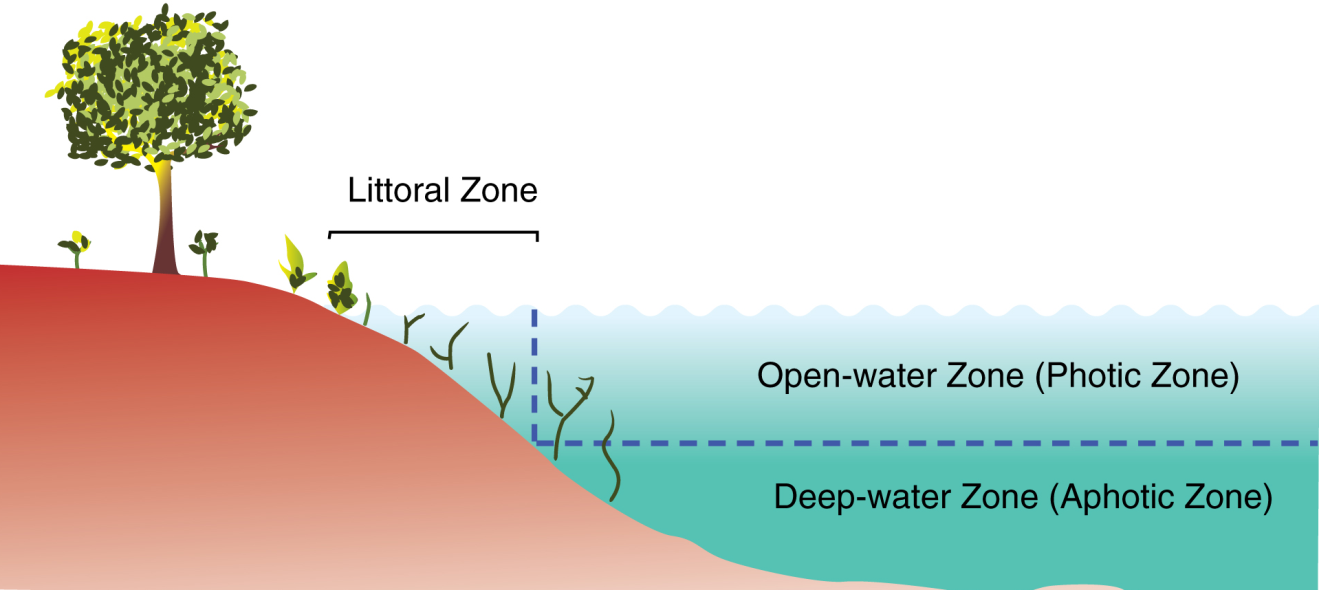
**Aquatic Ecosystem**: An **aquatic ecosystem** is an **ecosystem** in a body of water. Communities of organisms that are dependent on each other and on their environment live in**aquatic ecosystems**. The two main types of **aquatic ecosystems** are marine **ecosystems** and freshwater**ecosystems**.

* Aquifers and springs
* Rivers and streams
* Lakes and ponds
* Wetlands
* Bay and estuaries
* Oceans and seas ( Pacific, Atlantic, Indian, Suthern Antarctic and Arctic)

Marine ecosystem: Salt Marshes, Intertidal zone, Estury, lagoons, mangroves, coral reef, deep sea and sea floor



Freshwater Ecosystem (LAKE)



Three zone of a lake

**Lake** ecosystems can be divided into zones. One common system divides lakes into three zones (see figure). The first, the [littoral zone](https://en.wikipedia.org/wiki/Littoral_zone), is the shallow zone near the shore. This is where rooted wetland plants occur. The offshore is divided into two further zones, an open water zone and a deep water zone. In the open water zone (or photic zone) sunlight supports photosynthetic algae, and the species that feed upon them. In the deep water zone, sunlight is not available and the food web is based on detritus entering from the littoral and photic zones. Some systems use other names. The off shore areas may be called the [pelagic zone](https://en.wikipedia.org/wiki/Pelagic_zone), the [photic zone](https://en.wikipedia.org/wiki/Photic_zone) may be called the [limnetic zone](https://en.wikipedia.org/wiki/Limnetic_zone) and the [aphotic zone](https://en.wikipedia.org/wiki/Aphotic_zone) may be called the [profundal zone](https://en.wikipedia.org/wiki/Profundal_zone" \o "Profundal zone). Inland from the littoral zone one can also frequently identify a [riparian zone](https://en.wikipedia.org/wiki/Riparian_zone) which has plants still affected by the presence of the lake—this can include effects from windfalls, spring flooding, and winter ice damage. The production of the lake as a whole is the result of production from plants growing in the littoral zone, combined with production from plankton growing in the open water.

