



RIVER MURRAY WEEKLY REPORT

FOR THE WEEK ENDING WEDNESDAY, 3RD FEBRUARY 2016

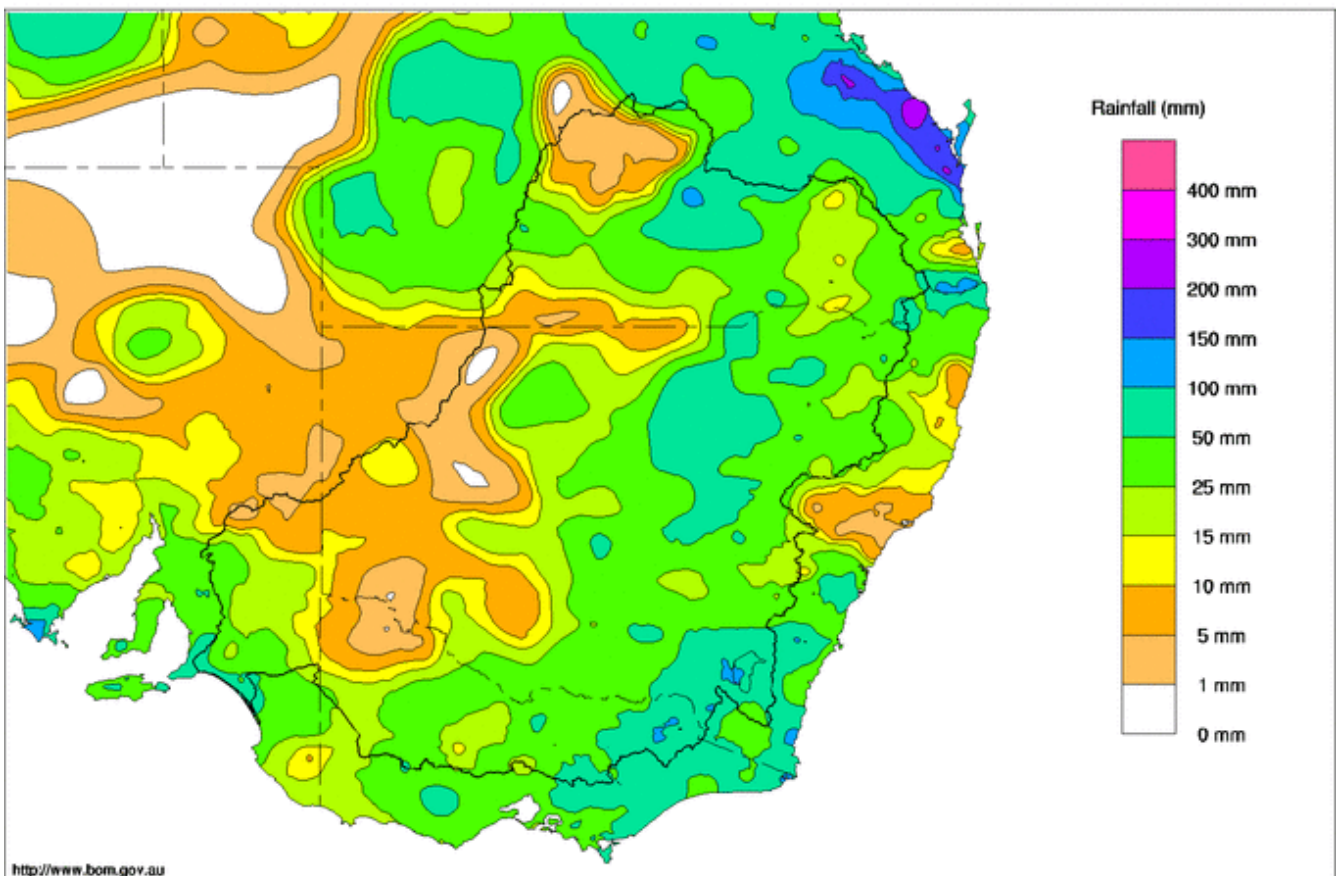
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Rainfall and Inflows

Humid and stormy weather persisted over the Murray-Darling Basin this week as a low pressure system tracked slowly in from the west before stalling over the region. Widespread thunderstorms developed with this system, bringing intense rainfall and significant weekly rain totals for many locations. Late in the week, there was further heavy rainfall through parts of South Australia as the remnants of Tropical Cyclone Stan crossed through from the north-west (Map 1).

