Improving Fire Outlooks

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Australian Government
Bureau of Meteorology

Photo: Mark Wilgar

2018 Review of seasonal outlooks (via QFES)

- The current system does not reflect the PSG strategy, e.g., it does not provide confidence through scientifically rigorous, reliable and specific procedures

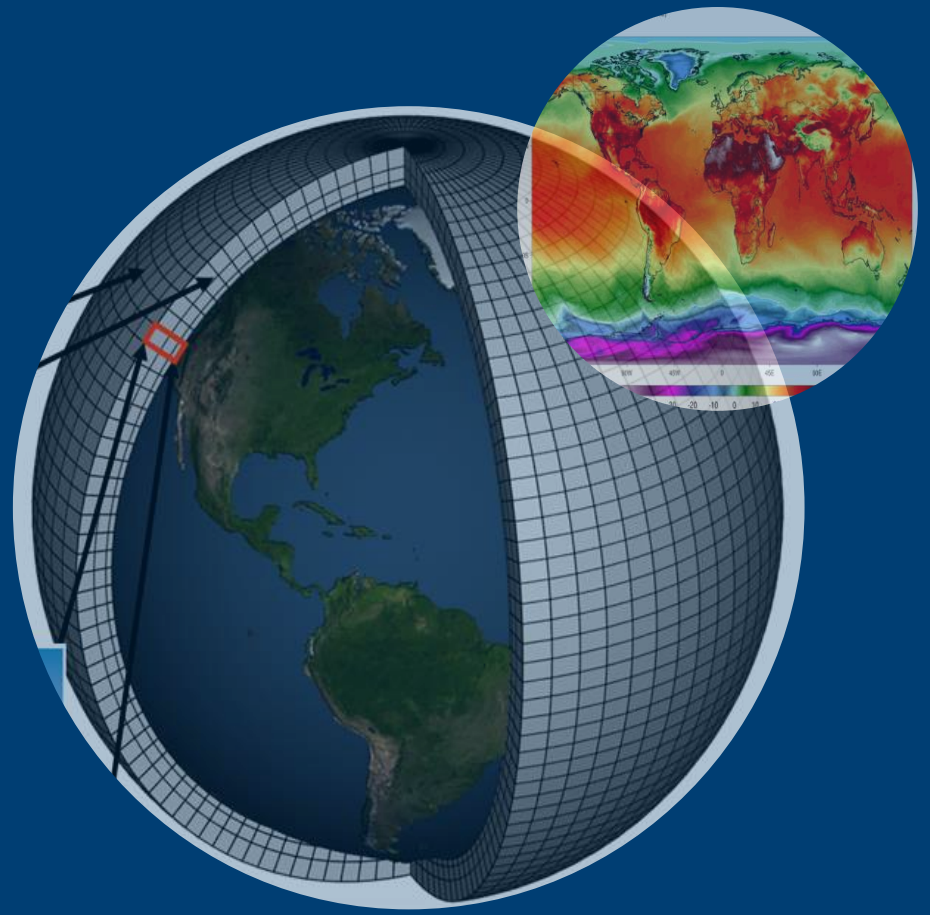
- Two workshops have been held and significant work has been undertaken over the past two years by the Systems group, Amelia Dell, David Jones, Rochelle Richards, Greg Esnouf et al.

- Funding is likely to be made available to develop a product that is verifiable and is true to the PSG strategic drivers and is fit for purpose so that decisions on preparedness levels are better supported

- This DELWP/CFA project would build the foundations of a long range forecast product that would fit perfectly with a NFDRS that is modular and open to continuous improvement

Good News

- Funding Committed for a research project leading to prototype system (via BNHCRC supported by Vic DELWP), next ~18 months
- Operational service development through Australia New Zealand Emergency Management Council next ~2 years
- On-going climate model (ACCESS-S) based service as part of BoM core beyond



Phasing of project outcomes

BNHCRC/DELWP Project

Stakeholder Group Established
Derive ACCESS-S FFDI data
Prototype Services (southern Australia)

Australia NZ Emergency Management Council

Extend prototype nationally
Extended forecasts to GFDI
Add to climate outlook service
Extended to the NFDRS fuel models
Move into production using ACCESS-S2

