



ABARES Special Report
21 January 2011

The impact of recent flood events on commodities



- The recent flooding in eastern Australia is estimated to have reduced agricultural production by at least \$500–600 million in 2010–11, with significant impacts on the production of fruit and vegetables, cotton, grain sorghum and some winter crops. Losses of livestock reported to date have been small in relation to the national herd and flock. The main impact for livestock appears to have been associated with disruptions to transport and other infrastructure support. These costs do not take into account the cost of lost farm infrastructure and assets which may amount to much more.
- Fruit and vegetable prices have risen significantly for some products, such as watermelons, sweet potatoes, broccoli and zucchini, but the impacts on other fruits and vegetables appear limited to date. While there has been significant damage to fruit and vegetable production in some of the flood-affected regions, especially in Queensland, there is considerable scope for fruit and vegetable producers in other regions of Australia to respond to flood-induced supply shortages from Queensland and other regions, which may ease upward pressure on prices overall.
- It is estimated that Queensland's coal exports between December 2010 and March 2011 could be around 15 million tonnes lower than previously anticipated. This represents a reduction in export earnings of around \$2–2.5 billion. However, it is anticipated that coal prices could be settled at higher levels, partially offsetting the adverse impact on coal industry revenues.

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The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) was formed following the merger of the Australian Bureau of Agricultural and Resource Economics (ABARE) and the Bureau of Rural Sciences (BRS) in 2010–11.

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Summary

- In this report, an attempt is made to assess the impact on Australian commodity production of recent floods in eastern Australia. While it is still too early to determine the full impact of the floods, this assessment is based on information sourced from industry organisations, including major grain handlers, marketing organisations, agricultural and mining companies, state departments, transport authorities, the Bureau of Meteorology and satellite imaging.
- As observed in other major natural disasters, significant damage to property and infrastructure has occurred, which has resulted in disruption to economic activity in the flood-affected regions. While there have been widespread reports on flood-related disruption, no attempt has been made in this report to quantify these short-term impacts. The situation can be expected to improve gradually as rebuilding starts and gathers momentum in the near future.
- While the focus of this assessment has been on the aggregate effect on a state or national basis, there will be significant financial hardship for individuals and businesses who have experienced substantial crop or livestock losses and damage to their property.
- ABARES will release its next *Australian crop report* on 15 February 2011, which will contain its updated estimates of major summer (grain sorghum, rice, cotton and sunflowers) and winter crops (wheat, barley, canola and pulses) on a state and national basis for 2010–11. The next quarterly edition of *Australian commodities* is to be released on 1 March 2011 and will include forecasts of the value of Australian commodity production and exports in 2010–11, as well as medium-term projections.

Agriculture

- The recent flooding in eastern Australia is estimated to have reduced agricultural production by at least \$500–600 million in 2010–11, with significant impacts on production of fruit and vegetables, cotton, grain sorghum and some winter crops.
- The winter crop harvest in most of the flood-affected regions was either complete or near completion before the recent flooding. While it is too early to estimate the likely total losses in value of grain production as a result of the recent floods, if 1 million tonnes of the remaining production were lost the total cost would be around \$250 million. The adverse effects on the value of exports are expected to be offset by recent increases in prices on world markets.
- Plantings of grain sorghum in southern Queensland reached around 80 per cent of the intended area (around 350 000 hectares) in late December. The floods are estimated to have damaged between 15 and 20 per cent of these plantings. This implies a loss in the value of grain sorghum production of around \$30 million.
- It is estimated that around 7 per cent of total Australian cotton plantings (valued at around \$150 million) in 2010–11 have been destroyed and a further 2 per cent are at risk if these cotton crops do not have the opportunity to dry out.
- Based on information at hand, ABARES estimates that around \$225 million of fruit and

vegetables have been lost in Queensland as a result of the flooding. For the flood-affected areas in New South Wales, Victoria and Tasmania, it is still too early to determine the damage to production of fruit and vegetables.

- Fruit and vegetable prices have risen significantly for some products, such as watermelons, sweet potatoes, broccoli and zucchini, but the impacts on other fruits and vegetables appear limited to date. While there has been significant damage to fruit and vegetable production in some of the flood-affected regions, especially in Queensland, there is considerable scope for fruit and vegetable producers in other regions of Australia to respond to flood-induced supply shortages from Queensland and other regions, which may ease upward pressure on prices overall.
- Losses of livestock reported to date have been small in relation to the national herd and flock. The main impact for livestock appears to have been associated with disruptions to transport and other infrastructure support.
- For dairy, road closures in some regions have prevented the collection of milk. Infrastructure, crops and feed stores have been damaged on some farms. The floods could also increase the incidence of mastitis and loss of milk production due to stress.

Minerals and energy

- Coal production at a number of mines has been affected by flooded pits and difficulties in removing the water, and a lack of access to mine sites because of flooded roads. Parts of the Queensland rail network linking coal mines to ports have been severely affected by the flooding.
- It is estimated that Queensland's coal exports between December 2010 and March 2011 could be around 15 million tonnes lower than previously anticipated. This represents a reduction in export earnings of around \$2–2.5 billion.
- It is anticipated that metallurgical coal prices negotiated for the June quarter 2011 will be settled at a significantly higher price, reflecting the tight market balance created by the floods in Queensland.
- The wet weather in Queensland has had a limited impact on other mineral and energy commodity production. The one notable exception was Rio Tinto declaring force majeure at its Boyne Island aluminium smelter in mid-January. Road and rail access between Gladstone and Brisbane was cut and, combined with the closure of the port of Brisbane, prevented deliveries to some customers.

Rainfall and flooding in January 2011

This report focuses on the flood events that have occurred in eastern Australia in January 2011. Some context to the lead-up to these events is also provided, as high rainfall events in late 2010 in a number of regions contributed to high levels of water in catchments, which increased the severity of subsequent events.

The nature of flooding

Flooding, as considered here, is generally a localised event and tends to follow river valleys, spreading across the flood plain and lower lying areas to varying extents. As a proportion of total land, the actual area of land affected is usually relatively small.

Flood impacts can be caused by flash flooding or when floodwaters inundate an area for a long period of time. The recent flooding in Australia has ranged from localised flash flooding to widespread flooding with extended periods of inundation.

Urban and rural infrastructure has been damaged from flooding in parts of eastern Australia, notably Queensland, Victoria, New South Wales and, to some extent, Tasmania. Towns and cities are often situated on rivers and experience more damage to infrastructure than rural areas.

Flood damage to urban and rural infrastructure often provides a trigger for natural disaster declarations. However, these declarations are not indicators of the extent of flood impacts on a region or on agricultural production. For example, in the Rockhampton (Queensland) Local Government Area (LGA), only around 4 per cent of the land in the LGA was covered by floodwater at the height of the floods in early January.

As flooding generally affects low-lying areas and comprises a small proportion of the total land area, the impacts of flooding on agricultural production tend to be localised and concentrated on those products grown in the affected areas. This can have a significant impact on individuals and businesses in these areas. There can also be wider effects caused by heavy rainfall on the quality of production and delays to the harvest, such as occurred in November and December 2010 for the winter grain harvest. Flooding can also have significant impacts on infrastructure generally, and transport networks in particular, which can interrupt the flow of products to market. This has been an issue for a number of products, including grain, livestock and coal.

While there has been some significant short-term damage to individual producers in several agricultural regions, in the medium to long term the recent heavy rainfall and associated flooding may provide some benefit to agriculture, through increases in soil moisture levels, improved pasture growth and increased water in storages for future irrigated agricultural production. For example, water storages in the Murray–Darling Basin increased from 26 per cent of capacity at the end of December 2009 to more than 80 per cent of total capacity at the end of December 2010.

Events leading up to the January floods

The rain in late 2010 and January 2011 has been influenced by a dominant La Niña event in the Pacific Ocean. The December 2010 Southern Oscillation Index (SOI) was the highest December value on record and the highest monthly value since 1973, while other indicators of La Niña also point to the strongest event since at least the mid-1970s. Previous strong La Niña events, such as those of 1955 and 1974, have also been associated with widespread and severe flooding in eastern Australia.

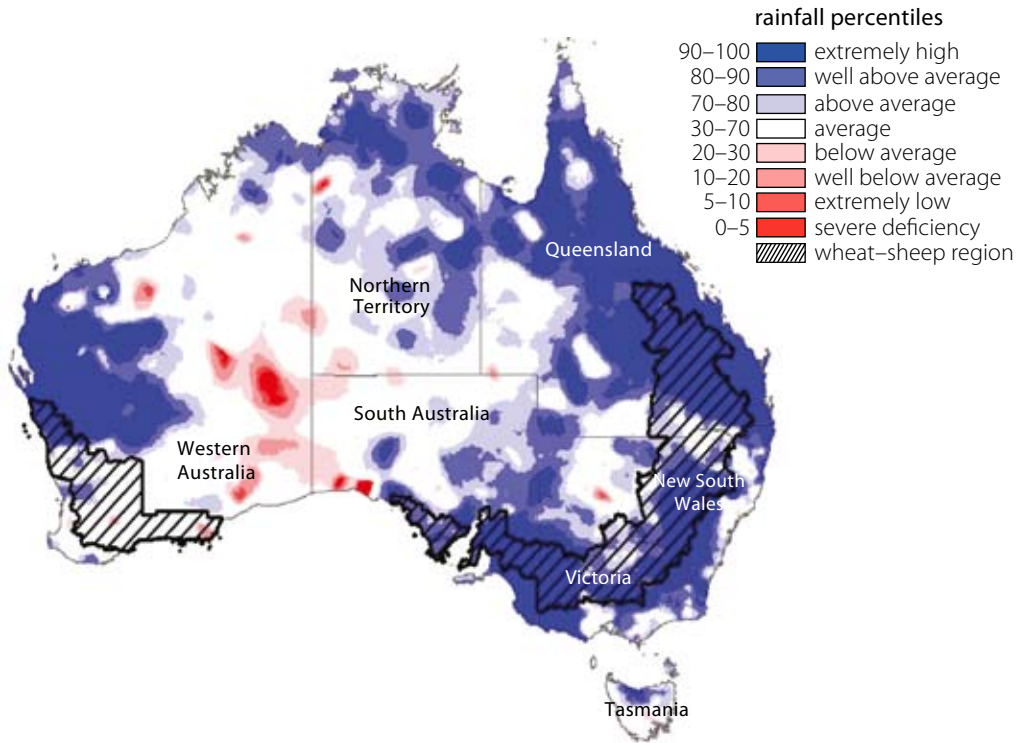
Late November and December 2010 were extremely wet across much of eastern Australia. All states and territories experienced areas of extremely high rainfall during December 2010 (map 1). Many areas in eastern Queensland and central Western Australia, and areas of eastern New South Wales, South Australia and western Victoria experienced their highest December rainfall on record. For Australia as a whole, it was the third-wettest December on record. This followed an extremely wet spring, the wettest on record for Queensland, New South Wales, eastern Australia and the Murray–Darling Basin.

