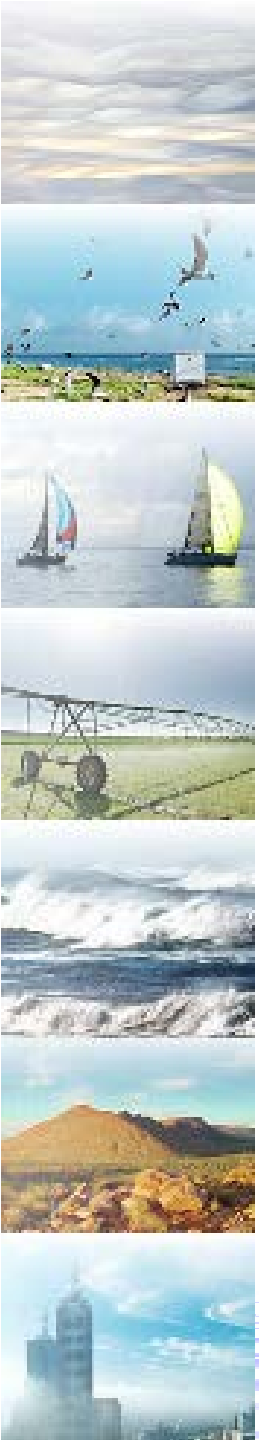

Drought services in Australia

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David Jones, Mohammed Bari

Bureau of Meteorology

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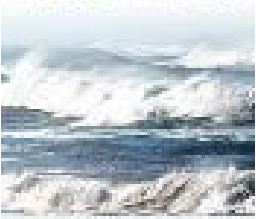
Acknowledgment: Bureau Colleagues







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.

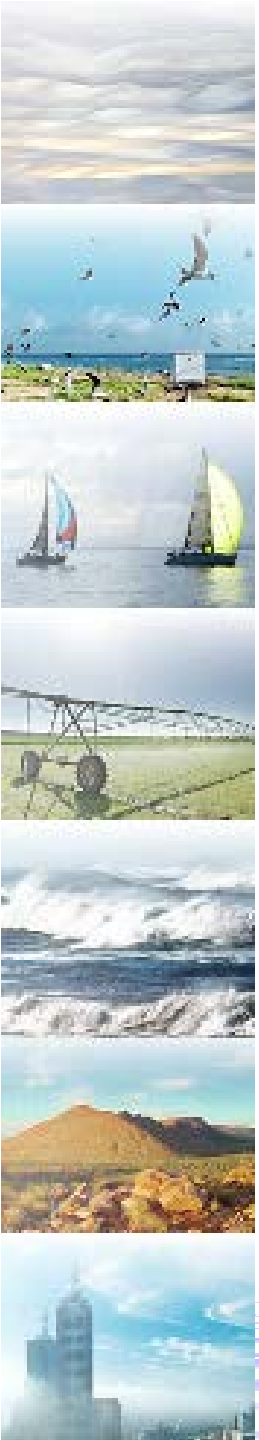
According to the statistics some may hit the bottle, some may suicide.

