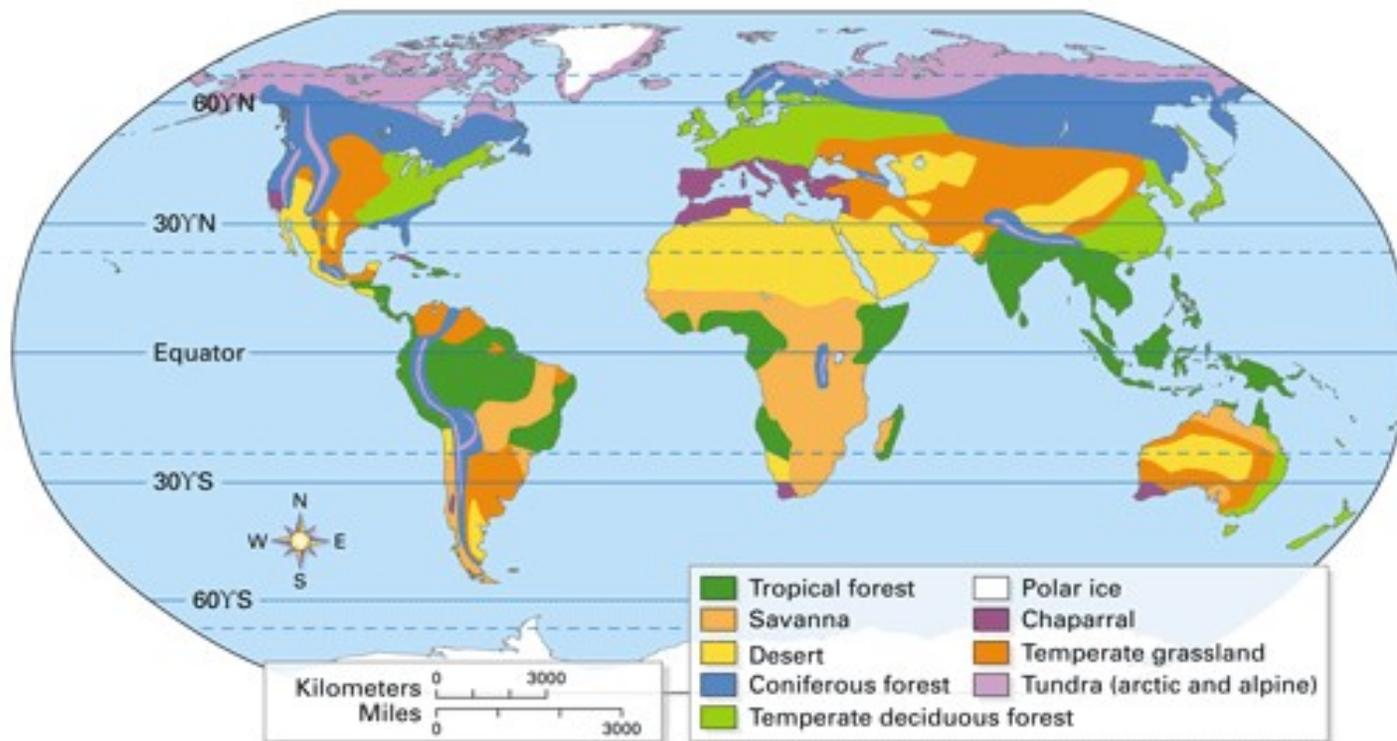


# Biomes

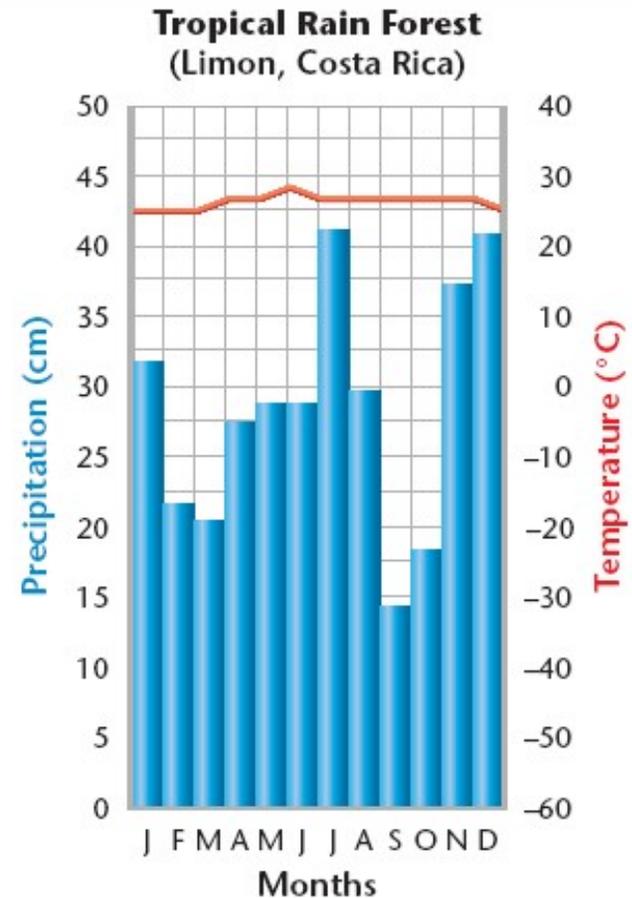


**Biome** – A large region characterized by a specific type of climate and certain types of plant and animal communities.

