



GLOSSARY OF TERMS

For Floodplain Risk Management

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A	
Acid sulphate soil	Are sediments which contain sulfidic mineral pyrite which may become extremely acid following disturbance or drainage as the sulphur compounds react when exposed to oxygen to form sulphuric acid.
Annual Exceedance Probability - AEP	The probability flood reaching or exceeding a particular magnitude in any one year. (see also ARI)
Average Recurrence Interval - ARI	The result of statistical data which estimates the probability that a particular rainfall event (or intensity) will be equalled or exceeded at a particular place within a particular time period. It should be noted that this does not mean that a 1:100 year storm will only occur once every 100 years. (see also AEP)
Australian Height Datum - AHD	A common national surface level datum approximately corresponding to mean sea level.
Average Annual Damage - AAD	Depending on its size (or severity), each flood will cause a different amount of flood damage to a flood prone area. AAD is the average damage per year that would occur in a nominated development situation from flooding over a very long period of time.
Average Recurrence Interval - ARI	The long term average number of years between the occurrence of a flood as big as, or larger than, the 20 year ARI flood event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.

B	
Bathymetry	Description of the shape of the ocean bed (underwater contours etc.). The measurement of depths of water.
Bed load	That portion of the total sedimentary material subject to transportation by flowing water (e.g. currents) which is moved by rolling, pushing, and saltation.
Biodiversity	Refers to the variety of life on three different levels: genetic diversity; species diversity; and ecosystem diversity.
BoM	Bureau of Meteorology

Buffer Zone	An appropriately managed and un-alienated zone of unconsolidated land between high water mark development, within which tidal fluctuations and hazards can be accommodated in order to minimise damage to the development.
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C	
Catchment	The land area above a specific location draining through a main stream, tributary streams or constructed drainage system, such that all outflow is directed to a single point.
CEMC	Coastal and Estuary Management Committee
Check banks/dams	Flow spreaders constructed across a channel to decrease velocities and promote uniform flows over a wider length.
CMA	Catchment Management Authority
Coastal Process	The active forcing functions (waves, wind, currents etc) and their interaction with, and affects on, the coastal environment (sediments, beach and cliff erosion etc)
Coastal Waterway	A body of water situated on or near the ocean coast with some association with the ocean. Includes embayment, wave and tide-dominated estuaries, wave and tidedominated deltas, coastal lagoons, and tidal creeks.
Consent Authority	Council, government agency or person having the function to determine an application for land use under the EP&A Act 1979. The consent authority is most often the council, however legislation or an EPI may specify a Minister, public authority (other than a council), or the Director General of Department of Planning (DoP) as having the function to determine an application.
Corridor	Lines of native vegetation connecting separate habitat areas essential for maintaining biodiversity. Corridors enable fauna to access larger habitats by encouraging mobility between areas. Corridors may also assist native plant species to spread and colonise new areas over time.
COSS	Coastal Open Space System

D	
DECCW	Department of Environment, Climate Change & Water
Design Flood	The flood of specified magnitude that is adopted for planning purposes. The selection should be based on an understanding of flood behavior and associated flood risk, and take account of social, economic and environmental considerations. Also referred to as a flood standard. There may be several of these for an individual area.

Design flow	Calculated flow used to size engineering structures to a defined standard.
Detention	Detention devices capture and temporarily store stormwater runoff during major (infrequent) storm events. Stormwater is then discharged to the drainage system at a controlled rate to mitigate potential downstream flooding impacts.
Development	<p>Infill development: refers to the development of vacant blocks of land that are generally surrounded by developed properties.</p> <p>New development: refers to development of a completely different nature to that associated with the former land use. Eg, the urban subdivision of an area previously used for rural purposes. New development involves re-zoning and typically requires major extensions of existing urban services, such as roads, water supply, sewerage and electric power.</p> <p>Redevelopment: refers to rebuilding in an area. Eg, as urban areas age, it may be necessary to demolish and reconstruct buildings. Redevelopment does not require re-zoning or extension to urban services.</p>
Disaster plan - DISPLAN	A step by step sequence of previously agreed roles, responsibilities, functions, actions and management arrangements for the conduct of a single or series of connected emergency operations, with the object of ensuring the coordinated response by all agencies having responsibilities and functions in emergencies.
Discharge	The rate of flow of water measured in terms of volume per unit time, for example, cubic metres per second (m ³ /s). Discharge is different from the speed or velocity of flow, which is a measure of how fast the water is moving for example, metres per second (m/s).

