Australian Antarctic Science Funding Model

A Review by the Australian Antarctic Science Council

April 2023

Image: F. Hurley, SY Aurora at the Shackleton Ice Shelf, Australasian Antarctic Expedition 1911-14 (National Archives of Australia).

Sir Douglas Mawson's AAE 1911-14 was the first major Australian-led Antarctic science field program. The expedition was funded by the Australian and some State Governments, and the Australasian Association for the Advancement of Science. The extensive scientific reports of the expedition however were not fully published until 1947, due in part to inadequate funding.

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Executive Summary

Australia's national Antarctic interests are framed by the Antarctic Treaty System and global climate change, and are underpinned by delivering an impactful Antarctic science program. Recent reviews have focussed on improving the governance and focus of the program, but the funding model has not been addressed. The Minister for the Environment and Water requested the Australian Antarctic Science Council to advise her on options for the funding model, in the context of the Decadal Plan for Australian Antarctic science currently under development. The current funding model and options are summarised in Figure 1.

The Council developed a framework for assessing options and consulted with stakeholders. Options have been assessed against the following four principles:

- *Coherence*: be simple, efficient, transparent and drive research and policy alignment.
- *Certainty*: provide certainty for long-term science programs, be resilient to logistics disruptions, and support the ongoing development of the Antarctic science workforce.
- *Excellence*: uphold scientific excellence and external engagement.
- *Impact*: maximise impact and effectiveness, in accordance with Australia's geopolitical and environmental interests in Antarctica.

The current model involves multiple funding streams and entities, and includes terminating measures administered by the Australian Research Council and Industry Department. It performs poorly for coherence and certainty. Option 1 would consolidate the major funding streams, to be administered by the Australian Antarctic Division (AAD) Chief Scientist. This model would enhance coherence, provide certainty if the funding were ongoing, and improve both excellence and impact. Option 2 would go one step further, integrating the disparate entities into a new Antarctic science agency. This model is superior against all principles, but the separation of science from logistics would introduce significant risks.

The status quo is clearly not fit for purpose. The Council makes three recommendations:

1. Funding certainty: The current terminating measures (ARC Antarctic SRIs and DISR AAPP) be made ongoing at their current annual levels (indexed). Any future additional funding for Australian Antarctic science should be either ongoing or tied to specific program outcomes.

2. Funding consolidation: The annual appropriation for Antarctic science be consolidated into DCCEEW at the current level, with an explicit reference in the Budget Papers. The AAD Chief Scientist should be the designated manager of these funds within the Department. The AASC should approve the allocation of funds between AAD Science Branch and universities, with the ARC administering the selection of universities to deliver designated programs. Transition arrangements should be managed by the Chief Scientist, with Council oversight.

3. Institutional model: Consideration be given over the next three years to establishing the AAD as a Commonwealth agency (corporate or non-corporate entity), in parallel with implementing the new science funding arrangements (Recommendations 1 and 2), implementation of the recent O'Kane and Russell review recommendations, and consolidation of the new logistics capabilities.

These changes would set up the Decadal Plan for success and align Australia with its peers.

Figure 1: Australian Antarctic Science Program Funding Models

Australian Antarctic Science Program (AASP)

Portfolio	DCCEEW (Environment)	DISR (Science)	DESE (Education / Australian Research Council - ARC)		DESE (Education/ARC)	DISR, DCCEEW
Program funding	Australian Antarctic Division (AAD) [ongoing]	Antarctic Science Collaboration Initiative (ASCI) [terminating]	Special Research Initiative (SRI) for Excellence in Antarctic Science (EAS) [terminating]	Special Research Initiative (SRI) for Excellence in Antarctic Science (EAS) [terminating]	ARC and other university sources of funding [specific programs]	Agency appropriations [ongoing]
Program delivery entities	AAD Science Branch Includes national and international collaborations	Australian Antarctic Partnership Program (AAPP) UTas, with AAD, CSIRO, BoM, GA, Tasmania, IMOS	Securing Antarctica's Environmental Future (SAEF - Monash) Monash Uni, with 24 university and agency partners (Australian and international)	Antarctic Centre of Excellence in Antarctic Science (ACEAS - UTas) UTas, with eight university partners	Multiple university researchers and groups, often in collaborations	Agencies that do some Antarctic science as part of their broader roles: - CSIRO - Geoscience Aus - BoM - others
Future state	**Decadal Plan**				University and agency research may or may not be aligned with the Decadal Plan	
Logistics support	**Australian Antarctic Division** AASP fieldwork supported by AAD (or occasionally by other national operators)					

Notes
- *Current Funding Model: each column provides a distinct line of funding to the AASP, through multiple portfolios, programs and entities.*
- *Option 1 - Funding consolidation: shaded funding streams consolidated and appropriated (all ongoing) to DCCEEW, for AAD Science Branch management.*
- *Option 2 - Agency alignment: all entities in the shaded area form a new Australian National Antarctic Research Institute (Commonwealth agency).*
- *Decadal Plan: funded from the consolidated ongoing streams, under Australian Antarctic Science Council governance.*

1. Background

1.1 Authorisation

The Minister for the Environment and Water, The Hon Tanya Plibersek MP, has asked the Australian Antarctic Science Council (AASC) to conduct a review of the Australian Antarctic science funding model (Attachment 1, letter of 20 February 2023).

