SECURING AUSTRALIA THROUGH SPACE: SHARED INTERESTS IN THE INDO-PACIFIC REGION

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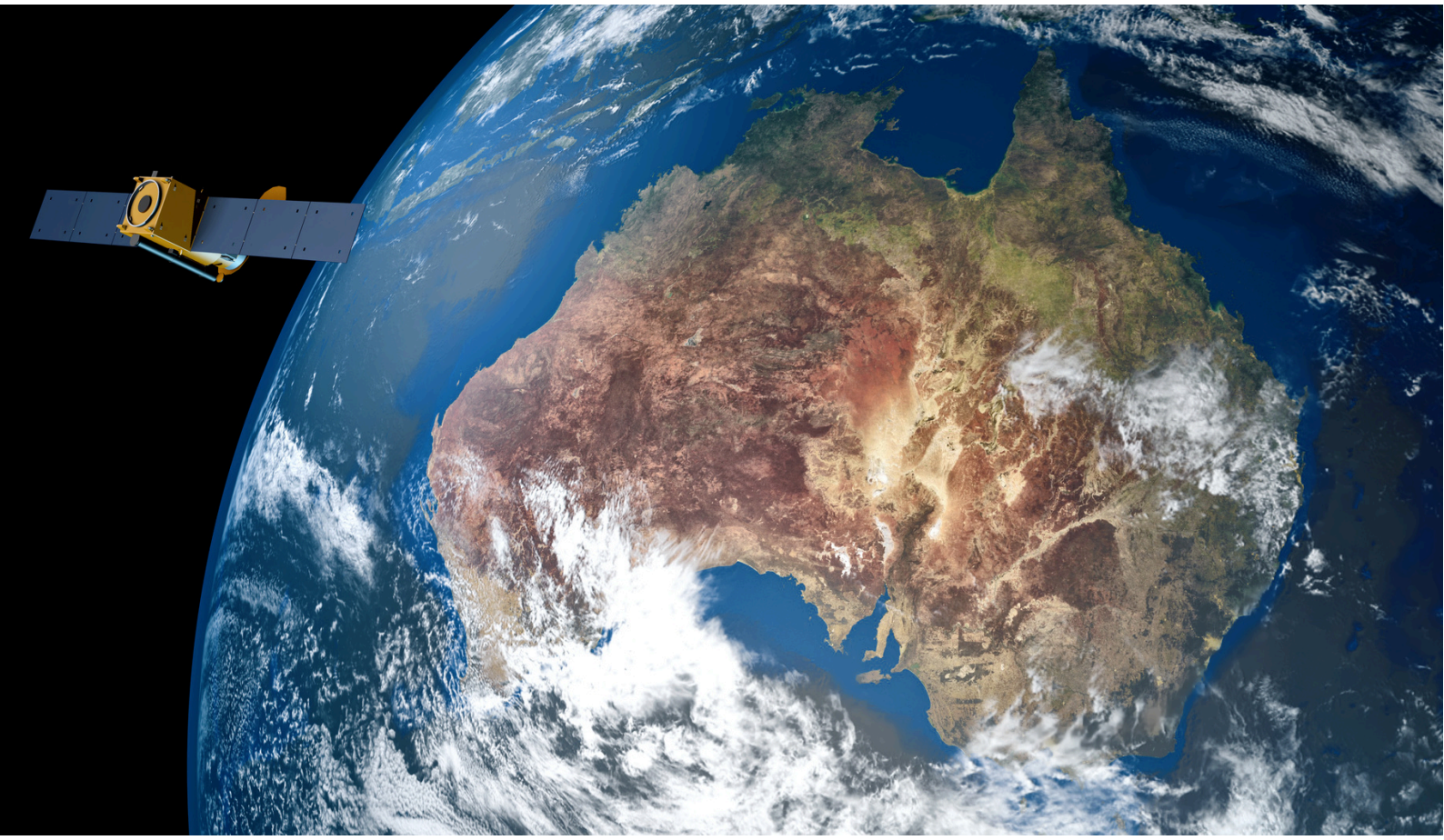

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About the Securing Australia Through Space Policy Papers Series

The Australian Centre for Space Governance hosted a workshop in March 2024 titled “Securing Australia Through Space”, where the question was posed: what does Australia need to secure, and how do space technologies help us to do so?

