



## SIGNIFICANT WEATHER – December 2008

### SUMMARY

Tropical cyclone *Billy* was the first cyclone to cross the Western Australian coast for the 2008/2009 season. *Billy* formed in the Joseph Bonaparte Gulf before making landfall near Wyndham as a category two system. This system brought heavy rainfall to the Northern Territory's Top End west coast.

In Queensland, there were numerous thunderstorms, many were severe. In northern New South Wales there were frequent thunderstorms due to the interaction of low pressure troughs with the inflow of moisture from the Tasman Sea. Some storms were severe with large hail and destructive winds.

Winds were reported in Queensland, New South Wales and Tasmania. Duststorms were reported in New South Wales. Flooding occurred in Queensland from thunderstorm activity. Rainfall in Western Australia caused damage to crops.

### TROPICAL CYCLONES

#### Western Australia

A tropical low formed in the Timor Sea, northwest of Darwin on the 15th, initially moving to the southwest before tracking to the southeast on the 17th. The low moved into the Joseph Bonaparte Gulf on the 18th and intensified to a tropical cyclone north of Wyndham. The slow moving system reached category two intensity before moving to the west-southwest, crossing the coast near Wyndham early on the 20th. Tropical cyclone *Billy* passed over Oombulgurri community at category 2 strength, causing tree damage and power outages before weakening to a tropical low. Heavy rainfall caused flooding and road closures in the northeast Kimberley. The heaviest rainfall was recorded at Wyndham, with 384.0 mm in the 48 hours to 9am on the 21st. The low tracked west-southwest across the Kimberley, redeveloping to cyclone strength after moving off the northwest Kimberley coast near Kuri Bay on the 22nd.

Tropical cyclone *Billy* then moved southwest along the coast, passing over the northern part of the Dampier Peninsula to the north of Broome overnight on the 22nd and in the morning of the 23rd. Broome Airport recorded a wind gust of 91 km/h at 9:22 am on the 23rd as tropical cyclone *Billy* passed to the northwest of the town. Tropical cyclone *Billy* rapidly intensified late on the 23rd and during the 24th after moving westwards into open waters and reached category four intensity late on the 24th, about 280 kilometres north of Port Hedland. Tropical cyclone

*Billy* then moved to the west-northwest away from the Pilbara coast, weakening from late on the 25th due to increasing vertical wind shear. Tropical cyclone *Billy* eventually weakened below tropical cyclone intensity late on the 28th, about 750 kilometres north of Exmouth.

#### Northern Territory

Tropical cyclone *Billy* formed in the Joseph Bonaparte Gulf on the 18th, and reached Category 2 intensity before making landfall on the East Kimberley coast north of Wyndham in the early hours of the 20th. Heavy rainfall affected the Darwin-Daly District and north Kimberley. Port Keats received 327 mm in the 48 hours to 9am on the 18th.

### TROPICAL LOW

#### Northern Territory

A tropical low formed in the Gulf of Carpentaria on the 20th. It moved over land near Port Roper on the 22nd and moved just south of Katherine and into the Victoria River District over the next few days. Winds associated with the system blew over several big trees and caused minor damage to a house at Ngukurr. Heavy rainfall during the event affected the Arnhem, Roper-McArthur, Darwin-Daly and Victoria River Districts, with 225 mm of rain at Foelsche Headland in the Katherine area in the 24 hours to 9am on the 24th, and many other 24 hour falls of over 100 mm.

### THUNDERSTORMS/TORNADOES

#### Queensland

On the 2nd near Charters Towers trees were blown down along the highway to the east of town and on some properties. 22 mm of rain was recorded in 10 minutes on one property. "Pellet" sized hail fell, which is not categorised as severe, but hail is uncommon so far north.

On the 3rd damage was caused by lightning, 30,000 houses lost power. A tree was struck by lightning and speared through multiple levels of a house in the suburb of Taringa in Brisbane.

On the 4th strong winds and hailstones between pea and golf ball size were reported at Nanango. Damaging wind gusts of up to 120 km/h occurred, trees were blown down and there was very heavy rain. 24,000 homes lost power. Hailstones the size of golf balls fell in Redcliffe. There were reports that insurance claims to the total value of \$295 million

were made between the 16th of November and the 4th of December in Southeast Queensland (Couriermail.com).

On the 6th hail up to 2 cm in diameter 25 mm of rainfall in 23 minutes were reported at Upper Caboolture, a tree landed on a house in Caboolture and there was roof damage to a house in Clifton.

