



Extreme weather in Australia: Climate change or La Niña?

Neville Nicholls

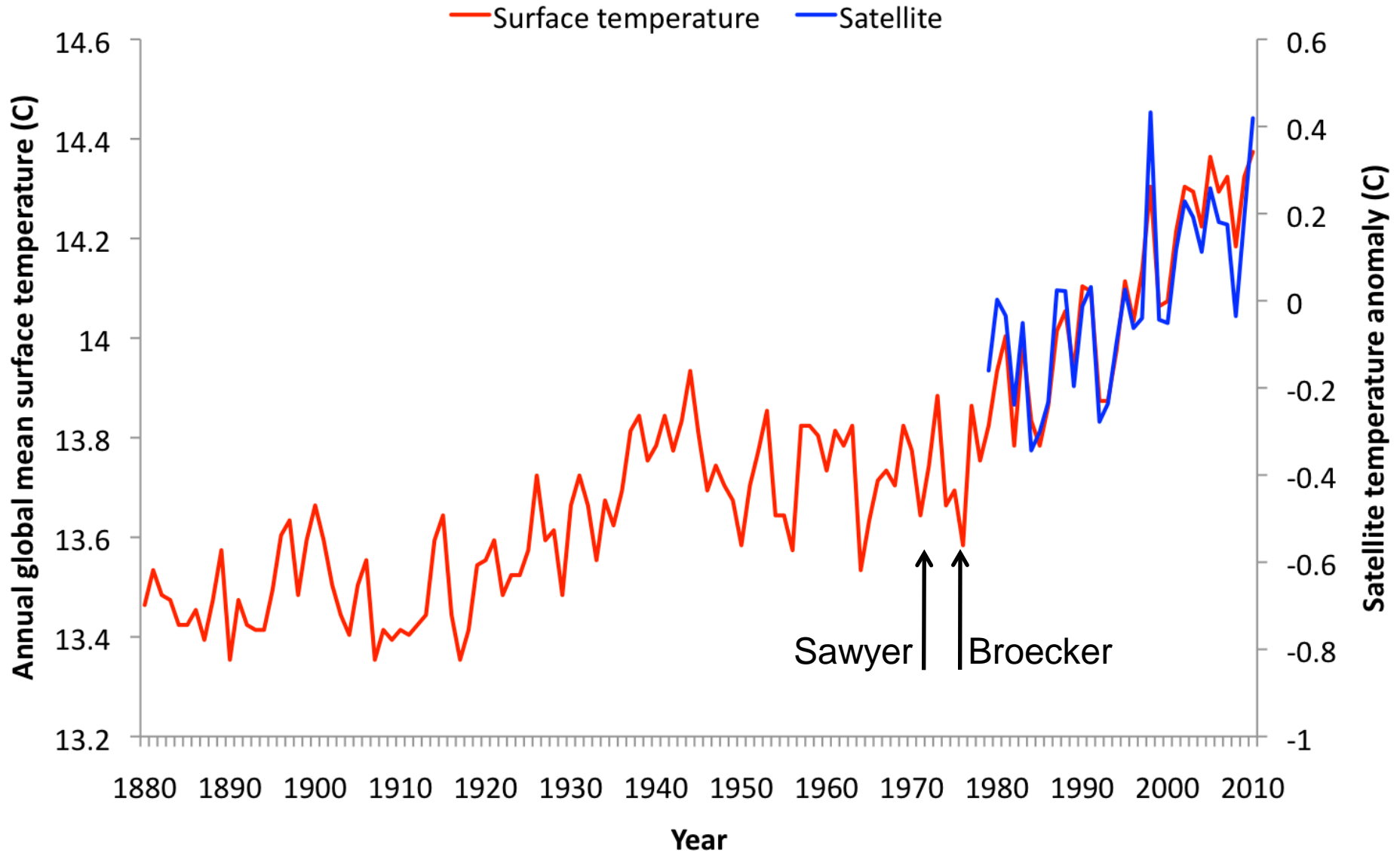
Geography and Environmental Science



Some recent Aussie extremes:

