

## AIR MASSES

When the air remains over a homogeneous area for a sufficiently long time, it acquires the characteristics of the area.

→ The air with distinctive characteristics in terms of temperature and humidity is called an air mass. It is a large body of air having little horizontal variation in temperature & moisture.

→ Air masses form an integral part of the global planetary wind system. Therefore they are associated with one or other wind belt.

→ Pressure Belts - Equatorial low, sub-tropical high, sub-polar low and Polar high

→ wind movement - factor affecting wind - Coriolis force

→ winds - General circulation - Permanent, secondary local winds.

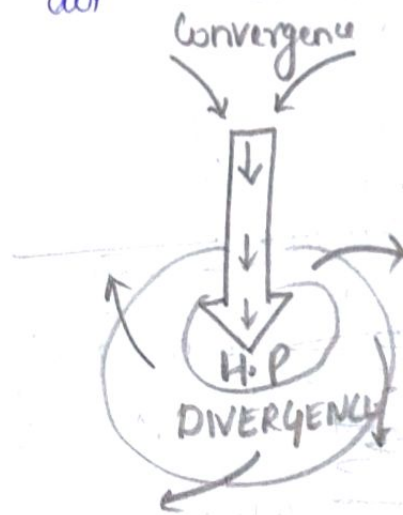
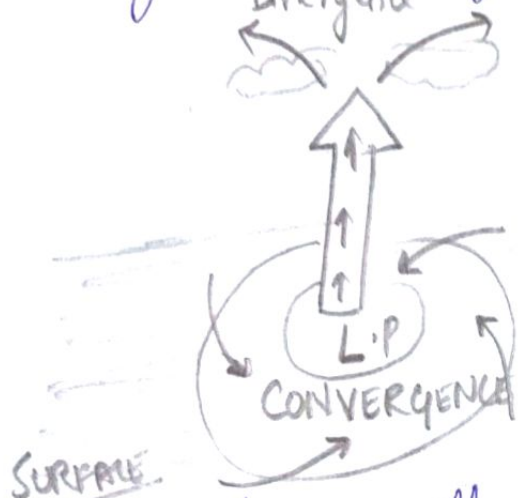
### \* SOURCE REGIONS

→ The main source regions are the high sub-tropics and around the poles

→ Source region establishes heat and moisture equilibrium with the overlying air mass.

\* CONDITION FOR THE FORMATION OF AIR MASSES.

→ Source region should be extensive with gentle divergent air circulation



→ Areas with high pressure or pressure gradient are ideal source region

→ There are no major source region in the mid-latitude as these region are dominated by cyclonic & other disturbances.

\* AIR MASSES BASED ON SOURCE REGION :-

There are five major source regions :-

- 1) warm tropical and subtropical ocean
- 2) the subtropical hot deserts

- 3) The relatively cold high latitude oceans
- 4) The very cold snow covered continents in high latitudes
- 5) Permanently ice covered continents in Arctic & Antarctica

Accordingly, following types of air masses are recognised:-

- (i) Maritime tropical (mT)
- (ii) Continental tropical (cT)
- (iii) Maritime polar (mP)
- (iv) Continental polar (cP)
- (v) Continental arctic (cA)

→ Tropical air masses are warm & polar air masses are cold.

### \* COLD AIR MASSES :-

A cold air mass is one which is colder than the underlying surface and is associated with instability & atmospheric turbulence.

→ Cold source regions :-

- ⊙ Arctic Ocean - cold & moist
- ⊙ Siberia - cold & dry
- ⊙ Northern Canada - cold & dry
- ⊙ Southern Ocean - cold & moist

\* WARM AIR MASSES :-

A warm air mass is one which is warmer than the underlying surface and is associated with stable weather conditions.

→ Warm source regions (tropical air mass)

- ⊙ Sahara desert - warm & dry
- ⊙ Tropical oceans - warm & moist

\* CLASSIFICATION OF AIR MASSES :-

Broadly, the air masses are classified into polar & tropical air masses. Both the polar and continental air masses can be either of maritime or continental types.

→ Source region of these air masses are the Arctic basin, northern North America, Eurasia & Antarctica

→ These air masses are characterized by dry, cold, & stable conditions

→ The weather during winter is clear & stable

→ During summer, the weather is less stable with prevalence of Anti-cyclonic winds

### ⊙ Maritime Polar Air masses (MP)

→ The source region of these air masses are the oceans bet<sup>n</sup> 40° & 60° latitudes

→ The condition over the source regions are cool, moist and unstable.

→ The weather during winter is characterized by high humidity, overcast sky & occasional fog and precipitation

→ During summer, the weather is clear, fair and stable

## ⊙ Continental Tropical Air Masses (CT):-

→ The source regions include tropical & sub-tropical deserts of Sahara in Africa and of west Asia

→ These air masses are dry, hot and stable and do not extend beyond the source

## ⊙ Maritime Tropical Air masses (MT):-

→ The source region of these air masses include the oceans in tropics & sub-tropics such as Mexican Gulf, the Pacific and the Atlantic Ocean

→ These air masses are warm, humid and unstable

→ The winter's weather has mild temperature

→ During summer, the weather is characterised by high temperature, high humidity, cumulus cloud and convectional rainfall