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

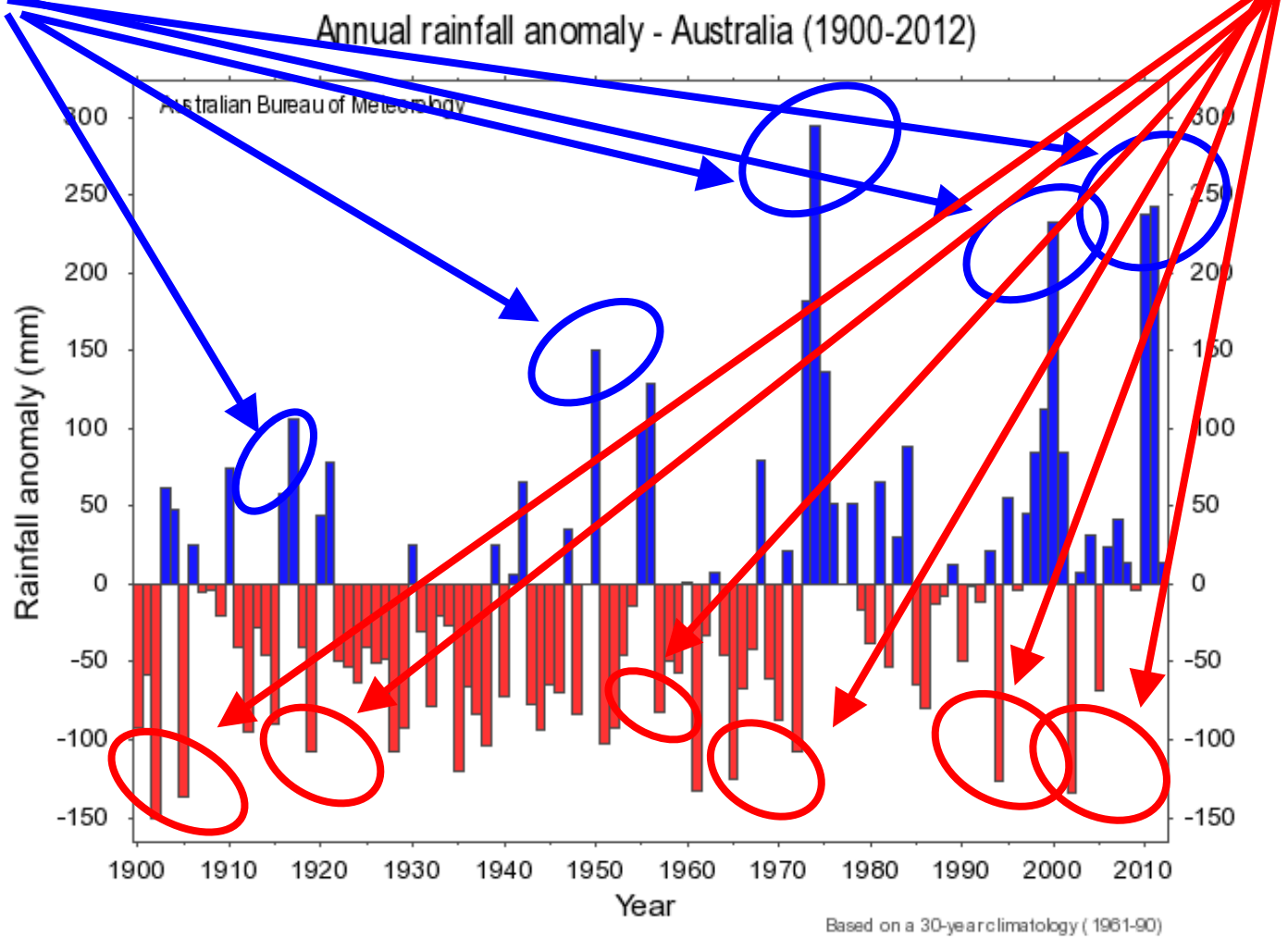
Future drought services

Drought in Australia

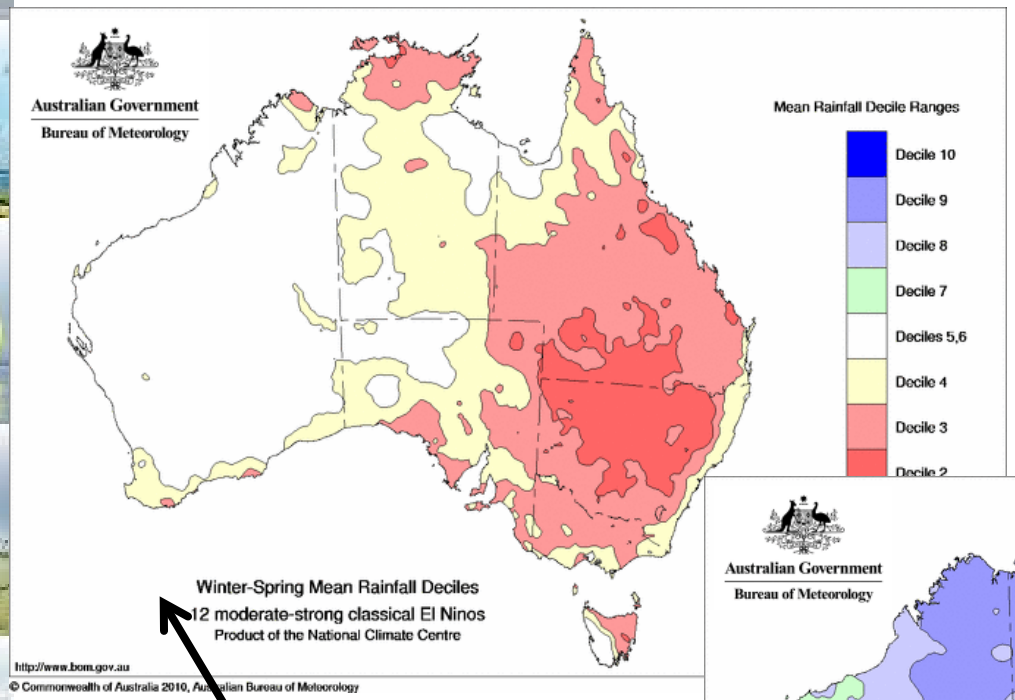
ENSO and Australian rainfall

Flood years and La Niña events

Major droughts and El Niño events

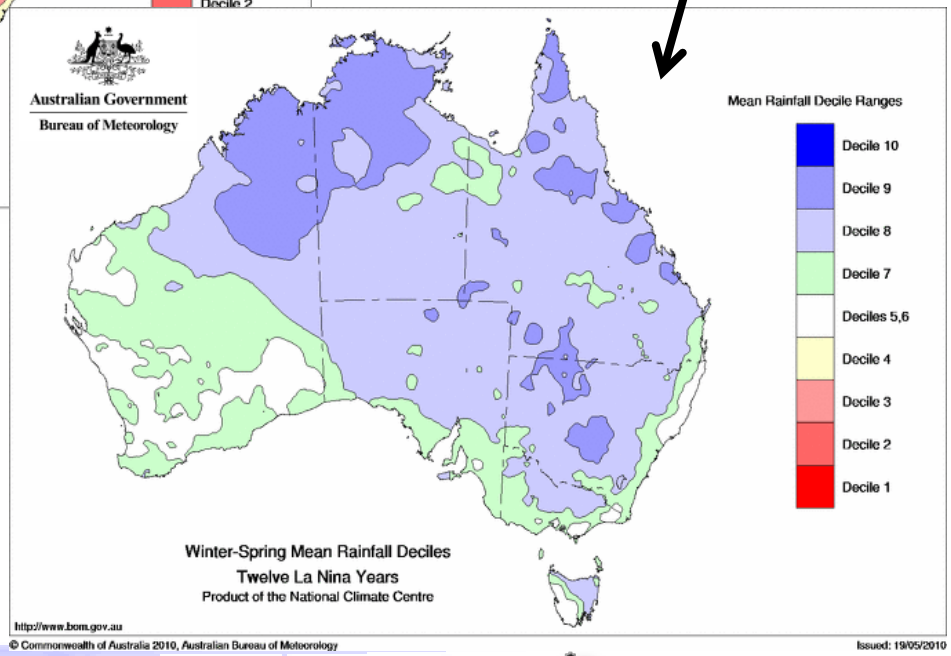


ENSO and Australian rainfall



Average rainfall deciles for
12 historical El Niño events.

Average rainfall deciles for
12 historical La Niña events.

