

2010 – a remarkable year

- * 2010 was Australia's third wettest year on record
- * Rapid transition from El Nino to La Nina in autumn
- * The period July to December was the wettest ever
- * Wettest ever year for Queensland
- * 3rd wettest for the NT, NSW and SA.
- * 5th wettest year on record for VIC.



2010 Australian Climate Highlights



Northern Australia

- Wettest dry season (May-Oct) on record for top half of continent

NT

- Wettest year on record with 927mm rain

Southwest WA

- Driest year on record with 392mm rain

SA

- 3rd wettest year on record with 362mm rain

Australia

- Third wettest year on record with 690mm rain
- 10 years ending 2010 warmest decade on record
- Sea surface temperatures 0.54° C above average and warmest on record
- Sea surface temperatures warmest decade on record by 0.15° C
- Wettest spring on record for NSW, QLD and NT

Northern Tropics

- Spring 2010 has the warmest sea surface temperatures on record

QLD

- Wettest year on record with 1110mm rain
- Major flooding in southern & inland areas

Murray-Darling Basin

- Wettest year on record
- Water storages up to 80% from 27% one year ago

NSW

- 3rd wettest year on record with 805mm rain
- Major flooding in inland areas

VIC

- Major flooding in northern area
- 5th wettest year on record with 858mm rain

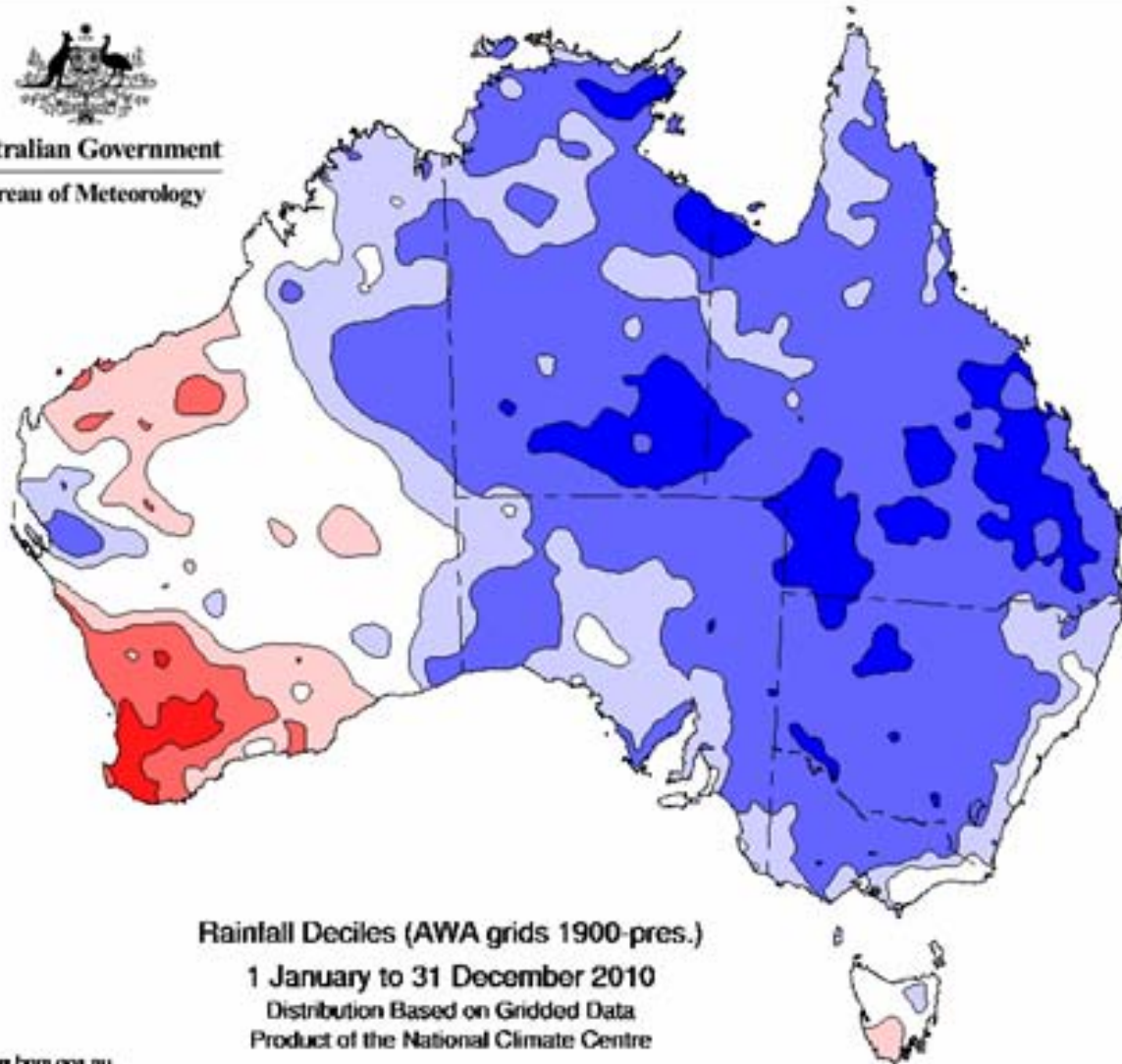
TAS

- Near average rainfall

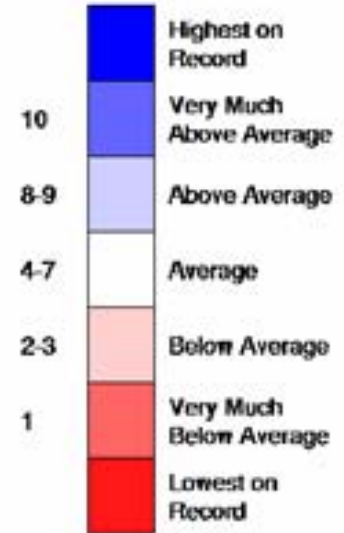




Australian Government
Bureau of Meteorology



Rainfall Decile Ranges



Rainfall Deciles (AWA grids 1900-pres.)
1 January to 31 December 2010
Distribution Based on Gridded Data
Product of the National Climate Centre

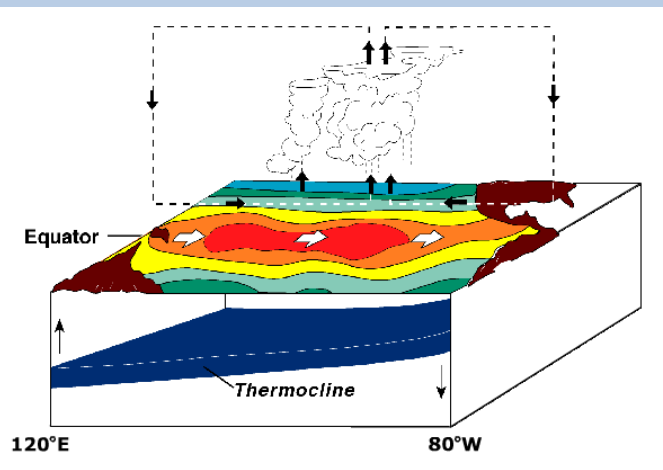
<http://www.bom.gov.au>

© Commonwealth of Australia 2011, Australian Bureau of Meteorology ID code: IGMapAWA/Deciles

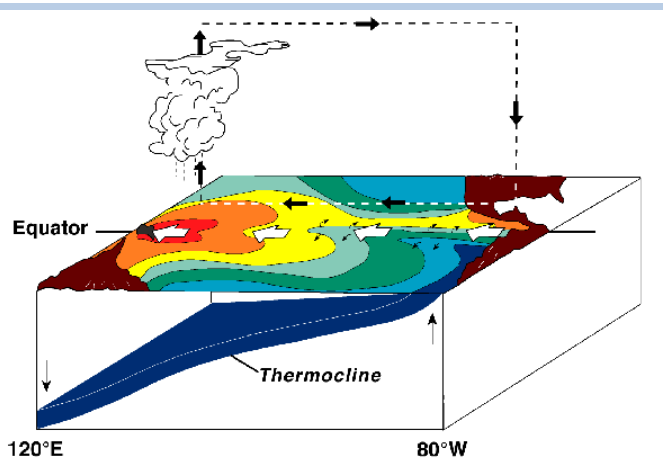
Issued: 04/01/2011

Bureau of Meteorology

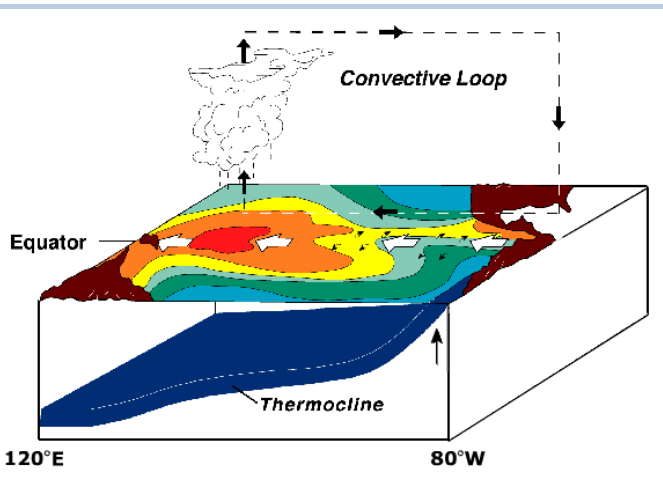




El Niño SST pattern
across the equatorial Pacific

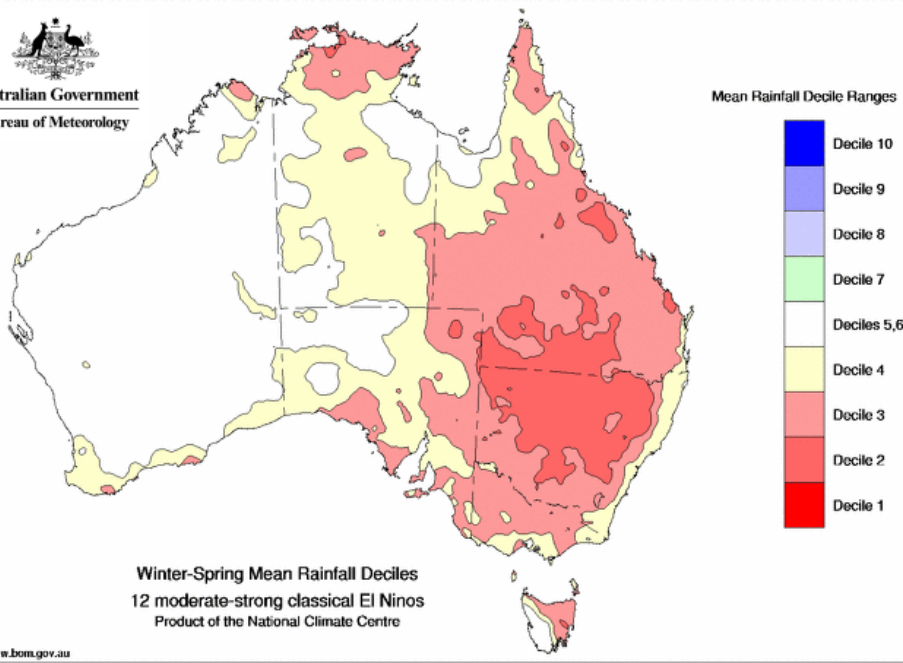


La Niña SST pattern
across the equatorial Pacific



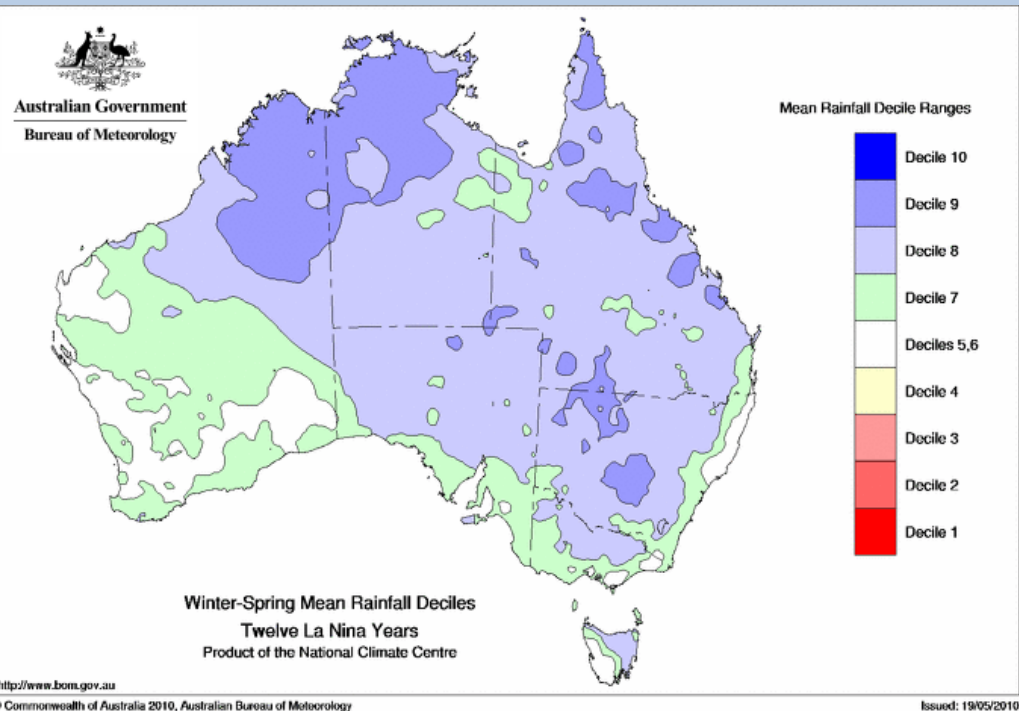
Neutral SST pattern
across the equatorial Pacific

(The thermocline is the boundary between the deep cold water and the warmer mixed surface layer)

