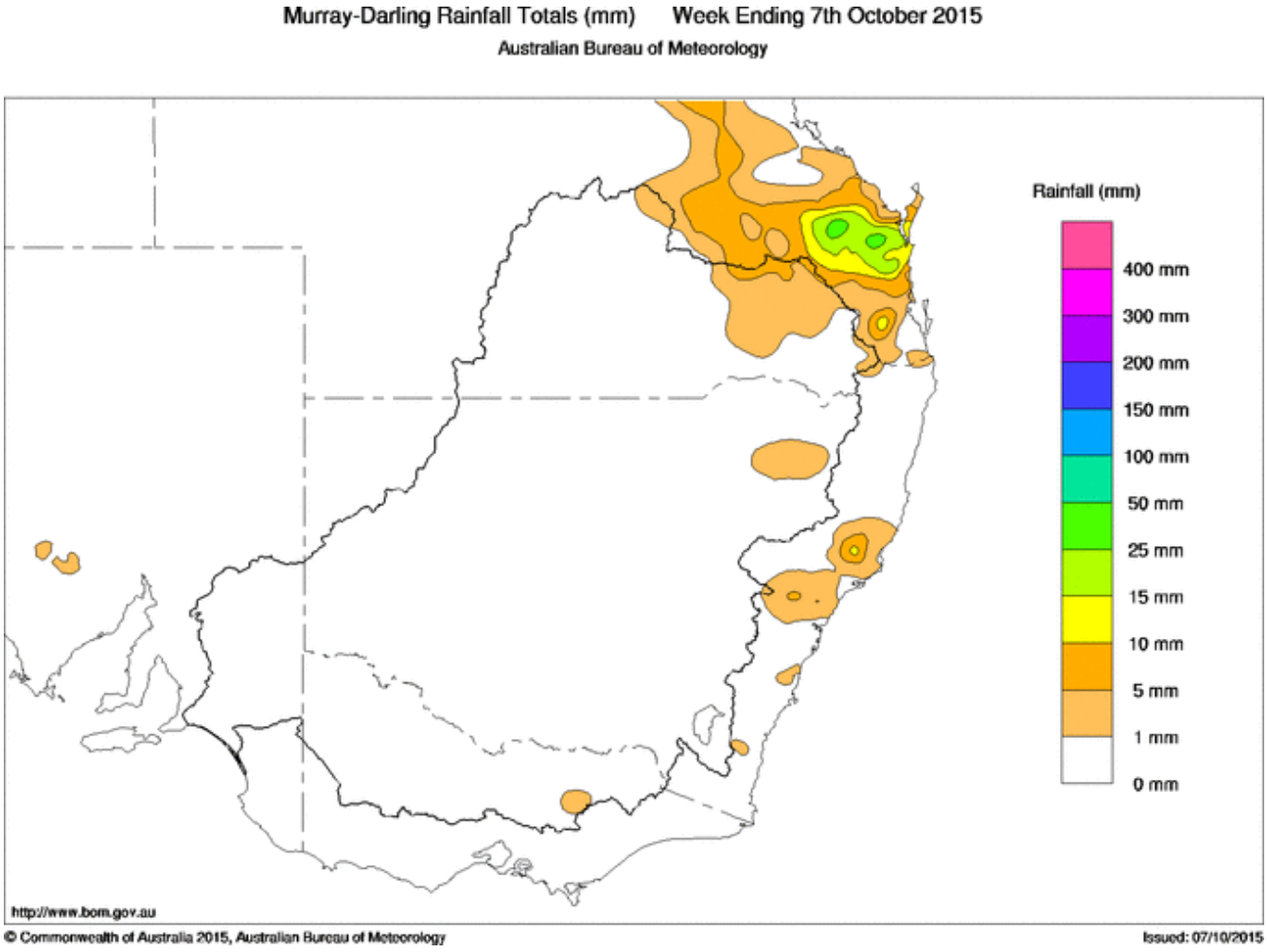
RIVER MURRAY WEEKLY REPORT

FOR THE WEEK ENDING WEDNESDAY, 7TH OCTOBER 2015

Trim Ref: D15/79314

Rainfall and Inflows

Almost the entire Murray-Darling Basin was devoid of rain this week, see map 1.



