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Australian Government
Great Barrier Reef
Marine Park Authority

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Ms Julia Morris
Committee Secretary
House of Representatives
PO Box 6021, Parliament House
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Dear Ms Morris

Thank you for your letter of 8 June 2011 concerning the new inquiry into Australia's Biodiversity in a Changing Climate. I greatly appreciate the opportunity to provide a submission to the inquiry, given the Great Barrier Reef's status as an environmental icon and its vulnerability to climate change.

The Great Barrier Reef Marine Park Authority would be keen to see the Great Barrier Reef used as a case study within the Inquiry's report and would be eager to assist in the development of such a case study, if that would assist the inquiry.

This letter forms the Great Barrier Reef Marine Park Authority's submission to the inquiry, and is structured according to the interest areas identified in the inquiry's Terms of Reference.

Terrestrial, marine and freshwater biodiversity in Australia and its territories

The Great Barrier Reef (the Reef) is a great Australian icon, part of the national identity, and of fundamental cultural value to its Traditional Owners. It encompasses a wide range of habitat types such as coral reefs, seagrass meadows, tidal wetlands, open waters and islands. Its amazing biodiversity, range of habitat types, and sheer size are key elements of what makes the Reef special. This uniqueness and value to the Australian people and the world is highlighted by the establishment of the Great Barrier Reef Marine Park in 1975 and the Reef's recognition as a World Heritage Area in 1981. Multiple Rare, Threatened and 'at risk' species and their habitats are found within the Reef ecosystem and the Great Barrier Reef World Heritage Area encompasses a number of Ramsar listed Wetlands of International Importance. The Great Barrier Reef is truly a nationally important ecosystem: and one that is seriously threatened by climate change.

Coral reefs are one of the world's ecosystems most vulnerable to climate change, and the Great Barrier Reef's vulnerability has been well documented in both the scientific literature and the popular press. Almost all Great Barrier Reef species and habitats will be affected by climate change, some seriously. Indeed, climate change has been identified as likely to be the greatest influence on the long-term outlook for the Reef (Great Barrier Reef Outlook Report 2009). Knowledge around the Reef's health and biodiversity, and threats to these, has been growing steadily since the compilation of the *Climate Change and the Great Barrier Reef: a Vulnerability Assessment* (2007) and the *Great Barrier Reef Outlook Report 2009*. However there remains a strong need for ongoing development and updating of understanding of the threats that may impact the resilience of the Reef's component ecosystems in a changing climate (*Scientific Information Needs for the Management of the Great Barrier Reef Marine Park 2009-2014).*

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Connectivity between ecosystems and across landscapes that may contribute to biodiversity conservation

The Great Barrier Reef Marine Park Authority suggests that the importance of connectivity be recognised within and among terrestrial, marine and freshwater ecosystems.

For the Great Barrier Reef there are important connections between estuarine, coastal and inshore habitats; open water and seabed habitats; terrestrial catchment areas draining to the Reef; and larger scale connections to environments well outside the Great Barrier Reef, such as the Torres Strait and Coral Sea (p50, Great Barrier Reef Outlook Report 2009). Connectivity has fundamental influence on the biodiversity and health of the Reef. It is relevant, for example, to larval dispersal, migration paths (including of several species of conservation concern) and nutrient flows. Degradation in one geographic area may ultimately affect many others. For example, coastal development is affecting habitats that support the Great Barrier Reef and connectivity between habitats (p103, Great Barrier Reef Outlook Report 2009).

Connectivity between locations and systems means work to reduce pressures and threats must occur in a range of geographic areas, marine, freshwater and terrestrial. The Australian and Queensland Government's *Reef Water Quality Protection Plan 2009* and the *Reef Rescue* initiative are active demonstrations of mechanisms that aim to support the resilience of the Great Barrier Reef's biodiversity.

The Great Barrier Reef Marine Park Authority's *Scientific Information Needs for the Management of the Great Barrier Reef Marine Park 2009-2014* document includes focus on identifying ways to improve catchment and nearshore management strategies (planning and decision making across all uses) in the Reef catchment to better protect coastal ecosystems adjacent and connected to the Reef and to improve water quality, ecosystem health and ecosystem resilience of the Great Barrier Reef. Understanding links between coastal ecosystems and their influence(s) on the Reef ecosystems enables all levels of biodiversity conservation to be handled at a landscape/ecosystem level where delivery of outcomes has failed in the past.

