



Water facts 1

Water words

These Water Facts sheets and other literature on water issues contain a variety of geographic and water resource terms. This sheet explains commonly-used terms to help the reader.

Acid(ic)

See pH.

Aerobic

Organisms living or active only in the presence of free oxygen.

Algae

A diverse group of aquatic plants containing chlorophyll and other photosynthetic pigments. Many are microscopic (often being single cells) but some can be large, including the large seaweeds. They grow as single cells or aggregations of cells (colonies) (see Phytoplankton and Macroalgae).

Algal bloom

The rapid excessive growth of algae, generally caused by high nutrient levels and favourable conditions. Can result in deoxygenation of the water mass when the algae die, leading to the death of aquatic flora and fauna.

Alkaline

See pH.

Alluvial

Transported by water flow processes e.g. alluvial plain.

Alluvium

Ecologically recent sediment deposited by flowing water.

Anaerobic

Anoxic; lacking oxygen. Anaerobic organisms can or must live without oxygen.

Angiosperms

Flowering plants.

Anoxia

Deficiency of oxygen in the water.

Aquaculture

Farming of fresh or saltwater fish, molluscs, crustaceans or plants, usually for commercial purposes.

Aquatic

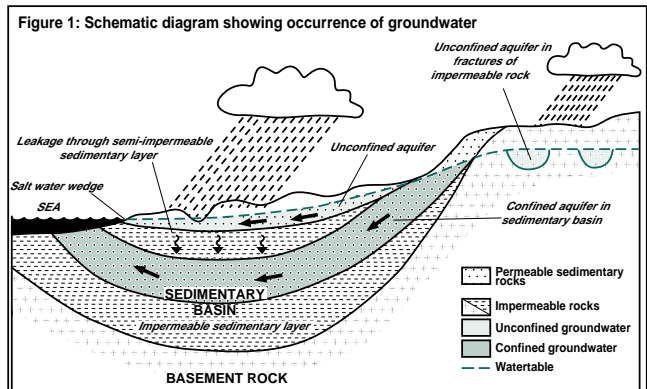
Living in, growing in, or frequenting water.

Aquifer

A geological formation or group of formations capable of receiving, storing and transmitting significant quantities of water (see Fig. 1).

Artesian aquifer

A form of confined aquifer in which the pressure in the aquifer is sufficient to cause the well to flow at the surface.



Beneficial use

The current or future uses for a water resource which have priority over other potential uses because of their regional significance to the community. Beneficial use designations provide guidance in determining the management and protection of the quality and quantity of the resource.

Benthic organisms (benthos)

Sedentary organisms (plants and animals) that dwell on the sediment at the bottom of a water body.

Billabong

An Australian term for pools associated with a river which become isolated from the main channel when the river ceases to flow.



Biological control

Control of pests using biological means such as natural enemies.

Biomass

The amount (weight) of living material (plants or animals) (see Biota).

Biological pollution

Pollution by micro-organisms e.g. bacteria and viruses (see Pollution).

Biota

Flora and fauna in a given region.

Blue greens

Blue greens or Cyanobacteria are an ancient group of photosynthetic bacteria without a nucleus which produce their own energy from sunlight. Some can assimilate dissolved gaseous nitrogen. A number of species produce toxins. Cells can also cause irritation of the skin and eyes on contact.

Bore

A narrow, lined hole drilled to monitor or withdraw groundwater (see Well).

Borefield

A group of bores to monitor or withdraw groundwater.

Brackish water

See Salinity.

Brine

Water containing high quantities of sodium chloride.

Catchment

The area of land which intercepts rainfall and contributes the collected water to surface water (streams, rivers, wetlands) or groundwater.

Conservation

The management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations.

Confined aquifer

An aquifer saturated with water under pressure and situated between relatively impervious layers (see Fig. 1) (see Artesian aquifer).

Confluence

Running together, flowing together or intermingling e.g. where a tributary joins a river.

Dam

A structure constructed across a drainage system to store surface water flow for water supply use or release in a controlled manner for downstream use. A dam can be constructed across a river valley or at the side of a valley to store water pumped into it from “run of river” flow. Dams also store water for farm use. (See Fig. 4).

