Presentation on

- Heatwave climate and trend
- Heatwave service
- Warning decision support
- Seamless forecasts
- Climate change attribution & Climate projection

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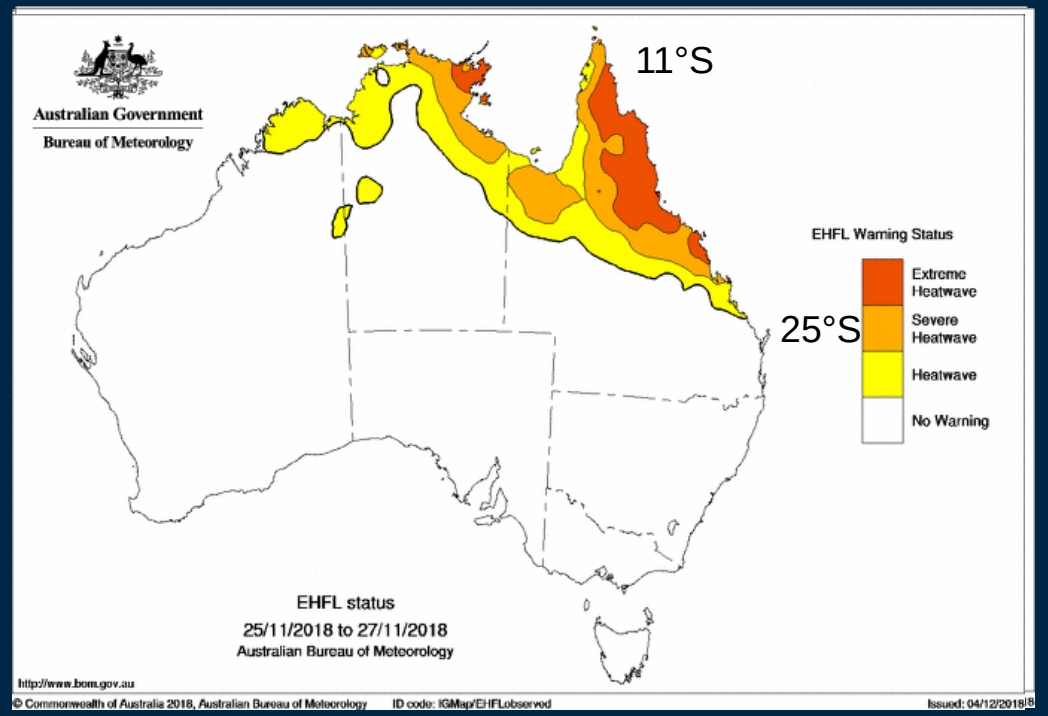
Heatwave service

- Maps showing colour-coded heatwave severity for the previous two three-day periods, and the next five three-day periods

- Heatwave evaluation is based on:
  - Intensity as a function of long and short term daily temperature anomaly
  - Severity categories as a function of the 85th percentile of heatwave intensity climate distribution

- Gridded data via FTP / WMS
- Public display available on BOM website



Heatwave Service

www.bom.gov.au/australia/heatwave/

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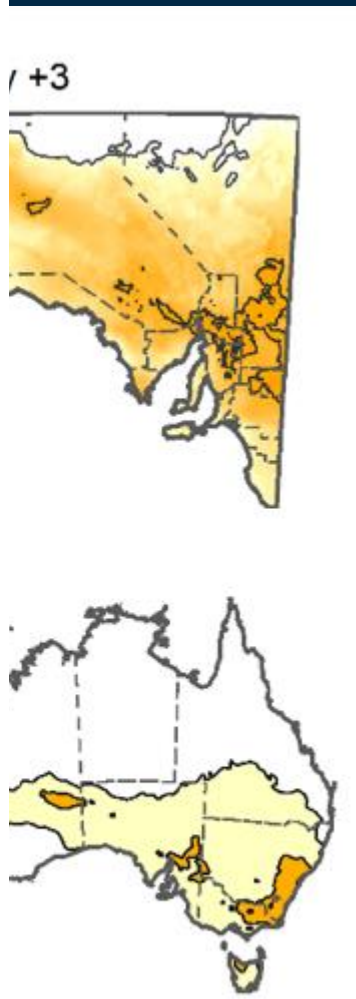
Warning Decision Support – national framework

