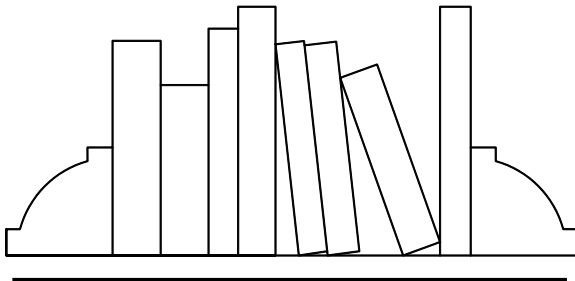


Biodiversity

Lecture Outline:

5. ECOLOGY
 - A. The Structure of Ecosystems
 - B. Definition and Examples of Ecosystems
 - C. Biotic Structure



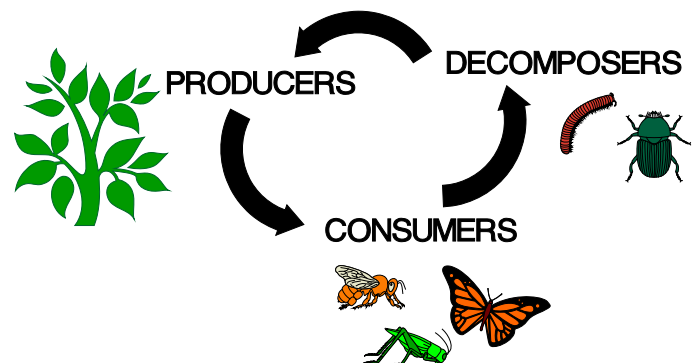
Learning Objectives:

When you are finished with this unit you should be able to:

1. Name the major land-based and water-based biomes and give prime biotic and abiotic characteristics of each.
2. Contrast the function of producers, consumers and decomposers.
3. Describe biotic structure.
4. Describe the process of photosynthesis.
5. Understand the second principle of ecosystem sustainability.
6. Be able to compare and contrast ecosystems, biomes and plant communities.
7. Given a specific geographic area (state, country), name several biomes that should be native to that locale.

Terms You Should Know:

- ❖ Biota
- ❖ Biome
- ❖ Ecosystem
- ❖ Plant community
- ❖ Species
- ❖ Photosynthesis
- ❖ Chlorophyll
- ❖ Herbivores
- ❖ Omnivores
- ❖ Detritus
- ❖ Ecotone
- ❖ Biotic structure
- ❖ Producers
- ❖ Consumers
- ❖ Decomposers
- ❖ Primary consumers
- ❖ Secondary consumers
- ❖ Predator-prey
- ❖ Host-parasite

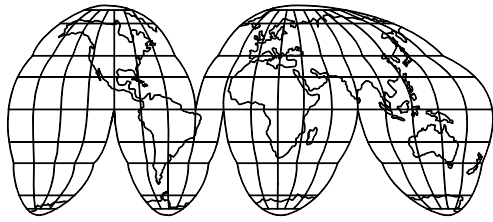


Reading Assignment:

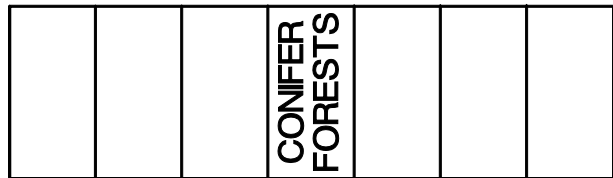
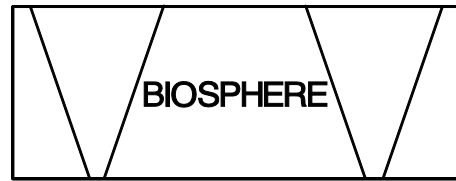
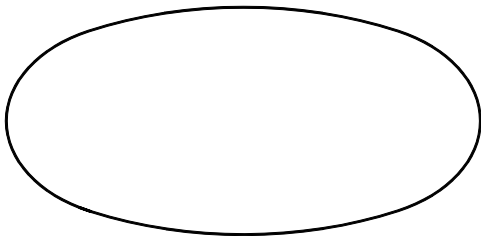
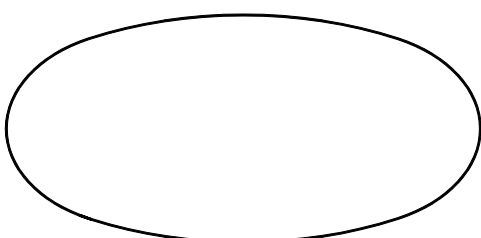
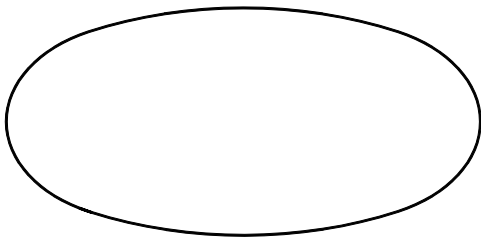
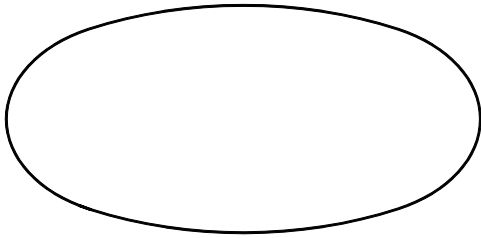
Brennan and Withgott:
Chapter 11; pages 280-312.

