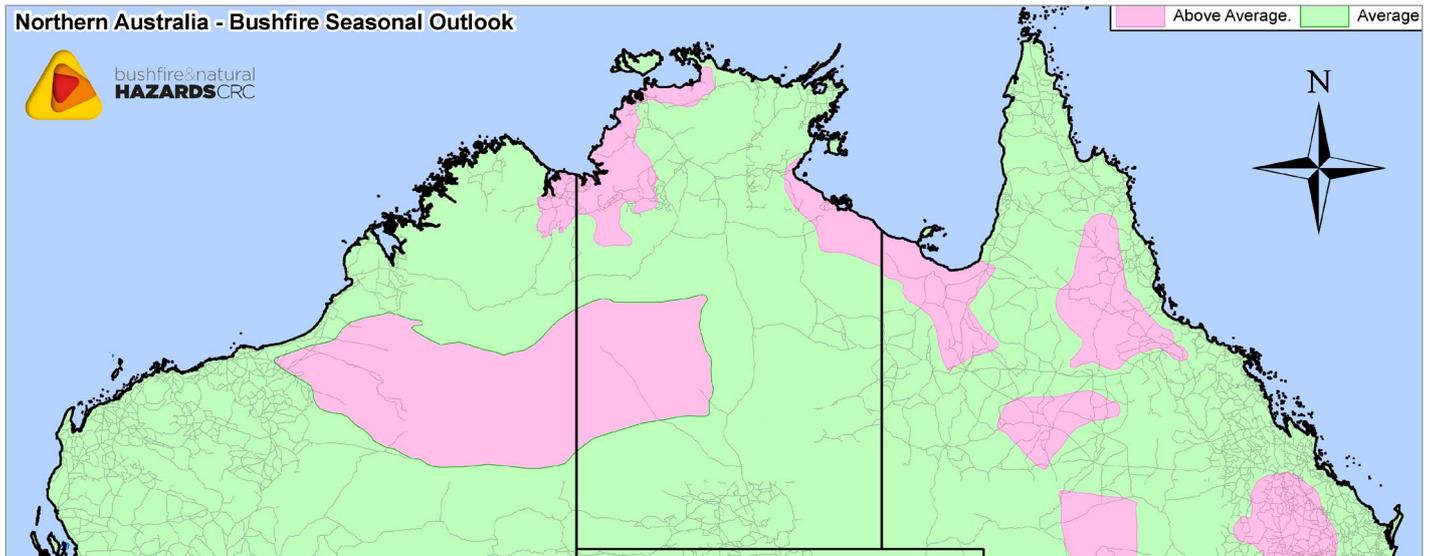


## NORTHERN AUSTRALIA SEASONAL BUSHFIRE OUTLOOK 2014



### BUSHFIRE POTENTIAL

This *Northern Australia Seasonal Bushfire Outlook* provides information to assist fire authorities in making strategic decisions such as resource planning and prescribed fire management, and to reduce the negative impacts of bushfire.

The Bushfire and Natural Hazards CRC is continuing the role begun by the Bushfire CRC as the convener of the meetings to discuss the seasonal outlooks and as the distributor of the final outlook.

A *Seasonal Bushfire Outlook* for southern Australia will be distributed in early September, and will include an update on the northern fire season.

Bushfire potential depends on many factors. In northern Australia, conditions are determined by the nature of the previous wet season. The volume, location and timing of rainfall are critically important when estimating fuel volumes and growth. They also affect the timing of the drying of the fuel.

The climate outlook for the next few months is also a crucial factor. Of particular interest are the future

tendencies of Pacific sea surface temperature associated with the El Niño-Southern Oscillation, a major climate driver over Australia. Other less quantifiable factors, such as the distribution and readiness of firefighting resources, are also considered.

The annual Northern Australian Fire Managers' Group Forum, chaired by Bushfire and Natural Hazards CRC CEO Richard Thornton, met in Broome in July.