Map 1 - Murray-Darling Basin rainfall week ending 7th October 2015 (Source: Bureau of Meteorology)

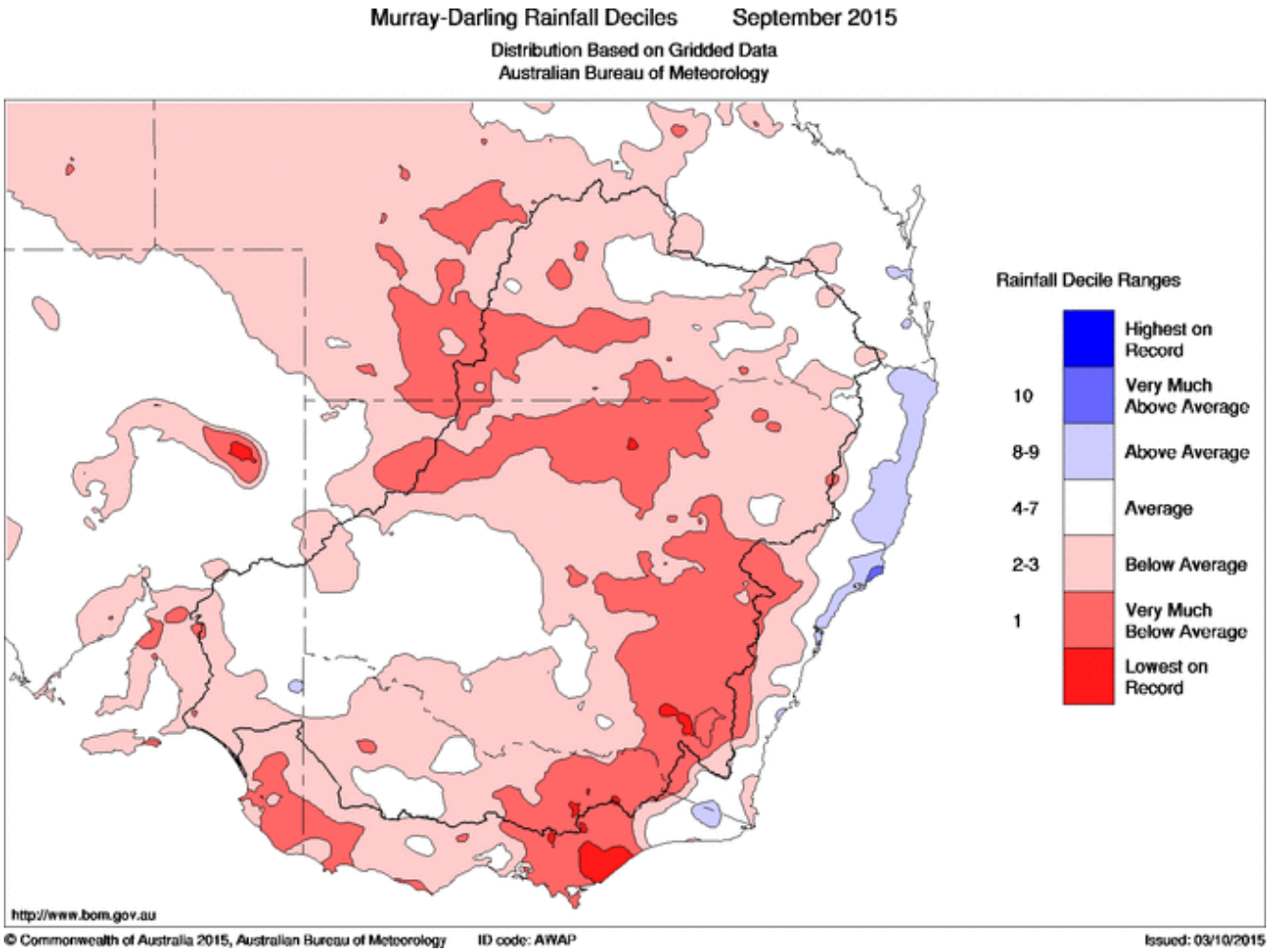
Although it was dry across the Murray-Darling Basin, the flow in some of the upper Murray tributaries slightly increased this week due to the high temperatures increasing the rate of snow melt on the alpine peaks. On the Mitta Mitta River, the flow at Hinnomunjie increased from 1,000 to 1,200 ML/day. On the upper Murray, the flow at Biggara increased from 1,100 to 1,200 ML/day during the week. On the Ovens River, flows at Wangaratta continued to recede, averaging 750 ML/day this week compared to 1,000 ML/day last week.

