



RIVER MURRAY WEEKLY REPORT

FOR THE WEEK ENDING WEDNESDAY, 2ND SEPTEMBER 2015

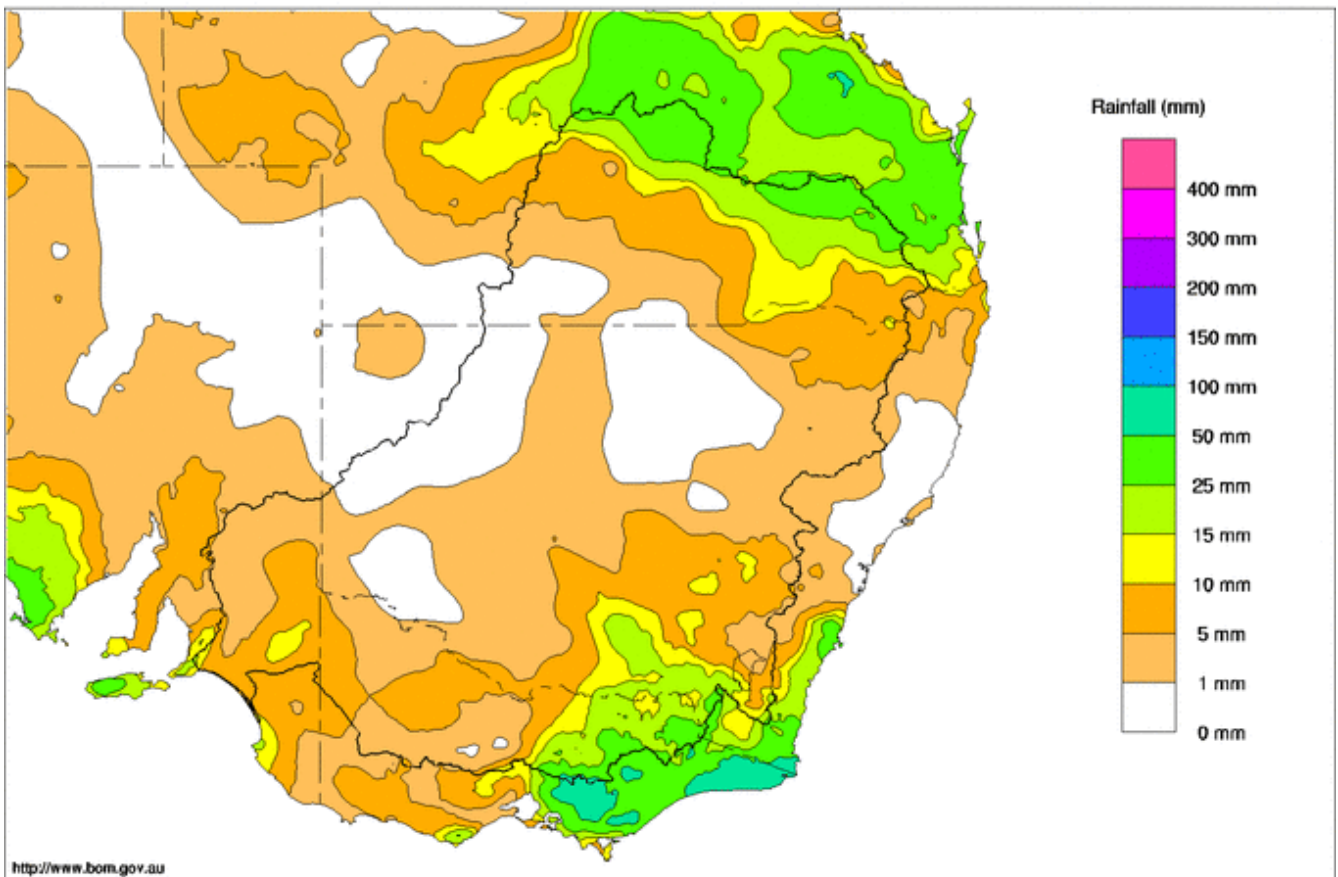
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Rainfall and inflows

Rainfall persisted over both the south-eastern and far northern Murray–Darling Basin this week as a complex low pressure system lingered off south-eastern Australia. Late in the week, a new system began moving into South Australia from the west.