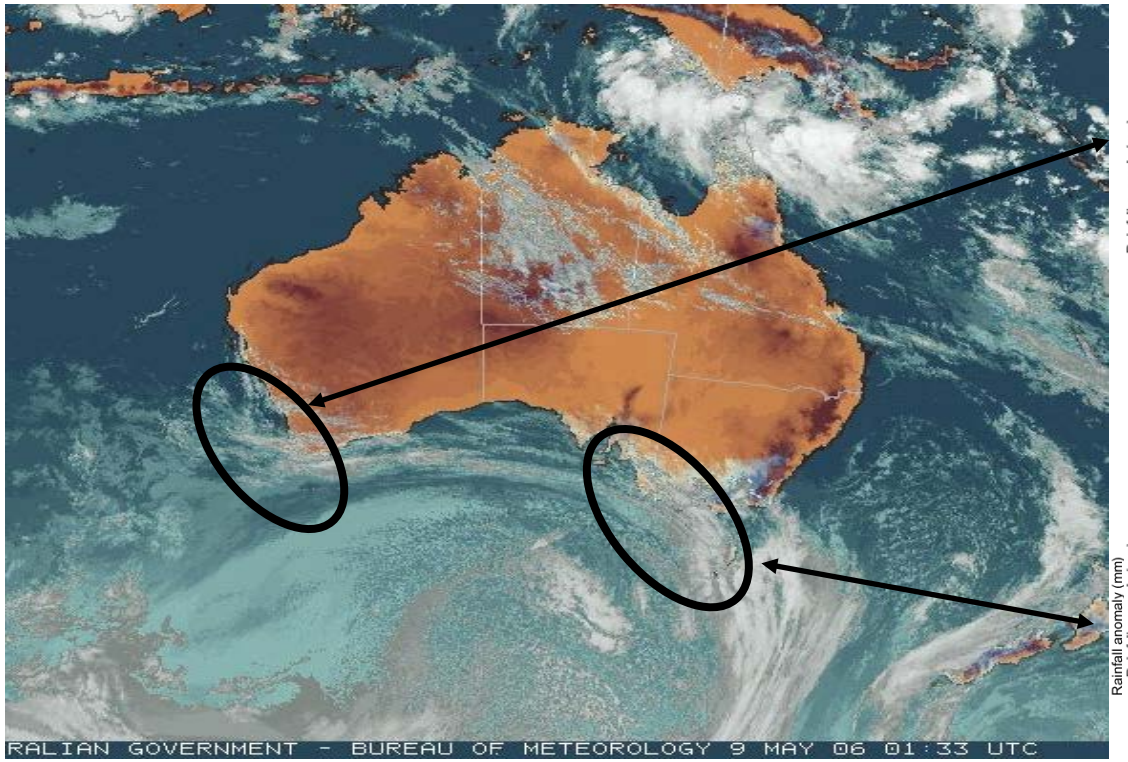


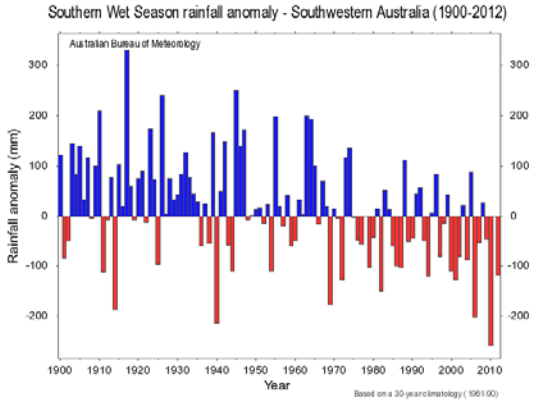
Drought under climate change

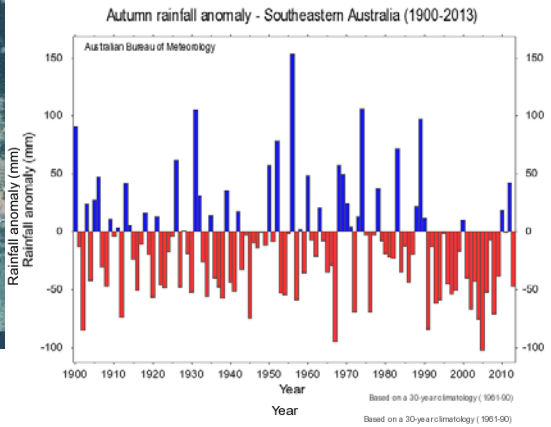
Australian Government
Bureau of Meteorology

Future of drought in Australia:

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







See www.seaci.org or www.**ioci**.org.au

Drought Services in Australia

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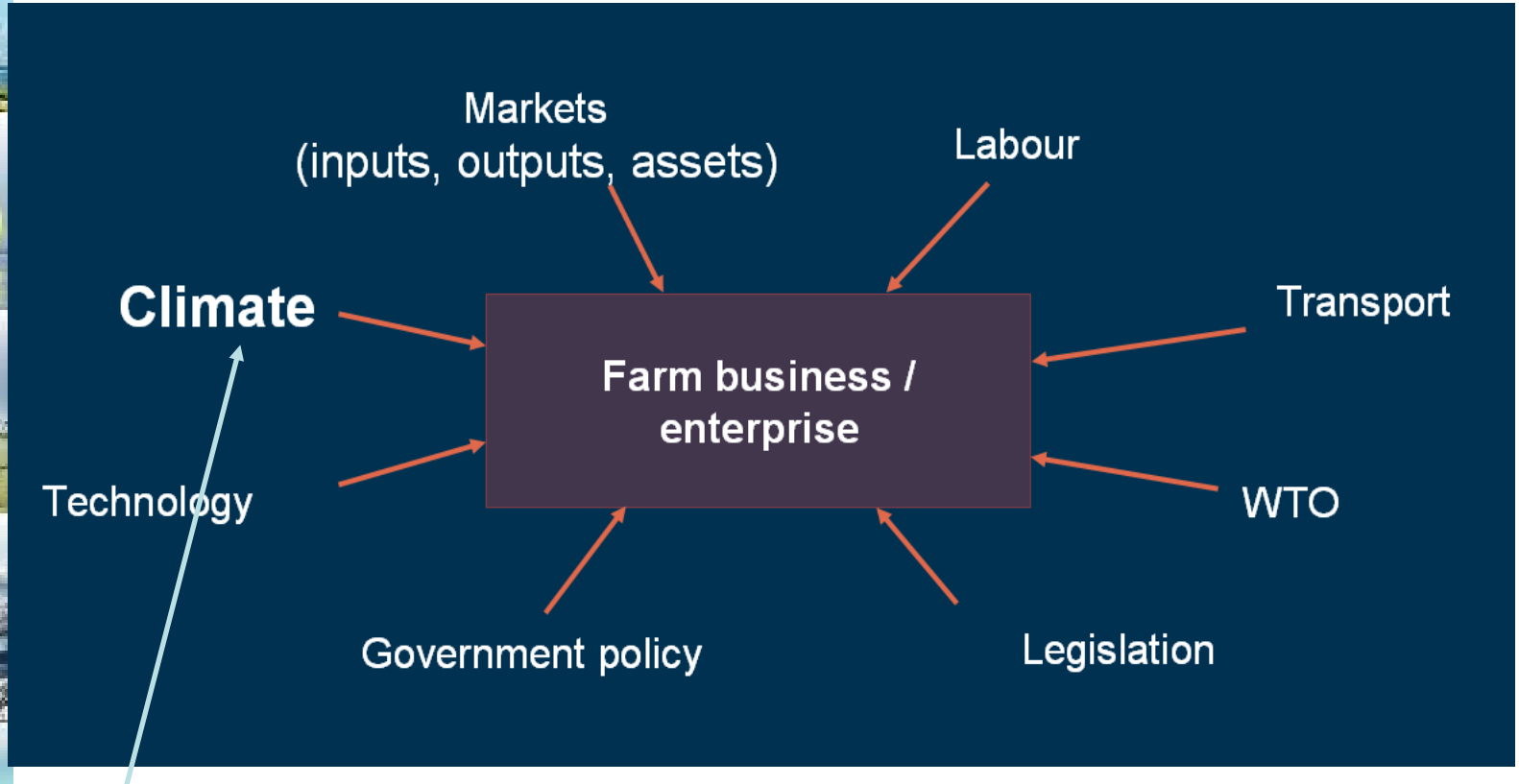
Bureau of Meteorology

National drought program reform

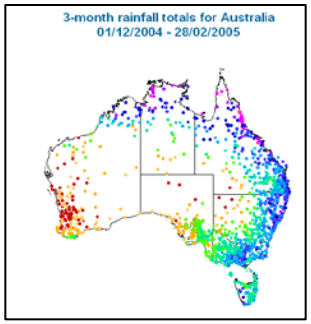


Tools and technologies to inform farmer decision making.

