

Biodiversity, biomes, biogeography, and human impacts

BIOMES: Determined primarily by Temperature and Precipitation. Described by their plant communities

* Major regions

Tropical

Temperate

Polar

* Biome (is within a region, described by plant communities)

factors distinguishing different biomes

Deserts

grasslands (polar ie. fragile tundra)

forests

human and natural disturbances and their effects

BIOMES: Described by vegetation

Defined by Temperature and Precipitation

On earth there are similar conditions (abiotic and soil) which can lead to similar plant and animal assemblages (comparable communities). These broad types of communities are **biomes**. Although variations exist (temporal and spatial), allows us to make predictions about communities and adaptations.

2 most imp factors are temp. and precipitation. **Mountains** are also very important. Biomes usually described by plant communities.

Mountains: moisture trapping, and altitude. Biome distribution is a result of latitude and altitude. Altitudinal transition can resemble the latitudinal one. Altitude = dec. temp.

Characteristic diversity of plants and animals in a biome are determined by physical (abiotic) factors and dominant vegetation types.

Distribution of biomes often follows latitudes, more obvious in N hemisphere: Equator---N: tropical rain forest, desert, grassland, temperate deciduous forest, taiga (coniferous forest), tundra, ice-cap. Not orderly due to variations in terrain and topography (mountain ranges block moisture and create deserts) and ocean current influence.

East-west distribution of biomes: the ocean current connections (eastern and western boundary currents)

Boundaries of biomes are often indistinct. Important transition zones. Like boundaries between communities (oak woodland - grassland), species diversity tends to be high in transition zones, though many species are opportunistically using the transition zone.

Temperature:

Latitude: Polar, Temperate, Tropical (DEFIN??)

Altitude: same kind of zonation

Rainfall: Deserts, grasslands, forests

BIOME is within these latitudinal/altitudinal regions, described by the plant communities.

Each latitudinal distinction (Polar, temperate, tropical) has deserts, grasslands and forests. ie: polar grassland (tundra), temperate grassland (U.S) and tropical grassland (savannah). We will characterize the major deserts, grasslands and forests.

Deserts

Polar
Temperate
Tropical

Grasslands

Polar: Tundra
Temperate
Tropical

Forests

Polar: evergreen and Taigas (swamp forest)
Temperate: deciduous and evergreen
Tropical: tropical rainforests (evergreen)

* *The ocean*

importance of currents (gulf stream (warm) and California current (cold))
zones

coastal
open sea-pelagic
deep sea

* *Coastal ecosystems*

estuary
mangrove-filters!
coral reefs

kelp beds

* *Fresh water*

lakes-eutrophication

streams-pollution, salmon stock depletion

* *Wetlands-importance*

* Stability and resilience of ecosystems

* Interactive and compounding nature of human impacts on the ecosystem. The chain reaction. Give some examples!!

Biodiversity

- Taxonomy KPCOFGS
- genetic, biological, ecological
- 40-100 mill sp. We know 1.7 mill!
- SO MUCH UNKNOWN
- Why is it important?
- Biodiv like gen div is an insurance policy
- Extinctions: greatest now in 65 mill years 10-140 sp. per day!
- What makes a species extinction prone:
 - Critical population size
 - Niche: specialists vrs. generalists
 - Animal size
 - Organism's range
 - Tolerance (intolerance) to humans
 - Behavioral patterns
 - Feeding high on the trophic level
- evolution slower than extinction 2-100,000 generations for new sp.
- How does extinction happen?
- human role in gene pools?
- What can we/you do??!

Variety and variability among living organisms and the ecological complexes in which they occur. In functional terms: relationships between species and ecosystems.

1.4 million named species, of potentially **10 million**

250,000 plants

44,000 vertebrates

750,000 insects

69,000 fungi - may be 1.5 million

Why preserve wild species?

- √ Genetic diversity
- √ Economic and medical importance
- √ Aesthetic and recreational importance
- √ Ecological importance
- √ Ethical importance

Endangered: so few survivors that the species could soon become extinct over its natural range

Threatened: declining in numbers and likely to become endangered

Biogeography

- Plate movement influences and geographical features

As the **great features** and **plate movement** of our globe divide continents and subcontinents, and create climate differences and zonation, so too do they divide major plant and animal distributions and 'type' associations.

Some continents have similar fauna: continental drift and **plate tectonics** (PANGAEA O.H). Continents ride the earth's convection cells within the mantle. Light rock on dense molten rock.

can look at rocks and fossils on diff continents and test if they were likely once attached. Mesosaurus was a fossil found in S. Africa and S. America (Brazil)!

Species similar (ie. camels) that occur in disjunct (separated) areas. Because the continents were once attached, now separated, so pops are similar, but not in contact. Camels in N.A (U.S) moved to S.A and Asia. No longer in U.S but in S.A and N. Africa. tot. separated.

Some species are confined in range due to other factors such as mountain ranges, ocean currents, intolerance to climatic conditions (such as a desert in the way...).

Isolated areas have unique assemblages

- ISLAND BIO (ZOO) GEOGRAPHY:

Islands often have unique faunal assemblages due to their isolation from immigration sources.

Island endemism is often a result.

studies of island bio and zoogeography often reveal clues about adaptation, selection and evolution.

Island flora and fauna are very easily disturbed and destroyed as many plants and animals have evolved in isolation from mainland cousins.

Thus: Catalina isl. is a similar biome to S. California and much of Baja, plants are more similar to Baja (was once off that coast) with many similar but endemic plants and animals.

Conservation of islands, human impact.