



## Wetlands and changes in water flows

The way that rivers flow and wetlands are filled in response to rainfall and groundwater flows is called the water regime. The water regime describes where, when and how much water is present, including the timing, frequency, duration and variability of the presence of water.

Natural water regimes that provide a pattern of wetting and drying are the key to the health of rivers, wetlands and floodplains. High flows and floods connect rivers to floodplains and wetlands, moving nutrients around, allowing seeds to germinate and supporting breeding and movement of birds, frogs, fish and other animals. Low flows keep rivers flowing, allowing fish to migrate and breed. Dry periods where there are no flows can be important too and don't necessarily indicate a wetland is not healthy.

In Australia flows are highly variable both within and between years. Northern Australia has marked wet summers and dry winters. Most parts of south eastern Australia and south west Western Australia have wet winters and low summer rainfall or dry summers. A rich variety of plants and animals has evolved to suit these varying conditions.

Australia's arid areas have low, variable rainfall. Wetlands may be dry for much of the time, but plants and animals have adapted to respond and flourish as soon as the rain comes. This is a boom and bust environment.

The Coongie Lakes Ramsar wetlands in northern South Australia includes a vast array of temporary and near permanent wetlands spanning over two million hectares. The wetlands are driven by periods of boom, associated with the arrival of floodwaters from upstream and through local rainfall, followed by the bust period of extreme dryness. Floods trigger a spectacular concentration of waterbirds which reflects the incredible productivity of the wetlands and the availability of abundant food resources as well as habitat. The bust period, when the wetlands dry, can result in large numbers of fish and waterbird deaths.



Photo: Coongie Lakes Ramsar site—a boom and bust environment  
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The large volumes of water that fill tropical rivers, wetlands and floodplains in northern Australia during summer support large numbers and a high diversity of habitats, plants, insects, fish, birds and other animals including humans.

As a Ramsar wetland, Kakadu National Park in northern Australia, protects river systems encompassing gorges, wetlands, escarpments, coastal floodplains and estuaries. Kakadu's healthy and productive wetlands support an enormous diversity of plants and animals. During the wet season nutrients and organic matter are flushed from the floodplains, billabongs and lagoons into the estuaries by large freshwater flows and tides. At the end of the wet season the freshwater flows stop and so does the nutrient input, but there is enough to last the rest of the year. The crocodiles, sharks and around 340 species of fish (including commercial species such as barramundi) which inhabit the estuaries depend on the health and flows of the upstream wetlands.

## Changing water flows

When the water regime is altered by human activity plants, animals, rivers and wetlands are impacted. The ecological function of rivers, wetlands and floodplains is changed as a result of:

- damming rivers and building off-river water storages
- pumping and extracting water
- changing drainage patterns, including by constructing levee banks and other structures such as farm dams.

Alteration of natural water regimes can occur by increasing or reducing flows, altering the seasonality of flows, changing the frequency, duration, size, timing, predictability and variability of flow and changing the rate of rise or fall of water levels. Such alterations can support the needs of agricultural and other industries and prevent flooding of farms, towns and cities.



Photo: Kakadu National Park Ramsar site—an iconic wetland  
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Water flows that suit human needs may not suit the needs of plants and animals that have adapted over thousands of years to the natural conditions. Impacts include:

- loss of river bank vegetation such as River Red Gums—when they are inundated at the wrong time of year
- increased algal blooms—when low flows are prolonged
- decreases in waterbird populations—when wetland habitats are lost or reduced and water is not available at the right time for breeding or feeding
- increased pest fish species (such as carp) leading to loss of native species—when the patterns of flow favour introduced species over native species.

## National Programs

National programs and legislation have been implemented to balance the needs of the environment with the social and economic needs of communities in the use and management of Australia's water resources. More information is available about the:

- National Water Initiative: [www.agriculture.gov.au/SiteCollectionDocuments/water/Intergovernmental-Agreement-on-a-national-water-initiative.pdf](http://www.agriculture.gov.au/SiteCollectionDocuments/water/Intergovernmental-Agreement-on-a-national-water-initiative.pdf)
- Murray Darling Basin Plan: [www.mdba.gov.au/basin-plan](http://www.mdba.gov.au/basin-plan)
- Water Legislation: [www.environment.gov.au/water/australian-government-water-leadership/water-legislation](http://www.environment.gov.au/water/australian-government-water-leadership/water-legislation)
- *Environment and Biodiversity Conservation Act 1999*: [www.environment.gov.au/epbc](http://www.environment.gov.au/epbc)
- Commonwealth Environmental Water Holder: [www.environment.gov.au/water/cewo](http://www.environment.gov.au/water/cewo)

## Water information

The Bureau of Meteorology (BOM) is responsible for producing reports on water resources, availability and use in Australia. The Bureau's water [information](#) is used for informing decisions on investment and rural financing, infrastructure design, flood mitigation, water supply forecasting, river management and environmental flows, water sharing plans or policy advice.

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