Chapter 6 Biomes

Section 2: Forest Biomes

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Objectives

- **List three characteristics of tropical rain forests.**
- **Name and describe the main layers of a tropical rain forest.**
- **Describe one plant in a temperate deciduous forest and an adaptation that helps the plant survive.**
- **Describe one adaptation that may help an animal survive in the taiga.**
- **Name two threats to the world's forest biomes.**

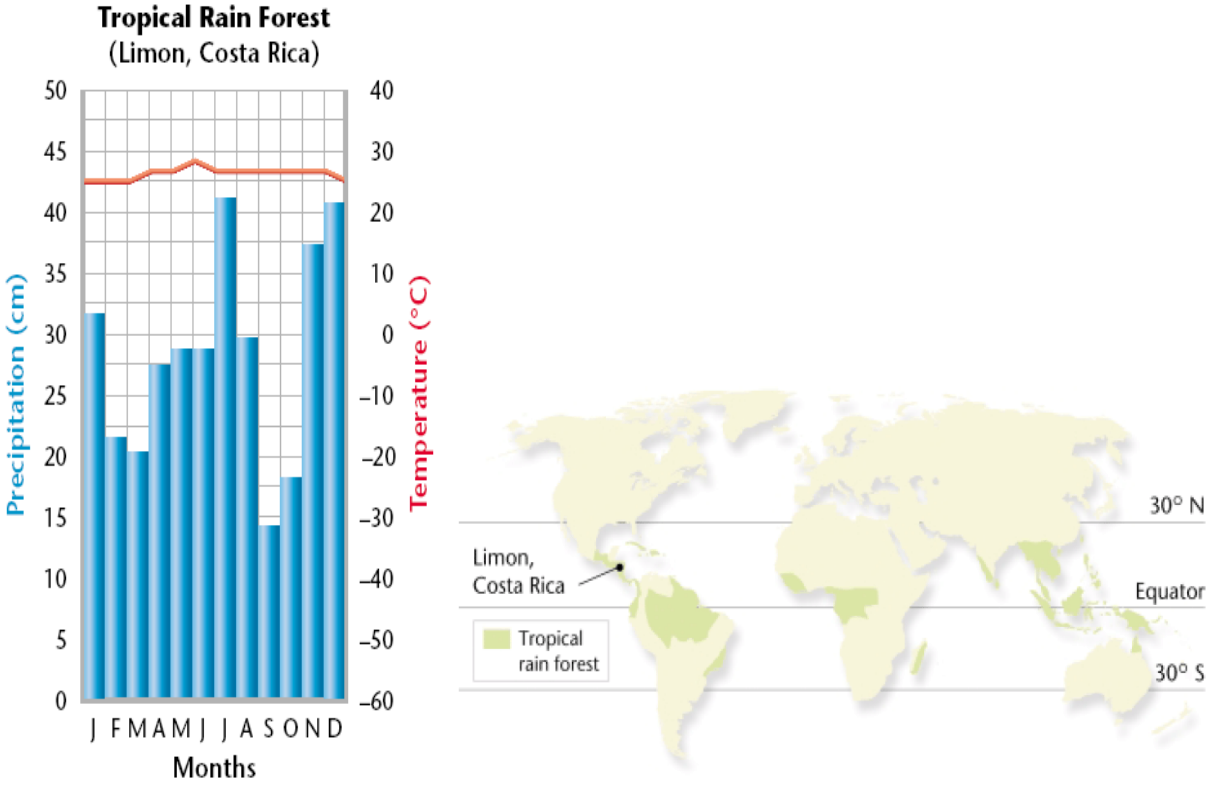
Forest Biomes

- **Of all the biomes in the world, forest biomes are the most widespread and the most diverse.**
- **The large trees of forests need a lot of water, so forests can be found where temperatures are mild to hot and where rainfall is plenty.**
- **There are three main forest biomes of the world: tropical, temperate, and coniferous.**

Tropical Rain Forests

- **Tropical rain forests are forests or jungles near the equator. They are characterized by large amounts of rain and little variation in temperature and contain the greatest known diversity of organisms on Earth.**
- **They help regulate world climate an play vital roles in the nitrogen, oxygen, and carbon cycles.**

