

This country profile was compiled by the OECD Secretariat and reflects information available as of March 2015. Further information and analysis can be found in the publication: OECD (2015) [Water Resources Allocation: Sharing Risks and Opportunities](#), OECD Studies on Water, OECD Publishing. Country profiles for all of the 37 allocation regimes in 27 OECD and key partner countries surveyed for this project are available for download at: <http://www.oecd.org/fr/publications/water-resources-allocation-9789264229631-en.htm>.

AUSTRALIA

Overview and highlights

In Australia, water resources allocation regimes vary significantly depending on the particular state or territory, the environmental conditions and water management capacities. The Murray-Darling Basin is a good example of an extremely variable river system that is prone to periodic drought and flood events.

Key characteristics of the prevailing allocation regime in the Murray-Darling Basin include:

- A Basin Plan¹ that sets sustainable diversion limits and includes an environmental watering plan, a water quality and salinity management plan, and water quality targets, which influence environmental flows and guide water resources management. The Plan is a statutory instrument that must be followed;
- Water ownership is independent of land ownership and water entitlements are granted to either individuals or collective bodies, such as water user associations;
- Entitlements are granted in perpetuity but conditional upon beneficial use;
- Annual water allocation regimes take into account climate variability by allocating less water to consumptive uses in drier years;
- A permanent water trading scheme is in place. Prices reflect changes in demand and supply of water entitlements related to climatic conditions, commodity markets, current and expected level of allocations (including unused allocations at the end of the water year) and changes in rules;
- For new entrants, access to surface water is limited to purchasing entitlements from existing owners. Ground water use is conditional on the assessment of third party impacts, an environmental impact assessment (EIA) and existing users forgoing use;
- All abstraction charges are volumetric and they do not reflect water scarcity; The definition of 'exceptional circumstances' varies across Basin jurisdictions. Stakeholders are involved in drafting legislation addressing exceptional circumstances.

¹ Further information on the Basin Plan is available at: www.mdba.gov.au.

Legal and institutional setting for water allocation

Institution	Scale	Main Responsibilities
Murray-Darling Basin Authority (MDBA)	Basin	Policy and planning to ensure resources of the Basin are managed in an integrated and sustainable way
New South Wales Office of Water	Provincial/State/ Regional	Policy, planning and management including issuing entitlements
Queensland Department of Natural Resources and Mines	Provincial/State/ Regional	Policy, planning and management including issuing entitlements
Victorian Department of Environment and Primary Industries	Provincial/State/ Regional	Policy, planning and management including issuing entitlements
South Australian Department of Environment, Water and Natural Resources	Provincial/State/ Regional	Policy, planning and management including issuing entitlements
West Australian Department of Water	Provincial/State/ Regional	Policy, planning and management including issuing entitlements
Tasmanian Department of Primary Industries, Parks, Water and Environment	Provincial/State/ Regional	Policy, planning and management including issuing entitlements
Northern Territory Department of Land Resource Management	Provincial/State/ Regional	Policy, planning and management including issuing entitlements
Australian Capital Territory Environment and Sustainable Development Directorate	Provincial/State/ Regional	Policy, planning and management including issuing entitlements

Legal context for water allocation: Common Law.
Legal definition of ownership of water resources: ground and surface water are defined as owned by the Crown.

Tracking water scarcity

Several mapping exercises have been done to identify areas where water scarcity is becoming a problem: [CSIRO Sustainable Yields Reports](#) and [Water Resource Assessment for the Great Artesian Basin](#).

Allocation Regime Example: The Murray-Darling Basin

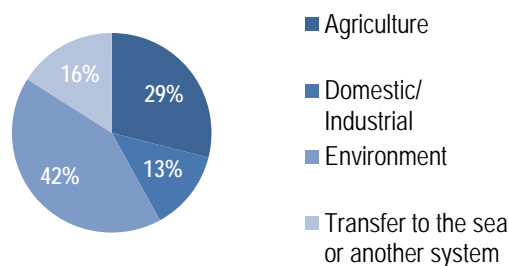
Physical features of the water resource

The water resource is defined by the catchment areas of the Murray and Darling rivers and their many tributaries. Comprising 23 main river valleys, the Basin extends over 1 million km² of south-eastern Australia. The Basin experiences considerable variation in annual inflow to its rivers and over the past 114 years, inflows have ranged from a high of 117 907 gigalitres (Gl) (in 1956) to a low around 6 740 Gl (in 2006). Average annual inflows (including inter-basin transfers) are around 32 500 (Gl) with an average rainfall over the Basin around 530 618 Gl/ p.a. Hydrological connectivity between surface and ground water is variable across the Basin.

