RANGELANDS
NRM CLUSTER

CLIMATE CHANGE IN AUSTRALIA

IMPACTS & ADAPTATION
INFORMATION
FOR AUSTRALIA'S NRM REGIONS

Rangeland Climate Change Information

The Rangeland Cluster

The approach….

Rangelands North – Key Messages

KEY MESSAGES

Average temperatures will continue to increase in all seasons (***very high confidence***).

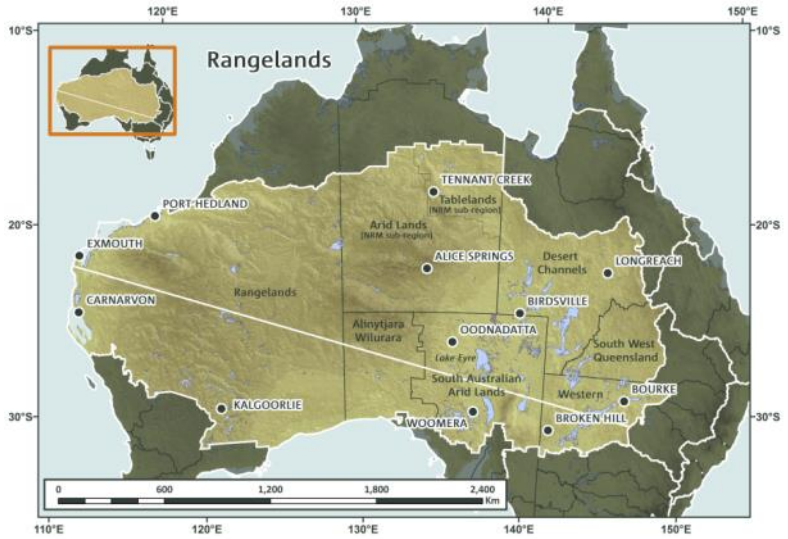
More hot days and warm spells are projected with ***very high confidence***. Fewer frosts are projected with ***high confidence***.

Changes to rainfall are possible but **unclear**.

Increased intensity of extreme rainfall events is projected, with ***high confidence***.

Mean sea level will continue to rise and height of extreme sea-level events will also increase (***very high confidence***).

On annual and decadal basis, natural variability in the climate system can act to either mask or enhance any long-term human induced trend, particularly in the next 20 years and for rainfall.



Projections – what the models told the climate scientists in CSIRO

Confidence...