- **They are humid, warm, and get strong sunlight which allows them to maintain a fairly constant temperature that is ideal for a wide variety of plants and animals.**



Nutrients in Tropical Rain Forests

- **Most nutrients are within the plants, not the soil.**
- **Decomposers on the rain-forest floor break down dead organisms and return the nutrients to the soil, but plants quickly absorb the nutrients.**
- **Some trees in the tropical rain forest support fungi that feed on dead organic matter on the rain-forest floor. In this relationship, the fungi transfer the nutrients form the dead matter directly to the tree.**
- **Nutrients from dead organic matter are removed so efficiently that runoff from rain forests is often as pure as distilled water.**
- **Most tropical soils that are cleared of plants for agriculture lack nutrients and cannot support crops for more than a few years.**
- **Many of the trees form above ground roots called *buttresses* or *braces* that grow sideways from the tree to provide it with extra support in the thin soil.**

Layers of the Rain Forest

- **In tropical rain forests, different types of plants grow in different layers.**
- **There are four main layers of the rain forest:**
  - **The Emergent Layer**
  - **The Upper Canopy**
  - **The Lower Layer**
  - **The Understory**

- **The emergent layer is the top foliage layer in a forest where the trees extend above surrounding trees.**
- **Trees in this layer grow and emerge into direct sunlight reaching heights of 60 to 70 m and can measure up to 5 m around.**
- **Animals such as eagles, bats, monkeys, and snakes live in the emergent layer.**
- **The canopy is the layers of treetops that shade the forest floor, and is considered to be the primary layer of the rain forest.**
- **The tall trees, more than 30 m tall, form a dense layer that absorbs up to 95 percent of the sunlight.**
- **The canopy can be split into and upper and lower canopy with the lower canopy receiving less of the sunlight.**
- **Epiphytes are plants that use another plant for support but not for nourishment, and are located on high trees in the canopy.**
- **Growing on tall trees in allows them to reach the sunlight needed for photosynthesis, and to absorb the water and nutrients that run down the tree after it rains.**

- **Most animals that live in the rain forest live in the canopy because they depend on the abundant flowers and fruits that grow there.**
- **The understory is the foliage layer that is beneath and shaded by the main canopy of a forest.**
- **Little light reaches this layer allowing only trees and shrubs adapted to shade to grow there.**
- **Most plants in the understory do not grow more that 3.5 m tall.**
- **Herbs with large flat leaves that grow on the forest floor capture the small amount of light that penetrates the understory.**

Species Diversity

- **The diversity of rain-forest vegetation has led to the evolution of a diverse community of animals.**
- **Most rainforest animals are specialists that use specific resources in particular ways to avoid competition and have adapted amazing ways to capture prey and avoid predators.**
- **Insects use camouflage to avoid predators and may be shaped like leaves or twigs.**