**River**: The major zones in river ecosystems are determined by the river bed's gradient or by the velocity of the current. Faster moving turbulent water typically contains greater concentrations of [dissolved oxygen](https://en.wikipedia.org/wiki/Oxygen_saturation), which supports greater biodiversity than the slow moving water of pools. These distinctions form the basis for the division of rivers into [upland and lowland](https://en.wikipedia.org/wiki/Upland_and_lowland_(freshwater_ecology)) rivers. The food base of streams within riparian forests is mostly derived from the trees, but wider streams and those that lack a [canopy](https://en.wikipedia.org/wiki/Canopy_(forest)) derive the majority of their food base from algae. [Anadromous fish](https://en.wikipedia.org/wiki/Fish_migration" \o "Fish migration) are also an important source of nutrients. Environmental threats to rivers include loss of water, dams, chemical pollution and [introduced species](https://en.wikipedia.org/wiki/Introduced_species).[[3]](https://en.wikipedia.org/wiki/Aquatic_ecosystem#cite_note-Alexander-3) A dam produces negative effects that continue down the watershed. The most important negative effects are the reduction of spring flooding, which damages wetlands, and the retention of sediment, which leads to loss of deltaic wetlands.



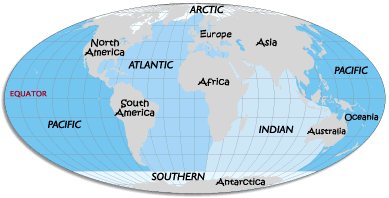
RIVER

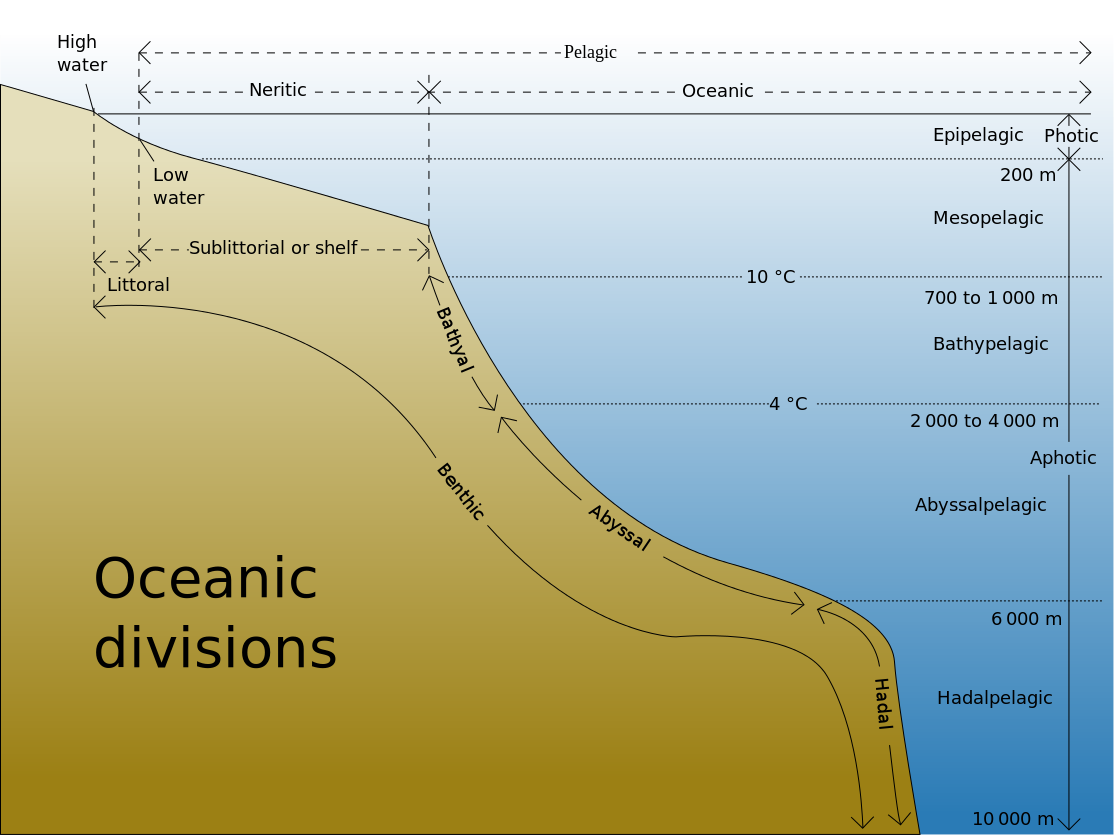
**Ponds**: Ponds are small bodies of freshwater with shallow and still water, [marsh](https://en.wikipedia.org/wiki/Marsh), and [aquatic plants](https://en.wikipedia.org/wiki/Aquatic_plants).[[7]](https://en.wikipedia.org/wiki/Aquatic_ecosystem#cite_note-7) They can be further divided into four zones: vegetation zone, open water, bottom mud and surface film.[[8]](https://en.wikipedia.org/wiki/Aquatic_ecosystem#cite_note-8) The size and depth of ponds often varies greatly with the time of year; many ponds are produced by spring flooding from rivers. [Food webs](https://en.wikipedia.org/wiki/Food_web) are based both on free-floating [algae](https://en.wikipedia.org/wiki/Algae) and upon aquatic plants. There is usually a diverse array of aquatic life, with a few examples including algae, snails, fish, beetles, water bugs, frogs, turtles, otters and muskrats. Top predators may include large fish, herons, or alligators. Since fish are a major predator upon amphibian larvae, ponds that dry up each year, thereby killing resident fish, provide important refugia for amphibian breeding.[[9]](https://en.wikipedia.org/wiki/Aquatic_ecosystem#cite_note-Keddy-9) Ponds that dry up completely each year are often known as [vernal pools](https://en.wikipedia.org/wiki/Vernal_pools). Some ponds are produced by animal activity, including alligator holes and beaver ponds, and these add important diversity to landscapes.



