Marine Life Zones

A **life zone** is a region that contains characteristic organisms that interact with one another and with their environment.

**Intertidal zone**
The intertidal zone is the area located between high tide and low tide. This area is exposed to air at low tide but underwater at high tide. High tide is marked by the **strandline**, a long line of seaweed and debris deposited on the beach during each high tide. (See the next Figure). Organisms that live in the intertidal zone are well adapted to meeting the challenges of living in an area that has alternating periods of wet and dry, as the tides come in and go out each day.

![The high tide deposits a strandline of seaweeds and debris](image)

**Supratidal zone**
When you go to the beach, you put your blanket or towel down in a life zone called the **supratidal zone**, which is the area above the intertidal zone, up to the sand dunes. The supratidal zone gets fine droplets of **salt spray** from the crashing waves. The salt spray limits the growth of plants in the **lower supratidal zone**. In the **upper supratidal zone**, where there is less salt spray, many species of grasses, shrubs, and trees grow.

**Subtidal (sublittoral) zone**
Below the low tide line is the subtidal zone, the coastal life zone that remains underwater. The subtidal zone includes an area of heavy **wave** impact. Some organisms in this zone have structures that help them cling to hard substrates; this prevents their being swept away by waves and currents. (Refer to the Figure below) For example,

- Sponges secrete an acid that enables them to bore into rocks and shells. These shells are often found on the beach, pockmarked with holes from the sponges.
- Another clinging animal are the sea star and sand dollar. They cling to hard surfaces by means of suction from their tube feet.
- Marine snails or sea anemones use their muscular feet to cling to hard surfaces.
- Mussels cling to the rocks by secreting tough, fibrous threads that stick to hard substrates.
- The barnacle has the strongest attachment, because it literally cements itself with glue to rocks and other hard substrates.
- Clinging organisms also include marine algae, which are anchored to rocky surfaces by a fibrous pad of tissue called a holdfast.
- Many organisms that live in the subtidal zone possess flattened bodies. A flat body minimizes exposure to wave impact. Flat fish such as the flounder avoid turbulence, as well as their enemies, by burying themselves in the sand. Only their gill cover and eyes poke through the sand. While buried, the flounder might happen to see its prey.
- Other inhabitants of the subtidal zone are crabs, shrimp, clams, and worms.

**Pelagic zone**

The largest life zone in the ocean is the **pelagic zone**. (See the Figure). The pelagic zone covers the entire ocean of water above the sea bottom—that vast region where large schools of fish and pods of marine mammals swim freely.
The pelagic zone includes the **neritic zone** (fewer than 200 meters in depth) and the **oceanic zone** (more than 200 meters in depth).

- **Neritic zone**
The neritic zone is the pelagic environment or the region of water that lies above the continental shelf, it is fewer than 200 meters in depth. In fact, most of the world’s commercial fishing takes place in the neritic zone.

_Why is the neritic zone so productive?_
Rivers that contain runoff from the land flow into the neritic zone, thus providing nutrients for plankton. In addition, much of the neritic zone’s depths are sunlit, so algae, phytoplankton, and marine plants can carry on **photosynthesis**, the food-making process on which most living things depend.

![Diagram of marine environment zones](image)

- **Oceanic zone**
The pelagic waters beyond the shelf break. The oceanic zone is the life zone that extends beyond the neritic zone and includes most of the open ocean. The upper part of the oceanic zone receives light (photoic zone), whereas the lower part (most of the ocean) is in darkness (aphotic zone). There is more life in the photic zone, because light promotes the growth of algae and plants, which provide a source of food for marine animals. As a result, more communities of organisms develop in the photic zone than in the aphotic zone.

Although there are fewer communities of organisms in the aphotic zone, numerous life-forms, such as fish, worms, squid, and crustaceans, have been observed and photographed in the great depths of the ocean.
The pelagic environment could be also divided vertically into depths zones as following:

- **Epipelagic zone:** upper 150 m of water depth. Because this is approximately the depth of the continental shelf, nearly all neritic waters lie in the epipelagic.

- Other pelagic zones lie in the oceanic zone beyond the shelf, these include:
  - **Mesopelagic:** 150 - 2000 m depth.
  - **Bathypelagic:** 2000-4000 m depth.
  - **Abyssopelagic:** 4000-6000 m depth.
  - **Hadopelagic:** > 6000 m depth, include those in the seabed and the waters at the bottom of the trenches.

We refer to the last three zones together (bathypelagic, abyssopelagic, and hadopelagic) as the *deep sea* or *deep pelagic* environment.

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**The benthic zone**

It includes the entire ocean floor, from the shallow intertidal zone to the deep ocean basin. The benthic environment away from the shelf, it is subdivided by depth into *bathyal*, *abyssal*, and *hadal* zones. Many fish and invertebrates inhabit the bottom and rarely swim near the surface. Organisms that inhabit the benthic zone _Live on or buried in the bottom_ are called **Benthic organisms**, or the **benthos**. The benthos that live in the ocean basin are adapted to regions of very low temperatures and very high pressure.