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# The changing climate drivers of disasters



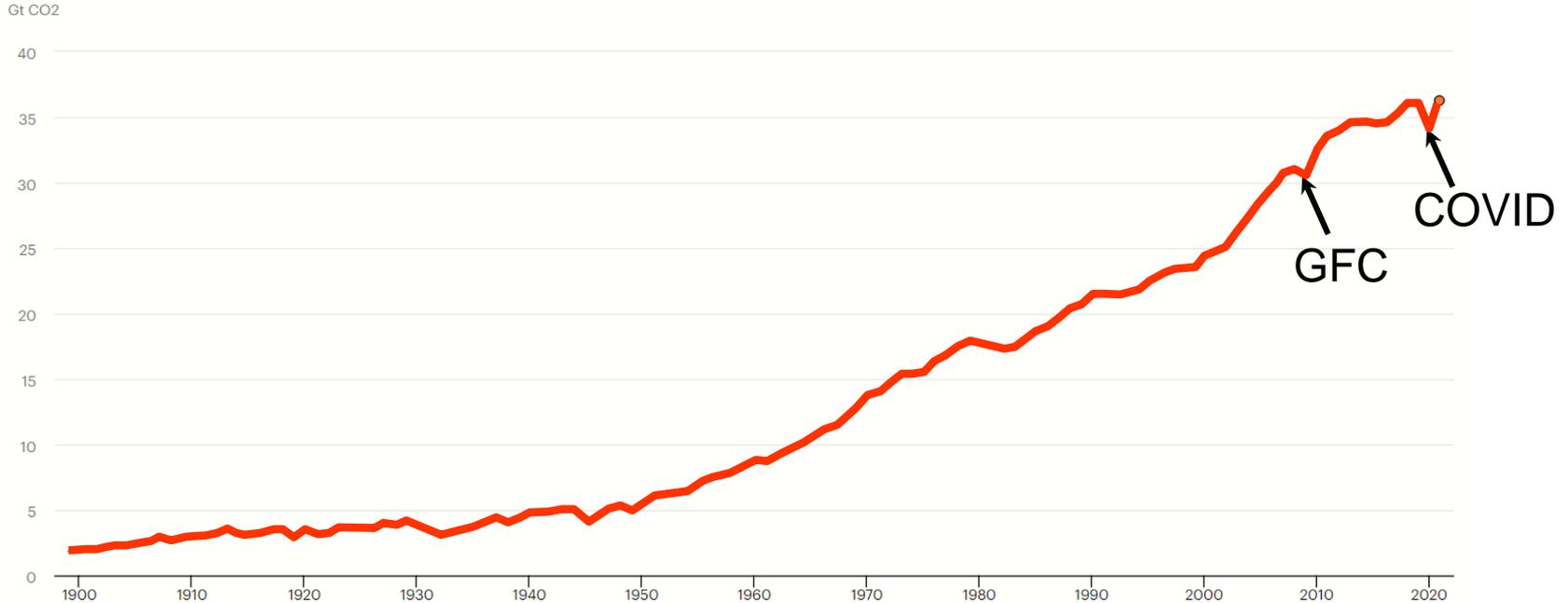
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# We are not on track for 1.5°C



