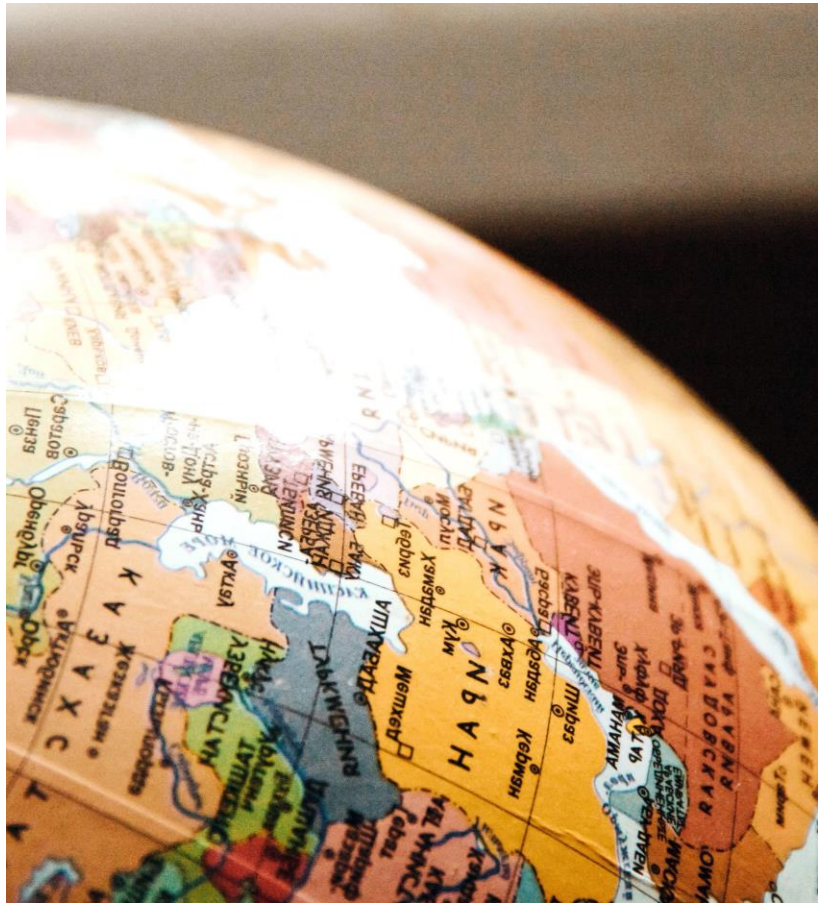


GEOGRAPHY

Class 9
Chapter – 4
Climate

CLIMATE AND WEATHER

- **Climate refers to the sum total of weather conditions and variations over a large area for a long period of time (more than thirty years). For e.g., India**
- **Weather refers to the state of the atmosphere over an area at any point of time. For e.g. , South Extension, Andrews Ganj etc.**



