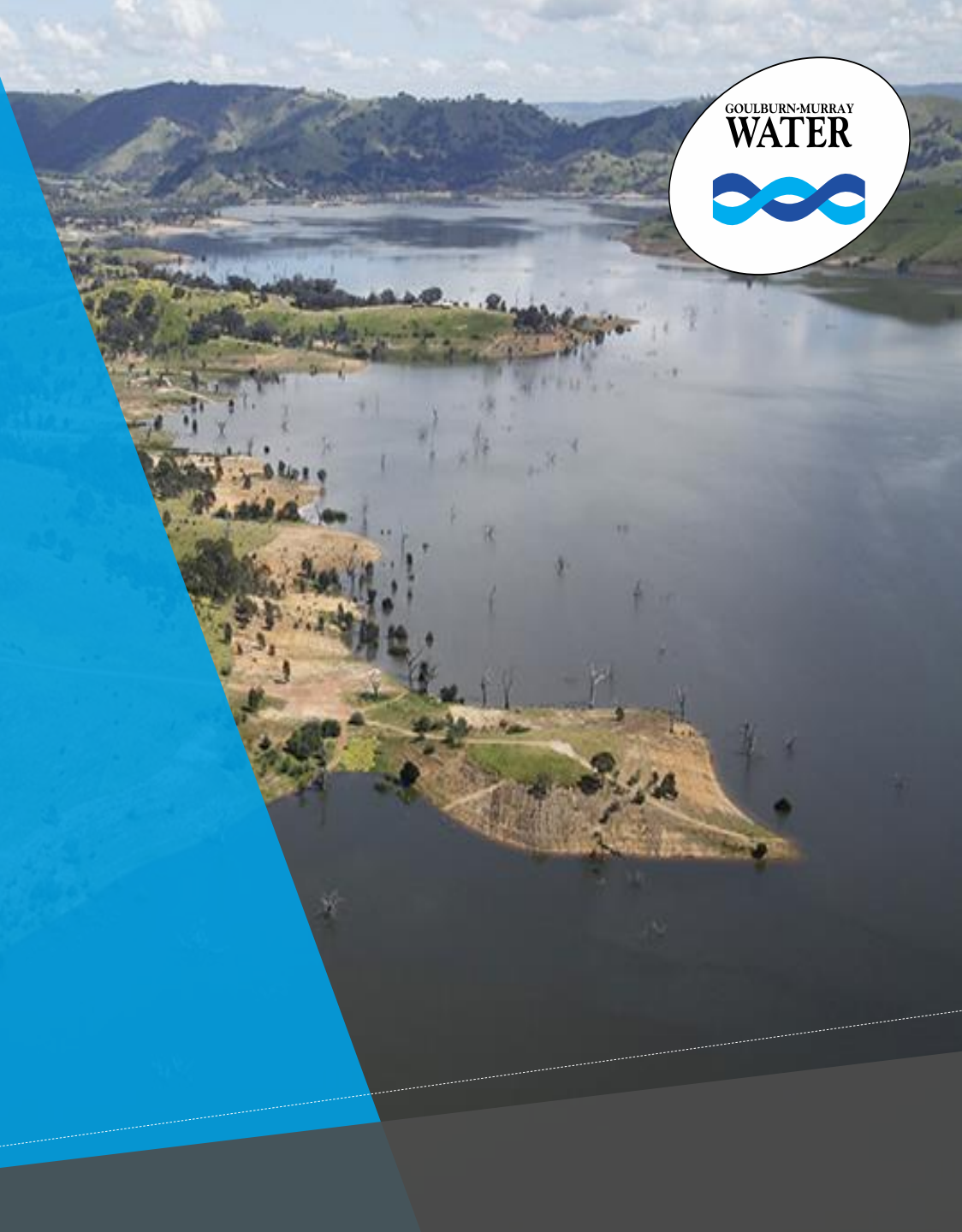




Meeting water demands

Murray Valley Winegrowers Information Forum

Andrew Shields
10 May 2018

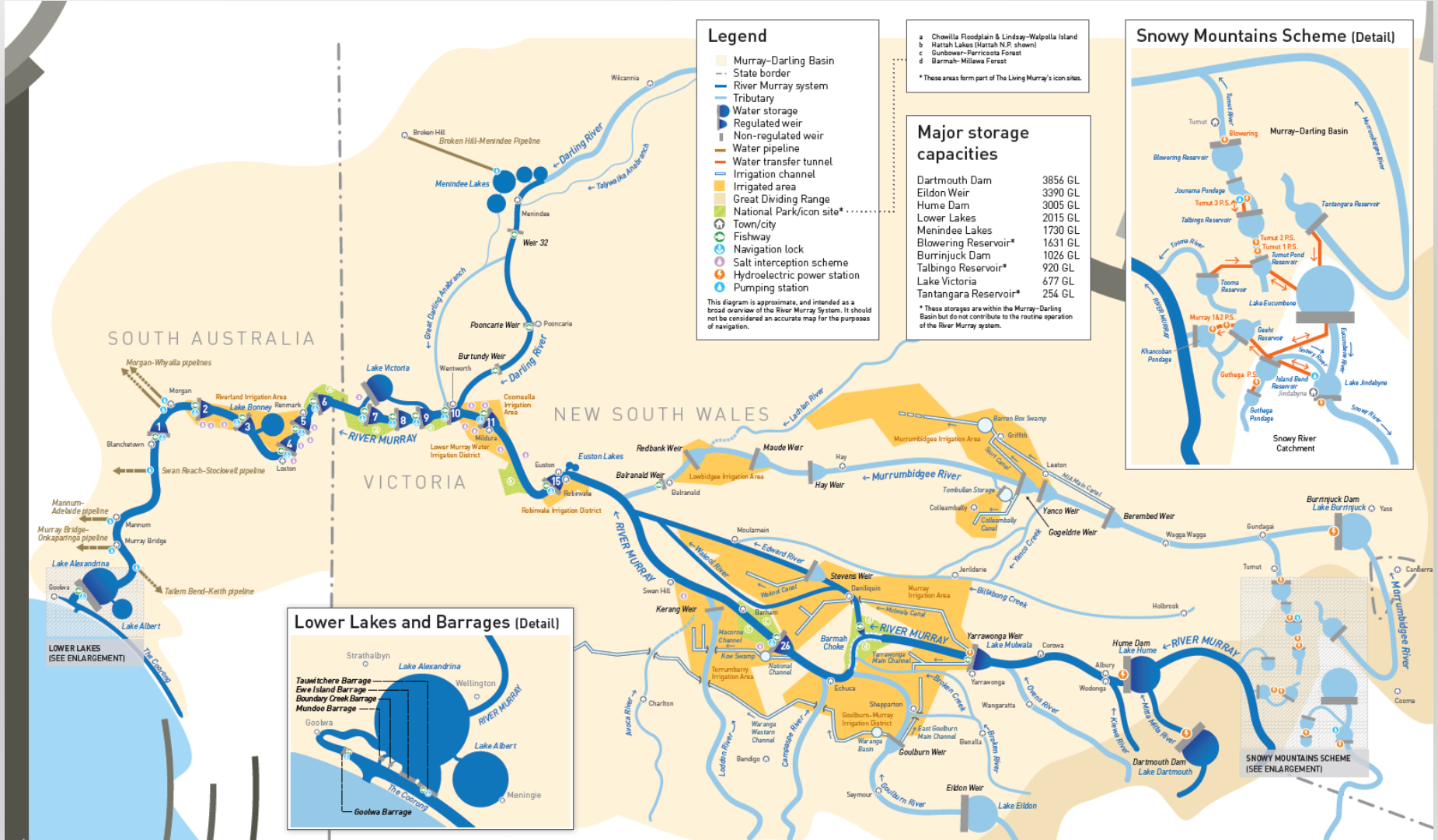


Meeting water demands



Overview

- Summary of system operations
- Operating challenges and response options
- January 2018 experience
- Future challenges



