

BIODIVERSITY & BIOMES

* **biodiversity** or *biological diversity*: the variety of life forms, the ecological roles they perform and the genetic diversity they contain

Types of diversity:

* **genetic diversity**: variety in genetic makeup among individuals within a species

* **species diversity**: variety among the species; the distinct types of organisms/species found in different habitats of the planet

* **ecological diversity**: variety of forests, deserts, grasslands, streams lakes oceans coral reefs wetlands and other biological communities

* **functional diversity**: biological and chemical processes or functions such as energy flow and matter cycling needed for the survival of species and biological communities.

** **Physical Factors** influencing biodiversity & biome structure

Temperature (T°): certain species, plants & animals, will only thrive in warm climates, OR only in cold climates; some in both

* megatherm plants: adapted to high T°'s (plants: banana trees, palm trees)

* microtherm plants: adapted to within stand low T°'s

Water: no water = no photosynthesis = no plants = no animals

xerophyte: adapted to low moisture conditions (cactus, camels)

hygrophyte: adapted to high moisture conditions

** **deciduous vs evergreen** trees and plants

(drop leaves) (keep leaves)

Light availability: increase light = increase photosyn.

* *shade tolerant vs shade intolerant* (need direct sunlight) ***know this difference**

Soils: structure, texture both affect plant root systems and thus plant survival and dispersal; root & plant support & water availability

Landforms: **elevation** affects T° and moisture; **slope steepness** affects water availability,

& soil thickness; **slope aspect** (compass direction a slope is facing) affects amount of sunlight, and thus T° & moisture levels North facing vs South facing slope of a mountain (cooler/wetter)(warmer/drier)

** **Biome**: broadest justifiable division of terrestrial plants and animals; an assemblage or association of plants and animals that forms a regional ecological unit.

* **Basic Types**: fall into one of three broad categories:

deserts, grasslands, forests

Tropical Rainforest: dominated by tall, closely spaced broad-leaf evergreen trees; **well developed 3-layer canopy**

- * highest biodiversity of any terrestrial environment
- * high annual rainfall (>80"/year)

Tropical Deciduous Forest: less dense canopy than Tropical Rainforest with less well developed canopy layers, monsoonal

- * also known as Tropical Scrub
- * has a pronounced dry season, so trees lose their leaves during this dry period; they are deciduous

Tropical Savanna: grassland/shrub transition zone between the Tropical Rainforest, the Tropical Deciduous Forest & Desert biome

- * dominated by tall grassland with widely spaced trees
- * EX: grasslands & Acacia trees of eastern Africa

Desert: sparse vegetation or none at all due to low precipitation & high evapotranspiration

- * vegetation is of the xerophytic or succulent variety (ex. Cactus)
- * Tropical (warm) & Mid-Latitude (cold) Deserts are differentiated due to varied climatic conditions & thus differing vegetation

Temperate or Mid-Latitude Grassland: **dominated by sod-forming grasses**;

Found in areas with between 12" & 20" annual rainfall

- * areas of this type biome in the U.S. are known as prairie
- * U.S. prairie is often differentiated into long-grass prairie (closer to 20" rainfall) & short grass prairie (lesser rainfall)
- * EX: Great Plains (US), Pampas (Argentina), Russian Steppe

Temperate or Mid-Latitude Deciduous & Mixed Forest: dominated by **broadleaf deciduous trees** of eastern US, Europe, & eastern China; also large areas of

mixed deciduous & needle-leaf evergreen trees esp. in southern areas such as the SE US

- * EX: oak, birch, walnut, maple, elm, ash with pine species in southern areas (loblolly, southern pine, sand pine, etc)

Temperate Rainforest: needle-leaf trees of US northwest coast;

also known as the Temperate Evergreen Forest, cooler conditions than tropical rain forests

- * EX: redwoods, Douglas fir, Sitka spruce

Mediterranean Scrub or Shrubland: consists of widely spaced evergreen & **deciduous trees, & hard or waxy-leaved evergreen bushes**

- * dominated by cyclic fire disturbance
- * EX: chaparral of coastal California

Northern Coniferous Forest: dominated by coniferous or cone-bearing trees; Also known as the **Boreal Forest**, in Canada or the **Taiga** in Siberia

- * EX: Spruce, hemlock, fir, pine, larch

Tundra: dominated by mosses, lichens, sedges (marsh grasses), & a few dwarf trees/shrubs; this area is controlled by permafrost-permanently frozen ground (know this)

Aquatic Life Zones or Biomes

** two major divisions: **Saltwater or Marine & Freshwater**

* can also be delineated into **3 layers: surface, middle, & bottom**

* important environmental factors to consider: *Salinity, temperature, access to sunlight, dissolved oxygen, availability of nutrients.* **Salinity and dissolved oxygen very important. **

** **Marine systems:**

Coastal Zone: high net primary productivity;

contains 3 ecosystems:

Estuaries: areas where freshwater & saltwater mix

Coastal wetlands: land areas covered with saltwater all or part of the year;

Salt marshes & Mangrove forest swamps

Coral reefs: found in relatively shallow, tropical waters