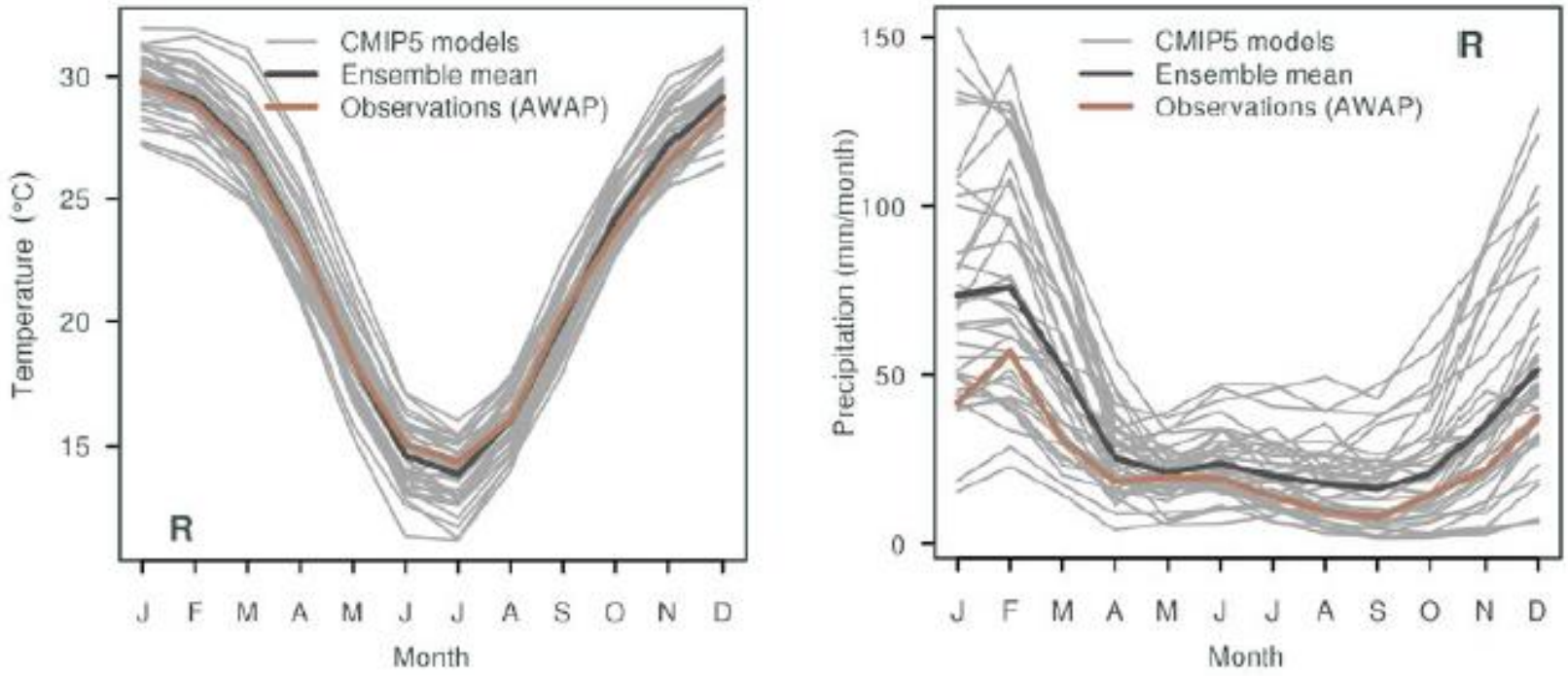
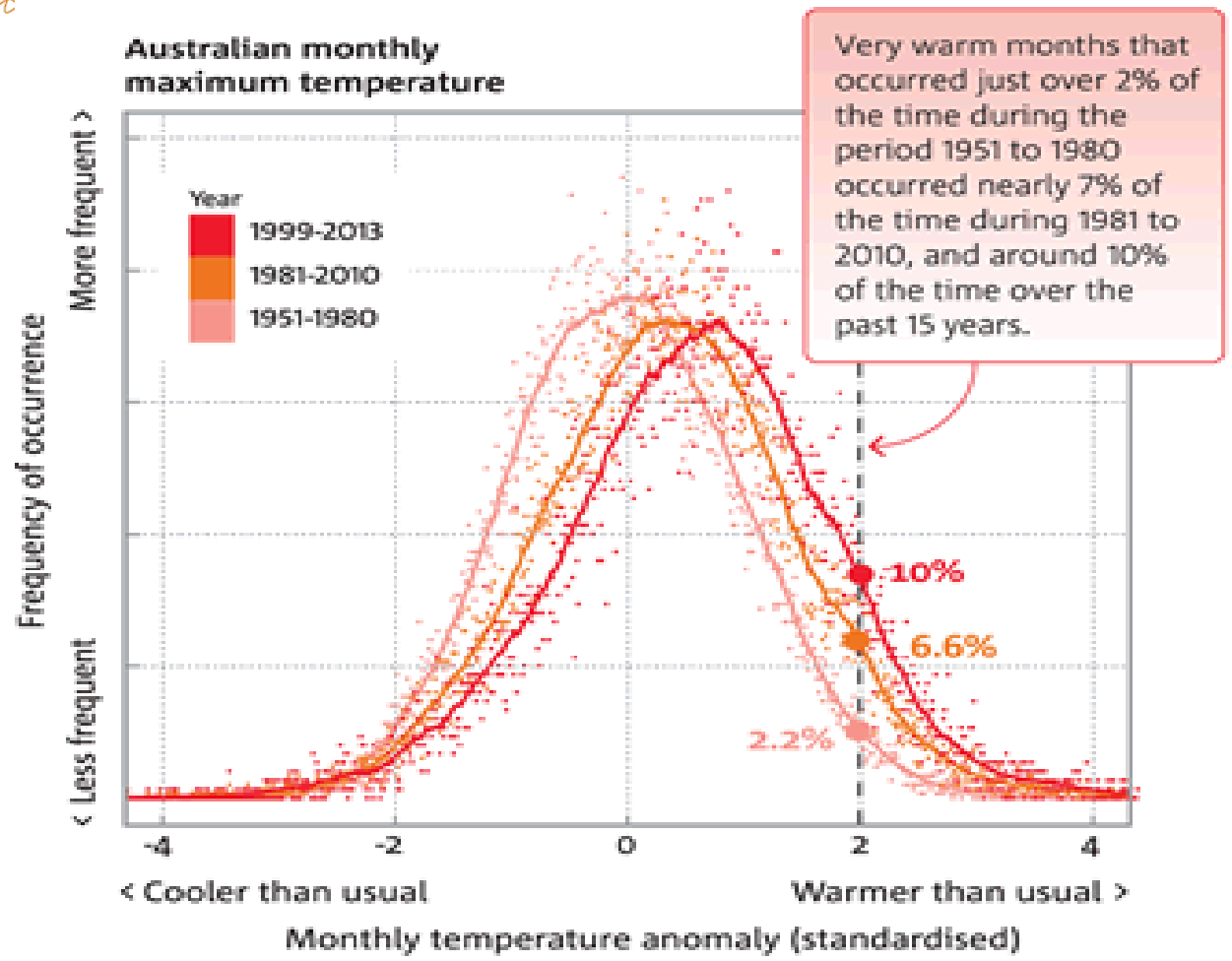


