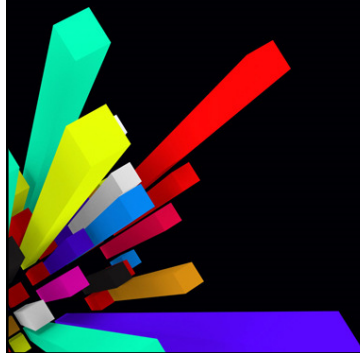




• What is a Biome?

- A large, relatively distinct terrestrial region with characteristic

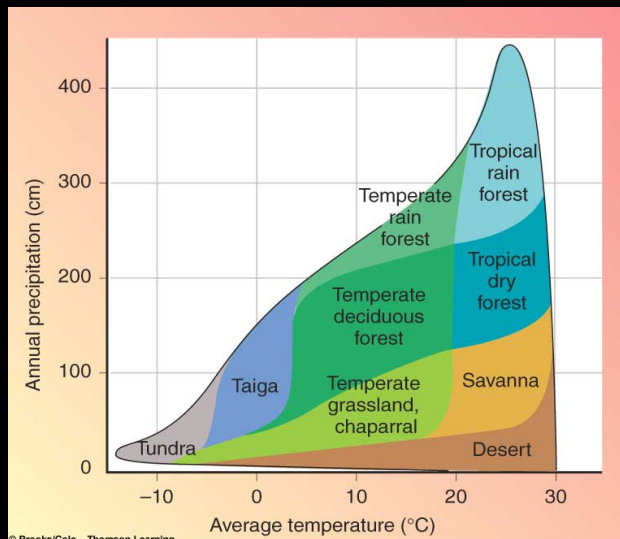
- Climate
- Soil
- Plants
- Animals
- Interacting landscapes



Terrestrial Biomes



Using Precipitation And Temperature To Identify Biomes





Arctic Tundra



- Tundra

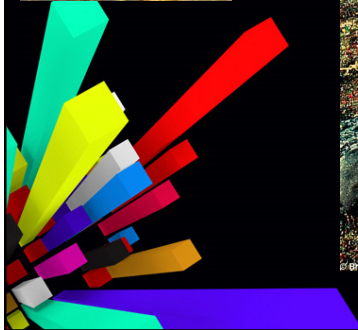


- Northernmost biome

- Frozen layer of subsoil (**permafrost**)
- Low-growing vegetation adapted to extreme cold/short growing season
- **Plants** include sedges, mosses, lichens, grasses and 400 varieties of flowers
- **Animals** include caribou, musk ox, arctic hare, voles and lemmings are the **principal herbivores**, which enable a **few carnivores** like the arctic fox, snow owl, polar bear, and wolf to survive.



Arctic Tundra





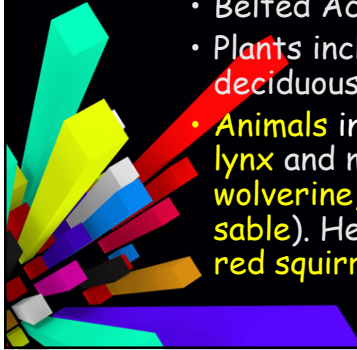
Taiga



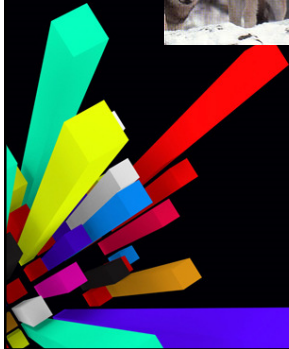
- Taiga

- **Coniferous** trees dominate the taiga, or **boreal forest**

- Cold winters, short growing season, and acidic, mineral-poor soil
- Belted Across **North America and Eurasia**
- Plants include evergreen **spruce, fir, pine**, and the deciduous **larch or tamarack**
- **Animals** include fur-bearing predators like the **lynx** and members of the weasel family (e.g., **wolverine, fisher, pine martin, mink, ermine, and sable**). Herbivores include the **snowshoe hare, red squirrel, lemmings, and voles**.



