

**Please note:** the substantive content of the 2026 NRI Roadmap Survey begins at Question 20 (with prior questions dealing with administrative and other information).

As such all submissions that are published include the responses submitted from Question 20 onwards only.

Q20.

**Part 2: Research themes**

2.1 NRI comprises the assets, facilities and associated expertise to support leading-edge research and innovation in Australia and is accessible to publicly and privately funded users across Australia and internationally. We are seeking your input on possible directions for future national-level investment - i.e., where the requirements are of such scale and importance that national-level collaboration and coordination are essential.

The [2021 Roadmap](#) used a challenge framework to support NRI planning and investment. With this in mind, consider likely future research trends in the next 5 - 10 years, and with respect to one or more of the 8 challenge areas identified in the 2021 Roadmap as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or not at sufficient scale and
- describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities.

Q21.

**Resources Technology and Critical Minerals Processing**

Q22.

# Food and Beverage

Understanding the effect of extreme weather conditions on plants, crops for food security, is increasingly crucial. APPN is working hard to provide infrastructure necessary for such research and will need to be continually positioned to adapt and provide access to the latest technological advances. This includes access and pipelines to apply machine learning to research and analysis, access to technologies for remote sensing of plant responses at scale, including rigorous ground truthing, and facilities for controlled growth facilities to support experiments where temperature, humidity and light level can be manipulated to simulate realistic future climate scenarios for extreme events. It is increasingly becoming clear that assessing impacts of changing climate and extreme events on crops needs nuanced research into how these changes impact not just the plants in isolation but their interactions with insects and microbes. Continued investment into infrastructure to support research in controlled environments and field (outdoor) experiments will be needed to ensure this work is done in a timely manner and that there is national collaboration in this space.

Q23.

## Medical Products

Q24.

## Defence

Q25.

## Recycling and Clean Energy

Q26.

## Space

Q27.

## Environment and Climate

To understand linkages between environment and climate good ecosystem science monitoring and research is crucial. TERN has established a commendable network in this space to support research spanning from on-ground assessment of shifts in biodiversity and productivity of individual species to landscape scale fluxes and vegetation changes, to remotely sensed products to support research a continental and global scales. The efficacy of that infrastructure is limited by the scope of the environments it can afford to monitor on ground and by the complexity of data management. Continued investment in on-ground monitoring is needed and must be responsive to emergence of new sensor systems for detecting biodiversity changes (e.g. insects and vertebrates) both through imaging and improved eDNA techniques, and functional changes of vegetation function through improved environmental physiology and flux sensor systems. Likewise continued focus on making data high quality and freely accessible is crucial. Having more datastreams covering a greater representation of Australia’s ecosystems will necessarily incur greater complexity and cost for data management.

Q28.

**Frontier Technologies and Modern Manufacturing**

Q29.

2.2 The 2024 statement of National Science and Research Priorities (NSRPs) includes outcomes linked to each priority to assist in identifying critical research needed in the next 5 to 10 years.

Consider the priority statements and, with respect to one or more of the 5 priority areas as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or
- not at sufficient scale and describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities, and where relevant, refer to the underpinning outcomes and research identified in the NSRPs document.

Q30.

**Transitioning to a net zero future**

Q31.

**Supporting healthy and thriving communities**

Q32.

**Elevating Aboriginal and Torres Strait Islanders knowledge systems**

Q33.

## Protecting and restoring Australia's environment

Climate and land use changes are putting great pressure on Australia's environment. The aim of managing our environment to maintain function, carbon sequestration and biodiversity is critical. However, a concerted national focus on how ecosystem functions can be maintained or augmented requires a paradigm shift away from 'restoring' to prior state. Infrastructure to support cross-disciplinary approaches to assessing different scenarios of change on ecosystem function and to support research into facilitating change trajectories that maintain biodiversity, carbon, water, cultural, social values is needed. We don't want just to monitor demise – we want infrastructure that enables us to explore alternative scenarios and identify effective proactive management options. TERN sites are an important resource spread across the continent and aiming to represent those ecosystems most likely to change or to change more rapidly. Rather than a focus on documenting and protecting and restoring biodiversity because particular species are rare, infrastructure needs to support a) experimental manipulations of climate at a local scale, b) reciprocal transplants across environment, c) research into changed patterns of species assemblage and interactions. Such experiments alongside monitoring will enable Australia to better anticipate change and manage environment to ensure diverse values are protected.

Q34.

## Building a secure and resilient nation

Q35.

2.3 The case for a new NRI capability, or enhancements to existing capabilities, typically emerges through advocacy from research communities clustering around rigorously identified needs and goals. Such a concept could respond to a requirement for novel or expanded capacity within a domain, or across domains, and must be such that it could only be made available with national-level investment.

If you have identified such a requirement, briefly describe the need, the proposed infrastructure capability, the medium-term goals, impacted research communities, and the timeframe over which you advocate its establishment. Your response can include links to relevant existing reports.

Q36.

## Part 3: Industry perspectives

**This section is seeking input specifically from industry-based respondents. Other respondents can skip this section.**

Recommendation 6 of the [2021 Roadmap](#) related to improvements in industry engagement with NRI. To complement work on this topic that has occurred since then, we are seeking additional advice on NRI requirements as perceived by current or potential industry-based users.

Q37.

3.1 Have you (or your organisation) interreacted with or used Australia's NRI?

☐ Yes

☐ No

Q38.

3.2 If so, please briefly outline the NRI capabilities you (or your organisation) have interacted with or used. Do not limit your response to NCRIS capabilities.

*This question was not displayed to the respondent.*

Q39.

3.3 Please indicate your (one or more) primary reasons for interacting with NRI:

*This question was not displayed to the respondent.*

Q40.

3.4 If you answered no, please indicate your (one or more) primary reasons:

*This question was not displayed to the respondent.*

Q41.

## **Part 4: Other comments**

4.1 Please elaborate on any of your above responses or add any other comments relevant to the development of the 2026 Roadmap. Your response can include reference or links to existing reports that you recommend be considered during the 2026 Roadmap development process.

Q49.

4.2 Optional Document Attachment.

Note: Our strong preference is that answers are provided against the relevant questions in the survey. However, this file upload option is available for submissions in file format, where needed. Please ensure the document includes your name or organisation.