

TOPIC: INTRODUCTION TO AQUATIC BIOMES

Introduction to Aquatic Biomes

◆ **Aquatic Biomes:** covered by _____ and characterized by their physical & chemical _____.

▸ Aquatic biomes can be divided into _____ categories:

1) **Freshwater Biomes:** relatively _____ [salt] (usually < 0.1%).

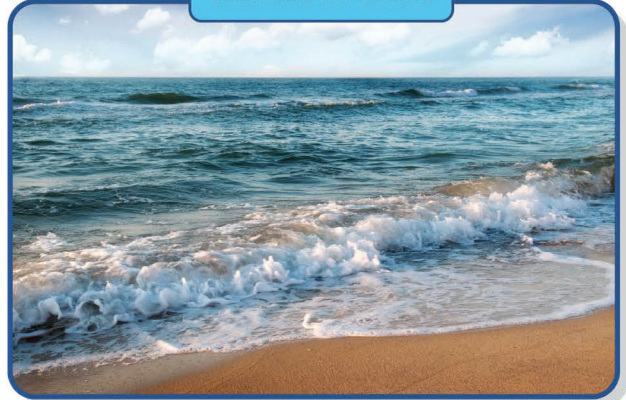
2) **Marine Biomes:** relatively _____ [salt] (usually ~3%).

Freshwater Biomes



Accounts for _____% of Earth's Water






Marine Biomes



Accounts for _____% of Earth's Water

EXAMPLE

Indicate if the following environmental factors of aquatic biomes are physical or chemical:

Factors	Physical or Chemical?	Factors	Physical or Chemical?
 Salinity	_____	 Light Intensity	_____
 Water Depth	_____	 Temperature	_____
 Nutrient & O ₂ Concentration	_____		

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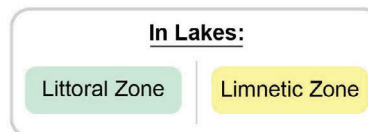
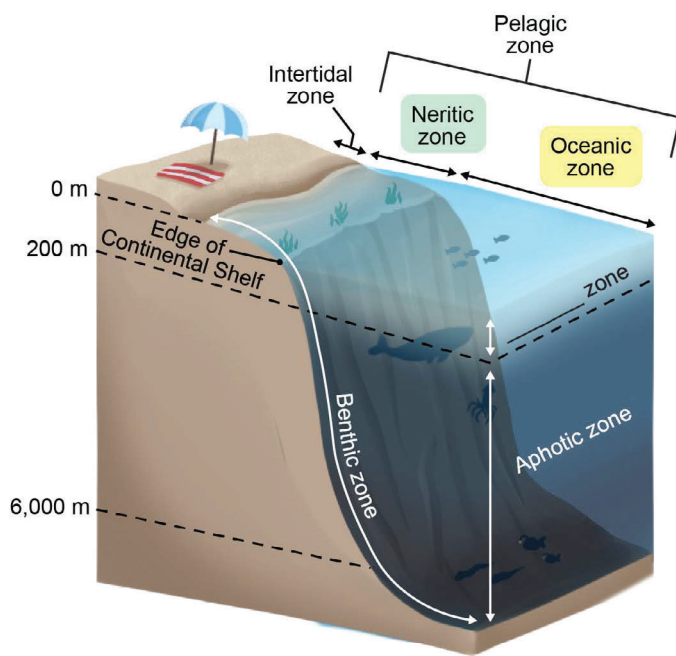
PRACTICE

Photosynthetic organisms in aquatic biomes tend to live near the surface, as there is more light availability. Is this constraint of light availability a physical or chemical factor?

- a) Physical.
- b) Chemical.
- c) Both.
- d) Neither.

Zonation in Marine Biomes & Lakes

- ◆ Marine biomes & lakes are physically & chemically divided into _____.
- Zones allow us to easily define & better understand aquatic habitats.



Neritic Zone: nearshore, shallow area between low tide & edge of continental shelf.

Oceanic Zone: offshore, deep water extending beyond continental shelf.

Pelagic Zone: all water in entire open ocean (Pelagic = Neritic + Oceanic).

Benthic Zone: entire ocean bottom.

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EXAMPLE

Indicate if the aquatic zones are found only in oceans (O), only in lakes (L), or in oceans & lakes (OL)?

