

Drought services in Australia

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Acknowledgment: Bureau Colleagues





As drought takes tragic toll, Queensland families must decide to stay on farms or leave the land behind

John McCarthy

[The Courier-Mail](#)

November 02, 2013

“EIGHT weeks - maybe 12 - is all many farmers in western Queensland have left before they have to make some of the toughest decisions of their life.

Some may walk off the farms they have spent a lifetime building.

Some will buckle under, try something different and rack up ever more crippling debt.

According to the statistics some may hit the bottle, some may suicide.

If rain doesn't come soon to the west, farming will stop and everything will be about survival.

In some towns, the flood recovery funding for roads is about the only money being spent.

Pubs in Cunnamulla are giving away food.

Rural mental health advocate Alison Fairleigh said she had never seen such deep despair.”



Outline

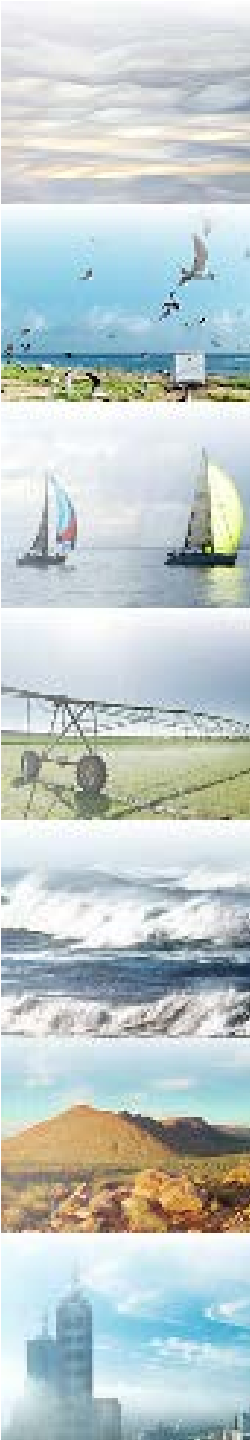
Drought in Australia

Drought under climate change

Current drought services

Future drought services





Drought in Australia

Drought Services in Australia

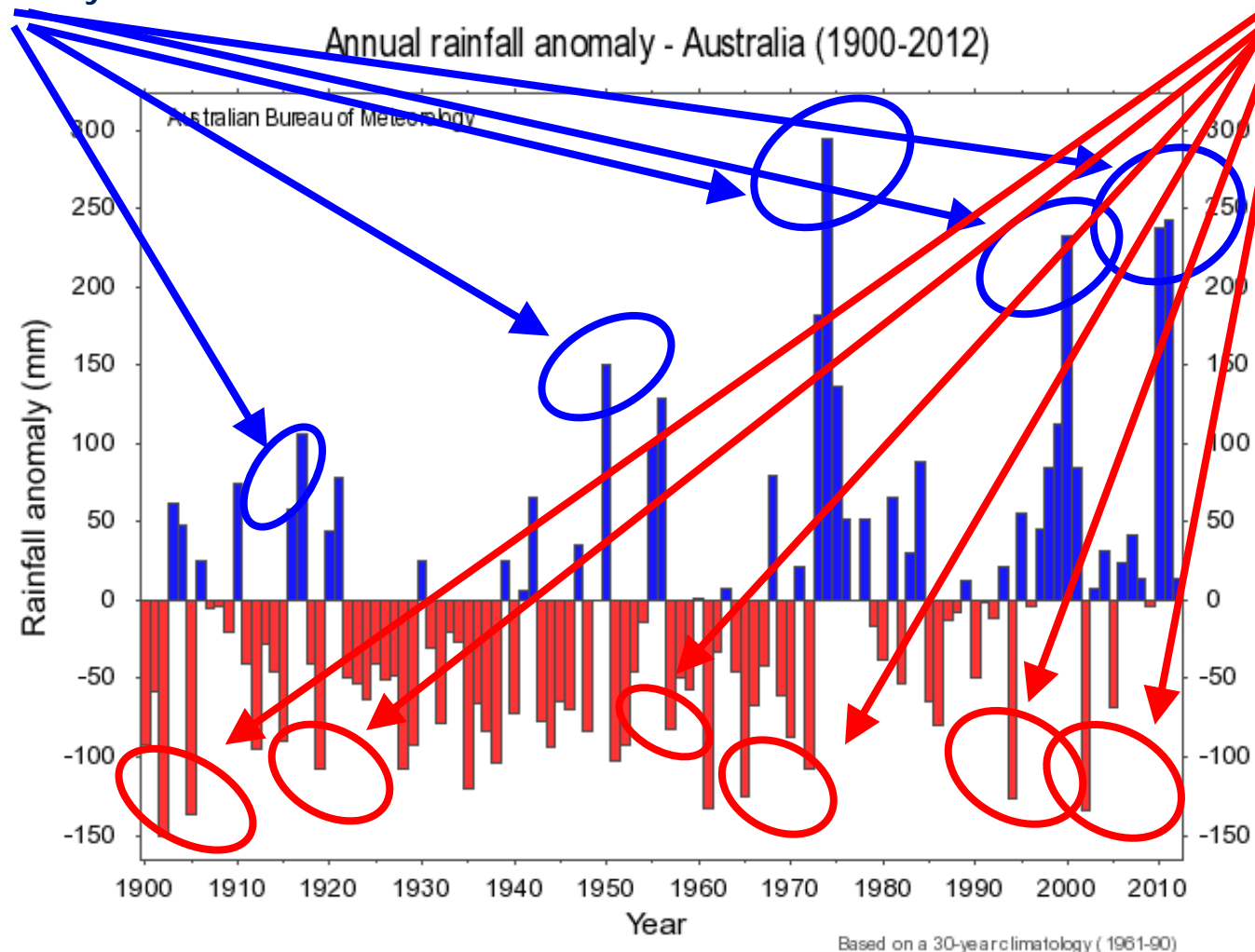


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ENSO and Australian rainfall