The Minister noted that the complex and challenging operational environment to deliver Antarctic science, the terminating status of the Australian Research Council's Special Research Initiatives and the need to deliver the science priorities set out in the Decadal Plan for Antarctic science, requires an enduring and simplified funding model to be developed.

1.2 Context

The strategic context for this review includes Australia's posture in the Antarctic Treaty System, the 2022 Australian Antarctic Strategy and 20 Year Action Plan, and our continuing national geopolitical and environmental interests in Antarctica. Scientifically, the international focus is on understanding climate change impacts on the Antarctic and Southern Ocean regions and the implications for the Earth System. We are therefore in an era of mission-driven science, which requires an aligned funding model.

More specifically for the science funding model, critical context includes:

- Clarke (2017) Review of Australian Antarctic Science Governance, partially implemented with creation of the Australian Antarctic Science Council (AASC), delivery of the Australian Antarctic Science Strategic Plan by the AASC and changes to science program administration.

- O'Kane (2021) Review of Australian Antarctic science, including refocussing and strengthening the Australian Antarctic Division (AAD) Science Branch, currently being implemented.

- Development of a Decadal Plan for Australian Antarctic Science, as recommended by O'Kane, due in late 2023, which will define our national Antarctic science priorities.

- Substantial changes in AAD, including major new logistics capability to support Australian Antarctic science, along with the complexity and challenges of supporting science fieldwork in a remote environment.

- Establishment of the two ARC Special Research Initiatives for Excellence in Antarctic Science in 2021 (led by Monash University and the University of Tasmania), with funding terminating in 2025 (UTas ACEAS) and 2028 (Monash SAEF). Both SRIs have requested a two-year funded extension (a reset) due to delays in AAD logistics support for critical fieldwork.

- Establishment of the Australian Antarctic Program Partnership in 2019 (UTas/IMAS, AAD, CSIRO, BoM, GA, IMOS, Tasmania Government), with funding terminating in 2029.

While not directly related to science funding, the Council notes the recent Russell Review of Workplace Culture and Change at the AAD which was released during the Council's review process. The comprehensive response to that review will be a significant (and necessary) overlay to the science-related context.

Australia's Science and Research Priorities, the Australian Research Council Act and the Universities Accord are currently under review. These may also impact Antarctic science.

Within the known science-related context, the Council prepared an Options Paper and consulted with stakeholders. Several assumptions and principles were tested during the consultation process. This report provides the Council's advice to the Minister, drawing on the consultations and the Council's deliberations.

2. Current Funding Model

2.1 Current Australian funding

The operating model for the Australian Antarctic Program (AAP) includes the Australian Antarctic Division (AAD) as the national operator providing nearly all logistical support, and scientific programs delivered through multiple entities with diverse funding arrangements.

The core elements of the current science funding model are:

- AAD Science Branch funding through DCCEEW appropriation as part of the AAD Budget (ongoing measure).

- Australian Research Council (ARC, in the Education portfolio)) funding for two Antarctic Special Research Initiatives (SRIs for Excellence in Antarctic Science) following a competitive process, with policy-ownership from DCCEEW (terminating measure). Although this funding flows from the ongoing ARC Linkage Program, the Antarctic SRIs have contractually fixed end dates.

- Australian Antarctic Partnership Program (AAPP) funding through the Department of Industry, Science and Resources' Antarctic Science Collaboration Initiative (ASCI, terminating measure).

- Commonwealth and State science agencies (CSIRO, GA, BoM, Tasmania DNRE for Macquarie Island) funding, through their budget appropriations (ongoing) as part of their broader science mandates.

- University research funding (separate from the SRIs), from ARC competitive grants and other funding sources (generally program-specific). Research that requires Antarctic fieldwork in the Australian Antarctic Territory must engage with AAD for logistics support. The University of Tasmania hosts a specific Institute of Marine and Antarctic Sciences (IMAS), with formal links to AAD.

These cash streams are summarised in the following table, but do not include other funding provided by universities, or in-kind resources from various entities including costs associated with workforce development.

