

## **What is a biome?**

Biomes are very large ecological areas on the earth's surface, with fauna and flora (animals and plants) adapting to their environment. Biomes are often defined by abiotic factors such as climate, relief, geology, soils and vegetation. A biome is NOT an ecosystem, although in a way it can look like a massive ecosystem. If you take a closer look, you will notice that plants or animals in any of the biomes have special adaptations that make it possible for them to exist in that area. You may find many units of ecosystems within one biome.

There are **Five** major categories of biomes on earth. In these five, there are many sub-biomes, under which are many more well defined ecosystems.

**1-The Desert Biomes:** They are the Hot and Dry Deserts, Semi-Arid Deserts, Coastal Deserts and Cold Deserts.

**2-The Aquatic Biomes:** Aquatic biomes are grouped into two, Freshwater Biomes (lakes and ponds, rivers and streams, wetlands) and Marine Biomes (oceans, coral reefs and estuaries).

**3-The Forest Biomes:** There are three main biomes that make up Forest Biomes. These are the Tropical Rainforest, Temperate and Boreal Forests (also called the Taiga)

**4-The Grassland Biomes:** There are two main types of grassland biomes: the Savanna Grasslands and the Temperate Grasslands.

**5-The Tundra Biomes:** There are two major tundra biomes—The Arctic Tundra and the Alpine Tundra.

### **1- The Desert Biome**

Deserts make up about 20% of total land cover on earth and are characterized by little (less than 50cm/yr) or no rainfall. Desert biomes come in four major kinds—each of these having their unique features, but have similarities in their biotic and abiotic makeup. They are the Hot and Dry Deserts, Semi Arid Deserts, Coastal

Deserts and Cold Deserts, and within these are many deserts located in many places of the world.

Desert biomes have very high temperatures because of the little vegetative cover, less cloud cover, low atmospheric moisture and the land's exposure to the sun. Humidity is very low, with a few events of very little rain in a year.

## **2- The Aquatic Biome**

This includes all water bodies on the earth's surface. Aquatic biomes are grouped into two, Freshwater Biomes (lakes and ponds, rivers and streams, wetlands) and Marine Biomes (oceans, coral reefs and estuaries). These biomes make up about 73% of the total earth's surface. Life forms in these waters depend on the abiotic factors such as sunlight entering the waters, temperature, pressure, salt content and so on. Water biomes with lots of light tend to have more flora (plant) diversity, and the growth of algae and plankton is more. Small water bodies that freeze during the cold seasons, or dry out in the dry and hot seasons tend to have less diversity. Lions in grassland Biome Examples of animals found in marine biomes include star fishes, sharks and tuna and sea birds. Examples of animals

in freshwater biomes include salmon, tilapia worms, water-surface insects and crabs. Aquatic biomes are very important because apart from being home to millions of water animals, they also form the basis of the water cycle and help with atmospheric moisture, cloud formation and precipitation. One example of a marine biome is the Great Barrier Reef (a coral reef system) of Australia.

An example of a fresh water biome is the Amazon River in Brazil.

## **3- The Forest Biome**

Forests make up about 30% of the total land cover on earth, and are of incredible value to life on earth. They are a store of carbon and play a very important role in climate control. They have a watershed role, and are a source of many raw materials that humans depend on. It is believed that forests have the most biodiversity. A small portion of the Rainforests, for example, may be home to millions of insects, birds, animals and plants. There are three main biomes that make up

Forest Biomes. These are the Tropical Rainforest, Temperate and Boreal Forests (also called the Taiga), Temperatures of forests biomes (especially the tropical rainforest) are generally high all year though, but a lot cooler at the surface. This is because there is very little sunlight reaching the forest floors as a result of the heavy vegetative cover. Humidity is extremely high with lots of rainfall, exceeding 200cm all year though. Soils are loose and very airy, with high acidity and decaying organic matter. Plant types of the Tropical Rainforests are usually huge trees with buttress roots, lots of large green leaves and shallow roots. Ferns and palms are also common. Plants in the temperate forests are less dense with a bit of sunlight reaching the floors. Tree types include the willow, basswood and elm. Plants of the Boreal are mostly conifers with needle-like leaves. There is very little understory and lots of light at the floors. Trees like fir and spruce are common.

