

Multiweek Prediction and Attribution of the Black Saturday Heatwave Event in Southeast Australia

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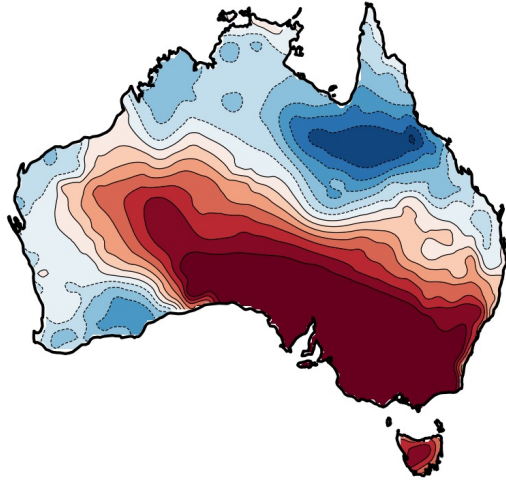
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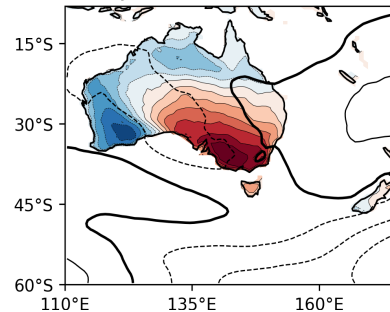
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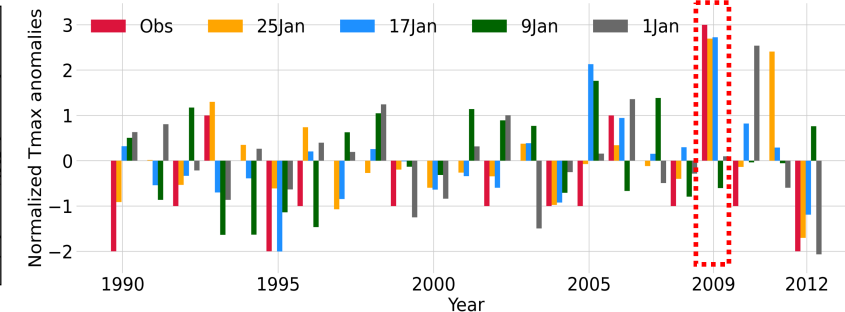
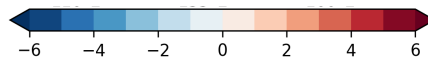
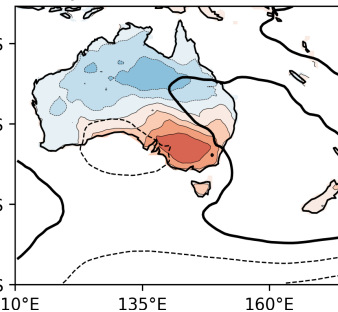


ACCESS-S1 forecast

IC: 25Jan2009



IC: 17Jan2009

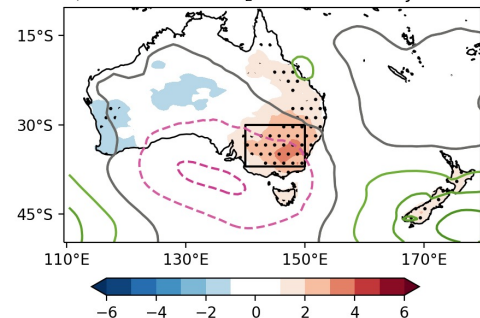


Black Saturday Heatwave event

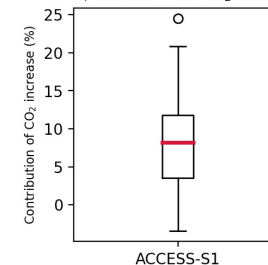
- **Period:** 27 January – 8 February 2009
- **Affected region:** VIC, SA, TAS, NSW (SE Australia).
- **Temperature:** 12°-18°C above normal, with 49°C in northern VIC, Melbourne (46.4°C), Adelaide (45.7°C).
- **Climate condition:** weak La Niña (Niño3.4: -0.8°C)
- **Casualty & loss:** 173 dead, 400+ injured, livestock, and major economic losses due to wildfires.

- Persistent High (Low) over Tasman Sea (southern Australia) → warmer T_{max} advection
- Observed pressure anomalies are weaker in the forecast.
- This leads to a weaker T_{max} forecast over SE Australia.
- Extreme T_{max} forecast is skillful up to 10 days lead time.

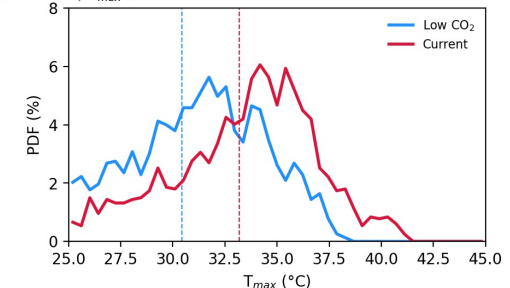
a) Current - Low CO₂ IC: 17Jan2009



b) Current - Low CO₂ statistics



c) T_{max} PDF



1. Black Saturday heatwave event could be predicted 10 days in advance.



2. Increased atmospheric GHG intensified the event.

Climate Attribution Forecast Experiment

- Low CO₂ level: 297 ppm (~1905 CO₂ level)
- 17 Jan 2009 modified O-A initial conditions for the counterfactual world.
- Current forecast is up to 4°C warmer over SE Australia than the “Low CO₂” forecast, with an areal average difference of ~2.6°C.