



NITRO-Oceania

NITRO-Oceania Online Submission

to

Australia's National Science and Research Priorities and National Science Statement

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NITRO-Oceania, the Network of Leaders of Interdisciplinary and Transdisciplinary Research Organisations in the Oceania region, is the peak body for interdisciplinary and transdisciplinary research and education in Australia and the wider region. Fifty-two of our more than 70 members are in leadership positions in 18 Australian research and education organisations. Detailed information about NITRO-Oceania can be found at <https://nitro-oceania.net/>.

Our mission is in harmony with the enquiry's desire to "align efforts and investments in science to deliver social, economic, and environmental benefits for all Australians." In particular, NITRO-Oceania's mission is inspiring and supporting researchers to achieve transformational impact on global challenges by:

- "Fostering attention to grand challenges of particular significance to the Oceania region."

NITRO-Oceania proposes that this can only be accomplished by strengthening interdisciplinary and transdisciplinary research to complement and maximise the benefits of discipline-based research.

DEFINITIONS

The terms interdisciplinary and transdisciplinary are often used interchangeably and also cover territory identified by the terms systems thinking, post-normal science, action research, convergence research and, for specific types of problems, sustainability science.

Simply put, transdisciplinary research involves identifying and bringing together a range of relevant perspectives from disciplines and key groups in society to develop a more comprehensive understanding of a multi-faceted issue and to determine the best possible way forward, as well as the most appropriate and effective implementation strategy. Interdisciplinary research tends to be focused on integrating insights from disciplines only and generally has less focus on assisting societal change.

Response to key questions:

1c. strengths we should maintain or build?

2. Does Australia have the capability and capacity needed to address these challenges, opportunities and strengths? If not, how could we build this?

Although there is growing interest in interdisciplinary and transdisciplinary research in Australia, expertise in conducting such research is underdeveloped and urgently needs to be strengthened. Furthermore the development of such expertise is fragmented across different areas of application. As an illustration: interdisciplinary and transdisciplinary research expertise is developed independently in areas such as environmental change, population health and national security and is not shared among them, leading to reinvention of methodological wheels and slowing progress in addressing problems.

Such expertise involves an ability to:

- work effectively in teams with diverse epistemologies, mental models and values
- engage, respectfully listen to, and incorporate the concerns of community members and other affected by problems under consideration
- effectively support decision makers, which involves honing skills in: critical thinking, overcoming cognitive biases, preparing for and managing adverse unintended consequences, avoiding disastrous tipping points, and understanding and working within the complexity of change processes
- appreciate and work with the opportunities and constraints provided by political, historical, economic, cultural and other aspects of context
- understand and work with the systemic nature of problems and solutions, especially the importance of connections and interdependencies. It also requires effectively managing imperfection, in that problems can never be fully understood and solutions will only ever be partial and temporary.

Fortunately, beginning to build such expertise is relatively straightforward. Researchers need to be encouraged to establish solid foundational expertise and then to develop advanced skills, such as understanding and describing positionality, co-production of problem framing, effectively understanding and managing group dynamics, and harnessing the power of a range of systems thinking tools.

Furthermore, as NITRO-Oceania's aims recognise, there is an urgent need to improve interdisciplinary and transdisciplinary research by:

- "Creating supportive environments and infrastructure
- Developing effective metrics for excellence, impact and return on investment
- Improving funding availability and outcomes
- Supporting next generation organisational leaders
- Providing effective career paths and role models for interdisciplinarians and transdisciplinarians at all levels, and especially to support early-career researchers."
- Developing workable transition pathways to implementation of new metrics and effective career paths.

Response to principles

NITRO-Oceania strongly supports the principles developed "to guide discussion on the priorities and the statement," especially principle 1 "Be community-informed."

We suggest that a set of principles is also developed to guide the research into the new national priorities, including:

Be collaborative: *Build talented teams from across the research domains and relevant sectors of society to deliver impactful research delivering social, economic, and environmental benefits for all Australians.*

Be community-engaged: Engagement of the public, including First Nations people, in the process of research design, delivery and outcomes (and building their capacity and capability in these areas) is essential to deliver social, economic, and environmental benefits for all Australians.

Be a capacity builder: Include graduate attributes and training programmes at all levels in research settings to ensure development of interdisciplinary and transdisciplinary research experience and expertise to deliver social, economic, and environmental benefits for all Australians.

NITRO-Oceania would welcome an opportunity to expand on these points and to assist in programs to develop interdisciplinary and transdisciplinary research expertise, as well as to foster environments that allow such expertise to thrive.