

## for NORTHERN AUSTRALIA

Climate change will have significant economic, social and environmental impacts in Northern Australia over the coming decades and into the future.

The most recent climate change projections for **Northern Australia** indicate that:



**Temperatures** will continue to increase, and there will be more hot days and warm spells.



**Rainfall** will change, and extreme rainfall events will be more intense.



**Mean sea level** will continue to rise, and the height of extreme sea-level events will increase.



**Tropical cyclones** will be more intense, but there will be fewer of them.

For more information about Northern Australia's future climate, please visit [www.climatechangeinaustralia.gov.au](http://www.climatechangeinaustralia.gov.au)

To make the best decisions about developing Northern Australia we need the best possible information about what the future climate might look like.

This information will help us to better identify and prepare for impacts on:

- roads, dams and other infrastructure
- natural resources and the environment
- agriculture
- water resources
- health and wellbeing of the population.

However, the climate of the past is no longer a reliable indicator of the climate of the future.

The **Earth Systems and Climate Change Hub** brings together Australia's leading Earth systems and climate change research institutions. Our work aims to improve our understanding of past and current climate and how the climate may change in the future, and to build the utility of climate change information.

The more we know about how our climate works and how it will change, the better placed we are for making robust decisions to manage future risk and take advantage of opportunities that may arise.

To find out more about our research, or to discuss your climate change information requirements, please contact:

**Dr Geoff Gooley**  
ESCC Hub Programme Manager  
03 9239 4462  
[geoff.gooley@csiro.au](mailto:geoff.gooley@csiro.au)

**Ms Mandy Hopkins**  
ESCC Hub Programme Coordinator  
03 9239 4649  
[mandy.hopkins@csiro.au](mailto:mandy.hopkins@csiro.au)

Our research will help **Northern Australia** to identify risks and opportunities resulting from our changing climate, and to plan and prepare for the future.



### Rainfall

Changes to the monsoon because of climate change could affect the **timing and amount of rainfall** Northern Australia receives. Hub researchers are using climate models to identify the nature and extent of these changes. The outcomes of this work will be important for informing development and planning decisions in Northern Australia.



### Water

Hub researchers are improving modelling that simulates how changes in climate and land will affect Australia's **hydroclimates and water resources** into the future. The development of consistent, current state-of-science projections for an extended range of hydroclimate measures will, among other things, fill the knowledge gaps around Northern Australia's future surface water.



### Tropical cyclones

Tropical cyclones are projected to be less frequent but more intense in the future. Hub researchers are investigating the mechanisms controlling the **formation and intensity of tropical cyclones**, which will allow for the development of more detailed tropical cyclone projections for Northern Australia.



### Thunderstorms

Hub researchers are examining the intensity, distribution and frequency of **extreme events associated with thunderstorms**, such as extreme rainfall, lightning, hail and severe wind events, to develop projections for direct use in planning and adaptation. In Northern Australia, this may translate into revised design standards and planning regulations.



### Sea-level rise

Hub-supported research provided the **sea-level rise data** for the CoastAdapt tool. Coastal councils in Northern Australia can use this tool for council-specific projections for mean sea-level rise and allowances (the height that coastal defences need to be raised to provide the same level of protection as they do today). See [www.coastadapt.com.au](http://www.coastadapt.com.au).



### Coastal hazards

New **storm surge and wave projections**, and **updated projections of sea-level rise**, will provide a better picture of future coastal erosion and inundation, and the consequent impacts on the natural and built environment. These datasets, being developed by Hub researchers, will support coastal planning and environmental protection in Northern Australia, as well as informing investment and development decisions.



### Carbon

Hub researchers are exploring potential for **carbon mitigation** in the Northern Territory by investigating how land surface changes and fire regimes interact with the region's carbon cycle. This work will provide important information for carbon farming initiatives and other development opportunities in Northern Australia.



### Fire weather

A new fire weather dataset developed by the Hub helps to determine **return periods for fire weather** and shows **how rare fire weather conditions are for a given region**. The dataset, delivered to the Bureau of Meteorology, provides regional-scale information that will help guide bushfire management procedures in Northern Australia and inform emergency services planning.



### Climate projections

Climate projections of **temperature, rainfall, extremes** and more are our best tool for planning for climate change. The Hub is enhancing the understanding, uptake and application of our current climate projections, as well as planning for improved projections in future.