



Lock 5, Renmark. Photo credit Grant Schwartzkopff

Weir pool raising and lowering

History of River Murray weirs

Prior to European settlement, the River Murray experienced variable annual and seasonal water levels in response to prevailing climatic conditions. Ecosystems which evolved in this environment, relied on a variable water regime to remain healthy.

When European settlers began using the river as a water source and for commerce, the variable river levels made it difficult for vessels, such as paddle steamers, to navigate the river, and posed challenges when sourcing water for livestock, irrigation, and other activities.

To overcome this unpredictability, locks and weirs were constructed along the river, with 6 locks installed in South Australia (see map on page 2).

How do weirs and locks work?

Construction of weirs create a series of 'steps' in the river and allow the water level behind them to be regulated at a stable height, referred to as 'Normal Pool Level' (NPL).

Immediately upstream of a weir, the water level is permanently elevated to approximately 3 metres above the downstream level, with levels only changing if there is a high flow event. This ensures water is always available for drinking, agriculture, and navigation.

To enable boats and water vessels to navigate between the different water levels, each weir has a fixed lock chamber that is used to raise or lower watercraft to the water level of the body they are entering.

Weir pool manipulation

While weirs play a vital role for human use, the restrictions they place on naturally occurring water level variability has had a negative effect on river ecosystems.

As variable flow and water levels provide positive ecological outcomes and maintain healthy waterways, changing the operation of locks and associated weir pools has been identified as a way of helping to counteract the effects of regulation. This involves using existing river infrastructure to increase or decrease water levels in the stretch of river between 2 weirs (known as a weir pool or reach) to achieve better outcomes for the environment. This is known as weir pool manipulation (WPM) and can include weir pool raising or weir pool lowering.

Benefits of weir pool manipulation

Water level variability allows for the natural inundation and drying phases required to maintain a healthy river system.

Weir pool raising

Weir pool raising provides water to areas that are often dry, such as riverbanks and low-lying floodplains, as well as connecting surrounding creeks, lakes, and wetlands. This stimulates growth and breeding in ecosystems, and increases crucial food sources, particularly for birds such as spoonbills and ducks, and small native fish species, which in turn, provide food for larger species.

Vegetation benefits equally from the inundation of wetlands and floodplains, as it mobilises organic material into the main river channel and increases the health and diversity of plants, with tree species such as river red gum, black box, and river coobah receiving much needed water.

Weir pool lowering

Weir pool lowering supports the important drying phase of the natural cycle, allowing vegetation to grow on the newly exposed banks and causing aquatic plants to dry and decompose, therefore attracting invertebrates, which are an important food source for wading birds.

The drying phase also creates faster-flowing habitats in the river channel. This supports native fish and transports seeds and other nutrients throughout the system.

How is weir pool manipulation planned?

The Department for Environment and Water (DEW) plans weir pool manipulation to partially mimic pre-regulation water level variability, and undertakes annual planning to understand the ecological needs of the River Murray, including its floodplains and wetlands.

Planning guides decision-making on how and when WPM will be undertaken, with the aim of varying water levels each year. Decisions will be based on assessments of conditions along the river, flow in the River Murray, and availability of environmental water. The changes will not always follow a set pattern.

When weir pool manipulations outside the normal operating range are planned, DEW will engage with river users and the wider community.

To learn more about the SA River Murray annual environmental watering plan and priorities, please visit www.environment.sa.gov.au/water-planning

How quickly will water levels change during weir pool manipulations?

Raising and lowering of water levels is undertaken at steady and controlled rates. During a planned action, water levels will typically be raised/lowered by between 2cm and 5cm each day, until the target water level is reached. Once this occurs, the level will be maintained for approximately 30 to 60 days before the same rate is then used to return to previous levels.

SA River Murray weir locations



How will it impact me?

Property owners

As changes to water levels will continue to vary due to both natural events and managed actions, people with privately owned equipment along the river are advised to ensure its ability to withstand water level variability.

Pumps and other infrastructure along the river are taken into account when WPM is being planned but operators are encouraged to adjust and adapt infrastructure to meet the changing River Murray levels.

River users

Raising and lowering water levels should not have a significant impact on boating, fishing, or other river activities. River users are reminded however, to take care and be aware of any changes in water levels, as river conditions are frequently changing.

More information

SA River Murray Flow Report

River Murray levels and information about environmental watering actions.

Subscribe or to read current and previous issues at waterconnect.sa.gov.au/River-Murray/

Water Data SA

Real-time River Murray flows and levels at water.data.sa.gov.au

Marine Safety

Latest information and news on boating safety at marinesafety.sa.gov.au

DEW Water Infrastructure and Operations

For queries relating to planned events

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www.environment.sa.gov.au