# 1 Summary of weather and flood events

What follows is an overview of the weather events leading up to and during the 2010/2011 floods with a summary of their effects across the state. It is not intended as an exhaustive account.

## 1.1 Summary of weather leading to 2010/2011 flood events

The Queensland wet season extends from October to April, with the initial monsoonal onset usually occurring in late December. The 2010/2011 wet season was different.

In June 2010 the Australian Bureau of Meteorology warned that a La Niña event was likely to occur before the end of the year.[1] The La Niña change has historically brought above average rainfall to most of Australia and an increased risk of tropical cyclone events for northern Australia. Previous La Niña effects had been associated with flooding in eastern Australia, including the large scale and devastating floods which occurred in 1955 and 1973/1974.[2]

As predicted, a strong La Niña event took place in the Pacific Ocean in late 2010. La Niñas are often described in terms of a positive Southern Oscillation Index, which represents the normalised pressure difference between Darwin and Tahiti and gives a positive reading when pressures are high in Tahiti and low in Darwin.[3] The index ranges from about -35 to +35.[4] During December 2010 the Southern Oscillation Index was +27.1, representing the highest December value on record and the highest monthly value since 1973.[5]

In turn, Australia experienced an extremely strong La Niña during the end of 2010 and beginning of 2011; the second strongest on record since 1917-1918.[6]

Coupled with the effect of the La Niña event, Australia also experienced uncharacteristically persistent monsoonal rainfall during the end of 2010 and beginning of 2011, with periods of rain lasting longer than usual.[7] Very strong bursts of the Madden-Julian Oscillation (which reflects patterns of atmospheric circulation and convection and, as it rises, manifests in tropical thunderstorm activity) in the Australian region also occurred between October and January, which increased the strength of the monsoon.[8] On 4 October 2010, the Madden-Julian Oscillation was at its strongest since the early 1980s.[9]

As a result of both the La Niña episode and the increased strength of the annual monsoon, Australia experienced record rainfalls during the end of 2010 and beginning of 2011.

The period from July to December 2010 was the wettest on record for Australia,[10] while December 2010 was the wettest on record for Queensland and third wettest recorded for the whole of Australia.[11]

The above average rainfalls experienced throughout Queensland during late 2010 meant that many catchments were already very wet before

the Queensland floods occurred.[12] When further record rainfalls were experienced in December 2010 and January 2011, already soaked catchments could not absorb the excess rain.

In turn, flooding was experienced across the state. Some of this flooding was caused when river systems overflowed; some of it resulted from 'short-period' falls where considerable amounts of rain fell in small areas within short time frames. Whatever the causes, the effects across Queensland were widespread and long-lasting.

# 1.2 Summary of 2010/2011 flood events

## 1.2.1 General note on terminology for flood levels

This summary describes events in terms of river level peaks that occurred during the 2010/2011 Queensland floods. A 'peak' represents the highest river height (in metres) reached by a river at a specified gauge site during a flood event.[13] Peaks are described as 'minor', 'moderate' or 'major', denoting the severity of the peak and its likely impact on nearby areas.

## 1.2.2 December 2010

Queensland experienced higher than average rainfall during early December 2010. Between 28 November and 4 December 100 to 300 millimetres of rain fell in central Queensland between Mackay and Emerald, resulting in the Capricorn Highway being cut between Rockhampton and Emerald on 3 December.[14] Between 4 and 10 December, major flood peaks were recorded in the Balonne River at St George and Dawson River at Theodore.[15] The Balonne River at St George exceeded its major flood level again on 16 December.[16]

The Fitzroy River at Rockhampton remained above its minor flood level between 13 and 20 December.[17] By 20 December, flood warnings were current for the Barcoo, Bremer, Bulloo, Don (Bowen), Condamine, Balonne, Moonie, Paroo and Warrego rivers; the Fitzroy River Basin; the Brisbane River above Wivenhoe Dam; the Burnett catchment; the Mary River and Cooper Creek; and the Laidley and Warrill creeks.[18]

On 21 December, the Balonne River at St George again exceeded its major flood level, where it remained for a total of 43 days.[19] St George experienced partial inundation at this time, causing some residents, including high care patients in local hospitals, to evacuate.[20] By 23 December there were flood warnings for the Fitzroy River system (including the Comet, Connors, Dawson, Don, Nogoa and Mackenzie rivers), the Bremer River and the Lockyer Creek.

