

Aquatic Biodiversity

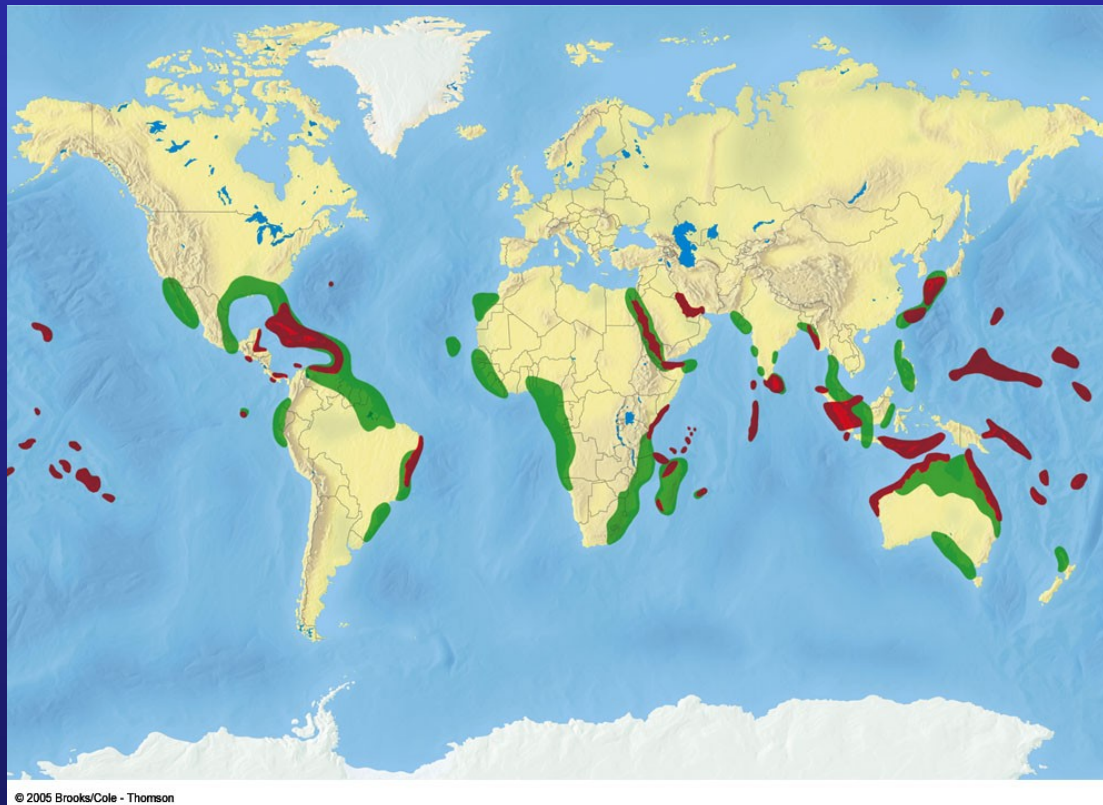
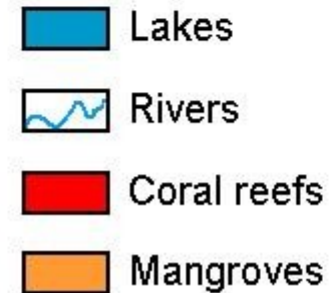
Miller 14e
Chapter 7

Key Concepts

- **Factors that influence aquatic systems**
- **Saltwater life zones**
- **Freshwater life zones**
- **Human activities that affect aquatic systems**