Weekly rainfall totals in Queensland were heaviest over the Warrego, Maranoa and upper Condamine catchments and included 164 mm at Mitchell, 94 mm at Injune and 73 mm at Applethorpe. Totals in NSW and the ACT included 120 mm at Mt Ginini, 108 mm at Coonamble, 101 mm at Walgett Airport, 89 mm at Pindari Dam, 81 mm at Adelong and 74 mm at Dubbo. In Victoria, totals were highest over the eastern ranges and included 114 mm at Dartmouth Dam, 99 mm at Rocky Valley Dam, 90 mm at Biggara and 86 mm at Corryong. Elsewhere in Victoria, there was 113 mm at Mt William and 66 mm at Kyabram. There were also quite heavy falls across parts of South Australia. Weekly totals included 76 mm at Meningie, 47 mm at Mt Barker and 36 mm at Tailem Bend.

Murray-Darling Rainfall Totals (mm) Week Ending 3rd February 2016
Australian Bureau of Meteorology



<http://www.bom.gov.au>

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Issued: 03/02/2016

Map 1 - Murray-Darling Basin rainfall week ending 3rd February 2016 (Source: Bureau of Meteorology)

Although stream flows remain relatively low along the upper Murray tributaries, increasing catchment moisture from the rain during the last two weeks has boosted flow responses from the most recent rain.