Current drought services

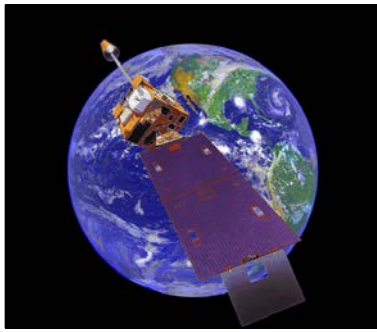
Constructing AWAP Gridded Datasets

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



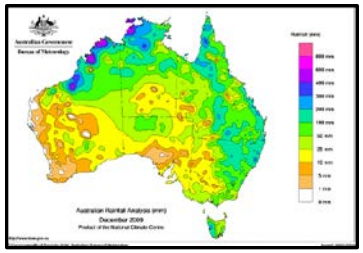
In-situ observations

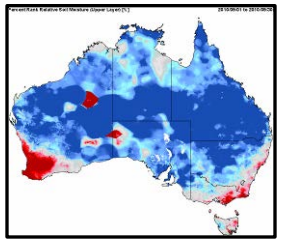
Sophisticated spatial analyses
&
Physical water/carbon model

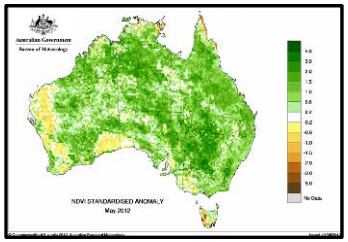


Remote sensing: NDVI, Solar Radiation

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

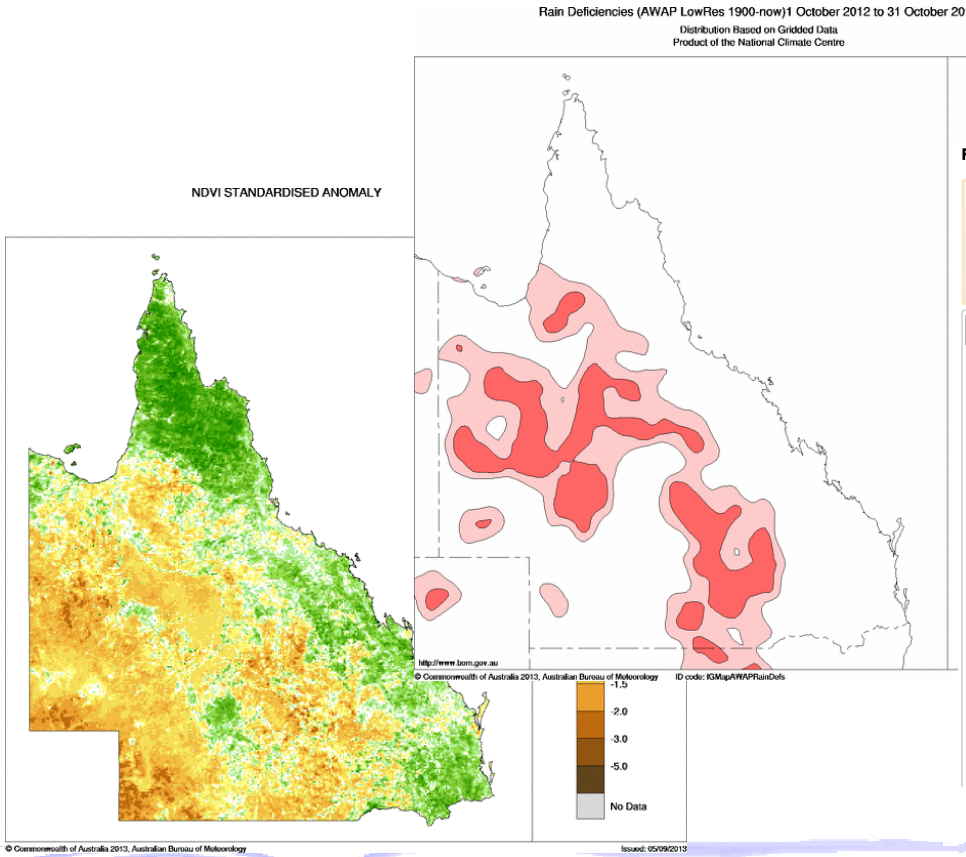


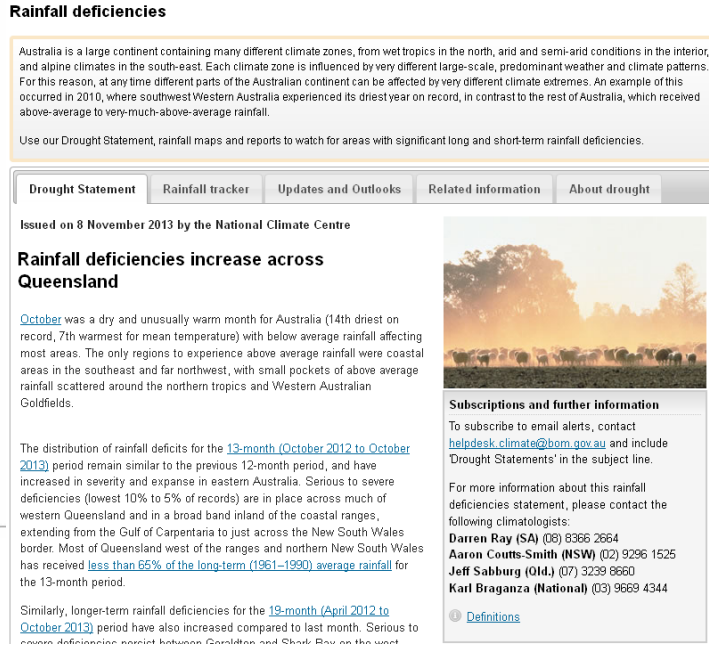




Drought Watch

- 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).





