River Murray Flow Report and Water Resources Update

Government of South Australia
Department for Environment and Water

Report #40/2021

Issued 10:00 am 15 October 2021

This supersedes the previous flow report issued by the Department for Environment and Water (DEW) on 8 October 2021. The next flow report will be provided on Friday 22 October 2021.
In this report, for ease of representation, large volumes of water are expressed in gigalitres (GL), while smaller volumes are expressed in megalitres (ML). One GL is equal to 1 000 ML.

WATER RESOURCES UPDATE

During September 2021, the total River Murray System inflow was approximately 1 634 GL, which is above the September long-term average of 1 628 GL. During September 2021, the total Menindee Lakes inflow was approximately 498 GL, which is above the September long-term average of 182 GL.

The flow to South Australia during September 2021 was approximately 725 GL, which is about 72 % of the September long-term average of 1 001 GL. The flow comprised of Entitlement Flow (including environmental water on SA licence), environmental water, trades and unregulated flow.

MANAGEMENT OF SOUTH AUSTRALIA'S DEFERRED WATER

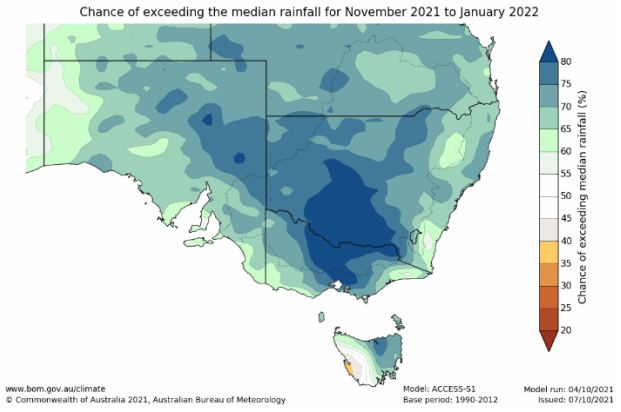
The Murray-Darling Basin Authority confirmed that on 1 October 2021 South Australia had 337.1 GL of deferred water held in storage in the Murray-Darling Basin. During September 21.2 GL of stored water spilt from the storage right due to pre-releases being made from Hume Dam to make airspace for future inflows. Under Schedule G of the Agreement when a storage spills then the SA storage right is the first water to spill from the storage. The following table identifies the storage in which it is held and its purpose. Volumes stored are adjusted for net evaporation losses and spills until delivered to South Australia.

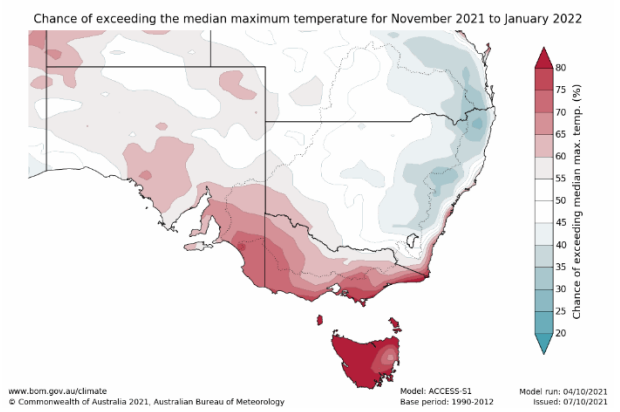
At 1 October 2021				
Purpose	**Lake Victoria (GL)**	**Hume (GL)**	**Dartmouth (GL)**	**Total (GL)**
***CHWN**	0	0	236.3	236.3
Private Carryover	0	0	100.8	100.8
Total	0	0	337.1	337.1

*Critical Human Water Needs (CHWN)

RAINFALL AND TEMPERATURE OUTLOOK

The latest Bureau of Meteorology weather outlook forecasts that rainfall from November 2012 to January 2022 is likely to be above median for the eastern half of Australia, including across the Murray-Darling Basin. Temperatures from November 2021 to January 2022 are more likely to be above median in the South East of South Australia and most of Victoria.





The Bureau's ENSO Outlook has risen to La Nina ALERT. In the past when the outlook has been set to La Nina ALERT a La Nina event has been met around 70 % of the time (triple the normal likelihood). Typically La Nina events increase the chance of above average rainfall for northern and eastern Australia during spring and summer.

The Indian Ocean Dipole (IOD) has weakened. Models are forecasting that the negative IOD will continue to weaken to neutral levels in late spring. A neutral IOD has little influence on Australian climate.

