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Record rainfall brings unprecedented flooding to Victoria in January 2011

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Special thanks to Victoria's *Regional Water Monitoring Partnership* for the flood images in this presentation

Outline

- Context
- Synoptic situation
- Daily rainfall
- Rainfall records
- Widespread flooding
- Record river heights
- Summary



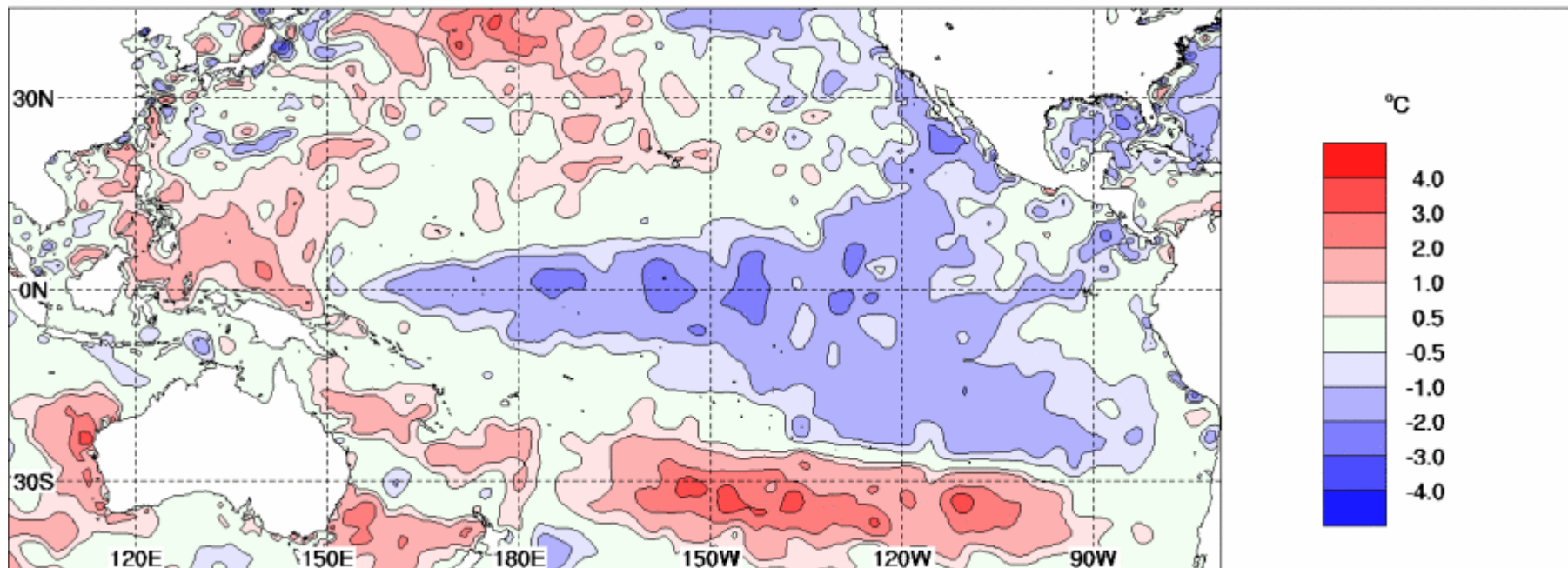
Creswick Creek at Clunes



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Context

- 2010/11 - One of the strongest La Niña events on record
- Strong atmospheric circulation evidenced by OLR anomalies and record breaking SOI
- Cool sea surface and sub surface temperatures anomalies in the eastern Pacific Ocean



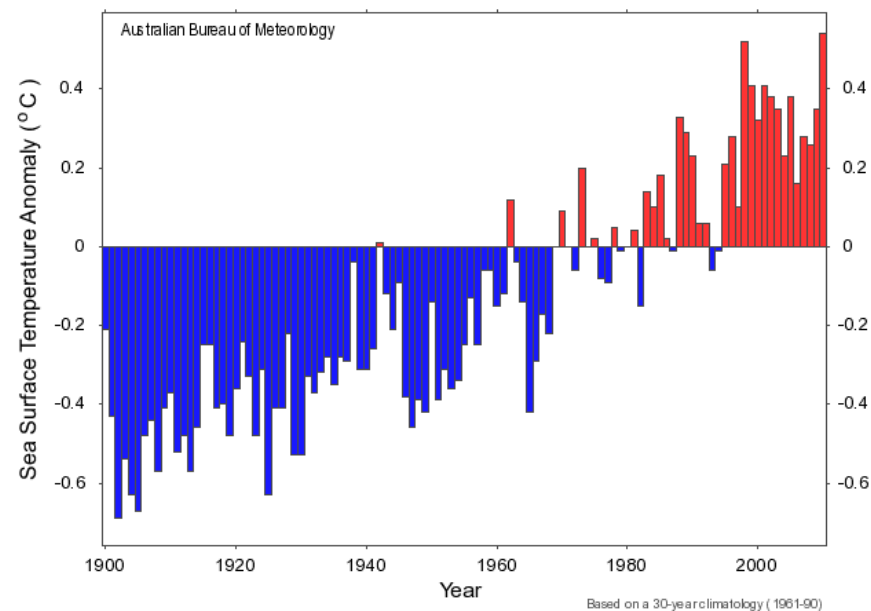
Sea surface temperature anomalies for the week ending 16th January 2011



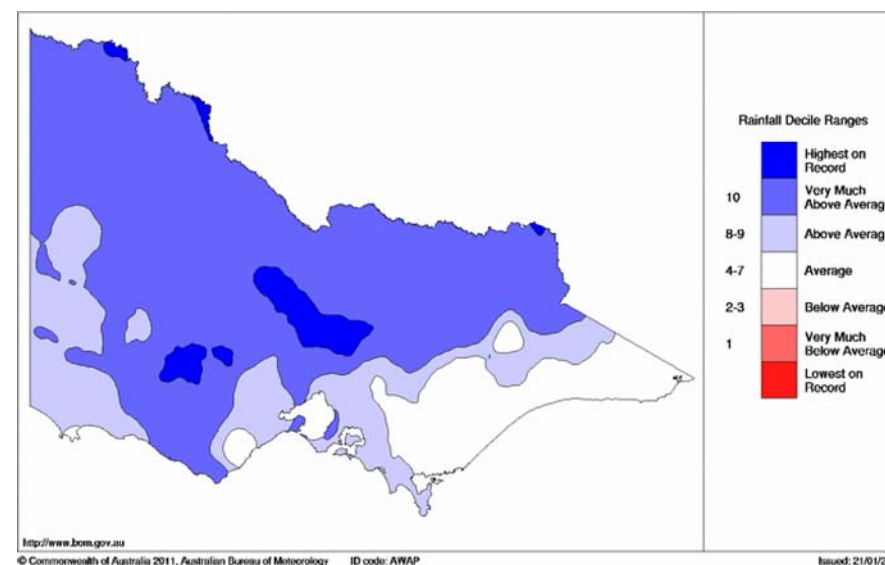
Context

- Record warm sea surface temperatures in the Australian region for 2010
- Negative Indian Ocean Dipole (IOD) throughout spring 2010
- 2010 was the wettest year in Victoria since 1974 and the 5th wettest on record