Issued at 17:00 Monday, 15 January 2018 **HEATWAVE SUMMARY PER DISTRICT, SA**

Assessed Heatwave Severity		District	Forecast Heatwave Severity				
13-Jan-18	14-Jan-18		15-Jan-18	16-Jan-18	17-Jan-18	18-Jan-18	19-Jan-18
Day -2	Day -1		Day 0	Day +1	Day +2	Day +3	Day +4
-	-	North West Pastoral	-	Low Intensity	Severe	Low Intensity	Low Intensity
-	-	North East Pastoral	-	Low Intensity	Low Intensity	Low Intensity	Low Intensity
-	-	West Coast	Low Intensity	Low Intensity	Severe	Low Intensity	Low Intensity
-	-	Eastern Eyre Peninsula	-	Low Intensity	Severe	Low Intensity	Low Intensity
-	-	Lower Eyre Peninsula	Low Intensity	Severe	Severe	Low Intensity	Low Intensity
-	-	Flinders	-	Low Intensity	Severe	Severe	Low Intensity
-	-	Mid North	-	Low Intensity	Severe	Severe	Low Intensity
-	-	Mount Lofty Ranges	-	Low Intensity	Severe	Low Intensity	Low Intensity
-	-	Adelaide Metropolitan	-	Low Intensity	Severe	Low Intensity	Low Intensity
-	-	Yorke Peninsula	-	Low Intensity	Low Intensity	Low Intensity	-
-	-	Kangaroo Island	-	Low Intensity	Low Intensity	Low Intensity	-
-	-	Riverland	-	Low Intensity	Severe	Severe	Low Intensity
-	-	Murraylands	-	Low Intensity	Severe	Low Intensity	Low Intensity
-	-	Upper South East	-	Low Intensity	Low Intensity	Low Intensity	-
-	-	Lower South East	-	Low Intensity	Low Intensity	Low Intensity	-



