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SPECIAL CLIMATE STATEMENT 26

Record wet January brings unprecedented flooding to northwest Victoria

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The wettest start to a year in Victoria breaks rainfall and river height records

Persistent low pressure systems associated with extraordinary tropical moisture led to Victoria recording its wettest January on record by the halfway point of the month. Heavy rainfall and flash flooding persisted between the 9th and 15th of January, resulting in rainfall totals of 100 – 300 mm across two-thirds of the state and consequently major and moderate flooding spanning north, west and central Victoria. Riverine flooding began on Wednesday the 12th on some rivers and continued until the end of the month on several northern rivers.

Synoptic Summary

The extreme rainfall was generated by the passing of complex and persistent low pressure systems. A broad slow moving trough centred over western Victoria and a ridge of high pressure to the south of Tasmania were the main drivers for the rainfall which commenced on Sunday the 9th January. The two systems created exceptionally humid conditions and unstable easterly flow across Victoria. The trough strengthened on Wednesday the 12th and developed into a low pressure system over eastern South Australia on Thursday 13th as a high pressure system moved into the Tasman Sea. The low pressure system cleared the state on Friday evening after adding an additional 50-100 mm to the deluge already received across Victoria. A broad ridge of high pressure persisted over the state from Saturday 15th through until Thursday 20th bringing settled and sunny conditions.

The event was characterised by extremely moist northeasterly flow and was associated with very high dewpoint temperatures between the 10th and the 14th, when the system cleared the state. The 13th was a particularly humid day in the northwest of the state, with Mildura Airport, Hopetoun Airport, Warracknabeal Museum, Echuca Aerodrome, Kerang and Kyabram DPI all recording dewpoint temperatures in excess of 24 °C. The persistence of tropical-like conditions between the 12th and 14th was evident in Melbourne where dewpoint temperatures exceeded 21 °C in the 3-hourly observations for 11 consecutive readings. Prolonged humid conditions of this nature have been observed only once before in Melbourne, with January dewpoint temperatures typically around 11.4 °C.

Widespread Flooding

Record daily rainfall totals initially caused flash flooding across western and central parts of the state, with the cumulative effects of unprecedented multi-day rainfall totals leading to major flooding in the Avoca, Loddon, Wimmera and Campaspe River systems. Most river gauges in these catchments far exceeded previous river height records between mid and late January, with even higher flood levels than the September 2010 event (Table 5). The Barwon catchment also observed major flooding on the 14th at the Leigh River site at Mt Mercer. The Lerderderg River in the Werribee catchment also experienced major flooding throughout Friday 14th January.

Over 80 towns were affected by the floods, including the major regional centres of Echuca, Kerang, Charlton and Horsham. The downstream gauge at Charlton exceeded the Major Flood Class level from Friday evening (14th) until the afternoon of the 16th (Sunday). The Echuca site (on the Campaspe River) went above the Major Flood Class level on Sunday the 16th. On Tuesday the 18th, the downstream gauge in Horsham peaked and the Kerang site entered the Major Flood Class level. High rainfall rates, on the 12th and 14th in particular, also caused flash flooding, especially on the northern side of the Great Dividing Range, with Kyneton and Halls Gap observing significant damage after being inundated by the intense rainfall. Significant flows from the Campaspe and Loddon into the Murray catchment led to major flood warnings being issued for the Murray River on the 20th of January, especially around Swan Hill.

Rainfall event summary

Many weather stations in Victoria have broken all-time records during this event (Table 2, Table 3, Table 4). Most stations in the west, central and north have recorded in just 6 days, what they would usually expect in an entire summer. More than 50 weather stations had recorded their highest ever January rainfall by the midway point of the month (Table 3), with several stations observing 6-day rainfall totals (Table 1) up to 12 times that usually expected for the month. In addition to breaking January records, 12 stations, including Kyneton, Annuello, Rupanyup and Maryborough, have observed their highest ever rainfall total for *any* month on record.

The event began with significant rainfall across northwestern Victoria, with Nyah and Canary Island, close to Swan Hill, recording the highest rainfall, a downpour of 127 mm and 110 mm respectively, in the 24 hours to 9am on Monday the 10th of January. Warracknabeal Museum, Annuello, Boort, Narraport and Korong Vale recorded between 50 and 80 mm in the same 24 hr period (Figure 3). Persistent rainfall in the 24 hours to 9am on Tuesday the 11th (Figure 4), delivered rainfall totals in the 40 – 60 mm range to several stations in the central and western parts of the state.

Rainfall intensified in the 24hrs to 9am Wednesday the 12th (Figure 5) as the western half of the state experienced rainfall between 40 and 150 mm. Around 20 stations broke their highest daily January rainfall on the 12th. Jeparit recorded the highest daily rainfall for the event of 161.2 mm on the 12th, which is also the highest daily rainfall for the site for any day in over 100 years of record. Horsham (Polkemmet Rd) surpassing its previous record from 1886 by 22.6 mm. Mildura Airport and Avoca (Homebush) also exceeded their previous highest January daily rainfall on the 12th, observing 61.6 mm and 67.0 mm respectively.

In the 24 hours to 9am Thursday the 13th (Figure 6), the system progressed eastward bringing the largest rainfall totals to the north, central and eastern parts of Victoria. Some of the highest rainfall totals were in the Alpine region, with more than 60 mm observed at Mount Buffalo Chalet, Mount Buller, Edi Upper and Whitlands. Kyneton recorded its highest ever daily rainfall for any time of year with 109.0 recorded on the 13th, 9mm higher than the previous record from the 21st March 1989.

The rainfall across the state between 9am Thursday 13th and 9am Friday 14th (Figure 7) was amongst the highest for the event and the most record breaking state-wide. More than one-third of Victoria recorded rainfall totals in excess of 40mm, which is approximately the equivalent of doubling the long-term average for January in this area. 53 stations recorded their highest ever daily rainfall for January during this 24 hour period, including the station at Maryborough which opened in 1878. 70 stations recorded rainfall totals in excess of 80 mm, with Halls Gap and Mount William in the Grampians recording 146.6 mm and 132.8 mm respectively.

On the evening of Friday the 14th the low pressure system cleared the state, with central and eastern parts of the state experiencing between 20 and 80 mm to 9am on Saturday the 15th of January (Figure 8). The highest falls were recorded in the Alpine region, with Mount Buffalo Chalet recording 132 mm, Cheshunt 89 mm, Whitlands 83 mm and Whitfield 78 mm.

Rainfall totals over the 6 days (Figure 2; Table 1) were in excess of 270 mm at four sites: Halls Gap, Grampians (Mount William), Kyneton and Canary Island. Kyneton has recorded a monthly total over 200 mm only twice since 1969, with 217.6 mm in February 1973 and 239.8 mm in October 1975. These totals are more than 30 mm lower than the exceptional total of 273.8 mm recorded in the 6-day event in January 2011. Notably, Canary Island has rainfall data dating back to 1887 and has never recorded a monthly rainfall total in excess of 180 mm (the previous record of 174.3 mm was reported in January 1978), receiving 270.7 mm between the 9th and the 15th of January. Rainfall to 9am on the 16th of January, for the state as a whole, already ranked 2011 as the wettest January on record (Figure 1). The area-averaged rainfall total for Victoria in January 2011

was the highest on record, with a total of 118.58 mm, surpassing the previous January record from 1941 of 109.32 mm. Such extreme rainfall totals are unprecedented and the significance of these rainfall quantities for Victoria is highlighted by the impacts on river catchments and the widespread flooding which has been observed.