Annual Sea Surface Temperature Anomaly - Australian Region



Rainfall Deciles – Victoria in 2010



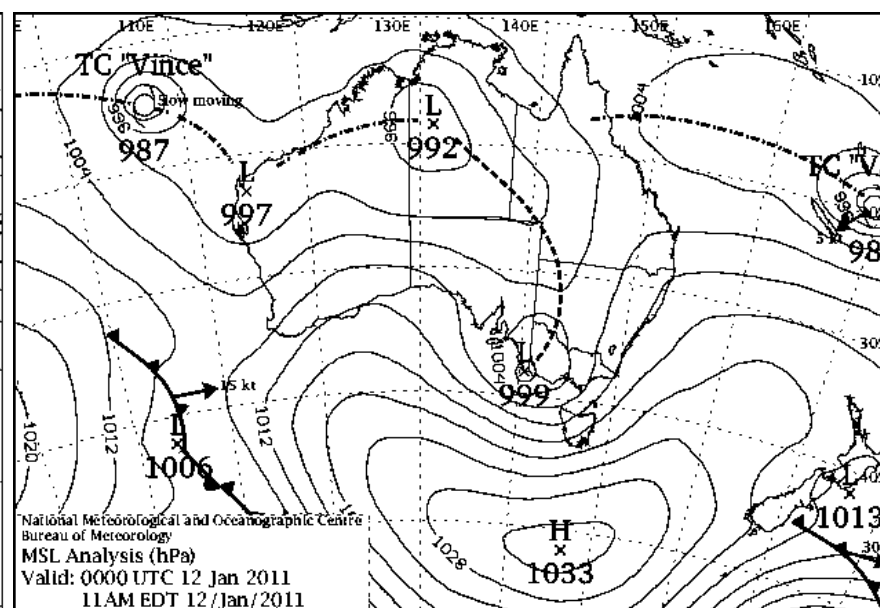
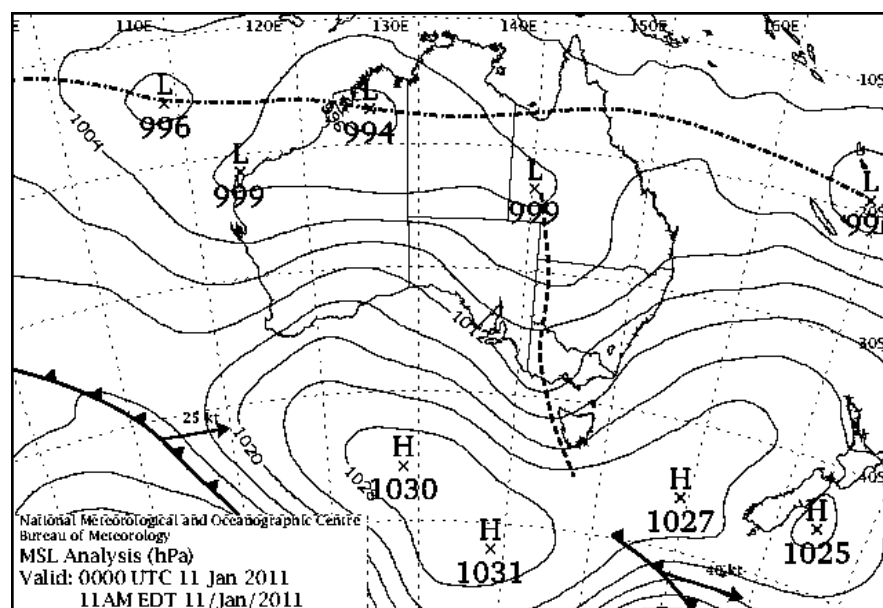
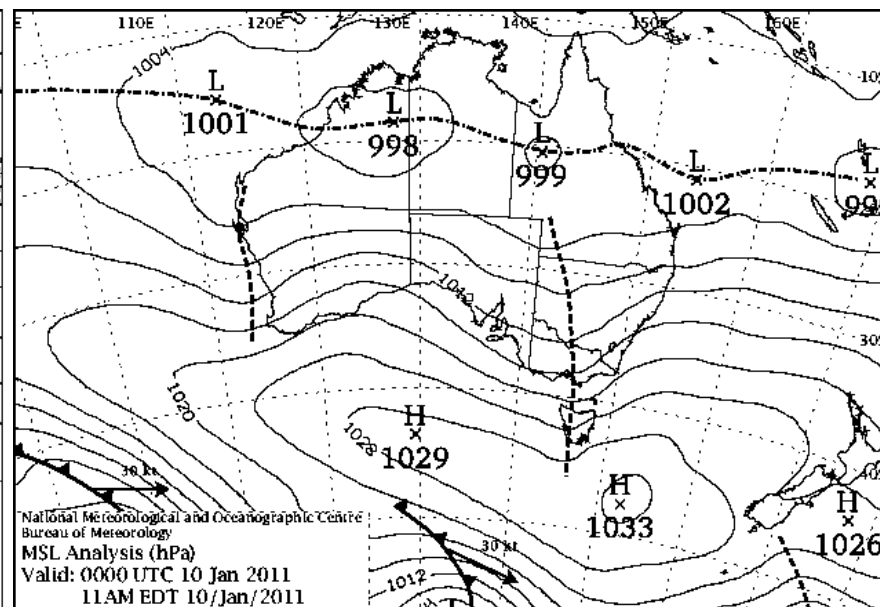
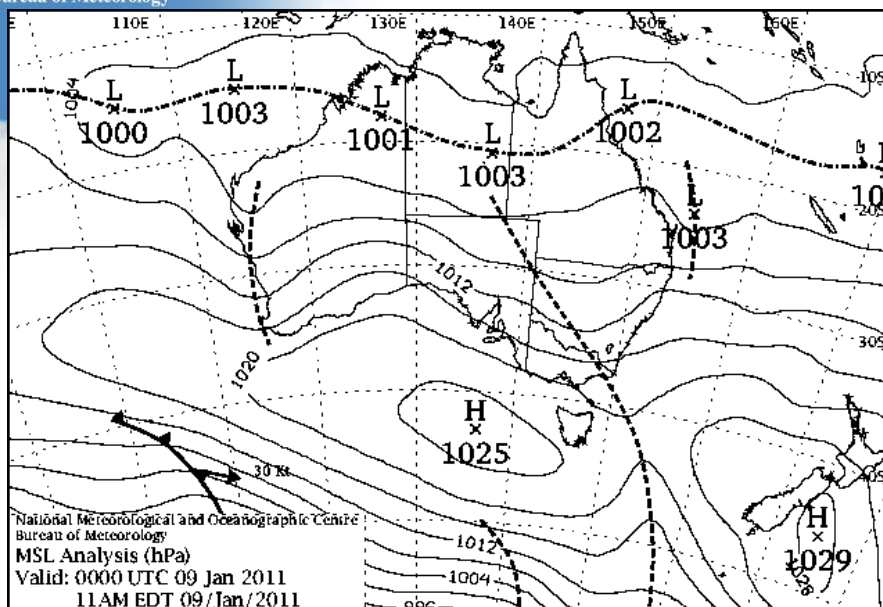
Synoptic situation

