

Biology 10 - Introduction to Biology

West Valley College - Norris

Global Ecosystems: The Biomes

I. Definitions

- A. Biosphere
- B. Ecosystem (biome)
 - 1. Abiotic Components
 - 2. Biotic Components
- C. Community
- D. Population
- E. Organism

II. Factors that Lead to the Different Biomes

A. Physical and Chemical Factors

- 1. Solar Energy
- 2. Water
- 3. Temperature
- 4. Wind

B. Global Climate Patterns

- 1. Solar Radiation - provides the energy that drives weather
 - a. Seasonal Variations

- 2. Currents
 - a. Air Currents (atmosphere circulation)

 - b. Ocean Currents (ocean water circulation)

- 3. Topography (both terrestrial and marine - effect current patterns)

C. Distribution of Landmass and Topography

- 1. Barriers to Migration (isolate species and restrict gene flow)
- 2. Latitude and Elevation - influence temperature and water availability

D. Soil Types

III. Terrestrial Biomes (Global Ecosystems)

- A. Tropical Forest – high rainfall

- B. Grassland / Savannas - Semiarid (low rainfall)

C. Desert - Arid (evaporation often exceeds rainfall)

D. Shrublands / Woodlands / Chaparral - Semiarid (low rainfall)

E. Forests - trees close enough to form continuous forest (medium to high rainfall)

1. Deciduous Forest
2. Coniferous Forest

F. Tundra - two types: Alpine and Arctic (cold, little liquid water)

IV. Aquatic Biomes - cover over 70% of the earth's surface

- influenced by: light penetration, temperature, dissolved materials

a. Marine (ocean)

1. Estuaries

2. Zones / Provinces

a. Intertidal Zone - shoreline that is covered at high tide and exposed at low tide

b. Pelagic Province - entirety of ocean water

i. Neritic Zone - water above the continental shelves

ii. Oceanic Zone - open ocean (water of the ocean basin)

- Euphotic Zone - limit of light penetration

- Aphotic Zone - deep water, below limits of light penetration

c. Benthic - sea floor

b. Fresh Water (lakes and rivers)

1. Zones

a. Littoral - near shore, typically shallow

b. Limnetic - limit of light penetration

c. Profundal - deep water, below limits of light penetration

2. Seasonal Changes

3. Trophic Nature

V. Additional Selected Key Terms

aphotic	atmosphere	climate	desertification	euphotic	eutrophic
eutrophication	hydrosphere	oligotrophic	ozone plankton	rain shadow	

Study Questions – Global Ecosystems: The Biomes

1. What is the “biosphere”?
2. What is an “ecosystem”? What is a “biome”?
3. Define “abiotic” and “biotic”.
4. Describe the physical and chemical factors that influence life:
 - a. Solar Energy
 - b. Water
 - c. Temperature
 - d. Wind
5. How does sunlight vary across the surface of the earth from pole to pole?
 - a. How does this affect temperature and rainfall at different latitudes?
 - b. How does this affect air and ocean currents?
6. How does sunlight vary seasonally
7. How do mountain ranges effect rainfall?
8. How do the continents effect ocean currents and the distribution of nutrients?
9. How does the distribution of the continents influence terrestrial life?
10. Compare how latitude and elevation influence temperature and water availability.
11. How do soil types influence ecosystem diversity?
12. Briefly describe each of the different biomes:
 - a. Tropical Forest
 - b. Grassland / Savannas
 - c. Desert
 - d. Shrublands / Woodlands / Chaparral
 - e. Forests
 - f. Tundra
13. Briefly describe each of the different zones of the marine ecosystem:
 - a. Estuaries
 - b. Intertidal Zone
 - c. Pelagic Province
 - d. Neritic Zone
 - e. Oceanic Zone
 - i. Euphotic
 - ii. Aphotic
 - f. Benthic
14. Briefly describe each of the different zones of the fresh water ecosystem:
 - a. Littoral Zone
 - b. Limnetic Zone
 - c. Profundal Zone
15. How does the season effect fresh water ecosystems?

“The “control of nature” is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man.”

Rachel Carson