During the two-day proceedings the Forum discussed the seasonal outlook for the imminent fire season, enabling the production of this *Hazard Note*. All other presentations from the Forum are online at [www.bnhcrc.com.au](http://www.bnhcrc.com.au)

Forum attendees included representatives of the Bureau of Meteorology, Bushfires NT, the NT Fire and Rescue Service, the WA Department of Fire and Emergency Services, the WA Department of Parks and Wildlife, Queensland Rural Fire Service, Charles Darwin University, University of Western Australia, Carpentaria Land Council Aboriginal Corporation and Kimberley Land Council.

### ANTECEDENT CONDITIONS

The 2013-2014 northern wet season saw neutral ENSO conditions (neither La Niña nor El Niño) in the Pacific along with generally warmer than average sea surface temperatures (SSTs) in the eastern Indian Ocean. With the major climate drivers in a neutral phase and generally not favouring wet or dry conditions over northern Australia, shorter-term weather features contributed to the seasonal variability.

The position of the northern Australian monsoon and the movement of tropical lows delivered above average rainfall to large areas of northern Australia, except for the southern two-thirds of Queensland, which experienced an extended period of drier than normal conditions.

A typical build-up period was followed by one of the earliest monsoon onsets on record at Darwin. The last week of November saw an active monsoon trough over the Top End and included the impact of tropical cyclone *Alessia*. A second burst in monsoon activity began around Boxing Day and brought rainfall mostly to northern Western Australia and included severe tropical cyclone

## DEFINITIONS

**Bushfire potential:** The chance of a fire or number of fires occurring of such size, complexity or other impact (such as biodiversity or global emissions) which requires resources (from both a pre-emptive management and suppression capability) beyond the area in which it or they originate. Fire potential depends on many factors including weather and climate, fuel abundance and availability, recent fire history and fire-fighting resources available in an area.

**Rainfall decile:** A decile is a statistical technique that ranks sorted observations into 10 equal groups. A decile rainfall map will show whether the rainfall is above average, average or below average for the chosen time period and area.