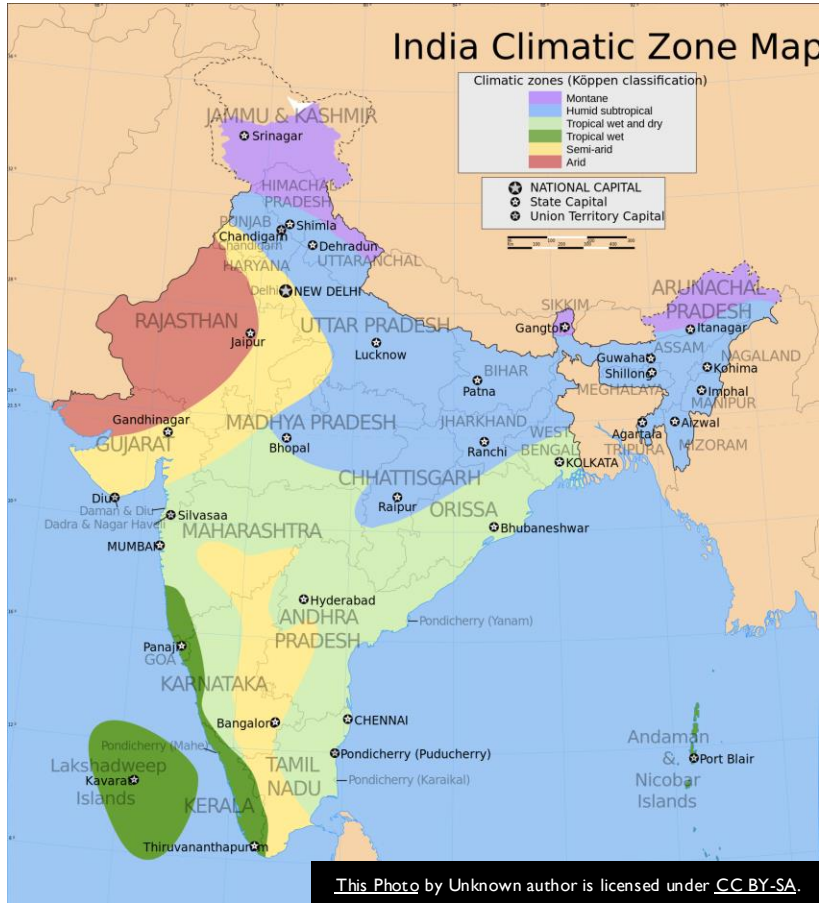
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ELEMENTS OF WEATHER AND CLIMATE

- The elements of weather and climate are the same.
- Temperature
- Atmospheric pressure
- Wind
- Humidity
- Precipitation.

CLIMATE OF INDIA

* The climate of India is described as the ‘monsoon’ type because it is strongly influenced by monsoon wind.
* The monsoon wind is characterised by a distinct seasonal pattern.
* It causes the weather conditions to change from one season to the other.
* These changes are particularly noticeable in the interior parts of India.



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MONSOON

- The word monsoon is derived from the Arabic word ‘mausim’ which literally means season.
- ‘Monsoon’ refers to the seasonal reversal in the wind direction during a year.