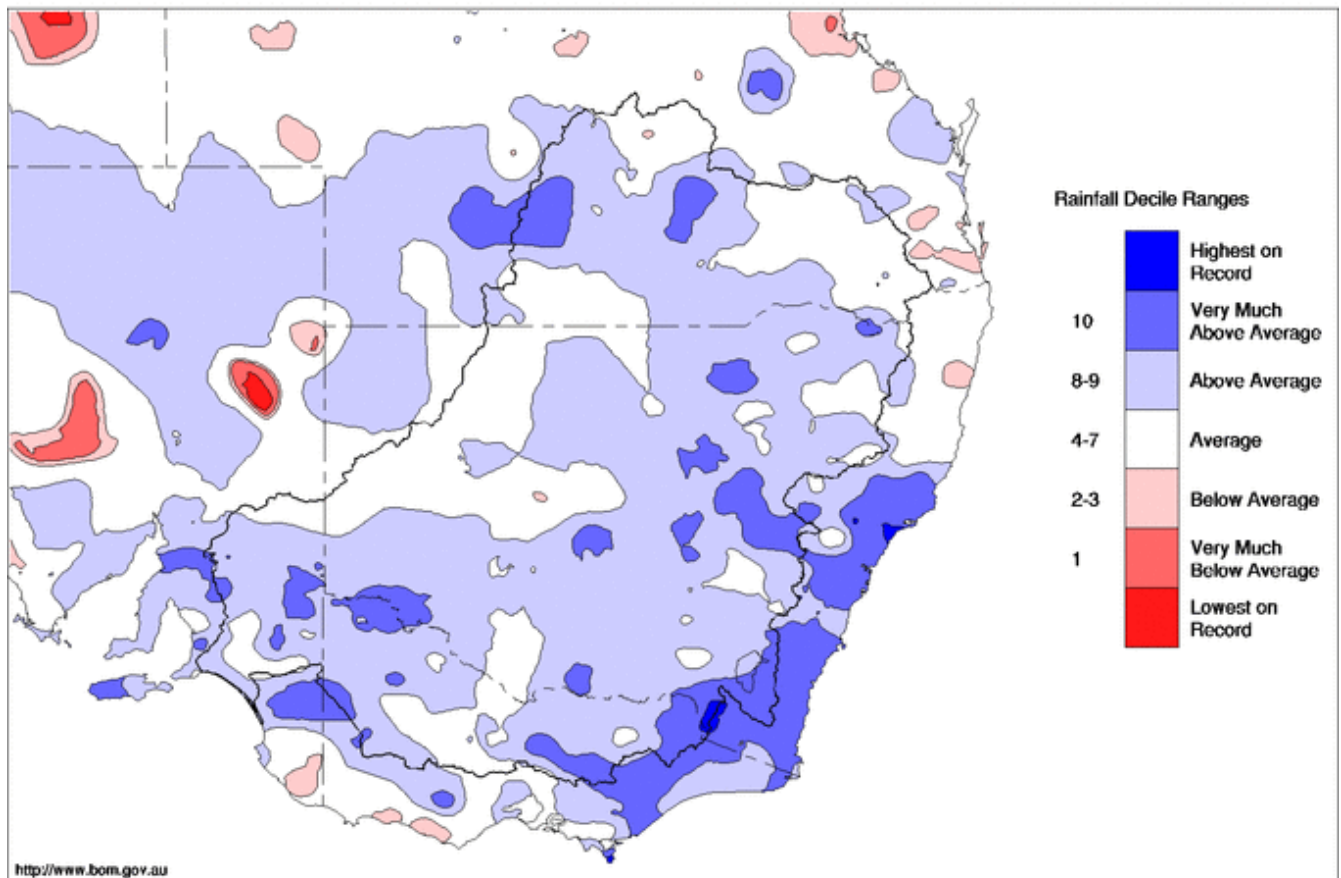


The most notable increases were upstream of Dartmouth Dam, where some tributaries reached their highest flow rates since November last year. For example on the Mitta Mitta River at Hinnomunjie bridge, the flow increased from 200 ML/day to a peak of 1,400 ML/day. It was a similar story on tributaries upstream of Hume Dam, where the Murray at Biggara increased from 300 to 1,200 ML/day. Downstream on the Kiewa River, the flow at Mongans bridge increased from 200 to a peak of about 1,300 ML/day.

January 2016 Summary

January 2016 saw wetter conditions than historically observed for this time of year across the majority of the Basin (Map 2). Of particular note is the 'Very Much Above Average' rainfall across parts of the Goulburn, upper Murray, upper Murrumbidgee and Macquarie catchments with a small patch of 'Highest on Record' rainfall within parts of the upper Murray catchment.

Murray-Darling Rainfall Deciles January 2016
Distribution Based on Gridded Data
Australian Bureau of Meteorology



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Map 2 - Murray Darling Basin rainfall deciles for January 2016 (Source: Bureau of Meteorology).
Issued: 03/02/2016

This relatively wet January follows on from generally below average rainfall in December 2015 and hot and dry conditions more generally during spring 2015. Given the dry underlying nature of the catchments there was very little flow response from the January rains. Monthly inflows to the Murray system for January (excluding Snowy Scheme, Darling River, Inter Valley Trade and managed environmental inflows) fell to about 90 GL which is close to one third of the long-term January average.

The Bureau of Meteorology (BoM) reported above average mean temperatures throughout most of Victoria and western, south-western and southern NSW. Apart from a small patch of 'below average' temperatures in northern NSW, the remainder of the Basin experienced near average mean temperatures for the month of January.



Estimated evaporative losses from MDBA storages for January 2016 are listed in Table 1. Rainfall over Dartmouth Dam resulted in a small gain (negative net evaporation), while at Hume Dam local rainfall helped to lower evaporative losses.

The evaporation is calculated by multiplying the surface area of the storage by the net evaporation. Net evaporation is derived by subtracting the rainfall recorded at the storage from the measured evaporation.

Table 1: Monthly evaporation figures for MDBA storages

Storage	Approximate (net) evaporative loss in January 2016 (GL)**	Average storage volume in January 2016 (GL)	Percentage Evaporative Loss Jan 16
Dartmouth	-0.4	1,880	-0.02
Hume	8.2	1,150	0.7
Lake Victoria	16	470	3.4
Menindee Lakes	6.3	63	10.0

**Evaporative loss from storage = surface area of the storage x net evaporation. Net evaporation = measured evaporation (using a 'pan' instrument) - rainfall.



River Operations

- Above average January rainfall across the majority of the Basin
- Lock 15 at Euston closed for about 16 weeks to enable refurbishment of the lock chamber.
- Weir pool manipulation trial continues.

MDBA total storage decreased by 38 GL this week, with the active storage now at 3,159 GL (37 % capacity). At **Dartmouth Reservoir**, the storage volume decreased by 30 GL to 1,783 GL (46% capacity). The release from Dartmouth, measured at Colemans, continues to recede and is currently close to 5,400 ML/day and is forecast to drop to around 4,500 ML/day by the end of the coming week.

