Department of Primary Industries

NSW Seasonal Conditions Report - September 2013

Highlights

- Wetter conditions are expected, with higher probabilities over south western & north to north eastern NSW.
- Near normal daytime temperatures are likely, cooler in the south & north east. Warmer overnight temperatures are likely in central, coastal & north western NSW.
- August was warmer than normal, with below average rainfall across most of NSW.
- Pasture growth declined across the far west, north west & mid north coast. Crop and pastures are reasonable to good in the central & southern areas.
- Late frosts have affected crop yields in the northern & some central areas, & poor rainfall in the north west.
- Modelled topsoil moisture levels fell dramatically due to the temperatures & lack of rainfall. Levels are low across most of central, northern & western NSW. Subsoil moisture levels declined slightly.
- Stock condition & crop and pasture production will depend upon follow up rainfall over the coming months. Considerable resources are available to assist in management at http://www.dpi.nsw.gov.au/agriculture/emergency/drought/managing

1. Summary

The outlook for NSW from September to November indicates that wetter conditions are likely across the State, with the highest probabilities of above median rainfall in the south west and north to north east of NSW. Near normal daytime temperatures are likely over this period, with a slightly higher probability of cooler temperatures in the south and north east. There is a slightly increased probability of higher than normal overnight temperatures across central and northern NSW.

The majority of the State received below average rainfall and above average daytime temperatures for the month, with August being the 10th driest on record, and the 8th warmest.

The entire northern half of the State and the south east received rainfall that was well below average. The rainfall across much of this area was less than 10 mm, and was in the lowest 10% of records.

The far north west received no rain during the month.

Parts of the south west slopes and southern tablelands received 25-50 mm, with areas further west receiving 10-25 mm. Rainfall increased to 50-200 mm to the south and east of Wagga and east of Corowa. Only the alpine areas received above average rainfall.

The three month relative rainfall assessment is still under the influence of the June rainfall, with most of the State showing average conditions and above average in some central areas. The exceptions are areas of the north west, far north west, northern tablelands and the Hunter valley, which show below average rainfall.

Relative rainfall for the last six months is also rated as average across most of western and central NSW, with the exception of similar areas.

Modelled topsoil moisture decreased greatly over most of NSW. Levels are still moderate across the south west slopes and southern tablelands. Higher than normal rainfall is required to replenish depleted profiles. Modelled subsoil moisture remained relatively static.

Modelled pasture growth and biomass declined across north western and far western NSW and the mid north coast, and relative levels also declined. Growth was average to good in the central and southern areas but poor in parts of the south east. Relative biomass levels were generally average or above, but low in the north west.

While higher than normal temperatures favoured crop and pasture growth generally, widespread late frosts damaged cereal and oilseed crops in the northern and central areas of the State. Dry conditions in the north have also affected crop growth.

Crop and pasture growth in southern and central areas is still good, although follow up rainfall is required. Pasture growth has slowed along the mid north coast and across the north west.

The seasonal outlooks presented in this report are obtained from the Bureau of Meteorology and other sources. These outlooks are general statements about the likelihood (chance) of exceeding the median rainfall or minimum or maximum temperatures. Such probability outlooks should not be used as categorical or definitive forecasts, but should be regarded as tools to assist in risk management and decision making.

2. Seasonal outlook

Seasonal outlook and ENSO information are sourced from Australian Bureau of Meteorology (BoM) and international sources. The BoM's official forecasts are based on modelled output from the Predictive Climate Ocean Atmosphere Model for Australia (POAMA), which is a dynamical (physics-based) climate model developed by the BoM and CSIRO Marine and Atmospheric Research. Further information on POAMA forecasts can be obtained here and at http://poama.bom.gov.au/.

2.1 Seasonal rainfall outlook

- For the 3 month period from September to November there is at least a 60% chance of exceeding median rainfall across most the State, with higher probabilities in the north to north east and the south west. Slightly lower probabilities exist in the far north west corner of NSW and in parts of the central tablelands.
- This means that for every ten years with similar climate patterns to those at present, six September to November periods would be expected to be wetter than average, and four years drier than average.
- The outlook confidence (skill) for this forecast is moderate across NSW, ranging from 55-65%.

2.2 Monthly rainfall and temperature outlook (experimental)

The monthly experimental climate outlooks from the POAMA model are provided with thanks to, and by special agreement with, the Bureau of Meteorology. However, they are experimental only, do not currently form part of the BoM's standard services and are not yet fully calibrated. They also may differ from the operational seasonal outlooks as they may be based on a different number of scenarios (ensembles). They should therefore be used with some caution. Feedback on the experimental outlooks can be provided to climate.helpdesk@bom.gov.au.

- The experimental rainfall outlook for September (Figure 4) suggests lower than normal rainfall conditions, with a 0-30% probability of above median rainfall across most of the State. The outlook has a moderate to high confidence (skill).
- The experimental temperature outlooks for September (Figure 4) suggest warmer than normal conditions, with an 80-100% probability of above median maximum and minimum temperatures for the month. The outlook confidence (skill) for these forecasts is low to moderate.
- Weekly experimental outlook information suggests that the drier and warmer than normal conditions may be primarily in the first two to three weeks of the month.
- The experimental rainfall outlook for October (Figure 5) suggests a near normal rainfall conditions across the State, with a 40-60% probability of above median rainfall. The outlook confidence (skill) for this forecast is moderate to high.
- The experimental temperature outlooks for October suggest near normal maximum and minimum temperatures (40-60% probability of above median temperature) over most of the State, with a slightly elevated probability for above median temperatures along the coast (60-70% probability). The outlook confidence (skill) for these forecasts is high for the maximum temperature forecast and moderate for the minimum temperature forecast.

2.3 Seasonal temperature outlook

- Over the period from September to November, the probability of exceeding the long term median maximum temperature across NSW is near neutral. There is a 45-55% probability across most of NSW, with southern and south eastern NSW and parts of the northern tablelands and north coast having the greatest probability of below average daytime temperatures (Figure 2). The outlook confidence (skill) for this forecast is moderate for NSW.
- This means that for every ten years with similar climate patterns to those at present, about four to five September to November periods would be expected to be warmer than average and five to six cooler than average.
- Warmer than normal overnight temperatures over September to November are likely across much of central and northern NSW, with the exception of the south and Riverina. The probability of September to November minimum temperatures being higher than the long term median is from 55-65% in central and north western NSW, near normal in the Riverina and Northern Tablelands, and 40-45% in the far south of NSW (Figure 3).
- The confidence (skill) for the minimum temperature outlook is moderate for most of

NSW, high in the far north west and low to moderate on the far north coast.

Other climatic models

- The Bureau of Meteorology's old statistical model indicates a likelihood near neutral rainfall and temperature conditions across most of the State over the next three months, with warmer than normal minimum temperatures likely in the south east. However, the statistical forecast does not take the IOD into account and is based on past trends in sea surface temperatures.
- The UK Meteorology Office's long range model indicates a 60-80% probability of average rainfall for most of NSW over the September to November period, and above average temperatures along the coast and in the west. No skill assessment is available for this model output.
- The International Research Institute (IRI) for Climate and Society's climate forecast indicates that temperatures are likely to be higher than normal across the State over the September to November period. The IRI forecast indicates a 50% likelihood of being in the warmest third of years, 35% the middle third and 15% of falling into the coolest third. A similar range of likelihoods is given for the November to January period. No skill assessment is available for this model output.

2.4 El Niño-Southern Oscillation (ENSO)

- The Pacific Ocean remains in a neutral ENSO state (neither El Niño nor La Niña). Most international climate models indicate this state is likely to continue through to early 2014. Currently, 66% of models suggest ENSO neutral conditions in September to November, 21% La Niña and 13% El Niño conditions. The Bureau of Meteorology's POAMA model and that of the UK Meteorology Office are indicating that weak La Niña conditions may develop over winter and into spring.
- Monthly sea surface temperatures from the Bureau of Meteorology and the US National Oceanic and Atmospheric Administration (NOAA) indicate cool anomalies remain in the eastern tropical pacific and along the coast of South America. Warm anomalies are persisting in the west. The sub surface sea temperatures in the eastern Pacific are slightly cooler than average in the east and slightly warmer in the west. Overall, they are close to the long term average.
- Trade wind patterns over the western Pacific weakened over the last two weeks, and are near average across most of the tropical Pacific (these strengthen during La Niña and weaken during El Niño events).
- Cloud conditions at the equator near the International Date Line are below average (cloudiness in this area decreases during La Niña and increases during El Niño events).
- The Southern Oscillation Index (SOI) has dropped to near zero over the last fortnight, with the 30-day at +0.3. Values of between -8 and +8 indicate neutral conditions, sustained values above +8 may indicate a La Niña event, and sustained values below -8 may indicate an El Niño event.
- The Indian Ocean Dipole (IOD) has weakened over the last month and is near neutral.
- The latest IOD index value is -0.1°C for the week ending 25th August. This year has been officially classified as a negative IOD event, but if such values persist to mid-September, the event will be considered to have ended. The model outlooks suggest the negative IOD event could continue into mid spring. A negative IOD increases the chances of above normal rainfall across southern NSW and much of western and central NSW. However, the chances of rainfall across northern and coastal NSW are near neutral and are slightly lower in far north western NSW in negative IOD and neutral ENSO years, as shown in this link.

2.5 Other climatic indicators

- The experimental Southern Annular Mode (SAM) index was negative over most of August, with a few short duration weakly positive events early and late month. It is currently negative. Predictions from POAMA and the US National Oceanic and Atmospheric Administration (NOAA) are for it to remain weakly negative till mid-September and then move to being neutral or weakly positive later in the month.
- A negative SAM indicates an expansion of strong westerly winds towards the equator, resulting in more or stronger low pressure systems across southern Australia and increased rainfall. A positive SAM indicates the contraction of westerly winds towards Antarctica and higher pressure over southern Australia and a decrease in rainfall. However, a strongly positive SAM in spring and summer can lead to a slightly higher

likelihood of increased rainfall over south eastern and central NSW.

- Atmospheric pressure during August was near normal in the north of the State and slightly below normal in the south. High atmospheric pressure is linked to drier than normal conditions.

3. Rainfall

3.1 Relative rainfall

Relative rainfall information is sourced from the AussieGRASS project of the Queensland Department of Science, Information Technology, Innovation and the Arts and from the Bureau of Meteorology.

Relative rainfall is calculated by comparing and ranking the current rainfall against that for the same period over every year since 1900.

