Examrace

Temperature Zones and Inversion, Thermal Equator and Distribution of Pressure

Temperature Zones

- Torrid zone (tropical region), temperate zone (mid-latitude areas) and frigid zone (polar areas)
- Isotherms: The horizontal distribution of temperature is represented with the help of isotherms – the lines joining places with the same temperature. They are generally parallel to the latitudes but are modified at places due to the maritime influence. In the month of July, they bend northwards while moving from land to sea while in January they bend southward.
- Vertical distribution of temperature: Lapse rate. It is also measured by adiabatic rate. Adiabatic cooling occurs when the air moves upwards and expands. Adiabatic rate higher when air is dry and lower when it is saturated.

Temperature Inversion

- When temperature increases with increasing altitude (instead of decreasing), it is called inversion of temperature. Mostly found in mountain valleys.
- Air gets cooled and night and becomes heavier to move downwards to the valley and in the process pushing the warmer air upwards. This kind of inversion is also called drainage inversion. It is responsible for frosts at valley bottoms. This is the reason why fruit orchards in mountainous regions are laid on valley slopes instead of valley bottoms.
- When inversion occurs due to rapid cooling of air near the surface it is called radiation inversion. It is common in plains in winter.
- Advection inversion: When air from a warmer area blows over to a colder surface.
- Frontal inversion: When warm air and cold air masses converge, the warm air will rise above the cold air. It is found in latitudes where polar air mixes with tropical air. It leads to foggy conditions.
- Thermal anamoly: The difference between the average temperature of a place and the normal temperature of its latitude. They are caused by the factors mentioned before. Depicted on map using isanomals which are lines joining places with equal anomalies. In winter, oceans have positive anomaly while continents have negative anomaly. Vice versa in summers.
- The annual range of temperature is the lowest over the oceans and near the equator.

Thermal Equator

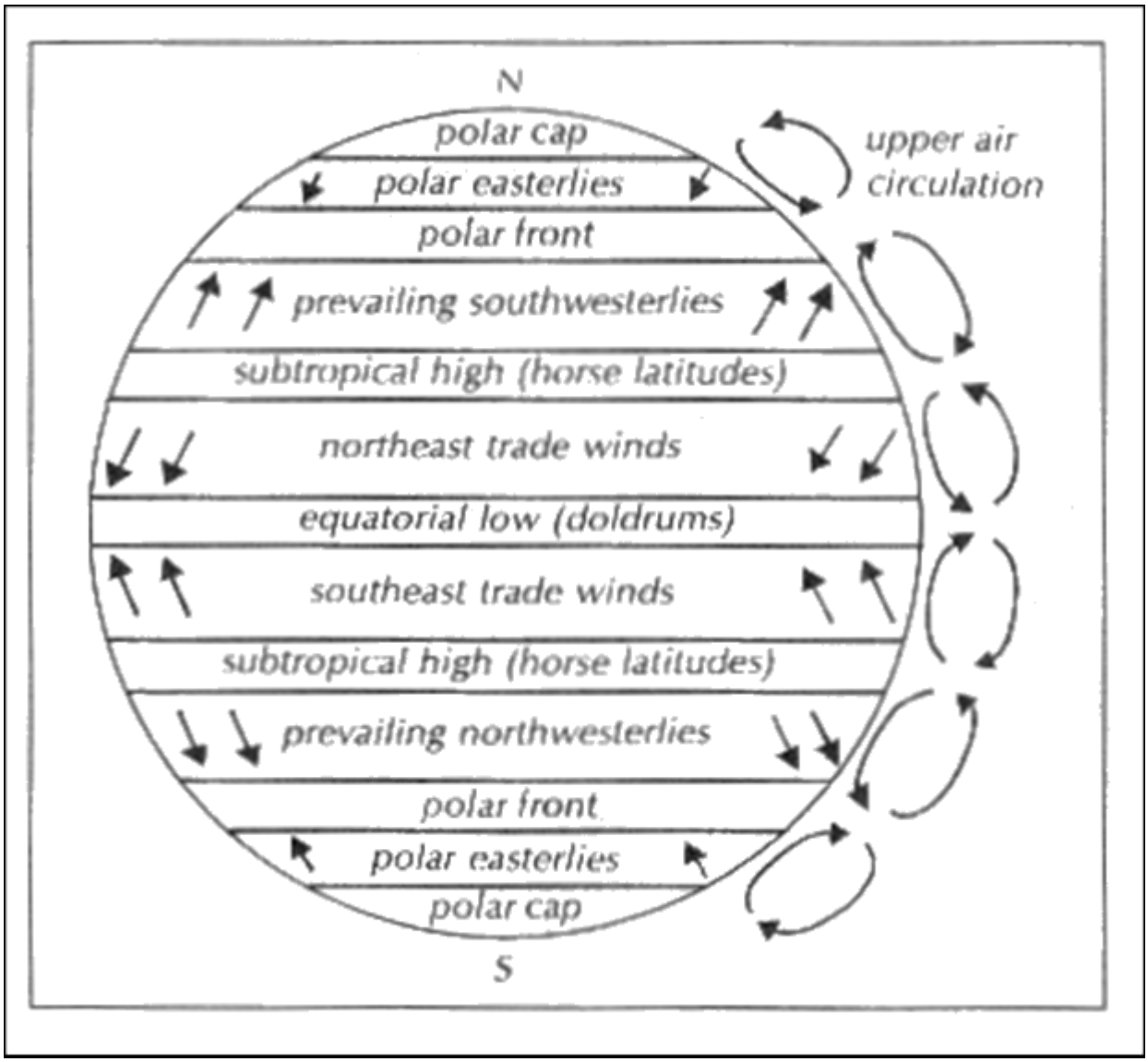
It is the isotherm of the highest mean annual temperature. It is generally taken as coinciding with the geographical equator. The annual range of temperature near the equator is lower than the daily range of temperature.

Pressure

- Pressure = force/area
- 1 millibar = 1000 dynes/sq.cm.
- Measured through barometer. Aneroid barometer: no liquid. Barogram.

Distribution of Pressure

- Pressure is inversely related to temperature and altitude.
- Depends on rotation of earth and effect of ascent and descent of air.
- There are seven belts of pressure: the equatorial low, the subtropical high (two belts), sub-polar low (two belts) and the polar high (two belts). This is the planetary distribution of pressure.



- Swing of pressure belts: Due to the shift in the position of vertical rays of the sun, the pressure belts move slightly northwards during summer solstice and southwards during winter solstice.
- Interruption of pressure belts: Due to maritime and continental effects, the pressure belts are not continuous but subdivided into blocks of low and high pressure.
- Isobar: lines joining places with equal pressure. Use to show distribution of pressure on map. Sea level affects here as well.

Planetary Winds

- Winds are caused due to differences in pressure.
- Pressure gradient: rate of decrease of pressure per unit of horizontal distance. It is measured in the direction of fall of pressure. Direction of the pressure gradient determines the direction of the wind. Its steepness determines the velocity of wind.
- Coriolis effect: Deflection of winds due to the rotation of earth. Due to this the winds are deflected to their right in the northern hemisphere and to their left in the southern

hemisphere. This is referred to as Farrel's law.

- The May 22, 1960 Valdivia earthquake or Great Chilean Earthquake is to date the most powerful earthquake ever recorded, rating 9.5 on the moment magnitude scale.