This week's rainfall increased the storage at **Hume Reservoir** by 1 GL to 1,129 GL (38% capacity). Releases, measured at Doctors Point, have varied between 9,500 ML/day and 14,600 ML/day this week and are likely to increase if downstream irrigation demands increase as expected.

Rainfall across northern Victoria and the NSW Riverina led to reduced irrigation demands from **Lake Mulwala**. Diversions to Yarrowonga Main Channel were around 600 ML/day before falling to 400 ML/day. Diversions to Mulwala Canal fell from 2,200 ML/day to 1,820 ML/day with approximately 1,200 ML/day of this water bypassing the Barmah Choke for use further downstream. Releases from **Yarrowonga Weir** reduced from close to 10,000 ML/day to around 9,600 ML/day to introduce some variability to the release rate. Over the coming week the release is expected to increase to around 9,800 ML/day.

In the **Edward-Wakool** system, the Gulpa offtake continued to average near 500 ML/day. These higher flows have been due to environmental water targeting a bird breeding event in the Reed Beds wetland of Millewa Forest. This event is now coming to a close, and as such flows are anticipated to reduce to a more typical flow rate of around 350 ML/day over the coming week. The Edward offtake has continued to be close to 1,550 ML/day and this is expected to persist over the coming week in order to meet downstream demands. Diversions to Wakool Main Canal have fallen to around 110 ML/day. On the Edward River, the release from **Stevens Weir** remains close to the channel capacity of 2,700 ML/day.

Rice's Weir on the **Broken Creek** has risen to just above 400 ML/day. At McCoys Bridge on the **Goulburn River** recent rainfall resulted in a peak 1,050 ML/day. The flow is forecast to gradually drop back towards 700 ML/day.

Rainfall across northern Victoria resulted in lower irrigation demands from **Torrumbarry Weir**, with diversions to National Channel reduced from 2,400 ML/day to around 1,900 ML/day. Reduced demands have increased the flow downstream of Torrumbarry to around 7,200 ML/day and the flow is forecast to remain above 7,000 ML/day for the coming week.

On the **Murrumbidgee** at Balranald the flow has increased to near 1,900 ML/day and is expected to rise to around 2,000 ML/day in the coming week. This flow is well above the January end of system target minimum of 180 ML/day due to the delivery of IVT into the Murray system.

Rainfall along the mid-Murray resulted in both reduced evaporation and irrigation demands which, when combined with increasing flows from the Murrumbidgee, resulted in the Murray at **Euston** increasing to 9,850 ML/day. The flow is expected to remain close to 10,000 ML/day over the coming days. Boat operators are reminded that **Lock 15** at Euston will be closed for approximately 16 weeks to enable refurbishment of the lock chamber. Further information can be found on the Water NSW website <http://www.watarnsw.com.au/about/newsroom/2016/work-at-euston-lock-to-start-late-january>.

The storage volume at **Menindee Lakes** decreased by 2 GL to 62 GL (4% capacity). A red alert warning for blue green algae at several sites at Menindee Lakes and along the lower Darling is still current. Releases from Weir 32 were effectively ceased by Water NSW in December 2015. On the lower Darling **Burtundy** has not received flow since April 2015. A series of block banks have been installed in order



to retain sufficient water for local requirements (see Photo 1). These block banks will remain in place until reliable flows return to the lower Darling River.



Photo 1 – Installed block bank at Jamesville on the lower Darling River (Source: Jeff Finch, Water NSW)

Downstream at the junction of the Darling and the Murray, the weir pool at **Wentworth** remains above Full Supply Level (FSL) to assist water users on the lower Darling arm of the weir pool.

The weir pool at **Lock 9** remains around 10 cm below FSL, while **Lock 8** continues to be 80 cm below FSL and **Lock 7** 50 cm below FSL. These changes are part of an on-going weir pool variability trial aimed at achieving a more natural wetting and drying cycle for the riverine environment.

This week the storage volume at **Lake Victoria** fell by 8 GL to a total storage volume of 441 GL (65% capacity). The flow to **South Australia** has averaged near 7,600 ML/day and will remain close to this level for the month of February as environmental water is delivered downstream to support Lower Lake levels and maintain releases through the barrage fishways into the Coorong.

The 5-day average at the **Lower Lakes** fell 1 cm to 0.57 m AHD before higher inflows and welcome rain over the region helped to increase the 5-day average level to 0.59 m AHD.