This means that if the current period has a rank of between 30 to 70 against all other years, it is regarded as being "average" and the conditions experienced will occur over about 4 out of every 10 years.

August

- Relative to historical records, rainfall for August was below average for most of the State (Figure 6).
- Relative rainfall was well below average or below in a band covering the northern half of the State, and extending along the south coast. These areas generally received between 0-20% of their normal August rainfall.
- Areas of average relative rainfall occurred in the far south west of NSW in a belt extending from Balranald to Broken Hill, in the east of the Riverina LLS district, and in the eastern and central areas of the Murray LLS district. In the South East LLS district, average relative rainfall was also received in the west of the Monaro.
- A small area of well above average to extremely high relative rainfall occurred in the alpine areas.

June to August (3 months)

- The relative rainfall assessment for June to August was greatly influenced by the above average falls that occurred across much of the State in June.
- Over the period from June to August, relative rainfall was generally average most of the State (Figure 7).
- Above average to well above average rainfall occurred in a belt across the centre of the Western LLS district and the southern half of the Central West LLS district. Patches of above average relative rainfall also occurred in the north of South East LLS district and in the alpine areas, and in areas of Murray and Riverina LLS districts.
- Below average to well below average relative rainfall occurred in the west of the North West LLS district, and the far north east of the Western LLS district. This area extended from Bourke and Goodooga to Walgett, Narrabri, Moree and Boggabilla.
- Some 52% of the North West LLS district, 40% of Hunter, 20% of Northern Tablelands, 12% of North Coast and 6% of Western LLS districts received below average or worse rainfall during the period.
- Some 54% of Central West, 43% of South East, 41% of Murray and 38% of Western and 29% of Riverina LLS districts received above average or better rainfall over the period.

March to August (6 months)

- Over the six months to June, relative rainfall was average or better across most of NSW (Figure 8).
- Areas of above average to well above average relative rainfall occurred in the central-eastern area of the Western LLS district and the south west of Central West LLS district.
- Below average to extremely low rainfall occurred in the west and north are far south east of the North West LLS district, the far north east of the Western LLS district, the western area of the Northern Tablelands and areas of the South East LLS district.
- Some 34% of the Northern Tablelands, 27% of the North West, 24% of the Hunter, 20% of the South East and 19% of the Central Tablelands LLS districts had below average relative rainfall for the period.

December to August (9 months, BoM)

- Over the 9 month period from December to August, relative rainfall across the State was below average across parts of central, north western and far south western and south eastern NSW (Figure 9). Most of these areas received 60-80% of their normal rainfall.
- Areas of particular deficiency occurred in the far north west with these areas receiving

between 40-60% of their long term average rainfall.

- The North Coast and areas of Northern Tablelands, Hunter and Greater Sydney and the alpine areas of South East LLS districts received above average rainfall for the period. The remainder of the State was near average.

September to August (12 months)

- Relative rainfall for the last 12 months remained generally below average to well below average across much of the north west, central areas of the State and the far west and south west (Figure 10).
- Areas of the Western, North West, Central West, Riverina and Murray LLS districts had below average relative rainfall, along with the western edges of Central and Northern Tablelands LLS districts.
- Areas of extremely low relative rainfall over the last year extended in a belt from Bourke to Brewarrina, Quambone, Coonamble, Pilliga and included Goodooga, Lightning Ridge and Walgett.
- The eastern side of Northern Tablelands and much of the North Coast LLS districts had generally above average to well above average relative rainfall for the period. The remainder of the State was within the average range.

3.2 Total rainfall

Total rainfall information is sourced from the AussieGRASS project of the Queensland Department of Science, Information Technology, Innovation and the Arts and from the Bureau of Meteorology.

August

- Unfortunately, rainfall during August was below average across the majority of the State. It was the 10th driest August on record, with almost half of the State recording rainfall in the lowest 10% of years. The low rainfall was associated with westerly wind anomalies and clear conditions.
- Rainfall across much of the north, far north west and east of the State was restricted to falls of less than 10 mm. Rainfall was limited to less than 5 mm to the west of Moree, Narrabri, Coonabarabran and Dubbo and to the north of Ivanhoe and Broken Hill. Much of this area received no rain during the month.
- The alpine areas were the only part of the State to record above average rainfall. With the exception of the alpine areas and the far southern tablelands, rainfall across the State ranged from 0-50 mm (Figure 11).
- Parts of the south west slopes and southern tablelands received 25-50 mm, within the east of Riverina and Murray LLS districts, the south east of the Central Tablelands and the west of South East LLS district. The far southern tablelands received 50-200 mm and the alpine areas 200-400 mm.

June to August (3 months)

- Total rainfall over the three months to August ranged from 50-200 mm across most of the State. The north west and far north west received 25-50 mm, except for an area near Tibooburra which received less.
- Limited areas of the State received 200-400 mm, including an area between Albury and the ACT, between Parkes and Orange, Cowra, Goulburn, Sydney and Nowra and north east of Lismore.
- Higher rainfall in excess of 300 mm was received across the alpine areas, near Tweed Heads and between Wollongong and Jervis Bay (Figure 12).

March to August (6 months)

- Rainfall across the State during the March to August period ranged from 50 mm to more than 1,200 mm (Figure 13).
- The lowest rainfall over the period (50-100 mm) fell in patches in the far west of the State, to the north and south of Broken Hill and in the north west near Bourke.
- The west of the State generally received 100-200 mm, with some areas receiving 200-300 mm. The central areas of the State generally received 200-300 mm, with some areas receiving up to 400 mm.
- The eastern edge of the Northern Tablelands and Hunter LLS districts, the south of the Central Tablelands LLS district, and the North Coast, Greater Sydney and the coastal areas of South East LLS districts generally received 300 mm or more.
- The far southern tablelands, on the eastern edge of the Riverina and Murray and west of the South East LLS districts received 300-600 mm, with heavier recordings of 600-800 mm in the alpine areas. Falls of 600-800 mm or more also occurred between Wollongong and Jervis Bay, Taree and Port Macquarie and north and east of Lismore.

4. Temperature anomalies

Temperature information is sourced from the Bureau of Meteorology.

- Maximum temperatures across the State in August averaged 2.5°C above normal, being the eighth warmest on record. Conditions were warmest in the north west and far north west, where maximum temperatures were from 3-5°C above normal.
- Maximum temperatures across the remainder of the State were generally 2-3°C above normal from the far south west to Sydney and the far north east. In the south east and south of the State, maximum temperatures ranged from near normal to 2°C above normal (Figure 15).
- Minimum temperatures during the month averaged 0.7°C above normal. Minimum temperatures were generally cooler than normal in the north, with widespread frosts affecting cereal and oilseed crops.
- Overnight temperatures in the far west and in the south and south east were generally warmer than normal by 1-2°C (Figure 16).
- Overnight temperatures in the central areas of the State, the far north east and some areas in the Riverina were close to normal.

5. Relative soil moisture

Soil moisture information is sourced from the joint CSIRO and Bureau of Meteorology Australian Water Availability Project (AWAP).

5.1 Topsoil

- Modelled topsoil moisture declined dramatically across the State in August, as a result of the generally low rainfall and higher than average temperatures (Figure 17). Levels are particularly low across north west, far north west and far west.
- Declines from moderate to low levels of modelled topsoil moisture also occurred in the north of Central West and the south of Western LLS districts, and the west of Riverina and Murray LLS districts, possibly due to the warmer than average temperatures.
- Over the month, modelled topsoil moisture declines from moderate to low occurred across every LLS district and in 31-87% of the LLS district areas.
- In total, 100% of Western and North West, 93-97% of Central West, North Coast, Northern Tablelands and Hunter, and 84% of Greater Sydney LLS districts now have low modelled topsoil moisture. Some of these areas have less than an average of 10 mm of modelled topsoil moisture, and most areas have less than an average of 40 mm.
- The remainder of the LLS districts have no more than 47% of their area with moderate topsoil moisture, and 5% or less of their area with high modelled topsoil moisture. The south of the Central Tablelands, eastern half of Riverina and Murray, and far south east of Central West and west of South East still have generally moderate levels of modelled topsoil moisture.
- Improvements in modelled topsoil moisture were limited to the far southern tablelands and the alpine areas.

5.2 Subsoil

- Modelled subsoil moisture levels remained relatively static during the month. Levels across most of the cropping areas were generally moderate, apart from the western half of North West, the north west of Central West and the west of Murray LLS districts (Figure 18). Average modelled subsoil moisture for the month is less than 200 mm for most of the cropping zone, with some areas below 100 mm.
- Small declines in modelled subsoil moisture occurred in the Central West, Greater Sydney, Hunter, North Coast, North West, Northern Tablelands and Western LLS districts. These declines were limited to 3-9% of the area of the LLS districts.
- Levels across the remainder of the coastal districts and the eastern edge of the Central and Northern Tablelands LLS districts remained mostly stable or declined slightly.
- Subsoil moisture levels are very high along a narrow coastal strip from Ulladulla to Tweed Heads.
- Improvements in subsoil moisture only occurred in the east of the Murray LLS district and far south east of the Riverina LLS district.
- The North West LLS district has the lowest relative subsoil moisture, with 57% of its area in the low category. This is followed by 42% of Murray (in the western half) and 35-39% of the Central West and Western LLS districts.

6. Pasture growth and biomass

Pasture growth and biomass information is sourced from the AussieGRASS project of the Queensland Department of Science, Information Technology, Innovation and the Arts.

6.1 Modelled pasture growth

- Particular declines in modelled pasture growth occurred across the north west, far west and Hunter regions of the State during August (Figure 19).
- In these areas, including the north and west of Western, the western half of North West and the western half of Hunter LLS districts, modelled pasture growth decreased from up to 500 kg/ha of dry matter (DM) in July to less than 50 kg/ha DM in August. In many areas, modelled growth declined to less than 10 kg/ha DM.
- The most favoured areas for modelled pasture growth remained the Murray, Riverina LLS districts, as well as the southern half of Central West and south east of Western LLS districts. Modelled growth in these areas ranged from 200-1,000 kg/ha DM, with some areas achieving more than 1,000 kg/ha DM.
- Modelled growth over the rest of the State was variable, ranging generally from 20-500 kg/ha DM. Patches of low growth of 20 kg/ha DM or less occurred across areas of the South East, North Coast and Northern Tablelands LLS districts.