Deoxygenation

Depletion of oxygen.

Desalination

The process of removing salts from water to produce fresher water (see Salinity).

Destratification

Breaking down stratification or layering in a water mass.

Detritus

Organic material, including animal waste products and the remains of animals, plants and micro-organisms, together with the associated microbial community (bacteria and fungi).

Diatoms

Single-celled algae found in most waters. Each cell is surrounded by two overlapping silica cases which show characteristic patterns. Diatoms are the primary producers in many food chains.

Diffuse source pollution

Pollution originating from a widespread area e.g. urban stormwater runoff, agricultural runoff. The opposite of point source.

Dinoflagellates

A unicellular microscopic plant characterised by two flagella. They are divided into two groups; ‘naked’ with a thin cell wall and “armoured’ with a theca made of thick plates. Some species are toxic.

Discharge

Volumetric outflow rate of water, typically measured in cubic metres per second.

Discharge area

Area where groundwater discharges to the surface.

Dissolved oxygen (DO)

The concentration of oxygen dissolved in water or effluent, measured in milligrams per litre (mg/L).



Divertible (renewable) water

The average annual volume of water which, using current practice, could be removed from developed or potential surface or groundwater sources on a renewable (sustainable) basis at rates capable of serving urban, irrigation, industrial or extensive stock uses.

Drainage basin

An area delimited by the Australian Water Resources Council as a basis for presenting surface hydrological data (see Catchment).

Ecology

The study of the interrelationships between living organisms and their environment.

Ecosystem

A term used to describe a specific environment, e.g. lake, to include all the biological, chemical and physical resources and the interrelationships and dependencies that occur between those resources.

Effluent

The liquid, solid or gaseous wastes discharged by a process, treated or untreated (see Wastewater).

Entrance bar

Deposit of sand or silt across the entrance to an estuary.

Estuary

An enclosed or semi-enclosed coastal body of water having an open or intermittently open connection to marine waters and fresh input from land runoff which measurably reduces salinity. Water levels vary in response to ocean tides and river flows.

Eutrophication

A natural process of accumulation of nutrients leading to increased aquatic plant growth in lakes, rivers, harbours and estuaries. Human activities contributing fertilisers and other high nutrient wastes can speed up the process, leading to algal blooms and deterioration in water quality. (See Nutrient enrichment, Algal bloom and Trophic status).

Evaporation

Loss of water from the water surface or from the soil surface by vaporisation.

Evapotranspiration

The combined loss of water by evaporation and transpiration.

Fauna

Animal life of a particular area or period of time.

Floodplain

The portion of a river valley next to the river channel which is or has been periodically covered with water during flooding (see Fig. 2).

Floodprone land

All land subject to flooding including the floodway, flood fringe and flood plain.

Flood - 100 year

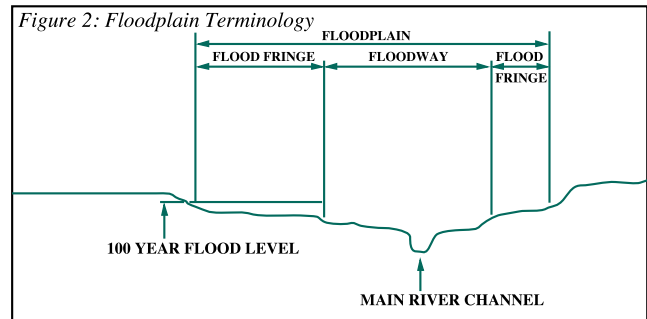
Refers to a severe flood which has a statistical probability of occurring once in 100 years. The 100 year flood level is generally defined as a contour through the floodplain to which this flood will rise. The flood has a 1% chance of occurring in any given year; on average it will occur once in every 100 years (see Fig. 2).

Flood fringe

The area of the floodplain, outside the floodway, which is affected by flooding. This area is generally covered by still or very slow moving waters during the 100 year flood (see Fig. 2).