Large-scale climate drivers

The past 6 to 12 months have been particularly wet across the state, but particularly north of the Divide. In 2010 Victoria recorded its wettest year since 1974, the 5th wettest on record. Major flooding across the north of the state in September and persistent rainfall through October, November and December, meant that catchments were already wet before the record January rainfall. The rainfall events of the past 6 months were driven by record warm sea surface temperatures to the north of Australia and one of the strongest La Niña events ever observed in the Pacific Ocean.

Further information

This statement is based on information available as of midday Monday 21st February.

Further information can be obtained from the following contacts:
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Appendix 1

1. Extreme rainfall hits Victoria

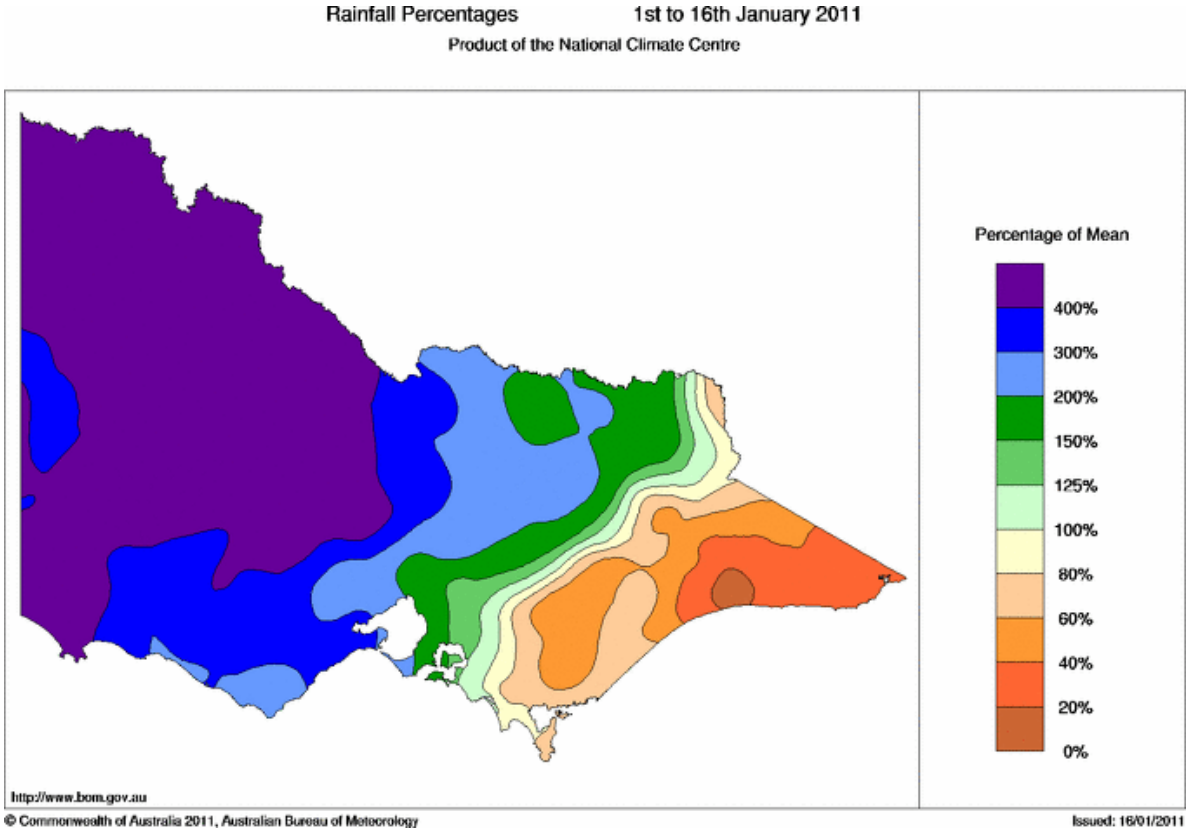
1.1 Rainfall totals between 9th and 15th January 2011

January 2011 is the wettest start to a year that Victoria has experienced since records began. Victoria is also on track to observe one of its wettest ever summer seasons, with more rainfall than usual experienced in December and a record breaking January. Stations recording more than 220 mm for the January event are presented in Table 1 below.

Table 1: Rainfall totals for stations recording more than 220 mm between 9am on the 9th and 9am on the 15th of January

Station Number	Station Name	Saturday 15-Jan-11	Friday 14-Jan-11	Thursday 13-Jan-11	Wednesday 12-Jan-11	Tuesday 11-Jan-11	Monday 10-Jan-11	Total
79074	HALLS GAP	0.0	146.6	0.2	135.0	0.4	4.6	286.8
79103	GRAMPIANS	0.0	132.8	3.4	134.6	1.4	6.8	279
88123	KYNETON	10.8	88.0	109.0	32.8	28.6	4.6	273.8
80004	CANARY ISLAND	0.0	60.0	12.5	39.2	49.0	110.0	270.7
76000	ANNUELLO	0.0	76.6	16.0	34.0	59.2	75.6	261.4
76046	NYAH	0.0	70.0	20.2	28.4	12.0	127.0	257.6
76042	BANNERTON	0.0	59.2	15.2	40.2	82.0	51.2	247.8
587118	MOUNT MACEDON MW	19.4	97.6	55.8	56.2	13.0	5.8	247.8
89107	RAGLAN	0.0	109.4	4.8	106.8	20.6	6.0	247.6
89106	ADDINGTON	2.0	109.0	9.0	74.4	47.6	5.4	247.4
588006	CAMPASPE RIVER @ REDESDALE	12.2	96.8	30.6	50.2	17.8	37.4	245
78039	WATCHEM	0.0	77.2	0.0	140.0	10.4	17.4	245
88037	LAURISTON RESERVOIR	41.0	83.4	59.0	28.6	27.0	3.0	242
83073	MOUNT BUFFALO CHALET	132.0	0.0	64.0	13.5	5.8	20.0	235.3
83032	WHITLANDS	83.0	33.0	73.8	28.0	10.0	7.0	234.8
88137	LILLICUR	0.0	106.4	6.8	75.0	40.0	5.8	234
88056	TALBOT	0.2	91.6	15.2	68.6	49.2	9.2	234
587037	BLACKWOOD	6.6	116.2	23.2	57.8	26.0	4.2	234
587016	LANCEFIELD	16.0	114.0	20.2	61.2	15.6	6.0	233
88043	MARYBOROUGH	1.3	90.4	16.0	59.7	49.6	12.3	229.3
81090	MOLIAGUL	0.0	92.0	8.9	70.0	38.0	20.0	228.9
581012	BET BET CK @ BET BET	5.0	96.2	12.0	60.2	47.4	7.6	228.4
88042	MALMSBURY RESERVOIR	22.6	73.4	80.4	28.0	22.8	0.6	227.8
88059	TRENTHAM	7.2	110.8	26.4	50.8	29.6	2.0	226.8
80024	KERANG	1.2	40.2	30.0	31.0	39.0	80.6	222
89005	BEAUFORT	0.0	96.8	9.8	79.2	25.8	8.6	220.2

Figure 1: Month-to-date (to 9am 16 January) Rainfall Percentages for Victoria (Compared to January average)



Note: Maximum range on contours for rainfall percentages is 400% with several areas exceeding this range.

