

Lesson 3

# Aquatic Ecosystems

## Focus Question

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What are some examples and characteristics of aquatic communities?

# New Vocabulary

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sediment

littoral zone

limnetic zone

plankton

profundal zone

intertidal zone

pelagic zone

photic zone

aphotic zone

abyssal zone

benthic zone

wetlands

estuary

# Review Vocabulary

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**salinity:** a measure of the amount of salt in a body of water

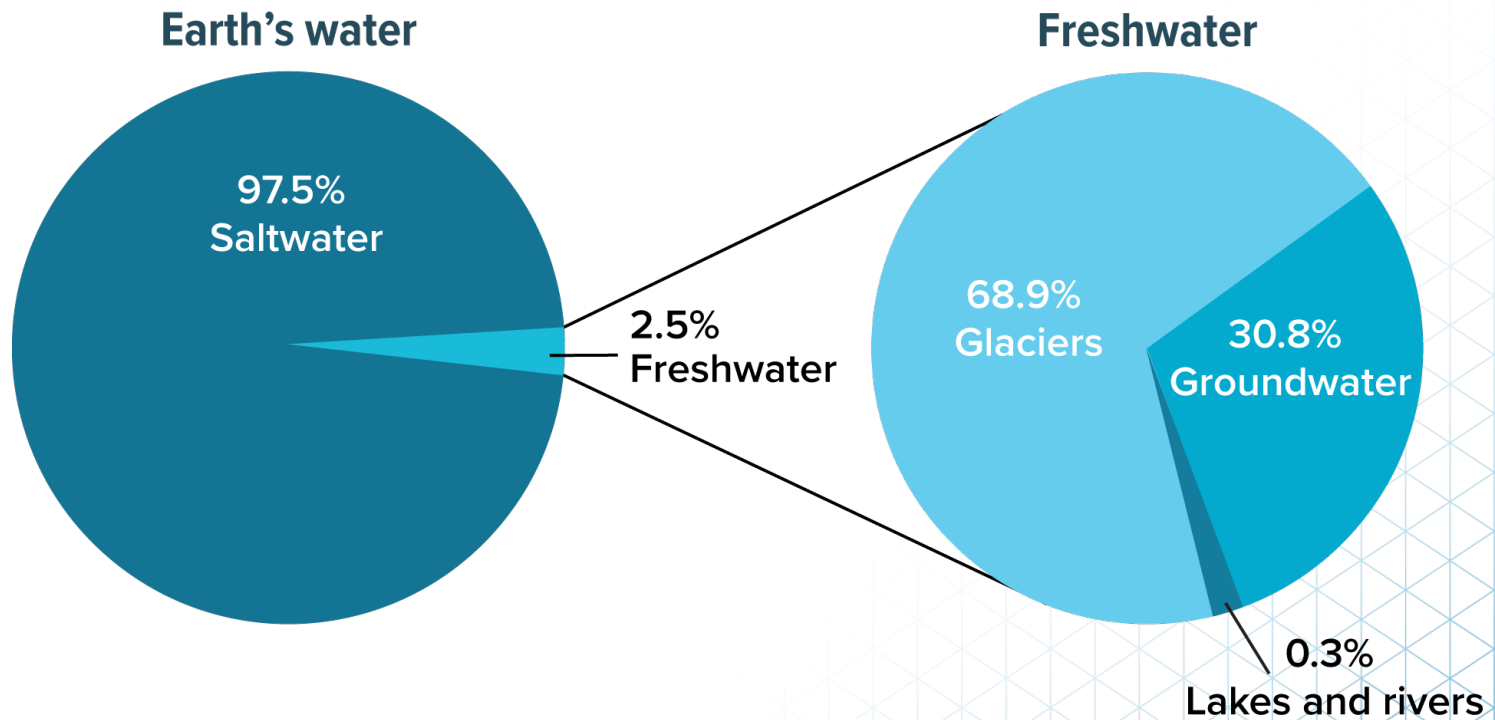
# The Water on Earth

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- The planet is largely covered with water.
- Ecologists recognize the importance of water because of the biological communities that water supports.
- Earth's aquatic ecosystems include freshwater ecosystems, marine aquatic ecosystems, and transitional aquatic ecosystems.