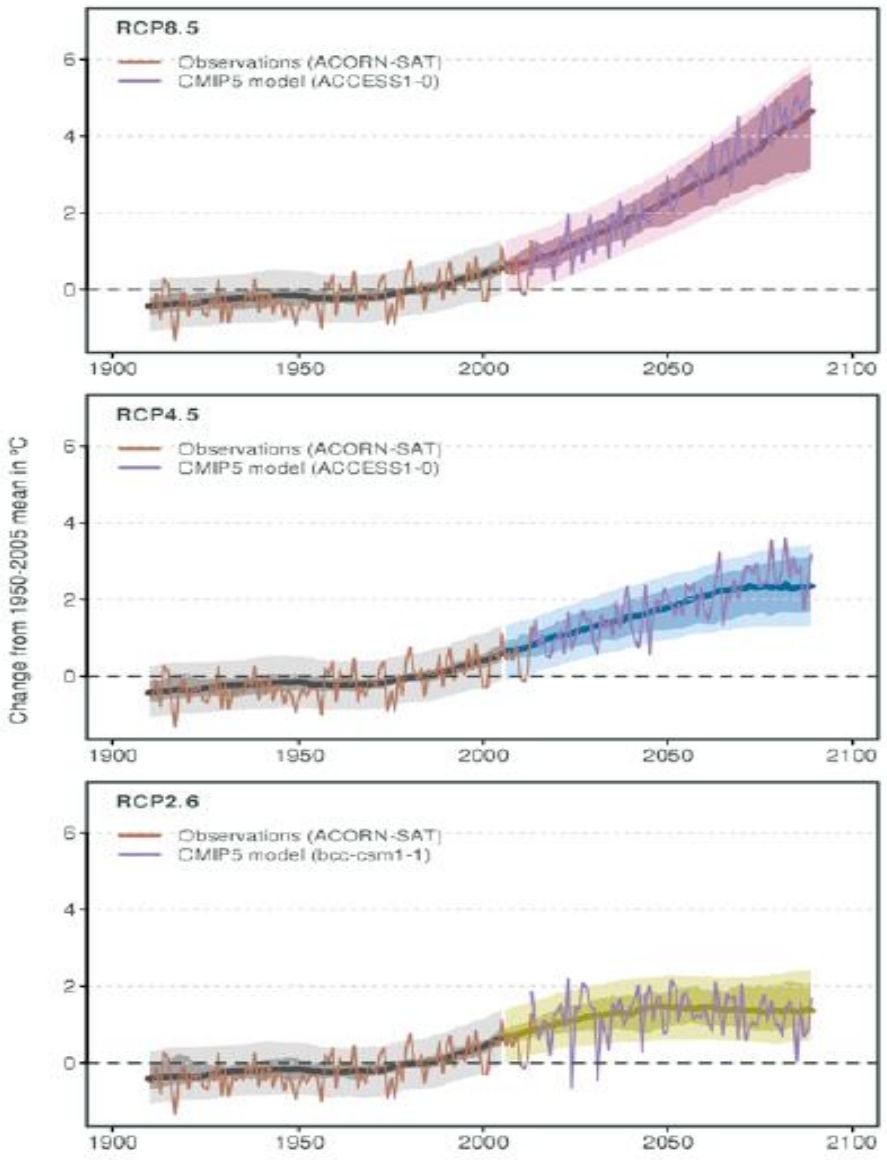
FIGURE 3.1: THE ANNUAL CYCLE OF TEMPERATURE (LEFT PANEL) AND RAINFALL (RIGHT PANEL) AVERAGED OVER RANGELANDS SIMULATED BY CMIP5 MODELS (GREY LINES) WITH MODEL ENSEMBLE MEAN (BLACK LINE) AND OBSERVED CLIMATOLOGY BASED ON AWAP (BROWN LINES) FOR THE BASELINE PERIOD 1986–2005.