Table 1: Overview of current Australian Antarctic Science Program Funding Streams

Department	DCCEEW (AAD)	DISR (ASCI)	Education (ARC Discovery)[+]	Education (ARC SRI)	Education (ARC SRI)
Amount	$115.9M*	$50M	$4.4M	$20.6M	$37.0M
Term	5 years 2021-26	10 years 2019-29	Up to 5 years	4 years 2021-25	7 years 2021-28
Mechanism	Sustainable Funding Review	Antarctic Science Collaboration Initiative	Discovery, Linkage and Early Career Programs	Australian Centre for Excellence in Antarctic Science	Securing Antarctica's Environmental Future
Delivery Lead	AAD	UTAS	Various	UTAS	Monash

* ongoing from 2026-27 $22.4M pa; open for applications each year;
[+] for projects commencing 2023

The current intent is that the Decadal Plan will provide a framework for focussing and integrating the science done through these disparate funding mechanisms, while continuing to leverage other financial and in-kind support.

2.2 Previous reviews

The 2017 Clarke review of Australian Antarctic science governance proposed a model that institutionalised long-term collaboration at the discipline, agency and international level, with coherent leadership and integrated strategy and planning. This has been partly implemented, through the establishment of the AASC and the subsequent strengthening of AAD Science Branch and development of a Decadal Plan.

The key Clarke recommendation that was not implemented was the establishment of an Australian National Antarctic Research Institute to integrate the work of the multiple science bodies into a more coherent Australian Antarctic Science Program. The 2017 Review also found that uncertainty over future funding, caused by terminating measures, has impeded the science program. That arrangement was however continued.

The 2021 O'Kane Review was focussed on the science program itself, rather than the funding and governance. O'Kane found that the AAD Science Branch should be the engine for driving a Decadal Plan for Australian Antarctic Science, focussed on global excellence in high priority science. The recommendations included a long-term East Antarctica monitoring program and a new digital initiative, which would underpin the science program. Significantly, O'Kane recognised the importance of collaboration with the SRIs, AAPP, Geoscience Australia, CSIRO and BoM, with all having a role in shaping the Decadal Plan, and recommended that the institutional model for Australian Antarctic Science should be further strengthened.

These themes from the two most recent science reviews are not new. A 1967 review into Australian Scientific Research in Antarctica, undertaken by the Australian Academy of Science for the Department of External Affairs, canvassed similar issues. Notably, the Academy supported a science-led program, drawing on the capabilities of multiple agencies, focussed on the national interest, and guided by a representative committee.

The Council considers that the funding model and associated institutional arrangements are the last pieces of the puzzle to fully implement the recommendations of the previous science reviews.

2.3 Scope of funding under review

For this 2023 AASC review, the AAD, ARC Antarctic SRIs and Antarctic Science Collaboration Initiative (ASCI) AAPP funding streams are considered in scope. The Commonwealth and state science agency and university funding (including other ARC programs such as competitive Discovery grants) are not in scope and are assumed to continue, including collaboration with in-scope entities. Although the CSIRO-operated Marine National Facility contributes some voyages to Antarctic science, that is not its main focus so it is out of scope.

This scope comprises all the current Commonwealth lines of funding that are fully directed to the Australian Antarctic Science Program (AASP), while recognising that other Commonwealth agency and university funding also make material contributions to the Program.

2.4 International models

In undertaking this review, the Council examined the science funding model used in a number of comparator national Antarctic programs. The analysis highlighted a fundamental difference between the Australian Antarctic Science Program, and the governance framework for the majority of its peers. Most other national Antarctic programs operate with centralised research funds, administered by a single agency/institute, that is also responsible for the relevant logistics pathway.

These alternative funding governance models are outlined in Appendix 2. The British Antarctic Survey (BAS) model best illustrates the centralised funding approach, with funding aligned to a set of five science streams (analogous to the Australian Decadal Plan).

3. Framework

In formulating and assessing options, the Council made a number of assumptions and adopted a set of principles, which together provided the framework for assessing options.

3.1 Assumptions

The following assumptions have been made and are considered to be uncontentious:

- AAD will continue to provide logistics support for the AASP;

- AASC will continue to provide AASP governance and advice to the Minister (noting that the Council has no formal powers in regard to the various scientific entities);

- AASP will be aligned to the Decadal Plan (including long-term monitoring and integrated data programs);

- Australian universities will continue to undertake a significant proportion of Antarctic research and workforce development, with diverse sources of funding including the AASP, ARC Discovery grants and the universities themselves (some of this research will be aligned to the Decadal Plan, some not);

- BoM, GA, Tasmanian State Government (for Macquarie Island) and CSIRO self-funded Antarctic work will continue at no less than the current level, including programs outside the Decadal Plan where required by the agency mission;

- Hobart will continue to be the headquarters for Australian Antarctic activities. The University of Tasmania (through IMAS) will continue to have a special relationship with the AAD and AASP (details will need to be defined in the context of the future funding model).

3.2 Principles

The Council has adopted the following four principles to guide the assessment of options:

- Coherence: the model should be coherent - simple, efficient, transparent - and drive alignment with research and policy priorities as expressed through the Decadal Plan and the Australian Antarctic Strategy.

- Certainty: the model should provide sufficient certainty to enable planning and delivery of long-term science programs, resilience and adaptability to the inevitable disruptions in logistics support, and the ongoing development of the Antarctic science workforce.