Weekly rainfall totals were generally modest and were highest over the south-eastern slopes and ranges, and along the central Queensland divide. The western Basin was fairly dry (Map 1). Notable totals in Queensland included 35 mm at Derbyshire Downs, 33 mm at Barakula and 32 mm Jandowae. In NSW, there was 36 mm at Orange Airport, 27 mm at Corowa and 24 mm at Narrandera. Victorian totals included 35 mm at Woods Point and 24 mm at Mt Buller, Wangaratta and Archerton.

Murray-Darling Rainfall Totals (mm) Week Ending 2nd September 2015
Australian Bureau of Meteorology



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Map 1 - Murray-Darling Basin rainfall week ending 2nd September 2015 (Source: Bureau of Meteorology)

Stream flows in the upper Murray tributaries increased somewhat through the first half of the week before receding. On the Mitta Mitta River, the flow at Hinnomunjie Bridge peaked at 2,400 ML/day with the current flow at 1,300 ML/day. On the upper Murray, the flow at Biggara peaked on 28 August at around 3,000 ML/day before receding to the current flow of 1,800 ML/day. Highest flows on the Ovens River were recorded on the lower reaches where the Peechelba gauge increased from 2,900 to 4,100 ML/day before receding to 2,600 ML/day.

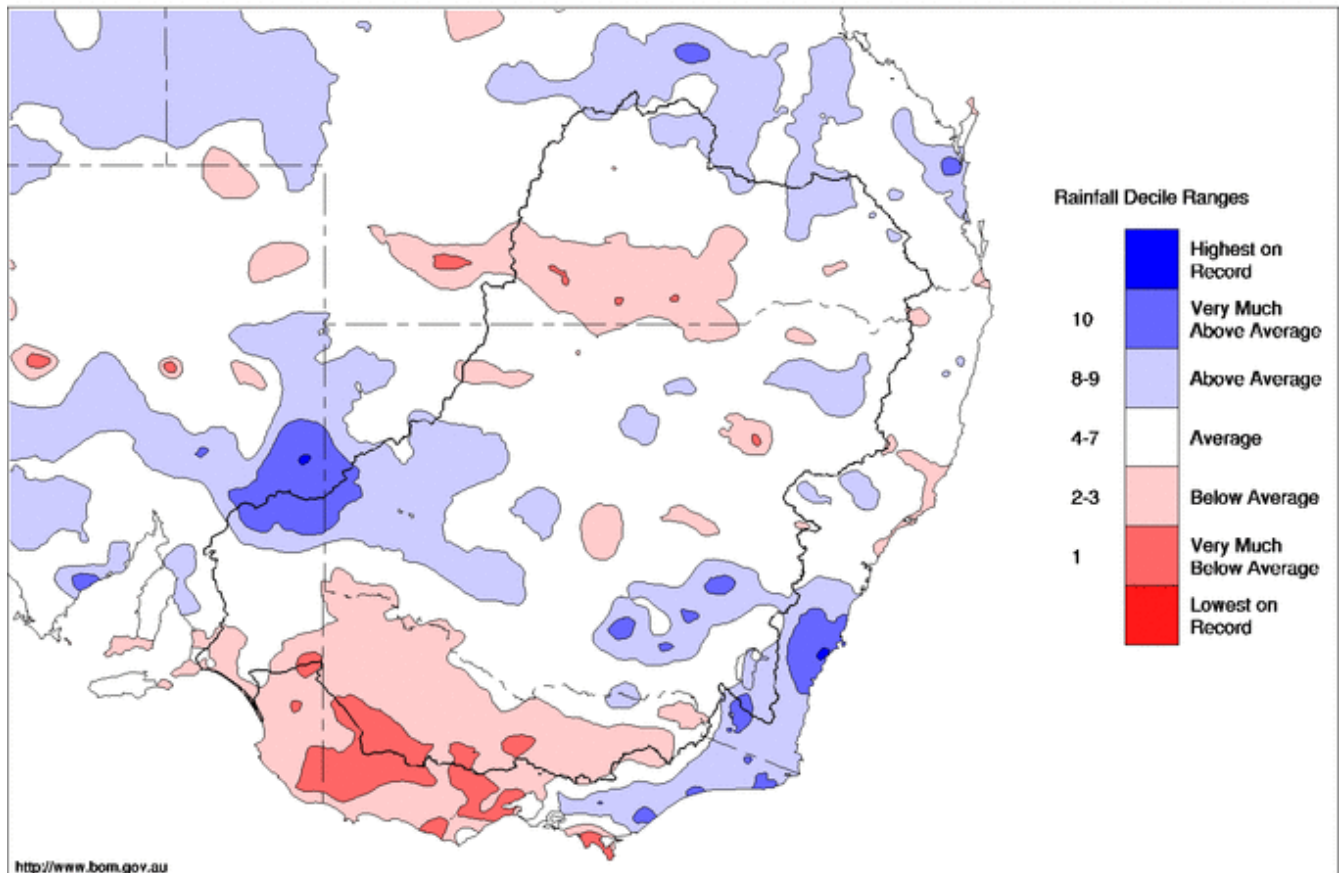


August 2015 Summary