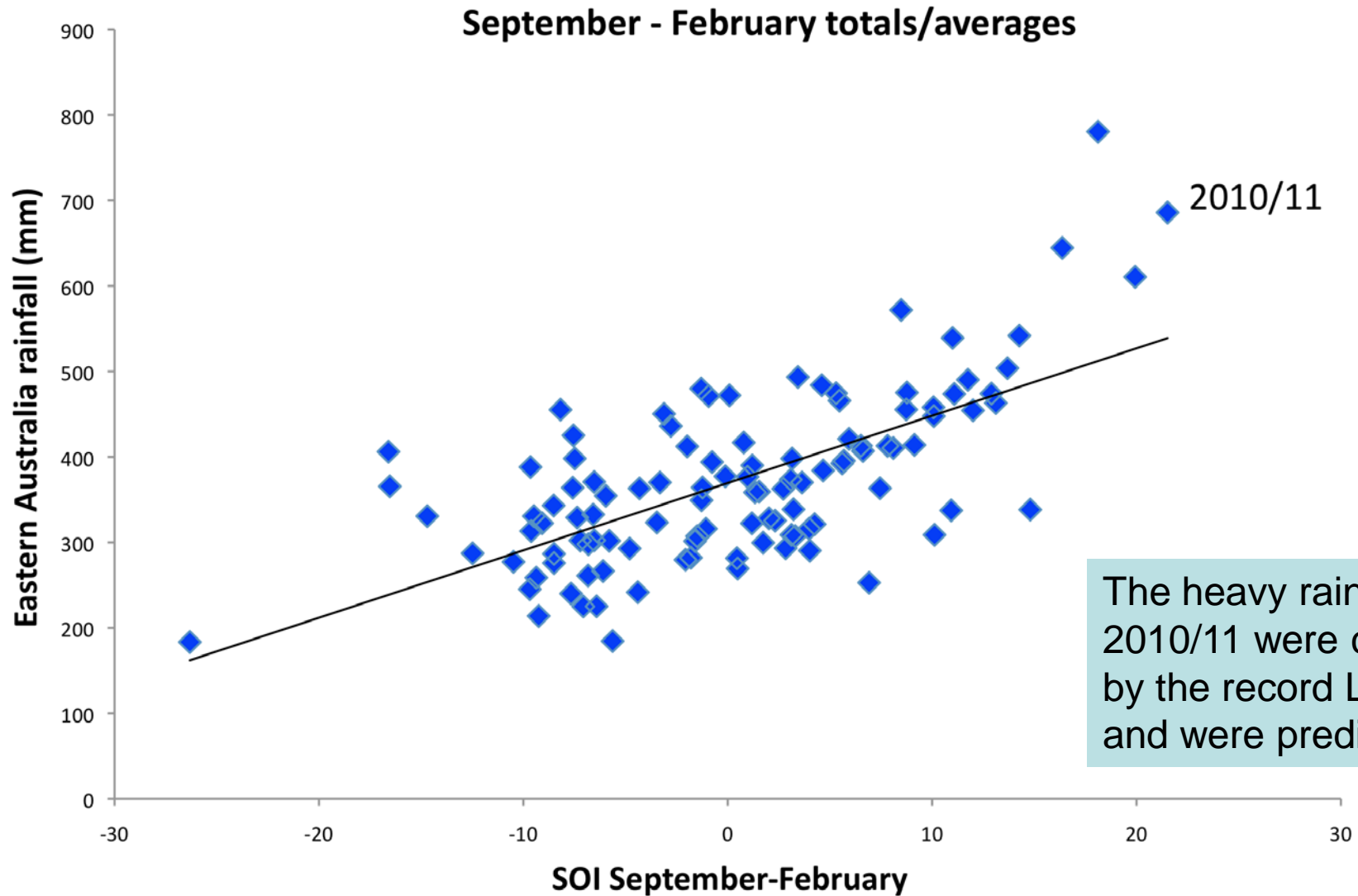
- **Sydney, February 2011. Seven consecutive days > 30°C (previous record was 5 days).**
- **Adelaide, March 2008. 15 consecutive days > 35°C (previous record was 8 days).**
- **Melbourne, 7 February 2009: Tmax was 46.4°C (previous February record was 43.2°C).**
- **Bedourie (Qld), March 2011: Record March rainfall 474.3mm (previous record was 194.4mm set in 2010) [65 years of data].**
- **September 2010: Wettest September on record averaged across country. Rainfall three times long-term average.**

