
Glossary

μS/cm (microSiemens/cm). Often used to measure concentration in water such as water salinity.

adaptive management. Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs by employing management programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed.

aggradation. The accumulation of stratigraphic sequences by deposition that stacks beds atop each other, building upwards during periods of balance between sediment supply and accommodation.

allochthonous. Derived from an external source, for example, organic matter entering a stream or lake but derived from adjacent terrestrial areas.

alluvial. Deposited by running water.

alluvial fans. A sediment formation as a result of a stream cutting into its floodplain and depositing sediment in a fan pattern.

anabranh. A diverging branch of a river that re-enters the main stream.

anoxic. Without oxygen.

apiarists. Those involved in the production of honey.

aquifer. A body of rock that is sufficiently permeable to conduct groundwater and to yield significant quantities of water to wells and springs.

armour layer. An impermeable surface built up over a period of time by weathering.

autochthonous. Derived from within.

avulsion. A change in channel course that occurs when a stream suddenly breaks through its banks.

bank scour. The erosive action of running water in streams, which excavates and carries away material from the bed and banks. Scour may occur in both earth and solid rock material.

bank slumping. An indication of the degree of bank erosion. A healthy habitat has gentle bank slopes and no evidence that the stream is undercutting the bank.

bankfull (or bankfull flow level). The stream discharge corresponding to the water stage that first tops the natural banks but does not spill over into the floodplain.

barrages. An artificial bar or obstruction placed in a river or water course to increase the depth of water or obstruct flow.

baseflow. The sustained portion of stream discharge that is drawn from natural storage sources, and not affected by human activity or regulation.

baseline. Establishing the current status of the system.

bed-load. Sediment moving on or near the streambed and transported by jumping, rolling, or sliding on the bed layer of a stream. *See also* suspended load.

bed-forms. Topography of the riverbed: the sediment formed structures on the bed.

benthic. Associated with the river bed, for example, benthic invertebrates.

bifurcate. Division or a fork, often represented by two branches splitting from one.

bioclastic. Sediment or rock formations developed as a result of expulsion from a volcano.

biodiversity. Refers to variety of organisms, their genetic information and the biological communities where they live.

biofilms. Layered groups or communities of microbial populations.

biomass. The total dry weight of all organisms in a particular sample, population, or area.

biota. All living organisms of a region, as in a stream or other body of water.

blackwater. Water that contains waste of humans, animals or food.

block failure. Refers to failure of a slope or sediment movement associated with erosive activity.

Bonn Convention. The Bonn Convention was established to protect those species of wild animals that migrate across or outside national boundaries. Adopted in Bonn, Germany, on 23 June 1979, and entered into force on 1 November 1983.

CAMBA. The China Australia Migratory Bird Agreement, a treaty between Australia and China with the aim of preserving areas that provide habitat for internationally migrating birds within the tropics or the southern hemisphere.

carbon exchange. The process by which carbon is exchanged between the biosphere, geo-sphere, hydrosphere and atmosphere of some habitable body.

catchment. The area of land drained by a river and its tributaries.

channel capacity. Volume at which a channel spills its bank (*see* bankfull).

chenopod. From New Latin *Chenopodiceae*, meaning a small shrub or bush tolerant of dry and salty conditions, commonly found as an understorey species.

choke. Refers to the 'Barmah Choke'. This is a narrow section of the River Murray near Barmah, Victoria, that makes it difficult to move large volumes of water downstream.

cladocerans. An order of *Crustacea*. *Cladocera* or water fleas are small animals commonly found swimming in standing inland waters.

