctic and Antarctic research. Geomagnetics research is used by militaries to help determine local geomagnetic field characteristics in order to detect anomalies in the natural background that might be caused by a significant metallic object, such as a submerged submarine. China (along with Russia and the US) is researching high-frequency active auroras in Antarctica, investigating potential defence-related uses of the ionosphere. Electromagnetic pulses can be used to upset, jam or even destroy enemy electronics. Polar auroras often interfere with radio and radar signals, and solar flares can interfere with military and civilian communication. China's ability to develop an independent satellite communications system, improve the safety of its polar navigation in difficult areas such as the Arctic seas, and expand its cross-Arctic air routes all depend on whether it can manage this strategically important concern. Chinese polar scientists are also researching how to harvest aurora-generated energy. Zhongshan Station, Kunlun Station and China's Arctic stations are China's key research sites for these programs. China's Antarctic Zhongshan Station and Arctic Huang He Station are perfectly paired sites for atmospheric physics and space-related research, as they are geographical cognates.⁶⁷

China's use of this technology during a conflict would greatly enhance its defensive capabilities in an air-sea battle in its near seas.

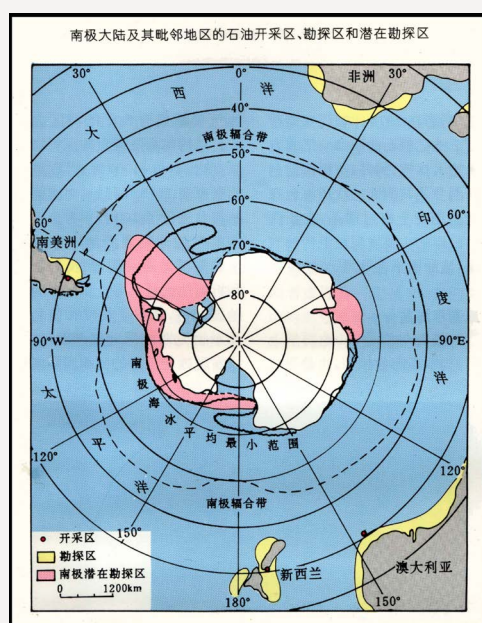
China's astronomical program at Dome A has direct military applications. Infrared telescopes can be used to search for enemy satellites, drones and launched missiles, and to identify whether they have been shot down when targeted. China's use of this technology during a conflict would greatly enhance its defensive capabilities in an air-sea battle in its near seas. This capacity isn't unique to Chinese telescopes in Antarctica: all the Antarctic states with advanced telescopes and satellite receiving stations there have similar dual-use capabilities.

CHINA'S INTEREST IN EXPLOITING ANTARCTIC RESOURCES

The Antarctic Treaty permits the orderly exploitation of certain Antarctic resources; free access to the continent for scientific research; free access for individual exploration and adventure; managed fishing; and unlimited tourism and bioprospecting. However, since the 1991 Protocol on Environmental Protection entered into force in 1998, mineral exploitation and exploration have been banned, although scientific research into Antarctic minerals has not. From the Chinese Government's point of view, the protocol simply postponed what Chinese polar policymakers believe is the inevitable opening up of Antarctic resources.⁶⁸ Any of the original 33 signatories can request a review of the protocol at any time, but consensus is needed to make any change. After 2048, however, any modification to the terms of the protocol must be passed by a three-quarter majority of the parties.

Researchers from the Polar Research Institute of China (PRIC) estimate that there are 500 billion tons of oil and 300–500 billion tons of natural gas on the Antarctic continent, plus a potential 135 billion tons of oil in the Southern Ocean.⁶⁹ In 2009, PRIC staff produced a book-length study investigating the full range of Antarctic mineral resources and their legal status, stating that 'when all the world's resources have been depleted, Antarctica will be a global treasure house of resources'.⁷⁰ Similarly, the 2013 and 2014 annual reports on China's polar policy both emphasised that access to the considerable natural resources at the two poles was essential for the continued growth of the Chinese economy (Figures 5, 6, 7 and 8).⁷¹

Figure 5: Chinese Government map showing 'Antarctic mineral exploration zones'



Source: Ding Huang (ed.), *Jidi guojia zhengce yanjiu baogao, 2012–2013*, [Annual report on national polar policy research 2012–13], Kexue chubanshe, Beijing, 2013, 57.

