CHAPTER 3 VOCABULARY - Ecosystems: What Are They and How Do They Work?

MILLER LITE, 17th EDITION

abiotic	Nonliving. Compare *biotic*.
aerobic respiration	Complex process that occurs in the cells of most living organisms, in which nutrient organic molecules such as glucose ($C_6H_{12}O_6$) combine with oxygen (O_2) to produce carbon dioxide (CO_2), water (H_2O), and energy. Compare *photosynthesis*.
anaerobic respiration	Form of cellular respiration in which some decomposers get the energy they need through the breakdown of glucose (or other nutrients) in the absence of oxygen. Compare *aerobic respiration*.
atmosphere	Whole mass of air surrounding the earth. See *stratosphere, troposphere*. Compare *biosphere, geosphere, hydrosphere*.
autotroph	See *producer*.
bacteria	Prokaryotic, one–celled organisms. Some transmit diseases. Most act as decomposers and get the nutrients they need by breaking down complex organic compounds in the tissues of living or dead organisms into simpler inorganic nutrient compounds.
biogeochemical cycle	Natural processes that recycle nutrients in various chemical forms from the nonliving environment to living organisms and then back to the nonliving environment. Examples include the carbon, oxygen, nitrogen, phosphorus, sulfur, and hydrologic cycles.
biological community	See *community*.
biomass	Organic matter produced by plants and other photosynthetic producers; total dry weight of all living organisms that can be supported at each trophic level in a food chain or web; dry weight of all organic matter in plants and animals in an ecosystem; plant materials and animal wastes used as fuel.
biosphere	Zone of the earth where life is found. It consists of parts of the atmosphere (the troposphere), hydrosphere (mostly surface water and groundwater), and lithosphere (mostly soil and surface rocks and sediments on the bottoms of oceans and other bodies of water) where life is found. Compare *atmosphere, geosphere, hydrosphere*.
biotic	Living organisms. Compare *abiotic*.
biotic pollution	The effect of invasive species that can reduce or wipe out populations of many native species and trigger ecological disruptions.
calorie	Unit of energy; amount of energy needed to raise the temperature of 1 gram of water by 1 C° (unit on Celsius temperature scale). See also *kilocalorie*.
carbon cycle	Cyclic movement of carbon in different chemical forms from the environment to organisms and then back to the environment.
carnivore	Animal that feeds on other animals. Compare *herbivore, omnivore*.
chemosynthesis	Process in which certain organisms (mostly specialized bacteria) extract inorganic compounds from their environment and convert them into organic nutrient compounds without the presence of sunlight. Compare *photosynthesis*.
community	Populations of all species living and interacting in an area at a particular time.
consumer	Organism that cannot synthesize the organic nutrients it needs and gets its organic nutrients by feeding on the tissues of producers or of other consumers; generally divided into *primary consumers* (herbivores), *secondary consumers* (carnivores), *tertiary (higher–level) consumers, omnivores*, and *detritivores* (decomposers and detritus feeders). In economics, one who uses economic goods. Compare *producer*.

decomposer	Organism that digests parts of dead organisms, and cast–off fragments and wastes of living organisms by breaking down the complex organic molecules in those materials into simpler inorganic compounds and then absorbing the soluble nutrients. Producers return most of these chemicals to the soil and water for reuse. Decomposers consist of various bacteria and fungi. Compare *consumer, detritivore, producer*.
detritivore	Consumer organism that feeds on detritus, parts of dead organisms, and castoff fragments and wastes of living organisms. Examples include earthworms, termites, and crabs. Compare *decomposer*.
detritus	Parts of dead organisms and castoff fragments and wastes of living organisms.
detritus feeder	See *detritivore*.
ecologist	Biological scientist who studies relationships between living organisms and their environment.
ecology	Biological science that studies the relationships between living organisms and their environment; study of the structure and functions of nature.
ecosphere	See *biosphere*.
ecosystem	One or more communities of different species interacting with one another and with the chemical and physical factors making up their nonliving environment.
eukaryotic cell	Cell that is surrounded by a membrane and has a distinct nucleus. Compare *prokaryotic cell*.
evaporation	Conversion of a liquid into a gas.
fermentation	See *anaerobic respiration*.
food chain	Series of organisms in which each eats or decomposes the preceding one. Compare *food web*.
food web	Complex network of many interconnected food chains and feeding relationships. Compare *food chain*.
geosphere	Earth's intensely hot core, thick mantle composed mostly of rock, and thin outer crust that contains most of the earth's rock, soil, and sediment. Compare *atmosphere, biosphere, hydrosphere*.
global warming	Warming of the earth's lower atmosphere (troposphere) because of increases in the concentrations of one or more greenhouse gases. It can result in climate change that can last for decades to thousands of years. See *greenhouse effect, greenhouse gases, natural greenhouse effect*.
GPP	See *gross primary productivity*.
greenhouse gases	Gases in the earth's lower atmosphere (troposphere) that cause the greenhouse effect. Examples include carbon dioxide, chlorofluorocarbons, ozone, methane, water vapor, and nitrous oxide.
gross primary productivity (GPP)	Rate at which an ecosystem's producers capture and store a given amount of chemical energy as biomass in a given length of time. Compare *net primary productivity*.
herbivore	Plant–eating organism. Examples include deer, sheep, grasshoppers, and zooplankton. Compare *carnivore, omnivore*.
heterotroph	See *consumer*.
hydrologic cycle	Biogeochemical cycle that collects, purifies, and distributes the earth's fixed supply of water from the environment to living organisms and then back to the environment.
hydrosphere	Earth's liquid water (oceans, lakes, other bodies of surface water, and underground water), *frozen water* (polar ice caps, floating ice caps, and ice in soil, known as permafrost), and *water vapor* in the atmosphere. See also *hydrologic cycle*. Compare *atmosphere, biosphere, geosphere*.
infiltration	Downward movement of water through soil.
kilocalorie (kcal)	Unit of energy equal to 1,000 calories. See *calorie*.
land degradation	Decrease in the ability of land to support crops, livestock, or wild species in the future as a result of natural or human–induced processes.

