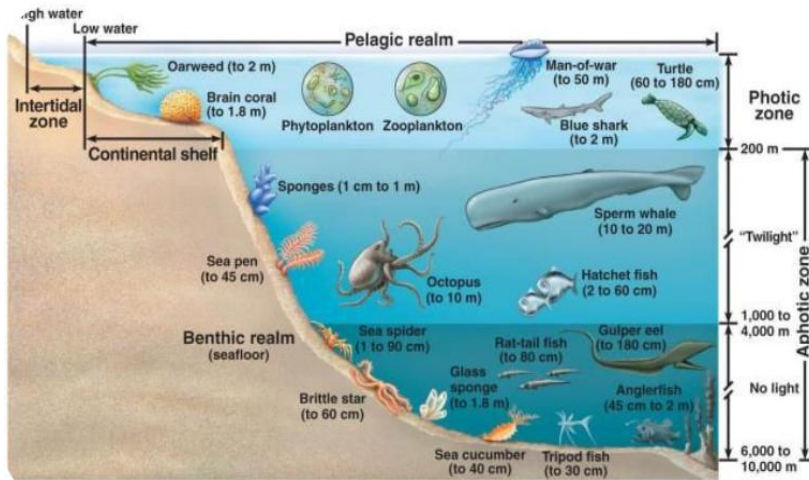


Introduction to Marine Environment



Oceans Provide Ecological & Economic Resources

- **The world's oceans occupy most of the Earth's surface and provide many important ecological and economic services**
- **About 70% of the surface of the earth is covered by salt water, freshwater covers only about 1% of the earth's surface. By volume, 97% of all water is in the oceans.**

Natural Capital

Marine Ecosystems

Ecological Services

Economic Services

Climate moderation

CO₂ absorption

Nutrient cycling

Waste treatment and dilution

Reduced storm impact (mangrove, barrier islands, coastal wetlands)

Habitats and nursery areas for marine and terrestrial species

Genetic resources and biodiversity

Scientific information



Food

Animal and pet feed (fish meal)