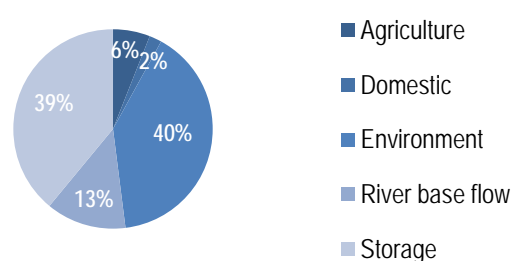
Depending on the particular location, the **flow is managed or controlled** either fully, partially, or not at all.

There is significant **non-consumptive use** for recreation (e.g. fishing) and tourism. An estimated 430 000 people use the Basin for more than 5 million fishing trips per year. This use is generally non-consumptive, but is dependent on the degree of ecological health. Some Ramsar listed wetlands and riverine national parks are significant tourist destinations. Also, more than 40 Indigenous nations across the Basin value water resources for cultural, social, environmental, spiritual and economic purposes. Lastly, inflows are augmented through the operation of the Snowy Mountains Hydro-electric scheme.

Surface water mean annual inflow/ recharge consumed per use:



Groundwater mean annual inflow/ recharge consumed per use:



Defining the available resource pool

Are limits defined on consumptive use? Yes

- The Murray-Darling Basin Authority has produced a Basin Plan that serves as a comprehensive basin-wide regulatory instrument that sits above Basin state water resources plans to ensure resources of the Basin are managed in an integrated and sustainable way. It is a statutory instrument that must be followed. The allocation regimes are determined for each river catchment in the Basin by Basin states through their water resource planning process. Each of the state water resource plans are required to be accredited under the Basin Plan.

Are environmental-flows clearly defined? Yes

- The Basin Plan limits water use at environmentally sustainable levels by determining long-term sustainable diversion limits for both surface and groundwater resource. A key component of the Basin Plan is the environmental watering plan, which coordinates all environmental watering across the Basin. The Basin Plan also contains a water quality and salinity management plan and water quality targets which influence how environmental flows and the water resources are managed.
- Freshwater biodiversity is considered in watering requirements of various elements of the rivers and floodplains of the Basin, including flood-dependent vegetation, fish and water birds.
- Terrestrial biodiversity is also addressed in the assessment of environmental watering requirements by considering key habitat components that support a range of terrestrial species, particularly those that rely on the structural components of floodplain vegetation for parts of their lifecycles.

What is the status of resource pool? Over-used

- **Measures to address over-use:** the Australian Government has initiated a range of programs to recover water entitlements in regions identified as currently taking water in excess of the sustainable diversion limit. Once recovered, these entitlements are transferred to the Commonwealth Environmental Water Holder and managed for environmental purposes. The programs include: purchasing entitlements from willing sellers at market prices and implementing infrastructure works (both on farm and in irrigation delivery systems) to reduce losses and improve water efficiency. State governments also undertake similar efforts.

Are there arrangements to deal with impacts of climate change? Yes

- Water resource plans need to specify how water resources will be managed during extreme events, including extreme dry periods. As part of this requirement, the water resource plan need to provide that, if new scientific information suggests a change in the likelihood of an identified extreme event occurring (for example, due to climate change), consideration must be given to whether, as a result of this new information, the water resources should be managed differently.
- Water allocation regimes respond to climate variability (and potentially climate change) by allocating less water to consumptive uses in drier years. Also, the 10 year review cycles (or sooner) for the Basin Plan incorporate new knowledge about climate change, including impacts on the resource pool, and implement management arrangements to accommodate these impacts.

