Meeting water demands

Murray Valley Winegrowers Information Forum

Andrew Shields
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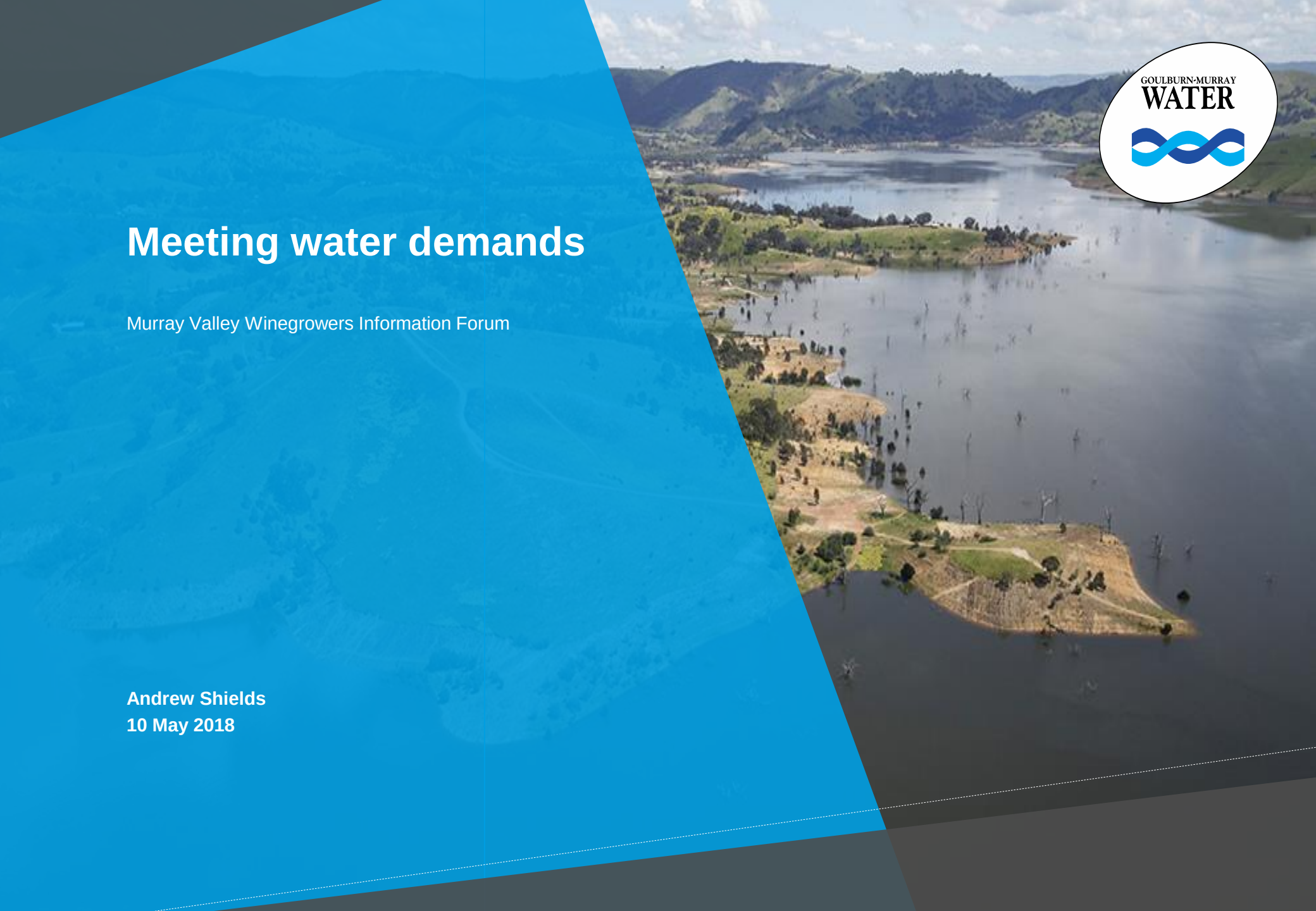
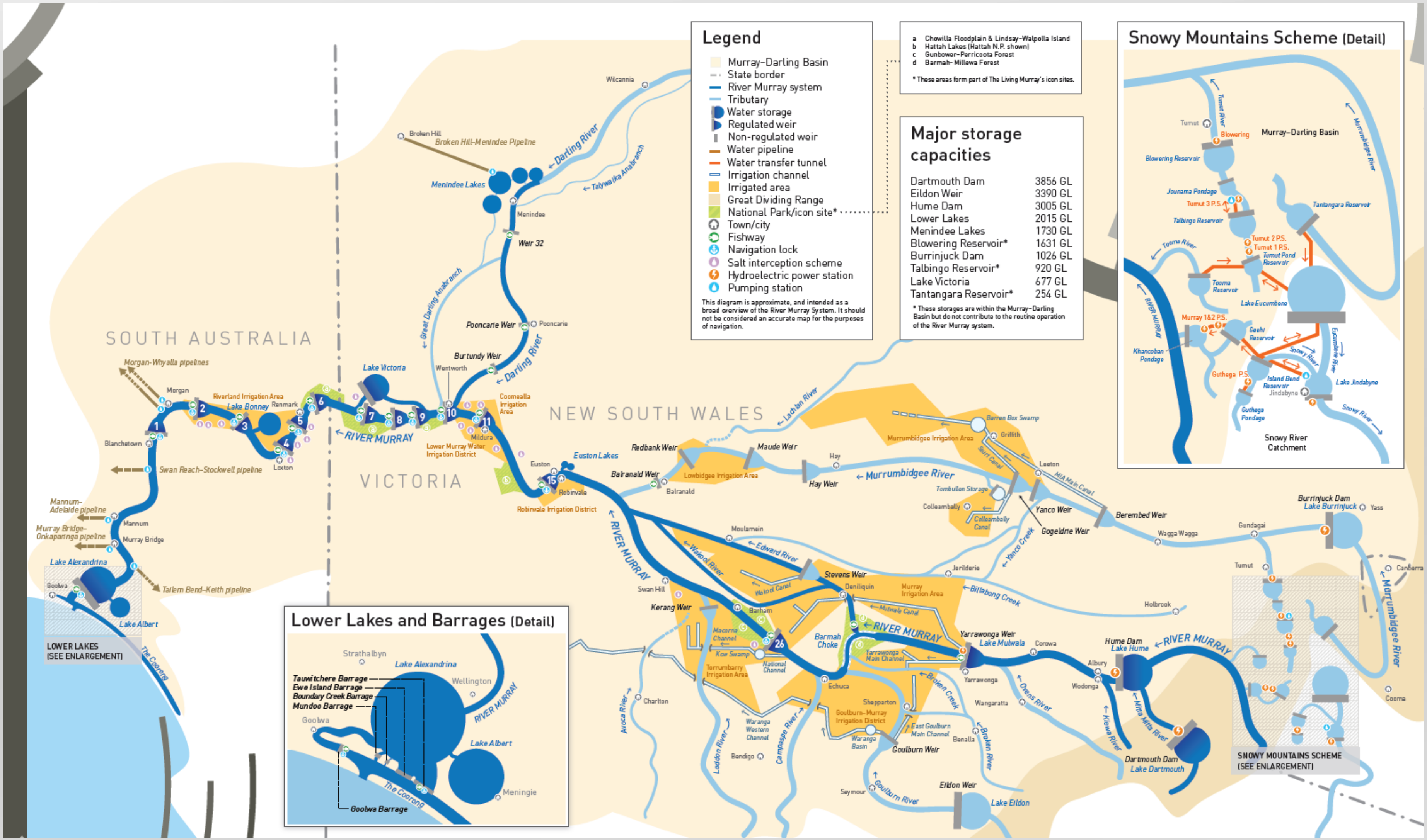


