

Energy Transfer in Ecosystems

Ecology: the interactions of organisms with one another and with the environment in which they occur

- Individuals: physiology, reproduction, development, behavior
- Populations: habitat and resource needs of individual species, group behaviors, population growth, and what limits abundance or causes extinction
- Community: how populations of many species interact with each other such as predators and prey, or competitors that share common needs or resources
- Ecosystem: functional aspects of system – amount of energy produced by photosynthesis, how energy or materials flow along the many steps of the food chain, what controls the rate of decomposition materials or rate at which nutrients are recycled through the system

Ecosystem: ecological system encompassing a community and all the physical aspects of its habitat

Habitat: place where certain species lives

Community: groups of different species living together

Components of ecosystem:

Abiotic: sunlight, temperature, precipitation, water or moisture, soil or water chemistry

Biotic: primary producers, herbivores, carnivores, omnivores, detritivores

Ecosystems consists of physical aspects of a community and run on energy

Energy from the sun is converted to chemical energy of organic molecules (food), which are consumed for energy

Energy flows through food webs

Food webs: network of feeding relationships in an environment, which contain food chains,

Food chains: linear pathway of energy transfer in an ecosystem, composed of trophic levels

Trophic levels: group of organisms that have the same source of energy

Producers: convert energy of the sun into food

Herbivores: eat only plants

Carnivores: eat only animals

Omnivores: eat plants and animals

Detritivores: consume droppings and carcasses of all

Scavengers

Decomposers: break down wastes and dead organisms and return nutrients to the soil

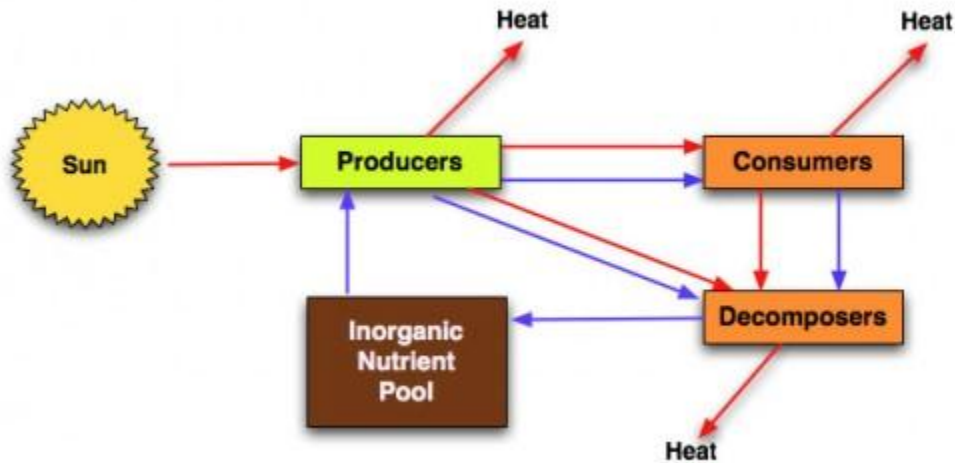
Organisms acquire energy through foods they consume. Some energy is stored as fat, and some is lost through wastes. Most energy escapes as heat, which is produced during energy transformation. Heat is considered lost energy, in that it cannot be recycled; solar energy must be continually input. Transfer of energy in ecosystem is inefficient; only 10% of the energy is incorporated into the next trophic level. The further into the food chain, the less energy is available. Therefore, consumers at the top of the food chain must eat a lot of food regularly.

