

Aquatic biomes occupy the largest part of the biosphere

- Marine biomes have a salt concentration of approximately 3% and cover approximately 75% of the earth's surface.
- Zonation in Marine communities.*
 - The **intertidal zone** is where the land meets the water.
 - The **neritic zone** includes the shallow regions over the continental shelves.
 - The **oceanic zone** extends past the continental shelves, and can be very deep.
 - The **pelagic zone** is the open water.
 - The **benthic zone** is the seafloor.
 - Intertidal* zones are alternately submerged and exposed by the twice-daily cycle of tides.
 - They can be rocky or sandy and provide excellent examples of distributional limitations.
 - Many types of organisms inhabit these areas, such as suspension-feeding worms, crustaceans, mollusks and others.
 - These areas are often destroyed by pollution and human activity.
 - Coral reefs** exist in the *neritic* zone.
 - They constitute a conspicuous and distinctive biome.
 - They are dominated by coral and include a very diverse assortment of vertebrates and invertebrates.
 - The **oceanic pelagic biome** includes most of the ocean's water.
 - The water is constantly mixed by ocean currents.
 - Plankton live in the photic zone and are the producers for this biome.
 - This biome also includes a great variety of free swimming fish and mammals.
 - The **benthic zone** is the ocean bottom below the neritic and pelagic zones.
 - This area is extremely productive due to the great amount of nutrients found.
 - Benthic communities consist of bacteria, fungi, seaweed and filamentous algae, numerous invertebrates, and fish.
 - The very deep sea benthic communities lie in the **abyssal zone**.
 - Organisms here are adapted to continuous cold.
 - Deep-sea thermal hydrothermal vents of volcanic origin are found here.
- Freshwater biomes are usually characterized by salt concentration of less than 1% and are closely linked to the soils and biotic components of the terrestrial biomes through which they pass.
- Types of freshwater biomes:
 - Oligotrophic** lakes are deep, nutrient-poor and do not contain much life.
 - Eutrophic** lakes are shallower and have increased nutrients.
 - Mesotrophic** have a moderate amount of nutrients and phytoplankton productivity.
 - Over long periods of time, oligotrophic lakes may become mesotrophic as runoff brings in nutrients.
 - Pollution from fertilizers can cause explosions in algae population and cause a decrease in oxygen content.

- Streams and rivers are bodies of water moving continuously in *one direction*.
- Headwaters are cold and clear and carry little sediment and relatively few mineral nutrients.
- As the stream travels down, it picks up O₂ and nutrients on the way.
- Nutrient content is largely determined by the terrain and vegetation of the area.
- Many streams and rivers have been polluted by humans and have caused many environmental problems.
- Damming can also be a problem.
- Wetlands** are areas covered with water that supports many types of plants.
- They can be saturated or flooded and include areas known as marshes, bogs, and swamps.
- They are home to many different types of organisms, from herbivores to crustaceans.
- Unfortunately, humans have destroyed them, but many are now protected in many places.
- Estuaries** are areas where freshwater and salt water meet.
 - The salinity of these areas can vary greatly.
 - They are crucial feeding areas for many types of water fowl.

The geographic distribution of terrestrial biomes is based mainly on regional variations in climate

- These areas are defined by their abiotic and biotic factors.
- Vertical stratification is also important in these biomes; the shapes and sizes of plants largely define the layering.
 - The **canopy** of the tropical rain forest is the top layer, covering the layers below.
 - The **permafrost** in the tundra is a permanently frozen stratum that lies under ground.
- The species composition of any biome differs from location to location.
- Human activity has radically altered the natural patterns of many biomes.
- Tropical forests are close to the equator, receive high amounts of rainfall (although this can vary from region to region), and contain a great variety of plants and animals.
- The vegetation is layered, with the canopy being one of the top layers.
- Savannas are grasslands with scattered trees, that show distinct seasons, particularly wet and dry.
 - They have many types of plants and animals.
 - Fire is an important abiotic factor.
- Deserts have low rainfall, and are generally hot.
- Vegetation is usually sparse, and includes cacti and succulents.
- Many animals are nocturnal, so they can avoid the heat.
- Chaparrals have mild wet winters and dry hot summers.
- They contain dense spiny, evergreen shrubs and have periodic fires.
- Some plants produce seeds that will only germinate after a fire.
- Temperate grasslands exhibit seasonal drought, occasional fires, and are usually used for grazing and agriculture.

- ❑ Temperate deciduous forests contain dense stands of trees and have very cold winters and hot summers.
 - ❑ The trees lose leaves and go dormant in winter.
 - ❑ This biome includes a large variety of plants and animals.
 - ❑ Humans have logged many of these forests around the world.
- ❑ Coniferous forests are the largest terrestrial biome on earth.
 - ❑ They exhibit long cold winters and short wet summers.
 - ❑ Conifers inhabiting them are adapted for the climate.
 - ❑ Conifer forests are home to various animals, some of which hibernate.
- ❑ Tundra contains low growing plants.
 - ❑ The climate is windy and cold which causes a short growing season.
 - ❑ A layer of permafrost is found below 1 meter and does not thaw, which prevents root growth; not many animals live in tundra biomes.
 - ❑ There are two types; arctic, which is found in areas of Alaska and the Arctic circle, and alpine, which is found on very high mountaintops.