Factors taken into account in the definition of the available resource pool

Factor	Taken into account?	If taken into account, how?
Non-consumptive uses (e.g. navigation, hydroelectricity)	✓	Modelling work performed for instance on existing hydro-electricity.
Base flow requirements	✓	Where groundwater discharge provides base flow to the unregulated river reach, a conservative approach (10% of groundwater recharge) is used to estimate the available water. Surface water requirements are one of the flow regime components when establishing the available resource pool and sustainable diversion limits.
Return flows (how much water should be returned to the resource pool, after use)	✓	Included in State water resource plans prepared under the Basin Plan, where relevant. Hydrological models used to determine the available resource pool include return flows in their routing routines.
Inter-annual and inter-seasonal variability	✓	Methods used to determine the volume of water that can be taken during a water year adapt to variability of inflows. Moreover, the definition of the available resource pool has been informed by assessments using 114 years of data which covers a wide range of climatic conditions and inter-annual variability.
Connectivity with other water bodies	✓	Where the rivers are highly connected to the groundwater system, the groundwater use is capped at the current level of extraction to ensure no further impact on surface water resources.
Climate change	✓	Potential climate change impacts are partially addressed through limits on extraction and allocation rules, which ensure less water is available for consumptive use in drier years.

Entitlements to use water

Definition of entitlements	Characteristics of entitlements
<p>Are entitlements legally defined? Yes. Defined as the maximum volume that may be taken in a nominated period and as a proportion of any water allocated to a defined resource pool.</p> <p>Are private entitlements defined? Yes, as an individual entitlement (to an individual person) and as collective</p>	<p>If the entitlement is not used in a given period, it remains in place for the period it was issued for.</p> <p>Are entitlements differentiated based on the level of security of supply (or risk of shortage)? Yes. Several classes generally apply across the Basin for surface water. Ranging from the highest to lowest level of reliability these are: urban, domestic and stock; high</p>

<p>entitlement (to an institution representing water users). For collective irrigator groups with a collective entitlement, the entitlement is defined as a share of the entitlement based on the rules of association of their membership. For urban authorities providing town water supply, individuals enjoy unlimited supply on a pay for use basis (typically on a full cost basis). Different levels of restriction may be imposed to further limit demand and subsequent use in periods of low allocation to the urban entitlement.</p> <p>Nature of entitlement: water entitlements unbundled from property titles. The principle of unbundling has been endorsed across the Basin. The process of converting bundled entitlements into unbundled entitlements has been largely completed.</p> <p>Period granted for: in perpetuity, but conditional upon beneficial use</p> <p>Return flow obligations: not specified.</p>	<p>security; low security; and unregulated or supplementary (opportunistic).</p> <p>Is there a possibility to trade, lease or transfer entitlements? Yes. Buyers and sellers operate in a market using intermediaries to be matched. Prices reflect changes in demand and supply of water entitlements and contracts are exchanged between buyer and seller. Trades of entitlements (and lease or transfers) are subject to approval by licensing authorities (both the buyers and sellers, as these may be different).</p> <p>Are allocations (the amount that can be taken at any point in time) managed separately from entitlements? Yes.</p> <p>Is allocation trading allowed? Yes. Trading occurs as a function of market demand and supply of water, which is in turn related to climatic conditions, commodity markets and the current and expected level of allocations. Price may also be impacted by any change in rules including whether the remaining unused allocation at end of the water year can be carried over to be used in the following water year. Licensing authorities set the rates for administrative charges for allocation trades. However, specific restrictions on trading of entitlements and/ or allocations apply. A primary consideration is whether the trade will result in adverse third part impacts. Also, rules are constructed to protect the needs of the environment, limiting the volume that can be traded in a region due to physical constraints, or preventing trading due to a lack of physical inter-connectivity.</p> <p>Can entitlements function as a financial instrument? Yes, they can be held as security against a mortgage or be held and traded as a financial instrument.</p>
<p>Type of users not required to hold a water entitlement to abstract water: Basic rights include the right to take water for domestic or stock purposes, harvestable rights, and native people holding title rights. Interception activities include runoff dams, floodplain harvesting and commercial plantations. Total water uses related to these groups of users account for 8%. The sustainable diversion limit in the Basin Plan includes estimates for these forms of take and compliance with the Plan requires that the total take, including these forms of take, cannot be exceeded without reasonable cause.²</p> <p>Requirements to obtain a new entitlement or to increase the size of an existing entitlement: The catchment is closed for surface and ground water. Access to surface water for new entrants is limited to purchasing entitlements (or leasing entitlements or purchasing allocations annually) from existing owners. Access to ground water is conditional on the assessment of third party impacts, environmental impact assessment (EIA) and existing users forgoing use.</p>	

² Several States (e.g. New South Wales, Victoria, South Australia) have additional specific rules relating to these forms of take.