6.2 Modelled biomass

- Modelled total standing dry matter (biomass) levels for August generally decreased slightly from those of July (Figure 20).
- The areas where less than 500 kg/ha of dry matter (DM) was estimated increased over parts of the North West and Hunter LLS districts, and in the far north east of Western LLS district.
- Limited improvements in modelled biomass levels occurred in the north of the South East LLS district.
- Generally, modelled biomass levels were low over the north west, far west and east of the State.
- Modelled biomass levels were and moderate to high across the central and southern areas and the south east of Western LLS district.

6.3 Relative pasture growth

Relative pasture growth and biomass area calculated by comparing and ranking the current modelled growth and biomass against that for the same period over every year since 1957.

This means that if the current period has a rank of between 30 to 70 against all other years, it is regarded as being “average” and the conditions experienced will occur over about 4 out of every 10 years.

August

Relative monthly pasture growth should be compared to modelled pasture growth for interpretation. “Average” levels of relative growth may correlate with modelled levels (in kg/ha) that are quite low or high at certain times of year.

- Relative pasture growth was variable across the State in August (Figure 21).
- The worst areas of relative pasture growth occurred in the North West LLS district, and in the far north east, far north west and far south west of Western LLS district. Areas of poor growth also occurred in the north and east of Central West and in the Hunter LLS district. Another area of poor growth occurred around and north of Grafton in the North Coast LLS district.
- Modelled growth across the remainder of coastal NSW was generally average, as was that across the western half of the Central West, Riverina and Murray LLS districts.
- Areas of high relative growth occurred in the south east of Western LLS, across the Central Tablelands and South East, and in the eastern ears of Riverina and Murray LLS districts.
- Patches of missing data occurred across the north west of Western LLS district, much of the alpine areas and some of the coastal areas.

June to August (3 months)

- Over the three months to August, most of the State experienced above average to extremely high relative pasture growth (Figure 22). This was in part due to the favourable conditions in June.
- The far north and north west of the State had generally average growth, with areas of lower growth between Goodooga, Lightning Ridge Walgett and Moree, and also around Boggabilla.
- Greater Sydney and North Coast LLS districts had generally average relative pasture growth.

March to August (6 months)

- In the period from March to August, the tablelands, upper slopes, south east and much of the far west had above average relative growth (Figure 22).
- The remainder of the coast and most of central and southern NSW had average growth.
- Areas of below average or worse relative growth occurred between Enngonia, Bourke, Brewarrina, Goodooga, Lightning Ridge, Walgett and Pilliga, and also in scattered areas of the Hunter LLS district.

September to August (12 months)

- Relative pasture growth across the State over the last 12 months was below average to extremely low across the north west of the State, the mid north coast, the far south coast and areas of the Central West, Riverina and Murray LLS districts (Figure 24).
- The Western LLS district had generally average relative growth, with the exception of the far north east and the far south west.
- Relative growth across the tablelands, the remainder of central NSW and the remainder of the coast was generally average, with pockets of above and below average growth.

6.4 Relative biomass

Relative monthly biomass should be compared to modelled biomass for interpretation. “Average” levels of relative biomass may correlate with modelled levels (in kg/ha) that are quite low or high at certain times of year.

- For the time of year, modelled relative total standing dry matter (biomass) levels across the central and western areas of NSW were generally average to above average (Figure 25).
- Better areas of relative biomass (above average or higher) occurred in areas of the far west and along the tablelands and upper slopes.

  Areas of below average or worse relative biomass occurred between Enngonia, Bourke, Brewarrina, Goodooga, Lightning Ridge, Walgett, Moree and Boggabilla.

7. Crop production

Crop production information is sourced from the NSW DPI grains report.

The last grains report was released in April, and a new report was not available at the time of publication of this report.

8. Water storage and irrigation allocations

8.1 Storage levels

Storage levels are given as at 5th September 2013.

- Levels in water storages remain generally moderate, with the average effective capacity being 78%.
- Increases over the month were generally small, with the exception of the Hume (21%) and Blowering (11%) Dams. Minor decreases occurred at Pindari, Chaffey and Keepit Dams and Lake Wetherill.

Table 1: Capacity of storages

Storage	Current Volume (GL)	Effective Capacity (%)	Monthly Change (%)
Toonumbar	-	-	-
Glenbawn	745	99	-
Glennies	275	97	-
Lostock	-	-	-
Brogo	-	-	-
Cochrane	0	-	-
Dartmouth	3786	98	2
Hume	2971	99	21
Blowering	1470	90	11
Burrinjuck	529	51	5
Brewster	-	-	-
Carcoar	23	65	-
Cargelligo	31	83	-
Wyangala	886	73	3
Glenlyon	235	-	-
Pindari	197	63	-3
Copeton	1009	74	-
Chaffey	50	80	-3
Keepit	193	45	-1
Split Rock	350	88	-
Burrendong	564	46	0
Oberon	38	84	0
Windamere	207	56	-
Lake Cawndilla	369	52	-3
Lake Menindee	264	36	-
Lake Pamamaroo	349	127	4
Menindee	-	-	-
Total Menindee	-	-	-
Wetherell	243	127	-1
Total	**14784**		
Average		**78**	

8.2 Irrigation allocations

Allocations are given as at 5th September 2013.

- High security allocations are unchanged from early July. They remain at 100%, except for the Murray (97%) and Murrumbidgee (95%) River Valleys.
- General security allocations increased for the Macquarie and Cudgegong, Murray, Murrumbidgee and Lower Namoi River Valleys.

Table 2: Irrigation allocations

River valley	Allocation	Licence category
NSW Border Rivers*	100%	General security A Class
	1.7%	General security B Class
	100%	High security
Richmond	90%	General security
	100%	High security
Gwydir*	0%	General security
	100%	High security
Hunter	100%	General security
	100%	High security
Paterson	100%	General security
	100%	High security
Lachlan*	0%	General security
	100%	High security
Belubula*	0%	General security
	100%	High security
Lower Darling*	100%	General security
	100%	High security
Macquarie and Cudgegong*	6%	General security
	100%	High security
Murray*	79%	General security
	97%	High security
Murrumbidgee*	28%	General security
	95%	High security
Lower Namoi*	5%	General security
	100%	High security
Upper Namoi*	100%	General security
	100%	High security
Peel	45%	General security
	100%	High security
Bega Brogo	40%	General security
	100%	High security

* Carry over water may be available

Appendix

Maps and data used in the production of this report.