The workshop was attended by over 90 people, with the vast majority of attendees coming from a range of federal government departments and agencies. Experts from academia, government and industry were invited to give presentations and take part in roundtable discussions. This policy paper series is a result of the workshop.

The papers are authored by those who presented, and edited by Sarah O’Connor, Tristan Moss and Cassandra Steer on behalf of the Australian Centre for Space Governance. The opinions expressed in each paper are those of the authors in their individual capacity, and do not represent the views of any of their employers.

About the Australian Centre for Space Governance

The Australian Centre for Space Governance advocates for Australia’s interests in space in the 21st century and advances the agenda for responsible space governance.

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Summary

- The Pacific Island nations are among the most vulnerable countries in the world, economically, socially and environmentally.
- Climate change remains the single greatest threat to the security and wellbeing of Pacific Island peoples. Average economic losses to the Indo-Pacific region, as a consequence of climate-induced natural disasters, are estimated at US$1.075 billion per year. This is equivalent to nearly five per cent of the combined GDP for Pacific Island Countries and Territories (PICTs).
- Major national and regional security concerns for PICTs include securing reliable communications and combating illegal, unreported, and unregulated (IUU) fishing using maritime domain awareness (MDA).
- Australia shares common national security concerns with PICTs and can take a leadership role in the Indo-Pacific by working collaboratively to respond to national security issues of mutual interest.
- Space-based capabilities can respond to many of the national security threats identified in the Pacific with Australia uniquely positioned to provide the support.

Policy recommendations

- Geoscience Australia should extend its collaboration with Digital Earth Pacific to accelerate the development of the platform and work more intensely on knowledge transfer. This could include developing tools for PICTs to use on the platform based on lessons from other Digital Earth platforms.
- The Australian Government should invest in remote sensing and Earth Observation (EO) satellites that support a greater response to environmental issues, in particular climate change and disaster management.
- The Department of Education should fund the SmartSatCRC and iLAuNCH to provide education and training support through the existing Pacific Security College to ensure effective utilisation of the services provide by space-based capabilities. This should focus on EO, satellite development and downstream use capabilities.
- The Department of Defence, in partnership with the Department of Foreign Affairs and Trade (DFAT), should develop better Marine Domain Awareness (MDA) with a satellite system that can support IUU fishing awareness.

As the *Asia-Pacific Disaster Report 2019* shows,[1] high disaster risk, high levels of poverty and inequality compound each other. Yet, the *Report* also identifies opportunities to capitalise on new technologies to solve these problems. This is where space-based capabilities come to the fore.

The Australian Government has identified space as a critical and enabling domain for national security. As stated in the *2022 Defence Space Strategy* and the *2024 National Defence Strategy* (NDS): "[s]pace and cyber capabilities play a significant role in safeguarding national security, which means they are equally as important as the maritime, land and air domains".[2] This is also highlighted in Pillar 2 of AUKUS where surveillance and radar will be vital to national security.[3] The Australian Space Agency (ASA) has also pivoted their civilian activities to include a dedicated team to respond to national security policy issues. This focus on national security and the space industry is deliberate and a recognition of the current geopolitical environment.

The NDS acknowledges that strategic competition between the United States (US) and China will likely have the greatest impact on regional security in the Indo-Pacific region. As China's economic position grows, it is expected to continue to seek a prominent and influential role in the Pacific. One way to improve regional security – and position Australia as the preferred security partner for the Pacific – is to leverage Australia's space capabilities for the benefit of the region.