Rainfall across Victorian and upper Murray headwater catchments was below average for the month of August, see Map 2. Pockets of the Murrumbidgee catchment received above-average rainfall while the majority of the Murray–Darling Basin has had average rainfall for the month. River Murray system inflows for August (excluding Snowy Scheme, Darling River and managed environmental inflows) totalled around 670 GL (77% annual exceedance probability). This figure represents only around 40% of the long-term monthly average for August of about 1,600 GL, see figure on page 8.

Murray-Darling Rainfall Deciles August 2015

Distribution Based on Gridded Data
Australian Bureau of Meteorology



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

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Map 2 - Murray Darling Basin rainfall deciles for August 2015 (Source: Bureau of Meteorology).

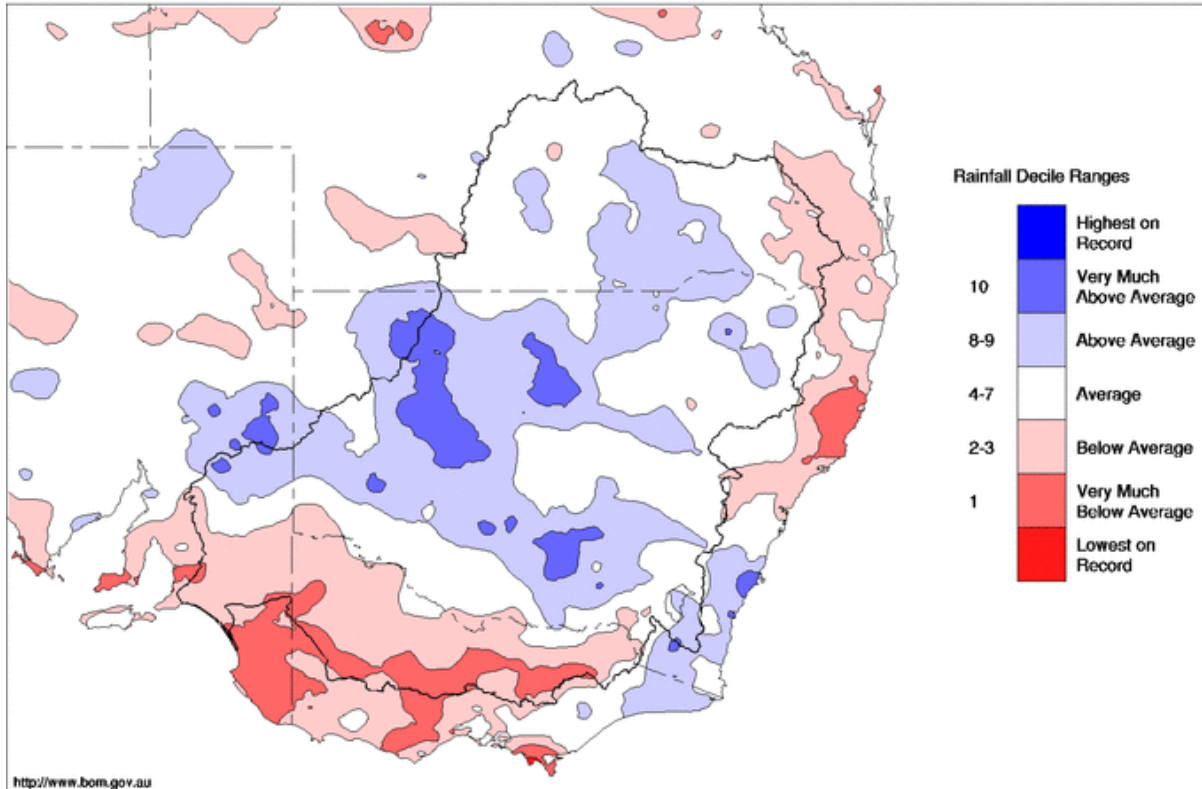
Rainfall deciles for winter (see Map 3) show that dry conditions have prevailed across the headwaters of Victorian and upper Murray tributaries. River Murray system inflows for winter totalled around 1,330 GL compared to the long-term average of 3,580 GL. This puts winter 2015 in the lowest 18% of winters on record (82% annual exceedance probability) and is consistent with the downward trends in late autumn and early winter rainfall and streamflows observed across southeast Australia since the mid-1990s.