Bureau Operations

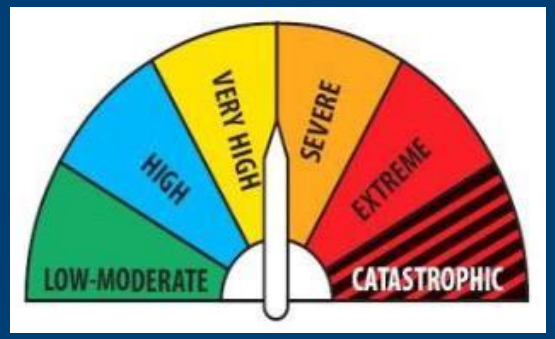
Operational multi-week to seasonal "fire weather" outlooks

ACCESS-S based forecasts now in production

- Higher resolution (60km)
- More accurate forecasts
- New fortnightly forecasts (filling the current gap between the 7-day weather forecast and monthly and seasonal outlooks)
- More frequent issue of outlooks (weekly instead of current monthly)
- Moving to use downscaled 5km resolution data for Australia
- ACCESS-S2 coming in ~18 months

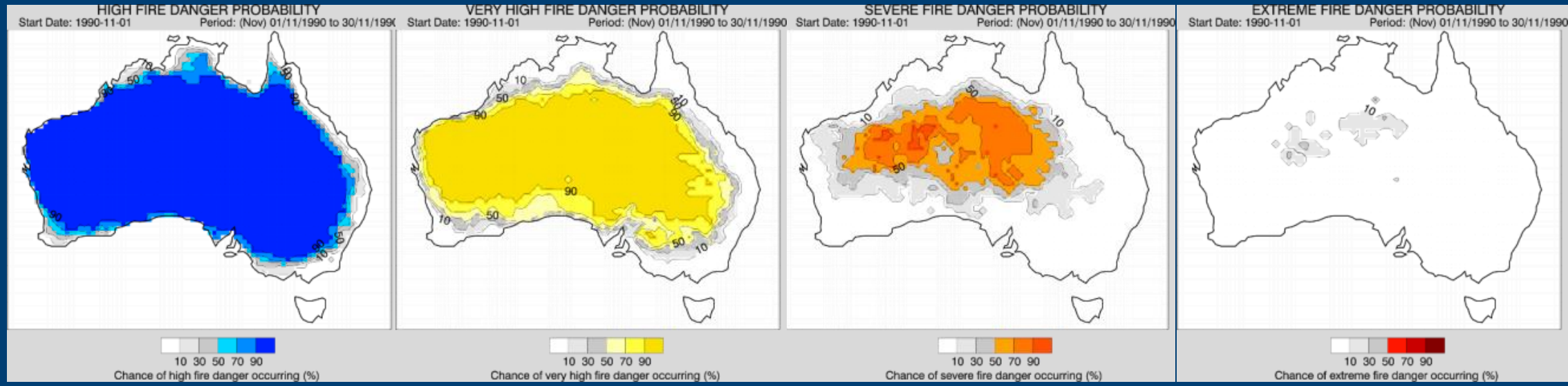
Future Service Definition

- Supporting current activities – community awareness, pre-season planning, other?
- Clear definition of what the outlooks show
- Reproducible outlooks and able to verify
- Lower cost of production
- Ability to update
- Higher skill
- Operationally supported
- Seamless – next week, next month, next season



What products are possible?

