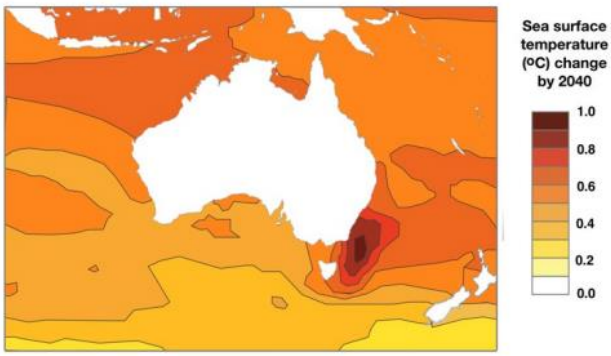
Climate impacts on the Northern Prawn Fishery

Climate change is already impacting northern Australian waters with consequences for marine ecosystems and the fisheries they support. Because of climate change, the region is experiencing, on average, rising sea levels, warmer ocean temperatures, and extreme weather events are becoming more severe.

Ocean warming

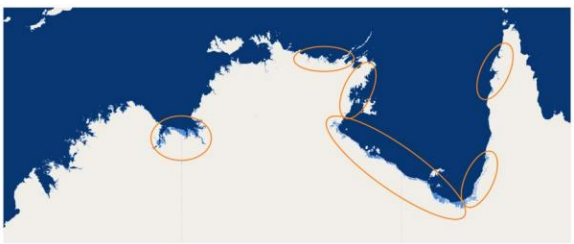
By 2040, annual average temperatures in Northern Australian oceans are expected to rise by 0.6-1.0°C. Marine heatwaves have become more frequent and intense, causing widespread damage to ecosystems and fish communities. Heatwave conditions are predicted to extend for more than 200 days of the year by 2040.



Water temperature change 2015-2040 (degrees Celsius per decade). Source: CSIRO

Rising Sea levels

The Northern Australia region is currently experiencing sea level rises of between 6-8mm per year. Models of future sea level rise across this region depict it to be a sea level rise hotspot with further rises of as much as 20cm predicted by 2030-2040.



Map of inundation under future sea level rise in Northern Australia coastline through to 2030-2040. Source: FRDC

Threatened vegetation

Mangrove and seagrass ecosystems are critical nurseries for banana prawn species and habitats for estuarine and coastal fish species. Mangroves in the Gulf of Carpentaria are extending inland, which may be in response of rapidly rising sea levels. Projected long-term sea-level increase presents a risk of dieback events and may leave mangroves more vulnerable to intensifying El Nino seasons. El Nino conditions feature high temperatures, low precipitation and drop in sea levels, which can impact seagrass beds and cause mangrove dieback from moisture stress. Depleted mangrove and seagrass habitats are likely to have negative impacts on prawn productivity.

Photographs of Mangrove dieback in four example locations across southern Gulf of Carpentaria from Northern Territory to Queensland in 2016. Source: CSIRO publishing

Australian Government
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Impact on Northern Prawn Fisheries

Changes occurring in northern Australian waters are affecting the abundance, distribution, seasonality (phenology), and condition of marine species. Because some species are more sensitive to the impacts of climate change than others, these responses vary significantly between species. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) have assessed the sensitivity of Commonwealth fish stocks to climate impacts and modelled stock responses to climate change through to 2040.

CSIRO stock projections for some key species

Banana Prawns

Moderately sensitive to climate change. Abundance projected to decline by 10 per cent by 2040, especially the gulf (annual variability due to rainfall influences).

Endeavour Prawns

Moderately sensitive to climate change. Abundance projected to decline by more than 20 per cent by 2040 especially in northern extent of the NPF (annual variability due to rainfall influences).

Tiger Prawns

Moderately sensitive to climate change. Abundance projected to decline variably by 10-20 per cent by 2040 (annual variability due to rainfall influences).

Sawfish

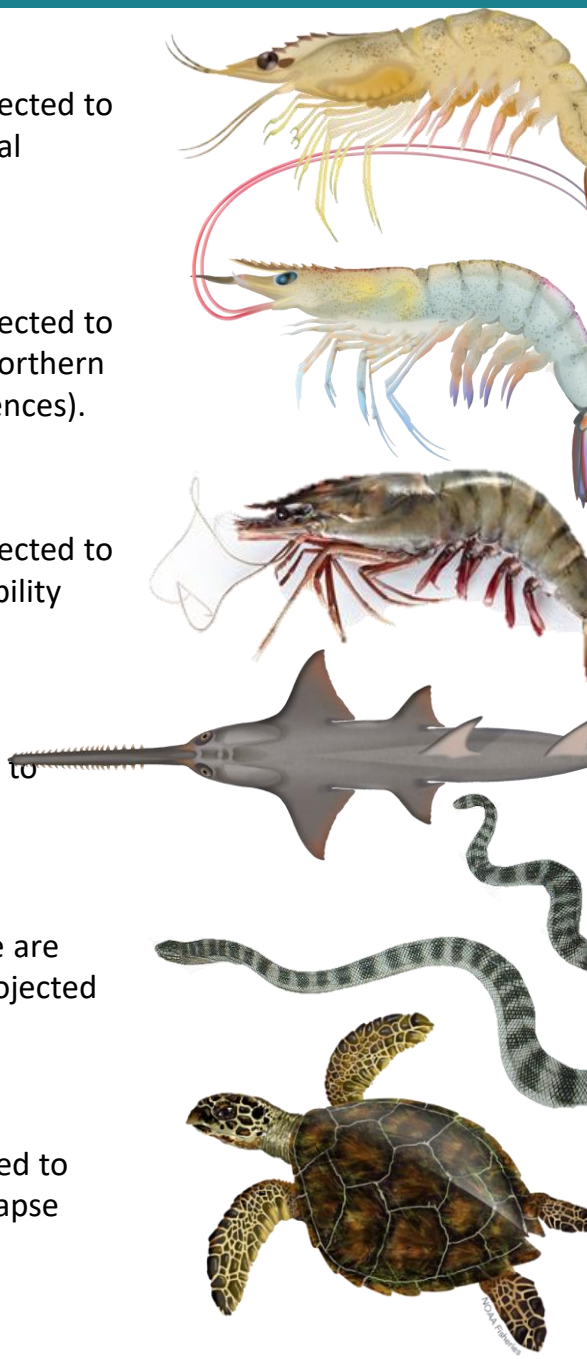
Highly sensitive to climate change. Abundance projected to decline by 10-25 per cent by 2040.

Sea Snake

Low sensitivity to climate change. Impacts on abundance are uncertain, with decline or incline of up to 30 per cent projected by 2040.

Turtles

Highly sensitive to climate change. Abundance is projected to decline by 10-30 per cent by 2040. Turtles could see collapse through egg inundation.



Further information on the stock projections produced by CSIRO can be found in the regional report for Northern Australia, the CSIRO report 'Decadal scale projection of changes in Australian fisheries stocks under