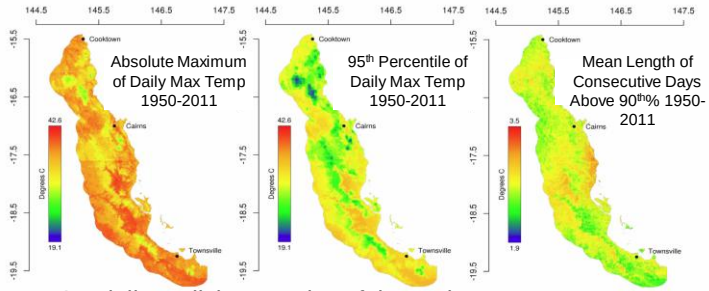
NERP Tropical Ecosystems Hub Project Factsheet

Climate change and the impacts of extreme climatic events on Australia's Wet Tropics biodiversity

Project leader: Dr Justin Welbergen (JCU)

Project summary

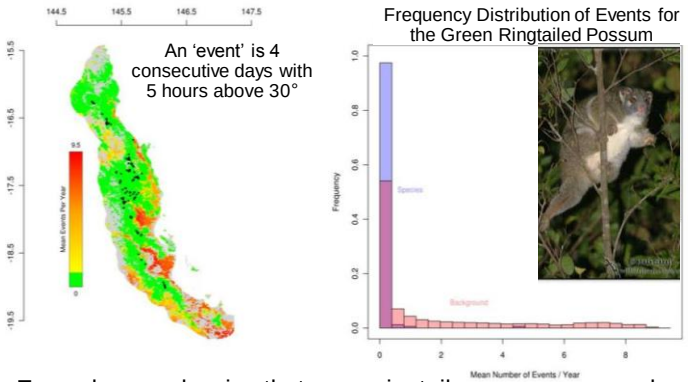
The project will investigate the exposure and sensitivity of Wet Tropics plants and animals to extreme climatic events, such as heat waves, fires, flooding rain and cyclones. This information will be used to assess and map the vulnerability of species in the Wet Tropics Bioregion and the impact of current and future climatic events on biodiversity in the region. The information gathered in the Wet Tropics can potentially be applied to other regions in Australia and elsewhere to predict and mitigate the impacts of extreme climatic events on biodiversity.



Spatially explicit examples of thermal extremes exposure at the Wet Tropics landscape scale.

Why this research is needed

Understanding the ecological responses to extreme climatic events is paramount for predicting the impacts of climate change on natural ecosystems and for preserving the unique plants and animals of the Wet Tropics ecosystems in this century and beyond.



Example map showing that green ringtail possums occur only where extreme temperature events that are critical for the species are absent (Krockenberger *et al* 2011).

Research-user focus

The project will deliver outcomes that are useful to a range of stakeholder organisations, including state government agencies, the tourism sector and conservation planners/managers. Research-user organisations identified include the Wet Tropics Management Authority, Queensland Department of Environment and Heritage Protection and Terrain NRM.

Outcomes

The work carried out in this project will provide a framework for assessing the impacts of extreme climatic events on natural systems of the Wet Tropics and elsewhere.

Outcomes will include:

- Accurate high resolution maps of the exposure to temperature extremes already being experienced.
- Accurate estimates of the sensitivities of organisms to temperature extremes.
- Identification of areas where biodiversity is currently most vulnerable to temperature extremes ('thermal hotspots').
- Identification of areas where biodiversity is least vulnerable to temperature extremes in the future ('thermal refugia').
- A list of biodiversity values particularly at risk from extreme events.
- A generalised analytical toolkit for assessing vulnerability to extreme climatic events.

Research Provider:

JAMES COOK UNIVERSITY AUSTRALIA

CENTRE FOR Tropical Biodiversity & Climate Change

Find this project at www.nerptropical.edu.au
Theme 2: Understanding ecosystem function and cumulative pressures
Program 7: Threats to rainforest health
Project: 7.3

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National Environmental Research Program

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Department of Sustainability, Environment, Water, Population and Communities

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