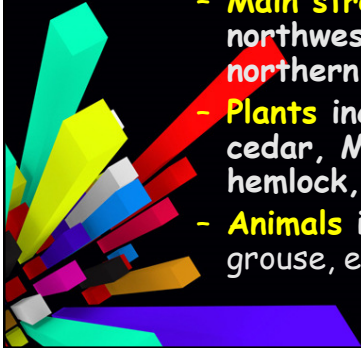
Taiga



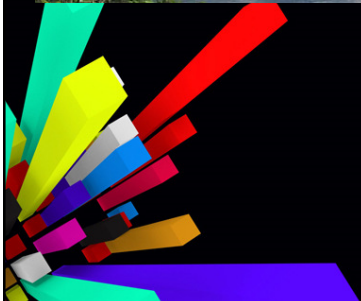
Temperate Forests



- Temperate Rain Forest
 - **Large conifers**
 - **High precipitation** 200 - 350 cm as rain and snow
 - **Average temperatures** 0°C to 20°C
 - **Main stretch** of this habitat is along the northwestern coast of North America from northern California though southern Alaska
 - **Plants** include Douglas fir and Western red cedar, Mountain hemlock, Western hemlock, Sitka spruce and Lodgepole pine
 - **Animals** include deer, bears, coyotes, slugs, grouse, etc.



Temperate Rain Forest



Temperate Rain Forest



Temperate Forests



- Temperate deciduous forest
 - Precipitation relatively high (30 to 60 inches a year)
 - Soils rich in organic matter
 - Broad-leaf trees that lose their leaves seasonally dominate
 - Average annual temperature in a deciduous forest is 50° F.
 - Four distinct seasons - spring, summer, autumn, and winter
 - Oaks, maples, hickory, elms
 - Eagles, black bear, deer, squirrels, coyotes

Temperate Deciduous Forest



Grasslands

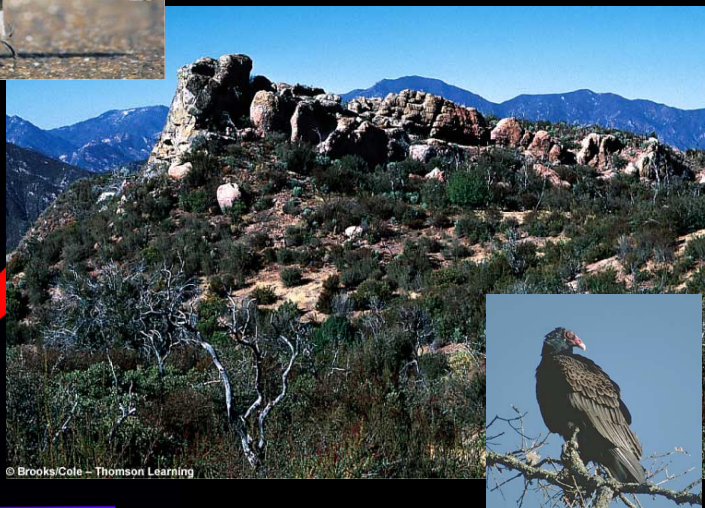
- **Temperate grassland**
 - Deep, mineral-rich soil
 - Moderate but uncertain precipitation
 - Well suited to growing grain crops
- **Chaparral**
 - Thickets of small-leaf evergreens
 - Climate of wet, mild winters and dry summers