5. ECOLOGY

A. THE STRUCTURE OF ECOSYSTEMS



EARTH



Douglas fir / Grand fir / plants / animals / microbes



firs / plant understory



Oregon grape

B. DEFINITION AND EXAMPLES OF ECOSYSTEMS

ECOSYSTEM—a grouping of various species of plants, animals, and microbes interacting with each other and their environment

- Each ecosystem is characterized by a distinctive plant community
- **PLANT COMMUNITY**—grouping of particular plants
- Major ecosystems, such as forests, are not entirely uniform... they consist of a number of more or less related ecosystems
- **BIOME**—refers to a number of closely related ecosystems

There are twelve different major land biomes:

1. Desert Biome

- dry
-
- amount of vegetation varies widely
-

2. Temperate Grassland Biome

- dominated by grasses
-
-
- also known as steppe, or prairie

3. Savanna Biome

- dominated by grasses, some shrubs/trees
-
-
- distinct rainy and dry seasons

4. Tropical Rainforest Biome

- yearly uniform warm temperatures
- year-round rain (no dry season)

–

–

5. Tropical Dry Forest Biome

- yearly uniform warm temperatures
- distinct dry season (trees lose leaves)

–

–

6. Temperate Rainforest Biome

–

- year-round rain (no real dry season)
- often dominated by conifer trees

–

7. Temperate Deciduous Forest Biome

–

- broadleaf trees that lose leaves in winter

–

- oaks, beeches, maples, etc.

8. Conifer Forest Biome

- cool summers, cold winters

–

–

- pines, firs, spruces, larch

9. Tundra Biome

- dry as desert

–

- high latitudes, alpine

–

10. Taiga Biome

- also known as boreal forest
-
-
- long, cold winters; short, cool summers
- Siberia, Finland, Canada

11. Chaparral Biome

- Mediterranean climate
-
- evergreen shrubs, densely thicketed
-

12. Swamps, Marshes, Bogs Biome

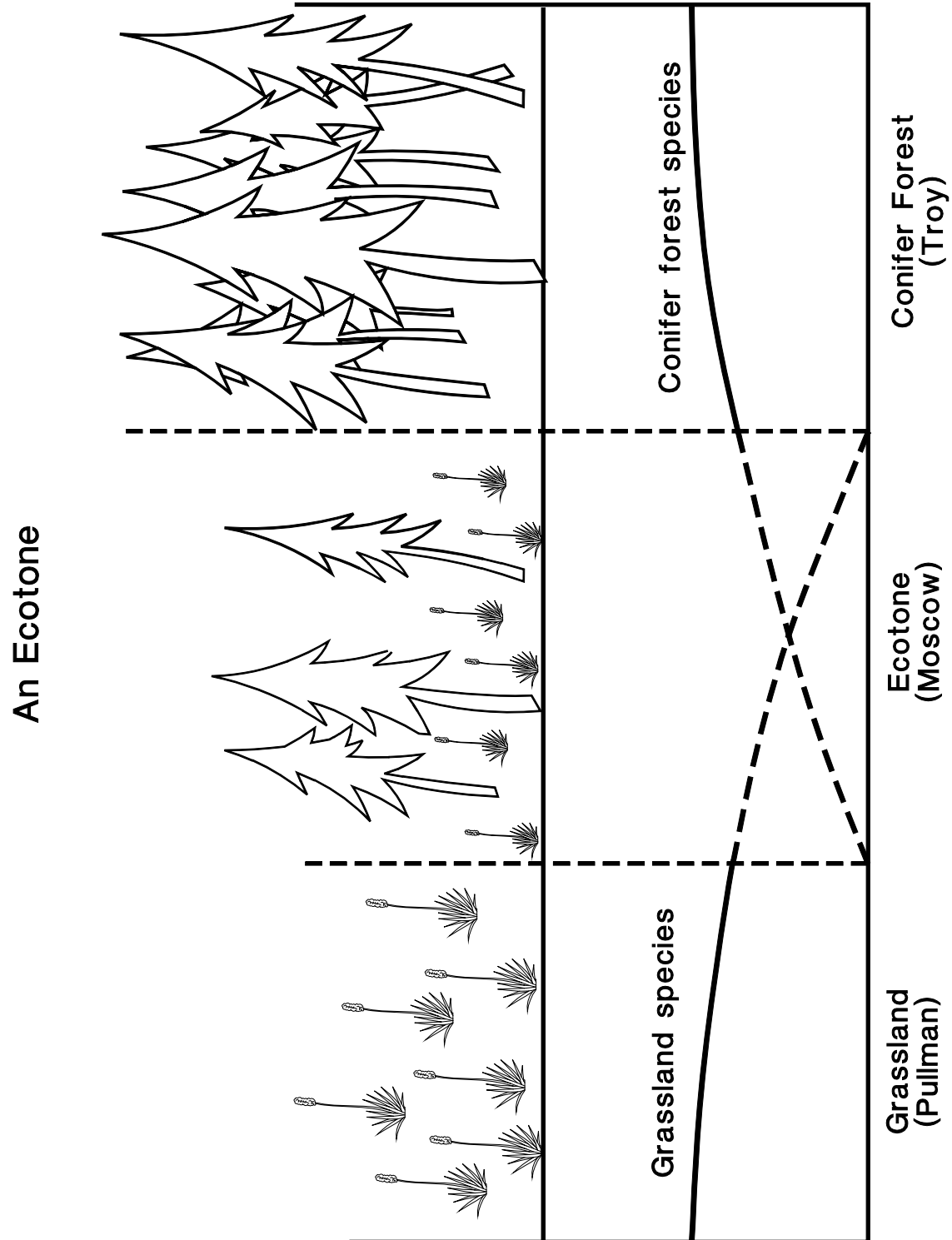
- land-based, but heavily water-influenced
- standing water for at least 3 months
-
-