Annual Global Mean Surface Temperature and Lower Atmospheric Temperature





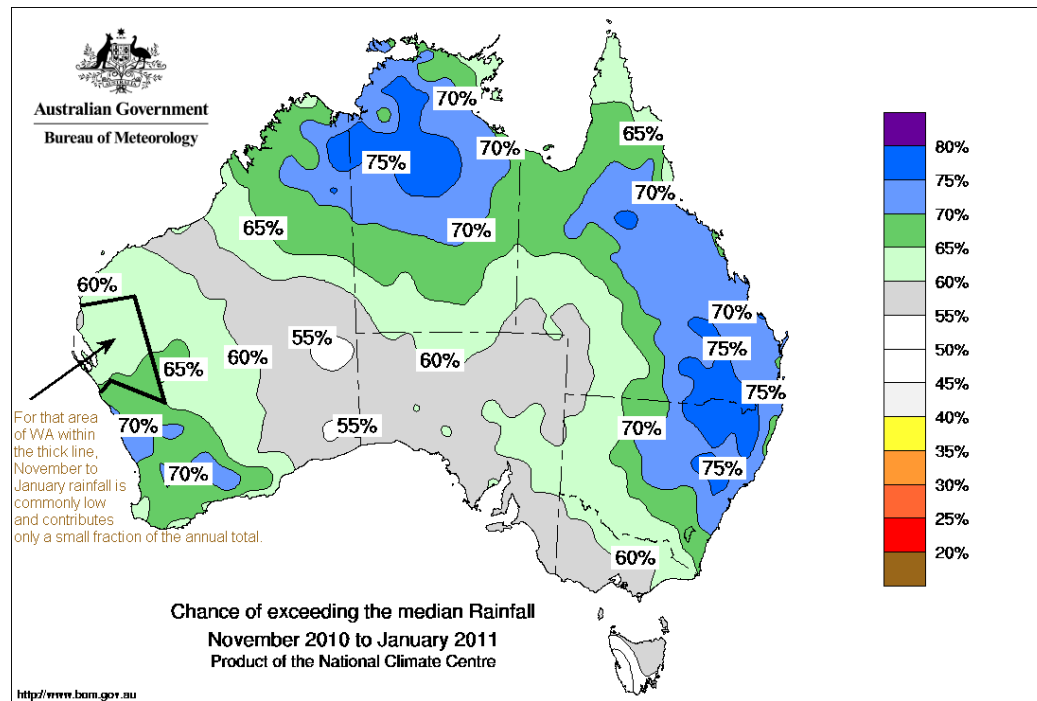
- **“It [the climate] is changeable beyond any other I ever heard of”** (Watkin Tench, 1793)
- **"The average rainfall is comparable with that of other countries, but what still remains as an anomalous fact is the extraordinary irregularity of the mode in which it falls"** (William Stanley Jevons, 1859)
- **“There are years without an autumn or a winter or a spring”** (Henry Lawson, 1892)
- **“The inland pastoral country of Australia is a land of alternate feast and famine”** (Francis Ratcliffe, 1947)



The heavy rains of 2010/11 were caused by the record La Niña – and were predictable