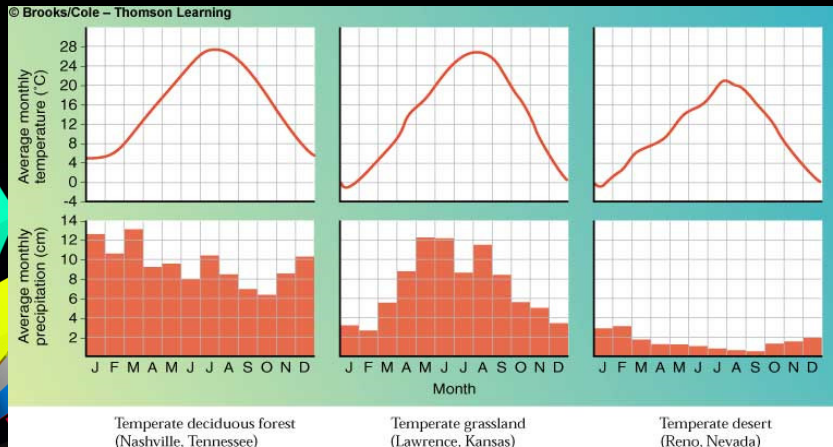
Temperate Grassland



Chaparral

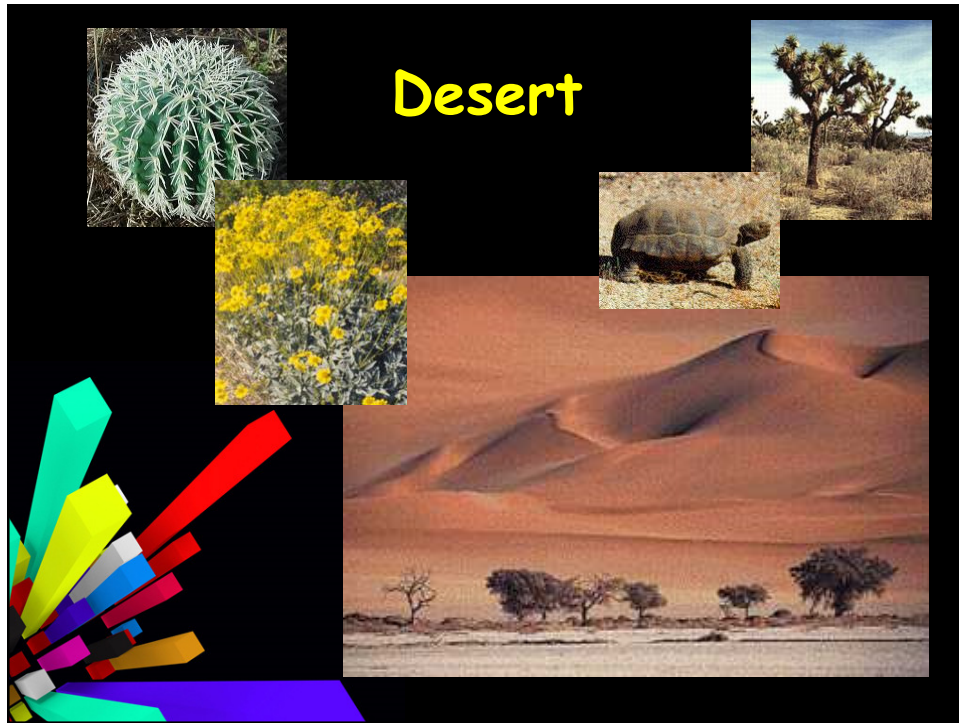


Significance Of Precipitation In Temperate Biomes



Dry Biomes - Deserts

- **Desert**
 - Cold deserts in temperate climates
 - Warm deserts in subtropical or tropical regions
 - Low levels of precipitation
 - Organisms with specialized water-conserving adaptations
 - **Cactus, roadrunners, peccary, yuccas, Gila monster, kangaroo rat, bobcat, etc**



Tropical Biomes

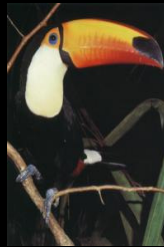
- **Savanna**
 - Tropical grassland
 - Widely scattered trees interspersed with grassy areas
 - Occurs in tropical areas with low or seasonal rainfall
 - Giraffes, elephants, lions, hyenas, springbok
 - Acacia trees, elephant grass, baobab trees, Bermuda grass

A photograph of an adult elephant and a young elephant calf standing in a savanna landscape. The adult elephant is on the left, and the calf is on the right. They are surrounded by green grass and some trees in the background. In the bottom left corner, there is a decorative graphic consisting of several colorful, 3D rectangular blocks in shades of cyan, yellow, red, blue, and purple, arranged in a fan-like pattern.