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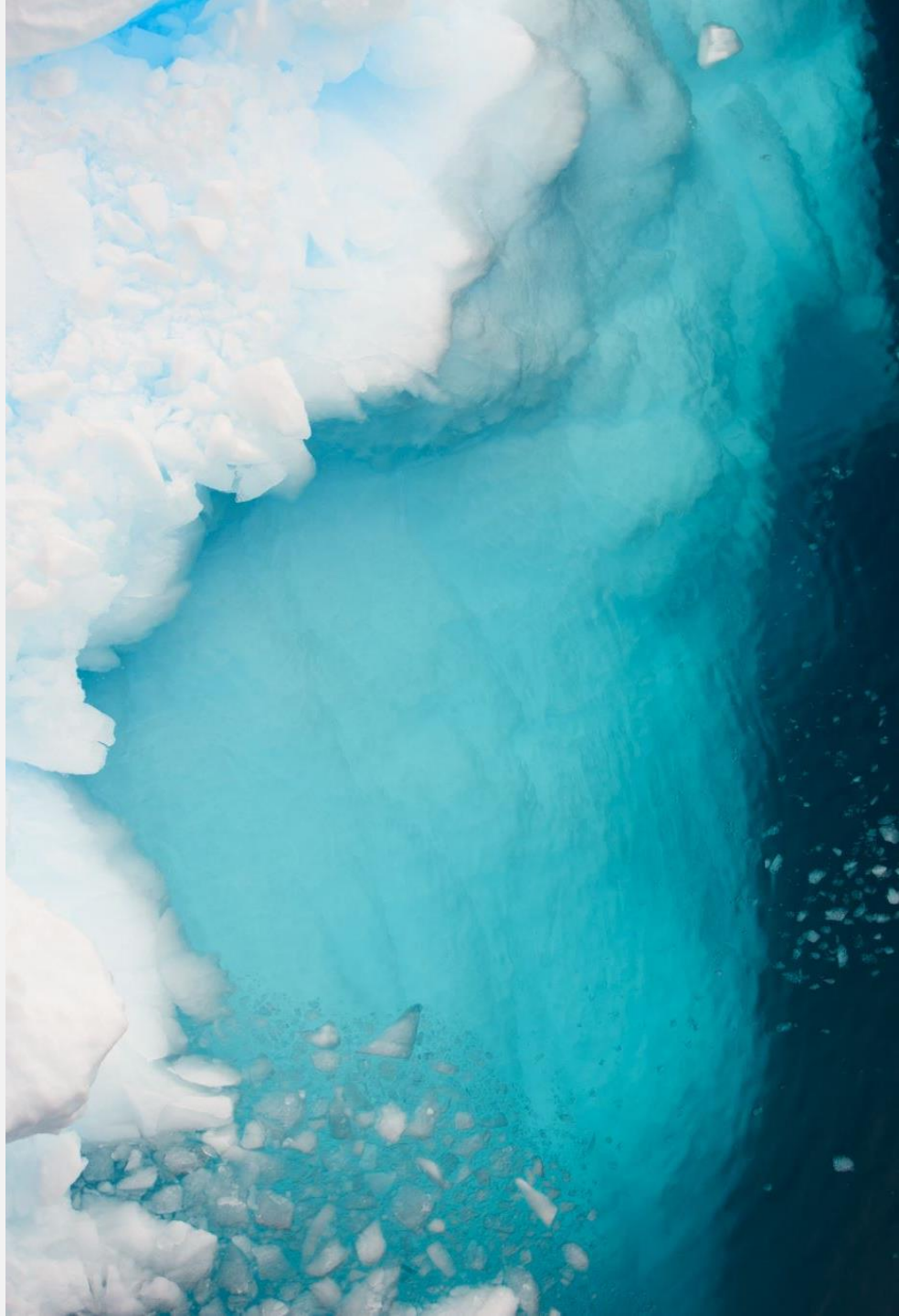
DESPITE AN OVERALL UNITY IN THE GENERAL PATTERN, THERE ARE PERCEPTIBLE REGIONAL VARIATIONS IN CLIMATIC CONDITIONS WITHIN THE COUNTRY. FOR EXAMPLE-

- In summer, the mercury occasionally touches 50°C in some parts of the Rajasthan desert, whereas it may be around 20°C in Pahalgam in Jammu and Kashmir.
- On a winter night, temperature at Drass in Jammu and Kashmir may be as low as minus 45°C. Thiruvananthapuram, on the other hand, may have a temperature of 22°C.
- Precipitation is mostly in the form of snowfall in the upper parts of Himalayas, whereas it rains over the rest of the country.
- The annual precipitation varies from over 400 cm in Meghalaya to less than 10 cm in Ladakh and western Rajasthan.
- Most parts of the country receive rainfall from June to September. But some parts like the Tamil Nadu coast get a large portion of its rain during October and November.

