



What changes are likely?

Increasing ocean acidity



- Numbers and distribution of fish and other animals will continue to change.
- Changes in coral cover and diversity.
- Healthy tourism and fishing sites may become harder to find.
- Conditions will suit different stock breeds and crops.
- Different weeds and diseases will become issues.
- The growth rates and nutritional content of grasses and crops may change.

Increased carbon dioxide in the atmosphere



- Increased shut-down of industry and infrastructure (airports, seaports, rail lines) due to power failure, over-heated industrial cooling water, workplace health and safety.
- Loss of crops and livestock from heat stress.
- Damage to tourism values of natural systems from heat stress (e.g., coral bleaching).

Rainfall will continue to be driven by natural variability



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More frequent very hot days



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Tropical cyclones will be more intense but less frequent



- Perception by visitors of increased risk to personal safety.
- Increased failure and sedimentation of farm dams.
- Infrastructure and services will be damaged or interrupted more frequently.
- Crops and livestock will be lost to heatwaves and cyclones and flooding.
- The reef will be damaged by freshwater pulses during floods and cyclones.
- Fish breeding patterns may be affected by changes to mangroves and estuaries following sea level rise and flooding.
- Coastal agriculture will be affected by increased river flooding, the upstream extension of tides, and saltwater contamination of freshwater wetlands and groundwater.
- Freshwater will be less reliable due to increased losses from irrigation channels and dams.

More heavy rainfall events



Sea levels will continue to rise



Increased evaporation



What can be done?

Plan

- Use information about locations vulnerable to sea level rise, storm tide inundation, flooding from heavy rainfall and coastal erosion to plan buildings and infrastructure.
- Include the economic value of services provided by natural systems.
- Integrate new production and processing infrastructure, supply chain and distribution networks. Reduce reliance on supplies and markets external to the region.
- Plan to facilitate new fish breeding areas, for example by helping to establish mangroves upstream of their current locations.

Research

- Improve information about the climatic suitability of current and alternative crops, breeds and industries.
- Evaluate effectiveness, efficiency and economic feasibility of sun-shading structures for coral and vulnerable agricultural systems.
- Seek complementarity between industries (e.g., aquaculture and heated industrial water)
- Develop clear understanding of the areas threatened by sea level rise, storm surge, flash flooding, excessive heat and bushfires.
- Monitor impacts of climate change on industry practices.
- Develop practical understanding of management for whole-system health.
- Evaluate different options for reducing evaporative losses from dams and irrigation channels.
- Evaluate ecological impacts of options such as tidal gates on coastal streams.

Implement

- Work together across community sectors to promote community-based adaptation to climate change.
- Develop backup water and power supplies.
- Engage community support networks to manage potential social and cultural impacts of transition to new industries.
- Promote resilience by increasing soil retention, water efficiency, water re-use and recycling, reduced fertiliser and other inputs.
- Anticipate more frequent need for early harvest and other cyclone plans.
- Create elevated refuges and increase shading for livestock.

Educate

- Increase awareness of the impacts of climate change on regional industries.
- Promote understanding of the need to make changes (adapt) in response to climate change.
- Communicate the opportunities to get involved in planning for adaptation.
- Increase awareness of opportunities to participate in emissions abatement schemes.

Sustainable industries in a changing climate

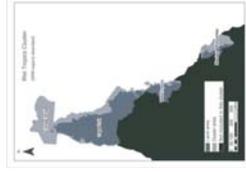
Adaptation to the changes brought about by climate change will involve all of society. The type and extent of action required will depend on how much we are able to reduce emissions of global greenhouse gases. Some adaptation actions may require relatively small, continuous improvements in current practices, whereas others will involve fundamental changes to our ways of doing things, including what we do and where we do it.

Industries in the Wet Tropics cluster region are characterised by a high level of dependence on natural resources and will therefore be particularly vulnerable to climate changes. Different industries will need different specific strategies to adapt to the effects of climate change. Across all industries, developing and implementing suitable adaptation strategies will require strong links between researchers, policy-makers, NRM groups, industry bodies and farmers, operators and other on-ground managers. Industry-led discussions will help ensure that adaptation pathways are based on realistic understanding of the ways industries work, opportunities for change, and the capacity of the industry and individual businesses to change

Additional information

Hilbert, D. et al. (2014) Climate change issues and impacts in the Wet Tropics NRM region. <https://terranova.org.au/repository/climate-change-issues-and-impacts-in-the-wet-tropics-nrm-cluster-region-1>

Moran C. et al. Eds. (2015) Adaptation pathways and opportunities in the Wet Tropics NRM cluster region. <https://terranova.org.au/repository/adaptation-pathways-and-opportunities-for-the-wet-tropics-nrm-cluster-region-volume-1-introduction-biodiversity-and-ecosystem-services>



What's happening in your region

Projected changes in climate (and degree of confidence)



Substantial increases in average, maximum and minimum temperatures
Very high confidence



Substantial increases in the temperature, frequency and duration of hot days
Very high confidence



Average sea level and height of extreme sea-level events will continue to rise
Very high confidence



Increases in evapotranspiration in all seasons
High confidence



Increased intensity of extreme rainfall
High confidence



Less frequent but more intense tropical cyclones
Medium confidence



Changes to rainfall are possible but unclear
Low confidence

http://www.climatechangeinaustralia.gov.au/media/cia/2.1.5/cms_page_media/172/WET_TROPICS_CLUSTER_REPORT_1.pdf
The degree of confidence in each projection is determined by considering the number of models that project a similar long-term trend, together with how well we understand the mechanisms underlying the models. If the evidence is robust and there is a high level of agreement among models about trend in that climate variable, scientists have a high level of confidence in the projection.

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