Threats to Rain Forests

- **Every minute of every day, 100 acres of tropical rainforest are cleared for logging operations, agriculture, and oil exploration. Exotic-pet trading robs the rain forests of rare and valuable plant and animal species only found there.**
- **Habitat destruction occurs when land inhabited by an organism is destroyed or altered.**
- **If the habitat that an organism depends on is destroyed, the organism is at risk of disappearing.**
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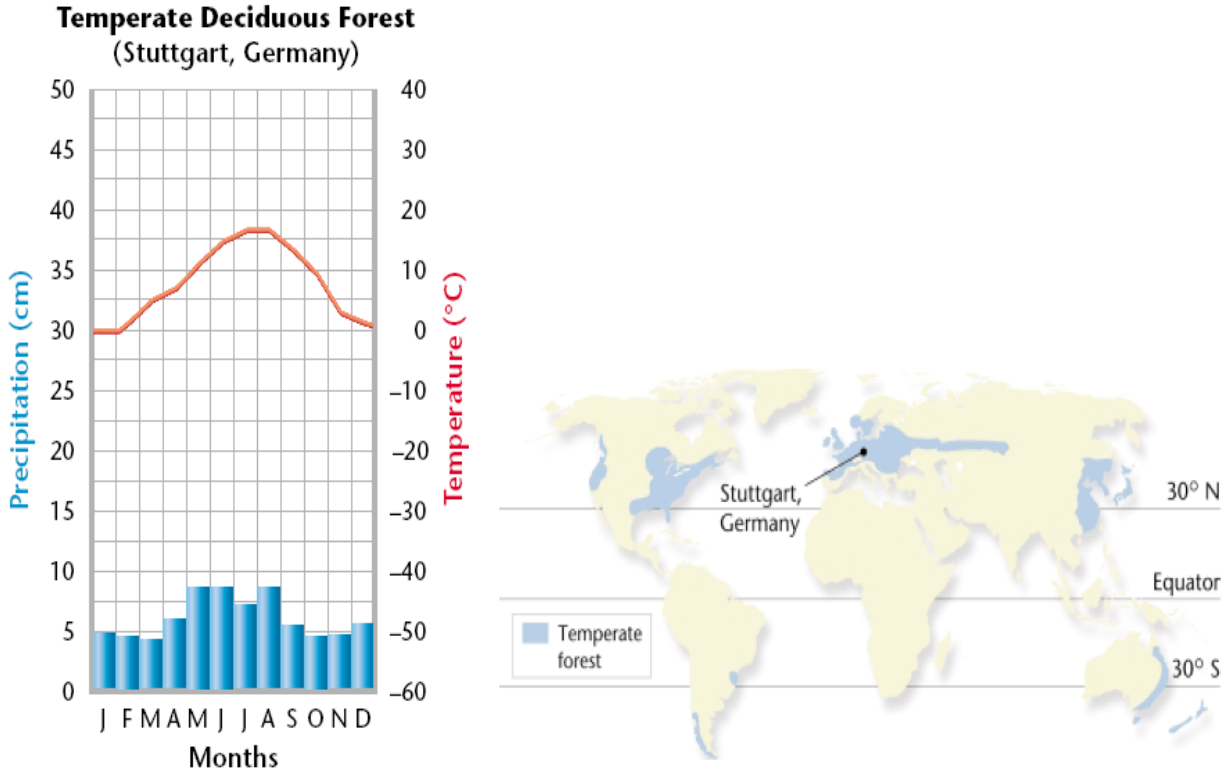
- **An estimated 50 million native peoples live in tropical rain forests and are also threatened by habitat destruction.**
- **Because they obtain nearly everything they need form the forest, the loss of their habitat could force them to leave their homes and move into cities.**
- **This drastic change of lifestyle may then cause the native peoples too lose their culture and traditions.**

<u>Temperate Forests</u>

- **Temperate rain forests are forests communities that are characterized by cool, humid weather and abundant rainfall, where tree branches are draped with mosses, tree trunks are covered with lichens, and the forest floor is covered with ferns.**
- **They occur in North America, Australia, and New Zealand, and are dominated by evergreen trees such as the Douglas fir and Sitka spruce.**
- **Although located north of most other rain forests, the temperate rain forest of the Pacific Northwest still maintains a moderate temperature year round.**
- **It rarely freezes because the nearby Pacific Ocean waters keep temperatures mild by blowing cool ocean water over the forest.**
- **As the ocean winds meet the costal Olympic Mountains, a large amount of rainfall is produced which keeps the temperature cool and moist.**

<u>Temperate Deciduous Forests</u>

- **Temperate deciduous forests are forests characterized by trees that shed their leaves in the fall, and located between 30º and 50º north latitude.**
- **The range of temperatures can be extreme, with summer temperatures soaring to 35ºC and winter temperatures often falling below freezing.**
- **They receive 75 to 125 cm of precipitation annually which helps to decompose dead organic matter contributing to the rich soils of the forest.**



Plants of Deciduous Forests

- **Plants in the deciduous forests grow in layers with tall trees, such as birch, dominating the canopy while shrubs cover the understory. Also, more light reaches deciduous forest floors than rain forests floors allowing more plants to grow.**
- **Temperate-forest plants are adapted to survive seasonal changes. In the fall and winter, trees shed their leaves and seeds go dormant under the insulation of the soil. With the returning warmth in the spring, the trees grow new leaves and seeds germinate.**

