

Some key reflections from the ACEAS Workshop – structured reflections on Australia’s national environmental research programs

These reflections were discussed at the ACEAS workshop at Bungendore on 22-24 April 2014, involving: Nic Bax, Stefan Caddy-Retallic, Andrew Campbell, Peter Doherty, Michael Douglas, Dave Johnson, Hugh Possingham, Alison Specht, Diane Tarte and Judy West.

The scope of our reflections on what success might look like?

- These ‘reflections’ from key players provide additional learnings which complement the formal program evaluations of both CERF and NERP - which typically focussed on program effectiveness and efficiency.
- All groups in these programs have been united by the desire to positively impact on our environment. In addition, research funders, researchers and research users may have their own additional expectations and criteria for success – which aren’t always included in the formal program documentation.
- The NERP has been well positioned to provide a national focus with respect to geographical boundaries and continental scale environmental issues.

How have they contributed to the broad spectrum of our information needs?

- Noted that CERF and NERP both had a ‘research’ focus – they were not investments in research infrastructure (eg. TERN, IMOS, and other NCRIS Investments), nor were they established to provide funding for the roll-out of ongoing monitoring programs.
- Research infrastructure and long term monitoring continue to be high priorities which need an appropriate scale of investment, but these were clearly beyond the scope of CERF and NERP. The focus of these applied environmental research programs was appropriate for investment by the environment portfolio, which complemented the broader government investments in research infrastructure.
- Synthesis and analysis of ecosystem data and information has been considered part of the investment in research infrastructure (ie ACEAS within TERN) and outside the scope of CERF and TERN. However, this could potentially sit within the scope of future national environmental research investment.

Applied versus fundamental research

- These programs have contributed to a positive cultural change to problem solving between researchers and the Environment Portfolio.
- The applied nature of CERF and NERP has had a significant emphasis on policy and practice and provided a continuous thread for everyone being involved in the collaborative research model, but this remains elusive to measure.
- The programs have been successful in bringing together a range of researchers and institutions, and building on the crucially important infrastructure elements, have made a real change in practice. There is more implementation that can be achieved through the existing investment.
- CERF and NERP were uniquely placed to address the scale and complexity of environmental issues in Australia. These require large, multi-disciplinary teams working from multiple institutions in partnership with research users, over a sufficiently long time frame.

- The success of these multi-institutional programs relies on separate investment by government in fundamental research, including the Universities, CSIRO, Geoscience Australia, the Australian Institute of Marine Science, Australian Research Council etc.

Scope of environmental research – biodiversity focus

- The focus on biodiversity over the course of these 2 programs (ie over 8 years) has provided momentum and resulted in significant outcomes – which wouldn't have been possible if the focus had been broadened to cover all environmental issues.
- However, we should continue to regard biodiversity as an integrating issue which is intimately connected and part of the broader environmental context – for example, including climate change, water management and sustainable development.
- The continued success of future research to tackle these large scale issues, involving trans-disciplinary and multi-institutional programs, will benefit from not being constrained by artificial and ephemeral intradepartmental and interdepartmental boundaries.
- The longevity of funding for these programs (over 8 years) has been an important factor in supporting these large-scale research programs.

Defining research needs – what have we learnt about setting research priorities?

- Success in establishing effective multi-disciplinary teams across multiple institutions has been greatest when the groups have been self-organising and where the membership criteria include passion for applied research, enthusiasm to collaborate, and a track record of delivery in relevant research.
- Committing funding to a 'prospectus' of research is considered more effective than committing funding on an institutional basis. It is also considered more effective to provide funding to specified individuals for their research, rather than at an institutional level.
- A key to the success in targeting research which addresses user-needs, has been the ability of these programs to be responsive and flexible. This flexibility provides the opportunity to maximise advantages from relationships and existing networks.
- The longevity of funding for these programs (over 8 years) has been an important factor in supporting these large-scale research programs.
- Specifying research needs remains a challenge for the department, and this requires input from researchers from the outset. While enduring key research needs should be identified, a process for iteration and refinement will be an ongoing need to adjust to the current context.
- Tactical research needs of the environment portfolio have not generally been delivered through the main (multi-year) hub investment in research. However the hub framework has provided a useful and efficient mechanism for allocating additional contingency funds (such as the 'emerging priority' process) to deliver further research on tactical priorities.
- There has been positive refinement of the focus of these two programs over the past 8 years - CERF had a wide 'public good' environmental remit, while the NERP was more explicitly targeted at the Environment Portfolio priorities.
- The key five policy questions (with subsidiary questions) that were used at the start of the NERP were probably about the right level of detail to call for hub proposals and shape a research 'prospectus', as the first step in a 2 step process.

