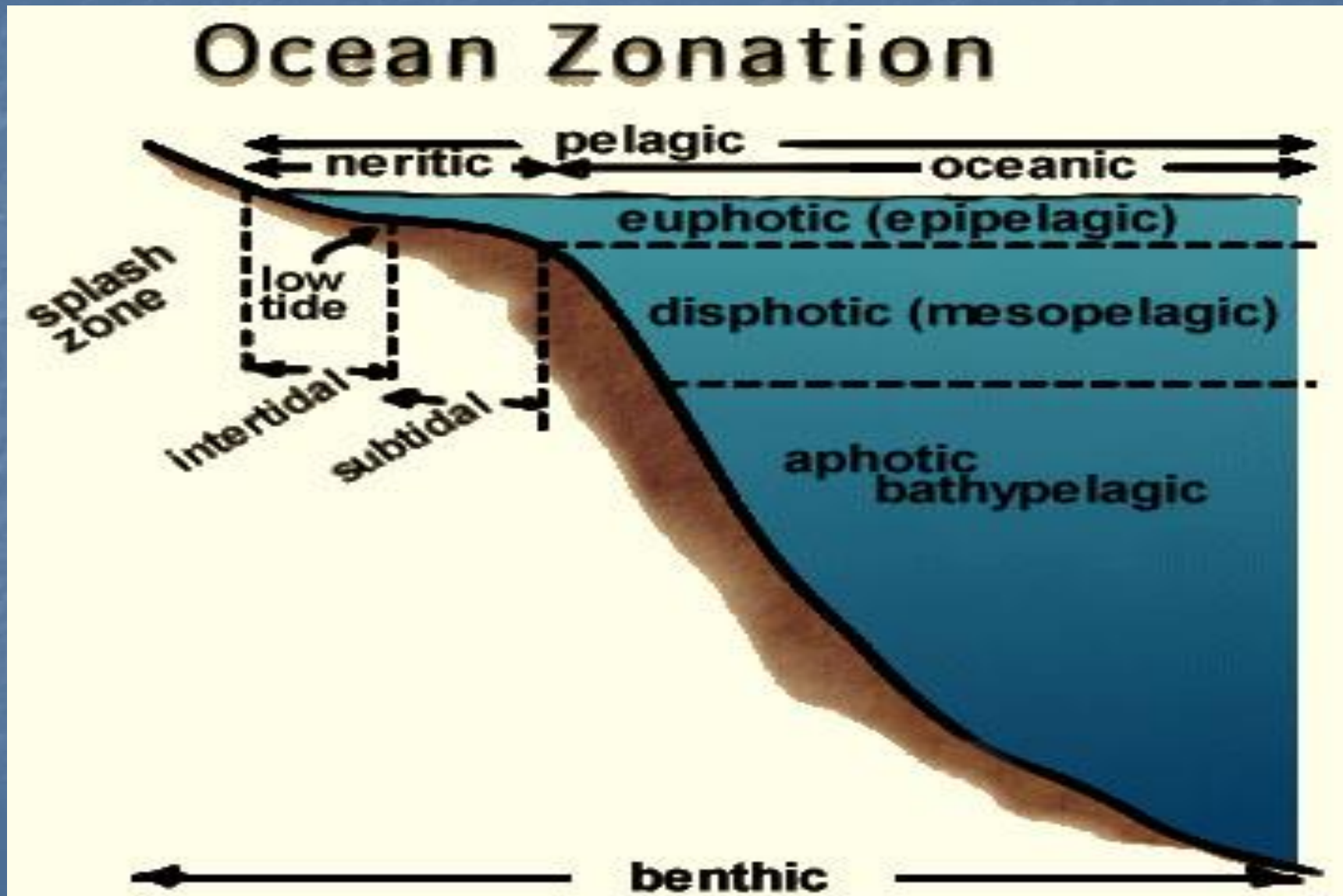


# Zonation of Ocean



The ocean can be divided into many zones.

❖ *Pelagic & Benthic Zone:*

- The ocean bottom is the benthic zone and the water itself (or the water column) is the pelagic zone.

❖ *Neritic & Oceanic Zone:*

- The neritic zone is that part of the pelagic zone that extends from the high tide line to an ocean bottom less than 600 feet deep.