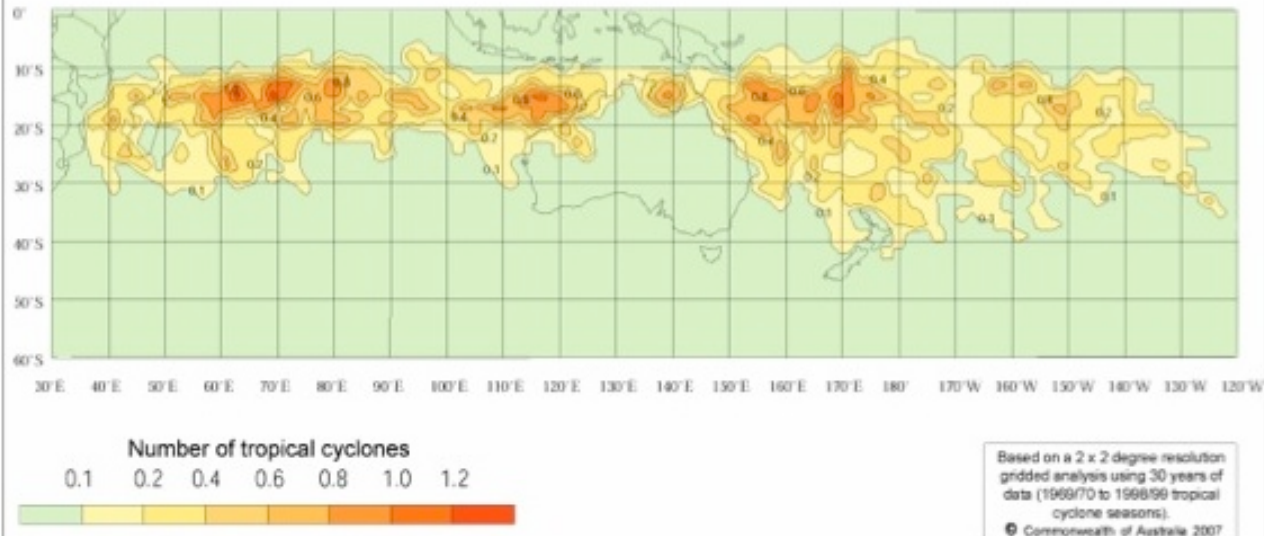


Winter spring rainfall deciles 12 El Niño years

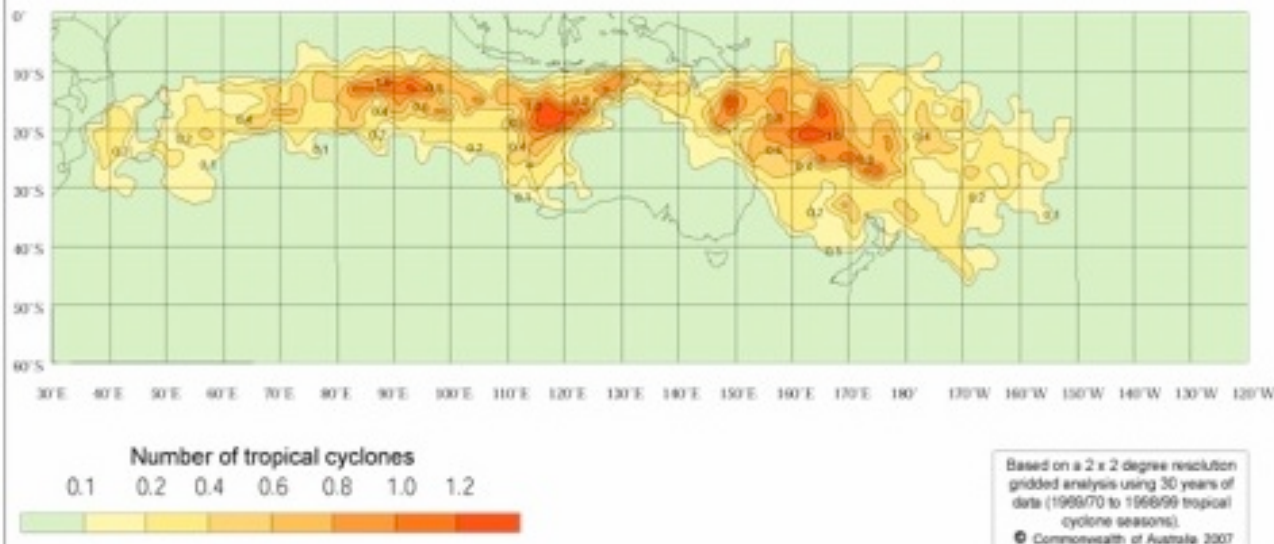
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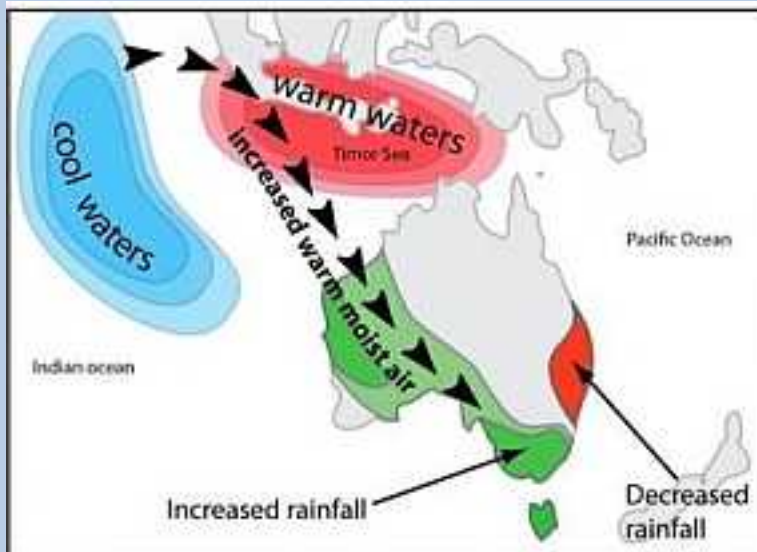


Average annual number of tropical cyclones - El Niño years

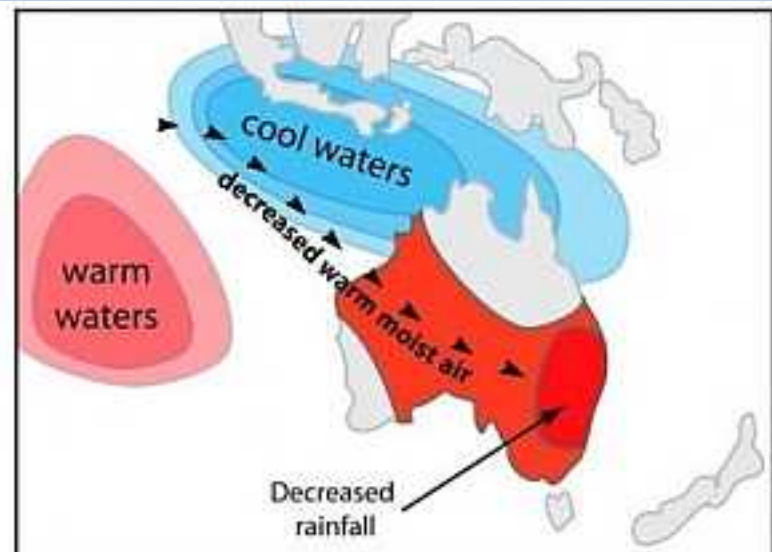


Average annual number of tropical cyclones - La Niña years





Negative phase



Positive phase

Image: University of NSW

The Indian Ocean Dipole

Inter - decadal Pacific Oscillation?

1940's: - Dry with dust - storms and **bushfires**

1950's: - Widespread **floods** – 1955 Maitland

1960s: - Dry decade – 1967 Tasmanian **bushfires**

1970's: - Widespread **floods** – Brisbane and tropical cyclone Tracy

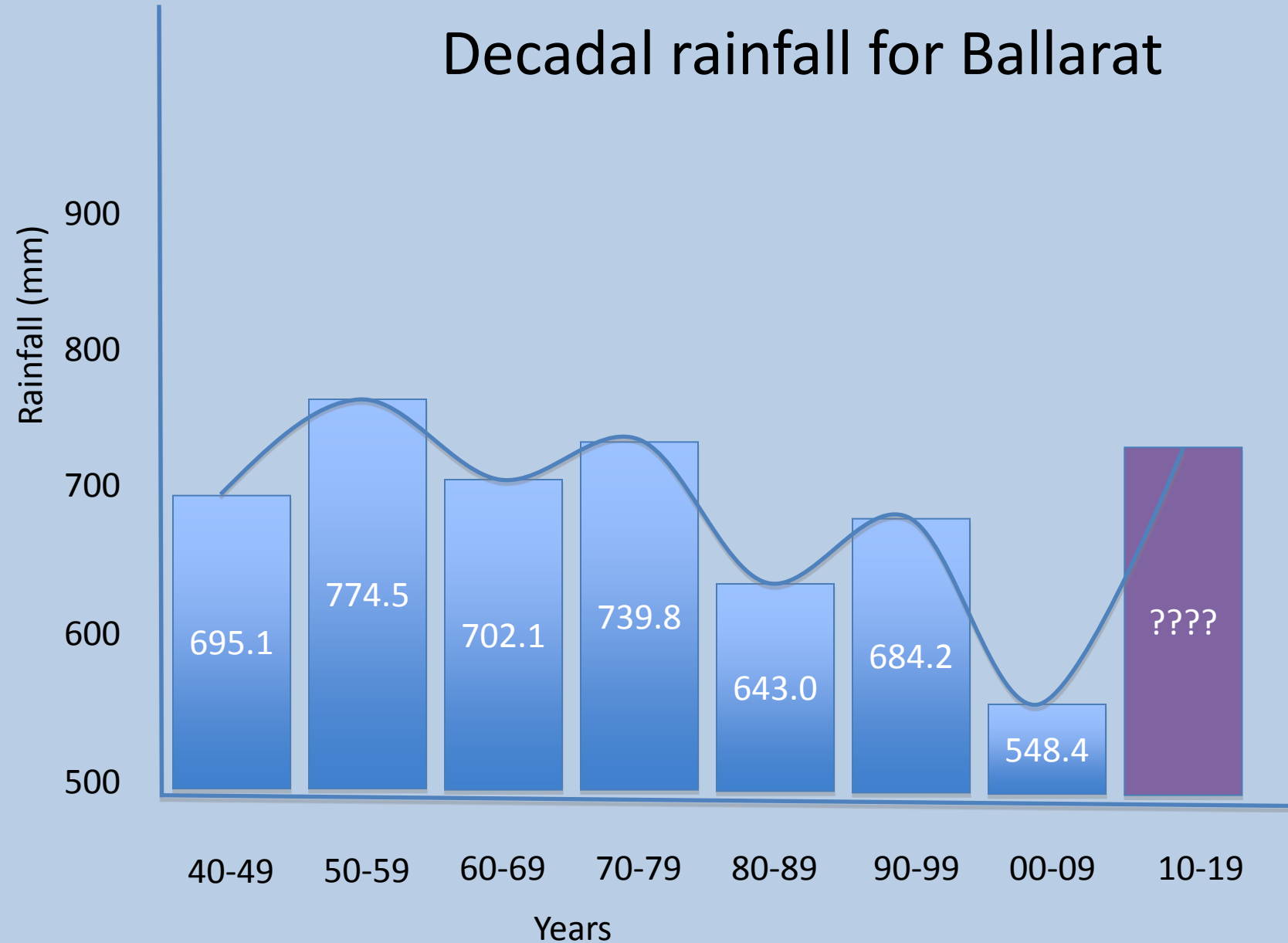
1980's: - Drought – Ash Wednesday **bushfires** Victoria

1990's: - **Floods** – 1993 in Victoria – Shepparton

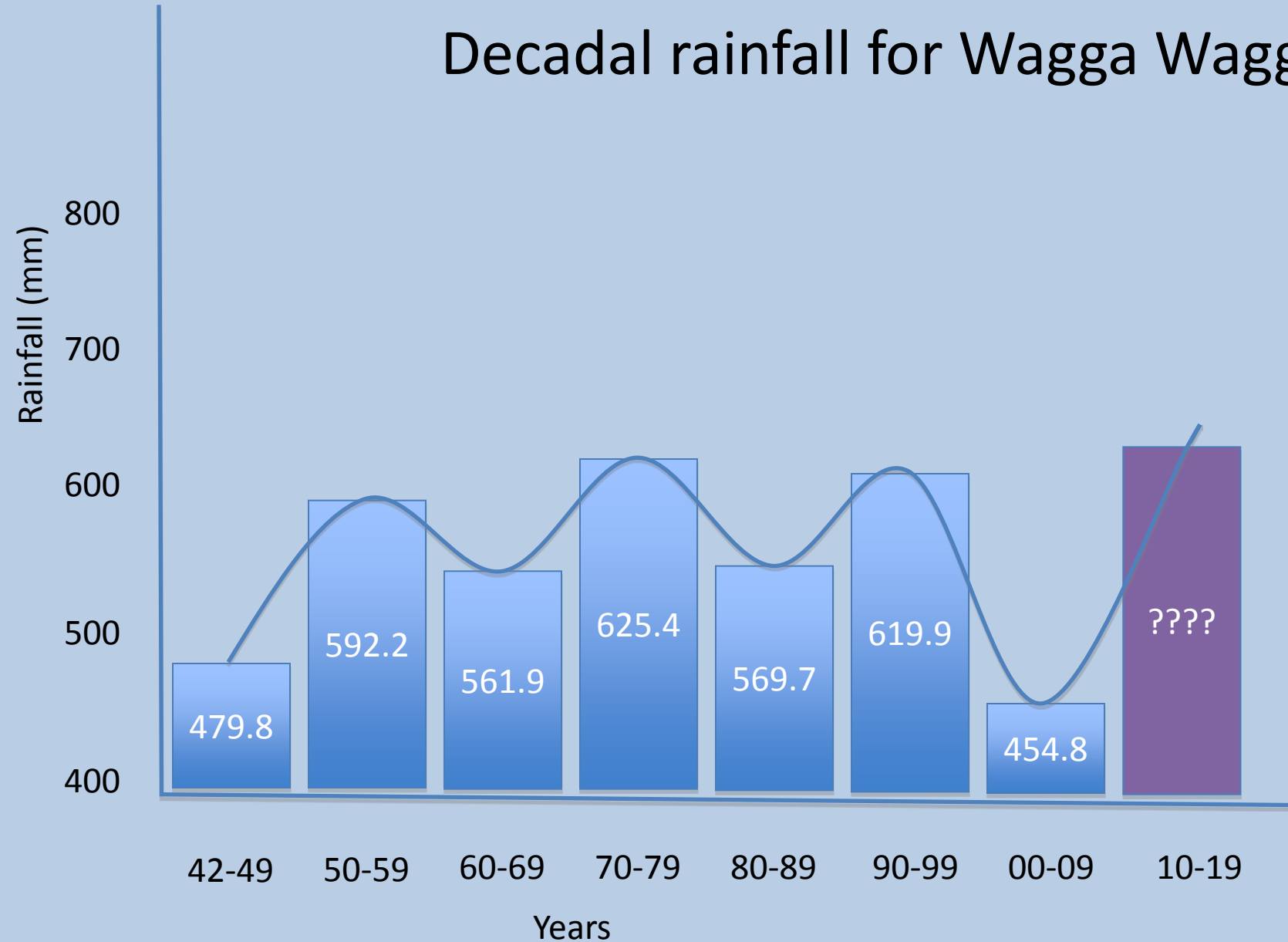
2000's: - Dry decade – 2003 Canberra and 2009 Black Saturday **bushfires**

2010's: - So far - **floods**

Decadal rainfall for Ballarat



Decadal rainfall for Wagga Wagga



Black Friday

13th January 1939



The lead up:

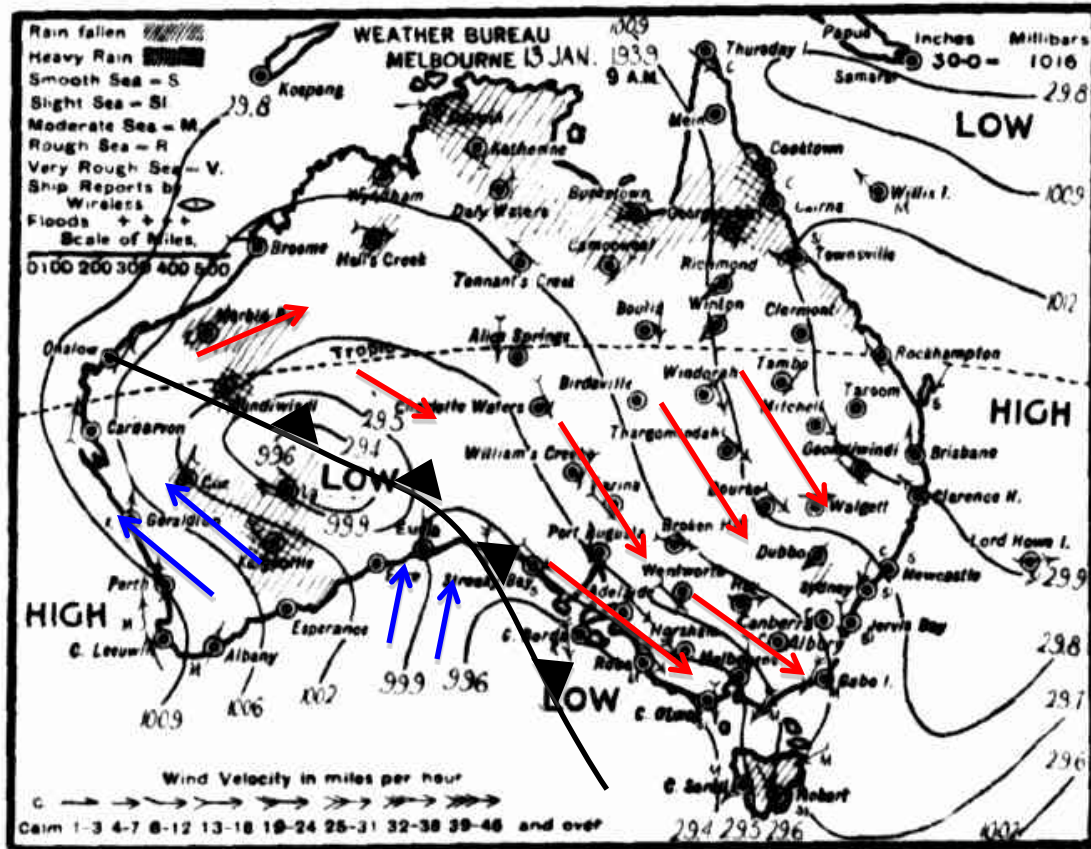
- * 1938 - Driest July to December on record for much of southern Victoria
- * Unprecedented heat-wave built from early January
- Approaching front with northerly winds produced record temperatures

12th January: Adelaide 46.1C

13th January: Melbourne 45.6C

14th January: Sydney 45.3C

CHART and FORECASTS



The synoptic chart
Friday 13th 1939

“Black Friday”

Steamers from which reports have been received are indicated the bow pointing to the direction of travelling. The arrow indicates the direction of the wind.