Four major rain events during late November and December 2010 affected large parts of the eastern states. The heavy December 2010 rain, which fell on already saturated catchments, resulted in major widespread flooding on many rivers, especially in Queensland, New South Wales and Victoria.

In early December, there was substantial flooding in various parts of the eastern states, especially in inland New South Wales. There was widespread flooding in the Murrumbidgee, Lachlan and Castlereagh catchments. Eugowra was flooded three times during the month, on 4, 10 and 27 December, and Wagga Wagga experienced its worst flooding since 1974 when the Murrumbidgee peaked at 9.7 metres on 6 December.

Significant flooding also occurred in the Gascoyne region of Western Australia in mid-December 2010. Heavy rainfall between 16 and 18 December resulted in the Gascoyne River rising to one of its highest flood levels on record. The catchment went from drought conditions to flood in less than 24 hours. Horticultural crops and pastoral areas were inundated with reports of stock losses. Highest river levels on record occurred at three of the five river gauging stations along the Gascoyne River from 18 to 20 December.

map 1 December 2010 rainfall percentiles



Source: Bureau of Meteorology.

January 2011

January 2011 rainfall continued to be heavy across northern parts of Australia (map 2), with large areas of Queensland, the Northern Territory and Western Australia recording more than 100 millimetres (mm). Some regions in Victoria, New South Wales and Western Australia have already recorded more than 400 per cent of their average January rainfall (map 3). January 2011 rainfall to date has already provided the wettest January on record at a number of sites in northern Tasmania.

In the first week of January, heavy rainfall was recorded across large parts of the tropical north, as well as in the Gascoyne region of Western Australia and parts of central Australia. The highest totals, in excess of 200 mm, were recorded near Cairns in Far North Queensland.

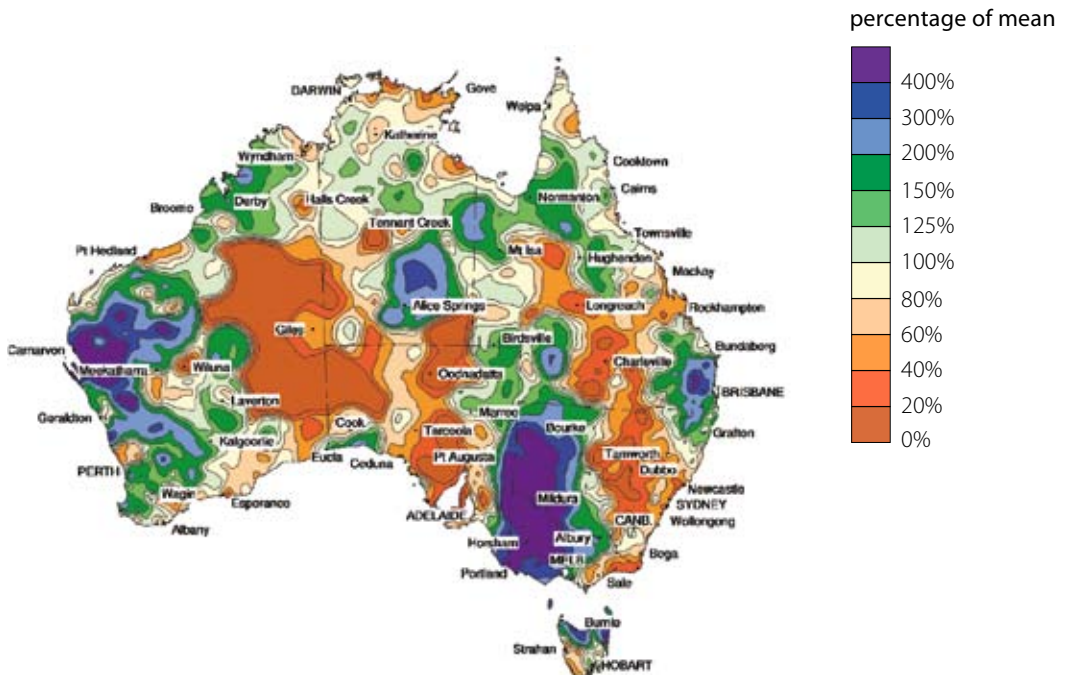
A very active monsoon trough produced heavy falls over the tropical north during the week of 10 January. Further south, a low pressure system and associated trough brought very heavy falls to south-east Australia. Rainfall in excess of 200 mm was recorded in northern Western Australia, the Northern Territory, north and south-east Queensland and north-east New South Wales. The largest areas of heavy falls were in the south-east, across western New South Wales, western Victoria and northern Tasmania, where widespread falls were in excess of 100 mm. Peachester in south-east Queensland recorded a total of 824 mm for the week.

map 2 January 2011 rainfall to date (as at 20 January 2011)



Source: Bureau of Meteorology.

map 3 January 2011 rainfall percentages (1 to 20 January)



Source: Bureau of Meteorology.

The heavy rain recorded in many parts of central and southern Queensland in late December 2010 resulted in exceptional flooding, with many rivers reaching record levels. By 23 December, many rivers were already at or near flood level as a result of the rain in preceding weeks. Rainfall during the following days, on top of the pre-existing wet conditions, resulted in major flooding over an extensive area.

Almost every river in Queensland, south of the Tropic of Capricorn and east of Charleville and Longreach, reached major flood levels at some stage during the period from 26 November to 7 January, mostly between 23 December and 4 January. Properties were inundated in at least 17 towns in Queensland and adjacent border areas of New South Wales, with the largest impacts occurring in Theodore, Dalby, Chinchilla, Emerald, Bundaberg and Rockhampton. Extreme flooding occurred in the Fitzroy and Condamine–Balonne catchments. In some cases, these flood peaks broke records that had recently been set during the February–March 2010 rainfall event.

Satellite images for 14 December 2010 and 4 January 2011 for central Queensland provide an example of the extent of the flooding (maps 4 and 5).

Extremely heavy rainfall on 10 January caused flash flooding in Toowoomba and areas downstream over the following few days. The flooding damaged some urban and rural infrastructure in and around Toowoomba.

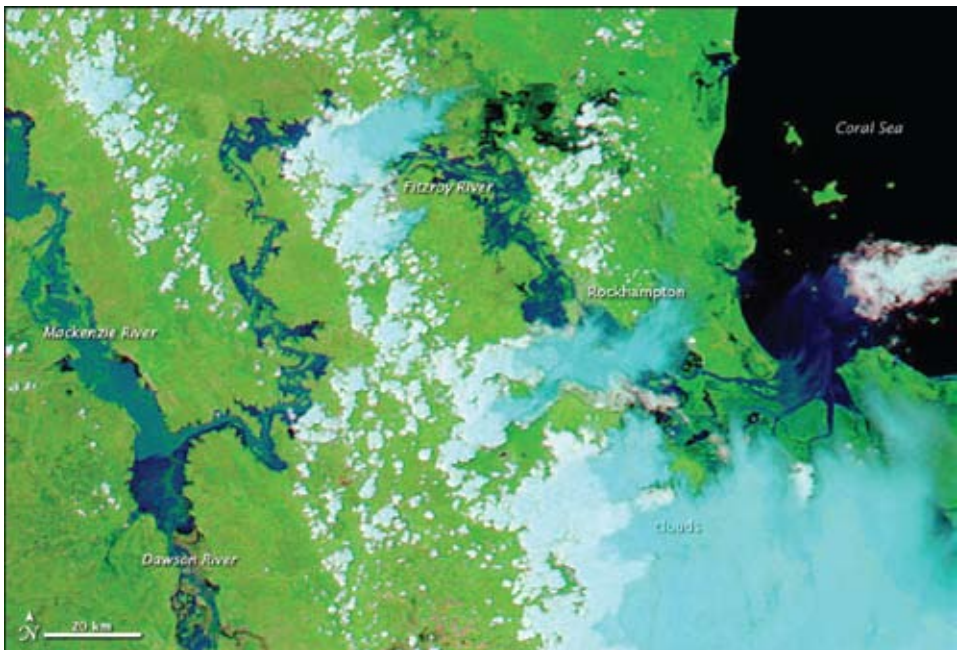
As a result of heavy rainfall across south-east Australia in January, widespread flooding was also experienced in south-west New South Wales, western Victoria and northern Tasmania.