- COAG.** Council of Australian Governments—the peak intergovernmental forum in Australia, comprising the Prime Minister, state premiers, territory chief ministers and the President of the Australian Local Government Association.
- colonially nesting.* Colonial birds nest in the same place at the same time, and coloniality has been a successful evolutionary strategy for many bird species.
- commence to flow.* Volume at which flow spills into a channel or wetland. For instance, commence to flow for a wetland is the volume at which water enters the wetland.
- confluence.* (1) The act of flowing together; the meeting or junction of two or more streams; also, the place where these streams meet. (2) The stream or body of water formed by the junction of two or more streams.
- Convention on Wetlands.* The broad aim of the Convention on Wetlands (Ramsar, Iran 1971) is to halt the worldwide loss of wetlands and to conserve those that remain through wise use and management. The Convention was signed by representatives at the town of Ramsar in 1971. There are now more than 135 Contracting Parties to the Convention who have designated the Ramsar List of Wetlands of International Importance.
- cotyledon.* The ‘seed leaves’ produced by the embryo of a seed plant that serve to absorb nutrients packaged in the seed, until the seedling is able to produce its first true leaves and begin photosynthesis. The number of cotyledons is a key feature for the identification of the two major groups of flowering plants.
- cyanobacterial.* Predominantly photosynthetic prokaryotic organisms containing a blue pigment in addition to chlorophyll; occur singly or in colonies in diverse habitats; important as phytoplankton.
- rain rejection events.* See rain rejection.
- deflation.* A process whereby finer silts and clays are removed by the action of wind over geological time.
- deglaciation.* Disappearance by melting of ice covering an area. Deglaciation can vary greatly in speed, and ranges in nature from the retreat of a melting ice margin to the downward melting and fragmentation of stagnant ice.
- diadromous.* Refers to fish that migrate between salt and fresh water.
- die-back.* Loss of biodiversity due to environmental pressures such as weed invasion, nutrient-laden run-off or sedimentation.
- digital terrain model.* A data model that attempts to provide a three dimensional representation of a continuous surface. Often used to represent relief or elevation.
- drawdown.* Lowering of the water table, surface water, or piezometric surface resulting from the withdrawal of water from a well or drain; the elevation of the static water level (at the well) at a given discharge.

EC units. Electrical conductivity is a measure of the physical ability of a sample to carry an electric current. In this case, it can be used to measure salt concentration of water. A higher salt load will have a greater ability to conduct electricity.

ecological modelling. A representation of an ecological system, either qualitative or quantitative, that can predict, simulate or identify a response as a result of perturbation from an environmental process outside of the ecological system identified.

ecosystem. An interdependent biological system involving interaction between living organisms and their immediate physical, chemical and biological environment.

effluent stream. A stream that takes source water from the water table.

environmental outcomes. Project outcomes that benefit the ecological health of the river system.

environmental flows. Any river flow pattern provided with the intention of maintaining or improving river health.

estuarine. Refers to the water quality of an estuary, being influenced by both salt and fresh water.

estuary. A stretch of a river mouth directly affected by sea tides.

ephemeral. Temporary or intermittent; a creek or wetland that dries up intermittently.

evapotranspiration. The combination of water that is evaporated and transpired by plants as a part of their metabolic processes.

evaporation. The process by which atoms or molecules in a liquid state gain sufficient energy to enter the gaseous state (usually with a heat catalyst).

extraction. Water taken from rivers for off-stream use or consumption.

facies. Seeks to classify geological deposits based on similar recurrent characteristics, such as sedimentary facies and biological facies.

fault block. A plane of fracture in a rock along which displacement has occurred.

fauna. A living organism characterised by voluntary movement.

First Step Decision. A decision announced in November 2003 by the Murray-Darling Basin Ministerial Council.

fishways. Structures that provide fish with passage past an obstruction or stream.

flood hydrograph. A line graph plotting discharge of a river over time.

flood pulse. This concept suggests that periodic changes in water level are crucial to the biota in floodplain rivers and that the primary source of productivity in lowland rivers are the nutrients and particulate material derived from the lateral exchange between the floodplain and the channel.

- flood runners.* Anabranches or side channels of water that break out from the main channel at low to medium flood levels, flow through the floodplain, and rejoin it downstream.
- flood spawners.* In the River Murray, include fish species of Golden perch and Silver perch which spawn and recruit following flow rises and during periods of floodplain inundation.
- floodplain.* The flat or nearly flat land along a river or stream that is covered by water during a flood.
- flora.* The plants of a particular region.
- flow regime.* The spatial and temporal patterns of flow in a river.
- flow rights.* Access to a particular volume of water in time and space.
- fluvial.* From the Latin word *fluvius*, meaning river.
- food-web.* A conceptual way of showing how plants and animals in a habitat depend on each other.
- geomorphology.* The study of present day landforms.
- gigalitre (GL).* A measurement of water equivalent to one billion litres.
- groundwater recharge.* Water that is returned to subsurface flow from surface flow.
- gum-leaf skeletoniser.* A native Australian moth (*Uraba lugens*) that primarily feeds on gum leaves.
- habitat.* The type of environmental in which a given plant or animal lives and grows, including physical and biological conditions.
- halophytic.* Refers to a plant that can tolerate or thrive in alkaline soil rich in sodium or calcium salts; tolerant of saline conditions.
- head.* In the hydrological sense, refers to water pressure as a result of flow, usually as a result of a pressure gradient created by the movement of water.
- headworks.* Structural works designed to induce a pressure gradient or move water in a particular way. May include drainage channels, dams and weirs, for example.
- herbland.* Extensive community or herbaceous plant species (that is, with non-woody stems).
- healthy working river.* In the case of The Living Murray, a healthy working river is one that is managed to provide a compromise, agreed to by the community, between the condition of the river and the level of human use.
- holocene.* Geological time spanning the last 10 000 years.
- hydraulic.* Refers to river surface profiles, including cross section, length and depth.