NOTES ON THE CHART.—Friday's chart shows a weak "high" over the seas to the east of Australia, with practically the whole of the Australian continent under the influence of two low-pressure systems, one centred over the eastern Bight and the other centred over south-east inland regions of Western Australia. The latter "low" has moved from the north-west coast of Western Australia across inland Western Australia, weakening considerably in intensity and causing very heavy rains in its passage. This low has practically effected a union with the southern "low" in the Bight. During the 24 hours ended 9 a.m. Friday heavy rain occurred in central and south inland Western Australia, and at places north of the tropic, with some light rains in Tasmania. Very strong north-westerly winds were blowing in South Australia, inland New South Wales, and Victoria; many dust-storms being reported from South Australia, and much smoke haze in South Australia, New South Wales, and Victoria. On Thursday, under the influence of the hot northerly winds in the south-east of the continent, maximum temperatures were very high, Adelaide recording a record maximum of 118deg. On Friday the hot northerly winds had freshened very much and extended to Tasmania, and as a result extreme temperatures were again registered through most of South Australia, New South Wales, and Victoria, Melbourne having a record maximum of 114.1deg. A slight cool change passed through Victorian coastal districts during the late afternoon, reaching Melbourne shortly before 4 p.m. It is expected that this change will intensify and gradually extend to inland areas.



The remnants of a hospital near Omeo

Image: Courtesy of Department of Primary Industries, Victoria



Guest house destroyed near Healesville

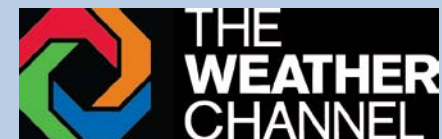
Image: Courtesy of Department
of Primary Industries, Victoria





The timber town of Matlock was virtually destroyed

Image: Courtesy of Department
of Primary Industries, Victoria



MARATHON
THE GREAT
SHEETING
FOR LINS, TENTS,
BARNES, SHEDS, & ALL
OTHER PURPOSES
LOFTUS NORAN Pty. Ltd.
MELBOURNE

The



Argus.

Penfold
HOSPITAL
Brandy
STOPS ALL ILL FEELING.

Published for the Proprietor by The Melbourne Press Printing Co. (Limited) at the Melbourne Press Printing Co. (Limited) Printers, Melbourne, Thursday, January 12, 1939.

MELBOURNE, THURSDAY, JANUARY 12, 1939. 8 PAGES. PRICE 1s.

18 PERISH IN FOREST FIRE TRAGEDY ONLY TWO NOW MISSING; OTHERS SAFE CHANGE OF WIND AVERTS FURTHER DANGER

STORIES OF RESCUERS' HEROISM

Twenty people have perished in the forest fires which have swept the mountain districts of Victoria. The bodies of 18 men, women, and children were recovered yesterday. Two men are still missing, one of them being in the Walwa district.

Lives in peril of those perished with tragedy were feared to be in the Rubicon under circumstances, as in the Acheron area. Scores of families, after day, night and night, have been rescued and about 1500 lives have been saved from the clutches of death.

Hundreds of people have lost their homes and are destitute. At Rubicon some 50 families, with more than 150 children, have lost all, and the plight of those in many other districts is pitiful.

The worst of the forest fire is now in the Walwa district. The people in the district are in a state of panic. It is expected that more people will be lost tonight. The fire is now spreading rapidly and has been reported to have reached the station where it was found to have started.

- The 11 men who died in the Rubicon district were:
- ALVIN ARNOLD
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' TRAGIC SCENE IN BURNT FOREST

MELBOURNE, January 11.—A tragic scene was witnessed in the burnt forest near Rubicon, where the bodies of 18 people were recovered yesterday. The scene was one of utter desolation, with the charred remains of the victims scattered across the landscape.

Red Belts Placed
The bodies of the victims were placed in a line, and red belts were placed around their waists to identify them. The scene was a heartbreaking sight for the rescuers and the families of the victims.

How Men Died
The men who died in the forest fire were caught in the flames while trying to escape. Some were found with their hands raised in a gesture of surrender, while others were found in various positions of death. The fire had spread rapidly, and the men had no time to react.

SEVEN PERISH ON ACHERON WAY

Seven people perished on the Acheron way, where a forest fire swept through the area. The victims were found in various locations, and their bodies were recovered by the rescuers. The fire had spread rapidly, and the people had no time to escape.



ERIC MANNS & BILL WHELLY RECOVERED THE ACHERON WAY TRAGEDY. THE BODIES OF SEVEN PEOPLE WERE FOUND IN THIS PILE OF CHARRED REMAINS.



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200 NEED HELP APPEAL FOR RUBICON

GREAT URGENCY

ALEXANDRIA, Wednesday.—Help is urgently needed for about 200 men, women, and children who have been left in a state of destitution in the Rubicon district. The people are in a state of panic and need immediate assistance.

Alexandra Affair

The Alexandra affair has caused a great deal of concern in the district. The people are in a state of panic and need immediate assistance. The situation is dire, and the people are in a state of utter despair.

£2,129 IN A DAY

A sum of £2,129 was raised in a day for the relief of the people in the Rubicon district. The money was raised through a public subscription, and the people are grateful for the help.

The Lowest Price in Humber's history



£498
Gives You Ownership of the
Finest of England's Fine Cars

THE WEATHER CHANNEL

ERICA NOW SAFE AFTER NARROW ESCAPE

ERICA, Wednesday.—The daughter of Eric, who was in a narrow escape, is now safe. She was found in a state of shock and was taken to the hospital. The father is now looking for her.

Eric is now looking for his daughter, Erica. She was found in a state of shock and was taken to the hospital. The father is now looking for her.

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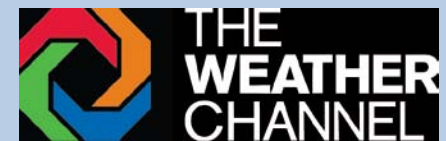


THE WEATHER CHANNEL



The Black Spur road near Healesville

Image: Courtesy of Department
of Primary Industries, Victoria





The devastated Victorian township of Omeo

Image: Courtesy of Department
of Primary Industries, Victoria



FORCAST—Fire and warm to day

The

Comprising the "Daily News" which was published from 1888 to 1917



Published by "The Daily News" at the "Melbourne Advertiser" building from 1888 to 1917

Argus.



MELBOURNE, TUESDAY, JANUARY 10, 1939

11 PAGES PRICE 1/6

NIGHTS OF TERROR IN FIRE AREAS

TWO FOREST OFFICERS LOSE LIVES

RANGES ABLAZE OVER WIDE AREA

MILL FAMILIES IN GRAVE PERIL

Forest bush fires continue to sweep a black trail of death and destruction across thousands of square miles of Victoria. The fire zone extends from the coast to the mountains and from the north to the south. The fire zone extends from the coast to the mountains and from the north to the south. The fire zone extends from the coast to the mountains and from the north to the south.

TWO MILLS BURNT

FAMILIES IN PERIL

Buxton twice threatened. Forest fires in the Buxton area have threatened two mills. The families living in the mills are in grave peril.

BAKED APPLES, HOT OFF TREES

Forest fires in the Buxton area have threatened two mills. The families living in the mills are in grave peril.

NIGHT OF TERROR

LONG DUG-OUT VIGIL

Peril at Mill. Erica Moody, about 25 children, spent a night of terror at Mill. The families living in the mills are in grave peril.

TRAPPED IN FLAMES

2 KILLED AT TOOLANG

Horrible officers' lives. Forest fires in the Toolang area have killed two officers. The families living in the mills are in grave peril.

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EFFECTS OF THE BUSH FIRE—Woods have been swept clean. Mill families in grave peril.



EMERGENCY SERVICES BEING CALLED IN TO DEAL WITH THE FIRE IN THE BUSH.



CHILDREN AT THE ENTRANCE OF A BUSH FIRE.



CHILDREN AT THE ENTRANCE OF A BUSH FIRE.

NEED FOR HEAT DUE TO-DAY

FIRE VICTIMS' PLIGHT

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Friday, January 13 1939

BAW BAW ABLAZE

Mill Workers in Peril

Mill workers in peril. The fire in Baw Baw has put the mill workers in a state of peril. The fire in Baw Baw has put the mill workers in a state of peril.

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"The Garrick Tip safeguards my throat"



THE WEATHER CHANNEL



The ruined main street of Wood's Point

Image: Courtesy of Department
of Primary Industries, Victoria

Vauxhall
outsells all
other English cars
in Australia
CHENEY'S
No. 28-820

FORECAST—becoming cooler

The



ASCOT GUIDE—Pages 13 and 14.

Argus.

Continuing the "Daily News" which absorbed the "The Philip Daily" merged in the "Melbourne Argus" and published since 1, 1892

MELBOURNE, SATURDAY, JANUARY 14, 1939

28 PAGES

PRICE 1/6

SIX MORE PERISH IN FIRES

GRAVE FEARS FOR OTHERS

TERRIBLE TOLL OVER WIDE AREA

TOWNSHIPS WIPED OUT

WARRANTYTE DEVASTATED

By Our Special Reporters

Breaking out afresh over an area extending throughout the mountains and from one end of the State to the other, shocking bush fires have taken further terrible toll of life and property. At least six more people have been burned to death, many are missing, and hundreds of homes have been lost.

With a blistering wind that reached a velocity of 70 miles an hour at times, and a record temperature of 114 deg. in the city and as high as 120 deg. in the country yesterday, Friday, January 13, was the most appalling fire day in the history of Victoria.

The damage has been enormous. Whole townships have been wiped out, others have been saved only after frantic fighting by terrified bands of courageous men and women on the point of exhaustion, after being for days and nights through nightmare experiences.

Four children of Mr. and Mrs. John Robinson, Kawarren, 10 miles south of Colac, were burned to death. Two others were overcome by the heat of the fire but were revived. Three women whose homes at Kawarren were destroyed were admitted to the Colac Hospital suffering from burns and shock.

When fleeing from a fire near Hillend, Gippsland, a man, believed to be Mr. W. Loosemore, aged 67 years, retired farmer, collapsed in a drain and was burned to death. The whole settlement of Hillend is reported to have been swept away, and the neighbouring village of Willow Grove is also in grave danger.

Four of seven children of Mr. J. M. Wilson, Winton, also reported a day or two ago, in a sudden blaze which took the lives of the two youngest of the seven children of the late J. M. Wilson, a well-known local business man, were rescued by the fire department's arrival, which took place about 11 p.m. on Saturday, January 13.

Nearly half the township of Warrandyte was razed. It was not possible last night to obtain an accurate estimation of the destruction, but it is believed that nearly 100 homes were burnt.

An Anderson, Albert Edward, Malinda, a public house proprietor at Warrandyte, 10 miles south of Melbourne, where his mother is a patient in the Royal Melbourne Hospital, was reported to have been burnt to death in a fire which broke out at his public house on Saturday night.

Five men are reported to have been killed by a fire at St. Albans, where the residents are believed to be in the fire. Five men were killed through the burning of a building at the hotel and a railway home.

Before assistance reached Warburton, firemen with inadequate water pressure had a hopeless task. Six of them, making a valiant but ineffectual fight, were in grave danger when the fire flooded in behind them. Had they not been called at once, there was no doubt that they would have been exterminated.

Mr. and Mrs. W. Jones, and their five children, are in Maresfield Hospital in a grave condition. They were trapped in their car while trying to escape from the flames that destroyed their home.

At Hall's Gap, Soadoberry's timber mill was destroyed and 15 men are reported missing. The whole settlement of Pannal has been wiped out.

Among the missing was one Ken Mackay, aged 17 years, of Stawell, who has not been seen since Thursday night, when he was fighting a fire at Mr. Mackay's and A. C. C. O'Keefe's, a main road, which met the road at Stawell. Police and Maresfield fire trucks arrived, but did not come on the log timber fire, which is still burning.

Erica was reported safe last night, but the neighbouring small settlement of Kouti's Sliding and Anon's Sliding were destroyed.

Mr. Ben Mackay, who is believed to have been at Woodend, was reported to have been killed in a fire at Woodend, and a man named Bentley was also seriously burned at Woodend.



THE JOSEPH FERLIAS (GIRL) AT WARRANDYTE (Left) is seen at the scene of the fire which swept over the whole of the township yesterday. About 100 houses were destroyed.



FRIDAY THE THIRTIEN TH (Left) is seen at the scene of the fire which swept over the whole of the township yesterday. About 100 houses were destroyed.

Royal George Scotch Whisky
The Scotch Whisky of the 19th and 20th centuries is made in the Royal George Distillery. It is made from the finest Scotch barley and is bottled in the Royal George Distillery. It is the only Scotch Whisky in Australia that is made in Scotland.

TOTAL OF £18,004
'THE ARGUS FUND'
\$9,075 IN DAY
Victoria's response to the appeal made on behalf of the 823 lives suffered in the most disastrous bush fire in the State's history has been immediate and generous.

The total of £18,004 has been received in the first 24 hours of the appeal. The fund is being managed by the Argus and the State's response to the appeal has been so generous that the fund is now £18,004. The fund is being managed by the Argus and the State's response to the appeal has been so generous that the fund is now £18,004.

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at a Cost of only £30-£40 and obtained with few years' effort.

Get your son into the Weather Channel and he will be successful in all his business and social life.



Is he Average—?
or Brilliant!

He can be the great success story of the day, or the average man of the street, or the man who is struggling along in an unprofitable hole, or the man who is struggling along in an unprofitable hole, or the man who is struggling along in an unprofitable hole.

