



Tropical cyclones in the Australian region: past, present and future

Tuesday 20 August 2019, 2:30-3:30 pm (AEST)

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Tropical cyclones are intense weather systems that occur in tropical regions of the world, including around northern Australia. They are deep low pressure systems with extreme winds, rainfall and destructive waves that cause coastal hazards such as storm surges, flooding and coastal erosion.

On average, about 10 tropical cyclones form or move into the Australian region each year, with about four of these systems crossing the Australian coast. However, tropical cyclone frequency in the Australian region varies considerably from year to year due to the influence of naturally-occurring climate drivers. For example, fewer cyclones generally occur during El Niño years than in La Niña years.

Tropical cyclones are among the costliest natural disasters to regularly impact Australia. For instance, insured losses from Cyclone Debbie in Queensland exceeded \$1 billion in 2017, making it the most expensive cyclone in the state's history. Understanding extreme weather hazards such as tropical cyclones and how they may change as the climate continues to warm is valuable for increasing Australia's preparedness and resilience to such events.

Researchers in the Earth Systems and Climate Change Hub are working on ways to develop more detailed and regionally specific tropical cyclone projections to help us plan for and deal with future climate change with greater confidence, and to improve the accuracy of projections of future tropical cyclone frequency and intensity. This research includes a new method to determine tropical cyclone severity in climate models, and an investigation into the effects of climate change on specific cyclone-related hazards such as extreme winds, rainfall and storm surges.

In this webinar, Tony Rafter from the CSIRO will outline some of the recent research performed through the Earth Systems and Climate Change Hub, including a synthesis of our understanding of historical tropical cyclone behaviour and recent trends in the Australian region. He will also demonstrate how an interactive web tool developed through the Hub – the [Tropical Cyclone Projections Portal](#) – is helping us understand and communicate potential changes in tropical cyclone frequency and location in future climates.



Tony Rafter is a Senior Experimental Scientist in the Extreme Weather and Climate Team within the CSIRO Climate Science Centre, and a PhD candidate at the ARC Centre of Excellence for Climate Extremes. He is a contributor to the Earth Systems and Climate Change Hub *Project 5.5 Extreme weather hazards in a changing climate*, and led the development of the Tropical Cyclone Projections Portal for *Project 2.8 Extreme weather projections*. Tony has nearly 15 years of experience in developing climate projections for extreme weather phenomena such as extreme rainfall and tropical cyclones, using both global and regional climate modelling techniques.

The Earth Systems and Climate Change Hub science webinars are open to anyone interested in finding out more about the Hub's research (noting that the content may assume some understanding of climate change science and the fields being discussed).