Seasonal outlook

Figure 1: Quarterly rainfall outlook

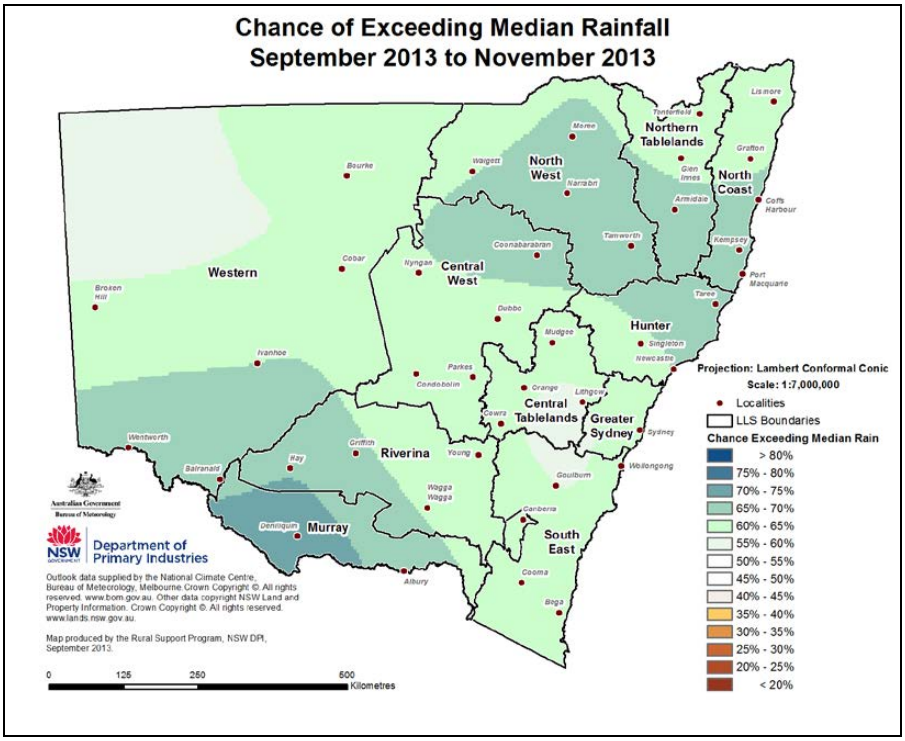


Figure 2: Quarterly maximum temperature outlook

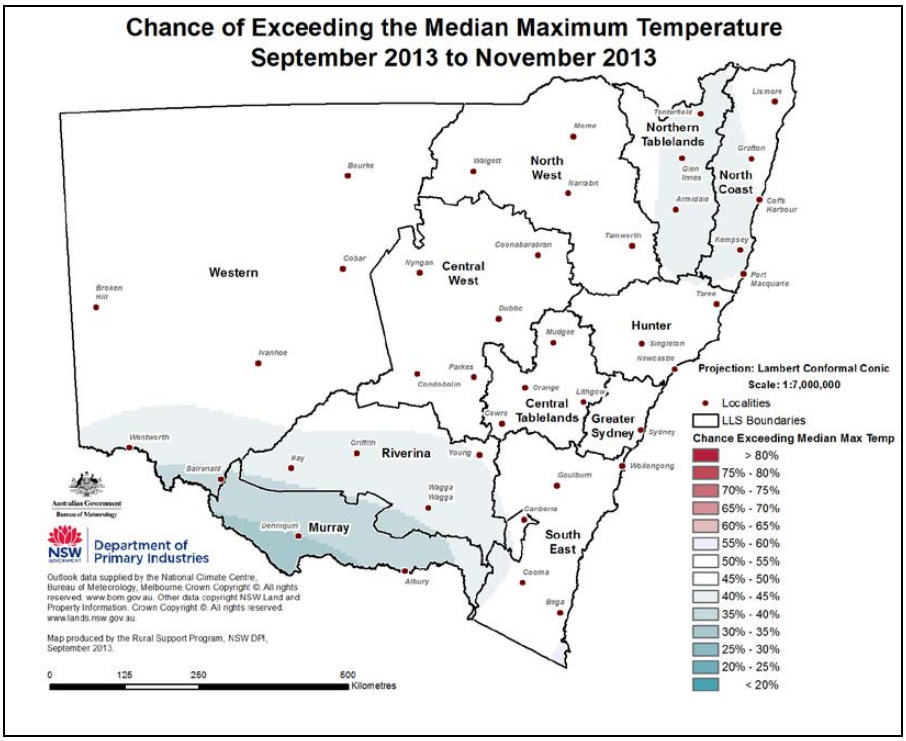
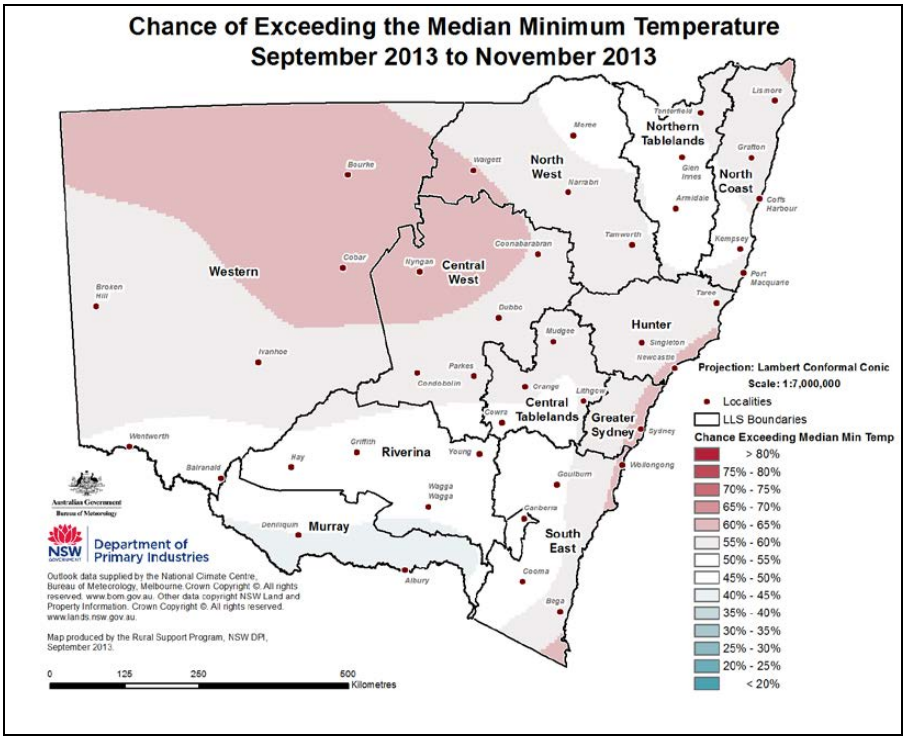


Figure 3: Quarterly minimum temperature outlook



Monthly rainfall & temperature outlook

(Bureau of Meteorology, POAMA - experimental)

Figure 4: Experimental September rainfall and maximum temperature outlook

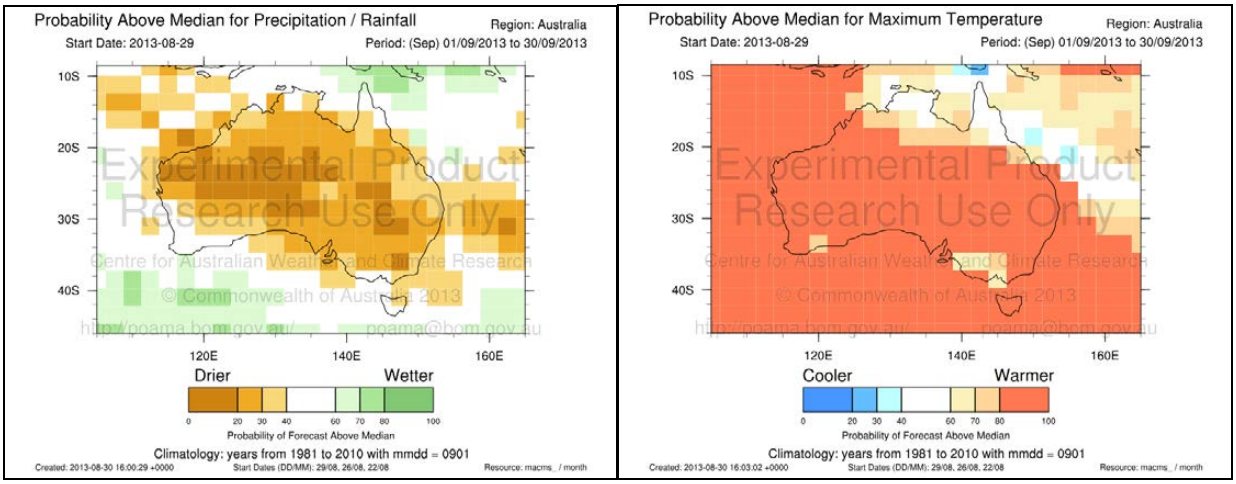
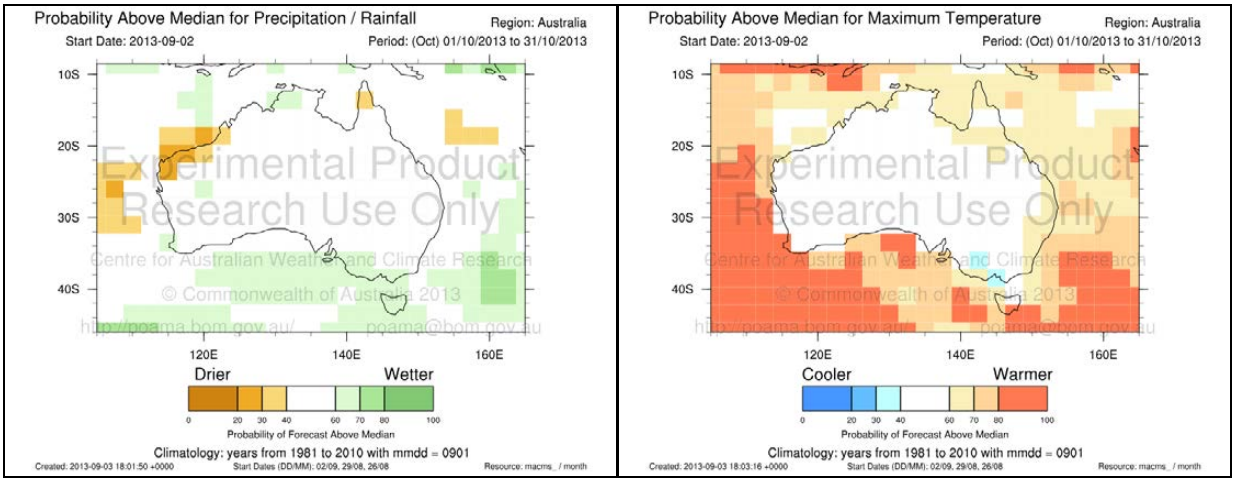