The Southern Annular Mode (SAM) is currently neutral but expected to return to positive levels from October to December. A positive SAM typically brings wetter conditions to eastern parts of Australia.

The latest Bureau of Meteorology outlook information can be accessed here.

STORAGE VOLUMES

Table 1: Murray-Darling Basin Storage volumes

Storage	Full Supply Volume (GL)	13/10/2021 (GL)	13/10/2020 (GL)	Long-term average (end of Oct) (GL)
Dartmouth	3 856	**3 127 (81%)**	2 241 (58%)	
Hume	3 007	**2 918 (97%)**	2 180 (72%)	
Lake Victoria	677	**609 (90%)**	638 (94%)	
Menindee Lakes	*1 731	**1 976 (114%)**	468 (27%)	
TOTAL	9 271	**8 630 (93%)**	5 527 (60%)	7 497 (81%)

*Menindee Lakes can be surcharged to 2 015 GL

WATER QUALITY - Salinity

A number of targets are identified under the Murray-Darling Basin Plan, which all Basin jurisdictions must have regard to in managing River Murray flows. The targets for real-time salinity are identified below. Salinity should not exceed these values for 95 % of the time:

- 580 EC at Lock 6
- 800 EC at Morgan
- 830 EC at Murray Bridge
- 1 000 EC at Milang.

The following graph shows the salinity at these locations and the flow to South Australia (QSA) from October 2020 to October 2021. The dashed-lines identify the Basin Plan (BP) thresholds for the corresponding colour coded location.

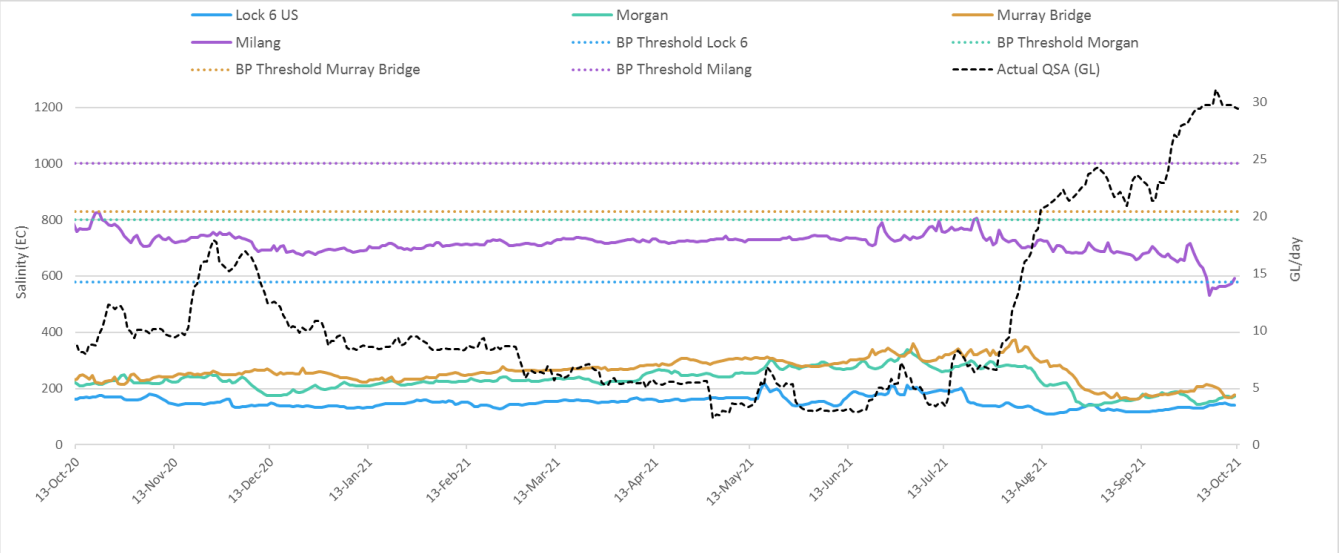


Figure 1: SA River Murray daily average salinity

FLOW OUTLOOK

The flow at the South Australian border is approximately 27.5 GL/day and will remain around 27.5 GL/day over the coming week. It comprises:

- full October Entitlement Flow (5.5 GL/day);
- plus water for the environment (see below *Environmental News*);
- interstate trade adjustments; and
- Unregulated flow.