E	
Ebb Tide	The outgoing tidal movement of water within an estuary.
Ecological Sustainable Development - ESD	Using, conserving and enhancing natural resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be maintained or increased. A more detailed definition is included in the Local Government Act, 1993.
Ecosystem	A community of living organisms, together with the environment in which they live and with which they interact.
EEC	Endangered Ecological Community

Effective warning time	Time available after receiving advice of an impending flood and before the floodwaters prevent appropriate flood response actions being undertaken. The effective warning time is typically used to move farm equipment, move stock, raise furniture, evacuate people and transport their possessions.
El Nino and La Nina - Southern Oscillation ENSO	The El Nino - Southern Oscillation (ENSO) is a global climatic phenomenon marked by see-saw shifts in air pressure between the Indo-Australian and eastern regions of the Tropical Pacific. El Nino and La Nina refer to extreme phases in a 2-7 yr cycle. During the warm 'El Nino' phase, the Australian seaboard cools and extended periods of drought are experienced in Aus. In the cool 'La Nina' phase, the seas around Australia warm, the SE trade winds intensify, and widespread rain and flooding occur in Australia.
Emergency management	A range of measures to manage risks to communities and the environment. In the flood context it may include measures to prevent, prepare for, respond to and recover from flooding.
EP&A Act	Environmental Planning & Assessment Act 1979
EPI	Environmental Planning Instrument such as LEP or SEPP
Estuary	The tidal portion of river mouths, bays and coastal lagoons within which sea water is measurably diluted with fresh water derived from land drainage.
F	
Flash flooding	Flooding which is sudden and unexpected and generally caused by sudden local or nearby heavy rainfall. Often defined as flooding which peaks within six hours of the causative rain.
Flood	Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defenses excluding tsunamis.
Flood awareness	An appreciation of the likely effects of flooding and knowledge of relevant flood warning, response and evacuation procedures.
Flood education	Flood education seeks to provide information to raise awareness of the flood problem so as to enable individuals to understand how to manage themselves and their property in response to flood warnings and in a flood event. It invokes a state of flood readiness.
Flood fringe areas	The remaining area of flood prone land after floodway and flood storage areas have been defined.

Flood liable land	Is synonymous with flood prone land (i.e.) land susceptible to flooding by the PMF event. Note that the term flood liable land covers the whole floodplain, not just that part below the FPL (see flood planning area).
Flood mitigation standard	ARI of the flood, selected as part of the floodplain risk management process that forms the basis for physical works to modify the impacts of flooding.
Floodplain	Area of land which subject to inundation by floods up to and including the PMF event, that is, flood prone land.
Flood Runner	A Watercourse that only flows during floods
Floodplain risk management options	Measures that may be feasible for the management of a particular area of the floodplain. Preparation of a FRMP requires a detailed evaluation of floodplain risk management options.
Floodplain Risk Management Plan - FRMP	A management plan developed in accordance with the principles and guidelines in the NSW Govt Floodplain Development Manual (April 2005). Usually includes both written and diagrammatic information describing how particular areas of flood prone land are to be used and managed to achieve defined objectives.
Flood plan (local)	A sub-plan of a DISPLAN that deals specifically with flooding. They can exist at state, division and local levels. Local flood plans are prepared under the leadership of the SES.
Flood planning area	The area of land below the FPL and thus subject to flood related development controls.
Flood planning level - FPL	Combinations of flood levels (derived from significant historical flood events or floods of specific AEPs) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans.
Flood proofing	A combination of measures incorporated in the design, construction and alteration of individual buildings or structures subject to flooding, to reduce or eliminate flood damages.
Flood prone land	Land susceptible to flooding by the PMF event. Flood prone land is synonymous with flood liable land.
Flood readiness	An ability to react within the effective warning time.
Flood risk	<p>Potential danger to personal safety and potential damage to property resulting from flooding. Degree of risk varies with circumstances across the full range of floods. Flood risk is divided into 3 types: existing, future and continuing.</p> <p>Existing flood risk: the risk a community is exposed to as a result of its location.</p> <p>Future flood risk: the risk a community may be exposed to as a result of new development.</p>

	<p>Continuing flood risk: the risk a community is exposed to after floodplain risk management measures have been implemented. E.g. for a town protected by levees, the continuing flood risk is the consequences of the levees being overtopped. For an area without any floodplain risk management measures, the continuing flood risk is simply the existence of its flood exposure.</p>
Flood storage areas	<p>Those parts of the floodplain that are important for temporary storage of floodwaters during the passage of a flood. The loss of flood storage can increase the severity of flood impacts by reducing natural flood attenuation. It is necessary to investigate a range of flood sizes before defining flood storage areas.</p>
Floodway areas	<p>Those areas of the floodplain where a significant discharge of water occurs during floods and often aligned with naturally defined channels. Floodways are areas that, even if only partially blocked, would cause a significant redistribution of flood flow or a significant increase in flood levels.</p>
Freeboard	<p>Provides reasonable certainty that the risk exposure is actually provided. It is a factor of safety typically used in relation to the setting of floor levels, levee crest levels, etc. Freeboard is included in the flood planning level.</p>