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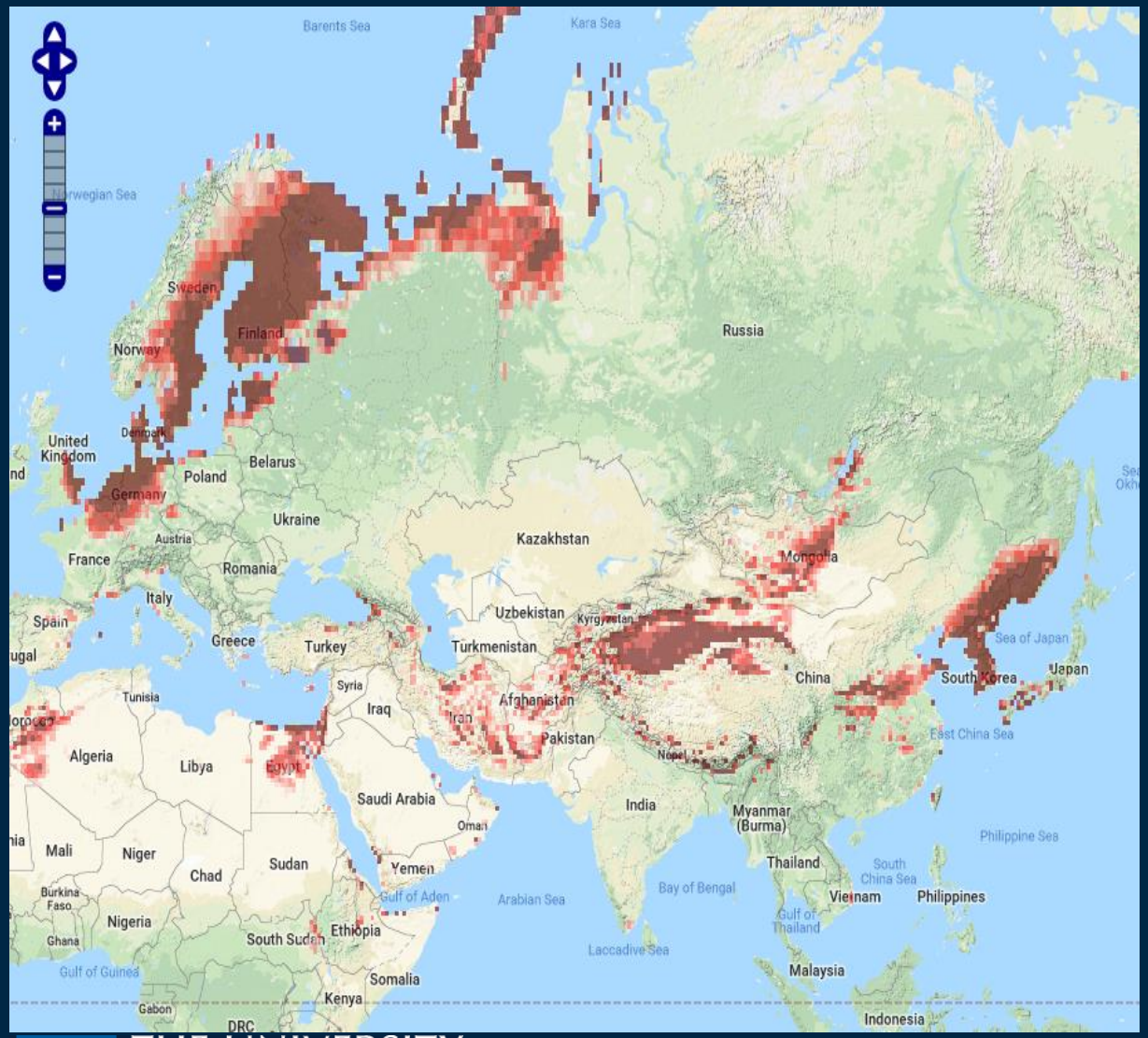
The role of seasonal, multi-week and daily forecasts



Probability of severe heatwave

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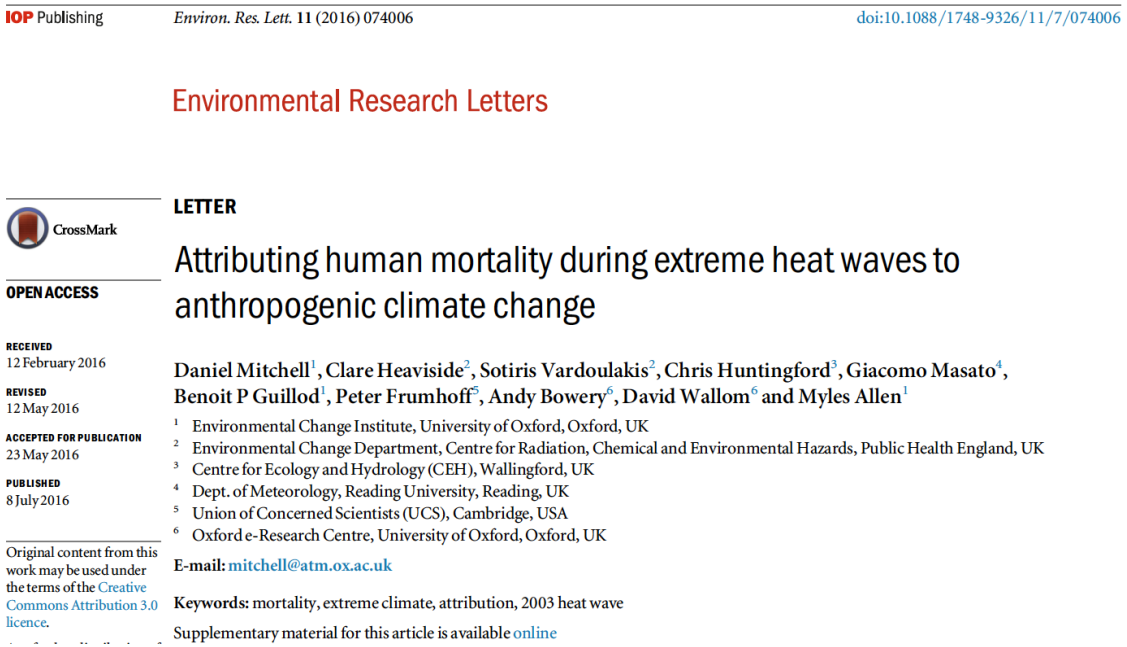
Can we attribute the health impacts of heatwaves to climate change?