For media inquiries contact the Media Officer on 02 6279 0141

DAVID DREVERMAN
Executive Director, River Management



Water in Storage

Week ending Wednesday 03 Feb 2016

MDBA Storages	Full Supply Level	Full Supply Volume (GL)	Current Storage Level	Current Storage		Dead Storage (GL)	Active Storage (GL)	Change in Total Storage for the Week (GL)
	(m AHD)		(m AHD)	(GL)	%			
Dartmouth Reservoir	486.00	3 856	446.87	1 783	46%	71	1 712	-30
Hume Reservoir	192.00	3 005	179.97	1 129	38%	23	1 106	+1
Lake Victoria	27.00	677	24.93	441	65%	100	341	-8
Menindee Lakes		1 731*		62	4%	(- -) #	0	-2
Total		9 269		3 415	37%	--	3 159	-38
Total Active MDBA Storage							37% ^	

Major State Storages

Burrinjuck Reservoir	1 026	542	53%	3	539	+12
Blowering Reservoir	1 631	477	29%	24	453	+8
Eildon Reservoir	3 334	1 450	43%	100	1 350	-13

* Menindee surcharge capacity – 2050 GL

** All Data is rounded to nearest GL **

NSW takes control of Menindee Lakes when storage falls below 480 GL, and control reverts to MDBA when storage next reaches 640 GL

^ % of total active MDBA storage

Snowy Mountains Scheme

Snowy diversions for week ending 02 Feb 2016

Storage	Active Storage (GL)	Weekly Change (GL)	Diversion (GL)	This Week	From 1 May 2015
Lake Eucumbene - Total	2 043	-47	Snowy-Murray	+23	414
Snowy-Murray Component	1 042	-9	Tooma-Tumut	+1	141
Target Storage	1 460		Net Diversion	23	273
			Murray 1 Release	+27	602

Major Diversions from Murray and Lower Darling (GL) *

New South Wales	This Week	From 1 July 2015	Victoria	This Week	From 1 July 2015
Murray Irrig. Ltd (Net)	3.6	269	Yarrowonga Main Channel (net)	1.6	154
Wakool Sys Allowance	1.7	51	Torrumbarry System + Nyah (net)	9.3	325
Western Murray Irrigation	0.5	13	Sunraysia Pumped Districts	2	74
Licensed Pumps	4.1	125	Licensed pumps - GMW (Nyah+u/s)	0.7	25
Lower Darling	0.3	7	Licensed pumps - LMW	11.2	217
TOTAL	10.2	465	TOTAL	24.8	795

* Figures derived from estimates and monthly data. Please note that not all data may have been available at the time of creating this report.

** All data above is rounded to nearest 100 ML for weekly data and nearest GL for cumulative data**

Flow to South Australia (GL)

* Flow to SA will be greater than normal entitlement for this month due to the delivery of additional environmental water.

Entitlement this month	194.0 *
Flow this week	53.5
Flow so far this month	23.3
Flow last month	218.8

(7 600 ML/day)

Salinity (EC) (microSiemens/cm at 25° C)

	Current	Average over the last week	Average since 1 August 2015
Swan Hill	80	90	80
Euston	90	80	-
Red Cliffs	100	110	130
Merbein	100	100	130
Burtundy (Darling)	1 400	1 400	1 100
Lock 9	110	110	140
Lake Victoria	200	200	210
Berri	200	200	220
Waikerie	250	250	280
Morgan	270	270	280
Mannum	360	350	320
Murray Bridge	430	430	330
Milang (Lake Alex.)	810	830	780
Poltalloch (Lake Alex.)	850	810	630
Meningie (Lake Alb.)	2 050	2 110	2 070
Goolwa Barrages	1 430	1 440	1 130



