

# Challenges for meeting water demand in the River Murray System

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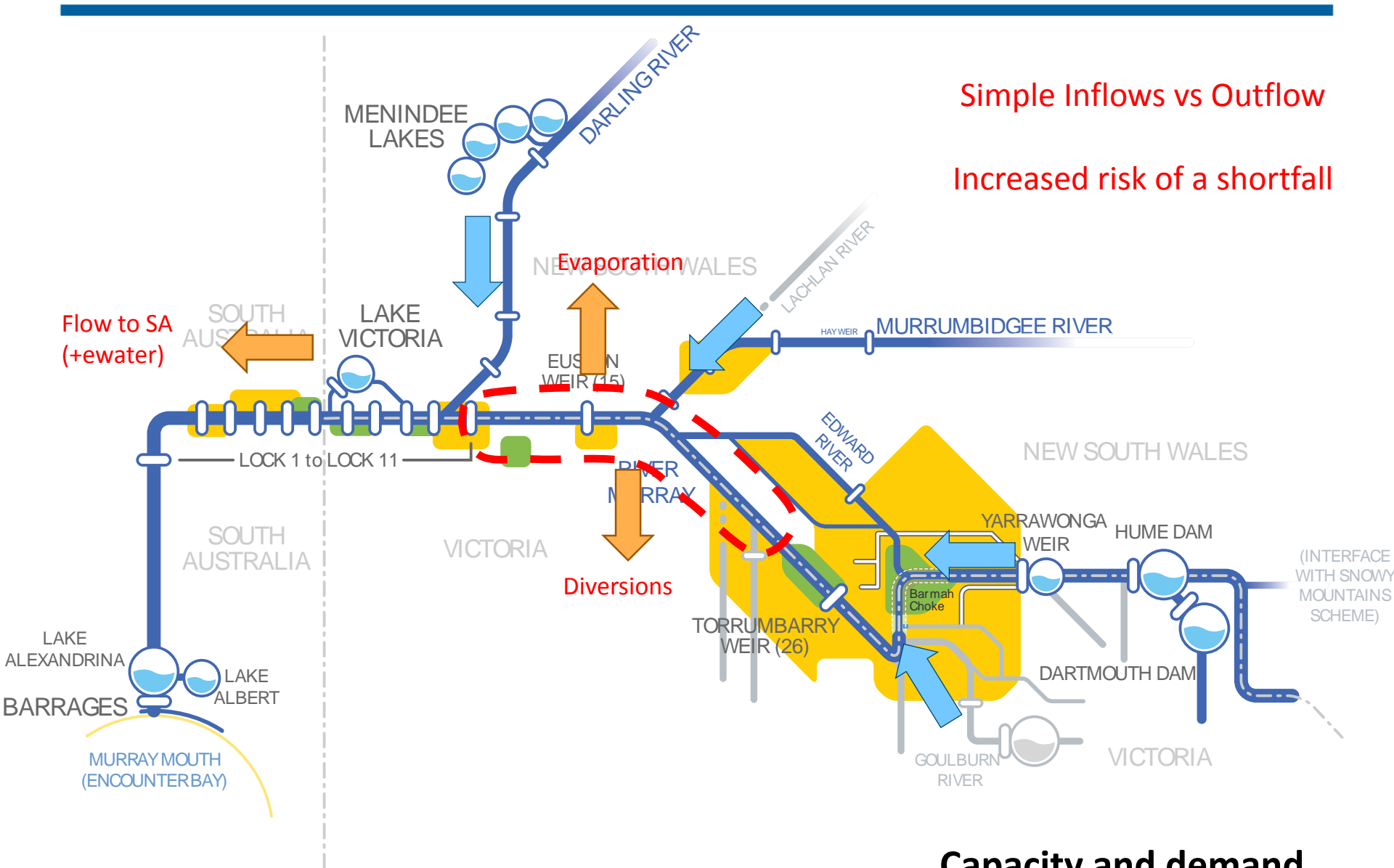
River Murray Operations

30 July 2019



Australian Government





Simple Inflows vs Outflow  
 Increased risk of a shortfall

Capacity and demand



## Drivers for change

- Water trade and carry over
- New and substantial E-water portfolio
- Changing inflow patterns and record temperatures
- Changing agricultural practices and distribution

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# Demand trends and capacity risks

- Large changes evident and evolving
  - New crop types
  - Movement of demands
  - Trade volumes – driving or servicing demands
- Concern is growing across all levels of government
- Number of areas of work
  - analysis of past years to understand drivers and effectiveness of mitigation measures
  - detailed modelling to understand risk of shortfall (ie risk of not being able to supply demands and frequency of years)
  - impacts on Choke bank stability, lower Goulburn River and environmental character of the river
  - potential impact on third parties (MD agreement, state shares, losses, trade rules etc.)
  - impacts on the delivery of environmental water