Figure 2: Rainfall Totals for Victoria (Week ending 16 January)

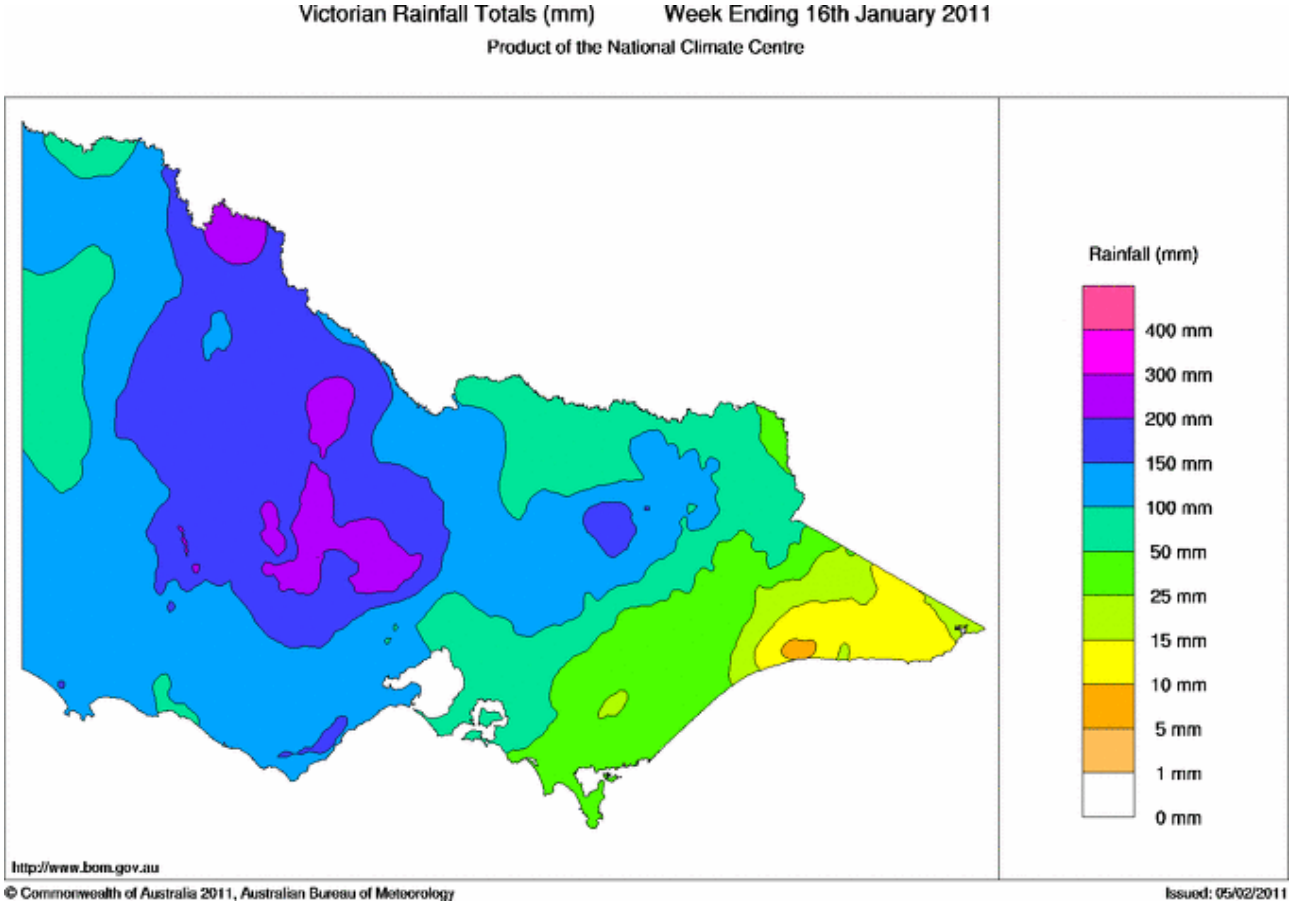


Figure 3: Rainfall Totals for Victoria for the 24 hours to 9am on Monday the 10th of January

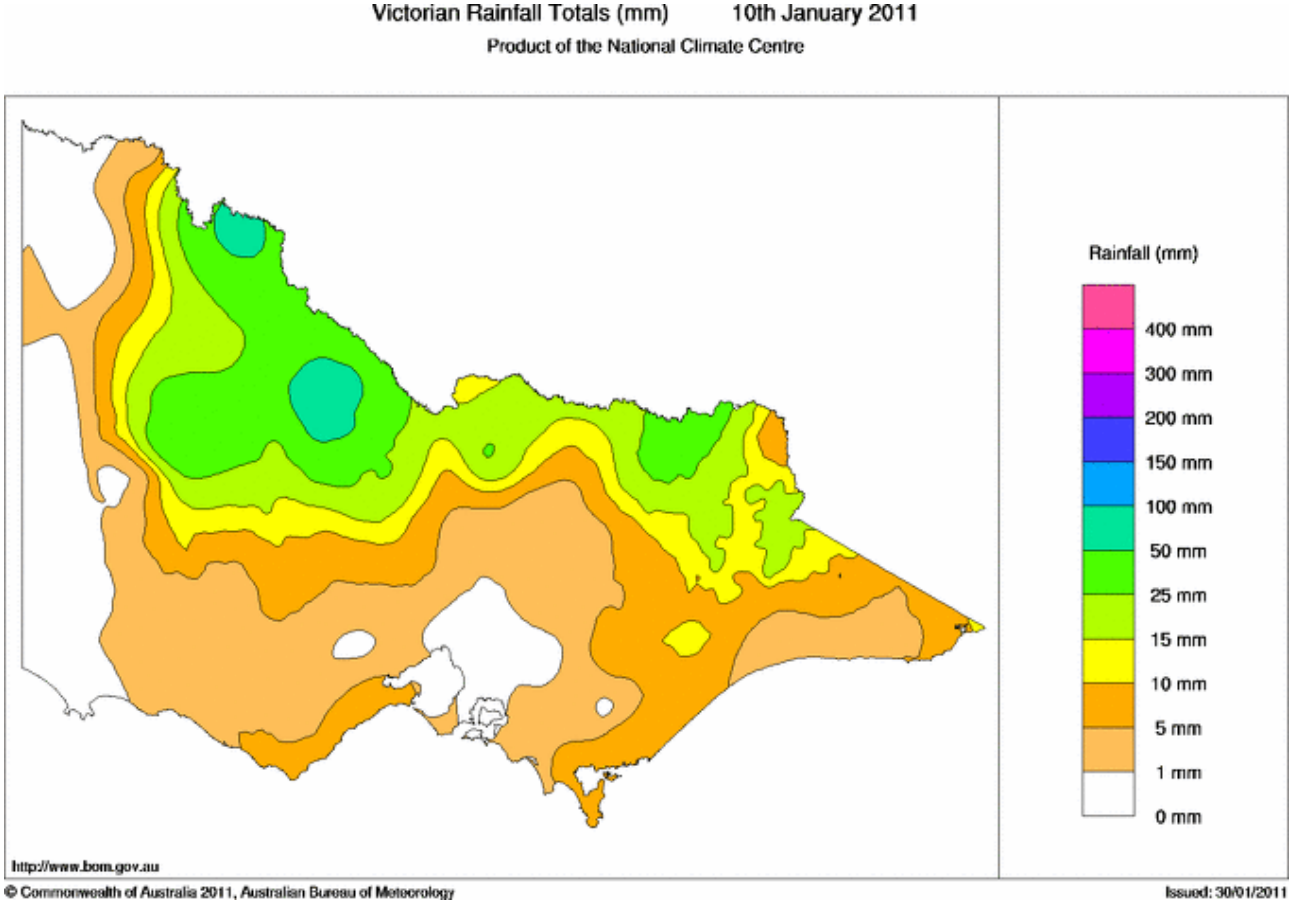


Figure 4: Rainfall Totals for Victoria for the 24 hours to 9am on Tuesday the 11th of January