# Neritic Zone

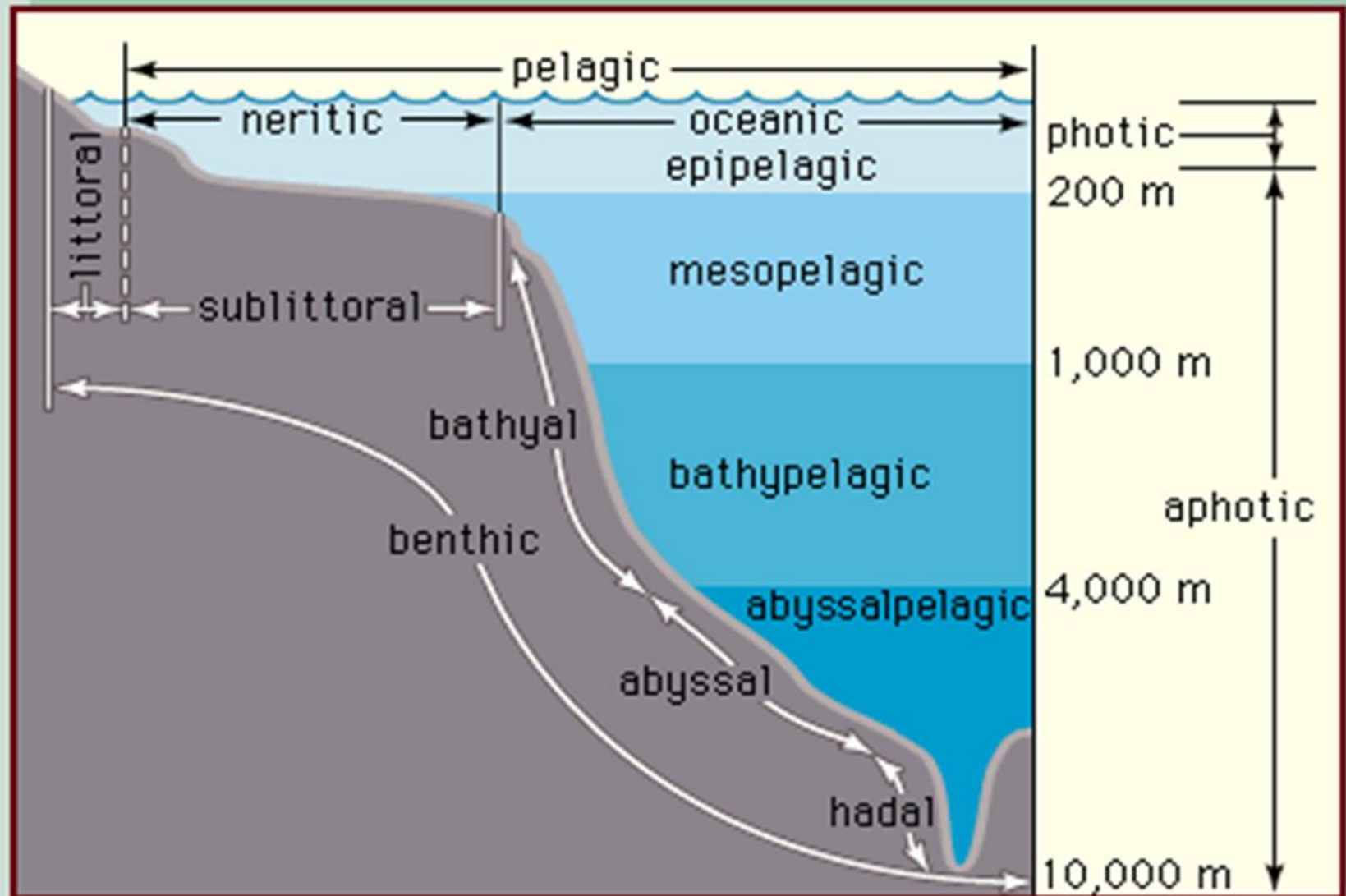
- ❑ The neritic zone can be partitioned based on tide levels. The upper band is known as the intertidal zone, encompassing the region from the wave splash zone to the low tide mark.
- ❑ The highest zone within the intertidal is known as the supra-littoral zone and is the area above the high tide mark that receives only wave splash and sea-water mist.



- Below the supra-littoral zone is the supra-littoral fringe, or "splash zone", which receives a regular splashing from waves at high tide.
- The next zone is the mid-littoral zone, which includes the majority of the intertidal zone and receives periodic exposure and submersion by tides.

- The lowest zone, the infra-littoral zone, includes the lowest levels exposed by extreme spring tides and extends into the subtidal zone, marking the beginning of the marine environment.

# Oceanic Zone



- Water deeper than 600 feet is called the oceanic zone, which itself is divided on the basis of water depth into the epipelagic, mesopelagic, bathypelagic and abyssopelagic zones.



- The oceanic zone is subdivided into the epipelagic, mesopelagic, and bathypelagic zones and Abyssopelagic zone.

### Epipelagic (euphotic) zone:

- The epipelagic zone (or upper open ocean) is the part of the ocean where there is enough sunlight for algae to utilize photosynthesis (the process by which organisms use sunlight to convert carbon dioxide into food). Generally speaking, this zone reaches from the sea surface down to approximately 200 m (650 feet)



# Mesopelagic Zone

- The mesopelagic zone (or middle open ocean) stretches from the bottom of the epipelagic down to the point where sunlight cannot reach.
- Generally speaking the deep end of the mesopelagic zone is approximately 1000 m (3300 feet) deep.
- The mesopelagic zone is much larger than the epipelagic, and the most numerous vertebrates on Earth (small bristle mouth fishes) live in this zone.

