

Land Biomes

The term **biome** refers to a geographic region that has a distinct climate. A biome contains characteristic types of plants and animals adapted to the region and its climate.

Tropical Rainforest

Tropical rainforests are found near the equator, so the climate is hot and wet. Heavy rainfall (around 150 cm per year) and year-round warm temperatures make it very humid. A tropical rainforest is very dense with lots of large trees that block out sunlight. Very little sunlight reaches the rainforest floor, so plants located near the ground are adapted to live with little light.

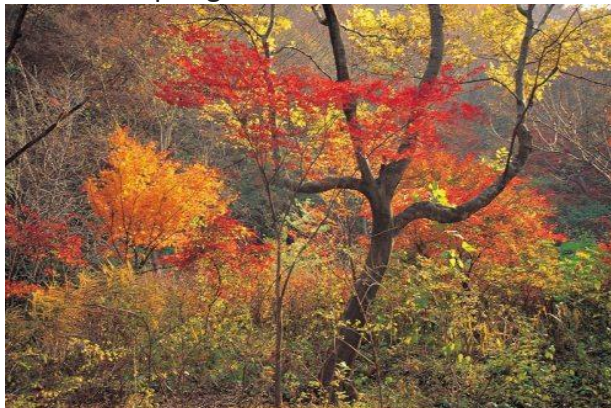


The warm and humid climate of tropical rainforests allow for a great diversity of organisms. In fact, rainforests have the greatest number of species compared to all other land biomes. They also have one of the greatest populations densities (number of organisms in a given area) of all land biomes, so competition is fierce. Many tropical organisms have adapted very specialized structures or behaviors that help reduce competition with other species.

- **Characteristic Plants:** bromeliad, orchid, fig, mangrove, banana, coconut, ferns, vines, coffee
- **Characteristic Animals:** macaw, poison arrow frog, howler monkey, jaguar, snake, ant, lizard, sloth, orangutan

Temperate Biomes

Temperate deciduous forests cover most of the eastern United States. Most of the trees in this biome experience a dormant period during the winter. They drop their leaves in the fall and stop growing during the winter. Their leaves grow back in the spring.



The climate of a deciduous forest is temperate with four distinct seasons (spring, summer, fall, and winter). Deciduous forests have warm summers and cold winters. They have moderate precipitation throughout the year.

During winter months, however, the precipitation is usually frozen and unavailable to the organisms that live there. Trees in a deciduous forest usually lose their leaves during the winter and have thick bark to conserve water and protect them from the cold.

- **Characteristic Plants:** bromeliad, orchid, fig, mangrove, banana, coconut, ferns, vines, coffee
- **Characteristic Animals:** macaws, poison arrow frogs, howler monkeys, jaguars, snakes, ants, lizards, sloths

Temperate grasslands are generally cold in the winter and warm, wet, and humid in the summer. In North America, temperate grasslands are called *prairies*. In Asia, they are referred to as *steppes*, and in South America, they are called *pampas*.



Temperate grasslands receive enough rainfall to support grasses, but not enough to support the growth of large trees. The temperatures are generally warm in the summer and cold in the winter. The native plants and animals are adapted to droughts and wildfires, which are common in grasslands.

- **Characteristic Plants:** buffalo grass, milkweed, bluestem grass, cottonwood, wild rose, thistle
- **Characteristic Animals:** prairie dogs, bison, pronghorn, grasshoppers, cottontail rabbits, coyotes, prairie rattlesnakes

Taiga

The **taiga**, known also as a *boreal or coniferous forest*, is a biome found only in the northern hemisphere. It is the largest continental biome and is characterized by coniferous forests. Taiga covers most of Alaska, Canada, and Siberia.



The taiga experiences long, cold winters and short, mild summers. It receives less precipitation than a deciduous forest, but more than grasslands. In the winter, most precipitation falls as snow.

- **Characteristic Plants:** aspen, juniper, lodgepole pine, ponderosa pine, spruce, birch, fir
- **Characteristic Animals:** snowshoe hare, lynx, warblers, moose, elk, wolverines, mink, lemmings, red squirrels

Savanna

Savannas are dry, tropical grasslands where trees are present but more widely scattered than in forest ecosystems. The savanna climate has a temperature range of 68°F to 86°F.



Savannas receive around 125 centimeters of rain every year, with most of the rain falling during the summer. Because of the vast differences in precipitation, the summer is referred to as the "wet season," and the winter referred to as the "dry season."

- **Characteristic Plants:** acacia, elephant grass, gum tree eucalyptus, bermuda grass, palm
- **Characteristic Animals:** elephants, zebra, lions, impalas, gazelles, leopards, cheetahs, jackals, rhinos, giraffe, wildebeest

Desert

Deserts get less than 25 centimeters of rain every year, and the amount of precipitation in all deserts is less than the amount of water that could potentially evaporate. The climate of tropical deserts is generally hot and dry. However, temperate deserts, such as the Gobi in Asia, are much cooler.



Desert plants and animals are adapted to store water and withstand year-round hot temperatures.