- Excellence: the model should uphold science excellence and external engagement. Research should be undertaken by the entity best-placed to deliver science excellence, with independent oversight. Engagement with universities and international science programs should be enhanced, for science, innovation, outreach and workforce development.

- Impact: the model should maximise impact and effectiveness, in accordance with Australia's geopolitical and environmental interests in Antarctica. The Decadal Plan will identify the national interest science priorities.

4. Options

4.1 Current model

Under the current model, ARC Antarctic SRI and DISR-ASCI funding will terminate during the active period of the AASP Decadal Plan, resulting in a step-change reduction in science

funding. Delivery of logistics in support of the scientific program would remain the responsibility of the AAD, with ongoing operational challenges further disrupting the terminating programs.

Current AAD science programs would continue to be delivered by the AAD Science Branch. Future funding to support the Decadal Plan would remain contingent on Portfolio budget allocations, impacting the development of long-term strategic science and enduring research capabilities including the science workforce. The Council would have limited capacity to set strategic science objectives beyond AAD Science Branch, although development of any future ARC-SRI and/or DISR-ASCI funding could be guided by the Decadal Plan.

Close engagement with the Australian Government and the ability to support domestic and international policy development remain a strength of this arrangement. However, the ability to develop enduring strategic science programs, and to further enhance scientific excellence and international standing in the scientific community, would remain limited by uncertainty in departmental and government objectives and structures.

4.2 Option 1 - Funding consolidation

In this option, core funding streams from the ARC Antarctic SRI and DISR-ASCI programs would be appropriated to DCCEEW, pooling the current Antarctic science funding. Science programs would continue to be delivered by AAD Science Branch, together with the ARC-SRIs (SAEF, ACEAS) and DISR-ASCI (AAPP) under their current contracts. The ARC-SRI and DISR-ASCI contracts would need revision to reflect the change, representing an opportunity to reset timelines consistent with operational capabilities and strategic science priorities.

Future priorities for the AASP would be linked to the Decadal Plan, managed through the AAD Chief Scientist's office. Oversight of funding priorities and administration would be enacted through the Council, with merit competition for funding overseen by the ARC. Such a model would strengthen linkages between priorities and outcomes, directly link the science program with operational capability, and enhance engagement and workforce development.

Before the expiry of the terminating programs, a policy decision would need to be taken on whether that funding should be renewed (either another set of terminating measures, or ongoing), and how any new funding should be allocated. Any new funding could at that stage be fully aligned with the Decadal Plan. A commitment to ongoing funding would support enduring science priorities and deliver long-term science capabilities.

Similar to the status quo, this model allows for close engagement with the Australian government for policy development (strengthened through funding alignment), but would carry the same risks in relation to shifting objectives and structures.

4.3 Option 2 – Structural alignment

In this option, an 'Australian National Antarctic Research Institute' (agency) would be established as a new Commonwealth entity. Current DCCEEW (AAD science branch), ARC Antarctic SRI and DISR-ASCI funding would be pooled, with a single line of ongoing Budget appropriation to the Institute. In transitioning to the structure, AAD Science Branch and

DISR-ASCI (AAPP) staff would be transferred to the Institute. The AAD Chief Scientist position would become the Institute CEO.

In this model, the close relationship with AAD for logistics support, and the respective international roles of the Institute and AAD, would need to be formally defined – potentially through a Service Level Agreement or Memorandum of Understanding. Poor alignment between the two entities would introduce a new set of problems.

Similar to Option 1, the current ARC-SRIs and DISR-ASCI funding contracts would be revised, with the SAEF and ACEAS research community linked to the Institute as affiliates, and short-term research priorities would be transitioned to align with Decadal Plan objectives and operational capabilities.

Future funding allocations to the broader research community would be administered by the Institute, with the ARC utilised in a service delivery arrangement to assess research proposals from universities (excellence focus). The Council would function as the science governance Board to the Institute, ensuring that adherence to strategic priorities (Decadal Plan) and research excellence is maintained. Ongoing funding would enable the Institute to identify and support enduring science priorities and to deliver long-term science capabilities.

Through the establishment of the Institute, Australia's international standing in the Antarctic scientific community would be enhanced, and the capacity for the Australian science community to engage in international programs would be significantly improved. The Institute would continue to work with policy and international colleagues to provide strategic scientific policy advice to government.

Notably, other Commonwealth science bodies engaged with the AASP - Geoscience Australia, CSIRO and BoM - are all separate Commonwealth entities within their portfolios. Most other Commonwealth activities with major ongoing science and operational roles, including the Great Barrier Reef Marine Park Authority (GBRMPA), the Australian Institute of Marine Science (AIMS) and the Australian Nuclear Science and Technology Organisation (ANSTO), are similarly structured.