The flow over Lock 1 is approximately 26 GL/day and will remain around 26 GL/day over the coming week.

It is important to note that flow forecasts in this advice are base.0d on the information available at the time of preparation. Advice may change as new gauging information becomes available or due to rainfall events or changed operations upstream.

QUARTER 1 METER READINGS DUE BY 31 OCTOBER 2021

If you hold a water resource works approval that includes a condition that requires you to provide quarterly meter readings to the Department for Environment and Water, please be reminded that meter readings for the Quarter 1 accounting period for 2020-21 (which ended on 30 September 2021) must be recorded within the first fourteen days of October 2021 and submitted to the department by 31 October 2021.

Your meter reading can be submitted via one of the following options:

- The online Meter Reading Form at https://forms.business.gov.au/smartforms/sa-dfw/meter-reading-form/; or
- By emailing the Department for Environment and Water at DEW.waterlicensingberri@sa.gov.au.

Should you require any assistance in supplying your meter reading, including how to complete the online Meter Reading Form, please call the Berri office on (08) 8595 2053 and an officer of the department will be happy to assist you.

The department's preferred approach is to encourage and facilitate voluntary compliance. However, failure to voluntarily comply with the conditions of a water resource works approval may result in an expiation notice being issued.

ENVIRONMENTAL NEWS

Recent rainfall in upstream catchments continues to provide unregulated flow to South Australia. South Australia is also receiving water for the environment from South Australia's environmental water allocation and return flows from upstream watering actions.

During spring, the Commonwealth Environmental Water Office is contributing additional water for the environment through the 2021 Murray Wetland Flow. More information on this event can be found here.

The current flows from the River Murray and upstream tributaries, through to the Coorong, will provide a range of benefits for the environment in SA, including:

- providing for barrage releases to the Coorong to support a productive, food-rich environment for fish and birds;
- providing habitat for birds, frogs and threatened small-bodied native fish species in the Lower Lakes;
- maintaining good connections from the Coorong to the upstream areas of the River Murray, and its tributaries, to enable fish movement and migration including for lamprey which are currently migrating into the river from the Southern Ocean for spawning;
- maintaining healthy water quality, salinity and water levels in the River Murray Channel and the Lower Lakes and Coorong, including through targeted releases at the barrages when weather conditions are best suited to push water down the Coorong;
- removing excess salt from the River Murray;
- undertaking floodplain operations at Chowilla, Pike and Katarapko as well as raising the water levels in weir pools 2, 4, 5 and 6 (see more details below in Environmental Water Operations); and
- Delivering a range of outcomes to wetlands in the Riverland via arrangements with Renmark Irrigation Trust, Australian Landscape Trust, Accolade Wines Ltd and the Murraylands and Riverland Landscape Board.

Larry the Lamprey is back!

It's already been a year since Larry the Lamprey made his heroic journey from the Southern Ocean up the River Murray as far as Lock 11 in 2020. Larry's next generation are now migrating up the River Murray and scientists have been in the field monitoring their movements. During August and September 2021 regular monitoring of barrage fishways by South Australian Research and Development Institute Aquatic Scientists assessed lamprey migration. Monitoring in 2021 saw 22 pouched lamprey captured from fishways at Goolwa and Tauwitchere barrages. Scientists have fitted these fish with monitoring tags so their journey can be tracked upstream, to help solve the mystery of where they spawn. You can follow Larry's 2021 travels here: https://www.environment.sa.gov.au/topics/river-murray/improving-river-health/environmental-water/where-is-larry-the-lamprey .

MURRAY MOUTH

Dredging operations at the Murray Mouth commenced on 9 January 2015 to maintain connectivity (exchange of water) between the Coorong and the Southern Ocean. At 10 October 2021, a total of approximately 7 667 462 cubic metres of sand had been removed by dredging operations.

Both dredges are currently operating between the Goolwa and Tauwitchere channels 24 hours a day, seven days a week.

Barrage releases combined with dredging have helped to maintain flow connectivity of the River Murray Channel to the Murray Mouth and have assisted in exporting salt from the river system.

There are a number of shallow zones in and adjacent to the Murray Mouth. Mariners should use caution when traversing the mouth area, follow all directions, reduce speed and avoid travelling at low tide. Mariners equipped with echo sounders should check depths regularly. Navigation through the Murray Mouth is only permitted during daylight hours. Exclusion Zones established around the dredging operations are in place to ensure public safety. Refer to Notice to Mariners No 42 of 2016 Notice 42.