- Complex and persistent low pressure systems – broad slow moving trough
- Warm moist northeasterly flow – exceptionally high dewpoint temperatures and humidity



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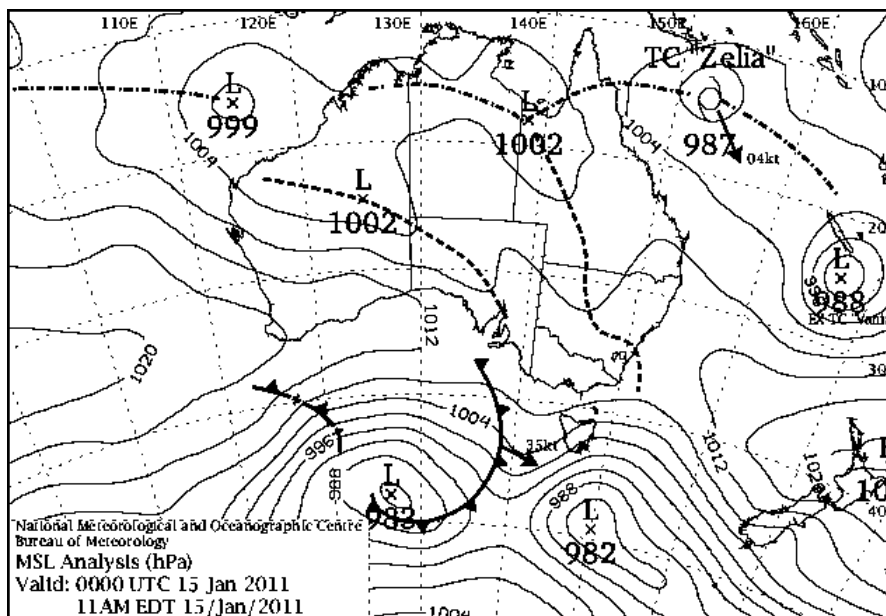
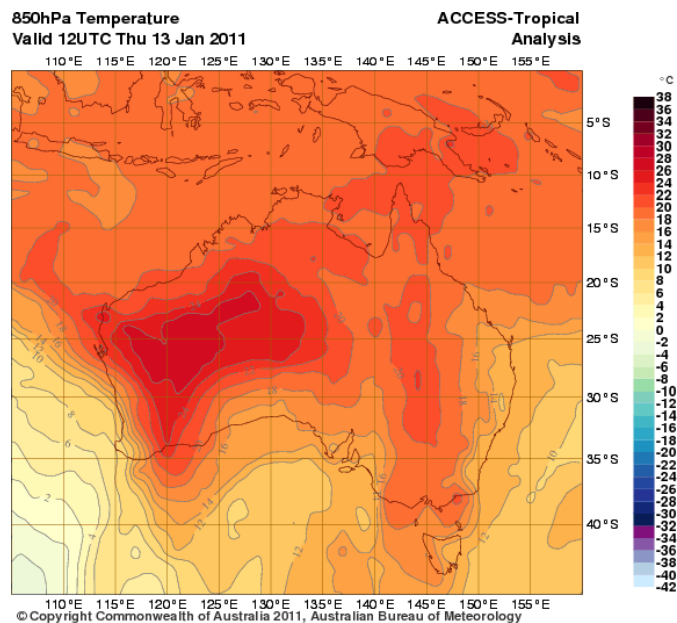
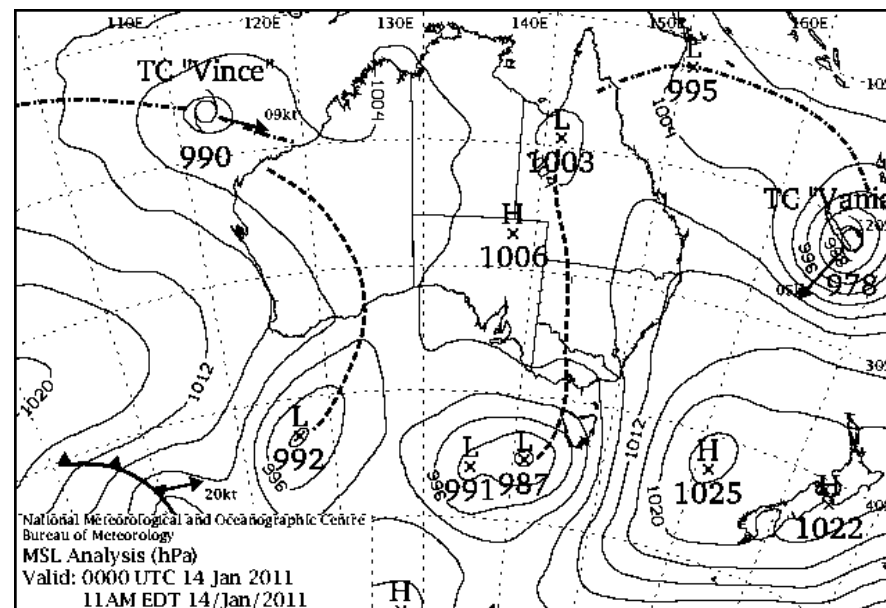
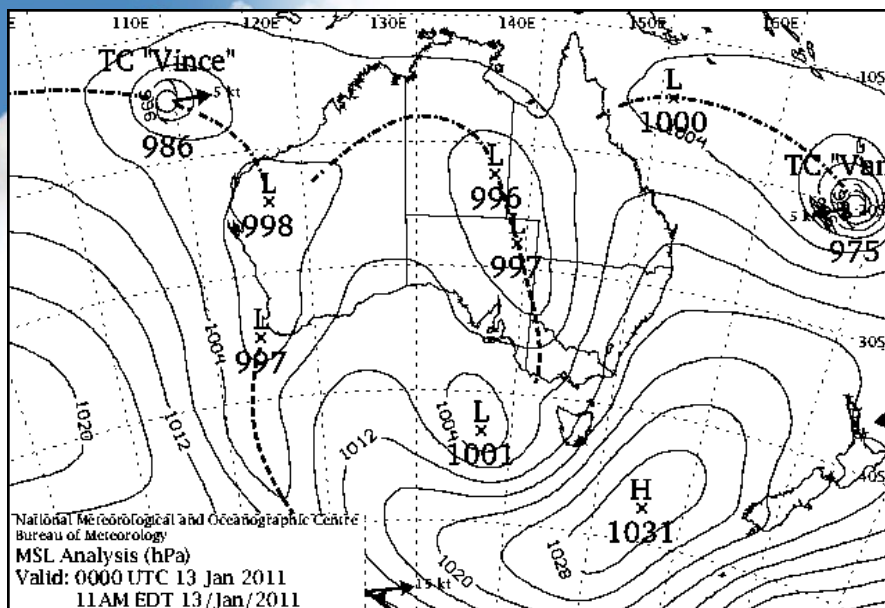
Synoptic situation 9th – 12th January