Meeting water demands

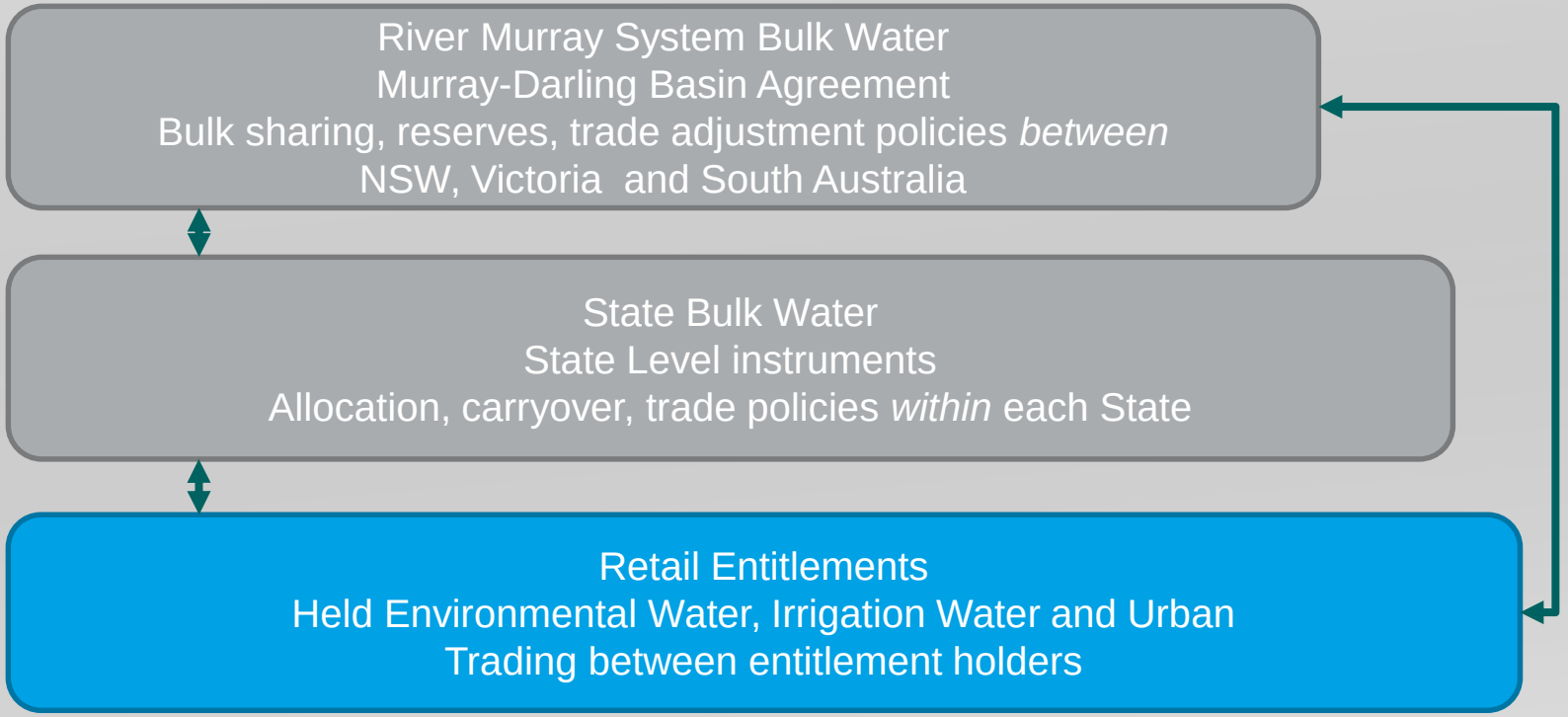
Overview

- 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–Walpolla Island
b Hattah Lakes (Hattah N.P. shown)
c Gunbower–Perricoota Forest
d Barmah- Millewa 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
Talbingo 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.
Snowy Mountains Scheme (Detail)
Murray–Darling Basin
Tumut
Blowering
Blowering Reservoir
Jounama Pondage
Tumut 3 P.S.
Talbingo Reservoir
Tantangara Reservoir
Tooma River
Tumut 2 P.S.
Tumut 1 P.S.
Tumut Pond Reservoir
Tooma Reservoir
Lake Eucumbene
Murray 1&2 P.S.
Geehi Reservoir
Khancoban Pondage
Guthega P.S.
Island Bend Reservoir
Jindabyne
Lake Jindabyne
Guthega Pondage
Snowy River
Snowy River Catchment
SOUTH AUSTRALIA
NEW SOUTH WALES
VICTORIA
Wilcannia
Broken Hill
Broken Hill-Menindee Pipeline
Darling River
Menindee Lakes
Menindee
Talyawalka Anabranch
Weir 32
Great Darling Anabranch
Pooncarie Weir
Pooncarie
Burtundy Weir
Lake Victoria
Wentworth
Morgan-Whyalla pipelines
Morgan
Riverland Irrigation Area
Lake Bonney
Renmark
Blanchetown
Loxton
RIVER MURRAY
Coomealla Irrigation Area
Mildura
Lower Murray Water Irrigation District
Swan Reach–Stockwell pipeline
Mannum–Adelaide pipeline
Mannum
Murray Bridge–Onkaparinga pipeline
Murray Bridge
Lake Alexandrina
Goolwa
Tailem Bend–Keith pipeline
Lake Albert
The Coorong
LOWER LAKES (SEE ENLARGEMENT)
Lachlan River