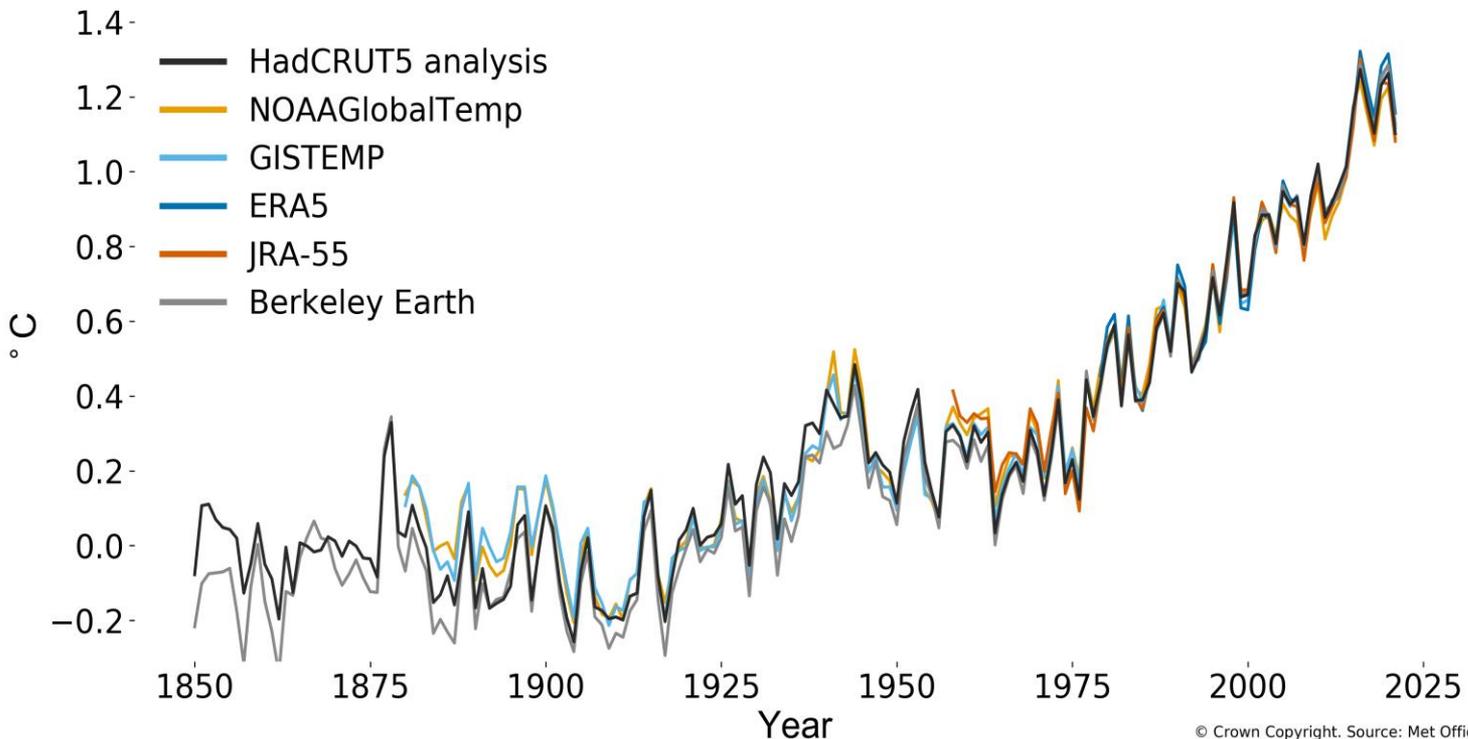
- CO<sub>2</sub> this year 421ppm (pre-industrial levels were about 280ppm) highest in at least 2M years
- Record levels of methane, nitrous oxide and other GHGs



# Globally – temperature rising

Met Office

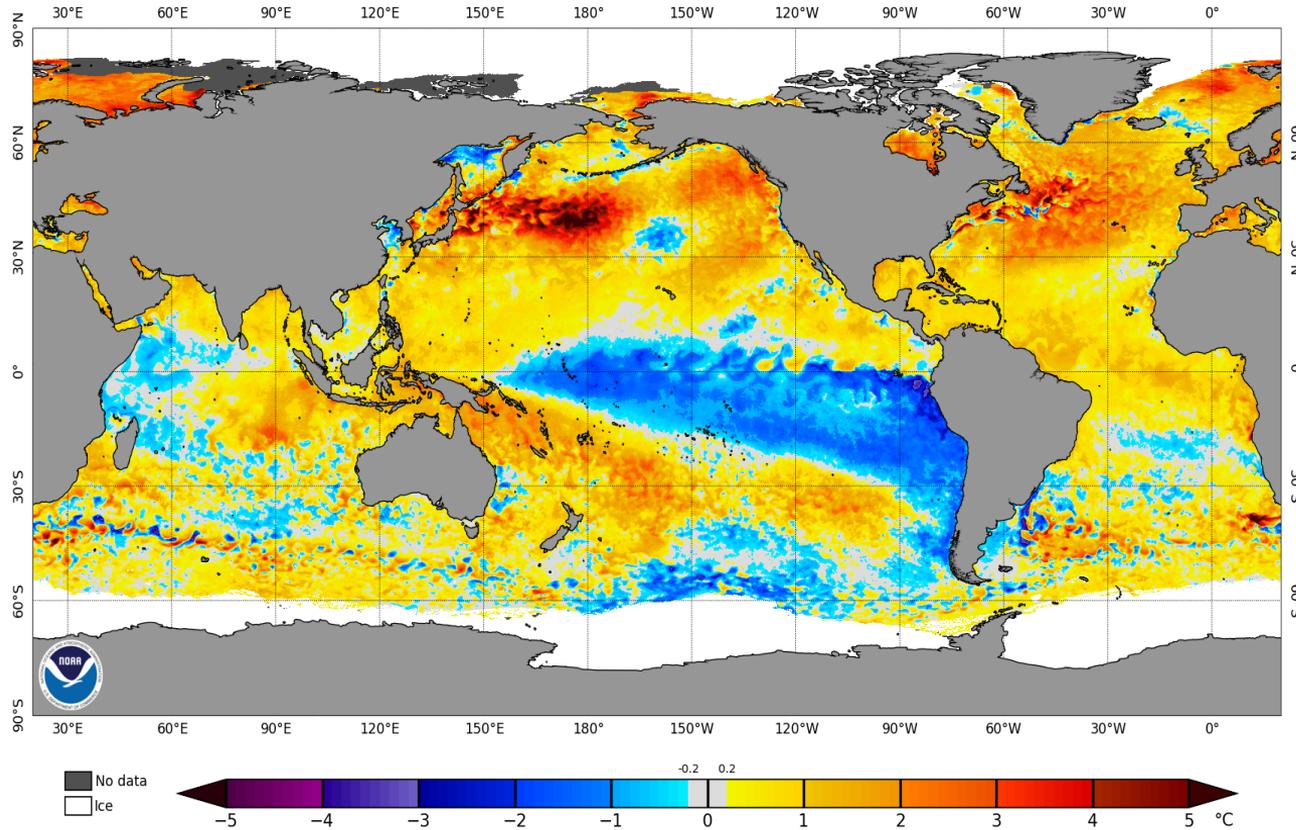
Global mean temperature difference from 1850-1900 ( ° C)



