

# River Murray Flow Report and Water Resources Update



Report #49/2021

Issued 10:00 am 17 December 2021

**This supersedes the previous flow report issued by the Department for Environment and Water (DEW) on 10 December 2021. The next flow report will be provided on Friday 24 December 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 November 2021, the total River Murray System inflow was approximately 1 121 GL, which is above the November long-term average of 803 GL. During November 2021, the total Menindee Lakes inflow was approximately 100 GL, which is below the November long-term average of 125 GL.

The flow to South Australia during November 2021 was approximately 946 GL, which is above the November long-term average of 898 GL. The flow comprised of Entitlement Flow (including environmental water on SA licence), environmental water, trades, Additional Dilution Flow (ADF) and unregulated flow.

## MANAGEMENT OF SOUTH AUSTRALIA'S DEFERRED WATER

The Murray-Darling Basin Authority confirmed that on 1 December 2021 South Australia had 337.1 GL of deferred water held in storage in the Murray-Darling Basin. 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.

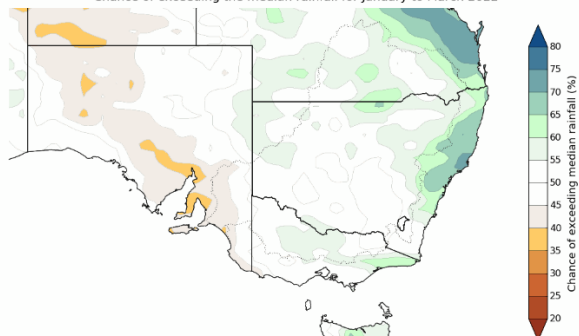
At 1 December 2021				
Purpose	Lake Victoria (GL)	Hume (GL)	Dartmouth (GL)	Total (GL)
*CHWN	0	0	236.3	236.3
Private Carryover	0	0	100.8	100.8
<b>Total</b>	0	0	337.1	337.1

\*Critical Human Water Needs (CHWN)

## RAINFALL AND TEMPERATURE OUTLOOK

The latest Bureau of Meteorology weather outlook forecasts that rainfall from January to March 2022 will have a 40 -60% chance of exceeding the median rainfall across the Murray Darling Basin depending on location. Temperatures from January to March 2022 are more likely to be above median for the majority of the Southern Connected Basin and part of the Northern Basin.

Chance of exceeding the median rainfall for January to March 2022

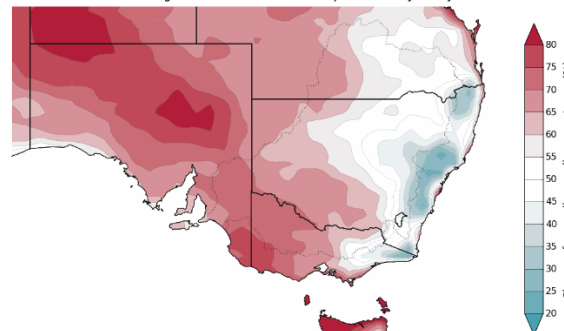


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Model: ACCESS-S2  
Base period: 1981-2018

Model run: 06/12/2021  
Issued: 09/12/2021

Chance of exceeding the median maximum temperature for January to March 2022



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Model: ACCESS-S2  
Base period: 1981-2018

Model run: 06/12/2021  
Issued: 09/12/2021

The Bureau's ENSO Outlook shows that a La Nina is firmly established. Models are suggesting that the event will persist until the late summer or early autumn in 2022. 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) remains negative however is near its end. Models are forecasting that the IOD will remain neutral for the coming months. A neutral IOD has little influence on Australian climate.

The Southern Annular Mode (SAM) has returned to positive levels. It is forecast to remain positive until the end of the year. 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)	15/12/2021 (GL)	15/12/2020 (GL)	Long-term average (end of Dec) (GL)
Dartmouth	3 856	3 367 (87%)	2 384 (62%)	
Hume	3 007	2 944 (98%)	2 112 (70%)	
Lake Victoria	677	586 (86%)	473 (70%)	
Menindee Lakes	*1 731	1 750 (101%)	376 (22%)	
<b>TOTAL</b>	9 271	<b>8 647 (93%)</b>	5 345 (58%)	

\*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 December 2020 to December 2021. The dashed-lines identify the Basin Plan (BP) thresholds for the corresponding colour coded location.

