Chapter 13 (pp. 384-413)

Abrasion – Wind erosion in which airborne particles chip small fragments off rocks that protrude above the surface
Cryosphere – The perennially frozen part of the hydrosphere
Deflation – Wind erosion in which loose particles of sand and dust are removed by the wind, leaving coarser particles behind
Desert – An arid land that receives less than 250 mm of rainfall of snowfall per year and is sparsely vegetated unless it is irrigated
Desertification – Invasion of desert conditions in non-desert areas
Dune – A hill or ridge of sand deposited by winds
Glacier – A semi-permanent of perennially frozen body of ice, consisting largely of recrystallized snow, which moves under the pull of gravity.
Land Degradation – Land damage or loss of productivity caused by human activity, which may lead to the advance of desert conditions into non-desert areas
Moraine – A ridge or pile of debris that has been, or is being, transported by a glacier
Permafrost – Ground that is perennially below the freezing point of water
Saltation – Sediment transport in which particles move forward in a series of short jumps along arc-shaped paths
Surface creep – Sediment transport in which the wind causes particles to roll along the ground
Suspension – Sediment transport in which the wind carries very find particles over long distances and periods of time
Till – heterogeneous mixture; crushed rock, sand, pebbles, cobbles, and boulders deposited by a glacier

Convergence – Where warm moist air masses meet and rise
Divergence – Where cool, dry masses sink downwards
Arid – area which receive less than 250 mm precipitation a year
Semi-arid – Land that receives between 250-500 mm of precipitation per year
Drylands – Arid and semi-arid regions are collectively known as drylands
Subtropical deserts – two belt of rainfall between 30N and 30S
Polar deserts – Receive as much precipitation as subtropical deserts, but its in the form of snow, which never gets a chance to melt
Continental interior deserts – Desert explicitly related to local geography
Rainshadow deserts - Desert explicitly related to local geography
Coastal deserts - Desert explicitly related to local geography
Eolian – related to wind
Venifact – wind artifact
Buttes – an isolated hill with a flat top and steep sides
Desert pavement – Most of the fine particles are removed, leaving a continuous pavement-like covering of coarse particles
Slip face – Sand dunes are asymmetrical, and the slip face is on the leeward face (downwind)
Cross beds – crisscrossed strata within the dune, former slip faces
Angle of repose – The steepest angle at which loose particles will come to rest
Desertification – process by which fertile land becomes desert, typically as a result of drought, deforestation, or inappropriate agriculture

Arroyos – Rapid rain runoff erodes steep-sided canyons, forming arroyos into the landscape
Bajada – Large alluvial fans
Accelerated desertification – Human influenced, faster-paced desertification
Ice sheet – largest type of glacier on Earth
Ice shelves – thick sheets of floating ice hundreds of meters thick that adjoin glaciers on land
Icebergs – large chunks of ice that break off of ice shelves
Sea ice – form of ice that never touches land at all, but forms by the direct freezing of seawater
Temperate glaciers – form in low and middle latitudes
Polar glacier – At high and low altitudes, commonly with little or no seasonal melting
Sublimate – solid to vapour, without melting
Glacier ice – extremely dense snow, no longer penetrable by air
Accumulation – glacier gains
Ablation – glacier losses
Mass balance – The difference between the accumulation and ablation
Creep – very slow movements of water underground
Crevasse – A deep gaping fissure in the upper surface of a glacier
Basal sliding – When the ice at the bottom of a glacier slides across its bed
Surges – Rates of glacier movement 100 times faster than normal
Longitudinal dunes – run parallel to prevailing winds
Parabolic dunes – holes left from vegetation growing on the floor of coastal regions
Cirque glacier – bowl-shaped depression on a mountainside
Valley glaciers – flow down valleys and are fed either from cirque glaciers or ice caps
Ice cap – Covers a mountaintop, with a radial outward flow pattern
Fjord glacier – when a glacier is partly filled by an arm of the sea, its called a fjord. And the associated glacier is a fjord glacier.
Piedmont glacier – When a glacier flows from the mountains and onto the surrounding lowlands
Glacial striations – long, nearly parallel striations
Glacial grooves – similar to striations but deeper
Cirques – bowl-shapes
Arete – Two cirques on opposites sides of a mountain meeting to form a crest-shaped ridge
Horn – cirques developing on all sides, forming a peaking horn on mountain tops
Lateral moraines – moraines along the edges
Terminal moraines – forms at the terminus
Recessional moraine – forms when a glacier melts and recedes
Medial moraine – when two glaciers converge, and trap lateral moraines between then, forms a ridge of material called a medial moraine.
Esker – raised bar of sediment from a melted glacier
Kettles – Terrain full of pits left behind from a melted glacier, basically a lake segmented from other bodies of water.
Eratics – boulders that are different from the bedrock
Tundra – the most common type of landscape in present day periglacial regions
Active layer – When the thin layer near the surface melts
Ice wedges / patterned ground – characteristics left behind from