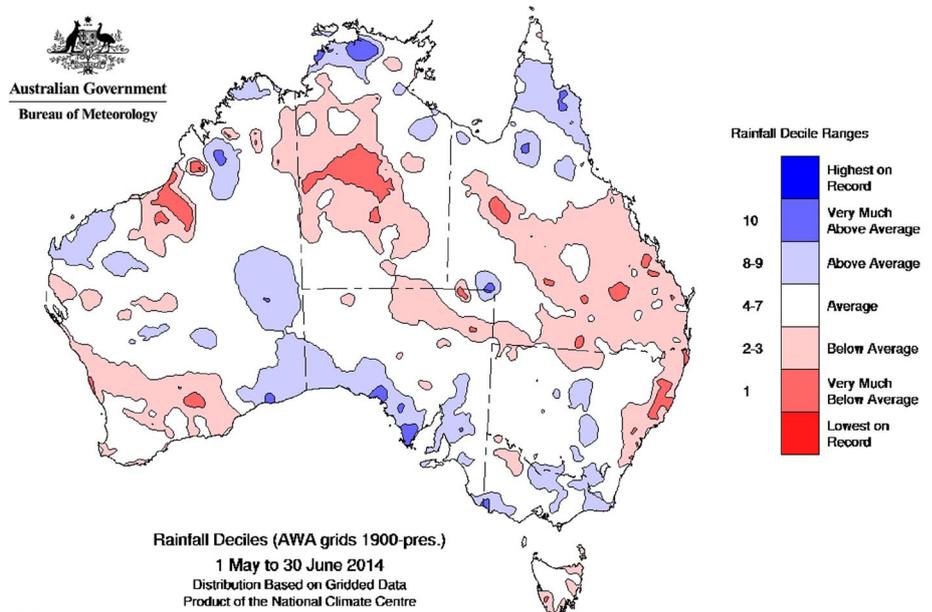
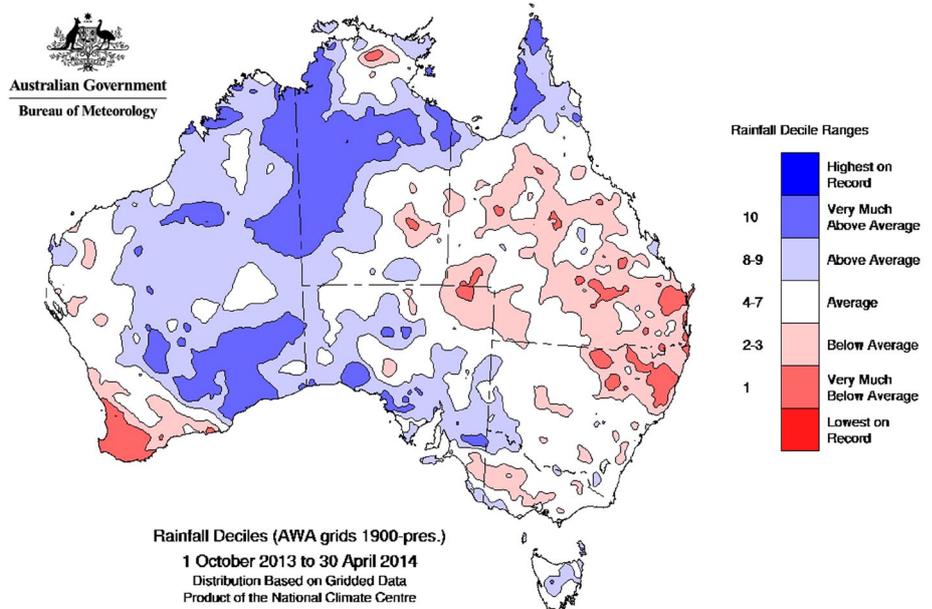
**IBRA:** Interim Biogeographic Regionalisation for Australia. Australia's landscapes are divided into 89 large geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The Bushfire Outlook map is based on the IBRA regions for northern Australia.

*Christine*, which made landfall near Karratha, WA, on 30 December 2013. While WA received above average rainfall, Queensland had its third driest December on record.

Early January saw high temperatures and a few January temperature records set across northern Australia. In mid-January another active monsoon period began that lasted nearly five weeks and included ex-tropical cyclone *Fletcher* in the Gulf of Carpentaria and two other tropical lows that moved across the Northern Territory and the Kimberley region. The monsoon produced continual, and at times heavy, rainfall across the Top End, Victoria River District and the Barkly, parts of the Pilbara and Interior WA.

In Queensland, however, the monsoon did not move far enough south to produce significant rainfall over northern Queensland except for coastal regions around the Gulf, including Cape York. Most of interior Queensland was the driest since 2003 for January and received near average rainfall for February, which was not enough to make up for several months of dry conditions.

Following an exceptionally wet January



and February, March was relatively dry for most of northern Australia with no large-scale monsoon patterns for the month. The wet season ended with a series of small rainfall events that continued until the end of April, with April rainfall totals being near average for most of the tropical north. A northwest cloudband in late April brought welcome rainfall to the Kimberly, Interior WA, the Alice Springs District and parts of Southern Australia, with some locations setting new April rainfall records.

## CLIMATE OUTLOOK

The tropical Pacific Ocean surface temperature has been at levels typically associated with a weak El Niño since May.

However, waters below the surface have cooled and atmospheric patterns have only recently shown some response to the warm ocean temperatures. These changes would need to persist for several weeks in order for an El Niño to become established, and it remains possible they are simply related to shorter-term weather variability.

Most climate models surveyed by the Bureau of Meteorology along with recent observations continue to indicate El Niño is likely (70 per cent chance) to develop later this year.