Intertidal zone _____	Oceanic zone _____	Benthic zone _____
Photic zone _____	Aphotic zone _____	Neritic zone _____
Littoral zone _____	Limnetic zone _____	Pelagic zone _____
Continental shelf _____		

PRACTICE

In which of the following regions would you expect to find photosynthetic organisms?

- | | |
|---|--|
| a) Abyssal zone, benthic zone, & neritic zone. | c) Intertidal zone, photic zone, & neritic zone. |
| b) Intertidal zone, benthic zone, & neritic zone. | d) Littoral zone, aphotic zone, & intertidal zone. |

PRACTICE

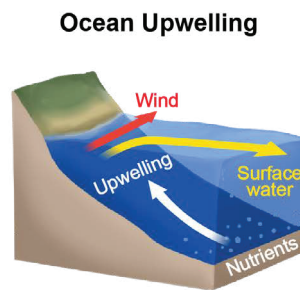
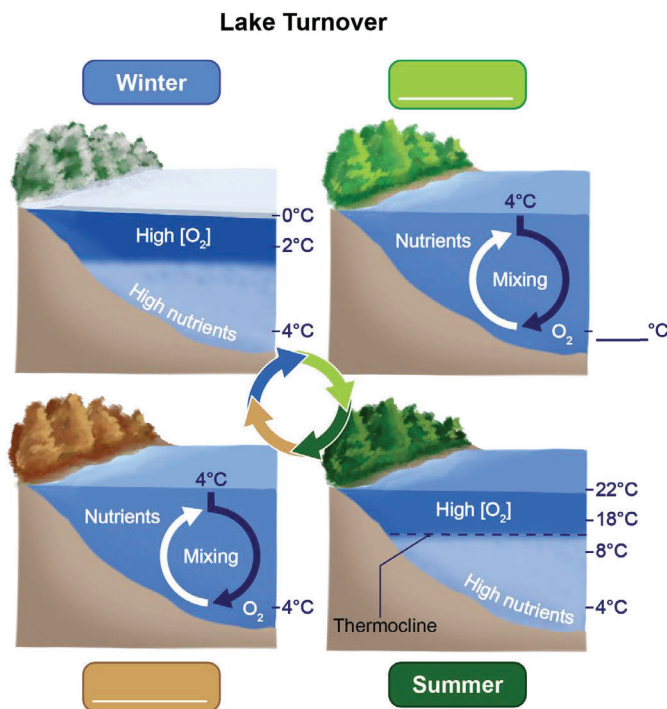
Detritus is organic matter produced by the decomposition of dead organisms. Considering that detritus tends to sink in water over time, in which ocean zone does detritus make up the base of the food chain?

- a) Photic zone because many organisms can photosynthesize and live here, producing organic matter.
- b) Intertidal zone because detritus is frequently washed up on shore by waves & tides.
- c) Aphotic/Benthic zones because photosynthesis cannot occur, but detritus falls to the ocean floor.
- d) All of the above.

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Seasonal Turnover & Ocean Upwelling

- ◆ In lakes/oceans, nutrients tend to _____ & O_2 becomes depleted at the bottom.
 - _____ processes help replenish nutrients in surface waters & O_2 in deeper waters:
- 1) **Seasonal Turnover:** the vertical _____ of water layers in a lake/ocean during spring & fall.
 - Mixing driven by changes in water _____ due to seasonal temperature fluctuations.
- 2) **Ocean Upwelling:** deep, cold, nutrient-rich water _____ to replace surface water moving along coast.



EXAMPLE

The occurrence of turnover in lakes relies on the fact that:

- a) Water is at its least dense at $4^{\circ}C$.
- b) Water is at its most dense at $4^{\circ}C$.
- c) Nutrients sink to the bottom of a lake/ocean over time.
- d) Oxygen sinks to the bottom of a lake/ocean over time.

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PRACTICE

How do the processes of turnover & upwelling benefit aquatic ecosystems?

- a) They allow photosynthetic organisms at the surface to receive more light.
- b) They allow photosynthetic organisms in the benthic zone to receive more light.
- c) They allow organisms at the surface to receive more nutrients.
- d) They allow organisms in the benthic zone to receive more nutrients.