Floodway

The river channel and portion of the floodplain which forms the main flow path of flood waters once the main channel has overflowed (see Fig. 2).



Flora

Plant life.

Flushing time

The time in days that it takes for the water in a semi-enclosed water body to be renewed.

Foreshore

Area of land next to a waterway.

Fresh water

See Salinity.

Geomorphology

The study of the origin, characteristics and development of landforms.



Gigalitre

1000 000 000 litres or 1 million cubic metres or 1 million kilolitres (kL).

Grey water

Water which has been used for domestic purposes not including sewage.

Groundwater

Water which occupies the pores and crevices of rock or soil (see Surface water) (see Fig. 1).

Groundwater mound

Unconfined (shallow) groundwater sometimes forms “mounds” where the watertable slopes away from a high central area with groundwater flowing outward to ocean or rivers. The Gngara Mound is 70 metres above sea level at its highest point.

Groundwater and surface water management areas

Groundwater Area

An area proclaimed under the Rights in Water and Irrigation Act 1911 in which private groundwater abstraction is licensed.

Water Reserve

An area proclaimed under the Metropolitan Water Supply Sewerage and Drainage Act or Country Areas Water Supply Act to allow the protection and use of water on or under the land for public water supplies.

Underground Water Pollution Control Area

(UWPCA) An area defined under the Metropolitan Water Supply Sewerage and Drainage Act, in which restrictions are put on activities which may pollute the groundwater.

Public Water Supply Area

(PWSA) As for UWPCA but allowing the taking of groundwater for public supplies.

Habitat

The environment or place where a plant or animal grows or lives (includes soil, climate, other organisms and communities).

Headwaters

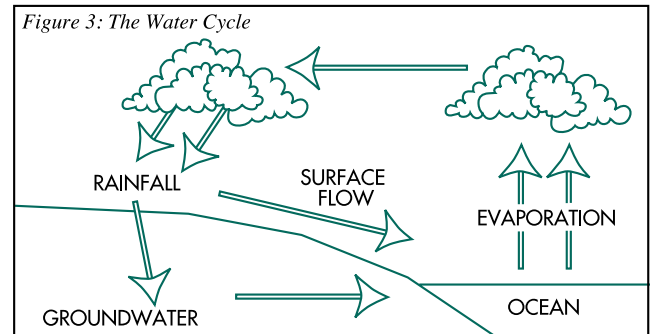
The upper tributaries of a river.

Hydrogeology

The study of groundwater, especially relating to the distribution of aquifers, groundwater flow and groundwater quality.

Hydrologic cycle (water cycle)

The continual cycle of water between the land, the ocean and the atmosphere.



Hydrology

The study of water, its properties, distribution and utilisation above, on and below the earth's surface.

Hypersaline

Having a salinity greater than seawater (i.e. above 35 parts per thousand) (see Salinity).

Integrated catchment management (ICM)

The coordinated planning, use and management of water, land, vegetation and other natural resources on a river or groundwater catchment basis. ICM is based on cooperation between community groups and government agencies at all levels to consider all aspects of catchment management.

Intertidal

Areas of land covered by water at high tide and exposed at low tide.

Kilolitre (kL)

1000 litres. A cubic metre is the volume occupied by a cube measuring one metre along each edge. One cubic metre contains one kilolitre of water.

Landscape

The visual appearance of natural and manmade environments.

Leaching/Leachate

The process by which materials such as organic matter and mineral salts are washed out of a layer of soil or dumped material by being dissolved by or suspended in percolating rainwater; the material washed out is known as leachate. Leachates can pollute groundwater and waterways.

Lentic

Standing water bodies e.g. lakes.



Levee

An artificial embankment or wall built to exclude flood waters, or a natural formation next to a waterway built by the deposition of silt from floodwaters.

Litre (L)

Unit of volume equal to one cubic decimetre.

Lotic

Flowing waters e.g. streams.

Macroalgae

Algae which can be seen by the unaided human eye in contrast to microscopic algae which must be studied under the microscope. Include large green, red and brown algae often up to many metres long and referred to as seaweed.