El Niño is often associated with below normal rainfall across large parts of inland eastern Australia during the second half of the year. The recent Seasonal Climate Outlook suggests a northern Australian

rainfall pattern may have some features typical of El Niño periods. Parts of northern Queensland are likely to experience drier than normal conditions for the remainder of the northern dry season. During an El Niño, the northern wet season and monsoon typically arrive later than normal, with northern Australia tending to have lower than usual rainfall from September through January. There is not a strong correlation between El Niño and rainfall across northern WA.

The Indian Ocean Dipole (IOD) typically has influence on Australian climate from about May to November. So far, the IOD has been neutral for most of the year. In mid-June, the sea surface temperature pattern across the tropical Indian Ocean tended towards a weak negative dipole pattern (warmer in the east than the west). However, some model outlooks suggest this may be a short-term shift, and the IOD may return to a neutral pattern for the rest of the year. Negative IOD events are typically associated with average to above average rainfall for central Australia from August to November.

Warmer than normal sea surface temperatures have surrounded northern Australia for most of the dry season. These warmer waters can provide more moisture to the atmosphere, which in favourable weather conditions (for example, interactions with fronts or northwest cloudbands) may result in increased rainfall.

The temperature outlook for Australia favours warmer than normal maximum and minimum temperatures for the remainder of the dry season across northern Australia. This could be partially caused by the warmer than average waters across mid-latitude Indian and south Pacific oceans - air masses moving over Australia need to travel over a large swathe of warmer than average ocean.

## REGIONAL SUMMARIES

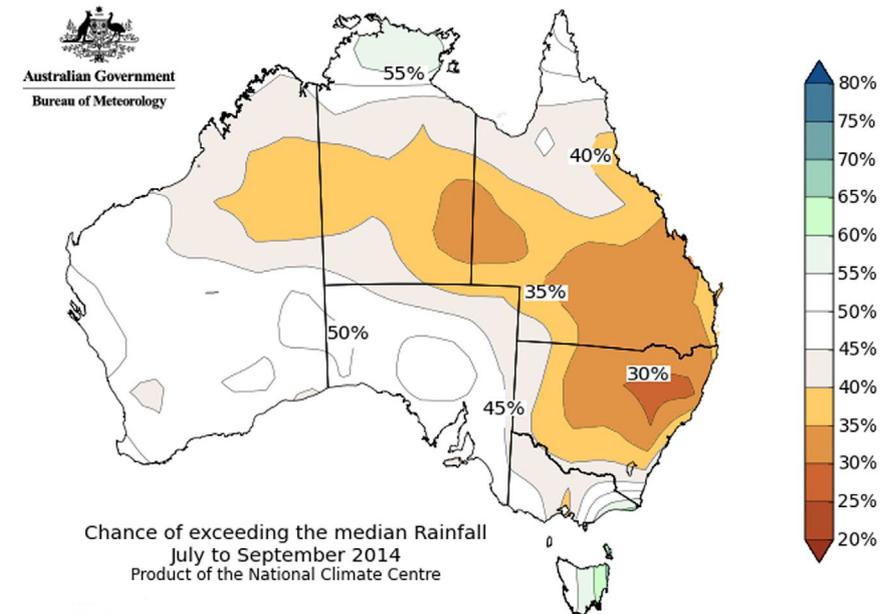
### NORTHERN TERRITORY

#### Overview

Significant rain events across a large part of the Northern Territory over the past six to nine months, together with longer range forecasts from Bureau of Meteorology and an expectation of a long and hot fire season, allow for the following observations on bushfire potential in the Northern Territory.

#### Top End

The Darwin Coastal and Darwin IBRA regions had average rainfall totals over the wet season and this has resulted in significant growth



of vegetation. In addition, the range and density of Gamba Grass continues to have an impact on this region, greatly increasing the complexity and potential risk associated with managing bushfires. The relatively late curing of the vegetation in the coastal area and limited opportunities to undertake mitigation efforts means that the assessment for the Darwin Coastal region is for Above Average bushfire potential, and an Average potential remains in the neighbouring regions.