- Areas of similar climates have similar ecosystems
- Plants determine the animal species present



# Tropical Rainforest



**Figure 5** ► The world's tropical rain forests have heavy rainfall during much of the year and fairly constant, high temperatures.

# Tropical Rainforest

- Near the **equator**
- Warm year-round (Tropical)
- **Lots of rainfall** – 138 inches per year
- Ideal growing conditions for many plants
- **Greatest biodiversity** on Earth
- Soil thin and poor in nutrients
- Unique species provide food, medicine, and valuable products
- **Threat** - being cleared for  
lumber and housing



# Layers of the Rainforest



# Tropical Rainforest

## Plant and Animal Adaptations

### Plants

- Different plants with different sunlight needs at different layers of the canopy
- Shallow, wide roots since soil is thin and poor in nutrients



### Animals

- Camouflage common
- Have specialized niches to lower competition for resources



# Review Questions

What is a biome?

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Where are tropical rainforests found?

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What are the layers of a tropical rainforest?

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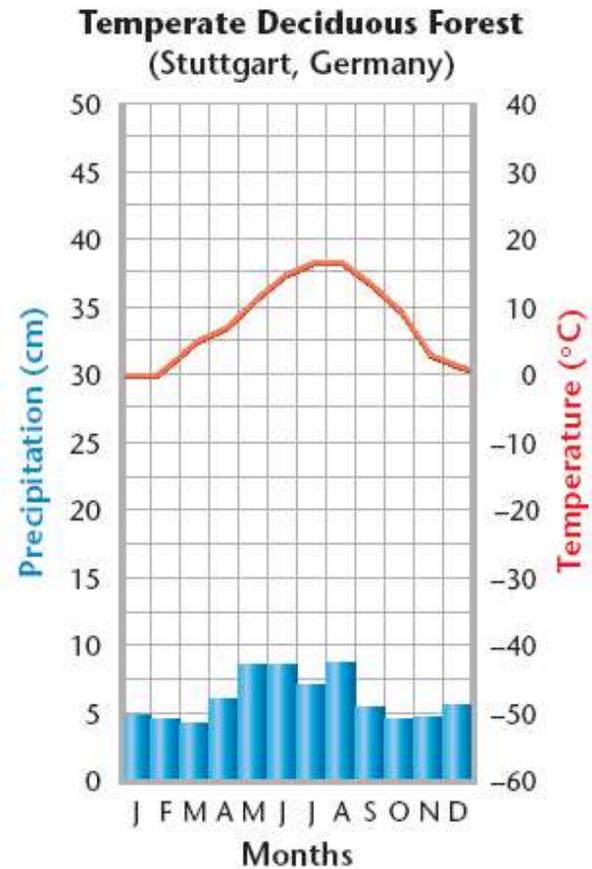
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Why are tropical rainforests important?

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# Temperate Deciduous Forest



**Figure 10** ► The difference between summer and winter temperatures in temperate deciduous forests is extreme.

# Temperate Deciduous Forest

- Mostly deciduous trees (lose leaves in fall)
- Large human population (Our Biome)

**Temperate** – Has 4 seasons

- Cold winters
- Hot summers
  
- Deep soil, **rich in nutrients**
- Average Precipitation 30-100 inches per year
- **Threat**-being cleared for housing



# Temperate Deciduous Forest Plant and Animal Adaptations

## Plants

- Trees adapt by becoming dormant in winter, losing their leaves
- Many ground plants in forest because sunlight is able to reach the floor