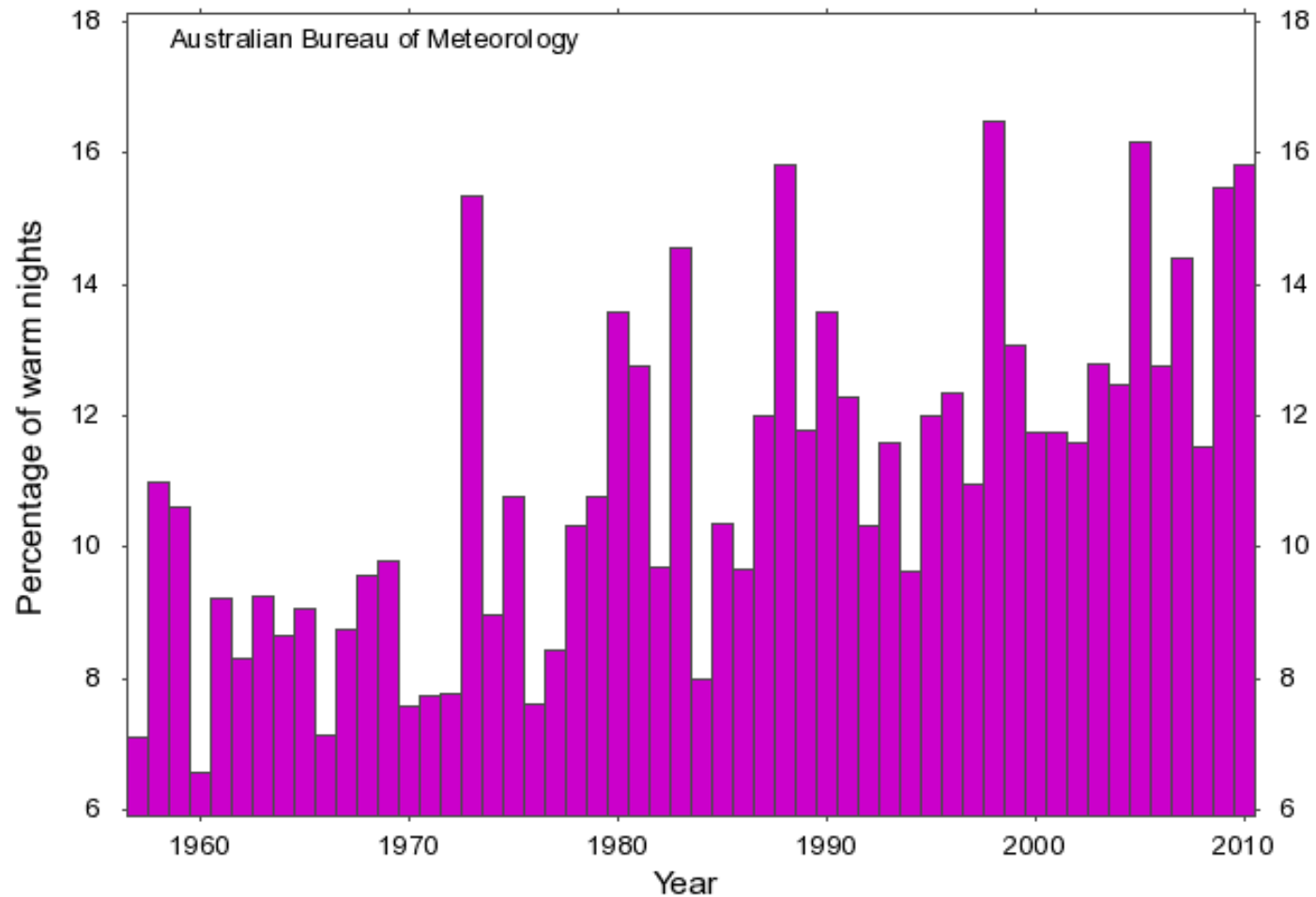
Seasonal rainfall forecast issued 26 October 2010