Saturday January 14, 1939

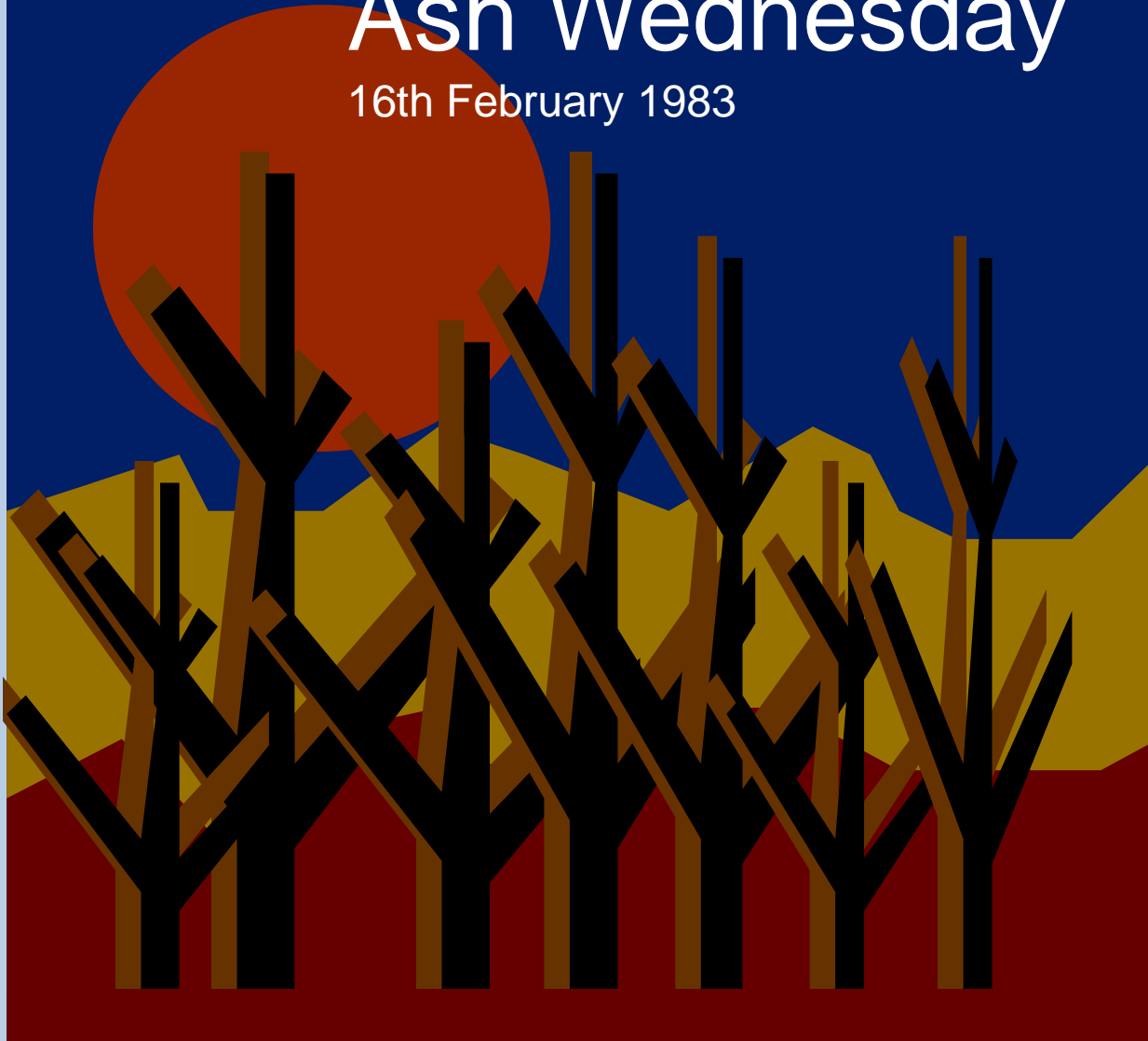
THE WEATHER CHANNEL



The areas of Victoria affected by the fires of 1939

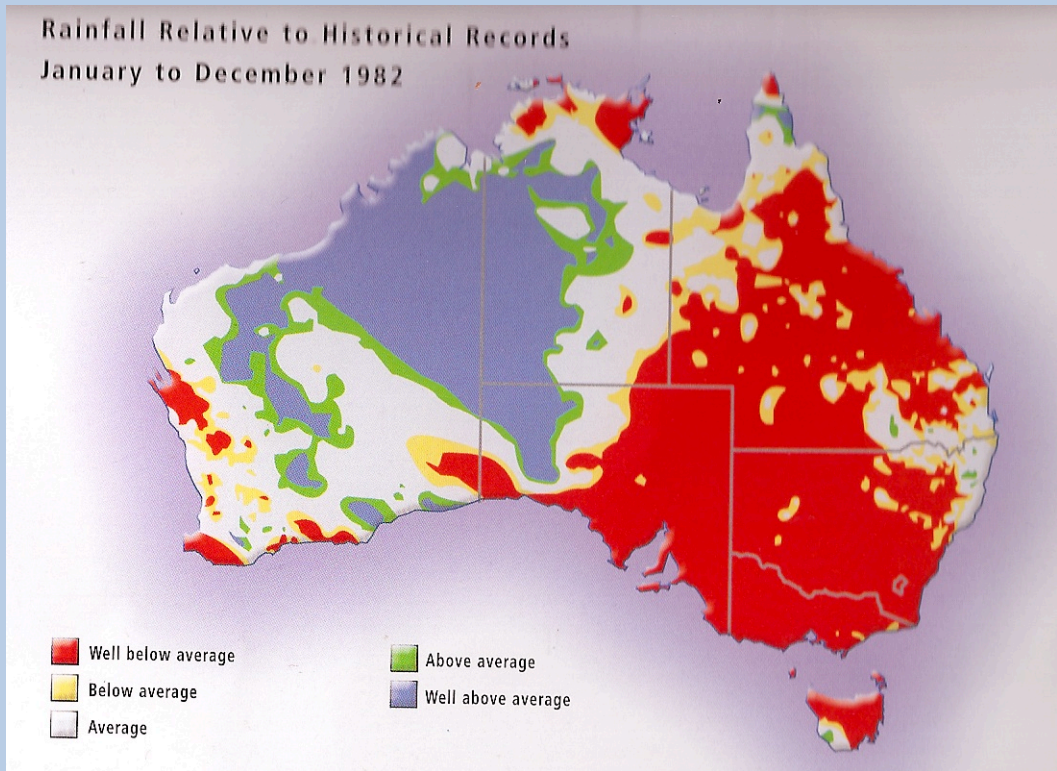
Ash Wednesday

16th February 1983



The lead up:

- * 1982 - driest year for much of eastern Australia.
- * Heat-wave conditions and strong winds developing ahead of a cold front on 16 February 1983



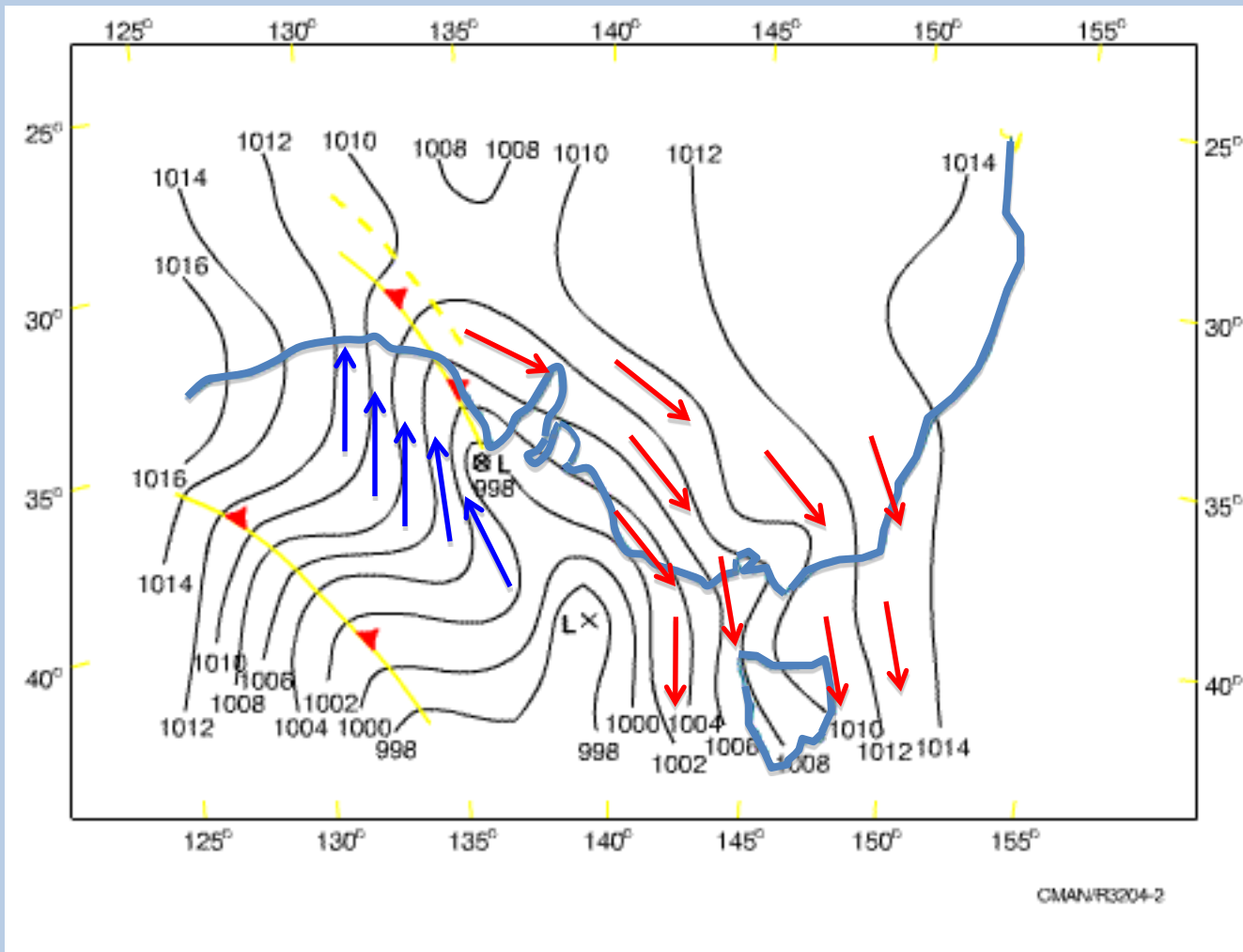
Rainfall deciles for the year 1982 – parts of eastern Australia driest year on record.



Dust storm in Melbourne - 8th February 1983

Photo: Trevor Farrar, Bureau of Meteorology





The synoptic chart on 16th February 1983
(Bureau of Meteorology image)



Smoke from the Ash Wednesday fires 16th Feb 1983
(Image: Bureau of Meteorology)

Massive fires near Mt. Macedon;
Crown fires race through the bush



Post blaze landscape – trees still
burning after main front had
passed through.

(Images: Wikipedia Commons)



High intensity fire damage

Trees burnt from crown to base

Surface cover destroyed, fences burnt down.



(Images: Wikipedia Commons)



Ash Wednesday 1983 (Image: State Library Victoria)



Areas devastated by the Ash Wednesday fires
16th February 1983 (Image: Wikipedia Commons)

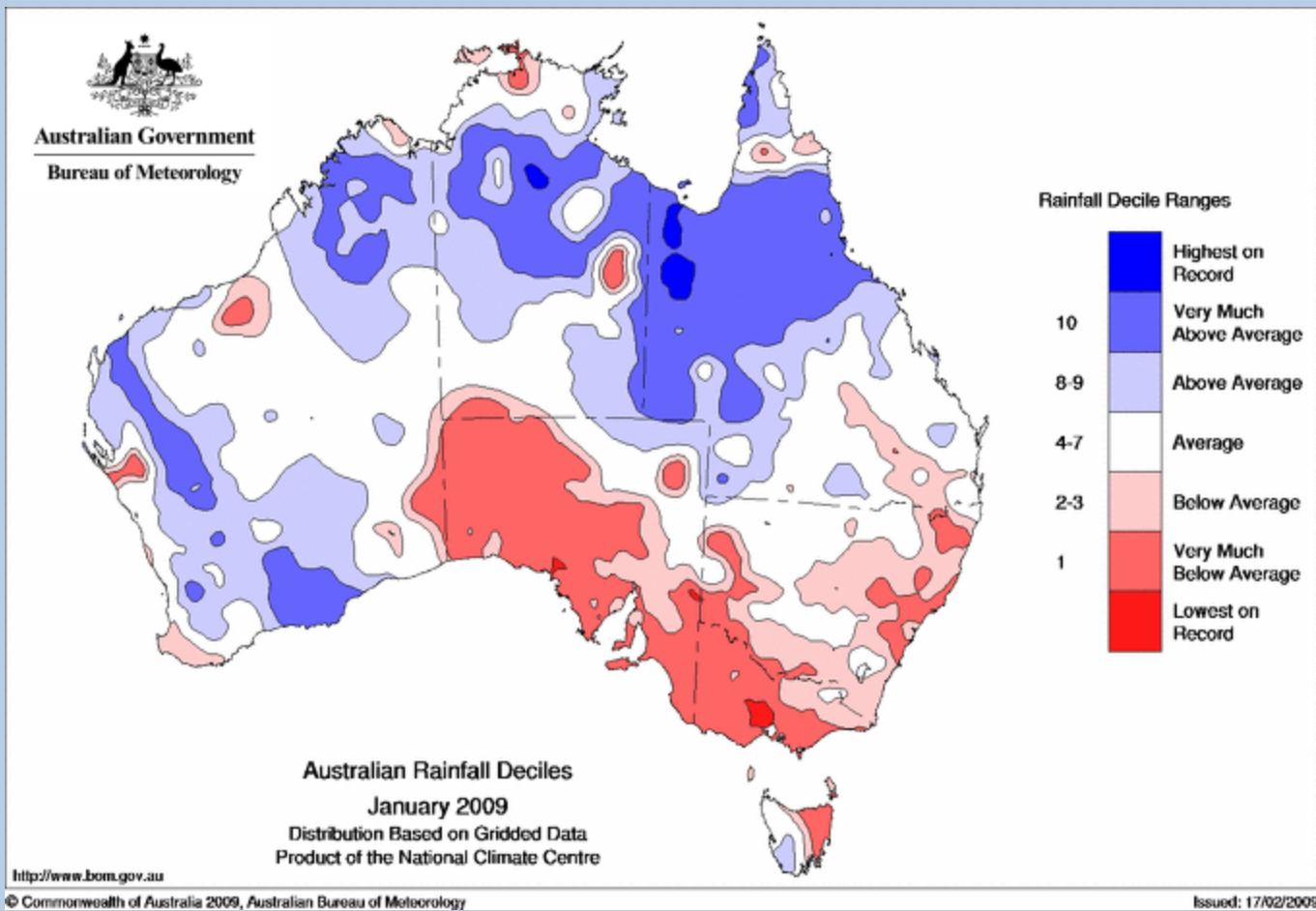
Black Saturday

7th February 2009



The lead up:

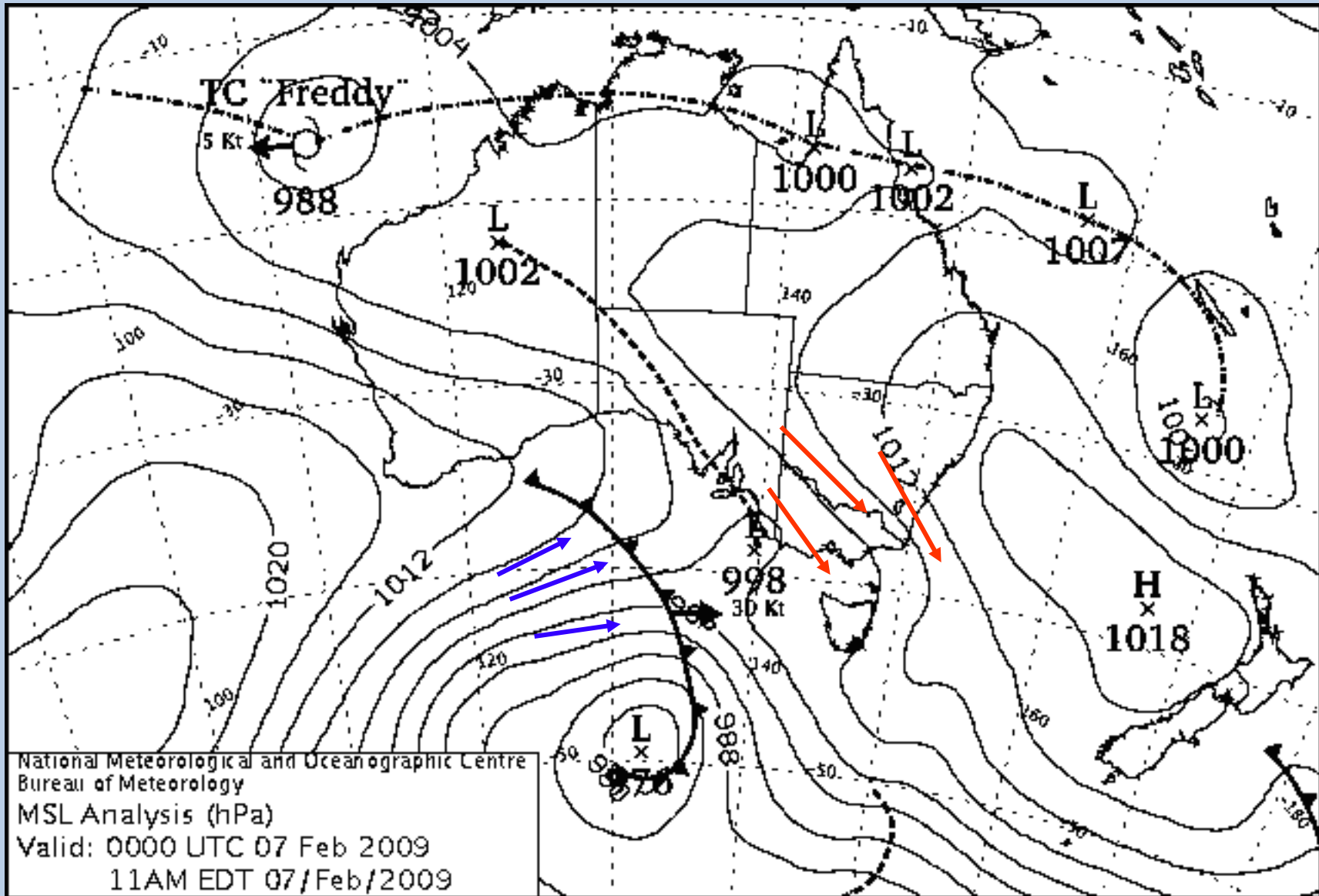
- * Good rains across Victoria during December - increase in fuel load
- * Very dry weather during January and 1st week of February
- * Record prolonged heat-wave across southeastern Australia
- * New record temperature for Melbourne 46.4C on Saturday 7th February - strong frontal system