**Oceans**: An **ocean** is a body of [saline water](https://en.wikipedia.org/wiki/Saline_water) that composes much of a [planet](https://en.wikipedia.org/wiki/Planet)'s [hydrosphere](https://en.wikipedia.org/wiki/Hydrosphere). On [Earth](https://en.wikipedia.org/wiki/Earth), an ocean is one of the major conventional divisions of the [World Ocean](https://en.wikipedia.org/wiki/World_Ocean). These are, in descending order by area, the [Pacific](https://en.wikipedia.org/wiki/Pacific_Ocean), [Atlantic](https://en.wikipedia.org/wiki/Atlantic_Ocean), [Indian](https://en.wikipedia.org/wiki/Indian_Ocean), [Southern](https://en.wikipedia.org/wiki/Southern_Ocean) (Antarctic), and [Arctic](https://en.wikipedia.org/wiki/Arctic_Ocean) Oceans. The word "ocean" is often used interchangeably with "sea" in [American English](https://en.wikipedia.org/wiki/American_English). Strictly speaking, a [*sea*](https://en.wikipedia.org/wiki/Sea) is a body of saline water (generally a division of the world ocean) partly or fully enclosed by land, though "the sea" refers also to the oceans.

| **#** | **Ocean** | **Location** | **Area (km2) (*%*)** | **Volume (km3) (*%*)** | **Avg. depth (m)** | **Coastline (km)** |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | [Pacific Ocean](https://en.wikipedia.org/wiki/Pacific_Ocean) | Separates [Asia](https://en.wikipedia.org/wiki/Asia) and [Oceania](https://en.wikipedia.org/wiki/Oceania) from the [Americas](https://en.wikipedia.org/wiki/Americas)[[19]](https://en.wikipedia.org/wiki/Ocean#cite_note-eoe-pac-19)[NB] | 168,723,000 *46.6* | 669,880,000 *50.1* | 3,970 | 135,663 |
| 2 | [Atlantic Ocean](https://en.wikipedia.org/wiki/Atlantic_Ocean) | Separates the [Americas](https://en.wikipedia.org/wiki/Americas) from [Europe](https://en.wikipedia.org/wiki/Europe) and [Africa](https://en.wikipedia.org/wiki/Africa)[[20]](https://en.wikipedia.org/wiki/Ocean#cite_note-eoe-atl-20) | 85,133,000 *23.5* | 310,410,900 *23.3* | 3,646 | 111,866 |
| 3 | [Indian Ocean](https://en.wikipedia.org/wiki/Indian_Ocean) | Washes upon [southern Asia](https://en.wikipedia.org/wiki/Indian_subcontinent) and separates [Africa](https://en.wikipedia.org/wiki/Africa) and [Australia](https://en.wikipedia.org/wiki/Australia_(continent))[[21]](https://en.wikipedia.org/wiki/Ocean#cite_note-eoe-ind-21) | 70,560,000 *19.5* | 264,000,000 *19.8* | 3,741 | 66,526 |
| 4 | [Southern Ocean](https://en.wikipedia.org/wiki/Southern_Ocean) | Sometimes considered an extension of the Pacific, Atlantic and Indian Oceans,[[22]](https://en.wikipedia.org/wiki/Ocean#cite_note-eoe-sth-22)[[23]](https://en.wikipedia.org/wiki/Ocean#cite_note-IHO-23) which encircles [Antarctica](https://en.wikipedia.org/wiki/Antarctica) | 21,960,000 *6.1* | 71,800,000 *5.4* | 3,270 | 17,968 |