Warm nights

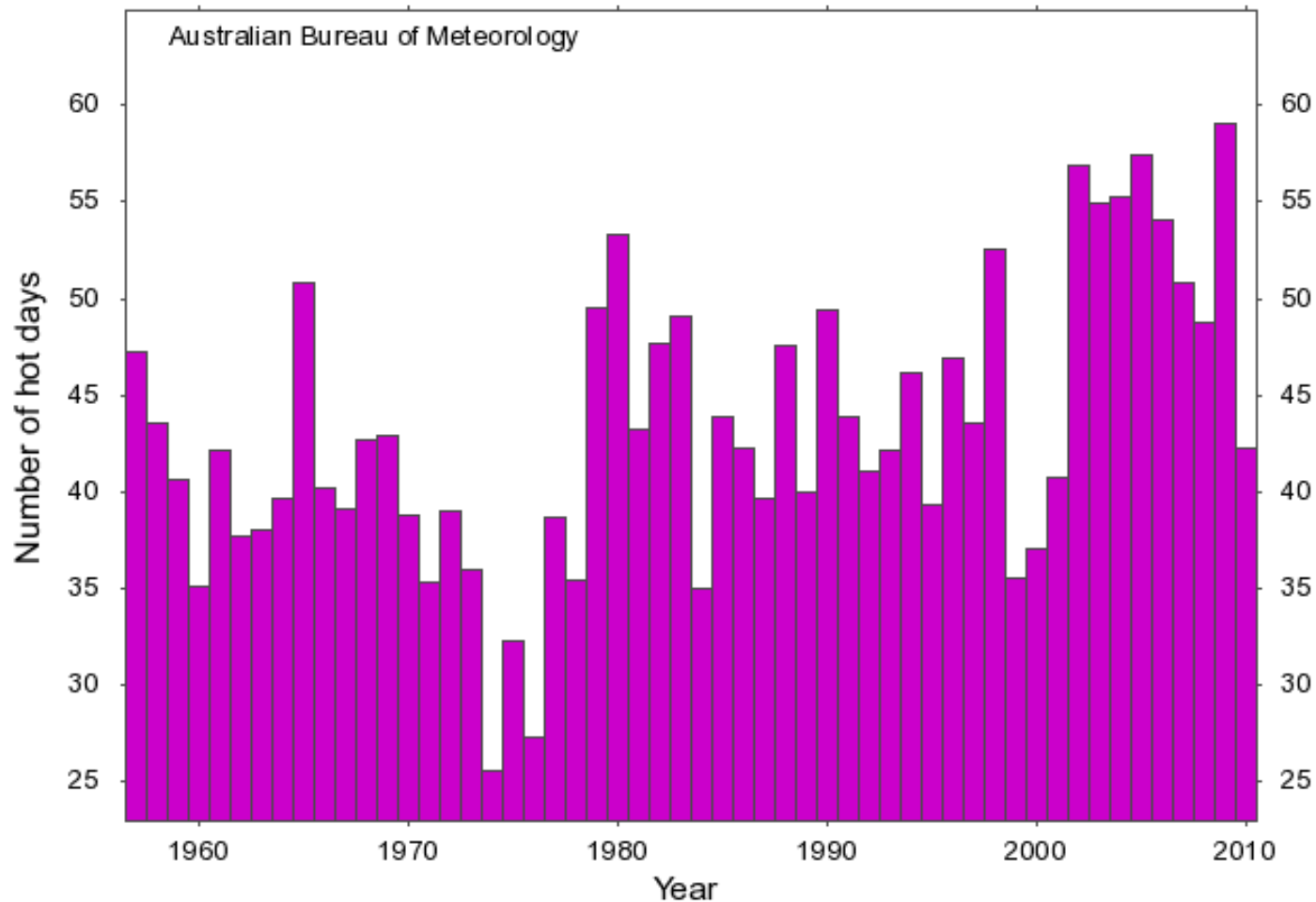
Average percentage of warm nights





Number of hot days (>35°C)