Australian rainfall deciles January 2009 – very dry weather across southeastern Australia

Bureau of Meteorology image



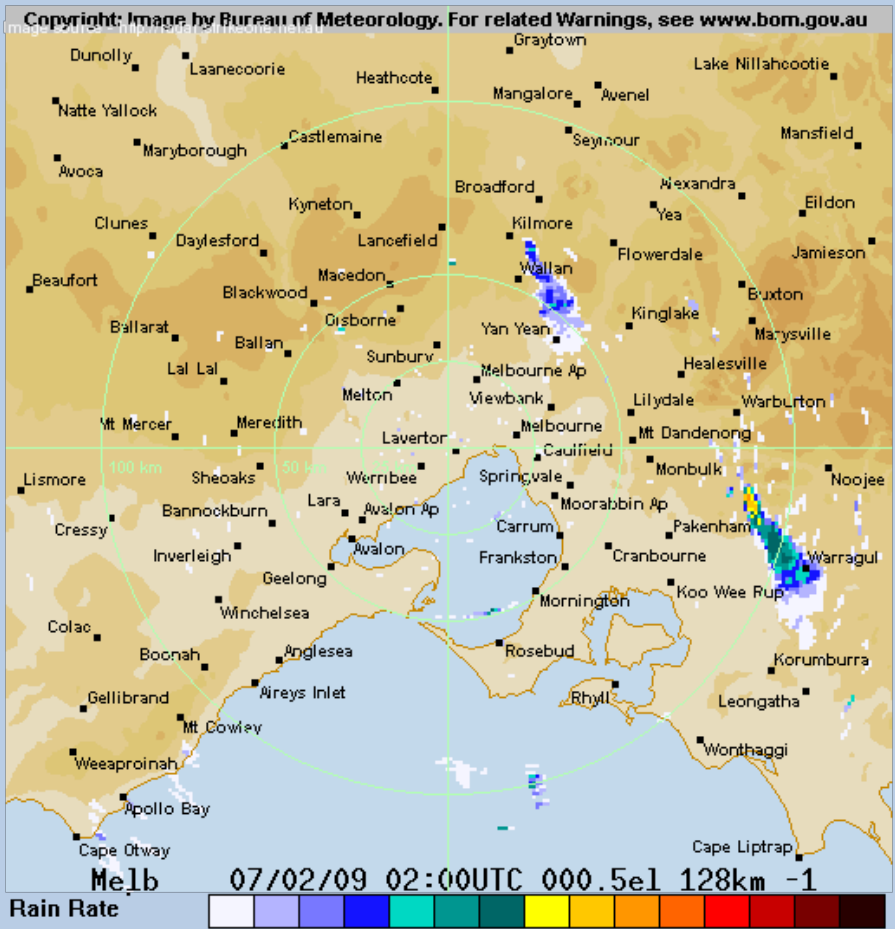


Synoptic chart at 11 am 7 February 2009
 (Bureau of Meteorology image)





Bushfire smoke dispersal in northwest winds (NASA image)



Melbourne radar 1 pm
7 February

(Bureau of Meteorology images)

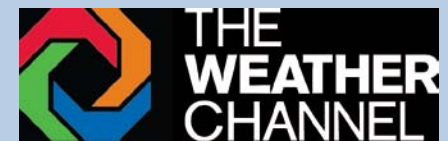


Melbourne radar 8 pm
7 February





Black Saturday fires (Wikipedia Commons)





Black Saturday fires (Wikipedia Commons)

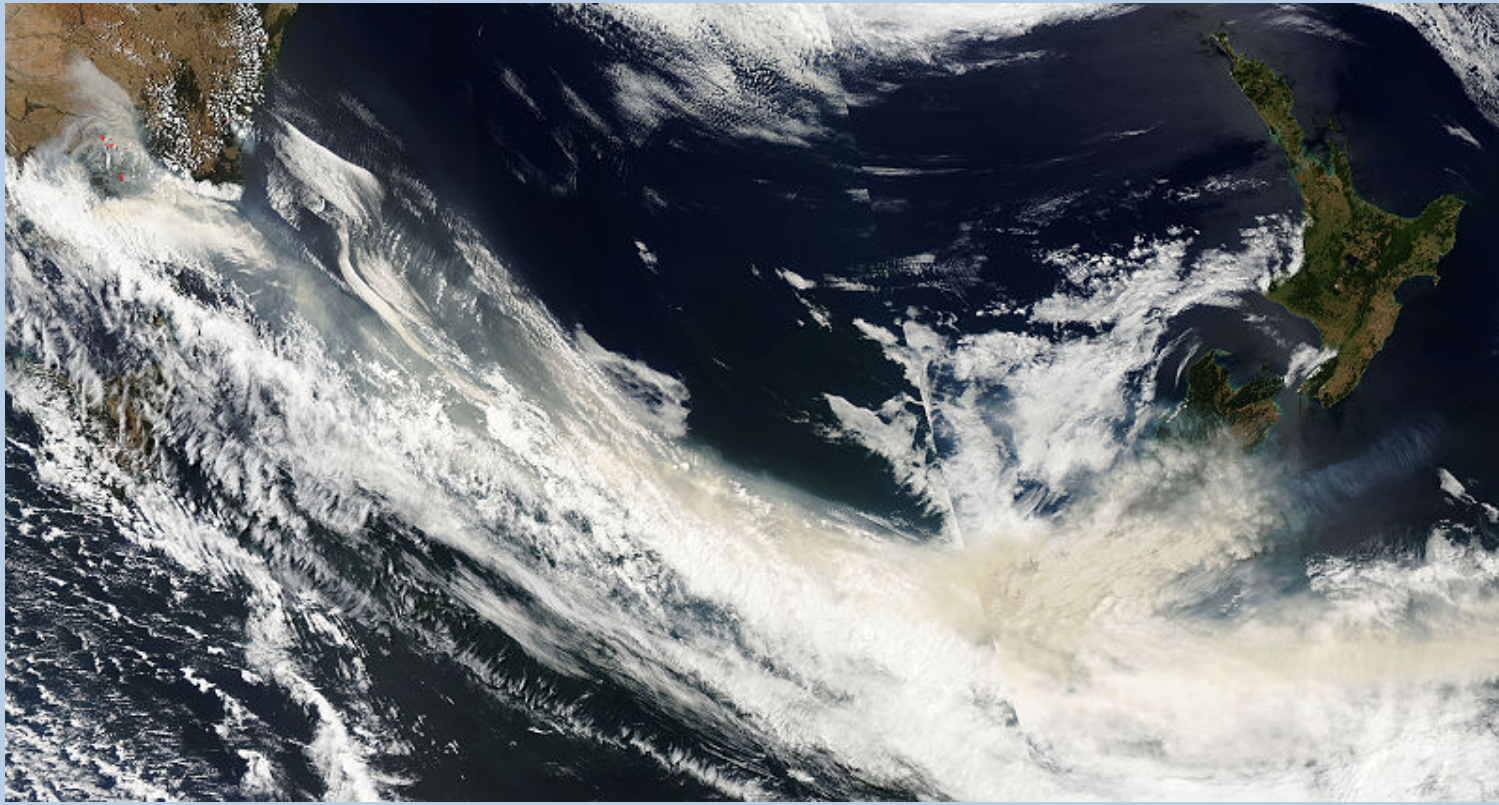




Massive crown fire shoots flames
Up to 50 meters in the air

Apocalyptic scenes near
Yarra Glen at the height of
the fires
(Wikipedia Commons)





NASA image shows smoke being carried across the Tasman Sea to New Zealand during the fires.

Black Friday:

Friday 13th January 1939

71 deaths, 1300 homes destroyed

Ash Wednesday:

Wednesday 16th February 1983

75 deaths, 2500 homes destroyed

Black Saturday:

Saturday 7th February 2009

173 deaths, 1800 homes destroyed

Common features:

- * Drought in the lead up
- * High temperatures with NW winds ahead of a front
- * Low humidity - less than 8%
- * Strong NW winds ahead of a SW change



Black Friday 1939



Ash Wednesday 1983



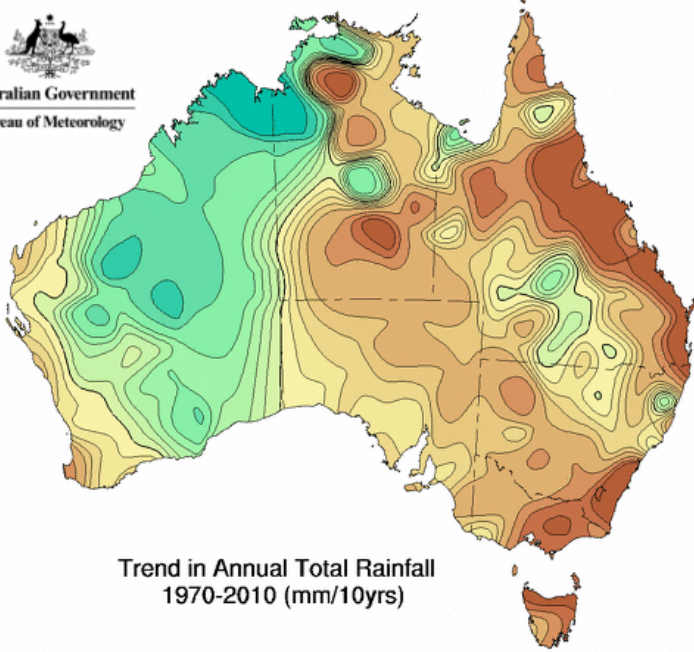
Black Saturday 2009 (in red)

(Wikipedia Commons)





Australian Government
Bureau of Meteorology



Trend in Annual Total Rainfall
1970-2010 (mm/10yrs)

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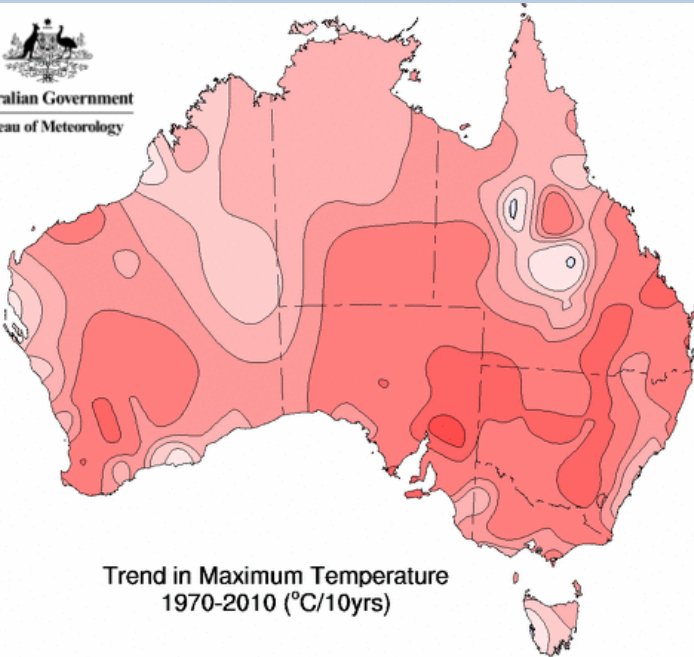
Issued: 17/02/2011

Rainfall and temperature trends 1970 to 2010

(Bureau of Meteorology)



Australian Government
Bureau of Meteorology

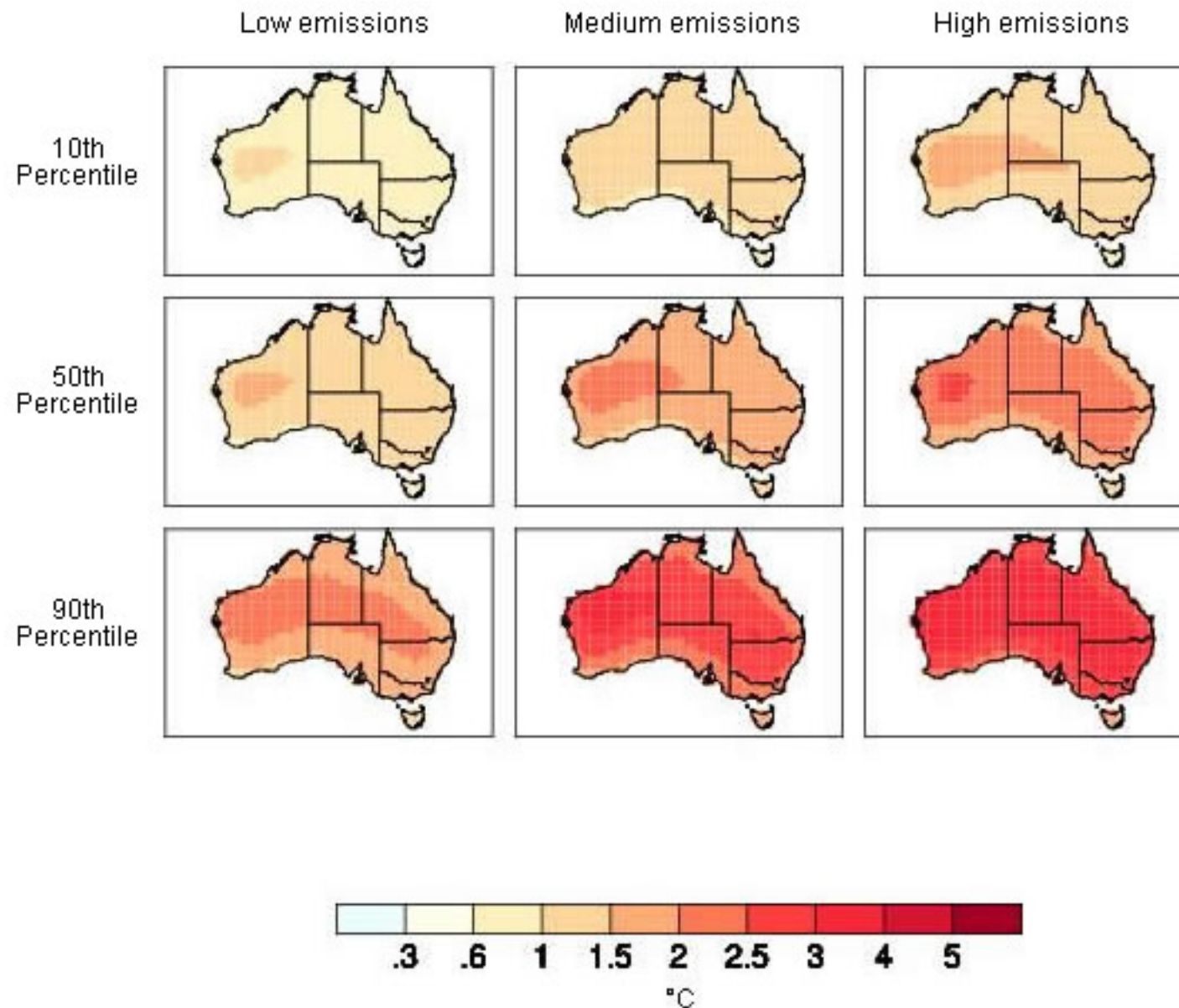


Trend in Maximum Temperature
1970-2010 (°C/10yrs)

