

## SHORTLIST OF PHYSICAL GEOGRAPHY TERMS

The following is an introduction to the basic terms of geography. Terms and concepts are categorized into subject areas: physical geography concepts; physical processes; rivers and streams; land forms and processes; oceanographic; glaciological; atmospheric; and hydrological.

### PHYSICAL GEOGRAPHY CONCEPTS

**Spatial Perspective** - To observe the physical and human characteristics of our planet as they vary over space, looking specifically for patterns and processes.

**Physical Geography** - Study (description) of the physical earth -or- the spatial analysis of the physical elements and processes that make up the environment: energy, air, water, weather, climate, landforms, soils, animals, plants, and the Earth itself.

**System** - A system is any ordered, interrelated set of materials or items that work together as an organized whole.

**Atmosphere** - The system of gases above the Earth that regulate energy and moisture flows to the surface of the Earth.

**Hydrosphere** - The system of water movement and storage in the oceans, atmosphere, land surface and ground.

**Lithosphere** - The system of earth materials and the processes that form them (bedrock, volcanic materials and activity, earth movement, soils)

**Biosphere** - The system of living things and their interaction on the planet.

**Ecosystem** - A system in which various interconnected living and non-living components in an area of the Earth work together.

**Natural Hazard** - A natural occurring event that poses danger to humans.

**Human Induced Hazard** - Human activity (e.g., pollution) that poses danger to the environment and by consequence, other humans.

**Plane of the Ecliptic** - The plane that intersects the orbit of the Earth (and most other planets in our Solar System).

**Revolution** - The movement of the Earth around the Sun. A complete revolution takes 365.25 days.

**Rotation** - The turning of the Earth on its own axis.

**Perihelion** - The position of the Earth when it is closest to the Sun.

**Aphelion** - The position of the Earth when it is farthest from the Sun.

**Equator** - The great circle made up of the set of points equidistant (midway) between the poles.

**Latitude** - Distance north or south of the equator.

**Longitude** - Distance east or west of the prime meridian.

**Prime Meridian** - Half circle from pole to pole running through Greenwich, England which defines 0 degrees Longitude.

**Cartography** - The art and science of making maps.

**Reference Map** - A map that shows what features are found in an area (like roads, airports, cities, countries, rivers; often used for navigation) "What is Where?"

**Thematic Map** - A map that shows information about a special topic (such as climate, population, incidents of crime, or ...) "What is Where?"

**Topographic Maps** - Reference maps with contours or other indication of the topography (land shape)

**Bathymetric Maps** - Topographic maps that show water depth and the topography of the ocean bottom.

**Global Positioning System (GPS)** - A system of orbiting satellites which provide location coordinates to GPS receivers on Earth.

**Digital Cartography** - Use of computers to aid in the process of making maps (aka Desktop Mapping)

**Remote Sensing** - The acquisition of data from a distance (e.g., aerial photography and satellite imagery)

**Geographic Information Systems** - The use of computers to combine maps with data about the features on the maps for the purpose of managing and analysing the mapped data.

## PHYSICAL PROCESSES

**Geomorphology** - The study of the Earth's surface features (landforms) and the processes that form them.

**Tectonic Processes** - The processes that build up the Earth through crustal plate movements.

**Gradational Processes** - The processes that wear down the Earth's surface features through weathering, mass wasting, erosion, and deposition.

**Subduction Zone** - Where two crustal plates meet and the more dense plate dives under the other plate

**Hot Spot** - A place where the upward movement of hot mantle material leads to an isolated zone of volcanic activity (often island formation).

**Slope** - The inclination or tilt of the Earth's surface in an area (0deg.-90deg.).

**Relief** - The measure of elevation gain in a set area (from low point to high point.).

**Mineral** - An inorganic chemical compound made up of one or more elements. It has specific properties including a unique crystal structure.

**Igneous Rock** - Rock that is a direct result of the cooling of molten earth material (magma or lava)

**Sedimentary Rock** - Rock formed from the compressed layers of weathered earth materials as they are brought into an area by water, wind, ice, and gravity

**Strata** - Layers of the same type of sediments which represent conditions at the time of deposition

**Metamorphic Rock** - Rock, whether igneous, sedimentary, or metamorphic, that has been physically transformed due to heating or pressure.