Flood years and La Niña events

Major droughts and El Niño events

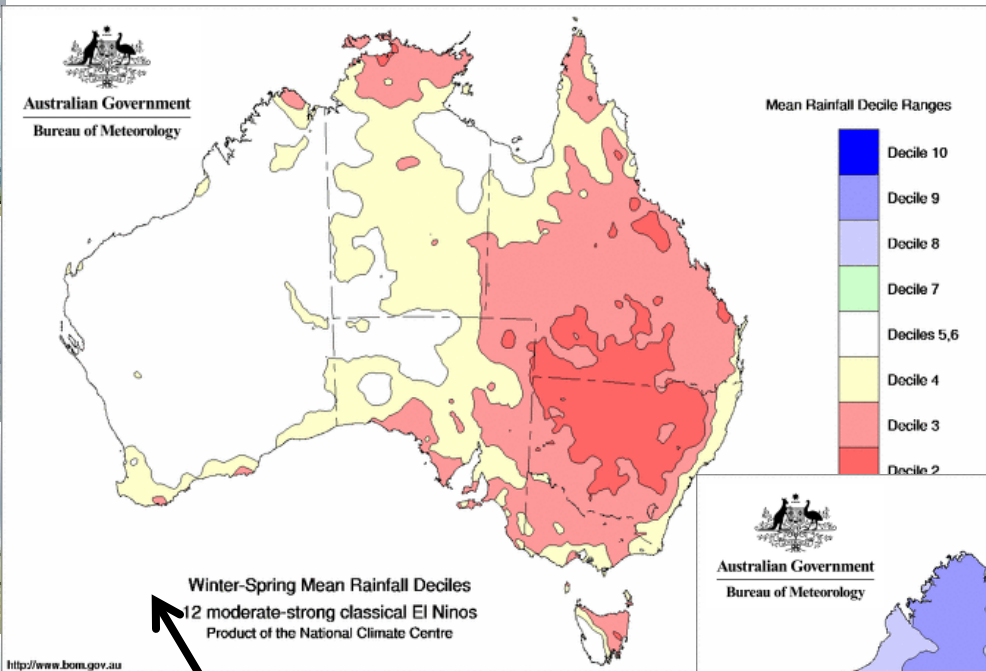


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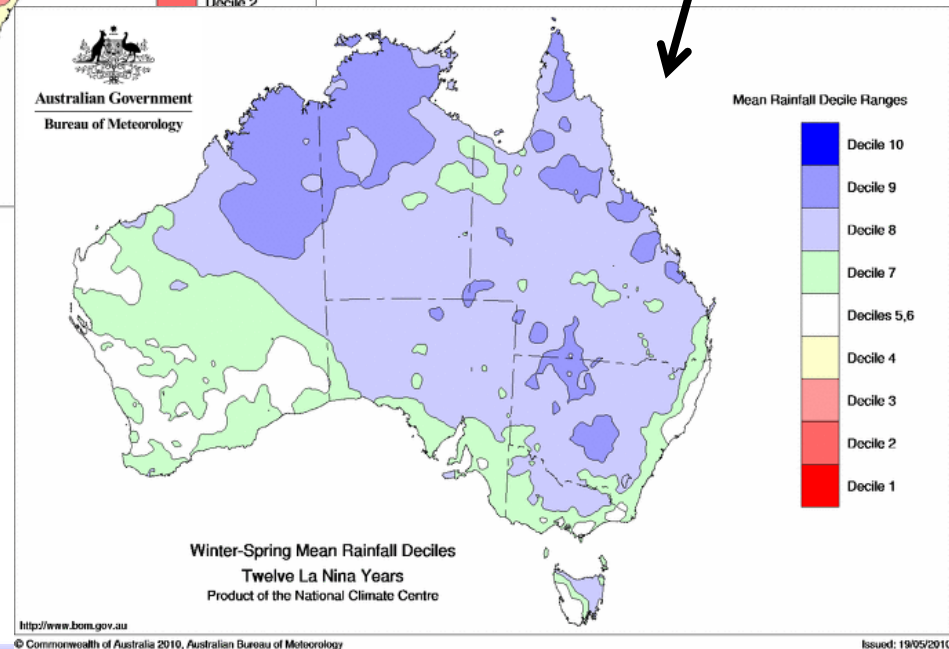


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ENSO and Australian rainfall



Average rainfall deciles for 12 historical La Niña events.



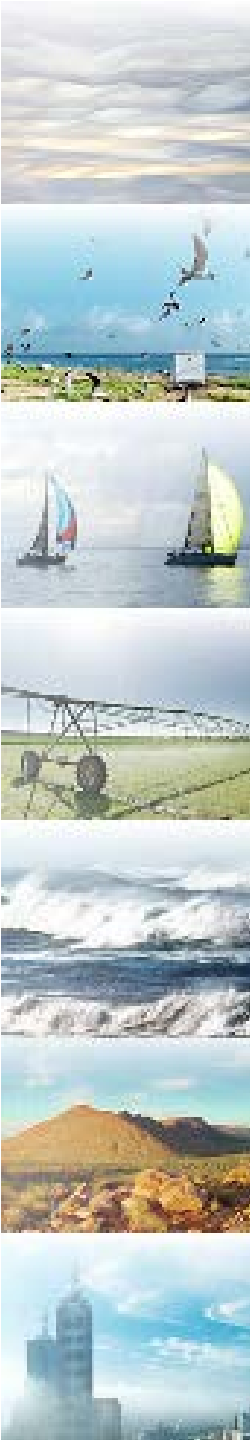
Average rainfall deciles for 12 historical El Niño events.

Drought Services in Australia



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Issued: 19/05/2010



Drought under climate change

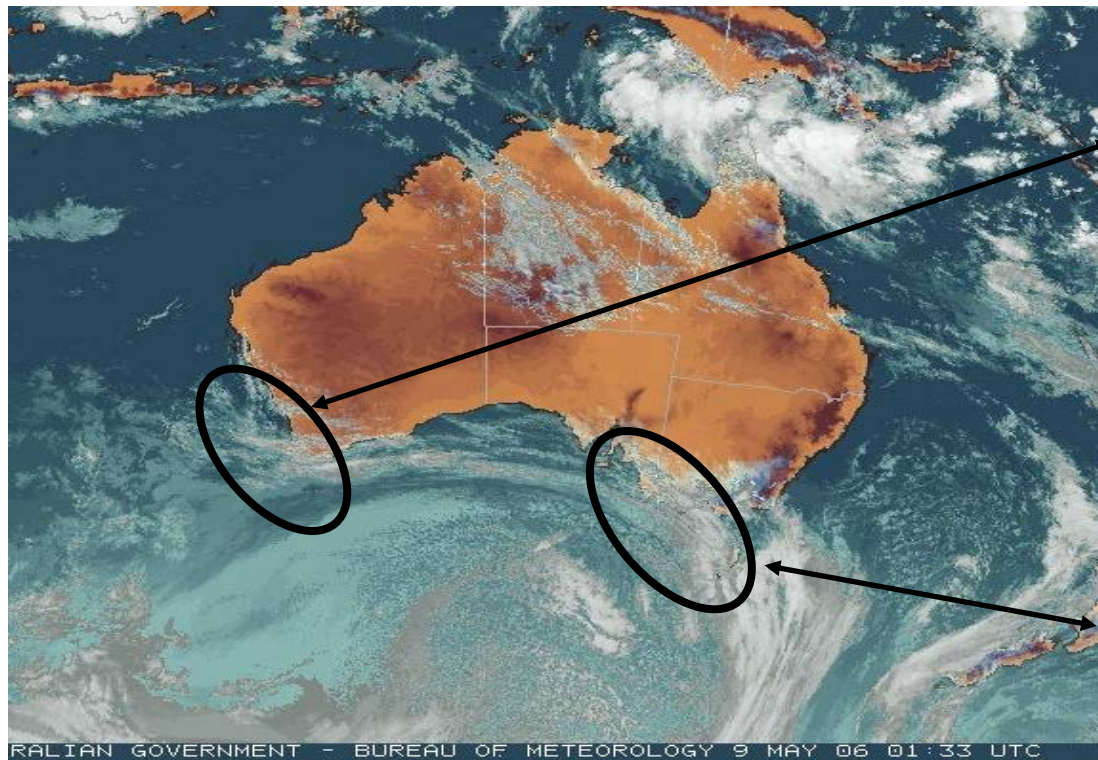
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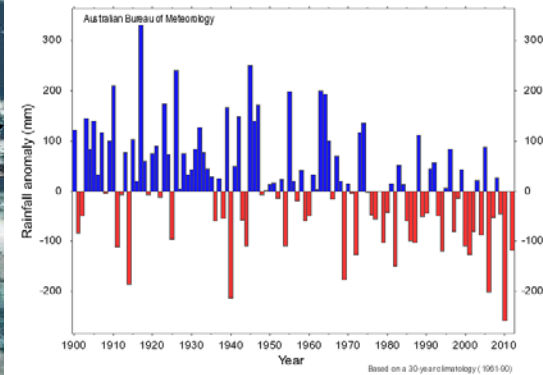
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Future of drought in Australia:

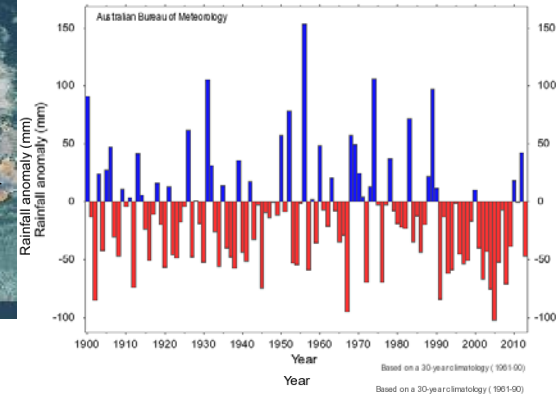
Increasing cool season aridity in southern Australia has probable links to climate change



Southern Wet Season rainfall anomaly - Southwestern Australia (1900-2012)



Autumn rainfall anomaly - Southeastern Australia (1900-2013)



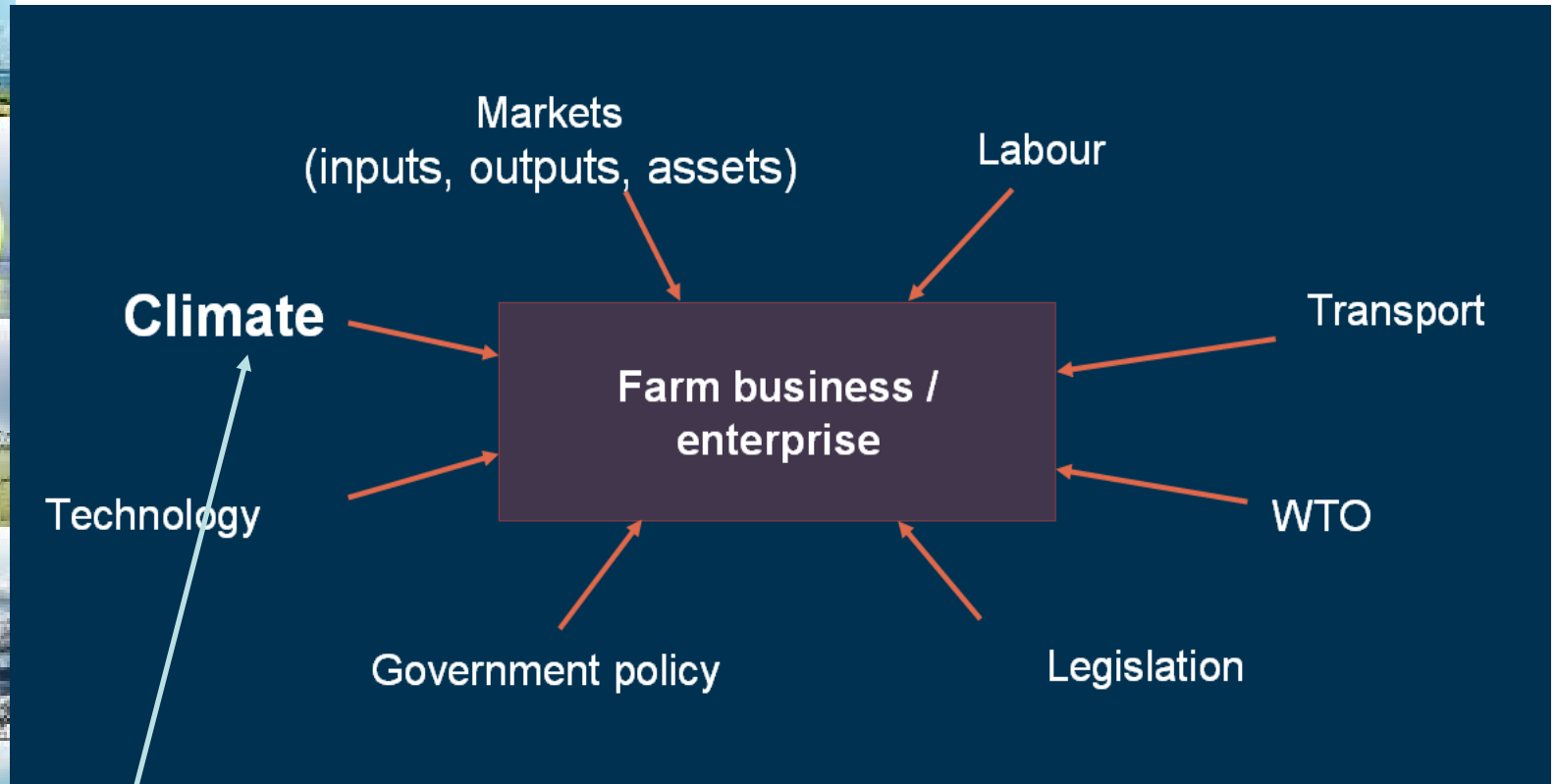
See www.seaci.org or www.ioqi.org.au

Drought Services in Australia



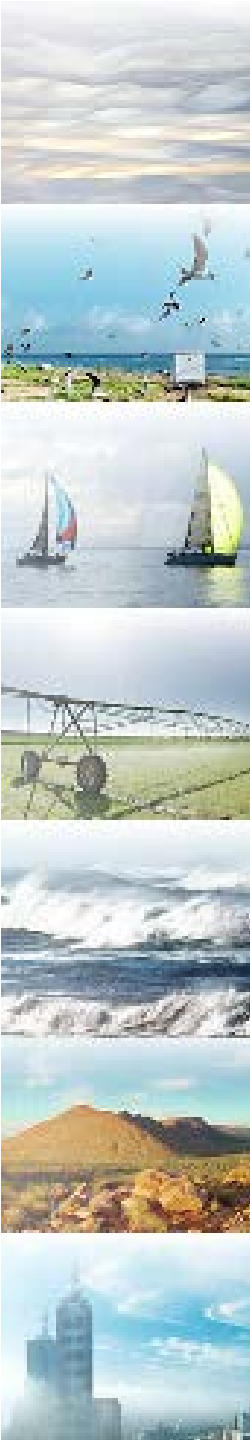
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National drought program reform



Tools and technologies to inform farmer decision making.





Current drought services

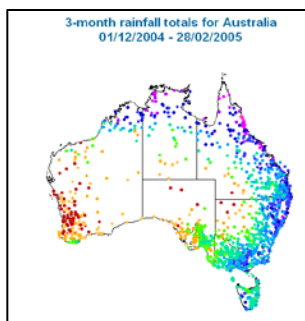
Drought Services in Australia



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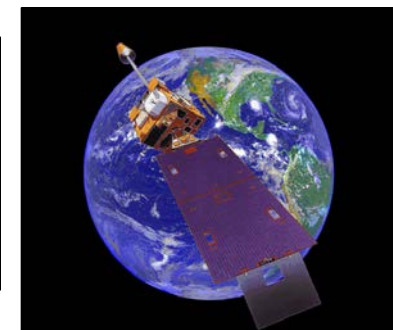
Constructing AWAP Gridded Datasets

Supporting an integrated approach to monitoring and predicting climate across Australia.



