

## GLOSSARY

(Source: NSW Government Coastline Management Manual 1990, NSW Government Estuary Management Manual 1992)

<b>Accreted Profile</b>	The profile (cross-section) of a sandy beach that develops in the “calm” periods between major storm events. During such periods, swell waves move sediment from the offshore bar beach onto the beach to rebuild the beach berm.
<b>Advective Transport</b>	The transport of dissolved material by water movement.
<b>AEP</b>	Annual Exceedance Probability
<b>Aerobic Bacteria</b>	Bacteria that obtain metabolic energy by aerobic (oxygen requiring) respiration.
<b>AHD</b>	Australian Height Datum
<b>Algae</b>	Non-rooted aquatic plants, specifically non-vascular photosynthetic organisms with unicellular reproductive organs, including phytoplankton and seaweeds.
<b>Algal Bloom</b>	The excessive growth of phytoplankton, generally caused by high nutrient levels. Can result in deoxygenation of the water mass, leading to the death of aquatic flora and fauna.
<b>Amenity</b>	Those features of an estuary that foster its use for various purposes, eg clear water and sandy beaches make beach-side recreation attractive.
<b>Amphibian (In the context of the National Parks and Wildlife Act, 1974)</b>	"Any frog or other member of the class amphibia that is native to Australia, including the eggs and the young thereof".
<b>Amphipods</b>	Laterally compressed crustacea, e.g. sand hoppers.
<b>Anaerobic Bacteria</b>	Bacteria that obtain metabolic energy by a variety of non aerobic (not oxygen dependent) pathways, including the reduction of nitrates ('denitrification') and/or sulphates.
<b>ANC</b>	Acid Neutralising Capacity
<b>Animal</b>	Any animal, whether vertebrate or invertebrate, and at whatever stage of development, but does not include fish within the meaning of the Fisheries and Oyster Farms Act, 1935, other than amphibians or aquatic or amphibious mammals or aquatic or amphibious reptiles'.
<b>Annual Exceedance Probability</b>	The chance or likelihood that an event of a nominated size or greater (e.g. flood discharge) will occur in any year.
<b>ANOVA</b>	Analysis of Variance
<b>Anoxic Conditions</b>	Conditions typified by very low to zero dissolved oxygen concentrations.
<b>ANZECC</b>	Australian and New Zealand Environment and Conservation Council

<b>ARI</b>	Average Recurrence Interval
<b>Balanced Development</b>	The weighing of ecological, social and economic consequences in determining the nature, location and degree of estuarine development.
<b>Barometric Setup</b>	The increase in mean sea level caused by a drop in barometric pressure.
<b>Baseline Monitoring</b>	A monitoring program aimed at determining long-term and possibly pre-disturbance levels and variation in some parameter of interest, e.g. dissolved oxygen.
<b>Bathymetry</b>	The measurement of depths of water, also information derived from such measurements.
<b>BBQ</b>	Barbeque
<b>Beach Berm</b>	That area of shoreline lying between the swash zone and the dune system.
<b>Beach Erosion</b>	The offshore movement of sand from the sub-aerial beach during storms.
<b>Beach Nourishment</b>	The supply of sediment by mechanical means to supplement sand on an existing beach or to build up an eroded beach.
<b>Bed Load</b>	That portion of the total sediment load that flowing water moves along the bed by the rolling or saltating of sediment particles.
<b>Benthos, Benthic Organisms</b>	Organisms living in or on the bed of a waterbody.
<b>Biological Oxygen Demand (BOD)</b>	Oxygen required by aerobic bacteria in metabolising detritus.
<b>Biomass</b>	The mass of living material contained in a system of interest (includes both plant and animal matter).
<b>Biota</b>	Living organisms.
<b>Bird</b>	"Any bird that is native to, or is of a species that periodically or occasionally migrates to, Australia, and includes the eggs and the young thereof and the skin, feathers or any other part thereof".
<b>Blowout</b>	The removal of sand from a dune by wind drift after protective dune vegetation has been lost. Unless repaired promptly, the area of blowout will increase in size and could lead to the development of a migrating sand dune and its associated problems.
<b>BOD</b>	Biological Oxygen Demand
<b>Breaking Waves</b>	As waves increase in height through the shoaling process, the crest of the wave tends to speed up relative to the rest of the wave. Waves break when the speed of the crest exceeds the speed of advance of wave as a whole. Waves can break in three modes: spilling, surging and plunging.
<b>Breakwater</b>	Structure protecting a shoreline, harbour, anchorage or basin from ocean waves.