Chapter 14 (pp. 416-451)

Albedo – The reflectivity of a surface, as a percentage of the total reflected radiation
Anthropogenic greenhouse effect – The portion of greenhouse warming that results from human activities rather than natural processes
Carbon cycle – The set of processes by which carbon cycles from reservoir through the global environment
Climate – The average weather conditions of a location or region over time
Climate proxy record – Records of natural events that are influenced by and closely mimic climate
Feedback – A cycle in which the output from a process becomes an input into the same process
General circulation model – A computer model of the climate system, linking processes in the atmosphere, hydrosphere, biosphere, and geosphere.
Glaciation – (aka glacial period or ice age) A relatively cold period, when Earth's ice cover greater exceeded its present extent
Global Warming – Present-day global warming of the world's climate that most scientists believe is likely to continue and is at least partly caused by human activities
Interglaciation – (aka interglacial period) A relatively warm period, when Earth's ice cover and climate resembled those of the present day
Intergovernmental Panel on Climate Change (IPCC) – An international, interdisciplinary panel of scientists and other experts, established to keep the world community up to date on the science of the global climate system
Milankovitch cycles – the combined influences of astronomical orbital factors that produce changes in the Earth's climate
Paleoclimatology – The scientific study of ancient climates
Reservoir – A place in the Earth system where a material is stored for a period of time
Sequestration – Long-term storage of material, in isolation from the atmosphere
Sink – A reservoir that takes in more of a given material than it releases
Trend – A long-term or underlying pattern in a time series of data

Anthrosphere – the realm of human activity
Greenhouse effect – trapping of the suns warmth in the lower atmosphere
Koppen system – used to describe variations of the present-day distribution of climate zones
Eccentricity – departure from circularity
Precession – wobbling
Aerosols – extremely fine suspended particles
Younger Dryas – tundra like, when the Earth was emerging from an ice age
Paleocene-Eocene Thermal Maximum – period when the oceans were significantly warmer than they are now
Negative feedback – occurs when a system is stabilizing or self-limiting
Positive feedback – self perpetuating and self-reinforcing
Gas hydrates – frozen gas molecules in the seafloor
Medieval warm period – Episode of mild climate during the middle ages
Little Ice Age – When temperatures in western Europe averages 1 to 2 degrees lower.
Anthropogenic – chiefly from human activity

Chapter 15 (pp. 454-488)

Angiosperm – A flowering , or seed-enclosed, plant
cell – The basic structural and function unit of life; a complex grouping of chemical compounds enclosed in a porous membrane
DNA – Deoxyribonucleic acid; a double-chain biopolymer that contains all the genetic information needed for an organism to grow and reproduce
domain – The broadest taxonomic category of living organisms; biologists today recognize three domains: bacteria, Archaea, and eukaryotes
Eukaryote – An organism composed of eukaryotic cells – that is, cells that have a well-defined nucleus and organelles
Evolution – The theory that life on Earth has developed gradually, from simple organisms to more complex organisms
Fossil – Remains of an organism from a past age, embedded and preserved in rock
Gymnosperm – A naked-seed plant
Kingdom – The second-broadest taxonomic category. There are six recognized kingdoms, including animals and plants
Mass Extinction – A catastrophic episode in which a large fraction of living species become extinct within a geologically short time
Natural Selection – The process by which individuals that are well adapted to their environment have a survival advantage and pass on their favorable characteristics to their offspring
Photosynthesis – A chemical reaction whereby plants use light energy to induce carbon dioxide to react with water, producing carbohydrates and oxygen
Prokaryote – A single-celled organism with no distinct nucleus – that is, no membrane that separates its DNA from the rest of the cell.
Species – A population of genetically and/or morphologically similar individuals that can interbreed and produce fertile offspring
Trace Fossil – Fossilized evidence of an organisms life processes, such as tracks, footprints and burrows