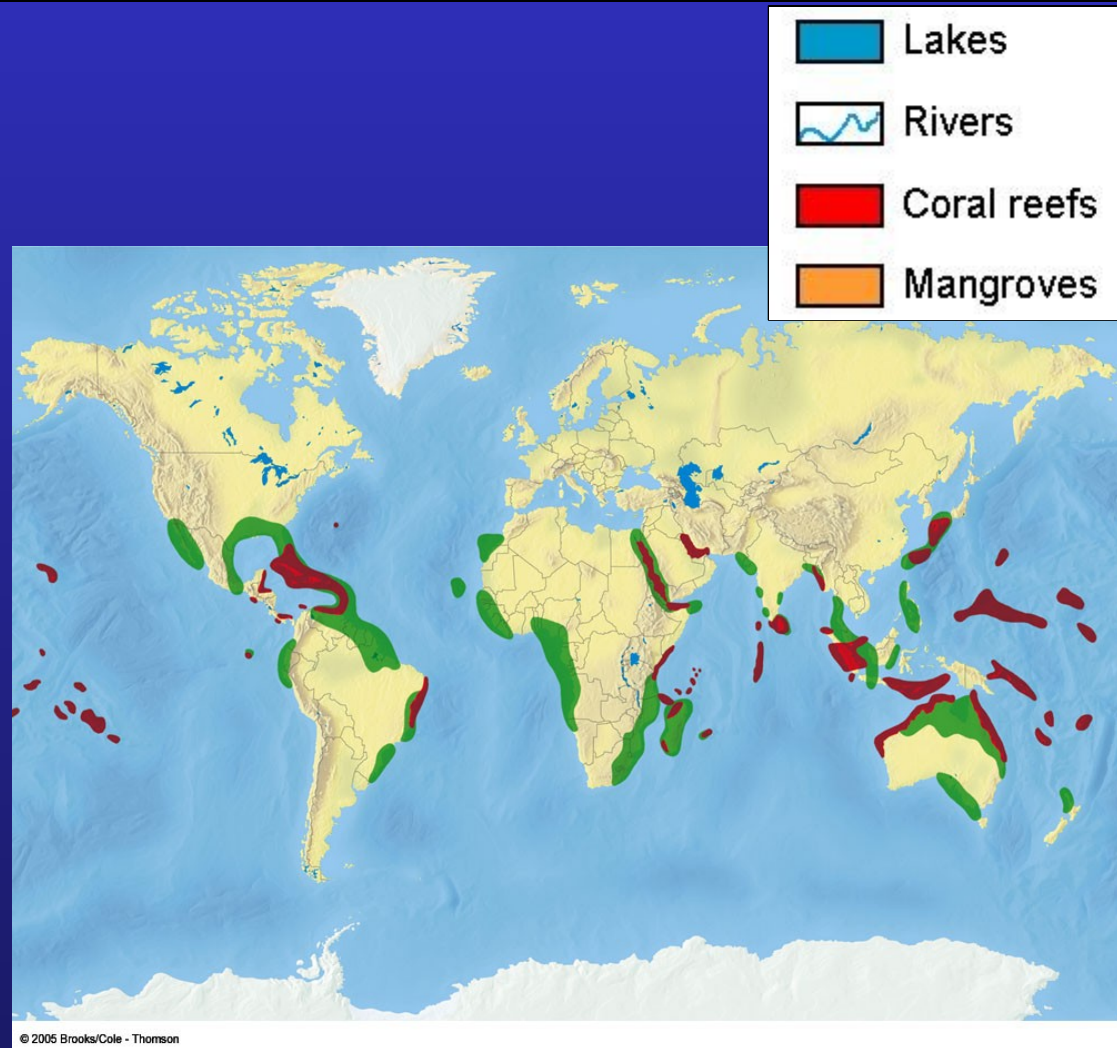
Aquatic Environments:

- Marine systems
- Freshwater systems



Aquatic Environments: 4 Major types of organisms

- Plankton
- Nekton
- Benthos
- Decomposers



Saltwater Life Zones: Coastal

- 10% of oceans
- 90% of a marine species
- Range: High tide → continental shelf
- Ample Sunlight
- Nutrient flow from land

Saltwater Life Zones: Estuaries