<b>Buffer Zone</b>	An appropriately managed and unalienated zone of unconsolidated land between beach and development, within which coastline fluctuations and hazards can be accommodated in order to minimise damage to the development.
<b>CD</b>	Chart Datum
<b>Coastal Structures</b>	Those structures on the coastline designed to protect and rebuild the coastline and/or enhance coastal amenity and use.
<b>Coastline Hazards</b>	Detrimental impacts of coastal processes on the use, capability and amenity of the coastline. This manual identifies seven coastline hazards: <ul style="list-style-type: none"> <li>• Beach erosion</li> <li>• Shoreline recession</li> <li>• Entrance Instability</li> <li>• Sand drift</li> <li>• Coastal inundation</li> <li>• Slope and cliff instability</li> <li>• Stormwater erosion</li> </ul>
<b>Damage Potential</b>	The susceptibility of coastline development to damage by coastline hazards.
<b>Degradation</b>	A reduction in the area of estuarine habitat; or in the well-being, health and viability of estuarine ecosystems; or in estuarine amenity.
<b>Denitrification</b>	See anaerobic bacteria.
<b>Depauperate</b>	A condition which is generally poor or impoverished
<b>Detritus</b>	All non-living organic material, including animal waste products and the remains of animals, plants and micro-organisms/ together with the associated microbial community {bacteria and fungi}.
<b>Diatoms</b>	Single celled water plants.
<b>Diffraction</b>	The “spreading” of waves into the less of obstacles such as breakwaters by the transfer of wave energy along wave crests. Diffracted waves are lower in height than the incident waves.
<b>Diffuse Source Pollution</b>	Pollution originating from a widespread area, e.g. urban stormwater runoff, agricultural runoff.
<b>DIP</b>	Dissolved Inorganic Phosphorus
<b>Discharge</b>	Volumetric flow rate of water, typically measured in terms of cubic metres per second (m <sup>3</sup> /s).
<b>Dispersive Transport</b>	The transport of dissolved matter through the estuary by vertical, lateral and longitudinal mixing associated with velocity shear.
<b>Dissolved Oxygen</b>	Atmospheric oxygen that dissolves in water. The solubility of oxygen in water depends upon temperature and salinity.
<b>Diurnal</b>	A daily variation, as in day or night.
<b>DLWC</b>	Department of Land and Water Conservation

<b>DO</b>	Dissolved Oxygen
<b>DON</b>	Dissolved Organic Nitrogen
<b>DPWS</b>	Department of Public Works and Services
<b>Dune Field</b>	The system of incipient dunes, foredunes and hind dunes that is formed on sandy beaches to the rear of the beach berm.
<b>Dune Maintenance</b>	The management technique by which dunes, dune vegetation and dune protective structures are kept in good “working order”; activities may include weed/pest/fire control, replanting, fertilising, repair of fences and accessways, and publicity.
<b>Dune Management</b>	The general term describing all activities associated with the restoration and/or maintenance of the role and values of beach dune systems; dune management activities and techniques include planning, dune reconstruction, revegetation, dune protection, dune maintenance, and community involvement.
<b>Dune Protection</b>	The management technique by which the dune system is protected from damage by recreational and development activities; dune protection activities generally include the use of fences, accessways and signposts to restrict and control access to dune systems.
<b>Ebb Tide</b>	The outgoing tidal movement of water within an estuary.
<b>Ecologically Sustainable Development</b>	Development that does not interfere with the short and long term well-being, health and viability of estuarine ecosystems.
<b>Ecosystem</b>	A community of living organisms, together with the environment in which they live and with which they interact.
<b>Eddies</b>	Large, circular, swirling movements of water, often metres or tens of metres across.
<b>E-folding time</b>	The time required for the concentration of a conservative water quality constituent at a given point in a simulated system to reduce from an initial value of 1.0 to a value of $1/e$ or 0.3679. In the context of this report, the e-folding time is related purely to the action of the tides. This parameter can therefore be used as an indication of flushing efficiency. Care needs to be taken when interpreting this parameter in terms of water quality improvements as it neglects the effects of wind driven currents and catchment inflows on water quality.
<b>EIS</b>	Environmental Impact Statement
<b>Elevated Half-Tide Levels</b>	An increase in half-tide level caused by the 'trapping' of tidal water in upstream estuary reaches.
<b>EMC</b>	Event Mean Concentration
<b>Endangered Fauna (In the context of the National Parks and Wildlife Act, 1974)</b>	"Protected Fauna of a species named in Schedule 12".