Primary atmosphere – envelop of gas on young Earth, stripped away by solar wind
Secondary atmosphere – replaced the primary atmosphere, created by volcanic outgassing
Photodissociation – breakdown of water molecules into oxygen and hydrogen by ultraviolet light
Stromatolites – layered structures, formed by entire colonies of bacterial life-forms, hardened
Homeostasis – Constant chemical environment (balanced)
Polymerize – act of forming very long and complex molecules
Nucleotides – complementary organic molecules
RNA – ribonucleic acid, may have formed backbone of pre-DNA life
Aerobic metabolism – using oxygen to release energy
Anaerobic metabolism – nonoxygenated breakdown of foods
Fermentation – chemical breakdown via bacteria
Chemosynthesis – synthesis of organic compounds, typically by bacteria, typically in absence of light
Extremophiles – bacteria that survive in high-temperature of high-salinity environments, often considered uninhabitable
Archaea – similar to bacteria in size and function

Edia-cara fauna – earliest fossils of multicellular eukaryotic organisms, toward the end of the Proterozoic Eon
Mutations – accidental substitutions of one nucleotide for another
Gradualism – extremely slow, gradual change
Punctuated equilibrium – Idea that a species could be the same for many generations, then undergo occasional periods of very rapid change
Mineralization – process in which bones and other hard parts are replaced by minerals carried in solution
Petrified wood – volatile plant material evaporates, and is replaced by a thin film of carbon
Mold – An imprint
Coprolites – fossilized animal droppings
Cambrian explosion – (aka Cambrian radiation) a great many changes 542 million years ago
Phylum – above class, and below kingdom (taxonomically)
Vascular plants – plants with a set of vessels to transfer water and dissolved elements
Stomata – adjustable openings in the leaves
Spores – male and female reproductive bodies
Seed – fusion of two male cells
Chitin – fingernail like material
Chordates – animals with a primitive version of a spinal cord
Notochord – primitive spinal cord
Hominids – human-like organisms
Bipedal – routinely walked upright
Background extinctions – the majority of extinctions that have already occurred
K-T extinctions – The most famous mass extinction, about 65 million years ago.

Chapter 16 (pp. 526-592)

Biomass energy – Any form of energy that is derived, more-or-less, directly from plant life, including fuel wood, peat, animal dung, and agricultural wastes
Coal – A combustible rock (50 to 95% carbon), formed by the compression heating, and lithification of peat
Fossil Fuel – combustible organic matter that is trapped in sediment or sedimentary rock
Hydroelectric energy – Electricity generated by running water
Natural gas – The gaseous form of petroleum
Natural resources – A useful material that is obtained from the lithosphere, atmosphere, hydrosphere, or biosphere
non-renewable resource – A resource that cannot be replenished or regenerated on the scale of a human lifetime
Oil – The liquid form of petroleum
Oil shale – A fine-grained sedimentary rock with a high content of kerogen
Ore – A deposit from which one or more minerals can be extracted profitably
Peat – A biogenic sediment formed from the accumulation and compaction of plant remains from bogs and swamps, with a carbon content of about 25%
Petroleum – Naturally occurring gaseous, liquid, and semisolid substances that consist chiefly of hydrocarbon compounds
Renewable resource - A resource that can be replenished or regenerated on the scale of a human lifetime
Tar sand – A sediment or sedimentary rock in which the pores are filled by dense, viscous, asphalt-like oil

Hydrocarbon compounds – hydrogen and carbon
Rank – refers to the carbon content of coal, higher carbon content, higher rank
Lignite – lowest rank of coal
Anthracite – highest rank of coal
Bituminous coal – intermediate between lignite and anthracite, comprises most of the worlds coal
Maturation – series of complex physical and chemical changes (re: petroleum, pressure, heat, etc.)
Source rock – A rock in which organic material has been converted into oil and natural gas
Cap rock – impermeable rock that prevents migrating oil or gas from reaching the surface
Reservoir rock – Porous rock in which oil accumulates
Kerogen – wax-like organic substance, from very-fine grained sedimentary rocks such as shale
Photovoltaic – solar cells
Fuel cells – like batteries, but can be replenished with new fuel
Chain reactions – in the context of sustained reactions
Geothermal energy – from the Earth's interior, the radioactive decay of radioactive isotopes
Hydrothermal reservoirs – underground systems of hat water or stream that circulate in fractured or porous rocks
Metallic minerals – mined for metals to be extracted
Non-metallic minerals – mined for their properties as minerals
Economic geology – branch of geology concerned with discovering new supplies of useful minerals

Hydrothermal deposits – formed when minerals precipitate from hot water solutions
Placer deposits – contains minerals that were carried very far away from their origin, usually by water
Residual deposits – minerals that are left behind by chemical weathering
Metallogenic provinces – The distinction given to groups of deposited minerals