Describing Aquatic Ecosystems

- **Salinity**: the amount of dissolved salt present in water.

- **Ecosystems** are classified as salt water, fresh water, or brackish, depending on salinity.

- **Photosynthesis** tends to be limited by light availability, which is a function of depth and water clarity.

- Aquatic ecosystems are either flowing or standing.

- **Aquatic ecosystem zones**: photic, aphotic, benthic
Freshwater Ecosystems: Ponds, Lakes, Inland Seas

- Salinity is less than 0.5 ppt (parts per thousand)
- Ponds and lakes are similar, except in size, but inland seas contain organisms adapted for open water.
- Ponds and lakes are divided horizontally into zones: littoral and limnetic.
Freshwater Ecosystems: Wetlands

- Areas of land flooded with water at least part of the year
- Include freshwater marshes, swamps, and bogs
- Wetlands prevent flooding, recharge aquifers, filter pollutants, and provide habitats.
swamp - trees

bog - thick layer of decaying plants

marsh - open area with grasses and small plants

vernal pool -> temporary pond
Freshwater Recap

• Describe the benthic, aphotic, and photic zones of a lake.
• Describe the limnetic and littoral zones of a lake.
• Where does photosynthesis occur in a lake?
• Describe the differences between the 4 types of wetlands.
Vernal Pools

A) Woodland ponds that contain water for only part of the year.

B) Species of toads, frogs, small freshwater clams, salamanders, and fairy shrimp lay their eggs.

C) No fish – fish eggs transplanted off of bird legs will dehydrate or the young fish die when the water evaporates.
Spring Peeper - Breeds in swamps and vernal pools, moist woodlands and fields during summer
Video - Frogsicles: Frozen But Still Alive

• https://www.youtube.com/watch?v=pLPeehsXAr4
Wood Frog - Breeds in swamps, vernal Pools, woodlands other times
Lakes and Ponds

A. **Ponds** - muddy bottom, light reaches the bottom in the deepest section(s), and has a uniform water temperature.

B. **Lakes** - rocky or muddy bottom, light does not reach the deepest end, and the temperature changes with depth.
Estuaries

• Occur where a river flows into the ocean or an inland sea

• Coastal estuaries are brackish ecosystems; organisms must tolerate wide salinity and temperature ranges.

• Coastal estuaries are home to salt marshes and mangrove forests.

• Like wetlands, estuaries help prevent flooding and soil erosion as well as provide habitats.

Did You Know? Salt marshes and mangrove forests are two of the most productive ecosystems on Earth.
Oceans

• Currents are driven by water temperature and density differences, wind, and gravity.

• Surface winds and heating generate vertical currents that transport nutrients and oxygen.

• **Horizontal ocean zones:** intertidal, neritic, open ocean

• **Vertical ocean zones:** photic, aphotic, benthic

**Did You Know?** If the water in the oceans evaporated, a 60 m (200 ft) deep layer of salt would be left behind.
Ocean Ecosystems

- **Intertidal**: Highly diverse; extreme range of temperature, moisture, and salinity

- **Neritic**: Productive kelp forests and coral reefs provide habitats and help protect shorelines from erosion.

- **Open ocean**: Low productivity due to low light penetration; phytoplankton base of food chain; deep sea organisms and hydrothermal vent communities

**Did You Know?** Over 90% of ocean water on Earth is in the open ocean zone.
The ocean is home to a number of different ecosystems. Factors such as water temperature and the amount of sunlight determine what types of organisms can live in each zone.
Ocean Zones and Conditions

- Ocean zones include the intertidal zone, the neritic zone, and the open-ocean zone.

- **Photic zone:** sunlight penetrates, photosynthesis can occur by *phytoplankton* or *rooted plants*.

- **Aphotic zone:** depths in which sunlight no longer penetrates.
Life in the Ocean

- **Plankton**: float and sometimes propel in the water, do not swim and often carried by currents.

- **Benthos**: aquatic organisms that live, on or in, rocks and sediments on the bottom of lakes, streams, or oceans.