

Chapter 6: Biomes

Section 1: What is a Biome?

Objectives:

1. Describe how plants determine the name of a biome.
2. Explain how temperature and precipitation determine which plants grow in an area.
3. Explain how latitude and altitude affect which plants grow in an area.

A. Biomes

- Are large regions characterized by a specific climate and specific plant and animal communities

• _____

1. Climate

- Is determined by average temperature and precipitation
- Varies with _____ and _____
- Determines what plants can live in an area

2. Plants

- Have characteristics, specialized structures, and/or adaptations that allow them to survive in a particular biome
- Determine all other organisms that can live in an area

Section 2: Forest Biomes

Objectives:

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

A. Tropical Rain Forests

• _____

- Are characterized by
 - High rainfall: 200-450 cm of rain per year → high humidity
 - High temperatures due to year-round direct sunlight → no seasonal variation
 - Highest biodiversity of all biomes and contains the most plant species of all forest biomes

• _____

- Play vital role in N, O, and C cycles
- Nutrients are mostly found in plants – NOT soil – so run-off is almost *pure* H₂O

1. Layers (Fig. 7, p. 148)

- (1) Top layer = _____

- Receives most sunlight
- Has the tallest trees: 60-70 m
- Has a variety of animals: eagles, bats, monkeys, and snakes

(2) Middle (primary) layer = _____

- Receives filtered light
- Is divided into upper and lower canopy
- Has trees with heights ≥ 30 m and epiphytes
- Is where most animals live

(3) Bottom layer = _____

- Receives very little light, so plants are adapted to shade
- Has the shortest trees: ≤ 3.5 m

2. Species Diversity

- Special adaptations of plants and animals
 - _____: plant that uses another plant for support but not for nourishment
 - _____: a shape or color that allows an animal to blend into its environment

3. Threats

- Once covered 20% of Earth's surface, now only cover 7% due to
 - Logging, agriculture, and/or oil exploration \rightarrow *~100 acres is clear-cut every minute of every day*, destroying habitat and threatening plants, animals, and native peoples
 - Trading of exotic plants and animals

B. Temperate Rain Forests

- Occur in N. America, Australia, and New Zealand
- _____
- N. America's only temperate rain forest = Pacific Northwest (northern CA, OR, and WA)

C. Temperate Deciduous Forests

- Once dominated vast regions of Earth, including parts of N. America, Europe, and Asia, but are now generally limited to between 30-50° N latitude (map on p. 152)
- Are characterized by
 - _____
 - _____
 - Growing season = 4-6 months

1. Plants

- Grow in layers – similar to a rain forest – but the forest floor receives more light, so there is more plant growth in the understory
- Adapted to survive seasonal changes: _____

2. Animals

- Adapted to forest plants for food and shelter
- Adapted to survive seasonal changes: _____

D. Taiga

- Is located just below the Arctic Circle (map on p. 153)
- Is characterized by
 - Long winters (6-10 months) with average temperatures of $<0^{\circ} - -20^{\circ} \text{ C}$
 - Short summers with nearly constant daylight and lots of rainfall = short growing season (may be as short as 50 days nearest the Arctic Circle)
 - Rough terrain
 - Coniferous forest with a dark, sparsely-vegetated forest floor

1. Plants

- Few plants because of slow soil formation (due to climate) and acidic soil (due to conifer needles)
- Adaptations of conifers: _____

2. Animals

- Are adapted to survive harsh winters: migration, burrowing/hibernation, camouflage, etc.

Section 3: Grassland, Desert, and Tundra Biomes

Objectives:

1. Describe the difference between tropical and temperate grasslands.
2. Describe the climate in a chaparral biome.
3. Describe two desert animals and the adaptations that help them survive.
4. Describe one threat to the tundra biome.

A. Savannas (Tropical Grasslands)

- Are located in tropical to subtropical areas near the equator and between tropical rain forest and desert biomes (map on p. 155)
- Characterized by
 - _____
 - _____
 - _____

1. Plants

- Must be able to survive long periods without H_2O
- Adaptations: large horizontal root systems, leaf loss during dry season, thorns/sharp leaves

2. Animals

- Adaptations: _____

B. Temperate Grasslands

- _____
 - _____
 - Characterized by
 - Most have hot summers and cold winters
 - Average rainfall = 50-88 cm/year... In some cases, mountains block rains, which limits rainfall and makes the biome susceptible to fire
 - Dominated by grasses, very few trees and grazing animals
 - _____
 - Many have been replaced with farms and grazing areas
1. **Plants**
 - Determined by amount of rainfall
 - Adaptations: most are perennials with dense root systems, which help them survive fire and drought
 2. **Animals**
 - Grazing
 - Adaptations: large, flat back teeth for grinding tough grasses; thick winter coats; underground burrows
 3. **Threats**
 - _____: grains do not hold soil as well as native grasses
 - _____: domestic animals have replaced native animals
 - _____

C. Chaparral (Temperate Woodland)

- Occurs in the mid-latitudes, about 30° N and S of the equator (map on p. 159)
 - Characterized by
 - _____
 - Evergreen shrubs; scattered, low-growing, small trees; and herbs
1. **Plants**
 - Are well-adapted to _____
 - (1) Most have oil-containing, leathery leaves that prevent water loss and promote fire, which destroys competition
 - (2) Can resprout from small bits of surviving plant tissue
 2. **Animals**
 - Most common adaptation: _____
 3. **Threats**
 - _____: lots of sun, access to the oceans, and a mild year-round climate

D. Deserts

- Hot deserts are closer to the equator (= hotter average temperatures) than “cold” deserts (map on p. 160)
- _____
- Are often found near large mountain ranges, which limit or block rain

1. Plants

- **Adaptations:**

- (1) _____: thick and fleshy stems, waxy coating, expansive root systems near the surface
- (2) Grazing prevention: sharp spines
- (3) Drought-resistance: dormancy, require less H₂O

2. Animals

- Adaptations:

- (1) H₂O conservation: thick, scaly skin
- (2) _____ (bury themselves underground and sleep through the dry season)
- (3) Body armor or nest in cacti
- (4) _____

E. Tundra

- _____
- Characterized by
 - Short summers
 - _____ = permanently frozen soil
 - Tough grasses, lichens, and herbs
 - Caribou, moose, deer, wolves, foxes, etc.
- Is one of the most fragile biomes on Earth

1. Plants

- Adaptations: grow without soil (mosses and lichens); have wide, shallow root systems; grow close to the ground

2. Animals

- Adaptations: migration, burrowing, camouflage, _____

3. Threats

- Food chains are simple and easily disrupted
- Land is easily damaged and slow to recover
- _____