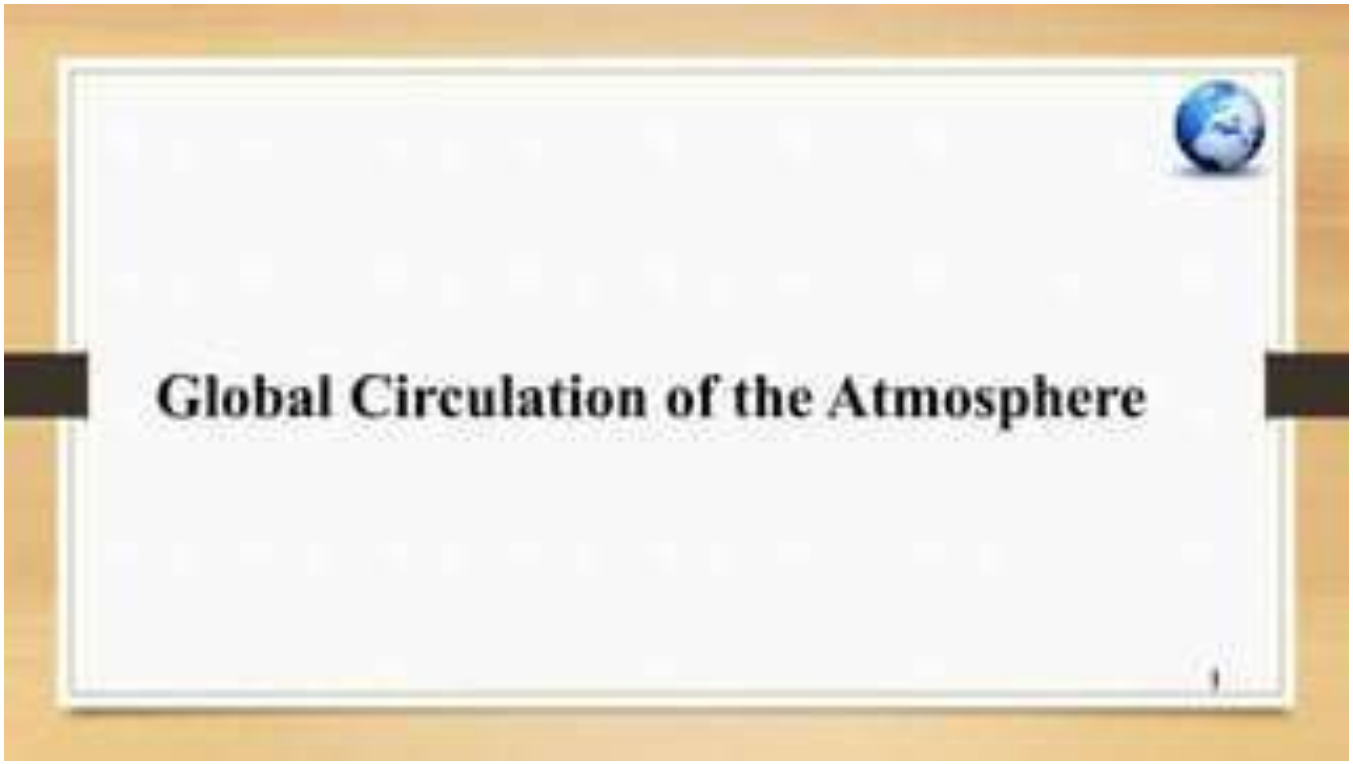

SEMESTER-1 – NEP- MAJOR

Web Material Compiled By

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❑ What is Atmospheric Circulation?

The circulation of wind in the atmosphere is driven by the rotation of the earth and the incoming energy from the sun. Wind circulates in each hemisphere in three distinct cells which help transport energy and heat from the equator to the poles.