Figure 6: Map of Antarctic minerals, from a popular news story on Antarctica



Source: 'Nanji wei shenme you meitan?' ['Why does Antarctica have coal?'], Yuzhou qiwen wang, 4 November 2016, [online](#).

Figure 7: 'Nanji youqi ziyuan' [Antarctic oil and gas resources]



Source: Polar Research Institute of China, [online](#). (link discontinued)

Figure 8: Map of Antarctic mineral resources, from a Chinese encyclopaedia



Source: Zhongguo da baike quanshu [China Encyclopedia], 2nd edition, Zhongguo da baike chubanshe, Beijing, 2009.

China has never stopped exploring Antarctic mineral resources, despite the requirements of the Madrid Protocol. It stepped up its exploration activities from 2012, focusing on a few key areas known to hold significant reserves in order to help China in its bid to gain rights to those resources.⁷² The most recent large study, which was conducted from 2012 to 2016, involved hundreds of scientists and social scientists, churned out more than 50 classified reports and included a 'preliminary exploration of mineral resources in Antarctic waters' and 'surveyed coal reserves'.⁷³ China is also investigating undersea metal deposits in an area between Africa and Antarctica through a contract with the International Seabed Authority.⁷⁴

China wants access to and quotas for fishing, tourism and bioprospecting. It aims to take up its rights before other states or international bodies attempt to take them away. Southern Ocean fishing is managed by an Antarctic Treaty organisation, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), based in Hobart. China has the third-largest catch of Antarctic krill after Norway and South Korea, and sends five boats, more than any other state, to the Southern Ocean to fish for krill.⁷⁵ In 2016, China fished for krill in East Antarctica for the first time. Its 2014 catch in the Southern Ocean was 55,000 tons of krill, worth around US\$10 million. In 2015, China announced that it planned to increase its krill catch to between 1 million and 2 million tons per year.⁷⁶ It regards the Southern Ocean as an underutilised fishery.⁷⁷ Currently, the CCAMLR limits the overall annual take of krill to 680,000 tons.

Chinese polar researchers list biotechnology as an area of research ripe for exploitation in the Antarctic.⁷⁸ China has already collected more than a thousand Antarctic biological specimens with commercial potential and has applied for patents on some of the findings of that bioprospecting, but is still at a relatively early stage of biotechnology compared to other Antarctic states.

The Chinese Government wants to have China-based travel agents and operators working in Antarctica (and the Arctic) in order to make China 'a major tourism nation in Antarctica'.

Chinese tourism into Antarctica has grown exponentially. In 2010, senior Chinese Antarctic diplomat Wu Yilin recommended that China encourage Chinese tourism operators to become active in Antarctica in order to take advantage of a legitimate Antarctic 'resource'—the pristine environment—and gain market share before restrictions on tourist numbers are introduced.⁷⁹ China is now the second-largest source of Antarctic tourists after the US and Australia. Chinese Antarctic tourist numbers went up 25% in the 2016–2017 season.⁸⁰ The Chinese Government wants to have China-based travel agents and operators working in Antarctica (and the Arctic) in order to make China 'a major tourism nation in Antarctica'.⁸¹ Becoming a significant market for Antarctic tourists adds weight to China's Antarctic authority, influence and presence.

In Antarctic affairs, China ranks as shown in Table 1.