**Volcanism** - The movement of melted earth material (magma) up through the Earth's crust and onto the Earth's surface as lava and tephra.

**Composite Volcano** - This is the classic, steep, conical volcano made up of alternating layers of lava and tephra.

**Shield Volcano** - This is a volcano formed by less viscous (more fluid) lava which leads to broad, gradual (not steep), often symmetrical slopes.

**Cinder Cone** - Small volcanic hills which emit little lava, but rather are composed mainly of tephra material which forms a steep pile of debris.

**Caldera** - The collapsed summit or crater of a volcano.

**Epicenter** - The point on the surface of the Earth directly above an earthquake's focus.

**Seismograph** - A device that records Earth Movement

**Weathering** The processes -- physical, chemical, or organic -- that break down rock material.

**Crystallization** - The process in which waterborne salts crystallize in rock cracks when the water evaporates.

**Frost Wedging (Frost Action)** - The breaking apart of rock due to pressure from water freezing in the rock cracks

**Hydration** - Water molecules attaching onto minerals in a rock which causes the rock to swell and crack.

**Oxidation** - The chemical change caused by oxygen (from water) combining with some minerals to create a new minerals (Oxides).

**Hydrolysis** - The chemical change caused by water combining with some minerals to create new minerals.

**Solution** - The dissolving of minerals (*evaporites*) in water without chemical change.

**Mass Movement (Mass Wasting)** - The downward movement of earth materials in response to gravity.

**Landslide** - The general term referring to any rapid downhill movement of rock and soil.

**Rockslide (Debris Avalanche)** - The movement of a very large mass of rock quickly downslope.

**Rockfall** - The periodic drop of a rock or group of rocks down a steep slope or cliff.

**Debris Flow (Mudflow)** - The rapid flow of water thick with earth materials down valleys.

**Groundwater** - All subsurface water found in the pore space of soils and rocks.

**Gravity Water** - Water in excess of capillary water that is able to flow down through a permeable earth layer.

**Porosity** - The amount of space between rock and soil particles (affects water storage)

**Permeability** - The ability of soil or rock to allow water to pass through (affects ground water movement)

**Water Table** - The top of the zone of saturation where it meets the zone of aeration.

**Aquifer** - A layer of porous earth materials that stores and transmits water.

**Subsidence** – The sinking of land due to the removal of water from the ground below.

**Karst Topography** - Pitted surface and cave topography created by chemical weathering of limestone regions

**Sinkhole** - A dip (depression) in the surface of a Karst landscape

**Cavern** - A large, room-like cave

**Speleology** - The scientific study of caves

**Haystacks (Karst Towers)** - The remaining limestone hills in a highly eroded Karst landscape.

## RIVERS & STREAMS

**Runoff** - The flow of water on the land surface in unchanneled *sheet flow* and channeled *stream flow*

**Fluvial** - Stream related processes and land features

**Tributaries** - Smaller streams that join a larger stream

**Watershed** - Land area drained by a group of streams upstream from a point on the stream network [or from the mouth of a river] (aka *Catchment Area* or *Drainage Basin*)

**Intermittent** - Streams that flow only part of the year

**Perennial** - Streams that flow all year long

**Abrasion** - Wearing down of stream bed materials by the grinding action of moving particles in the stream.

**Bed Load** - Materials moved along the stream bottom (traction)

**Suspended Load** - Materials moved above the stream bottom (suspension)

**Oxbow Lake** - A curved lake found where a former meander in a river was cut off, isolating it from the river

**Floodplain** - The flat land next to a river which is occasionally flooded and covered with alluvium.

**Delta** - The depositional feature, often triangular shaped, where a stream or river meets a water body.

**Estuary** - A body of water at the mouth of a river where freshwater and saltwater mix.

## LAND FORMS & PROCESSES

**Drought** - A period of time in which there is little or no rain, or when the amount received is below what usually falls. Common in arid and semi-arid climates.

**Pluvial** - Refers to a region's past climate in which there was more rainfall.

**Exotic Streams** - A stream that originates in a wet area (often up in the mountains) and has enough water volume to flow through a desert area without drying up.

**Badlands** - A region of rain carved hills and gullies with little or no vegetation. It is a rugged landscape created by the easy erosion of soft materials.