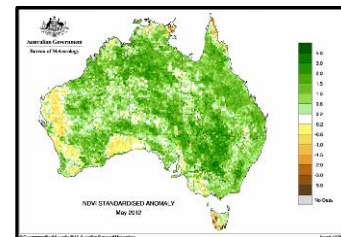
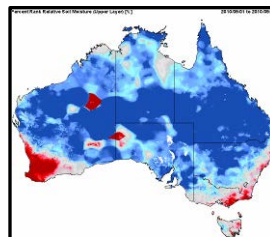
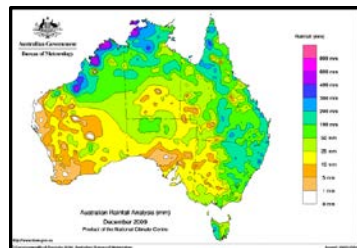
In-situ
observations

Sophisticated spatial analyses
&
Physical water/carbon model



Remote
sensing: NDVI,
Solar Radiation

Rainfall, temperature, soil moisture, runoff, *etc.*



Drought Services in Australia

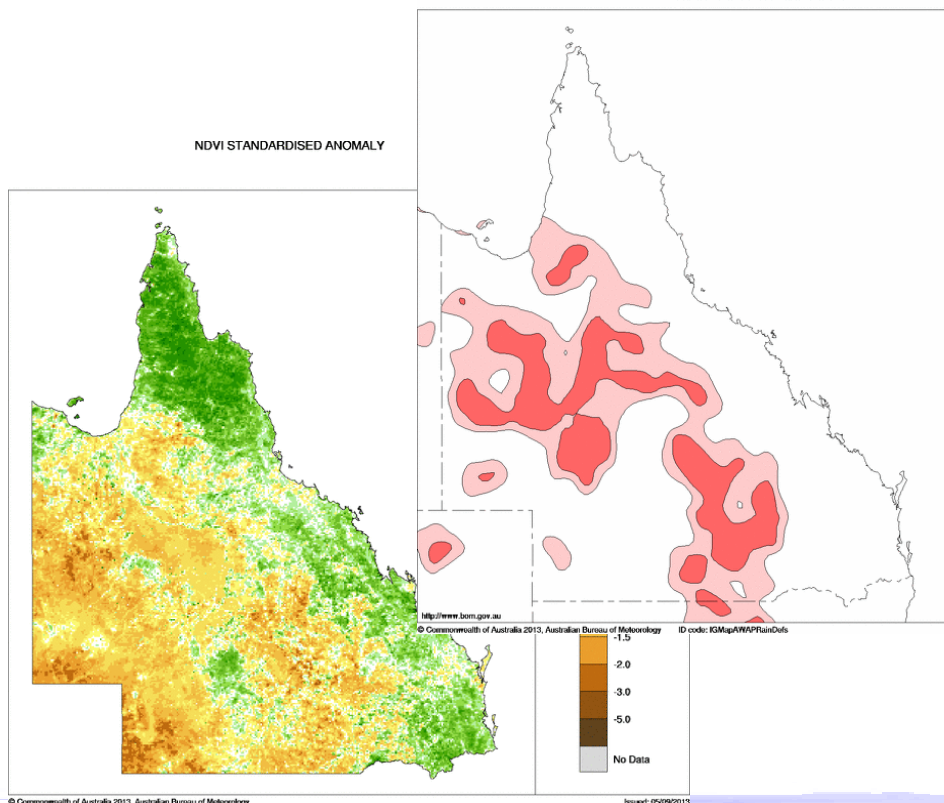


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Drought Watch

- Monitoring and reporting of meteorological and agricultural drought: A Drought Statement and Weekly Rainfall Update.
- Reports on Significant Events and contributions to briefings, research reports etc).

Rain Deficiencies (AWAP LowRes 1900-now) 1 October 2012 to 31 October 2013
Distribution Based on Gridded Data
Product of the National Climate Centre



Rainfall deficiencies

Australia is a large continent containing many different climate zones, from wet tropics in the north, arid and semi-arid conditions in the interior, and alpine climates in the south-east. Each climate zone is influenced by very different large-scale, predominant weather and climate patterns. For this reason, at any time different parts of the Australian continent can be affected by very different climate extremes. An example of this occurred in 2010, where southwest Western Australia experienced its driest year on record, in contrast to the rest of Australia, which received above-average to very-much-above-average rainfall.

Use our Drought Statement, rainfall maps and reports to watch for areas with significant long and short-term rainfall deficiencies.

[Drought Statement](#) [Rainfall tracker](#) [Updates and Outlooks](#) [Related information](#) [About drought](#)

Issued on 8 November 2013 by the National Climate Centre

Rainfall deficiencies increase across Queensland

October was a dry and unusually warm month for Australia (14th driest on record, 7th warmest for mean temperature) with below average rainfall affecting most areas. The only regions to experience above average rainfall were coastal areas in the southeast and far northwest, with small pockets of above average rainfall scattered around the northern tropics and Western Australian Goldfields.

The distribution of rainfall deficits for the 13-month (October 2012 to October 2013) period remain similar to the previous 12-month period, and have increased in severity and expanse in eastern Australia. Serious to severe deficiencies (lowest 10% to 5% of records) are in place across much of western Queensland and in a broad band inland of the coastal ranges, extending from the Gulf of Carpentaria to just across the New South Wales border. Most of Queensland west of the ranges and northern New South Wales has received less than 65% of the long-term (1961-1990) average rainfall for the 13-month period.

Similarly, longer-term rainfall deficiencies for the 19-month (April 2012 to October 2013) period have also increased compared to last month. Serious to severe deficiencies exist between Geraldton and Shark Bay as the west



Subscriptions and further information

To subscribe to email alerts, contact helpdesk-climate@bom.gov.au and include 'Drought Statements' in the subject line.

For more information about this rainfall deficiencies statement, please contact the following climatologists:

Darren Ray (SA) (08) 8366 2664
Aaron Courts-Smith (NSW) (02) 9236 1525
Jeff Sabburg (Old.) (07) 3239 8660
Karl Braganza (National) (03) 9669 4344

[Definitions](#)