On the 7th "Flat" hail 7 cm by 3.5 cm, some trees were damaged and 15 mm of rain in 10 minutes were reported 25 kilometres north northeast of Jandowae. Wind gusts of up to 110 km/h and marble sized hail were reported at Godwin Beach. Flash flooding, wind gusts of up to 100 km/h and marble sized hail occurred on Bribie Island. Roofs were ripped off the hospital complex in Baralaba and 6 homes in the area were damaged.

On the 8th trees and powerlines were blown down and local flash flooding occurred in Townsville during the early morning. One of the higher rainfall reports was from Louisa Creek Alert on the Ross River, where 61 mm of rain was recorded in the 30 minutes ending at 6:15am, which was fairly typical of other reports in the area.

A funnel cloud was reported 40 kilometres west of Mackay associated with a thunderstorm during the afternoon.

During afternoon thunderstorms on a property 30 kilometres northeast of Clermont there was a wind gust of 199 km/h, a 14 inch hardwood tree snapped off at the base, a galvanized iron rainwater tank was blown 2 kilometres and there was widespread damage to several neighbours' properties. In Mackay, heavy rainfall occurred, power was lost to 500 homes and the Bureau of Meteorology's office was struck by lightning. There was minor roof damage to the Police Youth Centre at Goondiwindi.

On the 11th houses were unroofed at Clifton. Knapps Peak Alert on the Upper Logan River recorded 30 mm of rainfall in 10 minutes and 63 mm in 30 minutes.

On the 18th there was a tornado which touched down for 2 kilometres reported near Batania 45 kilometres west of Amberley.

On the 20th hail 75 mm in diameter fell at Tungamull (south of Yeppoon). Dakiel TM on the Upper Burnett River recorded 25 mm of rain in 10 minutes and 50 mm in 30 minutes.

On the 23rd nine homes in Mitchell sustained roof damage from a severe storm around 8pm. A house in St George also sustained significant roof damage.

On the 26th there were wind gusts at Blackall of 98 km/h.

On the 27th there were reports of 180 mm of rain and flash flooding near Kingaroy and in the Bunya Mountains. The highest rainfall reports were; Haystack on the Dumaresq River with 34 mm in 30

minutes, the 27 Mile Garden on the Warrego River with 39 mm in 30 minutes and Raceview TM on the Warrego River with 27 mm in 20 minutes.

On the 28th there was flash flooding on the Gold Coast at Helensvale, Mudgeeraba and Nerang. A selection of the highest rainfalls were; Ridgeland on the Macintyre River with 81 mm in 60 minutes, Nerang River with 61 mm in 30 minutes, Little Nerang Dam Alert on the Nerang River with 93 mm in 60 minutes, Mt Nimmel Alert on the Nerang River with 109 mm in 60 minutes and Blenheim Alert on the Lower Burdekin River with 65 mm in 60 minutes.

On the 29th strong winds blew down trees at Junabee, near Warwick. There was damage to several properties at Goondiwindi, with winds gusts estimated to 140 km/h and a report of an "air conditioner" flying through the air. Strong winds blew down tree branches at Rosewood. Trees were blown down near Mt Tamborine with reports that it "felt like a tornado". At Leslie Dam (west of Warwick) wind gusts were estimated at 110 km/h, tents were destroyed and a boat was lifted off a trailer. Large hail fell at Mudgeeraba. Large trees were blown down between Woodenbong (on the NSW border) and at Rathdowney.

There was major damage at Guanaba (in the Gold Coast Hinterland); many large trees were blown down, a brick entrance and postbox were knocked down and no rain measurements were made because the rain gauge blew away. Approximately 10 kilometres west of Maleny there was some small hail and 40 mm of rain fell in 10 minutes, resulting in flash flooding. At Gunnawarra Alert on the Herbert River, 72 mm of rain fell in 60 minutes.

On the 31st marble sized hail was reported at Calliope. Upper Rudd Creek Alert on the Herbert River recorded 42 mm of rain in 30 minutes.

## **New South Wales**

On the 2nd hail 2 cm in size was reported in the Grafton area.

On the 3rd a thunderstorm with strong winds estimated at over 90 km/h was reported at Woolgoolga on the Mid North Coast caused minor damage to buildings. Strong winds at Woodburn on the North Coast uprooted trees and brought down power lines, causing power outages to town.

On the 7th hail mostly pea-sized but up to 3 cm in size was reported by storm spotters caused damage to motor vehicles at Gorokan, near Norah Head on the Central Coast. Rainfalls of up to 58 mm were recorded at Swansea and Avoca Beach.