Heavy rainfall in the third week of January caused major flooding across parts of western and central Victoria. The flood affected many towns, including Kerang, Horsham, Charlton, Rochester, Carisbrook, Shepparton, Echuca, Beaufort and Bridgewater On Loddon. Rivers affected by the floods include the Wimmera, Loddon, Campaspe and Avoca rivers. The heavy rainfall also caused flooding in a number of areas of north-west Tasmania, with flash flooding in some areas.

map 4 Satellite image for central Queensland – 14 December 2010



map 5 Satellite image for central Queensland – 4 January 2011

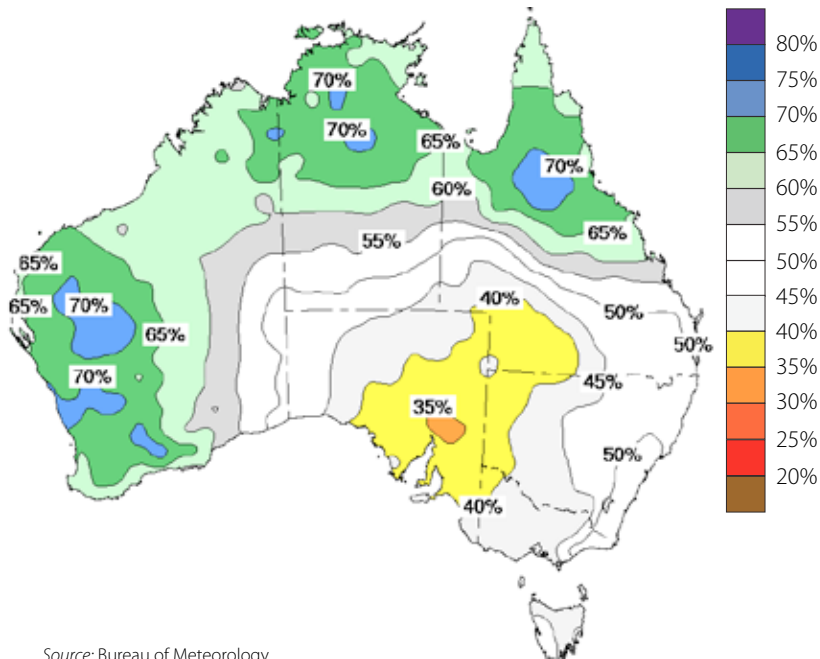


Note: Dark blue areas indicate water. Light blue and white are clouds.

Rainfall outlook

The seasonal outlook for February to April 2011 favours wetter than average conditions for northern and western Australia (map 6). The rainfall outlook is heavily influenced by the current La Niña conditions that continue to dominate in the tropical Pacific Ocean.

map 6 Three-month rainfall outlook (February to April 2011)



Long-range forecast models (used by the Bureau of Meteorology) indicate that the La Niña event will persist into autumn 2011, gradually weakening and approaching neutral conditions by mid-2011.

La Niña periods are generally associated with above-normal winter, spring and summer rainfall, particularly over eastern and northern Australia. During La Niña periods, tropical cyclone occurrence for northern Australia is typically higher than normal during the cyclone season (November–April).

Impact on agricultural products

Winter crops

The winter crop harvest in most of the flood-affected regions was near completion before the flooding in January 2011. Before heavy rain late in the season, the crop growing season in eastern Australia was generally favourable and a bumper grain harvest was expected. ABARES forecast (in its December *Australian crop report*) a 22 per cent rise in the winter crop harvest to 43.2 million tonnes in 2010–11, compared with the previous season. However, the rainfall and flooding in November and December significantly affected the quality of the harvest, with a significant downgrading in quality expected for the winter grain harvest. This resulted in a downward revision of the value of wheat production (for 2010–11) by around \$1 billion and exports by around \$480 million in the December 2010 issue of *Australian commodities*.

The subsequent flooding events in January are expected to have damaged remaining crops to be harvested in the affected areas. Receipts to date by major grain handlers and estimated farm stocks are shown in table 1. The difference between the sum of these numbers and the ABARES December forecasts represent receipts by smaller grain handlers, grain still to be harvested and losses of grain. While it is too early to estimate the likely total losses in value of grain production as a result of the recent floods, if 1 million tonnes of the remaining production in table 1 were lost, the total cost would be around \$250 million.

Despite the adverse effect of these recent floods, the value of winter crop exports for 2010–11 for Australia is not expected to be significantly reduced further. Higher grain prices on world markets are expected to provide support for the value of exports and to offset the possible decline in volume as a result of the floods. Using wheat as an example, the world indicator price (US hard red winter, fob Gulf) was around US\$336 a tonne in mid-January 2011, compared with US\$181 a tonne in June 2010. Prices for other crops on world markets (for example, barley and canola) have also increased significantly.

Queensland

By the start of January 2011 the winter crop harvest was complete in central Queensland and around 70–80 per cent complete in southern Queensland. The harvest in Queensland is unlikely to progress further as the wet weather and subsequent flooding is expected to result in the abandonment of unharvested winter crops.

In December 2010, ABARES forecast that the winter crop harvest in Queensland would be around 1.7 million tonnes in 2010–11, or around 4 per cent of the total Australian winter crop. As at 19 January 2011, around 1.5 million tonnes of grain had been received by the major grain handlers (table 1).

There have been reports indicating that damage to the rail line from Toowoomba to Brisbane's Fisherman Island grain export terminal could take months to repair, which may cause some disruption to the transport of grain for export. Other export terminals in Queensland (Gladstone and Mackay) are reportedly continuing to operate normally.

1 Winter crop production, grain receivals and on-farm stock estimates to date

	Winter crop production forecast	Grain receivals by major handlers	On-farm grain stock estimates	Received by others, yet to be harvested and losses
	Mt	Mt	Mt	Mt
New South Wales	17.1	9.0	5.0	3.1
Western Australia	6.0	5.7	0.3	–
South Australia	9.7	6.0	0.6	3.1
Victoria	8.6	5.0	3.0	0.6
Queensland	1.7	1.5	–	0.2
Australia	43.2	27.2	8.9	7.0

New South Wales

The winter crop harvest is approaching completion for New South Wales as a whole. The recent floods in northern New South Wales are estimated to have had a minimal impact on winter crop production because harvest was largely finished in the north of the state before the flooding.

The harvest is progressing in the south of the state, with remaining areas to be completed in the next few weeks assuming favourable weather conditions. The recent rainfall has further delayed harvest in parts of the south-east of the winter grains belt that had yet to finish their harvest. Owing to significant rainfall throughout the harvest period, grain quality was markedly affected in many regions.

It is estimated that around 9 million tonnes of grain had been received by major grain handlers in New South Wales as at 19 January 2011. In addition, around 5 million tonnes of winter crop may be stored on farms. On-farm storage capacity in New South Wales is around 6.4 million tonnes. It is not yet known the likely level of receivals by non-major grain handlers. In December 2010, ABARES forecast that the winter crop harvest in New South Wales in 2010–11 would be around 17.1 million tonnes (around 40 per cent of the national total).

Victoria

For Victoria as a whole, the winter crop harvest is around 80 per cent complete. The current harvest is approximately a month behind schedule and further progress will depend on favourable weather conditions over the next few weeks.

Major flooding occurred in various regions, predominantly in the Wimmera, North Central and southern Mallee regions. The winter crop harvest in the Mallee was near completion before the flooding, while in the Wimmera was approximately 70 per cent complete, with the majority of unharvested crops being wheat. Further harvest of weather-damaged crops in these flood-affected regions is likely to be limited.

The Western District also recorded heavy rainfall, but there is no reported flooding in the region. Harvest was approximately 50 per cent complete before the recent heavy rainfall, with the majority of barley and canola crops having been harvested. Wheat is the remaining crop to be harvested.

As at 19 January 2011, around 5 million tonnes of grain is estimated to have been received by major grain handlers in Victoria. With silos reportedly at or near capacity, it is estimated that around 1–3 million tonnes of winter crop may be stored on farms. Victoria has an on-farm storage capacity of around 3.5 million tonnes. In December 2010, ABARES forecast that the winter crop harvest in Victoria in 2010–11 would be around 8.6 million tonnes.

South Australia

Winter cropping regions of South Australia have largely avoided major flooding. Significant rainfall occurred in early January 2011 along the Victorian border, but this area does not form a significant proportion of the South Australian winter cropping area.

Around 6 million tonnes of grain is estimated to have been received by major grain handlers. Winter crop production in South Australia is forecast to be around 9.7 million tonnes, with wheat at 5.5 million tonnes. The harvest in South Australia is continuing and is around 80 per cent complete. Some delays are expected because of recent heavy rainfall.

Western Australia

The winter crop harvest in Western Australia is complete and in December 2010 the Co-operative Bulk Handling Group estimated winter crop receivals for the season totalled around 5.7 million tonnes, after a dry season. On-farm grain stocks are estimated at around 300 000 to 500 000 tonnes. In December 2010, ABARES forecast that the winter crop harvest in Western Australia in 2010–11 would be around 6 million tonnes.

Summer crops

Grain sorghum

Queensland

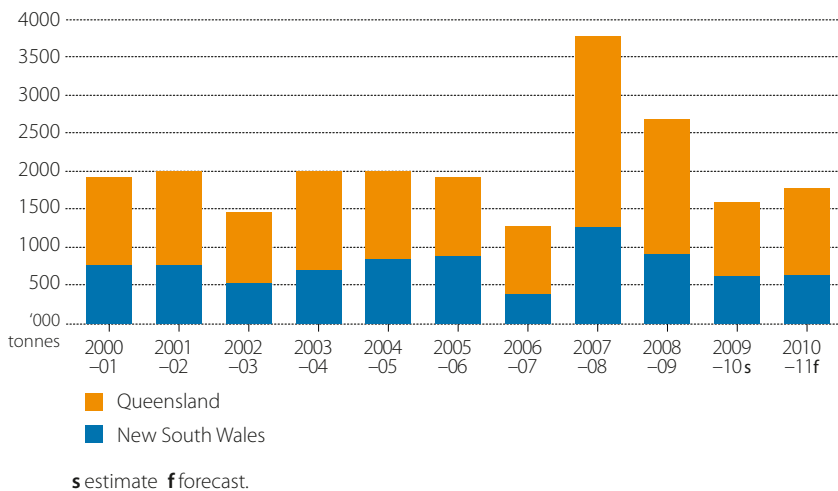
The major summer crop in Queensland is grain sorghum, accounting for 975 000 tonnes, or more than 60 per cent, of Australian grain sorghum production in 2009–10. Grain sorghum is primarily used as an animal feed. Despite the significant losses to grain sorghum production, expected large increases in the availability of feed wheat and barley are expected to more than offset any impact of lower grain sorghum production on livestock-feeding industries in Australia.

