



factsheet



Climate Change - potential impacts and costs

Queensland

Snapshot

In 2010, Queensland's population reached 4.5 million with over 3 million people living in South-East Queensland (SEQ), Queensland's economic hub stretching from Noosa in the north to Coolangatta in the south and west to Toowoomba. By 2031, the population in SEQ is expected to reach around 4 million people, an increase of 1 million people over two decades.

The following information highlights potential impacts and costs to the state's industries, infrastructure, environment and people from climate change.

Coastal Zone

Queensland's highly developed and populated coastal communities are likely to be substantially affected by the impacts of climate change. Between 48,300 and 67,700 residential buildings, with a current value of between \$15.4 billion and \$20 billion may be at risk of inundation from a sea level rise of 1.1 metres. A 1.1 metre sea level rise will also put up to 4,700km of Queensland's roads, up to 570km of Queensland's railways and up to 1,440 commercial buildings at risk. These assets have an estimated value of up to \$12.9 billion, \$2.3 billion and \$15 billion respectively.

Global sea levels increased by 1.7 mm per year over the 20th century. Over the past 15 years, this trend has increased to approximately 3.2 mm per year. This rate varies significantly around Australia. Since the early 1990s, northern Australia has experienced increases of around 7.1 mm per year, while eastern Australia has experienced increases of around 2.0 to 3.3 mm per year.

In 2009, the Australian Government produced the report, [Climate Change Risks to Australia's Coasts](#), followed in 2011 by an update to this report entitled [Climate Change Risks to Coastal Buildings and Infrastructure](#). These reports provide information on sea level rise in Australia. For a visualisation of the potential sea level rise in Queensland, the Department has also produced a series of maps available at: www.ozcoasts.org.au.

Water Supply

Climate modelling for Queensland indicates that by 2050 rainfall is likely to be regionally variable across the state, with total rainfall decreasing in some regions while remaining stable in others. There is likely to be an increase in average temperature and evaporation rates across the entire state, suggesting that climate change may impact on regional water supplies with less surface water likely to be available for water catchments and dams.

Extreme Events

Tropical cyclones are highly variable in terms of their frequency and intensity. Projections indicate there may be an increase in the proportion of tropical cyclones in the more intense categories (3-5), however a decrease in the total number of cyclones. By 2030, projections show that there may be a 60 per cent increase in severe storm intensity and a 140 per cent increase by 2070. Projections also indicate that tropical cyclones are moving southward as sea surface temperatures increase. By 2070 cyclones may occur up to 300 km further south than they do currently.



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More intense tropical cyclones in Queensland could result in damage to infrastructure and a decline in agricultural production. Tropical Cyclone Larry, a category 4 cyclone in 2006 resulted in losses in excess of \$500 million. Costs associated with Tropical Cyclone Yasi in 2011, a category 5 cyclone at landfall, are still being assessed. Emergency Management Australia estimates that the Queensland floods and Cyclone Yasi will cost the Commonwealth Government alone at least \$5.6 billion.

Extreme rainfall intensity is also projected to increase, indicating that despite projections showing that total rainfall across most of Queensland will remain stable or decrease, the projected increase in rainfall intensity could result in more flooding events.

Heatwaves and Human Health

The population of Queensland is susceptible to heat-related deaths. Without mitigation, climate change is projected to cause an increase in the number of days in Brisbane above 35°C from 1 per year to up to 21 per year by 2100. With no mitigation, total temperature-related deaths may reach 5,878 by 2100 compared to 1,747 in a world with no human-induced climate change.

Dengue is a mosquito-borne infection that causes a severe flu-like illness and sometimes a potentially lethal complication called dengue haemorrhagic fever. Under moderately warmer and wetter climate conditions, dengue fever could move south and become established throughout all the coastal areas of Queensland.

Natural Environments

The Great Barrier Reef Marine Park contributed an estimated \$5.4 billion to Australia's economy in 2006-07, largely through a thriving tourism industry and commercial and recreational fishing. It was also responsible for providing full time employment for approximately 53,800 people in Queensland.

Sea surface temperatures across the Great Barrier Reef have increased by 0.4 degrees in the past 30 years and increasing atmospheric carbon dioxide has also resulted in an increase in ocean acidity. These trends are expected to continue with climate change.

As a result of this prolonged increase in sea surface temperatures, the Great Barrier Reef has recently experienced a number of coral bleaching events. The most severe mass bleaching events spanned the summer

seasons of 1997-98 and 2001-02, with over 50 per cent of reefs affected by bleaching, resulting in lasting damage to an estimated 5 per cent of reefs.

Rising sea surface temperatures are projected to result in more frequent and widespread coral bleaching events, where an increase of 2°C is projected to result in the bleaching of 97 per cent of coral. This is likely to diminish the ability of corals to recover and adapt, seriously threatening the Great Barrier Reef ecosystems.

Cloud forests and other highland rainforest types are predicted to become greatly reduced in area and more fragmented across the Wet Tropics of Queensland, even under a moderate climate scenario of 1°C temperature increase and a small reduction in rainfall. A 2°C rise in average temperatures could force all endemic (i.e. unique to the region) Australian tropical rainforest vertebrates (such as ringtail possums, tree kangaroos and many insects) to extinction.

Agriculture

Agriculture plays an important role in the Queensland economy. In 2009-10, the state's agriculture production was valued at \$9.2 billion. Future productivity growth may be affected by climate change in the medium to long term through higher temperatures, reduced rainfall and extreme weather events. ABARE modelling (2007) estimates the following declines in agricultural production for Queensland compared to a 'business as usual' scenario.

	Approximate decline in production by 2030 (%)	Approximate decline in production by 2050 (%)
Beef	19	33
Sugar	11	17

Adaptation

Given the state's high vulnerability to projected climate change, it is important that appropriate actions are taken by government, businesses, communities and individuals to ensure effective adaptation is possible in a changing environment.

The Australian Government is co-funding a \$14 million, three year study by CSIRO to investigate the impacts of climate change on SEQ.

More information

For details on what the Australian Government is doing to prepare for the impacts of climate change, visit www.climatechange.gov.au

See what the Queensland Government is doing at: www.climatechange.qld.gov.au

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