



Australian Government



MURRAY-DARLING  
BASIN AUTHORITY

# Climate change, science and evaluation

Changes in global and regional climate patterns are having significant impacts on the availability of water for both communities and the environment throughout the Murray-Darling Basin.

The Murray-Darling Basin Authority (MDBA) works with other Australian Government agencies, including the Australian Bureau of Meteorology, CSIRO and Basin state governments to understand climate risk and manage the Basin's water resources under these changing conditions.

The Bureau of Meteorology projects rainfall will decrease. Increased variability is also predicted, with declines less certain in the northern Basin, which historically, has a more variable and intermittent rainfall pattern. Overall, the southern Basin is receiving less annual rainfall compared to the long-term average.

In 2012, there was widespread agreement across government that a plan was needed to manage our water carefully and protect the Basin for future generations.

The Basin Plan, which is being implemented, has been developed to ensure climate variability and climate change is considered in real-time, and climate change patterns, measured over decades, are considered through regular reviews. To specifically address climate change, regular 10-yearly reviews of the Basin Plan are required, which allow for emerging climate change patterns to be considered.

Climate variability describes the way climate elements such as temperature and rainfall differ from the average in given months, seasons, years, decades or centuries. Water management practices in the Basin already account for climate variability. Water is allocated to users based on availability. In a wet year, more water will be available compared to a dry year.

## Key facts

**Climate change is expected to have significant impacts on water availability in the Basin.**



The Murray-Darling Basin is **complex, diverse and constantly changing** in response to the climate and human activities.



The Bureau of Meteorology says **average rainfall in the Basin is projected to decrease** because of climate change. However, there is much variability predicted, with declines less certain in the northern Basin.



Projections suggest a likely **increase in drought frequency and severity**, while at the same time, heavy rainfall is expected to increase.



CSIRO warns that outflows at the **River Murray mouth in South Australia** are likely to be influenced by climate change.



Less rainfall will affect the storage of water and **increase demand** from irrigators and communities.



**Monitoring, new science and evaluation** are at the core of adaptive management in the Murray-Darling Basin.

# Responding to climate change

In February 2019, the MDBA released a discussion paper on climate change and the Murray–Darling Basin Plan. The paper signalled the MDBA’s commitment to a major research program on climate change in the Basin, which will be informed by a series of workshops convened by MDBA’s Advisory Committee on Social, Economic and Environmental Sciences (ACSEES).

The MDBA is committed to this work and it will be prioritised over the coming years. It is expected this research will be critical to ongoing adaptive management decisions, along with the formal built-in reviews of the Basin Plan.

The MDBA is focusing on **four key actions** that respond to these risks and prepare for the impacts of climate change:

- **Refining existing arrangements** – this will support adaptation to climate change (such as water trade), avoid duplication and disrupting stakeholder operations.
- **Buffering the system from stress** – preparing the Basin for climate-related stress (including recovering water for the environment) will mitigate the impact climate change has on its ecosystems.
- **Enhancing with new arrangements** – there are opportunities to implement new initiatives that explicitly address climate change (such as greater collaboration with the research community) to generate a deeper understanding of climate change impacts on water.
- **Adapting to future changes** – adaptive responses to climate change are being further developed following monitoring of, and investigations into, climate change impacts. These are articulated in longer-term plans and on a shorter time scale in annual environmental watering priorities.

## Regular reviews, monitoring and evaluation

There are two ‘built-in’ formal evaluations of the Basin Plan. The MDBA conducted a preliminary evaluation in 2017 to monitor progress and shape future management decisions, with the next evaluations set for 2020 and 2025, and a formal 10-yearly review taking place in 2026.

Monitoring the social and economic conditions of the Basin, and the impact of the Plan on communities, is conducted by the MDBA—with community impacts research conducted as part of the Northern Basin Review, and southern Basin research as part of the MDBA 2017 Basin Plan Evaluation.

As an interim review, the **2017 Basin Plan Evaluation** showed good signs that the plan is working and on track in many areas. It concluded that the adaptive mechanisms written into the Basin Plan have fostered a culture of seeking new knowledge and learning by doing (adaptive management).

## Adaptive management

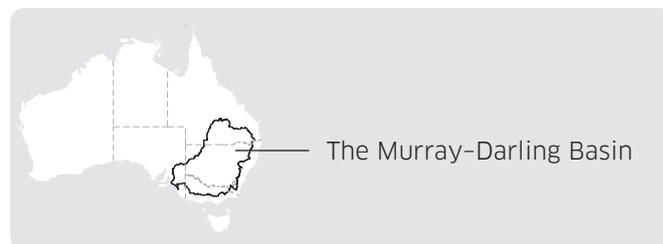
A cornerstone of the strategy for managing water resources in the Basin is adaptive management – ‘learning as you go’ by trialling techniques, monitoring, and making changes as needed.

Water managers must be flexible and dynamic to ensure the best possible outcomes are achieved. This is the modern way of managing natural resources.

Adaptive management allows governments and communities to adjust their approach in response to current climatic conditions, new information and local knowledge when planning for the future.

The features of this approach are **planning, management, monitoring and evaluation**. Adaptation can happen at any one of these stages.

The adaptive management approach to environmental watering is a practical example of this method at work. The MDBA and its partners have put in place monitoring programs to assess whether water for the environment is reaching the right places at the right times. Timings, flows and target areas are adjusted in response to the results.



### Connect with us.

The MDBA has offices in Adelaide, Albury-Wodonga, Canberra, Goondiwindi, Griffith, Mildura, Murray-Bridge, Toowoomba, and regional engagement officers around the Basin.

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