

## Draft 2016 National Research Infrastructure Roadmap Submission Template

The Ecological Society of Australia Ltd (ESA, [www.ecolsoc.org.au](http://www.ecolsoc.org.au)) is the peak group of ecologists in Australia, with over 1200 members from all states and territories. Our members work in universities and other research institutions, government departments, NGOs, private industry and consultancies.

Our submission focuses on the 'Environmental Systems' priority area, with key conceptual feedback provided first, followed by other specific points below.

### **Key feedback:**

- **The ESA supports the nine key recommendations** of the Roadmap (listed on pages 6-7) as long as the implementation of Recommendations 2 and 3 is transparent and ensures the inclusion and representation of all science domains.
- **We support the broad vision of a landmark environmental prediction system** for Australia proposed in 2.6 'Environmental Systems', and agree this can be developed as an integrative capability drawing upon the data, expertise and capability delivered through existing NCRIS platforms such as ALA, AURIN, AuScope, BPA, IMOS, TERN and others.
- **We strongly suggest that the Roadmap broaden the scope of the potential environmental modelling capability** beyond the ACCESS modelling system, which is primarily a regional to continental scale climate modelling system. ACCESS clearly must form part of any national predictive environmental modelling capability, however this capability should be much wider in scope to encompass all environments (terrestrial, aquatic, marine, atmospheric, urban, natural and managed) and to address questions about a range of environmental matters (e.g. climate, biodiversity, water, and carbon) at a range of scales from continental to regional to local. For this reason, **we recommend that Table 8 is amended as follows:**
  - Row 1 'Environmental prediction system', Column 2 'NRI Response', change third dot point to: *'Enhance capability to re-engineer and develop environmental modelling systems.'*
- **There are two critical gaps** in the identification of future needs for 'Environmental Systems':
  - (1) **Continuing the collection of data in all environments** and ensuring there is appropriate baseline data for all environments is a non-negotiable component of the National Research Infrastructure for 'Environmental Systems', and will be required to underpin a future environmental prediction system. Models and predictions are of limited value when there is a lack of data to inform them. In addition, the value of environmental measurements and data increases over time as longitudinal datasets build up, enabling analysis of the function and changes in ecosystems.
  - (2) **Field-based data collection** must also be part of the capabilities for 'Environmental Systems'. To meet the vision and goals outlined in the Roadmap,

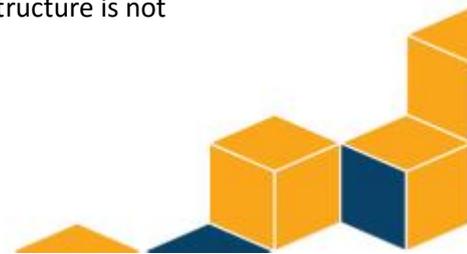


environmental data must be collected through a broader range of techniques and scales than remote sensing alone, and will require ongoing field programs for collection of relevant environmental data in Australian ecosystems. The National Research Infrastructure should make provision over coming decades for the transition from direct (observer/technician) data collection to sensor/technology-based data collection *as appropriate technologies become available and can be rigorously tested and validated*. However, it is likely that for decades to come national environmental data collection will require onground field programs with skilled teams of technicians collecting data.

- For these gaps to be addressed in the Roadmap, **we suggest that Table 8 is amended as follows:** Row 1 'Environmental prediction system', Column 2 'NRI Response' should have an additional point added first that reads '*Enhance land and biodiversity observing capability and development of observing infrastructure including national field monitoring capabilities, satellite and airborne data, and remotely operated systems such as climatic sensors, audio and visual monitoring, and remotely-piloted aircraft systems (RPAS)*'
- **We support the development of the National Research Infrastructure to provide easier access to the diverse range of environmental datastreams available** (see paragraph 1, page 48 for list), and for this access to be provided in a well coordinated and integrated fashion. While the draft Roadmap only mentions the ALA, we note that many of the datastreams listed are already collected and/or delivered through existing NCRIS capabilities including AURIN, IMOS and TERN, as well as other national agencies such as the Bureau of Meteorology and Geoscience Australia. Because of this, we believe future development of this capability will be best achieved through engagement across all of these platforms, facilities and organisations through the development of the Roadmap Investment Plan. Such an approach would enable a strategic whole of government response. To provide the best foundation for such a collaborative, strategic and well-designed approach, **we recommend that the Roadmap refrain from naming any one specific platform as the primary means of delivery for this capability.**
  - **This point can be addressed by:** (1) amending the beginning of the first sentence on page 48 to read: '*Further development of environmental data infrastructure to include data streams such as...*' and (2) by deleting the phrase '*such as ALA*' from the first row in Table 8.

#### **Other remarks:**

- We strongly support the conclusion in Section 1.4 that '*People form the core of the national research infrastructure system*' and endorse measures to support an 'infrastructure-ready' research workforce both to deliver and maintain the infrastructure, and to use the outputs of the infrastructure for excellent research.
- We are concerned by the over-emphasis on marine systems throughout the Roadmap, which implicitly devalues the existing contributions and future needs of research infrastructure in other environmental systems including terrestrial, aquatic, urban and agricultural. In particular, the significant international engagement and opportunities facilitated through existing non-marine environmental research infrastructure is not



mentioned even though we are aware of numerous submissions on the Infrastructure Issues Paper that detailed these activities (including our own:

<https://submissions.education.gov.au/Forms/National-Research-Infrastructure-Capability-Issues-Paper-Submissions/Documents/Ecological%20Society%20of%20Australia.pdf>). This

gap could be addressed by including details of non-marine international engagement activities in the Roadmap, and replacing some of the existing marine case studies in the Roadmap with examples from other environmental systems (relevant information for these should be readily available from the NCRIS section of the Department of Education and Training).

- Table 2 should be amended to show that 'Environmental Systems' also aligns with 'Transport' and 'Health' Research Priorities.