**Mesa** - A flat-topped, steep-sided remaining portion of a plateau or tableland.

**Alluvial Fan** - The fan shaped depositional feature created when a stream with a heavy sediment load slows down as it enters a valley.

**Alluvial Plain** - The extensive alluvial deposits (stream deposited materials) on a desert valley floor.

**Pediment** - The slightly sloped bedrock surface covered by alluvial materials at the

**Eolian** - Wind related erosional processes and landforms.

**Deflation** - The removal of surface material by wind action.

**Abrasion** - The grinding up of surface materials as they are moved against each other by wind (or water).

**Dust Storm** - The movement of large quantities of lighter materials in the air column. Can darken the sky.

**Sandstorm** - Like a dust storm, but with heavier sand particles that move closer to the ground.

**Dunes** - A desert or beach feature created by the movement and piling up of sand and other coarse materials by the winds.

**Loess** - Large deposits of *windblown* silts and clays from arid areas (that may have been covered earlier by glaciers.)

## OCEANOGRAPHIC

**Sea** - Saline water bodies connected to, but smaller than the world's oceans

**Salinity** - A measure of the amount of dissolved solids in water

**Seamounts** - A volcanic mountain rising from the sea floor that does not extend above sea level

**Continental Shelf** - The near shore, fairly flat, underwater extension of the continent

**Continental Slope** - The slope that connects the continental shelf with the deep ocean bottom.

**Tides** - The rise and fall of sea level along a coast in response to the pull of the Moon's (and Sun's) gravity.

**Spring Tide** (highest tidal shift, sun & moon work together)

**Neap Tide** (lowest tidal shift, sun & moon cancel out)

**Flood Tide** (incoming or rising tide)

**Ebb Tide** (outgoing or falling tide)

**Slack Water** (in between Flood and Ebb Tides, no flow)

**Tidal Bore** (upstream flow/wave in a river channel during a flood tide)

**Tsunami** - An ocean wave created by *subsea* landslides, earthquakes, or volcanic eruptions

**Swells** - The up-and-down wave pattern in the open ocean. As they approach shore, they become irregular waves and then breakers.

**Littoral Drift** - The movement of sand down the beach (Beach Drift) and water down the coast (Longshore Current)

**Headlands** - Parts of the coastline that extend out into the sea

**Submergent coastlines** - Flooding of coasts due to sea level rise

**Fjord Coasts** - Deep glacial valleys filled by the rising sea

**Barrier Island Coasts** - Low lying coasts, where wave action creates sandy islands parallel to the coast

**Delta Coasts** - Coasts with river deltas extending out to sea

**Coral Reef Coasts** - Coasts where coral formations are found

**Fringing Reefs** - Stage in which reefs are attached to land

**Barrier Reefs** - As an island sinks or is worn down, the reefs surrounding it are found farther from shore

**Atoll** - Ring shaped coral islands and reefs that remain once the main island is gone

## GLACIOLOGICAL

**Glacier** - A mass of year-round ice which can flow downward.

**Ice Sheet** - A very large continuous continental glacier

**Ice Cap** - A smaller ice sheet covering a mountainous area

**Ice Field** - A large expanse of ice in a mountainous area (larger than an ice cap, smaller than an ice sheet)

**Ice Age** - A time of colder climate with an increase in glaciers

**Valley Glacier** - An alpine glacier that flows down a valley

**Calving** - The loss of ice, in the form of icebergs, at the snout of a glacier that lies over a water body

**Ice Shelf** - The large, flat portion of an Antarctic tidal glacier where it extends over a bay. It can break off forming a large iceberg.

**Fjord** - The deep U-shaped troughs formed by valley glaciers that are now filled with sea water.

**Glacial Surge** - When a glacier moves much faster than usual

**Striations** - Scratches and grooves created in rock surfaces by abrasion

**Drift** - All of the rock material moved along and deposited by a glacier

## ATMOSPHERIC

**Insolation** - Solar radiation (energy) received by the Earth

**Electromagnetic Radiation** - Energy in the form of waves in various wavelengths traveling at the speed of light (eg. Shortwave from Sun to Earth; Longwave from Earth to Atmosphere)

**Conduction** - The transfer of heat energy from molecule-to-molecule within substances or between touching substances

**Convection** - The vertical transfer of heat energy by the circulating movement of a liquid or gas (warm rises, cool sinks)

**Advection** - The horizontal transfer of heat energy as air masses move in response to pressure differences (winds)

**Latent Heat** - The addition or removal of heat energy from the atmosphere by water changing states between ice, liquid, and gas (Evaporation, Condensation, Melting, Freezing)

**Inversion** - A temperature inversion is the reversal of the pattern of decreasing temperature with increasing altitude. This zone of warming air can stop the upward flow of air and trap pollutants.