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Issued: 16/02/2011

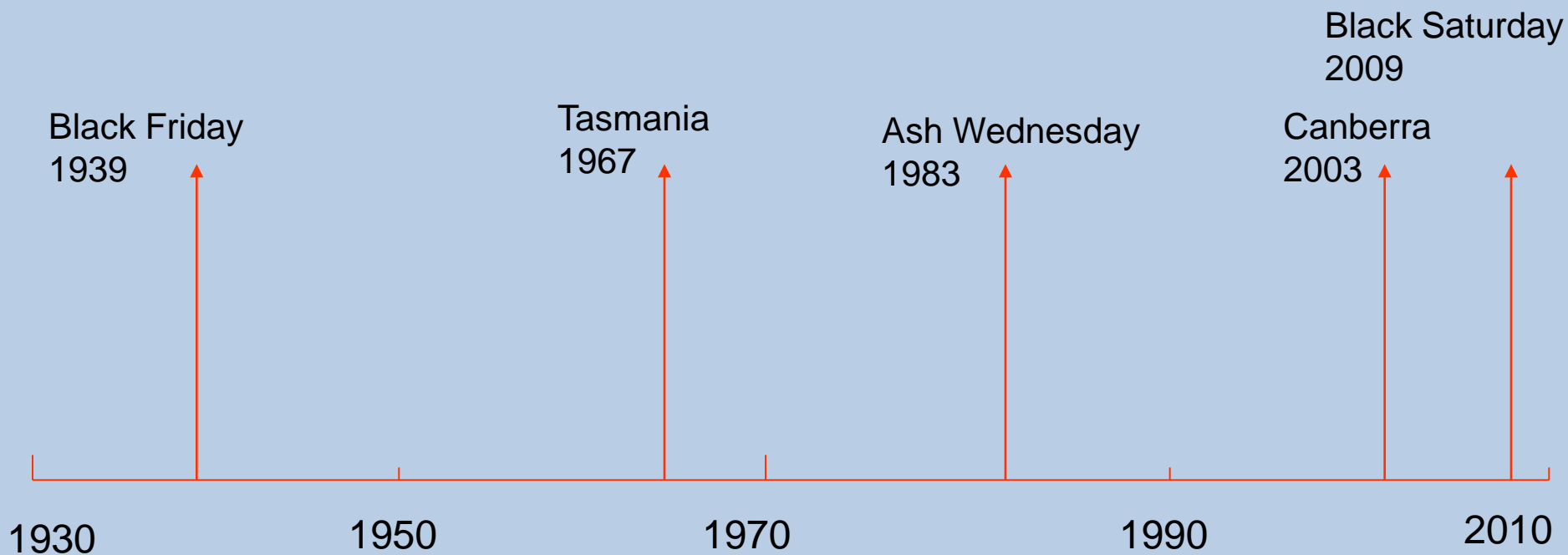




CSIRO Temperature predictions for the year 2050

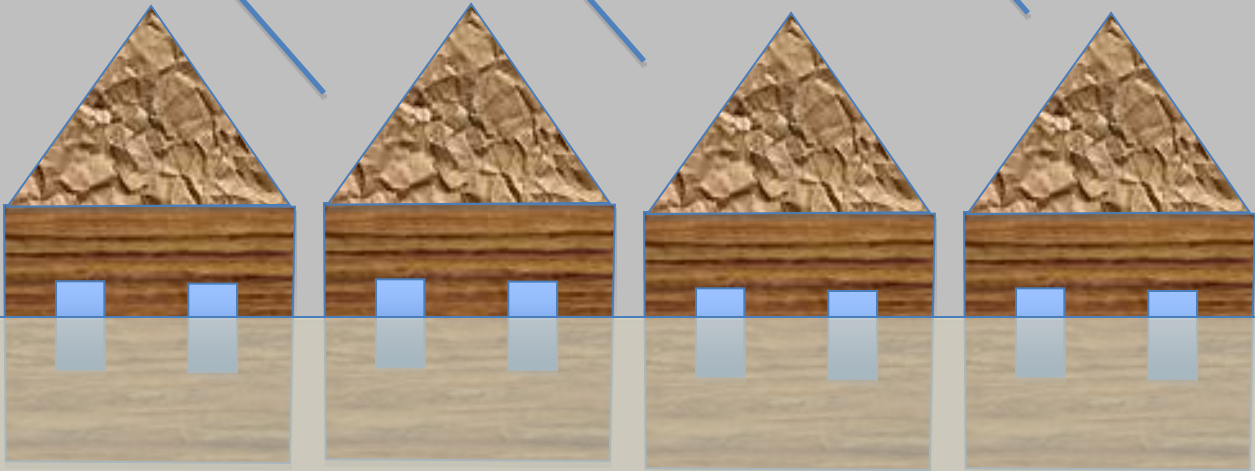


Research by the CSIRO, Climate Institute and the Bushfire Council found that a 'low global warming scenario' "will see catastrophic fire events happen in parts of regional Victoria every 5-7 years by 2020, and every 3-4 years by 2050, with up to 50 per cent more extreme danger fire days". .



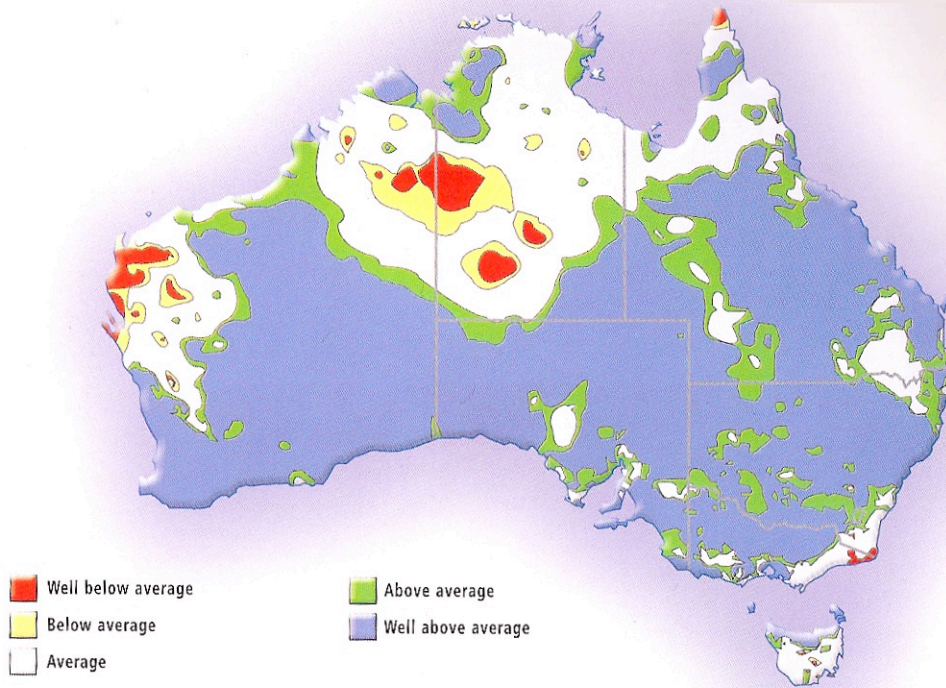
Maitland

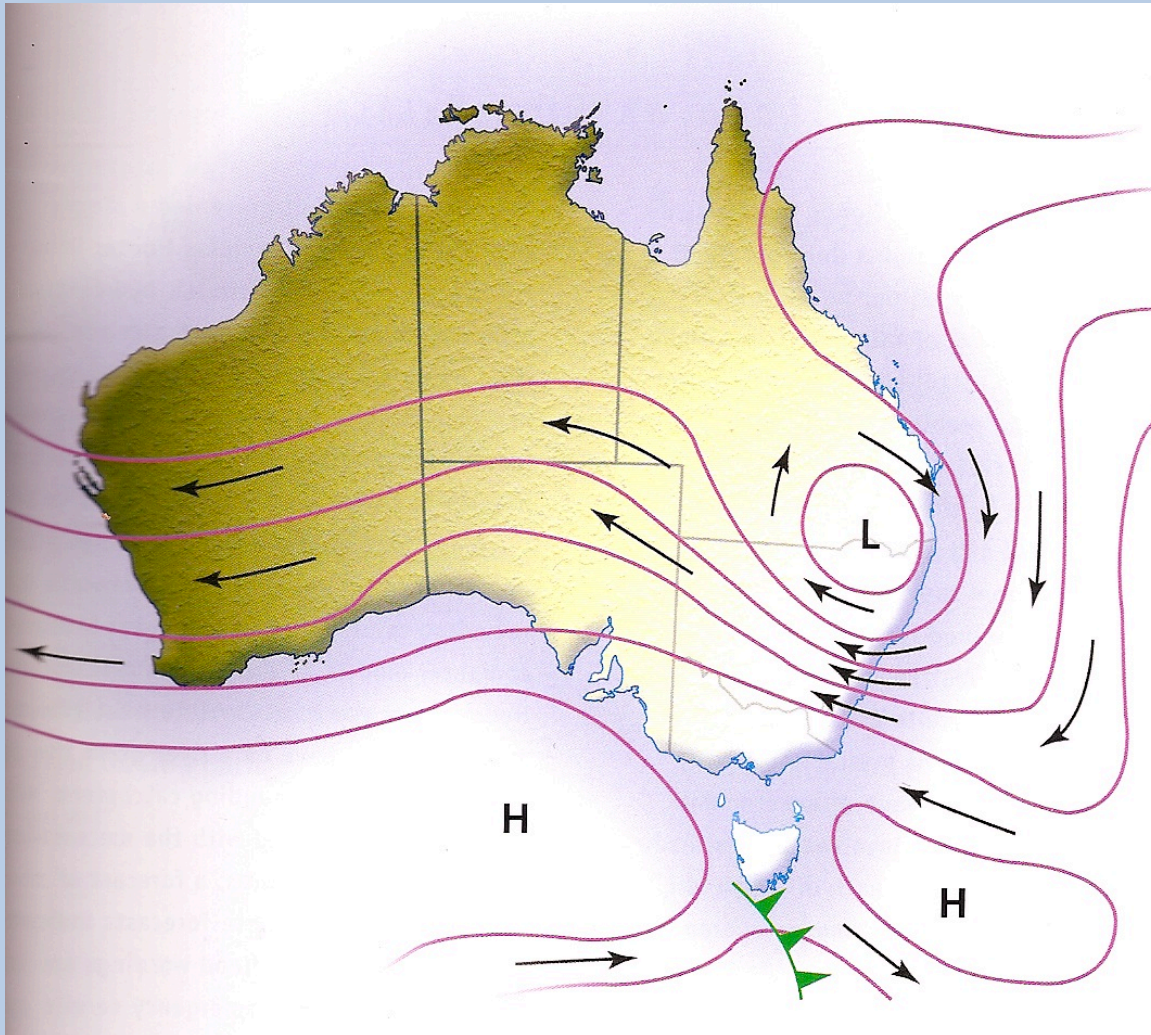
February 1955



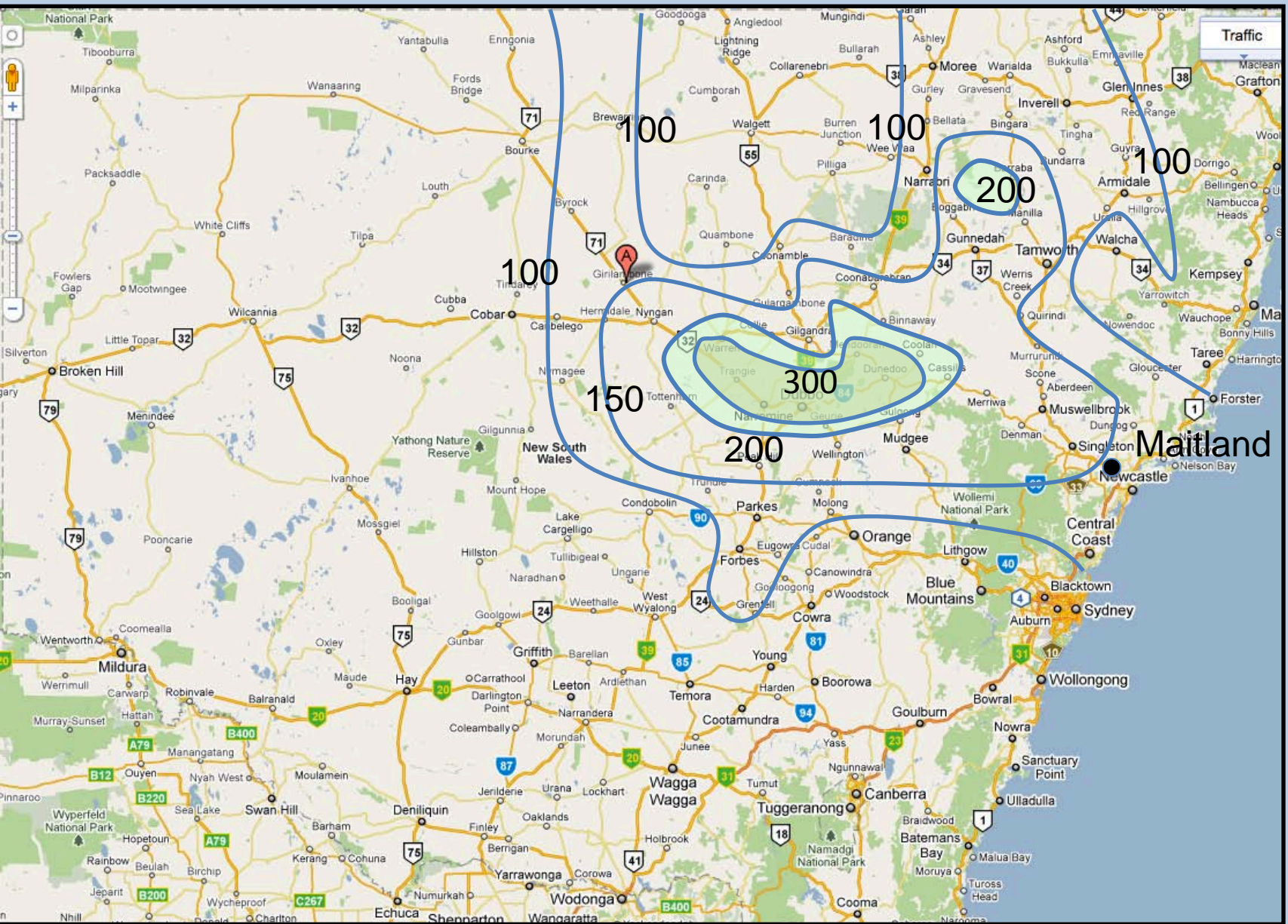
Rainfall Relative to Historical Records
January to December 1955