<b>Entrance Bar</b>	A deposit of sand or silt across the entrance to an estuary. The material may be either fluvial or marine in origin.
<b>Entrance Instability</b>	Refer to the tendency of entrances to estuaries and coastal lakes to migrate along the shore, close up, reopen, form new entrances, etc in response to wave and current action and freshwater flows.
<b>Environmental Impact Statement (In the context of the Environmental Planning and Assessment Act, 1979)</b>	"An assessment of the impact of a proposed development".
<b>Epibiota</b>	Organisms (plants and animals) attached to other organisms.
<b>Epiphytic</b>	(Of living organisms) attached to and growing on the surface of a plant, but not obtaining food or nutrients from the plant.
<b>Estuarine Processes</b>	Those processes that affect the physical, chemical and biological behaviour of an estuary, e.g. predation, water movement, sediment movement, water quality, etc.
<b>Estuarine Resources</b>	The totality of the animal, vegetable and mineral matter associated with an estuary and its environs' including estuarine waters, together with the amenity of the estuary.
<b>Estuary</b>	An enclosed or semi-enclosed body of water having an open or intermittently open connection to coastal waters in which water levels vary in a periodic fashion in response to ocean tides.
<b>Estuary Management Process</b>	A sequence of activities starting with the formation of an Estuary Management Committee and culminating in the implementation of an Estuary Management Plan that will foster the balanced and sustainable use of estuaries.
<b>Eutrophication</b>	The build-up of nutrient levels in a water body leading to the excessive growth of aquatic plants, which in turn depletes dissolved oxygen levels in the waterbody.
<b>Fauna</b>	"Any mammal, bird, reptile or protected amphibian".
<b>FC</b>	Faecal Coliforms
<b>Fish (In the context of the Fisheries &amp; Oyster Farms Act, 1935)</b>	"All or any of the varieties of marine, estuarine or freshwater fishes "whether indigenous or not} and their young, fry and spawn, and unless the contrary intention be expressly stated or the context otherwise requires, includes crustacea and oysters and all marine, estuarine and freshwater animal life, and any part of a fish as hereinbefore defined, but does not include any species of whales".
<b>Flocculate</b>	The coalescence, through physical and chemical processes, of individual suspended particles into larger particles ('flocs').
<b>Flood Mitigation Works</b>	Structures that are designed to manage floodwaters (e.g. levees, retarding basins).
<b>Flood Tide</b>	The incoming tidal movement of water within an estuary.

<b>Fluvial</b>	Pertaining to non-tidal flows.
<b>Fluvial Processes</b>	The erosive and transport processes that deliver terrestrial sediment to creeks, rivers, estuaries and coastal waters.
<b>Fluvial Sediments</b>	Land-based sediments carried to estuarine waters by rivers.
<b>Foredune</b>	The larger and more mature dune lying between the incipient dune and hinddune area. Foredune vegetation is characterised by grasses and shrubs. Foredunes provide an essential reserve of sand to meet erosion demand during storm conditions. During storm events, the foredune can be eroded back to produce a pronounced dune scarp.
<b>Foreshore</b>	The area of shore between low and high tide marks and land adjacent thereto.
<b>Fortnightly Tides</b>	The variation in half-tide levels caused by the monthly cycle of Spring and Neap Tides.
<b>Geomorphology</b>	The study of the origin, characteristics and development of land forms.
<b>GPT</b>	Gross Pollutant Trap
<b>Gravitational Circulation</b>	A residual circulation in the lower reaches of an estuary characterised by landward flowing bottom currents and ocean flowing surface currents, driven by the gravitational forces associated with differences in salinity levels along the estuary.
<b>Greenhouse Effect</b>	A term used to describe the likely global warming predicted to accompany the increasing levels of carbon dioxide and other “greenhouse” gases in the atmosphere.
<b>Groyne Field</b>	A system of regularly spaced groynes along a section of shoreline.
<b>Groynes</b>	Low walls build perpendicular to a shoreline to trap longshore sediment. Typically, sediment buildup on the updrift side of a groyne is offset by erosion on the downdrift site.
<b>Habitat</b>	The places in which an organism lives and grows. Many estuarine organisms require different habitats at different stages of their life cycles.
<b>Half-Tide Level</b>	The average of successive high tide and low tide levels.
<b>Heavy Metals</b>	Generally, those metals that occur in Groups IS to VIII B of the Periodic Table with atomic numbers between 21 and 84, but excluding Rare Earth elements. Heavy metals generally have a specific gravity of 5.0 or more and include chromium, iron, nickel, copper, zinc, silver, cadmium, platinum, gold, mercury and lead. Although essential in trace concentrations, some heavy metals are toxic to aquatic organisms at higher concentrations, e.g. mercury, lead, copper and zinc. Even when present in sub-lethal concentrations, heavy metals may adversely affect the health of aquatic organisms.
<b>Herbivores</b>	Grazing animals.
<b>Hinddunes</b>	Sand dunes located to the rear of the Foredune. Characterised by mature vegetation including trees and shrubs.