There is a partial park closure in place for the northern tip of the Coorong National Park. For more information visit Coorong partial park closure notice.

BARRAGE OPERATIONS AND WATER LEVELS IN THE LOWER LAKES

The water level in Lake Alexandrina is approximately 0.84 m AHD and Lake Albert is approximately 0.89 m AHD. The difference is due to wind effects.

As of Tuesday 12 October 2021, the weekly releases were approximately 168 GL. Gate openings at the barrages during the week can be seen in Table 1.

Table 2: Number of barrage gates open each day for the week ending Tuesday 12 October 2021

Barrage (total number of gates)	**6 Oct 2021**	**7 Oct 2021**	**8 Oct 2021**	**9 Oct 2021**	**10 Oct 2021**	**11 Oct 2021**	**12 Oct 2021**	**Objective of releases**
Goolwa (120)	5	5	5	5	5	5	5	Maintain connectivity between the River Murray channel through to the Murray Mouth to support fish migration, provide some scouring of the Goolwa Channel and Murray Mouth.
Mundoo (25)	6*	6*	6*	6*	6*	6*	6*	Provide some localised freshening conditions in the Mundoo channel and support fish passage.
Boundary Creek (5)	1	1	1	1	1	1	1	Provide attractant flow adjacent the fish way to support fish passage.
Ewe Island (110)	12*	12*	12*	12*	12*	12*	12*	Releases will help push fresher water down the Coorong to assist lowering salinity levels and provide habitat diversity.
Tauwitchere (319)	41	41	41	41	41	41	41	
Fishways	Fishways at all barrages and at Hunters Creek (11 in total) were open during the entire week							Provide for fish passage between the Coorong and Lower Lakes.

**Automated gate utilised to maximise delivery to Coorong and avoid reverse flows.*

During adverse weather conditions, SA Water will operate the barrages to minimise the risk of seawater entering Lake Alexandrina, therefore minimising any negative salinity impacts from reverse flow events.

Water levels and barrage operations are monitored closely by the South Australian Government, Murray-Darling Basin Authority and Commonwealth Environmental Water Office.

RIVER VESSEL WASTE DISPOSAL STATIONS

Lock 3

The Lock 3 River Vessel Waste Disposal Station is currently out of commission due to an infrastructure failure. Investigations are underway to replace the station. In the interim river vessel users can contact Riverland Tank and Drain directly on 0412 839 392 for emptying of black and grey water in the Lock 3 area. Alternatively they can utilise the nearest alternative waste facility located at Waikerie. Normal boat waste (domestic or galley waste) can still be deposited at the Lock 3 facility at the present time.

NAVIGATION ISSUES

Sandbars in the vicinity of the Murray Mouth may cause navigation hazards. Mariners are advised to navigate with caution when operating in the area. Sandbars are also present along sections of the River Murray downstream of Locks 7 and 8 and in South Australia. All Mariners should be aware of the risk of submerged navigation hazards and should regularly check river depth.

ENVIRONMENTAL WATER OPERATIONS

Chowilla Floodplain and Weir and Lock 6

A low to mid-level operation of the Chowilla environmental regulator has commenced, which will potentially inundate 2 000 – 5 000 hectares of the Chowilla floodplain upstream of the regulator than would otherwise be achieved by river flows. The operation plans to raise water levels in Chowilla Creek and through the Anabranch by between approximately 18.9 and 19.6 m AHD though the higher level is dependent on having flows in the River Murray of over 30 000 ML/day.

The water level in Weir and Lock 6 is also raised in conjunction with the Chowilla Regulator. This will see the water level raised up to a height of 19.67 m AHD depending on flow conditions at the time.

Pike Floodplain and Weir and Lock 5

Operations on the Pike Floodplain commenced 26 July 2021. The operation will raise water levels on the Pike Floodplain between 15 m AHD to 15.4 m AHD.

The water level in Weir and Lock 5 is also raised in conjunction with the Pike Regulator. This will increase the water level to a height of 16.8 m AHD (+0.5 m AHD) depending on flow conditions.

Should the flow to South Australia increase significantly the Pike Regulator may be operated to raise the water level further to between 15.4 m AHD to 15.8 m AHD. The exact height will depend on the flow and conditions within the river and the Pike anabranch.