<http://www.bom.gov.au/climate/drought/>

Drought Services in Australia



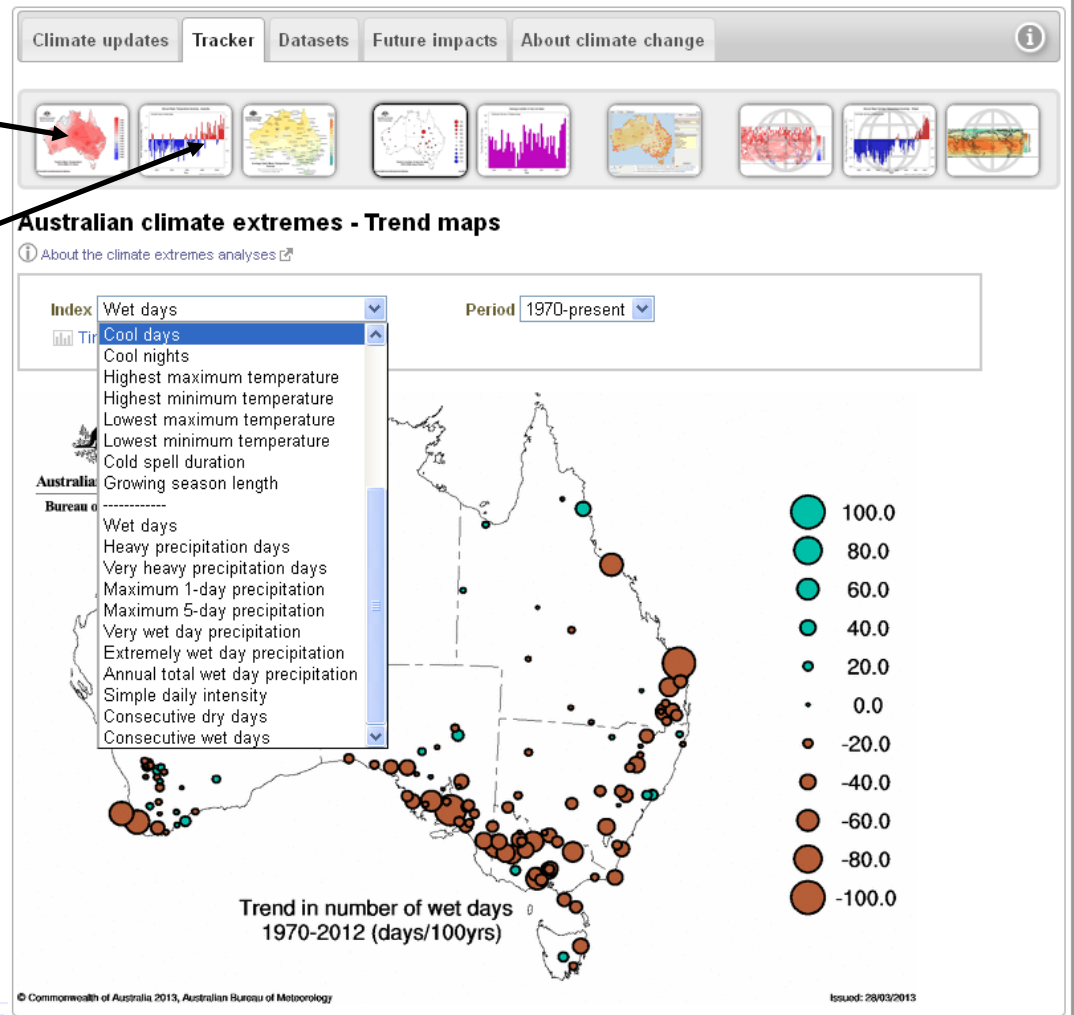
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Monitoring trends in rainfall and temperature

www.bom.gov.au/climate/change/

Trend maps

Australian timeseries graphs



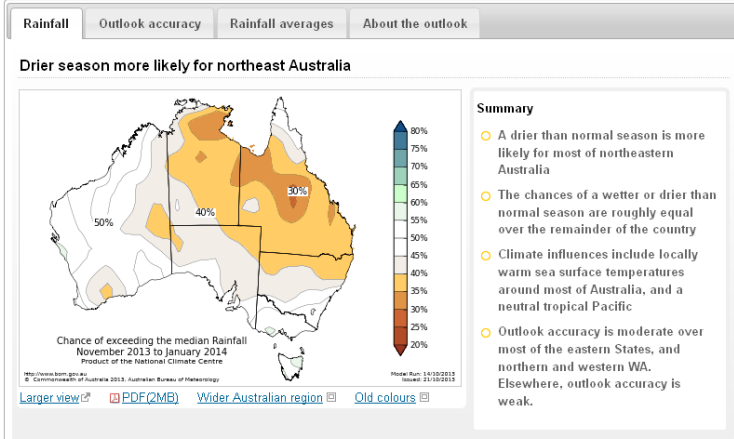
The Seasonal Climate Outlook

- 3-month prediction of the future *state* of the climate.
- Prediction of state of ENSO.
- Seasonal & experimental intraseasonal forecasts (weeks to months) based on a dynamical model (POAMA)

National rainfall outlook for November to January

Issued 23 October 2013

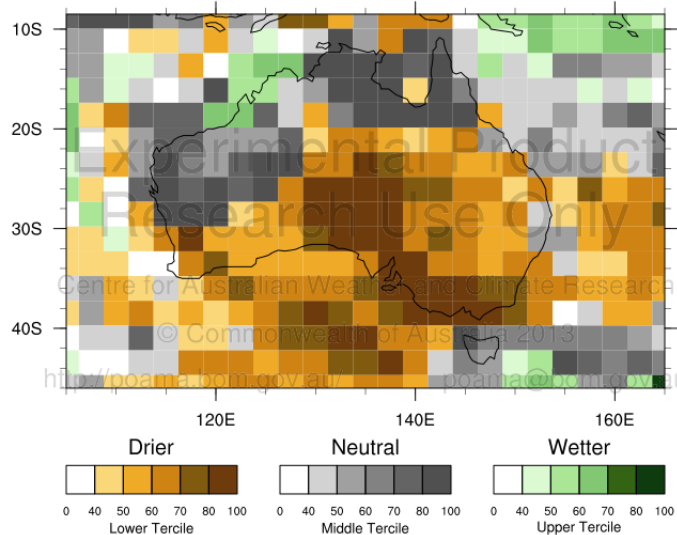
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Precipitation / Rainfall Tercile Probabilities

Start Date: 2013-10-24

Region: Australia
 Period: (2 Weeks) 24/10/2013 to 06/11/2013



Climatology: years from 1981 to 2010 with mmdd = 1021

Created: 2013-10-25 23:32:48 +0000

Start Dates (DD/MM): Start Date List

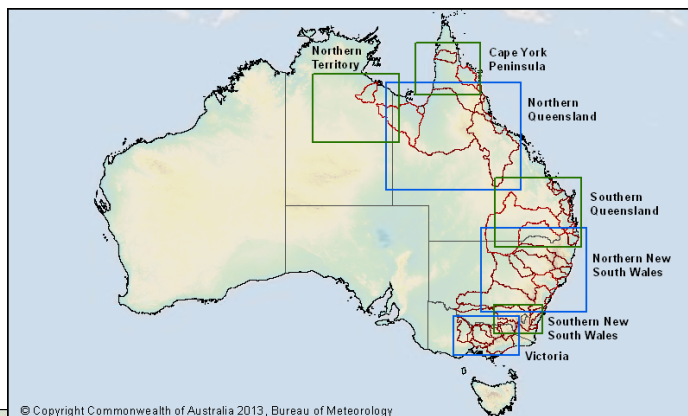
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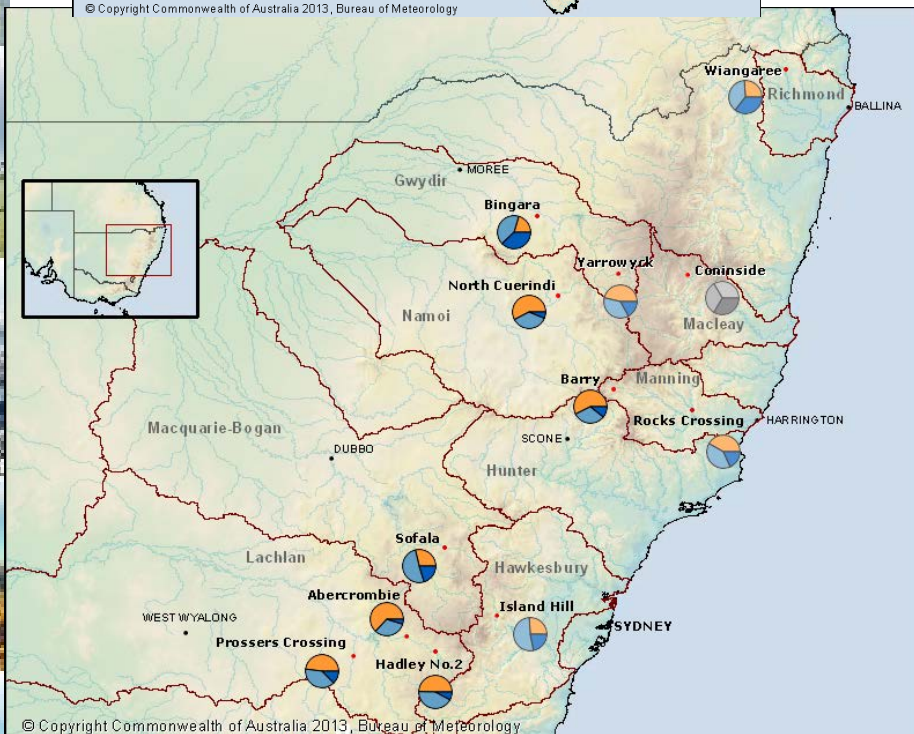


