

## Wind

- Wind is the movement of air caused by the uneven heating of the Earth by the Sun.
- Sometimes wind blows gently, refreshing us. At other times, it blows strongly creating storms that cause widespread damages.

Wind Measurement Instruments
<b>Wind vane or Weather - cock</b> measures the wind - direction.
<b>Anemometer</b> measures the wind velocity.

## Types of Wind

### Trade Winds

- They blow from the Sub - tropical High-Pressure Belt to the Equatorial Low-Pressure Belt in the tropics between **30° North and 30° South latitudes**.
- They blow as the **N.E. Trades** in the Northern Hemisphere and as the **S.E. Trades** in the Southern Hemisphere.
- The name '**Trade**' is derived from a nautical expression 'to blow tread' meaning to blow along a regular path or 'tread'.

### Westerlies

- They blow from the Sub - tropical high-Pressure Belt to the Sub - polar low-Pressure Belt in the temperate latitudes between **30° and 60°, on either side of the Equator**.
- They are more constant and stronger in the Southern Hemisphere because there are **no large landmasses** to interrupt them.
- In places they become so strong that these winds are known as the **Roaring Forties or the Brave West Winds and the Furious Fifties**.
- The belts of the Westerlies move north and south following the Sun's movement. These are known as Westerlies because they blow out of the west.

### Polar Winds

- They blow from the Polar High-Pressure Belt to the Sub - polar Low-Pressure Belt between latitudes 60° and the poles on both sides of the Equator.
- These winds blow from the east to form the Polar Easterlies.
- They are more regular in the Southern Hemisphere.
- Polar winds are extremely cold and dry.



## Jet Stream

- These are the winds blowing with great velocity near the Tropopause. The Jet Streams are active in 150 km wide and 2 - 3 km thick transition belt.
- The general velocity of these winds is about 150 - 200 km/hour. But sometime the velocity at the core of the Jet Stream is found to be 325km/hour.
- Jet Streams are generally found in the Northern Hemisphere only. In the Southern Hemisphere, they are found over the South Pole, though they are found in the form of light Rossby Waves over other latitudes also.

## Jet Streams are of four types -

**(i) Polar Night Jet Streams:** These are found beyond the 60° latitudes in both the hemispheres.

**(ii) Polar Frontal Jet Streams:** These are found over the zone between 30° to 70° N latitudes at a height of 9 - 12km. These are related to polar fronts and follow wave like inconsistent paths. Since this jet stream was made known by Swedish scientist Rossby, it is called **Rossby waves**.

**(iii) Sub - Tropical Westerly Jet Streams:** These are found between 20° - 35° N latitudes at a height of 10 - 14 km. The main reason behind their origin is the north - eastern flow of the air rising through the convection in the equatorial region in the Tropopause. These jet streams are responsible for bringing the western disturbances to India in the months from December to February.

**(iv) Tropical Easterly Jet Streams:** All the other jets follow a westerly direction, but these jet streams follow the north - easterly direction. These jet streams found in the zone of 25° - 35° N originate in the North Hemisphere in the summers. These jets originate in a zone of 100 - 130 pressure at a height of 14 - 16km. This is responsible for the origin of the Indian monsoon. Since these jets are warm, they lift the hot and humid surface air and cause convectional rainfall and in this way jet streams are responsible for the bursting of monsoon in India.

## Climatic or Periodic Winds

- These winds change their direction along with change in time or change in climate. **Land and sea breezes** and the **Monsoon winds** are typical examples of periodic winds.

## Monsoon Winds

- Monsoon winds are **seasonal winds** characterised by a complete **reversal in their direction** from one season to another.
- They blow from the **sea to the land in summer**.
- They blow from the **land to the sea in winter**.

## Local Winds:

These winds blow due to local variation in the temperature and pressure, and influence of very small area.

**Chinook:** Chinook means the **snow - eater**. It is the hot and dry wind blowing along the eastern slope of the Rockies and covers an area from the southern part of Colorado in the south to British Columbia in Canada in the north. Due to its effect, the snow melts and green grass sprout even in the winter. This wind is helpful for the animal rearing as it makes the grasslands snow free.

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**Foehn:** This is similar to Chinook and blows along the northern slope of Alps. It affects the snow, makes the weather pleasant and helps in early ripening of the grapes.

**Sirocco :** This is a warm and dry and dusty wind which blows in northerly direction from the Sahara Desert and after crossing over the Mediterranean Sea reaches Italy, Spain etc., where it is also known as **blood rain** because of its reddish sand brought along with it from the Sahara Desert. It is very much destructive to agricultural and fruit crops.

**Yoma:** This is the warm and dry wind like Santa Ana, blowing in Japan.

**Temporal :** This is the monsoon wind blowing in the Central America.

**Karaburan:** These are the dust laden fast blowing winds in the Tarim Basin in the central Asia. These winds blow towards the North - East.

**Harmattan :** This is the warm and dry wind blowing from north - east and east to west in the Sahara Desert. The weather becomes suddenly dry and pleasant in the western coast of Africa, at the arrival of Harmattan. Therefore, it is called **Doctor** in the Guinea coastal.

**Loo :** This is a hot and dry wind blowing in the northern India from the north west and west to east. It is sometimes called **heat wave**.

**Santa Ana :** This is the warm and dry wind blowing in California (USA).

**Levanter :** It is a strong easterly cold wind in southern Spain.

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