Australia has a unique role as a middle space power in the Indo-Pacific region. As a trusted voice in the United Nations (UN) Committee on the Peaceful Uses of Outer Space,[4] an early adoptee of the five UN space agreements and an inaugural member of the Artemis Accords,[5] Australia can provide space leadership in the Indo-Pacific region. This is reinforced by the focus of the Indo-Pacific Partnership for Maritime Domain Awareness and Quad Leaders on space capabilities.[6]

Australia has a solid base of government supported space research and development through organisations such as SmartSatCRC, Australian National University Institute for Space, the National Space Qualification Network, NSW Space Research Network and the Innovative Launch, Automation, Novel Materials, Communications and Hypersonic Hub (iLAuNCH) Trailblazer program. These centres are able to work collaboratively with Pacific Island Countries and Territories (PICTs) to respond to national security issues of mutual interest, such as natural disaster preparedness and response.

Risks to regional national security

PICTs are amongst the most vulnerable countries in the world, economically, socially and environmentally. All but three are aligned with the 'One China' policy and recipients of funding through China's Belt and Road initiative.[7] In 2024, Pacific leaders have met with Chinese diplomats, travelled to China and confirmed their strong relationships through diplomatic engagements and public statements.

There is a long history of support from China to the Indo-Pacific region, including for space-based capabilities. Suva – the capital of Fiji – is a perennial base for China's space and satellite tracking ships known as the Yuan Wang class. The Yuan Wang ships form part of China's Navy infrastructure and are deployed globally as

part of China's Satellite Maritime Tracking and Control Department's space flight tracking and data network.[8] Australia has accused these ships of spying on the Australian Navy.[9] Thus, not only is there a threat to Australia's position as the preferred security partner in the region, but there is a security threat to Australia itself.

China has also enjoyed a long and enduring relationship with Indonesia, notably dominating Indonesia's 5G communications market. This relationship was scuttled in April 2020 by the destruction of the Nusantara-2 satellite in a launch failure.[10] However, China is still in a position to leverage its financial capacity for greater influence as the Indonesian Government continues to seek investors and supporters to build a spaceport in the Papuan province island of Biak. Indonesia has approached China and SpaceX on numerous occasions, despite outrage from locals.[11] Indonesia seeks a launch capability due to its ambitious satellite program and to counterbalance influence from the US, and now China, based on its lost satellite. Australia could potentially offer an alternative launch site through its domestic capabilities.

The problem of implementation occurs with the contractual requirements for funding by China. The accompanying loan agreements have long term implications for PICTs, particularly for potential coercion. This coercion manifests in different ways, including as voting support in the UN (for instance regarding China's treatment of Uyghurs),[12] access for Chinese military,[13] and economic tariffs.[14]

The overarching policy of the Pacific region is 'Friends to all and enemies to none'[15] and articulating this view to indicate that enemies of friends are not enemies to the Pacific. This is how many PICTs balance their support of China and the western democracies of the US and Australia.

In 2018, the leaders of all PICTs, including Australia, signed the *Boe Declaration on Regional Security*. Signatories committed to strengthening respective national security approaches by developing national security strategies.[16] The Declaration identified the main security challenges as:

- climate change and natural disasters;
- the vastness of the region and its huge exclusive economic zones (EEZs), sparsely populated by mostly small island states remote from each other;
- small formal economies at a vast distance from major markets, with high costs and heavy reliance on development assistance;
- resource constraints and depletion of natural resources;
- illegal fishing and weak borders; and,
- sophisticated transnational crime.[17]

Security challenges, posed by issues such as climate change and natural disasters, are without borders and require regional cooperation to address effectively. With the Indo-Pacific region sharing similar challenges, regional cooperation would be desirable. The COVID-19 pandemic reinforced this criticality of national security engagement.