5. Assessment

5.1 Consultations

The Council prepared an Options Paper, outlining the current model, two alternative options and an assessment against principles, for consultation with the stakeholder community. Thirteen written responses were received, and Council members had several discussions with stakeholders. Further details are in Appendix 3.

The consultation process helped clarify the context for the review and principles for the assessment of options. In regard to the options, the key outcomes from the consultation process were:

- All stakeholders see the current model as having major problems, with none supporting its continuation.

- All stakeholders considered funding consolidation (Option 1 – funding to be pooled in DCCEEW) to be an improvement on the status quo. A key benefit of this model was the ability to align funding with the national priorities.

- Most of the research community saw institutional alignment (Option 2 – a new science agency) as the preferred model, but several stakeholders saw significant risks in separating logistics and science. Key benefits of this model were certainty and the enhancement of strategic science, engagement and workforce development.

- Several stakeholders proposed an 'Option 3' – with the AAD as a whole becoming a Commonwealth agency. This model would achieve all the benefits of Option 2, but without the structural risks.

The Council has considered the submissions in the following assessment and in forming its recommendations.

5.2 Assessment against principles

The Council has assessed the current model and two alternative options. The key findings were:

Coherence

- The current model has poor coherence, with disparate funding streams pursuing multiple objectives that do not necessarily align with either the national interest or AAD operational capabilities. It is inefficient, with complex funding arrangements, multiple entities, and duplication of science programs, leadership, administration and governance overheads.

- Funding consolidation (Option 1) would enhance coherence, particularly if ongoing, with pooled funding able to be clearly prioritised. Alignment, efficiency and simplicity would all be improved.

- Structural alignment (Option 2) would provide superior coherence, with pooled funding, clear governance, direct alignment with priorities, and enhanced transparency through agency reporting. It provides a simple and enduring model for supporting university and other agency Antarctic science.

Certainty

- The current model has low certainty, with short-term funding dissuading the development of long-term programs. Outside the AAD, the lack of institutional linkages to operational capabilities decreases logistical certainty and restricts adaptation of the science program to operational constraints. It severely limits development of the Australian Antarctic science workforce.

- Funding consolidation (Option 1) would greatly improve certainty for science and workforce development if the currently terminating measures were made ongoing. However, shifting departmental/government structures and priorities would continue to limit the development of long-term enduring projects. Linkages to operational capabilities would be enhanced and potential for adaptation of the science program in response to logistical challenges would be simplified.

- Structural Alignment (Option 2) provides the greatest certainty, with strategic and enduring science programs supported beyond shorter-term cycles. Science capability and career development is optimised. Long-term university research would be supported by long-term contracts. This option would however create a new risk around the relationship between the science agency and AAD in terms of logistics support and structures relating to national policy interests.

Excellence

- The current model provides a sound focus on excellence, through periodic ARC mechanisms and changes being implemented following the O'Kane Review. Engagement is however diluted through multiple entities.

- Funding consolidation (Option 1) has no material change to science excellence, but would enhance engagement through improved coherence and alignment.

- Structural Alignment (Option 2) provides a significant uplift in engagement with resulting strategic benefits to the science program. The continuing ARC role and oversight by AASC maintains an independent focus on science excellence.

Impact

- The current model does deliver impactful science, but it is diluted through the disparate funding, entities and objectives.

- Funding consolidation (Option 1) would significantly improve impact if funding was ongoing, with clear alignment to national priorities and the Decadal Plan. Effective governance, to manage conflicts of interest and ensure delivery against objectives, would be essential.

- Structural Alignment (Option 2) would provide the maximum impact, but only if the risks of separating the science and logistics functions could be addressed and the additional costs were separately funded. A dedicated Australian Antarctic science agency would have peer status with other Australian science and international Antarctic entities, with strategic science and staffing benefits.

This is assessment is summarised in the following table.

Table 2: Assessment of options against principles

	Coherence	Certainty	Excellence	Impact
Current model	Poor	Poor	Good	Good (but diluted)
Funding consolidation	Good	Good (if ongoing)	Better	Better (if ongoing)
Structural alignment	Best	Best (if ongoing)	Best	Best (if risks managed)

6. Recommendations

Considering the context, assumptions, principles, options and assessment, the Council makes three recommendations for an enduring funding model to underpin delivery of the Decadal Plan. Some observations on implementation are also provided.

6.1 Funding certainty

The uncertainty and discontinuity of terminating funding measures is anathema to impactful scientific research. This problem has bedevilled the Australian Antarctic science program for decades and should be permanently ended, with the current funding levels set as a baseline. The fundamental limitations of terminating science programs in terms of planning and staffing are exacerbated in Antarctic science by the inherently high risk of delays due to weather and logistics.

Any additional funding beyond the baseline should be considered on the merits against the national interest (scientific and geopolitical value), but with caution to avoid any future terminating measures. This could be done by either increasing the baseline or tying additional funding to projects that have a clear end point. In the latter case, the additional funding should be tied to the completion of the project, not to an arbitrary date.