<b>Humic Acid</b>	Acidity resulting from the decomposition of organic materials.
<b>HWOST</b>	High Water Ordinary Spring Tides
<b>Hydraulic Regime</b>	The variation of estuarine discharges in response to seasonal freshwater inflows and diurnal tides.
<b>Hydrolyse</b>	Decompose by chemical reaction with water.
<b>Hypersaline</b>	Having a salinity greater than seawater (i.e. above 35 parts per thousand). (generally caused by salt concentration through evaporation).
<b>Incipient Dune</b>	The most seaward and immature dune of the dune system. Vegetation characterised by grasses. On an accreting coastline, the incipient dune will develop into a Foredune.
<b>Induration</b>	The cementing together of sand particles by natural physical and chemical processes.
<b>Intertidal</b>	Pertaining to those areas of land covered by water at high tide, but exposed at low tide, e.g. intertidal habitat.
<b>Invertebrate</b>	Animal without a backbone, e.g. jellyfish.
<b>Isohaline</b>	A line connecting parts of the water mass having the same salinity, i.e. a contour of equal salinity levels.
<b>ISQG</b>	Interim Sediment Quality Guideline
<b>Large-Scale Boundary Effects</b>	The promotion of mixing in estuarine waters caused by the presence of large boundary features, such as headlands, bays and channels, that disturb flood and ebb tide flow patterns and provide storage for waters on the flood tide and release of these waters on the ebb, and so facilitate mixing across the estuary.
<b>LEP</b>	Local Environment Plan
<b>Levee</b>	A man-made embankment or wall built to exclude floodwaters, or a natural embankment adjacent to a waterway built by the deposition of silt from floodwaters.
<b>Littoral Drift Processes</b>	Wave, current and wind processes that facilitate the transport of sediments along a shoreline.
<b>Littoral Zone</b>	Area of the coastline in which sediment movement by wave, current and wind action is prevalent. The littoral zone extends from the onshore dune system to the seaward limit of the offshore zone and possibly beyond.
<b>Littoral Zone</b>	An area of the coastline in which sediment movement by wave, current and wind action is prevalent.
<b>Longshore Currents</b>	Currents flowing parallel to the shore within the inshore and nearshore zones. Longshore currents are typically caused by waves approaching the beach at an angle. The “feeder” currents to rip cells are another example of longshore currents.
<b>Macroalgae</b>	Small to large attached algae of several types (red, brown and green). Green algae may become detached and accumulate in shallow waters.