On the 8th a thunderstorm caused heavy rain near Ashford on the North West Slopes with 35 mm falling in 15 minutes. Strong winds and small hail also reported in area. Large hail up to golf ball size was reported near Raymond Terrace in the lower Hunter

with heavy rain causing flash flooding and minor property damage. From the same line of storms, Total recorded 48 mm in 40 minutes accompanied by strong winds and Williamstown recorded 25 mm in 24 minutes. Thunderstorms and heavy rain in Sydney caused local flash flooding in the Bankstown-Panania area with Bankstown recording 25 mm in about half an hour. The highest fall was 42 mm in 45 minutes at Merrylands.

On the 10th thunderstorms with heavy rain, 25 mm in 12 minutes at Nundle (Malonga) on the NW Slopes. Strong winds brought down trees and caused power outages to more than 4,000 homes in the Tamworth area. Thunderstorm, strong winds and large hail up to 6 cm in size at Coutts Crossing and Braunstone near Grafton on the North Coast caused damage to several houses. Very heavy rain and 2 cm hail at Mount Seaview, 85 mm recorded in an hour. Thunderstorm, strong winds and marble size hail at New Italy, near Evans Head on the North Coast. Wind gusts reached 102 km/h at Evans Head.

On the 12th a thunderstorm with strong winds at Brewarrina in the Upper Western damaged houses and uprooted trees.

On the 18th a thunderstorm with 3-4 cm hail at Moss Vale accompanied by heavy rain and brief flash flooding. Strong winds up to 91 km/h caused minor damage. In the Riverina and South West Slopes, thunderstorms produced golf ball size hail at Leeton and very isolated falls of hail 3 cm in the Wagga Wagga area. A thunderstorm with strong winds at Taree on the Mid North Coast brought down trees and collapsed the roof of a shopping mall.

On the 23rd thunderstorms in the Monaro district of the Southern Tablelands caused heavy rain near Cooma and a tornado at Rock Flat (between Cooma and Nimmitabel). At Myalla Lake (near Cooma) 36 mm recorded in 30 minutes which is a 1 in 50 year event. On the North West Slopes, thunderstorms at Manilla produced golf ball size hail. A storm spotter at Cassilis in the Central Tablelands reported a thunderstorm with 3cm hail and 55 mm of rain in 30 minutes which caused local flash flooding. Strong winds caused structural damage to buildings. Bathurst was also hit by a severe thunderstorm with hail and heavy rain causing flash flooding. Strong winds gusting to 104 km/h uprooted several trees and caused power outages.

On the 24th a 20 minute thunderstorm with hail up to 5 cm in size at Bathurst on the Central Tablelands shredded trees, unroofed houses and covered the ground in a white layer of ice. A thunderstorm with heavy rain and 3 cm hail at Kyogle on North Coast. A microburst with estimated winds of 130 km/h ripped the roofs off several homes, bent street signs and left 300 houses without power. Up to 42 mm of rain was recorded in the Kyogle area.

On the 26th a storm spotter reported 3-4 cm hail with a thunderstorm west of Coonabarabran on the Central West Slopes.

On the 27th a severe thunderstorm with heavy rain and small hail in Canberra caused local flash flooding in the Deakin-Curtin area of Woden Valley. Up to 56 mm recorded at Curtin (Deakin West) in about 2 hours. A thunderstorm with hail and strong winds at Orange produced 20 mm in 20 minutes, causing local flash flooding.

On the 28th thunderstorms and heavy rain at Girralong, west of Nambucca Heads on the Mid North Coast. Falls of up to 74 mm in 24 hours recorded in the area with intensities of 43 mm in 15 minutes.

On the 29th 3-4 cm hail and heavy rain at Medowie, Morrisett, Raymond Terrace and Cooranbong in the Lower Hunter. At Cooranbong, hail caused damage to cars and stripped trees. At Ellalong (near Cessnock) 28 mm was recorded in about 15 minutes. The same line of storms continued on to Myall Lakes where a person was drowned after being tossed from his canoe when the storm hit.

A thunderstorm with heavy rain, strong winds and large hail up to 5 cm in size was reported near Comboyne on the Mid North Coast, with 30 mm of rain recorded in 15 minutes. In the north of the state, a severe thunderstorm and 3 cm hail hit the Goondiwindi-Boggabilla area of the NW Plains. Strong winds uprooted trees, crushed a grain silo, brought down power lines and fences and damaged 11 houses. Heavy rain caused local flash flooding in the town. A dust storm was reported just before the storm hit. At nearby Kenebri, southwest of Narrabri on the North West Plains, giant hail up to tennis ball size (6 cm) was reported.

On the 30th thunderstorms with 5 cm hail at McLeans Ridges and 4 cm hail at Goonellebah, near Lismore on the North Coast were reported. Several motor vehicles in Lismore and Byron Bay were severely damaged by hail.

