

Chapter 4: STUDY NOTES COMMUNITY DISTRIBUTION

I) Homeostasis in Communities

- ecosystems are always changing, either slowly or quickly
- changing conditions in the ecosystem affect the communities of organisms living there

LIMITING FACTOR: is any biotic/abiotic factor that restricts the existence, numbers, reproduction or distribution of organisms

Ex. temperature (abiotic limiting factor); food availability (biotic limiting factor)

TOLERANCE: is the ability of organisms to withstand fluctuations in abiotic & biotic environmental factors

- the number of organisms become fewer as conditions move from optimal conditions to the low or high ranges of tolerance

SUCCESSION: is the orderly, natural changes that take place in the communities of the ecosystems

- difficult to observe since may take decades to centuries to occur

a) **PRIMARY SUCCESSION:** is the colonization of new sites by communities of organisms

- ex. volcano creates a new island and new growth begins on the island

b) **CLIMAX COMMUNITY:** a stable, mature community that undergoes little or no succession

c) **SECONDARY SUCCESSION:** is the sequence of community changes that take place when a community is disrupted by natural disasters or human actions

- ex. forest fire; hurricane destroys a forest;
- takes less time to reach a climax community than primary succession

II) BIOMES:

BIOME: is a large group of ecosystems that share the same type of climax communities

- aquatic biomes: located in oceans; lakes, streams, ponds
- terrestrial biomes: biomes located on land

A) Marine biomes: contains the largest biomass / amount of living material on Earth

- made of extremely small organisms
- PHOTIC ZONE: portion of marine biome that is shallow for sunlight to penetrate
- APHOTIC ZONE: deeper water that never receives sunlight
- ESTUARY: is a coastal body of water, partially surrounded by land, in which freshwater and salt water mix

- salinity changes with the tide
- salt marshes are dominated by grasses
- INTERTIDAL ZONE: the portion of the shoreline between high and low tides
- many organisms live in the shallow zone

- nutrients are washed from the land, contributing to abundant life
- PLANKTON: are the microscopic organisms that float in the waters of the photic zone

- the aphotic zone: very dark and under high pressure of a mile of water in depth
- still depend upon plankton for food
- organisms must adapt

B) Freshwater biomes:

- many different kinds of plants grow around the edges of lakes
- although water at the top of a lake is warm, the temperature decreases on the way down
- temperature and light are abiotic factors that limit life in the lake

TERRESTRIAL BIOMES: (from north to south)

1) TUNDRA:

- a treeless land; long summer days, short periods of winter light
- PERMAFROST: layer of permanently frozen ground under the topsoil
- topsoil is very thin; can support only shallow rooted plants
- soil lacks nutrients; process of decay is slow

- growing season is very short = a limiting factor in the biome
- mosquitoes & other biting insects are common animals
- small animals include lemmings; weasels; foxes; hares
- large animals: caribou; reindeer

2) TAIGA: (northern coniferous forest)

- south of the taiga
- land of pine, fir, hemlock and spruce trees
- the tundra and taiga blend together
- warmer & wetter than the tundra; still have long winters & short summers

- permafrost is usually absent
- topsoil is acidic and poor in nutrient minerals
- has an abundance of trees for food and shelter
- more large species of animals than the tundra

3) DESERT:

- driest of the biomes
- is an arid region with sparse to almost nonexistent plant life
- get less than 25 cm of rain a year
- vegetation varies widely according to rainfall available

- plants germinate from seed and grow rapidly to maturity
- cacti have leaves reduced to spines to conserve water & thick waxy covering
- animals are small and emerge at night when it is cooler
- water is obtained from their food

4) GRASSLANDS:

- receives from 25 – 75 cm of rainfall per year
- large communities covered with grasses & similar plants
- occupies more area than any other terrestrial biome
- has a high biodiversity

- soil has a high humus content because of grass decay
- known as the breadbasket of the earth – growing oats, rye and wheat
- populated by large herds of grazing animals
- animals include bison(buffalo), wolves, coyotes, prairie dogs

5) TEMPERATE FORESTS:

- rainfall ranges from 70 – 150 cm annually.
- dominated by broadleaf hardwood trees that lose their foliage annually
- soil consists of a top layer of humus & a deeper layer of clay
- animals include squirrels, mice, rabbits, deer and bears

6) TROPICAL RAINFOREST:

- most biological diverse of all the biomes (large variety of plants, animals, fungi)
- region of uniformly warm, wet weather; dominated by lush plants
- occupy the equatorial zone of the world
- receives between 200 – 400 cm of rainfall

- average temperature is 25 degrees C
- form jungles of dense, tangled vegetation
- tree roots are shallow and cover the ground
- the uppermost part of the trees forms a canopy

- most of the nutrients in the soil is in living material – leaves, animals
- many animals live in the rainforest
- rainforest are rapidly being destroyed for farms, ranches and mining operations

- most animals live in the trees than on the ground
- butterflies & insects are the most numerous animals in the forest