Many of these security challenges can be tackled effectively through space-based capabilities. Options include domestic launch infrastructure, leveraging domestic satellite capabilities through Earth observation (EO) to support climate change or satellite capabilities to respond to illegal, unreported, and unregulated

(IUU) fishing using maritime domain awareness (MDA).

Opportunities afforded by emerging technologies for cooperation in the region

Many PICTs have engaged in some form of space-based capabilities. The use of emerging technologies is considered one of the greatest opportunities to capitalise in responding to the disaster 'riskscape' of the Pacific.[18] Space-based capabilities present an opportunity to cooperate with partners across the Pacific, lending Australian expertise to solve critical national security issues identified by the PICTs. The opportunities for Australia to position itself as the preferred security partner in the region include:

1. EO for disaster management and responding to climate change;
2. MDA to combat IUU fishing; and,
3. communications for vulnerable remote communities.

1.1 EO for disaster management and responding to climate change

The PICTs are severely impacted by natural disasters caused by cyclones, floods, severe storms and sea water level rising. This is compounded by climate change, identified by the *Boe Declaration* as the largest national security issue facing the region.[19]

In 2007, Indonesia launched its first remote sensing satellite, Lapan-TUBsat, in a polar orbit at 630km that enabled three passes over the Indo-Pacific region per day.[20] The intent was to relay topography images with the focus being on areas impacted regularly by disasters and flooding. The business case included the challenge of using EO data captured by the satellite of another state, on the basis that their satellites had limited coverage in the area. Beyond this one 18-year-old Indonesian satellite, there are no other sovereign EO capabilities dedicated to the PICTs.

With climate change and responding to environmental concerns in the PICTs being the number one national security challenge, it would be an obvious area for Australia to provide support. The recent launch of Kanyini by a SmartSatCRC consortium is a strong step forward in domestic capability.

Digital Earth Pacific provides a good platform to assess changes in climate to support decision making. However, the platform is still in its infancy of development and support is required to ensure that:

- data is readily available and in a format that is easy to utilise;
- tools are expanded beyond the existing regional products, acknowledging the full suite that is available on other Digital Earth platforms; and,
- knowledge transfer through education and training are prioritised to ensure its ongoing use and longevity.

Beyond its relative infancy, Digital Earth Pacific is limited in that it uses historical rather than real-time data. This makes it impractical for more urgent requirements, such as responding to natural disasters, monitoring military exercises or intelligence gathering. Moreover, access to the European and US remote sensing satellites is not guaranteed.

The Head of Geoscience Australia identified that Australia's lack of sovereign EO capabilities relied on the 'good will' of countries like Japan and South Korea to assist in times like the 2019-20 Black

summer fires, noting that, should there be other weather events, "obviously the Japanese and Korean governments would have prioritised their national interests over ours".[21]

Sovereign space-based capability in the region is urgently required, especially considering the continued threat of climate change and disaster management. This was also identified as an opportunity for the Quad Space Working Group.

Considering early successes of small Australian-based EO satellites, such as the South Australian Kanyini, there is the opportunity to grow Australia's domestic capabilities and support Pacific partners.

1.2 MDA to respond to illegal fishing

The Pacific region has limited MDA and relies heavily on the sharing of information from allies. There is no sovereign MDA capability in either the satellite or data analysis tools. Whilst MDA globally has a strong focus on piracy, the reality is that IUU fishing and climate change present bigger issues in the Pacific.

In May 2024, the Pacific Islands Regional Forum Fisheries Agency (FFA) released a policy wherein it assessed emerging technology engagement for its members.[22] While not specifically referenced as a priority, there was recognition of several space-based technologies for IUU fishing as emerging technologies.

Through the Western and Central Pacific Fisheries Commission (PFC), PICTs have established a satellite vessel monitoring system, a regional observer programme for the tuna fishery, and conservation and management measures. Coastal fisheries are a mainstay of food security and need careful management to avoid over-fishing and subsequent stock depletion.