Euston Lakes
Euston
Robinvale
Robinvale Irrigation District
Redbank Weir
Maude Weir
Balranald Weir
Balranald
Lowbidgee Irrigation Area
Hay
Hay Weir
Murrumbidgee River
Murrumbidgee Irrigation Area
Barren Box Swamp
Griffith
Leeton
MIA Main Canal
Tombullen Storage
Coleambally
Coleambally Canal
Yanco Weir
Gogeldrie Weir
Berembed Weir
Yanco Creek
Wagga Wagga
Gundagai
Burrinjuck Dam
Lake Burrinjuck
Yass
Canberra
Tumut
Murrumbidgee River
Cooma
Moulamein
Edward River
Wakool River
Wakool Canal
Stevens Weir
Deniliquin
Jerilderie
Murray Irrigation Area
Billabong Creek
Holbrook
Mulwala Canal
Swan Hill
Kerang Weir
Barham
Macorna Channel
Kow Swamp
National Channel
Torrumbarry Irrigation Area
Barmah Choke
Yarrawonga Main Channel
Yarrawonga Weir
Lake Mulwala
Corowa
Yarrawonga
Hume Dam
Lake Hume
Albury
Wodonga
Echuca
Broken Creek
Ovens River
Wangaratta
Kiewa River
Mitta Mitta River
Dartmouth Dam
Lake Dartmouth
SNOWY MOUNTAINS SCHEME (SEE ENLARGEMENT)
Charlton
Avoca River
Loddon River
Waranga Western Channel
Campaspe River
Bendigo
Shepparton
Goulburn-Murray Irrigation District
East Goulburn Main Channel
Waranga Basin
Goulburn Weir
Benalla
Broken River
Seymour
Goulburn River
Eildon Weir
Lake Eildon
Lower Lakes and Barrages (Detail)
Strathalbyn
Lake Alexandrina
Wellington
Tauwitchere Barrage
Ewe Island Barrage
Boundary Creek Barrage
Mundoo Barrage
Goolwa
Lake Albert
Meningie
The Coorong
Goolwa Barrage