| 5 | [Arctic Ocean](https://en.wikipedia.org/wiki/Arctic_Ocean) | Sometimes considered a [sea](https://en.wikipedia.org/wiki/Sea) or [estuary](https://en.wikipedia.org/wiki/Estuary) of the Atlantic,[[24]](https://en.wikipedia.org/wiki/Ocean#cite_note-Tomczak-24)[[25]](https://en.wikipedia.org/wiki/Ocean#cite_note-encyc-brit-25) which covers much of the [Arctic](https://en.wikipedia.org/wiki/Arctic) and washes upon northern [North America](https://en.wikipedia.org/wiki/North_America) and [Eurasia](https://en.wikipedia.org/wiki/Eurasia)[[26]](https://en.wikipedia.org/wiki/Ocean#cite_note-eoe-arc-26) | 15,558,000 *4.3* | 18,750,000 *1.4* | 1,205 | 45,389 |
| **Total – World Ocean** | | | **361,900,000 *100*** | **1,335,000,000 *100*** | **3,688** | **377,412**[[27]](https://en.wikipedia.org/wiki/Ocean#cite_note-itu-27) |





Classification of marine ecosystem

**Wetlands**

Wetlands are dominated by [vascular plants](https://en.wikipedia.org/wiki/Vascular_plant) that have adapted to saturated soil.[[9]](https://en.wikipedia.org/wiki/Aquatic_ecosystem#cite_note-Keddy-9) There are four main types of wetlands: swamp, marsh, fen and bog (both fens and bogs are types of [mire](https://en.wikipedia.org/wiki/Mire)). Wetlands are the most productive natural ecosystems in the world because of the proximity of water and soil. Hence they support large numbers of plant and animal species. Due to their productivity, wetlands are often converted into dry land with [dykes](https://en.wikipedia.org/wiki/Ditch) and [drains](https://en.wikipedia.org/wiki/Drainage) and used for agricultural purposes. The construction of dykes, and dams, has negative consequences for individual wetlands and entire watersheds.[[9]](https://en.wikipedia.org/wiki/Aquatic_ecosystem#cite_note-Keddy-9) Their closeness to lakes and rivers means that they are often developed for human settlement.[[3]](https://en.wikipedia.org/wiki/Aquatic_ecosystem#cite_note-Alexander-3) Once settlements are constructed and protected by dykes, the settlements then become vulnerable to land subsidence and ever increasing risk of flooding.[[9]](https://en.wikipedia.org/wiki/Aquatic_ecosystem#cite_note-Keddy-9) The Louisiana coast around New Orleans is a well-known example;[[10]](https://en.wikipedia.org/wiki/Aquatic_ecosystem" \l "cite_note-10) the Danube Delta in Europe is another.[[11]](https://en.wikipedia.org/wiki/Aquatic_ecosystem#cite_note-11)



Estury mouth

Estury: An **estuary** is a partially enclosed coastal body of [brackish water](https://en.wikipedia.org/wiki/Brackish_water) with one or more rivers or streams flowing into it, and with a free connection to the open sea.[[1]](https://en.wikipedia.org/wiki/Estuary#cite_note-james-1)

Estuaries form a transition zone between river environments and maritime environments. They are subject both to marine influences—such as [tides](https://en.wikipedia.org/wiki/Tides), waves, and the influx of saline water—and to riverine influences—such as flows of fresh water and sediment. The mixing of sea water and fresh water provide high levels of nutrients both in the water column and in [sediment](https://en.wikipedia.org/wiki/Sediment), making estuaries among the most productive natural habitats in the world.[[2]](https://en.wikipedia.org/wiki/Estuary#cite_note-McLusky-2)