- Sheltered
- Nutrient flow from land
- Regions of mixed water from rivers
- Subject to tidal rhythms
- Nutrients are available (constant mixing)
- 1/3 have been lost



Saltwater Life Zones: Mangroves

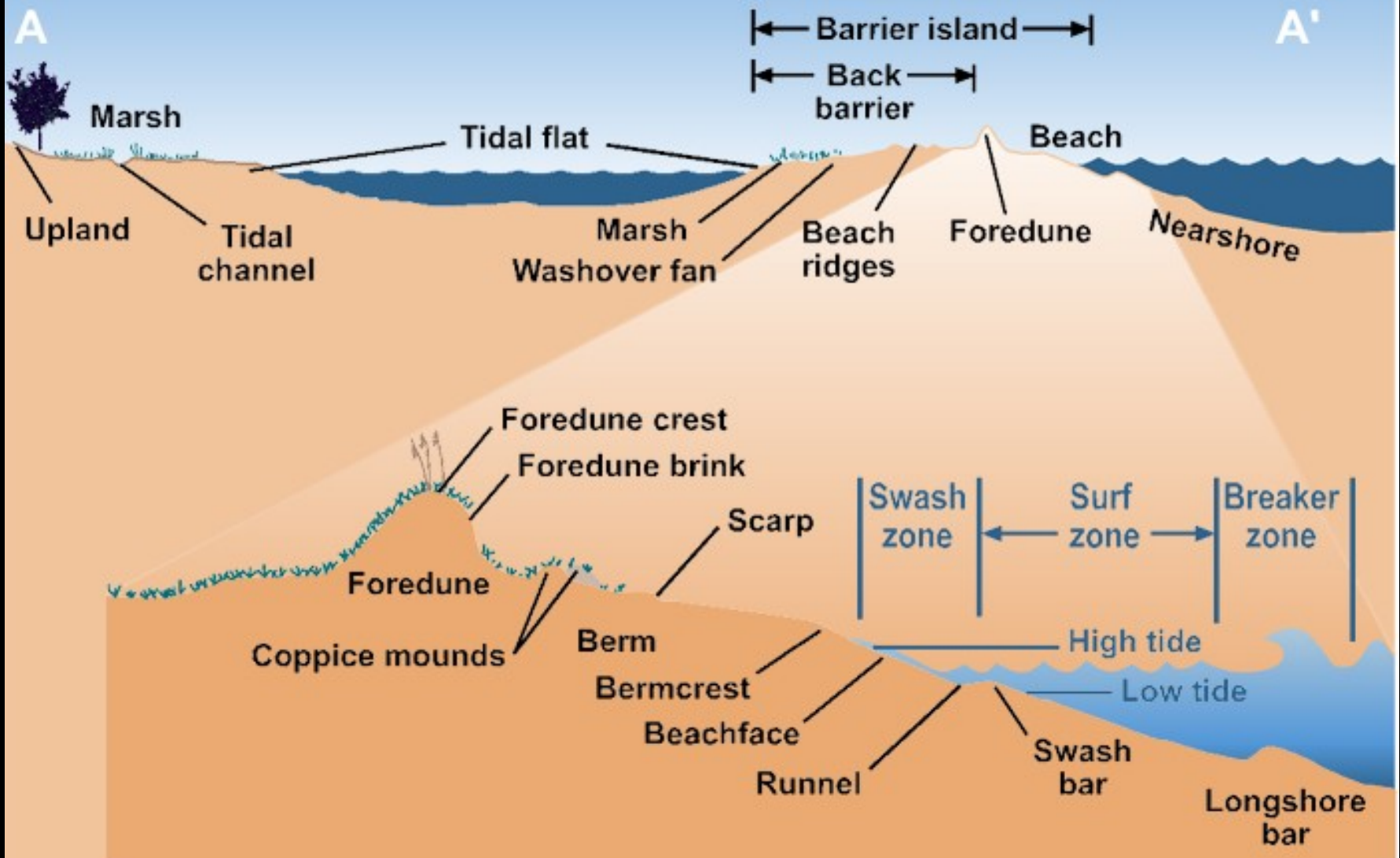
- Tropical
- Tidal
- Sheltered
- Collect mud & sediments
- Filter pollutants & nutrients
- Reduce storm damage
- Provide nursery sites
- 1/3 have been lost