Pharmaceuticals

Harbors and transportation routes

Coastal habitats for humans

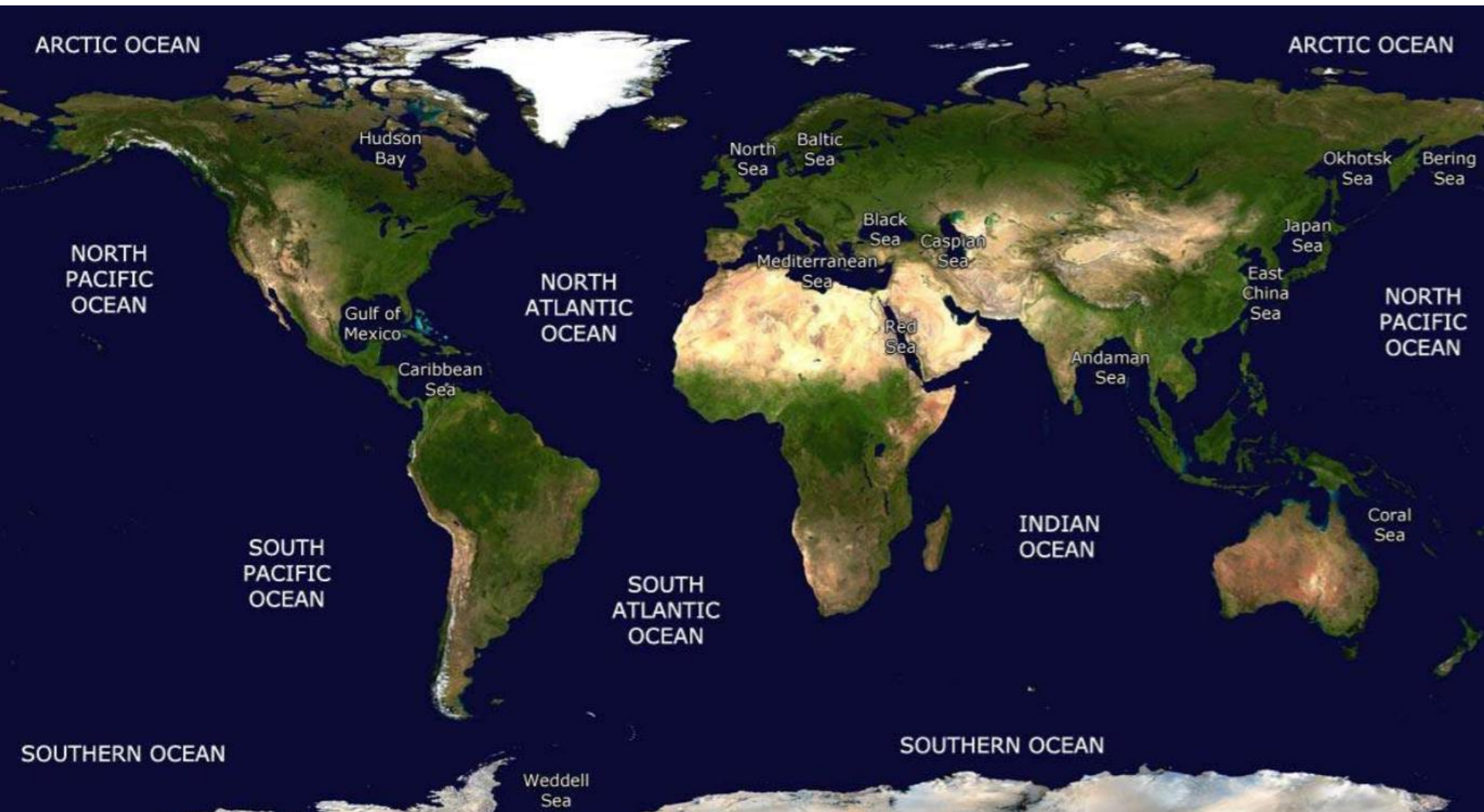
Recreation

Employment

Offshore oil and natural gas

Minerals

Building materials

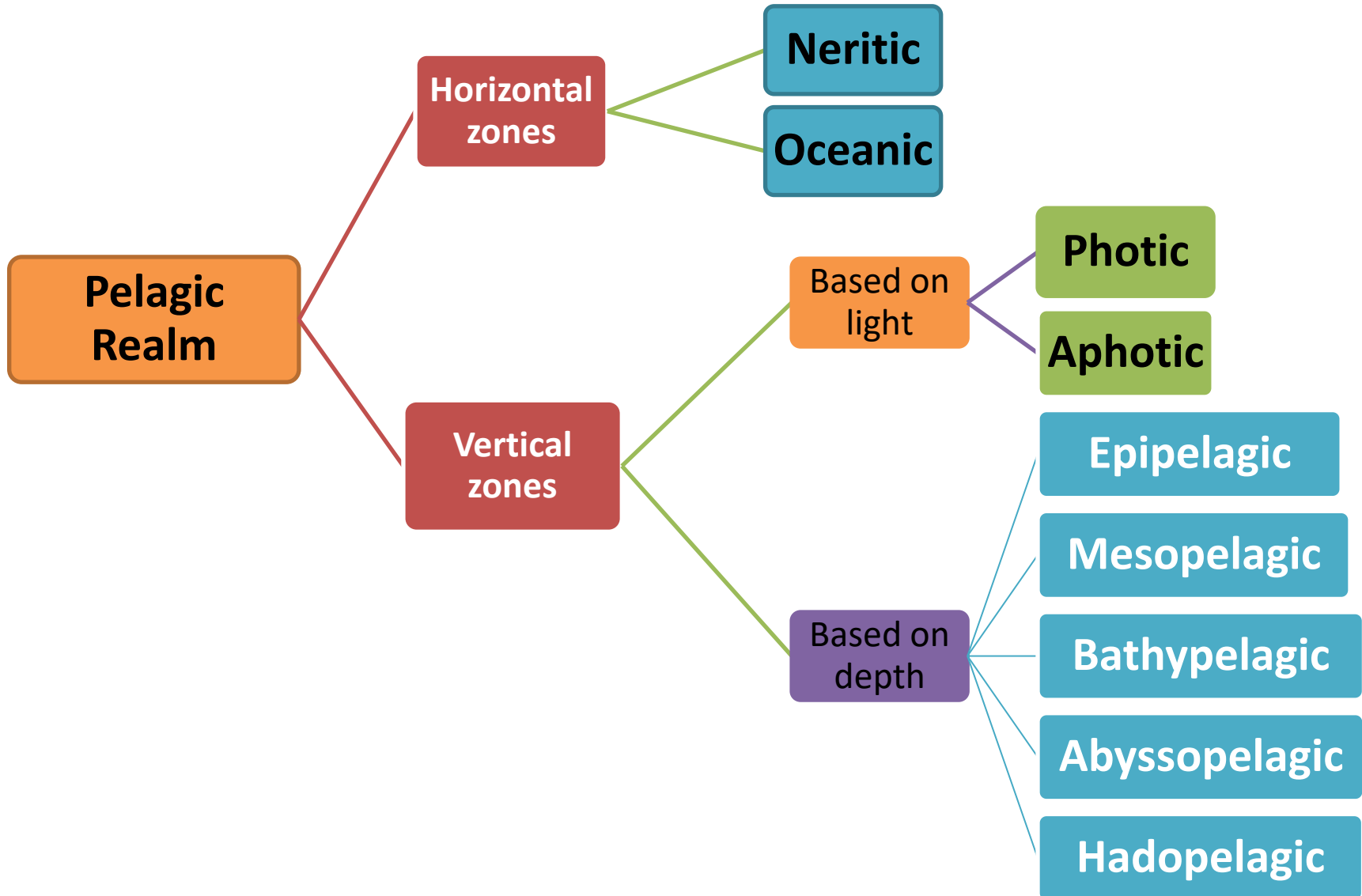


Zonation in Marine Environment/Ocean

Vertical and horizontal divisions (realms)

- **Pelagic realm** – entire area of open water. Pelagic organisms occupy the area away from the bottom. Has many zones.
- **Benthic realm** - organisms and zones of the ocean/sea bottom.
- **Demersal zone** - Just above the benthic zone. It is the part of the sea or ocean (comprising the water column that is near to the seabed and the benthos).