## **Victoria**

On the 1st thunderstorms were reported at Beechworth, Falls Creek, Corryong, Edi Upper and Hume Reservoir.

On the 17th thunderstorms were reported at Benalla, Bendigo, Echuca, Edi Upper, Eildon, Kerang, Maryborough and Warracknabeal.

On the 18th thunderstorms were reported at Ararat, Beechworth, Corryong, Dartmouth, East Sale, Echuca, Edi Upper, Falls Creek, Kyabram, Melbourne Airport, Noojee, Omeo, Orbost, Strathbogie, Horsham, Warracknabeal, Echuca and Kerang, hail was reported at Benalla and Eildon..

On the 19th thunderstorms were reported at Orbost, Corryong, Edi Upper, Falls Creek and Strathbogie, hail was reported at Orbost.

On the 22nd thunderstorms were reported at Corryong, Edi Upper, and Hume Reservoir.

On the 23rd a thunderstorm was reported at Corryong.

On the 26th thunderstorms were reported at Cape Otway, Warracknabeal, and Casterton.

On the 27th thunderstorms were reported at Corryong, Echuca, Kerang, Lakes Entrance, Omeo, Orbost and Strathbogie.

On the 28th thunderstorms were reported at Corryong, Omeo & Strathbogie.

On the 29th thunderstorms were reported at Benalla and Corryong.

On the 30th thunderstorms were reported at Benalla and Corryong.

### **South Australia**

On the 5th a wind gust to 113 km/h was reported at Coober Pedy from a thunderstorm.

On the 8th extensive thunderstorm activity in the west of South Australia produced a wind gust to 93 km/h at Eucla.

On the 9th a wind gust to 95 km/h was reported at Leigh Creek and a wind gust to 102 km/h was reported from Woomera as a result of thunderstorm activity in the north of South Australia.

On the 11th 35 mm of rain was reported from a thunderstorm at Penong.

On the 17th thunderstorms produced hailstones of around 1-2 cm diameter near Karoonda and Lamerloo.

### **Western Australia**

On the 3rd severe damage occurred at Laverton in the Goldfields. Power poles were torn down and trees were ripped out by the roots. At the sports club, the caretaker's roof was torn off and dumped 150 metres away. A "big dust storm" was reported to accompany the wind. In addition, severe thunderstorms were identified on radar near a surface trough in the Southeast Coastal district, extending from Hopetoun to Salmon Gums, although no damage was reported from these locations.

On the 8th a thunderstorm produced a wind gust of 93 km/h at Eucla.

On the 11th Giles recorded a wind gust of 94 km/h during a thunderstorm.

On the 20th Munglinup West recorded a wind gust of 91 km/h during a thunderstorm.

On the 23rd afternoon thunderstorms caused strong winds uprooting trees and downing power lines in Kalgoorlie, two trees fell on cars.

On the 26th strong winds during an afternoon thunderstorm caused some damage to a mine near Leinster in the northern Goldfields.

On the 30th a severe thunderstorm in the Central West district caused some damage with three houses roofs torn off and some broken tree branches and fences.

### **Northern Territory**

On the 9th, a suspected downburst from a thunderstorm caused damage to a house wall, pushed over a fence and some tin sheds, and felled some large trees at Kulgera. Flash flooding to a depth of 10 cm affected the roadhouse. On the same day there was the report of a possible tornado in the Ringwood/Numery area (in the Eastern Alice Springs District) and a number of thunderstorms in central and eastern parts of the Alice Springs district showed evidence of severity on radar.

## **WIND**

### **Queensland**

A trough entered Queensland south coastal waters late on the 19th and pushed north, reaching Mackay on the 21st, followed by strong south to south-east winds as firm ridging developed in it's wake. The strong winds reached Cape Bowling Green in the north, whilst abating from the south, with coastal wind warnings being finalised on the 22nd. A tropical low in the Northern Territory drove strong north-west to north-east monsoon winds across the western Gulf of Carpentaria during the 22nd.

The strongest recorded wind gust was 163 km/h at Hay Point AWS on the 14th, followed by 133 km/h at St George Airport on the 26th, followed by 102 km/h at Roma Airport on the 10th and 94 km/h at Oakey Aero on the 30th.

### **New South Wales**

On the 13th and 14th an intense low pressure system passed over southern New South Wales accompanied by strong to gale force winds over southeastern New South Wales. The strongest winds were along exposed coastal and mountain locations. The highest wind gusts were 115 km/h at Green Cape, 104 km/h at Mt Boyce and 102 km/h at Thredbo AWS. Even inland locations such as Moss Vale recorded wind gusts of 98 km/h.