Savanna



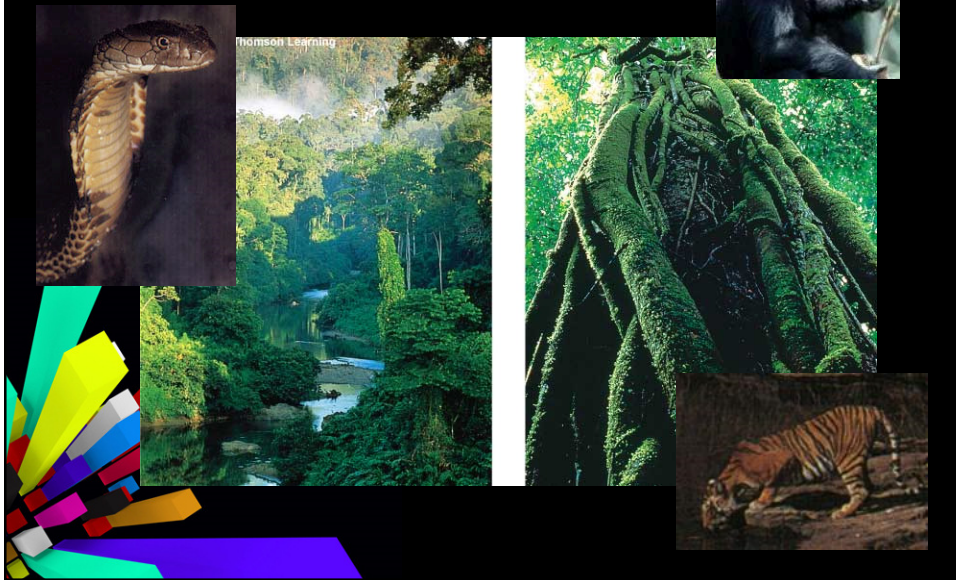
Tropical Biomes



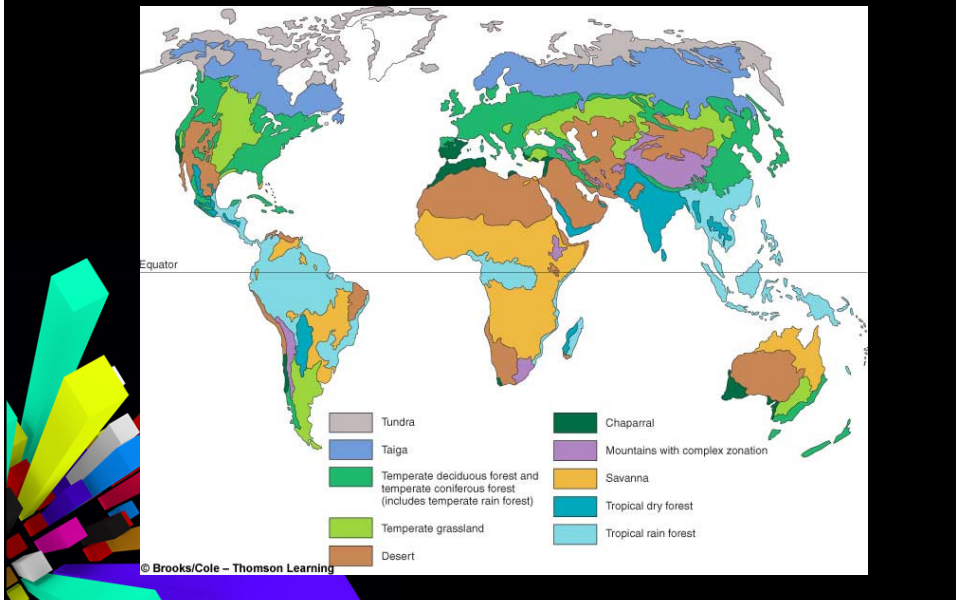
- **Tropical rain forest**

- Mineral-poor soil
- High rainfall evenly distributed throughout the year (50 to 260 inches)
- High species richness and high productivity
- Average temperature between 20°C to 34°C