© Crown Copyright. Source: Met Office

# Cooling influence of La Niña

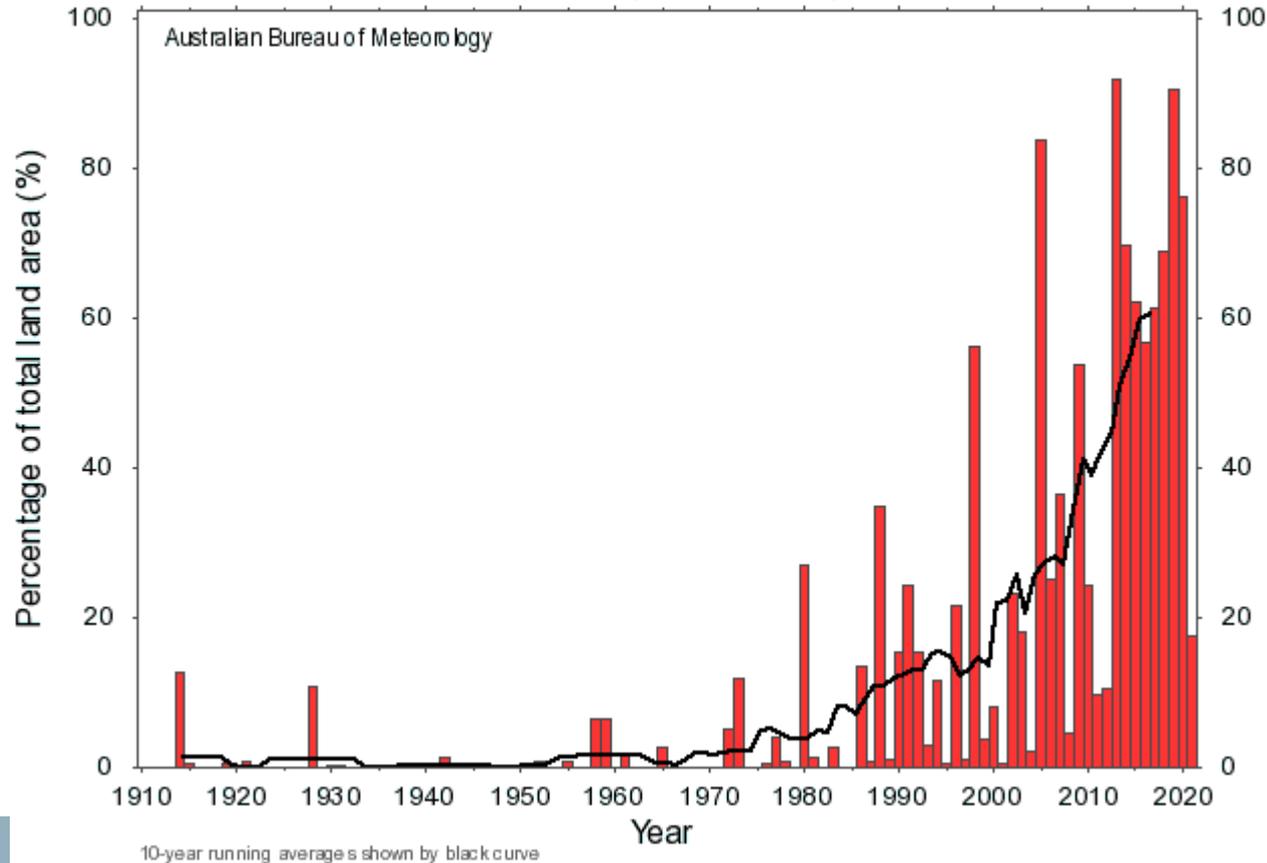
NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 16 Oct 2022



