



4th May, 2011

Ms Clare McLaughlin
Acting General Manager
Research Infrastructure and Science Policy Branch
Science and Infrastructure Division
Department of Innovation, Industry, Science and Research

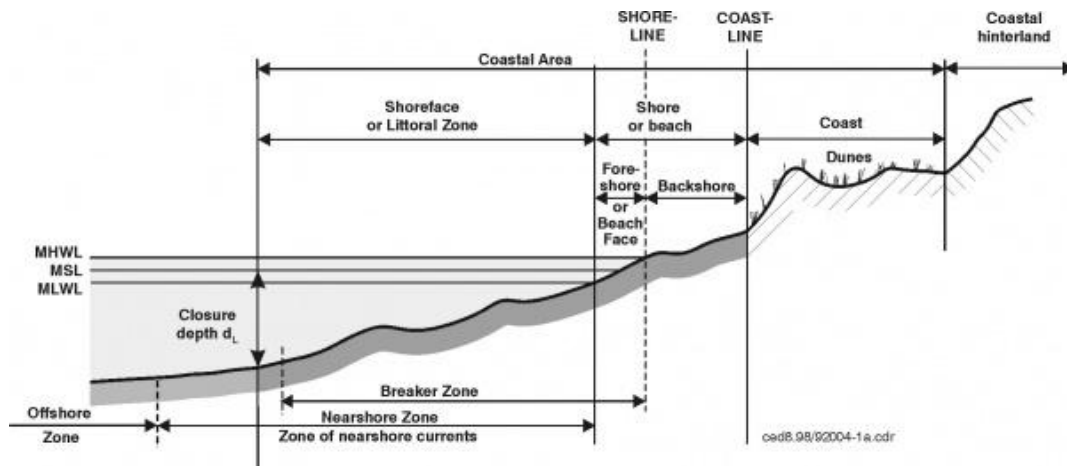
Dear Clare,

The *Strategic Roadmap for Australian Research Infrastructure* Discussion Paper makes reference to current investments by TERN, IMOS, ALA and AuScope in the coastal zone. These four existing Capabilities have come together to provide the following response.

Our comments should be read in conjunction with responses we have made as individual Capabilities. It should also be noted that, at this stage, we have not consulted more broadly with other parties outside of our own communities who might be interested in coastal zone issues.

Under **Future Research Directions** (Page 12), the Discussion Paper lists a key area as “*ecosystem research into Australia’s coastal zone, to inform sustainable development and improved understanding of the complex set of ecosystem – urban – industrial interactions*”.

We are interpreting the ‘ecosystem’ imperative as including marine, terrestrial, freshwater, geological, and atmospheric research interests, all of which are multi-disciplinary (e.g. physical to ecological). We also recognise that stronger engagement with the social sciences and humanities and the urban research community will be necessary. A diagram representing the complexity of the coastal zone is shown below:



This is the reality of conducting research in the coastal zone, and it is difficult to think of another area within the Australian Research Infrastructure portfolio that is so challenged to work across disciplines, communities, jurisdictions and interests. We believe this complexity, and the opportunities it represents for high impact, multi-disciplinary research, should be reflected in the Roadmap.

Under **Current Investments** (Page 15), the Discussion Paper notes that “*TERN, IMOS, ALA and AuScope currently provide infrastructure for coastal zone research (with the seaward extent to the edge of the continental shelf). However, in the EWG’s view the combined investments are inadequate for the scale of the coastal zone research and management/policy challenges.*”

In general, we agree that current investments are insufficient to meet the challenges. The existing Capabilities have identified gaps that could be addressed in the coastal zone. However a recurrent theme in the Discussion Paper is the need for stronger integration across Capabilities, including in the coastal zone. We are interpreting the Expert Working Group’s conclusion that ‘the combined investments are inadequate’ as a combination of within-Capability gaps, and the absence of mechanisms to develop cross-Capability responses.