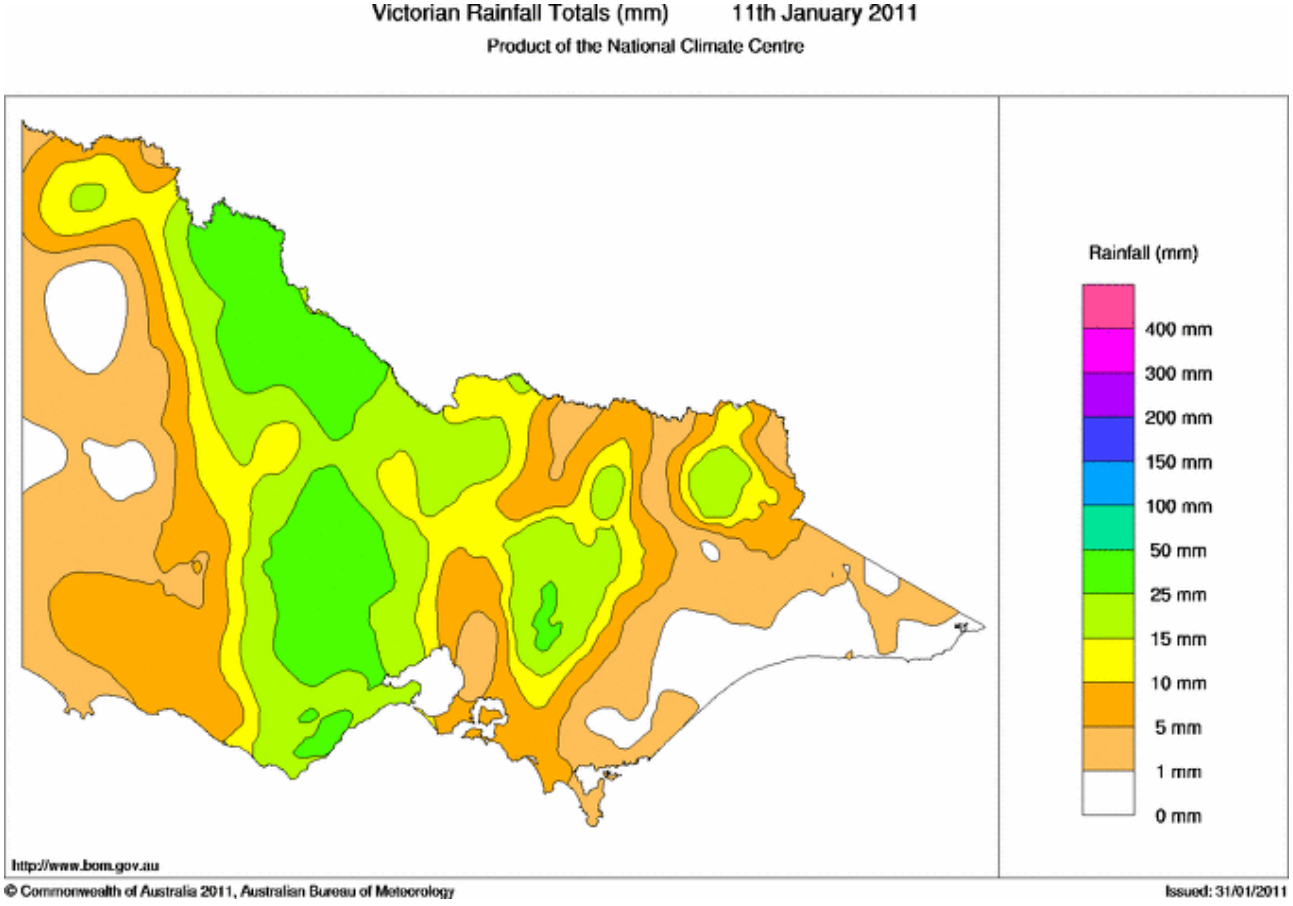


Figure 5: Rainfall Totals for Victoria for the 24 hours to 9am on Wednesday the 12th of January

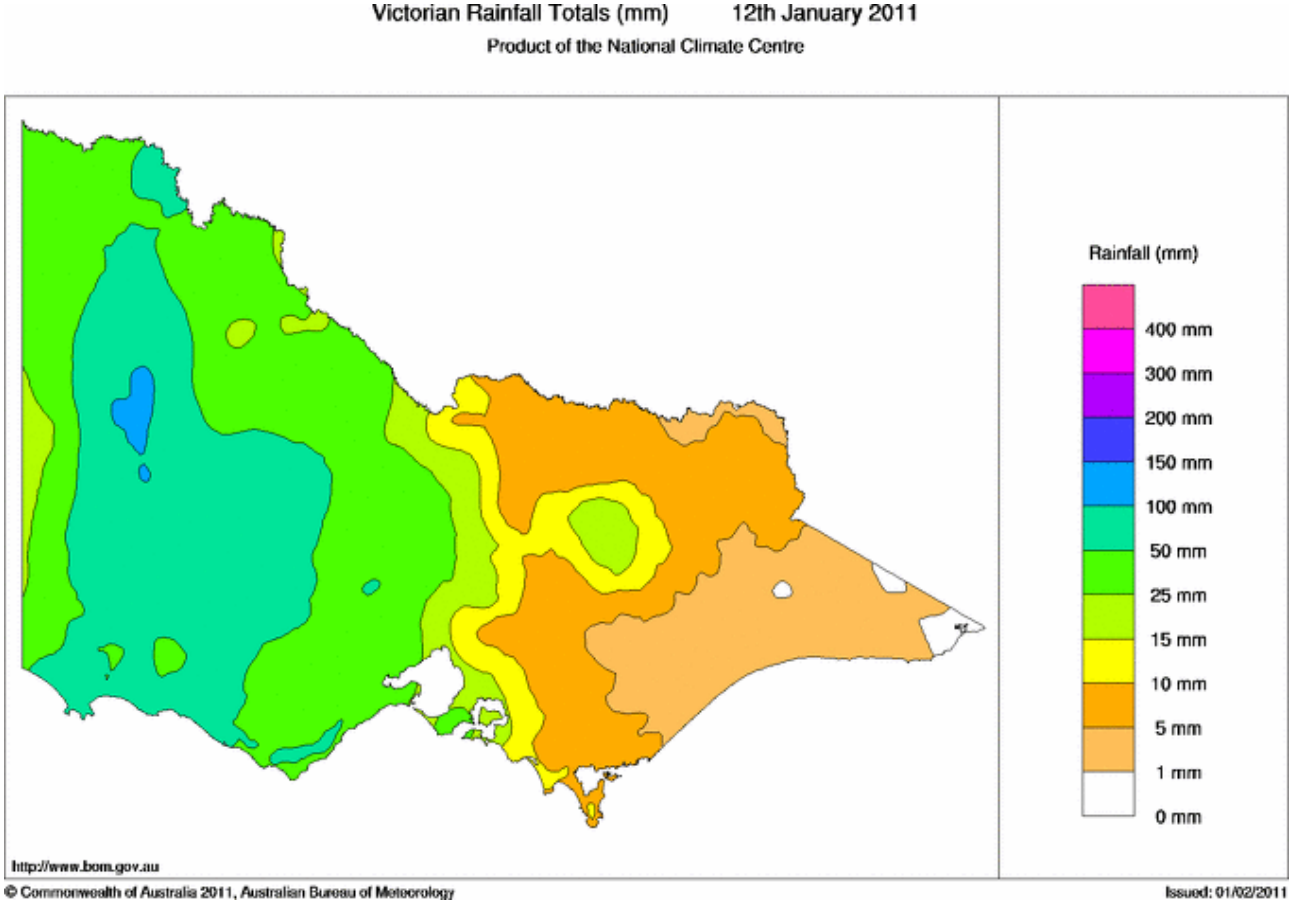


Figure 6: Rainfall Totals for Victoria for the 24 hours to 9am on Thursday the 13th of January