Pelagic Realms



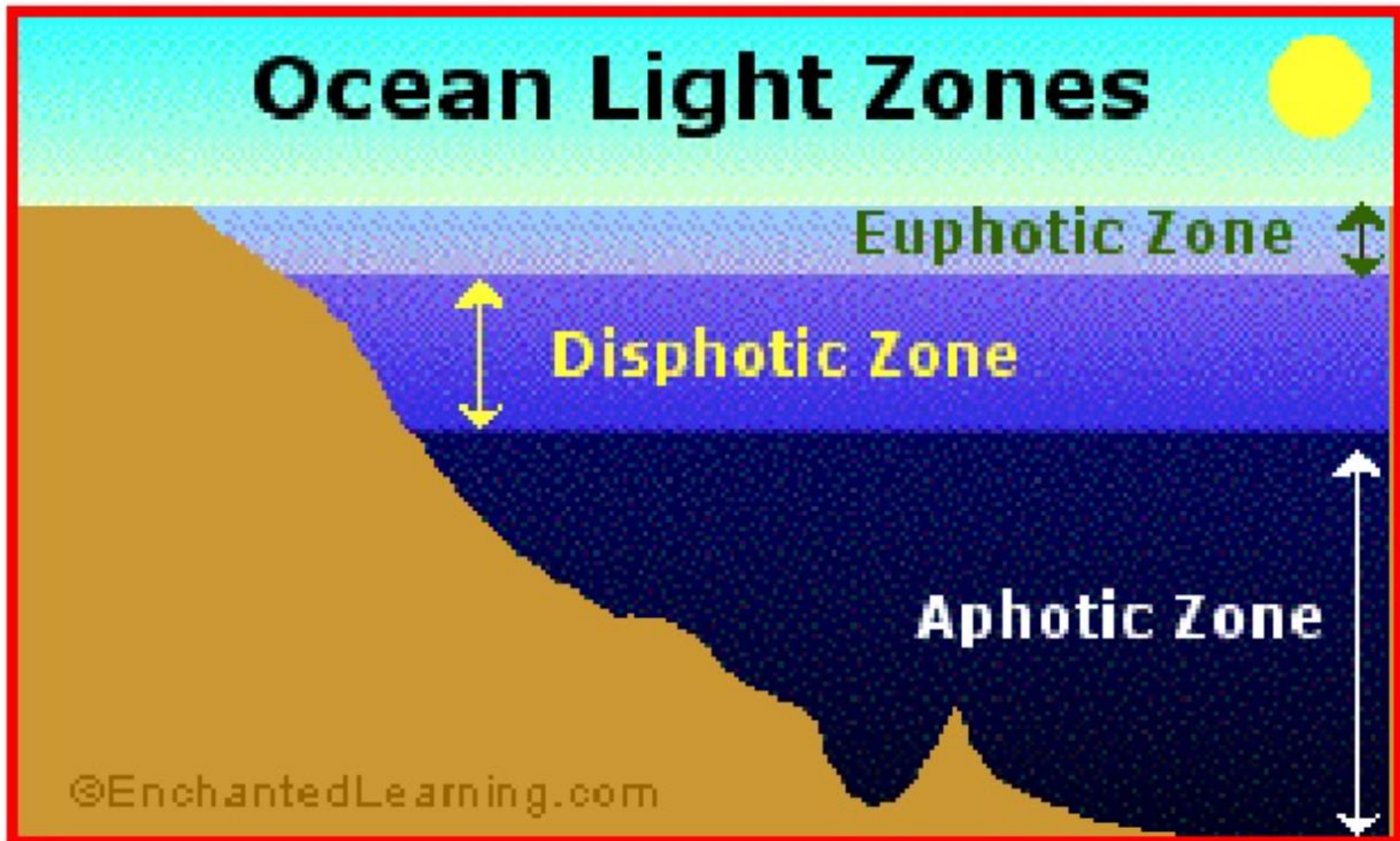
Ocean Light Zones



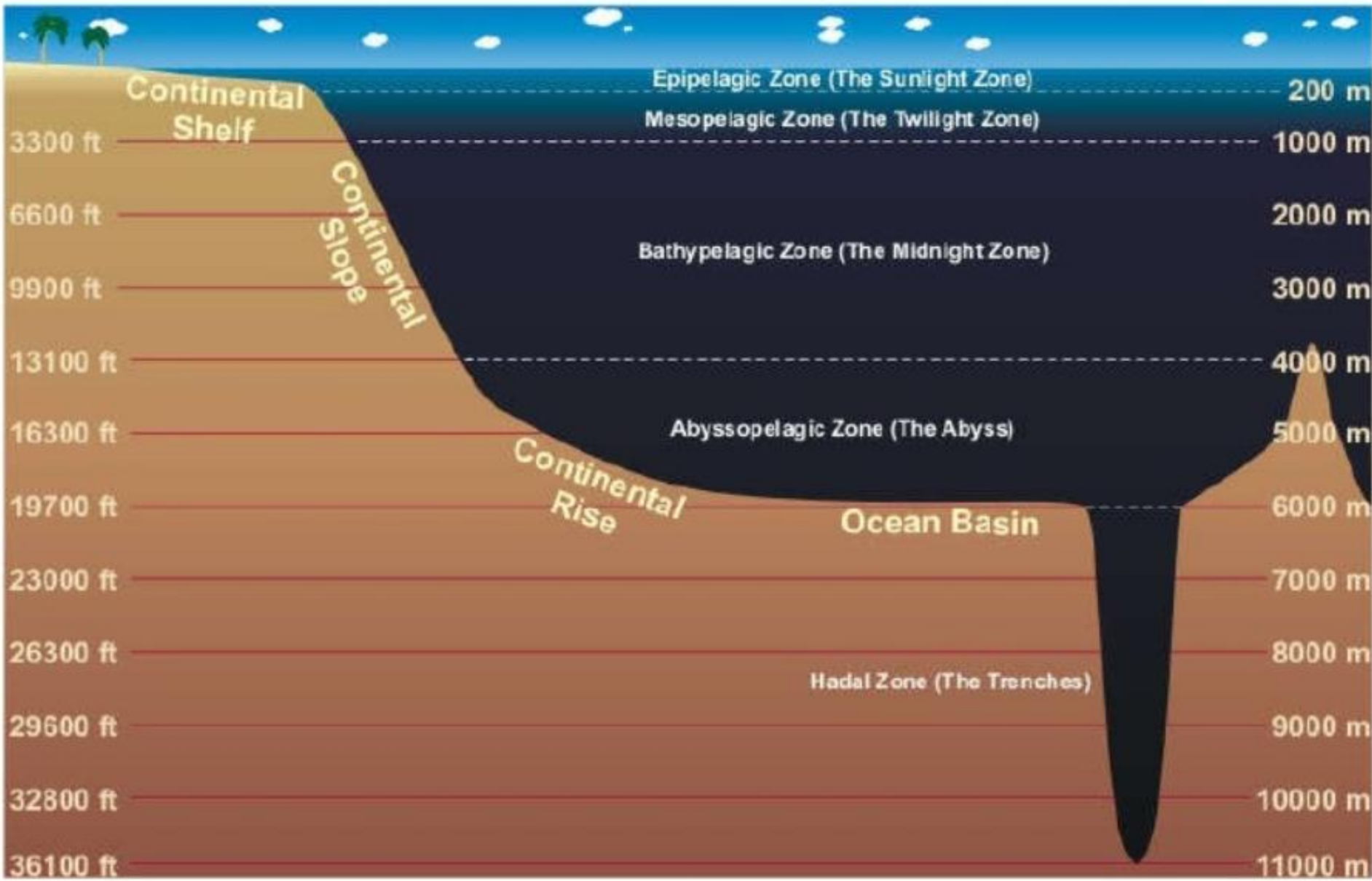
Euphotic Zone 

Disphotic Zone 