# Delivery Shortfall

- If demands cannot be fully met due to capacity constraints = a delivery shortfall
- Two main issues:
  - A pre-Christmas issue -> need to transfer large volumes from Hume to Lake Victoria, which may limit the delivery of spring and early summer demands
  - A post-Christmas issue -> hot and dry conditions driving high demands lower in the system
- The risk rapidly increases when unlikely or unusual sets of circumstances occur at the same time -> This is never fully predictable
- To date the risks have been **well managed** to avoid restrictions on all but one occasion (March 2002), but the drivers have significantly changed since this event

# Managing delivery risks

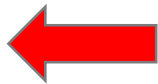
Routine measures used by the MDBA

Extra measures available to the MDBA

Extra measures available to the states

Actual shortfall – possible restrictions

Very rare  
10 GL shortfall  
in 2002



# Factors that Drive Shortfalls

Factors that drive shortfall risk		Mar. 2002 <sup>1</sup>	Spr. 2002	Apr. 2006	2012-13 <sup>2</sup>	2014-15	2015-16	2016-17 <sup>2</sup>	2017-18	2018-19
1	Maximum channel capacity constraints are reached									
2	Sustained transfers at/above channel cap. through Barmah Choke required									
3	Sustained high transfers coincide with high demands									
4	No or limited access to Menindee Lakes									
5	There are sustained high system losses									
6	There are short-term spikes in demands and losses									
7	There are very low tributary inflows									
8	There are no or limited periods of unregulated flow in late spring/early summer									
9	The channel capacity through Barmah Choke is less than previous season									
10	The upper limit of capacity to bypass the Barmah Choke is reached									
11	There is less 'spare' operational water in the river system									
12	Temporal reduction in operational performance at RMO Asset(s)									
13	Heavy reliance on use of IVT accounts, but limited ability to call									
14	Ability to use variable weir pool operations limited									
15	Inability to maintain higher flow rates to mitigate water quality impacts									
16	SA use of deferred water increases demand ds Barmah Choke									

<sup>1</sup> Year with actual (short-term) shortfall, <sup>2</sup> Years without emerging shortfall risk

# Measures to Mitigate Shortfall Risk

Measures to mitigate shortfall risk		Mar. 2002 <sup>1</sup>	Spr. 2002	Apr. 2006	2012- 13 <sup>2</sup>	2014- 15	2015- 16	2016- 17 <sup>2</sup>	2017- 18	2018- 19
1	MDBA prepares Annual Operations Plan (AOP)									
2	Reassessment of weather and inflow									
3	Review forecast demands									
4	Maintain default trade restriction across Barmah Choke									
5	Plan for 'worst case dry' scenario during peak demand periods									
6	Plan for and arrange delivery of IVT									
7	Use MIL and YMC to bypass Barmah Choke									
8	Surcharge and/or lower weir pool levels									
9	Environmental water holders actively apply good neighbour policy									
10	MDBA negotiates timing of demands with EWHs									
11	Make releases from Lake Victoria inconsistent with Lake Vic targets									
12	Obtain MinCo approval to delay May filling target of Lake Victoria									
13	Hume to Lake Victoria transfers above channel capacity									
14	Source water from tributaries other than IVT (e.g. draw on lakes)									
15	Negotiate reduced take at major offtake channels									
16	Create buffers in irrigation channels to meet demands later in season									
17	Negotiate with SA to defer some entitlement to reduce required SA flow									
18	Temporarily reduce minimum system flow requirements									
19	Vary SA's monthly entitlement for specified sequence of months									
20	Recommend water users to reduce demand or use alternative supply									
21	Rationing of diversions and sharing shortfalls									

<sup>1</sup> Year with actual (short-term) shortfall, <sup>2</sup> Years without emerging shortfall risk



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# Case Study Analysis

In summary the analysis of the case studies demonstrates that:

- shortfalls have been **well managed** to date.
- the frequency of difficult years is increasing with the measures used to reduce shortfall risk now becoming normal operating practice during the summer months.
- high allocation years are likely to be difficult years to deliver all demands (the risk of drought is effectively opposite to the risk of a shortfall).
- application of mitigation measures comes at a cost, the main one being the erosion of river channels, but also the potential impact on state water shares.
- delivery of held environmental water entitlements have been impacted.
- issues at the Barmah Choke are complex.