hydraulic modelling. Numerical modelling to simulate the hydraulics of a river and predict water surface profiles based on cross-sections, a long profile and a roughness coefficient (simple model) or simulating three dimensional-flow complexities.

hydrograph. A chart that measures the amount of water flowing past a point as a function of time.

hydrological. Refers to the study associated with water and the hydrological cycle—the way in which water circulates through the atmosphere and biosphere.

hypersaline. Characteristic of an aquatic environment where the water is much saltier than normal sea water.

hyporheic. A region of saturated sediments beneath and beside the active channel that contains some proportion of surface water.

in-channel benches. Bench-like formation of sediment formed in the river as a result of flow movement of sediment. Occurs where flow continually deposits sediment over time for a given location.

instream. Relating to the river channel.

JAMBA. The Japan Australia Migratory Bird Agreement, a treaty between Australia and Japan to preserve habitat for migratory birds that are known to migrate between the two nations.

lentic. Of standing (or still) water.

levees. An artificial or natural bank or length of raised ground, constructed along a swamp or river to confine flood water to the main channel.

litterfall. Leaves, branches or other material having fallen from vegetation.

littoral zone. The part of the shoreline that is submerged at high tide and exposed at low tide.

lock. Consists of a rectangular chamber of concrete with gates at each end to regulate flow and permit boats to move from one water level to another.

low-flow specialists. Flora and/or fauna that recruit and thrive in low flow conditions.

lottic. Moving water.

lunette. A wind-formed, half-moon shaped crescent, usually of sand or fine sediment.

macroinvertebrate. An invertebrate (animal without a backbone) that is larger than 1 mm.

macrophytes. Water plants that are not algae and which may either float or be attached to a substrate.

mAHD. Elevation in metres according to Australian Height Datum.

meander cut-off. A channel cut across the neck of a bend (often as a result of movement of a channel over time).

mg/L. Milligrams per litre.

micro-fauna. Any fauna not visible to the naked eye.

middens. A mound of domestic refuse containing shells and animal bones marking the site of an Indigenous settlement.

monitoring. Assessing the short- or long-term and localised change in environmental or river condition as a result of specific actions.

Murray-Darling Basin Commission. The executive arm of the Murray-Darling Basin Ministerial Council. Responsible for managing the River Murray and the Menindee Lakes system of the Lower Darling River and advising Ministerial Council on matters related to the use of water, land and other environmental resources of the Murray-Darling Basin.

ML/d. Megalitres per day.

nutrient recycling. The process of nutrients being passed between biosphere and atmosphere.

off-takes. Flow of water that is separated from a main body by a channel or diversion structure.

open water. A wide expanse of water such as the sea, lake or lagoon.

oxbow. An abandoned meander in a river or stream, caused by cut-off. Used to describe the U-shaped bend in the river or the land within such a bend of a river.

peak discharge. Maximum flow.

permanent wetlands. Wetlands that are permanently inundated, as opposed to semi-permanent wetlands, which are inundated periodically and may have long periods of no water inundation.

phragmites. A common reed found on the edges of creeks and rivers, especially near coast.

phytoplankton. Plant plankton.

piezometer. An instrument used for monitoring.

point bars. The convex side of a meander bend that is built up due to sediment deposition.

pond. A body of water smaller than a lake, often artificially formed.

prograding. A formation or geological complex that forms by the deposition of mud and sand at the mouth of a river system during relatively low sea level.

propagules. Any part of an organism, produced sexually or asexually, that is capable of giving rise to a new individual.

protozoans. A single-celled organism.

quaternary. A geological name given to the period of time that covers the last 2 million years.

rain rejection. Occurs when water ordered from a dam by an irrigator is not then taken from the river, or is returned to the river because of rain in the meantime.