How climate change impacts on biodiversity may flow on to affect human communities and the economy

Climate related changes to the ecosystem are expected to seriously affect Reef-based industries and communities (p98, Great Barrier Reef Outlook Report 2009). In developing a case study on the Great Barrier Reef, key areas of consideration should include the implications of climate change for those who depend on and are intimately connected to the Reef, and can help support its resilience. Tourism, commercial fishing, and small coastal settlements would be relevant focal areas (e.g. the impact of extreme weather events such as Tropical Cyclone Yasi).

Climate change has major consequences for most aspects of marine-based tourism, and this is strongly connected to the biodiversity value of the Reef. Issues of concern for operators are degradation of sites due to coral bleaching and loss of marketing appeal as a high quality reef destination. Patterns of use of the Reef and visitor satisfaction could be affected (p98, Great Barrier Reef Outlook Report 2009).

The Great Barrier Reef supports a wide variety of fishing activities both recreational and commercial. A healthy and biodiverse Reef ecosystem underpins the wellbeing of the commercial fishing industry. The commercial fishing industry of the Great Barrier Reef is important to both domestic and international markets, represents an important component of the Queensland seafood industry and generates regional economic value. For example, in

the 2006/07 financial year commercial fishing in the waters of the Great Barrier Reef Region contributed $139 million to the Australian economy (p71, Great Barrier Reef Outlook Report 2009).

A range of research work has examined social and economic effects of climate change related impacts on the Great Barrier Reef. For example, Tobin et al. (2010) explored Tropical Cyclone Hamish's impacts on the commercial and charter Coral Reef Fin Fish Fishery, with consideration to a context of predictions of increased frequency of severe weather events under a changing climate. Similarly, the Great Barrier Reef Marine Park Authority is currently running a rapid assessment project exploring the social and economic impacts of the extreme weather of summer 2010/11 (flooding and Tropical Cyclone Yasi) on commercial fishing and marine tourism operators working within the Great Barrier Reef Marine Park.

Strategies to enhance climate change adaptation, including promoting resilience in ecosystems and human communities

The *Great Barrier Reef Climate Change Action Plan 2007 - 2012* provides a useful illustration of a strategy specifically designed to address issues facing a nationally important ecosystem under a changing climate. Two pillars of this strategy address supporting the ecological resilience of the Reef to climate change impacts, and adaptation of Reef industries and communities.

In recent years both the seafood and coral and marine aquarium fish fishery sectors have been working to increase their awareness and adaptive capacity in relation to climate change implications for the Great Barrier Reef and their industries. The Great Barrier Reef Marine Park Authority has been supporting them in this, particularly through the *Great Barrier Reef Climate Change Action Plan 2007-2012* program. Relevant documents include the *Pro-vision Reef: Stewardship Action Plan. A Statement of Operational Standards and Climate Change Contingency Planning* (2009) and the *Coral Stress Response Plan for the Coral and Marine Aquarium Fish Fisheries* (2009) developed with Fisheries Queensland. Projects are currently beginning that support development of climate change adaptation planning for the east coast otter trawl fishery and the coral and marine aquarium fish fishery.

Likewise, support has been provided to development of the *Great Barrier Reef Tourism Climate Change Action Strategy 2009-2012* by the marine tourism industry Great Barrier Reef Tourism Climate Change Action Group. Support has also been ongoing for elements of the implementation of this strategy with a focus on building climate change awareness, support to emissions reduction within the industry, and promotion of thinking around climate change relevant business planning.

Additional examples of relevant strategies for the Great Barrier Reef Marine Park include the Australian and Queensland Government's *Reef Water Quality Protection Plan 2009*.

Mechanisms to promote the sustainable use of natural resources and ecosystem services in a changing climate

Not surprisingly, given the local, national and international importance of the Great Barrier Reef and the multiple use nature of the Great Barrier Reef Marine Park, there are a range of existing mechanisms that promote sustainable use of the Reef. The *Great Barrier Reef Marine Park Zoning Plan 2003* is the primary management tool for the protection of the Great Barrier Reef ecosystem, and is fundamental to the sustainable use of the Reef's natural resources (p126, Great Barrier Reef Outlook Report 2009) – now and under a changing climate. The zoning plan protects biodiversity by regulating some aspects of use in the in the Great Barrier Reef Marine Park, particularly fishing and shipping. It is a critical element in supporting the resilience of the Reef under a changing climate.