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

Drought Services in Australia

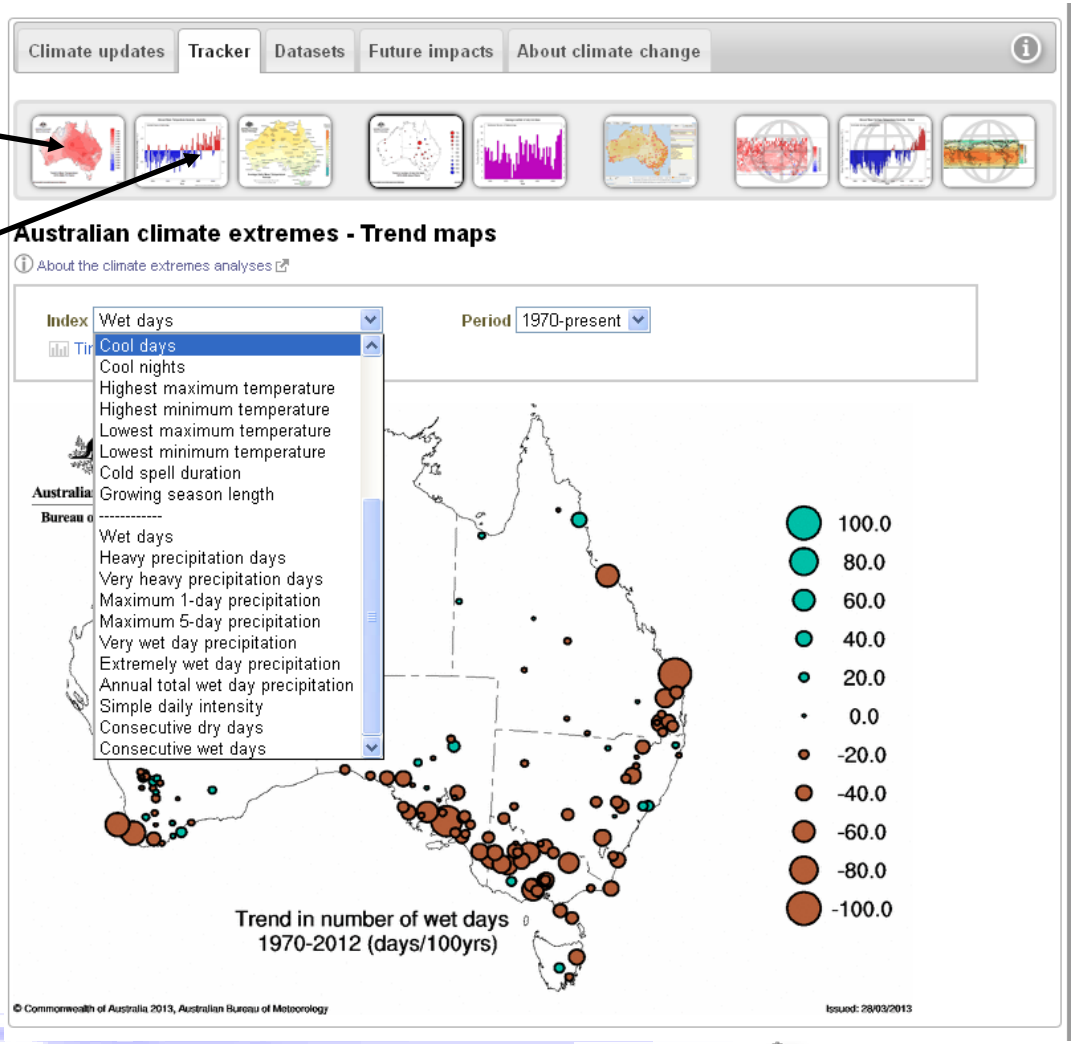
Australian Government
Bureau of Meteorology

Monitoring trends in rainfall and temperature

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

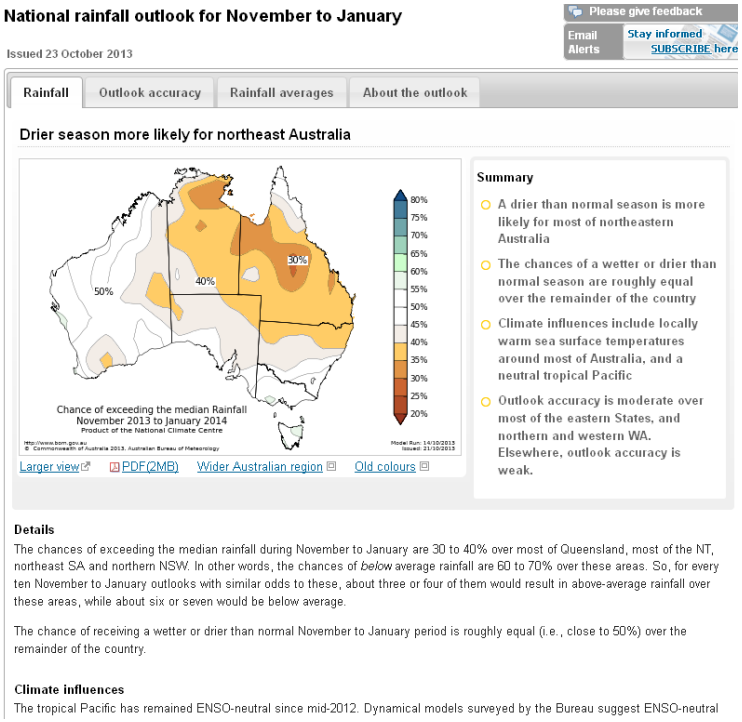
Trend maps

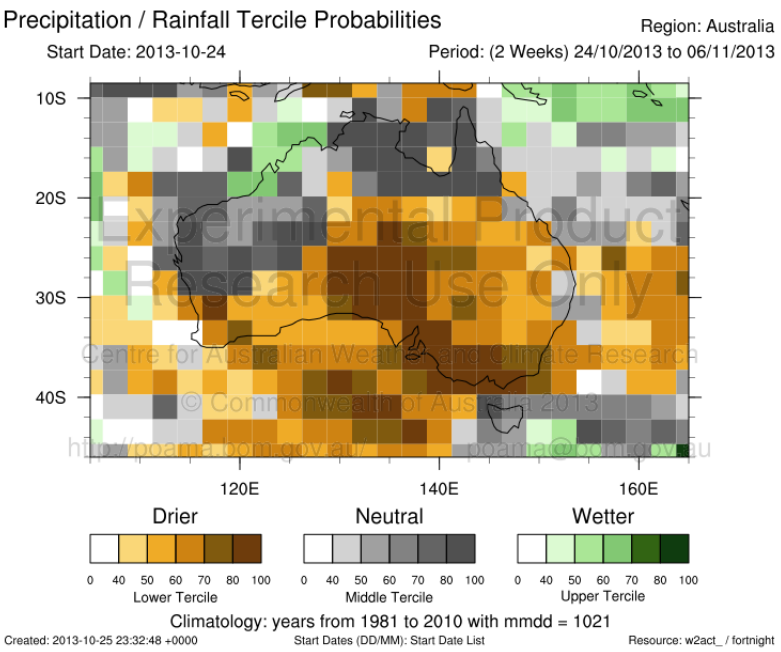
Australian timeseries graphs



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)





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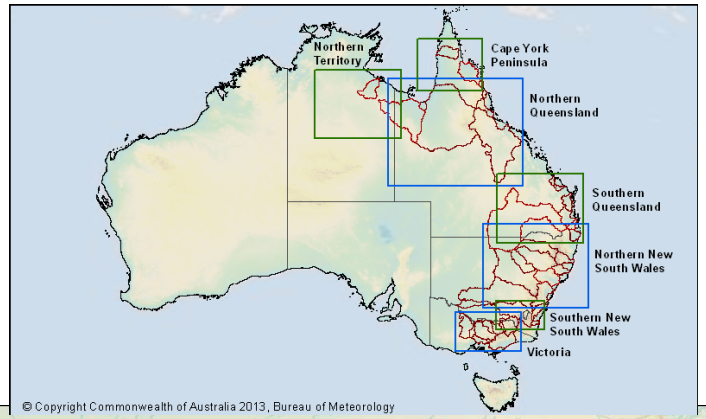
Seasonal streamflow forecasting