- El Niño and La Niña already seem to be strengthening
- Projections indicate this will continue
- Interaction with Indian and Southern Ocean influences
- Rainfall intensity

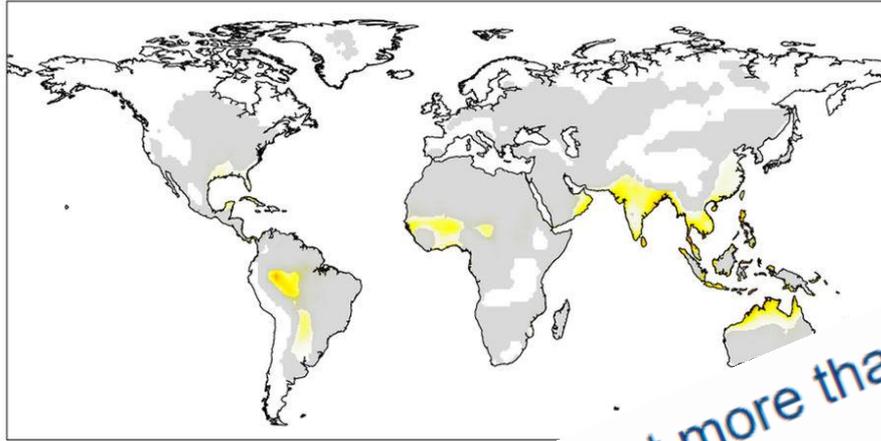
# Extremes almost everywhere, all the time

Annual mean temperature percentage area in decile 10  
Australia (1910 to 2021)