# The Barmah Choke Erosion

- Trade restriction in place
  - Has been since 2007 (enforced 2014)
- Slowly losing transfer capacity
- So what is going on
  - Use patterns and timing of water use have had the outcome of more concentrated delivery patterns
  - Interactions are complex – geomorphic & hydrologic
- Major focus over the next period, however no simple answers
  - Bypass options on the table
  - Lifting constraints may help

	Capacity downstream of Yarrowonga (ML/day)
1980's	~11,500
2003	~10,300
Currently	~ 9,500

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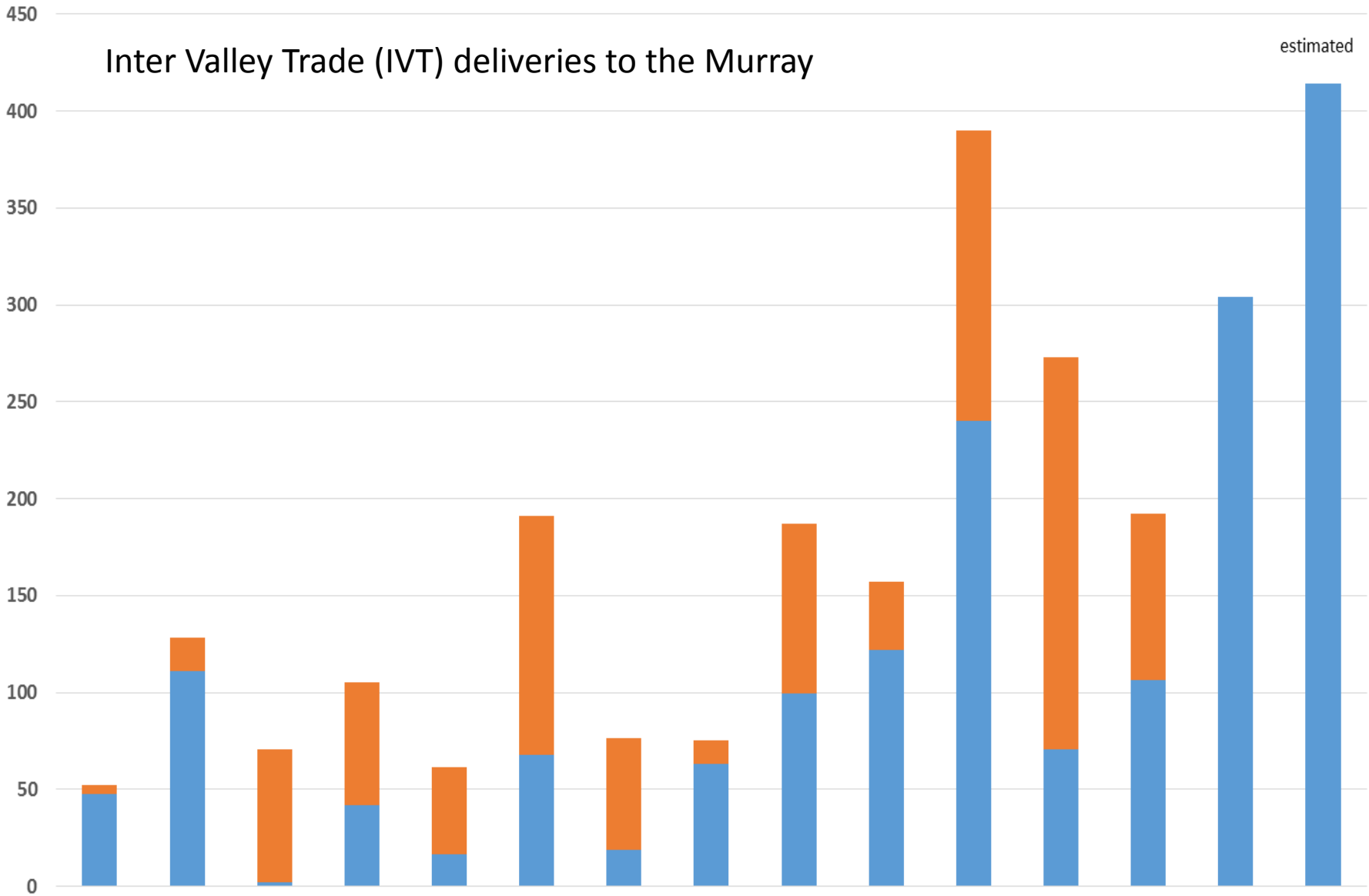
# Lower Goulburn River Erosion

- Trade has moved and is moving water out of the GMID into the Murray
  - Inter Valley Trade (IVT) Account
- Large volumes of water moving from the Goulburn to the Murray to service this demand
- Major focus for the Victorian government and the MDBA
- Again no simple answers
  - Review of trade rules and IVT releases
  - removing constraints may help

# Inter Valley Trade (IVT) deliveries to the Murray

estimated

Volume delivered (GL)