The Bureau of Meteorology, in its report [State of the Climate 2014](#), warns that reductions in streamflows are amplified compared with reductions in rainfall. For example, since 1970 a 17% reduction in average winter rainfall in the southwest of Western Australia has resulted in more than a 50% reduction in streamflows. With similar reductions in rainfall observed across the upper Murray catchments since the mid-1990s, the reductions in streamflows are evident in the graph on page 8 which compares average system inflows over the last ten years with those over the period of record – about 120 years.



Murray-Darling Rainfall Deciles 1 June to 31 August 2015

Distribution Based on Gridded Data
Australian Bureau of Meteorology



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Map 3 - Murray Darling Basin rainfall deciles for winter 2015 (Source: Bureau of Meteorology).

Evaporation tables

Estimated evaporation losses from MDBA storages for August 2015 are reported in Table 1. Evaporation is estimated 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 calculated evaporation. As a result of rainfall exceeding evaporation during August, net evaporation at both Dartmouth and Hume Reservoirs was negative. Net evaporation at Menindee Lakes also remained low during August due to the low storage volume and the prevailing cool winter conditions.

Table 1: Monthly evaporation figures for MDBA storages

Storage	*Approximate (net) evaporative loss in August 2015 (GL)	Average storage volume in August 2015 (GL)
Dartmouth	-2.5	2,720
Hume	-8	1,280
Lake Victoria	5	455
Menindee Lakes	3	99

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



River Operations

- Transfers to Lake Victoria are being reduced;
- Releases downstream of Yarrawonga continue at around 15,000 ML/day;
- Euston, Lock 8 and Lock 7 weir pool levels increase.

Inflows from the Murrumbidgee River are expected to boost Lake Victoria levels in September and October and as a result, less water is required to be transferred from Hume to Lake Victoria in spring.

MDBA total storage increased by 77 GL this week. Active storage is now 4,391 GL (52% capacity).

The storage volume in **Dartmouth** Reservoir decreased by 30 GL to 2,641 GL (68% capacity). This is the first time Dartmouth has been below 70% storage capacity since August 2011. The release, measured at Colemans, averaged 7,000 ML/day and is being temporarily reduced to 5,000 ML/day, over the coming week, for variability within the Mitta Mitta River. These releases are bulk transfers to Hume to meet demands for the coming water year.

Hume Reservoir storage increased by 72 GL this week and is now 1,443 GL (48% capacity). Hume releases were reduced to 6,200 ML/day this week in an effort to keep Lake Mulwala from surcharging.

Lake Mulwala reached a level of 124.905m AHD on Monday due to inflows to the Murray from ungauged tributaries between Doctors Point and Corowa and into Lake Mulwala itself. Releases downstream of **Yarrawonga** Weir were temporarily increased to 15,200 ML/day over the weekend to manage the weir pool level. Diversions to Mulwala Canal and Yarrawonga Main Channel remain low at 600 ML/day and 400 ML/day respectively.

In September, environmental water may be used to target flows between 12,000 ML/day and 15,000 ML/day downstream of Yarrawonga. Releases will be in a translucent pattern based on estimated natural inflows upstream of Yarrawonga Weir and will maintain low-level inundation of the Barmah-Millewa forest and provide environmental benefits all the way to the Murray Mouth in South Australia. Yarrawonga releases are expected to reduce this week based on the current inflow forecast.

On the **Edward-Wakool** system, the combined flow through the Edward River and Gulpa Creek offtakes is steady at around 2,400 ML/day. Flows through the Edward River offtake continue to be controlled at rates below 1,600 ML/day, and are expected to remain around this flow in September.

On the **Goulburn** River, a flow of just over 1,000 ML/day is continuing at McCoys. On the **Campaspe** River, a pulse of environmental water recorded a peak of 1,300 ML/day at Rochester on Monday.