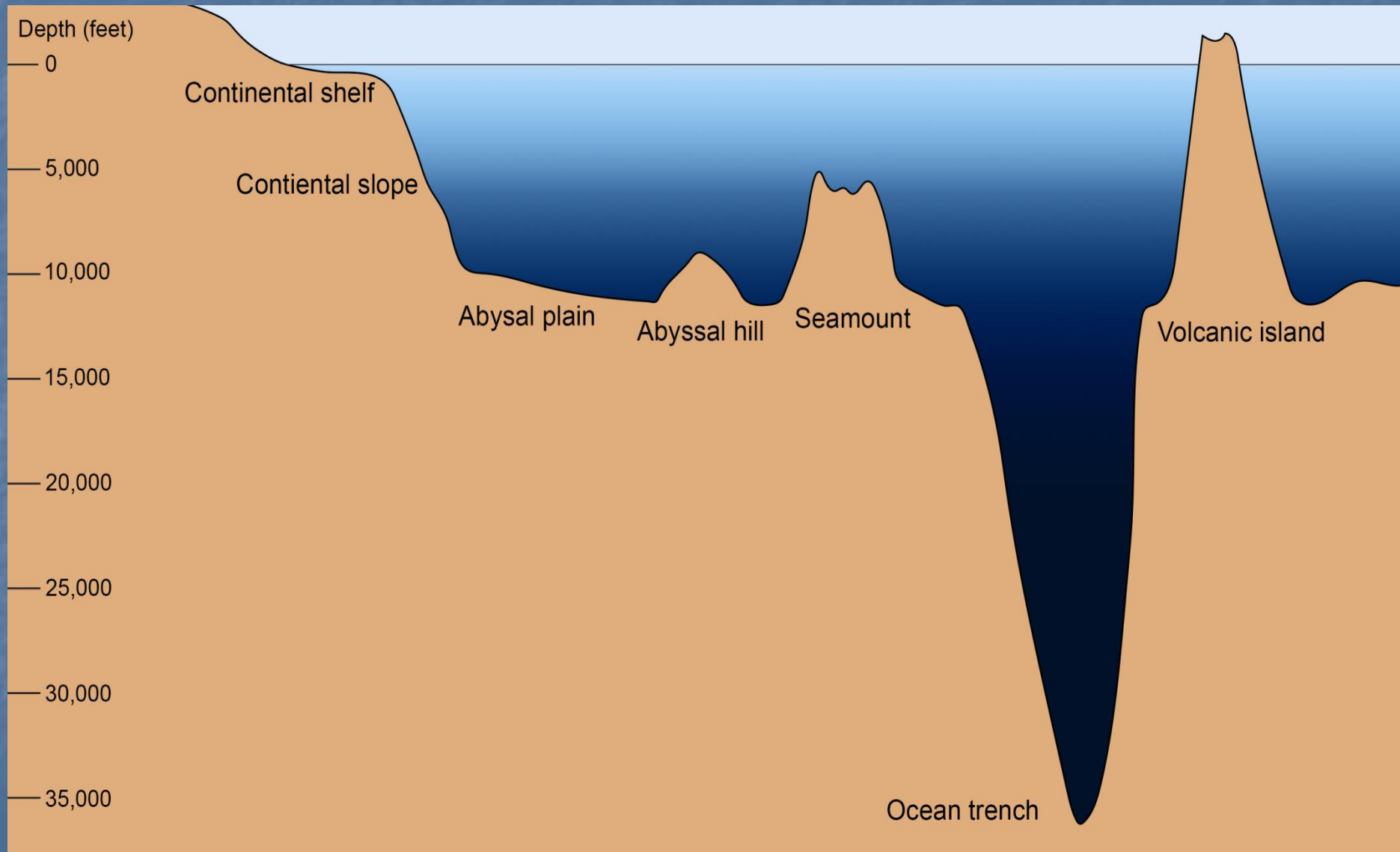
# Bathypelagic zone

- This zone starts at the bottom of the mesopelagic and stretches down to 4000 m (13,000 feet).
- The bathypelagic is much larger than the mesopelagic and 15 times the size of the epipelagic. It is the largest ecosystem on earth.
- The upper bound of this zone is defined by a complete lack of sunlight. Organisms in the bathypelagic live in complete darkness

# Abyssopelagic zone

- Abyssopelagic zone stretches from the bottom of the bathypelagic to the seafloor. This zone is characterized by a relative lack of life. It truly is the abyss (a deep or seemingly bottomless chasm)

# Bottom Features of Ocean





## Shore:

- The section of land seaward of the coast: extends from highest level of wave action during storms to the low water line.
- The strip of land bordering any volume of water which is alternatively exposed/covered by tides and/or waves.

## Shore line:

- The line making the intersection of the water surface with the shore. Migrates up & down as the tide rises and falls.

## Coast:

- It extends from the landward limit of the shore inland as far as features that seem to be related to marine processes found.
- The width of the coast may vary from less than one km to many tens of km.

## Coast line:

- Landward limit of the highest storm waves effect on the shore.

## Beach:

- Sediment seaward of the coastline through the surf-zone I.e. in transport along the shore and with in the surf zone.
- Surf zone:** The region between the shore line & the line of breakers, where most wave energy is released.
- Beach extends from coast line to low tide line of breakers.

## Fore shore & Back shore:

Foreshore: The portion of the shore lying between the normal high & low water marks-the intertidal zone.

- The portion exposed at low-tide and submerged at high tide.
- The slopping section of the beach below the berm & upper the lower mark.



## Backshore:

- Extends from normal high tide shore line to the coast line.

## Near shore zone:

- The region between the low tide shoreline & breakers.