#### **4- The grassland biome**

As the name suggests, these are massive areas dominated by one or a few species of grass, with a few sparsely distributed trees. There are two main types of grassland biomes: the Savanna Grasslands and the Temperate Grasslands. One major savanna is located in Africa, and takes up more than a third of the continents land area. Others can be found in India, South America and Australia.

Temperate grasslands can be found in South Africa, Argentina, and some plains in Central North America. If the grassland is prevented to develop into a forest by climatic conditions such as rainfall, it is termed as 'climatic savannas'. If their characteristics are kept by soils, they are termed as 'edaphic savannas'. Sometimes, large animals such as elephants can constantly disturb young trees from taking over grasslands. Human causes like farming or bush fires can also prevent grasslands from developing into forests. Such grasslands are termed 'derived savannas'. Soils in savanna are thin layered and do not hold water. The soils contain some organic matter from dead grass, which is the main source of nutrients for plants. Lions in grassland Biome Rainfall are moderate, and not enough to cause major floods.

## **5- The Tundra Biome**

This is known to be the coldest of all the terrestrial (land) biomes, with the least bio-diversity capacity. Tundra got its name from 'Tunturia' a Finnish word that means 'barren land'. This biome has very little rain and extremely freezing temperatures, and covers about a fifth of the earth's land surface. There are two major tundra biomes: The Arctic Tundra and the Alpine Tundra. The Arctic tundra is located around the north-pole in the northern hemisphere. This biome has temperatures of about 2-3degrees in the summer and about -35degrees in the winter. Bogs and ponds are common as a result of constantly frozen surface moisture and melted permafrost. Polar bear in the Tundra Biome Plants in the Arctic Tundra are short and grow closely to each other. Examples include mosses, heaths and lichen. They are adapted to perform photosynthesis even in the freezing conditions. Animals here include herbivores like hares and squirrels. Carnivores include polar bears and arctic foxes. It also has lots of birds, insets and fish like cod and salmon. The Alpine Tundra is very cold, located on top of high mountains, often with very few trees and very little vegetative cover. They are icy for a larger part of the year. Animals in this biome include some birds, mountains goats and marmots. There are also beetles and butterflies.

### **An example of a food chain in The Tundra**

#### **Omnivore**

Snowy owls have smaller golden eyes claws covered with feathers. They are found mainly in the arctic open and treeless spaces. They usually perch on the ground and wait for yummy food (arctic fox, lemmings and other birds and fish).

#### **Carnivore**

The arctic fox (a mammal) has short ears, beautiful flurry coat that helps it to keep warm and also camouflage in the snow or ice. They make tunnels and burrows in the snow to create shelter.

#### **Herbivore**

Lemmings are small mouse-like animals. They have tiny claws that help them dig tunnels in the snow to sleep in. They are white during the winter, but their fur turns brownie in the summer.

## **Producer**

A lichen is a plant made up of fungus and a green alga. They grow almost anywhere, on rocky coasts, mountain summits, icy regions, tropical forests, and even on trees, rocks and soils.

### **To understand a world biome, you need to know:**

- 1-What the climate of the region
- 2-Where each biome is found and what its geography
- 3-The special adaptations of the vegetation.
- 4-The types of animals found in the biome and their physical and behavioral adaptations to their environment.
- 5- Ecological Relationships of Biomes

**{Homework: Each student prepares presentation certain environment. Also can be joint work between two students in the same work} .**

### **References in website**

<http://eschooltoday.com/ecosystems/what-is-a-biome.html>

<http://www.ucmp.berkeley.edu/glossary/gloss5/biome/>

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<http://www.nclark.net/CommunitiesBiomes>