## Animals

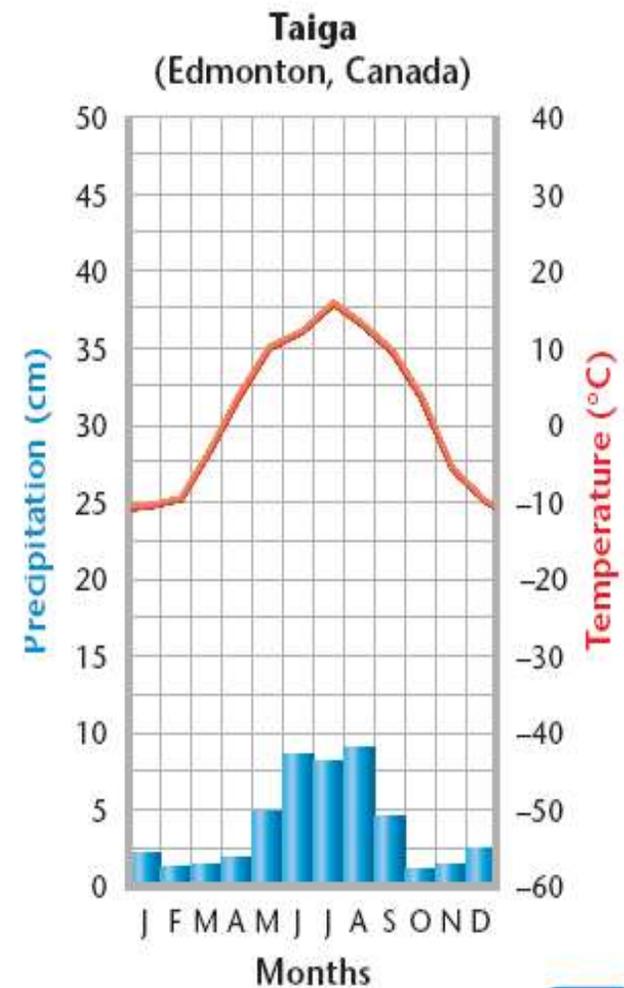
- Eat from different layers
- Lose their winter coat in summer
- Easily adapt to many seasons
- Some **hibernate** or **migrate**



# Taiga (Coniferous or Boreal Forest)



**Figure 13** ► The taiga has long, cold winters and small amounts of precipitation, as shown in the climatogram below.



# Taiga (Coniferous or Boreal Forest)

- Found in Northern Hemisphere
- **Coniferous** evergreen trees
- Long, **cold** winters
- Average precipitation 100 inches per year with **heavy snowfall**
- Short growing season
- Soil acidic and poor in nutrients
- **Threats** – mining and pollution



# Taiga (Coniferous or Boreal Forest)

## Plant and Animal Adaptations

### Plants

- Coniferous trees with long, thin, waxy needles to help prevent water loss
- Long roots to anchor trees



### Animals

- Burrow, hibernate and have warm coats for insulation from the cold



# Review Questions

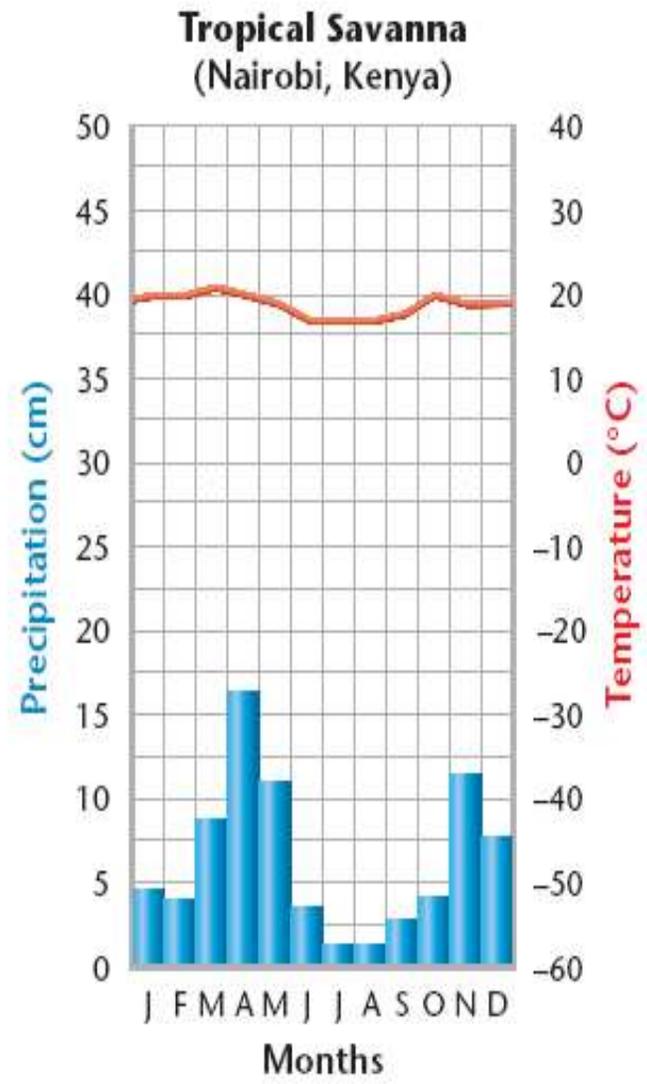
What plants are found in a temperate deciduous forest? \_\_\_\_\_

What is the climate like in a temperate deciduous forest?

What type of trees grow in a taiga?

What is the climate like in a taiga?