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

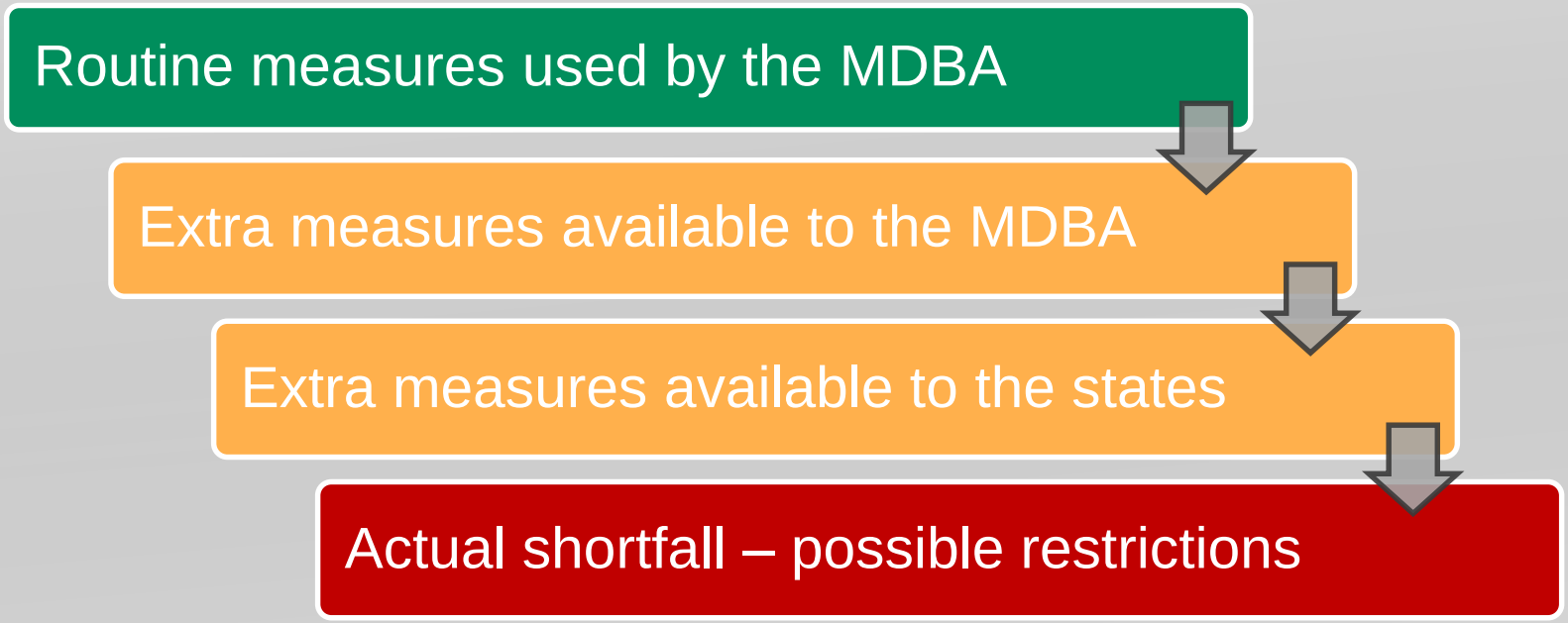
Two causes:

- 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



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

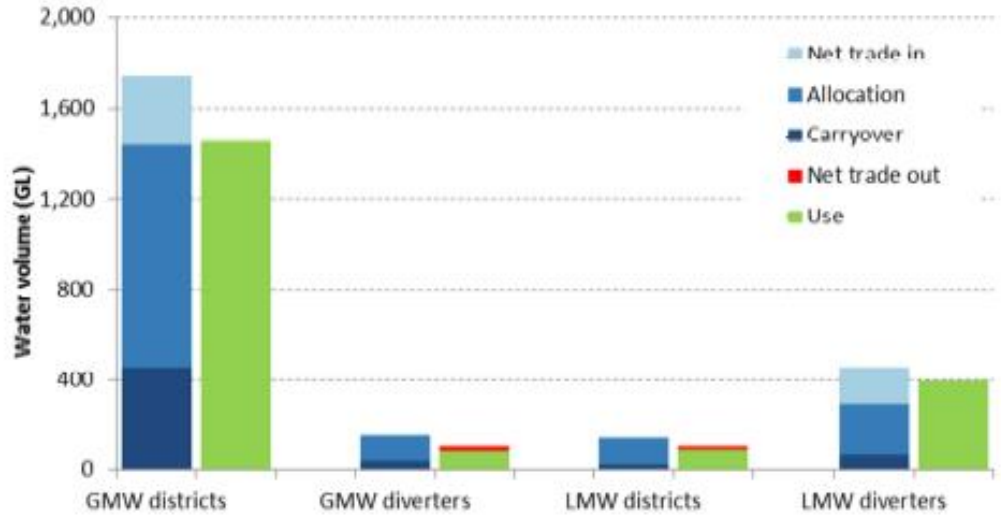


Figure 17. Where did northern Victorian irrigators source their water from in 2014-15

Source: Water Market Trends Report, 2016

What are the MDBA doing?

