

Ch:CLIMATE

Factors Affecting India's Climatic

Pressure and Winds

The following atmospheric conditions govern the climate and associated weather conditions in India

- Pressure and surface winds
- Upper air circulation
- Western cyclonic disturbances and tropical cyclones

Pressure and Surface Winds

India lies in the region of North-Easterly surface winds. These winds originate during winter from the sub-tropical high-pressure belt of the Northern hemisphere.

These winds blow South, get deflected to the right due to the Coriolis force and move towards the equatorial-low pressure region. These winds originate and blow over land and hence, carry very little moisture. Therefore, they bring no rain or very little rain. The unique feature of Indian pressure and wind conditions is its complete reversal. During winter, high-pressure areas develop over the areas North of Himalayas. This causes cold dry winds blow from the area towards low-pressure area over the oceans to the South.

In summer, due to high temperature, low-pressure area develops over interior Asia and over North-Western India. Air from high-pressure areas blow towards this region resulting in complete reversal of wind direction.

As these winds from high pressure area of Southern Indian ocean crosses the equator and turns right towards low pressure areas of Indian sub-continent. These winds gather large moisture while moving over the warm ocean and bring widespread rainfall over the mainland of India. These winds are known as the South-West Monsoon winds.

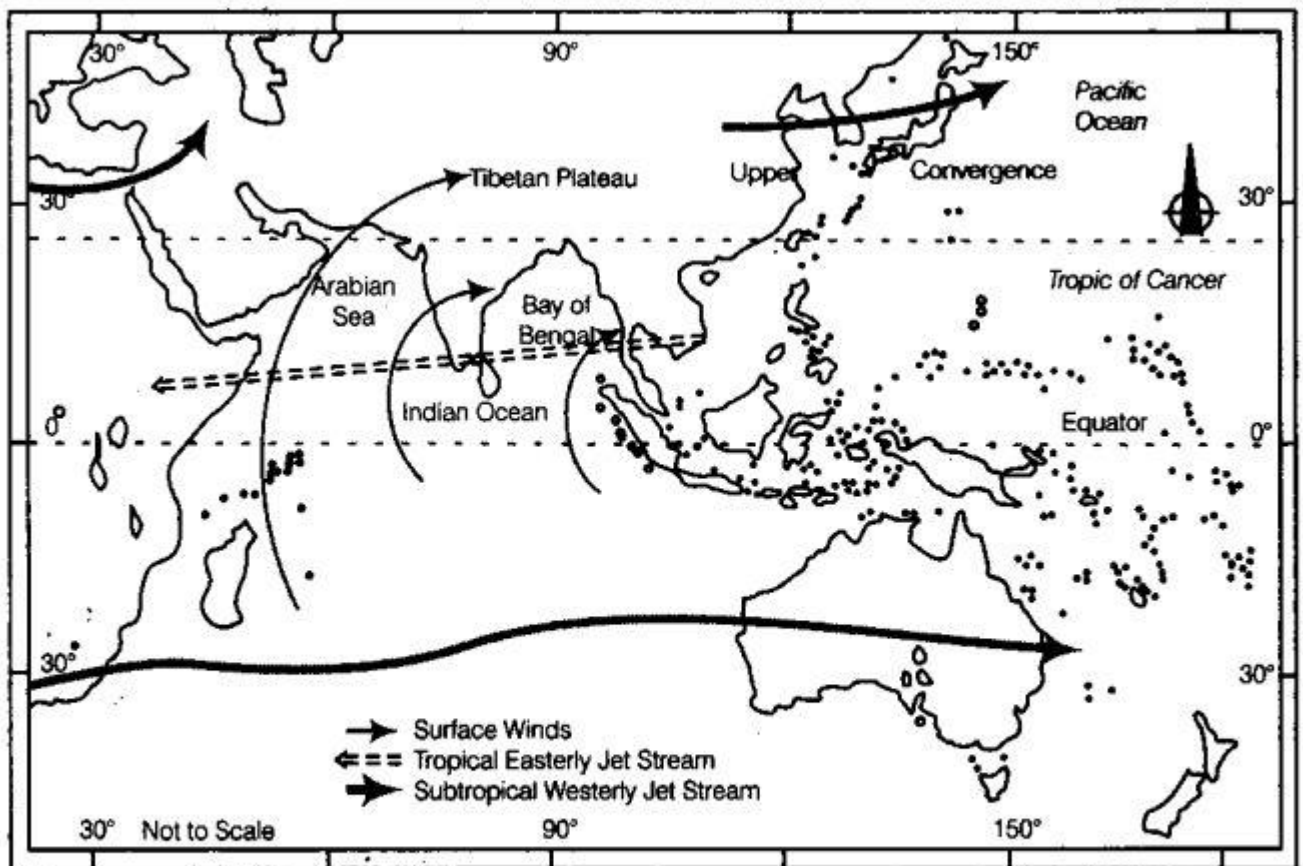
Upper Air Circulation and Western Cyclonic Disturbances

The upper air circulation of the region (Indian subcontinent) is dominated by a westerly flow which is governed by Jet stream. Due to their location over 27°-30° N latitude, these jet streams are known as sub-tropical westerly jet streams. They blow South of the Himalayas, throughout the year except in summer.