CLIMATIC CONTROLS

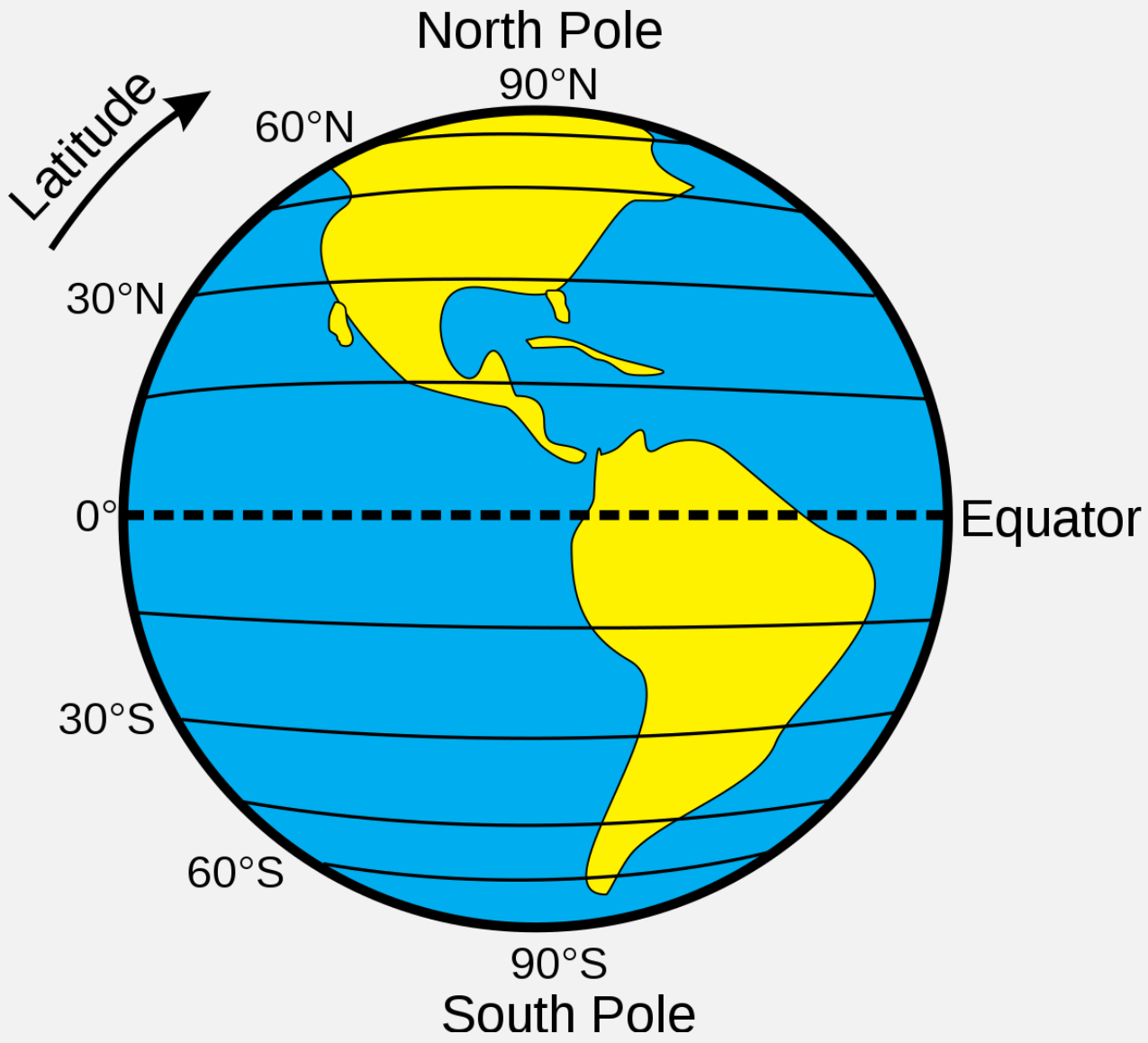
There are six major controls of the climate of any place.

- **Latitude**
- **Altitude**
- **Pressure and wind system**
- **Distance from the sea (continentality)**
- **Ocean currents**
- **Relief features**



LATITUDE

Due to the curvature of the earth, the amount of solar energy received varies according to latitude. As a result, air temperature generally decreases from the equator towards the poles.



ALTITUDE

As one goes from the surface of the earth to higher altitudes, the atmosphere becomes less dense and temperature decreases.