<u>Recommendation 1:</u> The current terminating measures (ARC Antarctic SRIs and DISR AAPP) be made ongoing at their current annual levels (indexed). Any future additional funding for Australian Antarctic science should be either ongoing or tied to specific program outcomes.

The Council endorses the request from the two SRIs for a funded two-year extension to address major problems that have already arisen with current delays to logistics support. This request is urgent, as significant damage is already being done to the science programs and to the development of a new generation of researchers.

6.2 Funding consolidation

The problems with terminating programs are exacerbated by having the measures administered by multiple agencies. The current arrangement reflects a period where Australia's Antarctic scientific interests were driven more by the disparate interests of the participating entities, than by a focus on national priorities. The AAD Science Branch was the only entity with a direct line to any form of national Antarctic science priorities.

The development of the Decadal Plan signals the end of the 'follow your own interests' period – the imperative now is to ensure that Commonwealth funding for Antarctic science is focussed on the national intertest, as defined through the Minister-approved Decadal Plan. Consolidating the funding in the Portfolio responsible for AAD will enable that focus to be delivered. There will necessarily be a period of transition, as the current Antarctic SRI and AAPP contracts reach their conclusion, and the Decadal Plan starts to shape new programs. The inevitable disruption of this transition will be minimised if the funding pool is administered by a single agency.

Consolidation of ongoing funding would facilitate a long-term strategic approach to addressing Australian science priorities and developing the science workforce.

It is however essential for the consolidated funding to be administered in a way that maintains a focus on excellence and manages conflicts of interest - separating the source of funding from the decision on who does the science. Within the Decadal Plan, the science programs should be undertaken by a mixture of AAD Science Branch, other Commonwealth agencies and universities – often in collaborative inter-disciplinary teams, with programs extending over multiple years.

The key funding decisions will be 'how much science funding goes to AAD' and 'who chooses which universities get funding support' - that is, which research programs are done where. The oversight of these decisions is best done by the Council itself, where all the key parties are represented under an independent Chair and the AAD conflict of interest (awarding funding to itself) is avoided.

The steady state for a consolidated funding model would then comprise:

- funding is appropriated to DCCEEW, for the purpose of delivering the Decadal Plan, with the AAD Chief Scientist as the manager;
- the Chief Scientist makes recommendations to the Council on the split of funds between AAD and universities, with Council taking the final decision (under Ministerial authority);
- the ARC administers the selection of which university research group will receive funding, through a competitive process based on scientific excellence criteria.

Under this model, Council would need to approve guidelines for the split between AAD and universities, under which the Chief Scientist would operate. These guidelines would be framed around the optimum delivery of the Decadal Plan and the associated development of an Australian Antarctic science workforce. That is, they would be impact-driven.

All Decadal Plan science programs and funding allocations would be subject to periodic review by the Council, with a focus on ensuring delivery against strategic and research objectives.

Other Commonwealth agencies (GA, CSIRO, BoM) would continue to fund their own Antarctic science programs, either under the Decadal Plan or in accordance with their own requirements. Similarly, university groups that do not receive Decadal Plan funding would be free to seek other funding (such as ARC Discovery grants) to pursue their scientific interests, albeit with the continuing requirement to negotiate any required logistic support with AAD.

A risk with the consolidated funding model is that future governments (or administrators) may reallocate some of the science funds to other priorities. Without diminishing their ultimate right to do this, the Council considers that transparency is critical to maintaining confidence in the model. This would best be achieved by an explicit reference in the Budget Papers that identifies the Antarctic science appropriation and Forward Estimates, and explains any variations from previous years.

<u>Recommendation 2:</u> The annual appropriation for Antarctic science be consolidated into DCCEEW at the current level, with an explicit reference in the Budget Papers. The AAD Chief Scientist should be the designated manager of these funds within the Department. The AASC should approve the allocation of funds between AAD Science Branch and universities, with the ARC administering the selection of universities to deliver designated programs. Transition arrangements should be managed by the Chief Scientist, with Council oversight.

6.3 Institutional model

The Council does not recommend establishment of an Australian Antarctic science institution (new Commonwealth agency) at this stage. Notwithstanding the benefits of such a model for the science program, there are several disadvantages.

First, the structural separation of the science and logistics functions of the AAD would introduce a new critical relationship to be defined and managed. Scientific fieldwork is entirely dependent on logistics support and so it is essential that the two functions have the closest possible working relationship. Separation of the two key elements of Australia's Antarctic geopolitical interests – science and occupation - would also risk diluting our standing and impact in the Antarctic Treaty System.

The transaction cost and distraction of establishing a new science agency at the same time as implementing the Decadal Plan and (if Recommendations 1 and 2 are accepted) developing the capability to administer the consolidated funding pool would be very high. Council notes that the AAD is already stretched by the challenges of responding to the recent science and culture reviews and in establishing new logistics capabilities.