- **Characteristic Plants:** sagebrush, barrel cacti, aloe, mesquite, prickly pear, saguaro, agave, creosote, Joshua tree, palo verde, chainfruit cholla
- **Characteristic Animals:** bobcat, coyote, bighorn sheep, gila monster, western diamondback rattlesnake, kangaroo rats, peccaries

Tundra

The **tundra** has very low temperatures (-30°F - 50°F) and very little precipitation (less than 10 centimeters). For this reason, tundras are sometimes called "frozen deserts." Winters in the tundra are long and extremely cold; summers are short, mild, and cool.

The tundra is characterized by its frozen subsoil, called *permafrost*, which makes only a small layer of soil available to plant life. This limits the size of plants to small, low growing species such as mosses and grasses and makes it impossible for trees to grow.



The animals living in tundra ecosystems have adaptations that allow them to stay warm in the very low temperatures. For instance, Arctic foxes, grizzly bears, and ermines (a kind of weasel) all have thick fur that reduces the amount of body heat lost to the environment.

- **Characteristic Plants:** moss campion, pasque flower, arctic moss, bearberry, crowberry
- **Characteristic Animals:** caribou, arctic fox, grizzly bears, ermines, arctic hare, lemmings, musk ox

Characteristics of Aquatic Ecosystems

Aquatic ecosystems are water-based ecosystems. Lakes, ponds, estuaries, saltwater marshes, oceans, and thermal vents are all examples of aquatic ecosystems, but each has different characteristics

The Earth has many different kinds of ecosystems. These include terrestrial, or land-based, ecosystems, and aquatic, or water-based, ecosystems. Some of the major aquatic ecosystems on Earth are lakes, ponds, estuaries, saltwater marshes, oceans, and thermal vents. Each of these ecosystems has specific characteristics that can be used to identify them.

Lake

Lakes are large bodies of water that are surrounded by land. Lakes are usually freshwater ecosystems.



Lakes can be large, but they are often still small enough to see the other side.

Algae, aquatic plants, freshwater fish, amphibians, ducks, slider turtles, and beavers are some of the organisms that live in lakes.

Pond

Ponds are small bodies of freshwater that are surrounded by land. Ponds are smaller and shallower than lakes, which means that the temperature of the water usually stays the same from top to bottom.



Ponds are smaller than lakes. They are not usually large enough to use a motorboat in.

Like lakes, the organisms that can be found in ponds include aquatic plants, algae, fish, amphibians, ducks, and slider turtles.

Estuary

An estuary is an area in which fresh water and salty ocean water mixes together. These areas may include bays, mouths of rivers, and lagoons. Estuaries have water that is saltier than the water found in lakes and ponds, but not as salty as the water that is found in the ocean.

In estuaries, ocean water provides nutrients needed for plants to grow well. These plants provide shelter and food for birds and other kinds of animals. Often, sea animals go to estuaries to breed and produce their young. The young sea animals live in estuaries during the first parts of their lives, until they are strong enough to survive in the open ocean.



Estuaries provide a place where young animals can grow up.

The plants in estuaries are marsh grasses and other plants that are adapted to water levels that change with the tides. Muskrats, sea birds (such as herons and egrets), shellfish (such as shrimp and crabs) and saltwater crocodiles are animals often found in estuaries.

Estuaries are valuable resources for humans. Many of the fish species that are caught by commercial fishermen spend at least part of their lives in estuaries. Estuary ecosystems are very fragile, and they can be easily harmed by pollution and erosion.

Saltwater Marsh

Saltwater marshes are marshy areas found near estuaries. They receive water daily from the ocean tides. The water in saltwater marshes is similar to that found in estuaries, but it often has more variety in salinity. The organisms that live in saltwater marshes must be able to live in salt water.



Saltwater marshes have water that is saltier than freshwater, but not as salty as ocean water.

The plants found in saltwater marshes include marsh grasses and mangrove trees. Saltwater crocodiles, crustaceans, and migratory water birds are a few of the kinds of animals that may live in salt marsh ecosystems.

Ocean

Oceans are large bodies of saltwater divided by continents. Oceans have many types of ecosystems depending on the characteristics (such as available sunlight, temperature, depth, and salinity) of that part of the ocean.

More organisms live in the shallow part of the ocean, which reaches from the coast to the continental slope, than in any other part of the ocean because sunlight can reach deep and the water is warm. This makes food easy to find. Some examples of organisms that live in the shallow ocean are jellyfish, seaweed, starfish, crabs, corals, and saltwater fish (such as tuna).

Some organisms are able to live in the open ocean. Many of these organisms need to come to the surface frequently for air or to find food, but can also dive deep into the ocean. These organisms include plankton (which float in the upper regions of the water and provide food for many different animals), whales, sea turtles, dolphins, octopuses and sharks.



The ocean ecosystem is the largest on Earth.

Thermal Vent

In some places under the ocean where the Earth's crust is very thin, very hot water can come out of the holes called hydrothermal vents. Some animals, such as tube worms, live near these vents at the bottom of the ocean. The animals that live near these vents must have the ability to live in high temperatures. They also must be able to live without energy from the Sun. Tube worms, for example, have billions of tiny bacteria that live inside of them and help them use the chemical energy from the vents to make food.



Animals that live in thermal vents must be able to stand high temperatures.