1955





Synoptic chart for 24th February 1955



Rainfall in mm recorded on 23rd and 24th February 1955



Maitland floods 1955

— Images Courtesy of the Newcastle City Library





Maitland floods 1955

- Images Courtesy of the Newcastle City Library





Maitland floods 1955

- Images Courtesy of the Newcastle City Library





Maitland floods 1955

- Images Courtesy of the Newcastle City Library

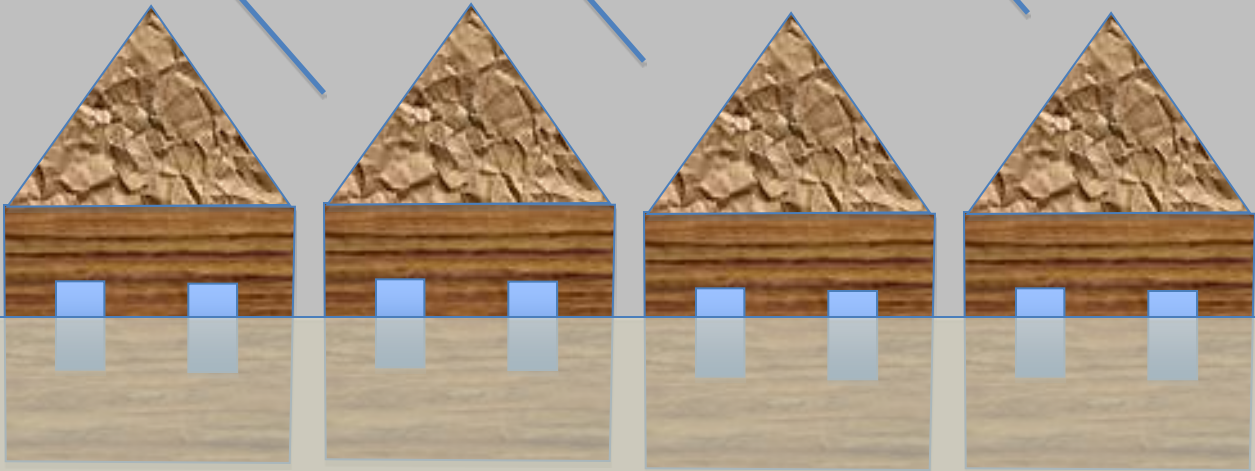




Maitland floods 1955 - Image Courtesy of the Newcastle City Library

Brisbane

January 1974



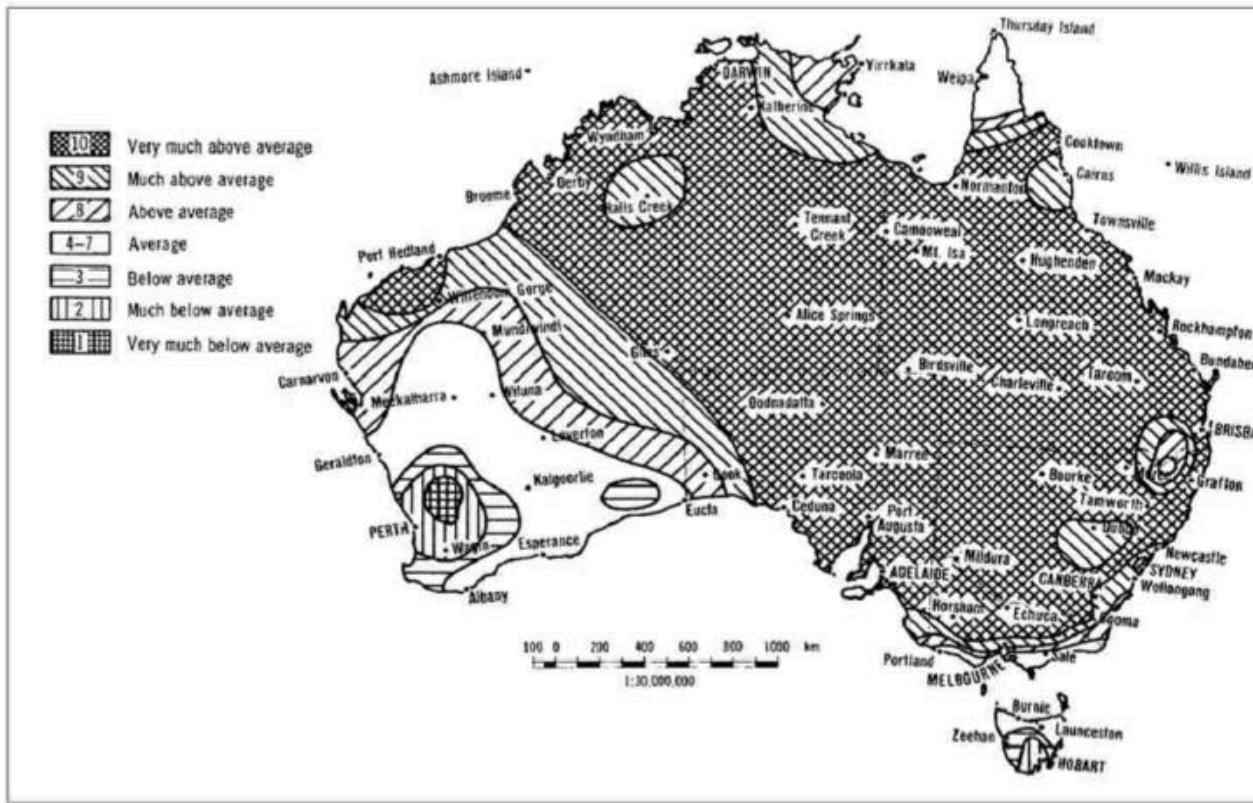


Figure 4: Distribution of decile range numbers of rainfall in January 1974

Rainfall deciles for January 1974
(Bureau of Meteorology)

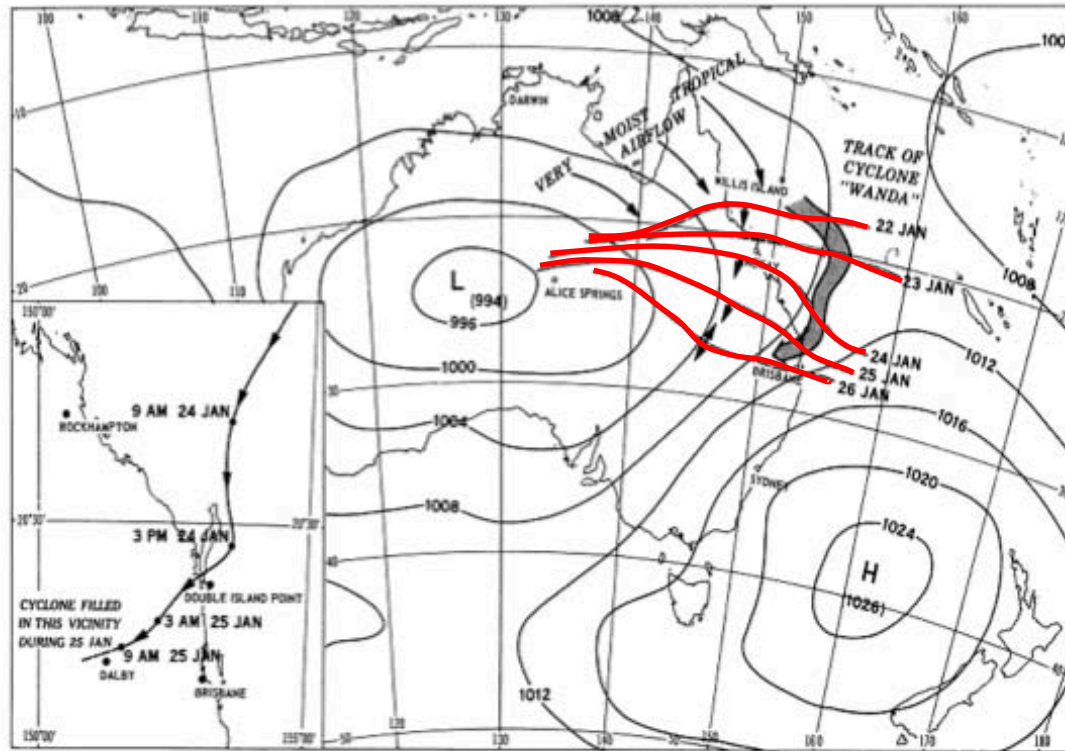


Figure 5: Schematic diagram illustrating the main meteorological influences between 22 –29 January 1974. The mean MSL pressure analysis (mb) is shown by the thin lines and the heavy dashed lines represent successive positions of the monsoonal trough. The broad arrow represents the track of cyclone 'Wanda'. (Inset: Enlargement of south Queensland coast showing landfall of cyclone 'Wanda'.)

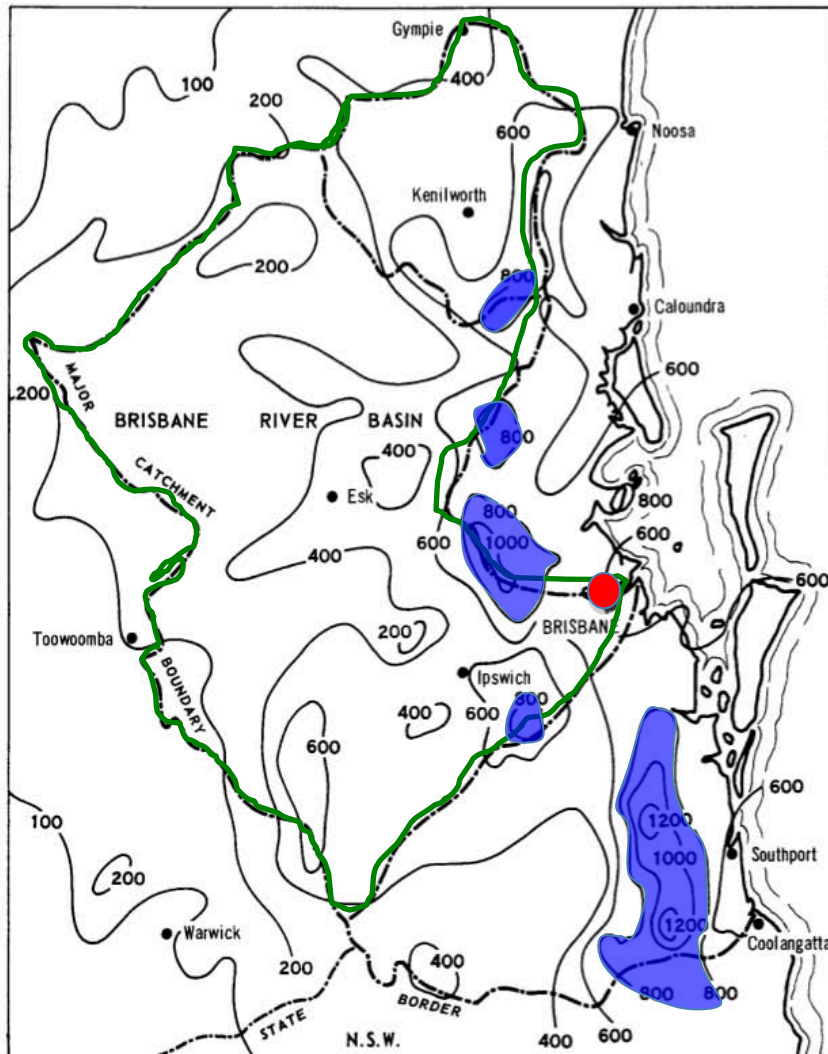


Figure 7: Rainfall isohyets (mm) for the 5 day period ended 9 am Tuesday 29 January 1974

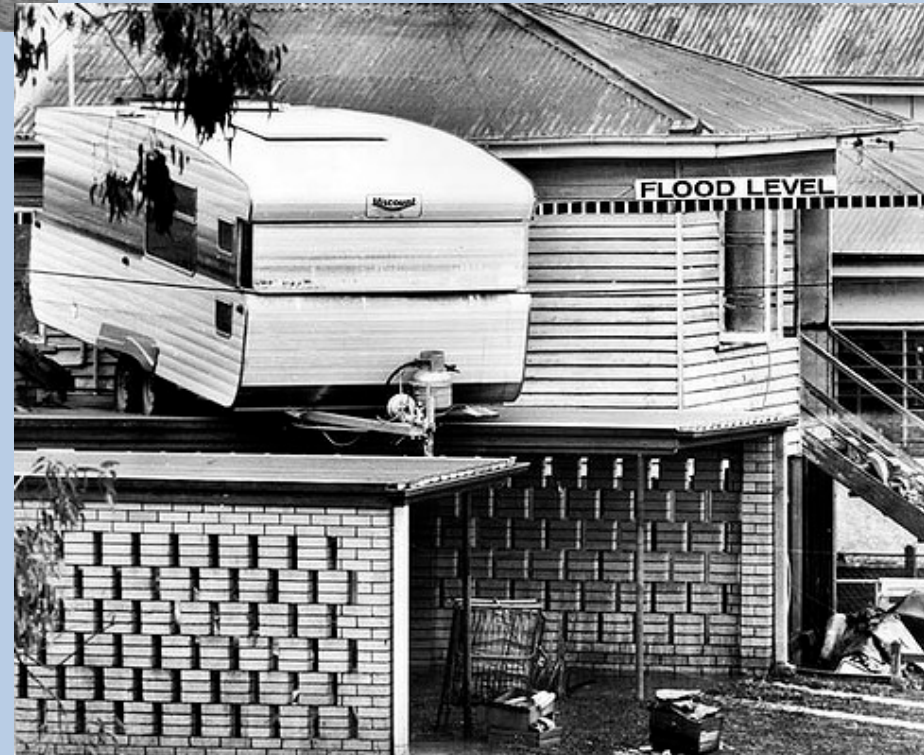
Rainfall isohyets across the Brisbane River Basin for the 5-Day period ending 9 am Tuesday 29th January 1974

(Bureau of Meteorology)



Floodwater reaching the eaves of houses in the Brisbane suburb of Yeronga, January 29, 1974

The floods carried this caravan from a sales centre five miles away and dumped it on a carport roof in Salisbury. January 1974 Brisbane

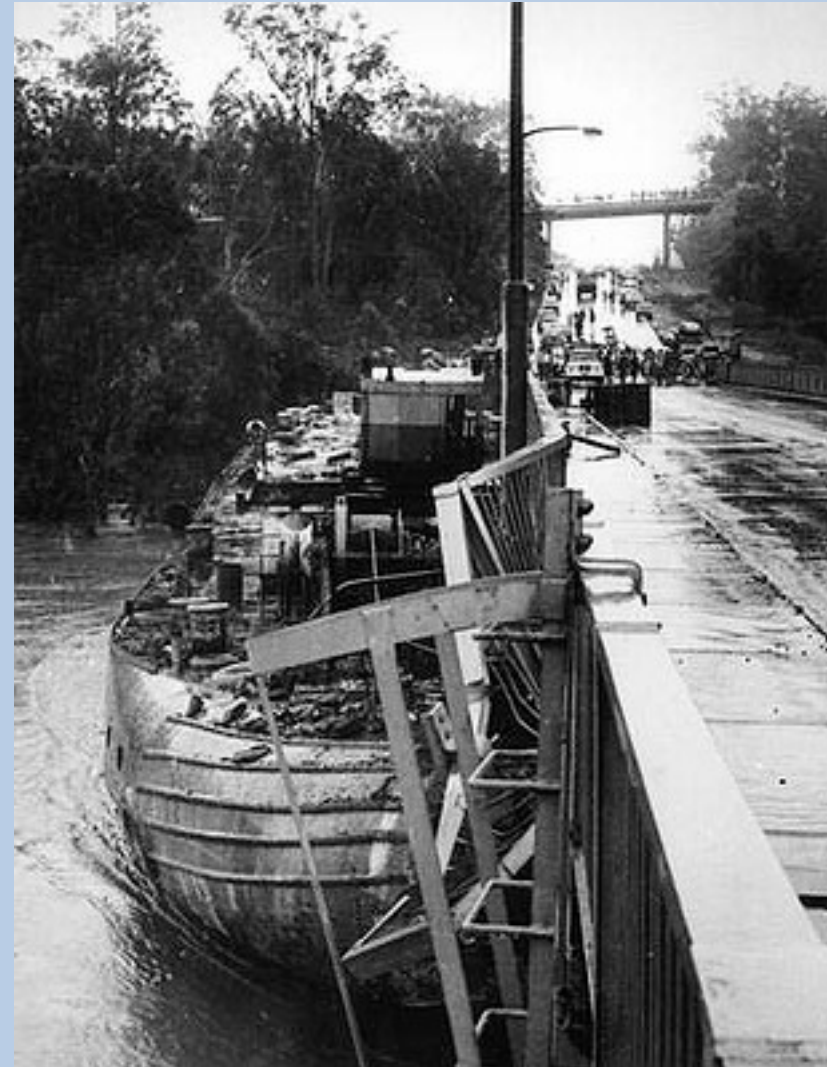


Images: State Library of Queensland



The flooded Riverside Expressway while under construction looking Towards South Brisbane in the background, January 1974.

A gravel barge wedged against the upstream side of the Centenary Bridge
27th January 1974



Images: State Library of Queensland





A flooded Charlotte Street in Brisbane's CBD, January 1974.