## Off shore zone:

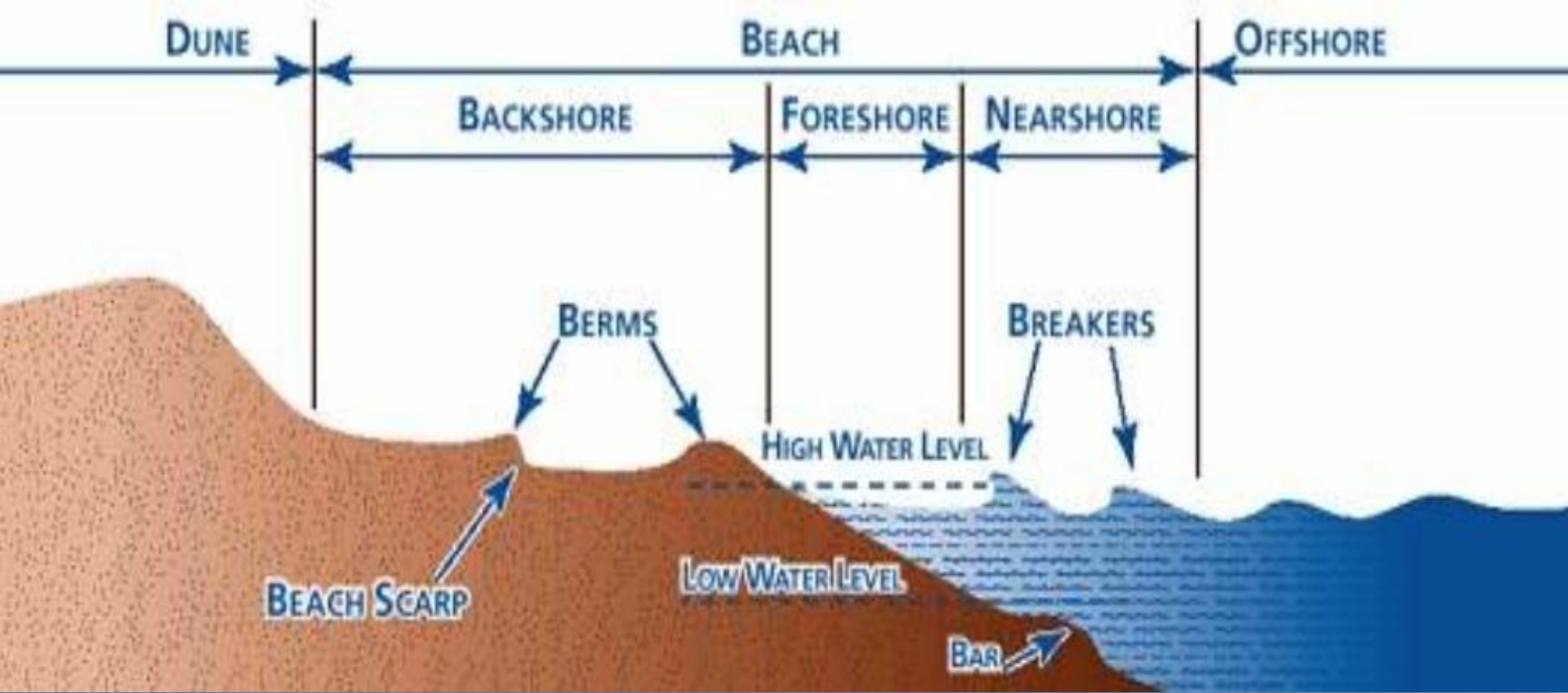
The region beyond the low tide breakers.

- Comparatively flat, submerged zone of variable width extending from the breaker line to the edge of continental shelf.

## Breakers zone:

- The region where waves break at the seaward margin of the surf zone.