Table 1: China's ranking in Antarctic affairs

| Area of interest | Rankings | | | | |
|--|--|----------------|-----------------|--|----------------------|
| Polar-related military capabilities | | | | | |
| Polar-capable submarines and surface vessels | 1. US | 2. Russia | 3. China | | |
| Satellites ^a | 1. US (549) | 2. China (142) | 3. Russia (131) | | |
| Nuclear missiles ^b | 1. Russia (1,648) | 2. US (1,538) | 3. China (250) | | |
| Number of Antarctic research stations | | | | | |
| Per China – South Korea joint operations agreement ^c | 1. Argentina | 2. Chile | 3. Russia | 4. China and South Korea | |
| Including only China-controlled bases | 1. Argentina | 2. Chile | 3. Russia | ... | 5. China and Germany |
| Quality of polar science (based on citation rates, ranking of journal) | US polar science is preeminent in Arctic and Antarctic studies | | | China still ranks relatively low on overall quality. | |
| Quantity of Antarctic science projects | 1. Australia | 2. US | ... | ... | 11. China |
| Antarctic science budget (operation costs/research funds/capital investment) | 1. China | 2. US | 3. Russia | | |
| Citizens in Antarctica (scientists, tourists, fishers, workers) | 1. US | 2. China | 3. Australia | | |
| Level and spread of engagement in Antarctic affairs | 1. US | 2. Russia | 3. China | | |
| Antarctic working papers | 1. UK | 2. New Zealand | .. | ... | 20. China |

a 'UCS Satellite Database', Union of Concerned Scientists, 1 September 2015, [online](#). The total numbers of satellites for the three states are given here, including both officially commercial and 'military' satellites, as all satellites have dual-use capacities.

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c 'Hamjung namegeugseo sonjab-assda, giji gongdonghwal-yong' ['China and Korea join hands, joint use of Antarctic bases'], Chosun Ilbo, 29 November 2013, [online](#).

CONCLUSION

China now has greater presence and capacity in the East Antarctic sector of the AAT than Australia can achieve with its current modest Antarctic spend. China has conducted undeclared military activities in Antarctica, is building up a case for a territorial claim, and is engaging in minerals exploration there. The calculation that the Australian Government has long made in short-changing Antarctic affairs in order to boost activities up north is looking increasingly risky.

The Australian Antarctic Strategy 20 Year Action Plan recommended bringing Australia's Antarctic presence and science into the next generation by investment in a new icebreaker, the restoration of inland traverse capability, preliminary work to develop year-round aviation access and the revitalisation of Antarctic science infrastructure.⁸² Those investments, while important, are still inadequate to match the challenges of the new strategic environment in Antarctica. Australia's Antarctic program has been chronically underfunded for years, Australia's presence in Antarctica is limited to three coastal bases that soak up most of the funding budget, and the scientific pool has halved. Antarctic policymaking lacks a senior leader to steer Australia's overall interests.

The Australian Government has to take another look at funding priorities and find a way to protect its interests in Antarctica. Australia should:

- use a whole-of-government response to expand and deepen its Antarctic capacity and institutional expertise.
- concentrate the coordination of Australia's Antarctic policy in an Antarctic Ambassador.
- increase the brief of government agencies with existing Antarctic capacity.
- support contestable deep policy research on the changing Antarctic political environment.

China should be encouraged to issue an official Antarctic strategy to formally state its Antarctic interests and policies. Antarctic states with an interest in environmental protection in Antarctica, such as Australia, need to do more to partner with China on projects that will strengthen China's ability to preserve the unique Antarctic environment. In their analysis, Chinese Antarctic policymakers and academics frequently state myths about Antarctic governance, such as that the Antarctic Treaty will end in either 2041 or 2048. Australia can help China to develop a more thorough understanding of Antarctic law by offering training and exchanges for Chinese polar personnel. China—and other states—should be held to account for breaches of the Antarctic Treaty. Speaking out on the military-use capabilities of states such as China in Antarctica could be a way to respond to capability imbalances in the Indo-Pacific and Asia-Pacific.

Australia must face up to the new challenges of the emerging global order. The US-centred hub-and-spokes model of security alliances and one international treaty may no longer be sufficient to protect Australia's interests. With careful diplomacy, a clear-headed strategy and leadership, and strategic investments in capacity, Australia can better manage its economic and political relationship with China while protecting its own national interests in Antarctica. Australia should also do more to partner with other like-minded states in the Asia-Pacific to protect its interests, both looking north and looking south.