# Freshwater Ecosystems

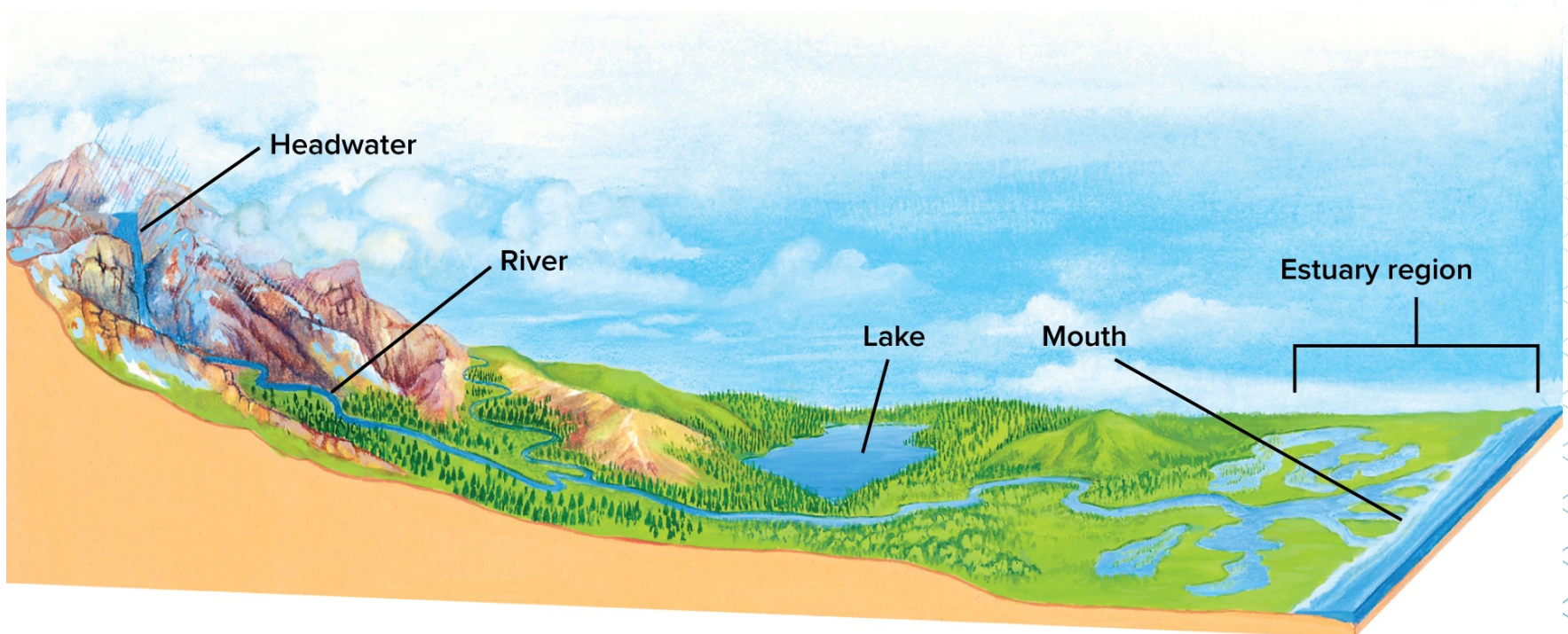
- Major freshwater ecosystems include ponds, lakes, streams, rivers, and wetlands.
- Plants and animals in these ecosystems are adapted to the low salt content in freshwater.



# Freshwater Ecosystems

## Rivers and Streams

- Water in rivers and streams flows in one direction.
- The slope determines the direction and speed.
- **Sediment** is material deposited by water, wind, or glaciers.





# Freshwater Ecosystems

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## Rivers and Streams

- An important characteristic of organisms in rivers and streams is their ability to withstand the constant water current.
- Fast-moving rivers and streams prevent much accumulation of organic material and sediment.
- There are usually fewer species living in rapid waters.



# Freshwater Ecosystems

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## **Lakes and ponds**

- An inland body of standing water is called a lake or a pond.
- The temperature of lakes and ponds varies depending on the season.