Figure 5: Experimental October rainfall and maximum temperature outlook



Rainfall

Figure 6: Relative rainfall – monthly

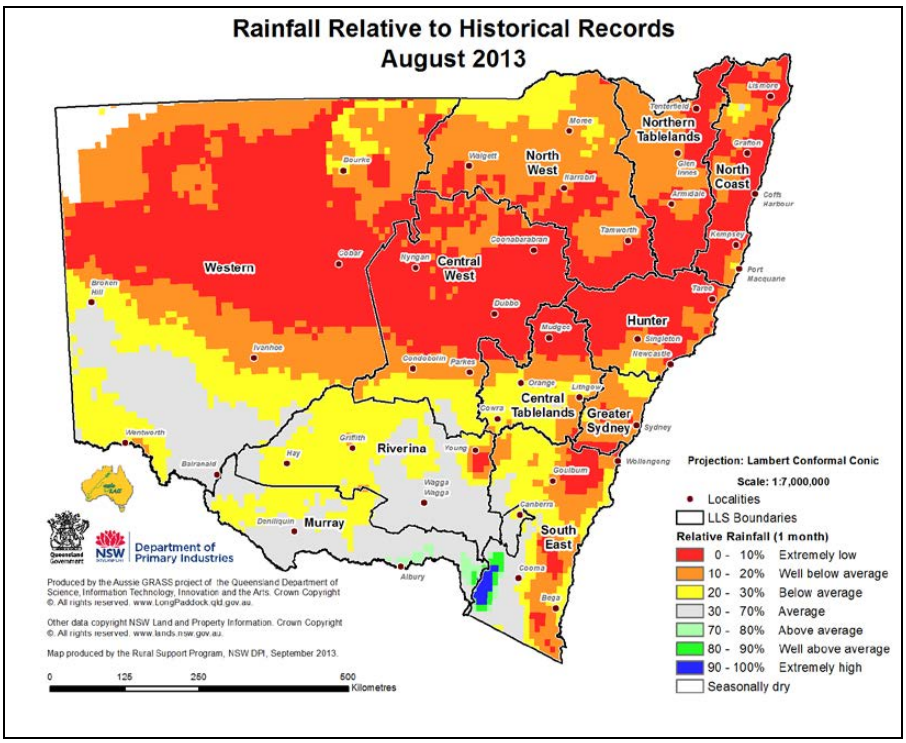


Figure 7: Relative rainfall – quarterly

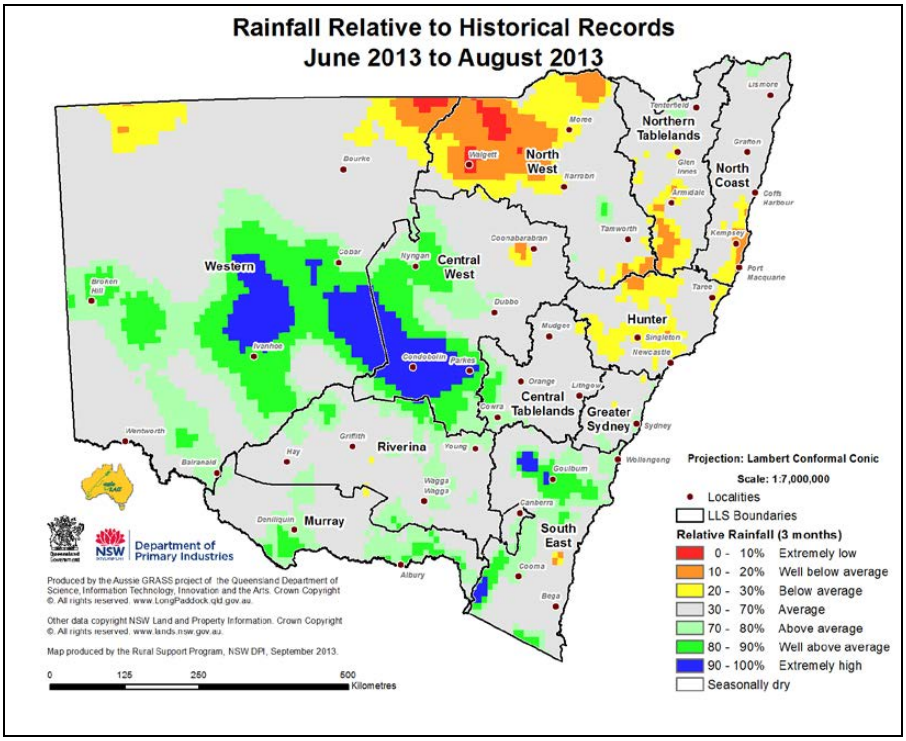


Figure 8: Relative rainfall – half yearly

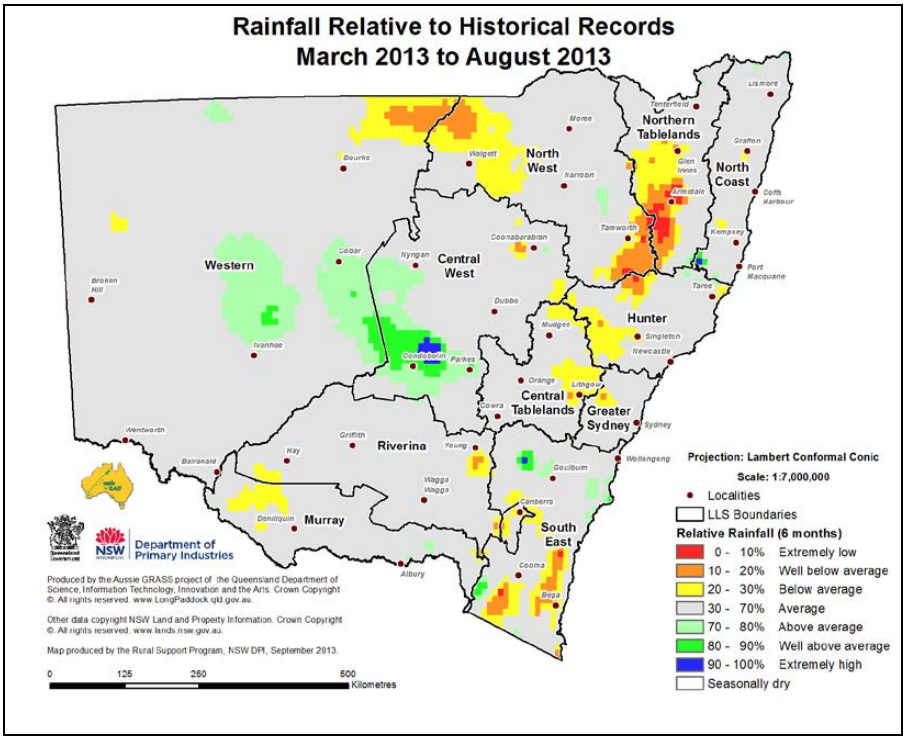


Figure 9: Relative rainfall – nine monthly

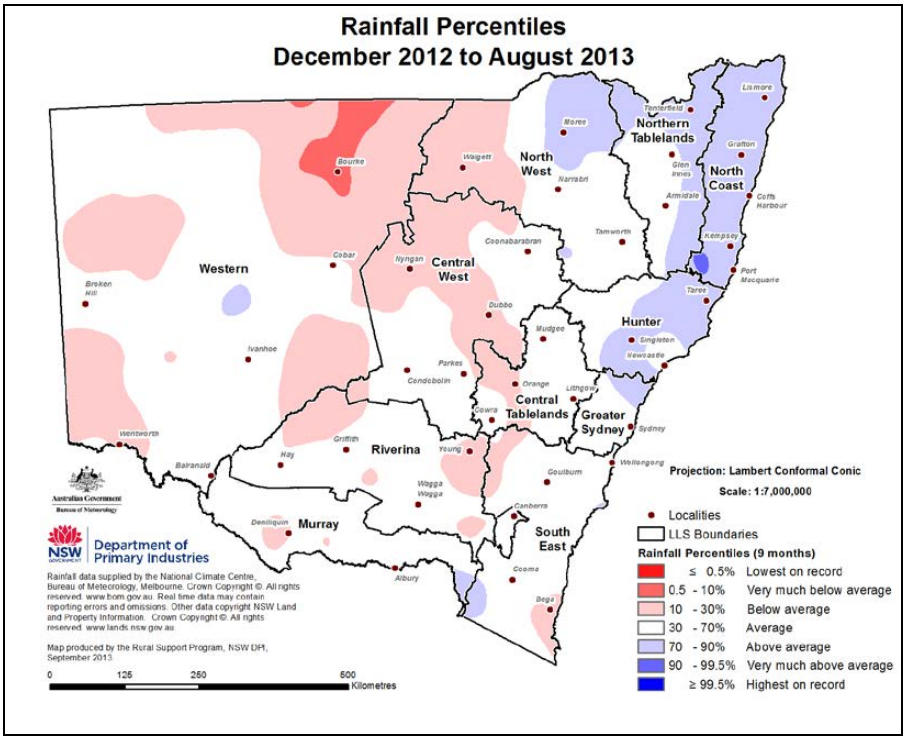


Figure 10: Relative rainfall – yearly

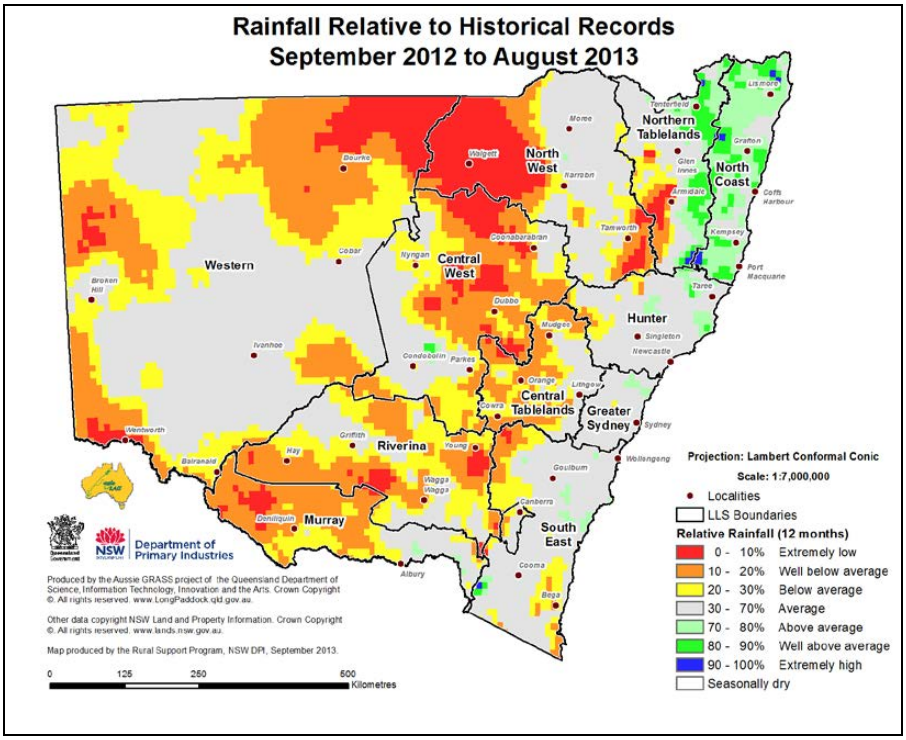