# Savanna



# Savanna

- Located near the equator - **Tropical Grasslands**
- Grasses with a few scattered trees, grazing animals
- Warm climate year round
- Average precipitation 25-150 inches per year  
- **rainy and dry seasons**
- **Threats**- Invasive species, sea level rise, and fire management

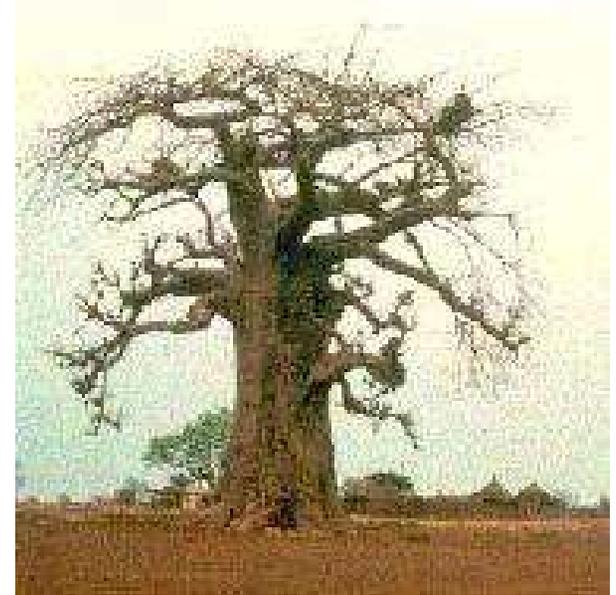


# Savanna

## Plant and Animal Adaptations

### Plants

- Baobab and Acacia Trees
- Thorns and sharp leaves protect against predation
- Resistant to **drought**



### Animals

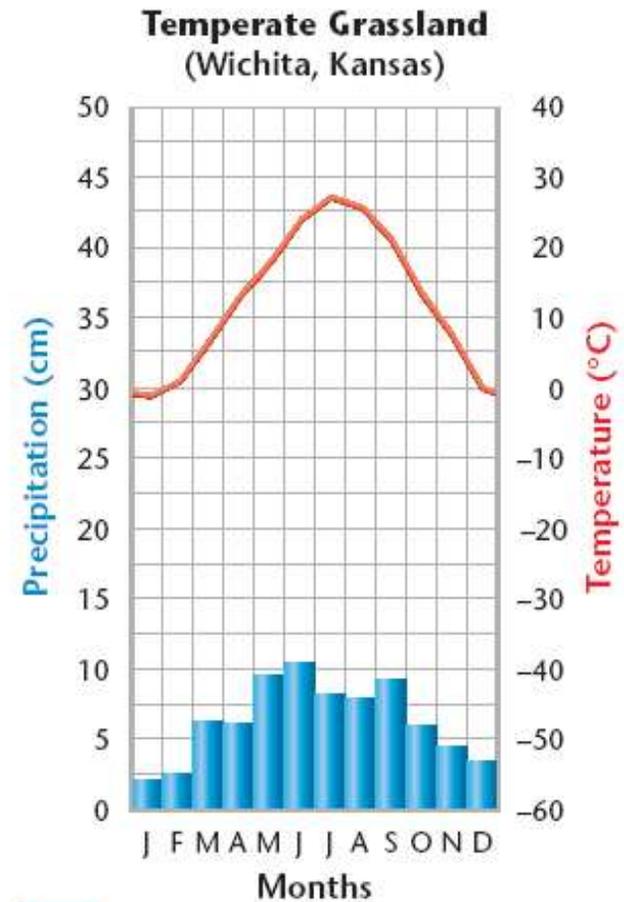
- Adapted for short rainy season
- **Migrate**
- Reproduce during the rainy season – more food available



# Temperate Grassland

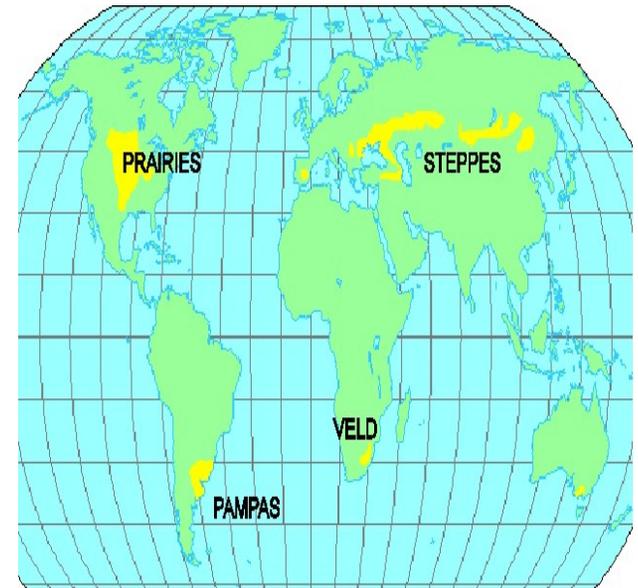


**Figure 18** ► Temperate grasslands are characterized by small amounts of rainfall, periodic droughts, and high temperatures in the summer.



# Temperate Grassland

- Deep, nutrient **rich soil**
- Hosts a variety of grass species
- Called “**prairies**” in the US
- Includes: Steppes, Pampas, Veld
- High winds
- Cold winter and warm summer
- Precipitation averages 20-60 inches per year
- **Threats** - land development, **overgrazing**, and **overhunting**



# Temperate Grassland Plant and Animal Adaptations

## Plants

- Sod like grasses that will not dry out or blow away.