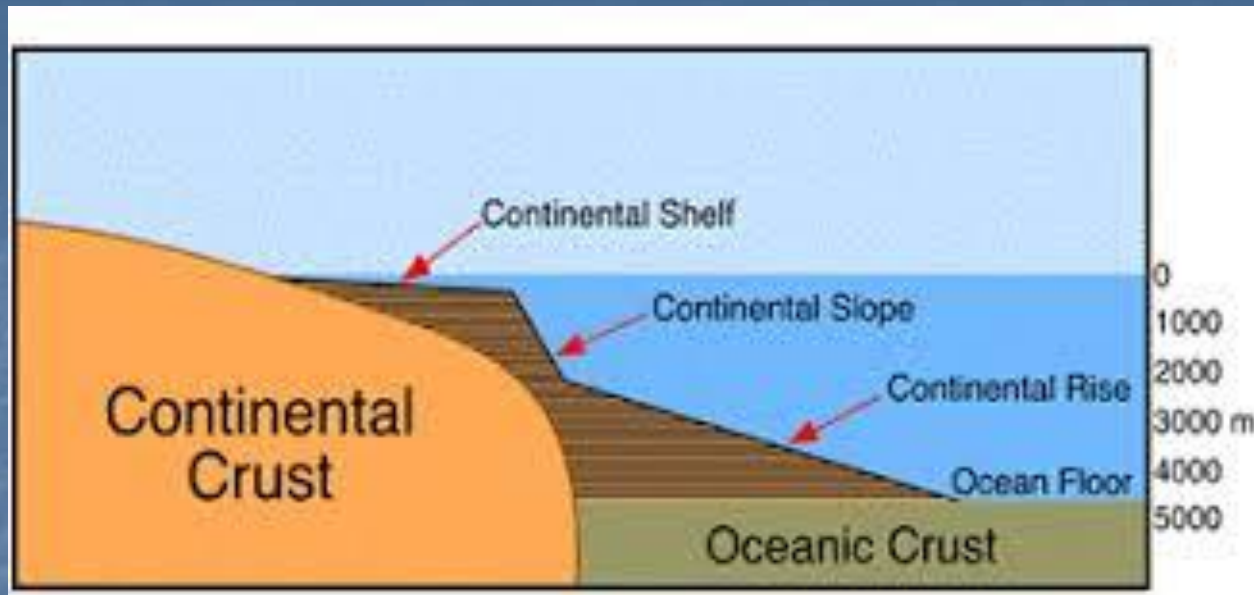




## BERM & SCARP:

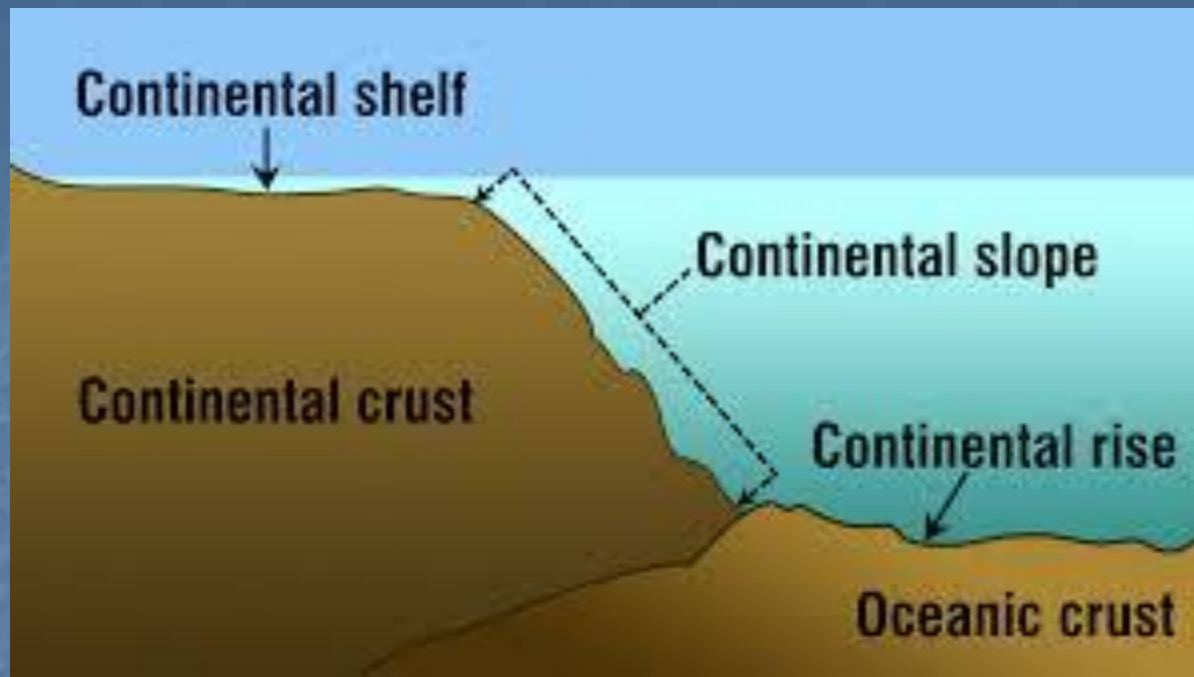
**Berm:** The horizontal depositional part of the beach inside the sloping fore shore.