Macrophytes (aquatic)

Rooted aquatic plants e.g. eelgrass.

Macroinvertebrates

Invertebrates are animals without a backbone.

Macroinvertebrates are big enough to be seen with the unaided human eye though they can be very small. For aquatic invertebrates they are termed macroinvertebrates if they are retained on a 0.25mm mesh net. The main groups are worms, snails, crustaceans (e.g. prawns) and insects.

Micro organism

An organism so small as to be invisible to the naked eye.

Minor local water sources

Miscellaneous sources of water generally too small or too distributed for major water supply development, or artificially developed sources the use of which would not significantly diminish the volume of divertible resources. Surface sources would include roof runoff, farm dams, roaded and paved catchments. Any other source not classed as divertible (e.g. desalted sea water) would be included in this category.

Millilitre (mL)

Unit of volume; one thousandth of a litre.

Nutrients

Minerals dissolved in water, particularly inorganic compounds of nitrogen (nitrate and ammonia) and phosphorus (phosphate) which provide nutrition (food) for plant growth. Total nutrient levels include the inorganic forms of an element plus any bound in organic molecules.

Nutrient enrichment

Over-enrichment of water by dissolved nutrients particularly nitrates and phosphates which leads to excessive growth of aquatic plants (see Algal bloom and Eutrophication).

Nutrient load

The amount of nutrient reaching the waterway over a given time (usually per year) from its catchment area.

Pesticides

Collective name for a variety of insecticides, fungicides, herbicides, algicides, fumigants and rodenticides used to kill organisms.

pH

A symbol denoting the concentration of hydrogen (H) ions in solution. A measure of acidity or alkalinity in water in which pH 7 is neutral, values above 7 are alkaline and values below 7 are acid.

Photic zone

The layer of a water body that permits photosynthesis to occur.

Photosynthesis

Conversion of carbon dioxide and water to carbohydrates using light energy.

Phytoplankton

Microscopic (up to 1-2mm in diameter) free-floating or weakly mobile aquatic plants e.g. diatoms, dinoflagellates, chlorophytes, blue greens.

Pipehead dam

A small structure allowing diversion of some of the water flowing in a stream into a pipe for water supply use. Does not provide any storage capacity, relying on "run of the river" flows (see Fig. 4).

Plankton

Small organisms which move or drift in the water. The plants are called Phytoplankton, the animals Zooplankton.

Point source pollution

Specific localised source of pollution e.g. sewage or effluent discharge, industrial waste discharge.

Pollution

Water pollution occurs when waste products or other substances, e.g. effluent, litter, refuse, sewage or contaminated runoff, change the physical, chemical, biological or thermal properties of the water, adversely affecting water quality, living species and beneficial uses. (National Water Quality Management Strategy).



Potable water

Fresh and marginal water generally considered suitable for human consumption (see Salinity).

Preservation

Keeping in existence unchanged, natural resources, structures or situations which have been inherited from the past.

Pumpback

A scheme in which water is diverted by means of a dam or pipehead dam and “pumped back” into a reservoir located further upstream. This allows the storage reservoir to obtain water from a greater catchment area than it would normally utilise, and hence increase its yield (see Fig. 4).

Receiving water

Waters into which effluent or waste streams are discharged.

Recharge

Water infiltrating to replenish an aquifer.

Recharge area (recharge zone)

An area through which water from a groundwater catchment percolates to replenish (recharge) an aquifer (see Catchment). An unconfined aquifer is recharged by rainfall throughout its distribution. Confined aquifers are recharged in specific areas where water leaks from overlying aquifers, or where the aquifer rises to meet the surface. Recharge of confined artesian aquifers is often at some distance ‘upflow’ from points of extraction and discharge.

Remnant vegetation

The parts of the natural vegetation still existing after major change to the environment.

Reservoir

(see Storage reservoir).

Reticulated supply

(see Scheme supply).

Riparian vegetation

Vegetation growing along banks of rivers, including the brackish upstream reaches of an estuary.

Riparian zone

The zone along or surrounding a water body where the vegetation and natural ecosystems benefit from and are influenced by the passage and storage of water.