<b>Macrophytes (aquatic)</b>	Rooted aquatic plants, e.g. Eelgrass.
<b>Mangroves</b>	An intertidal plant community dominated by trees.
<b>Marine Sediments</b>	Sediments in coastal waters moved along the coast by littoral processes.
<b>Mass Transport</b>	The net shorewards current associated with the movement of waves through the nearshore and inshore zones. Sediment transport from the offshore bar by this current is responsible for the rebuilding of storm eroded beaches during inter-storm periods.
<b>MHL</b>	Manly Hydraulics Laboratory
<b>ML</b>	Megalitres
<b>MNT</b>	Mean Neap Tide
<b>Mollusc</b>	A large phylum of animals, mostly aquatic, including mussels, snails and octopus, which are soft-bodied, often with a hard shell, unsegmented, and having a head and muscular foot.
<b>MSL</b>	Mean Sea Level
<b>MST</b>	Mean Spring Tide
<b>N/A</b>	Not Applicable
<b>NAGP</b>	Net Acid Generating Potential
<b>Neap Tides</b>	Tides with the smallest range in a monthly cycle. Neap tides occur when the sun and moon lie at right angles relative to the earth (the gravitational effects of the moon and sun act in opposition on the ocean).
<b>Nearshore Zone</b>	Coastal waters between the offshore bar and the 60m depth contour. Swell waves in the nearshore zone are unbroken, but their behaviour is influenced by the presence of the seabed. (This definition is adopted for simplicity in this Manual and is based on wave motion considerations rather than sedimentology).
<b>NSW</b>	New South Wales
<b>NTU</b>	Nephelometric Turbidity Units
<b>Numerical Model</b>	A mathematical representation of a physical, chemical or biological process of interest. Computers are often required to solve the underlying equations.
<b>NWQMS</b>	National Water Quality Management Strategy
<b>Offshore Bar</b>	Also known as a longshore bar. Submerged sandbar formed offshore by the processes of beach erosion and accretion. Typically, swell waves break on the offshore bar.
<b>Offshore Zone</b>	Coastal waters to the seaward of the nearshore zone. Swell waves in the offshore zone are unbroken and their behaviour is not influenced by the presence of the seabed. (See note to “Nearshore Zone”).
<b>Onshore/Offshore Transport</b>	The process whereby sediment is moved onshore and offshore by wave, current and wind action.

<b>Pelagic Organisms</b>	Organisms living in the water column of the ocean and capable of moving independently of currents.
<b>Phase Lag</b>	Difference in time of the occurrence between high (or low water) and maximum flood (or ebb) velocity at some point in an estuary.
<b>Physical Model</b>	The representation of physical processes of interest, e.g. water movement or sediment movement, by a scale model of the estuary and the process.
<b>Phytoplankton</b>	Microscopic free-floating aquatic plants (algae).
<b>Pneumatophores</b>	Air breathing roots.
<b>Pocket Beaches</b>	Small beach systems typically bounded by rocky headlands. Because of the presence of the headlands and the small size of these beaches, longshore currents are relatively insignificant in the overall sediment budget.
<b>Point-Source Pollution</b>	Specific localised source of pollution, e.g. sewage effluent discharge, industrial discharge.
<b>Polychaete</b>	A segmented worm with bristles.
<b>Poorly-Mixed Estuary</b>	An estuary characterised by poor vertical mixing, pronounced vertical salinity gradients and a discrete body of saltwater (a salt wedge) underlying freshwater.
<b>Prograde</b>	The apparent movement of a shoal caused by the addition of sediment to the leading edge of a shoal.
<b>Protected Amphibian (In the context of the National Parks and Wildlife Act, 1974)</b>	"An amphibian of a species named in Schedule 12A".
<b>Protected Fauna (In the context of the National Parks and Wildlife Act, 1974)</b>	"Fauna of a species not named in Schedule 11".
<b>Protected Native Plant (In the context of the National Parks and Wildlife Act, 1974)</b>	"A native plant of a species named in Schedule 13n.
<b>PWD</b>	Public Works Department (now DLWC)
<b>Receiving Waters</b>	Waters into which effluent or waste streams are discharged or discharge.
<b>Reflected Wave</b>	That part of an incident wave that is returned seaward when a wave impinges on a steep beach, barrier, or other reflecting surface.
<b>Refraction</b>	The tendency of wave crests to become parallel to bottom contours as waves move into shallower waters. This effect is caused by the shoaling processes which slows down waves in shallower waters.