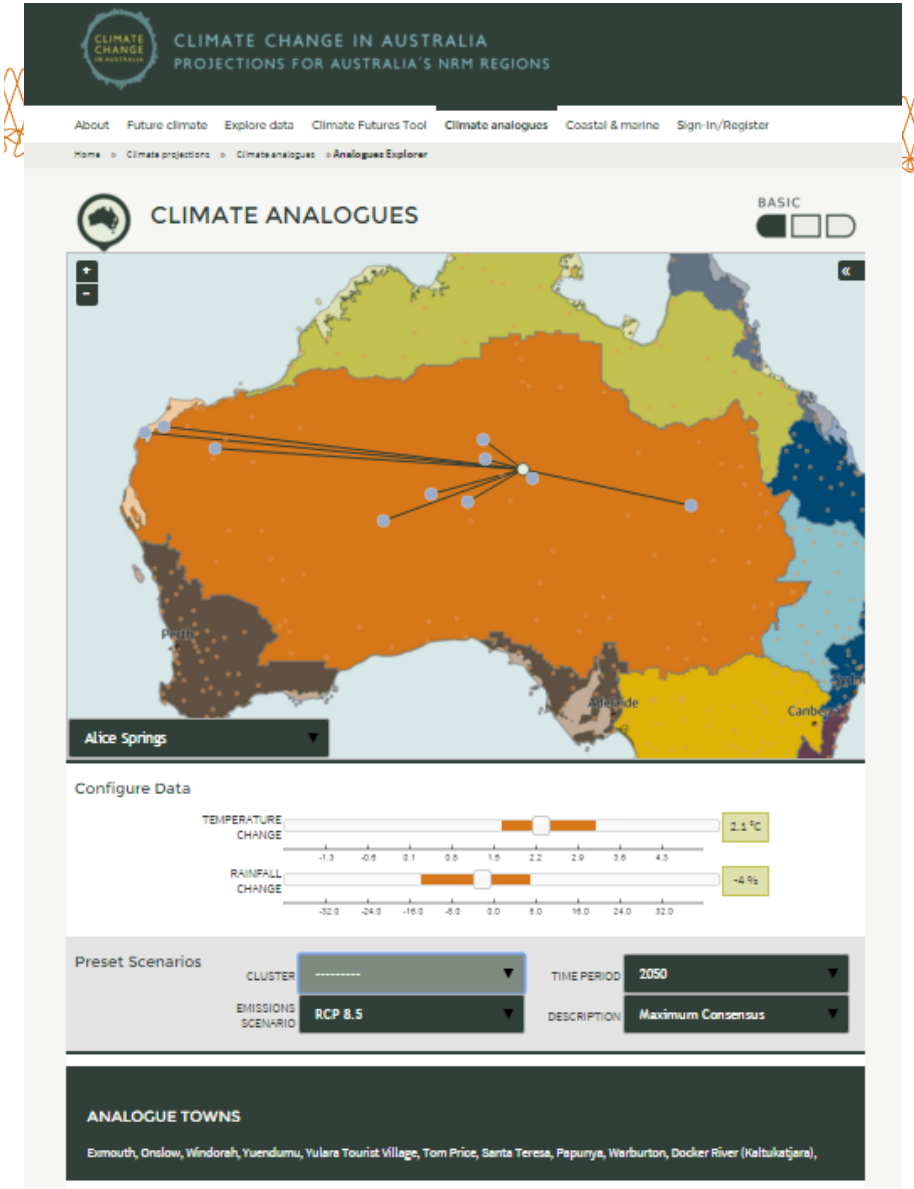
Some like it hot!