**Scarp:** In some cases, the berm will be a ridge with a reverse slope into the back shore forming a scarp.



## Continental Shelf

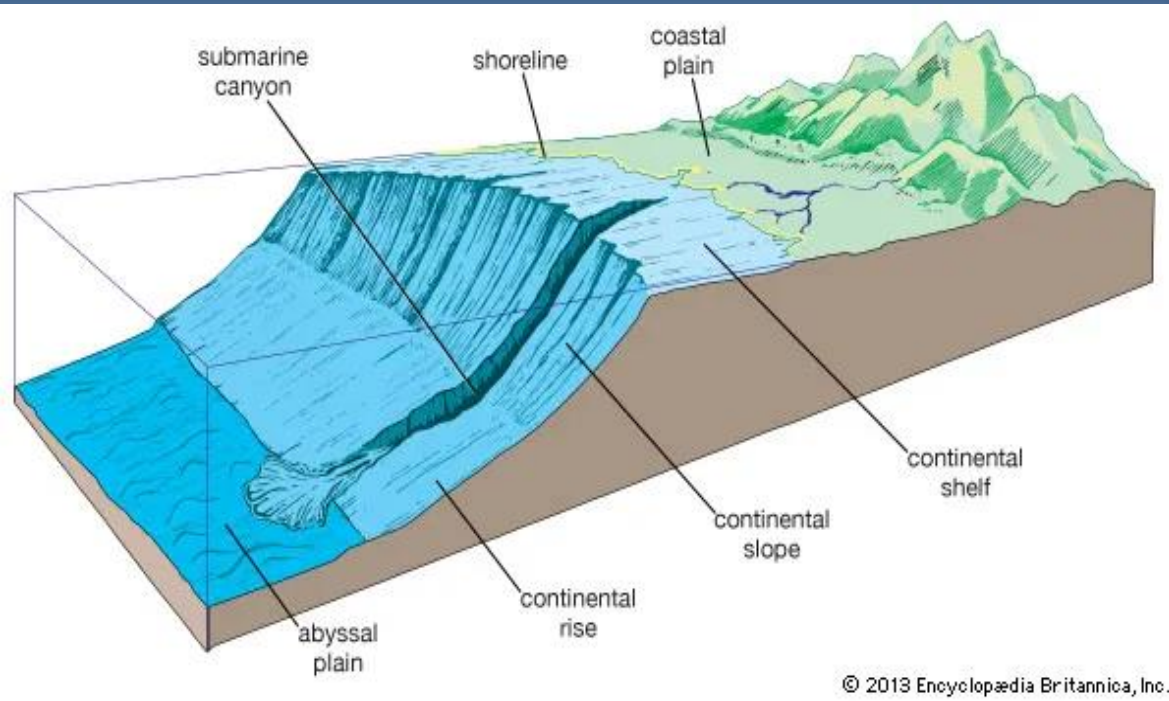
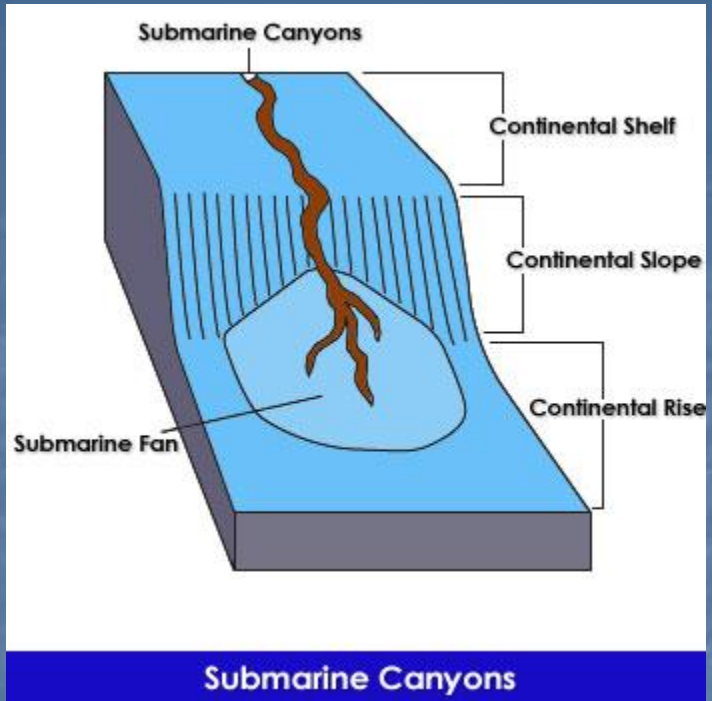
- Continental shelf is defined as a shelf like zone extending from the shore to a point at which a marked increase in slope occurs (to a depth of about 200m).
- Continental shelf constitute 5% of the earth's surface and about 8% of total sea area.



## Continental Slope

- The steeper slope beyond the continental break.
- Steepness from 1-25degree & avg. about 4degree.
- Slope in Pacific is more than in the Atlantic and Indian ocean.





