



# Invasive species and climate change



## What changes are likely?

Temperatures will continue to increase



- Most invasive species will persist in the region.
- Some other species may become invasive.
- Growth rates and flowering and fruiting patterns of invasive species may change.
- New (or 'novel') natural communities will form from new combinations of native and invasive species.
- Different invasive species will become priorities as different crops and stock breeds are used.

Rainfall will continue to be driven by natural variability



Increased carbon dioxide in the atmosphere



More frequent very hot days



- Changes in fire patterns will affect the management of invasive species.

Increased evaporation



Sea levels will continue to rise



Tropical cyclones will be more intense but less frequent



More heavy rainfall events



## What can be done?

### Plan

- Use information about how scientists expect climate and habitats to change to target management of invasive species in areas that will be suitable habitat in the future.
- Use information about where scientists expect different invasive species to occur in future climate conditions.
- Work with Indigenous and non-Indigenous communities to gain insight into potential social and cultural impacts of changes in management of invasive species.
- Plan for an increased need to manage invasive species following cyclones, fires and floods.

### Research

- Monitor changing impacts of invasive species on ecological processes
- Work with primary producers to research invasive species that may affect new agricultural industries, products or practices.
- Monitor changes in fire patterns and disturbance from cyclones, flooding and storm surge and associated changes in invasive species.

### Implement

- Monitor responses of invasive species to climate change
- Conduct experimental management using fire and other tools, incorporating local and Traditional knowledge.
- Work together with researchers to monitor the actual responses of invasive species to changed climate conditions.
- Adapt management of invasive species in natural areas based on new information about impacts on natural processes such as plant regeneration or water flow.

### Educate

- Increase community awareness of the potential for new invasive species in the region, including those that affect agricultural production and natural areas.
- Improve understanding of the positive roles of some invasive species (e.g., reduced soil erosion, protection of human settlements from cyclonic winds).

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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.

Management of invasive species is already prioritised on the basis of their relative impacts on production, the environment and social or cultural values. In a changing climate, invasive species may behave differently to how they do in current climates, and new invasive species may come in to the region. Also, different crops, breeds or production systems and novel ecosystems formed of different combinations of native species, may require changes to our prioritisation of invasive species.

The adaptation of strategies for invasive species management will require strong links between researchers, policy-makers, NRM groups, industry bodies, Traditional Owners and on-ground managers.

## Additional information

Scott, J.K. et al. (2014) AdaptNRM Weeds and climate change: supporting weed management adaptation. [http://adaptnrm.csiro.au/wp-content/uploads/2014/08/AdaptNRM\\_M2\\_WeedsTechGuide\\_51\\_LR.pdf](http://adaptnrm.csiro.au/wp-content/uploads/2014/08/AdaptNRM_M2_WeedsTechGuide_51_LR.pdf)

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](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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# REEF CATCHMENTS

