

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

Q23.
Medical Products

Q24.
Defence

Q25.
Recycling and Clean Energy

Q26.
Space

Q27.
Environment and Climate

Over the next decade, climate modelling will operate at significantly enhanced resolution, incorporating advanced components such as ice dynamics, ocean currents, and atmospheric processes. This advancement will enable detailed examination of weather and climate phenomena and significantly improve the precision of future climate scenario predictions. Accompanying this increased resolution is the necessity for extensive observational data storage, essential for validating model accuracy. To meet the challenges posed by these sophisticated, higher-resolution models and the immense volume of data they generate, the development of advanced software solutions is crucial. Investment in teams inclusive of skilled software engineers to develop and maintain high-quality software infrastructure will be paramount. A key challenge associated with this progression is the capacity to store and manage vast quantities of data using systems equipped with high-performance computing capabilities. As datasets continue to grow exponentially, substantial computational resources are required both for data analysis and for executing high-resolution climate simulations. For Australia to sustain its leadership in climate research and maintain its competitiveness internationally, it is critical to establish and maintain state-of-the-art high-performance computing facilities with substantial storage capabilities. Without this essential infrastructure, Australia risks falling behind global standards and compromising the effectiveness of its collaborative research efforts.

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

The response to this statement is the same as those below. High-resolution climate models, incorporating sophisticated representations of ecosystems, oceans, atmospheric processes, and ice dynamics, are essential tools. Without significant improvements in high-performance computing capabilities and enhanced data storage solutions, Australia's capacity to effectively transition to a net zero future will be incredibly difficult.

Q31.

Supporting healthy and thriving communities

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia's environment

Protecting and restoring Australia's environment necessitates substantial advancements in climate modelling and data management capabilities. High-resolution climate models, incorporating sophisticated representations of ecosystems, oceans, atmospheric processes, and ice dynamics, are essential tools for accurately predicting environmental changes and impacts. To achieve this, institutions such as ACCESS-NRI, NCI, and PAWSEY provide crucial high-performance computing and data management infrastructure. These resources are indispensable for handling the extensive datasets and complex simulations required for precise environmental forecasts, enabling informed decision-making and effective conservation strategies. However, Australia currently faces significant gaps in its critical research infrastructure, particularly regarding the ability to store and analyze vast environmental datasets generated by higher-resolution models. The development of advanced software tools to manage and interpret this data is equally vital. Investing in specialized teams, including software engineers, is necessary to ensure the creation, deployment, and maintenance of robust software infrastructure. Without significant improvements in high-performance computing capabilities and enhanced data storage solutions, Australia's capacity to effectively protect and restore its unique ecosystems and biodiversity will be substantially weakened. Addressing these critical infrastructure needs is essential for safeguarding Australia's environmental heritage and promoting long-term ecological resilience.

Q34.

Building a secure and resilient nation

To build a secure and resilient nation, it is imperative to significantly enhance our capabilities in climate projection and deepen our understanding of the processes governing climate variability and change. High-resolution climate modelling and comprehensive analysis of large-scale datasets are crucial to accurately predict climate impacts and inform strategies for adaptation, mitigation, and emergency preparedness. Institutions such as ACCESS-NRI, NCI, and PAWSEY are instrumental in meeting this critical national need. They provide the computational power and infrastructure necessary to run sophisticated climate simulations and manage vast quantities of environmental data, enabling researchers to generate precise, region-specific climate projections. However, these facilities need significantly more data storage and computing power to fully meet these goals.

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.

The primary National Research Infrastructure (NRI) capabilities that I have engaged with directly include the National Computational Infrastructure (NCI), the Pawsey Supercomputing Centre (PAWSEY), and the Australian Earth-System Simulator National Research Infrastructure (ACCESS-NRI). These facilities have been instrumental in enabling and significantly enhancing the quality and impact of my research. Access to the supercomputing resources and extensive observational datasets provided by NCI and PAWSEY has been absolutely essential, amplifying the scope and effectiveness of my work substantially. Without these critical computational and data management resources, my research activities would not be feasible, given the substantial computational demands and the complexity of the datasets involved. ACCESS-NRI has also played a pivotal role, particularly through their targeted employment of skilled software engineers who specialize in developing, maintaining, and enhancing software and data management solutions. These dedicated professionals possess the specialized expertise required to ensure robust, efficient, and reliable software infrastructure, enabling researchers like myself to maximize the value and productivity of the computational resources provided by NCI and PAWSEY. Such investments in skilled personnel are critical to the continued advancement and success of research reliant upon high-quality data and software solutions.

Q39.

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

- ☒ For expertise or advice
- ☒ Access to research resources or products
- ☒ Access to equipment for research
- ☐ Access to equipment for operational reasons
- ☐ Help in translating research
- ☒ Access to data
- ☐ Support for clinical trials
- ☐ Other (please specify)

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.

The advancement and sustained excellence of Australian research and collaborative initiatives depend critically on the availability of cutting-edge supercomputing facilities equipped with dedicated and scalable storage solutions. High-performance computing infrastructure capable of managing increasingly complex simulations and rapidly expanding datasets is essential to maintaining Australia's competitiveness on the global research stage. Without ongoing investment in powerful computational resources and robust storage capabilities, Australia risks lagging behind international peers, potentially compromising the quality, scope, and impact of research conducted across multiple scientific disciplines. Therefore, securing and upgrading supercomputing infrastructure must be recognized as a national priority to ensure the continued productivity, innovation, and effectiveness of Australian scientific research and collaboration.

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.