Saltwater Life Zones: Barrier Is.

- Protect mainland, estuaries from storms
- ¼ island are developed
- Sand is constantly shifting
- Dunes
- Consider the protective services they supply.

BARRIER ISLAND CROSS SECTION

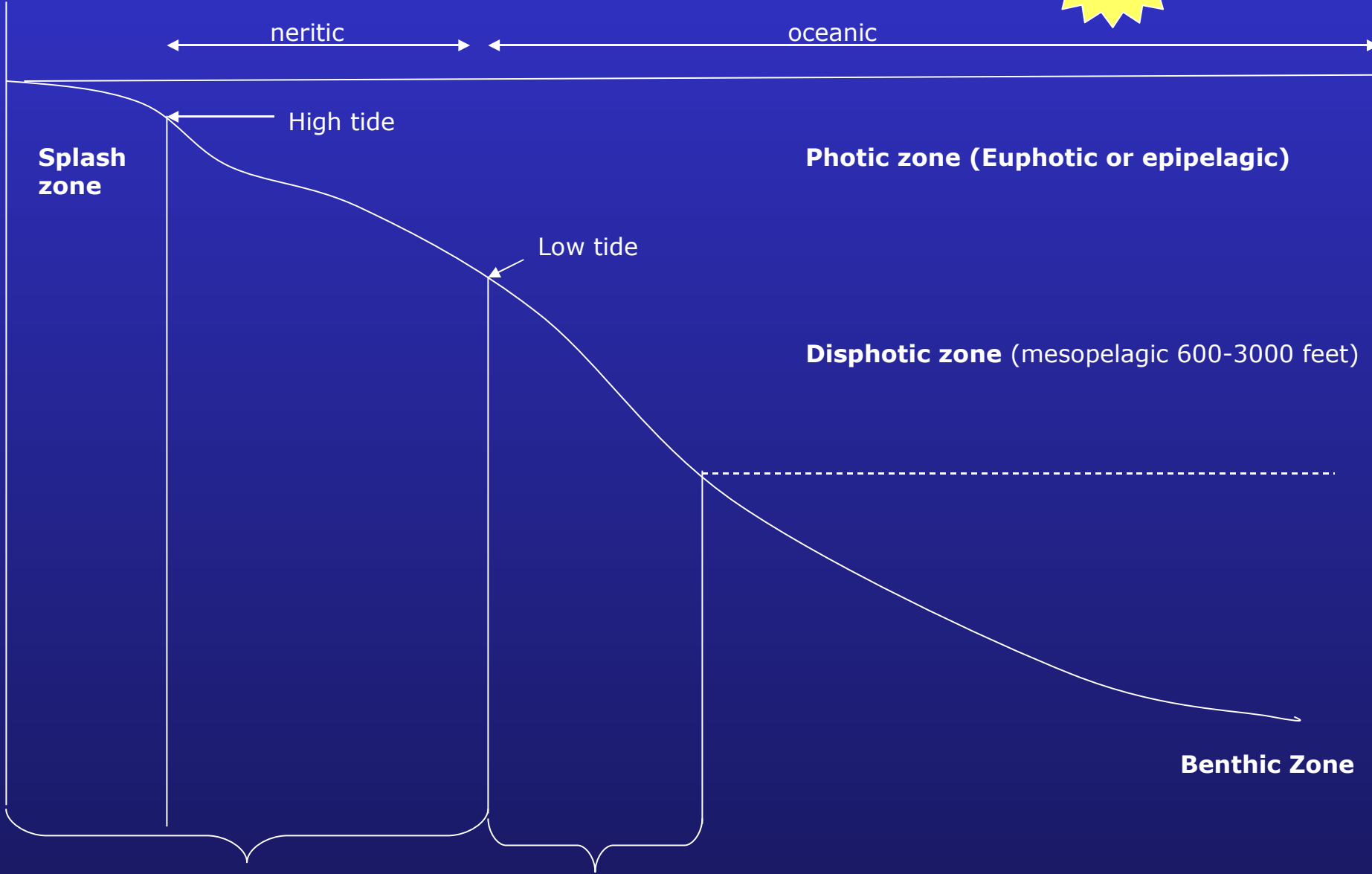
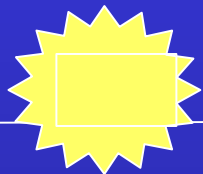