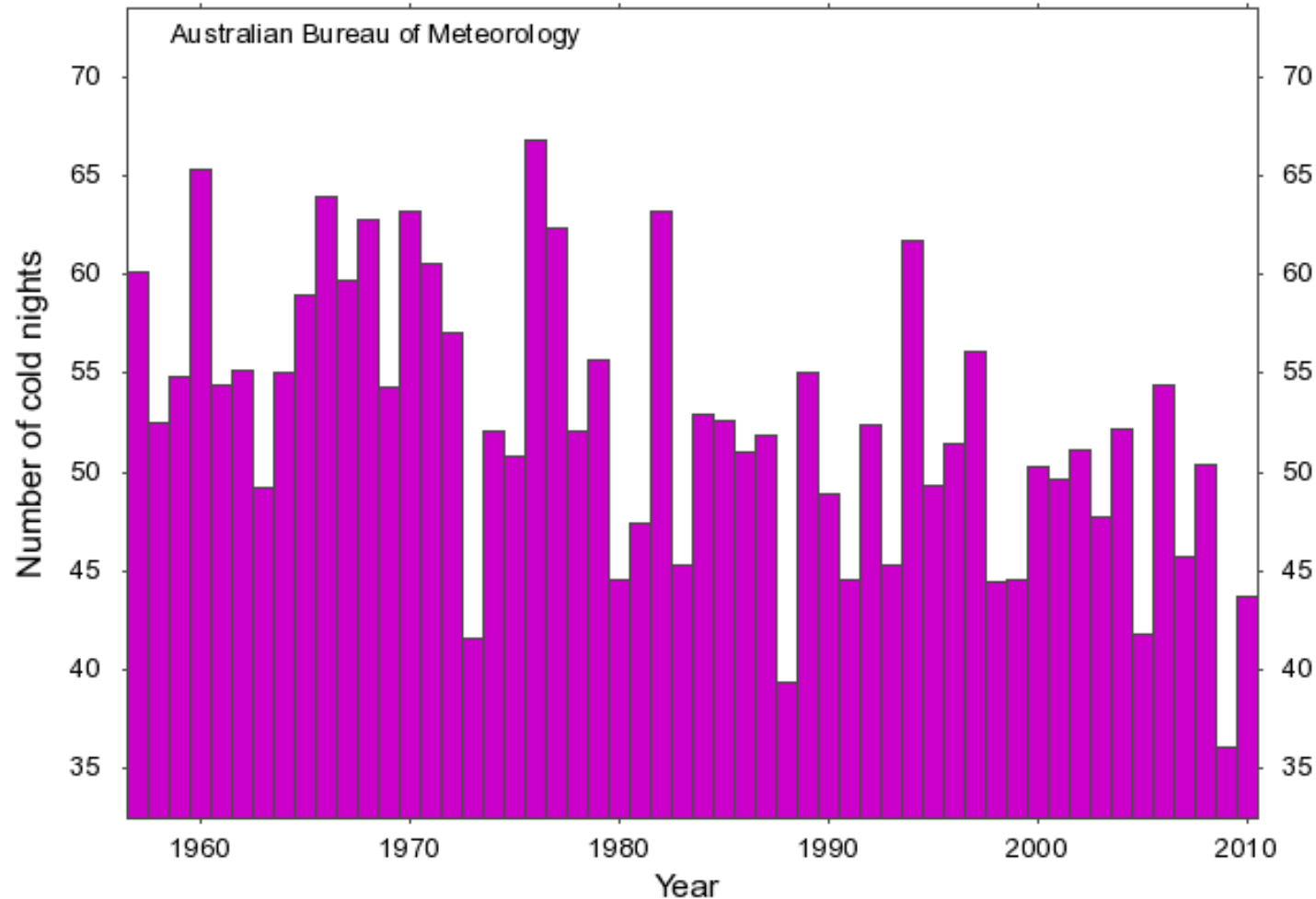
Average number of hot days





Number of cold nights (<5°C)