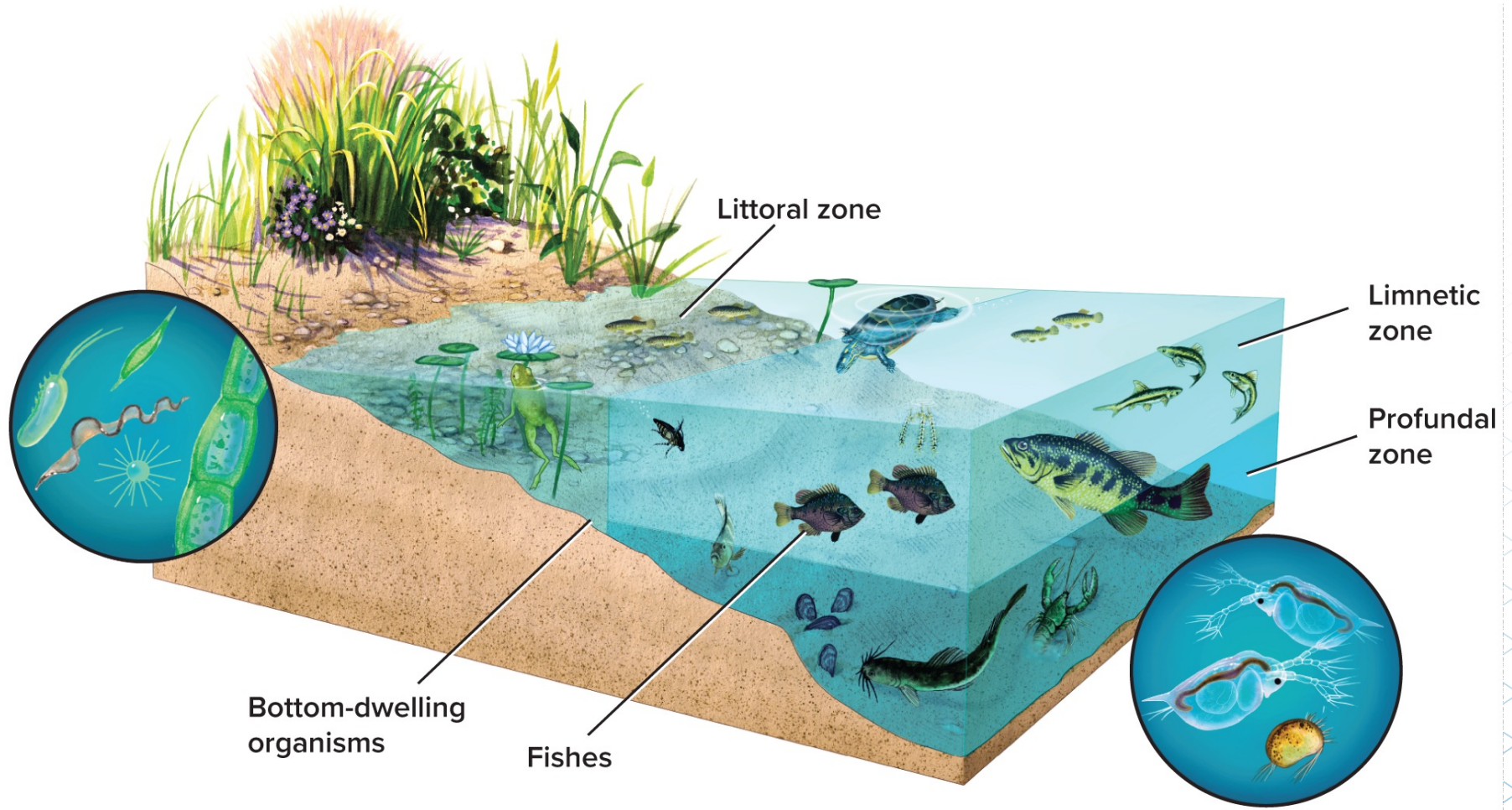
# Freshwater Ecosystems

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## Lakes and ponds

- Lakes and ponds are divided into three zones based on the amount of sunlight that penetrates the water.
- These zones are illustrated on the next slide.

# Freshwater Ecosystems



# Freshwater Ecosystems

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## Lakes and ponds

- The **littoral zone** is shallow, which allows sunlight to reach the bottom. Many producers and consumers live in this zone.
- The **limnetic zone** is well-lit and is dominated by **plankton**, which are free-floating autotrophs and heterotrophs. Many species of freshwater fish live in this zone and feed on the plankton.
- The **profundal zone** receives little sunlight. It is cold and lower in oxygen than the other zones. A limited number of species live in this zone.