There are nine water-based ecosystems:

1. Freshwater swamps, marshes and bogs
2. Lakes
- 3.
- 4.
5. Inter-tidal zones
- 6.
7. Open ocean
- 8.
- 9.

- One ecosystem tends to blend into the next through a transitional region called an **ECOTONE**

ECOTONE—a region that contains many of the species and characteristics of 2 adjacent systems



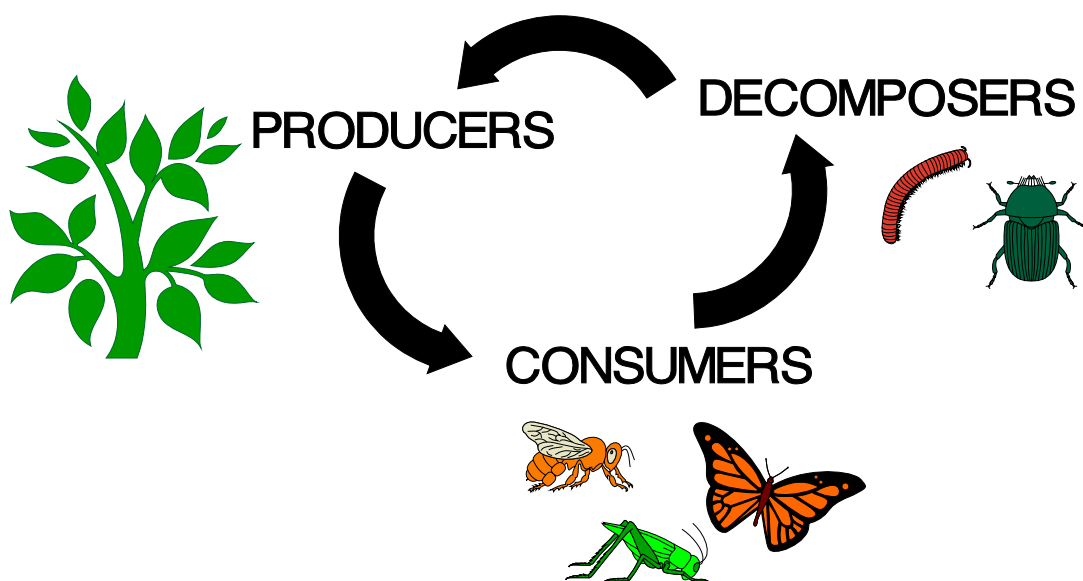
C. BIOTIC STRUCTURE

- Structure simply refers to the parts and the way they fit together to make the whole
-
-
- The way organisms fit together is called **BIOTIC STRUCTURE**
- Non-living chemical and physical factors of the environment (climate etc) are **ABIOTIC** factors

1. Biotic Structure

a. Categories of Organisms

- All ecosystems have the same three basic categories of organisms that interact together in the same ways
- PRODUCERS
-
-



i. Producers

-
-

Light energy + CO₂ + H₂O → glucose + O₂

- Driven by process called **PHOTOSYNTHESIS**
- **CHLOROPHYLL** is the molecule that captures light energy in plants

ii. Consumers

2 groups:

-
-
- Primary consumers — animals that feed directly on the producers
 -
 - also called **HERBIVORES**
- Secondary consumers — animals that feed on primary consumers
 - also called **CARNIVORES**

OMNIVORES feed on plants and animals

- **PREDATOR-PREY RELATIONSHIPS**
- **HOST-PARASITE RELATIONSHIPS**—parasites are predators intimately associated with their prey; feed on prey for an extended period of time; animal fed upon is called the host

iii. Detritus Feeders and Decomposers

Detritus (di TRI tus) — fecal wastes of animal and dead animals

-
- i.e. earthworms, millipedes etc
- Have primary detritus feeders secondary detritus feeders
- Decomposers — fungi and bacteria