- 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

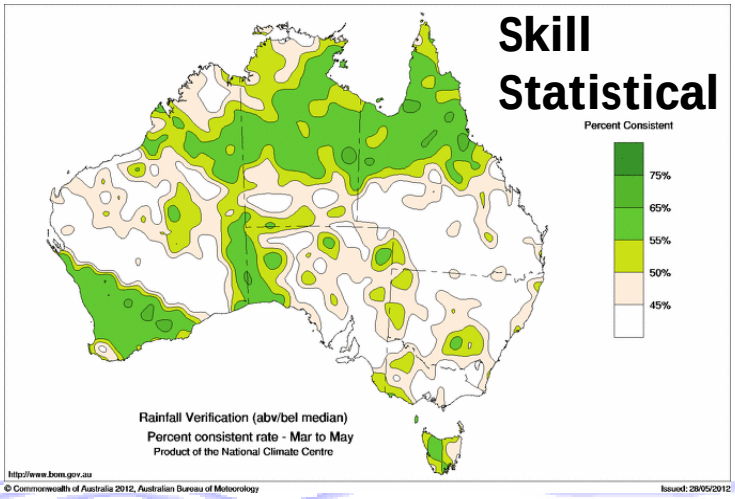
Australian Government
Bureau of Meteorology

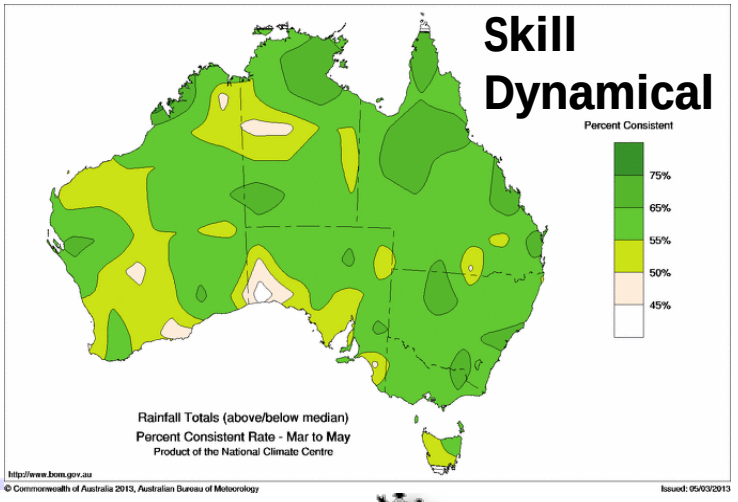
Future of drought services in Australia

Service push coming from improved science, modeling and observations

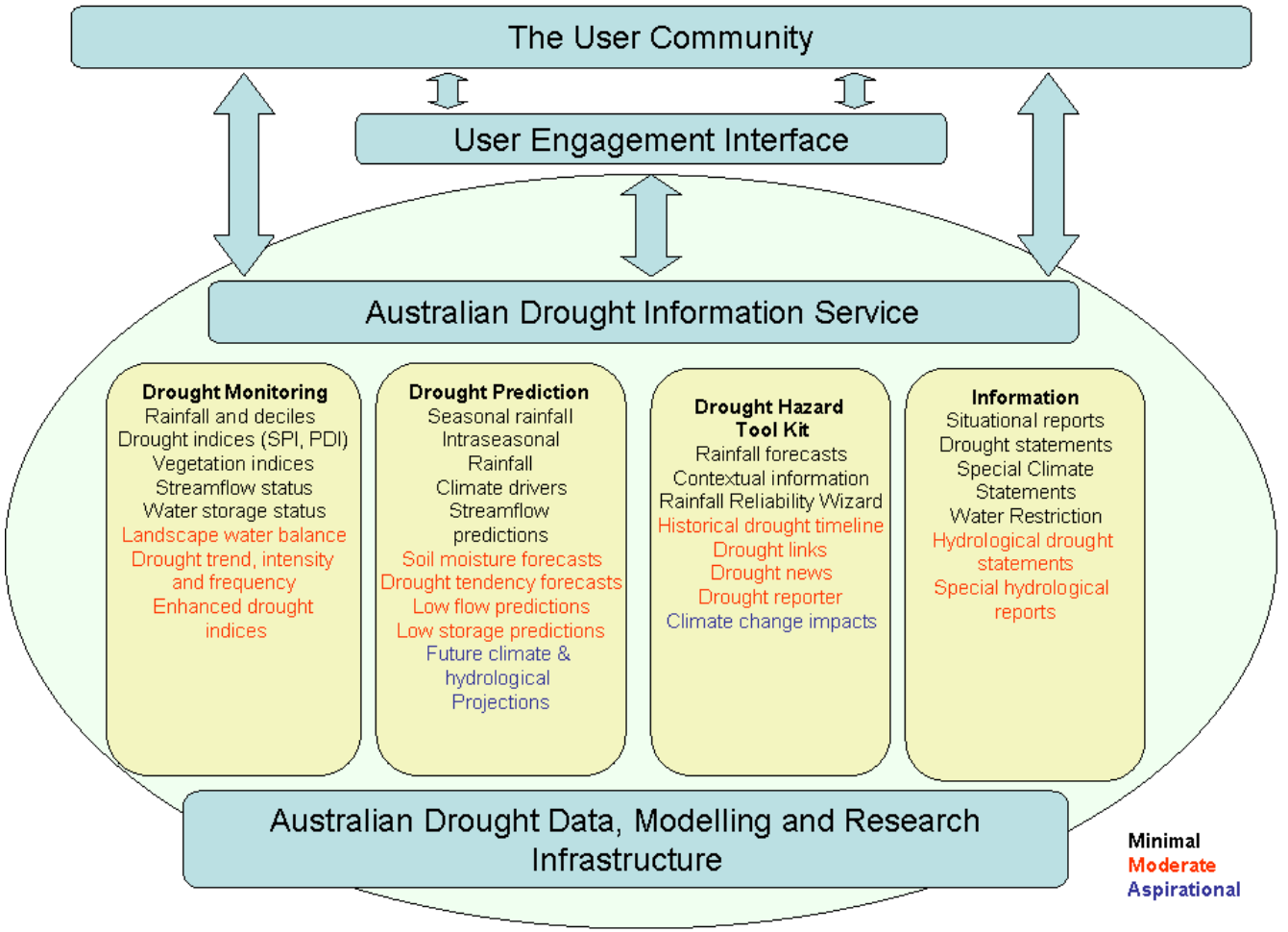
Recent stakeholder engagement - user priorities:

- 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



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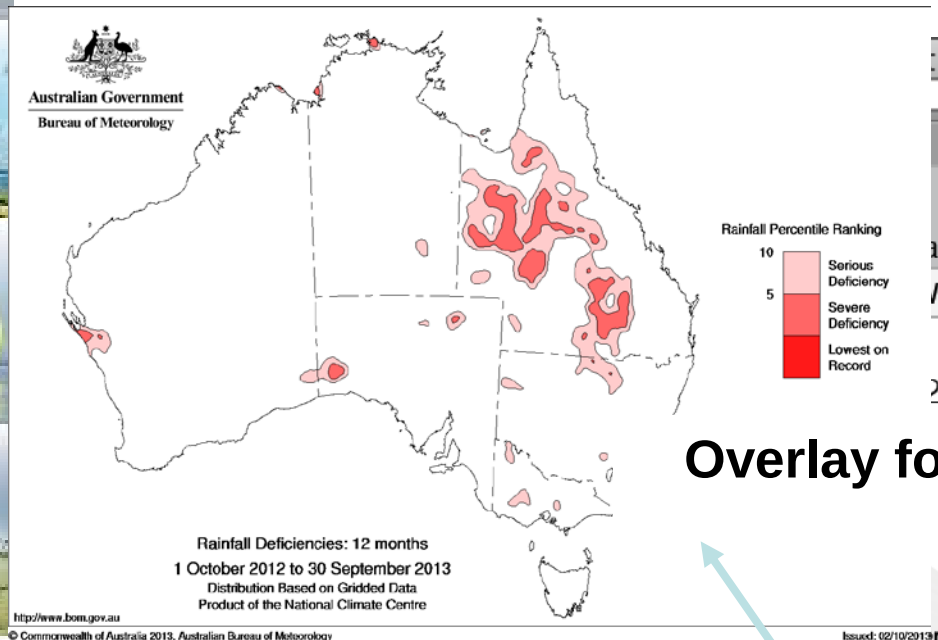
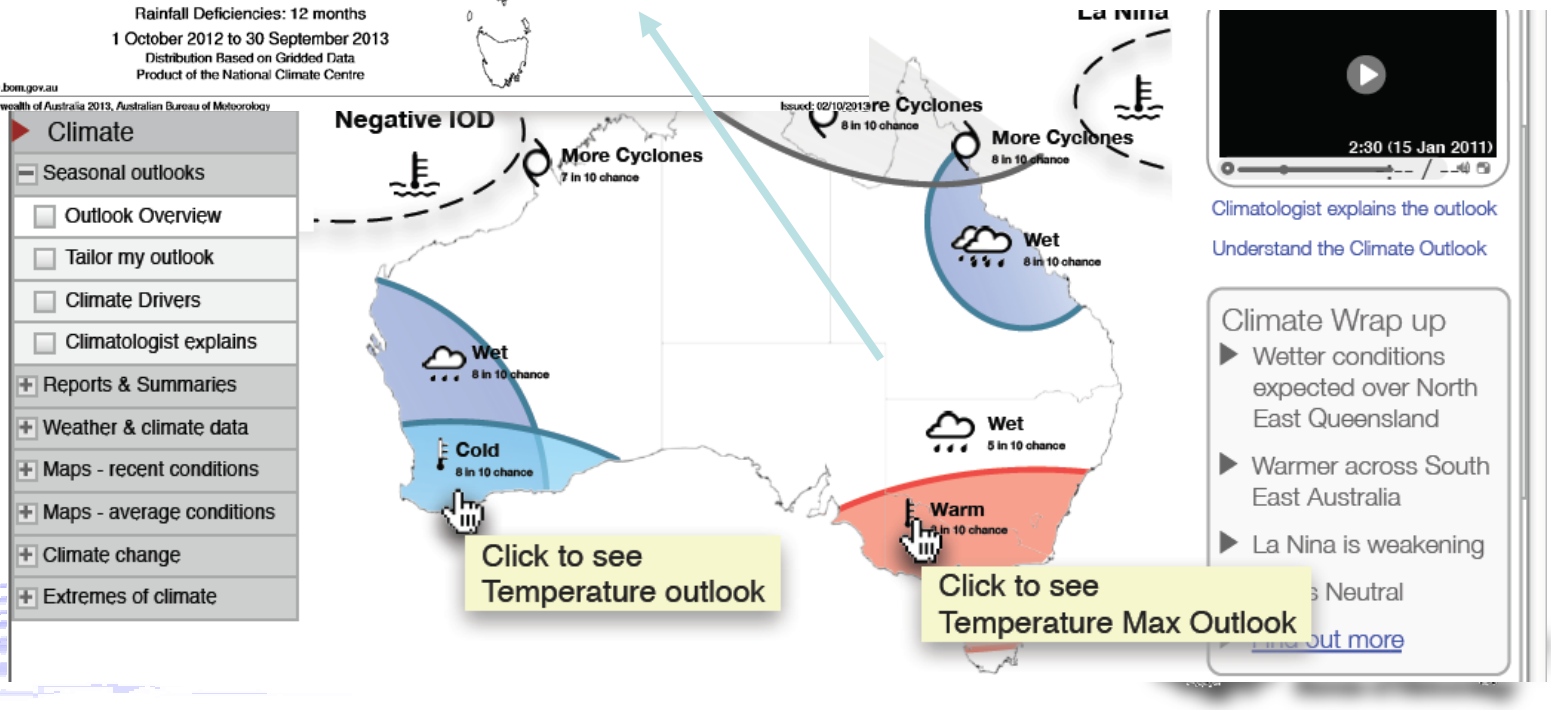
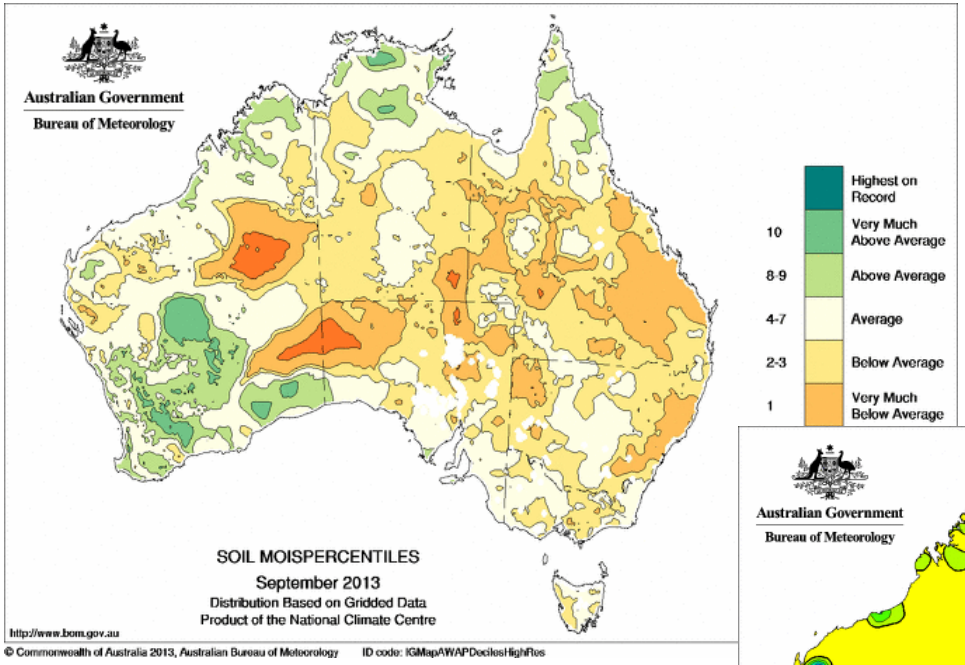
Remodel of Climate Outlook Service



Overlay forecast on drought map?