Saltwater Life Zones: Coral reef

- Grow slowly
- Clear, warm, shallow,
- ↑ salinity
- Problems: Storms, floods & predatory fish
- Threats: sediment runoff and people
- Recovery is possible with restrictions.



Ocean Zones



Splash zone

High tide

Low tide

Photic zone (Euphotic or epipelagic)

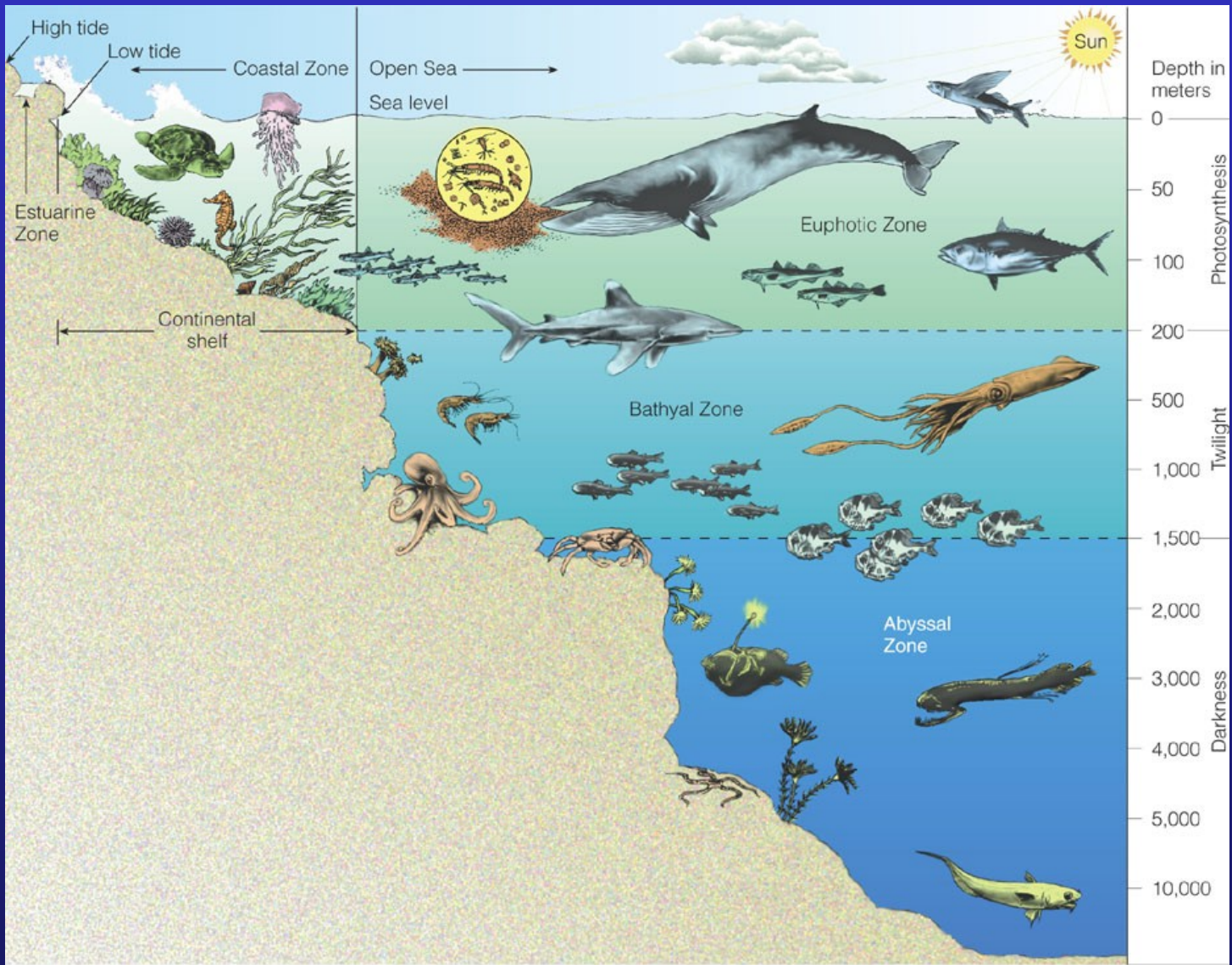
Disphotic zone (mesopelagic 600-3000 feet)

Benthic Zone

Intertidal zone

Subtidal zone

Ocean Zones



FYI

- 40% of world population lives along the coasts.
- Over half of U.S. population lives within 62 miles of coasts.

