

Draft 2016 National Research Infrastructure Roadmap Submission Template

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From: Australian Academy of Science National Committee for Earth Sciences (NCES)

Overview:

It is very pleasing to see the key recommendations of the draft National Research Infrastructure Roadmap, which provide a comprehensive high-level overview of priorities relevant to Australia's future.

The governance, access and strategy sections capture important principles that will provide a robust framework to develop more detailed programs. Many of these principles were applied to the original successful NCRIS processes and guided the success of many capability areas therein. The identification of the NCRIS AuScope capability is very positive, especially the reference to enhancing the capability to "include new Earth monitoring data; utilise new remotely sensed data and to visualise the findings", and the potential establishment of the "inward looking telescope".

The alignment with National Research Priorities is very appropriate, provided there is flexibility enabling response to changing needs over time. Disruptive technologies and conceptual advances, unpredictable at this time, may change priorities and/or directions. This flexibility would appear to be relevant to the brief for the Research Infrastructure National Advisory Group.

A highly important point clearly made as Key Recommendation 2 is the establishment of a Research Infrastructure National Advisory Group to provide advice on future planning. This group should be completely independent, with no representatives from institutions that will potentially house infrastructure granted under this scheme.



Recognition on p49 of UNCOVER and its role in characterizing the deep Earth and developing “an integrated distributed network of geophysical and remote sensing and geochemical sampling and analysis that will form a geological telescope to support research” is very significant.

The support expressed for supporting appropriate international consortia (e.g. IODP) and national collaborative infrastructure (e.g. Synchrotron) is very welcome.

Status of Earth Sciences:

However, subsuming Earth Science as a part of Environmental Systems does not reflect its national importance either as a highly performing discipline area in Australian science (as part of STEM), or its high national economic benefit. The current National Science and Research Priorities specifically identify both Energy and Resources as separate priorities to Environmental Change. Bringing these three highly significant areas under the umbrella of Environmental Systems devalues all of them.

The performance of Earth Sciences nationally can be gauged by its ERA rankings. For example, the weighted ERA ranking for more than 5,000 outputs places Earth Sciences nationally at the 4-digit level, ahead of Physical, Chemical and Mathematical Sciences.

The Australian Academy of Sciences National Committee for Earth Sciences (NCES) is currently preparing its second decadal plan: *Our planet, Australia's future: A decade of transition in the Earth Sciences*. It has recognised four Great science Challenges vital to Australia. The first, concordant with the UNCOVER and AuScope strategies, is “**The Earth Science Ten Million Square Kilometre Array: virtual visibility for deep Australia:** Create and implement, within 10-years, the Australian geological telescope, that looks into the Earth from the surface to the core. To this end, Australia needs to develop an integrated distributed network of geophysical and remote sensing deployments and a geochemical sampling program, consistent with the UNCOVER initiative. Earth’s continental and marine crust is the source of the physical resources required for our civilisation: minerals and energy, water and soils, and habitable land. Fundamental to our understanding of the Earth today is our perspective of the planet’s deep history, much of which is derived from our understanding of the early solar system, and the constituents that eventually came together to form the Earth.”

Recommendation:

For these reasons, the NCES recommends that Resources and Energy should be a stand-alone focus area, consistent with the current National Science and Research Priorities, with its high performance level as a discipline, and with the national importance of the energy and mineral exploration/mining industries. This recommendation is also consistent with the imperative, well-articulated in this draft Roadmap, to “enhance Australia’s capacity to supply the emerging demand for [non-bulk] minerals and rare earths vital to innovative manufacturing”. There is an urgency to finding and developing new (and new types of) mineral deposits because of Australia’s economic profile: more than 50% of our exports and around 10% of our GDP derive from the mineral (and energy) sector, new finds are almost non-existent, and a radical new approach (e.g. UNCOVER) is needed. This new approach requires infrastructure, and AuScope will be an important component.



Specific comments on some of the document text:

P45, Earth Sciences description:

1) AuScope provides infrastructure across a much broader front than “geospatial earth research”. The NCES suggests the following wording for AuScope’s role:

AuScope provides world-class research infrastructure for Earth and Geospatial Science research.

2) Geoscience Australia is responsible for providing pre-competitive datasets and not for actual mining and energy discoveries.

3) The presence of Earth Sciences in the document would also be enhanced by providing text for a case study on Earth Science analogous to those for “Antarctic Research” (p44) “Weather Prediction” (p48), and “Sustainable Fisheries” (p45)

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