GLOSSARY

Abiotic : Non-living thing. Usually refers to the physical and chemical components of an organism's *environment*.

Adiabatic Lapse Rate : The rate of change of temperature by an ascending or descending airmass. If no other non-adiabatic processes (i.e. no heat enters or leaves the system) occur (like condensation, evaporation and radiation), expansion causes the parcel of air to cool at a set rate of 0.98° per 100 m. The opposite occurs when a parcel of air descends in the atmosphere. The air in a descending parcel becomes compressed. Compression causes the temperature within the parcel to increase at a rate of 0.98° per 100 m.

Air Mass : A body of air whose temperature and humidity characteristics, acquired in source region, remain relatively constant over a horizontal distance of hundreds to thousands of km. Air masses develop their climatic characteristics by remaining stationary over a source region for a number of days. Air masses are classified according to their temperature and humidity characteristics.

Aphelion : It is the point in the Earth's orbit when it is farthest from the *sun* (152.5 million km). Aphelion occurs on the 3rd or 4th of July.

Asthenosphere : Zone in the Earth's *mantle* that exhibits plastic properties. Located below the *lithosphere* at between 100 and 200 km.

Atmospheric Pressure : Weight of the *atmosphere* on a surface. At *sea-level*, the average atmospheric pressure is 1013.25 mb. Pressure is measured by a device called a *barometer*.

Aurora : Multicoloured lights that appear in the upper *atmosphere (ionosphere)* over the polar regions and visible from locations in the middle and high latitudes. Caused by the interaction of *solar wind* with oxygen and nitrogen gas in the atmosphere. Aurora in the Northern Hemisphere are called *aurora borealis* and *aurora australis* in the Southern Hemisphere.

Batholith : A large mass of subsurface *intrusive igneous rock* that has its origins from *mantle magma*.

Big Bang : Theory about the origin of universe. It suggests that about 15 billion years ago all of the matter and energy in the *Universe* was concentrated into an area smaller than an atom. At this instant, matter, energy, space and time were not existant. Then suddenly with a bang, the Universe began to expand at an incredible rate and matter, energy, space and time came into being. As the Universe expanded, matter began to coalesce into gas clouds, and then stars and planets. Some scientists believe that this expansion is finite and will one day cease. After this point in time, the Universe will begin to collapse until a *Big Crunch* occurs.

Biodiversity : The *diversity* of different species (*species diversity*), genetic variability among individuals within each species (*genetic diversity*), and variety of ecosystems (*ecosystem diversity*).

Biomass : The weight of living tissues usually measured per unit area over a

particular time interval. Can include the dead parts of organisms like bark, hair, and nails.

Biome : Largest recognisable assemblage of *animals* and *plants* on the Earth. The distribution of the biomes is controlled mainly by climate.

Calcification : A dry environment soil-forming process that results in the accumulation of *calcium carbonate* in surface *soil* layers.

Caldera Volcano : Explosive type of *volcano* that leaves a large circular depression. Some of these depressions can be as large as 40 km in diameter. These volcanoes form when wet *granitic magma* quickly rises to the surface of the Earth.

Chlorofluorocarbons (CFCs) : Is an artificially created gas that has become concentrated in the Earth's *atmosphere*. This very strong *greenhouse* gas is released from aerosol sprays, refrigerants, and the production of fumes.

Cirrocumulus Clouds : Patchy white high altitude *cloud* composed of ice crystals. Found in an altitude range from 5,000 - 18,000 m.

Cirrostratus Clouds : High altitude sheet like *clouds* composed of ice crystals. These thin clouds often cover the entire sky. Found in an altitude range from 5,000 - 18,000 m.

Cold Front : A transition zone in the *atmosphere* where an advancing cold *air mass* displaces a warm air mass.

Continental Crust : *Granitic* portion of the Earth's *crust* that makes up the continents. Thickness of the continental crust varies between 20 - 75 km. See *sial layer*.

Coriolis Force : An apparent force due to the *Earth's rotation*. Causes moving objects to be deflected to the right in the Northern Hemisphere and to the left in the Southern hemisphere. Coriolis force does not exist on the equator. This force is responsible for the direction of flow in meteorological phenomena like *mid-latitude cyclones*, *hurricanes*, and *anticyclones.*

Cumulus Cloud : Large *clouds* with relatively flat bases. These are found in an altitude range from 300 - 2,000 m.

Cumulonimbus Cloud : A well developed vertical *cloud* that often has top shaped like an anvil. These clouds can extend in altitude from a few hundred m above the surface to more than 12,000 m.

Desert Pavement : A veneer of coarse particles left on the ground after the *erosion* of finer particles by *wind*.

Earthquake : A sudden motion or shaking in the Earth. The motion is caused by the quick release of slowly accumulated energy in the form of *seismic waves*.

Earthquake Focus : Point of stress release in an *earthquake* (also known as hypocentre).

Ebb Tide : Time during the *tidal period* when the *water* level in the sea is falling.

Ecosystem : A system consisting of biotic and abiotic components. Both these groups are interrelated and interacting.