Climate Change in Australia Website

Where there is a lot of information! Maps, graphs, diagrams and analogues galore





Rangeland Specific Reports

- Rainfall variability and pasture growth
- Meteorological drought
- Heatwaves
- Remotely-sensed ground cover
- Rangeland fire
- Rangeland dust
- Pastoral production
- *Cenchrus ciliaris* (buffel grass) and climate change
- Climate change impacts and adaptations, Rangelands Cluster – Invasive animals
- Rangelands Cluster aquatic refugia
- Climate change impacts and adaptations, Rangelands Cluster - Native species
- Information and guidance to support climate change adaptation

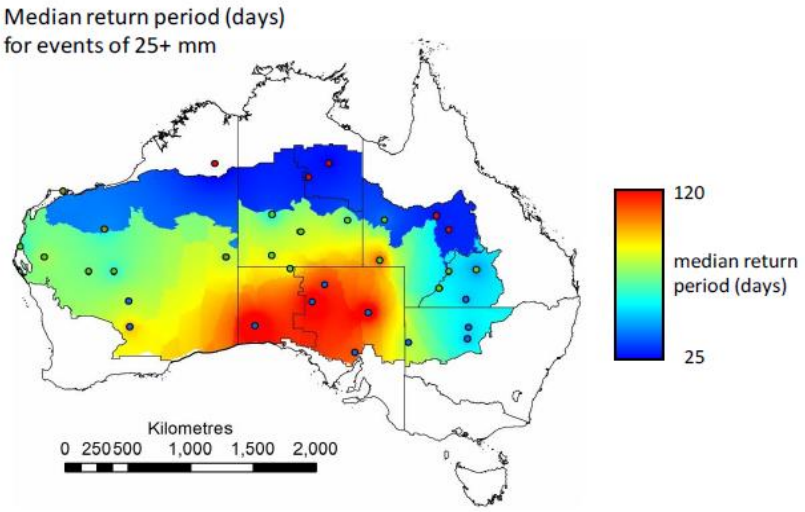








Median Return Periods for 25 and 50mm events



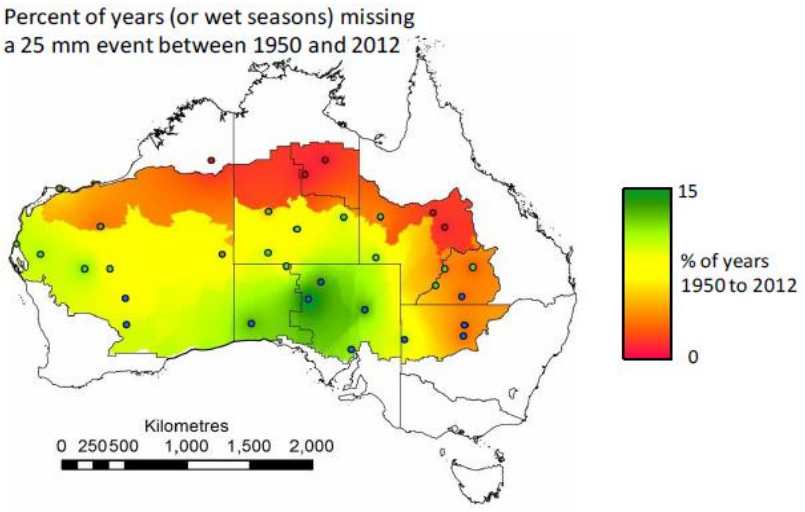
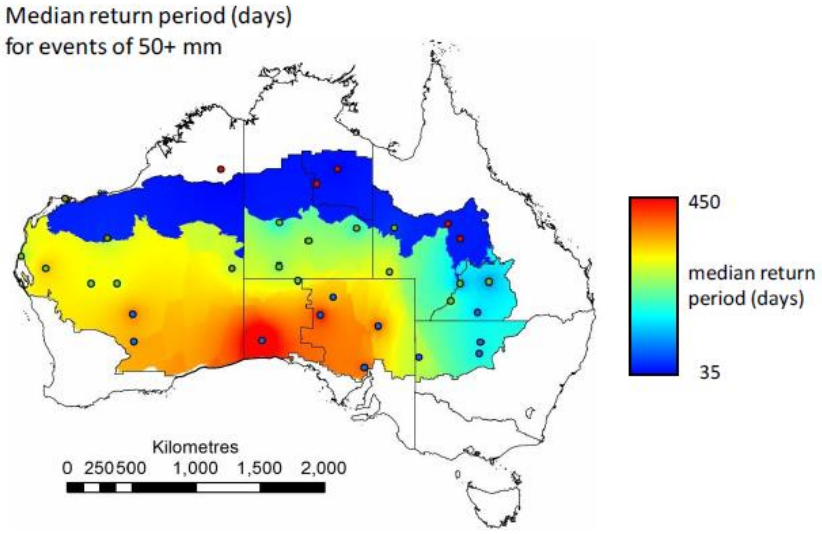


Figure 6. Top: interpolated median return period of 25+ mm rainfall events over continuously wet days based on the continuous rainfall record between 1950 and 2012 or summer (wet-season) rainfall for the northern part of the Rangelands cluster. Bottom: percentage of years between 1950 and 2012 not having a 25+ mm event in the calendar year (or summer wet season for the northern part of the Rangelands cluster region).