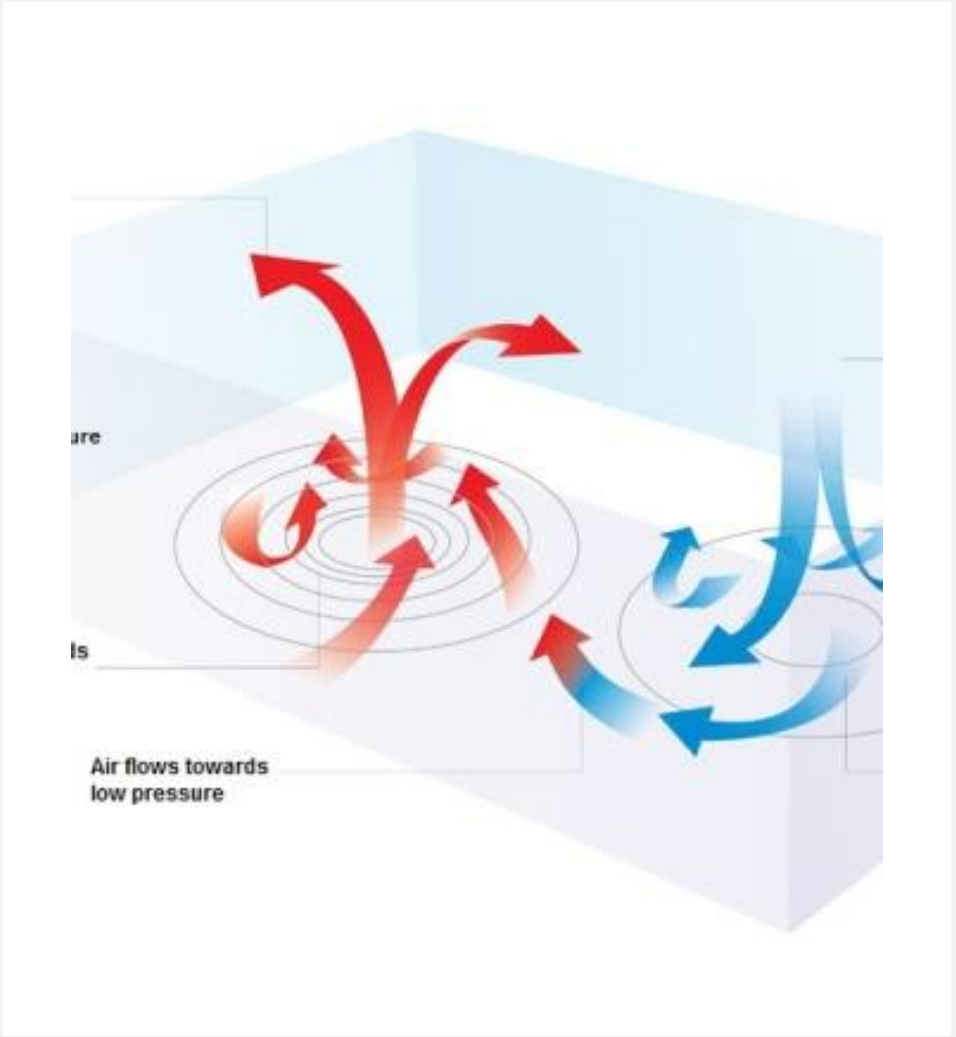
The hills are therefore cooler during summers.



PRESSURE AND WIND SYSTEM

The pressure and wind system of any area depend on the latitude and altitude of the place.

Thus it influences the temperature and rainfall pattern.





DISTANCE FROM THE SEA

The sea exerts a moderating influence on climate. As the distance from the sea increases, its moderating influence decreases and the people experience extreme weather conditions.

OCEAN CURRENTS

Ocean currents along with onshore winds affect the climate of the coastal areas, For example, any coastal area with warm or cold currents flowing past it, will be warmed or cooled if the winds are onshore.

