Submission 050
Date received: 29/07/2011

NCCARF
National
Climate Change Adaptation
Research Facility

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29 July 2011

Dear Sir/Madam,

Thank you for the opportunity to provide a submission to the inquiry of the House of Representatives Standing Committee on Climate Change, Environment and the Arts into Australia's biodiversity in a changing climate.

This submission briefly:

- outlines NCCARF activities pertinent to the inquiry, and
- provides links to further information about these activities.

The role of the National Climate Change Adaptation Research Facility (NCCARF) is to lead the Australian research community to generate the biophysical, social and economic information needed by policy- and decision-makers in government, and in vulnerable sectors and communities, to manage the risks of climate change impacts.

NCCARF pursues this role through three main programs:

(a) research to develop new information,
(b) synthesis and integration of existing information and
(c) networks that coordinate Australia's research community, build capacity and support effective interaction between research and decision-making communities.

All these activities focus on delivering information to decision-makers to support climate change adaptation investments and initiatives. Community and end user engagement is a key component of all activities undertaken by NCCARF.

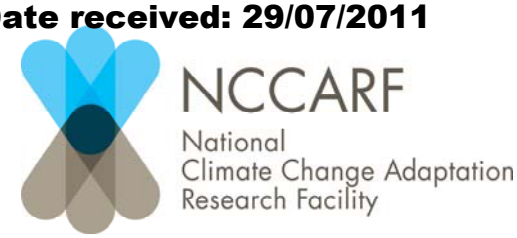
The potential contribution of each of NCCARF's programs to the inquiry is set out below.

(a) Research to develop new information

NCARF develops National Climate Change Adaptation Research Plans (NARPs) for each major sector, including several pertinent to your inquiry, in particular:

- Marine Biodiveristy and Resources,
- Terrestrial Biodiversity,
- Freshwater Biodiversity and
- Primary Industries.

NARPs provide a key sectoral research investment framework and prioritisation for all stakeholders at regional and local scales. They identify, through extensive processes of consultation, research priorities required for national policy purposes, industry development



and management. NCCARF invests in research that focuses on these priorities. I attach a document setting out the research priorities identified by the four NARPs most relevant to your inquiry.

The NARPs are available at: http://www.nccarf.edu.au/national-adaptation-research-plans. Lists of research supported are available at: http://www.nccarf.edu.au/node/611.

(b) Synthesis and integrative research

NCCARF's synthesis and integrative research program is designed to draw together and develop research capacity across the usual boundaries of the research community to address issues of specific relevance to practitioners and decision makers.

Several completed synthesis and integrative research projects are likely to be relevant to the inquiry, including:

- an assessment of the vulnerability of Australia's forests to climate change,
- a synthesis of coastal ecosystem response to climate change;
- historical case studies of adaptation to past climate change impacts in Australia..

Information about these projects is available at http://www.nccarf.edu.au/node/172.

(c) Research networks

NCCARF established research networks to build a collaborative, inclusive environment that supports creative, inter-disciplinary research to foster positive climate change adaptation. The networks bridge gaps between fundamental and applied science, advance priority sectoral research and facilitate interactions between researchers and practitioners to advance climate adaptation knowledge.

The networks are a significant strategic asset for Australia, with a rapidly growing membership of more than 3000 scientists and decision-makers. Networks have considerable autonomy to address key issues in their area of interest, and some have dealt with matter pertinent to your inquiry, as outlined in their separate submissions.

Further information about the NCCARF Adaptation Research Networks is available at http://www.nccarf.edu.au/adaptation-research-networks.

I would be pleased to provide further information about the wide range of programs and initiatives undertaken or supported by NCCARF that would be relevant to your inquiry.

Yours faithfully,

Jean Palutikof (Prof.)
Director, NCCARF

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ATTACHMENT

Table 1: Priority research questions for Freshwater Biodiversity

Goal 1: Incorporate climate change adaptation into management of freshwater species and ecosystems.
1. What management options will conserve freshwater species and ecosystems that are currently at or near their climate limits? (Very high)
2. What attributes will enable freshwater species to adapt and ecosystems to successfully change autonomously in response to climate change? (Very high)
3. How will climate change alter current freshwater biodiversity management effectiveness, and what management changes will be required, including for poorly understood species and ecosystems?
Goal 2: Identify climate change adaptation options for Australia's freshwater biodiversity refugia.
6. How can the climate resilience of freshwater biodiversity refugia be increased? (Very high)
7. What changes to Australia's conservation reserve system are required to improve protection of current and projected climate refugia and to support connectivity for freshwater biodiversity? (Very high)
8. What adaptation options will facilitate the type and level of connectivity and dispersal required under climate change impacts?
Goal 3: Understand climate change adaptation interactions between freshwater biodiversity and other sectors.
9. How will climate change impacts on other sectors affect existing stressors on freshwater biodiversity?
10. How can current non-climate stressors on freshwater biodiversity be managed or reduced to minimise the synergistic effects of climate and non-climate stressors? (Very high)
11. What integrated climate change adaptation response plans at the local, landscape, catchment and regional scales will build the resilience of freshwater biodiversity, and also terrestrial biodiversity, primary industries, water resources and associated communities and industries?
Goal 4: Understand the role of environmental policies in protecting freshwater biodiversity under changing climate conditions.
12. How will climate change affect existing conservation goals, policies and programs for freshwater biodiversity including meeting Australia's international obligations? (Very high)
Goal 5: Cross-cutting Theme: Ensure that adaptation initiatives for freshwater biodiversity and other sectors are mutually supportive and integrated where appropriate.
16. What climate change adaptation and mitigation actions taken in other sectors will benefit freshwater biodiversity?