Figure 11: Total rainfall – monthly

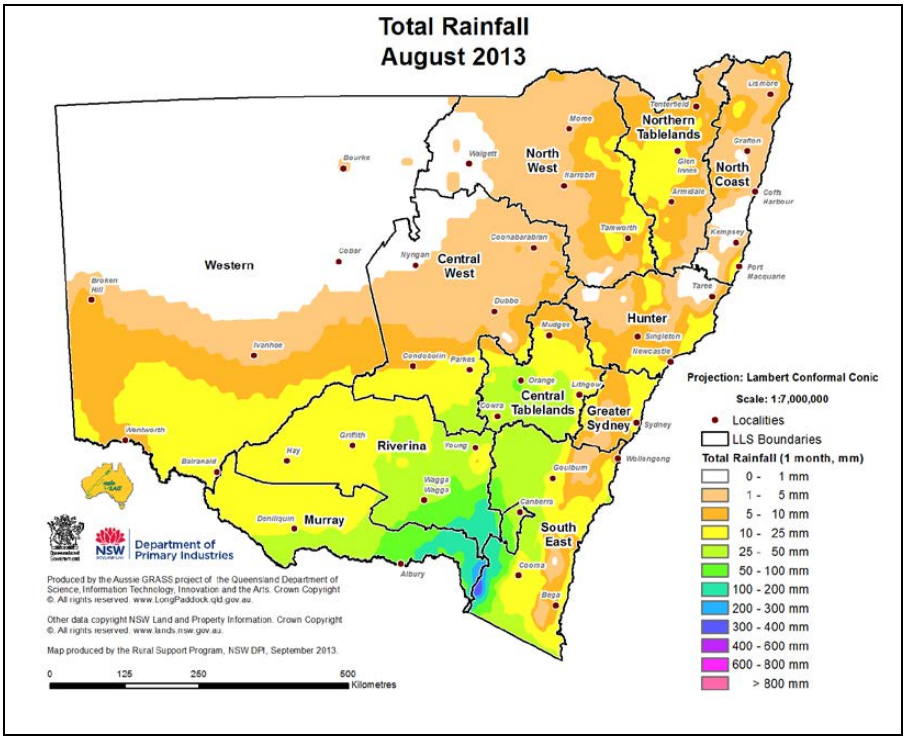


Figure 12: Total rainfall – quarterly

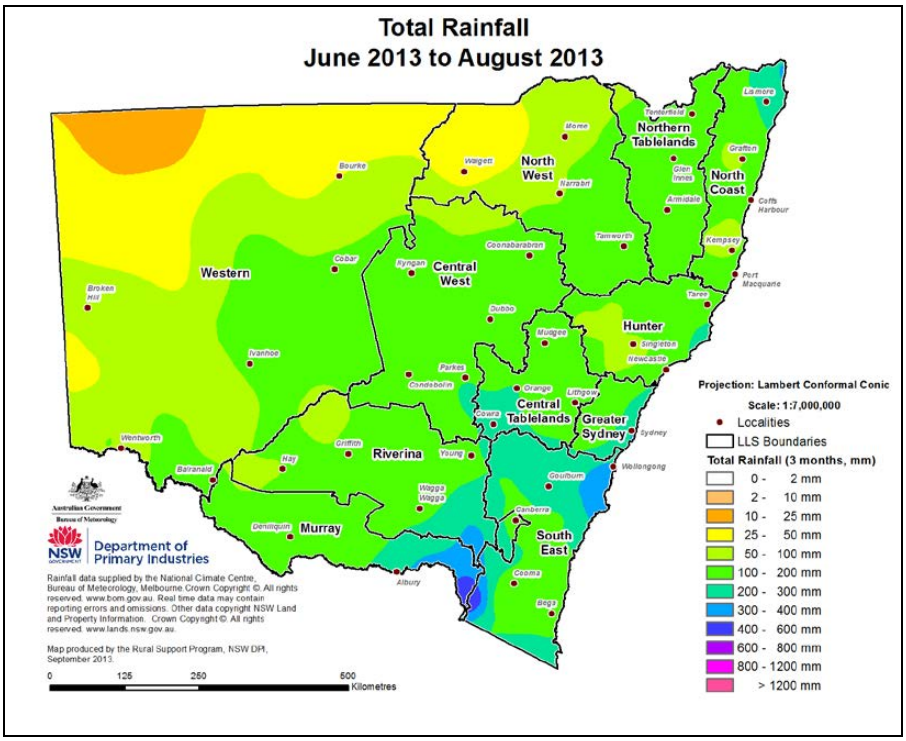


Figure 13: Total rainfall – half yearly

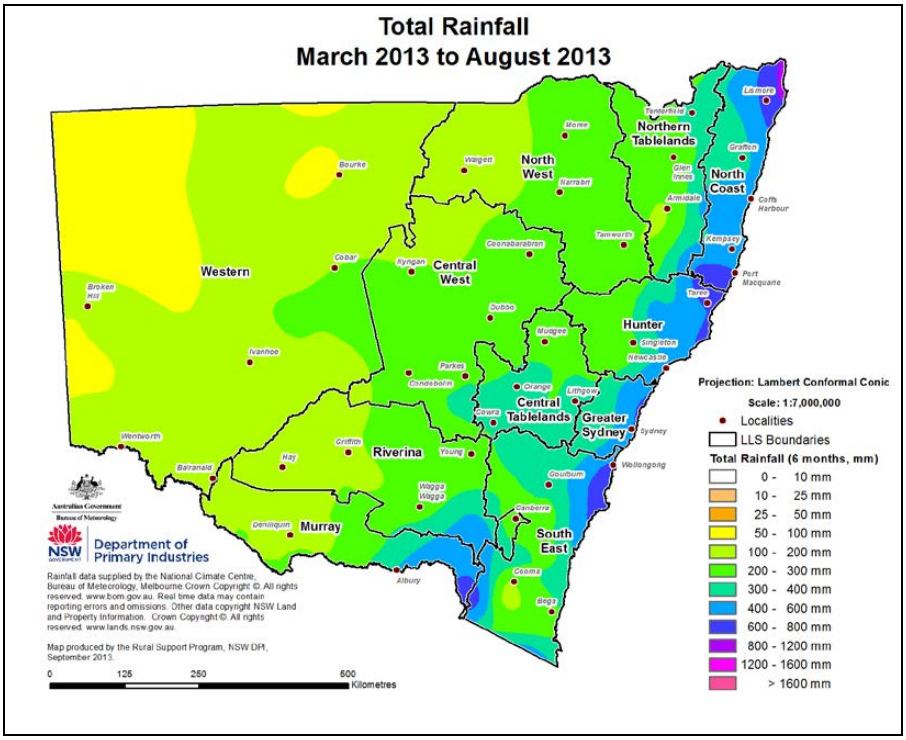
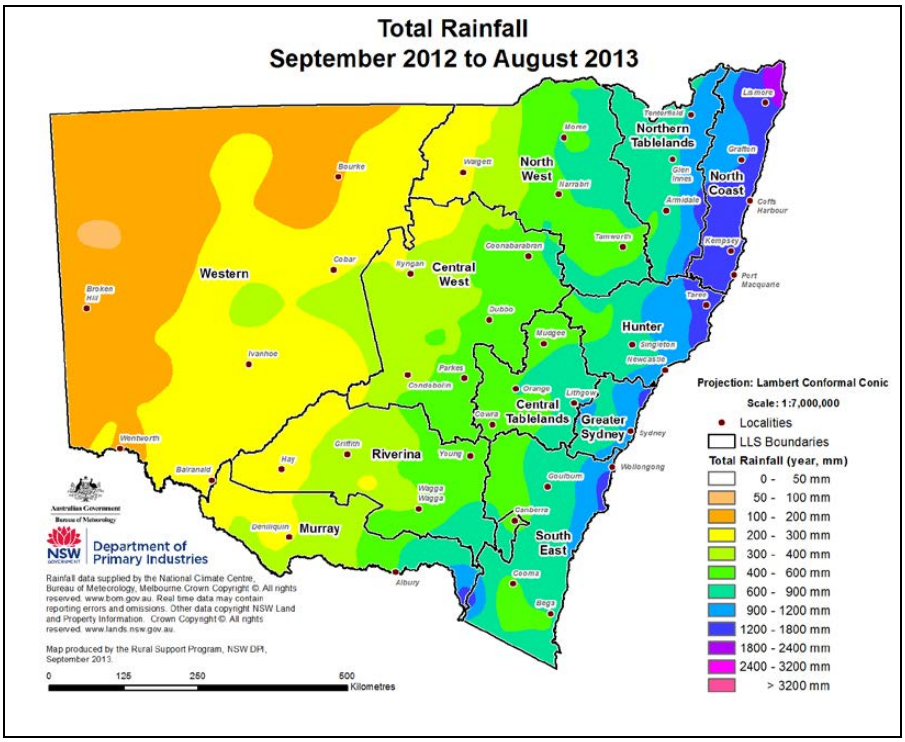


Figure 14: Total rainfall – yearly



Temperature

Figure 15: Maximum monthly temperature anomaly

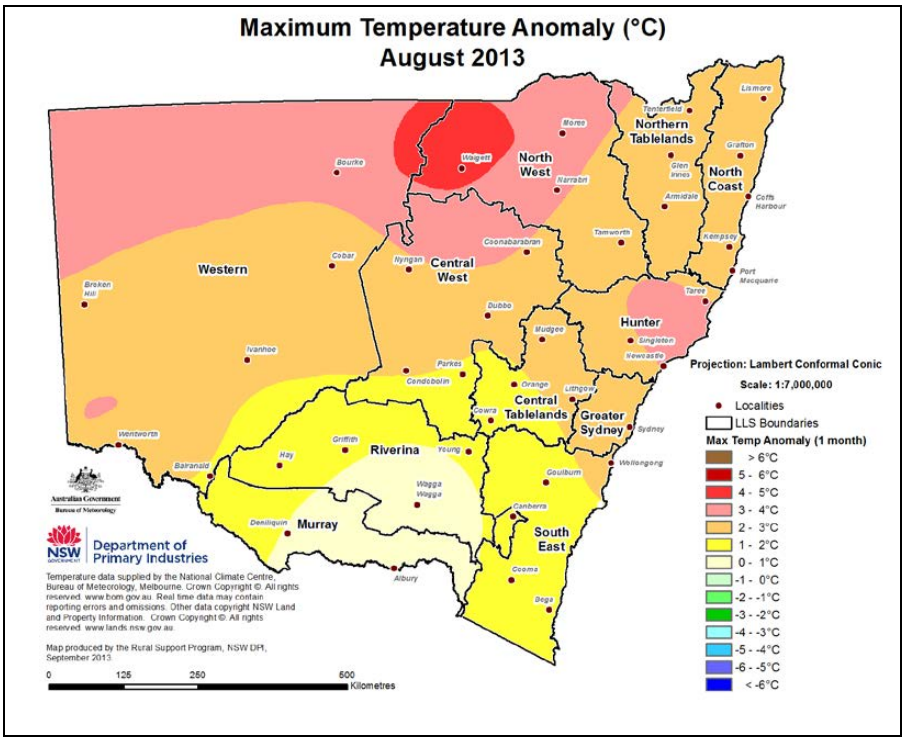
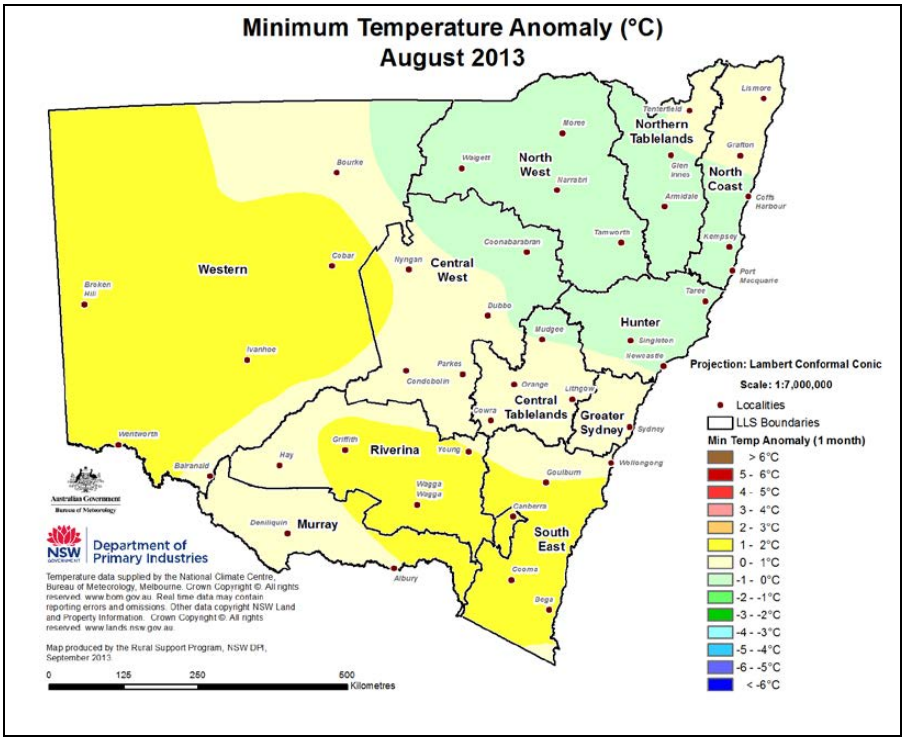