September 2015 Summary

The Bureau of Meteorology (BOM) reported above-average daily maximum temperatures in northern and central parts of Victoria during September. The majority of New South Wales recorded close to average daytime temperatures, except the northeast and parts of central western districts, which recorded below-average maximum temperatures. Warm days in the second half of the month resulted in above-average maximum temperatures for central and northern parts of Victoria that extended into the neighbouring areas of New South Wales and South Australia.

Across the Basin as a whole, BOM reported area-averaged rain totalling 11.7 mm, which is 66% below the long-term September mean and ranked 9th lowest.

Rainfall was very much below average in head water catchments, north east Victorian catchments and headwaters of the Murrumbidgee, see map 2. The majority of the basin experienced below average rainfall while an isolated pocket around the intersection of NSW, Victorian and SA borders received average rainfall for the month of September.



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

River Murray system inflows for September (excluding Snowy Scheme, Darling River and managed environmental inflows) totalled around 490 GL (90% annual exceedance probability). This figure represents only around one third of the long-term monthly average for September of 1,625 GL, see figure 1.

River Murray system inflows for the last 12 months (excluding Snowy Scheme, Darling River and managed environmental inflows) totalled around 3,130 GL (97% annual exceedance probability). This is in the lowest 3% on record for this period.

Murray system inflows over the last 10 years have been well below the long term average see figure 1. Total Murray system inflows in 2013-14 were similar in volume to the 10 year average but decreased in 2014-15 and have further reduced this year. Whilst inflows are currently tracking well below average they are better than the record low inflow in 2006-07.