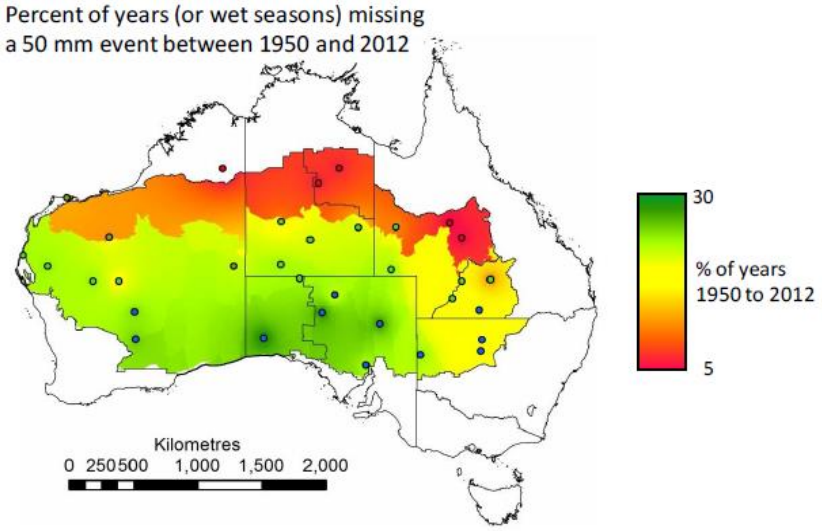
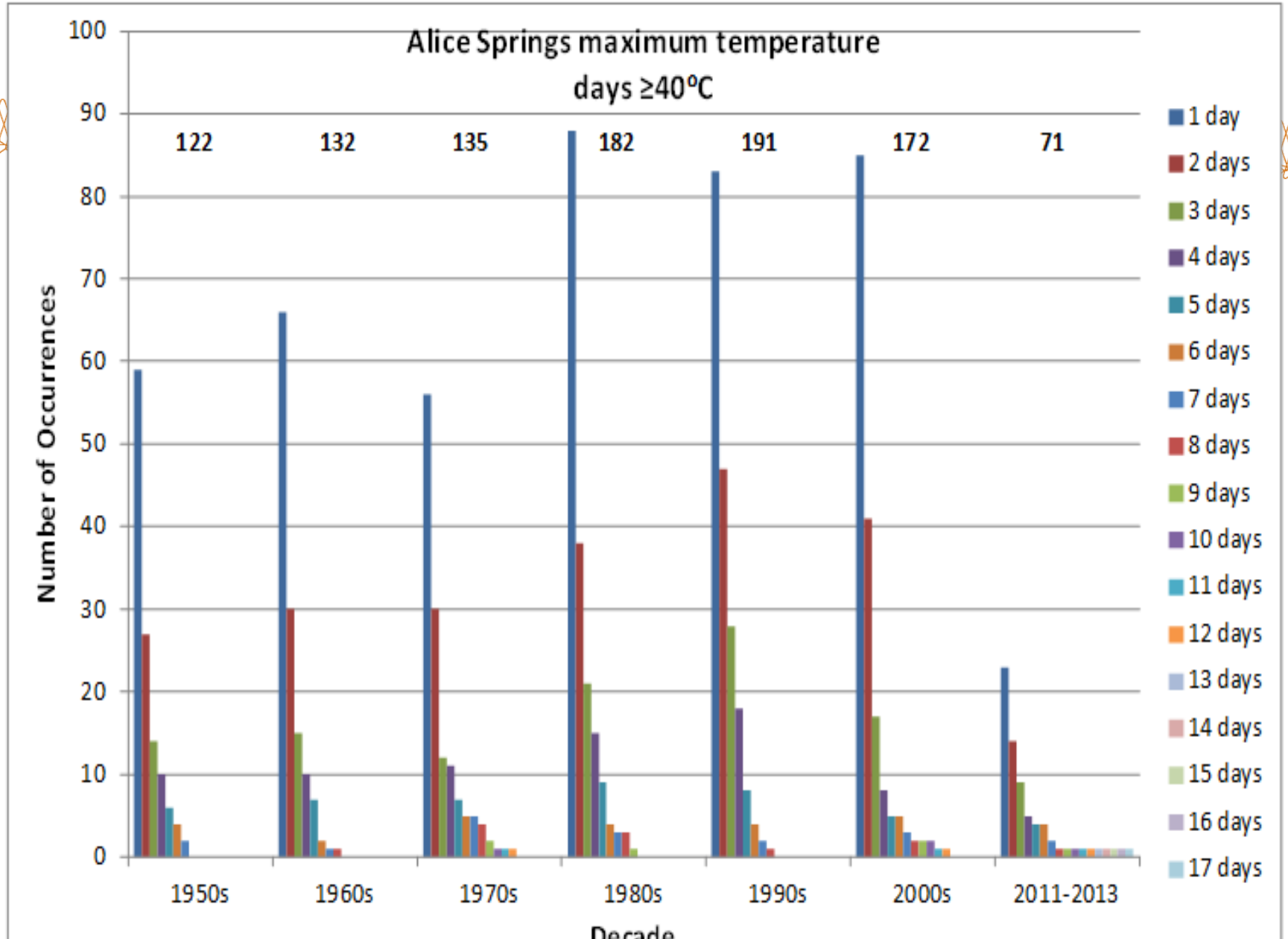