Figure 16: Minimum monthly temperature anomaly



Soil moisture

Figure 17: Relative topsoil moisture

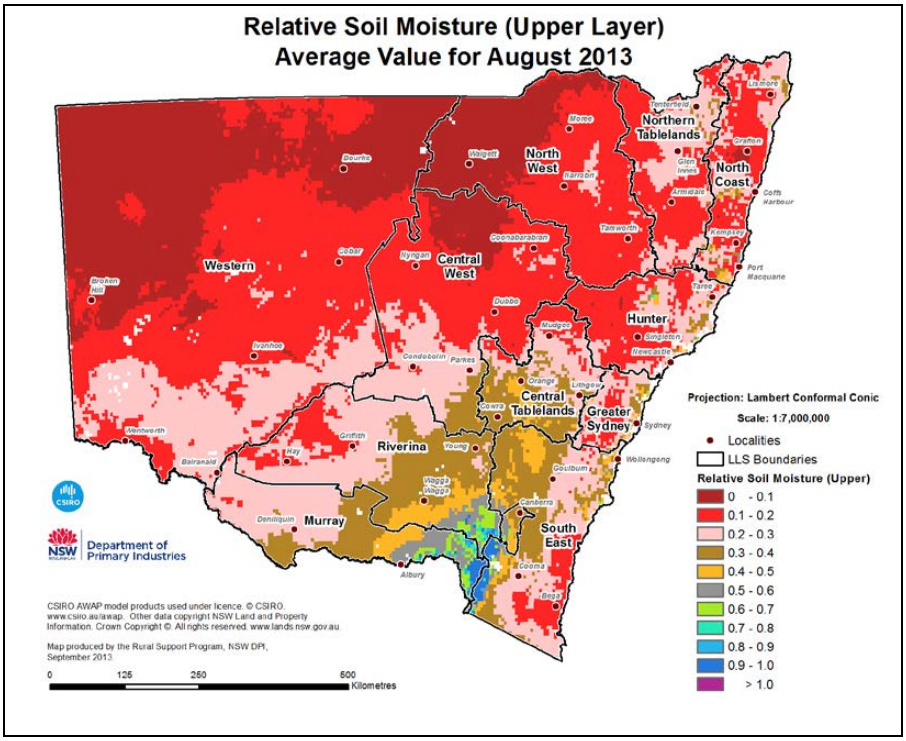
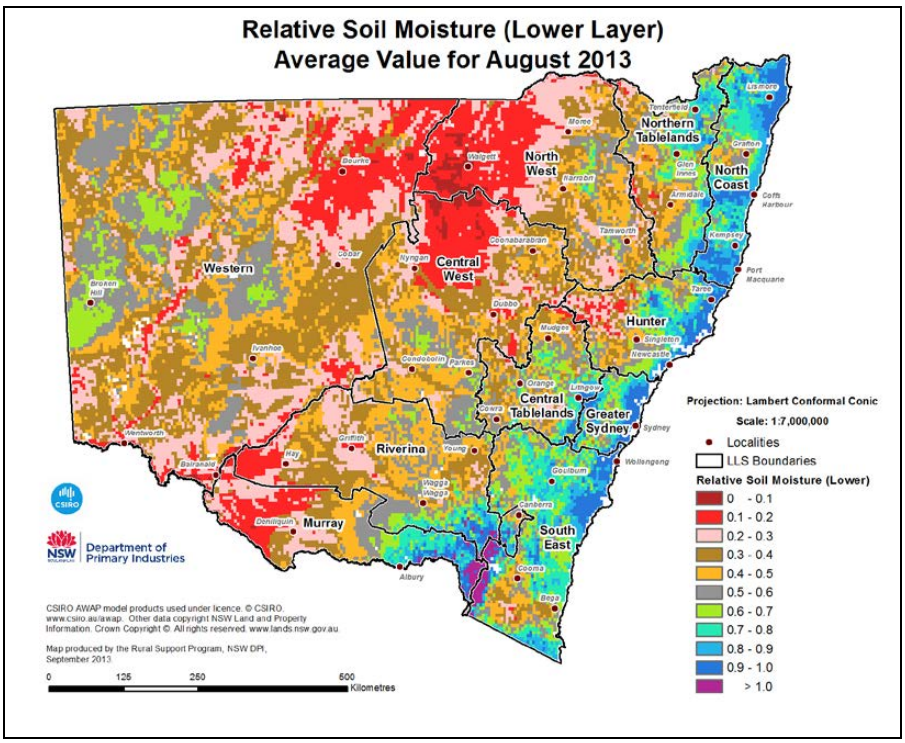


