

## **Climate and Terrestrial Biodiversity Chapter Seven and Supplement Eight**

### **Weather & Climate**

- \_\_\_\_\_ is the short-term properties of the troposphere at a given place and time.
- \_\_\_\_\_ is the average long-term weather of an area.

### **Climate**

- The average \_\_\_\_\_ and average \_\_\_\_\_ of an area are the most important factors in climate. These two variables are influenced by five main factors:
  - uneven heating of the earth's surface (air is heated at the equator and cooled at the poles)
  - seasonal changes (the earth's axis is tilted to create opposite seasons in the northern and southern hemispheres)
  - \_\_\_\_\_ effect (deflection of winds to the right in the northern hemisphere and to the left in the southern hemisphere due to the rotation of the earth)
  - long-term variations in the amount of solar energy striking the earth (due to orbital changes)
  - properties of air and water (evaporation of heated water creates low pressure systems at the surface)

### **The Greenhouse Effect**

- The greenhouse effect is the natural trapping of heat in the \_\_\_\_\_.
  - greenhouse gases allow light, infrared radiation, and some ultraviolet radiation from the sun to pass through the troposphere. The earth's surface absorbs this energy and radiates it back out as heat. This heat is absorbed by the greenhouse gases or radiated back toward earth, heating the atmosphere.
  - greenhouse gases include water vapor, carbon dioxide, ozone, methane, nitrous oxide, and chlorofluorocarbons.
    - Note: global warming and ozone will be discussed in detail in chapter 19

### **El Nino-Southern Oscillation**

- The El Nino-Southern Oscillation is a periodic climate change that can trigger extreme weather changes over two-thirds of the globe.
  - in an El Nino, the prevailing westerly \_\_\_\_\_ weaken or cease in the Pacific Ocean which makes the surface water \_\_\_\_\_ along the North and South American coasts.

### **Biomes**

- Biomes are terrestrial regions with characteristic types of natural, undisturbed ecological communities adapted to the climate of the region.

### **Desert Biomes**

- A desert is an area where \_\_\_\_\_ exceeds precipitation. Precipitation is typically less than 25 cm per year.
- Deserts cover about 30% of the earth's surface, mainly between 30° north and 30° south latitude.
- Plant Adaptations include small or no leaves, wax-coated leaves, tap roots, and spines
- Animal Adaptations include \_\_\_\_\_ lifestyle, thick outer coverings, and dry/concentrated waste

### **Desert Biomes: Human Impact**

- Habitat destruction is particularly harmful because of deserts slow plant growth, low species diversity, slow nutrient cycling, and water shortage
- \_\_\_\_\_ is the buildup of salt in soil due to the evaporation of water used for irrigation
- Aquifer depletion causes some deserts to subside (sink)
- Extraction of natural \_\_\_\_\_ such as oil, iron ore, copper, gold, silver, diamonds, and sand.

## Grassland Biomes

- A grassland is a region with enough average precipitation to allow grass to prosper, but with precipitation so erratic that drought and fire prevent large stands of trees from growing.
- Human Impact
  - \_\_\_\_\_ of domesticated animals on grasslands support 50 million people, mostly in Africa and Asia
  - conversion of grassland into cropland due to fertile soils
  - \_\_\_\_\_ and drilling for oil, natural gas, and other natural resources

### Grassland Biomes: Classification

- There are three main types of grasslands:
  - tropical grasslands are found in areas with high average temperature, low to moderate precipitation, and a prolonged \_\_\_\_\_ season
    - savannas are tropical and subtropical grasslands that are warm all year with alternating wet and dry seasons
  - temperate grasslands have large temperature differences from season to season and little rain that is \_\_\_\_\_ distributed through the year
    - types of temperate grasslands include tall-grass prairies, short-grass prairies, pampas, veldt, and steppes
  - polar grasslands, or arctic tundra, and alpine tundra are very cold with the small amount of precipitation falling as snow
    - \_\_\_\_\_ is the perennially frozen layer of soil

## Chaparral Biomes

- The chaparral, or temperate shrubland, occurs along \_\_\_\_\_ areas where the winters are mild and moderately rainy and summers are long, hot, and dry.
  - chaparral is dominated by dense growth of spiny evergreen shrubs

### Forest Biomes: Tropical

- There are three main types of forests: Tropical, Temperate, and \_\_\_\_\_
  - tropical rain forests are broadleaf evergreen forests with a warm annual mean temperature, high humidity, and heavy rainfall almost daily
  - tropical deciduous forests, or tropical monsoon forests, or tropical seasonal forests, are warm year-round with most rainfall occurring during a \_\_\_\_\_ season.

### Adaptations in the Rain Forest

- In Tropical Rain Forests, plants grow in layers
  - emergent layer
  - \_\_\_\_\_ layer
  - understory layer
  - immature layer
  - herb layer, or shrub layer
- Animals tend to be \_\_\_\_\_, avoiding competition and creating incredible biodiversity

### Forest Biomes: Temperate & Boreal

- temperate rain forests, or coastal coniferous forests, have moderate temperature with frequent rains
- temperate deciduous forests have moderate temperatures that change significantly from season to season with abundant \_\_\_\_\_ spread throughout the year.
- boreal forests, or evergreen coniferous forests, or tiagas have a dry and \_\_\_\_\_ climate with long winters and short summers.

### Forest Biomes: Human Impact

- \_\_\_\_\_ of forests, particularly tropical rain forests, dramatically decreases the biodiversity of these areas
- clear-cutting of forests, particularly temperate deciduous forests, for use as cropland or grazing areas
- hunting of large predators
- mining of boreal forests for peat, iron ore, gold, diamonds, and other minerals
- destruction by air pollution and acid \_\_\_\_\_

### **Mountain Biomes**

- Mountain regions make up about 20% of the earth's land surface, and are important because of their dramatic changes in altitude, climate, soil, and vegetation within short distances
  - mountains contain the majority of the world's \_\_\_\_\_
  - it is estimated that each 100-meter gain in elevation on a mountain is roughly equivalent to a \_\_\_\_\_-kilometer change in latitude

### **Rain Shadow Effect**

#### **Mountain Biomes: Human Impact**

- extraction of timber and mineral resources
- growing number of hydroelectric dams and reservoirs altering local ecosystems
- recreational disturbances (skiing, trekking, tourism)
- increased \_\_\_\_\_ pollution, primarily from increased automobile use
- changes in climate and UV radiation from global warming and ozone depletion
- increased \_\_\_\_\_