

Australian Marine Conservation Society

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Submission to the Senate Inquiry into the Current and Future Impacts of Climate Change on Marine Fisheries and Biodiversity

May 2017

Introduction

The Australian Marine Conservation Society (AMCS) welcomes the opportunity to make a submission to the Senate Inquiry into the current and future impacts of climate change on marine fisheries and biodiversity. We are especially grateful for the opportunity to submit a late submission.

AMCS is the only environmental organisation devoted solely to caring for Australia's oceans and their wildlife. AMCS has over 250,000 members and supporters in Australia whom we represent and work with on key marine issues facing the nation. Our focus includes working to protect the Great Barrier Reef, establishing Marine Protected Areas, improving fisheries management and protecting and recovering threatened ocean wildlife. We also work to protect the coasts from inappropriate development and to tackle human induced climate change, mitigating its impacts on the marine environment.

AMCS would welcome the opportunity to appear before any further public hearings to be held the Committee as part of the process of stakeholder consultations.

Current Impacts on Marine Fisheries and Biodiversity

Climate change is the single greatest threat to the health of Australia's oceans. The pace of climate change has accelerated in recent times and the impacts are becoming all too obvious and measurable. On average, species in the world's oceans are moving towards the poles at 17km per decade on land and 78km per decade in the ocean.¹

Australia's ocean currents are changing with the most notable change being the strengthening of the East Australian Current (EAC) current reaching as far south as Tasmania. Scientists have found that over the last 50 years, the EAC has stretched about 350 kms further south, usually in erratic bursts, introducing tropical and sub-tropical species to Tasmanian waters.² These major changes to ocean currents, temperature and chemistry (for example, the reduction in seawater pH, known as ocean acidification) will have highly variable effects on Australia's fisheries.

¹ <https://theconversation.com/climate-driven-species-on-the-move-are-changing-almost-everything-74752>

² <https://theconversation.com/things-warm-up-as-the-east-australian-current-heads-south-31889>

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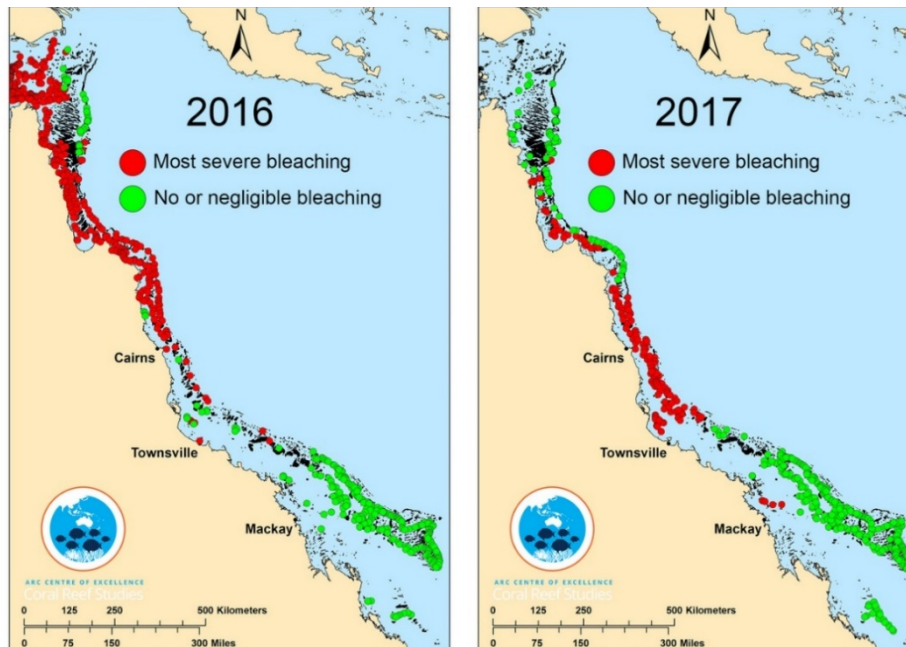
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In regards to biodiversity, three examples are provided below that demonstrate the rapid changes afoot in coral reef ecosystems, kelp forests and coastal mangroves.

The most conspicuous impact has been on the Great Barrier Reef. The Reef has experienced four mass coral bleaching events to date: 1998, 2002, 2016 and 2017. The 1998 and 2016 events were in El Niño years, but the 2017 event this year was not. The two back-to-back bleaching events were far more severe than the two earlier events. In both 1998 and 2002, 5% of the corals on the Reef died, resulting in 10% mortality for both events. In 2016, the GBRMPA and the ARC Centre of Excellence for Coral Reef Studies found that 22% of corals on the Reef died, however, this figure is likely to be revised upwards for last year's event, as more monitoring information becomes available.