Legend

- Murray-Darling Basin
- State border
- River Murray system
- Tributary
- Water storage
- Regulated weir
- Non-regulated weir
- Water pipeline
- Water transfer tunnel
- Irrigation channel
- Irrigated area
- Great Dividing Range
- National Park/icon site*
- Town/city
- Fishway
- Navigation lock
- Salt interception scheme
- Hydroelectric power station
- Pumping station

This diagram is approximate, and intended as a broad overview of the River Murray System. It should not be considered an accurate map for the purposes of navigation.

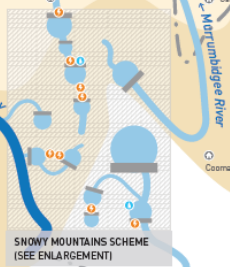
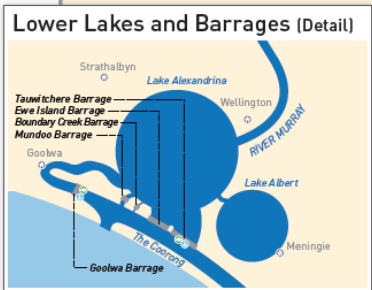
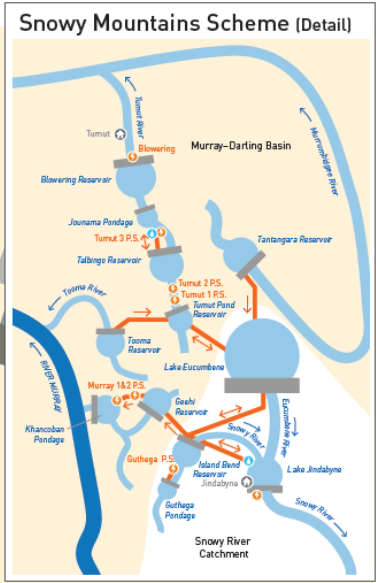
a Chowilla Floodplain & Lindsay-Walpeila Island
 b Hartzok Lakes (Hartzok N.P. stream)
 c Gunbower-Ferrisota Forest
 d Barmah-Millwells Forest

* These areas form part of the Living Murray's icon sites.

