WET TROPICS NRM CLUSTER

Fresh water and climate change

CLIMATE CHANGE IN AUSTRALIA — IMPACTS & ADAPTATION INFORMATION FOR AUSTRALIA'S NRM REGIONS

What changes are likely?

Rainfall will continue to be driven by natural variability

- Rainfall patterns will be less predictable.

Temperatures will continue to increase

More frequent very hot days

Increased evaporation

- There will be more water evaporating from dams, irrigation channels and crops.
- The temperature of stored water may become too warm for use in industrial processes.

Sea levels will continue to rise

Tropical cyclones will be more intense but less frequent

- Sea water may contaminate groundwater, wetlands, lakes and dams in coastal areas.
- Tides will bring salt water further upstream, affecting agriculture and infrastructure on coastal floodplains.
- Damage to pipes, pumps and other infrastructure will interrupt water distribution.

More heavy rainfall events

- There will be increased runoff of soil and pollutants into waterways, dams and wetlands.
- Low-lying infrastructure and facilities such as sewerage plants and waste dumps are likely to be flooded, increasing contamination of waterways.
- Poorly-designed dams are likely to fail, exacerbating downstream flooding and increasing infrastructure costs.

What can be done?

Plan

- Develop additional water recycling and re-use programs.
- Plan for impacts of unpredictable rainfall on hydro-power generation.
- Use information about vulnerability to sea level rise, storm tide and the potential for contamination during floods to plan water storage and distribution infrastructure.

Research

- Evaluate different options for reducing evaporative losses from dams and irrigation channels.
- Evaluate ecological, social and cultural impacts of options such as desalination, underground water storage and tidal gates on coastal streams.
- Research salt-tolerant crops for coastal lowlands and new industries that can use warmer water.

Implement

- Promote rainwater storage and power generation by households or local networks.
- Trial alternative management practices, breeds and crops to improve water-use efficiency in agriculture.
- Improve dam design to reduce losses to evaporation and increase capacity to withstand heavy rainfall events.
- Develop backup water and power supplies.
- Substantially improve soil erosion and runoff control using extensive revegetation and reduce the use of fertilisers and other pollutants.
- Elevate pumps, pipes and other water distribution infrastructure in vulnerable areas.

Educate

- Increase understanding of the uncertainty around water availability and promote water-use efficiency.

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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.

The Wet Tropics NRM cluster region (shown in map) generally enjoys access to sufficient, good quality water, although rainfall can be extremely seasonal. It's particularly difficult to understand what will happen with rainfall in this region as the climate continues to change, but it is possible to say that rainfall will continue to vary between both seasons and years. Together with other changes (e.g., sea level rise, increased evaporation), the availability of water for domestic, industrial and agricultural uses is likely to decrease over time. This will be exacerbated by increased population growth. Compared with other regions of Australia and the world, this region will maintain good water supply, at least for the early part of the century, making it even more attractive to new residents and businesses.

Developing and implementing suitable adaptation strategies will require strong links between residents, researchers, policy-makers, NRM groups, industry bodies, emergency services, farmers and other on-ground managers. Regionally-based discussions will help ensure that adaptation pathways are based on realistic understanding of the issues around water supply and use, opportunities for change, and the capacity of communities in the region 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/c-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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