

CHAPTER 52: An Intro to Ecology & the Biosphere

- ecology - scientific study of interactions between organisms and the environment

Biosphere - global ecosystem

Global Ecology - regional exchange of energy & materials influences functioning & distribution of organisms across the biosphere

Landscape - mosaic of connected ecosystems

Landscape Ecology - factors controlling exchange of energy, materials, organisms across ecosystems

Ecosystem - community of organisms in an area & physical factors they interact with

Ecosystem Ecology - energy flow & chemical cycling between organisms & environment

Community - group of populations of different species in an area

Community Ecology - how interactions b/w species affect community structure/org.

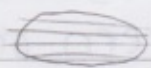
Population Ecology - factors that affect pop. size & how/why it changes through time

Organismal Ecology - how an organism's structure, physiology, and behavior meet challenges posed by environment

52.2 The structure and distribution of terrestrial biomes are controlled by climate and disturbance

- biomes - major life zones characterized by vegetation type or physical environment

I. Climate and Terrestrial Biomes

- terrestrial biomes show strong latitudinal patterns → across globe 
- climograph - plot of annual mean temp. and precipitation in a particular region
 - based on annual averages
 - pattern of climatic variation important too
- different areas, different wet/dry seasons or temperature ranges

II. General Features of Terrestrial Biomes

- characterized by vegetation & organisms
- ecotone - area of intergradation between biomes
 - can be wide or narrow
 - i.e. b/w temperate broadleaf forest and Northern coniferous forest
- vertical layering important
 - canopy, low-tree layer, shrub understory, ground layer, forest floor, root layer
 - nonforest biomes also have layers
 - provide various habitats for animals
- species composition varies from place to place

III. Disturbance and Terrestrial Biomes

- disturbance - event such as fire, storm, human activity that changes a community, removing organisms & altering resource availability
 - patchiness and different communities in one area
- plants depend on periodic disturbances
 - not by humans tho

Tropical Forest

- equatorial & subequatorial regions
- tropical rain & tropical dry forests
 - rainfall constant → rainfall seasonal
- vertical layering, competition for light is intense
- millions of species, huge diversity
- rapid & devastating destruction

Desert

- low precipitation
- temperature variable
- low, scattered vegetation
- succulents, cacti, shrubs, euphorbs, herbs
- many nocturnal species
- reduction of natural biodiversity by humans

Savanna

- equatorial + subequatorial regions
- seasonal rainfall, warm all year
- drought, seasonal fire
- grasses, scattered trees
- zebras, lions, wildebeests, insects, grazers
- cattle ranching & hunting = badness

Chaparral

- midlatitude coastal regions, far-flung distribution
- seasonal rainfall, cool-ish temperatures
- shrubs, small trees, grasses, herbs (diversity!)
- deers, goats, insects, birds, reptiles, etc.
- drought → tough leaves, fires
- heavily settled → agriculture, urbanization
- humans contribute to fires

Temperate Grassland

- seasonal precipitation, periodic drought
- cold winters, warm summers
- grasses, forbs, large grazers, burrowers
- conversion to farmland...
- cattle turn it into desert

Northern Coniferous Forest

- largest terrestrial biome on Earth
- varied rainfall, periodic droughts
- winters cold, summers warm
- cone-bearing trees
- birds, diverse mammals, insects
- being logged by dumb humans

Temperate Broadleaf Forest

- midlatitudes in Northern Hemisphere
- varied precipitation, warm/humid summers
- distinct vertical layering
- deciduous trees & evergreens
- mammals hibernate in winter
- birds, mammals, insects use all layers
- settling, farming, urbanization

Tundra

- Arctic
- winters cold (!), summers cool
- herbaceous vegetation, mosses, grass, forbs
- permafrost (frozen layer of soil)
- musk oxen, caribou, bears, wolves, foxes, birds
- significant mineral & oil extraction
→ little settlement