## Animals

- **Migration, hibernation, and burrow** during extreme temperatures and precipitation.



# Review Questions

Where are savannas located?

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What is another name for a savanna?

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What type of seasons does the savanna have?

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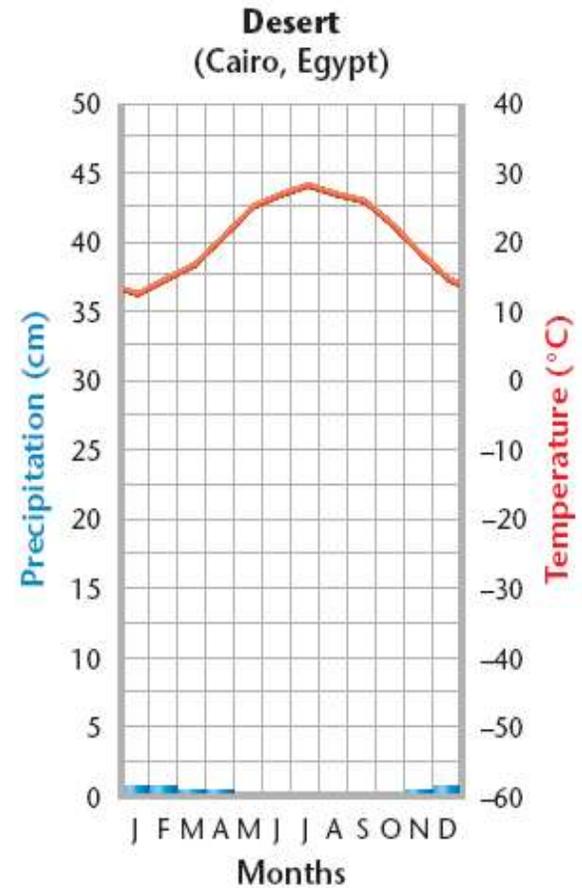
What are other names for temperate grasslands?

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What is the soil like in a temperate grassland?

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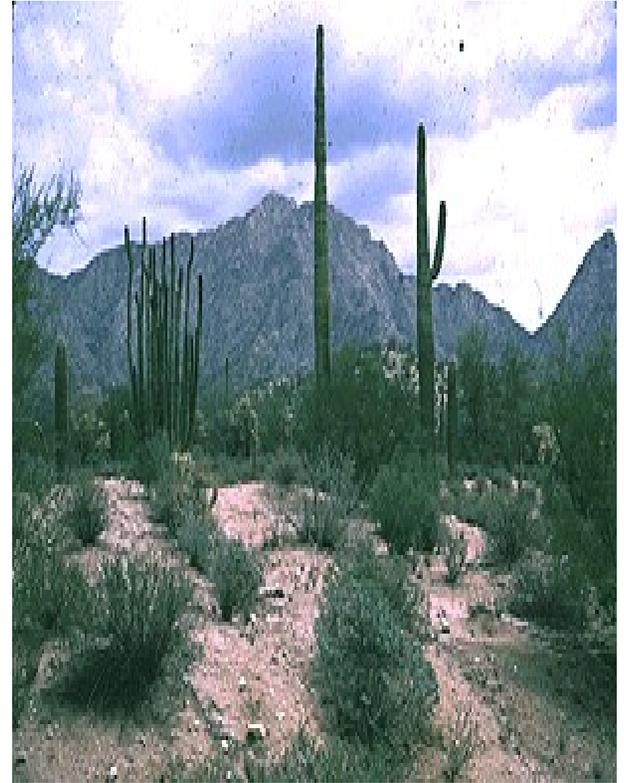
# Desert



**Figure 25** ► Deserts are the driest places on Earth. They typically receive less than 25 cm of precipitation a year.

# Desert

- Temperature can vary
  - Can be very **hot**; Gobi, Sahara
  - Or very **cold**; Antarctica
  - Can be hot / day and cold / night
- Precipitation less than 10 inches per year (driest on Earth)
- Little top soil due to high winds
- Small shrubs and **cacti**
- **Threats** – residential development, off road activities, over removal of plants by collectors