Freshwater Life Zones (<1% salt)

➤ Lentic

➤ Standing water

➤ Lotic

➤ Flowing water

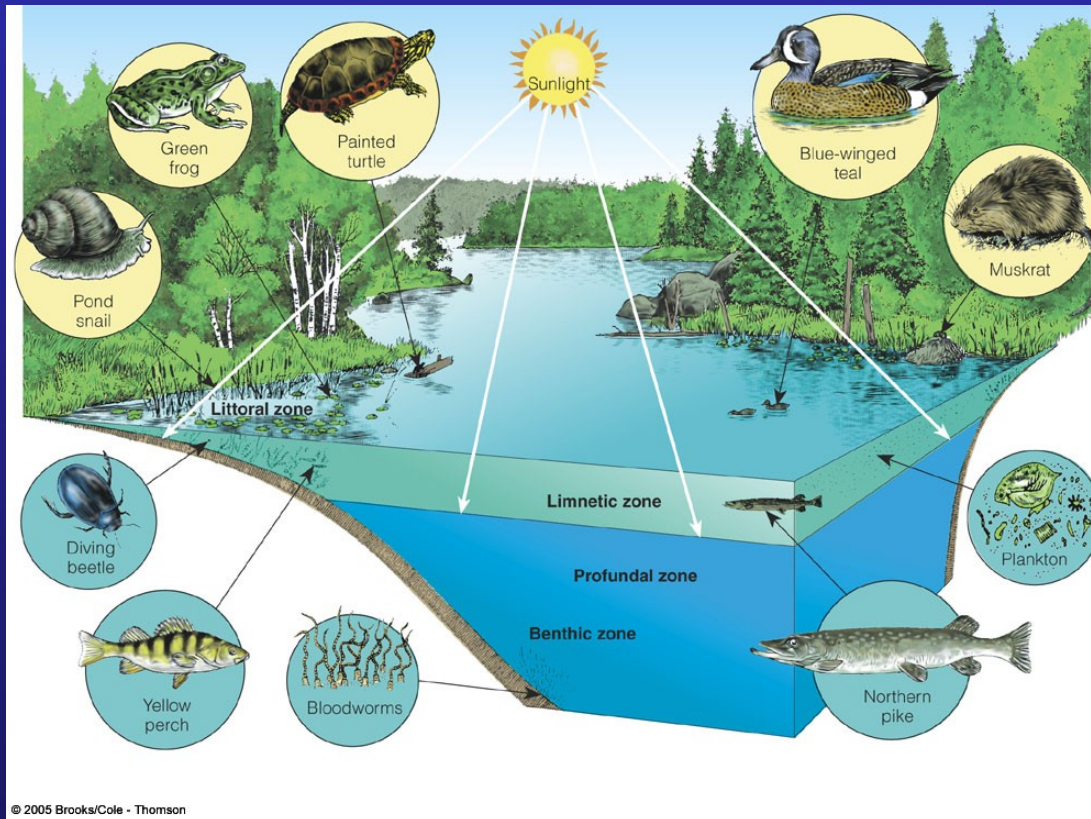
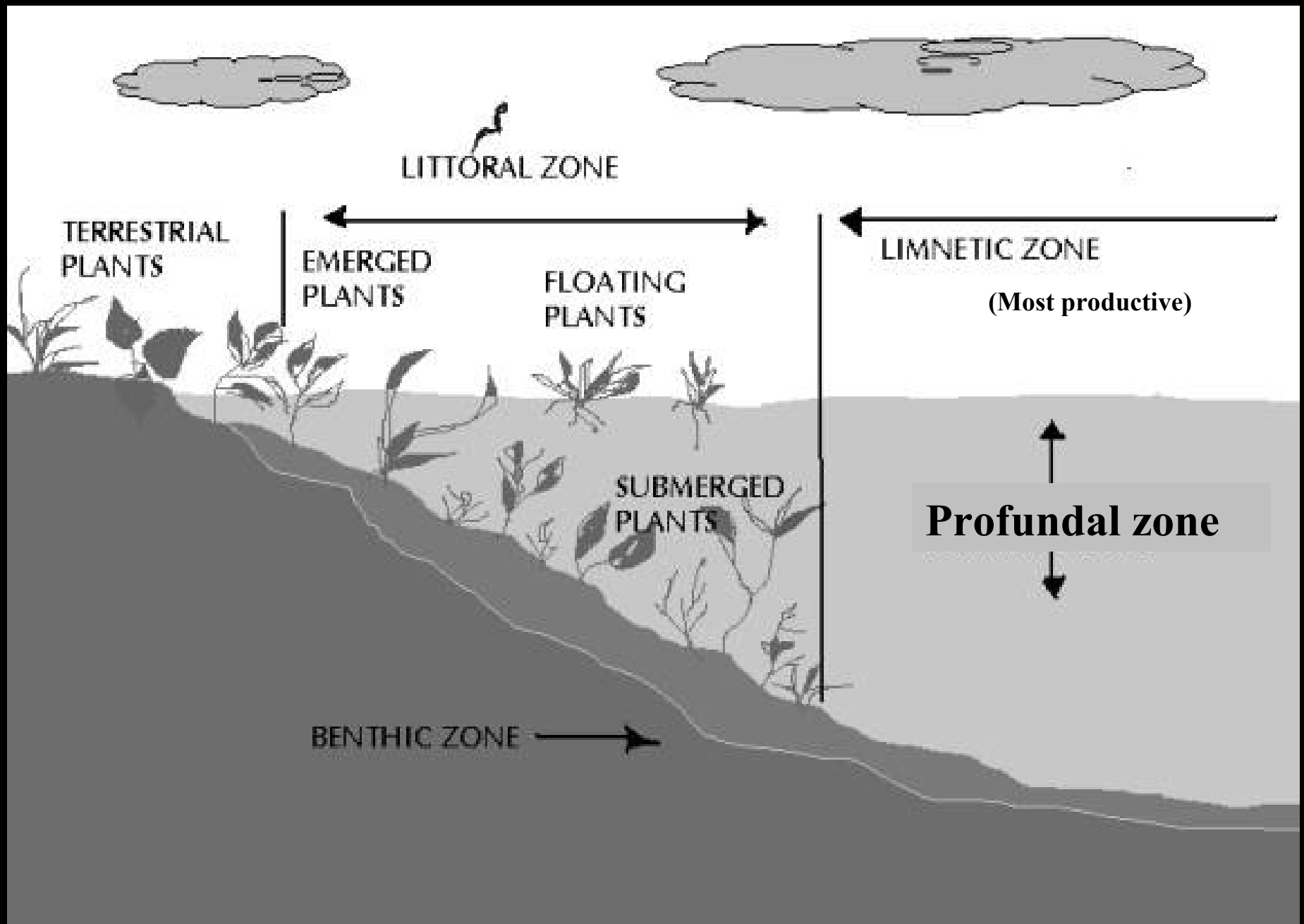