Albert Street,
Brisbane CBD, January 1974



Images: State Library of Queensland



Rubber dinghies traversing a flooded Alice Street in the CBD. The Parkroyal Motor Inn can be seen in the background. Brisbane January 1974

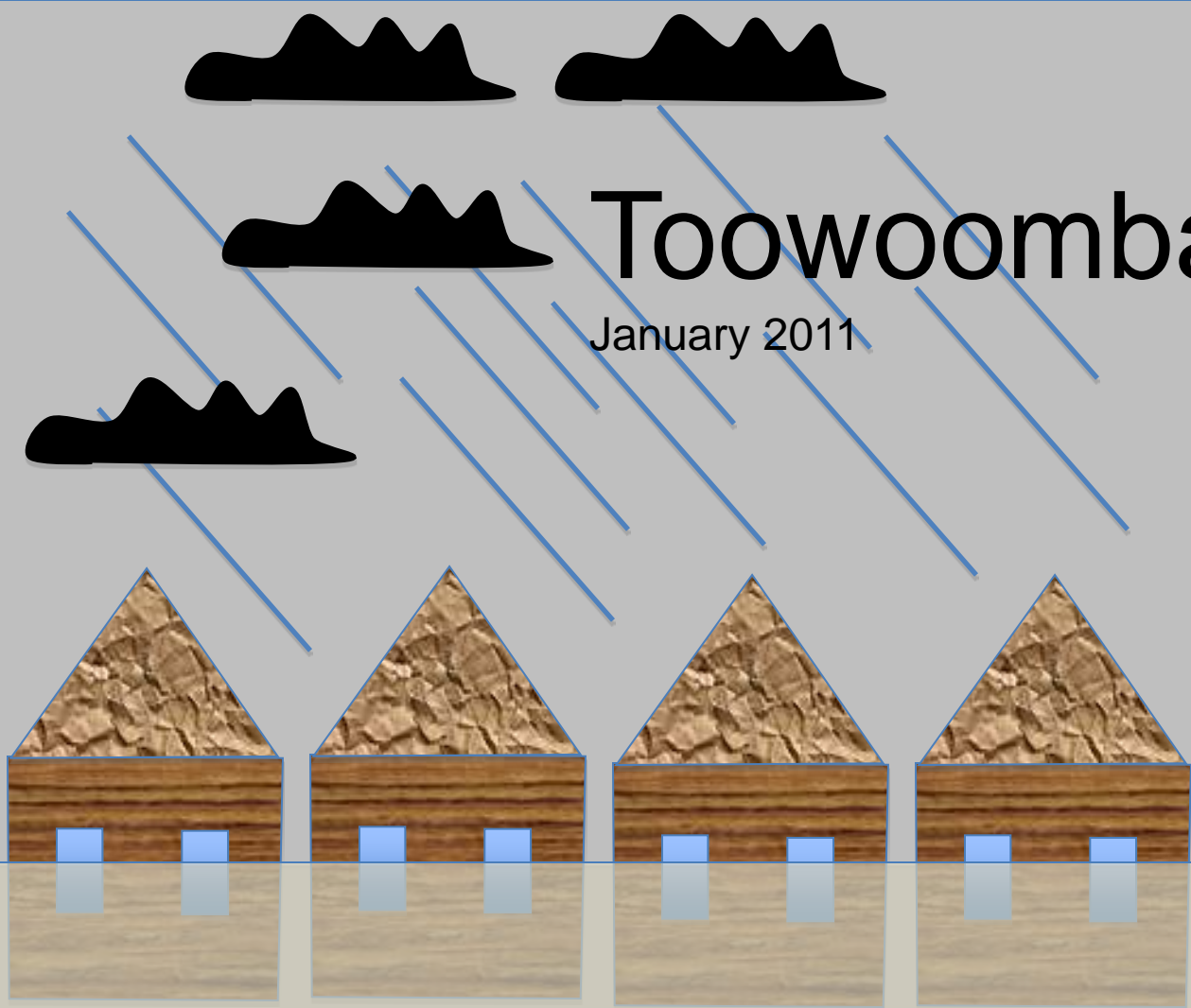
Extensive flooding through the CBD Brisbane 1974



Images: State Library of Queensland

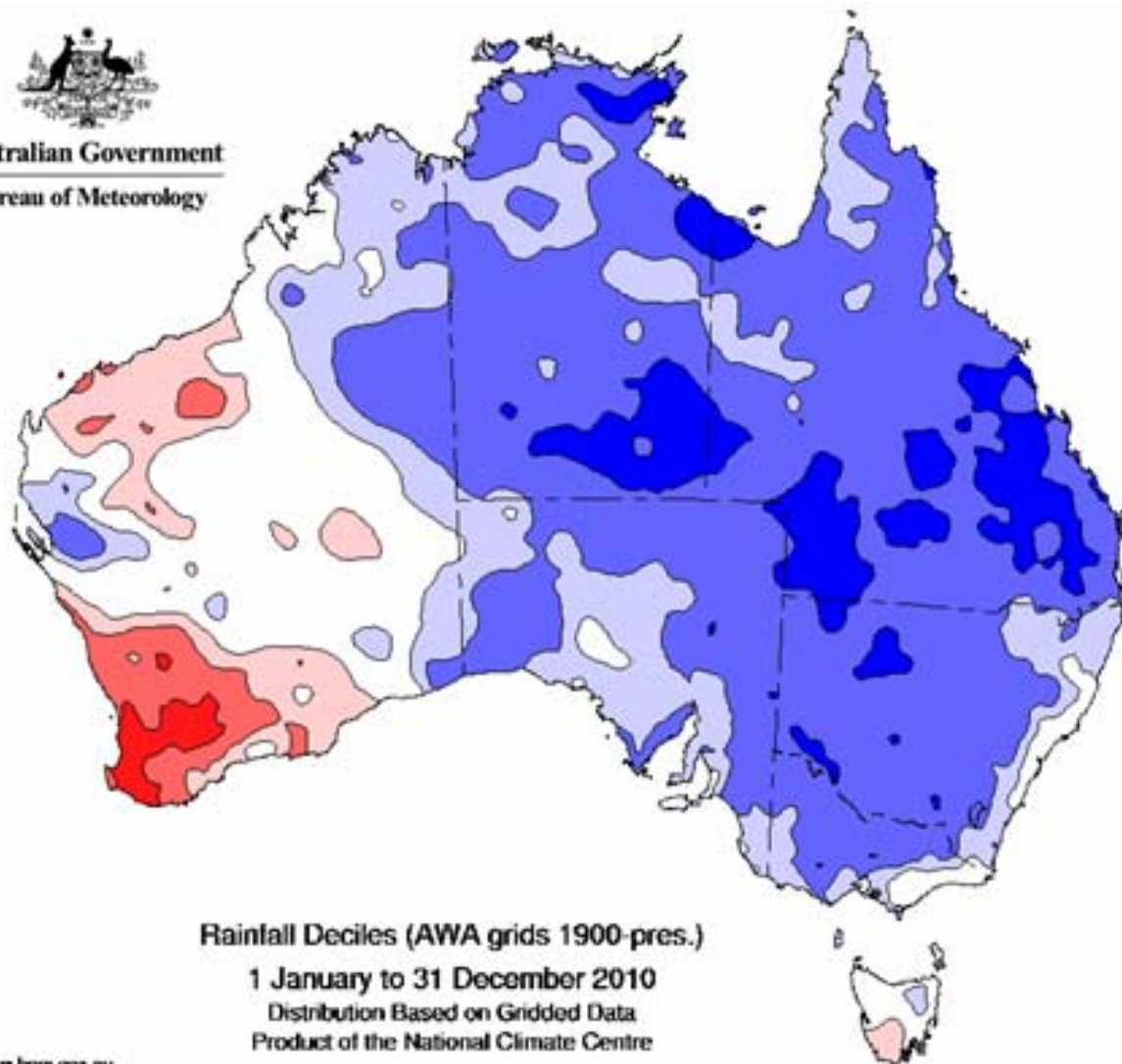
Toowoomba

January 2011

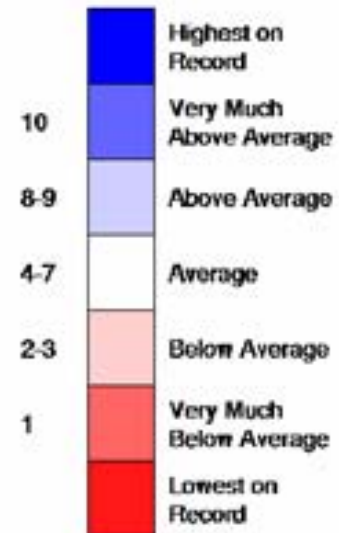




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Rainfall Decile Ranges



Rainfall Deciles (AWA grids 1900-pres.)
1 January to 31 December 2010
Distribution Based on Gridded Data
Product of the National Climate Centre

<http://www.bom.gov.au>

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Issued: 04/01/2011

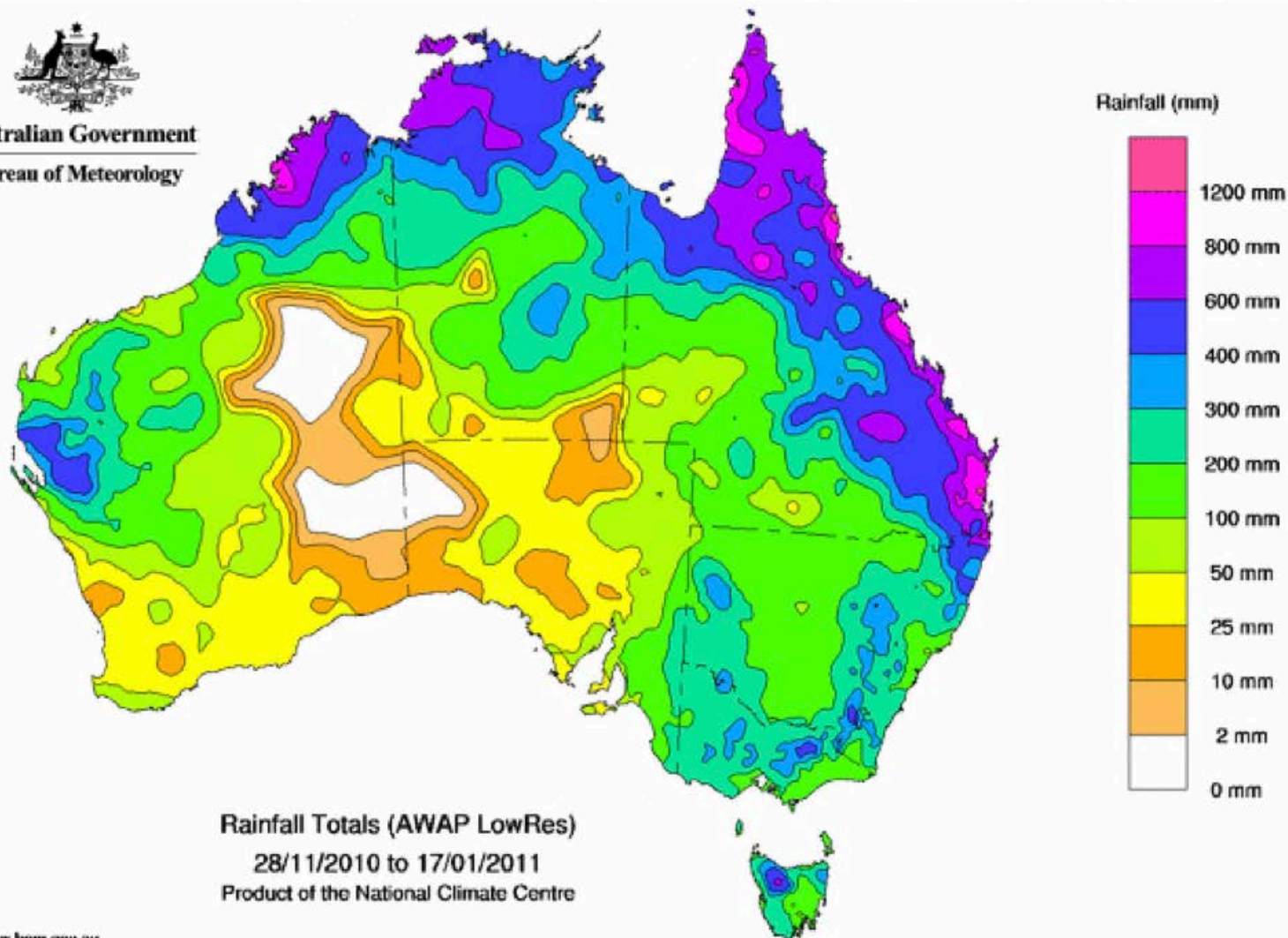
Rainfall deciles for 2010

(Bureau of Meteorology)





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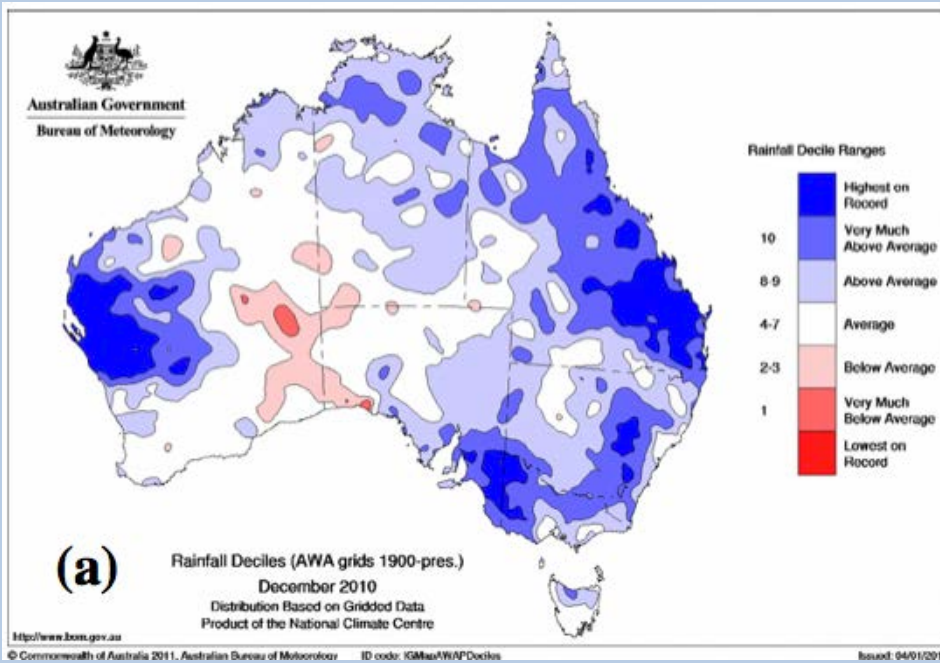


<http://www.bom.gov.au>

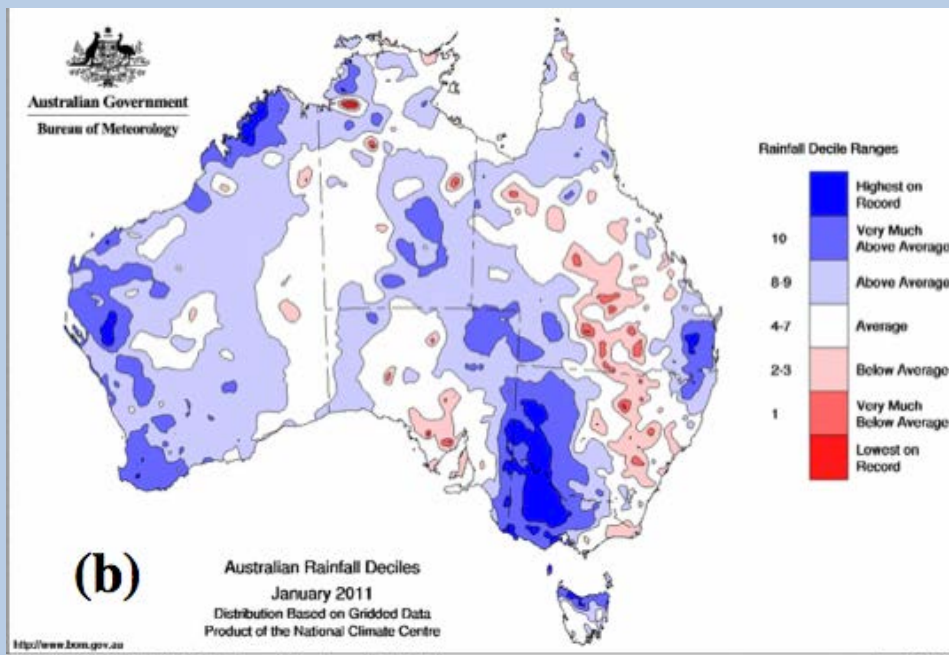
Rainfall totals 28th November 2010 to 17th January 2011

Bureau of Meteorology





Rainfall deciles December 2010



Rainfall deciles January 2011

Bureau of Meteorology





Disastrous flooding in Toowoomba 10th January 2011
Rainfall rate measured at 60 mm per hour but probably much greater
Image: Wikipedia Commons

Rainfall intensity, frequency and duration IFD data for Toowoomba

RETURN PERIOD (YEARS)

DURATION	1	2	5	10	20	50	100
5 mins	90.8	117.	146.	164.	189.	224.	252.
6 mins	84.7	109.	136.	153.	177.	209.	235.
10 mins	69.4	88.9	111.	124.	143.	168.	188.
20 mins	51.4	65.4	80.2	89.2	102.	119.	133.
30 mins	41.9	53.3	64.9	71.9	82.0	95.5	106.
1 hour	28.0	35.5	43.0	47.5	54.0	62.7	69.5
2 hours	17.6	22.2	26.9	29.7	33.8	39.2	43.5
3 hours	13.1	16.6	20.1	22.2	25.2	29.3	32.5
6 hours	7.86	10.0	12.1	13.4	15.3	17.8	19.8
12 hours	4.79	6.10	7.49	8.34	9.54	11.2	12.4
24 hours	3.01	3.86	4.82	5.41	6.24	7.36	8.25
48 hours	1.89	2.44	3.12	3.54	4.13	4.94	5.59
72 hours	1.38	1.79	2.32	2.64	3.10	3.74	4.26

(Raw data: 36.65, 6.19, 1.83, 59.69, 10.43, 3.51, skew= 0.340)

HYDROMETEOROLOGICAL ADVISORY SERVICE
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