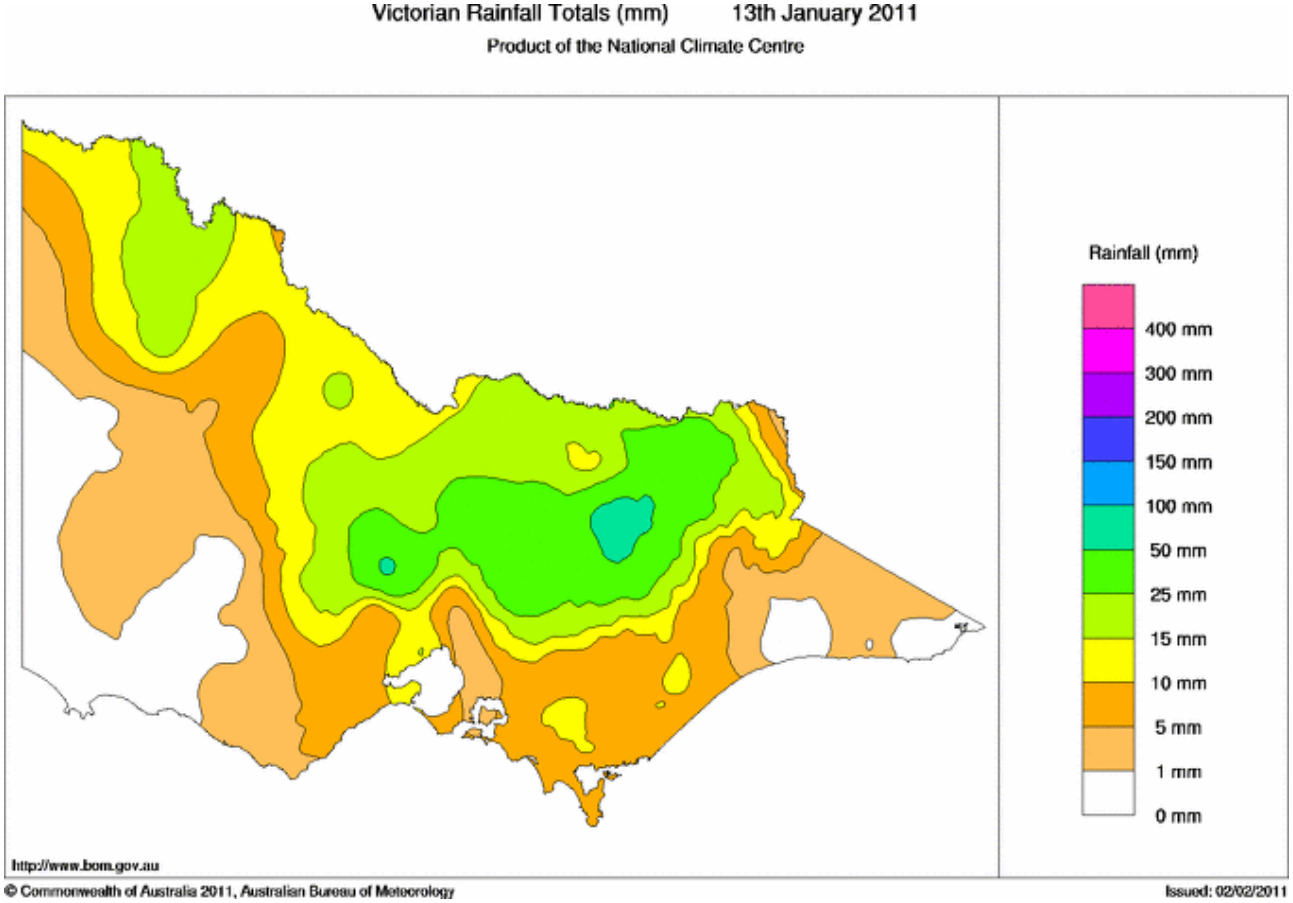


Figure 7: Rainfall Totals for Victoria for the 24 hours to 9am on Friday the 14th of January