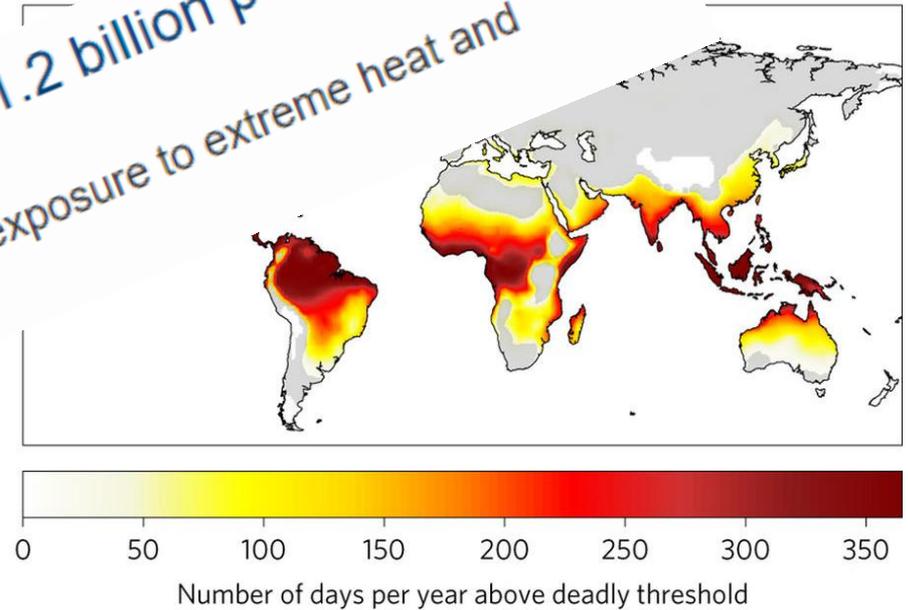
# Heat stress frequency: global

Historical

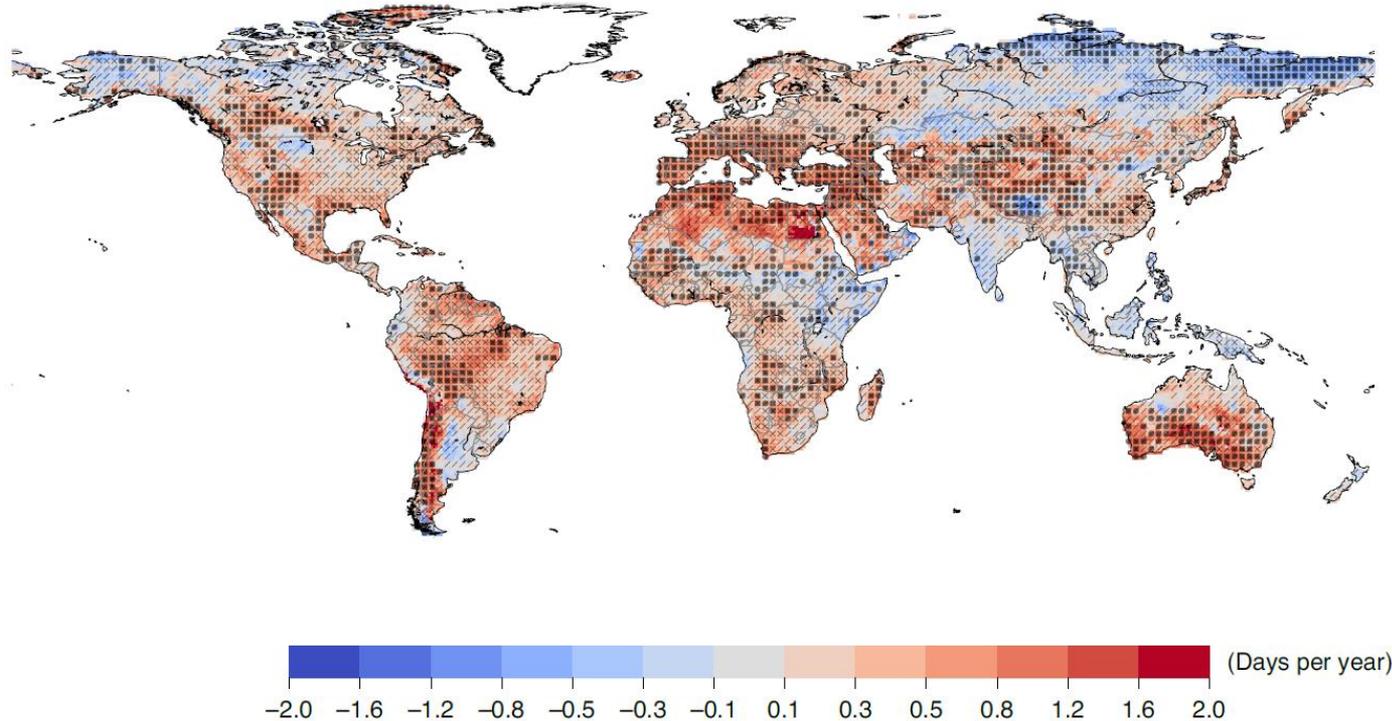


Heat stress may affect more than 1.2 billion people annually by 2100

Rising global temperatures are increasing exposure to extreme heat and humidity



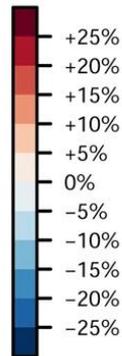
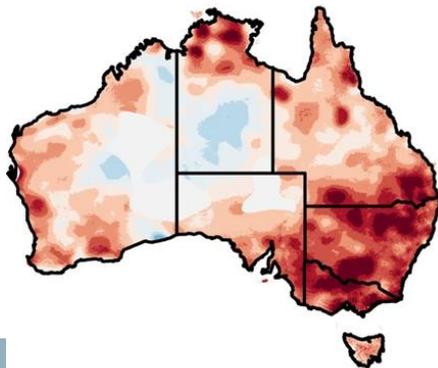
# Drought risk changes: spatially variable



