HANDOUT

THE SEASONS

Seasonality - refers to both the seasonal variation of the sun's position above the horizon & changing day lengths during the year; these variations are a response to changes in the sun's altitude or the angle between the horizon & the sun

Causes of the Seasons

1) **Declination** - the latitude of where the sun is directly overhead (sub solar point); it varies between 23.5°N (Tropic of Cancer) & 23.5°S (Tropic of Capricorn)
2) **Day length** - duration of exposure

Causes of the Declination & Day length

1) **Revolution of the Earth** - 365.242199 days @ 107,280 kph (66,660 mph); based on a tropical year - measured from equinox to equinox (elapsed time between 2 crossings of the equator by the sun)
2) **Rotation of the Earth** - 24 hours; west to east (i.e. ccw); has a rotational velocity of -1675 kph (1041 mph) at the equator, 838 kph (521 mph) at 60°, & 0 kph at the poles; determines the length of a day, creates the Coriolis Effect, produces the tides
3) **Tilted axis of the Earth** - 23.5° from the perpendicular
4) **Axial Parallelism** - Earth's axis remains in a fixed alignment relative to the plane of the ecliptic & with Polaris (North Star) directly overhead at the North Pole
5) **Spheroid of the Earth** - an oblate ellipsoid (geoid)

Day length - interval between sunrise & sunset

Solstice (sun stance) - extremes of daylight; when the sun's declination is at its farthest point north or south

a) Winter solstice - Dec 21-22 (N.H.) & June 20-21 (S.H.)
b) Summer solstice - June 20-21 (N.H.) & Dec 21-22 (S.H.)

Equinox - the perpendicular rays of the sun strike the equator; periods of daylight & darkness are each 12 hours long over the Earth

a) Vernal equinox - March 20-21 (N.H.) & Sept 22-23 (S.H.)
b) Autumnal equinox - Sept 22-23 (N.H.) & March 20-21 (S.H.)

Dawn - period of diffused light before sunrise; length increases towards the poles

Twilight - period of diffused light after sunset; length increases towards the poles