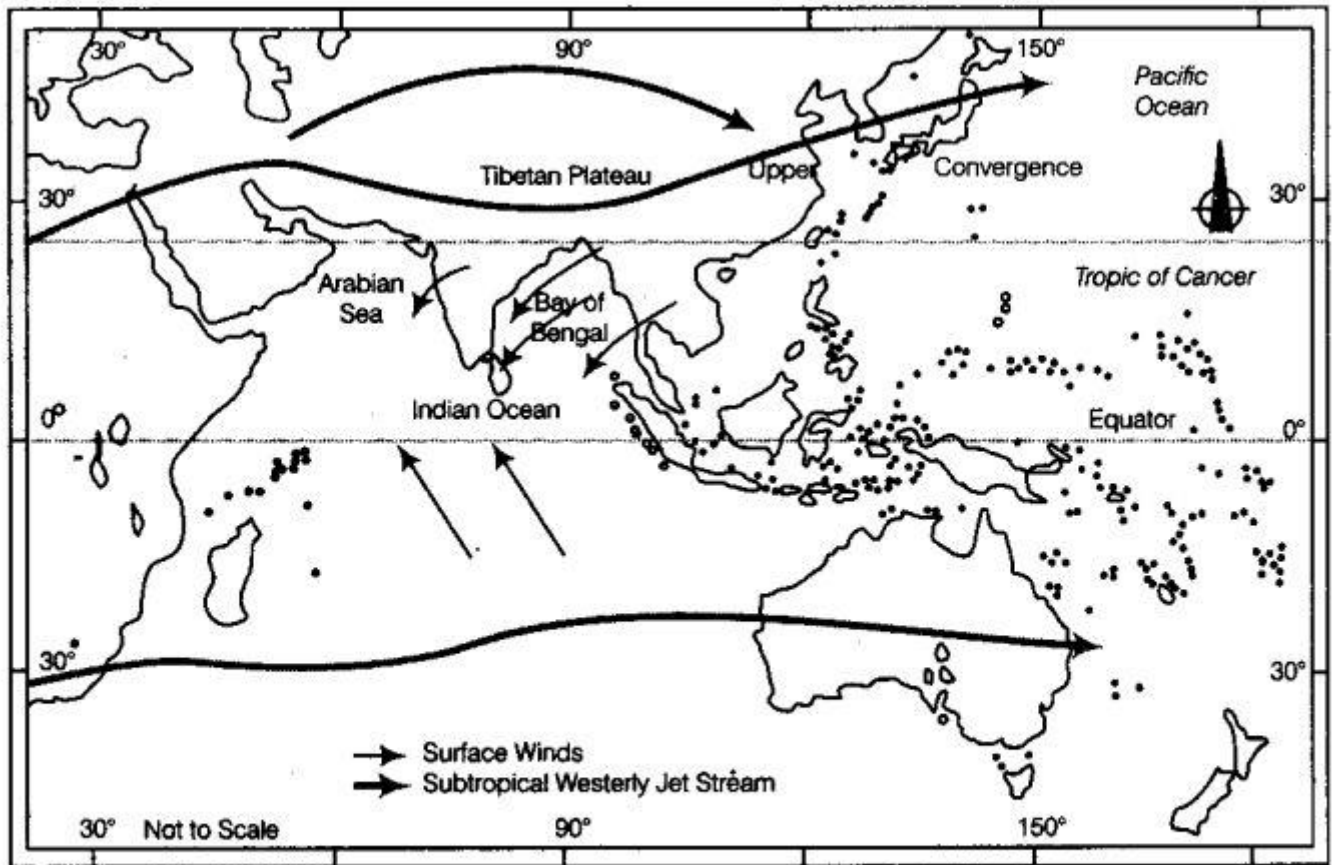
Western Cyclonic Disturbances and Tropical Cyclones

The Western cyclonic disturbances are weather phenomena of the winter months brought in by the westerly flow from the Mediterranean region. They usually influence the weather of the North and North-Western regions of India. Tropical cyclones occur during the monsoon as well as in October-November and are part of the easterly flow. These disturbances affect the coastal regions of the country.

The westerly flow brings the Western cyclonic disturbances in the North and North-Western India. In summer, the sub-tropical westerly jet stream moves North of the Himalayas due to apparent shifting of the sun. An easterly jet stream, called sub-tropical easterly jet stream, blows over peninsular India approximately over 14° N during the summer months.



Atmospheric conditions over the Indian Sub-continent in the month of June



Atmospheric conditions over the Indian Sub-continent in the month of January

Coriolis force An apparent force that as a result of the Earth's rotation, deflects moving objects like air currents to the right in the Northern Hemisphere and to the left in the Southern hemisphere. This is known as Ferrel's law. This law states that a wind in any direction tends to deflect towards right (West to East) in the Northern Hemisphere and to the left in the Southern Hemisphere with a force that is directly proportional to the mass of the wind in question, its velocity, the sine of the latitude and the angular velocity of the Earth's rotation.

READ THE ABOVE ARTICLE CAREFULLY AND TRY TO UNDERSTAND AND GIVE THE ANSWER OF THE FOLLOWING QUESTIONS :

1. **WHAT IS THE CYCLONE?**
2. **WHAT IS THE CORIOLIS FORCE?**
3. **WHAT IS THE JETSTREAM?**
4. **WHAT IS THE SOUTHERN WEST MONSOON?**

SUBJECT TEACHER MUKESH KUMAR