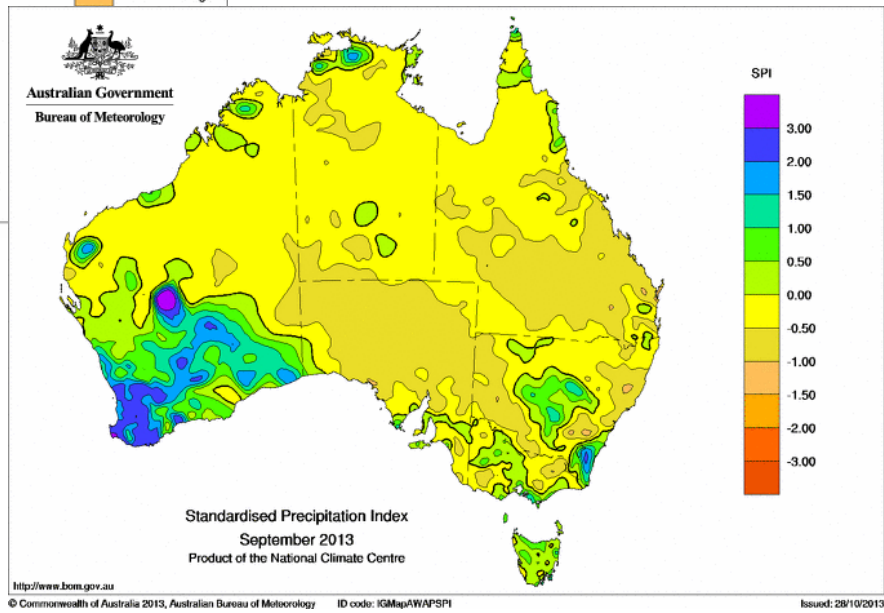


New indices to public



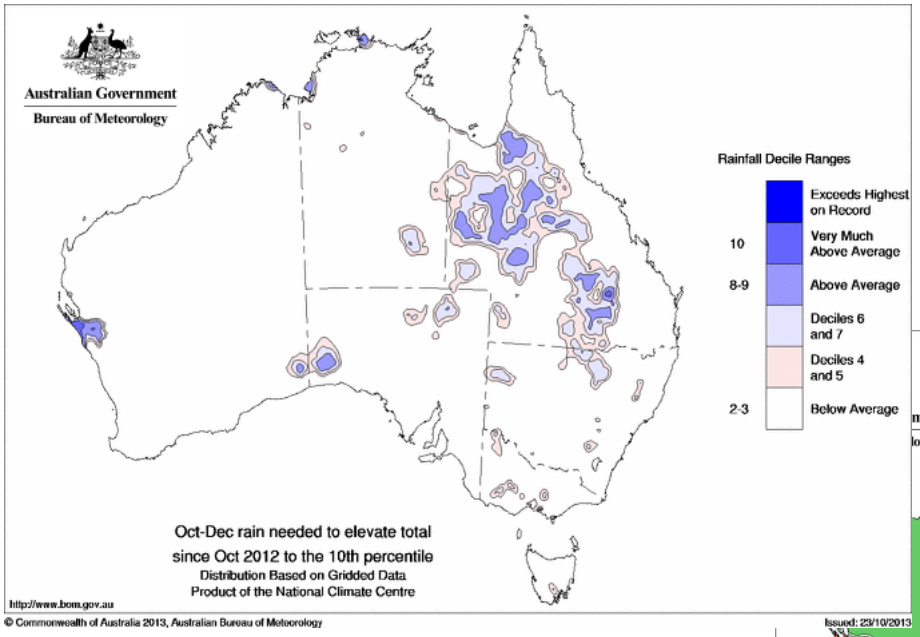
September upper layer soil moisture

September SPI



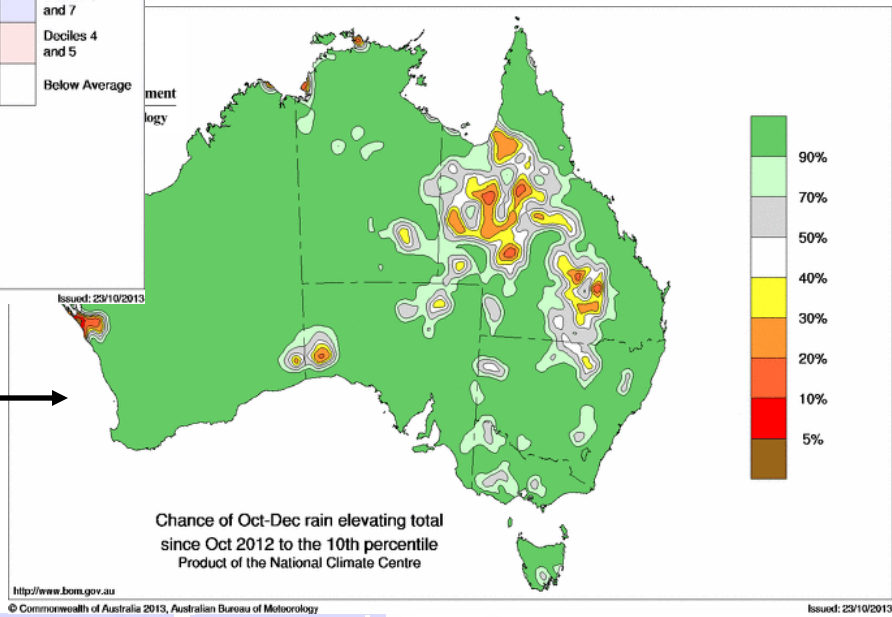
Predicting the end of Drought

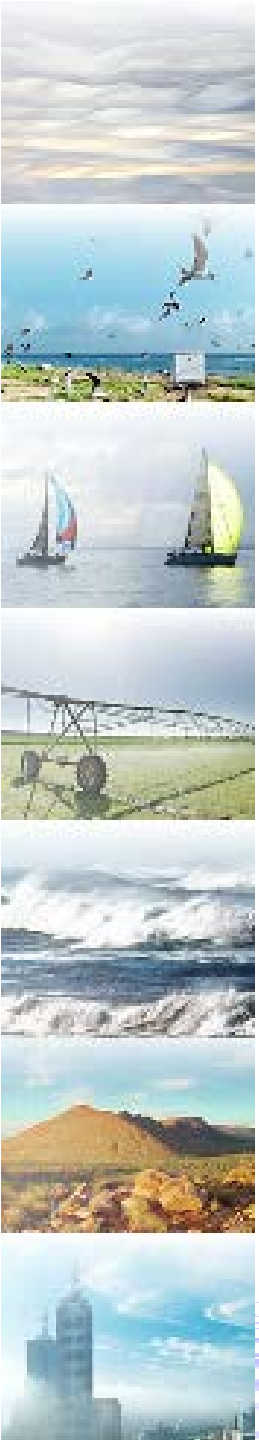
For areas in their lowest decile (drought) for a given period how much rainfall do they need to get out of that decile?



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.