Tropical Rain Forest



The World's Major Biomes



Human Effect On Biomes

Tundra

- Oil exploration and military exercises result in long-lasting damage

Taiga And Temperate Rain Forests

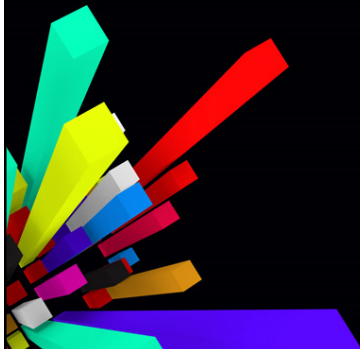
- Clear-cut logging destructive

Temperate and Deciduous Forests and Tropical Rain Forests

- Removed by logging and development



Aquatic Biomes



Aquatic Ecosystems

Important environmental factors

- **Salinity**
- Amount of **dissolved oxygen**
- Availability of **light** for photosynthesis



Aquatic Life

- Aquatic life divided into
 - Plankton
 - Free-floating organisms
 - Nekton
 - Strongly swimming organisms
 - Benthos
 - Bottom-dwelling organisms

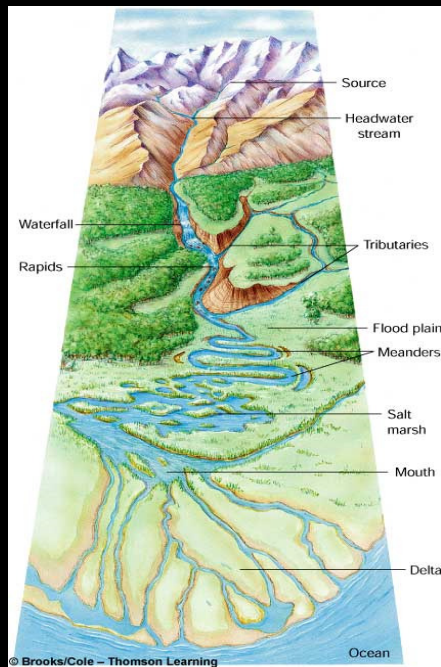
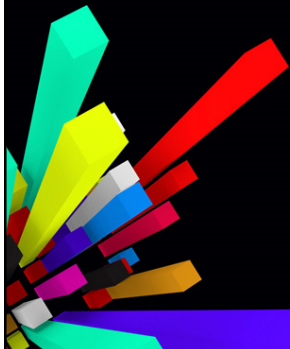


Freshwater Ecosystem

- Freshwater ecosystems include:
 - Flowing-water ecosystems
 - Streams and rivers
 - Standing-water ecosystems
 - Ponds and lakes
 - Freshwater wetlands
 - Estuaries