**Continentality** - A relative measure of how far a location is from a temperature moderating water body. The greater the continentality, the greater the temperature range.

**Albedo** - A measure of the percentage of light reflected by a surface. High albedo means a high level of reflection.

**Greenhouse Effect** - The process where incoming shortwave radiation passes through the atmosphere, but the re-radiated longwave energy from the Earth is trapped by the gasses and heats the atmosphere.

**Air Pressure** - The pressing force produced by the motion, size, and number of gas molecules.

**Wind** - The horizontal movement of air relative to the Earth's surface as air moves from zones of high pressure to those of low pressure

**Coriolis Force** - The apparent deflection of objects moving in relationship to the earth due to difference in surface rotation speed at different Latitudes.

**Isobar** - A line that connects all the points that have an equal pressure.

**Equatorial Trough** - The low pressure area which circles the globe in the tropics, which is a result of intense convection (aka, Intertropical Convergence Zone or ITCZ).

**Jet Stream** - High-speed upper level winds that flow strongly west to east over the upper mid-latitudes.

**Cyclone** - The spiral pattern of winds flowing into a low pressure cell (convergent winds).

**Anticyclone** - The spiral pattern of winds flowing out of a high pressure cell (divergent winds).

**Monsoon** - The strong winds that flow between land and sea in response to intense heating and cooling of the landmasses. Winter - dry, off-shore flow. Summer - very wet, on-shore flow.

**El Niño** - The weakening of Equatorial Pacific Tradewinds and the resulting shift of ocean current patterns (flow east rather than west) which leads to major changes in global weather patterns. Aka, ENSO (El Niño Southern Oscillation).

**Sea Breeze (On-Shore)** - Wind from sea to land (often in the afternoon)

**Land Breeze (Off-Shore)** - Wind from land to sea (often in early morning)

**Valley Breeze** - Warmed air above land rises, drawing air up-slope

**Mountain Breeze** - Cooled air sinks down the hillsides

**Gyres** - Major circular current patterns in the oceans. Gyres flow clockwise in northern hemisphere and counter clockwise in the southern hemisphere

**Weather** - The atmospheric conditions at any given time in a given place (**Meteorology** - Study of weather).

**Climate** - The long-term weather conditions of a place including common deviations from the norm. (**Climatology** - Study of climate)

**Air Mass** - A large body of air that gets its temperature and moisture characteristics from a source area with consistent conditions (temp/humid)

**Warm Front** - The advance of warm air into a region of cool air. Warm air moves over the cool air creating a broad zone of clouds and light rain.

**Cold Front** - The advance of cold air into a region of warm air. Cold air quickly pushes the warm air up, creating a narrow band of intense rainfall.

**Tornado** - A funnel created by violently spinning winds created by an extremely low pressure storm.

**Convictional Storm** - Storms that are a result of warmed air rising rapidly and condensing (Thunderstorms)

**Hurricane** - Major subtropical cyclonic storm in which winds exceed speeds of 74mph. (tropical disturbance to tropical depression to tropical storm to hurricane, class 1-5)

**Microclimate** - The unique climatic characteristics of a location (may vary from the general climate type).

## HYDROLOGICAL

**Water Vapor** - Water in the form of an odourless, tasteless, invisible atmospheric gas

**Relative Humidity** - The ratio (%) of water in the air to the amount of water that air could hold at the current temperature.

**Dew Point** - The temperature at which a given mass of air becomes saturated (reaches capacity)

**Condensation** - Conversion of water vapour to water droplets.

**Fog** - A low cloud in contact with the Earth's surface.

**Precipitation** - Condensed or frozen water that returns to the Earth (as rain, snow, drizzle, sleet, or hail).

**Hail** - Ice "balls" created in the updrafts and downdrafts of a thunderstorm.