River Levels and Flows

Week ending Wednesday 03 Feb 2016

River Murray	Minor Flood Stage (m)	Gauge	Height	Flow (ML/day)	Trend	Average Flow this Week (ML/day)	Average Flow last Week (ML/day)
		local (m)	(m AHD)				
Khancoban	-	-	-	3 070	F	4 140	4 060
Jingellic	4.0	1.94	208.46	6 260	F	5 310	5 030
Tallandoon (Mitta Mitta River)	4.2	2.76	219.65	5 720	F	6 310	6 640
Heywoods	5.5	2.78	156.41	9 230	F	11 190	12 410
Doctors Point	5.5	2.64	151.11	10 510	R	11 880	12 680
Albury	4.3	1.67	149.11	-	-	-	-
Corowa	4.6	2.65	128.67	11 880	F	12 070	13 340
Yarrowonga Weir (d/s)	6.4	1.57	116.61	9 560	S	9 710	9 990
Tocumwal	6.4	2.21	106.05	9 910	F	10 120	10 310
Torrumbarry Weir (d/s)	7.3	2.37	80.92	7 230	R	6 650	6 080
Swan Hill	4.5	1.32	64.24	6 850	R	6 500	6 070
Wakool Junction	8.8	3.34	52.46	9 390	R	8 890	8 510
Euston Weir (d/s)	9.1	1.87	43.71	9 850	R	8 970	8 860
Mildura Weir (d/s)	-	-	-	7 920	F	7 910	7 580
Wentworth Weir (d/s)	7.3	2.89	27.65	6 740	F	7 060	6 900
Rufus Junction	-	3.67	20.60	7 590	R	7 280	6 870
Blanchetown (Lock 1 d/s)	-	0.82	-	6 000	F	5 680	4 550
Tributaries							
Kiewa at Bandiana	2.8	1.54	154.77	1 300	R	610	210
Ovens at Wangaratta	11.9	8.01	145.69	650	R	430	260
Goulburn at McCoys Bridge	9.0	1.53	92.95	1 000	F	870	580
Edward at Stevens Weir (d/s)	5.5	2.41	82.18	2 640	F	2 660	2 670
Edward at Liewah	-	3.02	58.40	2 590	R	2 570	2 490
Wakool at Stoney Crossing	-	1.50	54.99	580	F	590	630
Murrumbidgee at Balranald	5.0	2.26	58.22	1 890	R	1 610	1 300
Barwon at Mungindi	6.1	3.48	-	710	S	710	300
Darling at Bourke	9.0	4.06	-	190	S	100	0
Darling at Burtundy Rocks	-	0.61	-	0	F	0	0

Natural Inflow to Hume	4 000	1 880
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(i.e. Pre Dartmouth & Snowy Mountains scheme)

Weirs and Locks Pool levels above or below Full Supply Level (FSL)

Murray	FSL (m AHD)	u/s	d/s		FSL (m AHD)	u/s	d/s
Yarrowonga	124.90	-0.03	-	No. 7 Rufus River	22.10	-0.51	+1.39
No. 26 Torrumbarry	86.05	+0.00	-	No. 6 Murtho	19.25	-0.01	+0.15
No. 15 Euston	47.60	+0.00	-	No. 5 Renmark	16.30	+0.01	+0.30
No. 11 Mildura	34.40	+0.03	+0.20	No. 4 Bookpurnong	13.20	+0.04	+0.86
No. 10 Wentworth	30.80	+0.05	+0.25	No. 3 Overland Corner	9.80	+0.06	+0.33
No. 9 Kulnine	27.40	-0.09	-0.68	No. 2 Waikerie	6.10	+0.07	+0.17
No. 8 Wangumma	24.60	-0.81	-0.25	No. 1 Blanchetown	3.20	-0.12	+0.07

Lower Lakes FSL = 0.75 m AHD

Lake Alexandrina average level for the past 5 days (m AHD)	0.59
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Barrages