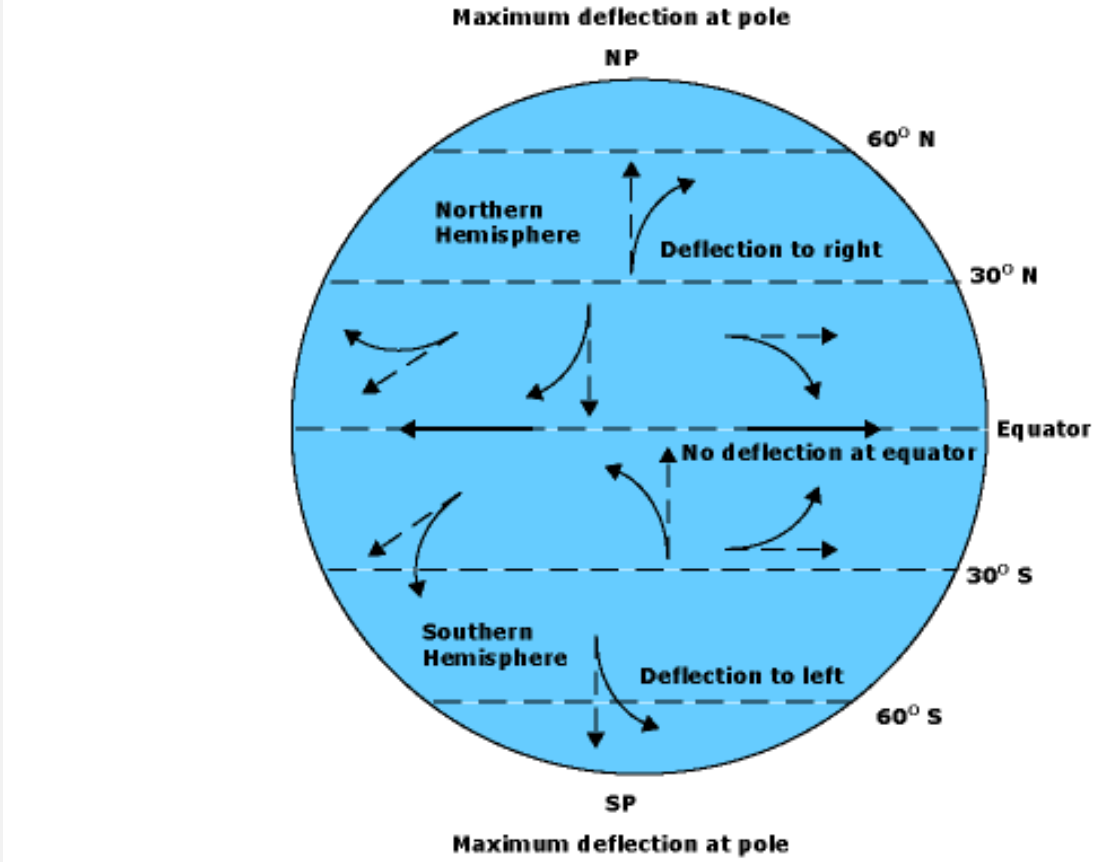


RELIEF FEATURES

Relief too plays a major role in determining the climate of a place. High mountains act as barriers for cold or hot winds; they may also cause precipitation if they are high enough and lie in the path of rain-bearing winds. The leeward side or opposite side of mountains remains relatively dry.

CORIOLIS FORCE

An apparent force caused by the earth's rotation. The Coriolis force is responsible for deflecting winds towards the right in the northern hemisphere and towards the left in the southern hemisphere. This is also known as 'Ferrel's Law.



WESTERN CYCLONIC DISTURBANCES

The cyclone which originate over the Mediterranean Sea and western Asia, move into India along with the westerly Jet stream and bring rainfall.