River basin

The area drained by a river and tributaries (river catchment) (see Catchment).

Runoff

Water that flows over the surface from a catchment area, including streams.

Salinity

The measure of total soluble (or dissolved) salt i.e. mineral constituents in water. Water resources are classified on the basis of salinity in terms of Total Soluble Salts (TSS) or Total Dissolved Salts (TDS). TSS and TDS are measured by different processes, but for most purposes they can be read as the same thing. Measurements are usually in milligrams per litre (mg/L) or parts per thousand (ppt). Measurements in ppt can be converted to mg/L by multiplying by 1000, e.g. seawater is approximately 35ppt or 35 000 mg/L TSS. Salinity is also often expressed as electrical conductivity, measured by an electronic probe (conductivity meter). Conversion factors to mg/L or ppt are given in reference 3.

Water resources are classified as fresh, marginal, brackish or saline on the basis of salinity.

	Water supply ⁽¹⁾ mg/L TDS	Environmental ⁽³⁾ mg/L TDS	Plant zones in a wetland ⁽⁴⁾ mg/L TDS
Fresh	< 500 good quality ⁽²⁾	< 500	< 3000 all year
Marginal	500 - 1500 500 - 1000 acceptable drinking based on taste ⁽²⁾ >1000 may have excessive scaling, corrosion, unsatisfactory taste ⁽²⁾	500 - 1500	
Brackish	1500 - 5000	1500 -5000	<10 000 all year < 3000 after inflow
Saline	>5000	> 5000	< 50 000 all year < 10 000 after inflow

1. Based on WA Water Resources Council classification.

2. Based on National Health and Medical Research Council and Agricultural and Resource Management Council of Australia and New Zealand (1996) National Water Quality Management Strategy. Australian Drinking Water Guidelines.

3. George, R, Weaver, D, & Terry, J (1996) Environmental water quality - a guide to sampling and measurement. Agriculture Western Australia.

4. Halse, SA, Pearson, GB, & Patrick, S, (1993) Vegetation of depth-gauged wetlands in nature reserves of south-west Western Australia. Department of Conservation and Land Management Technical Report No. 30.

Salinisation

An increase in salinity levels in soils or waters which impairs quality.

Salt wedge (Saltwater wedge)

The wedge shaped body of saltier water that underlies fresher water in poorly mixed estuaries, or underlies fresher groundwater in coastal or estuary situations where the fresher groundwater is discharging to the ocean or estuary over and through a fresh/salt water interface.



Saltwater intrusion

The inland or upgradient intrusion of saltwater into a layer of fresh groundwater.

Scheme supply

Water diverted from a source (or sources) by a water authority or private company and supplied via a distribution network to customers for urban, industrial or irrigation use.

Scum

Froth or floating matter on a liquid.

Seagrasses

Marine flowering plants (angiosperms) found in coastal rivers, estuaries and protected coastal embayments which are important to ecological functioning as they provide habitat for many organisms, stability to the bed of the water body and, in a decomposed form, a major food source for a variety of organisms.

Secchi disc

A black and white disc used to measure the turbidity of a water.

Sediment

Sand, clay, silt, pebbles and organic material carried and deposited by water or wind. Sedimentation is the process by which sediment is deposited e.g. in waterways.

Sediment load

The quantity of sediment moved past a particular cross-section in a specified time. Usually refers to the amount of sediment being transported by a stream or river.

Self supply

Water diverted from a source by a private individual, company or public body for their own individual requirements.

Service reservoir

A reservoir built near consumers to receive bulk supplies of water from major sources before final distribution to services.

Sewage

The waste matter that passes through sewers (see Wastewater, Effluent).

Sewerage

System of pipes (sewers) to transport sewage.

Siltation

Process whereby fine particles of sand, mud and other material picked up by moving water are deposited to form sediment.

Storage reservoir

A major reservoir of water created in a river valley by building a dam (see Dam) (see Fig. 4).