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Synoptic situation 13th – 15th January

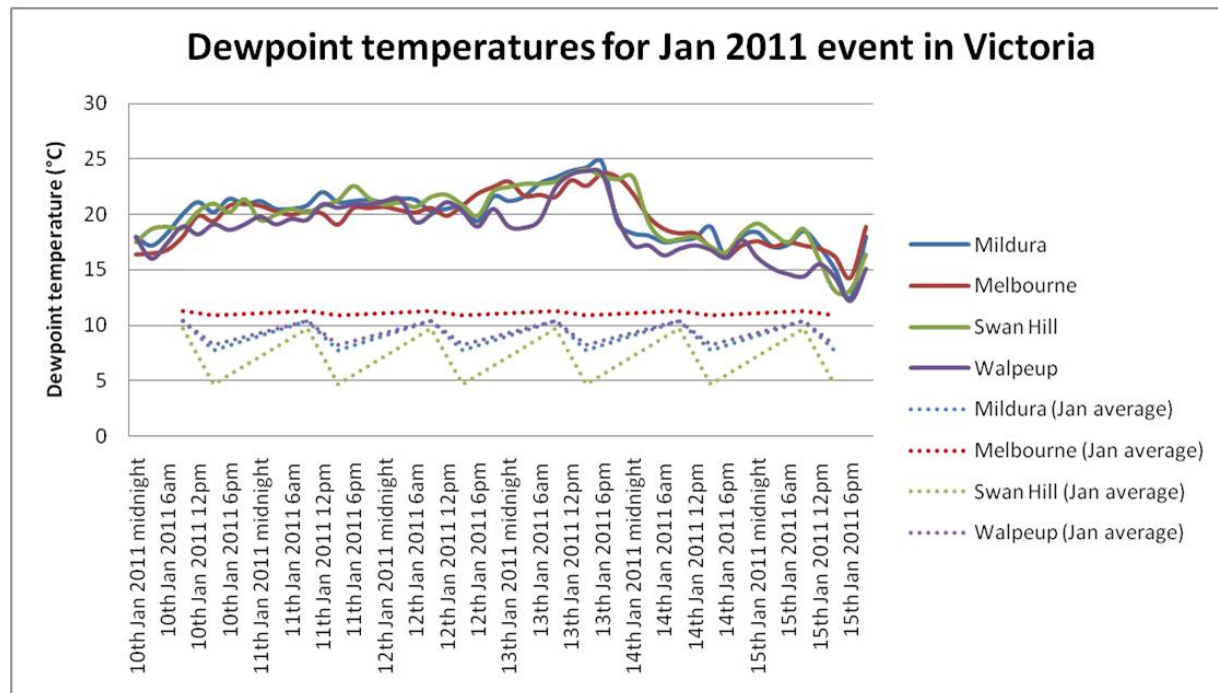


Synoptic situation - tropical conditions

- Exceptionally high moisture content of the atmosphere
- Total precipitable water at Melbourne on the 13th was 65.0 mm (previous record of 54.5 mm on 5 February 1973)

- Melbourne's peak dewpoint temperature was 23.7°C at 6pm on the 13th (record of 24.0°C set on 24 January 1982)

- In Melbourne, dewpoints remained above 21°C continuously for 30 hours and above 22°C for 9 hours (second to event on 12-14 February 1955)

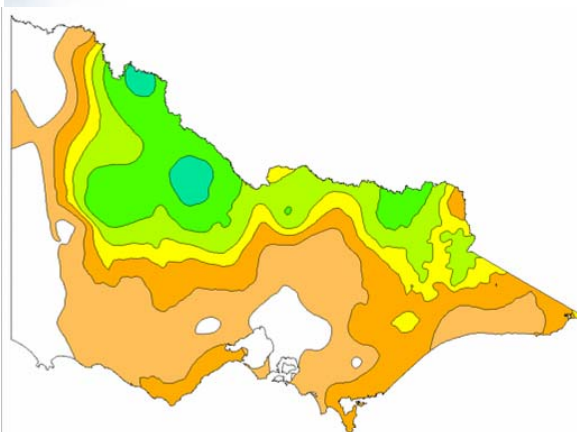
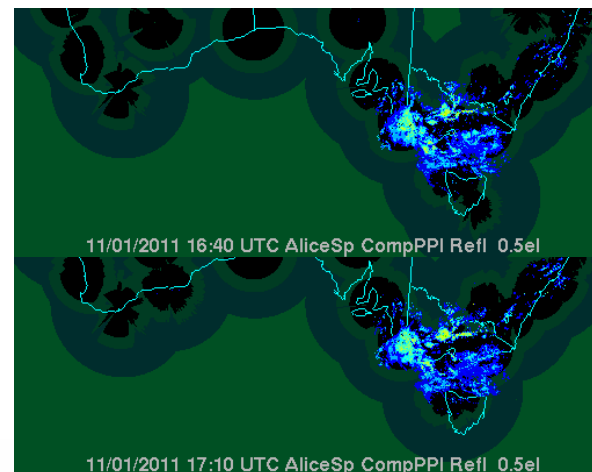




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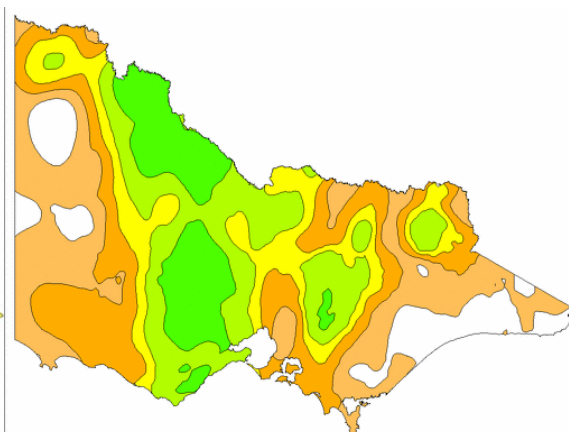
Daily rainfall