El Nino : The name given to the occasional development of warm ocean surface waters along the coast of Ecuador and Peru. Recently this phenomenon has been used for forecasting of climatic conditions in different parts of the world. The El Nino normally occurs around Christmas and lasts usually for a few weeks to a few months.

Epicentre : A place on the surface of the earth located at the shortest distance from the focus of the earthquake, the point at which the seismic energy gets released.

Global Warming : Warming of the Earth's *average global temperature* because of an increase in the concentration of *greenhouse gases*.

Geomagnetism : A property of magnetically susceptible minerals to get aligned to the earth's magnetic field during the period of rock formation.

Geostrophic Wind : Horizontal wind in the upper atmosphere that moves parallel to *isobars*. Results from a balance between *pressure gradient force* and *Coriolis force*.

Greenhouse Effect : The greenhouse effect causes the *atmosphere* to trap more heat energy at the Earth's surface and within the atmosphere by absorbing and re-emitting longwave energy.

Greenhouse Gases : Gases responsible for the *greenhouse effect*. These gases include: *carbon dioxide* (CO_2); *methane* (CH_4); *nitrous oxide* (N_2O); *chlorofluorocarbons* (CFC); and *tropospheric ozone* (O_3).

Habitat : Location where a *plant* or *animal* lives.

Hail : It is a type of precipitation received in the form of ice pellets or hail stones. The size of hailstones can be between 5 and 190 mm in diameter.

Halocline : The dinstinct zone in the ocean below which the salinity increases sharply.

Hydration : A form of *chemical weathering* that involves the rigid attachment of H+ and OH- *ions* to the *atoms* and *molecules* of a *mineral*.

Hydrolysis : *Chemical weathering* process that involves the reaction between *mineral* ions and the ions of water (OH- and H+), and results in the decomposition of the *rock* surface by forming new compounds.

Infiltration : A portion of the precipitation which reaches the earth surface seeps into the ground in the permeable strata. This process is known as infiltration.

Insolation : Incoming solar radiation in short wave form.

Inter Tropical Convergence Zone (ITCZ) : Zone of *low atmospheric pressure* and ascending air located at or near the equator. Rising air currents are due to global wind *convergence* and *convection* from thermal heating.

Katabatic Wind : Any *wind* blowing down the slope of a mountain.

Land Breeze : Local *thermal circulation* pattern found at the interface between land and water. In this circulation system, surface winds blow from land to water during the night.

La Nina : Condition opposite of an *El Nino*. In a La Nina, the tropical Pacific *trade winds* become very strong and an abnormal accumulation of cold water occurs in the central and eastern Pacific Ocean.

Latent Heat : It is the energy required to change a substance to a higher state of matter (solid > liquid > gas). This same energy is released from the substance when the change of state is reversed (gas > liquid > solid).

Neap Tide : *Tide* that occurs every 14 - 15 days and coincides with the first and last quarter of the moon. This tide has a small tidal range because the *gravitational* forces of the moon and sun are perpendicular to each other.

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Nimbostratus Clouds : Dark, gray low altitude *cloud* that produces continuous *precipitation* in the form of rain or snow. Found in an altitude range from the surface to 3,000 m.

Occluded Front : A transition zone in the *atmosphere* where an advancing cold *air mass* sandwiches a warm air mass between another cold air mass pushing the warm air into the upper atmosphere.

Ozone : Tri-atomic oxygen that exists in the earth's *atmosphere* as a gas. Ozone is highest in concentration in the *stratosphere* (10-50 km above the earth's surface) where it absorbs the sun's ultraviolet radiation. Stratospheric ozone is produced naturally and helps to protect life from the harmful effects of solar ultraviolet radiation.

Ozone Hole : It is a sharp seasonal decrease in stratospheric ozone concentration that occurs over Antarctica in the spring. First detected in the late 1970s, the ozone hole continues to appear as a result of complex chemical reaction in the atmosphere that involves *CFCs***.**

Palaeomagnetism : The alignment in terms of inclination from horizon acquired by magnetically susceptible minerals in the rock during the period of their formation.

Photosynthesis : It is the chemical process where *plants* and some *bacteria* can capture and organically fix the energy of the *sun*.

Plate Tectonics : Theory suggesting that the earth's surface is composed of a number of *oceanic* and *continental plates*. Driven by convection currents in the *mantle*, these plates have the ability to slowly move across the earth's plastic *asthenosphere*.

Precipitation : Showering of the raindrops, snow or hailstones from the clouds onto the surface of the earth. Rainfall, snowfall, cloud burst and hailstones are forms of precipitation.

Runoff : It is the flow of water over land through different channels.

Solar Wind : Mass of ionised gas emitted to space by the *sun*. Plays a role in the formation of *auroras*.

Subsurface flow : It is the movement of water below the surface of the earth. After infiltration, the subsurface water returns to the surface through seepage into the streams or eventually goes into the ocean. The subsurface water flow is influenced by land slope, rainfall, intensity of groundwater extraction, etc.

Thermocline : Boundary in a body of water where the greatest vertical change in *temperature* occurs. This boundary is usually the transition zone between the layer of warm water near the surface that is mixed and the cold deep water layer.