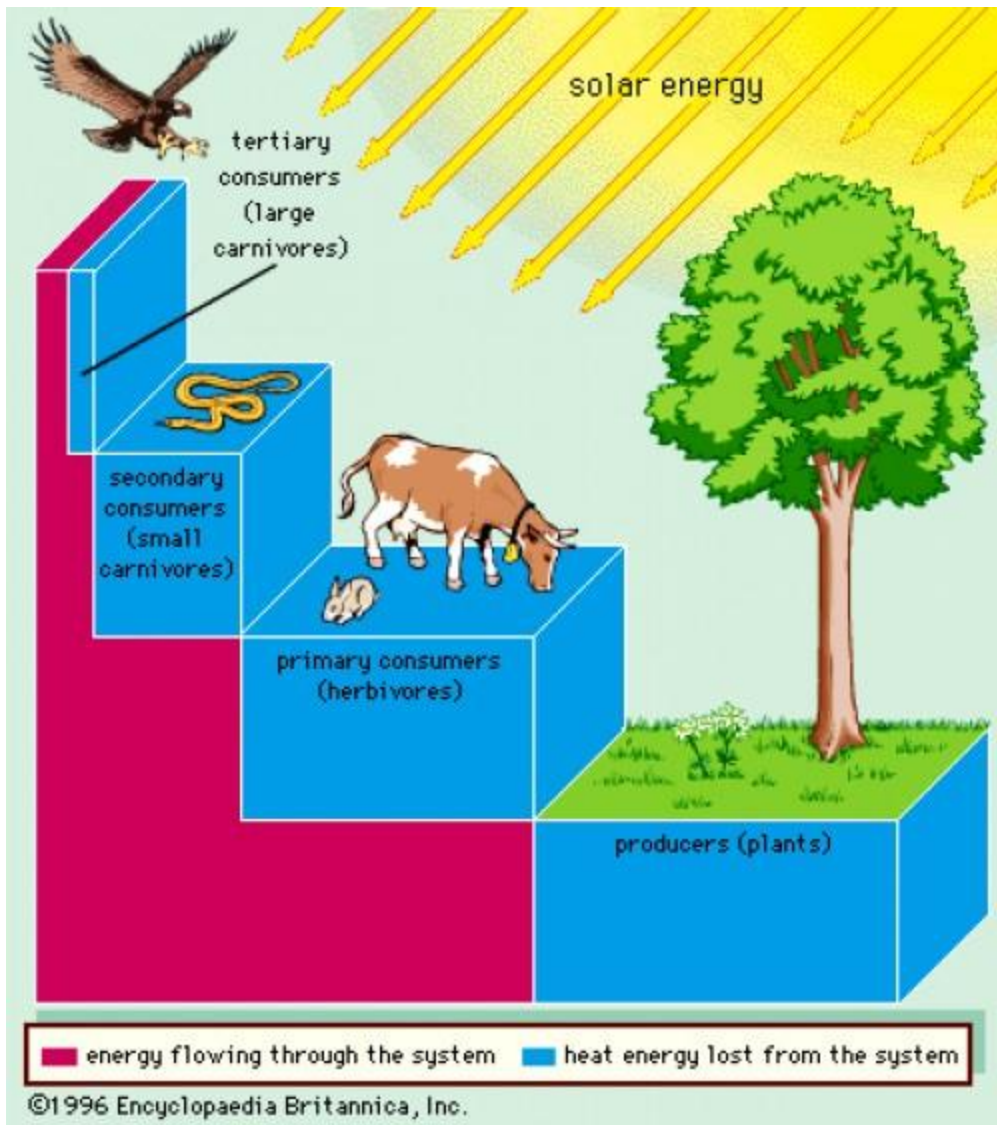
Earth is an open system with regards to energy but is considered closed with respect to elements (carbon, nitrogen, phosphorus). Materials are not destroyed or lost but are cycled endlessly

between abiotic and biotic states within ecosystems. Nutrients are the elements whose supply tends to limit biological activity.

Biome: group of ecosystems that have a similar climate and a similar plant and animal species; major vegetation type extending over a large area – distributions determined largely by temperature and precipitation patterns on Earth's surface

Types of biomes: freshwater, marine, desert, forest, grassland, tundra





Energy Flow through Ecosystems

<http://www.youtube.com/watch?v=hBvTDylIxMA>

Ecosystems, Biomes

<http://www.youtube.com/watch?v=WuejxJttBqo&feature=related>