<b>Reptile (In the context of the National Parks and Wildlife Act, 1974)</b>	"A snake, lizard, crocodile, tortoise, turtle or other member of the class reptilia (whether native, introduced or imported), and includes the eggs and the young thereof and the skin or any other part thereof".
<b>Residual Sediment Flux</b>	The net upstream or downstream movement of sediment over a tidal cycle, often determined by tidal distortion and gravitational circulation.
<b>Revetments</b>	Walls built parallel to the shoreline to limit shoreline recession.
<b>Rip Currents</b>	Concentrated currents flowing back to sea perpendicular to the shoreline. Rip currents are caused by wave action piling up water on the beach. Feeder currents running parallel to the shore (longshore currents) deliver water to the rip current.
<b>Riparian Vegetation</b>	Vegetation growing along banks of rivers, including the brackish upstream reaches of an estuary.
<b>RL</b>	Reduced Level
<b>Runoff</b>	That proportion of rainfall that drains off the land's surface.
<b>Salinity</b>	The total mass of dissolved salts per unit mass of water. Seawater has a salinity of about 35 g/kg or 35 parts per thousand.
<b>Salinity Limit</b>	The landward limit of salinity intrusion along an estuary. The location of the salinity limit changes with freshwater discharge, high freshwater inflows moving the limit downstream, whilst low flows allow salt and the salinity limit to migrate upstream.
<b>Salt Wedge</b>	The wedge-shaped body of saltwater that underlies freshwater in poorly-mixed estuaries.
<b>Saltation</b>	The movement of sediment particles along the bed of a waterbody in a series of 'hops' or 'jumps'. Turbulent fluctuations near the bed lift sediment particles off the bed and into the flow where they are carried a short distance before falling back to the bed.
<b>Saltmarsh</b>	A coastal wetland subject to tidal flooding and vegetated by grasses, herbs and low shrubs that are tolerant of high salinity.
<b>Sand Bypassing</b>	A procedure whereby sand deposited on the updrift side of a training wall or similar structure is mechanically delivered to the downdrift side. This facilitates the natural longshore movement of the sediment.
<b>Sand Drift</b>	The movement of sand by wind. In the context of coastlines, "sand drift" is generally used to describe sand movement resulting from natural or man-induced degradation of dune vegetation, resulting in either nuisance or major drift. Sand drift damage buildings, roads, railways and adjoining natural features such as littoral rainforest or wetlands; sand drift can be a major coastline hazard.
<b>Sand Drift Control</b>	The repair and maintenance of sand dunes to minimise sand drift. The protection and fostering of dune vegetation is an important element of such programs.

<b>Sand Dunes</b>	Mounds or hills of sand lying to landward of the beach berm. Sand dunes are usually classified as an incipient dune, a foredune or hinddunes. During storm conditions, incipient and foredunes may be severely eroded by waves. During the intervals between storms, dunes are rebuilt by wave and wind effects. Dune vegetation is essential to prevent sand drift and associated problems.
<b>Scarp</b>	Also known as the Dune Scarp and Backbeach Erosion Escarpment. The landward limit of erosion in the dune system caused by storm waves. At the end of a storm the scarp may be nearly vertical; as it dries out, the scarp slumps to a typical slope of 1V:1.5H.
<b>Sea Waves</b>	Waves in coastal waters resulting from the interaction of different wave trains and locally generated wind waves. Typically, sea waves are of short wavelength and of disordered appearance.
<b>Seawalls</b>	Walls built parallel to the shoreline to limit shoreline recession.
<b>Sediment Budget</b>	An accounting of the rate of sediment supply from all sources (credits) and the rate of sediment loss to all sinks (debits) from an area of coastline to obtain the net sediment supply.
<b>Sediment Load</b>	The quantity of sediment moved past a particular cross-section in a specified time.
<b>Sediment Sink</b>	A mode of sediment loss from the coastline, including longshore transport out of area, dredging, deposition in estuaries, windblown sand, etc.
<b>Sediment Source</b>	A mode of sediment supply to the coastline, including longshore transport into the area, beach nourishment, fluvial sediments from rivers, etc.
<b>Semi-diurnal</b>	A twice-daily variation, e.g. two high waters per day.
<b>Semi-Diurnal Tides</b>	Tides with a period, or time interval between two successive high or low waters, of about 12.5 hours. Tides along the New South Wales coast are semi-diurnal.
<b>Shadow Area</b>	Areas behind breakwaters and headlands in the lee of incident waves. Waves move into shadow areas by the process of diffraction.
<b>Shear Strength</b>	The ability of the bed to accommodate flowing water without the movement of bed sediments. The shear strength of the bed depends upon bed material, degree of compaction, armouring,
<b>Shear Stress</b>	The stress exerted on the bed of an estuary by flowing water. The faster the velocity of flow the greater the shear stress.
<b>Shoaling</b>	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, a shortening in wave length and an increase in wave height.
<b>Shoals</b>	Shallow areas in an estuary created by the deposition and build up of sediments.