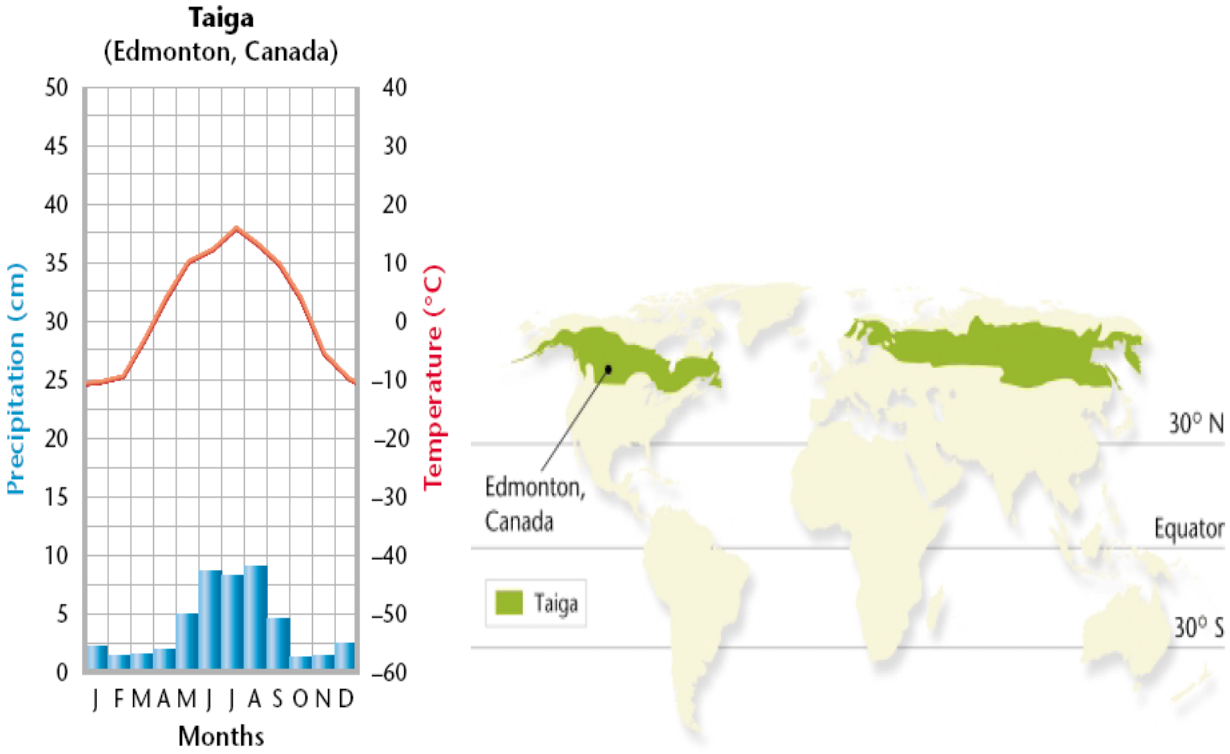
Animals of Deciduous Forests

- **The animals of temperate deciduous forests are adapted to use the forest plants for both food and shelter.**
- **Birds cannot survive the harsh winter of the deciduous forests so each fall they fly south for warmer weather and better availability of food.**
- **Other animals, such as mammals and insects, reduce their activity so that they do not need as much food for energy, enabling them to survive the winter.**

Taiga

- **The taiga is the region of evergreen, coniferous forest below the arctic and subarctic tundra regions.**
- **The taiga has long winters and little vegetation.**

- **The growing season can be as short as 50 days with most plant growth occurring during the summer months because of nearly constant daylight and larger amounts of precipitation.**



Plants of the Taiga

- **A conifer is a tree that has seeds that develop in cones. Their leaves' arrow shape and waxy coating helps them to retain water in the winter. The conifer's shape also helps the tree shed snow to the ground and not get weighed down.**
- **Conifer needles contains substances that make the soil acidic when they fall to the ground preventing plants from growing on the floor.**
- **Also, soil forms slowly in the taiga because the climate and acidity slow decomposition.**

Animals of the Taiga

- **The taiga has many lakes and swamps that in the summer attract birds that feed on insects.**
- **To avoid the harsh winters, birds migrate, while some year round residents, such as shrews, burrow underground for better insulation.**
- **Other animals, such as snowshoe hares, have adapted to avoid predation by shedding their brown summer fur and growing white fur that camouflages them in the winter snow.**