On 25 December, residents of Theodore experienced the Dawson River's third major flood peak since the start of December, causing a number of road closures and resulting in the inundation of two Theodore houses.[21] By 26 December, at least six families had self-evacuated from Theodore.[22]

By the end of December 2010, tropical cyclone Tasha had formed off the Queensland coast. Tasha crossed the coast as a category 1 cyclone around 5.30 am on 25 December between Gordonvale and Babinda, bringing more significant rainfall to northern Queensland.[23]

Emerald was put on high alert on 26 December. On the same day, a minor flood peak was recorded at the Lockyer Creek at Helidon while a major flood peak occurred in the Laidley Creek at Laidley.[24]

On 27 December, 20 people were evacuated from Chinchilla when the town experienced major flooding.[25] The Comet River at Rolleston also experienced a major flood peak when river levels reached 8.54 metres (4.04 metres above the river's major flood level) and set a new record.[26] Major flood peaks were observed in the Condamine River at Warwick and the Myall Creek at Dalby. The Condamine River peak affected about 45 homes and forced many Warwick residents to evacuate to local sports centres and schools. The Myall Creek flood split the town of Dalby in two and inundated some 100 properties.

On 28 December Charleys Creek in Chinchilla experienced a major flood peak, affecting about 36 properties.[27] It remained above its major flood level until 1 January 2011.[28] Also on 28 December, the Fitzroy River at Rockhampton exceeded its moderate flood level and an evacuation centre was established at a local university.[29] Approximately 4000 Rockhampton properties were affected. About 1000 homes had yard flooding, while 150 were inundated, that figure rising to 200 by the end of the month.[30]

After already experiencing three major flood peaks, the Dawson River at Theodore had another major peak on 28 December. On 27 December, Theodore and Bundaberg were isolated by floodwaters and by the following day, all 300 Theodore residents were evacuated from the town.[31]

The Jordan River at Jericho also peaked on 28 December.[32] Several properties were flooded across Jericho and severe damage was caused to local roads, the railway, local school and businesses. On the same day, the Alpha Creek at Alpha peaked, damaging local properties and infrastructure.[33] By 30 December, 150 people had been evacuated from Alpha and five houses had been inundated.[34] Most residents stayed with family and friends, though evacuation centres were established in both towns.[35]

Between 29 and 31 December, major flood peaks were recorded in the Dawson River at Taroom, the Burnett River at Bundaberg, and the Nogoa River at Emerald. Two hundred and eight Bundaberg houses were ultimately inundated, while the 16.05 metre peak in the Nogoa River at Emerald on 31 December set a new record for the town.[36] The Nogoa River peak caused major flooding in Emerald, where between 1000 and 1200 houses were flooded to some degree and approximately 95 per cent of businesses were damaged. Two thousand, four hundred and sixty-three residents registered as evacuees; more than 400 were forced to stay in evacuation centres.[37]

Flooding in the North Burnett Regional Council local government area during the end of December caused damage to the Gayndah town water supply station, prompting the council to introduce level 5 water restrictions.[38] At this time, four houses were inundated in Gayndah while 22 more were inundated in nearby Mundubbera.[39] Ninety per cent of the area's local industry was affected.[40]

## 1.2.3 January 2011

On 1 January 2011 the Condamine River at Condamine and the Dawson River at Theodore experienced major flood peaks.[41] The Condamine River remained above its major flood level for 29 days between 24 December 2010 and 22 January 2011.

On 4 January the Fitzroy River at Rockhampton peaked at Yaamba and Rockhampton, leaving both isolated.[42] About 1200 houses in Rockhampton were affected, with 400 houses flooded above floor level.[43] By 6 January, around 500 Rockhampton residents had self-evacuated.[44] The Balonne River also peaked at Surat on 4 January.[45]

As a result of major flood levels since 21 December 2010, on 5 January 2011 an emergency evacuation centre was established in the town of St George.[46] On 6 January Rockhampton was still isolated due to flooding on the Bruce and Capricorn Highways. Supermarkets in the region ran low on food stocks and the Australian Defence Force provided emergency food drops to some isolated areas.

The Balonne River experienced a major flood peak on 8 January.[47] The river water supply at St George failed as a result of the flooding, though the Balonne Shire Council managed to restore limited supplies.[48] A number of townships within the Balonne Shire experienced isolation during the early January flood. These included St George, Dirranbandi and Hebel. In some areas supplies were air-dropped by the Australian Defence Force or moved by boat or high vehicle transfers provided by the SES and local council.[49] By 10 January around 25 properties in the Balonne Shire Council local government area had water in their yards while 11 houses had experienced inundation.[50]

On 10 January, a major flood peak was observed in the Quart Pot Creek at Stanthorpe, resulting in 12 houses being inundated and the evacuation of 50 people.[51] Inundation of the Stanthorpe sewerage treatment plant resulted in effluent flowing into Quart Pot Creek and residents were advised to boil their water as a precautionary measure.[52] By the end of 11 January, 27 Stanthorpe homes were inundated to a depth of 100 to 150 millimetres.[53]

Oakey Creek burst its banks on the same day.[54] By 11 January, 128 homes were inundated by floodwaters, as were some businesses.