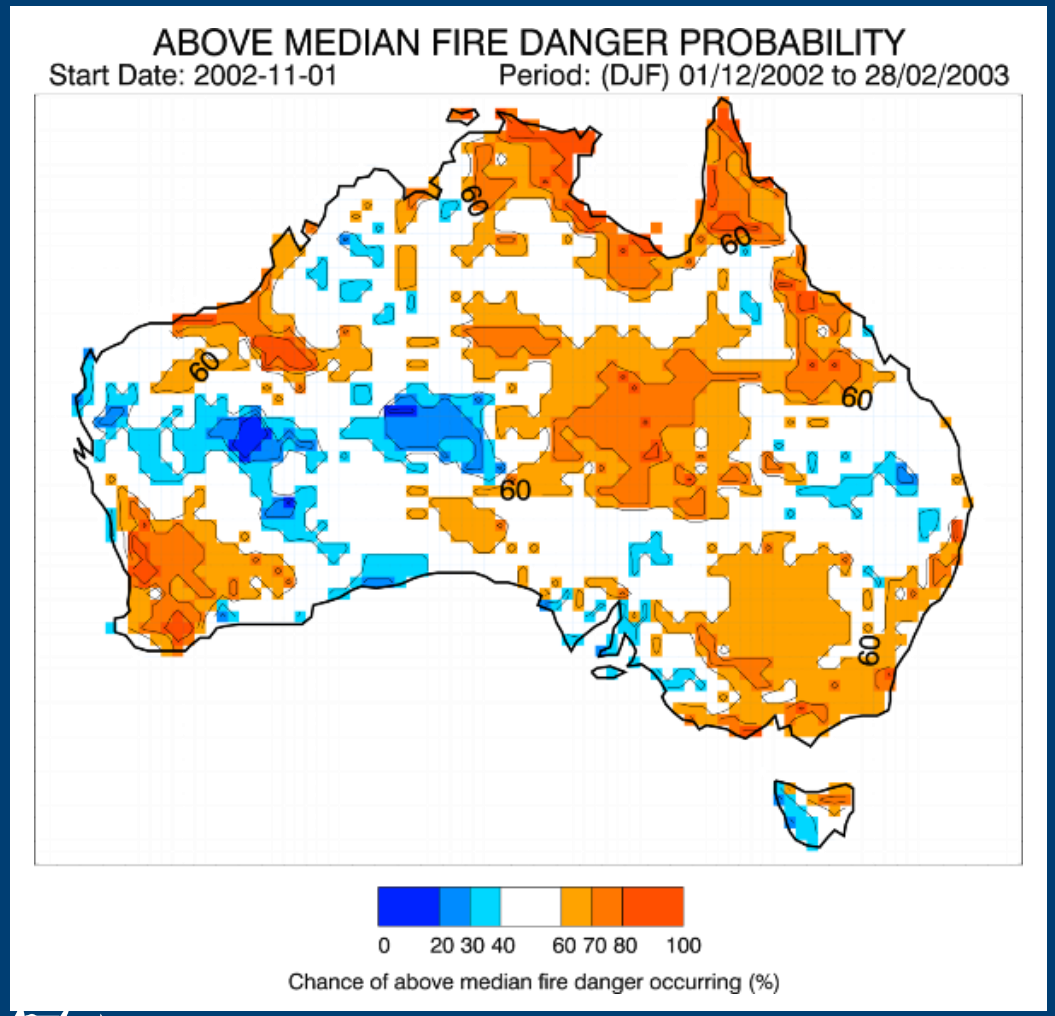
Example initialised **1 Nov 1990** for lead time **1 month (NOV)**