Background

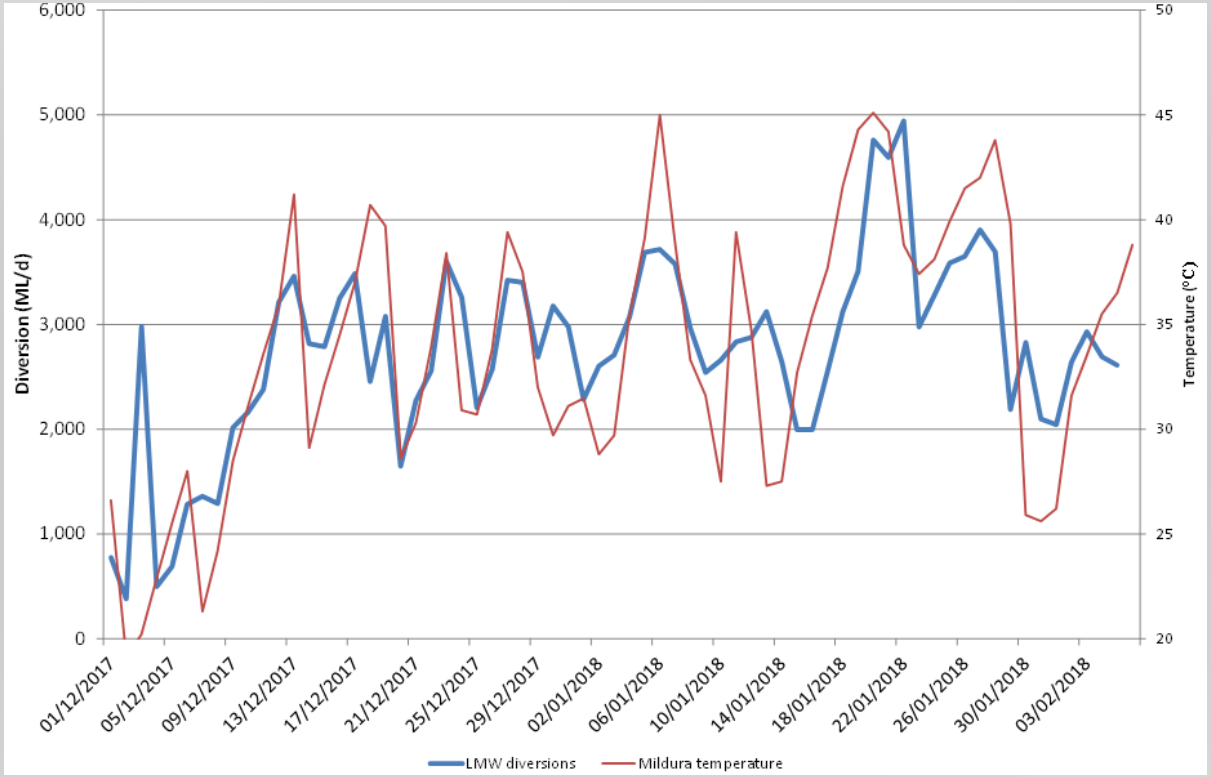
- Investigating the changes in demand and capacity and their likely impacts
- Improving models and forecasting abilities
- Refining management responses and looking at new ones
- Addressing erosion issues
- Raising awareness of delivery risks

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?

GOULBURN-MURRAY WATER

Contact us

1800 013 357

www.gmwater.com.au

40 Casey Street, Tatura

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