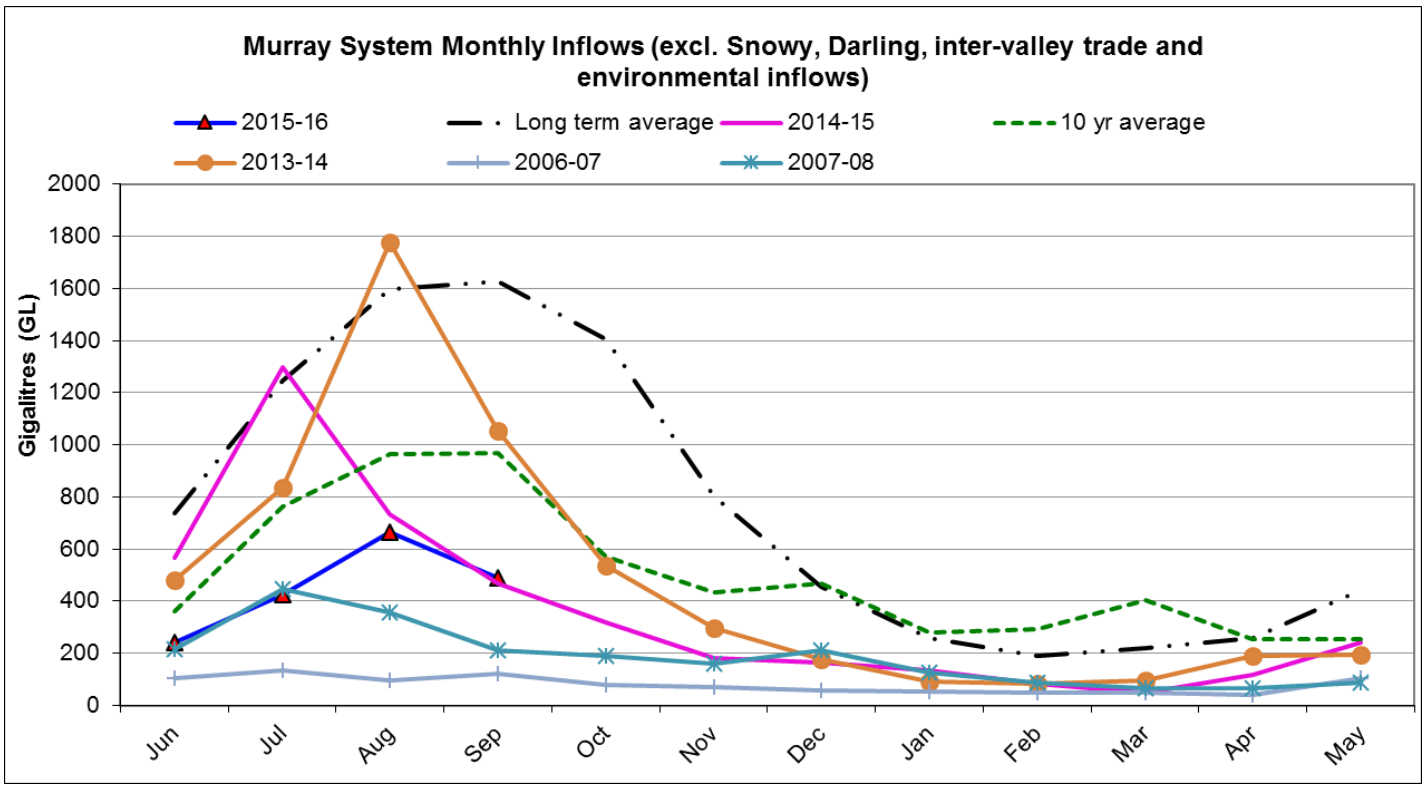


Figure 1 – Murray system inflows

Evaporation tables

Estimated evaporation losses from MDBA storages for September 2015 are reported in Table 1. Net evaporation rose at each of the storages this month with the onset of warmer spring temperatures. Menindee Lakes and Lake Victoria were estimated to have lost 7 GL each over the month.

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.

Table 1: Monthly evaporation figures for MDBA storages

Storage	*Approximate (net) evaporative loss in September 2015 (GL)	Average storage volume in September 2015 (GL)
Dartmouth	2	2,590
Hume	5	1,490
Lake Victoria	7	570
Menindee Lakes	7	100

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

River Operations

- BOM rainfall outlook forecasts a low chance of exceeding median rainfall in October;
- Lake Victoria transfers will increase via the Edward escape;
- Menindee Lakes establishes new record for low-flow period

The hot and dry conditions have resulted in MDBA total storage decreasing by 109 GL this week, with the active storage now 4,323 GL (51% capacity). These conditions are forecast to continue as BOM predict only a 20% chance of exceeding median rainfall throughout October due to an emerging positive Indian Ocean Dipole reinforcing the strong El Niño, see BOM climate outlook.

At **Dartmouth** Reservoir, the storage volume decreased 31 GL to 2,492 GL (65% capacity) and releases, measured at Colemans, are currently averaging 4,500 ML/day. Releases were reduced to minimise the likelihood of bank slumping along the Mitta Mitta River and for maintenance works on the power station. Releases will increase in around one week's time to around 7,000 ML/day.