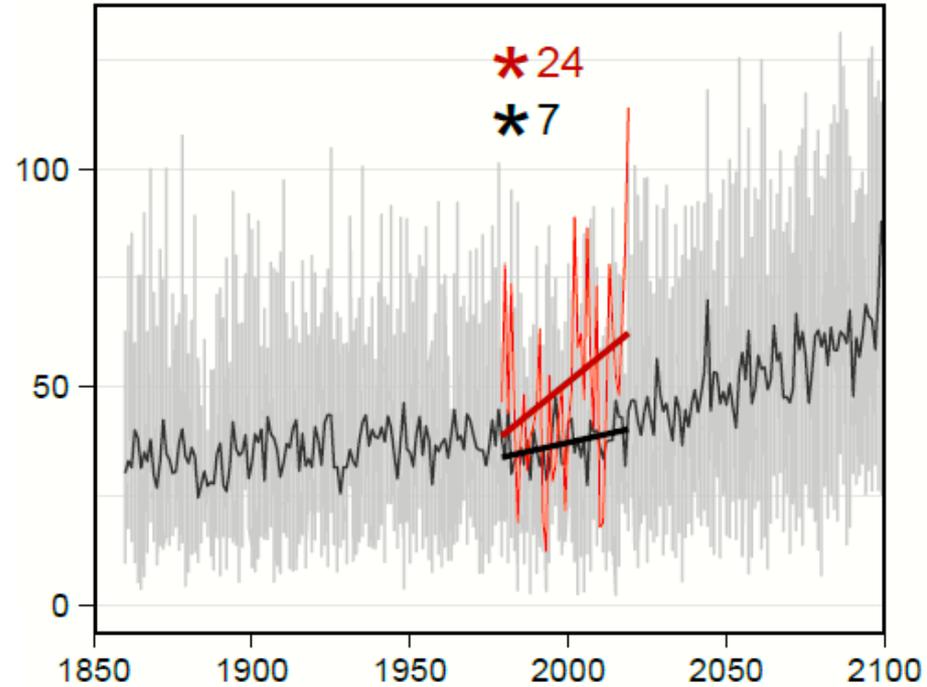
- Increased disruption to food system leading to reduced food security
- Increased food prices
- Increased food trade

- Fire risk already getting worse
  - Season length
  - Fire intensity
  - Number of fire danger days
  - Area burnt