# Desert

## Plant and Animal Adaptations

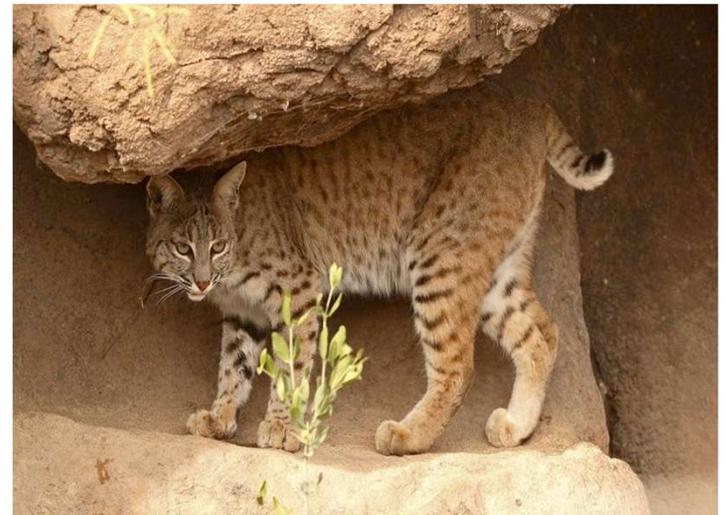
### Plants

- **Succulents**
- Spines, thick **waxy** outer layer
- Shallow, broad roots



### Animals

- Get water from food
- Reptile's skin prevents water loss
- Thick outer coat on mammals
- **Burrow** during the day
- **Nocturnal** – look for food at night



# Review Questions

What is the climate like in a desert?

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Are deserts always hot? If no, give an example.

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How might an animal escape the heat in a desert?

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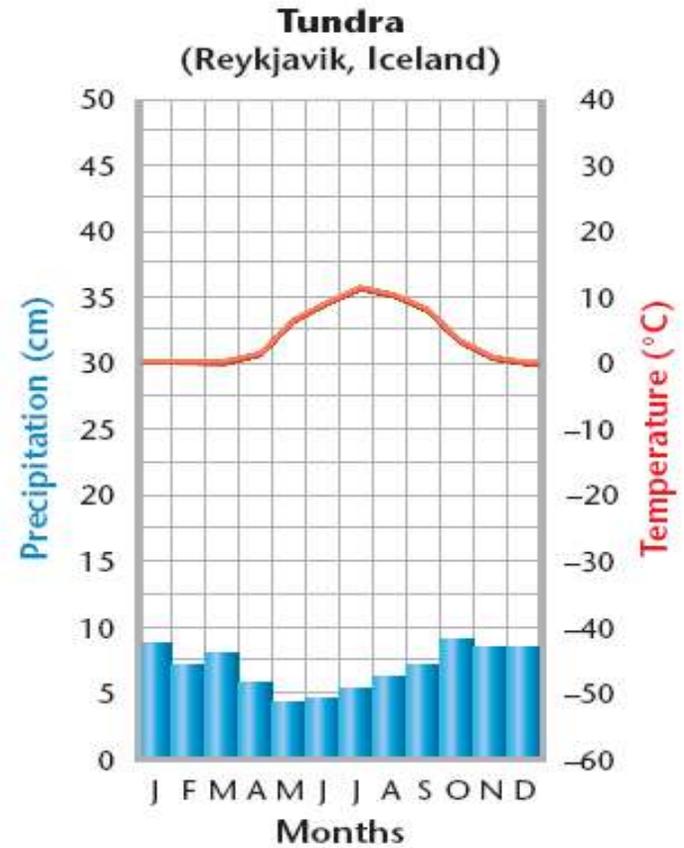
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How are plants adapted to the desert?

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# Tundra



**Figure 27** ► The precipitation that the tundra biome receives remains frozen much of the year.

# Tundra

- **Very cold** – Coldest on Earth
- Precipitation less than 25 inches per year (desert like)
- Found in **arctic** and high elevations
- High winds
- Has **permafrost** – frozen subsoil
- Short growing season
- Fragile biome, a long time to recover from damage
- **Threats** – possible oil drilling, **climate change**



# Tundra

## Plant and Animal Adaptations

### Plants

- Grow close to the ground
- Shallow roots



### Animals

- Small ears
- Thick coats for insulation
- **Migration**
- White coloring common
- Examples: caribou, reindeer, owl, penguins, arctic fox, and hares



# Review Questions

What is the climate like in a tundra?

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What is permafrost?

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Where is the tundra located?

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What is a threat to the tundra?