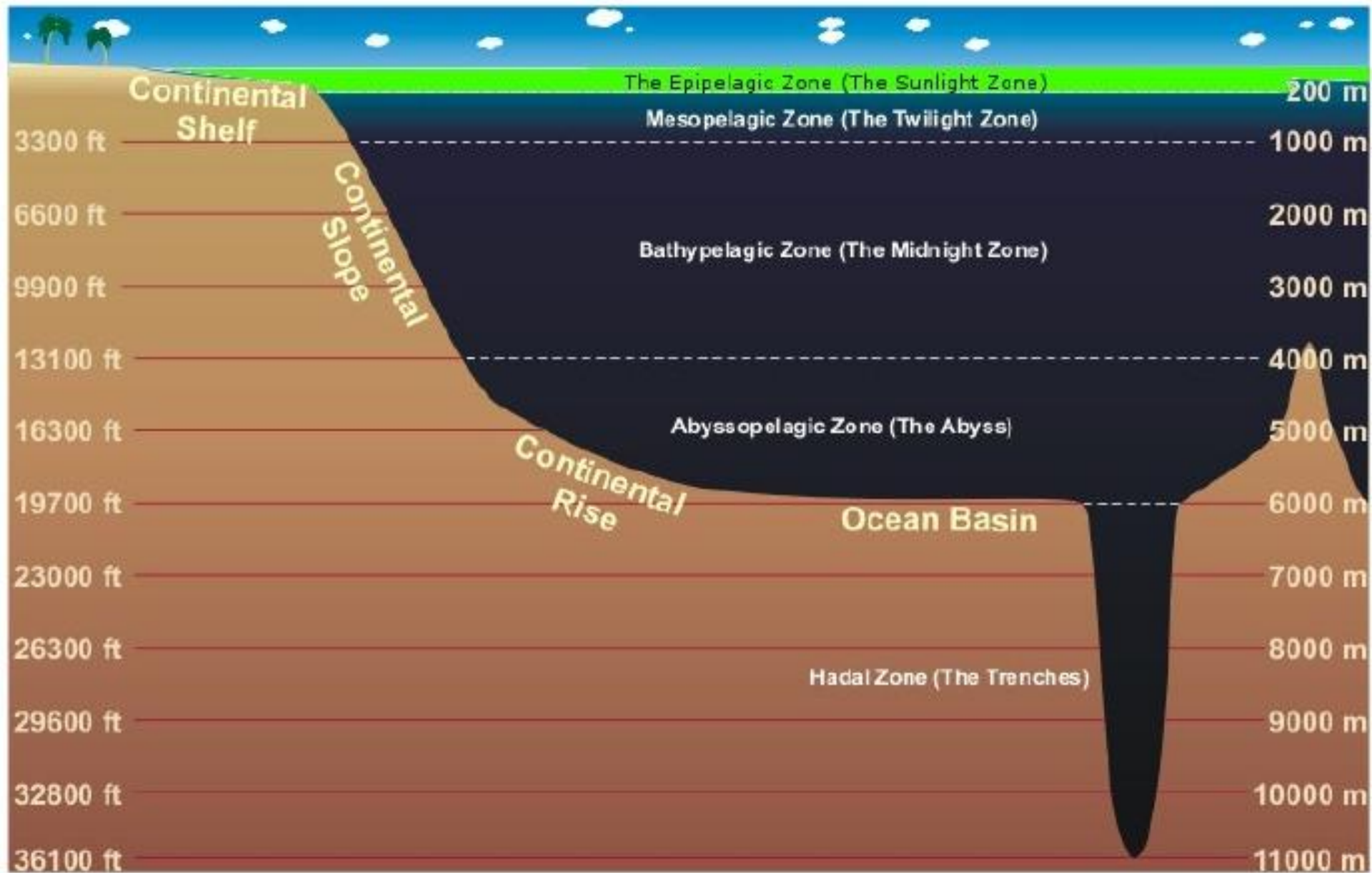
Aphotic Zone 

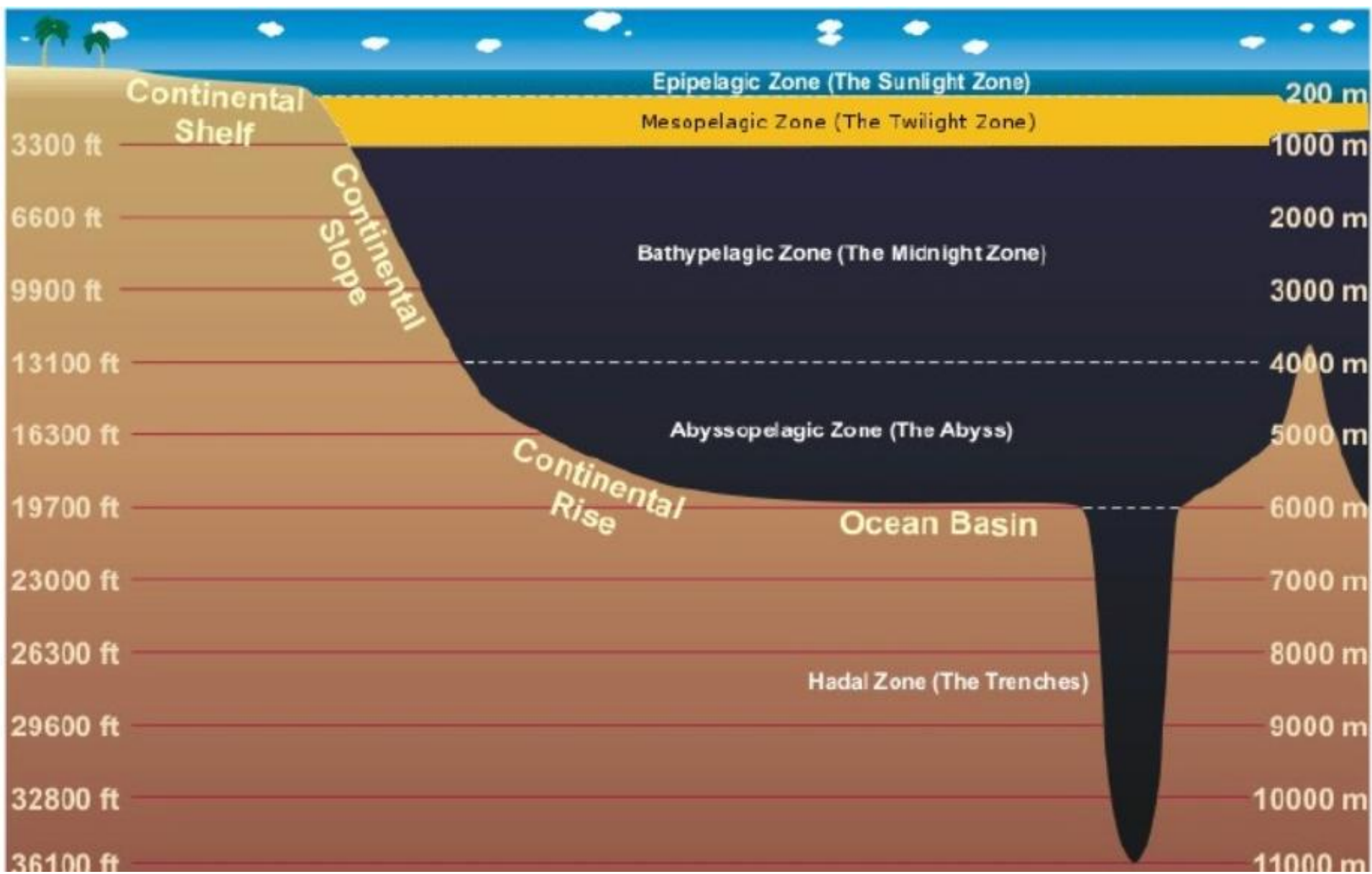


vertical zonation of the ocean depends on depth