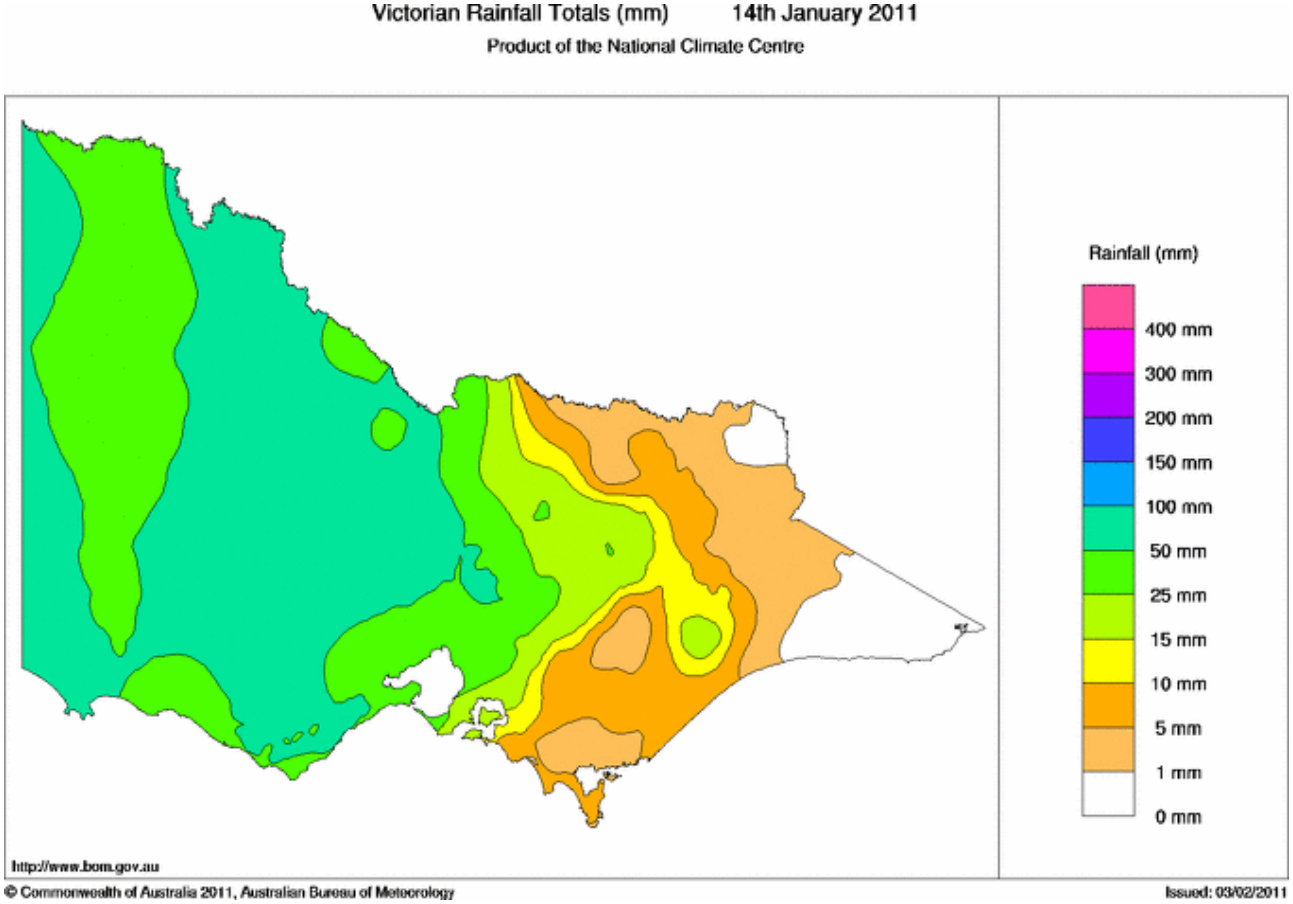
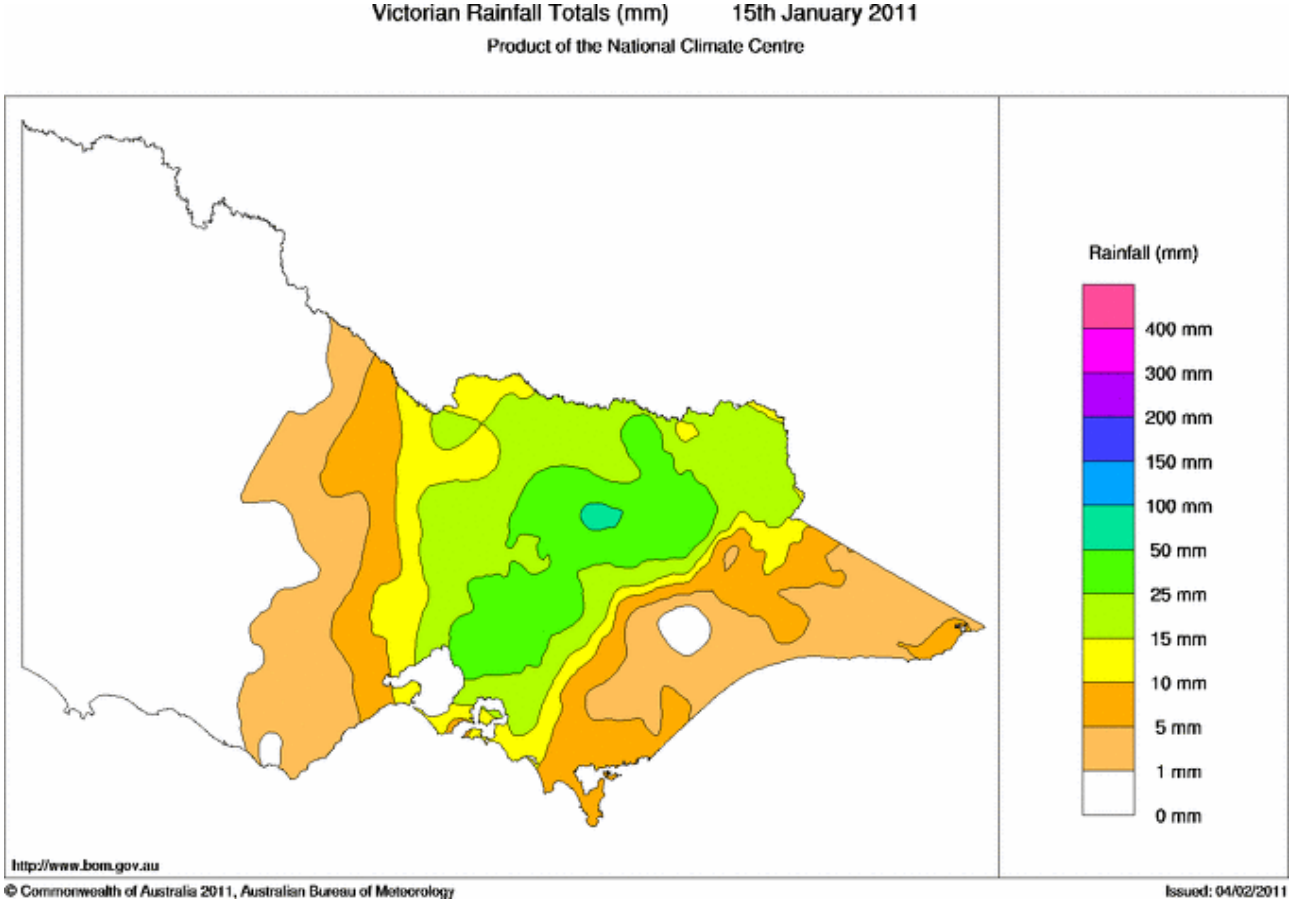


Figure 8: Rainfall Totals for Victoria for the 24 hours to 9am on Saturday the 15th of January



1.2 Daily rainfall records

Over 70 stations observed their highest ever January daily rainfall on the 12th or 14th (Table 2 shows stations with more than 100 years of record). Jeparit, Rainbow, Red Cliffs, Rupanyup, Wedderburn, Kyneton and Nelson all recorded the highest daily rainfall total ever observed at their station. Rainbow Post Office recorded 131.0 mm on the 12th, 6 times the average for the entire month of January and breaking the previous record of 118.4 mm on the 7th of March 1910.

Table 2: Record highest January daily rainfall totals for stations with more than 100 years of record