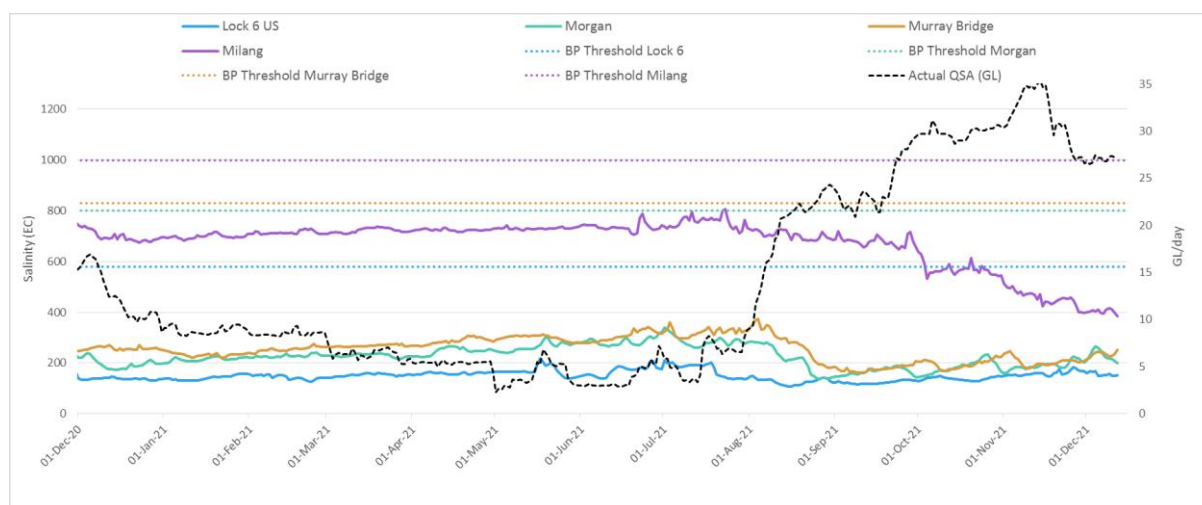


Figure 1: SA River Murray daily average salinity

## QUARTER 2 METER READINGS DUE BY 31 DECEMBER 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 2 accounting period for 2021-22 (which ends on 31 December 2021) must be recorded within the first fourteen days of January 2022 and submitted to the department by 31 January 2022.

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](mailto:DEW.waterlicensingberri@sa.gov.au)

Should you require assistance in supplying your meter reading, including how to complete the online meter reading form, please call the Berri office on (08) 85952053 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.

## NEW PENALTIES FOR UNAUTHORISED OR UNLAWFUL WATER USE

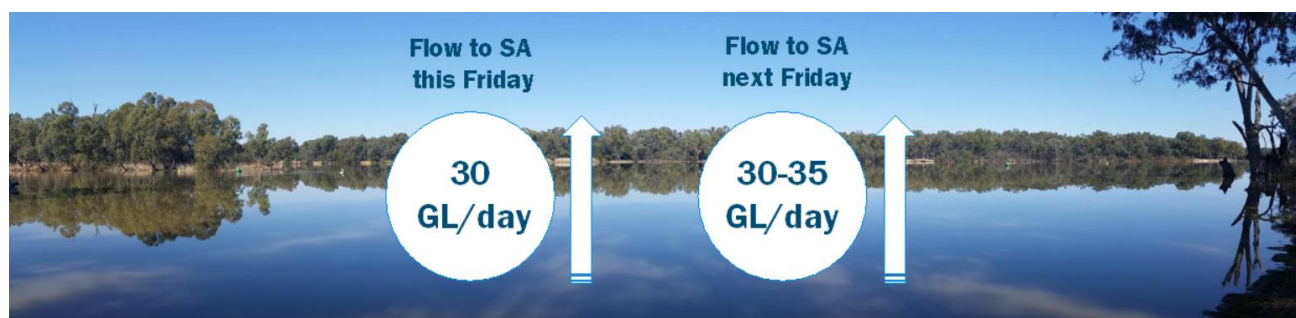
All South Australian River Murray water users are reminded that they must remain within the available allocation on their water account at all times.