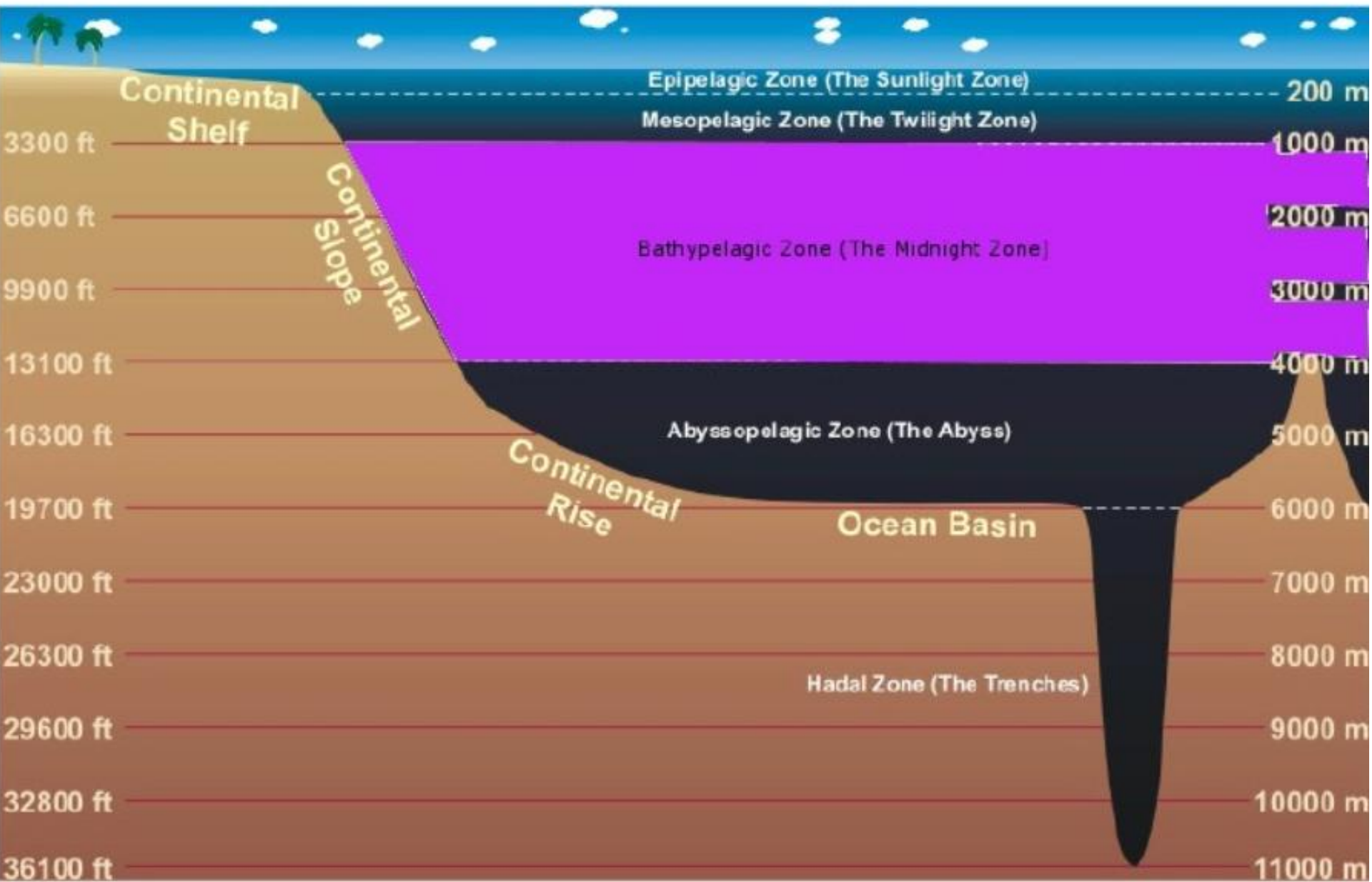


The Epipelagic Zone

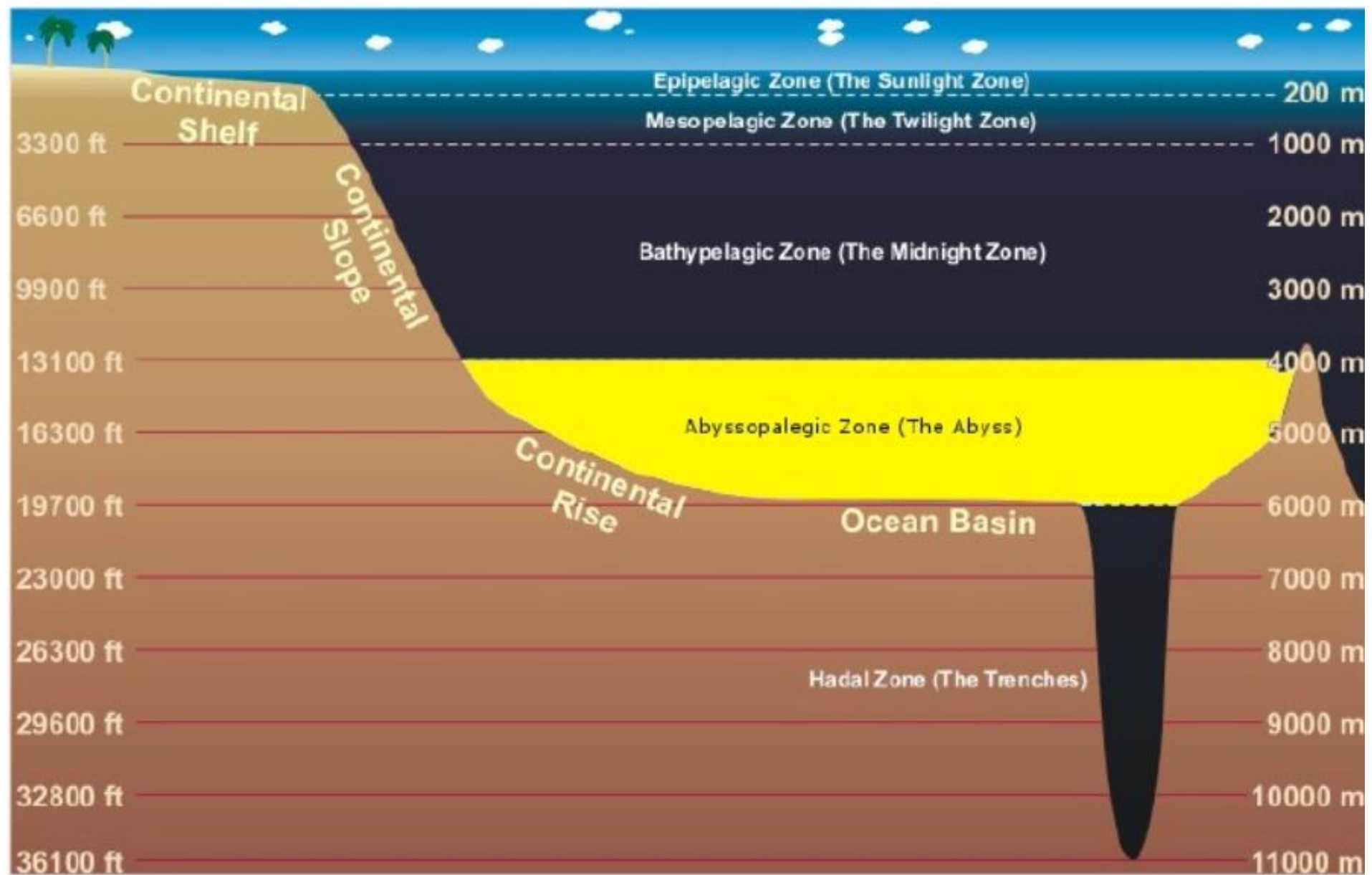




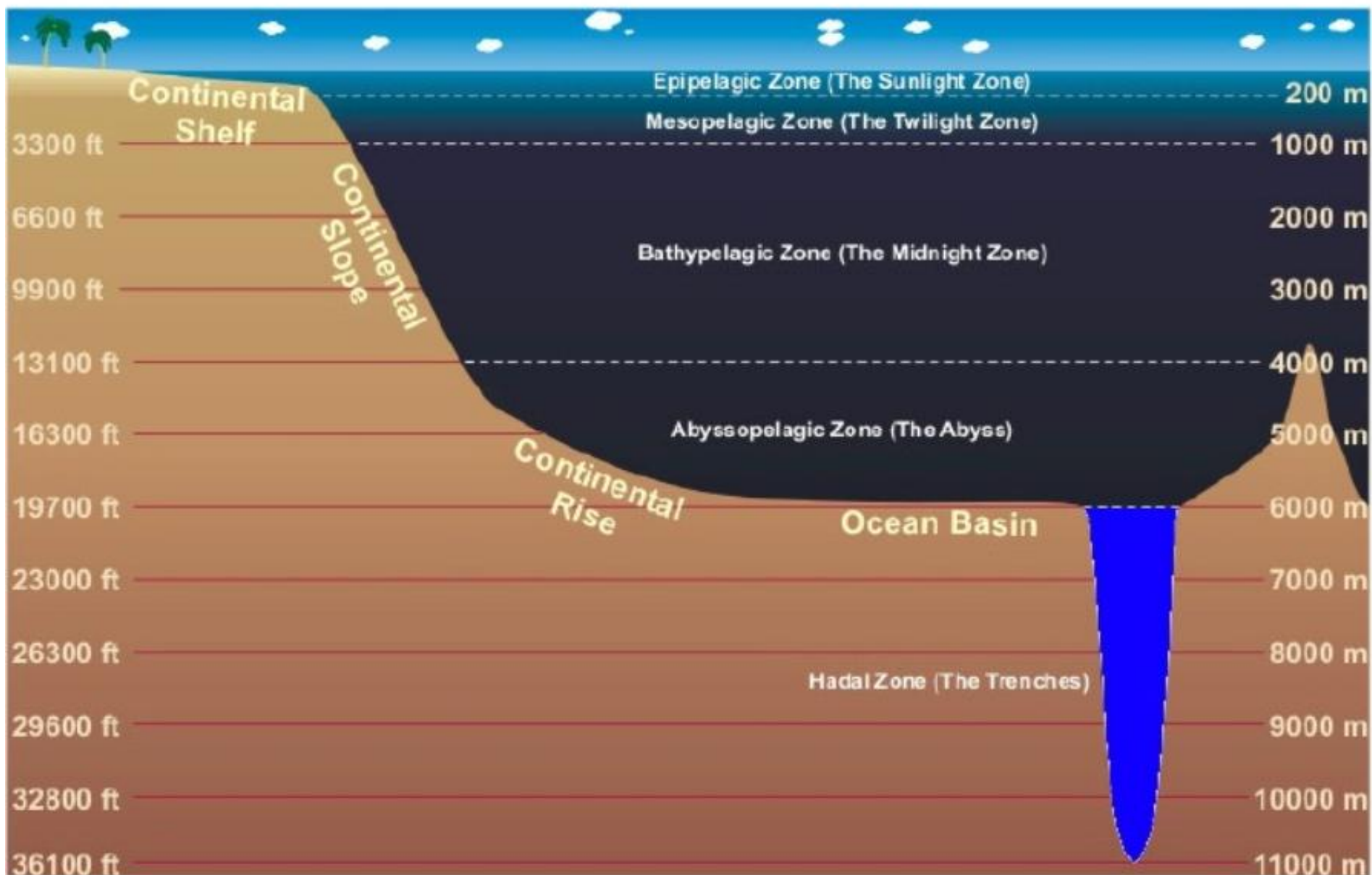
The Bathypelagic Zone