10th – 12th January
2011



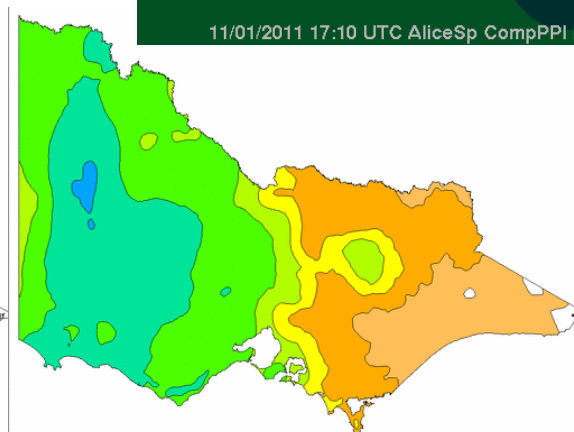
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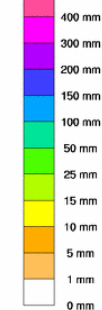
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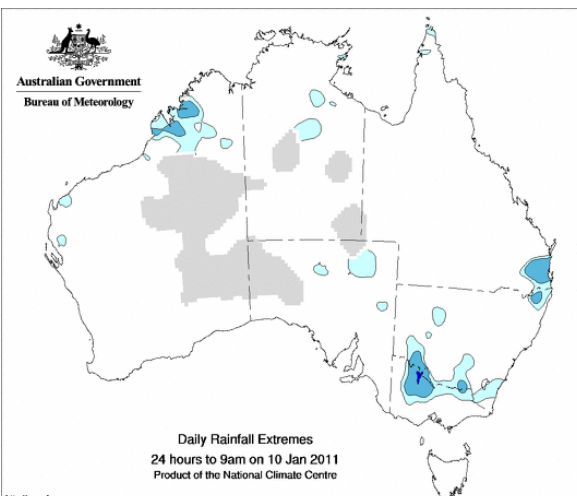
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Rainfall (mm)

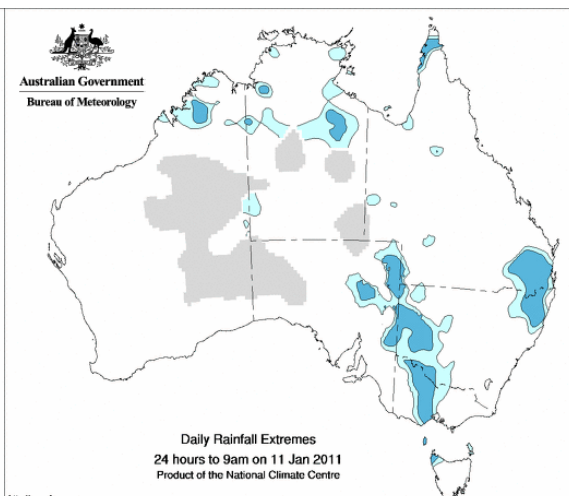


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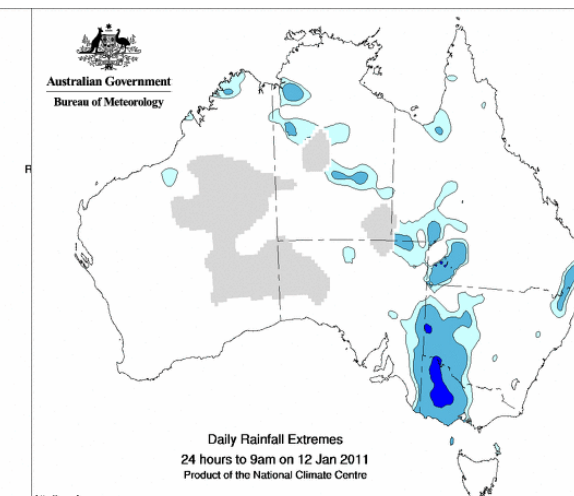
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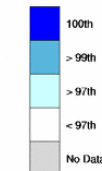
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Rainfall Percentiles



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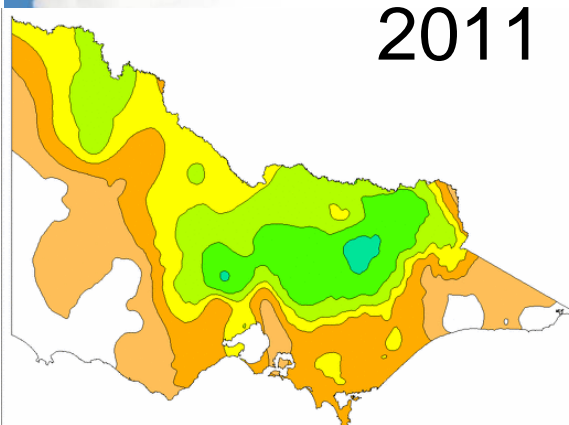


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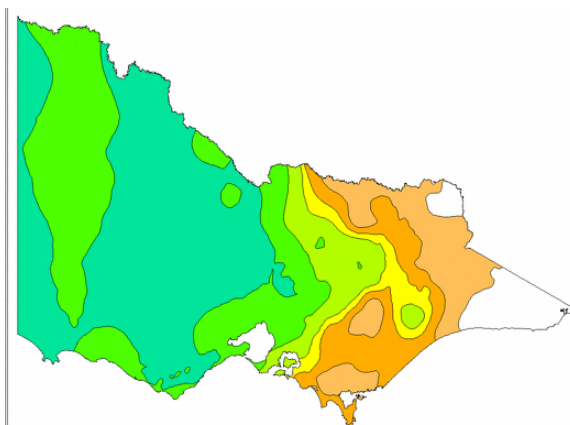
Daily rainfall

13th – 15th January
2011

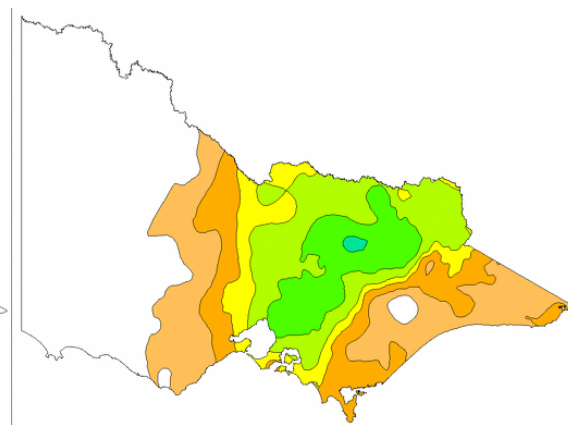
- Daily rainfall totals greater than 100 mm were common during this event – unusual for Victoria



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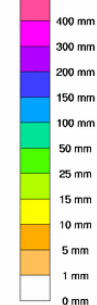