<b>Shoreline Recession</b>	A net long term landward movement of the shoreline caused by a net loss in the sediment budget.
<b>Significant Wave Height</b>	The average height of the highest one third of waves recorded in a given monitoring period. Also referred to as $H_{1/3}$ or $H_s$ .
<b>Slack Water</b>	The period of still water before the flood tide begins to ebb (high water slack) or the ebb tide begins to flood (low water slack).
<b>Slope Readjustment</b>	The slumping of a backbeach erosion escarpment from its near vertical post-storm profile to a slope of about 1V:3H.
<b>SPCC</b>	State Pollution and Control Commission (now NSW EPA)
<b>Spring Tides</b>	Tides with the greatest range in a monthly cycle, which occur when the sun, moon and earth are in alignment (the gravitational effects of the moon and sun act in concert on the ocean)
<b>SS</b>	Suspended Solids
<b>Storm Bar</b>	An offshore bar formed by sediments eroded from the beach during storm conditions.
<b>Storm Profile</b>	The profile (cross-section) of a sandy beach that develops in response to storm wave attack. Considerable volumes of sediment from the beach berm, the incipient dune and the Fore dune can be eroded and deposited offshore. The landward limit of the storm profile is typically defined by a backbeach erosion escarpment (dune scarp).
<b>Storm Surge</b>	The increase in coastal water levels caused by the barometric and wind setup effects of storms. Barometric setup refers to the increase in coastal water levels associated with the lower atmospheric pressures characteristic of storms. Wind setup refers to the increase in coastal water levels caused by an onshore wind driving water shorewards and piling it up against the coast.
<b>STP</b>	Sewage Treatment Plant
<b>Stratigraphy</b>	That branch of geology dealing with the ordering of rocks into their relative ages.
<b>Sub-Aerial Sand Barrier</b>	A sand barrier with crest level above high tide; usually vegetated.
<b>Super-Elevation</b>	See Storm Surge.
<b>Surf Zone</b>	Coastal waters between the breaker zone and the swash zone characterised by broken swell waves moving shorewards in the form of bores.
<b>Surface Pollutants</b>	Floating pollutants that do not mix effectively with water, e.g. Oil.
<b>Suspended Sediment Load</b>	That portion of the total sediment load held in suspension by turbulent velocity fluctuations and transported by flowing water.
<b>Swale</b>	A topographic depression in a dune system that may retain water.
<b>Swash Zone</b>	That area of the shoreline characterised by wave uprush and retreat.

<b>Swell Waves</b>	Wind waves remote from the area of generation (fetch) having a uniform and orderly appearance characterised by regularly spaced wave crests.
<b>Swept Prism</b>	The active area of the coastal system in which sediment may be mobilised by the forces of wind and wave action. On a sandy beach, it extends into the dune system and offshore to the limit of the nearshore zone.
<b>Tailings</b>	The residue of mined ores after the target mineral has been extracted.
<b>Tidal Amplification</b>	The increase in the tidal range at upstream locations caused by the tidal resonance of the estuarine waterbody, or by a narrowing of the estuary channel.
<b>Tidal Celerity</b>	The speed of travel of the tidal wave along estuaries. Celerity depends upon the depth of water; the deeper the water, the greater the celerity.
<b>Tidal Delta</b>	The build-up of shoals in the lower reaches of an estuary due to the gradual accumulation of marine sands transported into the estuary through its entrance.
<b>Tidal Distortion</b>	The distortion of the tidal variation of water levels in shallow estuaries caused by the differences in the celerity of rising (faster) and falling (slower) water levels.
<b>Tidal Exchange</b>	The proportion of the tidal prism that is flushed away and replaced with 'fresh' coastal water each tide cycle.
<b>Tidal Excursion</b>	The distance travelled by a water particle from low water slack to high water slack and vice versa.
<b>Tidal Lag</b>	The delay between the state of the tide at the estuary mouth {e.g. high water slack} and the same state of tide at an upstream location.
<b>Tidal Limit</b>	The most upstream location where a tidal rise and fall of water levels is discernible. the location of the tidal limit changes with freshwater inflows and tidal range.
<b>Tidal Planes</b>	A series of water levels that define standard tides, e.g. 'Mean High Water Spring' (MHWS) refers to the average high water level of Spring Tides.
<b>Tidal Prism</b>	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.
<b>Tidal Propagation</b>	The movement of the tidal wave into and out of an estuary.
<b>Tidal Pumping</b>	The generation of Elevated Half-Tide Levels because of the greater celerity of the flood tide compared to the ebb tide.
<b>Tidal Range</b>	The difference between successive high water and low water levels. Tidal range is maximum during Spring Tides and minimum during Neap Tides.

