



Australian Government



Managing water under a changing climate

The Murray-Darling Basin Authority climate workplan May 2021

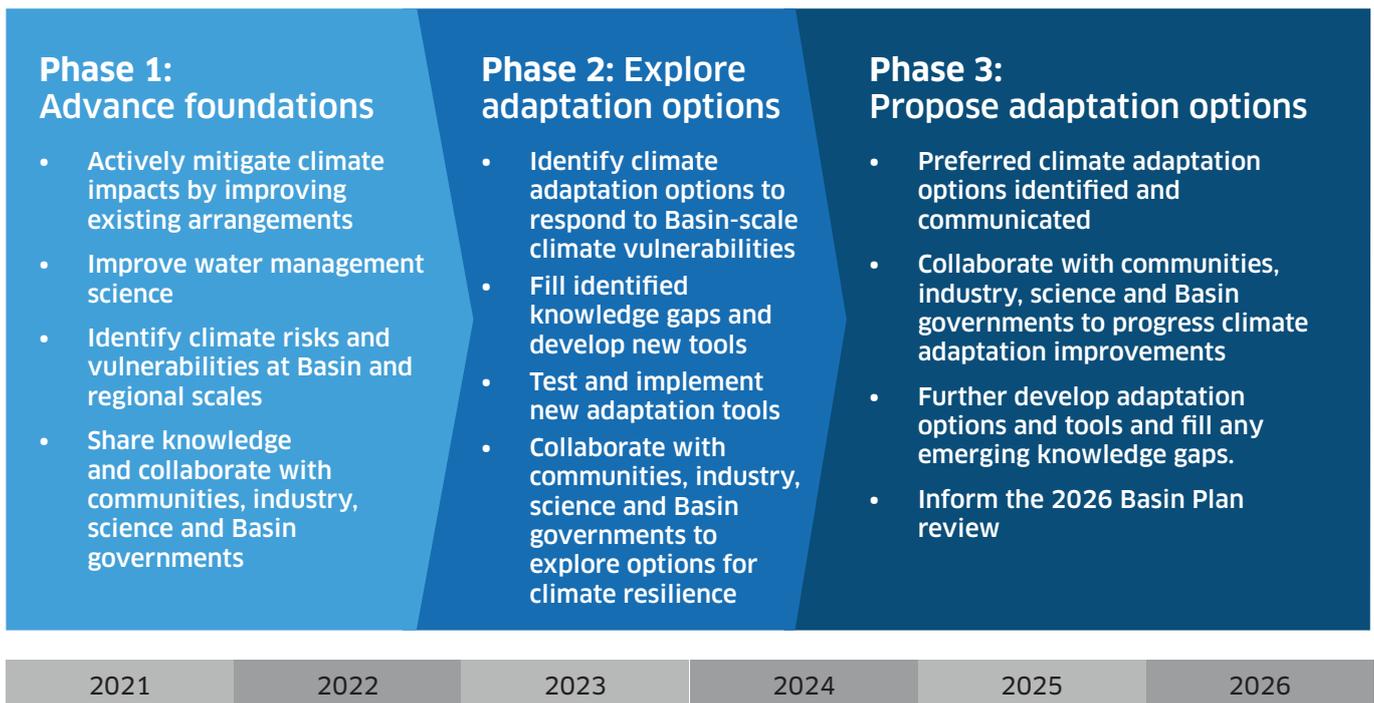
The Murray-Darling Basin's climate is changing. While the climate has natural variability and is prone to extremes, evidence provided by the CSIRO and Bureau of Meteorology identify the climate of the Basin is changing. The future is likely to be warmer, drier and include more frequent droughts and extreme weather events.

This Murray-Darling Basin Authority (MDBA) Climate workplan will steer effort from 2021 to 2026.

This workplan has 3 phases. Phase 1 will advance the foundations to mitigate climate change impacts, improve science and knowledge, assess Basin-scale vulnerabilities and identify options for improving Basin-scale water management arrangements. These foundations will be used in Phase 2, which will focus effort on Basin climate vulnerabilities and exploring adaptation options with Basin stakeholders. Phase 3 will propose climate adaptation options that need to be incorporated into the 2026 Basin Plan review.

Objective:

To strive towards a sustainable, productive and resilient Murray-Darling Basin



Phase 1 detail: Advance foundations

Basin-scale water management components <small>Areas we need to consider for responding to climate change</small>	Currently happening <small>Activities that actively consider climate</small>	Focus of effort for 2021 to 2023 <small>New actions to adapt now, and into the future</small>
Sustainable diversion limits set how much water can be taken from the Basin's river systems and groundwater aquifers for use	<ul style="list-style-type: none"> Accounting and compliance ensures water taken is within set limits Basin Plan evaluations monitor the effectiveness of the sustainable diversion limits (SDLs) 	<ul style="list-style-type: none"> Update the science and information that underpins the SDLs and informs our knowledge of the future climate
Water markets and trade allow water users to adapt to year-to-year climate risks	<ul style="list-style-type: none"> The Basin Plan monitors pre-existing water trading frameworks, allowing the most productive use of scarce water in dry times 	<ul style="list-style-type: none"> Help share information and science on future water availability, trends and key drivers of change
Water resource plans outline how water will be managed in catchments throughout the Basin	<ul style="list-style-type: none"> Annual State allocations are based on prevailing climatic conditions State developed plans incorporate climate risks, protect groundwater ecosystems and manage dry conditions 	<ul style="list-style-type: none"> Work with Basin states to improve climate measures in WRPs Monitor the effectiveness of existing extreme event measures Work with partners to improve catchment planning and management
Water for the environment contributes to improving the health of the Basin's rivers, lakes and wetlands	<ul style="list-style-type: none"> Protection of planned environmental water Water for the environment helps buffer the ecosystem against stress New works and measures help sustain the ecosystem in dry periods 	<ul style="list-style-type: none"> Maximise flexible and efficient use of water for the environment Invest in new environmental science and improve water management Partner water management with integrated catchment management
Information and monitoring provides the ability to track the effects of climate change and build strong community-science-government links	<ul style="list-style-type: none"> Foster a whole-of-system response by connecting interest groups across the Basin Help prepare Basin stakeholders by facilitating future climate information sharing 	<ul style="list-style-type: none"> Work with Basin state and Commonwealth partners to improve the sharing of future climate risks and vulnerabilities Expand/improve the monitoring framework with real-time reporting
Science and modelling is the basis for managing future climate risk - forecasting vulnerabilities and providing response options	<ul style="list-style-type: none"> Build decision-support tools for climate adaptation Work with Basin states to incorporate future climate modeling 	<ul style="list-style-type: none"> Share future climate science with impacts, risks and vulnerabilities Establish and maintain science community panels for regular community involvement
Water quality is actively monitored and communicated	<ul style="list-style-type: none"> Water quality targets are in place; water resource plans (WRPs) include water quality plans Water quality is monitored and managed with Basin states Water quality alerts are used to mitigate flow-on risks 	<ul style="list-style-type: none"> Improve monitoring and management systems with Basin states Improve procedures for responding and communicating cross-border risks
River Murray operations work to deliver balanced outcomes in meeting user demand	<ul style="list-style-type: none"> River operations respond to forecast climatic conditions daily Information is shared with Basin state partners and water users 	<ul style="list-style-type: none"> Invest in and apply improved forecasts (Bureau of Meteorology & MD-WERP*) Assess infrastructure capability and operational risk under extreme conditions

Phase 2: Explore adaptation options

Phase 3: Propose adaptation options

This workplan focuses on sharing the work being completed during phase 1. The outputs from phase 1 influences the approach and activities for the following phases. The MDBA will share progress annually.

* Murray-Darling Water and Environment Research Program



Latest progress

The MDBA adopted the Australian Government's Climate Compass developed by the CSIRO to help government agencies to assess climate change risks. The MDBA engaged the Bureau of Meteorology and the CSIRO to provide advice for the Murray-Darling Basin.

This work was released as part of the [2020 Basin Plan Evaluation](#) (see Bureau of Meteorology - [Trends and historical conditions in the Murray-Darling Basin](#); CSIRO - [Hydroclimate Futures for the Murray-Darling Basin](#); and MDBA - [Vulnerabilities to climate change in the Murray-Darling Basin](#)).

The CSIRO has developed a number of river health metrics and a range of scenarios depicting future climates. The climate metrics help to understand the implications of different climate scenarios on river health. These are being used to inform how climate change will impact dry spells, flow sequencing, mean annual flow, overbank flows, freshes, replenishment flows, baseflows and cease to flow events. All 6 scenarios are being used during Phase 1 of the workplan. This analysis complements science being undertaken by Basin state governments.

Summary of climate challenges and implications

Future climate challenges

- Higher temperatures
- Reduced rainfall and increased evaporation
- Reduced river flows
- Longer droughts and more heatwaves
- Heavy rainfall to become more intense
- More frequent bushfires

Implications for the Murray–Darling Basin

- Less water available for all users
- Increased pressure for efficient water use
- Reduced water quality
- River ecosystems under stress and changing
- Competing water demands across sectors
- Growing liveability challenges in regions

The Basin Plan

The Murray–Darling Basin Plan is a commitment all Basin governments made to work collectively towards a sustainable and healthy river system. It seeks to establish enduring arrangements for the benefit of all users – the environment, communities, cultural and recreational users, as well as irrigated and dryland agriculture.

The Basin Plan was developed to ensure climate variability and climate change would be considered in real-time, and climate change patterns, as measured over decades, are considered through regular reviews. Regular 10-yearly reviews of the Basin Plan are required to allow for emerging climate change patterns to be considered.

The Basin Plan has already helped cushion the impact of a warming climate during extremely dry periods, through emergency releases of water for the environment, strengthening connectivity and flushing stagnant water. Future changes to the plan will need to actively consider and adapt to climate change as we strive towards a sustainable, productive and resilient Basin.

This workplan provides the foundations for the science, analysis and options to support the 10-year Basin Plan review in 2026.

Working together

Climate change is a challenge that will affect every aspect of our lives and no individual or single group can solve it. Community action and partnerships will be central to successful adaptation of many impacted areas including water management and planning.

The MDBA's role is Basin-scale and considers the long-term Basin policy and water management settings. The state governments are actively incorporating climate change and adaptation into on-ground water management. MDBA is working collaboratively with Basin governments.

At the Basin Climate Summit in March 2021 many groups described how they are already adapting to the changing climate. The MDBA is committed to strengthening partnerships, collaborating and, wherever possible, co-designing solutions. As part of our everyday business the MDBA involves communities in developing and sharing user-friendly information on climate impacts, vulnerabilities and adaptation options.

MDBA commitment

Take action now and establish foundations for the future

The MDBA will build on the adaptation work already underway by states and the Australian Government. We will bring water managers together with communities, industries, First Nations and governments to identify further adaptation opportunities.

The MDBA will collaborate with others to improve access to science and evidence for all stakeholders' to plan and manage climate change in the Basin.

The Murray–Darling Basin



For more information visit

mdba.gov.au/changing-climate

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