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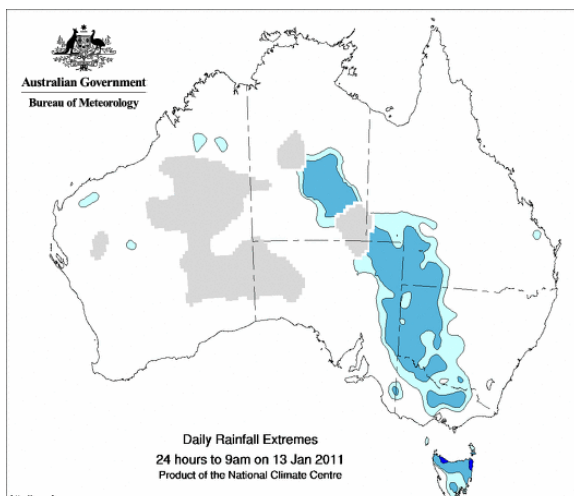


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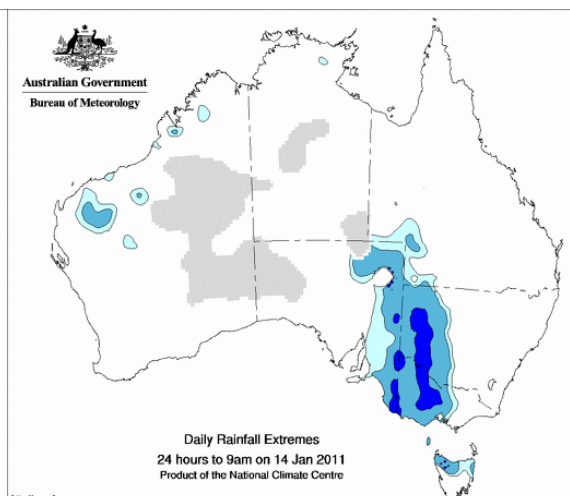
Rainfall (mm)



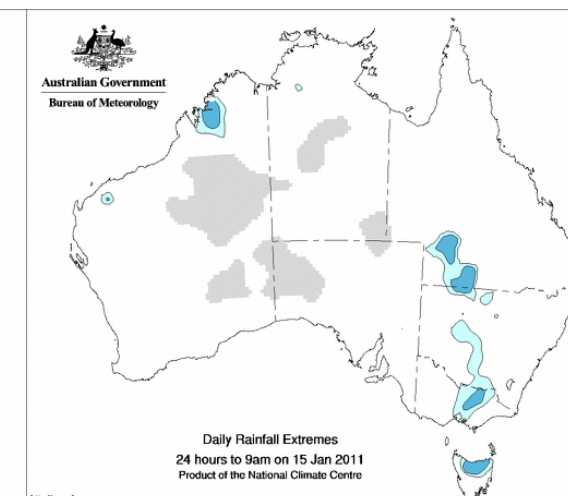
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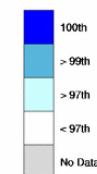


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Rainfall Percentiles

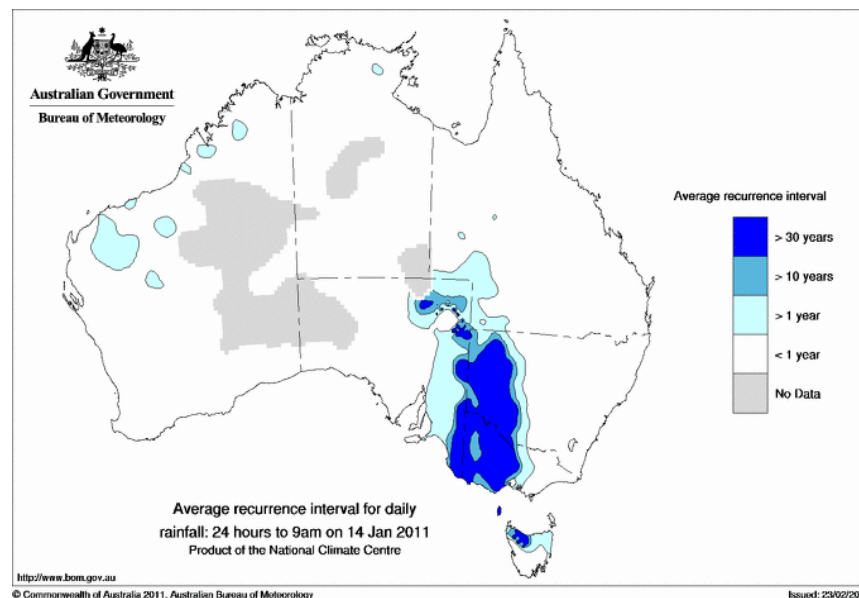
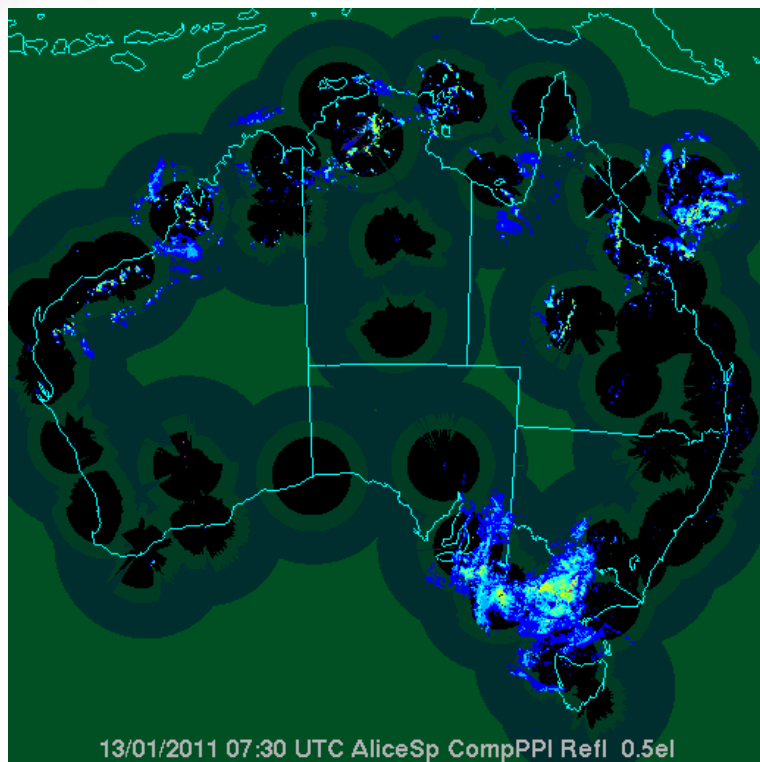