Complementary mechanisms include the Great Barrier Reef Marine Park Authority's draft *Biodiversity Strategy*, various species and ecological community vulnerability assessments, a recent ecological risk assessment of the east coast otter trawl fishery in the Great Barrier Marine Park and climate change vulnerability assessment for the fishery more generally, High Standard Operators program for marine tourism, Reef Guardian program, and Indigenous Partnerships program. All of these acknowledge or specifically address the additional challenges a changing climate represents for ensuring sustainable use of the Reef's natural resources and ecosystem services.

As understanding continues to grow around climate change implications for the Reef and its users there will be need for consideration of additional mechanisms. If future management is to reduce the forecasted effects of climate change and other identified risks, innovative strategies and arrangements are essential. The Great Barrier Reef Marine Park Authority's *Scientific Information Needs for the Management of the Great Barrier Reef Marine Park 2009-2014* document includes focus on exploring how to best understand and manage the cumulative impacts of multiple pressures on the Great Barrier Reef ecosystem and the goods and services it provides. It recognises a need to continue to identify adaptation strategies, including improvements to current management and completely novel strategies that could be used to improve the Great Barrier Reef's resilience in the face of climate change.

In order for credible outcomes to be achieved, there is an ongoing need for up to date information on the health and resilience and threats to the Great Barrier Reef as this is critical to inform mechanisms promoting sustainable use. Additionally, sufficient resources are required to implement the recommendations of relevant strategies and mechanisms.

An assessment of whether current governance arrangements are well placed to deal with the challenges of conserving biodiversity in a changing climate

The broad threats to the Great Barrier Reef from climate change are understood and management emphasis is on adaptation and improving resilience to change. However, the challenge remains to translate plans and measures into specific policies and measureable on-ground actions (p132, Great Barrier Reef Outlook Report 2009). Indeed, the *Great Barrier Reef Outlook Report 2009* notes management effectiveness challenges for management topics such as climate change that are broad in scale and complex socially, biophysically and jurisdictionally (p 142).

Management agencies need to know if implemented strategies are reducing risks and this requires understanding of how affected ecosystem components are responding. The Great Barrier Reef Marine Park Authority's *Scientific Information Needs for the Management of the Great Barrier Reef Marine Park 2009-2014* document encourages further research around the effects of existing management strategies on the Great Barrier Reef ecosystem. It notes understanding of current condition and trends in ecosystem status, particularly in monitoring recovery after disturbance (assessment of resilience) and following management interventions (effectiveness of management) is a key part of this. Additionally, building knowledge around the impacts of extreme weather events such as recent floods and cyclones and the implications for short and long-term management is important for planning and preparing for a changing climate. The Great Barrier Reef Marine Park Authority's 2010/11 *Extreme Weather Response* program is an example of recent contribution in this area.

Mechanisms to enhance community engagement
For community engagement to be successful, the community must be encouraged to take direct ownership of issues (including climate change) and the actions that can be implemented to preserve existing biodiversity values. Government leadership can be demonstrated through well planned and delivered engagement, education and awareness raising programs such as the Great Barrier Reef Marine Park Authority's Reef Guardian Program, and engagement and information exchange mechanisms such as the Reef Advisory Committees and Local Marine Advisory Committees. Strategies such as the *Great Barrier Reef Climate Change Action Plan 2007 – 2012* have been central to encouraging and facilitating inclusion of climate change issues into the Great Barrier Reef Marine Park Authority's range of community engagement processes and initiatives.

The Great Barrier Reef Marine Park Authority notes that in enhancing community engagement around protecting biodiversity in a changing climate:

a. The community will need a clear understanding of the value of nationally important terrestrial, freshwater and marine ecosystems biodiversity, and the importance of connectivity between each of these ecosystems.

b. The community will require a clear understanding of what they will need to do to achieve the desired outcomes.

c. There is a role for provision of incentive schemes that encourage behavioural change (e.g. as used within the *Reef Rescue* initiative).

Ultimately, if changes to the world's climate become too severe, no management actions will be able to climate-proof the Great Barrier Reef ecosystem (p180, Great Barrier Reef Outlook Report 2009).

Yours sincerely

Peter McGinnity
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References

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