Ramsar Convention. see Convention on Wetlands.

reach. Refers to a section of a main channel, usually defined between channel bends.

recharge. Water that infiltrates through the soil surface to the watertable.

recruitment. Increment to a natural population, usually from young animals or plants entering the adult population.

regulated. A river or creek where water is released from storage to meet diversion requirements downstream, or to reduce flooding.

regulators. Structural works that control flow.

re-snagging. Refers to the process of placing woody debris back into channels to improve aquatic fauna habitat.

riffle. A reach of stream that is characterised by shallow, fast-moving water broken by the presence of rocks and boulders.

riparian. Referring to or relating to areas adjacent to water or influenced by water associated with streams or rivers on geological surfaces.

riverine. Relating to, formed by, or resembling a river including tributaries, streams, brooks, etc.

run-off. Water that runs off the soil's surface. It is largely determined by rain intensity and duration, slope, surface cover and soil infiltration rate. Run-off is rainfall that does not infiltrate or evaporate.

salinity. The concentration of mineral salts dissolved in water. Salinity may be measured by weight (total dissolved solids), electrical conductivity, or osmotic pressure. Where seawater is known to be the major source of the salt, salinity is often used to refer to the concentration of chlorides in the water.

salinity gradients. Changes in salt concentration.

salt interception scheme. Involves large-scale groundwater pumping and drainage projects that intercept saline water flows and dispose of them by evaporation.

samphire. A leafless shrub that is tolerant of saline conditions. Part of the *chenopodiaceae* family.

- scarp*. A long steep slope or cliff at the edge of a plateau or ridge; usually formed by erosion.
- sedge*. A plant from the family *Cyperaceae*. Trees and shrubs usually absent. Most plants typically grow to less than 1 metre.
- seed bank*. Ground or soil where multiple seeds from plant species are stored until germination.
- senesced*. Includes vegetation whose leaves have lost most of their nutrients and are dropping from the trees.
- sheet flooding*. Run-off or artificially induced run-off that flows over the ground surface as a thin, even layer not concentrated in a channel.
- significant ecological asset (SEA)*. Relating to the six significant ecological assets: Barmah–Millewa Forest, Gunbower and Koondrook–Perricoota forests, Hattah Lakes, Chowilla Floodplain, Murray Mouth and Corrong and Lower Lakes and the River Murray Channel.
- sills*. Refers to the upper level of a levee, dam or regulator, above which flow spills into or out of the structure.
- saltation*. The leaping movement of sand or soil particles as they are transported in a fluid medium over an uneven surface.
- snag*. Fallen trees and dead branches in the river channel.
- spring flood*. A flood that occurs in spring months, in the southern hemisphere corresponding to the months of September, October and November.
- surcharging*. In this case, refers to the filling of groundwater, surface water or a structural feature such as a dam.
- swales*. Small depressions, natural or artificial, that carry water only after a rainfall.
- taxa*. In biology, a term used to denote any group or rank in the classification of organisms, eg class, order, family.
- terrace*. An abandoned floodplain that is located at a higher elevation than the current active floodplain.
- tertiary treatment*. The treatment of wastewater beyond the secondary or biological stage. Term normally implies the removal of nutrients, such as phosphorus and nitrogen, and of a high percentage of suspended solids. The liquid portion of wastewater leaving tertiary treatment.
- thalweg*. (1) The lowest thread along the axial part of a valley or stream channel. (2) A subsurface, groundwater stream percolating beneath and in the general direction of a surface stream course or valley. (3) The middle, chief, or deepest part of a navigable channel or waterway.

tidal prism. The volume of water stored in an estuary or tidal lake between the high and low tide levels; the volume of water that moves into and out of the estuary over a tidal cycle.

tilt block. A formation where two geological features tilt or dip around each other to form a depression.

tonnes/d. Tonnes per day.

top of bank. The break in slope between the bank and the surrounding terrain.

topography. Surface height, in this case refers to land surface height or relief.

translucent flood. Flow that is allowed to spill over a dam wall, not necessarily as a result of exceeding the height of the dam.

Tributary. A stream that flows into another stream, river, or lake.

trigger event. Environmental conditions (which may be flow or non-flow) that initiate an event. A flow trigger is one where flow reaches a certain volume before additional water is released from a reservoir. A non-flow trigger is one where a health warning indicates water is required to maintain, or prevent from dying, an ecosystem, habitat, wetland or some other part of the river.

turbidity. A measure of the content of suspended matter that interferes with the passage of light through the water or in which visual depth is restricted. Suspended sediments are only one component of turbidity.

understorey. Ground cover and below ground biomass (roots, bulbs and the seed bank).

waders. Refers to long-legged wetland bird species that forage for food in swamps and creeks.

water regime. Refers to flow pattern and timing of flows.

water table. The surface of a groundwater body.

wetland specialists. Refers to flora or fauna who forage for food, recruit or carry out their life cycle within wetland habitats.

weir. A structure to control water levels in a stream. Depending upon the configuration, weirs can provide a specific 'rating' for discharge as a function of the upstream water level.

weir pools. The water that is held back by the presence of a weir, forming a still body of water.

zooplankton. Floating microscopic animals.