Features Of A Typical River



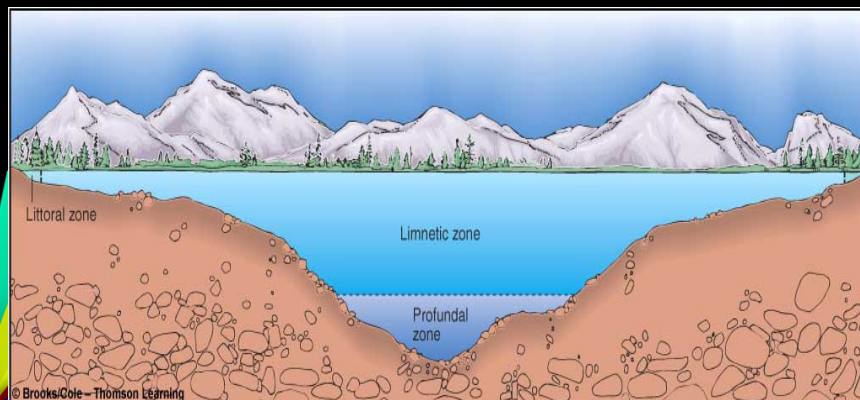
Estuary



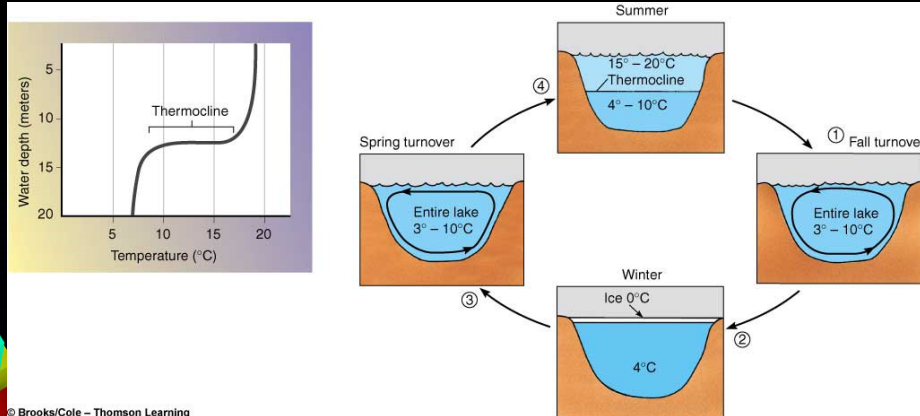
• Estuaries

- Coastal body of water with access to both the ocean and fresh water from rivers
- Transition from land to sea; freshwater to salt water
- Called bays, lagoons, inlets, or sounds
- Shore birds, fish, crabs and lobsters, marine mammals, clams and other shellfish, marine worms, and sea birds

Zonation In A Large Lake



Thermal Stratification In A Temperate Lake



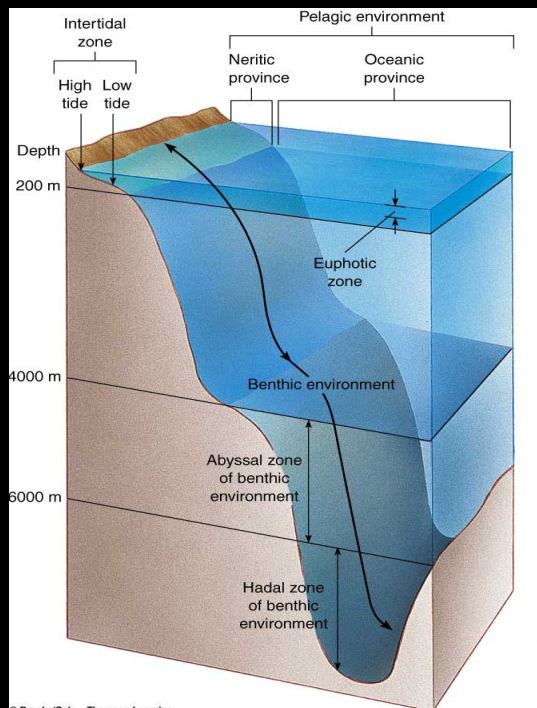
Freshwater Swamp



Marine Ecosystem

- Marine environments
 - Intertidal zone
 - Shoreline between low and high tides
 - Benthic environment
 - The ocean floor
 - Neritic province
 - Open ocean from shoreline to depth of 200 meters
 - Oceanic province
 - Ocean deeper than 200 meters

Zonation In The Ocean



Seaweeds In A Rocky Intertidal Zone



Sea Grass Bed



Coral Reef Organisms



Biogeography

- Study of the **geographic distribution of plants and animals**
- Each species originated from its center of origin
- **Alfred Wallace** divided the Earth's land areas into six major biogeographic realms

Wallace's Biogeographic Realms