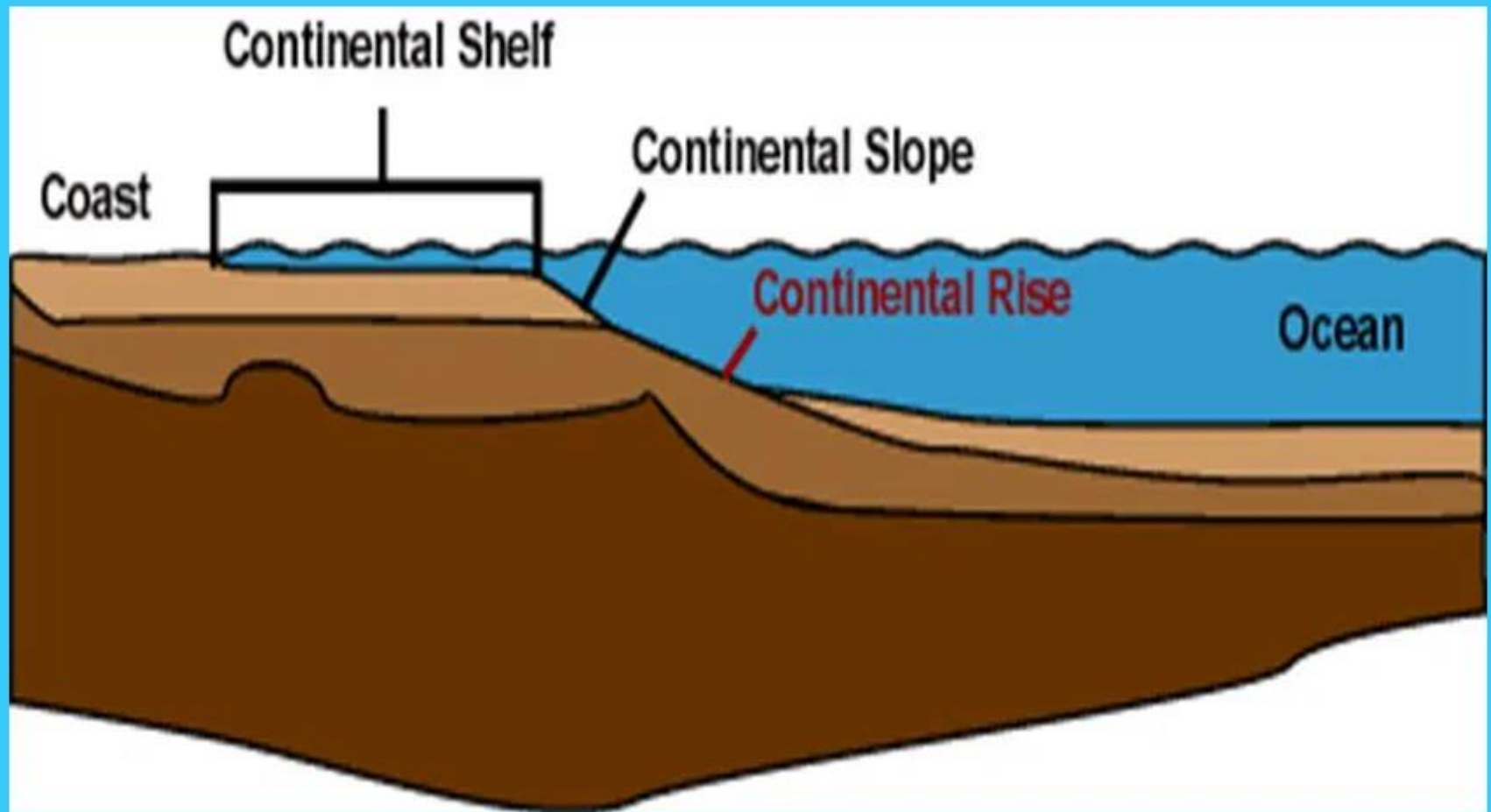
## Submarine Canyons

- The canyons are the erosional features.
- No canyons are present where the slope is less than 3degree.

**Fan:** A gently sloping fan shaped feature normally located at the lower end of the canyons.



# Continental Rise



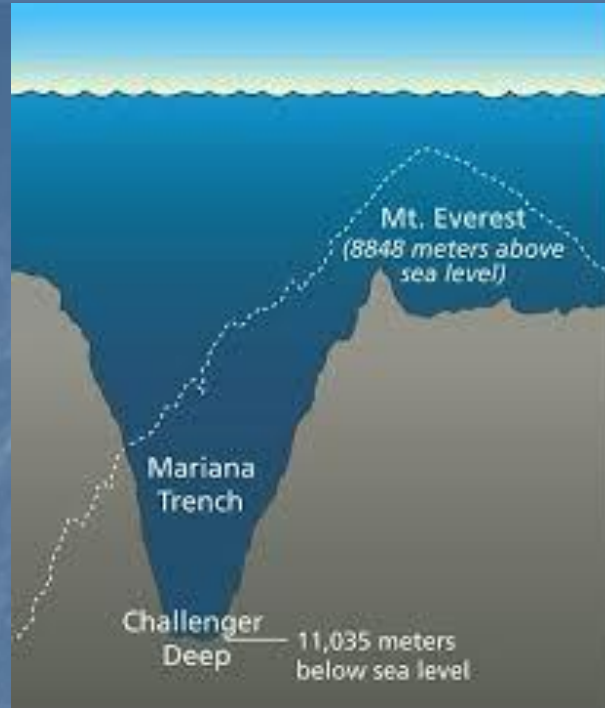
## Continental Rise and Ridge:

- Deep sea fans accumulate as deposits at the mouths of submarine canyons along the base continental slope and finally develop to the continental rise.
- A major factor in shaping the Continental rise is the strong western boundary under current (WBUC) or slope current that flows towards the equator.
- This strong WBUC picks up volcanic debris and sediments from the turbidity flows and forms a deposits above the ocean floor.
- When the rate of deposition increases, the deposits formed ridge.

## Deep ocean basins:

**Abyssal plains**- the flat surface of slope less than 1:1000 covering extensive from the base of the C rise is known as the Abyssal plains.

- Abyssal plains are occasionally interrupted by volcanic peaks.
- Peaks are called seamounts if height more than 1km above Abyssal plain.
- Smaller peaks are called abyssal hills.
- Most A. plain lie at depth of between 4500-6000m.