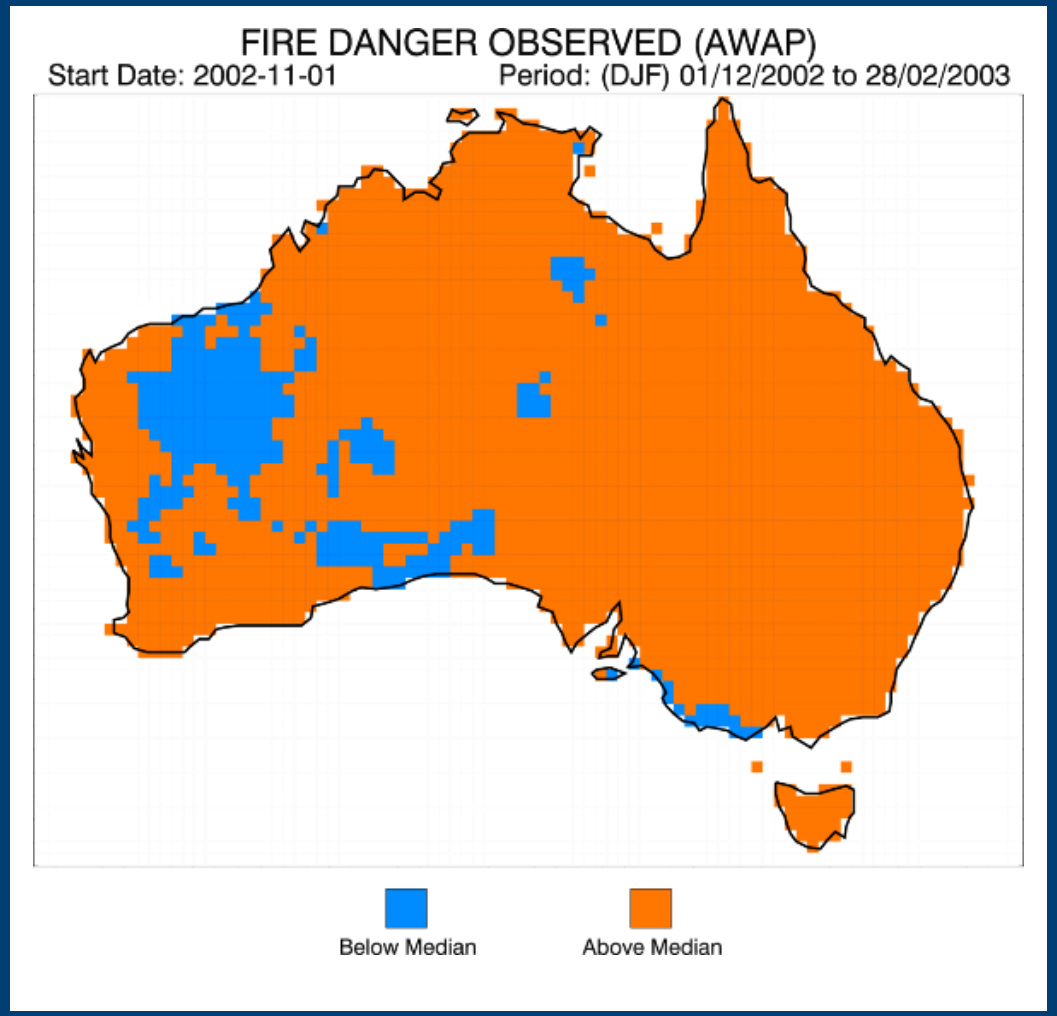


Likelihood of a day in the month reaching certain fire weather severity thresholds

What products are possible?

Example initialised **1 Nov 2002** for the **summer season (DJF)**



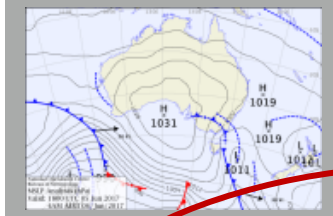


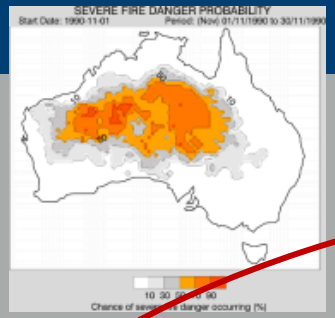
Probability of above median fire season severity

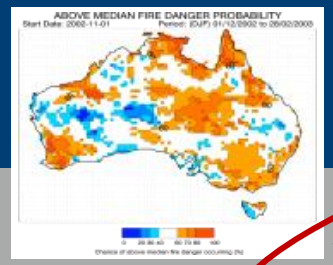
What products and when?