Reduced inflows to **Hume** Reservoir and increased downstream demand have seen Hume storage decrease 47 GL to 1,426 GL (47% capacity). Releases from Hume have averaged 17,300 ML/day during the week and contributed to a steady flow of around 16,500 ML/day at Doctors Point at the end of the week.

At **Lake Mulwala**, water orders at the major irrigation offtakes have remained steady, with diversions at Mulwala Canal averaging 3,200 ML/day for the week, and Yarrawonga Main Channel averaging 2,100 ML/day for the week. The Lake Mulwala pool level is 124.82m AHD.

Releases from Yarrawonga Weir are largely comprised of water to meet downstream demands and transfers to Lake Victoria and a small component of environmental water to provide benefit to the Barmah-Millewa Forest and sites further downstream. Environmental water will be used to vary releases between 12,800 and 13,200 ML/day over the coming week to provide a small pulse for fish spawning. A larger pulse of up to 14,000 ML/day for a few days is also planned for late October as part of this event.

In the **Edward-Wakool** system, flows through the Edward and Gulpa offtakes are steady at 1,550 ML/day and 800 ML/day respectively. The Gulpa offtake is expected to increase to 850 ML/day over the coming week. On the Edward River, the release from **Stevens** Weir has averaged 1,640 ML/day during the week, varying between 1,400 ML/day and 1,900 ML/day. Flow in the Wakool River at Gee Gee Bridge is steady at 360 ML/day, whilst the Niemur River at Mallan School has averaged 310 ML/day.

Flow through the Edward Escape will increase over the next week to meet downstream demands and increase transfers to Lake Victoria and the flow at Stevens Weir will increase towards channel capacity of 2,700 ML/day as a result. Environmental flows through the Wakool, Yallakool and Colligen Rivers are expected to continue at around rates of 70, 500 and 450 ML/day respectively.

On the **Goulburn** River, the flow at McCoys Bridge has increased to around 5,200 ML/day and is forecast to continue rising into the middle of next week as part of an environmental pulse to benefit riparian vegetation. The peak flow at McCoys is expected to be approximately 6,500 ML/day, slightly lower than previously forecast due to increased demands along the Goulburn River.

At **Torrumbarry** Weir, diversions from National Channel are 2,900 ML/day. The release from Torrumbarry Weir has increased to around 8,100 ML/day due to inflows from the Goulburn.

Further downstream, inflow to the Murray from the **Murrumbidgee** River at Balranald has decreased to 1,170 ML/day. At **Euston**, the pool level is being managed at around 60 cm above the Full Supply Level (FSL) of 47.6 m AHD and the downstream release has decreased to around 7,500 ML/day over the past week.

Downstream of Euston at **Hattah Lakes,** an environmental watering event will commence at the end of next week to provide a connection between the River Murray and Hattah Lakes which is expected to

improve the environmental and cultural values of local wetlands and creeks, in particular providing fish benefits.

At **Menindee Lakes**, the storage volume has decreased 2 GL to 99 GL (6% capacity). The release at Weir 32 remains low at around 100 ML/day. NSW Department of Primary Industries reported in the September Management of Menindee Lakes communique that without significant inflows in September total cumulative inflows would be less than in any 2.5-year period recorded during the Millennium drought. Inflows for September were low, which means a new record low-flow period will have been established for Menindee lakes.

At **Wentworth** Weir on the Murray, the pool level is being held around 10 cm above FSL to assist pumpers, with the release decreasing to 8,510 ML/day. Target weir pool levels for **Locks 8 and 7** have changed from last week:

- Lock 8 is being lowered by 30 cm to 50 cm above FSL once pumping from the weir pool into a nearby wetland is complete; and
- Lock 7 will remain at 50 cm above FSL to allow for pumping to Lake Wallawalla to continue.

At **Lake Victoria**, the storage volume decreased 28 GL to 599 GL (88% capacity). The flow to South Australia is currently around 11,000 ML/day, which incorporates entitlement flows and environmental water.

