

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

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

Q34.

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.

Risk of rapid sea level rise from instability of the Antarctic Ice Sheet: the need for an observing system on the continental shelf of Antarctica Australia is uniquely exposed to sea level rise, with half a million coastal properties already uninsurable due to high flood risk. The rate of global sea level rise has more than doubled over the past 30 years as a result of ice sheet melt and continues to accelerate. As sea level rises, the risk of coastal flooding will increase, with today's 1 in 100 year floods anticipated to occur weekly by 2100 on parts of Australia's most populated coastlines. The largest, and most uncertain, contribution to future sea level rise is the Antarctic Ice Sheet. Melt of the Antarctic ice sheet may also drive tipping points in ocean circulation, with projections of a 40% slowdown of the deep overturning circulation by 2050, reducing the ocean's ability to store heat and carbon and providing a positive feedback on climate change. The vulnerability of the Antarctic Ice Sheet is largely determined by the surrounding ocean: ocean heat melts ice shelves, which results in more rapid drainage of Antarctic ice to the sea, raising sea level. And yet, we have no observing system in place to observe the ocean on the Antarctic continental shelf, and some critical locations have never been sampled. Ocean observations on the continental shelf of Antarctica have been challenging because the region is remote and often covered with heavy sea ice. However, recent advances in autonomous instrumentation mean that it is now possible to collect the sustained, year-round observations needed to assess the vulnerability of the Antarctic Ice Sheet and its contribution to sea level rise. Pilot deployments have demonstrated that autonomous profiling floats provide a feasible and cost-effective way to sample the Antarctic shelf, including beneath sea ice and ice shelves. To enable reliable and useful projections of future sea level rise, investment in observations on the Antarctic continental shelf is essential. The critical research infrastructure required is a mix of platforms that can deliver sustained, year-round observations of water properties and circulation on the Antarctic continental shelf. Profiling floats will provide the backbone of such an observing system. Recent deployments have shown floats to be robust and cost-effective autonomous instruments that can be deployed by both ship and aircraft. Instruments moored to the seafloor or ice will be used in particularly critical locations (e.g. in warm water inflows to ice shelf cavities). The proposed observing system would complement existing satellite missions. The medium term goal is to establish observing systems at the ice shelf and glacier systems in the Australian sector of Antarctica that are most likely to contribute to future sea level rise (Totten, Denman and Cook). Within 5 years, the observations will be used to provide the first assessment of ice sheet vulnerability based on observations from this part of Antarctica. Longer-term goals include expanding the spatial coverage of the observing system to other areas of the Antarctic continental shelf. Research communities that will benefit from the proposed infrastructure investment include climate scientists, sea level researchers, oceanographers, glaciologists, ice sheet modellers, earth system modellers, Antarctic marine ecologists, experts on flood risk, and climate adaptation researchers. Timeframe • Year 1: broad consultation to complete observing system design; seek international co-investment; seek support for deployments • Year 2: Deploy profiling floats near Totten and Denman glaciers; data publicly available immediately after transmission by satellite • Year 3: Expand float observing system to other parts of the continental shelf and to use of other platforms • Year 4: Initial synthesis of multi-year data sets to identify parts of Antarctic most exposed to ocean heat • Year 5: Assessment of vulnerability of the East Antarctic Ice Sheet End users of the research enabled by the investment in an East Antarctic Shelf Observing System will include government and community leaders who need to plan for how to adapt to rising sea levels. At present, the timing of sea level exceeding a given threshold is highly uncertain. This makes it difficult to plan. Sea level rise puts at risk infrastructure with multi-decadal lifetimes (e.g. roads, airports, schools, hospitals, factories). Given that the cost of defending just the largest coastal cities from rising sea level has been estimated to exceed \$1 trillion a year by 2070, the remaining large uncertainty in how much and how fast sea level will rise means there is substantial risk of maladaptation. For low-lying island states, a critical question is when critical thresholds will be passed that threaten their viability. An ocean observing system on Antarctica's continental shelves is an essential part of delivering to end users the information they need to respond effectively to future risks.

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:

- ☐ I did not know about it
- ☐ Other facilities suit my needs better
- ☐ I would like to, but cannot get access due to geographical location
- ☐ I would like to, but believed that access was only available to academic researchers
- ☐ I am not aware of any capability that meets my needs
- ☒ Other (please specify)

sorry, accidentally ticked
box above and can't
untick it! I'm not industry

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.