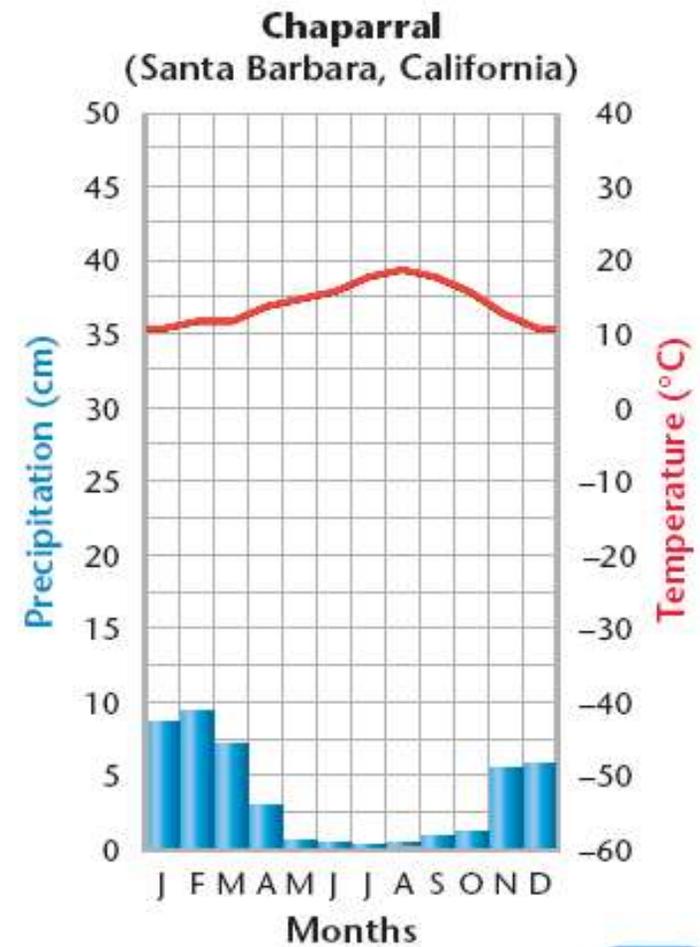
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# Chaparral



**Figure 24** ► Chaparral biomes are located in areas that have Mediterranean climates.



# Chaparral

- **Temperate coastal** biome dominated by dense evergreen shrubs
- Mild, rainy winters
- Hot, dry summers
- Precipitation averages 10-17 inches per year
- Example: **California**
- Natural **brushfires** happen often
- **Threat**-land development



# Chaparral

## Plant and Animal Adaptations

### Plants

- Small, leathery leaves retain water
- **Leaves** have **flammable oils** – burns trees that may cause competition
- Sprout/regrow after fires from small bits of surviving plant tissue

### Animals

- **Camouflage**, shape, and color for moving through shrubs unnoticed.



# Review Questions

What types of plants grow in the chaparral?

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What is the climate like in the chaparral?

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What role does fire play in the chaparral?

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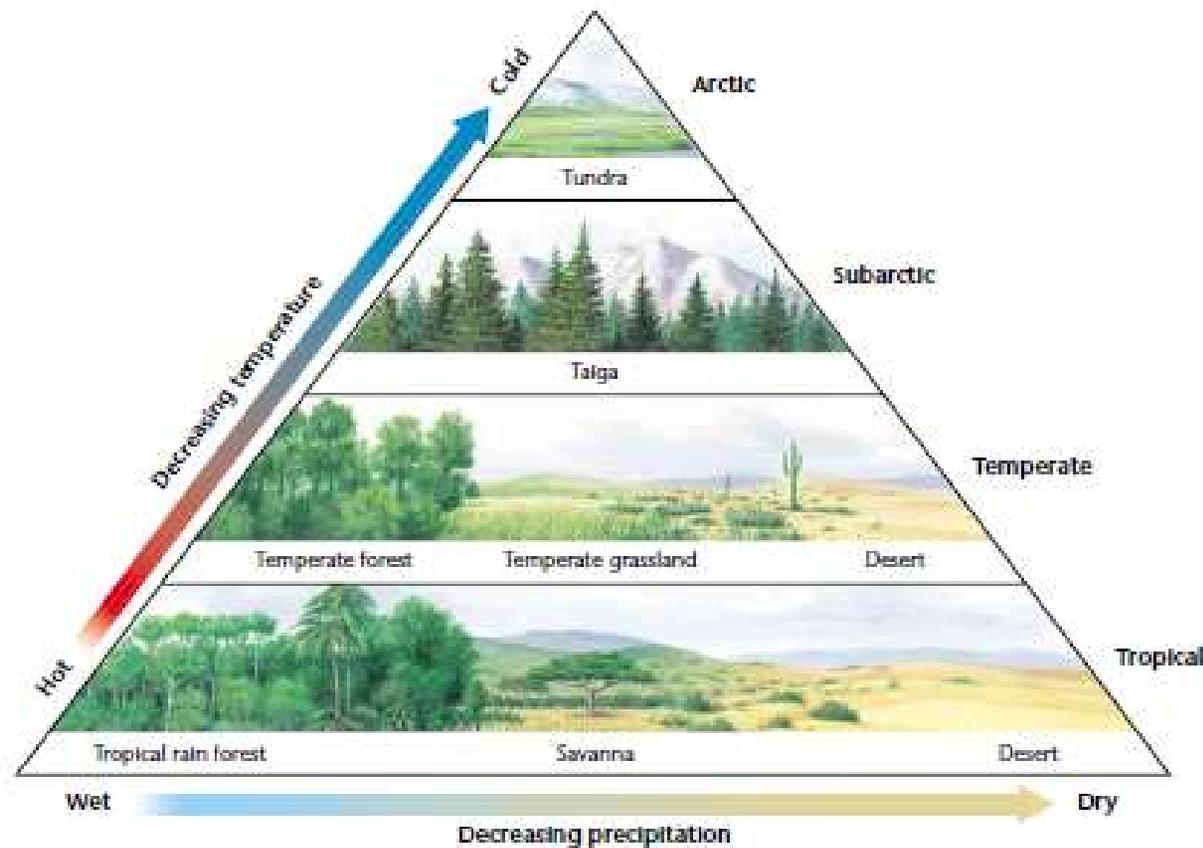
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# Biomes and Climate