Figure 18: Relative subsoil moisture



Pasture growth and biomass

Figure 19: Modelled pasture growth

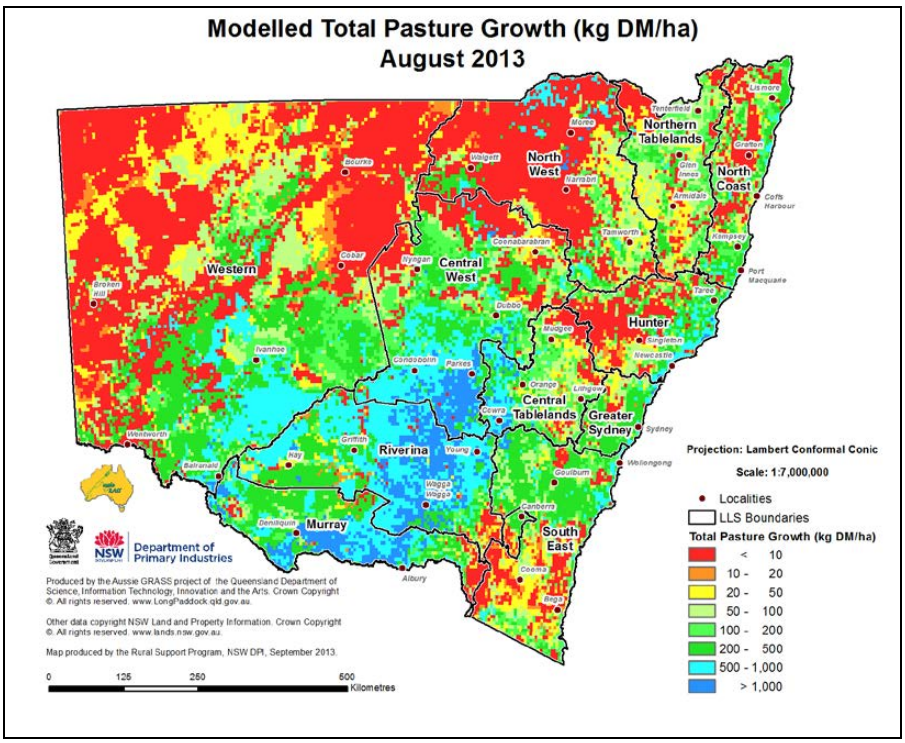


Figure 20: Modelled biomass

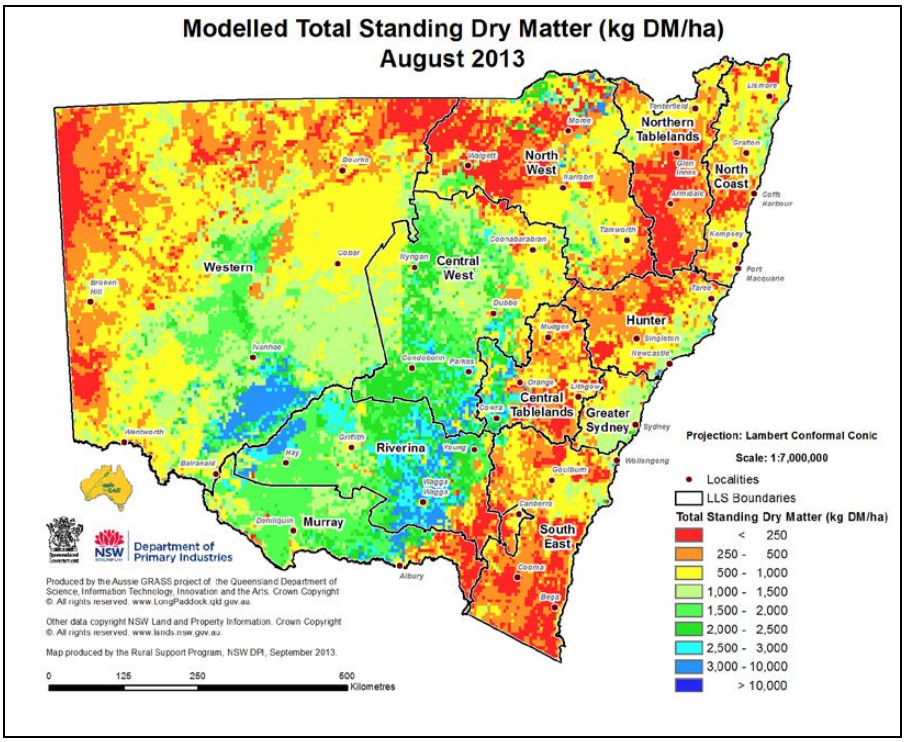


Figure 21: Relative pasture growth – monthly

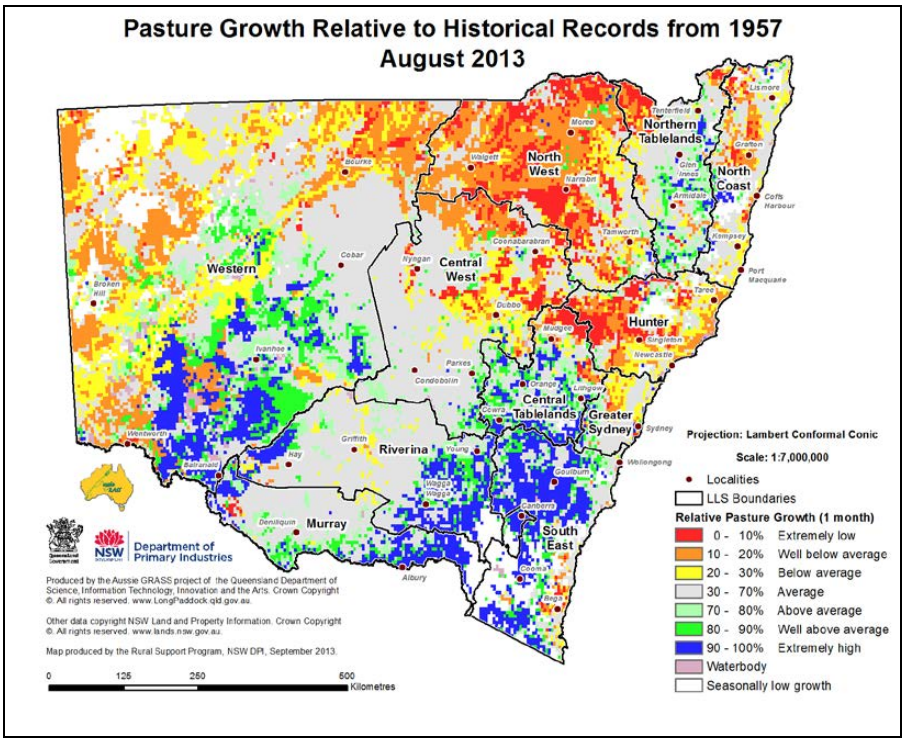


Figure 22: Relative pasture growth – quarterly

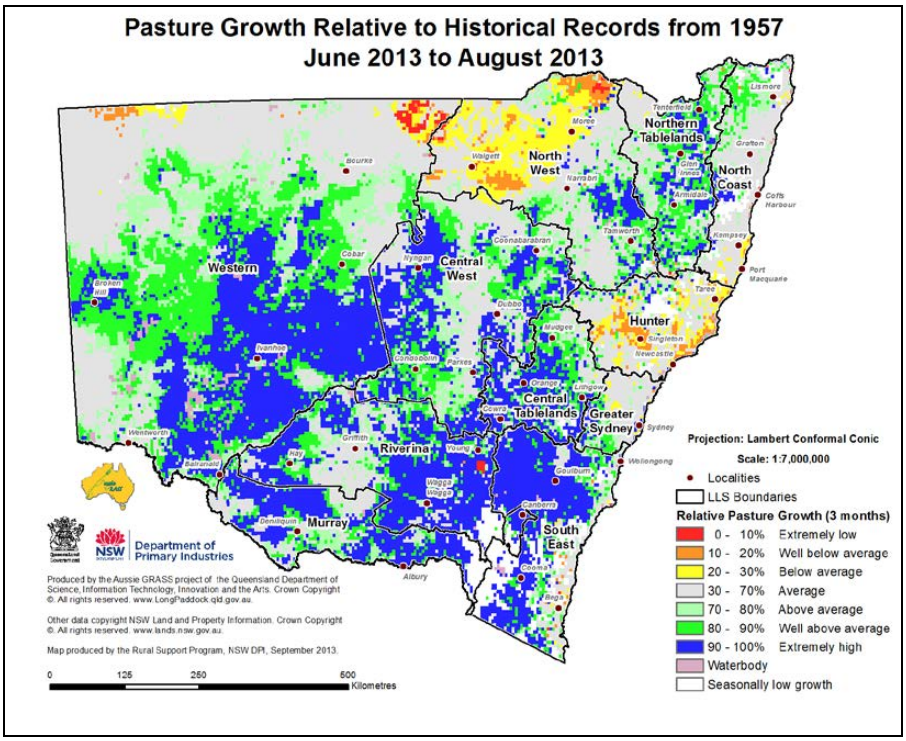


Figure 23: Relative pasture growth – half yearly

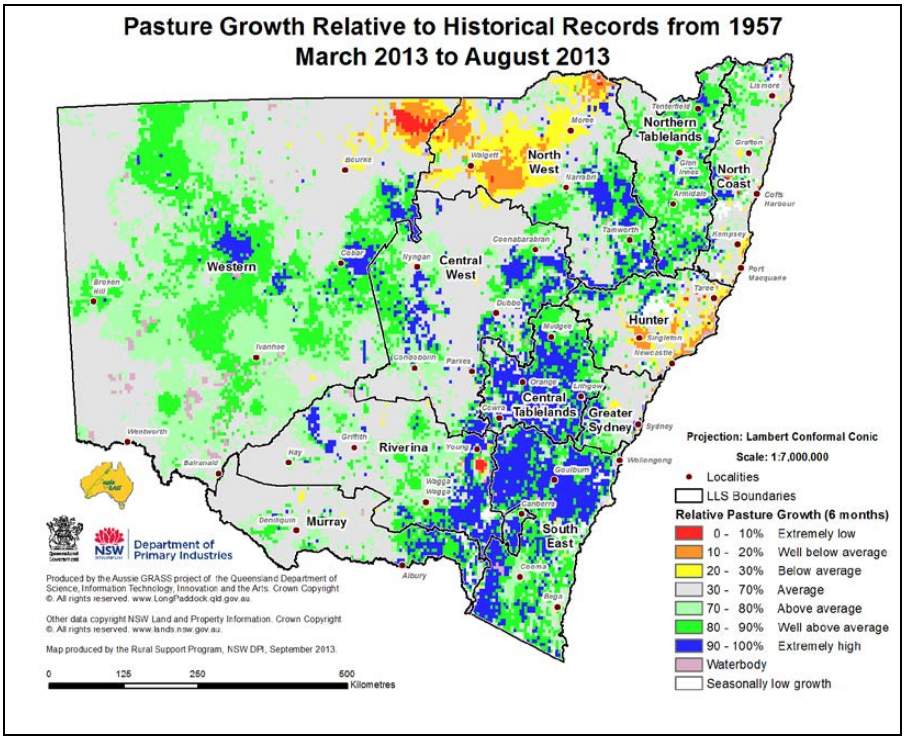


Figure 24: Relative pasture growth – yearly

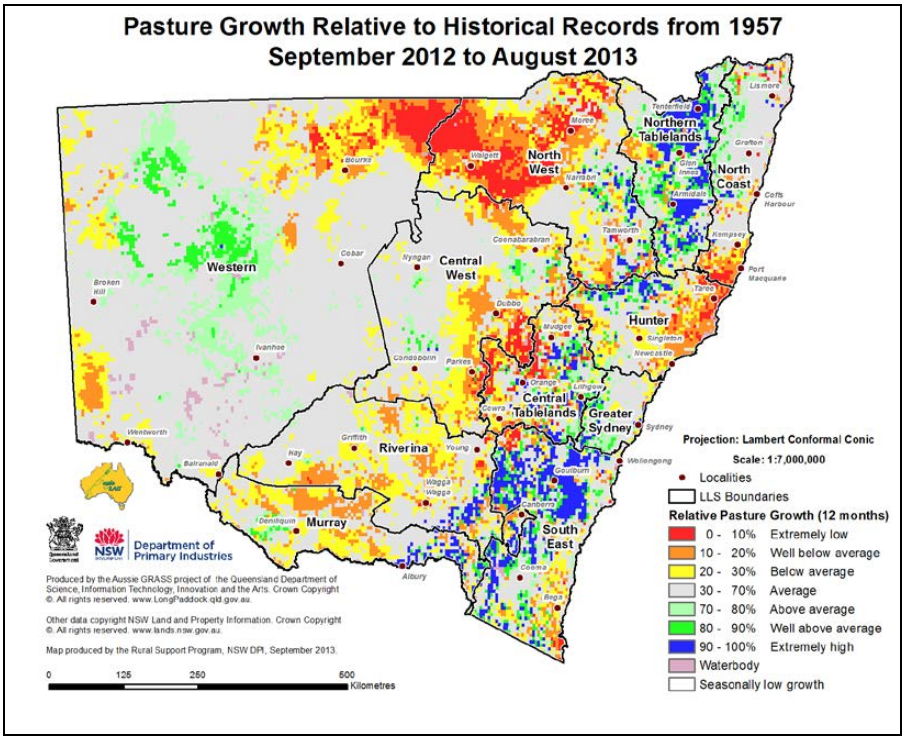
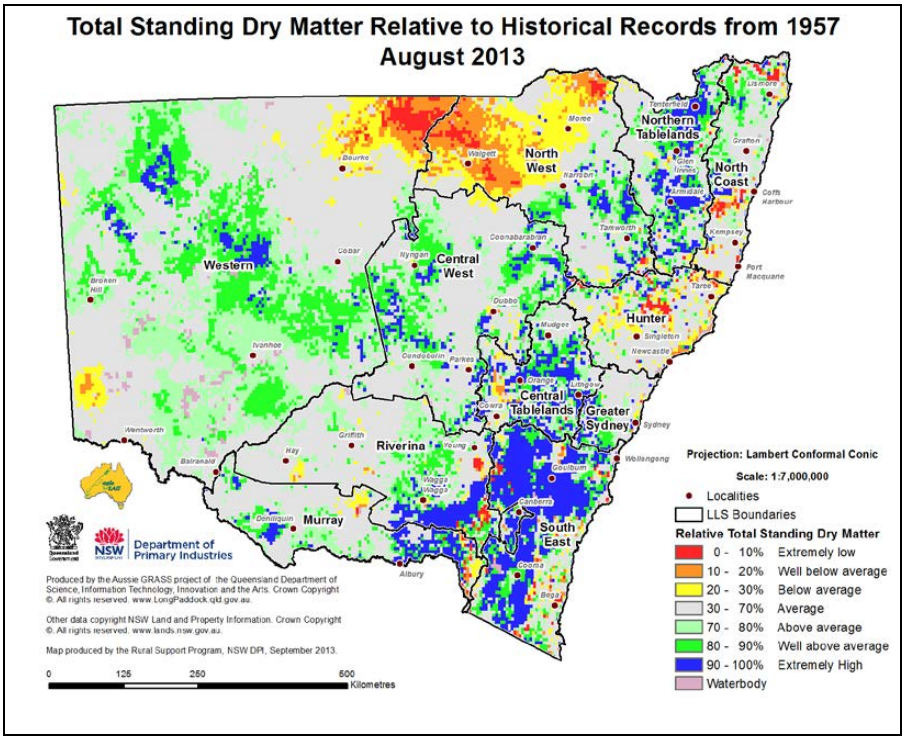


Figure 25: Relative biomass – monthly



More information

For more information, contact the NSW Department of Primary Industries on 02 6391 3100.

Acknowledgments

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