National Committee for Geography

A committee of the Australian Academy of Science

Submission to the *National Environmental Research Program* consultation

Overview

The Australian Government has a long track record of investing in environmental research to support evidence-based decision making. Some previous programs include the National Environmental Research Program (NERP; 2011-2015) and the Australian Climate Change Science Program (ACCSP; 1989-2016). These programs were amalgamated to form the National Environmental Science Program (NESP), which is scheduled for completion in 2021. Plans are underway for a future environmental research program that will succeed the NESP. The Australian Academy of Science submission to the Department of the Environment and Energy consultation to the NESP focuses on key aspects of the program to help inform the design and administration of the future program.

Enablers and barriers to engagement with the programme NESP

Feedback from Academy stakeholders indicates that there is a lack of clarity around the definition of "research-user" for NESP research, causing confusion about the needs of target groups. Without a clear understanding of who the research- or end-users are, their needs cannot be met.

Providing clarity and precision around the users of research may assist NESP hubs to balance the needs of the research partners with other potential users (for example, government, researchers, local council, etc.). A positive feature of the NESP model is that it enables partnerships and facilitates research outcomes. This aspect of the model should be retained and possibly developed further.

The NESP Mid-Term Evaluation Survey (NESP, 2018) indicates that when end-users change, researchers struggle to support them. Stakeholders stressed the need for early identification of suitable end-users to engage and maintain relationships with. When an end-user cohort changes, the responsibility for and understanding of the projects may not be transferred or maintained.

It is important also to provide project assessment guidelines and metrics that are appropriate to multidisciplinary and transdisciplinary research. Previous analyses of data from projects funded by the Australian Research Council (Bromham et al., 2016) indicate that the widespread perception that interdisciplinary projects are less likely to be funded than those with a narrower focus can act as a barrier to interdisciplinary research. Designing explicit assessment guidelines and reported metrics for multidisciplinary and transdisciplinary research may help address this problem, and we suggest that the NESP hub program adopt guidelines that engage in this way.

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Knowledge translation

Knowledge translation that informs policy in the Environment portfolio is a central component and driving purpose of NESP research. Program designs should demonstrate a clear understanding of the science–policy exchange cycle and end-users should be involved into the design process. Barriers to knowledge translation must be identified and addressed in a comprehensive and structured manner. Research programs need to combine the expertise of academics, practitioners and policy-makers in the design of problem-driven, usable and solution-oriented approaches (Oldekop et al., 2016).

Cvitanovic et al. (2016) have described a model that identifies potential barriers between scientists and end-users, including culture differences, institutional barriers, lack of specific scientific or disciplinary literacy, adherence to conventional approaches, and personal perception. This model provides a framework to address real and perceived barriers to knowledge translation, and has been incorporated in other 'science-policy' work.

Translational ecology (Hallett et al., 2017) is another example of a research approach that yields useful scientific outcomes through collaborations in which ecologists, stakeholders, and decision makers work together to design science-based research to inform decision making (see Figure 1).

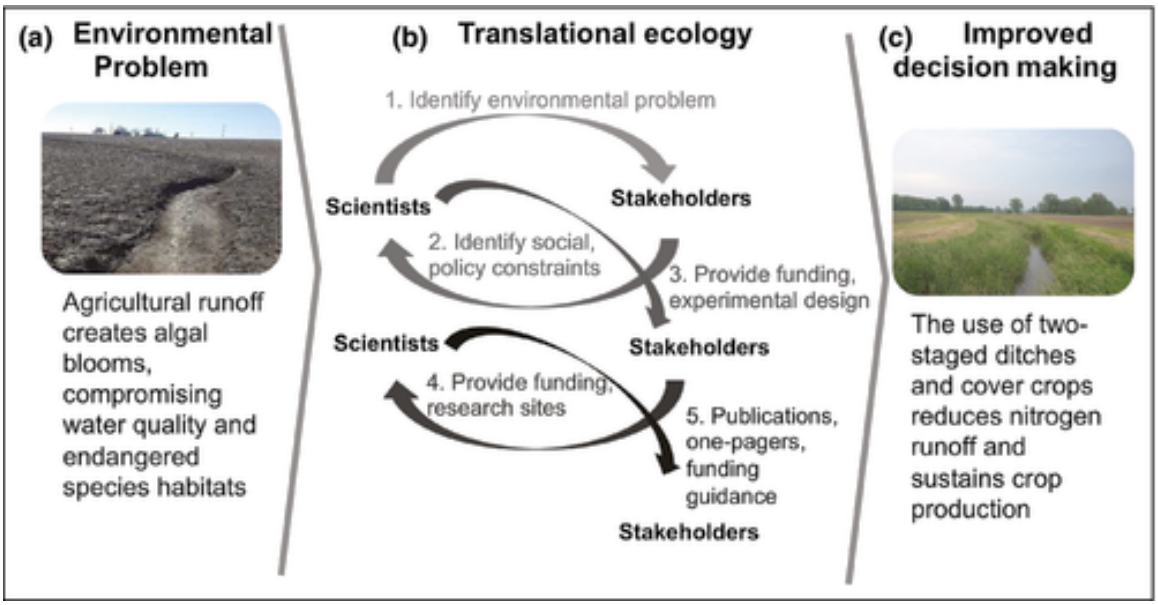

Figure 1. Translational ecology is an intentional process by which ecologists, stakeholders, and decision makers work collaboratively to develop scientific research via joint consideration of the sociological, ecological, and political contexts of an environmental problem, resulting in improved decision making (Hallett et al., 2017).

