

Glossary

Abyssal plain

An abyssal plain is an extensive, flat, gently sloping or nearly level region at abyssal depths. Trenches.

Area

Article 1, paragraph 1, of UNCLOS defines the Area as “the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.” Article 136 of UNCLOS provides that “[t]he Area and its resources are the common heritage of mankind.”

Atolls

Atolls are coral islands consisting of a ring-shaped reef, nearly or entirely surrounding a central lagoon. They occur in the warm waters of the tropics and subtropics. These low-lying and vulnerable landforms owe their origin to reef-building corals. The origin of atolls was explained by Charles Darwin as the result of subsidence (sinking) of a volcanic island.

Baseline

The baseline is the line from which the outer limit of a State’s territorial sea is measured. The breadth of other maritime zones is also measured from the same line. The United Nations Convention on the Law of the Sea (UNCLOS) sets out several methods for determining the baselines, providing that coastal States may determine baselines by any of these methods (article 15):

Normal baseline: “[e]xcept where otherwise provided in this Convention, the normal baseline for measuring the breadth of the territorial sea is the low-water line along the coast as marked on large-scale charts officially recognized by the coastal State” (article 5). “

Straight baseline: “In localities where the coastline is deeply indented and cut into, or if there is a fringe of islands along the coast in its immediate vicinity, the method of straight baselines joining appropriate points may be employed in drawing the baseline from which the breadth of the territorial sea is measured” (article 7, paragraph 1). The remaining paragraphs of article 7

direction of the coast, and the sea areas lying within the lines must be sufficiently closely linked to the land domain to be subject to the regime of internal waters. 4. Straight baselines shall not be drawn to and from low-tide elevations, unless lighthouses or similar installations which are permanently above sea level have been built on them or except in instances where the drawing of baselines to and from such elevations has received general international recognition. 5. Where the method of straight baselines is applicable under paragraph 1, account may be taken, in determining particular baselines, of economic interests peculiar to the region concerned, the reality and the importance of which are clearly evidenced by long usage. 6. The system of straight baselines may not be applied by a State in such a manner as to cut off the territorial sea of another State from the high seas or an exclusive economic zone."

Archipelagic baselines: "[a]n archipelagic State may draw straight archipelagic baselines joining the outermost points of the outermost islands and drying reefs of the archipelago provided that within such baselines are included the main islands and an area in which the ratio of the area of the water to the area of the land, including atolls, is between 1 to 1 and 9 to 1" (article 47). The remaining paragraphs of article 47 establish the criteria to draw archipelagic baselines as follows: "2. The length of such baselines shall not exceed 100 nautical miles, except that up to 3 per cent of the total number of baselines enclosing any archipelago may exceed that length, up to a maximum length of 125 nautical miles. 3. The drawing of such baselines shall not depart to any appreciable extent from the general configuration of the archipelago. 4. Such baselines shall not be drawn to and from low-tide elevations, unless lighthouses or similar installations which are permanently above sea level have been built on them or where a low-tide elevation is situated wholly or partly at a distance not exceeding the breadth of the territorial sea from the nearest island. 5. The system of such baselines shall not be applied by an archipelagic State in such a manner as to cut off from the high seas or the exclusive economic zone the territorial sea of another State. 6. If a part of the archipelagic waters of an archipelagic State lies between two parts of an immediately adjacent neighbouring State, existing rights and all other legitimate interests which the latter State has traditionally exercised in such waters and all rights stipulated by agreement between those States shall continue and be respected. 7. For the purpose of computing the ratio of water to land under paragraph 1, land areas may include waters lying within the fringing reefs of islands and atolls, including

perimeter of the plateau. 8. The baselines drawn in accordance with this article shall be shown on charts of a scale or scales adequate for ascertaining their position. Alternatively, lists of geographical coordinates of points, specifying the geodetic datum, may be substituted. 9. The archipelagic State shall give due publicity to such charts or lists of geographical coordinates and shall deposit a copy of each such chart or list with the Secretary-General of the United Nations."

UNCLOS also establishes the methods to draw the baselines in the presence of reefs (article 6); mouths of rivers (article 9) and bays (article 10), provided that certain conditions are met. In addition, UNCLOS regulates the effect of the outermost permanent harbour works (article 11), roadsteads (article 12) and low-tide elevations (article 13) on baselines.

Beach

A beach is a type of shore and is an area on which the waves break and over which shore debris, such as sand, shingle and pebbles accumulate. A beach includes backshore and foreshore. The foreshore is often defined as the area covered and uncovered by the tides.

Bioerosion

Bioerosion is an important process in reefs, with bioeroders, such as algae, sponges, polychaete worms, crustaceans, sea urchins, and boring molluscs (e.g., *Teredos*), reducing the strength of the framework and producing sediment that infiltrates and accumulates in the porous reef limestone

Biological pump

The biological pump is the process of active biological uptake of CO₂ into the biomass and skeletons of plankters (the individuals that collectively form plankton).