New penalty rates have been declared for taking water in excess of available allocation (unauthorised use) or without authorisation (unlawful use). These penalty rates will apply to any unauthorised or unlawful water use in the current quarter, being Quarter 2 of the 2021-22 water use year (between 1 October 2021 and 31 December 2021).

Accounting period	Up to and including 500,000kL overuse	More than 500,000kL overuse	Unlawful taking or use of water
1 Oct 2021 to 31 Dec 2021	\$0.96/kL	\$1.28/kL	\$1.28/kL

For further information please visit the following website <https://www.environment.sa.gov.au/topics/water/water-markets-and-trade/fees-and-charges>

## FLOW OUTLOOK



The flow at the South Australian border is approximately 30 GL/day and will remain in the range of approximately 30 - 35 GL/day over the coming week. It comprises:

- full December Entitlement Flow (7 GL/day);
- plus water for the environment (see below *Environmental News*);
- interstate trade adjustments;
- Additional Dilution Flow (ADF); and
- Unregulated flow.

Due to recent rainfall events across Victoria and New South Wales the flow to South Australia may increase again during late December and early January to around 35 – 40 GL/day. If forecasts continue to show that the flow to South Australia will exceed 40 GL/day then a formal High Flow Advice will be issued in due course.

More information on when River users will be notified of a forecast event can be found via the following link on the DEW website: <https://www.waterconnect.sa.gov.au/Hazard-management/SitePages/What%20warnings%20will%20get%20before%20a%20flood.aspx>

The flow over Lock 1 is approximately 26 GL/day and will increase to around 30 GL/day over the coming week.

It is important to note that flow forecasts in this advice are based 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.

## ENVIRONMENTAL NEWS

Unregulated flow from spring rainfall in upstream catchments continues to reach 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 including 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 'flowing water habitat' to benefit native fish, animals and plants in the River Murray channel that have adapted to a riverine environment, including supporting conditions that favour spawning and recruitment of golden perch and Murray cod. Monitoring has detected golden perch eggs and larvae at various sites throughout the Lower Murray in recent weeks;
- providing for barrage releases to the Coorong to support a productive, food-rich environment for fish and birds and promote suitable conditions for estuarine fish to spawn;
- 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;
- maintaining healthy water quality, salinity and water levels in the River Murray Channel and the Lower Lakes and Coorong;
- removing excess salt from the River Murray; and
- delivering a range of outcomes to wetlands in the Riverland via arrangements with Nature Foundation Limited, Australian Landscape Trust, Accolade Wines Ltd and the Murraylands and Riverland Landscape Board.

## 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 12 December 2021, a total of approximately 7 915 292 cubic metres of sand had been removed by dredging operations.

Both dredges are 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 0.82 m AHD and Lake Albert is approximately 0.73 m AHD. The difference is due to wind effects.

As of Tuesday 14 December 2021, the weekly releases were approximately 97 GL. Total daily release volumes from the barrage can now be accessed via [Water Data SA](#) by searching for the gauge [A4261002](#).

Gate openings at the barrages during the week can be seen in Table 1. Barrage releases are currently being prioritised through Tauwitchere barrage in order to maintain water levels in the Coorong.