Abstraction charges			
User category	Abstraction charge?	Basis for charge	Reflects water scarcity? ³
Agriculture	✓	Volumetric (including metered and unmetered estimates)	No
Domestic	✓	Volumetric (including metered and unmetered estimates)	No
Industrial	✓	Volumetric (including metered and unmetered estimates)	No
Energy production (not including hydro power)			
Hydro power	✓	Volumetric (including metered and unmetered estimates)	No
Other. Specify:			

³ The charges for water by state water licensing authorities are based primarily on cost recovery (e.g. the cost of maintaining infrastructure and operating the system). The cost of abstraction is also a function of a user's water abstracted. Prices paid for entitlements and traded allocation reflect water supply and demand, which are determined by the market.

Dealing with exceptional circumstances

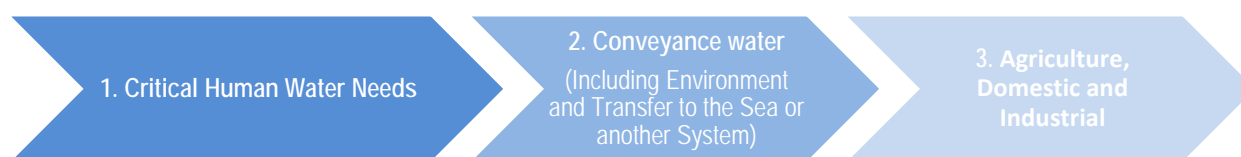
Distinction between the allocation regimes used in “normal” and extreme/severe water shortage times? Yes.

How is the amount of water made available for allocation adjusted? Each State has a similar process. At the beginning of the water year, there is an estimation of the water available, including an assessment of the forecast climatic conditions. Then, announcements on water allocations are made. Announcements are both formal and more informal, as some entitlements are automatically granted the full volume without any announcement. Where the full entitlement is not allocated at the commencement of the year, subsequent increases in the allocation are announced based on regular periodic reviews of the water available and estimates of climatic conditions. This continues through the water year until all water is allocated, or a decision is made not to allocate any more water in the year.

Definition of “exceptional” circumstances: extreme events including extreme dry periods, extreme water quality events, and any type of event that has resulted in the suspension of statutory regional water plan in the last 50 years. Various jurisdictions that make up the Basin may also have their own definitions of what comprises “exceptional circumstances”. However, definitions can vary across every jurisdiction. Stakeholders are involved in drafting legislation of exceptional circumstances.

Legal bodies declaring the onset of “exceptional” circumstances: the Murray–Darling Basin Authority, in consultation with relevant state governments. Under extreme circumstances Tier 2 and Tier 3 water sharing arrangements set out in Chapter 11 of the Basin Plan can be triggered in the River Murray System. These arrangements aim to ensure that critical human water needs can be met during times of very low water availability. The various jurisdictions that make up the Basin may implement their own changes to the allocation regime during extreme events, for example, suspending statutory water plans.

Pre-defined priority classes



Monitoring and enforcement

Responsible authority: State authority administering delivery and/ or licensing for all categories of uses/ users, except for transfer to the sea or another system. In this case, transfers to another system are the responsibility of the State water management authority for the region where the transfer occurs and for flows to the sea, the MDBA is responsible.

Types of withdrawals monitored: agriculture, domestic, industrial, energy production, environment and transfer to the sea or another system.

Monitoring mechanisms:

- In agriculture, metering and non-metered estimates;
- In urban domestic, metering and estimates (not applicable for non-urban and groundwater);
- In industrial and energy production, metering;
- In environment, metering and estimates where extraction occurs and where it remains in the river it is estimated;
- In transfer to the sea or another system, metering for transfers to another system and estimates for flows to sea.

Sanctions:

- In agriculture, penalties including both monetary fines and water payback, and license cancellation or suspension;
- In domestic, potential penalties such as monetary fines and water payback;
- In industrial and energy production, penalties like monetary fines;
- In environment, penalties as monetary fines and water payback.

Conflict resolution mechanisms? Yes, opportunity provided in some instances to establish or correct matters of fact that may be in dispute, prior to formal action being taken (e.g. fine or license cancellation).