Connecting research and research users

- The hubs under CERF and NERP have established strong links with a range of research users (in addition to the Environment Portfolio) such as State Governments, Catchment Management Authorities, NRM organisations and Industry groups. In some cases, such as the Australian Alps and Tasmanian Midlands, the hubs have provided unique opportunities in facilitating dialogue on difficult environmental issues (such as wild horses and fire management).
- A good example of the extent to which the Environment Portfolio is now connecting with researchers is evidenced in the way that the hubs have been drawn on for additional expertise, ad-hoc advice and as established deliverers for additional projects.
- CERF and NERP have both been significant in building strong relationships between environment portfolio staff and researchers. Some hubs have weekly contact with the portfolio and other research users, but maintaining enduring relationships, particularly in the face of churn and changing priorities, remains a challenge.
- The five key issues/challenges described in the [APS200 project on “The place of science in policy development in the public service”](#) continue to be relevant despite the investment in CERF and NERP. These are Timeliness, Cultural differences, relationships, timeframes and access to data and information.
- Despite the successes so far, further can be done to realise the potential of existing networks and relationships. These hold enormous value which hasn't yet been fully explored. Collaboration between researchers can also be further improved, while the focus of dialogue with end users would also benefit from further targeting and refinement.
- In addition to the good processes and structures established under CERF and NERP – serendipity and having strong champions (in both policy and research) will continue to be important factors of future success.

The role of communications and professional relationships

- An important success factor has been the connection between early career researchers and departmental staff in middle and lower management. We need to find ways of further supporting these connections.
- Individual connections and one-on-one relationships have been very important in connecting researchers and research users. Maintaining these relationships continues to be challenging in the face of evolving research programs and churn within government and the research community.
- The requirement under NERP for at least 10% of the funding to be spent on communications was a major positive influence on behaviour and focus. The considerable size of this requirement made a real difference. In traditional funding programs without such a requirement, it is very difficult for researchers and their scientific institutions to commit this level of funding.
- Trust between department (purchaser) and researchers (provider) has developed and is essential because the 'purchaser' does not entirely know what they want from the provider at the outset. Co-learning has been important, and combined with trust, has allowed the parties to openly share issues and provided the permission to make mistakes and try again.
- Having 'champions' in research and the department has been important to getting good outcomes from the research which meets the needs of research users. Experience has

shown this to involve a range of people. Those research projects which were of limited success were often identified as 'orphans' without champions.

- A benefit of working closely with the department and regionally based research users, is that researchers gain a working knowledge of these organisations – and how to frame questions and package the research to meet their needs. This requires and develops trust.
- Those projects that have involved social sciences, in particular, have benefited from having knowledge brokers embedded in the end user organisations. This has been more effective than having end users embedded in the research (ie social science) team.
- The emphasis in the NERP on communications and knowledge brokering has been very powerful. It has been a catalyst for developing strong relationships and provided a cultural change regarding expectations. This has delivered increased acceptance and trust and more informed dialogue between the portfolio and researchers.

Career development – science support

- An important success of these investments was the agreement regarding processes and protocols for Indigenous engagement in environmental research. The guidelines developed by the hubs are now being used widely across Northern Australia.
- The investment in these programs has also built significant capacity in the broader Australian community, by getting research users together to work with researchers and develop a united voice for addressing environmental issues. This influence goes beyond the researchers and the hubs and includes Indigenous communities, NRM bodies and other groups.
- The number of researchers supported through the NERP was recorded as just over 600 research staff. Although an estimate for the number of researchers involved in the CERF program was not made at the time, it is suggested that a similar number of researchers were probably involved.
- The extent to which these programs have supported early career researchers is thought to have been limited, with mixed results across the different research groups. A key reason is because PhD students need scope to deliver broader research programs, not just specific deliverables for research undertaken as part of commissioned research. The timeframes for PhD research under these programs is also limited, due to the time lags involved in research start up and recruitment processes.
- The number of PhD researchers involved in the programs has been on a downward trend from CRCs, to CERF and then NERP. However, the investment in Post Doctoral research has been more stable, with Post Docs could be considered the engine room of investments like NERP, as they have the dedicated focus and time allocations to do a substantial amount of the research.
- Does the trans-disciplinary and multi-institutional nature of the hubs provide useful or unique opportunities for early career researchers ?
 - Working collaboratively across institutions ? yes
 - Working with stakeholders (in both government and the private sector) ? yes
 - Working closely with more senior researchers who are experienced in collaborative and stakeholder engaged research ? yes
- The start-up delays and time taken for recruitment processes generally mean that there is only a 3 year timeframe for PhD projects within the scope of a 4 year environmental