Weather Station	Rainfall and date		Previous wettest January day		Years of record
Horsham Polkemmet Rd	98.0	on the 12th	75.4	on the 7th in 1886	133
Maryborough	90.4	on the 14th	83.8	on the 2nd in 1961	133
Dimboola	104.2	on the 12th	95.0	on the 14th in 1974	129
Kerang (Meran Downs)	80.6	on the 10th	73.9	on the 18th in 1928	129
Wedderburn (Post Office)	84.0	on the 14th	62.0	on the 15th in 1974	127
Avoca (Post Office)	87.4	on the 14th	73.4	on the 9th in 1897	126
Malmsbury Reservoir	80.4	on the 13th	74.6	on the 18th in 1993	125
Lancefield	92.0	on the 14th	71.1	on the 2nd in 1970	124
Narraport	70.0	on the 14th	53.0	on the 27th in 1993	123
Nelson	113.2	on the 14th	77.4	on the 24th in 1991	122
Beaufort	96.8	on the 14th	85.6	on the 21st in 1904	120
Great Western (Seppelt)	91.0	on the 12th	76.7	on the 17th in 1946	119
Longerenong	97.0	on the 12th	72.9	on the 25th in 1863	119
Birchip (Woodlands)	90.2	on the 14th	68.1	on the 11th in 1962	118
Trentham (Post Office)	110.8	on the 14th	101.6	on the 1st in 1921	118
Nyah (Yarraby Tank)	127.0	on the 10th	99.6	on the 21st in 1979	114
Rainbow (Werrap)	116.4	on the 12th	98.6	on the 14th in 1974	114
Moyston	90.2	on the 12th	73.4	on the 9th in 1897	113
Natte Yallock	81.8	on the 14th	68.0	on the 16th in 1984	112
Gerang Gerung	146.8	on the 12th	110.6	on the 14th in 1974	111
Jeparit	161.2	on the 12th	119.0	on the 14th in 1974	111
Pira Wild Horse Plains	96.0	on the 10th	90.0	on the 21st in 1979	111
Burkes Flat	81.6	on the 14th	72.4	on the 14th in 1974	110
Carisbrook	96.8	on the 14th	76.2	on the 9th in 1897	110
Talbot (Post Office)	91.6	on the 14th	58.0	on the 1st in 1988	110
Birregurra (Post Office)	52.0	on the 14th	48.0	on the 22nd in 1997	108
Clear Lake	109.0	on the 12th	90.2	on the 25th in 1952	108
Mirranatwa (Bowacka)	83.8	on the 14th	71.1	on the 25th in 1952	108
Beeac (Post Office)	66.2	on the 14th	52.6	on the 21st in 1904	107
Berriwillock	63.8	on the 14th	54.0	on the 17th in 1974	107
Rupanyup (Post Office)	90.0	on the 14th	71.0	on the 27th in 1993	106
Ballarat Aerodrome	95.0	on the 14th	83.1	on the 29th in 1963	103
Irymple (Arlington)	63.6	on the 12th	62.7	on the 4th in 1941	103
Sea Lake (Marston Downs)	86.4	on the 14th	48.0	on the 14th in 1974	103
Morrl Morrl (Valley View)	57.0	on the 12th	49.0	on the 26th in 1941	102
Ultima (Post Office)	64.4	on the 14th	61.4	on the 22nd in 1979	101
Watchem	140.0	on the 12th	56.8	on the 14th in 1974	101

1.3 January Rainfall records

Most of the stations in the north and west of the state have well exceeded their usual January rainfall, with more than 150 stations, recording their wettest ever January (
Table **3** shows stations with over 100 years of record). Annuello (83 years of record), recorded 261.4 mm for the 6-day period, almost 12 times what they would usually receive in January and double the previous record of 133.7 mm in February 1969 for monthly rainfall.

Table 3: Record highest January total rainfall for stations with more than 100 years of record

Weather Station	January 2011 rainfall	Previous wettest January		January average	Years of record
Portland	145.0	139.7	in 1870	149	35.8
Daylesford	237.5	162.7	in 1904	144	46.0
Malmsbury Reservoir	240.6	231.9	in 1889	139	40.4
Horsham Polkemmet Rd	146.2	116.6	in 1941	138	23.9
Clunes	217.2	139.5	in 1928	133	32.9
Dimboola	155.0	125.2	in 1974	133	22.3
Maryborough	240.7	132.5	in 1928	133	31.4
Blackwood	211.4	197.1	in 1970	132	50.6
Kerang	160.8	144.2	in 1928	131	23.8
Dunolly	154.6	123.0	in 1928	130	30.3
Kerang (Meran Downs)	222.2	115.2	in 1984	130	23.1
Lake Marmal	180.5	112.1	in 1928	130	21.5
St Arnaud	225.8	146.9	in 1897	130	28.8
Wedderburn (Post Office)	168.0	166.8	in 1974	128	27.4
Avoca (Post Office)	225.0	124.2	in 1984	126	31.3
Yea	137.8	130.2	in 1904	126	41.0
Longerenong	159.6	129.8	in 1863	125	25.0
Narraport	186.4	79.2	in 1984	125	20.8
St Arnaud (Coonooer Bridge)	174.4	128.4	in 1974	124	27.5
Canary Island	270.7	174.3	in 1928	123	24.5
Inglewood (Post Office)	231.2	174.6	in 1974	123	30.2
Lancefield	220.0	143.6	in 1904	123	41.8
Nelson	196.4	107.3	in 1963	123	30.4
Gladfield Hopefield Estate	217.0	161.5	in 1928	122	21.6
Wartook Reservoir	211.6	172.8	in 1941	122	38.9
Anakie	145.2	143.9	in 1970	121	40.0
Campbelltown	207.4	110.7	in 1928	120	33.1
Birchip (Woodlands)	180.6	105.3	in 1962	118	21.5
Great Western (Seppelt)	192.9	168.0	in 1963	118	29.1
Ninyeunook	140.0	118.6	in 1974	118	23.3
Trentham (Post Office)	237.0	212.1	in 1904	118	54.4
Nyah (Yarraby Tank)	257.6	101.2	in 1979	116	21.5
Bridgewater (Post Office)	220.2	176.4	in 1974	115	27.2
Warracknabeal (Ailsa)	144.0	127.0	in 1897	115	20.3
Bannockburn	108.2	104.2	in 1981	114	31.4
Newstead	191.6	112.6	in 1928	114	31.2
Rainbow (Werrap)	160.2	150.4	in 1974	114	19.7
Boort	202.8	99.6	in 1974	113	24.3
Dunkeld	171.8	136.3	in 1963	113	37.0
Jeparit	202.2	142.9	in 1974	113	21.7
Moutajup	141.6	127.5	in 1963	113	33.3
Tullaroop Reservoir	137.6	108.0	in 1886	113	27.4

Weather Station	January 2011 rainfall	Previous wettest January		January average	Years of record
Culgoa	103.4	84.0	in 1979	112	21.9
Gerang Gerung	193.2	153.8	in 1974	112	22.7
Moyston	187.4	152.3	in 1963	112	31.7
Natte Yallock	215.8	114.0	in 1984	112	27.0
Redbank	230.5	177.2	in 1984	112	30.1
Bealiba	214.8	121.4	in 1984	111	28.4
Carisbrook	226.6	109.5	in 1904	111	29.1
Pira Wild Horse Plains	214.0	102.0	in 1974	111	23.5
Beulah	160.4	127.8	in 1974	110	22.4
Navarre	167.3	131.2	in 1993	110	27.1
Talbot (Post Office)	248.6	121.8	in 1962	110	30.3
Burkes Flat	188.2	116.8	in 1974	109	27.2
Birregurra (Post Office)	155.0	131.8	in 1991	108	33.3
Clear Lake	156.0	121.2	in 1941	108	25.9
Avenel (Post Office)	156.2	152.5	in 1904	107	39.0
Berriwillock	155.2	113.3	in 1974	107	20.7
Princetown	125.2	124.4	in 1952	106	37.6
Rupanyup (Post Office)	200.6	93.6	in 1993	106	23.9
Sea Lake (Post Office)	157.0	101.8	in 1974	106	22.2
Ballarat Aerodrome	206.0	188.6	in 1963	103	39.8
Sea Lake (Marston Downs)	173.6	72.2	in 1979	103	19.7
Woomelang	130.4	109.8	in 1974	103	21.8
Ultima (Post Office)	172.8	73.5	in 1998	102	19.7
Lake Boga	133.6	98.3	in 1928	101	23.1
Barkly	130.6	130.4	in 1993	100	28.2
Drik Drik	129.4	128.2	in 1991	100	32.5
Quambatook (Barraport North)	185.1	122.2	in 1995	100	26.6
Watchem	250.6	119.8	in 1974	100	23.7

Table 3 continued: Record highest January total rainfall for stations with more than 100 years of record

1.4 Summer rainfall records

Although this event occurred halfway through summer, several stations in the north and west of the state had already exceeded their highest summer rainfall on record as a result of persistent rainfall. After the January rain event, the 2010-2011 summer period averaged over Victoria ranked as the second highest, and by the mid-way point of February, this summer period had surpassed previous records, resulting in Victoria marking its wettest summer on record.