The flooding in central and south-east Queensland in late December and early January has affected grain sorghum plantings. In central Queensland, around 7000 hectares of grain sorghum was planted during the spring planting window (September to November 2010). The floods in central Queensland in late December and early January are estimated to have caused significant damage to these early plantings.

Since then, around 60 000 to 80 000 hectares are reported to have been planted in central Queensland. If weather conditions are favourable, up to 250 000 hectares could be planted by the end of February when the planting window for central Queensland closes.

Plantings in southern Queensland reached around 80 per cent of the intended area (around 350 000 hectares) in late December. The floods are estimated to have damaged between 15 and 20 per cent of the planted crop. Using average regional yields as a basis, this implies a reduction in the grain sorghum crop of around 150 000 tonnes for the season (or around \$30 million). Because of the wet conditions, it is unlikely that further grain sorghum will be planted in southern Queensland before the planting window closes at the end of January.

a Grain sorghum production, by state



New South Wales

The grain sorghum crop in New South Wales has mostly avoided any flood damage. The recent heavy rain has caused some water logging in paddocks, which will result in lower yield prospects in some areas, but overall yield prospects remain positive for the majority of grain sorghum crops in New South Wales.

In the coming week, some of the grain sorghum crop planted around the northern river systems is likely to be affected by floodwater from southern Queensland through the Macintyre river system. Some crops in the Mungindi region and further down to Walgett could be affected as the floodwater makes its way down the river system. Around 9000 hectares of grain sorghum is usually planted in these regions.

Established grain sorghum crops will tolerate some flooding, provided there is no significant erosion caused by fast flowing water and the water subsides relatively quickly. However, recently planted crops that are still in the early stages of germination will be vulnerable to flooding.

Cotton

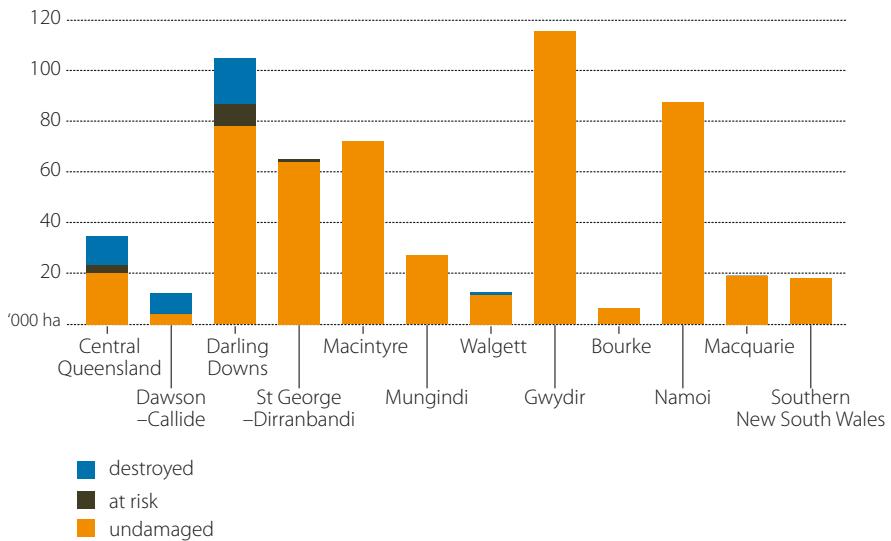
Floods have destroyed some cotton crops in central Queensland and the Dawson–Callide and Darling Downs regions. In early December 2010, floods also destroyed small areas of cotton in the Walgett region of New South Wales. In the St George–Dirranbandi and Macintyre regions, rivers have reached very high levels in recent days, but there are no reports of damage to date.

At this stage, it is estimated that around 7 per cent of total Australian plantings (around 62 000 tonnes of cotton lint or \$150 million) in 2010–11 have been destroyed and a further 2 per cent are at risk if these cotton crops do not have the opportunity to dry out (figure b). Relatively cold weather and water logging is also expected to reduce yields by 10–15 per cent in Queensland and some regions in northern New South Wales, such as the Macintyre Valley. In December, ABARES forecast that total cotton lint production in Australia in 2010–11 would be around 894 000 tonnes.

The adverse impact of the recent floods on the value of the Australian cotton crop is likely to be mostly offset by higher world cotton prices, which have risen to their highest levels in real terms since the mid-1970s. The world cotton indicator price (the Cotlook 'A' index) was around US170 cents a pound on 18 January 2011, compared with US77 cents a pound at the same time in 2010. However, for those cotton growers whose crops have been destroyed or whose lint yields will be dramatically reduced, there are significant financial implications, especially if they are required to close out any positions of forward selling.

Any impact on the value of exports would occur in 2011–12, after the cotton harvest.

b Estimated damage to Australian cotton plantings, 2010–11, by region



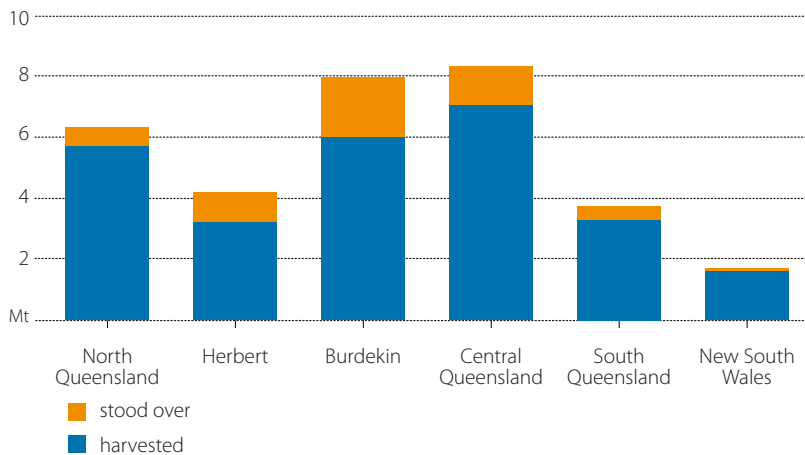
Sugar

The Australian sugar cane harvest (June to December) was severely hampered by excessive rainfall in the latter part of 2010. An estimated 3 to 5 million tonnes of sugar cane intended to be harvested in 2010–11 was stood over (not harvested) (figure c). The sugar content of cane was also down sharply in 2010–11 because of the excessive rain. Australian sugar production in 2010–11 is estimated to be around 3.6 million tonnes, 0.9 million tonnes lower than in 2009–10 and the lowest output since 1991–92. While information is not yet available on the impact of recent flooding on sugar cane plantings, the costs of the earlier damage was estimated by ABARES in December to be around \$470 million.

Excessive rainfall in the traditional planting period from February to April 2010 also limited new plantings, which would have been harvested in 2011–12. At this stage, Australian sugar production is forecast to recover to around 4 million tonnes in 2011–12, although there is still uncertainty about the impact on sugar yields from the cane stood over from 2010–11.

While Australian cane growers are benefiting from the highest world sugar prices in real terms since the mid-1970s, this could have caused financial difficulties for sugar millers and cane growers who sold forward in a rising market. There could be financial losses for these millers and growers in closing out their forward sold positions. To lock in favourable world sugar prices, selling forward was common for the 2010–11 cane crop.

C Harvested and stood over production of sugar cane in Australia, 2010–11



Horticulture

Queensland

In 2005–06, the flood-affected regions in Queensland accounted for 19 per cent of the total value of Australian vegetable production and 8 per cent of the total value of fruit and nut production. The key fruits and vegetables are beetroot, sweet potatoes, zucchini, mandarins, spring onions, peas, capsicums and chillies. Based on information at hand, ABARES estimate that the loss of fruit and vegetables in Queensland because of the floods could be around \$225 million.

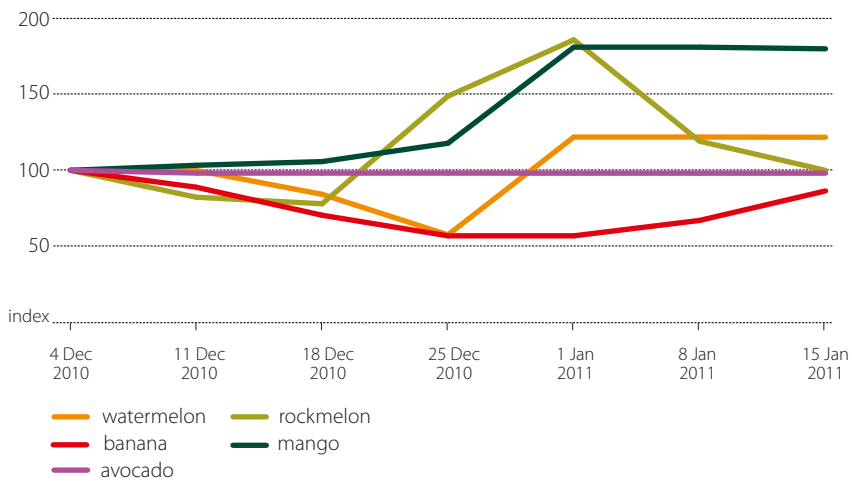
Recent price increases for watermelons in some markets in Australia have coincided with the very wet conditions and flooding in Queensland (figure d). The prices of sweet potatoes, brocolli and zucchini has also risen in a similar manner (figure e). Information is not yet available on price changes in Queensland markets.