Salt March: A **salt marsh** or **saltmarsh**, also known as a coastal salt marsh or a [tidal marsh](https://en.wikipedia.org/wiki/Tidal_marsh), is a coastal ecosystem in the upper [coastal](https://en.wikipedia.org/wiki/Coast) [intertidal zone](https://en.wikipedia.org/wiki/Intertidal_zone) between land and open [saltwater](https://en.wikipedia.org/wiki/Seawater) or [brackish water](https://en.wikipedia.org/wiki/Brackish_water) that is regularly flooded by the tides. It is dominated by dense stands of [salt-tolerant](https://en.wikipedia.org/wiki/Halophyte) plants such as [herbs](https://en.wikipedia.org/wiki/Herb), [grasses](https://en.wikipedia.org/wiki/Poaceae), or low [shrubs](https://en.wikipedia.org/wiki/Shrub).[[1]](https://en.wikipedia.org/wiki/Salt_marsh#cite_note-adam-1)[[2]](https://en.wikipedia.org/wiki/Salt_marsh#cite_note-woodroffe-2) These plants are terrestrial in origin and are essential to the stability of the salt [marsh](https://en.wikipedia.org/wiki/Marsh) in trapping and binding [sediments](https://en.wikipedia.org/wiki/Sediment). Salt marshes play a large role in the aquatic [food web](https://en.wikipedia.org/wiki/Food_web) and the delivery of nutrients to coastal waters. They also support terrestrial animals and provide [coastal protection](https://en.wikipedia.org/wiki/Coastal_management).[[2]](https://en.wikipedia.org/wiki/Salt_marsh#cite_note-woodroffe-2)

A **coral reef** is an underwater [ecosystem](https://en.wikipedia.org/wiki/Ecosystems) characterized by reef-building [corals](https://en.wikipedia.org/wiki/Coral). Reefs are formed of [colonies](https://en.wikipedia.org/wiki/Colony_(biology)) of [coral](https://en.wikipedia.org/wiki/Coral) [polyps](https://en.wikipedia.org/wiki/Polyp) held together by [calcium carbonate](https://en.wikipedia.org/wiki/Calcium_carbonate). Most coral reefs are built from [stony corals](https://en.wikipedia.org/wiki/Stony_coral), whose polyps cluster in groups.

Coral belongs to the [class](https://en.wikipedia.org/wiki/Class_(biology)) *[Anthozoa](https://en.wikipedia.org/wiki/Anthozoa" \o "Anthozoa)* in the animal [phylum](https://en.wikipedia.org/wiki/Phylum) *[Cnidaria](https://en.wikipedia.org/wiki/Cnidaria" \o "Cnidaria)*, which includes [sea anemones](https://en.wikipedia.org/wiki/Sea_anemone) and [jellyfish](https://en.wikipedia.org/wiki/Jellyfish). Unlike sea anemones, corals secrete hard carbonate [exoskeletons](https://en.wikipedia.org/wiki/Exoskeleton) that support and protect the coral. Most reefs grow best in warm, shallow, clear, sunny and agitated water.

A **lagoon** is a shallow body of water separated from a larger body of water by [barrier islands](https://en.wikipedia.org/wiki/Barrier_island) or [reefs](https://en.wikipedia.org/wiki/Reef). Lagoons are commonly divided into coastal lagoons and [atoll](https://en.wikipedia.org/wiki/Atoll" \o "Atoll)lagoons. They have also been identified as occurring on mixed-sand and gravel coastlines. There is an overlap between bodies of water classified as coastal lagoons and bodies of water classified as [estuaries](https://en.wikipedia.org/wiki/Estuary). Lagoons are common coastal features around many parts of the world.

A **mangrove** is a shrub or small tree that grows in coastal [saline](https://en.wikipedia.org/wiki/Saline_water) or [brackish water](https://en.wikipedia.org/wiki/Brackish_water). The term is also used for tropical coastal vegetation consisting of such species. Mangroves occur worldwide in the [tropics](https://en.wikipedia.org/wiki/Tropics) and [subtropics](https://en.wikipedia.org/wiki/Subtropics), mainly between latitudes [25° N](https://en.wikipedia.org/wiki/25th_parallel_north) and [25° S](https://en.wikipedia.org/wiki/25th_parallel_south). The total mangrove forest area of the world in 2000 was 137,800 square kilometres (53,200 sq mi), spanning 118 countries and territories.[[1]](https://en.wikipedia.org/wiki/Mangrove#cite_note-Giri2010-1)