At **Torrumbarry** Weir, the diversion at National Channel has remained steady at around 1,400 ML/day. National Channel orders may stay suppressed over the coming week with rainfall forecast for the mid-Murray. Flows downstream of Torrumbarry Weir peaked at just over 10,000 ML/day this week and are expected to recede to around 9,000 ML/day this week.

On the **Murrumbidgee** River, flows at Balranald are under 3,000 ML/day and are expected to recede over the coming week. However with recent rainfall across the upper Murrumbidgee catchment, flows at Balranald are estimated to rise above 5,000 ML/day by mid-September.

During September, the following Weirs will have pool levels increased as part of the current weir pool variability program that aims to achieve a more natural wetting and drying cycle for the riverine environment:

- **Euston** Weir – 50 cm above Full Supply level
- **Lock 8** – 80 cm above Full Supply level
- **Lock 7** – 50 cm above Full Supply level



At the **Menindee Lakes**, storage has increased by 1 GL this week and is currently 103 GL (6% capacity). The release of a small replenishing flow into the lower Darling River continues, with the current flow at Weir 32 at about 100 ML/day. Releases are planned to continue until the end of September, see the latest NSW Department of Primary Industries publication [community information communique issue 18](#).



Photo 1 – The new Mullaroo offtake that manages flows into Mullaroo creek. The new regulator includes a fishway providing fish passage between the renowned Murray Cod habitat of Mullaroo creek and the River Murray. The fishway has been constructed to help increase populations of this iconic fish (Photo by Allan Drechsler, 31 August 2015).

Storage at **Lake Victoria** increased by 33 GL to 501 GL (74% capacity) and the level is expected to continue rising in the week ahead. The target flow to **South Australia** is 7,000 ML/day for the beginning of September which includes the delivery of additional environmental water from releases upstream.

At the **Lower Lakes**, the five-day average level at Lake Alexandrina is 0.79 m AHD (4 cm above FSL). Releases through the barrages have been maintained throughout the week and are currently estimated to be around 2,000 ML/day.

For media inquiries contact the Media Officer on 02 6279 0141

DAVID DREVERMAN
Executive Director, River Management



Water in Storage

Week ending Wednesday 02 Sep 2015

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	465.31	2 641	68%	71	2 570	-30
Hume Reservoir	192.00	3 005	182.52	1 443	48%	23	1 420	+72
Lake Victoria	27.00	677	25.49	501	74%	100	401	+33
Menindee Lakes		1 731*		103	6%	(- -) #	0	+1
Total		9 269		4 688	51%	--	4 391	+77
Total Active MDBA Storage							52% ^	

Major State Storages

Burrinjuck Reservoir	1 026	731	71%	3	728	+68
Blowering Reservoir	1 631	765	47%	24	741	+32
Eildon Reservoir	3 334	2 064	62%	100	1 964	+17

* 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 01 Sep 2015

Storage	Active Storage (GL)	Weekly Change (GL)	Diversion (GL)	This Week	From 1 May 2015
Lake Eucumbene - Total	2 213	n/a	Snowy-Murray	+14	173
Snowy-Murray Component	1 071	n/a	Tooma-Tumut	+9	95
Target Storage	1 240		Net Diversion	5	78
			Murray 1 Release	+23	258

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)	4.8	32	Yarrowonga Main Channel (net)	0.1	1
Wakool Sys Allowance	1.9	6	Torrumbarry System + Nyah (net)	0	8
Western Murray Irrigation	0.1	0	Sunraysia Pumped Districts	0.9	3
Licensed Pumps	1.1	5	Licensed pumps - GMW (Nyah+u/s)	n/a	0
Lower Darling	0.1	1	Licensed pumps - LMW	n/a	10
TOTAL	8.0	44	TOTAL	1	22

* 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	135.0 *
Flow this week	48.2
Flow so far this month	16.4
Flow last month	210.4

(6 900 ML/day)

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

	Current	Average over the last week	Average since 1 August 2015
Swan Hill	80	70	80
Euston	-	-	-
Red Cliffs	130	130	130
Merbein	130	130	140
Burtundy (Darling)	910	900	890
Lock 9	130	130	160
Lake Victoria	200	210	200
Berri	270	250	250
Waikerie	300	310	330
Morgan	310	320	320
Mannum	330	320	330
Murray Bridge	350	360	360
Milang (Lake Alex.)	790	740	720
Poltalloch (Lake Alex.)	600	610	600
Meningie (Lake Alb.)	1970	1960	2 010
Goolwa Barrages	940	940	1 040