Future price increases for fruit and vegetables will depend on the extent of further rainfall and flooding. This will affect Queensland producers' ability to plant their next fruit and vegetable crops.

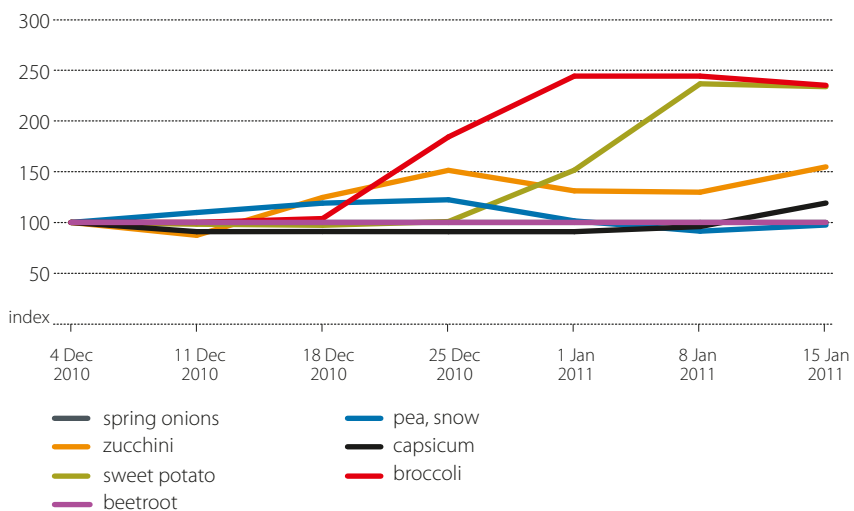
The impact of floods in Queensland on prices of fruit and vegetables is likely to be different to the situation in early 2006 when damage to north Queensland banana production from Cyclone Larry led to very sharp increases in banana prices that caused a significant increase in the Australian consumer price index in 2006–07. Bananas are mainly produced in north Queensland and, as such, there was little supply response from other regions in the presence of higher prices because of the damage to the industry. Imports of fresh bananas were also not permitted for quarantine reasons.

In the current situation, there is considerable scope for fruit and vegetable producers in other regions in Australia to respond to flood-induced supply shortages. There is also scope for consumers to switch to other fruit and vegetables that may be in relatively abundant supply. Fruit and vegetables that cannot meet higher export standards will also likely be redirected to the domestic market, easing upward pressure on domestic prices. There may also be scope for increased imports for some products, which will moderate price increases.

d Weekly wholesale prices for selected fruit, Melbourne market



e Weekly whole prices for selected vegetables, Melbourne market



New South Wales and Victoria

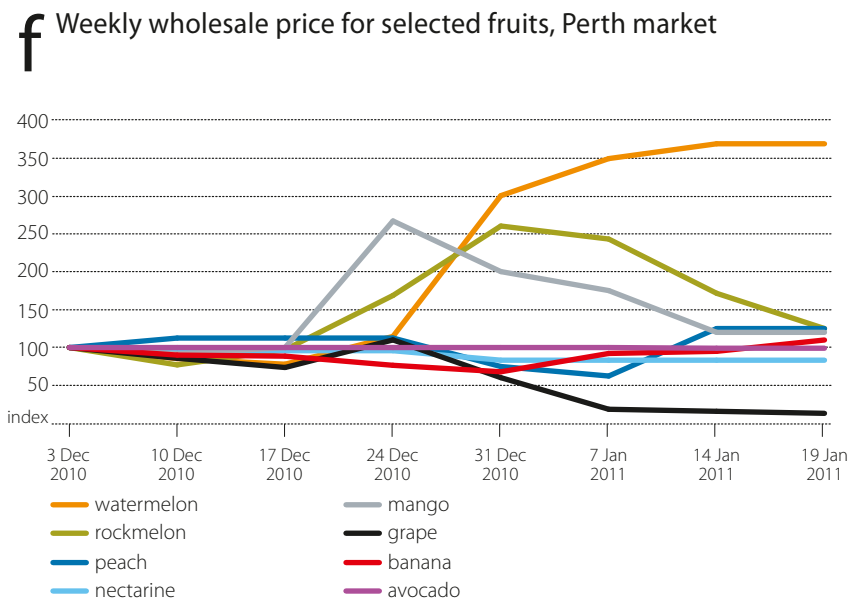
For the flood-affected areas in New South Wales and Victoria, damage to fruit and vegetables production appears to have been limited to date, at least relative to national production. Production of vegetables in the flood-affected regions in Victoria accounts for around 3 per cent of total Australian production. In the case of fruit, the flood-affected regions of New South Wales and Victoria each accounted for around 13 per cent of the total value of Australian fruit production.

Tasmania

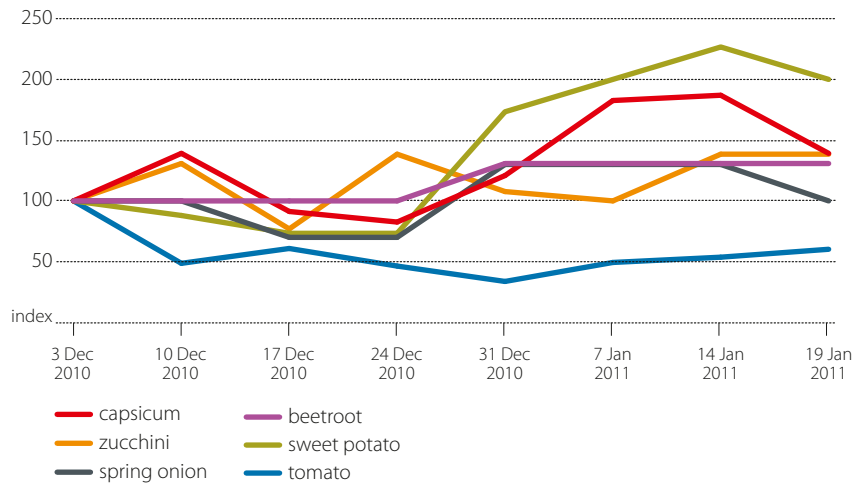
There have been reports of some damage to fruit and vegetable production in Tasmania, but at this stage it has not been possible to quantify the damage that has occurred. Key horticultural products, from a national perspective, produced in the affected region in Tasmania include turnips, peas, beans, brussel sprouts, carrots, onions and potatoes.

Western Australia

While the Gascoyne region in Western Australia only accounts for less than 1 per cent of the total gross value of Australia fruit and vegetable production, it is an important supplier of fruit and vegetables to the Perth market. Perth market prices for melons, mangoes and capsicums increased sharply in response to the Gascoyne floods, but have shown signs of easing in the past few weeks with the notable exception of watermelons (figures f and g).



g Weekly wholesale prices for selected vegetables, Perth market



Livestock

Dairy

Queensland

Queensland milk production was 529 megalitres in 2009–10—around 6 per cent of Australian milk production. Nearly all Queensland milk is processed into fresh milk products, such as drinking milk, for the domestic market.

It is too early to assess the full impact of the floods on Queensland milk production. It has been reported that, in some dairying areas, road closures have prevented the collection of milk and that farm infrastructure, crops and feed stores have been damaged on some farms. It is also likely that the floods will increase the incidence of mastitis and loss of production due to stress. There have been no reports of significant dairy stock losses as a result of the floods.

Victoria

Victoria is the main dairying state, producing 5790 megalitres of milk in 2009–10 and accounting for 64 per cent of Australian milk production. A significant share of processed dairy products is exported from Victoria. The flood-affected areas are estimated to have accounted for around 19 per cent of Australian milk production.

At this stage, it is unlikely that there will be a significant impact of the floods on dairy production in Victoria. While the Murray Goulburn factory at Rochester is expected to be closed for 2 to 3 weeks, milk is being diverted to other factories. There are a small number of farms from which milk was not able to be collected because of road closures. It is expected that the impact of the floods on dairy products exports from Victoria will not be significant.

Tasmania

Tasmania produces around 674 megalitres of milk, with a large share of production being exported as processed dairy products.

Information at hand indicates that flooding in Tasmania has not significantly affected milk production, although the rain has hampered fodder conservation, such as hay making, in the state's north-west.

Cattle and beef

Queensland

South-east Queensland is a major region for Australia's cattle processing sector. While there are no reports of major stock losses, damage to roads, bridges and rail lines is hampering the movement of cattle and beef in the region. The situation is expected to improve in the coming weeks as roads gradually reopen. January is traditionally the slowest period for the Queensland beef sector, with many processors closed for annual maintenance.

Flooding has resulted in some cattle sales being cancelled. However, there has been increased saleyard activity in other regions around the country. Saleyard prices have been high for most grades of cattle, and particularly for young cattle, with the eastern young cattle index closing at around 411 cents a kilogram (carcass weight) on 13 January, the highest since August 2005.