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Seasonal streamflow forecasting



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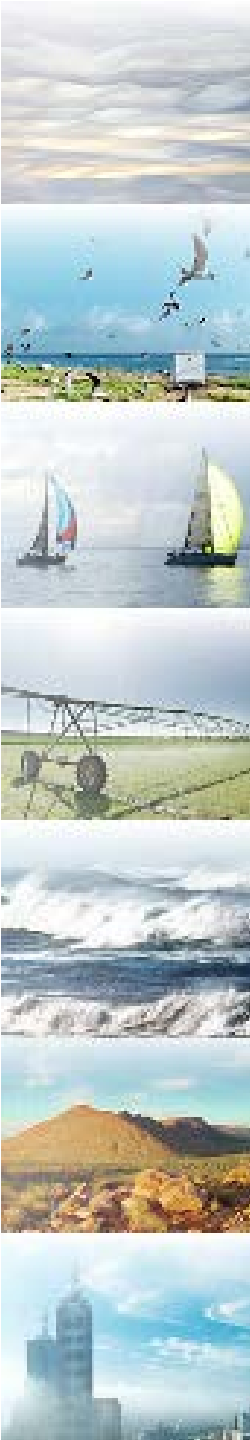


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- Three-month outlooks of total streamflow volumes at a site or total inflows to a water storage
- 70 locations in 32 river basins
- Statistical approach using Bayesian Joint Probability modelling
- Predictors include past rainfall and streamflow data and climate indices

www.bom.gov.au/water/ssf





Drought Services into the future

Drought Services in Australia



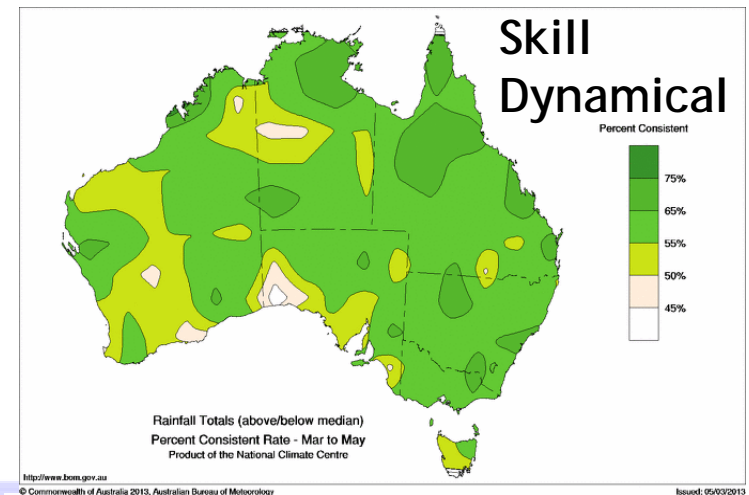
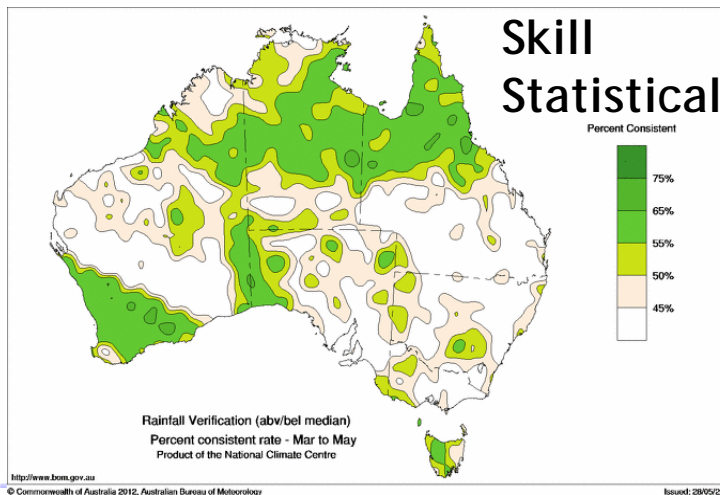
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Future of drought services in Australia

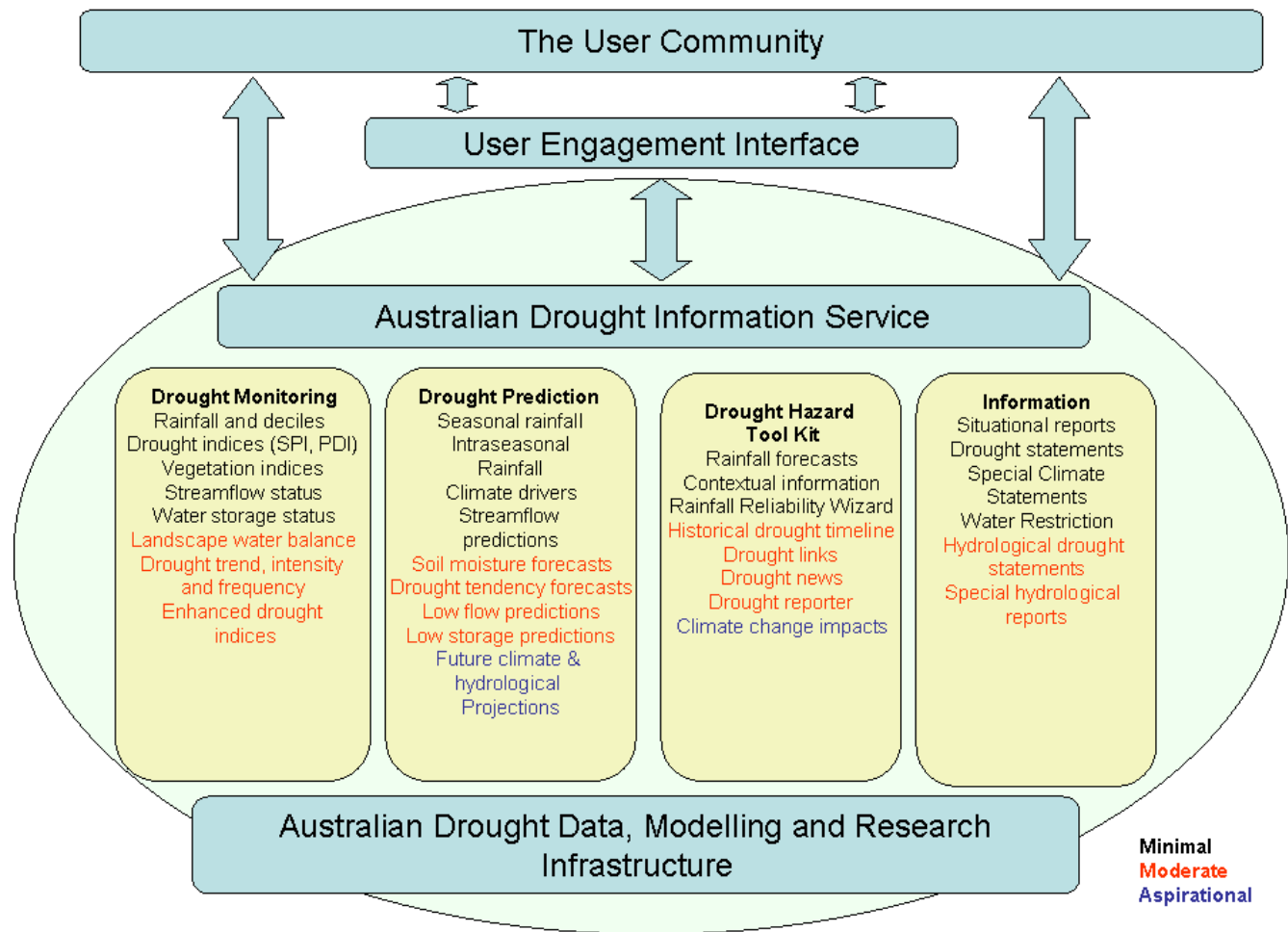
Service push coming from improved science, modeling and observations