Katarapko Floodplain and Weir and Lock 4

Operations on the Katarapko Floodplain also commenced 26 July 2021. The operation plans to raise the water levels on the Katarapko Floodplain initially up to 13 m AHD to 13.2 m AHD, depending on the actual flow conditions.

The water level in Weir and Lock 4 is also raised in conjunction with water levels on the Katarapko Floodplain. This will increase the water level to a maximum height of 13.5 m AHD (+ 0.3 m AHD).

Weir and Lock 2

The water level in Weir and Lock 2 is now being lowered after being at the maximum height of the event for over 40 days. The water level will be lowered back to normal pool level at a rate of 3 cm / day.

National Park access

There are some short term access restrictions and closures of some roads, trails and campsites due to the environmental watering at Katarapko and Chowilla floodplains. On-site signage provides guidance about safe access. More information can be found at https://www.parks.sa.gov.au/ or by contacting the Berri Regional Office on 8595 2111

RIVER MURRAY WATER LEVELS

Below is a table of River Murray water levels at a number of locations from Lock 10 to Murray Bridge.

River Murray Water Levels

Location	River km	Normal Pool Level (m AHD)	Current Level 13/10/2021 (m AHD)	2016 High Water Level (m AHD)
Lock 10	825.0	30.80	30.82	32.72
Lock 9 Kulnine	764.8	27.40	27.56	28.85
Lock 8 Wangumma	725.7	24.60	25.16	26.85
Lock 7 Rufus River	696.6	22.10	22.97	24.97
Lock 6 Murtho	619.8	19.25	19.68	20.19
Renmark	567.4	-	16.84	17.44
Lock 5	562.4	16.30	16.80	17.05
Lyrup	537.8	-	13.77	15.80
Berri	525.9	-	13.61	15.21
Lock 4	516.2	13.20	13.51	14.73
Loxton	489.9	-	11.21	13.54
Cobdogla	446.9	-	-	11.59
Lock 3	431.4	9.80	10.00	10.98
Overland Corner	425.9	-	7.55	10.41
Waikerie	383.6	-	6.88	9.20
Lock 2	362.1	6.10	6.56	8.32
Cadell	332.6	-	4.11	7.01
Morgan	321.7	-	3.75	6.38
Lock 1 Blanchetown	274.2	3.20	3.25	4.46
Swan Reach	245.0	0.75	1.14	3.11
Mannum PS	149.8	0.75	0.91	1.33
Murray Bridge	115.3	0.75	0.83	1.04

Note that the above water levels may be affected by local wind conditions

FURTHER INFORMATION

The Water Data SA website is South Australia's comprehensive water information portal. For real-time data (like salinity, water levels) go to the following page: Water Data SA.

Up-to-date River Murray salinity, flow and water level information can also be accessed at the SA Water and Murray-Darling Basin Authority websites:

- Water allocation and carryover announcements
- River Murray real-time water data
- SA Water River Murray info - levels, flows etc.
- Murray-Darling Basin real-time water data

The latest news, information and announcements about the River Murray and Basin Plan are available at River Murray Update.

The Department for Environment and Water has published a series of inundation maps for the River Murray. They are available at River Murray Inundation Maps.

Information on the management of acid drainage water in the Lower River Murray can be accessed at:
Managing Acid Sulfate Soils Research Project

Details of river height and rainfall information in the River Murray within Victoria and New South Wales are available at the Bureau of Meteorology website:

- Victoria rainfall and river conditions
- NSW rainfall and river conditions

Information provided by the Commonwealth Environmental Water Office can be accessed at CEWH Environmental Watering.

Information on The Living Murray can be accessed at MDBA TLM.

Chowilla Floodplain Icon Site management Chowilla-floodplain.

Katarapko Floodplain site management

Pike Floodplain site management

Department for Environment and Water Home page.

Information provided by the Department of Planning, Transport and Infrastructure on boat licences, registering motor boats, owning and operating water craft, and boat and marine safety can be accessed at Boating and marine.

ID	RM-Flow-Report-and-WR-Update-20211015
Classification	Public I2 A2
Issued	15 October 2021
Authority	DEW
Master Document Location	R:\Water Group\RMO\WRO\04 Communications\Flow Advices\2020-21
Managed and Maintained by	Water Infrastructure and Operations Branch
Author	Water Infrastructure and Operations Branch
Reviewer	Director, Water Infrastructure and Operations