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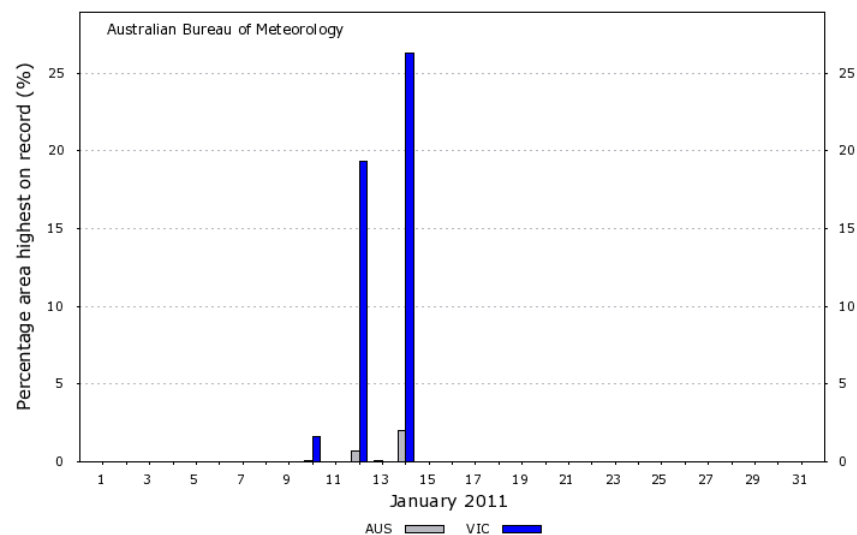


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Rainfall records – 14th January 2011



Daily Extreme Rainfall in Victoria

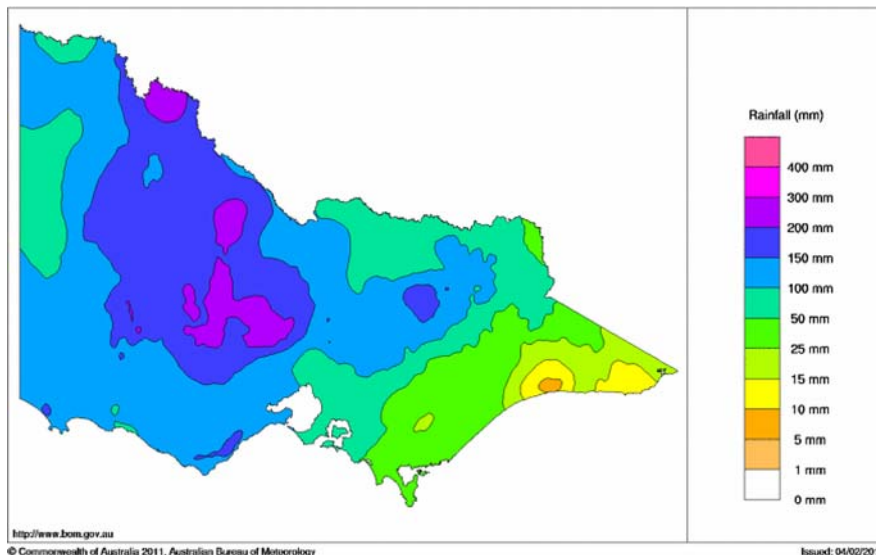
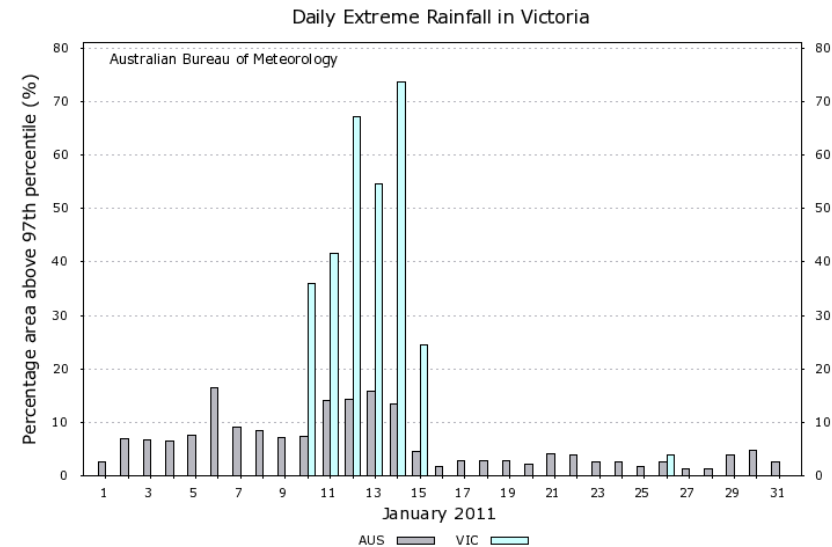




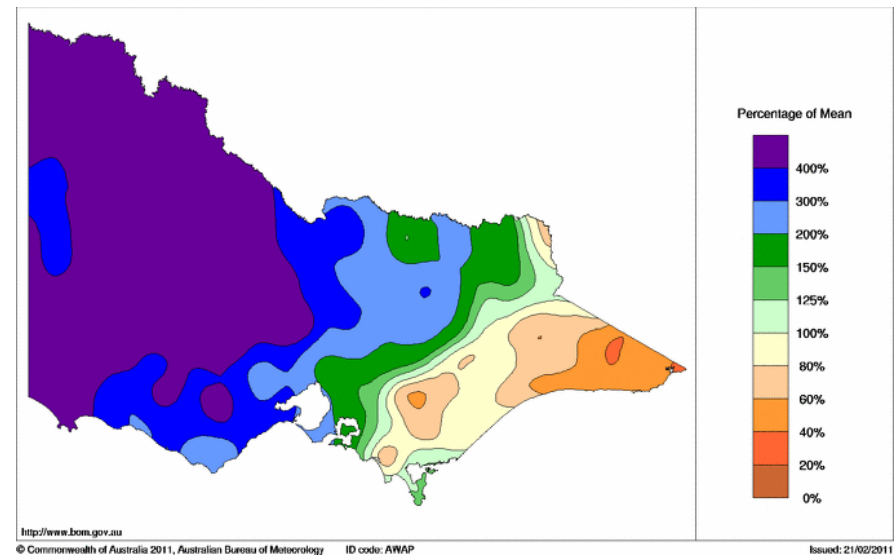
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Rainfall records – entire event

- More than 70 stations observed highest ever daily rainfall on 12th or 14th Jan
- Rainfall of 100 – 300 mm across two-thirds of the state