H

Habitable room	<p>In a residential situation: a living or working area, such as a lounge room, dining room, rumpus room, kitchen, bedroom, bathroom, laundry or workroom.</p> <p>In an industrial or commercial situation: an area used for offices or to store valuable possessions susceptible to flood damage in the event of a flood.</p>
Hazard	<p>Source of potential harm or situation with potential to cause loss. In relation to flooding, has potential to cause damage to the community. Hazard is generally defined as Low, Medium and High.</p>
Hard Engineering	<p>Engineered devices, typically using concrete, steel, bitumen etc to convey, treat or hold water and wastewater. Can be purpose designed and built in-situ, or be proprietary products purchased from commercial suppliers.</p>
Hydraulics	<p>Term given to the study of water flow in waterways; in particular, the elevation of flow parameters such as water level and velocity.</p>
Hydrograph	<p>A graph which shows how the discharge or stage/flood level at any particular location varies with the time during a flood.</p>

Hydrology	Term given to the study of the rainfall and runoff process; in particular, the elevation of peak flows, flow volumes and the derivation of hydrographs for a range of floods.
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I	
Intertidal	Pertaining to those areas of land covered by water at high tide but exposed at low tide.
IPCC	Intergovernmental Panel on Climate Change

L	
LIDAR	Light Detection And Ranging is an optical remote sensing technology that measures various properties of a target by illuminating the target with light, often using pulses from a laser. This technique is used to obtain more precise contour maps, location and height of buildings, etc
Littoral Zone	An area of coastline in which sediment movement by wave, current and wind action is prevalent.
Local drainage	Smaller scale problems in urban areas. They are outside the definition of major drainage in this glossary.
LGA	Local Government Area
Local overland flooding	Inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.

M	
Mainstream flooding	Inundation of normally dry land occurring when water overflows natural or artificial banks of a stream, river, estuary, lake or dam.
Major drainage	Councils have discretion in determining whether urban, drainage problems are associated with major or local drainage. For the purposes of this glossary, major drainage involves: <ol style="list-style-type: none"> 1. The floodplains of original watercourses (which may be piped, channelized or diverted), or sloping areas where overland flows develop along alternative paths once system capacity is exceeded; and/or 2. Water depths generally in excess of 0.3m (in the major system design storm as defined in the current version of Australian Rainfall and Runoff). These conditions may result in danger to personal safety and property damage to both premises and vehicles; and/or 3. Major overland flowpaths through developed areas outside of defined drainage reserves; and/or 4. The potential to affect a number of buildings along the major flow path.
MHL	Manly Hydraulics Laboratory

Mathematical / computer models	The mathematical representation of the physical processes involved in runoff generation and stream flow. These models are run on computers due to the complexity of the mathematical relationships between runoff, stream flow and the distribution of flows across the floodplain.
MHW	Mean High Water
MLW	Mean Low Water
MSL	Mean Sea Level
Merit approach	<p>Weighs social, economic, ecological and cultural impacts of land use options for different flood prone areas together with flood damage, hazard and behaviour implications, and environmental protection and well being of the State's rivers and floodplains. The merit approach operates at two levels.</p> <ul style="list-style-type: none"> ○ At the strategic level, it allows for the consideration of social, economic, ecological, cultural and flooding issues to determine strategies for the management of future flood risk which are formulated into council plans, policy, and EPIs. ○ At a site specific level, it involves consideration of the best way of conditioning development allowable under the FRMP, local flood risk management policy and EPIs.
Minor, moderate and major flooding	<p>Both the SES and the BoM use the following definitions in flood warnings to give a general indication of the types of expected problems:</p> <p>Minor flooding: causes inconvenience such as closing of minor roads and the submergence of low level bridges. The lower limit of this class of flooding on the reference gauge is the initial flood level at which landholders and townspeople begin to be flooded.</p> <p>Moderate flooding: low-lying areas are inundated requiring removal of stock and/or evacuation of some houses. Main traffic routes may be covered.</p> <p>Major flooding: appreciable urban areas are flooded and/or extensive rural areas are flooded. Properties, villages and towns can be isolated.</p>
Mitigation measures	Measures that modify the flood, the property or the response to flooding. Examples may include voluntary purchase, house raising, flood warning system, evacuation plans, retarding basins, etc

P	
Peak discharge	The maximum discharge occurring during a flood event.
PoEO Act	NSW Protection of Environment Operations Act 1997