As was highlighted during the consultations, there is an alternative institutional model that would achieve all the benefits of a new science agency, without any of the relationship or international engagement risks. If the AAD as a whole was granted agency status, there would be no new boundary issues between science and logistics, and no ambiguity at the international level. There are several agency forms that could be considered, both corporate (like CSIRO) and non-corporate (like BoM and Geoscience Australia). An agency model would support the enduring science function, and enhance both transparency and accountability. It would bring the AAD into line with other comparable Australian government entities which have an ongoing mandate requiring specialist scientific capabilities, and bring Australia into alignment with most other national Antarctic programs.

Council therefore considers that this more strategic option, with the AAD becoming an agency, is preferred over the creation of a science institution. All the structures that were canvassed in the 2017 Clarke Review and the 2021 O'Kane Review for improving the governance of Australia's Antarctic science program could be accommodated within an AAD

agency model. The British Antarctic Survey, a UK Government agency with both logistic and science roles, including administration of a consolidated science budget with science programs delivered by multiple agencies and universities, provides a good example of what the AAD could become.

Recommendation 3: Consideration be given over the next three years to establishing the AAD as a Commonwealth agency (corporate or non-corporate entity), in parallel with implementing the new science funding arrangements (Recommendations 1 and 2), implementation of the recent O'Kane and Russell review recommendations, and consolidation of the new logistics capabilities.

This recommendation could be initiated through a formal study of the costs and benefits (and risks and mitigations) of adopting an agency model for the AAD, drawing on the experience of comparable Commonwealth entities and that of the UK British Antarctic Survey. It would be beneficial for DCCEEW (AAD) staff to be deeply engaged in this process. If the AAD agency model were to be rejected by the Government, further consideration should be given to establishing a separate Australian Antarctic science institute, leveraging implementation of the consolidated funding and Decadal Plan initiatives.

6.4 Implementation

Successful implementation of the funding consolidation model (Option 1) with ongoing science funding will require significant administrative change at AAD. The key implementation tasks will include:

- Revision of the ARC Antarctic SRI and DISR-ASCI funding contracts to DCCEEW (AAD, incorporating updated timelines that reflect operational considerations, and transitional arrangements for aligning with the Decadal Plan for Antarctic science.
- Formalisation of the ongoing relationship between DCCEEW (AAD) and the ARC to administer future competitive funding elements of the AASP.
- Clarification of the enduring relationship between the University of Tasmania (IMAS) and the AAD.
- Revision of the Australian Antarctic Science Council Terms of Reference, and of the AAD Chief Scientist roles, to align with the new funding model, governance roles and associated science delivery pathways.
- Consideration of formal agreements between DCCEEW (AAD) and other Commonwealth agencies, that reflect the interdependencies of the AASP on other departmental appropriations.
- Development of a decision model for the allocation of science funding to the AAD and to the university sector (including consideration of funding for the East Antarctic Monitoring Program and Integrated Digital East Antarctica Program).

The AAD Science Branch is not currently resourced to undertake these implementation tasks and the ongoing AASP science funding administration. The Council notes that this would be a critical matter for DCCEEW (AAD) to address if the funding model recommendations are accepted by the Government.

Appendix 1: Letter from Minister Plibersek

THE HON TANYA PLIBERSEK MP
MINISTER FOR THE ENVIRONMENT AND WATER

MS22-002401

Mr Philip Marcus Clark AO
Chair, Australian Antarctic Science Council
28 Joubert Street
HUNTERS HILL NSW 2110

philipmarcusclark@gmail.com

Dear Mr Clark

As the Australian Antarctic Science Council works towards delivering a Decadal Plan for Antarctic science, there is need for clarity over future frameworks through which Antarctic science funding is delivered.

In the context of the complex and challenging operational environment to deliver Antarctic science, the terminating status of the Australian Research Council's Special Research Initiatives and the need to deliver science priorities set out in the Decadal Plan for Antarctic science, an enduring and simplified funding model is required.

Although the previous government accepted all the 2017 Clark science governance review recommendations 'in principle', some of the structural recommendations were not implemented. A new review, by the Council, would provide an opportunity to consider the most appropriate model in the current context.

I seek the Council's assistance in conducting this review and reporting future options for consideration by April 2023.

Thank you for your important work in guiding our Antarctic Science program, and I look forward to receiving the Council's advice.