On the 22nd a wind gust of 124 km/h at Bourke Airport in the Upper Western was reported. The strong winds were caused by a downburst from a thunderstorm which dropped the temperature from 36°C to 19°C.

On the 23rd wind gusts reached 104 km/h at Bathurst causing minor structural damage to houses.

On the 29th a thunderstorm caused a downburst with wind gusts to 107 km/h at Tamworth Airport.

## **Victoria**

On the 1st a wind gust of 94 km/h was recorded at Mount Hotham.

On the 2nd a wind gust of 94 km/h was recorded at Wilsons Promontory.

On the 6th a wind gust of 93 km/h was recorded at Eildon.

On the 13th a wind gust of 118 km/h was recorded at Falls Creek, 104 km/h at Mount William, 105 km/h at Mount Hotham and 115 km/h at Wilsons Promontory.

On the 19th a wind gust of 120 km/h was recorded at Wilsons Promontory.

On the 22nd a wind gust of 109 km/h was recorded at Mount William.

On the 27th a wind gust of 105 km/h was recorded at Mount Buller.

On the 28th a wind gust of 96 km/h was recorded at Wilsons Promontory.

On the 30th a wind gust of 98 km/h was recorded at Wilsons Promontory.

On the 31st a wind gust of 94 km/h was recorded at Wilsons Promontory.

## **Tasmania**

A man crayfishing on rocks near Fosters Creek (5.5 kilometres south of Granville Harbour) was swept into the water by a wave at about 6.30 pm on the 12th. His body was found about 100 metres offshore the next day. Near the time he was swept from the rocks, the waverider at Cape Sorell (approximately 35 kilometres to the south) was reporting a significant wave height of 2.2 metres, with a maximum of 4.3 metres.

A low pressure system to the northwest of Tasmania on the 12th intensified as it moved near Flinders Island on the 13th and brought strong, gusty southeasterly winds (up to 113 km/h) and heavy rainfalls to the northeast of the state. St Marys received 173 mm over 2 days, including 103 mm in the 24 hours to 9 am on the 14th.

The rain also caused rockfalls on the Tasman Highway at Paradise Gorge (near Orford) and on the Esk Highway near St Marys, and a small landslide at Beauty Bay (St Helens). Gray Rd at St Marys was closed due to flooding, and there were at least 29 car crashes due to wet roads during the day.

The strong winds and low pressure combined with high astronomic high tides to blow water over some coastal roads in eastern Tasmania on the night of the

13th, and the tide was reported as being "just inches away" from causing damage to some jetties near St Helens. The beaches at Scamander and Beaumaris were covered with a metre of foam.

Significant damage was reported on Flinders Island, where several buildings flooded, bridges were damaged, trees blew over, roofs were torn off, a caravan was blown through the air and powerlines were blown over or pulled off transformers. Many homes there were without power for more than 12 hours, and broken windows and damaged fences caused the schools to remain closed on Monday the 15th.

A trough approaching on the 22nd directed strong and gusty northerly winds across the state, particularly in the south. About 1,000 homes south of Hobart lost power for two to three hours in the late afternoon, and several yachts were wrenched from their moorings. Winds gusts reached 104 km/h in Hobart.

## **DUST STORMS**

### **New South Wales**

On the 6th a dust storm with strong winds was reported at Lake Cargelligo during the evening. At Wilcannia, a brief dust storm was associated with a thunderstorm.

On the 12th strong winds ahead of a low pressure system over Victoria caused areas of raised dust in western New South Wales. White Cliffs reported a dust storm mid-afternoon.

On the 29th a dust storm was reported at Boggabilla (North West Plains) just before a thunderstorm hit the town.

## **FLOODING**

### **Queensland**

Flash flooding occurred on Bribie Island on the 7th and in Townsville on the 8th, with widespread thunderstorm activity. This was due to a combination of a ridge over the northeast tropical coast of Queensland and a broad trough extending across central areas of the state, linked to a front moving northwards along the far southern Queensland coast.

Severe thunderstorms also produced flash flooding on the Gold Coast on the 28th.

### **Tasmania**

Heavy rain resulted in moderate flooding in the middle reaches of South Esk River on 14th (Fingal had a peak height of 5.4 metres around midday).

## BUSHFIRES

### Tasmania

A bushfire on the Cape Sorell peninsula started on the 14th and burnt 20 hectares in total. Another, near Ahrberg Bay (north of Granville Harbour) started on the 22nd and had burnt 50 hectares of rainforest and dry eucalypt forest by the end of the month. There were a number of other small bushfires during the month, some of which were started by lightning.