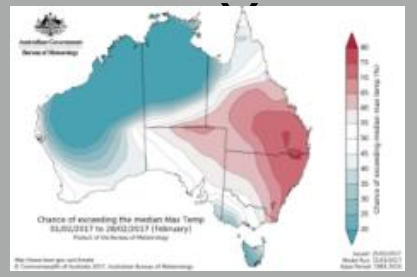
Forecast period

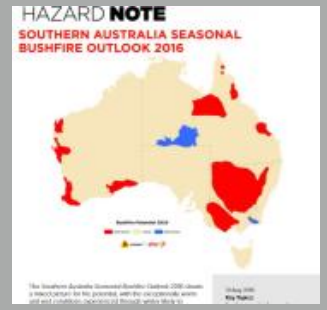
	Days	Weeks	Months	Season	Half year
Half year				X	X
Season			X		
Months		X	X		
Weeks	X	X			
Days	X				











Forecasting extremes: Example of good practice for services

Feedback

Extension and training

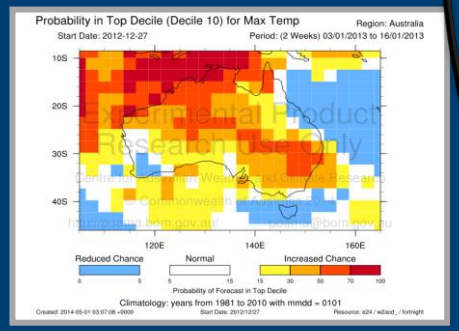
Adoption

USERS

Adoption

Interfacing to Industry decisions

Photo: Jennifer Metcalfe, Econnect Communications

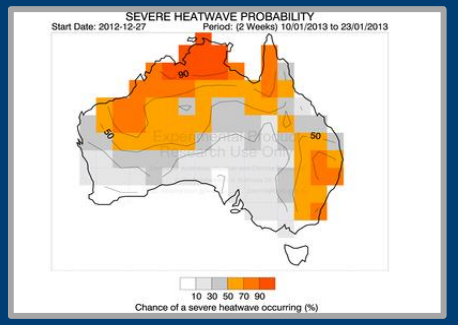


Adoption

Feedback

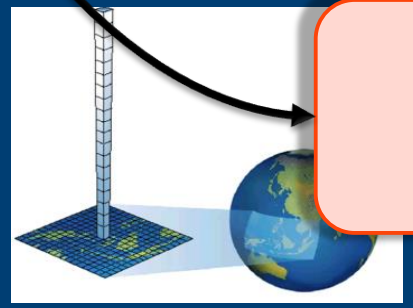
Feedback

Climate forecast products development and delivery

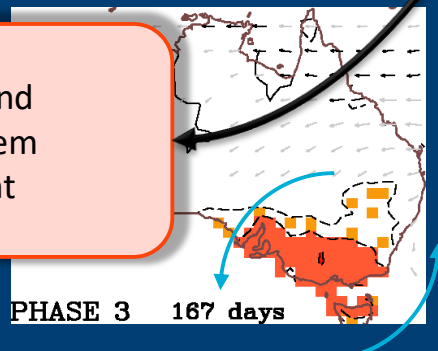


Feedback

Feedback



User needs and Forecast system development



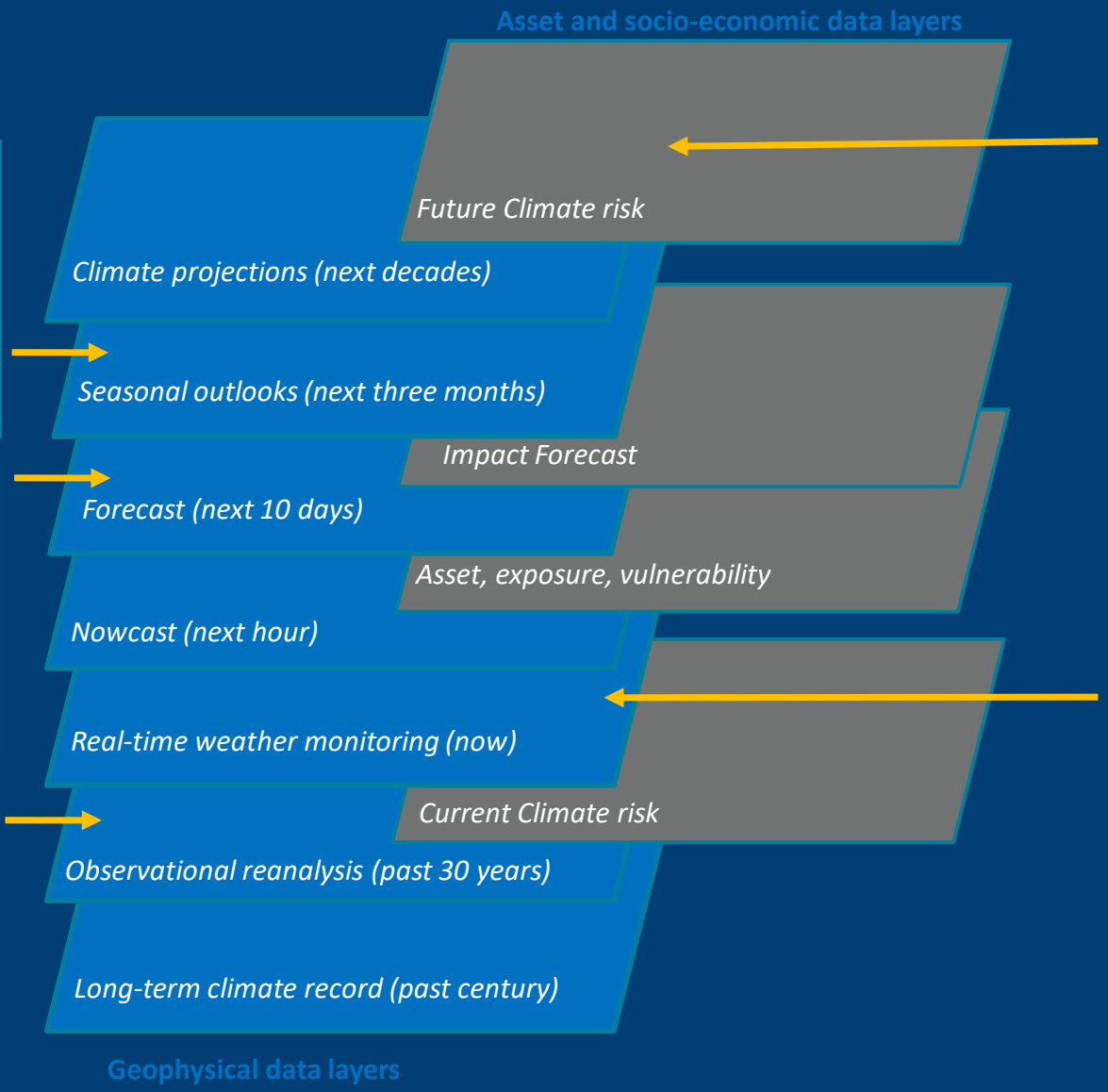
Research partners

BoM
Univ. Melbourne
Monash Univ.
Univ. S. Queensland
SARDI
DEDJTR
DAFQ
Birchip Cropping Group

Rural RDC & other partners

Meat and Livestock Australia
Grains RDC
Sugar Research Australia
Cotton RDC
Rural Industries RDC
Dairy Australia
Wine Australia
Australian Pork
Suncorp

Future Seamless Services



- Informs future demand and supply scenarios at longer lead times. Enabling operational management of maintenance times and asset provisioning.
- Ensemble Forecast (extant, operational)
- Value in 10s of millions of dollars *per summer*

- Informs demand and supply scenarios at lead times relevant for guaranteeing supply through short-term mechanisms (e.g. RERT)
- *Ensemble* NWP (operational 2019)
- Value in 10s of millions of dollars *per summer*

- Characterize current risk exposure.
- Informs settings for the operational management of NEM in relation to weather and climate hazards.
- Informs near-future projected risk.
- Includes machine learning applications.
- Value in billions of dollars

- Informs Integrated System Planning for future generation and distribution assets — investment valued around $90 billion.
- A correctly planned future network has resilience critical infrastructure and redundancy in operational requirements (eg. supply that can meet demand).
- A properly designed risk management system allows machine-to-machine operation of the NEM — taking in ensemble NWP (decisions required at short timescales humans cannot respond on)
- Multi-model ensemble of downscaled projections (does not exist currently in Australia and CORDEX 2 not provisioned currently)*
- Value in billions of dollars

- Informs real-time operation of the NEM at very short time intervals
- Value in millions of dollars *per event* (eg. RERT)

Australian Government
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Thank you

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