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Table 2: Priority research questions for Marine Biodiversity and Resources

1. Aquaculture

- Which farmed species in which locations are most likely to be impacted by climate change?
- What options are there for businesses to adapt to climate change effects either by minimising adverse impacts or taking advantage of opportunities? What are the barriers to implementing such changes and how might they be overcome?

2. Commercial and recreational fishing

- Which fishery stocks, in which locations, are most likely to change as a result of climate change? What will those changes be (e.g., in distribution, productivity) and when are they likely to appear under alternative climate change scenarios?
- What options or opportunities are there for commercial fishers in identified impacted fisheries to adapt to climate change effects through changing target species, capture methods and management regime, industry diversification, relocation or divestment?

3. Conservation management

- Which ecosystems and species of conservation priority most require adaptation management and supporting research, based on their status, value, vulnerability to climate change and the feasibility of adaptive responses?
- How should conservation managers and planners adapt their practices to ameliorate climate change risks and enhance adaptation options? What intervention strategies will increase system resilience and improve the time within which biological systems can adjust to a future climate?

4. Tourism and recreational uses

- What are the predicted regional impacts of climate change for marine tourism assets (e.g., what tourism sites will be most vulnerable to change and to what degree?)
- What is the adaptive capacity of the marine tourism industry and how can it be enhanced to cope with climate change impacts?

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Table 3: Priority research questions for Primary Industries

In the area of ***Understanding and expanding adaptive capacity***

- ☐ What is adaptive capacity in the primary industries sector and how can it be measured and increased at the individual, industry, regional and national levels?

In the area of ***Levels of adaptation***

- ☐ What factors define the effectiveness of different levels of adaptation response: adjusting practices, changing production systems, and transforming enterprises, industries and regions?
- ☐ What information, knowledge, tools, programs and policies are necessary for primary producers and industries to identify the range of potential climate change adaptation responses and understand their benefits, costs, risks and opportunities?

In the area of ***Adjusting primary production practices and technologies***

- ☐ What types of improvements to production practices and technologies exist or could be developed to increase the adaptive capacity of Australia's primary industries, and what practical issues need to be addressed for implementation?
- ☐ What adaptations could yield benefits from changing atmospheric and climate conditions, such as increased atmospheric CO_2 and changes in temperature and water availability?

In the area of ***Changing primary production systems***

- ☐ What characteristics of production system change in primary industries are likely to provide advantage under changed climate conditions?
- ☐ What information, knowledge, tools, programs and policies are needed to support effective changes in primary production systems?

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Table 4: Priority research questions for Terrestrial Biodiversity

1 National/continental scale issues
1.1 How will climate change affect existing conservation goals and how should changed conservation goals be promoted and achieved?
1.2 How can the existing Australian legal, policy and institutional architecture for land management and biodiversity conservation respond to changes in conservation goals caused by climate change?
1.3 What conceptual models and long-term observation systems are needed to support the design, analysis and assessment of active adaptive management and policy experiments at regional and national scales under climate change?
2 Regional issues
2.1 What designs of landscapes in regions having different land-uses confer maximum resilience for biodiversity in the face of climate change, including the uncertainty associated with future climate scenarios?
2.2 How will climate change interact with other key stressors such as fire, invasive species, salinity, disease, changes to water availability, grazing and clearing, and what are the integrated implications for ecosystem structure and functioning?
2.3 How can large-scale carbon mitigation initiatives, such as revegetation and forest-related mitigation, be designed to maximise biodiversity conservation benefits and to avoid adverse impacts on biodiversity?
2.4 How can major socio-economic trends occurring in many regions of Australia contribute to effective climate change biodiversity adaptation responses?
3 Local land management issues
3.1 What are the costs and benefits of different climate change adaptation measures in vulnerable ecological communities and ecosystems?
3.2 How should fire management adapt to climate change?
3.3 How can management of local protected areas incorporate and adapt to climate change?
3.4 How can we better integrate conservation plans and actions across landscapes, incorporating protected area management, off-reserve conservation measures and other land-uses, to maximise biodiversity conservation benefits/outcomes under a changing climate?
4 Managing key species
4.1 Which species should be the focus of investment in climate change adaptation?
4.2 How will climate change affect current management actions for protecting priority species and what management changes will be required?
4.3 How will climate change affect current or potential problem species and what management responses will be required?