#### Southern Top End

Rainfall totals and associated vegetation growth in the far north including the Victoria Bonaparte IBRA region. Broad scale efforts at mitigating late bushfires have been partially successfully with the high fuel loads somewhat reduced. However, an above average bushfire potential is evident in this region.

On the eastern side of the Northern Territory, significant rain and good vegetation growth has resulted in well above average levels of fuel on the coastal region, including the Gulf Upper Coast. The work that local land management groups and land holders have achieved in fuel hazard abatement is helping management of this area, but above average bushfire potential is still expected for the Gulf Upper Coast region. Neighbouring areas have average bushfire potential.

#### Central Regions

There has been significant rain across the central reaches of the Northern Territory from the west to middle areas. Rainfall was well above average or at extremely high levels. Average bushfire potential remains

elsewhere across the central Northern Territory, south and east towards the South Australian and Queensland borders.

### WESTERN AUSTRALIA

#### Overview

Bushfire potential depends on many factors including climate and weather, fuel abundance and availability, recent fire history and available fire-fighting resources. The Kimberley and Pilbara are fire-prone landscapes and it is normal for bushfires to occur each year. Above normal bushfire potential means that there is a high chance of fires occurring that may be complex, protracted or that could require resources beyond the local capacity.

#### Kimberley

Overall there is basically an above average bushfire potential in the central region. The extensive prescribed burning in the northern region of the Kimberley has assisted in reducing the very heavy grass growth to an average bushfire potential. The areas to the east and west of the central region are also of average bushfire potential. This assessment is cognisant of the increase in prescribed burning that is planned or has been undertaken across the region.

#### Pilbara/Northern Goldfields

In general, rainfall across the Pilbara has been average or above average. Due to these rainfall patterns there is an above average bushfire potential in the central and eastern part of this region. On the western side of the central zone the outlook potential is for an average season.

## NORTH QUEENSLAND

### Overview

Queensland's bushfire season is primarily influenced by long-term and seasonal short-term climate conditions and the relationship the climate has on vegetation.

In the 2014 wet season monsoon Tropical Cyclones Dylan and Ita provided much needed rainfall over Queensland, during a neutral ENSO phase over six months. Rainfall has generally been moderate tending average to below average across most of northern and central Queensland with the exception of Cape York Peninsula where above average rainfall occurred.

The wet monsoonal conditions and consistent thunderstorm activity encouraged vegetation growth over grasslands throughout regional areas of northern, central, coastal and western Queensland.

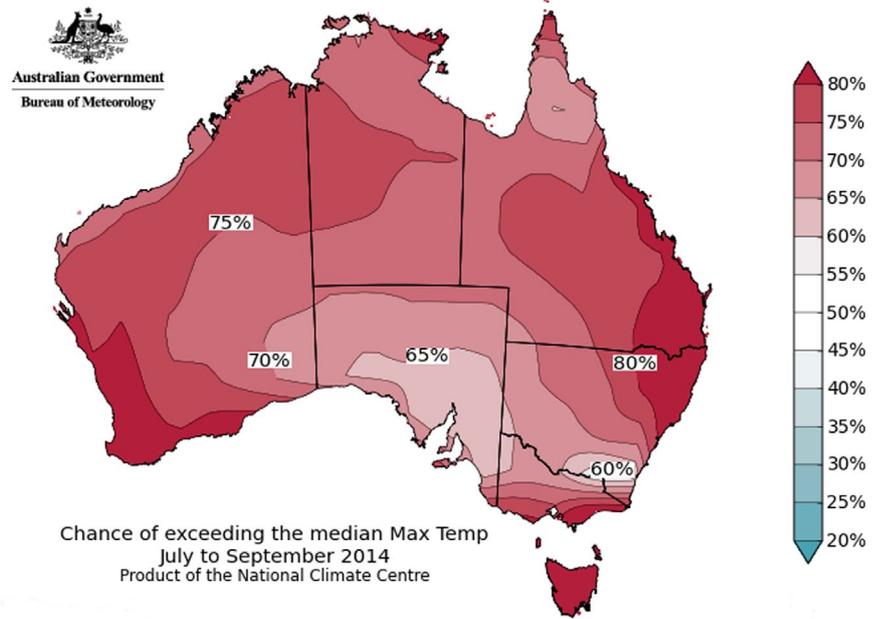
Consistent above average temperatures from April to June 2014 promoted considerable drying of the soil moisture profile, adversely affecting vegetation conditions.