Figure 7. Top: interpolated median return period of 50+ mm rainfall events over continuously wet days based on the continuous rainfall record between 1950 and 2012 or summer (wet-season) rainfall for the northern part of the Rangelands cluster. Bottom: percentage of years between 1950 and 2012 not having a 50+ mm event in the calendar year (or summer wet season for the northern part of the Rangelands cluster region).

Temperature Extremes and Heatwaves



Resources

Rangeland Cluster Project Reports
http://www.climatechangeinaustralia.gov.au/en/impacts-and-adaptation/rangelands/

Rangeland Projections Brochure
http://www.climatechangeinaustralia.gov.au/media/ccia/2.1.5/cms_page_media/176/RANGELANDS_BROCHURE.pdf

Rangeland Projections Report
http://www.climatechangeinaustralia.gov.au/media/ccia/2.1.5/cms_page_media/172/RANGELANDS_CLUSTER_REPORT_1.pdf

Bob Spiers at Reef, Range and Red Dust Conference (Video)
https://www.youtube.com/watch?v=Jus9tFPd9Bw

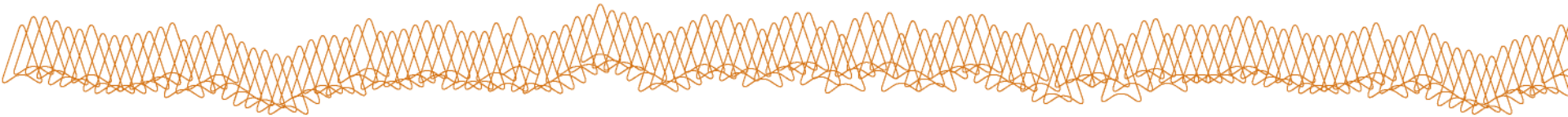
BOM - Climate Change information, maps, data and trends
http://www.bom.gov.au/climate/change/

BOM – Climate Outlooks monthly and seasonal (including 3 monthly seasonal outlook video)
http://www.bom.gov.au/climate/outlooks/#/overview/summary

Climate Champions – local case study Peter Whip
http://www.climatekelpie.com.au/farmers-managing-risk/climate-champion-program/peter-whip

Thank you

From the Rangelands Cluster



An Australian Government Initiative

CSIRO

Territory Natural Resource Management

NINTI ONE RANGE LANDS CLUSTER

Government of South Australia
Alinytjara Wilurara Natural Resources Management Board

Government of South Australia
South Australian Arid Lands Natural Resources Management Board

desert channels QUEENSLAND

RANGELAND NRM alliance

South West NRM Ltd
Achieving sustainable landscapes for rural communities

UNIVERSITY OF CANBERRA

INSTITUTE FOR APPLIED ECOLOGY

Rangelands NRM Western Australia

NSW GOVERNMENT Local Land Services Western