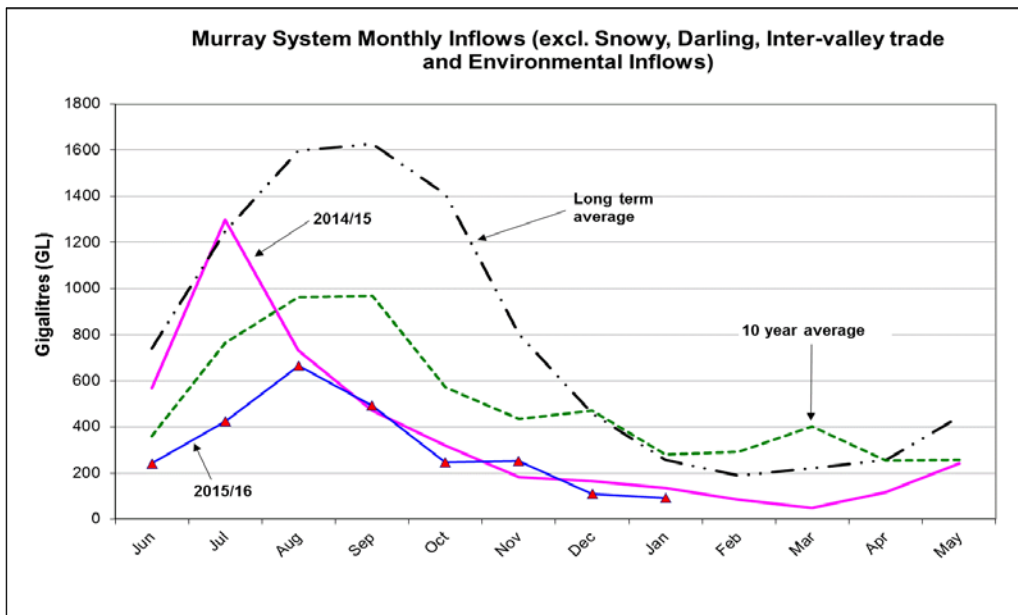
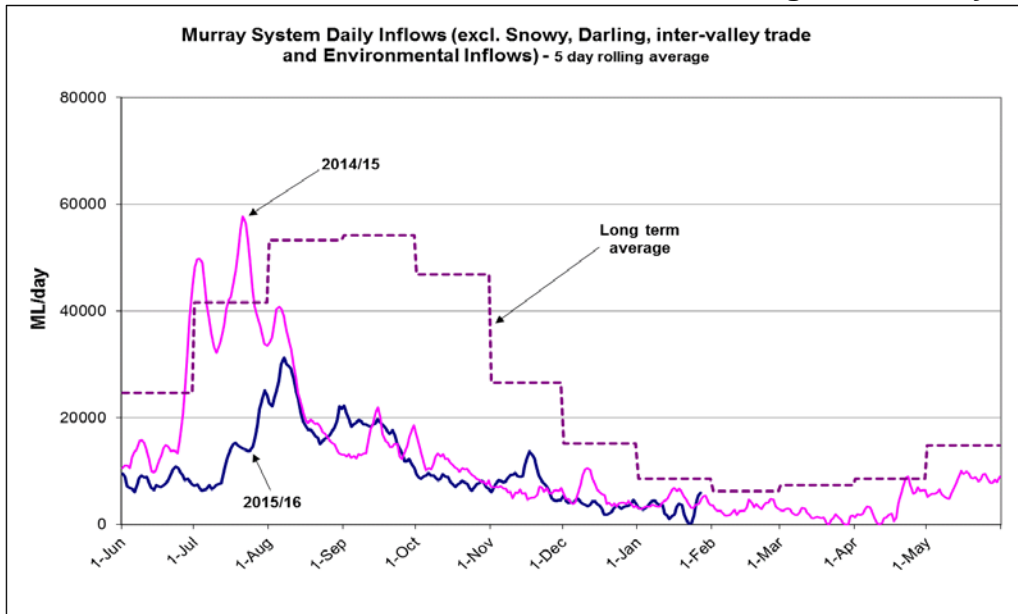
Fishways at Barrages

	Openings	Level (m AHD)	No. Open	Rock Ramp	Vertical Slot
Goolwa	128 openings	0.49	All closed	-	Open
Mundoo	26 openings	0.45	All closed	-	-
Boundary Creek	6 openings	-	All closed	-	Open
Ewe Island	111 gates	-	All closed	-	Open
Tauwichee	322 gates	0.51	All closed	Closed	Open

AHD = Level relative to Australian Height Datum, i.e. height above sea level



Week ending Wednesday 03 Feb 2016



State Allocations (as at 03 Feb 2016)

NSW - Murray Valley

High security	97%
General security	19%

Victorian - Murray Valley

High reliability	98%
Low reliability	0%

NSW - Murrumbidgee Valley

High security	95%
General security	35%

Victorian - Goulburn Valley

High reliability	87%
Low reliability	0%

NSW - Lower Darling

High security	75%
General security	0%

South Australia - Murray Valley

High security	100%
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NSW : <http://www.water.nsw.gov.au/Water-management/Water-availability/Water-allocations/Water-allocations-summary/water-allocations-summary/default.aspx>

VIC : <http://www.nvrm.net.au/allocations/current.aspx>

SA : <http://www.environment.sa.gov.au/managing-natural-resources/river-murray>