River Levels and Flows

Week ending Wednesday 02 Sep 2015

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	-	-	-	5 310	F	3 930	4 260
Jingellic	4.0	2.20	208.72	8 400	R	8 370	6 910
Tallandoon (Mitta Mitta River)	4.2	2.96	219.85	6 880	F	7 590	7 930
Heywoods	5.5	2.68	156.31	8 860	R	8 360	8 670
Doctors Point	5.5	2.73	151.20	11 580	R	10 550	10 090
Albury	4.3	1.72	149.16	-	-	-	-
Corowa	4.6	2.15	128.17	8 740	F	11 710	9 890
Yarrowonga Weir (d/s)	6.4	2.26	117.30	14 980	F	14 510	12 280
Tocumwal	6.4	2.91	106.75	15 400	R	14 010	12 540
Torrumbarry Weir (d/s)	7.3	3.25	81.80	10 540	R	10 030	9 880
Swan Hill	4.5	1.75	64.67	9 710	R	9 540	9 520
Wakool Junction	8.8	3.95	53.07	12 280	S	12 010	10 640
Euston Weir (d/s)	9.1	2.48	44.32	14 460	S	14 150	12 710
Mildura Weir (d/s)	-	-	-	14 020	F	13 390	11 320
Wentworth Weir (d/s)	7.3	3.42	28.18	12 890	R	12 660	11 240
Rufus Junction	-	3.72	20.65	7 910	S	6 600	5 650
Blanchetown (Lock 1 d/s)	-	0.72	-	5 080	R	4 840	5 710
Tributaries							
Kiewa at Bandiana	2.8	2.04	155.27	2 180	R	2 290	1 740
Ovens at Wangaratta	11.9	8.65	146.33	2 260	F	2 920	3 010
Goulburn at McCoys Bridge	9.0	1.55	92.97	1 050	R	1 050	1 070
Edward at Stevens Weir (d/s)	5.5	1.77	81.55	1 670	F	1 730	1 900
Edward at Liewah	-	2.81	58.19	2 300	S	2 230	1 570
Wakool at Stoney Crossing	-	1.51	55.00	630	F	700	480
Murrumbidgee at Balranald	5.0	3.02	58.98	2 740	F	2 890	2 780
Barwon at Mungindi	6.1	3.26	-	210	F	260	370
Darling at Bourke	9.0	4.15	-	540	S	540	510
Darling at Burtundy Rocks	-	0.78	-	0	F	0	0

Natural Inflow to Hume	13 540	9 900
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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	-0.06	-	No. 7 Rufus River	22.10	+0.26	+1.38
No. 26 Torrumbarry	86.05	+0.00	-	No. 6 Murtho	19.25	+0.04	+0.17
No. 15 Euston	47.60	+0.42	-	No. 5 Renmark	16.30	+0.07	+0.23
No. 11 Mildura	34.40	+0.06	+0.47	No. 4 Bookpurnong	13.20	+0.02	+0.84
No. 10 Wentworth	30.80	+0.02	+0.78	No. 3 Overland Corner	9.80	+0.04	+0.22
No. 9 Kulnine	27.40	+0.30	+0.63	No. 2 Waikerie	6.10	+0.03	+0.13
No. 8 Wangumma	24.60	+0.60	+0.36	No. 1 Blanchetown	3.20	-0.07	-0.03

Lower Lakes FSL = 0.75 m AHD

Lake Alexandrina average level for the past 5 days (m AHD)	0.79
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Barrages