## TEMPERATURE

**Note:** The record tables below are only shown for sites with 30 years or more of observations. (Northern Territory is 20 or more years).

### Lowest Mean Maximum Temperature for December

Station	Actual °C	Previous Lowest °C	Year	Years of Record
<b>New South Wales</b>				
Corowa Airport	26.8	26.8	1993	83

### Highest Mean Minimum Temperature for December

Station	Actual °C	Previous Highest °C	Year	Years of Record
<b>Queensland</b>				
Cardwell Marine Pde	24.6	24.4	1985	100
Innisfail	24.2	23.9	2001	99
Winton Post Office	25.7	25.7	2005	70
Ayr DPI Res Stn	23.8	23.8	2001	53
South Johnstone Exp Stn	23.5	23.4	1990	52
<b>Northern Territory</b>				
Brunette Downs	25.8	25.8	2005	43

### Lowest Daily Maximum Temperature for December

Station	Actual °C	Date	Previous Lowest °C	Year	Years of Record
<b>Western Australia</b>					
Wyndham	26.0	19	26.5	2000	41

### Highest Daily Minimum Temperature for December

Station	Actual °C	Date	Previous Highest °C	Year	Years of Record
<b>Queensland</b>					
Maryborough	26.1	07	26.1	1960	50

### Lowest Daily Minimum Temperature for December

Station	Actual °C	Date	Previous Lowest °C	Year	Years of Record
<b>Western Australia</b>					
Mandora	14.5	13	16.4	1978	44
Learmonth Airport	14.2	11	14.4	1981	34

## RAINFALL

**Note:** The record tables below are only shown for sites with 30 years or more of observations. (Northern Territory is 20 or more years).

### South Australia

On the 12th a low pressure system produced very heavy rain, with 50 mm in 2.5 hours reported at Cape Jaffa and 40 mm in a similar time at Robe.

### Western Australia

On the 10th/11th the passage of a middle level trough and moist low level southeasterly winds resulted in heavy rainfall over southern parts of the Southwest Land Division (SWLD) and southern Goldfields. A storm spotter reported that a thunderstorm (on the 10th) to the east of Hyden produced 50 mm of rainfall in 30 minutes and hail up to 1.5cm in diameter. Crops were flattened and paddocks were under water. In the 24 hours to 9am on the 11th, Fitzgerald (Southeast Coastal) recorded 95.4 mm, Desert Fringe (Great Southern) 70 mm and Bremer Bay (Southeast Coastal) 59 mm. Flooding and road closures were reported near Tambellup. In addition, a storm spotter at Kambalda reported 40 mm of rainfall in 20 minutes on the 11th with the 24 hour to 9am rainfall on the 12th recorded at Kambalda West of 42.4 mm.

On the 21st heavy rainfall associated with an upper trough caused damage to fruit and vegetable crops around Pemberton and Northcliffe estimated in the millions of dollars. The heaviest daily rainfall was 70 mm at Karri Valley Resort. There were reports of severe winds that brought trees down and disrupted power supplies. Hail also contributed to the damage.

### Highest Monthly Rainfall on Record for December

Station	Actual mm	Previous Highest mm	Year	Years of Record
<b>Queensland</b>				
Aurukun Shire Council	632.6	626.6	1992	92
The Lynd Station	301.0	224.6	1975	36
<b>Victoria</b>				
Penshurst (The Gums)	125.0	117.8	1985	103
Coleraine Melville Forest	108.4	90.6	1986	65
Gatum	97.6	96.4	1985	53
Caramut	129.2	98.9	1966	50
Strathdownie	127.1	106.8	1986	45
<b>South Australia</b>				
Hoyleton	104.2	97.9	1992	131
Greenock	100.4	93.0	1929	128
Hamley Bridge	83.0	77.4	1937	125
Port Augusta West	86.0	82.3	1894	120
Penong	98.2	83.6	1966	113
Penong (Penalumba)	86.3	78.8	1957	111
Kalangadoo	128.0	107.1	1937	94
Owen	83.2	72.0	1992	85
Nundroo	81.6	67.3	1950	77
Mount Gambier Aero	118.4	109.0	1986	67
Tantanoola	111.8	97.0	1986	59
Tarlee (Hazelton)	107.4	93.8	1992	48
Balaklava (Wanappe)	89.2	70.6	1992	40
Bordertown (Beeama Section 48)	93.0	87.2	1986	40