Fig. 7-16 p. 139



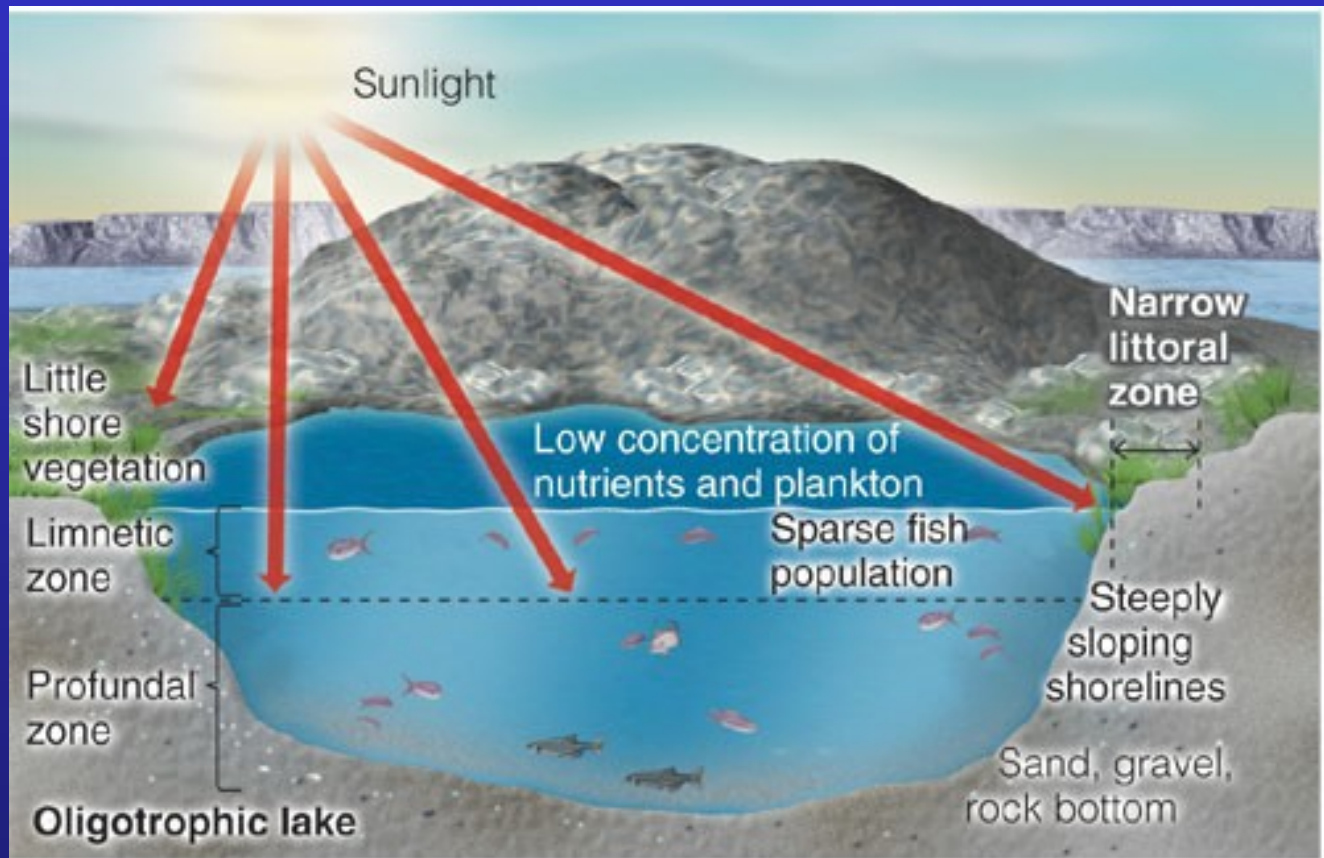
Life Zones in Lakes

- **Littoral zone**
- **Limnetic zone**
- **Profundal zone**
- **Benthic zone**

Lakes

- Stratification by temperature (deep)
- Turnover in spring and fall
 - Re-oxygenates bottom
 - Evens out water temp.
- Types:
 - Oligotrophic
 - Mesotrophic
 - Eutrophic

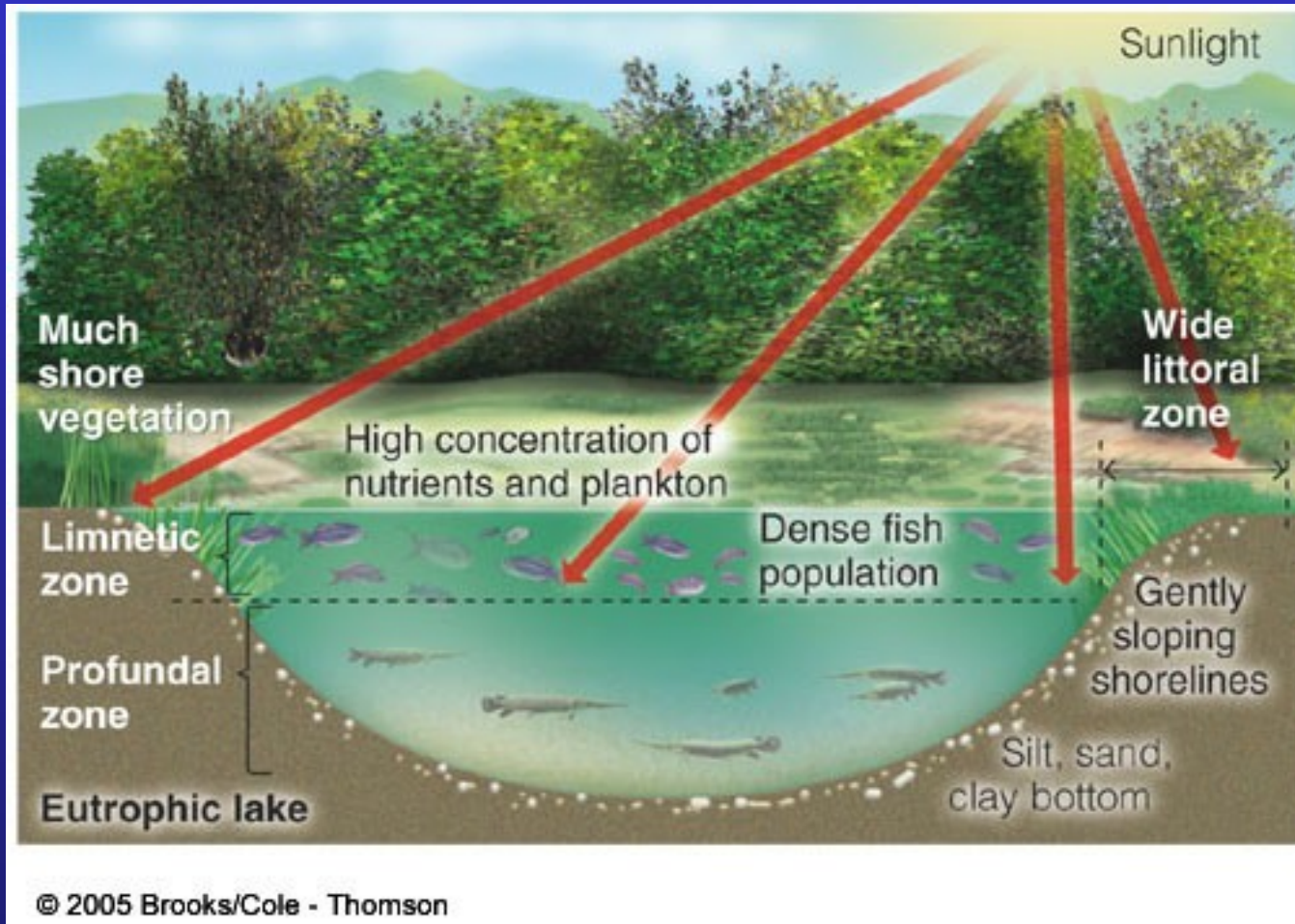
Types of Lakes: Oligotrophic



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Newly formed, ↓plant nutrients, deep clear water