a) Change in mean FFDI



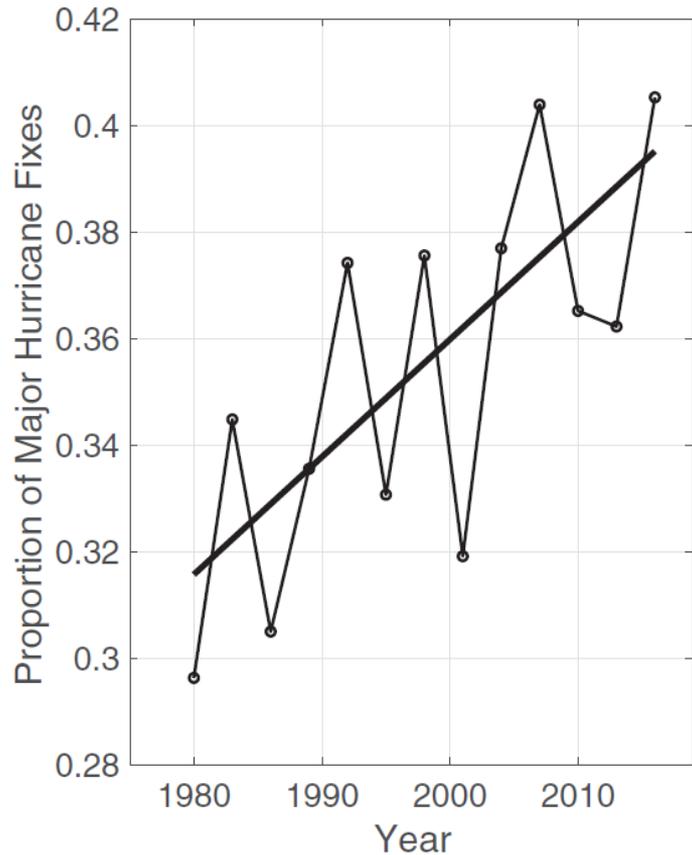
**Southeast Australian Forests**



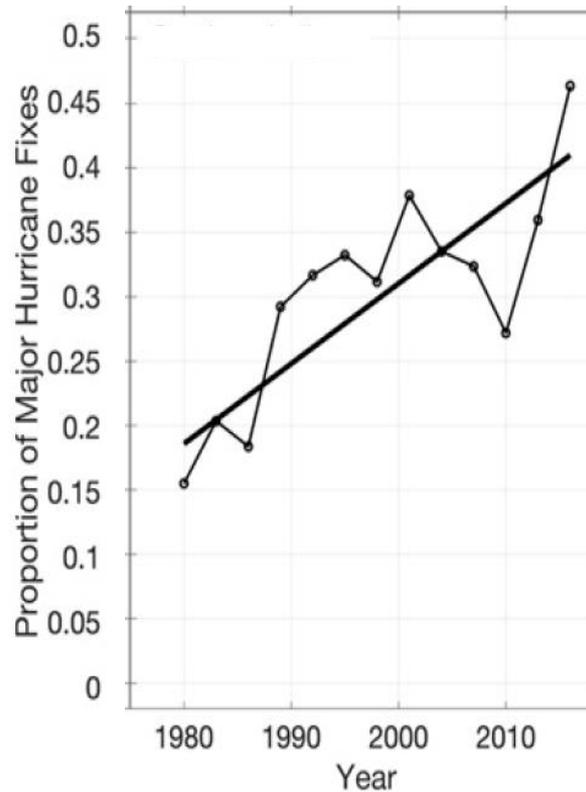


# More, stronger cyclones

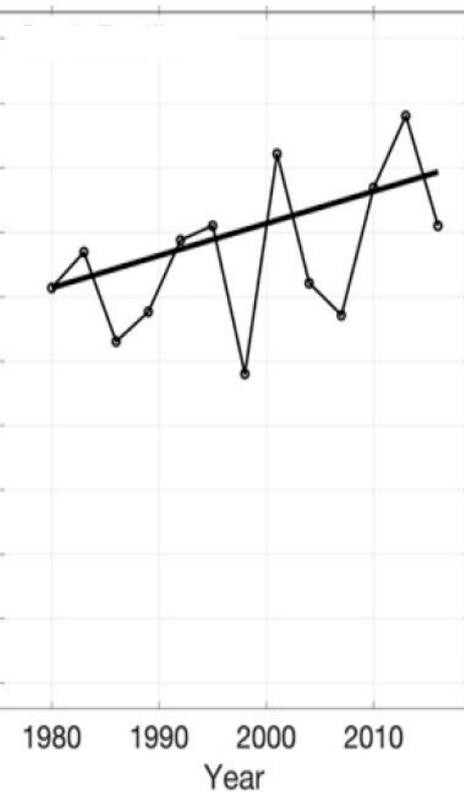
## Global



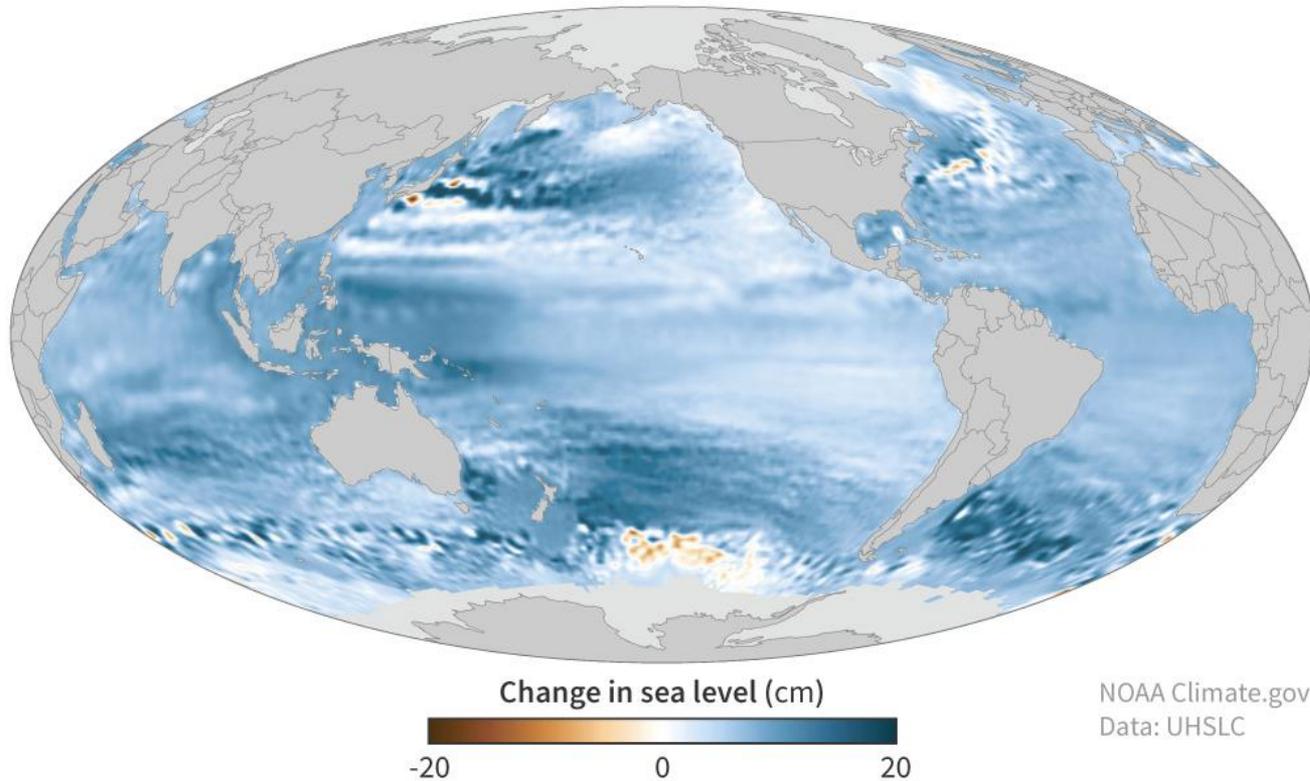
## Southern Indian



## South Pacific



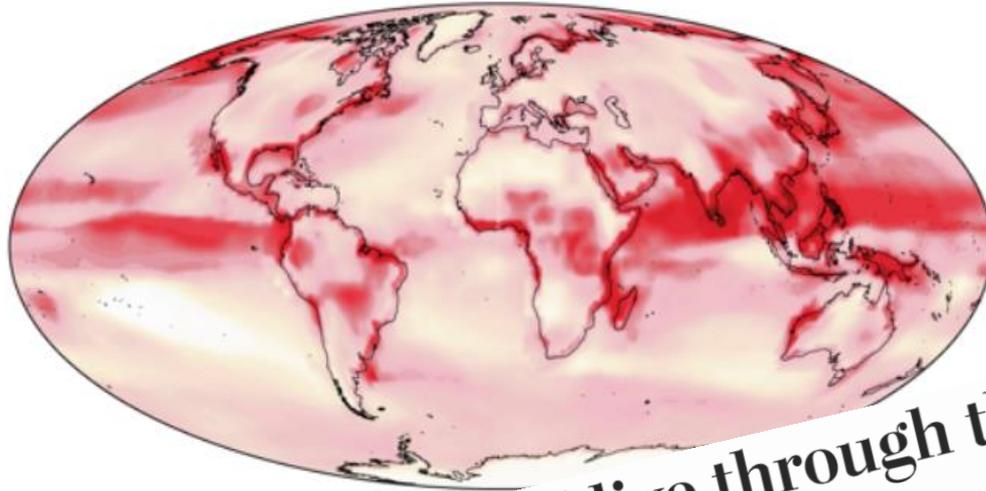
# Global sea level rise varies



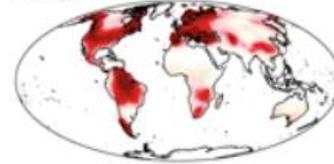
- Rose by about 4.5mm last year
- Continuing the acceleration seen over the past decades
- Interacting with other changes (e.g. cyclone strength)



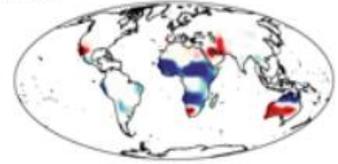
# Multiple hazards from climate change



Drought



Fires



Floods



Heatwaves



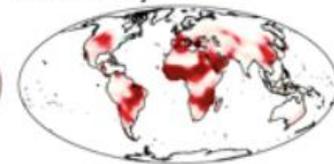
**Today's kids will live through three times as many climate disasters as their grandparents, study says**

Cumulative index Individual variables

Sea lev

Published in the journal Science, the findings quantify the "intergenerational inequality" of climate change.

Water scarcity



Ocean chemistry





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*Thankyou*

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Every half a degree matters  
Every year matters  
Every choice matters

*Howden and Colvin 2018*