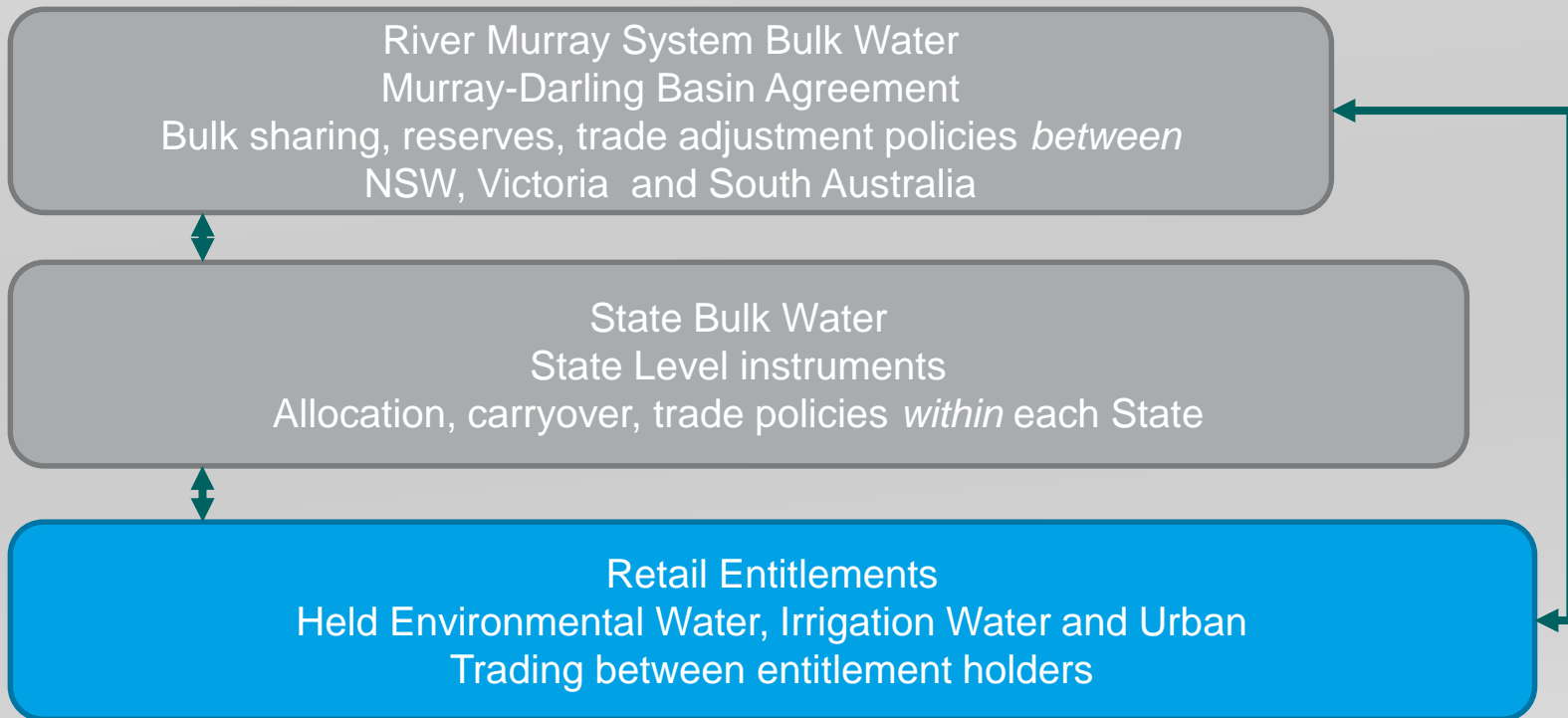
Major storage capacities

Dartmouth Dam	3856 GL
Eildon Weir	3390 GL
Hume Dam	3005 GL
Lower Lakes	2015 GL
Menindee Lakes	1730 GL
Blowering Reservoir*	1631 GL
Burrinjuck Dam	1026 GL
Talingo Reservoir*	920 GL
Lake Victoria	677 GL
Tantangara Reservoir*	254 GL

* These storages are within the Murray-Darling Basin but do not contribute to the routine operation of the River Murray system.



Bulk versus Retail



Summary of System Operations



River Murray System Features

- Long 'travel times' – 1 to 3 months (~2,500 km)
- Vast bulk of storage in headwaters
- Channel capacity limitations
- Seasonal Inflows – winter/spring
- Highly variable flow regime – wettest year has 50x volume of driest year
- Mid river floodplains & anabranches
- Evaporation (can be in the order of 5,000 ML/day in summer)

Summary of System Operations



Seasonal planning

- MDBA prepare an Annual Operating Plan at the start of the water year
- Multiple scenarios
- Updated in October
- Adapt during the water year as conditions arise
- Publically available
- Weekly report provides information on up to date operations

Operating challenges



Challenges are inherent in the River Murray System

- Peak demands occur in summer, when losses and environmental impact is highest
- Barmah Choke – natural capacity restriction
- RMS is operated as efficiently as possible to conserve water - a balance between releasing enough without being 'wasteful'
- Long travel times
- Limited lower system storage and re-regulating capacity

Operating challenges



Delivery Risks

If demands cannot be met = a delivery shortfall

Two causes:

- Demands exceed capacity
- Unanticipated spike in demands with not enough time to release extra water from dams

This is never fully predictable!

