

SEGMENT FOUR, LECTURE FIVE: AQUATIC AND TERRESTRIAL BIOMES

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 O₂) to eutrophic.

Temperate lakes may experience seasonal thermoclines (layers of rapid temperature change) and turnover (Fig. 52.17).

Selected aquatic biomes (cont.)

Marine—salt concentrations are ~3%.

- Coral Reefs are limited to photic zones with temps from 20-30°C. This biome is defined by corals, diverse cnidarians with algal symbionts, that build calcium carbonate skeletons; However, fish and invertebrate diversity is similarly high when compared to tropical forests.

- Wetlands—may be either freshwater or marine; are areas periodically covered by water long enough to support aquatic plants. Wetlands have a high capacity to absorb water and filter dissolved nutrients (& chemical pollutants).

Terrestrial biomes (Fig. 52.19); largely determined by climate.

Climographs can indicate the expected types of terrestrial biomes given annual rainfall and temperatures (Fig. 52.20).

Terrestrial biomes are layered; the canopy is an upper layer formed by the vegetation in the biome.

Selected Terrestrial biomes—

- Tropical rainforests have steady annual rainfall; there is intense competition for sunlight and the biomes has multiple layers; trees are generally broadleaf evergreen trees that support epiphytes. Tropical dry forests have seasonal rain. Both types have exceptionally high diversity and species richness.

- Deserts—have the least precipitation, which is highly variable <30 cm/year. Temperature changes are extreme. Adaptations for this biome include defenses in plants (physical, such as spines or chemical); water-efficiency (C₄ photosynthesis); nocturnality.

POPULATION ECOLOGY

Population ecologists study how population characteristics—
size,
density,
distribution, and
age structure—

are determined by biotic and abiotic factors.

Population growth can be described by generalized growth curves.
There are two types:

Logistical - population growth slows because of some limiting factor
(Fig. 53.12).

Exponential - there is no limit to population size increase (Fig. 53.10-11).

Carrying Capacity is the maximum population size that the available resources in the environment can support. In many species, population sizes increase until the point where some essential resource (food, space etc.) becomes limiting. At this point, the growth curve levels off at the carrying capacity.

An alternative measure, more appropriate to a study of human populations, is the **ecological footprint**.