Yours sincerely

Tanya Plibersek

TANYA PLIBERSEK

20-2-23

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Appendix 2: International Antarctic Research Funding Models

	Australian Antarctic Division (AAD)		British Antarctic Survey (BAS)		United States Antarctic Program (USAP)	Antarctica New Zealand	Japanese Antarctic Research Expedition (JARE)	Alfred Wegener Institute (Germany)	
Entity Type	Division of Government Department		Government Research Institute		Independent Federal Agency	Government Agency (Statutory)	University JV Research Institute	Independent Foundation	
Parental Organisation	Department of Climate Change, Energy, Environment and Water (DCCEEW)		NERC - UK Research and Innovation		Office of Polar Programs - NSF	Ministry of Foreign Affairs	Multi-ministry headquarters group	N/A	
Funding Agency(ies)	DCCEEW		Multiple - NERC, EU, Foreign Office		NSF Congressional Budget Bid	Multiple - Ministries, Universities and research institutes	Multiple ministries	Federal and state (90% Federal Ministry of Education & Research)	
Funding (AU$M p.a.)	80 AAD (+ external agencies)		90		613 (total polar funding)	23	47	160 (total polar funding)	
Staffing	600		500		3000	35	200	>1,000	
Science Staff	120		140		1500	Nil	70		
Research Funding	Internal DCCEEW	External DoE (ARC), DISR, Government agencies and Universities	Centralised via NERC Discovery Science Applications - BAS oversight		Centralised via the NSF-OPP - Fixed term and continuing projects supported	Multiple Ministry grant programs and through the Antarctic Science Platform	Centralised via JARE - in accordance with 6-year campaign cycles	Domestic, European and International grant programs with applications supported by AWI research office	
Research Delivery	Internal DCCEEW - AAD Science	External Government agencies, Universities	Internal BAS Science	External Government agencies, Universities	External Institutions (universities, Federal agencies)	External NZ Universities, Institutes	Internal Contract/Seconded Scientists	Internal AWI Scientists	External German Institutions
Logistics Support	Administered by AAD		Linked to funding, administered by BAS		Administered by USAP, marine science by National Oceanographic Laboratory System	Administered by Antarctica New Zealand	Via Center for Antarctic Programs	Administered by AWI	

Appendix 3: Consultations

Responses to the Options Paper were received from a broad range of stakeholders across the Australian Antarctic Science Program, including the Australian Research Council (ARC), Department of Industry Science and Resources (DISR), Department of Foreign Affairs and Trade (DFAT), Bureau of Meteorology, Geoscience Australia, National Committee for Antarctic Research (NCAR), ARC SRIs Securing Antarctica's Environmental Future (SAEF) and Australian Centre for Excellence in Antarctic Science (ACEAS), Australian Antarctic Program Partnership (AAPP), University of New South Wales, University of Tasmania, Integrated Marine Observing System (IMOS), Australian Antarctic Division (AAD) and former AAD Director A.J. (Tony) Press.

Stakeholders were asked to address three options – the status quo (Option 0), funding consolidation (Option 1) or structural alignment (Option 2). Several respondents also outlined a possible 'Option 3'.

Current model

All respondents identified issues with the current funding model and a desire to consolidate funding streams. The current state was described as 'a major problem', with 'disparate sources of funds' that 'create a culture of institutional competitiveness that undermines coherence'. Respondents identified a need for enduring funding and a simplified model, 'with the development and delivery of a new Decadal Plan requiring long-term collaboration across multiple institutions'.

Option 1 – Funding consolidation

All respondents recognised a funding consolidation as an improvement on the status quo. Broadly, government entities identified Option 1 (or a minor variant thereof) as the preferred model. The alignment of funding with national interests was identified as a key strength of this model across the sector. Stakeholders identified further clarification of the implementation details for Option 1 as a key consideration to its success, particularly in defining enduring funding beyond the term of the current SRI and ASCI mechanisms.

Option 2 – Structural alignment

A significant proportion of respondents, including most of the research community, identified Option 2 as more desirable than the current state, but noted significant implementation risks that would require further clarification for full support. A key risk was the broad recognition that separation of Antarctic science from operational and policy functions could create misalignment in priorities and cultures that could manifest in poor coordination and delivery of science activities, duplication in workloads, and reduced real-science funding. These risks were balanced by perceptions of improved coherence and strategic alignment, leading several respondents to identify a 'third option'.

Further Feedback – 'Option 3'

Though beyond the scope of the proposed options developed by the Council, many respondents identified a separate institute/agency model incorporating logistics and policy functions alongside science as the most desired future state – 'option 3'. Respondents

identified that such a model would best align with the coherence, certainty and excellence principles used to assess the options, represents best alignment with international peers and 'would be a significant and visible move to demonstrate Australia's Antarctic posture'.

Several stakeholders also identified the need to define a long-term 30-40 year monitoring program with stable funding (such as Reef 2050), from which reliable data streams would be produced. This would broaden opportunities for short and medium-term projects to a much larger suite of Antarctic researchers. (The Council notes that this is the policy intent of the new East Antarctica Monitoring Program arising from the O'Kane review).

A generalised summary of the more comprehensive consultation responses to the options is provided in the table below.

Entity	Status Quo	Option 1	Option 2	'Option 3'
ARC				
BoM				
GA				
ARC-SRI SAEF				
IMOS				
NCAR				
UNSW				
UTas				
AJ Press				
AAD				

Not supported, Conditional support, Strong support.