To date the risks have been 'managed' well enough to avoid restrictions on all but occasion (March 2002)

Managing delivery risks



Routine measures used by the MDBA

Extra measures available to the MDBA

Extra measures available to the states

Actual shortfall – possible restrictions

Steps taken to avoid a shortfall



Four levels of action

Level 1 – Business as usual

- Routinely applied in RMS operations to reduce the likelihood of a shortfall occurring
- AOP, ongoing weather/inflow forecasting, worst-case planning, IVT, Choke bypass options etc.

Level 2 – Additional measures taken by MDBA

- Not routinely applied - taken when risk of shortfall is increasing and Level 1 options exhausted
- E-water 'good neighbour', Lake Vic supply SA entitlement, above channel capacity transfers etc.

Level 3 – Additional measures taken by others

- Taken by state water authorities/entitlement holders to reduce the impact/consequence of an impending shortfall
- Negotiate with entitlement holders to reduce/alter diversions, source 'non-IVT' from tribs etc.

Level 4 - Consequence management

- Taken if a shortfall is unable to be totally mitigated or avoided
- Ration or restrict diversions/share shortfall



Very rare
10 GL shortfall in 2002

Are the risks changing?



Capacity is not static

- Tributary flows / IVT availability
- Menindee shared or NSW resource
- Barmah choke degrading (<600 ML/d)
- Murray Irrigation Limited system access (~1,000 to 1,500 ML/day)
- Additional Choke bypass options (forest channels)

Are the risks changing?



Demands and supply are not static

- Increased development downstream of Barmah choke
- Trade and carryover have changed use patterns
- Climate change – increased losses, heat waves
- Environmental demands – majority early season use, but some summer demand
- Hume to Lake Victoria transfers

Role of trade

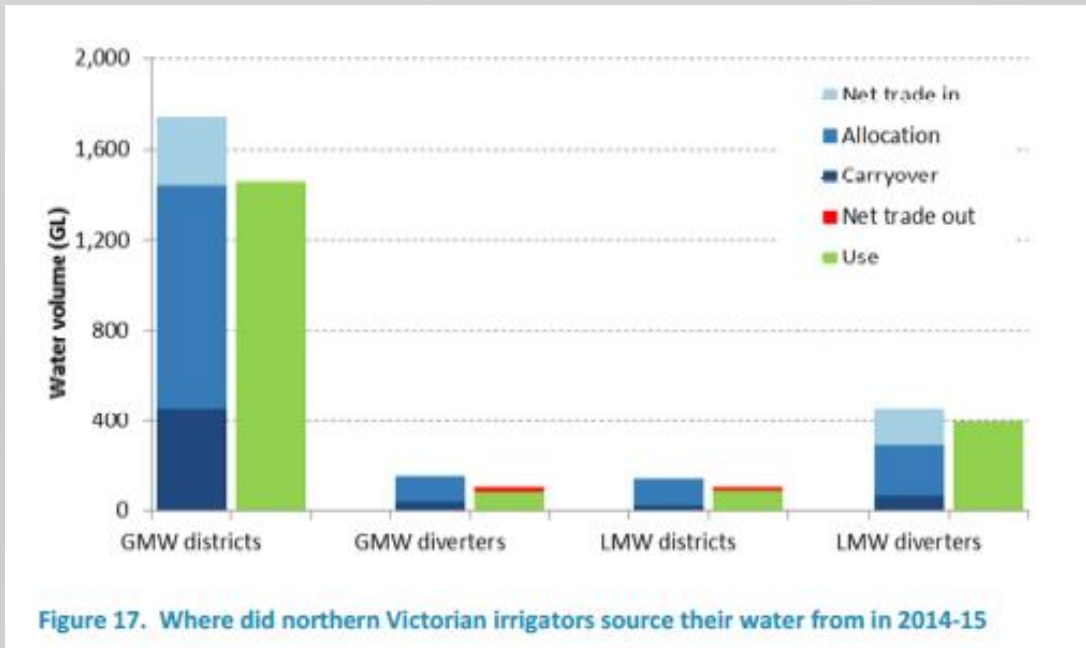


Figure 17. Where did northern Victorian irrigators source their water from in 2014-15

Source: Water Market Trends Report, 2016

What are the MDBA doing?