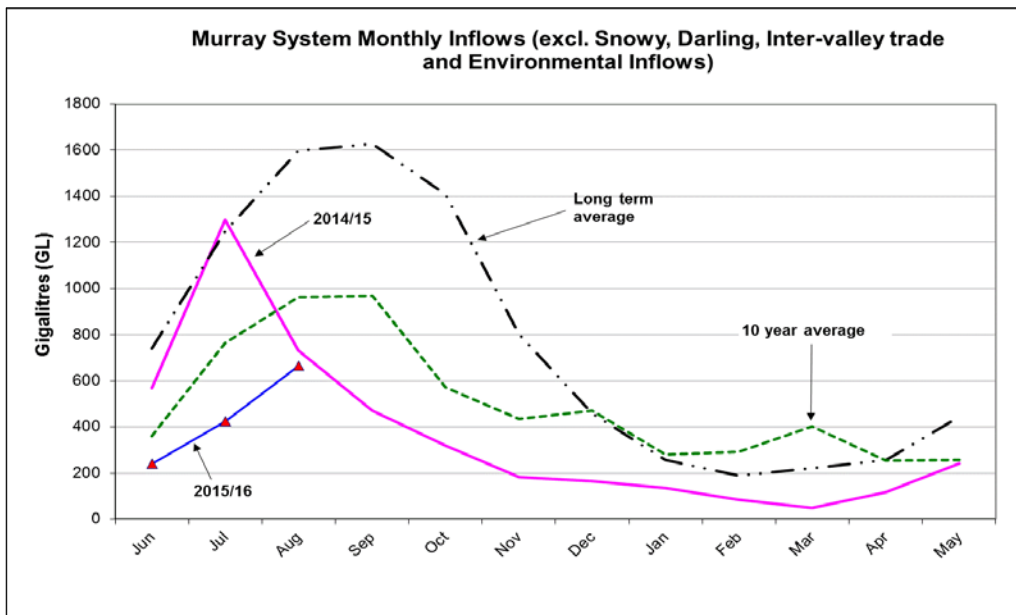
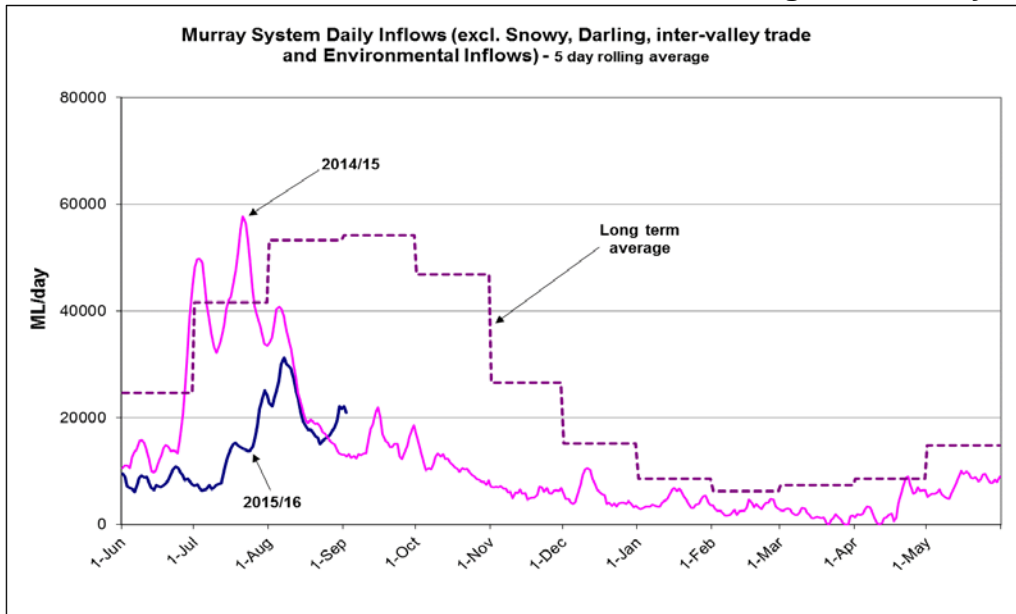
Fishways at Barrages

	Openings	Level (m AHD)	No. Open	Rock Ramp	Vertical Slot
Goolwa	128 openings	0.87	3	-	Open
Mundoo	26 openings	0.87	All closed	-	-
Boundary Creek	6 openings	-	0.1	-	-
Ewe Island	111 gates	-	All closed	-	-
Tauwichee	322 gates	0.89	4	Open	Open

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



Week ending Wednesday 02 Sep 2015



State Allocations (as at 02 Sep 2015)

NSW - Murray Valley

High security	97%
General security	0%

Victorian - Murray Valley

High reliability	61%
Low reliability	0%

NSW - Murrumbidgee Valley

High security	95%
General security	27%

Victorian - Goulburn Valley

High reliability	60%
Low reliability	0%

NSW - Lower Darling

High security	20%
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.nvrn.net.au/allocations/current.aspx>
 SA : <http://www.environment.sa.gov.au/managing-natural-resources/river-murray>