research program. Because of this limited timeframe, and the incompatibility of PhD research with targeted milestone delivery, it is suggested that a separate educational funding component for this research would have been more effective in supporting early career researchers.

Have these programs supported multi-disciplinary research across economics, social and biophysical research ?

- There's been some success at engaging social and economic research in these programs, but this has largely been as discrete projects. There is still some way to go before we're doing truly integrated trans-disciplinary research. Perhaps the most successful in this regard is the Landscapes and Policy Hub, which has clear inter-dependencies between projects which are working towards defined and integrated outcomes across geographical regions.
- The stability and longer term nature of funding provided by these programs has facilitated growing relationships across these scientific disciplines. There's been clear progress towards integration between the biophysical and social sciences, with considerably more work to do to integrate economics.
- These programs have helped improve trans-disciplinary and cross-organisational interactions and relationships. Clearly these, and further improvements, will be needed if we are to pursue further large, collaborative, integrative, trans-disciplinary research projects. We will also need to continue to engage research end users, if we are to deliver across multiple outcomes and address the future challenges which face us as environmental managers.

Data and information management – maximising the return on public investment

- There has been significant cultural change and significant achievements over the past 8-10 years, which is the culmination of a range of initiatives (in Australia and globally) – particularly in terms of data sharing between researchers.
- In terms of information sharing with government, progress to date hasn't been as positive, with the possible exception being the e-Atlas initiative developed in North Queensland through the Tropical Ecosystem Hub.
- NERP's requirement for all research outputs to be freely and publicly available has made a positive contribution in this space – with many other initiatives and processes now leading the way (TERN, IMOS, ANDS, ALA etc).

Linkages across government research investments

- We should celebrate synergies and connectedness in research and view funding alignment and co-investment as a natural, positive part of the research landscape. CERF and NERP have generally recognised this multifaceted nature of research funding. These programs have filled a critical gap that complements the other range of investments.
- Co-investment is important, and NERP was appropriate to recognise the level of co-investment in research bids, without having arbitrary minimum requirements.
- Because of the connected research landscape in Australia, CERF/NERP researchers and investments have been quite well connected to other research investments. There is considerable connection with TERN & other NCRIS investments, CSIRO, AIMS, ARC Centres of Excellence etc. In a way, the CERF/NERP investments are a platform for drawing on, and influencing many of those other initiatives.

International relevance and connections

- Internationally, researchers have taken notice of what has been happening with the hubs established under CERF and NERP. Many overseas researchers (for example in the United States and the United Kingdom) are envious of the level of interaction that Australian researchers have with government departments.
- For example, while the US has a formal internship program for researchers to be placed in departments for 2 years, these formal arrangements are not supported by the informal networks and collaborations that typify our Australian environmental research / government relationships. Australia is quite good at bringing together collaborative teams.
- Some hubs also work closely with the department supporting international environmental issues.

Competition and the importance of new collaborations

- Both NERP and CERF investments were the result of highly competitive processes. The relationships built up over the CERF/NERP are very valuable and are an important asset that contributes to effective research. The value of these relationships continues to grow, as the relationships mature and develop.
- A key factor in success so far has been flexibility and the need to adjust with changing times and circumstances. Collaborative environmental research programs will always benefit from access to new researchers, if they are to draw on additional expertise, experience and innovative approaches.

Administration

- Transaction costs for involvement in CERF/NERP are generally perceived as being lower than some other multi-institutional research programs (such as CRCs).