Between 12.45 pm and 2.15 pm on 10 January, heavy rainfall was recorded in the Toowoomba area.[55] This rainfall resulted in flash flooding in the centre of the city, which killed two people. The Lockyer Valley was also subjected on that afternoon to unprecedented flash floods following heavy rainfall across almost all catchments in the Upper Lockyer Valley. Flood water flowed through the Upper Lockyer Valley, causing severe damage in Murphys Creek, Spring Bluff, Withcott, Postman's Ridge, Helidon and Grantham, finally reaching Gatton after 5.00 pm. Sixteen lives were lost in the Lockyer Valley floods, while three people still remain missing. The events in Toowoomba and the Lockyer Valley are described in more detail in chapter 7.

After flooding in late December, the Burnett River at Bundaberg exceeded its minor flood level again from 10 to 15 January.[56] A major flood peak in the Condamine River at Warwick on 11 January resulted in the inundation of around 150 homes and 30 businesses.

Also on 11 January, the Caboolture River peaked at Caboolture, affecting 300 houses and damaging local roads and infrastructure. Woodford, Kilcoy and Moore were isolated while eight rooftop rescues were conducted at Lowood in the Somerset Regional Council area.[57] Residents of Condamine were again evacuated to Dalby while residents in low lying areas of Ipswich, Brisbane and the Sunshine Coast Hinterland were told to move to higher ground.[58] At around 5.00 pm the Mary River at Gympie experienced a major peak, inundating houses and businesses in Gympie's main street. Between 10 and 12 January, the Mary River remained above its major flood level.

On 12 January a moderate flood peak was experienced in the Myall Creek at Dalby while major peaks were recorded in Charleys Creek at Chinchilla and the Dumaresq River at Texas. Chinchilla was left with 35 inundated homes and 213 premises without power.[59] The flood peak in the Dumaresq River reached 9.21 metres, sitting 1.21 metres above the river's major flood level and representing its highest flood peak since 1956.[60] Texas suffered large crop and stock losses.[61]

On 12 January the Bremer River at Ipswich also experienced a major flood peak, the river's highest since 1974.[62] Around 7221 buildings were flood-affected, including 3000 homes. Approximately 1000 Ipswich homes were inundated.[63] The floods also caused widespread damage to local roads and infrastructure. Some 1100 Ipswich residents stayed in evacuation centres; another 3000 residents stayed with family and friends. Clean up crews began work in Ipswich on the morning of 13 January. By the morning of 14 January, 15 000 premises were still without power in Ipswich and surrounding areas.

The Brisbane City flood gauge exceeded its major flood level on 12 January. That night, electricity was switched off in many parts of Brisbane's central business district and most businesses were closed. Energex advised that around 115 000 customers across Queensland were without supply, with this number expected to increase to 150 000.[64] At approximately 3.00 am on 13 January the Brisbane River experienced a major flood peak of 4.46 metres; its highest peak since 1974.[65] During the flood peak, 14 100 Brisbane properties were affected, with 1203 houses suffering inundation.[66] Businesses were also severely affected: 1879 were partially inundated and 557 were completely inundated.[67] A great deal of debris washed down the Brisbane River, including a large section of Brisbane's floating 'River Walk' and numerous privately and publicly owned jetties, which were washed into Moreton Bay.[68]
On 14 January the Brisbane River fell below its minor flood level and the council's focus shifted towards re-supplying essential items to flood-affected western suburbs.[69] By 15 January, the total number of Brisbane properties still affected was 5930, with 5755 partially flooded and 175 still completely inundated.[70]

On 14 January the Macintyre River at Goondiwindi experienced a major flood peak, with some evacuations from the town. By 16 January, a monsoon trough over Cape York Peninsula moved south, bringing rain and thunderstorms to north Queensland.[71] The Condamine River at Condamine experienced another major peak on 16 January.[72]

By Monday 17 January, 10 000 homes in Brisbane and Ipswich were still without power and the receding floodwaters had left a thick layer of mud across both cities. On the first weekend after the Brisbane flood, 20 000 volunteers attended coordination points across the city to help in the clean up and recovery efforts to follow.

On 18 January another major flood peak was recorded in the Balonne River at Surat, causing further flooding in the township.[73] On 19 January, Flinton and Goondiwindi were both isolated, requiring re-supply efforts in both areas.[74]

The Bureau of Meteorology registered record flood peaks at over 100 Queensland river height stations during the 2010/2011 Queensland floods, indicating that in many locations, the floods were the most severe in living memory.[75] Response and recovery efforts continued in most flood-affected Queensland communities throughout January and February 2011. In many areas, recovery is expected to take months and even years.

# (Endnotes)

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7 Transcript, James Davidson, 13 April 2011, Brisbane [p268: line 20].

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20 Exhibit 271, Balonne LDMG Situation reports dated 3 January to 22 January 2011 [p7,8].

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38 Information received from North Burnett Regional Council, 23 March 2011 [p90].

39 Statement of MJP Pitt [p4: para 12].

40 Statement of MJP Pitt [p4: para 12].

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42 Information received from Australian Bureau of Meteorology, 24 March 2011 [p108, p165].

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