There are 17 PICTs working together as part of the FFA to respond to the challenge of illegal fishing (Indonesia is not part of the FFA). DFAT, working with the PFC and the FFA, contracted US-based Hawkeye 360, a space-based data analytics company, for nine months to help detect illegal fishing activity using radio-frequency sensors in the region. Under the contract, the FFA and PFC received data, analytics services, and training support to identify illicit maritime activity within its waters. This contract expired in December 2023 and the results are yet to be published publicly.

Another MDA challenge is support for search and rescue in the Pacific. In Australia, the Maritime Safety Authority (AMSA) leads the use of 'Search and Rescue' capabilities through COSPAS-SARSat, a satellite-based distress-alert detection system. As there are no sovereign capabilities, there is a reliance on MDA support from allies, particularly the US. SmartSatCRC, a consortium of industry and research organisations, has been working on new technology in this area for a few years now. Safety and search response efforts can be greatly enhanced through space-based capabilities. This is an area of opportunity for Australia to provide these services for use domestically and in the Pacific.

There is already a business case for the use of satellite technology to support MDA given the strategic importance of the fishing industry with respect to food security and economic development. While action is imperative, the vast area of coverage makes this challenging.

1.3 Communications for vulnerable remote communities

Communications are an essential service and critical to supporting the national security environment for PICTs. The lack of

disposable incomes and dispersed location of people makes it challenging to provide reliable communications across the region. This is compounded by the number of inhabited islands, vast geography and often very mountainous terrain that makes traditional communications infrastructure grossly uneconomical.

Collaboration is currently underway on the 4700 km Coral Sea Cable between Australia, Papua New Guinea (PNG) and the Solomon Islands.[23] However, undersea cable developments by tech giants (Google, Amazon etc) have few market incentives to fund similar cables for the smaller PICTs. This means many island countries are entirely dependent on a single cable, which creates a single point of weakness.

The rollout of undersea cables has become a major focus of the strategic competition between Western nations and China to gain influence in the Pacific. China is seeking to extend its influence with either cables or through Chinese technology, like Huawei and ZTE being rolled out across the Pacific, connecting into cables funded by Australia and the US. To counter-balance China's influence and be seen as the preferred security partner in the Pacific, Australia should focus on supporting data security.[24]

Satellite capabilities are the more appropriate solution due to their ability to provide broader coverage with less on-ground infrastructure requirements. They also present a more economic option due to the vast distances between islands and require limited infrastructure. There are, however, some problematic private sector contracting requirements for PICTs.

Indonesia has operated its own communications' satellites for decades and PNG has committed to launching a sovereign communications satellite by 2027. The need for independence is due to the unreliability of communications, particularly by foreign-owned satellite companies, including contractual requirements that are not always beneficial to the smaller PICTs. This presents a further opportunity for Australia to work with Pacific partners to ensure reliable communications and share experiences, like those gained with the nbn Sky Muster satellite.[25]

Working together on national security concerns of mutual interest

Australia can take a leadership role in the Pacific by working collaboratively with PICTs to respond to national security concerns of mutual interest, ensuring Australia is seen as the preferred security partner in the Pacific. This would directly contribute to the concept of National Defence as outlined in the National Defence Strategy.

The recent manufacture of the South Australian Government funded Kanyini satellite program, led by SmartSatCRC, could be an exemplar approach to a regional services mission providing EO, MDA and limited communications service (e.g. disaster warning) that would facilitate Australian industry development and provide meaningful regional cooperation. This could be further enhanced by education and training support to ensure effective utilisation of the services provided by the satellite system. With the continuing downward trend in the cost of satellite manufacture and launch, this could be an affordable mechanism to engage the region and increase situational awareness and communications across the southwest Pacific.

Together, Australia and the PICTs can better understand, respond to, and tackle national security issues with space-based capabilities whilst contributing significantly towards securing the Indo-Pacific region.

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