

Submission
Department of the Environment and Energy
2016 National Research Infrastructure Roadmap
Capability Issues Paper

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The Department of the Environment and Energy (the Department) relies on high quality research to make effective decisions in managing Australia’s environment and energy. The 2016 National Research Infrastructure Roadmap will be critically important to the Department’s ongoing access to quality research and the data and information which it provides. Access to environmental research and data is important to the broader economy, including natural resource dependant industries and for innovative solutions to domestic and global wellbeing.

The Department is particularly looking for the 2016 National Research Infrastructure Roadmap to provide strategic national research capacity in four areas:

1. Firstly, new opportunities for effective governance in relation to terrestrial biodiversity research, where a clear focus on the national agenda is needed. We recognise that the Terrestrial Ecosystem Research Network (TERN), the Atlas of Living Australia (ALA) and other key terrestrial National Collaborative Research Infrastructure System (NCRIS) investments have contributed to high priority collaborative research. This remains a key priority need for the department and it is vital that the investment be managed in the national interest. The governance of terrestrial biodiversity research infrastructure is currently fragmented and insufficient to meet future demands. Improvements need to be implemented which will integrate the funding, access and collaboration between components of the infrastructure. A new model of governance, involving the relevant players for all components of terrestrial biodiversity research, is needed to provide investment which is integrated, collaborative and focussed on the national interest, rather than the interests of individual components.
2. Secondly, an adequately funded, connected and strategic platform is required which can provide a stable and enduring national research infrastructure ‘environment’ to support future climate science. The Australia Climate Science community currently operates the Australian Community Climate and Earth-System Simulator (ACCESS), which is a dispersed network of investment, involving many partners and disconnected funding sources. This capability is needed to meet Australia’s future needs and to provide a uniquely southern hemisphere perspective, which will meet the needs of the global community. This should include the next generation of investment in National Computational Infrastructure, ACCESS and all the necessary supporting software and data management systems as vital components of this research infrastructure. This is a key missing piece of research infrastructure investment which should be included in the 2016 national roadmap.

3. Thirdly, support for basic research infrastructure to support remote research across Australia's jurisdiction from the tropics to Antarctica, which is coordinated to meet the national research priorities.
 - One area for improvement in this regard could be new opportunities for merging the processes for accessing research ship time in the Southern Ocean using the Research Vessel *Investigator* and Research Vessel *Aurora Australis* (and post 2020, on the new Australian icebreaker) to align with national priorities. Applicants currently apply for ship time through almost entirely separate systems leading to inefficiency, duplication and inequity in process. This is part of a broader need to also link to other granting processes, particularly between the Australian Antarctic Science program and the Australian Research Council.
 - Existing capacity in vessels that are capable of doing a range of research offshore is currently limiting key work needed to inform the management of Commonwealth marine reserves. The ability to leverage co-investment and collaboration with the private sector, international bodies and philanthropic organisations is also important if Australia is to better understand its marine estate.
 - A major new research facility should also be considered to support southern ocean and polar research in Australia, through the development of a Southern Ocean or Polar Sea Simulator, akin to the national facility managed by the Australia Institute of Marine Science for tropical marine research (Sea Simulator).
4. Fourthly, a new national environmental monitoring network for chemicals in the environment should be considered. This would support the objective: *"To ensure that development is optimised in a sustainable and effective manner, a robust, evidence based national system to understand and manage water, carbon, soil and air resources is needed"*. The results of this enabling infrastructure could be integrated with other environmental quality data (such as climate data, groundwater infrastructure, the integrated marine observing system, ecosystem monitoring infrastructure and various air sampling measurement programmes) using the concepts of digitisation and data discoverability discussed in Chapter 11 of the Issues Paper.