Recent stakeholder engagement - user priorities:

- Integration of prediction with drought monitoring – dynamical prediction model provides range of new opportunities.
- Wider range of indices, but not to have ‘lines on map’ approach
- Greater communication and engagement noting range of different needs from various sectors.

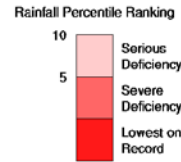
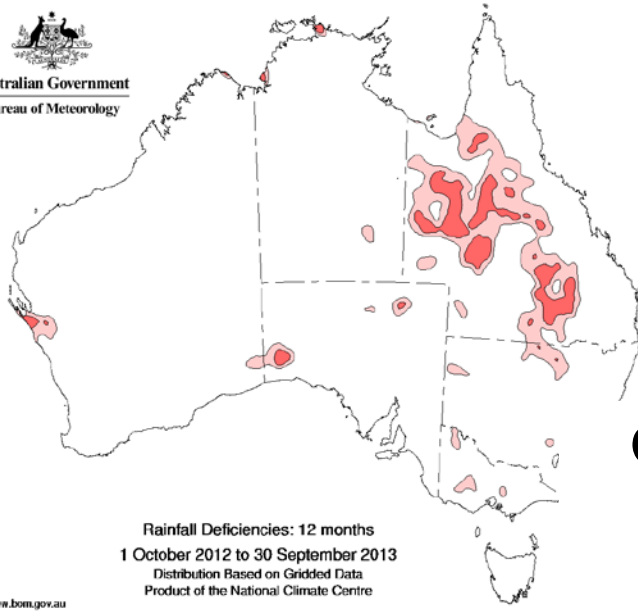


Proposed drought information service for Australia



Remodel of Climate Outlook Service

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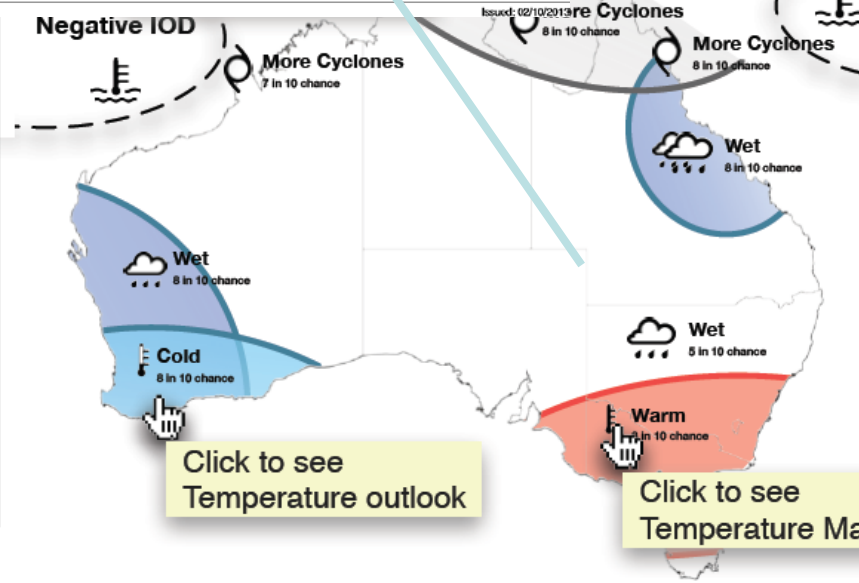


Rainfall Deficiencies: 12 months
1 October 2012 to 30 September 2013
Distribution Based on Gridded Data
Product of the National Climate Centre

<http://www.bom.gov.au>

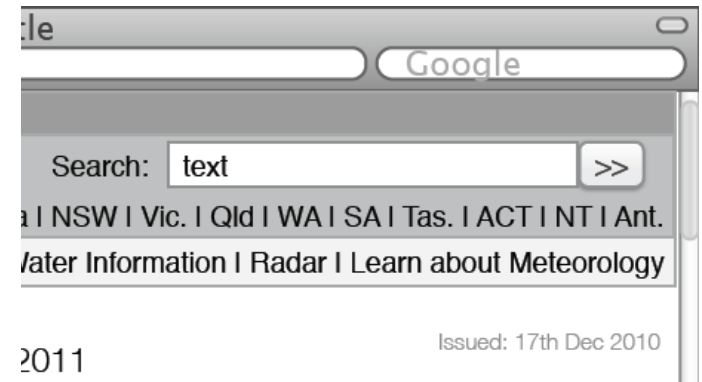
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- Climate
 - Seasonal outlooks
 - Outlook Overview
 - Tailor my outlook
 - Climate Drivers
 - Climatologist explains
 - Reports & Summaries
 - Weather & climate data
 - Maps - recent conditions
 - Maps - average conditions
 - Climate change
 - Extremes of climate

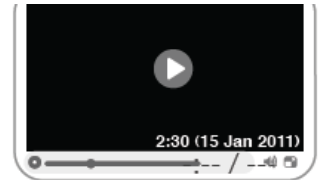


Click to see Temperature outlook

Click to see Temperature Max Outlook



Overlay forecast on drought map?