At the **Lower Lakes**, the five-day average water level in Lake Alexandrina is 0.8 m AHD and releases out the barrages are approximately 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 07 Oct 2015

MDBA Storages	Full Supply Level (m AHD)	Full Supply Volume (GL)	Current Storage Level (m AHD)	Current Storage (GL)	Current Storage %	Dead Storage (GL)	Active Storage (GL)	Change in Total Storage for the Week (GL)
Dartmouth Reservoir	486.00	3 856	462.39	2 492	65%	71	2 421	-31
Hume Reservoir	192.00	3 005	182.39	1 426	47%	23	1 403	-47
Lake Victoria	27.00	677	26.35	599	88%	100	499	-28
Menindee Lakes		1 731*		99	6%	(- -) #	0	-2
Total		**9 269**		**4 616**	**50%**	**- -**	**4 323**	**-109**
Total Active MDBA Storage							51% ^	
Major State Storages								
Burrinjuck Reservoir		1 026		732	71%	3	729	-35
Blowering Reservoir		1 631		823	50%	24	799	+8
Eildon Reservoir		3 334		1 933	58%	100	1 833	-56

* 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 06 Oct 2015

Storage	Active Storage (GL)	Weekly Change (GL)	Diversion (GL)	This Week	From 1 May 2015
Lake Eucumbene - Total	2 319	n/a	Snowy-Murray	+6	214
Snowy-Murray Component	1 101	n/a	Tooma-Tumut	+0	122
Target Storage	1 400		Net Diversion	6	93
			Murray 1 Release	+14	348

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)	24.1	128	Yarrawonga Main Channel (net)	12.9	59
Wakool Sys Allowance	3.5	17	Torrumbarry System + Nyah (net)	19.4	121
Western Murray Irrigation	0.5	-3	Sunraysia Pumped Districts	3.2	13
Licensed Pumps	5.6	30	Licensed pumps - GMW (Nyah+u/s)	1	6
Lower Darling	0.2	2	Licensed pumps - LMW	6.2	35
TOTAL	**33.9**	**174**	**TOTAL**	**42.7**	**234**

* 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	170.0 *
Flow this week	76.0
Flow so far this month	76.0
Flow last month	261.4

(10 900 ML/day)

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

	Current	Average over the last week	Average since 1 August 2015
Swan Hill	80	80	80
Euston	-	-	-
Red Cliffs	190	200	140
Merbein	170	160	140
Burtundy (Darling)	980	960	910
Lock 9	160	160	150
Lake Victoria	240	240	210
Berri	200	210	230
Waikerie	230	240	310
Morgan	240	250	300
Mannum	310	320	330
Murray Bridge	350	350	360
Milang (Lake Alex.)	750	740	720
Poltalloch (Lake Alex.)	450	520	570
Meningie (Lake Alb.)	2 050	2 070	2 040
Goolwa Barrages	1 010	1 000	1 000