Bruun Rule

The Bruun Rule is a simple heuristic that uses the slope of the foreshore and conservation of mass to predict the extent to which sea-level rise will cause erosion and net recession landwards for many beaches.

Canyon

Submarine canyons are defined as "steep-walled sinuous valleys with V-shaped cross sections and axes sloping outward as continuously as river-cut land canyons, with relief comparable to even the largest land canyons".

Clausius-Clapeyron relationship

The Clausius-Clapeyron relationship is the water-holding capacity of the atmosphere, which increases by 7 per cent

Contiguous Zone

Downwelling and upwelling

Where surface ocean currents move seawater toward coasts, the water is forced to sink, in the process known as coastal downwelling. Coastal upwelling occurs where surface waters are moved away from the coast: that water is replaced by water that wells up from below. Upwelling and downwelling also occur in the open ocean where winds cause surface waters to move away from a region (leading to upwelling) or to converge toward a region (leading to downwelling).

Ecosystem

The Millennium Ecosystem Assessment defines an ecosystem as “a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit”

Ecosystem services

The Millennium Ecosystem Assessment (2005) classified ecosystem services as: provisioning services (e.g., food – including food traded in formal markets and subsistence trade and barter - pharmaceutical compounds, building material); regulating services (e.g., climate regulation, moderation of extreme events, waste treatment, erosion protection, maintaining populations of species); supporting services (e.g., nutrient cycling, primary production) and cultural services (e.g., spiritual experience, recreation, information for cognitive development, aesthetics).

El Niño/Southern Oscillation

The name “El Niño/Southern Oscillation” (ENSO) refers to the way in which the ocean system of the tropical and subtropical Pacific can, in some years, produce a significant warming of the sea off the western coast of North and South America, often greatest off Peru, in the middle of the southern hemisphere summer.

Enclosed and semi-enclosed seas

Article 122 of UNCLOS defines an enclosed or semi-enclosed sea as a “gulf, basin or sea surrounded by two or more States and connected to another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States.”

Estuary

An estuary is the tidal mouth of a river, where the seawater is measurably diluted by the fresh water from the river.

Euphotic zone

This is the layer below the ocean’s surface that receives enough light for photosynthesis to occur. This is usually taken to be where photosynthetically active radiation [PAR] is more than 1 per cent of the surface intensity.

Exclusive economic zone

Ocean acidification:

When CO₂ reacts with water, it forms carbonic acid, which then dissociates and produces hydrogen ions. The extra hydrogen ions link with carbonate ions (CO₃²⁻) to form bicarbonate (HCO₃⁻). In this process, the pH and concentrations of carbonate ions (CO₃²⁻) decrease. As a result, the carbonate mineral saturation states also decrease. The water thus becomes more acid and less basic (alkaline). Due to the increasing acidity, this process in the ocean is commonly referred to as “ocean acidification”. (pH is a numeric scale used to specify the acidity or basicity of a water-based solution, calculated as the negative logarithm to base 10 of the activity of the hydrogen ions).

Ocean acidification hotspots

Although the average oceanic pH can vary on interglacial time scales, the changes are usually on the order of ~0.002 units per 100 years; however, the current observed rate of change is ~0.1 units per 100 years, or roughly 50 times faster. Regional factors, such as coastal upwelling, changes in riverine and glacial discharge rates, and sea-ice loss have created “Ocean acidification hotspots” where changes are occurring at even faster rates.

Ocean currents

Ocean currents are continuous, directional movements of seawater generated by forces such as wind, the Coriolis effect from the rotation of the Earth, differences in temperature and salinity of different parts of the ocean and the effects of mixing bodies of seawater with these different qualities. They are distinct from tides, which are caused by the gravitational effects of the moon and the sun. In the upper ocean, the effects of wind and Coriolis effect predominate. In deeper water, the main driver is the thermohaline circulation.

Oxygen minimum zones

Oxygen minimum zones are the places in the ocean where oxygen saturation in the water column is at its lowest. Such zones typically occur at midwater depths (200-1000 m).

Phenology

Phenology is the study of the timing and duration of cyclic and seasonal natural phenomena (e.g., spring phytoplankton blooms, seasonal cycles of zooplankton reproduction), especially in relation to climate and plant and animal life-cycles.

Salinity

Salinity refers to the level of dissolved salts in seawater. It varies significantly from place to place. On average, it is around 35 grams of salts per litre. In the Red Sea and the Persian Gulf, the most saline major sea areas, it reaches an average 40 grams of salts per litre, because of the high rate of evaporation and the low rate of freshwater inflow.

Salt marshes

Salt marshes are intertidal, coastal ecosystems that are regularly flooded with salt or brackish water and dominated by salt-tolerant grasses, herbs, and low shrubs. They