Sheep

New South Wales and Queensland

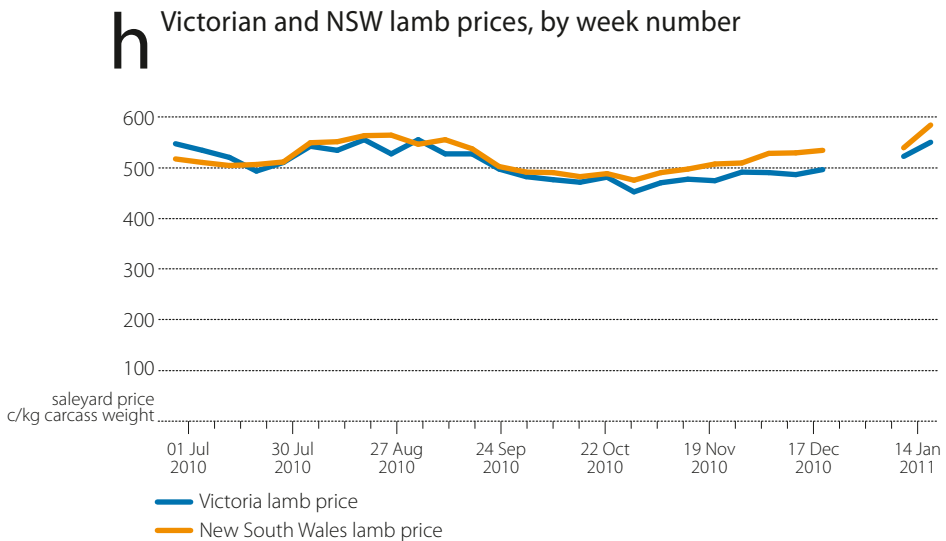
Flood-affected areas in northern New South Wales and southern Queensland are not significant producing regions for sheep meat. Recent flooding has resulted in short-term disruption to livestock markets. While there are no reports of major stock losses, it is too early to determine the extent of other damages such as to stockyards. Many producers in flood-affected areas moved stock to higher ground during the floods.

Victoria

In Victoria, there have been some reports of sheep losses (in the thousands); however, in the context of the overall national flock of around 68 million head, this is not expected to have a significant effect on wool and meat production. Some of the flooding occurred in significant sheep meat and wool producing regions, such as south-western Victoria around Hamilton and between Bendigo and Swan Hill in north-central Victoria. The number of losses in these areas

is not expected to be significant, as producers mostly had sufficient warning to move stock to higher ground.

Saleyards prices for both lamb and sheep in the eastern states rose significantly in the week ending 14 January (figure h). This primarily reflects the effect of lower throughput at saleyards, as producers concentrated on preserving flocks and held stock because of the flooding or transport issues. Meat inventories have reportedly been running low in some flood-affected areas, particularly Brisbane.



Pig meat

Based on reports to date, the floods in Queensland appear to have significantly affected only one small piggery. However, there have been issues around road closures and delivery of feed. Transport of feed by helicopter and rationing of feed have been reported. Slaughter has been delayed because of road closures and load restrictions on roads. As a result of delayed slaughter, pig producers have been receiving lower prices for animals with higher slaughter weights. Penalties of up to 60 cents a kilogram, or around 20 per cent, have been reported. Disposal of waste at some abattoirs has also been a problem.

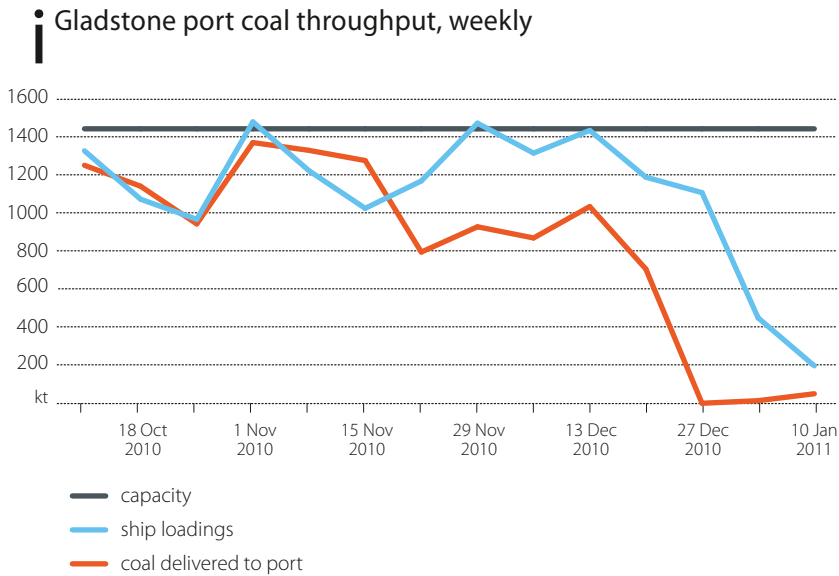
In 2009–10, Queensland accounted for around 25 per cent of Australian pig meat production and 25 per cent of Australian pig meat exports. No reductions on export shipments are expected at this stage, with sources of pig meat available in other states.

Impact on minerals and energy commodities

The recent floods in Queensland have had a significant impact on the state’s coal industry, which in 2009–10 accounted for around 56 per cent of Australia’s black coal production and 62 per cent of Australia’s coal exports. Production and sales of thermal and metallurgical coal will be affected because Queensland produces large quantities of both coal types.

It is estimated that the recent heavy rain, which caused damage to coal mines and associated infrastructure, could result in Queensland coal exports between December 2010 and March 2011 being 15 million tonnes lower than previously anticipated. It is estimated that the value of the lost exports could be in the order of \$2–2.5 billion.

The fall in exports reflects a combination of reduced coal production and transport capacity associated with flooded mines, potential difficulties sourcing labour and mining supplies, and damaged rail networks. As at 20 January, most port and rail networks affected by the floods were operating; however the majority were operating significantly below capacity (figure i). Despite the restart of mining and transport, the total impact of the floods on production and exports is difficult to estimate at this stage because there is a high degree of uncertainty as to when the industry will be able to return to full capacity.



Coal production

Above average rainfall in spring resulted in some companies declaring force majeure at a number of mines in early December. Force majeure is a legal clause in a contract that temporarily releases a party of its obligation to perform its part of the contract because of circumstances beyond its control. Following heavy rain in late December, force majeure was declared at a significant number of mines in Queensland's Bowen Basin. The vast majority of Queensland's coal mines are located in the Bowen Basin.

Coal production at affected mines has been reduced because of a number of factors, including flooded pits and difficulties in removing the water, and a lack of access to mine sites because of flooded roads. In addition, some mines are operating with reduced staff as some employees are stranded, are personally affected by flood waters or are participating in the recovery efforts of local communities.

Heavy rain has also impacted coal production in northern New South Wales. In late December, Whitehaven Coal reported that it anticipated its production for 2010–11 to be 700 000 tonnes below that forecast, as heavy rain affected production at its four mines. Further south, coal production in the Hunter Valley has continued over the past six weeks, largely unaffected by wet weather.

Rail

Parts of the Queensland rail network that link coal mines to ports have been severely affected by the flooding, which will also result in reduced coal exports. The Goonyella rail network, which connects mines in the Bowen Basin to the Hay Point and Dalrymple Bay coal terminals, was closed from 24 to 30 December. The 130 million tonne a year rail network has continued to operate since 30 December, although at a reduced rate, reflecting coal availability and a reduction in train speeds.

The Blackwater rail system (annual capacity of 66 million tonnes a year), which delivers coal to the Port of Gladstone, was closed on 27 December and partially reopened on 20 January. However, there has been extensive damage to the rail spurs that connect the Rolleston and Minerva mines to the network, which could prevent full capacity operation of the Blackwater system for some time.

On 10 January, the western rail network, which links coal mines in southern Queensland to Brisbane, was shut down following heavy rain and flooding on the Toowoomba Range. The 8 million tonne a year network was extensively damaged and could be out of operation until mid or late February, which would significantly impact coal transport and exports from southern Queensland.

Ports

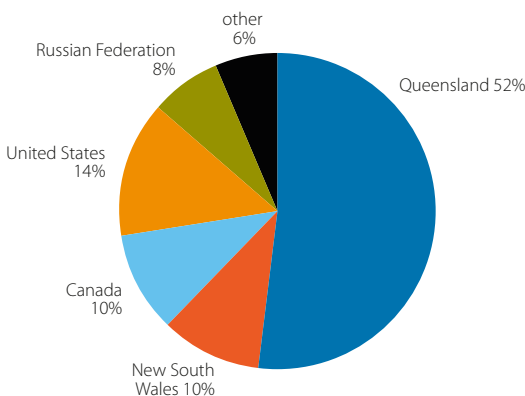
Ports in Queensland have not sustained any significant damage because of the heavy rains and floods; however, all are operating well below capacity as a result of lower coal receipts. Where possible, port stocks were used to load ships; however, coal stocks at most ports have been run down significantly. It is anticipated that Queensland's coal terminals will not operate at capacity until full coal production and transport resume.

Price

In early December 2010, contract prices for the March quarter 2011 for high quality metallurgical coal were settled at US\$225 a tonne. It is anticipated that coal prices negotiated for the June quarter 2011 will be settled at a significantly higher price, reflecting the tight market balance created by the floods in Queensland (figure j). Spot price indicators for high-quality metallurgical coal were above US\$300 a tonne in mid-January, so it is possible that high-quality metallurgical coal prices for the June quarter could be settled near or even above US\$300 a tonne. However, upward price pressure could ease gradually over time as production and export resume to capacity.

Coal prices for thermal coal have also recently increased, as a significant proportion of lost sales from Queensland are thermal coal. Before the flooding, spot thermal coal prices were trading at around US\$100 a tonne, similar to contract prices with Japanese power utilities for Japanese Fiscal Year 2010 (JFY, April 2010 to March 2011). In mid-January, thermal coal spot prices were trading at around US\$135 a tonne, which may indicate that negotiated prices for JFY 2011 could increase significantly.

j World metallurgical coal exports, by producer, 2010



Other commodities

The wet weather in Queensland has had a limited impact on other mineral and energy commodity production. The one notable exception was Rio Tinto declaring force majeure at its Boyne Island aluminium smelter in mid-January. Road and rail access between Gladstone and Brisbane was cut and, combined with the closure of the port of Brisbane, prevented deliveries to some customers.