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Environmental Research Letters

LETTER

Attributing human mortality during extreme heat waves to anthropogenic climate change

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OPEN ACCESS

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Supplementary material for this article is available online

Mitchell et al. 2016 attempted this for the 2003 European heatwave

Event was attributed to climate change over Paris and London, and was fitted to the respective excess mortalities

Useful and cutting edge, but idea needs to be examined further

Workshop held at UNSW Sydney October 2018, bringing together experts in heatwaves, detection and attribution of climate extremes, and human health

Planning a commentary/perspective discussing:

- various ways heatwave impacts might be attributed to climate change
- challenges in bringing disparate research communities together
- Future directions of appropriate methods to attribute *any* impacts of extremes to climate change

A special issue on attributing the health impacts of heatwaves to climate is planned for 2020/2021

Contact Sarah Perkins-Kirkpatrick (sarah.Kirkpatrick@unsw.edu.au) for more information

What is GLORIOUS?

GLObal useRs In the cOpernicUs climate change Service (GLORIOUS) → Berit Arheimer, SMHI

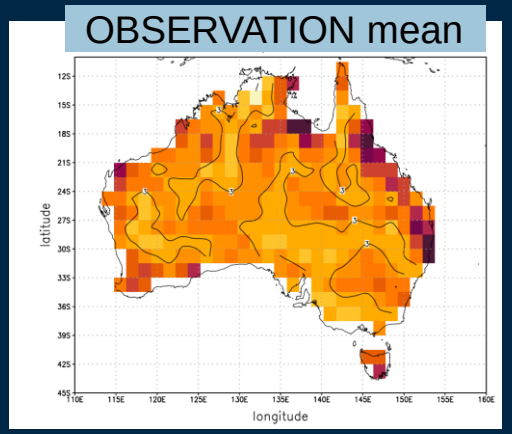
C3S_422_Lot1_SMHI

The **aim** is to ensure user uptake of relevant (and high-impact) climate information from the C3S Climate Data Store, addressing sectors such as health, agriculture and food security, transport, tourism, biodiversity, health and natural hazards

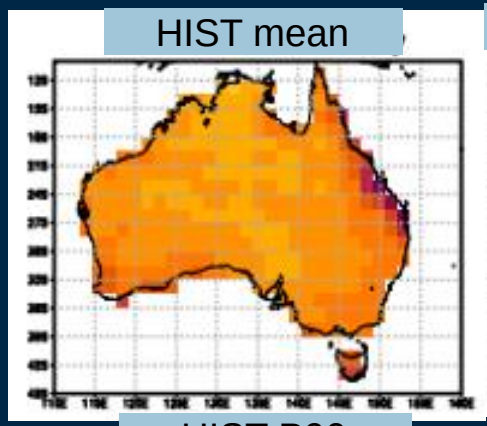
Summer (DJF) heat wave SEVERITY – future change

Scenario = RCP85 (high); Compare HIST (1976-2005) and RCP85 (2071-2100)