<b>Tidal Trapping</b>	The process whereby a discrete body of water is trapped over shallow shoal areas on the flood tide and separated from other water moving up the estuary. This facilitates mixing.
<b>Tidally Averaged Models</b>	Models that predict estuarine behaviour over periods greater than a tidal cycle, i.e. the temporal resolution is of the order of days, weeks or months.
<b>Tidally Varying Models</b>	Numerical models that predict estuarine behaviour within a tidal cycle, i.e. the temporal resolution is of the order of minutes or hours.
<b>Tides</b>	The regular rise and fall of sea level in response to the gravitational attraction of the sun, moon and planets. Tides along the New South Wales coastline are semi-diurnal in nature, ie. they have a period of about 12.5 hours.
<b>TKN</b>	Total Kejldahl Nitrogen (Ammonia + Oxidised Nitrogen)
<b>TN</b>	Total Nitrogen
<b>Total Catchment Management (In the context of the Catchment Management Act, 1989)</b>	"The coordinated and sustainable use of land, water, vegetation and other natural resources on a water catchment basis so as to balance resource utilisation and conservation".
<b>TP</b>	Total Phosphorus
<b>TPR</b>	Tidal Prism Ratio
<b>Training Walls</b>	Walls constructed at the entrances of estuaries and rivers to improve navigability.
<b>Turbidity</b>	A measure of the ability of water to absorb light.
<b>Vegetation Degradation</b>	The process by which coastal vegetation is "degraded" or damaged; this reduces the effectiveness of vegetation in protecting coastal landforms and increases the potential for erosion of underlying soil materials by wind (resulting in sand drift), water or waves.
<b>Velocity Shear</b>	The differential movement of neighbouring parcels of water brought about by velocity gradients. Velocity shear causes dispersive mixing, the greater the shear (velocity gradient), the greater the mixing.
<b>Vertebrate</b>	Animal with a backbone, e.g. fish, birds.
<b>Water Quality</b>	The suitability of the water for various purposes, as measured by the concentration or level of a wide variety of contaminants.
<b>Wave Height</b>	The vertical distance between a wave trough and a wave crest.
<b>Wave Hindcasting</b>	The estimation of wave climate from meteorological data (barometric pressure, wind) as opposed to wave measurement.
<b>Wave Length</b>	The distance between consecutive wave crests or wave troughs.
<b>Wave Period</b>	The time taken for consecutive wave crests or wave troughs to pass a given point.

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<b>Wave Rider Buoy</b>	A floating device used to measure water level variation caused by waves. It is approximately 0.9m in diameter and is moored to the sea floor.
<b>Wave runup</b>	The vertical distance above mean water level reached by the uprush of water from waves across a beach or up a structure.
<b>Wave Setup</b>	The increase in water level within the surf zone above mean still water level caused by the breaking action of waves.
<b>Wave Train</b>	A series of waves originating from the same fetch with more or less the same wave characteristics.
<b>Well-Mixed Estuary</b>	Estuary characterised by strong vertical mixing and weak or non-existent vertical salinity gradients.
<b>Wind Setup</b>	The increase in mean sea level caused by the “piling up” of water on the coastline by the wind.
<b>Wind Shear</b>	The stress exerted on the water's surface by wind blowing over the water. Wind shear causes the water to pile up against downwind shores and generates secondary currents.
<b>Wind Waves</b>	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.
<b>Windborne Sediment Transport</b>	Sand transport by the wind. Sand can be moved by the processes of suspension (fine grains incorporated in the atmosphere), saltation (medium grains “hopping” along the surface) and traction (large grains rolled along the surface).