

Water Banking in the Goulburn Murray

The Goulburn Murray Climate Alliance is a formal collaboration of 13 local government councils, two Catchment Management Authorities, Alpine Resorts Victoria, and an informal partnership with DEECA Hume. The Alliance has worked together to build capacity to undertake programmes that reduce greenhouse gas emissions and implement regional adaptation projects generally beyond the reach of individual member organisations for the last 16 years. The GMCA's work is complemented by advocacy, capacity building and regional partnerships across Victoria and beyond.

In 2023 the GMCA has undertaken large-scale climate-change adaptation projects, including those within the 'A Resilient Public Estate' project. This project acknowledges the enormous range of public assets that local government manages, and the impacts financially, socially, and environmentally that climate change has on these. Assets include roads, drainage, public buildings, open spaces and street trees, bridges, culverts and more. Studies assessing the economic impact of drought, heatwaves, bushfire, flooding and storms are ongoing and will produce tools and internal capacity to continually improve and review asset assessments year-on-year, within each participating council.

The region has experienced fluctuations in water availability during drought which places immense strain on irrigated agriculture, the environment and communities, and the utilities that supply the resource. To reduce the variability of water availability, integrated conjunctive water storage and management of surface water - and groundwater is needed in the basin. 'Banking' water underground for later use for example via managed aquifer recharge (MAR), presents an opportunity to recharge groundwater during periods of surface water surplus and withdraw water from aquifers when demand for water exceeds supply to enhance long-term water security for irrigated agriculture, communities and for the environment of the region.

As part of A Resilient Public Estate, the impact of drought on both public open space assets and the community has been front of mind. GMCA has partnered with CSIRO to build understanding and commence the co-design of a MAR project with selected municipalities. As part of this we have also joined with a number of water utilities and agencies throughout the region, including North East Water, Goulburn Murray Water, as well as the Goulburn Broken and North East Integrated Water Management Forums.

MAR is the purposeful recharge of water to aquifers for subsequent recovery or environmental benefit. It is distinct from unintentional or incidental recharge i.e., through seepage. In Australia MAR has been applied either through infiltration-based techniques under gravity (Figure 1), or through pressurised well injection methods, and tends to be operated for intra-year storage to supplement seasonal demands. The term 'water banking' has been used to describe a form of MAR that focusses on inter-year storage for enhancing long-term water security for increasing drought resilience. More specifically, water banking refers to a system or institution where water rights are deposited in a 'bank' for later use or transfer to other users.

Southern Australia continues to experience a widespread drying trend and recent droughts have greatly affected agriculture, communities and the environment of the Murray Darling Basin where the majority of the GMCA members are based. While droughts are a natural part of Australia's seasonal cycles, they are likely to become more severe and more frequent.

Long-term water banking through MAR for inter-year drought resilience is proven internationally and has significant potential for application in Australia. Drought impacts tend to be magnified in Australia’s rural and regional communities largely because of the deep impact on agricultural industries.

Agriculture contributes approximately 2% of Australia’s GDP and employs approximately 350,000 people, with the Goulburn Valley and Hume regions in Victoria being critical to this activity.

In the USA water banking through MAR has improved drought resilience with hundreds of millions of cubic metres banked for decades for later recovery during drought for example in California and Arizona.¹

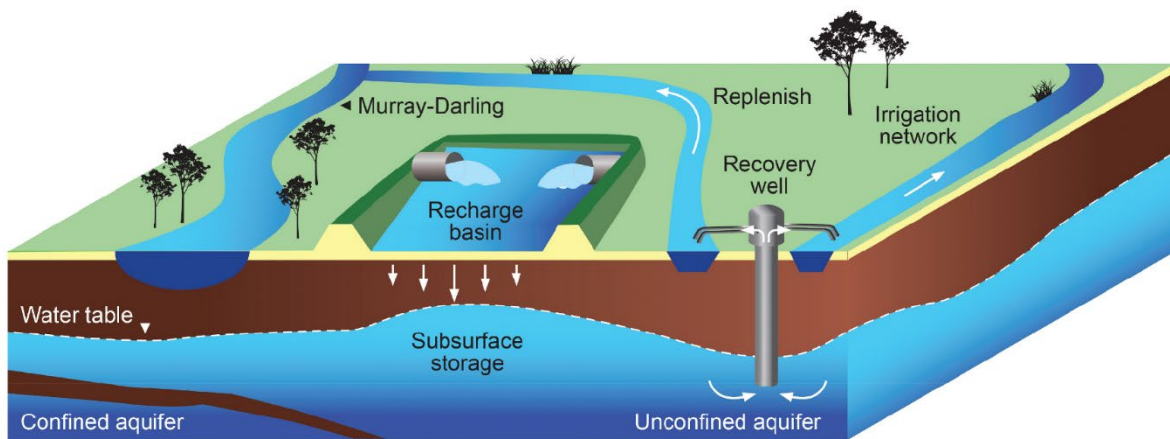


Figure 1. Water banking in unconfined aquifers through recharge basins.

¹ D.W. Page, D. Gonzalez, T. Clune, Y. Colton & G.D. Bonnett (2022): Water banking in aquifers as a tool for drought resilience in the Murray Darling Basin, Australasian Journal of Water Resources, DOI: 10.1080/13241583.2022.2144115