River Levels and Flows

Week ending Wednesday 07 Oct 2015

River Murray	Minor Flood Stage (m)	Gauge Height local (m)	Gauge Height (m AHD)	Flow (ML/day)	Trend	Average Flow this Week (ML/day)	Average Flow last Week (ML/day)
Khancoban	-	-	-	5 720	F	3 090	2 510
Jingellic	4.0	2.04	208.56	7 080	R	4 640	5 080
Tallandoon (Mitta Mitta River)	4.2	2.55	219.44	4 590	F	5 960	7 080
Heywoods	5.5	3.15	156.78	15 520	S	17 310	16 660
Doctors Point	5.5	3.12	151.59	16 330	F	17 890	17 400
Albury	4.3	2.17	149.61	-	-	-	-
Corowa	4.6	3.32	129.34	16 460	F	17 920	16 820
Yarrawonga Weir (d/s)	6.4	2.03	117.07	13 120	F	13 010	12 380
Tocumwal	6.4	2.67	106.51	13 440	R	13 170	12 400
Torrumbarry Weir (d/s)	7.3	2.62	81.17	8 110	R	6 540	6 110
Swan Hill	4.5	1.14	64.06	5 640	F	5 630	5 570
Wakool Junction	8.8	2.88	52.00	7 410	F	7 650	8 400
Euston Weir (d/s)	9.1	1.53	43.37	7 510	F	8 320	11 500
Mildura Weir (d/s)		-	-	7 660	F	8 080	12 780
Wentworth Weir (d/s)	7.3	3.05	27.81	8 510	F	9 050	12 530
Rufus Junction	-	4.06	20.99	10 240	S	10 230	9 310
Blanchetown (Lock 1 d/s)	-	1.06	-	7 590	S	7 540	8 170
Tributaries							
Kiewa at Bandiana	2.8	1.56	154.79	1 360	S	1 160	1 300
Ovens at Wangaratta	11.9	8.08	145.76	820	R	750	1 030
Goulburn at McCoys Bridge	9.0	3.62	95.04	5 160	R	2 780	790
Edward at Stevens Weir (d/s)	5.5	1.77	81.54	1 670	F	1 640	1 350
Edward at Liewah	-	2.24	57.62	1 590	R	1 600	1 930
Wakool at Stoney Crossing	-	1.53	55.02	660	F	720	810
Murrumbidgee at Balranald	5.0	1.57	57.53	1 170	F	1 320	1 680
Barwon at Mungindi	6.1	3.24	-	130	F	190	280
Darling at Bourke	9.0	4.10	-	370	F	380	400
Darling at Burtundy Rocks	-	0.84	-	0	F	0	0

Natural Inflow to Hume	6 150	7 560

(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
Yarrawonga	124.90	-0.08	-	No. 7 Rufus River	22.10	+0.51	+1.74
No. 26 Torrumbarry	86.05	+0.00	-	No. 6 Murtho	19.25	+0.02	+0.66
No. 15 Euston	47.60	+0.59	-	No. 5 Renmark	16.30	+0.45	+0.39
No. 11 Mildura	34.40	+0.03	+0.23	No. 4 Bookpurnong	13.20	+0.03	+1.25
No. 10 Wentworth	30.80	+0.09	+0.41	No. 3 Overland Corner	9.80	+0.02	+0.73
No. 9 Kulnine	27.40	+0.09	+0.79	No. 2 Waikerie	6.10	+0.50	+0.29
No. 8 Wangumma	24.60	+0.73	+0.61	No. 1 Blanchetown	3.20	-0.11	+0.31

Lower Lakes FSL = 0.75 m AHD

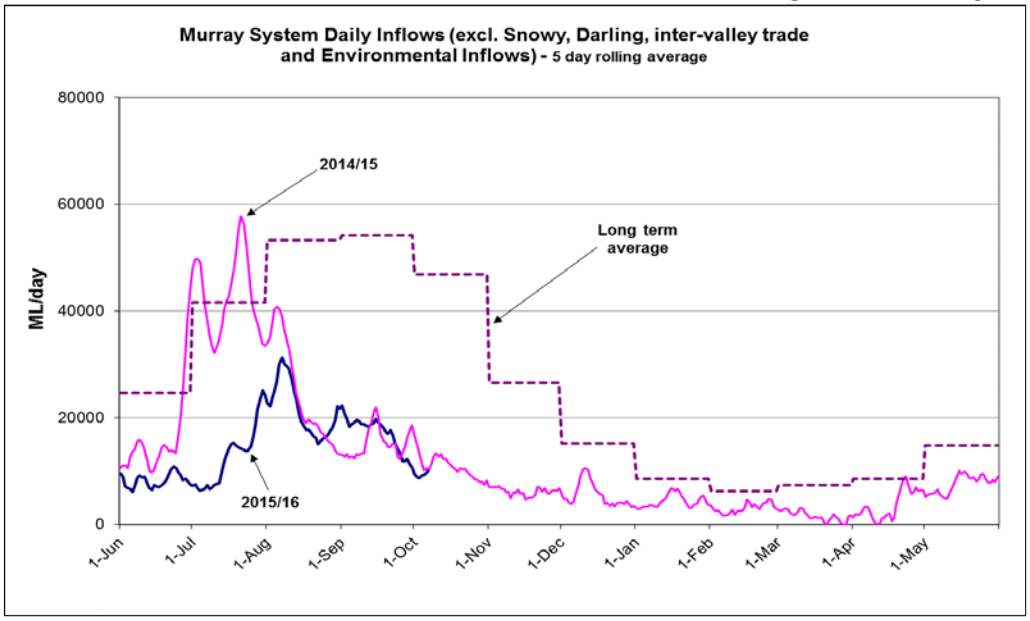
Lake Alexandrina average level for the past 5 days (m AHD)	0.80