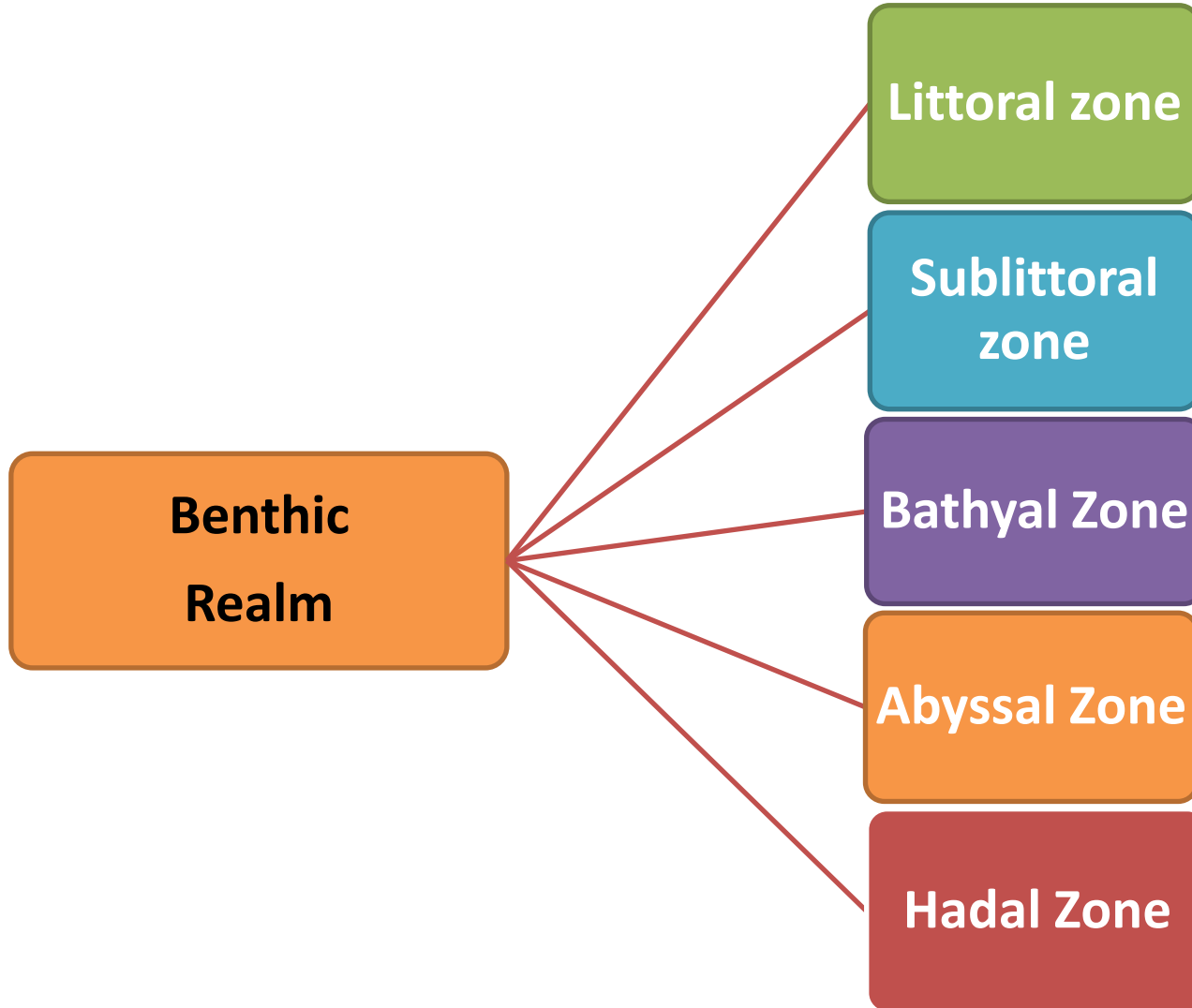
The Abyssopelagic Zone



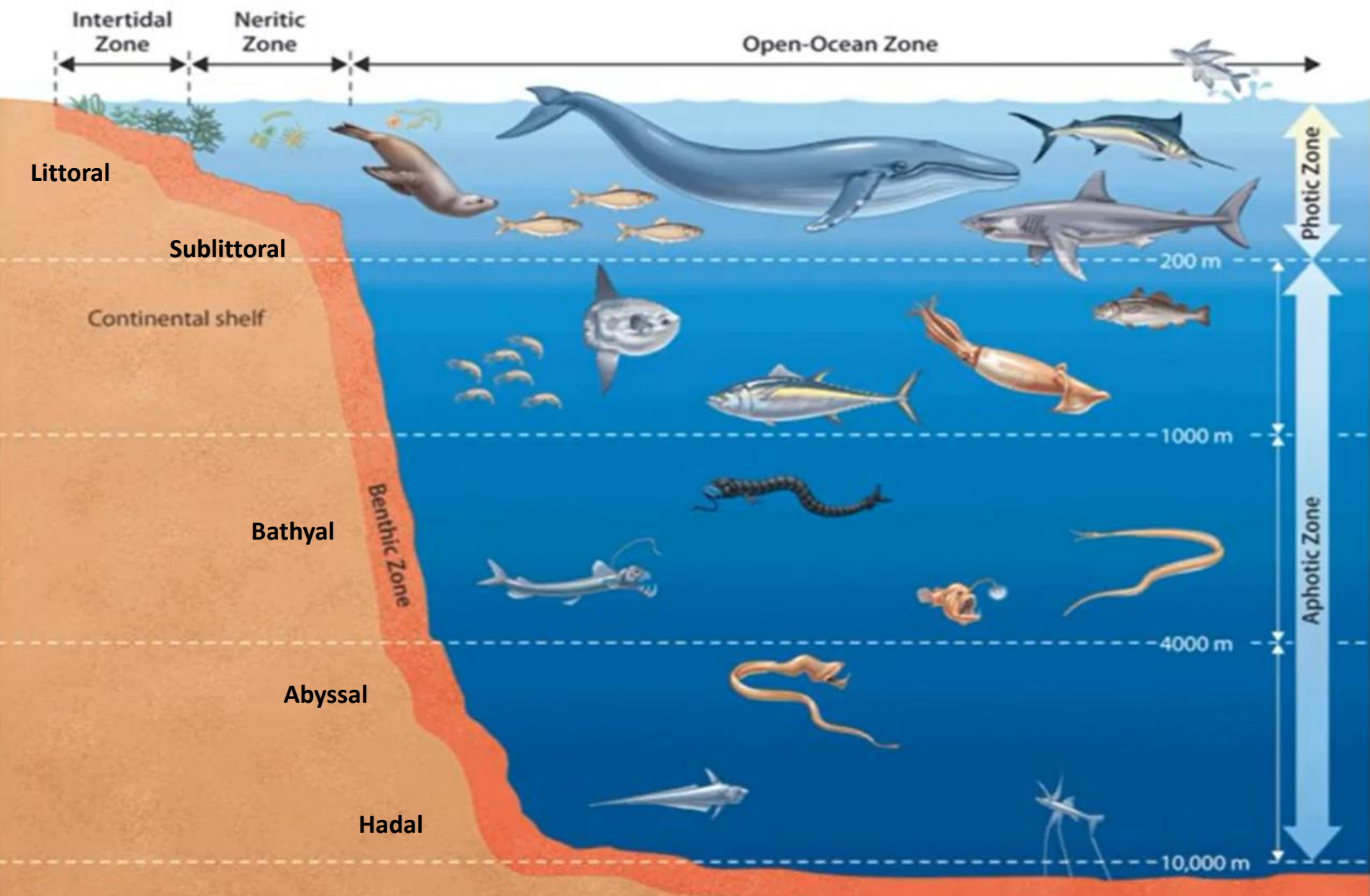
The Hadal or Hadopelagic Zone



Benthic Realm