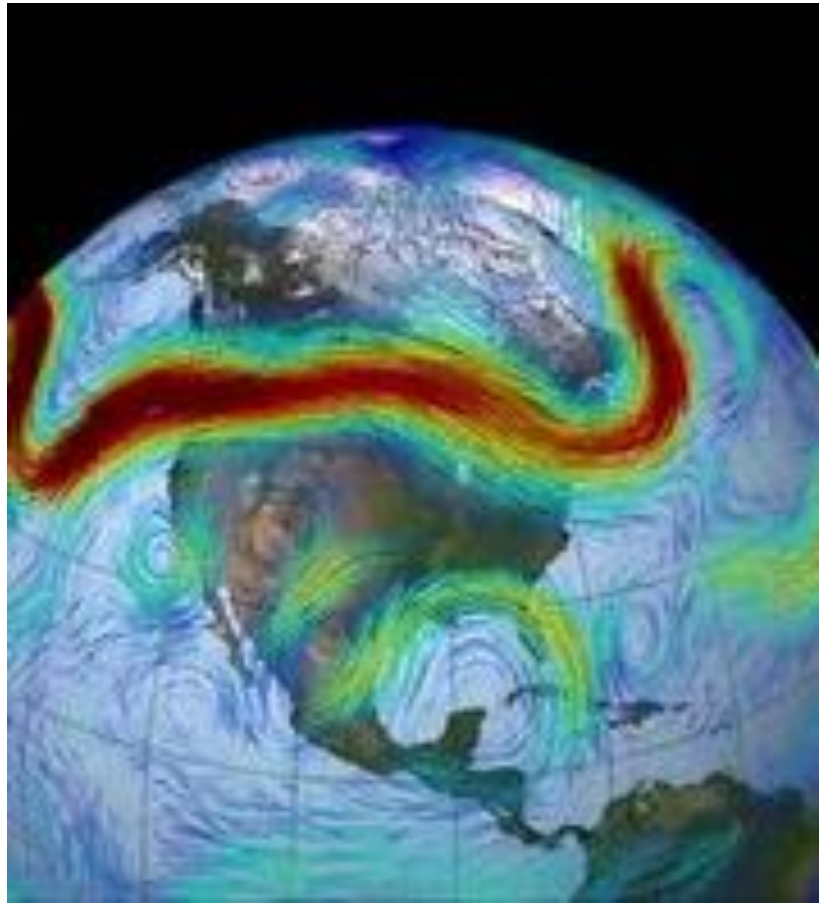
They usually influence the weather of the north and north-western regions of India in winter months.



JET STREAMS

These are a narrow belt of high altitude (above 12,000 m) westerly winds in the troposphere.

Their speed varies from about 110 km/h in summer to about 184 km/h in winter.



FOLLOWING ARE THE FACTORS RESPONSIBLE FOR THE MECHANISM OF MONSOON:-

(a) The differential heating and cooling of land and water creates low pressure on the landmass of India while the seas around experience comparatively high pressure.

(b) The shift of the position of Inter Tropical Convergence Zone (ITCZ) in summer, over the Ganga plain (this is the equatorial trough normally positioned about 5°N of the equator. It is also known as the monsoon trough during the monsoon season).

(c) The presence of the high-pressure area, east of Madagascar, approximately at 20°S over the Indian Ocean. The intensity and position of this high-pressure area affects the Indian Monsoon.

(d) The Tibetan plateau gets intensely heated during summer, which results in strong vertical air currents and the formation of low pressure over the plateau at about 9 km above sea level.

(e) The movement of the westerly jet stream to the north of the Himalayas and the presence of the tropical easterly jet stream over the Indian peninsula during summer.

INTER TROPICAL CONVERGENCE ZONE (ITCZ)

- The Inter Tropical Convergence Zone (ITCZ,) is a broad trough of low pressure in equatorial latitudes.
- This is where the northeast and the southeast trade winds converge.
- This convergence zone lies more or less parallel to the equator but moves north or south with the apparent movement of the sun.

WHAT IS EL NINO?

- **El Nino is a name given to the periodic development of a warm ocean current along the coast of Peru as a temporary replacement of the cold Peruvian current.**
- **'El Nino' is a Spanish word meaning 'the child', and refers to the baby Christ, as this current starts flowing during Christmas.**
- **The presence of the El Nino leads to an increase in sea-surface temperatures and weakening of the trade winds in the region.**

WHY IS THE MONSOON CONSIDERED A UNIFYING BOND?

- The subcontinent of India has great variations in the temperature conditions and the amount of rainfall.
- Nevertheless, the unifying influence of the monsoon on the Indian subcontinent is quite perceptible.
- The Indian landscape, its animal and plant life, its entire agricultural calendar and the life of the people, including their festivities, revolve around this phenomenon.
- The monsoon thus binds the entire continent, where all wait eagerly for their arrival.
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