It should be noted that under the 2006 and 2008 Roadmaps, there was no imperative for a cross-Capability focus on the coastal zone, and the existing Capabilities have not been established with that as a driver. We therefore see the imperative in the Discussion Paper as an emergent property of Australia’s national collaborative approach to research infrastructure development. In our view, the successful establishment of IMOS, TERN, ALA and AuSCOPE under NCRIS/EIF has created an opportunity to develop responses to coastal zone issues at a scope and scale not previously achievable in Australia. In addition, developments in important areas outside of the research infrastructure domain, such as water information systems in the Bureau of Meteorology and a National Plan for Environmental Information, give cause for optimism.

The Discussion Paper notes the inadequacy of combined investments of TERN, IMOS, ALA and AuSCOPE in the coastal zone, but provides no further detail. Although some of the higher level frameworks cited at the top of Page 12 are of relevance to the coastal zone, none are specifically focused on this issue. As the Discussion Paper notes, this is an area in which “*broader research*

community input is needed to refine gap analyses and develop recommendations on priority investments”.

Some national-level guidance is available from recent reports and plans, including the following:

- House of Representatives inquiry report *Managing the Coastal Zone in a Changing Climate* <http://www.aph.gov.au/house/committee/ccwea/coastalzone/report.htm>
- National Approach to Integrated Coastal Zone Management: Framework and Implementation Plan <http://www.environment.gov.au/coasts/iczm/index.html>

Guidance can also come from the science community, both globally and nationally.

By way of example, the Global Ocean Observing System Panel for Integrated Coastal Observations is developing a Requirements-Based Phased Implementation Plan for ‘End-to-End Solutions’ in seven key areas:

1. Impacts of coastal inundation and sea level rise on coastal ecosystems
2. Coastal eutrophication and hypoxia
3. Loss of biologically structured, benthic habitats
4. Declining living marine resources
5. Ocean acidification
6. Exposure to waterborne pathogens
7. Exposure to Algal toxins

In the US, the Integrated Ocean Observing System (US-IOOS) is using this framework to develop Proof of Concept Initiatives in the areas of Coastal Inundation Forecasting, Surface Current Mapping, Harmful Algal Bloom Forecasting and Integrated Ecosystem Assessments for Marine and Coastal Spatial Planning.

A recent paper by Morton et al¹ entitled “The big ecological questions inhibiting effective environmental management in Australia” focused on questions requiring fresh research under the following headings, most of which are relevant to the coastal zone:

- A. Integrating ecosystem management with human social systems
- B. Climate change
- C. Ocean acidification
- D. Coastal inundation
- E. Alteration, degradation and replacement of natural habitats
- F. Invasive species
- G. Altered fire regimes
- H. Water extraction
- I. Urban development and industrial pollution

The Australian Academy of Science has also recently developed plans for Earth System Science and Earth Observation which have sections on coastal issues:

¹ Morton et al, *Austral Ecology* (2009) **34**, 1–9

- <http://www.science.org.au/natcoms/nc-ess/documents/ess-report2010.pdf>
- <http://www.science.org.au/reports/documents/EOSfinal.pdf>

In summary, these areas correspond to the key research and management drivers that local, regional, state and national agencies in Australia are facing. We believe that with appropriate high-level guidance in determining requirements, and appropriate levels of investment, the existing Capabilities working with other partners in coastal zone research and management are capable of responding to the challenge identified in the Discussion Paper.

One issue that will need to be considered is the Governance of increasingly integrated activities. Given the breath of capability required in the coastal zone, we do not believe that it will be sensible to deal with integration by simply merging Capabilities into larger, more diffuse entities. Australia now has a track record in establishing a national collaborative research infrastructure program, and in creating science-community-driven, multi-institutional, multi-disciplinary Capabilities. We therefore see it as plausible that cross-Capability plans could be developed, funded and implemented within the existing governance structures. Indeed, this will be critical to ensure that initial investments in the various science domains can be leveraged to develop a national capability suitable for the coastal zone.

Please do not hesitate to contact us if you wish to discuss further.

Yours sincerely,

Tim Moltmann
IMOS Director
University of Tasmania

Stuart Phinn
TERN Director
University of Queensland

Donald Hobern
ALA Director
CSIRO

Bob Haydon
CEO
AuSCOPE