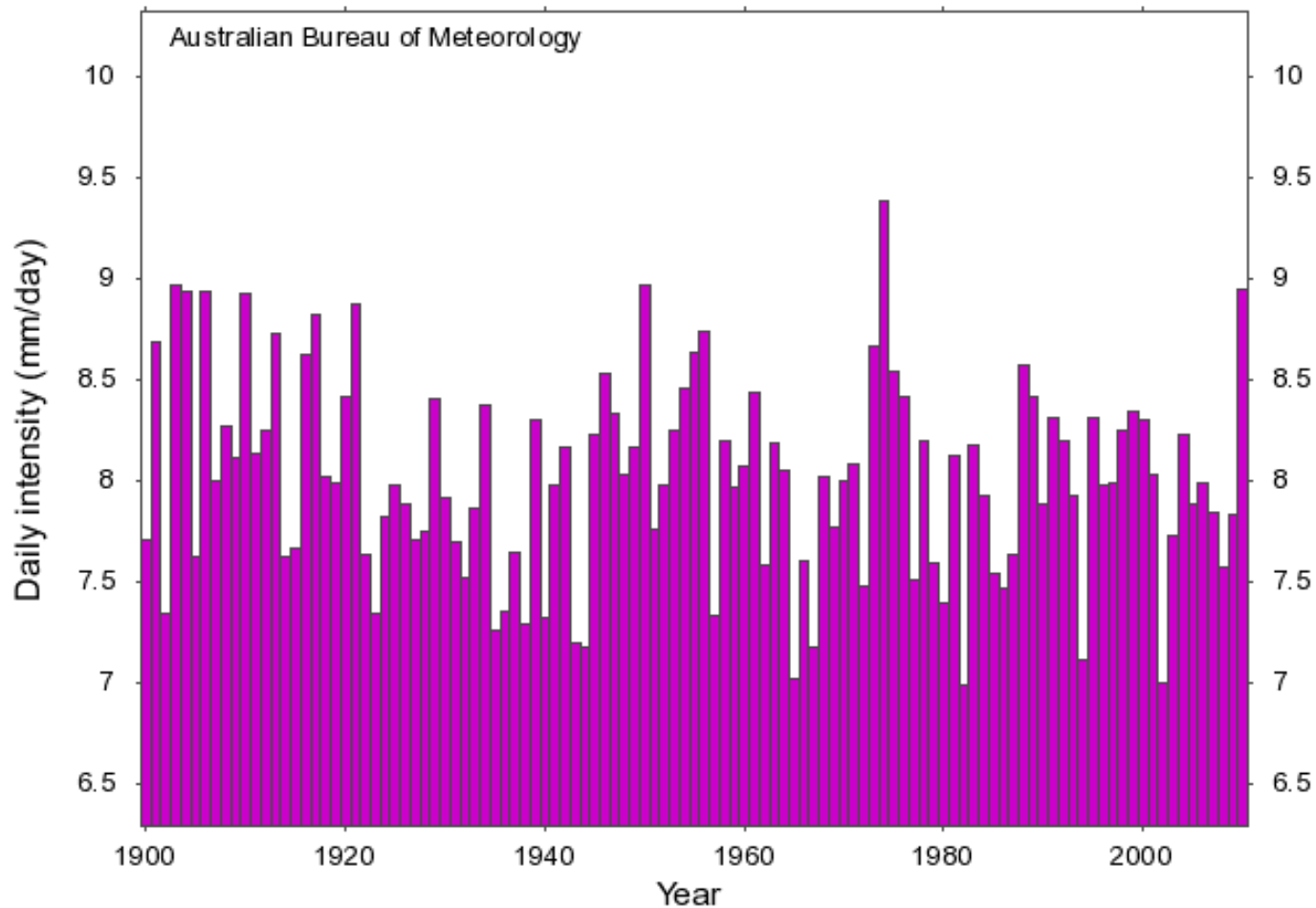
Average number of cold nights



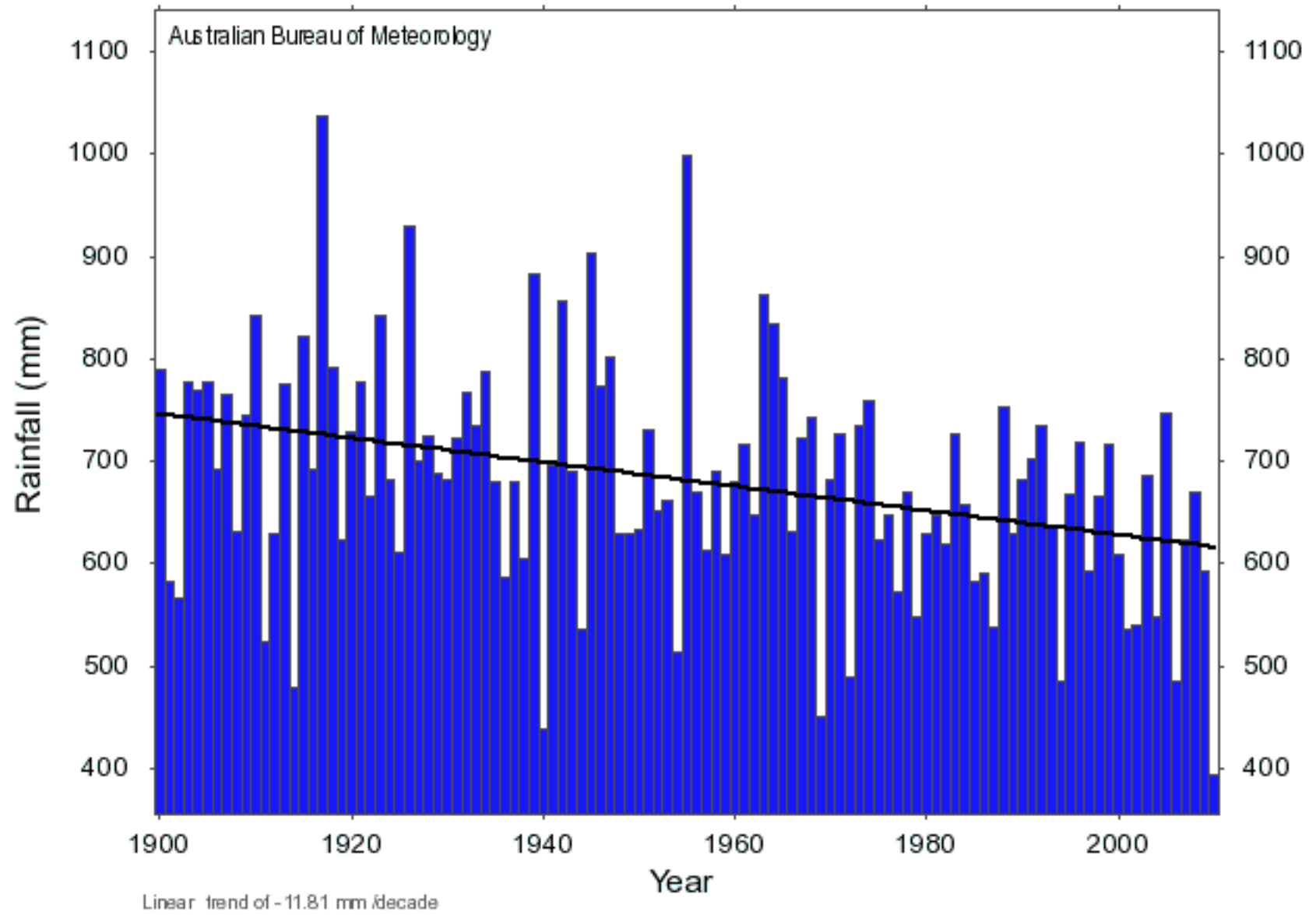


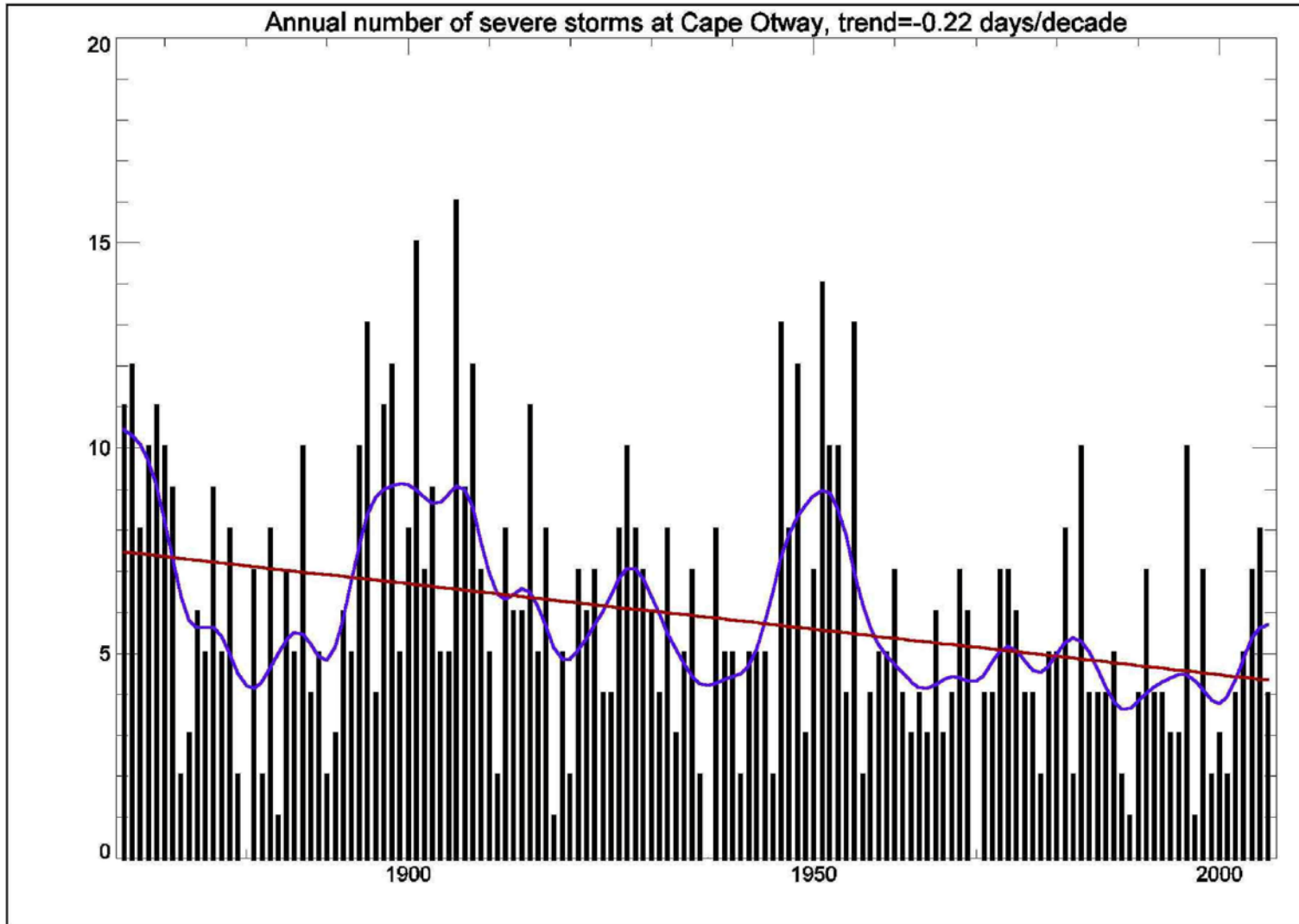
Daily precipitation intensity

Average daily intensity



Annual Rainfall - Southwestern Australia







Summary

- **Australian climate is extreme because of the El Niño – Southern Oscillation**
- **Some recent extremes are due to the record La Niña event**
- **But some extremes are changing**
 - Hot extremes getting hotter
 - Cold extremes getting warmer
 - Little change in heavy precipitation
 - Some changes in droughts & storms
- **Some of these changes are global warming**



What should we do?

- **The El Niño – Southern Oscillation affects human health in Australia (and elsewhere)**
- **Changes in extremes due to global warming will also affect human health**
- **We can improve health outcomes by taking advantage of what we know about:**
 - Natural climate variability
 - Global warming