<p>Probable Maximum Flood - PMF</p>	<p>The largest flood that could conceivably occur at a particular location, usually estimated from PMP and, where applicable, snow melt coupled with the worst flood producing catchment conditions. Generally, it is not physically or economically possible to provide complete protection against this event. However, the PMF defines the extent of flood prone land or the floodplain. The extent, nature and potential consequences of flooding associated with a range of events rarer than the flood used for designing mitigation works and controlling development, up to and including the PMF event should be addressed in a floodplain risk management study.</p>
<p>Probable Maximum Precipitation - PMP</p>	<p>The PMP is the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of the year, with no allowance made for long-term climatic trends (World Meteorological Organisation, 1986).</p>
<p>Probability</p>	<p>A statistical measure of the expected chance of flooding.</p>

<p>R</p>	
<p>Retention</p>	<p>Procedures and schemes (such as rainwater tanks) whereby stormwater is held on-site for considerable periods causing water to continue in the water cycle rather than via direct discharge to a drainage system.</p>
<p>Riparian Zone</p>	<p>The vegetated corridor along streams and rivers. It serves a number of important functions including:</p> <ul style="list-style-type: none"> ○ acts as a trap for sediments and nutrients heading from hill-slopes to streams, improving stream water quality; ○ shades streams, lowering water temperature and altering food sources by preventing the growth of algae. This special environment is home to specifically adapted animals, which are lost following vegetation clearance; ○ protects stream banks from collapse thus reducing streambank erosion and allowing for a diversity of bank habitats to form; ○ provides food for terrestrial animals, especially in arid areas, and aquatic animals, particularly in small streams; ○ provides habitat for birds, mammals and reptiles that live along the river; and ○ hosts a number of interesting plants that have intrinsic value.

Risk	Chance of something happening that will have an impact and is measured in terms of consequences and likelihood. In the context of this glossary, it is the likelihood of consequences arising from the interaction of floods, communities and the environment.
Runoff	The amount of rainfall which actually ends up as stream flow.

S	
Saltmarsh	A community of plants and animals that grow along the upper-intertidal zone of coastal waterways.
Seagrass	Seagrass is an aquatic flowering plant that forms 'meadows' in near-shore brackish or marine waters, in temperate and tropical regions. Australia has approximately 51,000 km ² of seagrass meadows, comprising the most diverse array of seagrass species in the world. Coastal seagrasses are particularly diverse, and can be found in subtidal and intertidal environments. Seagrass meadows are very productive, support complex food webs and are valued as a habitat and refuge for a number of organisms. Changes in seagrass areas indicate major changes in environmental characteristics, and are an important indicator for State of the Environment reporting.
Shoal	Shallow area in an estuary created by the deposition and build-up of sediments.
Shoaling	The influence of the seabed on wave behaviour. Such effects only become significant in water depths of 60m or less. Manifested as a reduction in wave speed, shortening in wavelength and an increase in wave height.
Stage	Equivalent to "water level". Both are measured with reference to a specified datum.
Stage Hydrograph	A graph that shows how the water level at a particular location changes with time during a flood. It must be referenced to a particular datum.
Storm Surge	Storm surge consists of two components: the increase in water level caused by the reduction in barometric pressure (barometric setup); and the increase in water level caused by the action of wind blowing over the sea surface (wind setup).
Stormwater	All surface water runoff from rainfall, predominantly in urban catchments. With regard to Stormwater Harvesting & Retention Systems, stormwater includes all rainwater except that which falls upon roofs.
Surging Waves	The wave does not "break" but maintains its basic shape as it moves towards the shore where it surges up the beach. Very little white water is evident before surging waves reach the shore.

Survey Plan	A plan prepared by a registered surveyor
Swell	Wind generated waves that have travelled out of their generating area. Swell characteristically exhibits a more regular shape and longer period than the sea.

T	
Turbidity	A measure of the ability of water to absorb light

W	
Water Surface Profile	A graph showing the flood stage at any given location along a watercourse at a particular time.
Wave Height	The vertical distance between a wave trough and the following wave crest.
Wave Period	The time taken for consecutive wave crests or wave troughs to pass a fixed point.
Wavelength	The distance between consecutive wave crests or wave troughs.
Wetlands	Wetlands are areas of marsh, fen, peatland or water. They may be natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt. They may also include areas of marine water the depth of which at low tide does not exceed six metres and may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands.
Wind Sheer	Stress exerted on water surface by wind blowing over the water. Wind sheer causes the water to pile up against downwind shores and generates secondary currents.
Wind Waves	The waves initially formed by the action of wind blowing over the sea surface. Wind waves are characterised by a range of heights, periods and wavelengths. As they leave the area of generation (fetch), wind waves develop a more ordered and uniform appearance and are referred to as swell or swell waves.
WSUD	Water Sensitive Urban Design