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ACRONYMS AND ABBREVIATIONS

| | |
|--------|--|
| AAT | Australian Antarctic Division |
| ASMA | Antarctic Specially Managed Area |
| ATCP | Antarctic Treaty Consultative Party |
| C4ISR | command, control, communications, computers, intelligence, surveillance and reconnaissance |
| CCAMLR | Commission for the Conservation of Antarctic Marine Living Resources |
| PANDA | Prydz Bay, Amery Ice Shelf and Dome A |
| PLA | People's Liberation Army |
| PLAN | PLA Navy |
| PRIC | Polar Research Institute of China |
| SOA | State Oceanic Administration |

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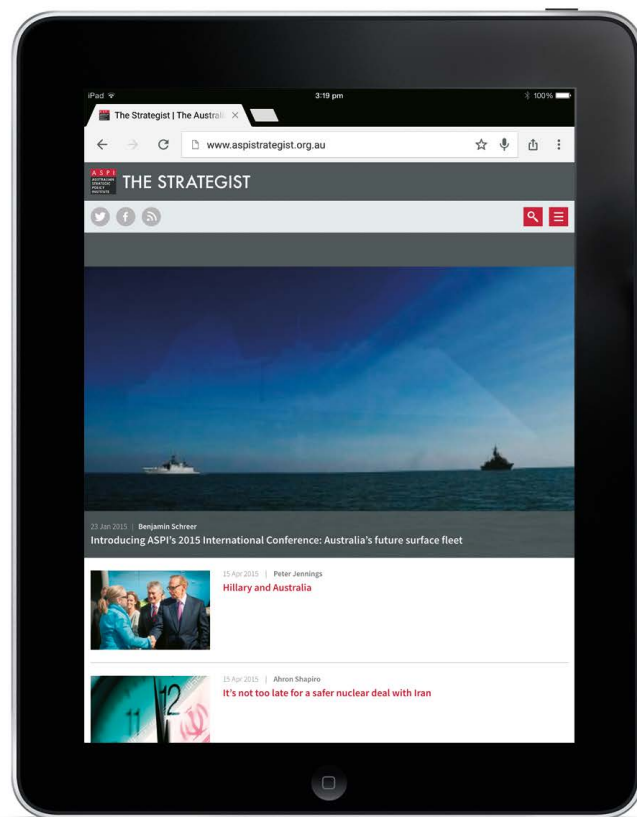
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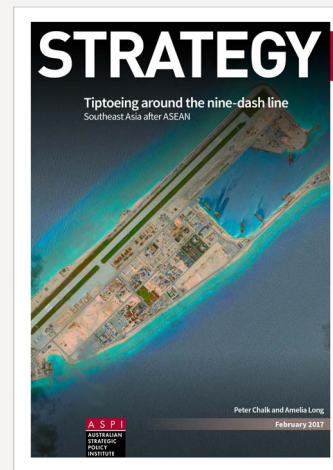
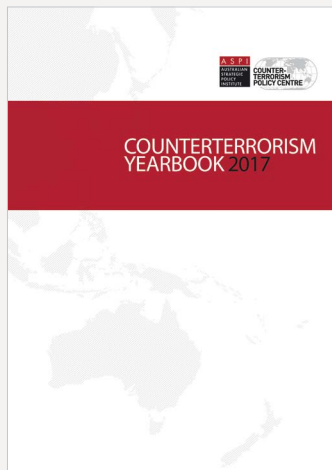
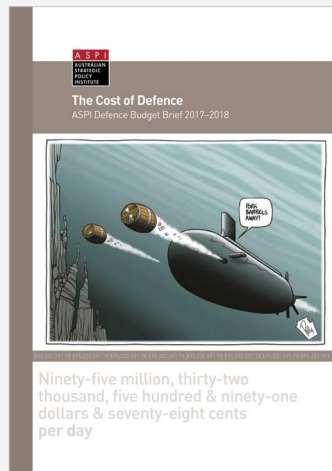


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