Background

- Investigating the changes in demand and capacity and their likely impacts
- Improving models and forecasting abilities
- Refining management responses and looking at new ones
- Addressing erosion issues
- Raising awareness of delivery risks

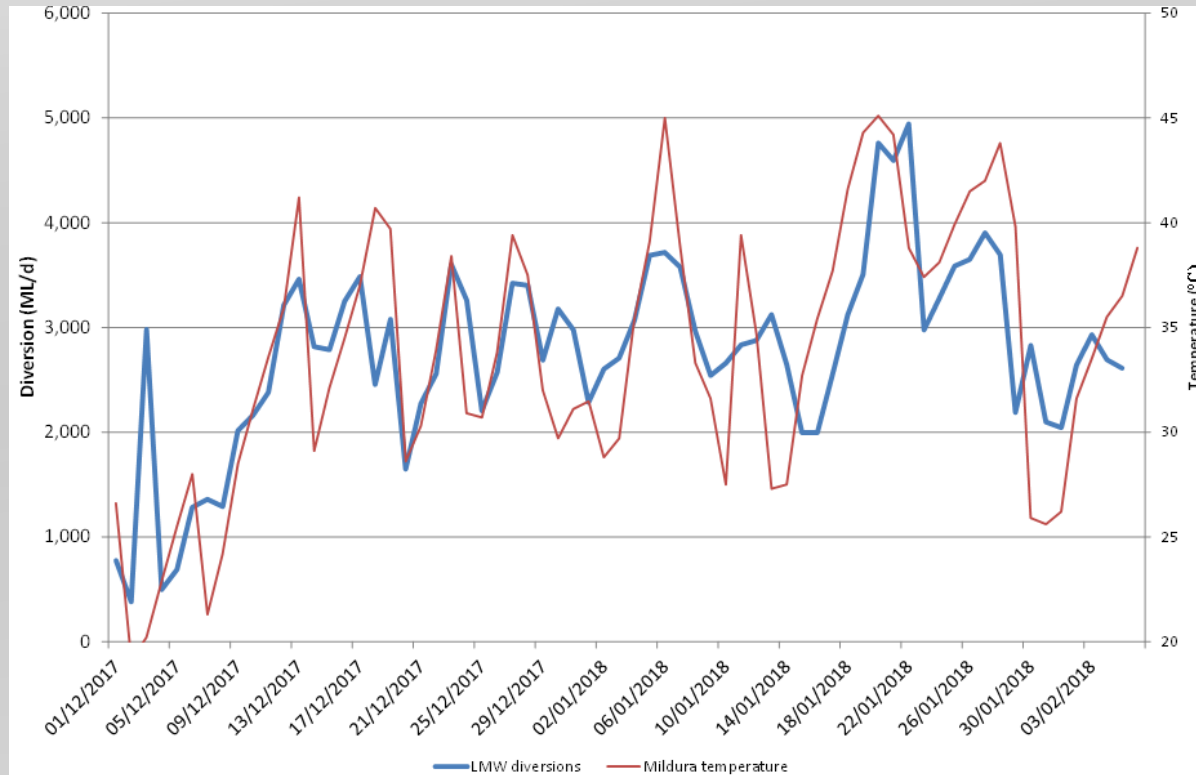
January 2018



Background

- Sustained high temperatures
- Falling river flows
- Demand increased

January 2018



January 2018



Actions

- Increased contributions from the Goulburn
- Euston weirpool
- Lake Boga
- National Channel diversions
- Kings Billabong

Future challenges



Meeting growing demand

- Concentration of demand in lower Murray region
- Source of allocation or entitlements
 - Dry times
- Water markets and commodities
 - Murrumbidgee
- Goulburn capacity
- Possible shortfalls

**Thank you
Questions?**



Contact us



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