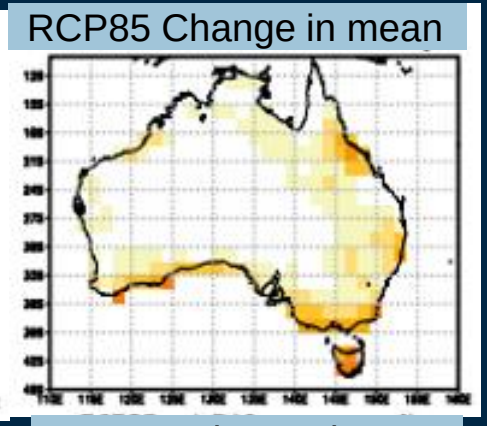
OBSERVATION mean



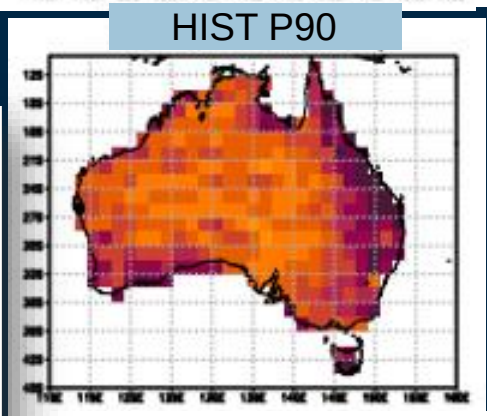
HIST mean



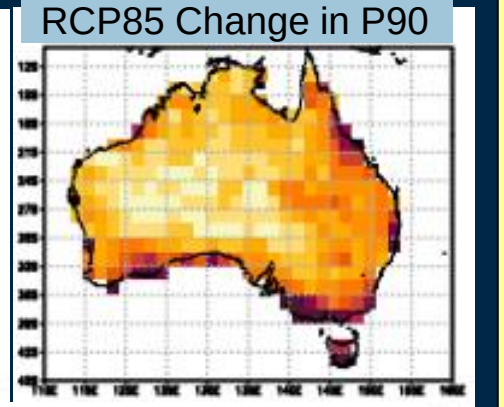
RCP85 Change in mean

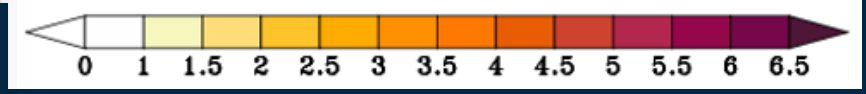


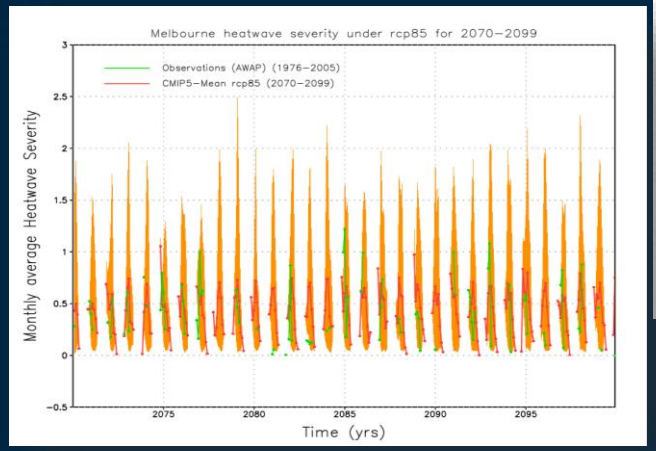
HIST P90



RCP85 Change in P90







0-1 = LOW heat wave
1-3 = SEVERE heat waves
>3 = EXTREME heat wave

Key messages:

- Spatial distribution of severity in OBS
- CMIP5 models do a fairly good job (HIST mean)
- Future Change in severity:
- Coastal impacts
- Seasonal extension (not shown here)
- Model range shows much higher values are possible in future
- Urban: large increase in heat wave days either side of summer season

Australian Government
Bureau of Meteorology

GLORIOUS products

- http://climateservice-global.eu/climate-impacts/
- http://climateservice-global.eu/showcases/