Types of Lakes: Eutrophic



Excessive supply of nutrients, shallow and murky

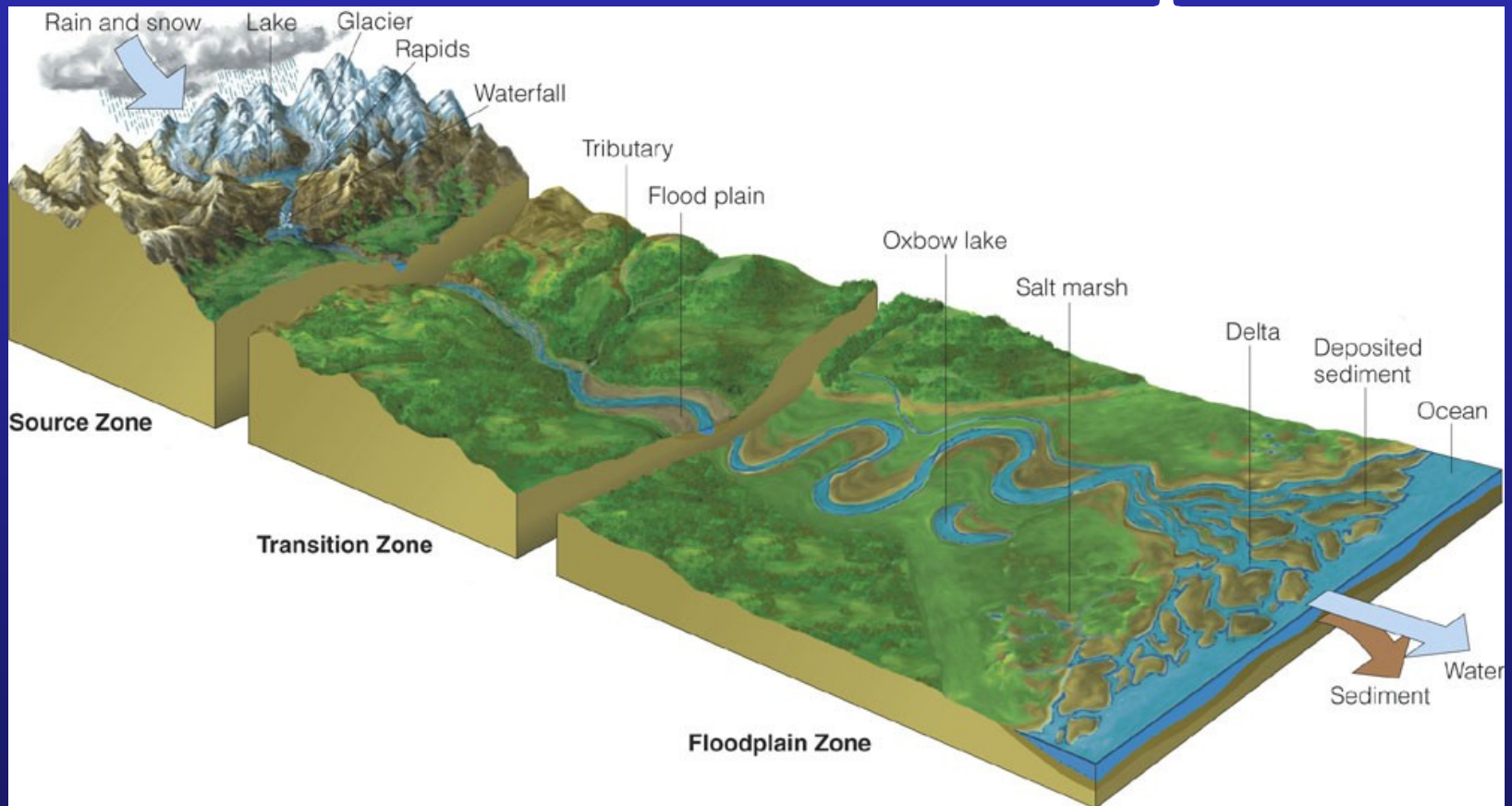
Stream Systems

➤ **Runoff**

➤ **Watershed**

➤ **Drainage basin**

➤ **Floodplain**



Flowing Aquatic Life Zones

- Source:
 - fast& narrow,
 - ↑DO,
 - plants are attached to rocks
- Transition:
 - wider, deeper streams,
 - warmer, more nutrients
 - lower DO
- Floodplain
 - Slower, warmer
 - ↓DO
 - Algae, cyanobacteria, rooted plants

Inland Wetlands

➤ **Importance of Wetlands**

- **Defined by soil types**
 - **Filter wastes/sediments**
 - **Absorb and store**
 - **Water (from storms)**
 - **Nutrients**
 - **Provide habitats**
-
- **U.S. Lost >50%**
 - **Can recover if allowed**

➤ **Types:**

- **Marshes**
- **Swamps**
- **Prairie Potholes**
- **Floodplain**
- **Tundra**
- **Seasonal (vernal pools)**

Human Impacts on Wetlands and Streams

- **Dams, diversions and canals**
- **Flood control levees and dikes**
- **Pollution and Eutrophication**
- **Wetland destruction**