AIR MASSES – Comprehensive Notes

1. Introduction

An air mass is a large body of air having relatively uniform temperature and humidity characteristics over a horizontal extent of hundreds to thousands of kilometers. Air masses form over homogeneous source regions and acquire the thermal and moisture properties of those regions.

2. Conditions for Formation

- Large, uniform surface (ocean, desert, snowfield, plains).
- Atmospheric stability to allow air to remain stationary for long duration.
- Weak pressure gradient and calm winds.

3. Major Source Regions

- Equatorial and Tropical Oceans.
- Subtropical Deserts.
- Polar Regions.
- Continental Interiors.

4. Classification of Air Masses

- Continental (c) – Dry air mass.
- Maritime (m) – Moist air mass.
- Tropical (T) – Warm air mass.
- Polar (P) – Cold air mass.
- Arctic/Antarctic (A) – Very cold air mass.

5. Major Types of Air Masses

- cT – Continental Tropical (Hot and Dry).
- mT – Maritime Tropical (Warm and Moist).
- cP – Continental Polar (Cold and Dry).
- mP – Maritime Polar (Cool and Moist).

- cA – Continental Arctic (Extremely Cold and Dry).

6. Air Mass Modification and Fronts

When two contrasting air masses meet, a boundary called a front is formed. Major types include Cold Front, Warm Front, Stationary Front, and Occluded Front. These fronts are responsible for significant weather changes.

7. Comparison: Continental vs Maritime

Type	Moisture Content	Temperature Range
Continental (c)	Low (Dry)	High temperature variation
Maritime (m)	High (Moist)	Moderate temperature variation