Appendix 1: Agricultural production in flood-affected areas

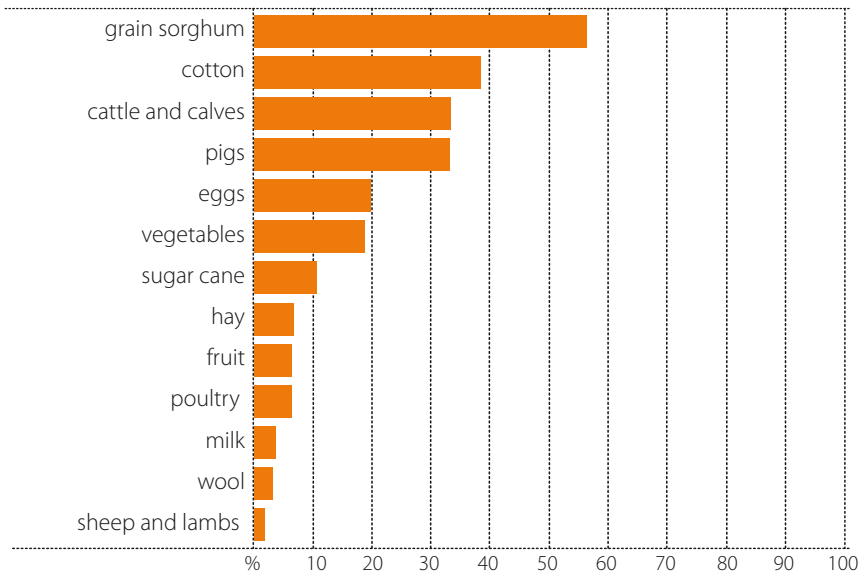
The value of agricultural production in the flood-affected regions of eastern Australia is presented below, based on data from the Agricultural Census conducted in 2006 by the Australian Bureau of Statistics. Flood-affected regions have been defined as Local Government Areas (LGAs) where flood-affected primary producers can access concessional interest rate loans under Natural Disaster Relief and Recovery Arrangements (NDRRA).

Queensland

As at 12 January 2011, there were 23 LGAs where flood-affected primary producers can access concessional interest rate loans under NDRRA.

From a national perspective, grain sorghum is the most valuable crop produced in the flood-affected regions of Queensland, followed by cotton, and cattle and calves (figure k). In 2005–06, 56 per cent of the value of national grain sorghum crop was produced in these regions. Cotton production in these flood-affected regions accounted for around 40 per cent of Australian cotton production in 2005–06.

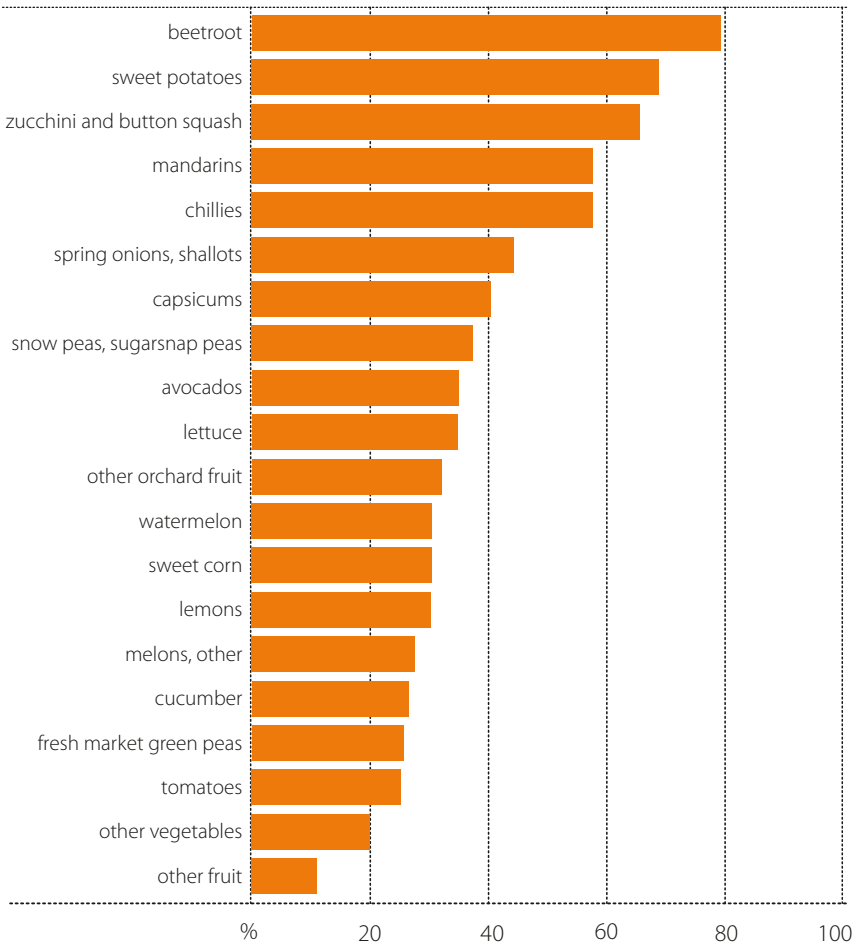
k Share of national value of production of crops in the flood-affected regions of Queensland, 2005–06



Source: Australian Bureau of Statistics, *Agricultural Commodities, Australia, 2005–06*, cat. no. 7125.0.

In the case of horticulture crops, the flood-affected regions of Queensland are important producers of a range of fruit, nuts and vegetables. In 2005–06, the regions accounted for around 18.7 per cent of the total value of Australian vegetable production and 8.5 per cent of the total value of fruit production. Key fruits and vegetables are beetroot, sweet potatoes, zucchini, mandarins, spring onions, peas, capsicums and chillies (figure I).

Share of national value of key fruit and vegetables produced in flood-affected Queensland, 2005–06



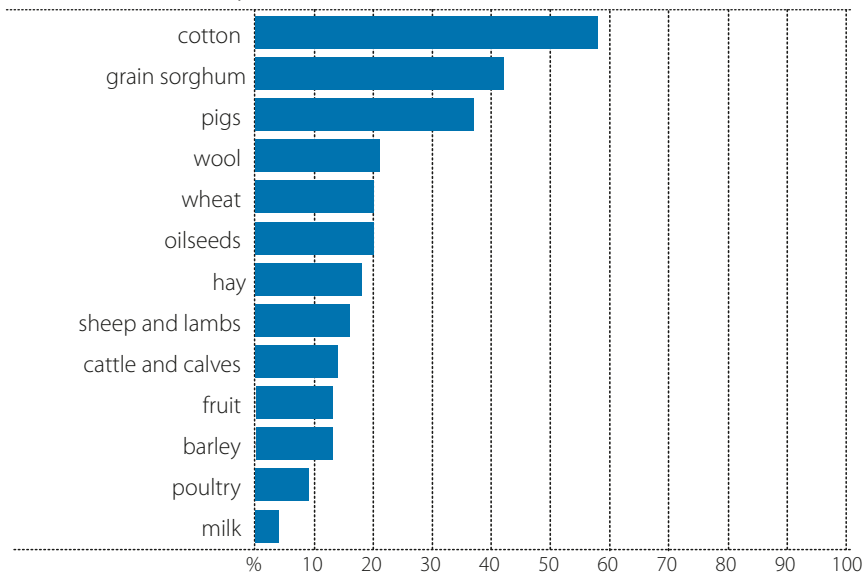
Source: Australian Bureau of Statistics, *Agricultural Commodities, Australia, 2005–06*, cat. no. 7125.0.

New South Wales

NDRRA assistance has been made available to 63 flood-affected LGAs in New South Wales between November 2010 and 17 January 2011.

From a national perspective, cotton is the most valuable crop produced in the flood-affected regions of New South Wales, followed by grain sorghum and pigs (figure m). In 2005–06, 58 per cent of the national value of cotton crop was produced in these regions. These flood-affected regions also accounted for around 42 per cent of the value of Australian grain sorghum production and 37 per cent of the value of pigs slaughtered in 2005–06.

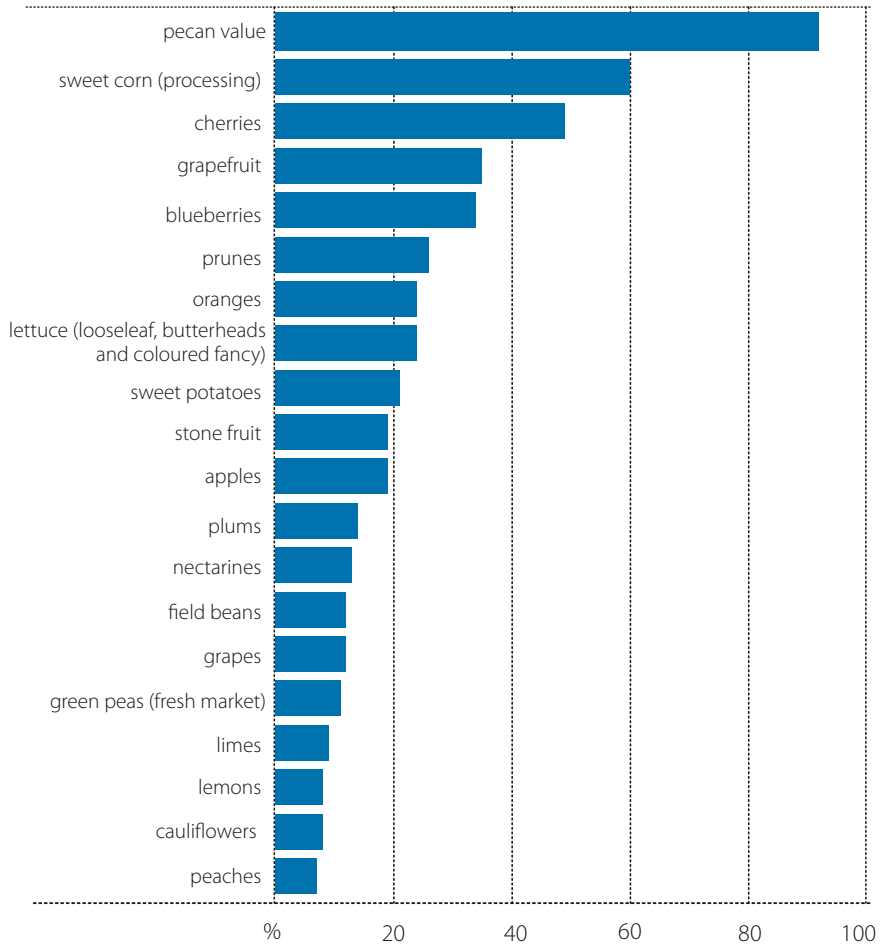
m Percentage share of national value of production in the affected regions of New South Wales, 2005–06



Source: Australian Bureau of Statistics, *Agricultural Commodities, Australia, 2005–06*, cat. no. 7125.0.