Crystal Brook Section 299	81.8	73.4	2004	40	Wollondilly (River View)	52.8	13	41.9	1987	31	
Mount Schank (Jethia)	103.4	97.3	1986	40	<b>Victoria</b>						
Naracoorte (Bettws-Y-Coed)	113.4	110.2	1986	40	Portland	60.0	15	50.4	1980	129	
Port Broughton (Wandearah)	92.2	56.2	1992	40	Cavendish PO	65.0	13	61.0	1902	124	
Avenue (Downer)	101.0	72.8	1999	36	Balmoral PO	56.4	13	46.0	1902	122	
Furner (Kennion Section 235)	111.6	87.4	1976	33	Woolsthorpe	60.8	13	49.5	1894	122	
<b>Western Australia</b>					Nelson	69.4	13	51.1	1902	121	
Peppermint Grove	119.0	110.3	1983	101	Merino	74.6	13	68.4	1986	117	
Fossil Downs	284.3	253.6	1917	99	Hawkesdale PO	69.0	13	61.5	1905	116	
Bremer Bay	112.8	105.4	1983	98	Dunkeld	64.0	13	61.0	1964	110	
Northcliffe	105.2	90.7	1944	83	Apollo Bay	68.0	13	64.8	1987	105	
Kimberley Res Stn	480.3	322.8	1987	64	Branxholme (Bassett)	87.0	13	55.4	1959	105	
Oombulgurri	697.8	359.3	1933	56	Dergholm (Hillgrove)	68.6	13	47.0	1930	105	
Chesalon	80.0	72.0	1987	43	Harrow PO	66.3	13	46.0	1930	100	
Wyndham	676.6	311.5	1996	41	Jung	35.0	12	31.6	1985	72	
Cherrabun	208.0	129.6	1971	37	Penshurst (The Gums)	76.0	13	43.0	1987	72	
Kununurra Aero	382.0	333.2	1996	34	Gatum	65.0	12	49.4	2003	56	
Mount Elizabeth	503.1	354.1	1998	34	Coleraine (Melville Forest)	64.1	13	36.8	1987	55	
Brooking Springs	299.4	278.0	1996	32	Beaumaris	56.0	13	53.0	1987	54	
<b>Northern Territory</b>					Rokewood (Wurrook South)	62.0	13	54.2	1987	54	
Auvergne	429.0	307.0	1973	69	Casterton Showgrounds	86.0	13	81.2	1986	53	
Mataranka	626.8	396.7	1956	64	Caramut	75.0	13	44.4	1987	51	
Homestead Resort					Horsham	43.6	13	33.8	1987	51	
Beatrice Hill	499.4	461.0	1998	42	Avoca	52.6	13	48.0	2004	49	
Mango Farm	519.2	446.1	2000	27	Strathdownie	85.5	13	47.2	1986	46	
Timber Creek	374.7	329.1	2007	27	Glenthompson	65.0	13	48.4	1987	44	
					Murrayville (Carina)	36.0	13	33.4	1983	41	
					Simpson South	48.0	13	37.6	1991	41	
					Benayeo	70.2	12	50.4	1985	37	
					<b>South Australia</b>						
<b>Highest Daily Rainfall on Record for December</b>					Auburn	51.4	12	50.3	1917	125	
					Port Broughton	44.4	12	43.2	1992	124	
					Riverton	63.0	12	55.4	1917	123	
					Hoyleton	62.0	12	41.7	1946	122	
					Coonalpyn	64.6	13	61.0	1983	120	
<b>Queensland</b>					Frances	64.0	13	54.2	1986	120	
Orion	139.8	28	137.2	1942	99	Penong (Penalumba)	62.0	12	43.9	1950	111
Yandaburra	98.0	27	98.0	1970	69	Penong	75.8	12	43.2	1923	106
Birraban	135.6	28	126.2	1956	56	Nonning	67.8	12	54.6	1942	100
Carina Downs	161.2	28	116.8	1992	39	Coomandook	43.2	13	38.8	2007	99
Mountain View	122.2	28	75.0	1990	36	Iron Knob	62.0	12	50.6	1997	96
The Lynd Station	126.5	18	80.0	1975	36	Snowtown (Condownie)	46.6	12	44.2	1997	96
<b>New South Wales</b>					Kalangadoo	81.0	13	43.9	1937	94	
Willow Tree (Valais)	82.0	13	81.4	1992	128	Whyalla (Mullaquana)	39.2	12	38.1	1948	91
Wollar (Barrigan St)	104.0	13	90.2	1909	106	Owen	43.0	12	42.7	1953	85
Dunedoo Post Office	71.6	13	68.6	1926	97	Warrambo	60.6	12	59.4	1958	82
Crookwell	60.0	13	58.4	1948	64	Ceduna (Maltee)	70.0	12	48.2	1990	80