With the onset of the dry season the condition of the vegetation is declining across inland and northern inland areas, significantly increasing bushfire risk especially over landscapes with moderate to abundant grassland fuel loads.

Pasture conditions vary considerably throughout the state with sparse grass conditions in the far western border and nearby inland regions with moderate to abundant grass fuel loads over the northern, central and coastal regions. Winter frosts over inland pastures have added to the denigration of grassland conditions.

Livestock numbers are reduced over large areas due to the increasing drought conditions now covering most of inland Queensland. Landowners are now focused on protecting existing pasture growth, which has increased the risk of fire in some regions.

Forecast climate conditions indicate the potential of receiving less than 50 percent chance of median rainfall over most of



Queensland. The temperature outlook for the same period indicates an increase in day time and night time temperatures.

This in combination with the drying soil profile will contribute to an increased bushfire risk. Bushfires may develop and spread quickly in grassland areas, challenging the response. Already, fire activity is noted to be freely burning during cool overnight temperatures.

In collaboration between state fire and land management agencies, Carpentaria Land Council, landowners and Bushfires NT the following areas have an Above Normal Bushfire Potential for the 2014/2015 bushfire season:

- A buffer area surrounding Coen.
- Inland Northern Tablelands – from Hopevale west of Cooktown south to follow along the western edge of the dividing range south to Innisfail, west to Bulleringa NP north to Laura and east to Hopevale.
- Gulf Plains – north of Normanton to Julia Creek west to about Mary Kathleen, north to Gregory Downs and west to the Northern Territory Border.
- Mitchell Downs and Uplands – West of Pentlands near White

Mountain NP, south west to Winton, northwest to Kynuna north to Saxby, east to Dutton Park and south east to White Mountain NP.

- Brigalow Belt North (Bowen Basin) – Bowen River east to Eungella Hinterland south along the ranges to Alsace (north of Dingo), west to Blackwater, north west to Capella, Clermont, north to Pasha and northeast to Bowen River/Bowen Development Road crossing.
- Central West – Barcardine east to Bogantungan south west to Tambo, North West to Blackall and north to Barcardine.
- Upper Burnett - Colosseum south to Childers, Miva, west to Tansey, and Monogroilby, northwest to midway between Eidsvold and Cracow, north to Lawgi Dawes, north east to Kroombit Tops NP, east to Wietalaba NP, south east to Colosseum.

A Normal Bushfire Potential is predicted for all other areas north of latitude S25°.

Regions of South East and Western Queensland south of latitude S25° will be assessed during the Southern Australia Bushfire Season workshop August 2014.

**Bushfire and Natural Hazards CRC is a national research centre funded by the Australian Government in the Cooperative Research Centre (CRC) Program. It was formed in 2013 in partnership with the fire, land and emergency service management agencies in Australia and New Zealand for an eight year program to undertake end-user focused research.**

Hazard Notes is prepared from available research at the time of publication to encourage discussion and debate. The contents of the Hazard Notes do not necessarily represent the views, policies, practices or positions of any of the individual agencies or organisations who are stakeholders of the Bushfire and Natural Hazards CRC.

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