Biology Chapter 15 Notes

The Earth has 4 major systems:
Biosphere – all organisms and the part of the Earth where they exist (includes biotic and abiotic components)
Hydrosphere – all of the Earth's water, ice, and water vapor
Atmosphere – the air that surrounds the entire planet
Geosphere – the physical features of the Earth's surface – includes continents rocks, the sea floor, and everything below Earth's surface

Climate – the long-term pattern of weather conditions in a region

The Earth has 3 main climate zones: polar, tropical, and temperate
polar: found at the far northern and southern regions of Earth - receives the least direct sunlight – temperature if typically cold and often below freezing
tropical: near the equator – receives the most direct sunlight – characterized by warm, moist conditions
temperate: the area in between the tropical and polar zones – has summer and winter seasons of about equal length
*The amount of direct sunlight is a main factor in determining the type of climate in that region.

Six Major Biomes: defined by the climate and the plant communities that live in the area

- **Tropical Rain Forest**
- **Grassland (tropical and temperate)**
- **Desert**
- **Temperate Forest (deciduous and rain)**
- **Taiga**
- **Tundra**

* Tropical Rain Forest:
  - warm temperatures and abundant rainfall all year
  - thick lush forests
  - most animals live in the canopy
  - contains the most biodiversity

* Grassland:
  * Tropical and Temperate – main plant life is grass
  - tropical - hoofed animals such as gazelles and zebras are common
  - temperate - many animals, such as prairie dogs live underground

* Desert:
    - very dry climate
    - plants and animals have adaptations to survive the dry climate (plants -store water or have deep root systems, animals – may be nocturnal)

* Temperate Forest:
    * Deciduous and Rain – very different summer and winter seasons
    - deciduous – trees drop their leaves to survive cold winters
    - rain – coniferous trees keep their needles all year

* Taiga:
    - long, cold winters, and short, warm, humid summers
    - coniferous trees
    - mammals here have heavy fur coats to withstand the cold winters

* Tundra:
    - coldest and longest winters
    - permafrost – only mosses and other low-lying plants survive

Polar ice caps are not considered biomes because they have no soil and no specific plant communities.

The ocean can be divided into zones according to the distance from the shore and water depth.

1. Intertidal zone – shoreline area between high and low tide
2. Neritic zone – next closest area to shore may be very shallow or up to 200 meters
   Plankton found here, contains coral reefs and kelp forests
3. Bathyal zone – from the edge of the neritic zone to the ocean bottom 200 – 2000m
4. Abyssal zone – deepest zone, no sunlight

*** Estuaries and Freshwater Ecosystems**

Estuaries – areas where rivers flow into an ocean - nutrient rich, lots of biodiversity

Watershed – region of land that drains into a freshwater ecosystem

Freshwater ecosystems include: rivers, streams, lakes, ponds, and wetlands (an area that stays soaked in water for at least part of the year) – bogs, marshes, and swamps

Lakes and ponds may be divided into 3 zones:

1. **littoral zone – along the shoreline, where rooted plants can grow- snails, water lilies, other organisms**
2. **limnetic zone – open water further out from shore – large amounts of plankton and fish**
3. **benthic zone – bottom of the lake or pond- less sunlight reaches this zone- bacteria and other decomposers found here**