

## SEGMENT FOUR, LECTURE FOUR: OVERVIEW OF ECOLOGY

Biogeographic distributions are determined by biotic and abiotic factors (Fig. 52.6).

Biotic Components (Organisms), which are classified by ecologists as

- Competitors (within and between species)
- Predators, parasites, pathogens and herbivores (Fig. 52.8)
- Prey & hosts
- Scavengers and Decomposers.

Abiotic (nonliving) Components

- 1) Mineral nutrients in rocks, soil or dissolved in water effect pH.
- 2) Climate Patterns are either global (**macroclimate**) or restricted (**microclimate**):
  - a) Solar intensity and temperature
    - Latitudinal variation (Fig. 52.10)
    - Seasonal variation is due to the 23.5° tilt of the earth's axis
    - In aquatic environments, sunlight is limiting.  
Every meter of water depth absorbs about 45% of red light and 2% of blue light.
  - b) Global air circulation
    - Vertical circulating cells (p. 1157)
    - Horizontal rotational displacement
  - c) Ocean circulation (e.g., California current; Gulf Stream – see Fig. 52.11)
    - Ocean currents influence the temperature and humidity of overlying air masses;
    - Ocean currents may cause “upwelling,” which circulates nutrients;
  - d) Mountains
    - Rain-shadow effect (Fig. 52.13). Air masses moving up over mountain ranges lose moisture, but regain moisture as they pass down the other side. Thus, deserts occur on the leeward side of mountain ranges in what is called a rain shadow.

Aquatic biomes (Fig. 52.15); structure is influenced by availability of light. The photic zone has sufficient light for photosynthesis unlike the aphotic zone (Fig. 52.16).

Selected aquatic biomes—

Freshwater—salt concentrations are <1%.

- Lakes—Range from oligotrophic (nutrient-poor; high O<sub>2</sub>) to eutrophic. Temperate lakes may experience seasonal thermoclines (layers of rapid temperature change) and turnover (Fig. 52.17).