In 2016, the most severe bleaching occurred in the northern third of the GBR, from Torres Strait to Cairns, an area stretching 700 kms. In 2017 the most severe bleaching occurred further south, between Cooktown and Townsville. The mortality data for the 2017 event has not yet been publicly released, but is likely to be substantially greater than the 1998 and 2002 events. There has been no time for any meaningful recovery to take place on reefs that were severely affected in 2016. Coral reefs take at least 15 years to recover from such an event, and the slower growing coral species, longer still.



(Maps from ARC Centre for Coral Reef Studies, JCU)

The effects of the severe mass bleaching events on the Outstanding Universal Value of the Great Barrier Reef World Heritage area are likely to be very damaging. With nearly a quarter of the corals on this ecosystem dying last year, it is virtually impossible to conclude that the Great Barrier Reef is not in danger. Indeed, non-other than Sir David Attenborough warned last year that the Reef is "in grave danger" due to climate change,

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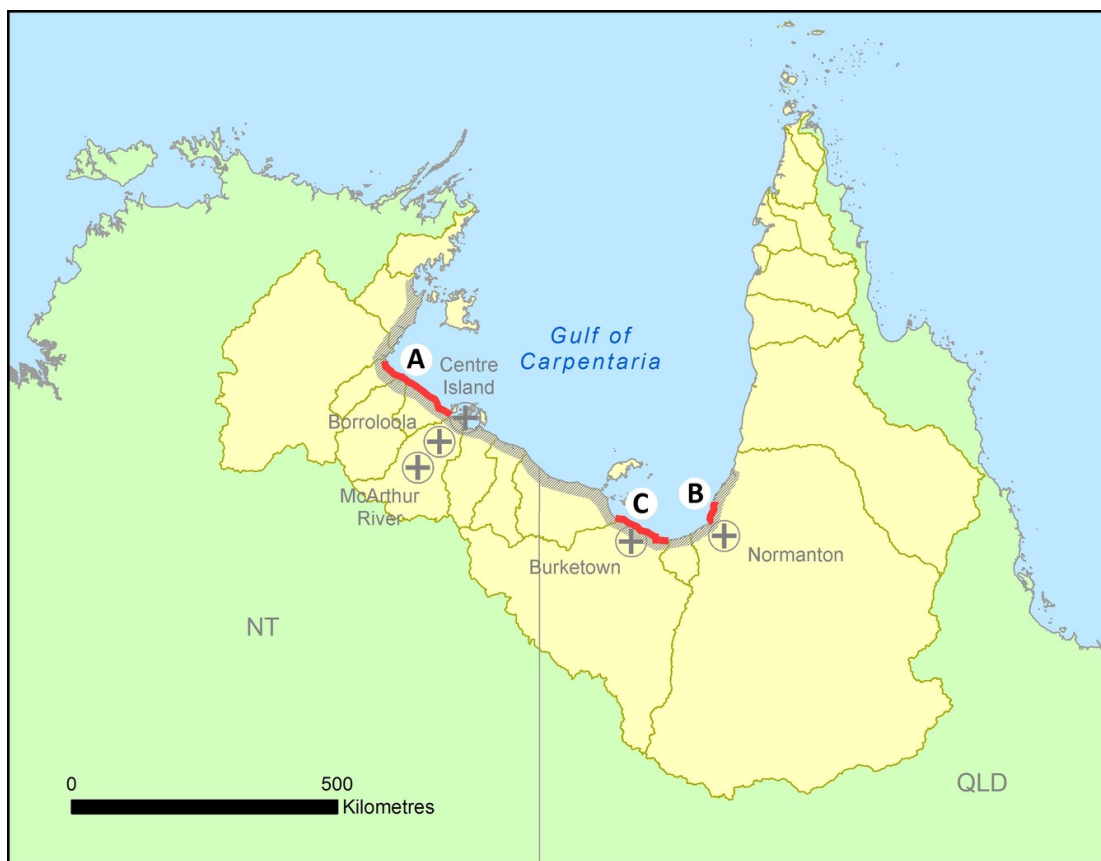
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Australia's kelp forests which support a complex and intricate array of temperate marine species and some of the most valuable fisheries in Australia, have also been ravaged by ocean warming. In 2011, a massive undersea heatwave struck the kelp forests along the WA coastline, wiping out 385 square kms of kelp forest and ushering in an abrupt change in marine plant life, with temperate species being replaced by subtropical and tropical reef communities.³

In Tasmania, ocean warming has enabled a kelp-eating sea urchin to jump from the mainland and graze on local kelp forests.⁴

In the summer of 2015-16, along the coastline of the Gulf of Carpentaria, a massive dieback of mangroves occurred. It was one of the largest mangrove forest diebacks recorded in the world. Scientists found it was likely due to a combination of extreme temperatures, drought and lowered sea levels. The dieback affected 1,000km of coastline between the Roper River in the Northern Territory and Karumba in Queensland.



