

Atmospheric pressure

The atmospheric pressure is weight of the air which lies vertically above a unit area at earth surface. The weight of the air presses down to earth with the pressure of 1034 gm/cm^2 . The atmospheric pressure is equivalent to 76 cm of mercury (Hg) or 1013 mb or 101.325 Kpa.

Factors controlling pressure of air

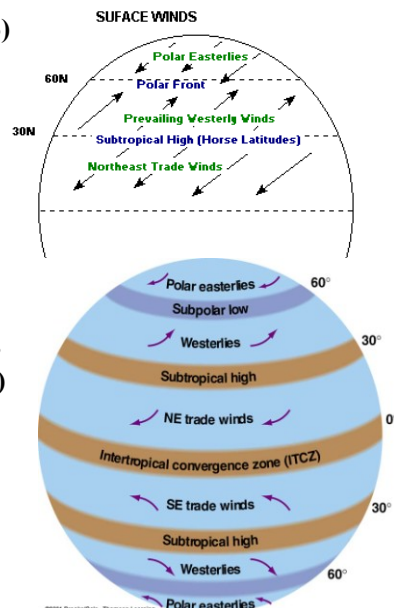
- 1. Temperature** – Hot air expands and exerts low pressure.
- 2. Altitude** – With every 5.5 km of altitude the pressure become half. In other words increase in altitude by 1000 ft decreases the pressure by 1 inch.
- 3. Water vapour** – water vapour are lighter than the air. With increasing amount of water vapour decreases the pressure
- 4. Rotation of the earth**- Different pressure belts due to rotation .
- 5. Seasonal variation** –Shifting of pressure belt with sun movement. This is known as "**Swing of pressure belts** .
- 6. Diurnal Changes**- During day time intense heating take place which decrease the atmospheric pressure

Pressure Belts

1. Equatorial trough of low pressure ($5^\circ \text{ N}-5^\circ \text{ S}$)
2. Subtropical high pressure belt ($25^\circ -35^\circ \text{ N}$)
3. Subtropical high pressure belt ($25^\circ -35^\circ \text{ S}$)
4. Subpolar low pressure belt ($60^\circ -70^\circ \text{ N}$)
5. Subpolar low pressure belt ($60^\circ -70^\circ \text{ S}$)
6. Polar high pressure belt ($80-90^\circ \text{ N}$)
7. Polar high pressure belt ($80-90^\circ \text{ S}$)

These pressure belts are accompanied by the corresponding following wind pattern zones

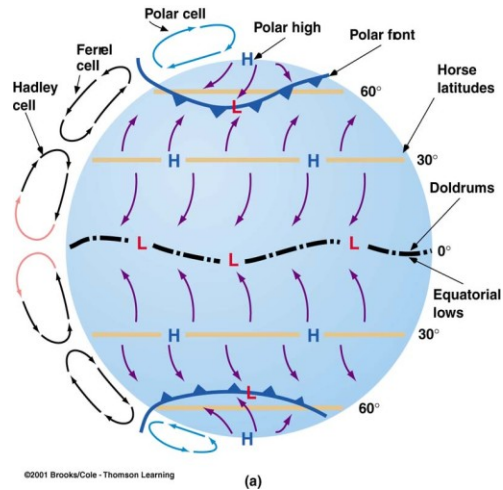
1. Doldrums (Intertropical Convergence Zone)
2. Trade wind belts
3. Westerlies belts
4. Polar easterlies



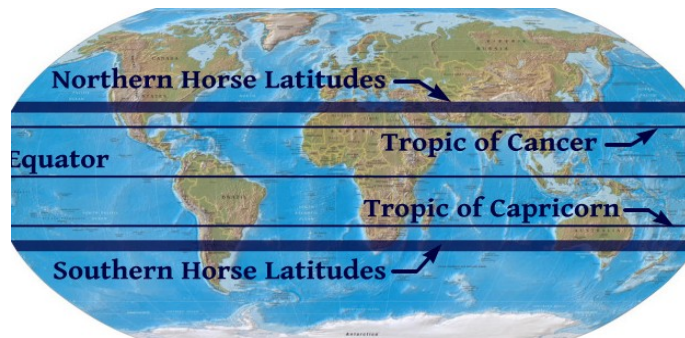
General Atmospheric Circulation

Three-Cell

1. Earth now rotates
2. Critical latitudes
3. Regions and winds
4. Cells
 - a. Hadley cell - 0° to 30°
 - b. Ferrel cell - 30° to 60°
 - c. Polar cell - 60° to 90°



Unique Winds : Latitude wise



Horse latitude
30-38°
both hemispheres



Air Pressure Instruments

Air pressure = Barometric pressure

Instruments - three types

1. Mercury barometer

Mercury in a vacuum tube
36 inches tall
pressure raises mercury
76 cm at sea level

2. Aneroid barometer

Without liquid
Vacuum cylinder = squeezed
Needle swings

3. Barograph - aneroid w/graph