■ Goulburn End of Valley Account

■ Murrumbidgee End of Valley Account

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# Where to next

- Whole of river solution required
- Need to get Basin Ministers fully across this issue - raise it beyond the MDBA or Basin Official Committee (BOC)
- Modelling work - Updated crop areas to 2019
- Ministerial Council - August 2019
  - Discuss factors contributing to increased risk of shortfall
  - Develop communication products to explain the shortfall risk and what the MDBA and partner governments does to manage the issues
  - Needs a comprehensive engagement strategy
  - Present to MinCo on draft modelling results comparing 2009 risk to 2016 risk
- Channel Sharing Discussion – Mid 2019
  - Interim channel sharing arrangements to be discussed by upper states
  - BOC hopes to have these in place prior to the 2019/20 irrigation season

# Thank you.

## Office locations

Adelaide

Albury-Wodonga

Canberra

Goondiwindi

Toowoomba

 [mdba.gov.au](http://mdba.gov.au)  1800 630 114

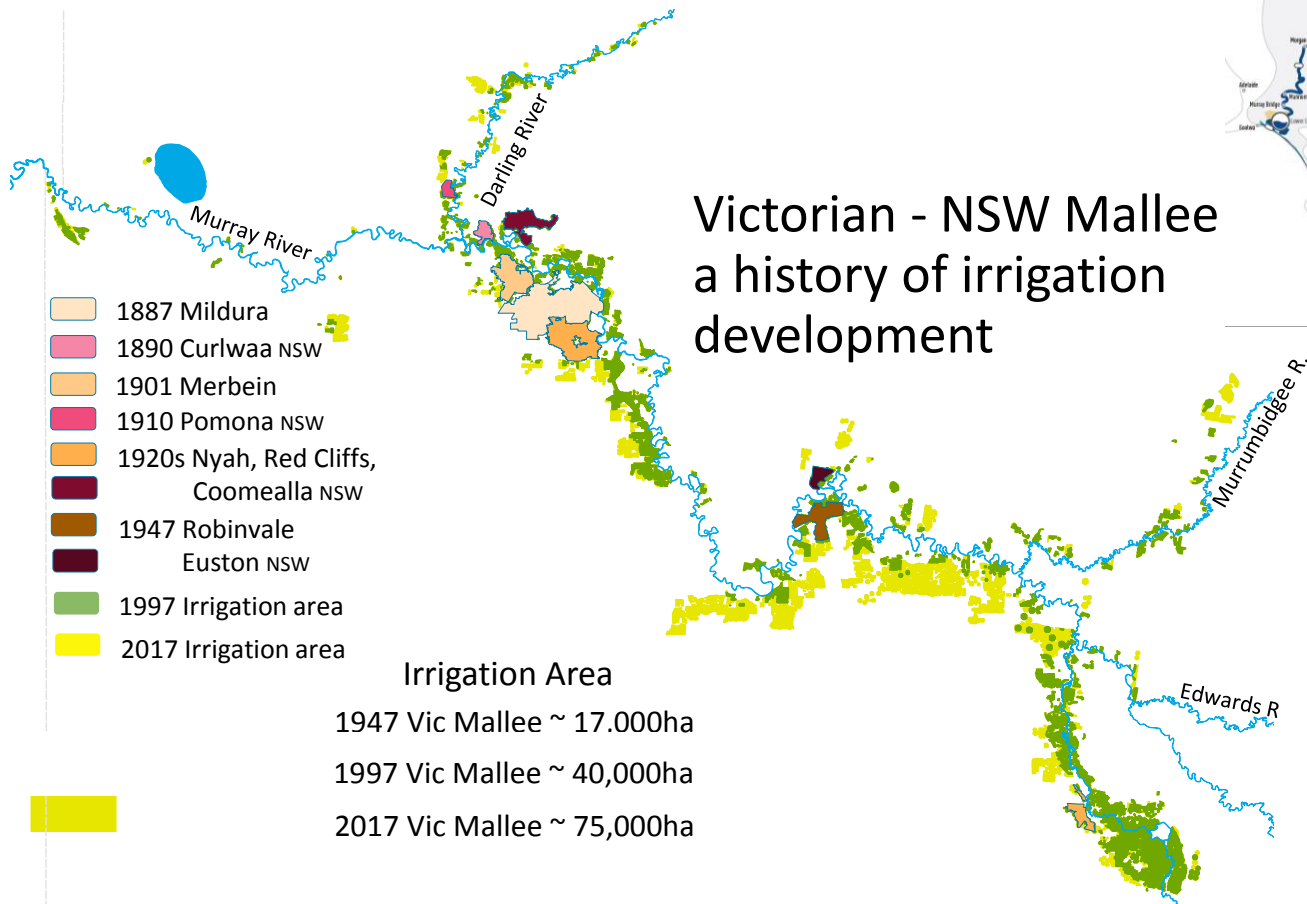
 [engagement@mdba.gov.au](mailto:engagement@mdba.gov.au)

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Australian Government





# Victorian - NSW Mallee a history of irrigation development