Rainfall totals (mm) – Week ending 15th January 2011



Rainfall Percentages (% of mean) - January 2011

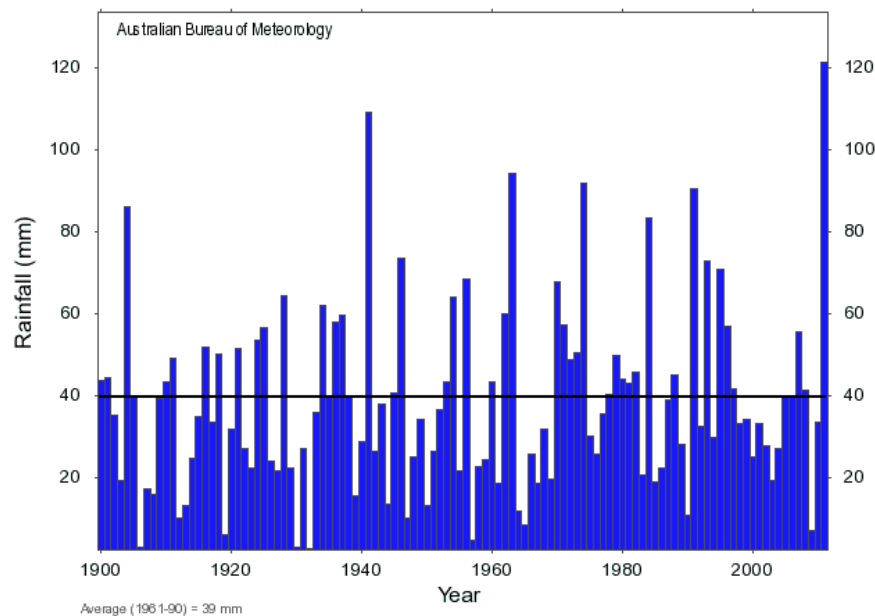


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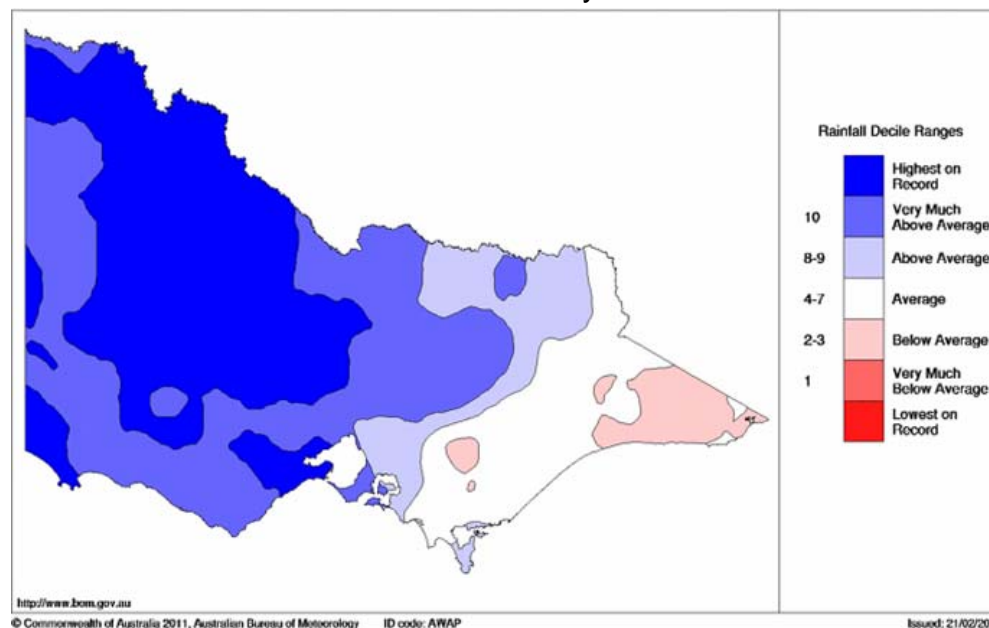
Rainfall records - wettest January

- Ranked wettest January on record by the halfway point of the month

January Rainfall - Victoria



Rainfall Deciles - January 2011

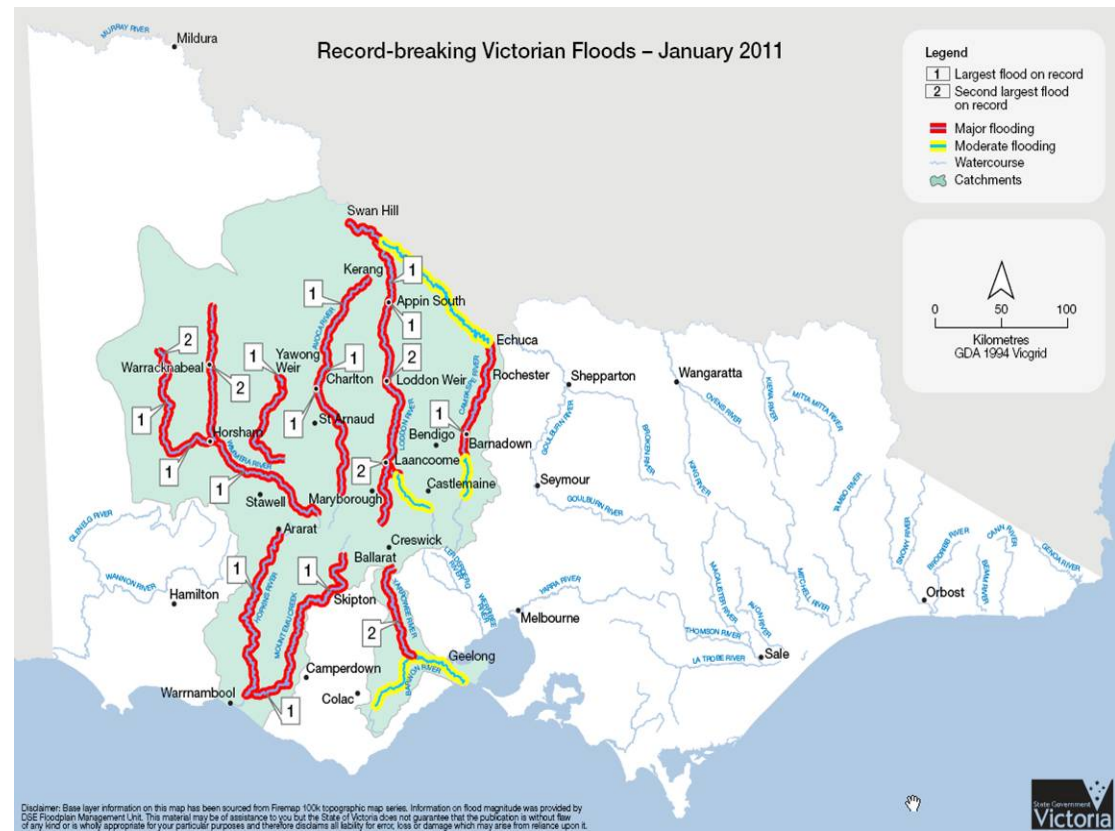




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Widespread Flooding

- Record river heights observed at 13 sites in the west of the state
- Widespread riverine flooding and localised flash flooding
- Over 80 towns across Victoria affected – including major regional centres Echuca, Kerang, Charlton and Horsham



Map of flood levels and records for the January 2011 Flood event in Victoria.
Source: Department of Sustainability and Environment, Victoria.



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Record river heights



Loddon River at Cairn Curran



Loddon River at Laanecoorie



Charlton

Summary

- Large-scale atmospheric circulations contributed to event
- Broad slow moving trough brought warm moist air from the tropics triggering :
 - Unprecedented rainfall in both duration and intensity
 - Record flood levels for northwest Victoria
- Wettest January on record for Victoria



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Thank you

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** More information about the January 2011 event can be accessed via Special Climate Statement 26 on the Bureau of Meteorology website***