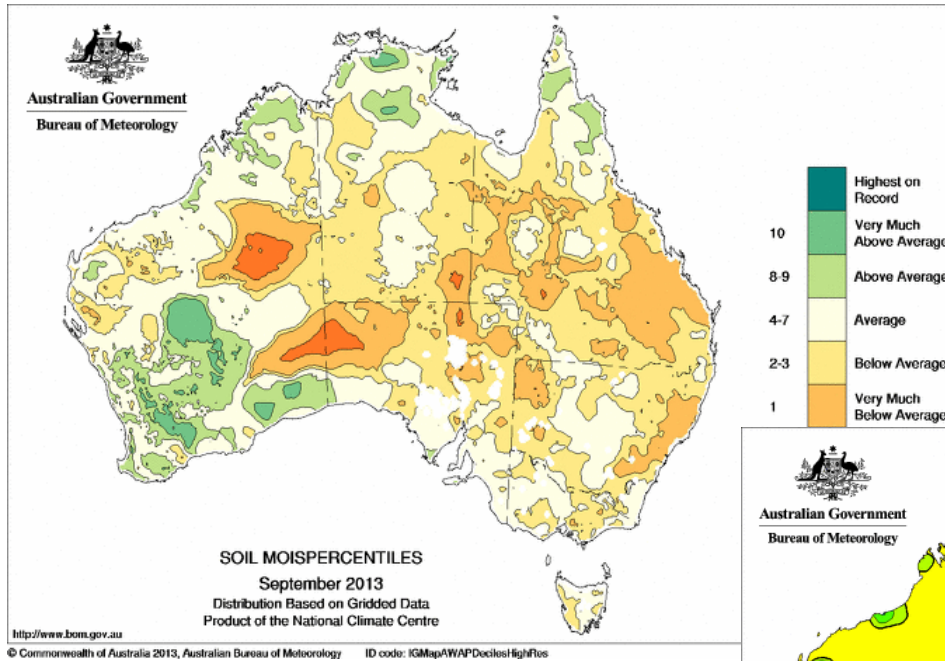
[Climatologist explains the outlook](#)
[Understand the Climate Outlook](#)

Climate Wrap up

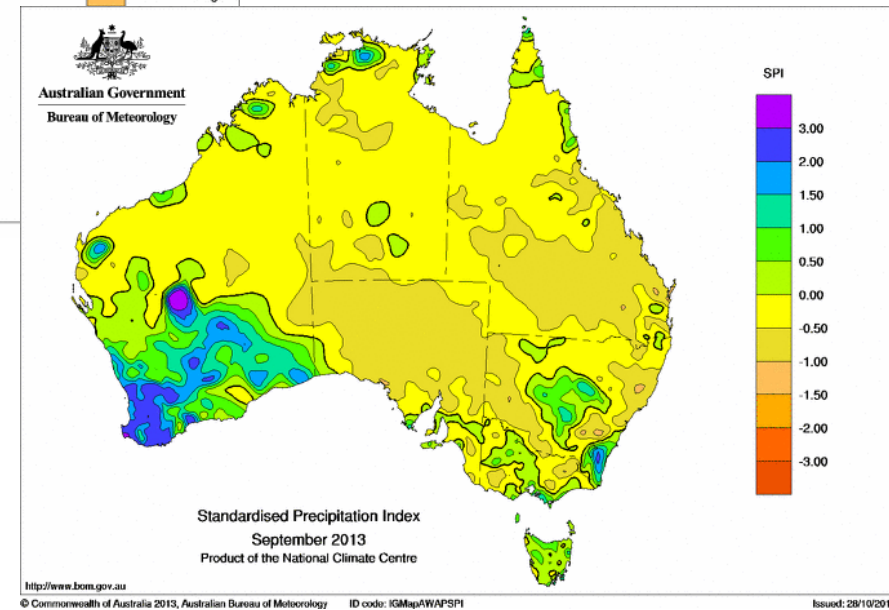
- Wetter conditions expected over North East Queensland
- Warmer across South East Australia
- La Nina is weakening

Neutral
[Out more](#)

New indices to public



September SPI



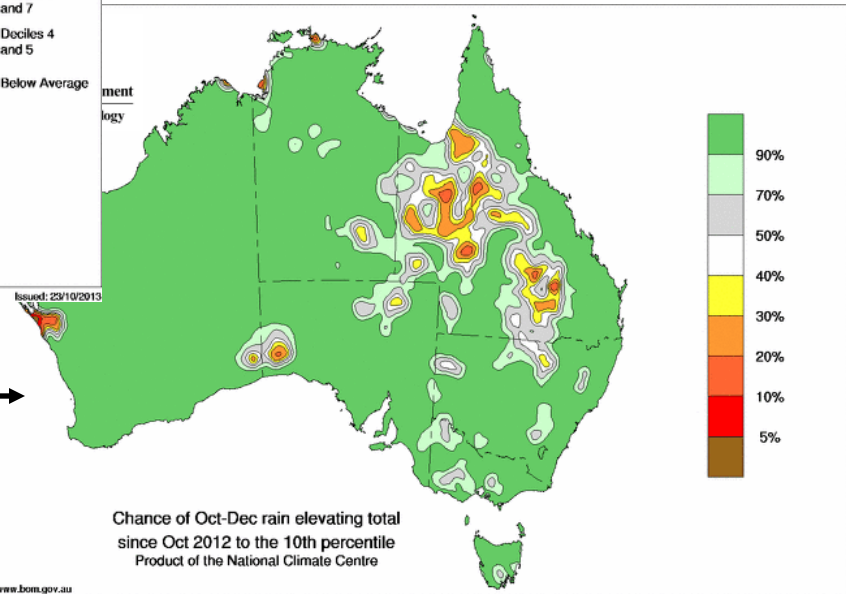
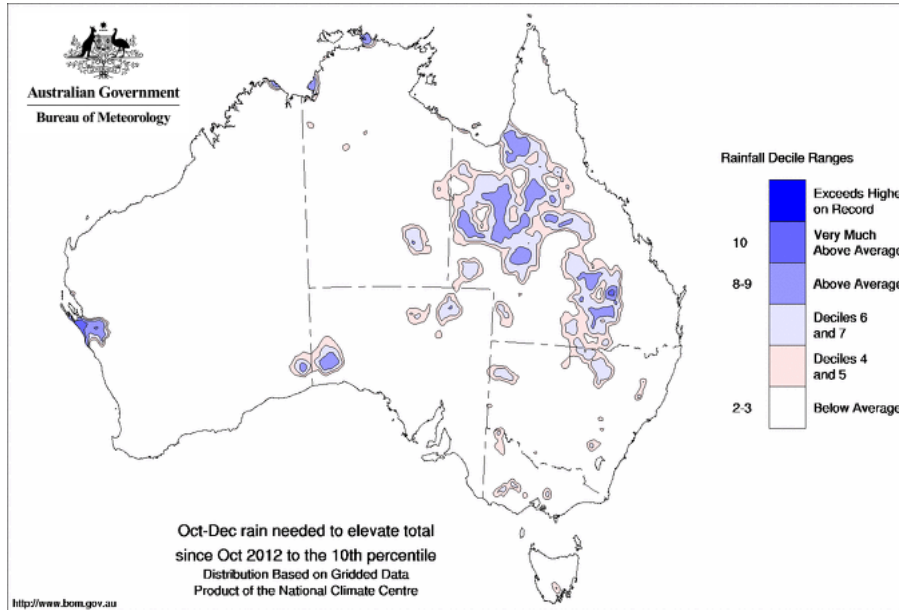
September upper layer soil moisture

Drought Services in Australia

Predicting the end of Drought

For areas in their lowest decile (drought) for a given period how much rainfall do they need to get out of that decile?

How much rainfall do you need to get out of 'drought'?



What is the chance of getting that rainfall?

Conclusions

In improving our drought service, we are partnering with key stakeholders to improve and tailor products and services so they better meet their decision-making needs.

Achieved through:

- Preparing for the next major drought
- Seamless days to weeks to seasons service
 - Integrate weather, climate and water services
 - Continuous engagement
- Better characterisation and prediction of state variables (rainfall, temperature, soil moisture), particularly using dynamical models
- Adoption of representative drought indices
- Linking the climate to the hydrology (e.g. streamflow), vegetation (e.g. fuel dryness), etc.