(Gundowringa)					Nundroo	59.8	12	57.9	1950	77	
Kandos Cement Works	54.0	13	48.9	1995	58	Mount Gambier Aero	78.8	13	50.6	1986	67
Leadville (Moreton Bay)	81.6	13	67.8	1965	55	Tantanoola	74.4	13	56.2	1999	59
Goulburn (Springfield)	63.0	13	62.4	1999	54	Manoora (Cooinda)	58.8	12	40.4	1997	52
Elsmore (Paradise Station)	82.0	28	77.5	2003	53	Bordertown (Yacca Vale)	76.0	13	53.8	1992	50
Swan Vale (Numeralla)	84.2	28	68.4	1991	52	Stockport (Clifton)	43.0	12	29.6	1997	50
Cheetham Flats	67.0	13	65.6	1995	50	Freeling	38.5	13	25.6	1997	45
(Jundas)						Courela (Lindarnoe)	77.0	12	43.6	1990	42
Lidsdale (Maddox Lane)	72.2	13	69.8	1981	50	Balaklava (Wanappe)	41.4	12	39.0	1997	40
Brayton (Longreach)	61.0	13	59.9	1962	49	Bordertown (Beeama Section 48)	61.6	13	55.4	1986	40
Ginninderra CSIRO	58.2	13	53.6	1988	46	Crystal Brook Section 299	62.0	12	38.8	1997	40
Old Bonalbo	69.0	02	69.0	1991	40	Hamley Bridge (Linwood)	31.0	12	30.0	1992	40
(Alcheringa)						Mount Schank (Jethia)	63.0	13	47.0	1994	40
Glen Alice	49.0	13	42.7	1970	39	Naracoorte	76.0	13	47.0	1986	40
Sutton (Uba)	50.0	13	47.6	1999	39	(Bettws-Y-Coed)					
The Lagoon (Springfield)	59.0	13	57.5	1981	39	Port Broughton (Wandearah)	64.0	12	28.2	1980	40
Aranda (Bindaga St)	60.8	13	58.8	1999	38	Sherlock (Warrana)	49.2	13	35.8	1987	40
Berrima West (Medway)	60.2	13	49.8	1970	38	Wirrulla (Pimbena)	71.0	12	30.4	2001	40
(Wombat Creek))						Mount Remarkable	51.6	12	40.8	1993	39
Stromlo Forest	57.8	14	56.4	1995	38	(Mambray Creek)					
Canberra Parliament House	60.0	13	54.4	1980	37	Tintinara (Richards)	67.0	13	65.0	1983	39
Garran (Federal Golf Club)	55.2	13	54.0	1980	37	Riverton (Leaward)	69.0	12	52.0	1992	38
Melba (Verbrugghen Street)	66.0	13	57.4	1995	36	Avenue (Downer)	49.0	13	40.0	1999	36
Numeralla (Glocca Morra)	48.0	23	47.0	1970	36	Policemans Point	30.0	13	29.0	1999	36
Camden Airport AWS	70.4	13	53.6	2004	35	Mount Remarkable	65.0	12	52.8	1993	35
Gungal (Merryfields)	65.4	13	63.0	2004	35	(Alligator Gorge)					
Bevendale (Riverview)	52.4	13	48.6	1983	31	Reeves Plains (Parana Park)	28.2	13	26.8	1997	35
Marulan (Johnniefelds)	68.0	13	39.0	1984	31	Furner (Kennion Section 235)	69.4	13	44.0	1976	33
Rock Forest (Bimbil)	72.0	13	51.0	1988	31						

**Western Australia**

Peppermint Grove	61.0	11	41.1	1914	100
Gnowangerup	48.0	10	46.7	1959	95
Fossil Downs	160.0	26	114.3	1916	93
Bendering	39.0	11	34.8	1951	80
Bremer Bay	59.0	11	47.8	1913	77
Pemberton	56.9	21	46.7	1996	68
Oombulgurri	223.0	20	147.3	1948	49
Derby Aero	126.8	23	102.0	1996	48
Wyndham	254.0	21	154.8	1998	41
Yalleen	61.4	30	51.8	1994	41
North Stirlings	35.0	11	29.2	1999	40
Esperance Aero	29.0	11	25.6	1999	39

**Northern Territory**

Mataranka Homestead Resort	156.0	24	128.3	1956	60
The Garden	129.0	11	80.0	1975	52
Bullita	214.0	25	165.1	1929	37
Gove Airport	140.6	23	111.8	1999	32
Timber Creek	109.8	25	96.2	2007	26
Yirrkala Tropical Gardens	136.0	23	110.0	2006	25

*Note: Some statistical records mentioned in this report are based on data that have yet to be fully validated*