Areas affected by severe mangrove dieback in late 2015 (grey shaded) along southern shorelines of Australia's Gulf of Carpentaria from Northern Territory to Queensland. Aerial surveys (red lines) were undertaken on three occasions during 2016 to cover around 600km of the 1000km impacted. NC Duke

³ <https://theconversation.com/a-marine-heatwave-has-wiped-out-a-swathe-of-was-undersea-kelp-forest-62042>

⁴ <https://theconversation.com/underwater-health-check-shows-kelp-forests-are-declining-around-the-world-68569>

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About 7,400 hectares, or 6%, of the gulf's mangrove forest had died. Losses were most severe in the NT, where around 5,500ha of mangroves suffered dieback. Some of the Gulf's many catchments, such as the Robinson and McArthur rivers, lost up to 26% of their mangroves.⁵

Future Impacts

In January 2017, a landmark paper was released, *Local scale projections of coral reefs futures*,⁶ which predicted the onset of *annual* severe bleaching of the world's coral reefs, including Australia's Great Barrier Reef, according to two IPCC emissions pathways: RCP8.5 (a high emissions scenario, with a likely global average temperature rise by the end of the century of 3.7 C) and RCP 4.5 (a lower emissions scenario, with a likely global average temperature rise by the end of the century of 1.8 C).

Australia's 26-28% by 2030 target, if matched by the rest of the world, would see us follow the RCP 8.5 pathway. This pathway would see the onset of *annual* severe bleaching in parts of the Great Barrier Reef by 2035, with almost half of the Reef experiencing annual severe bleaching by 2045, and four fifths of the Reef experiencing annual severe bleaching by 2050, the year in which the federal government's Reef 2050 Plan is to meet its vision statement:

Our vision is to ensure the Great Barrier Reef continues to improve on its Outstanding Universal Value every decade between now and 2050 to be a natural wonder for each successive generation.

The gap between the Reef 2050 Plan and the reality of the government's Paris target is as wide as the ocean is deep.

New Policy Direction is Urgently Needed

According to the Communique of the Reef 2050 Plan's Independent Expert Panel (5 May 2017):

The Panel were united in their concern about the seriousness of the impacts facing the Reef and concluded that coral bleaching since early 2016 has changed the Reef fundamentally. There is great concern about the future of the Reef, and the communities and businesses that depend on it, but hope still remains for maintaining ecological function over the coming decades.

Members agreed that in our lifetime and on our watch, substantial areas of the Great Barrier Reef and the surrounding ecosystems are experiencing major long-term damage which may be irreversible unless action is taken now. The planet has changed in a way that science informs us is unprecedented in human history. While that in itself may be cause for action, the

⁵ <https://theconversation.com/extreme-weather-likely-behind-worst-recorded-mangrove-dieback-in-northern-australia-71880>

⁶ <http://www.nature.com/articles/srep39666>

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extraordinary rapidity of the change we now observe makes action even more urgent.

The Panel considers that action to reduce emissions of greenhouse gases must be central to the response.

Recommendations

1. The Australian government must replace its Paris target with a new target of a 65-85% reduction in greenhouse emissions, based on 2005 levels, by 2030, setting Australian on the pathway to meeting a limit of 1.5 C. This will provide some assurance that coral reefs will have a future, albeit a diminished one, into the future.
2. The Australian and Queensland governments must reverse their support of the Adani Carmichael coal mine, rail link and Abbot Point coal port extension, and withdraw the approvals given. The mine would lead to 4.7 billion tonnes of carbon pollution over its lifetime, and accelerate global warming.
3. The Australian and Queensland governments must commit to a policy of not approving any new coal mines or any existing coal mine expansions.
4. The Australian government must commit to a rapid transition to 100% renewable electricity in Australia by 2035.
5. The Australian government must develop a transition plan and orderly phase out of Australia's coal fired power stations by 2035.
6. The Australian government must rapidly phase out fossil fuel subsidies.
7. The Australian and state governments must develop marine biodiversity and fisheries resilience plans to assist wherever possible species and ecosystems to adapt to the rapid changes already being experienced - changes which will accelerate in the coming decades. These must recognise the fundamental importance of marine protected area networks in building resilience in marine ecosystems to the impacts of climate change.

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