Table 4: Record highest summer rainfall for stations with more than 20 years of record (as at 20th January 2011)

Weather Station	2010-11 Summer rainfall to date	Previous wettest summer		Summer average	Years of record
Horsham Polkemmet Rd	288.9	205.4	in 1885	74.5	130
Maryborough	284.0	281.6	in 1972	100.5	130
Dimboola	291.0	203.4	in 1972	70.1	123
Dunolly	321.2	248.6	in 1954	93.4	123
St Arnaud	285.3	249.9	in 1972	84.6	123
Canary Island	340.8	262.0	in 1927	70.7	120
Nelson	286.2	277.2	in 1945	98.4	119
Narraport	271.4	246.4	in 1910	64.6	118
Balmoral (Post Office)	343.0	209.8	in 1945	89.8	117

Weather Station	2010-11 Summer rainfall to date	Previous wettest summer		Summer average	Years of record
Inglewood (Post Office)	278.2	246.1	in 1973	88.7	114
Beaufort	370.6	358.8	in 1903	127.9	111
Natimuk	275.0	228.2	in 1948	75.9	109
Boort	306.2	218.9	in 1930	74.8	108
Natte Yallock	262.6	257.4	in 1972	88.6	108
Jeparit	281.2	202.0	in 1910	71.4	107
Berriwillock	255.0	174.6	in 1961	64.8	104
Longerenong	278.6	202.7	in 1972	75.2	104
Rupanyup (Post Office)	341.0	196.2	in 1992	75.2	102
Sea Lake (Post Office)	260.0	230.1	in 1910	69.5	102
Willaura (Main Street)	287.6	256.7	in 1962	104.4	101
Woomelang	190.0	161.2	in 1992	66.8	99
Murrayville	187.6	176.1	in 1968	64.2	96
Ouyen (Post Office)	282.8	206.4	in 1968	68.4	96
Drung Drung	258.0	221.2	in 1992	77.6	94
Whitlands (Burder's Lane)	477.6	455.7	in 1933	209.0	80
Annuello	327.4	180.3	in 1945	70.7	77
Patchewollock	231.5	157.0	in 1954	67.5	75
Rainbow Post Office	268.4	220.2	in 1910	74.8	73
Red Cliffs (Post Office)	252.0	181.6	in 1992	62.0	68
Werrimull	192.9	162.0	in 1971	53.5	68
Walpeup Research	258.4	181.4	in 1992	67.0	66
Korong Vale (Burnbank)	274.8	221.1	in 1972	76.8	65
Mildura Airport	268.0	265.2	in 1992	63.5	64
Lalbert	201.2	182.1	in 1973	68.3	59
Casterton Showgrounds	279.2	243.7	in 1959	94.2	54
Caramut	210.1	190.3	in 1959	105.9	45
Donald	303.6	298.1	in 1972	74.9	44
Ararat Prison	274.9	261.7	in 1972	107.2	41
Glenthompson	221.3	221.2	in 1986	106.7	41
Kyneton	353.0	349.0	in 1972	135.3	41
Warracknabeal Museum	282.4	191.4	in 1972	70.5	41
Portland (Cashmore Airport)	265.2	163.6	in 1995	109.2	28

Table 4 continued: Record highest summer rainfall for stations with more than 20 years of record (as at 20th January 2011)

2. Record river heights and flow levels across catchments in the north and west

2.1 Major flooding

Extreme rainfall and already wet catchments led to widespread flooding in northern and western Victoria, with most gauges reaching their highest flood levels on record, far exceeding even the September 2010 event.

2.2 Record river heights

Many areas of northwest Victoria observed record river heights in the January 2011 event. Table 5 below indicates peak river heights recorded during the event. The Avoca River at Quambatook peaked at 3.01 mm, beyond the highest ever recorded level of 2.5 metres. The Wimmera experienced a 1 in 200 year event, with record river heights at several stations, including Glenorchy, which peaked at 5.04 metres at approximately 8:30pm on the 15th. The Wimmera River at the Walmer gauge (immediately downstream of the Horsham Township) has peaked at 4.27 metres. This is the highest river level on record at this site. In the Loddon catchment, the Laanecoorie Reservoir recorded its second highest outflow of 194,000 Ml/day on the 14th, the highest since 1909 when the reservoir failed.

Major flooding across the Campaspe catchment area led to record breaking river heights. At Rochester Syphon gauge, the Campaspe River peaked at a record flood level of 9.17 metres (Major Flood Level 9.1 metres) on Saturday evening. This is 2 centimetres higher than the 1983 flood peak of 9.15 metres. The Campaspe River at Barnadown peaked at a record flood level of 7.59 metres on Saturday the 15th. On Sunday the 16th the gauge on the Campaspe River at Echuca (located in the southern area of Echuca about 5km upstream of where the Campaspe River joins the Murray River) peaked at 95.75 metres above Australian Height Datum (AHD) around 9pm Sunday.

Table 5: Selected catchment conditions and peak river heights as at midday 20th January

Catchment	Location	Highest river height observed (m)	Flood Class Levels (m)			Highest river height observed (m)	Largest floods on record to date		Start of record
		Jan 2011	Minor	Moderate	Major	Sep 2010	Height (m)	Date	
Campaspe	Redesdale	6.30	2	4	6	~ 5.80	4.87	Sep-1975	1953
	Barnadown	7.59	4	4.6	5.5	4.82	6.15	8-Sep-1983	1977
	Rochester Syphon	9.17	8	8.8	9.1	8.25	9.15	9-Sep-1983	1963
	Echuca (Campaspe) †	95.75 †							
Loddon	Newstead	5.86	3	4.5	6	4.91	5.35	Jul-1990	1967
	Laanecoorie Res.**	194,000**	2000**	8500**	43000**	6.10	7.79	20-Aug-1909	1891
	Loddon Weir DS	7.29	3.3	6	7	7.03			1965
	Appin South	3.52	2.8	3.1	3.3	3.08	3.19	Oct-1996	1927
	Kerang †	78.03 †	77 †	77.5 †	77.8 †	76.95			
Avoca	Archdale Junction	5.32				5.14	5.15	2-Sep-1988	1966
	Yawong Weir	~ 6.20	3	4.3	5	5.64	5.59	Aug-1909	1931
	Charlton D/S	8.05	5	7	7.5	7.30	7.20	11-Oct-1992	
	Quambatook	3.01	2	2.2	2.4	2.24	2.50	15-Sep-1983	1967
Wimmera	Glenorchy	5.04	4	4.75	4.9	4.93	4.97	3-Sep-1988	1950
	Horsham	na	na	na	na	na	3.87	Oct-1894	1881
							3.87	22-Aug-1909	
	Walmer for Horsham	4.27	na	na	na	3.35			1970

*Note: Stations with the following symbols have different units to those specified in the above table due to data availability: † m above Australian Height Datum (mAHD)i.e. height above mean sea level, ** Flow (Ml/day).*

Note: This statement has been prepared based on information available at midday 20th January 2011. Some checks have been made on the data, but it is possible that results will change as new information becomes available.