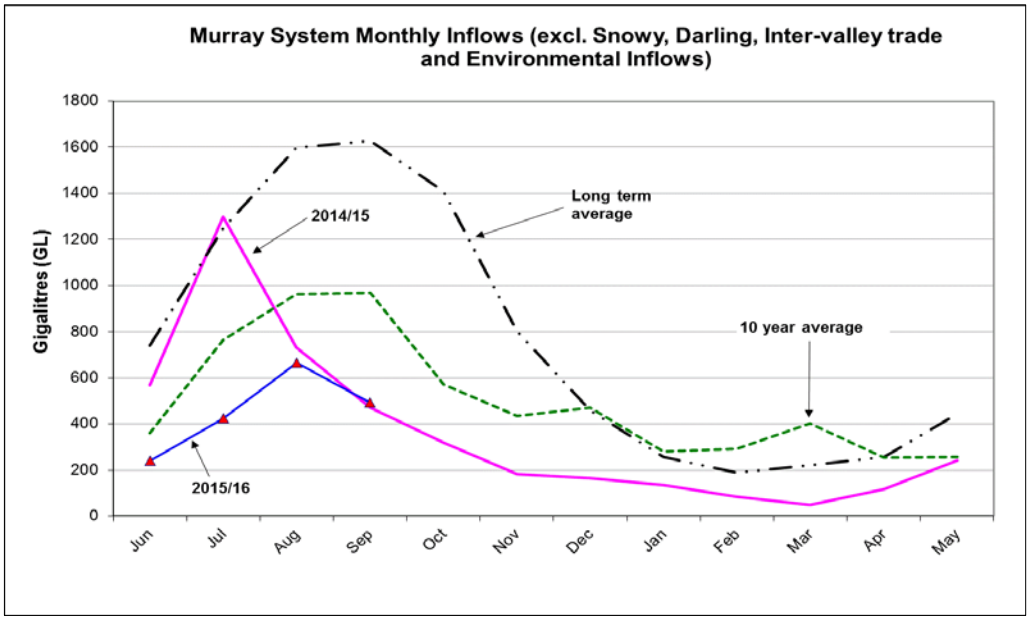
Barrages

	Openings	Level (m AHD)	Fishways at Barrages: No. Open	Rock Ramp	Vertical Slot
Goolwa	128 openings	0.85	1	-	Open
Mundoo	26 openings	0.85	All closed	-	-
Boundary Creek	6 openings	-	0.1	-	-
Ewe Island	111 gates	-	All closed	-	-
Tauwitchere	322 gates	0.83	6	Open	Open

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

Week ending Wednesday 07 Oct 2015





State Allocations (as at 07 Oct 2015)

NSW - Murray Valley

High security	97%
General security	6%

Victorian - Murray Valley

High reliability	76%
Low reliability	0%

NSW – Murrumbidgee Valley

High security	95%
General security	27%

Victorian - Goulburn Valley

High reliability	69%
Low reliability	0%

NSW - Lower Darling

High security	20%
General security	0%

South Australia – Murray Valley

High security	100%

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