microorganisms	Organisms such as bacteria that are so small that it takes a microscope to see them.
natural greenhouse effect	See *greenhouse effect*.
net primary productivity (NPP)	Rate at which all the plants in an ecosystem produce net useful chemical energy; equal to the difference between the rate at which the plants in an ecosystem produce useful chemical energy (gross primary productivity) and the rate at which they use some of that energy through cellular respiration. Compare *gross primary productivity*.
nitrogen cycle	Cyclic movement of nitrogen in different chemical forms from the environment to organisms and then back to the environment.
nitrogen fixation	Conversion of atmospheric nitrogen gas, by lightning, bacteria, and cyanobacteria, into forms useful to plants; it is part of the nitrogen cycle.
NPP	See *net primary productivity*.
nutrient cycle	See *biogeochemical cycle*.
omnivore	Animal that can use both plants and other animals as food sources. Examples include pigs, rats, cockroaches, and humans. Compare *carnivore, herbivore*.
organism	Any form of life.
phosphorus cycle	Cyclic movement of phosphorus in different chemical forms from the environment to organisms and then back to the environment.
photosynthesis	Complex process that takes place in cells of green plants. Radiant energy from the sun is used to combine carbon dioxide (CO_2) and water (H_2O) to produce oxygen (O_2), carbohydrates (such as glucose, $C_6H_{12}O_6$), and other nutrient molecules. Compare *aerobic respiration, chemosynthesis*.
phytoplankton	Small, drifting plants, mostly algae and bacteria, found in aquatic ecosystems. Compare *plankton, zooplankton*.
population	Group of individual organisms of the same species living in a particular area.
precipitation	Water in the form of rain, sleet, hail, and snow that falls from the atmosphere onto land and bodies of water.
primary consumer	Organism that feeds on some or all parts of plants (herbivore) or on other producers. Compare *detritivore, omnivore, secondary consumer*.
primary productivity	See *gross primary productivity, net primary productivity*.
principles of sustainability	Principles by which nature has sustained itself for billions of years by relying on solar energy, biodiversity, and nutrient recycling.
producer	Organism that uses solar energy (green plants) or chemical energy (some bacteria) to manufacture the organic compounds it needs as nutrients from simple inorganic compounds obtained from its environment. Compare *consumer, decomposer*.
prokaryotic cell	Cell containing no distinct nucleus or organelles. Compare *eukaryotic cell*.
pyramid of energy flow	Diagram representing the flow of energy through each trophic level in a food chain or food web. With each energy transfer, only a small part (typically 10%) of the usable energy entering one trophic level is transferred to the organisms at the next trophic level.
respiration	See *aerobic respiration*.
scavenger	Organism that feeds on dead organisms that were killed by other organisms or died naturally. Examples include vultures, flies, and crows. Compare *detritivore*.
secondary consumer	Organism that feeds only on primary consumers. Compare *detritivore, omnivore, primary consumer*.
stratosphere	Second layer of the atmosphere, extending about 17–48 kilometers (11–30 miles) above the earth's surface. It contains small amounts of gaseous ozone (O_3), which filters out about 95% of the incoming harmful ultraviolet radiation emitted by the sun. Compare *troposphere*.

sulfur cycle	Cyclic movement of sulfur in various chemical forms from the environment to organisms and then back to the environment.
tertiary (higher–level) consumers	Animals that feed on animal–eating animals. They feed at high trophic levels in food chains and webs. Examples include hawks, lions, bass, and sharks. Compare *detritivore, primary consumer, secondary consumer*.
transpiration	Process in which water is absorbed by the root systems of plants, moves up through the plants, passes through pores (stomata) in their leaves or other parts, and evaporates into the atmosphere as water vapor.
trophic level	All organisms that are the same number of energy transfers away from the original source of energy (for example, sunlight) that enters an ecosystem. For example, all producers belong to the first trophic level and all herbivores belong to the second trophic level in a food chain or a food web.
troposphere	Innermost layer of the atmosphere. It contains about 75% of the mass of earth's air and extends about 17 kilometers (11 miles) above sea level. Compare *stratosphere*.
water cycle	See *hydrologic cycle*.