Table 2: Number of barrage gates open each day for the week ending Tuesday 14 December 2021

Barrage (total number of gates)	8 Dec 2021	9 Dec 2021	10 Dec 2021	11 Dec 2021	12 Dec 2021	13 Dec 2021	14 Dec 2021	Objective of releases
<b>Goolwa (120)</b>	3	3	3	3	3	3	3	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.
<b>Mundoo (25)</b>	0	0	0	0	0	0	0	Provide some localised freshening conditions in the Mundoo channel and support fish passage.
<b>Boundary Creek (5)</b>	1*	1*	1*	1*	1*	1*	1*	Provide attractant flow adjacent the fish way to support fish passage.
<b>Ewe Island (110)</b>	0	0	0	0	0	0	0	Releases will help push fresher water down the Coorong to assist lowering salinity levels and provide habitat diversity.
<b>Tauwitchere (319)</b>	30	30	30	50	30	30	30	
<b>Fishways</b>	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 mid-level operation of the Chowilla environmental regulator raised water levels in Chowilla Creek and through the Anabranche to a maximum height of 19.59 m AHD resulting in inundation across over 6,000 hectares with widespread benefits for floodplain plants and animals. The operation of the regulators has now finished with the water levels equalised with the current higher water levels in the main river channel. As the river level recedes back to normal pool level, so will the floodplain water levels.

Small boat access can now occur through the Chowilla regulator.

The water level in Weir and Lock 6 was also raised in conjunction with the Chowilla Regulator and reached a maximum height of 19.68 m AHD. The water level is now lowered slightly within normal operating range.

### **Pike Floodplain and Weir and Lock 5**

Operations on the Pike Floodplain commenced 26 July 2021 and reached its planned maximum level on 30 September 2021 (15.8 m AHD) inundating approximately 950 hectares of the floodplain. The water level has now returned to normal operating level (14.55 m AHD).

The Lock 5 weir pool was temporarily raised by 50 cm to 16.8 m AHD in conjunction with the Pike floodplain watering to assist water flow through the floodplain and inundating approximately 1000 hectares of low floodplain along the river. The water level is now back to normal pool level (16.3 m AHD) NPL.

### **Katarapko Floodplain and Weir and Lock 4**

Operations on the Katarapko Floodplain also commenced 26 July 2021 and reached the maximum planned height of 13.2 m AHD on 15 September 2021, delivering water across approximately 800 hectares of the floodplain. Water levels within the floodplain have been drawn down and have equalised with higher water levels in the main river channel. As the river level recedes, so will the water levels on the floodplain.

The Lock 4 weir pool level was raised to a maximum level of 13.50 m AHD to assist with water flow into the Katarapko Creek system and inundated approximately 320 hectares of low floodplain along the river. Lock 4 is now lowered slightly within the normal operating range.

The floodplain operations across Chowilla, Pike and Katarapko have generated widespread benefits for floodplain plants and animals. This includes successful breeding across frog and waterbird species including threatened and rare species and provision of food resources and valuable habitat for many species including migratory waders.

### **National Park access**

There are still some short term access restrictions and closures of some roads, trails and campsites on the 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 15/12/2021 (m AHD)	2016 High Water Level (m AHD)
Lock 10	825.0	30.80	30.80	32.72
Lock 9 Kulnine	764.8	27.40	27.33	28.85
Lock 8 Wangumma	725.7	24.60	24.63	26.85
Lock 7 Rufus River	696.6	22.10	23.01	24.97
Lock 6 Murtho	619.8	19.25	19.18	20.19
Renmark	567.4	-	16.31	17.44
Lock 5	562.4	16.30	16.27	17.05
Lyrup	537.8	-	13.43	15.80
Berri	525.9	-	13.26	15.21
Lock 4	516.2	13.20	13.14	14.73
Loxton	489.9	-	10.96	13.54
Cobdogla	446.9	-	-	11.59
Lock 3	431.4	9.80	9.78	10.98
Overland Corner	425.9	-	7.22	10.41
Waikerie	383.6	-	6.42	9.20
Lock 2	362.1	6.10	6.04	8.32
Cadell	332.6	-	3.91	7.01
Morgan	321.7	-	3.60	6.38
Lock 1 Blanchetown	274.2	3.20	3.10	4.46
Swan Reach	245.0	0.75	1.16	3.11
Mannum PS	149.8	0.75	0.91	1.33
Murray Bridge	115.3	0.75	0.78	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](#).

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