# Marine Ecosystems

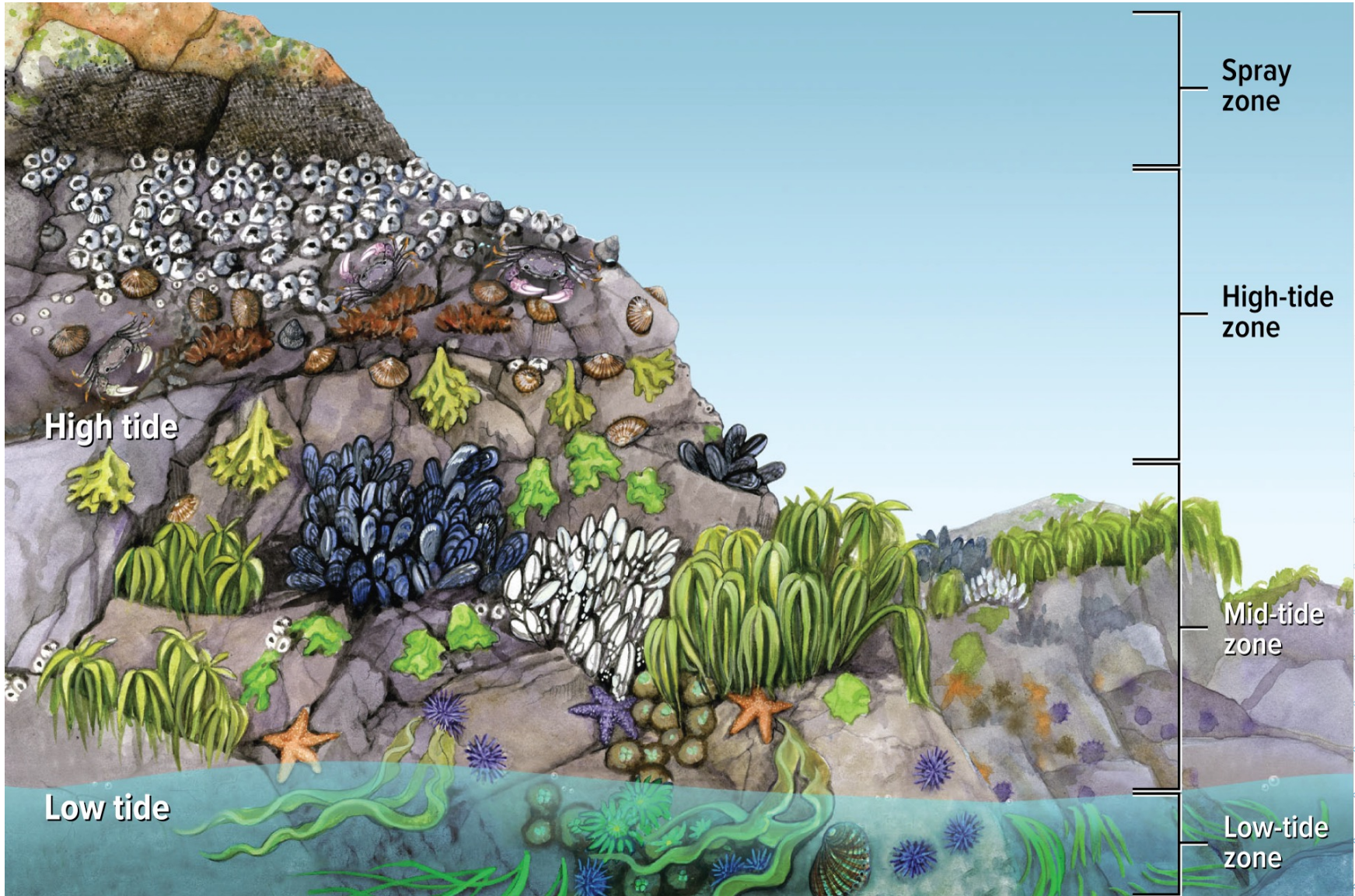
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## Intertidal zone

- The **intertidal zone** is a narrow band where the ocean meets the land. Organisms in this zone must be adapted to constant change.
- The zone is further divided into vertical zones.
- These zones are illustrated on the next slide.



# Marine Ecosystems



# Marine Ecosystems

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## Open ocean ecosystems

- The **pelagic zone** is all the water in the open ocean that is not in the intertidal zone or very near the bottom. It includes the photic, aphotic, and abyssal zones.
- The **photic zone** is shallow enough that sunlight can penetrate. Sunlight cannot penetrate the **aphotic zone**.
- The **abyssal zone** is the deepest region of the pelagic zone. It is very cold, except where hydrothermal vents spew hot water.