Some pre-conditions must be met for the successful application of these models. End-user organisations must have expertise and capacity to understand the research process, and there must be sufficient literacy in the relevant disciplines to engage productively with NESP researchers. One way to achieve this could be to develop an exchange program between end-user organisations and research providers (such as universities or CSIRO). The intent here would be to improve engagement between end-users and research

providers so that end-users understand the research process and researchers understand the possible applications.

Finally, evidence of end-user engagement should be integrated into NESP programs. Each project should have a clear communication strategy and the Department should incorporate metrics of impact to provide evidence that all identified end-users genuinely use the information. For example: what is the evidence that data, information and knowledge generated in a particular project have been used to support policy making? What outputs are mentioned in State of Environment reports at the Commonwealth, State, and local council levels? Have private industries adopted any of the science in their business policies and models?

Engagement with Indigenous researchers

The Academy considers that NESP initiatives must be relevant to and aligned with current principles of Indigenous engagement followed by the ARC. The inclusion of Indigenous-led activities (whether through improved connectivity and networking, leadership, inclusion of traditional ecological knowledge, or similar) is required to achieve outcomes relevant to indigenous people. The Australian Academy of Science Decadal Plan for Geography (NCGS, 2018) identifies engagement and inclusiveness as essential for identifying research needs of Indigenous people. The Plan recommends, amongst other things, increased research relating to Aboriginal and Torres Strait Islander peoples in southern and urban Australia, where the majority live.

The Decadal Plan reports a study in which geographers were involved to explore desert Aboriginal people's view that their health depended on their relationship with their land. The study concluded that "engagement with land management can lead desert Aboriginal people to feel that their own actions are consistent with their own sense of the right and proper way for them to behave towards land, family and community. This increased 'sense of control' impacts positively on health by moderating the impact of sustained stress from health risk factors in the environment and lifestyle" (Davies et al., 2011). Opportunities for collaborative research with Indigenous peoples should be highly valued and may include recognition of the role of Indigenous knowledge brokers in research projects and programs.

Indigenous Protected Areas and Indigenous Ranger Groups are two programs worthy of attention and support. Programs led by indigenous communities and peak bodies allow two-way learning and integration of knowledge and skills between these groups and researchers. The NESP model could also incorporate Indigenous led co-production of research and knowledge.

Informing the Sustainable Development Goals

In 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development, a plan of action for people, the planet and prosperity. Seventeen Sustainable Development Goals (SDGs) with 169 associated targets integrate the economic, social and environmental dimensions of sustainable development[1]. The goals aim to coalesce action towards global environmental, social, and economic sustainability, particularly related to human–environment interactions (for example, environmental

[1] https://sustainabledevelopment.un.org/?menu=1300

degradation, climate change, sustainable management of natural resources, fresh water scarcity and loss of biodiversity). Societal responses to these challenges require integrated solutions and collaborative work across disciplines (Australian Academy of Science, 2018).

In July 2018, Australia produced its first Voluntary National Review of the SDGs in a whole-of-government exercise. The Australian Bureau of Statistics (ABS), in conjunction with other lead agencies, undertook a data mapping exercise for the SDGs, exploring both ABS and other Government-held data sources to identify those relevant to monitoring and reporting on the SDGs (Metternicht et al., 2019). A Reporting Platform was created to:

a) house identified Australian Government datasets relevant to the development of the country's SDG indicator framework
b) assist in identifying new datasets
c) refine the SDG indicators, particularly as the move from a Tier III to a Tier I or II occurs and where additional datasets may be needed.

An inter-agency governance agreement set the responsibility for following up and completing additional data sets with individual agencies (particularly those that hold datasets relevant to the SDG indicator framework).

For the first Voluntary National Review, a total of 118 indicators were reported online using data drawn from a national indicator dataset. For 57 indicators, potential data sources were identified. Further analysis is needed to ensure the data are suitable for reporting and are compatible with the globally agreed methodology for each UN SDG indicator. Twelve indicators were not reported, either because the indicator was not relevant to Australia or because no suitable Australian Government data source exists for that indicator. Another 57 were not considered because, at the time of reporting, a globally agreed methodology for these UN SDG indicators did not exist (i.e., Tier III). The first Australia Voluntary National Review therefore took a narrative approach, addressing each of the SDGs without creating a baseline. Targets were not specified and Australia had complete and relevant datasets for only half of the SDG indicators (Metternicht et al., 2019). In this regard, NESP information and knowledge should be used to set baselines against which to set SDG targets and, in turn, measure progress against agreed goals.

Additional recommendations for future programs

In addition to the above, the Academy makes the following recommendations to strengthen the science policy interface of NESP:

1. **Incorporate Theory of Change into programme design**: current Hub programs focus on short term outputs and outcomes within the initial funding envelope. A Theory of Change model would enable planning for the long term, to ensure sustainability of project outcomes beyond the funding term, ensuring their 'durability'. Long term, lasting outcomes provide evidence of program effectiveness.
2. **Research design to include concepts of scale and space, as well as place of application of research outcomes.** Relevant research outcomes are bounded by scale, space and place. Data and/or information at one geographic scale may be absent, not evident, or revealed at another.

3. **Focus on making data/information discoverable and usable for 'knowledge for policy and management'**. Many portals from Hubs facilitate data access, though users often struggle to produce information and 'frame' it according to context. The latter is an essential aspect of policy and political decision-making processes (Metternicht et al., 2019).
4. **Develop innovation in environmental science programmes through transdisciplinary co-production.** Transdisciplinary approaches recognize that innovations need not be imported from outside but can arise from the integration of diverse knowledge types, through inclusion of relevant stakeholders, within a reflexive and collaborative process of mutual learning (Baumber et al., 2018).

Submitted by Professor Steve Turton

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