"Climate is what you expect. Weather is what you get." -Mark Twain

- Climate includes **temperature** and **precipitation**

## Temperature Vs. Precipitation

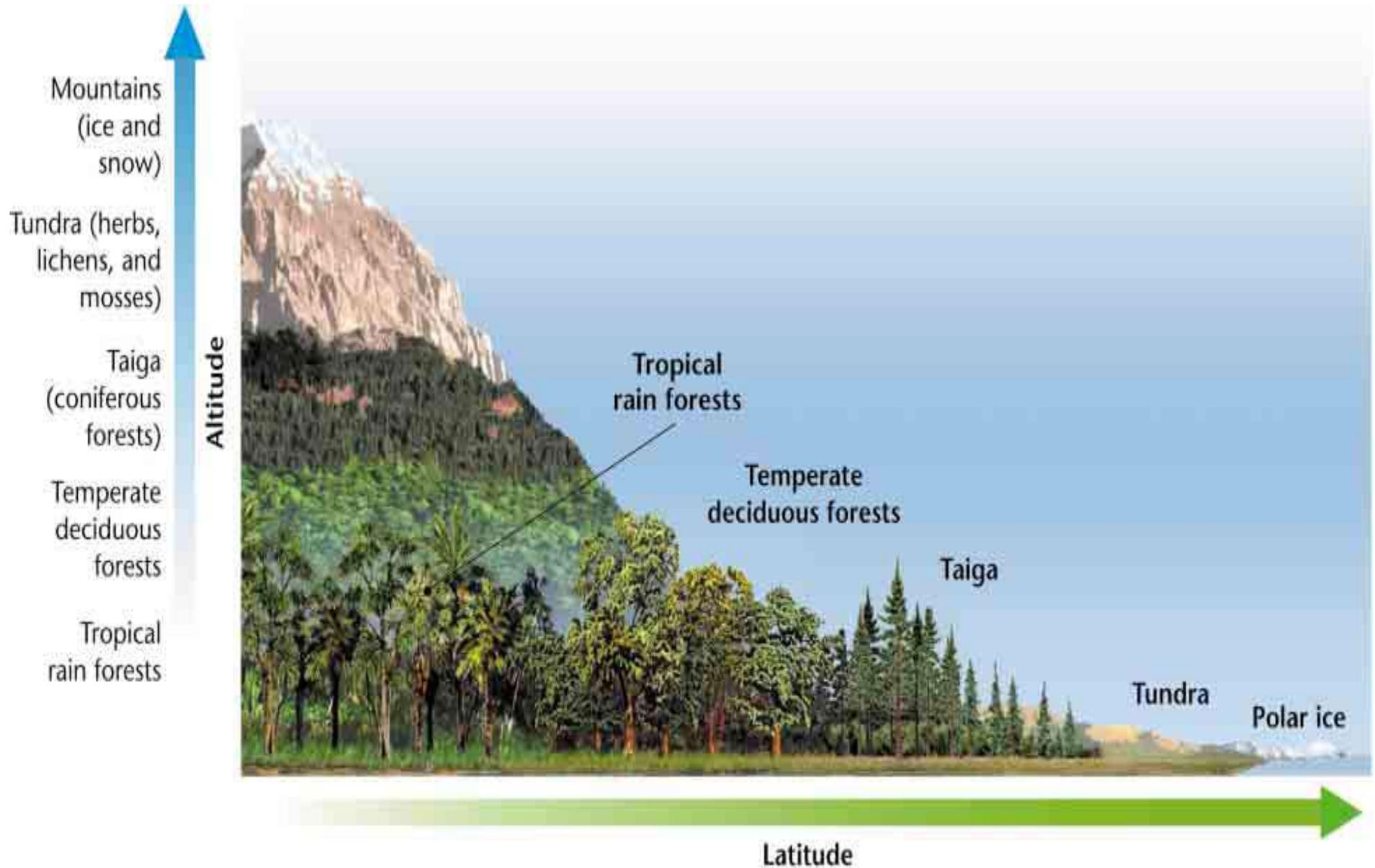


# Latitude vs. Altitude

- **Latitude** – Distance north or south from equator
- **Altitude** – Distance above or below sea level
- Climates change with altitude and latitude
  - colder as you move away from the equator
  - colder as you move higher above sea level



# Latitude vs. Altitude



# Review Questions

How are altitude and latitude different?

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Describe how the climate and biomes would change from the equator to the North Pole. (list order)

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Describe how the climate and biomes would change from sea level to the top of the tallest mountain.  
(temperature/precipitation)\_\_\_\_\_

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# The Eight Major Biomes