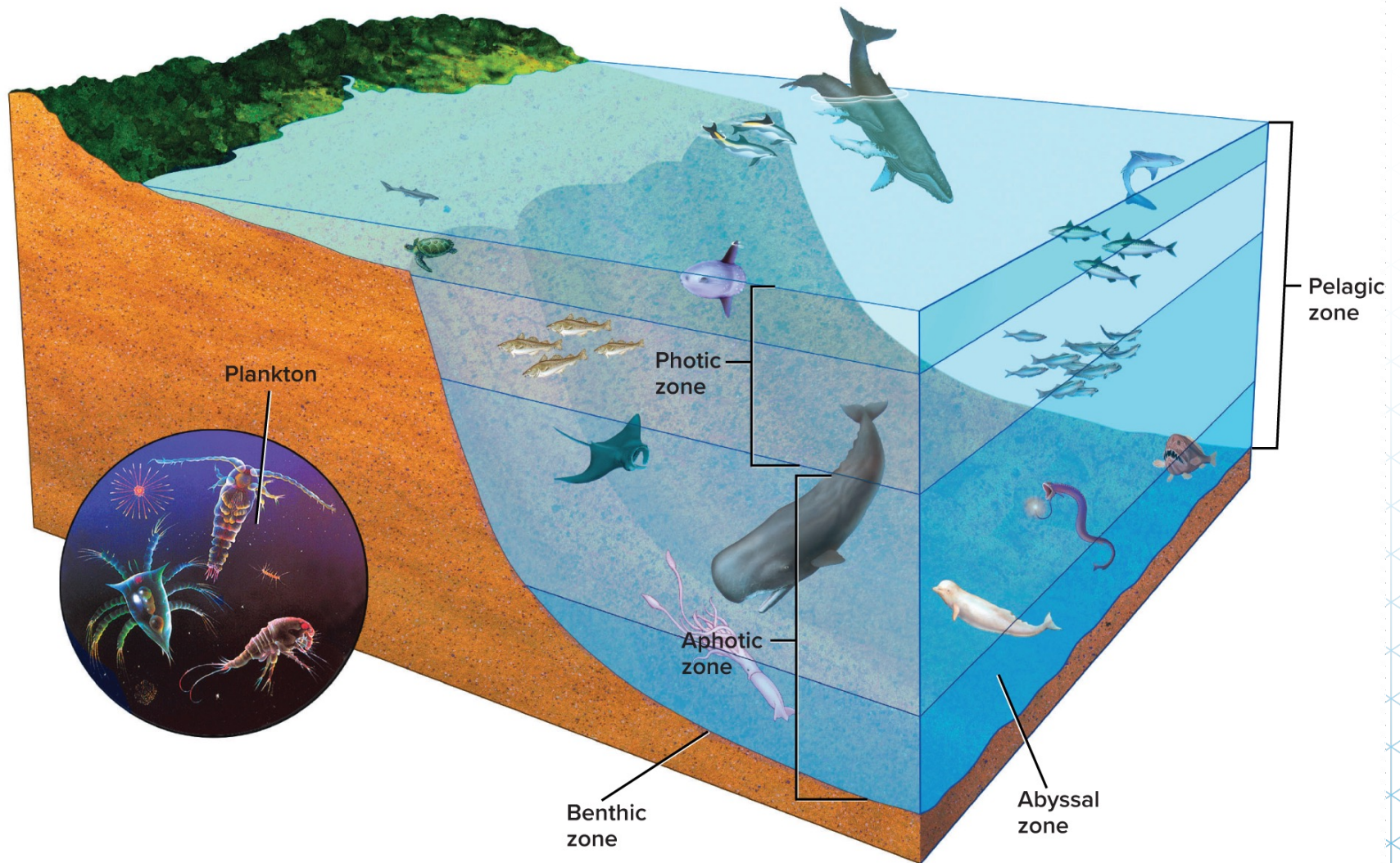
# Marine Ecosystems

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## Open ocean ecosystems

- The **benthic zone** is the area along the ocean floor that consists of sand, silt, and dead organisms.
- Species diversity in the benthic zone depends on depth, except in areas with hydrothermal vents.
- The next slide illustrates the zone.
- Producers are found mainly in the photic zone.
- Consumers live in the pelagic and benthic zones.

# Marine Ecosystems



# Marine Ecosystems

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## **Coastal ocean and coral reefs**

- Coral reefs, which are widely distributed in warm shallow marine waters, are among the most diverse ecosystems.
- Increased atmospheric carbon dioxide affects coral reefs.
- As seawater absorbs carbon dioxide, the water becomes more acidic.
- This reduces the availability of calcium carbonate minerals, which coral polyps use to build their hard protective structure.

# Transitional Aquatic Ecosystems

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## Wetlands

- Areas of land such as marshes, swamps, and bogs that are saturated with water and that support aquatic plants are called **wetlands**.
- Wetlands have high levels of species diversity

## Estuaries

- An **estuary** is an ecosystem that is formed where freshwater from a river or stream merges with salt water from the ocean.
- Estuaries are among the most diverse ecosystems.