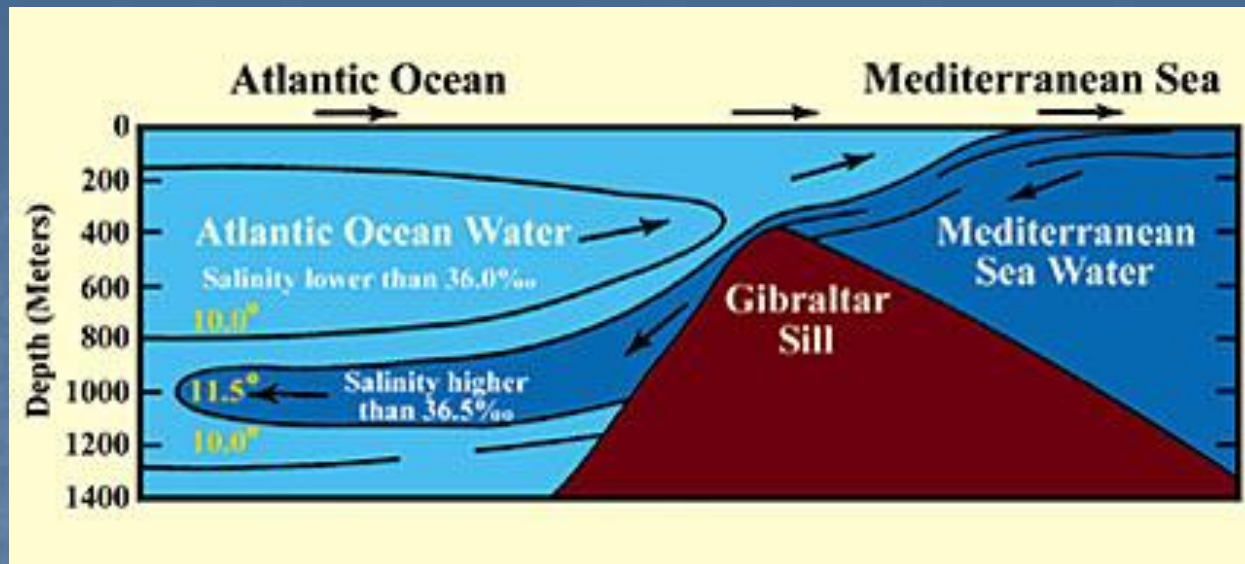


## Trenches:

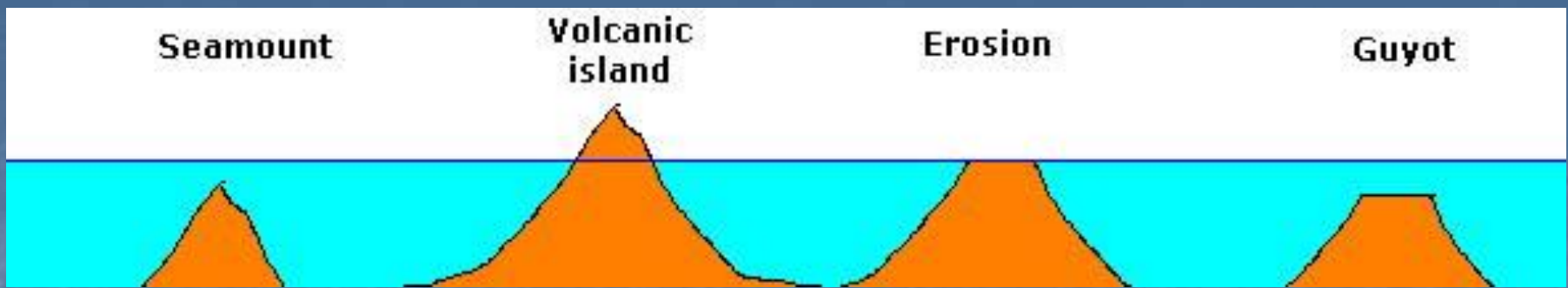
- Sometimes Continental slope descends into long narrow steep known as trenches.
- Deepest portion of World's oceans are found in these trenches. Mariana trench-11,034mt.

**Plateau:** An extensively raised area of the deep sea floor.





- **Sill:** A submarine ridge partially separating water bodies or two basins from each other or a basin from adjacent ocean.
- Sills are “a sea floor barrier of relatively shallow depth restricting water movement between basins” (IHO, 2008). Thus every basin has a sill, over which fluid would escape if the basin were filled to overflowing.



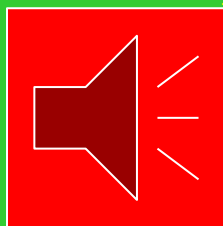
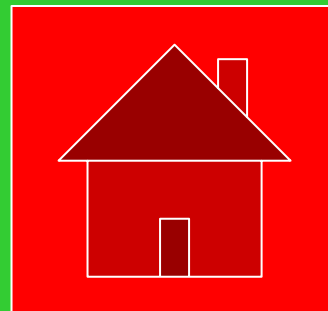
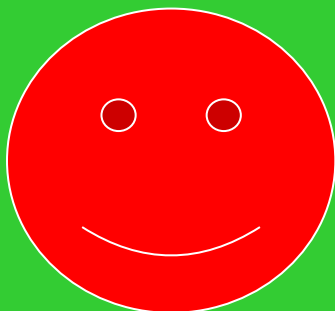
**Seamounts:** These are volcanos not reaching to sea level having sharp conical peaks. Individual peak extending over 1000m above the ocean floor. Chain of mountains is called seamounts.

**Gugot:** These are volcanic features on the ocean floor having a relatively flat surface.

**Basin:** A depression at the sea floor more or less circular or elliptical of any dimension.

**Trough:** Depressions in the seafloor having flat bottom.

**Dome:** Single elevations of height exceeding 200mts with steep sides.



**THANK  
YOU**