Stormwater

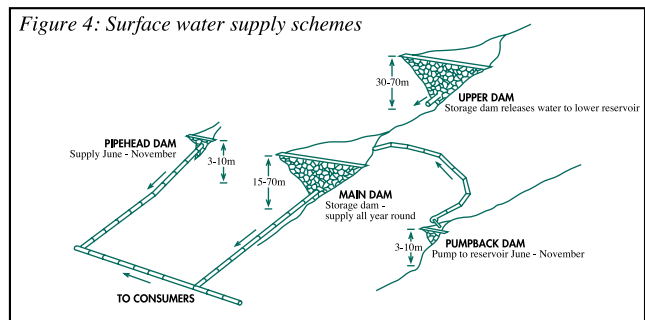
Rainwater which has run off the ground surface, roads, roofs, paved areas etc. and is usually carried away by drains.

Stratification

Formation of layers in a body of water.

Surface water

Water flowing or held in streams, rivers and other wetlands in the landscape.



Sustainable yield

The limit on potentially divertible water available from a source is determined after taking account of “in stream” values and making provision for environmental water needs, so that water extraction does not cause lowering of the watertable, intrusion of more saline water or environmental damage.

System yield

The demand that the water supply system can sustain with specified level of reliability or probability of restrictions. The rate that water can be taken from a surface or groundwater resource in perpetuity without unacceptable effects.

Thermocline

Formation of a layer of water where different temperature conditions prevail.

Transpiration

The process by which plants take up water from the soil and release water vapour through the leaves.

Treatment

Application of techniques such as settlement, filtration and chlorination, to render water suitable for specific purposes including drinking and discharge to the environment.



Tributary

A stream, creek or small river which flows into a larger stream, river or lake.

Trophic status

Trophic comes from the Greek word for feeding. There are generally three classes distinguished for estuaries and wetlands:

1. eutrophic (well fed) means nutrient-rich and is usually associated with low oxygen levels;
2. mesotrophic (medium);
3. oligotrophic (little-fed), nutrient-poor with high oxygen levels.

The trophic status for any wetland is a condition determined by the surrounding catchment, landform and geology, and land uses.

Turbidity

Muddiness or opaqueness of water due to suspended particles in the water causing a reduction in the transmission of light.

Unconfined aquifer

An aquifer containing water, the upper surface of which is lower than the top of the aquifer. The upper surface of the groundwater within the aquifer is called the watertable. An aquifer containing water with no upper non-porous material to limit its volume or to exert pressure (see Aquifer) (see Fig. 1).

Wastewater

Water which has been used for some purpose and would normally be treated and discarded. Wastewater usually contains significant quantities of pollutant (see Effluent and Pollution).

Water cycle

(See Hydrologic cycle)

Water quality

The physical, chemical and biological measures of water.

Water resources

Water in the landscape (above and below ground) with current or potential value to the community and the environment.

Watercourse

A river, stream or creek in which water flows in a natural channel, whether permanently or intermittently.

Watertable

The saturated level of the unconfined groundwater. Swamps or lakes in low-lying areas may be surface expressions of the watertable (see Fig. 1).

Waterways

All streams, creeks, rivers, estuaries, coastal lagoons, inlets and harbours.

Waterways environment

The waters and foreshores of a waterway and its natural components, both physical and biological, its ecological processes and its cultural components such as scenic, recreational and historic values.

Weir

A low structure across a watercourse retaining only a small proportion of the mean annual flow.

Well

A hole dug or drilled into an aquifer to monitor or withdraw groundwater. The term includes drilled bores as a specific type of well (see Bores). Household wells are commonly termed bores.

Wellfield

A group of wells to monitor or withdraw groundwater, including for scheme supply.

Wetland

Area of seasonal, intermittent or permanent waterlogged soils or inundated land, whether natural or otherwise, fresh or saline, e.g. lake, swamp, dampland.

Yield

The volume of water discharged from a well or water supply system measured in cubic metres per day, gigalitres per year, or equivalent.

Yield benefit

The increase in system yield which occurs when a new source is added to the water supply system.

Zooplankton

The animal component of plankton. Small animals which are weakly motile or carried passively in a body of water.

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