In the case of fruit, the flood-affected regions of New South Wales accounted for around 13 per cent of the total value of Australian fruit production. The key fruits produced are pecans, cherries, grapefruit, blueberries and prunes (figure n).

n Share of national value of key fruit and vegetables produced in flood-affected New South Wales



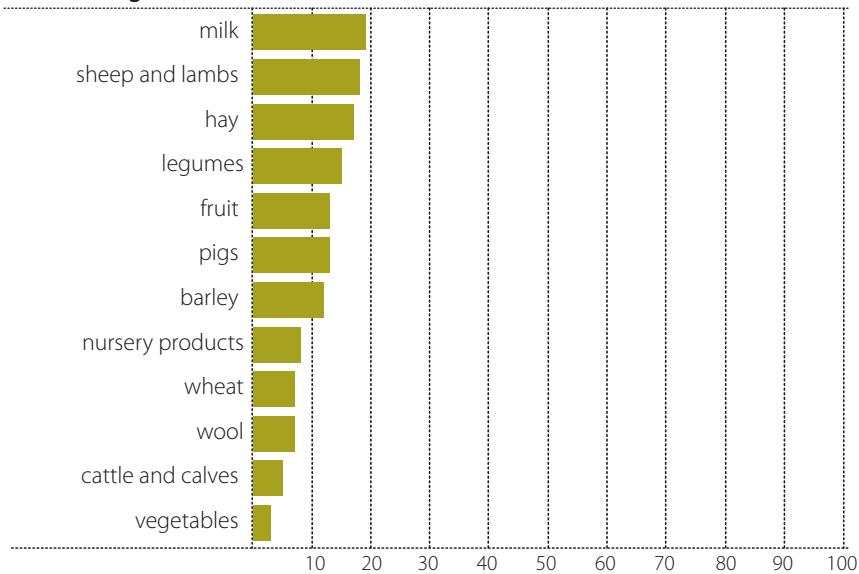
Source: Australian Bureau of Statistics, *Agricultural Commodities, Australia, 2005–06*, cat. no. 7125.0.

Victoria

As at 17 January, NDRRA assistance has been made available to 19 flood-affected LGAs across Victoria in 2011.

From a national perspective, milk is the most valuable agricultural commodity produced in the flood-affected regions of Victoria, followed by sheep and lambs, and hay (figure o). In 2005–06, 19 per cent of national milk production occurred in these regions. These flood-affected regions also accounted for around 18 per cent of the value of Australian sheep and lamb production and around 17 per cent of the value of Australian hay production in 2005–06.

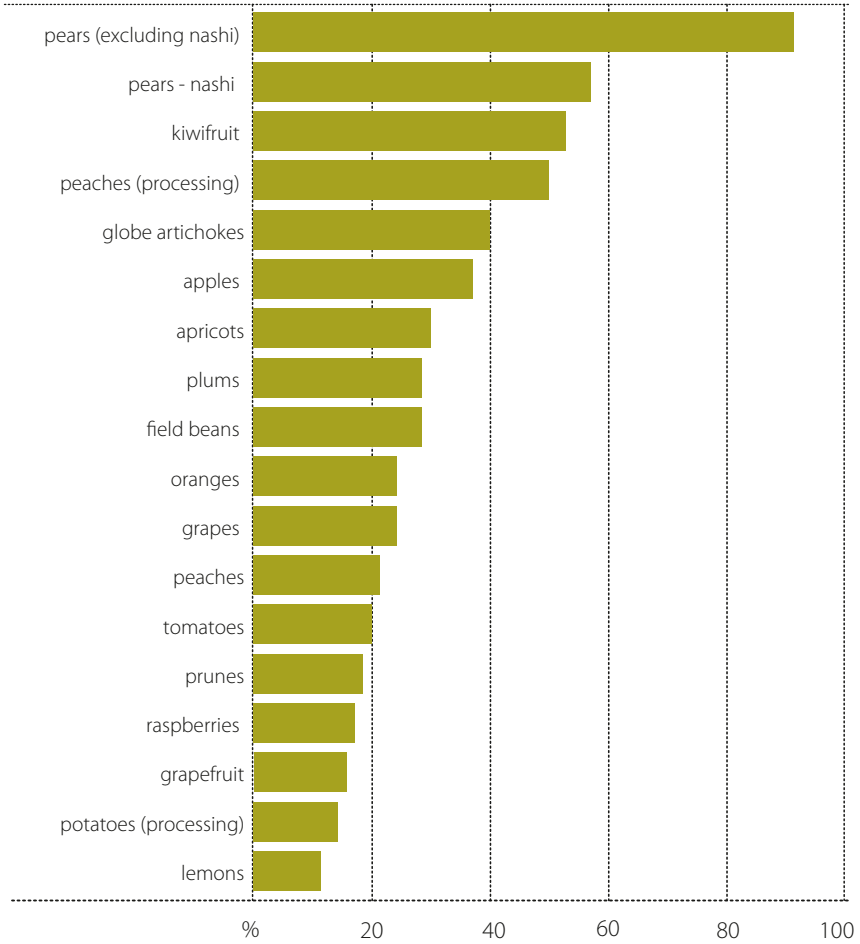
O Percentage share of national value of production of crops in the flood affected regions of Victoria, 2005–06



Source: Australian Bureau of Statistics, *Agricultural Commodities, Australia, 2005–06*, cat. no. 7125.0.

In the case of fruit, the flood-affected regions of Victoria accounted for around 13 per cent of the total value of Australian fruit production. The key fruits produced are pears, kiwifruit, peaches and apples (figure p).

p Share of national value of key fruit and vegetables produced in flood-affected Victoria



Source: Australian Bureau of Statistics, *Agricultural Commodities, Australia, 2005–06*, cat. no. 7125.0.

Appendix 2: Transport disruptions in flood-affected states

Updated to 20 January

Queensland

Darling Downs (Chinchilla, Dalby, Toowoomba, Warwick, Stanthorpe region)

Major roads are beginning to reopen to traffic in the Chinchilla region, albeit at slower speeds and with some weight limits. Secondary road closures persist, with localised flooding.

Wide Bay/Burnett (Bundaberg, Maryborough, Gayndah, Kingaroy region)

Most roads have reopened. In the Kingaroy area several secondary roads remain closed, while several more have reopened to traffic 'with caution' and to four-wheel drives.

Fitzroy (Rockhampton, Emerald, Blackwater, Theodore region)

Major roads to the west of Rockhampton are beginning to reopen to traffic, albeit with slower speeds and some weight limits. Several secondary roads remain closed, while the Dawson Highway remains closed west of Rolleston.

Mackay (Mackay, Clermont region)

Roads in the Clermont area, north-east of Rockhampton, remain closed.

South West (Surat, St George, Dirranbandi region)

Major roads surrounding these towns remain closed because of localised flooding.

Central West (Longreach, Winton, Boulia, Birdsville region)

Major roads around Longreach have reopened to traffic 'with caution'. Most roads are closed west of Longreach (Boulia and Birdsville).

Rail

The majority of rail lines have recommenced operations, but mostly at reduced speeds. However, the freight line servicing towns west of Brisbane (Darling Downs and South West regions) is expected to remain closed for an extended period.

Ports

The Fisherman Island grain export terminal at the port of Brisbane has reopened to ships, while the port of Bundaberg remains closed because of flooding to the Burnett River.

Victoria

Western Victoria (Horsham, North Grampians, Ararat)

With major flooding around Horsham, the Western Highway and sections of the Wimmera and Calder highways are closed, but detours are available. Numerous local roads are closed across the region.

Northern Victoria (Campaspe, Gannawarra, Loddon)

Sections of the Wimmera Highway and Murray Valley Highway are closed and numerous local roads are closed between Bendigo and the NSW border.

South-western Victoria (Corangamite, Golden plains, Moyne)

A section of the Princess Highway is closed, with limited other road closures in the region.

Rail

Rail lines, particularly in northern Victoria, have been affected by flooding, with inspections being carried out to assess the extent of the damage as waters recede.

New South Wales

North-eastern New South Wales

The Pacific Highway outside of Grafton is closed, but detours are available. There is localised flooding around Tenterfield, Boggabilla (near Goondiwindi), Woodenbong (between Kyogle and Warwick) and Bourke.

Sources: Queensland Department of Transport and Main Roads, QR National, Port of Brisbane, Gladstone Ports Corporation, VicRoads, V/Line and New South Wales Roads and Traffic Authority. Information updated to 20 January 2011.