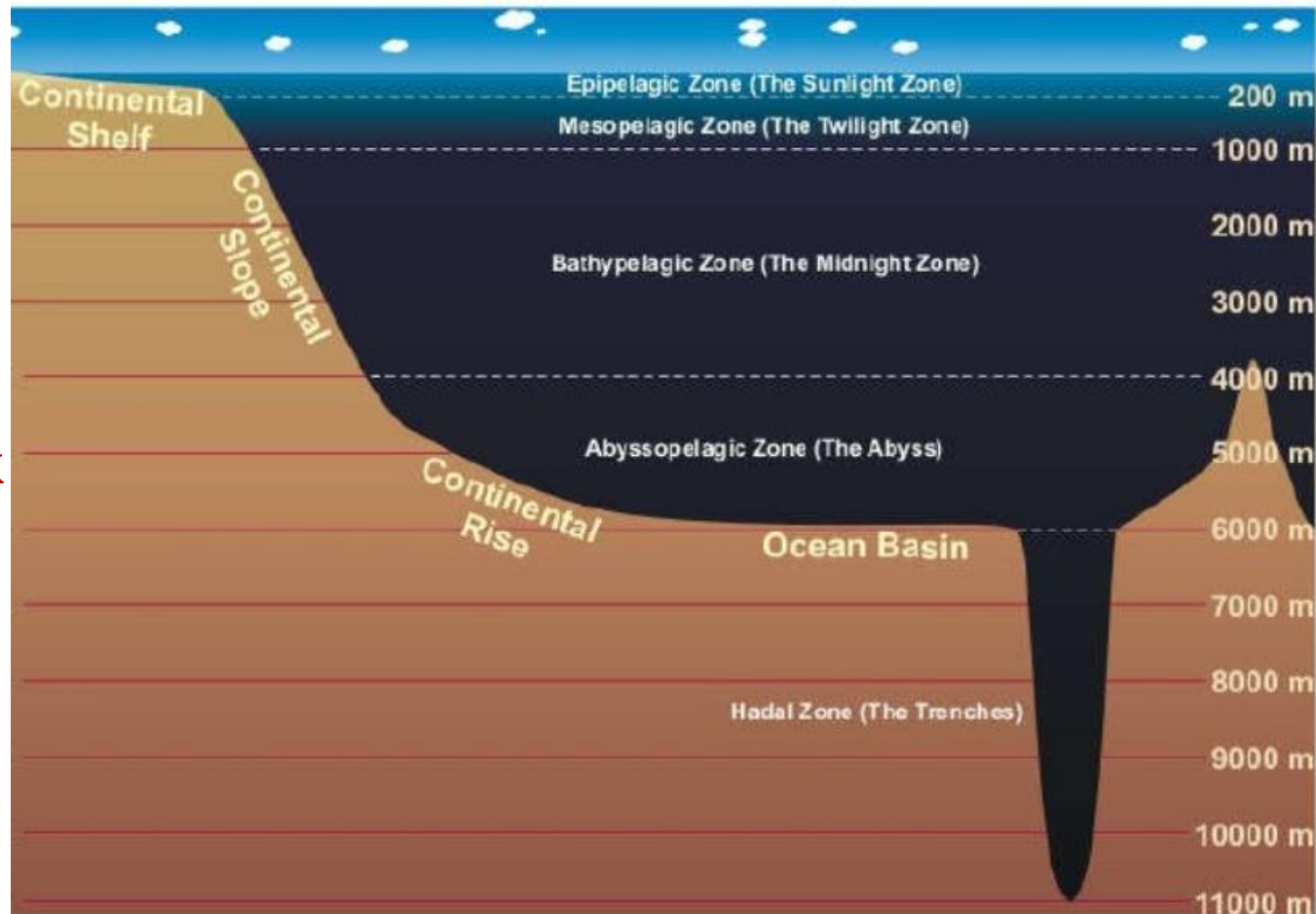


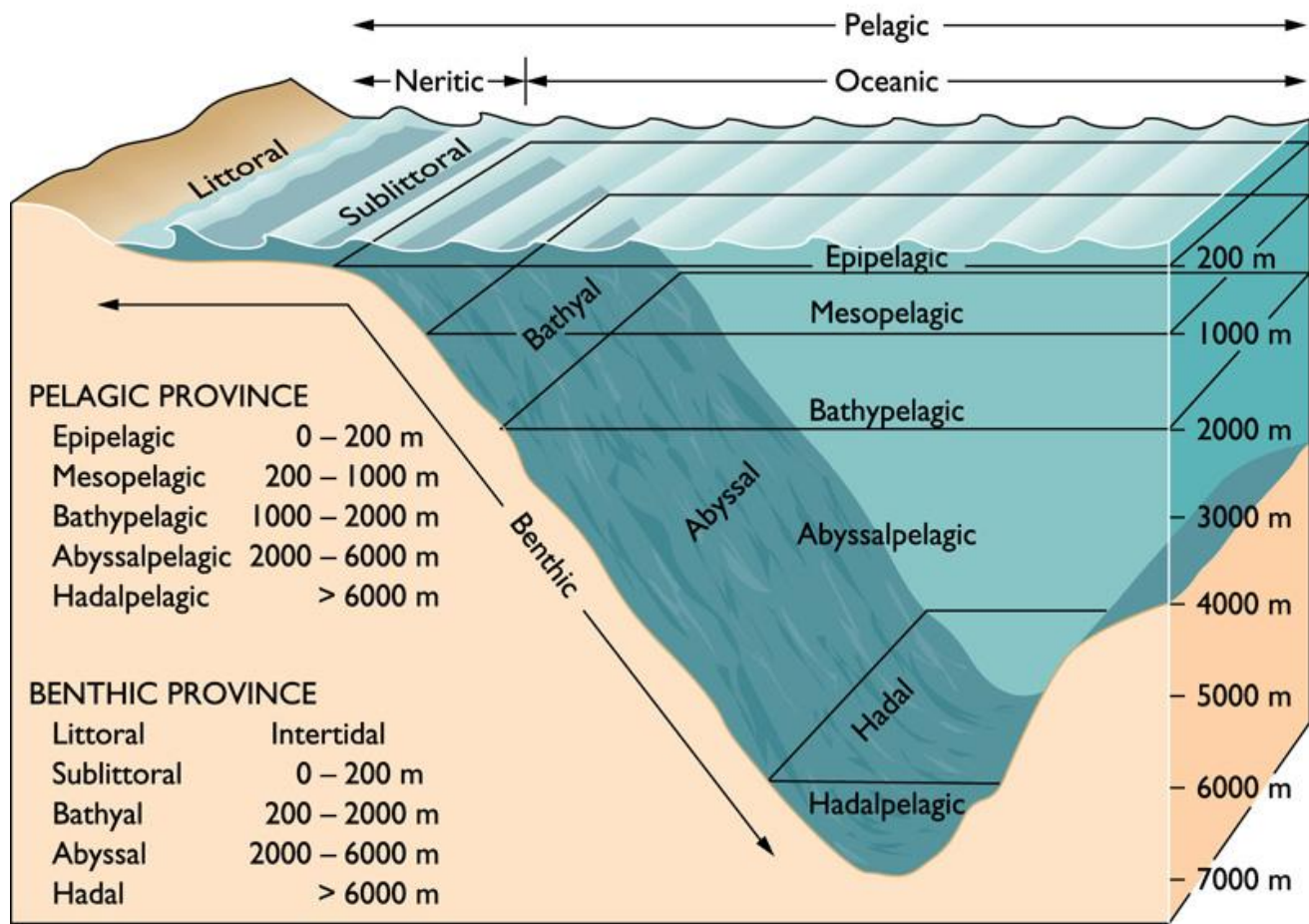
Ocean Ecosystems



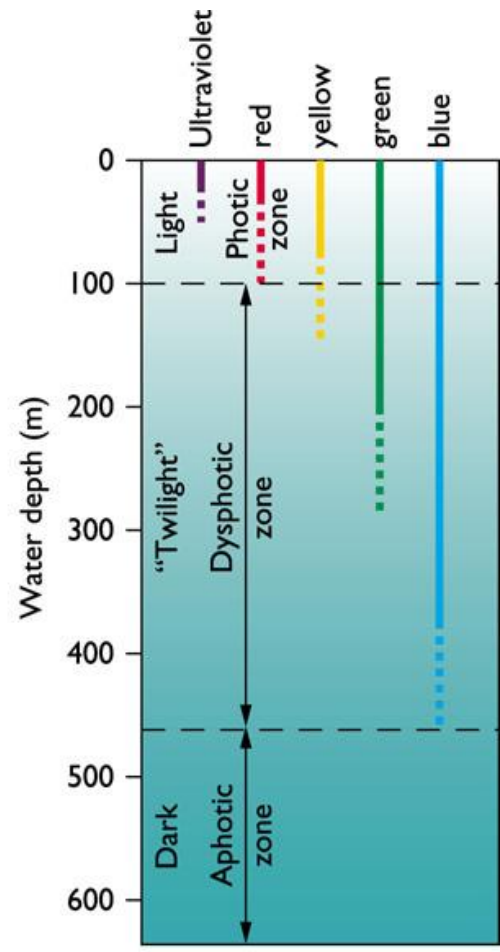
Benthic Realm

- Littoral
- Sub-littoral
- Continental Shelf
- Continental Break
- Continental Slope
- Continental rise
- Abyssal Plain
- Trench





(a) BIOZONES



(b) LIGHT ZONES