Cyclone

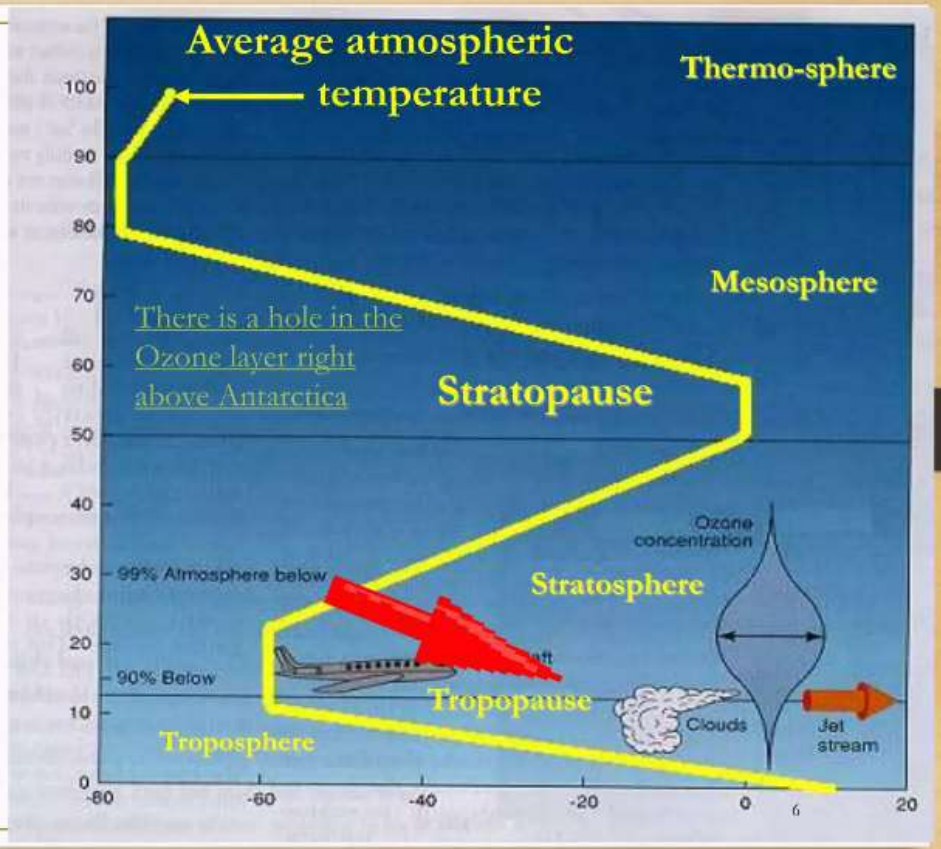
Spheres of Atmosphere

Troposphere

- extends to 16-18 km above the tropics but <10 km above the poles;

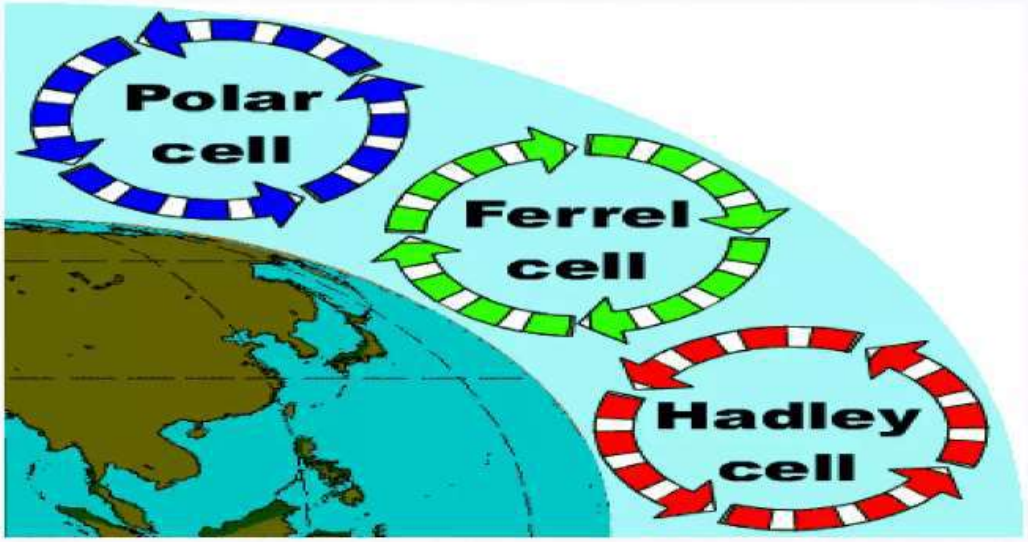
contains ~80% of atmosphere's mass; and

runs the hydrological cycle because tropospheric temperatures decrease with height



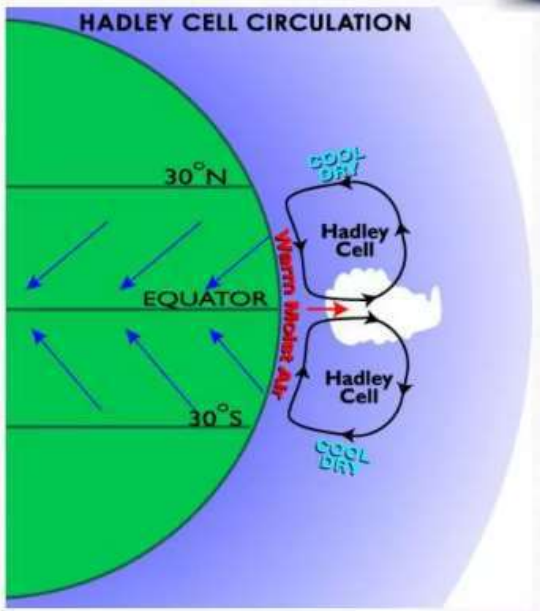
Three model of Atmospheric Circulation

- Hadley Cell
- Ferrel Cell
- Polar Cell



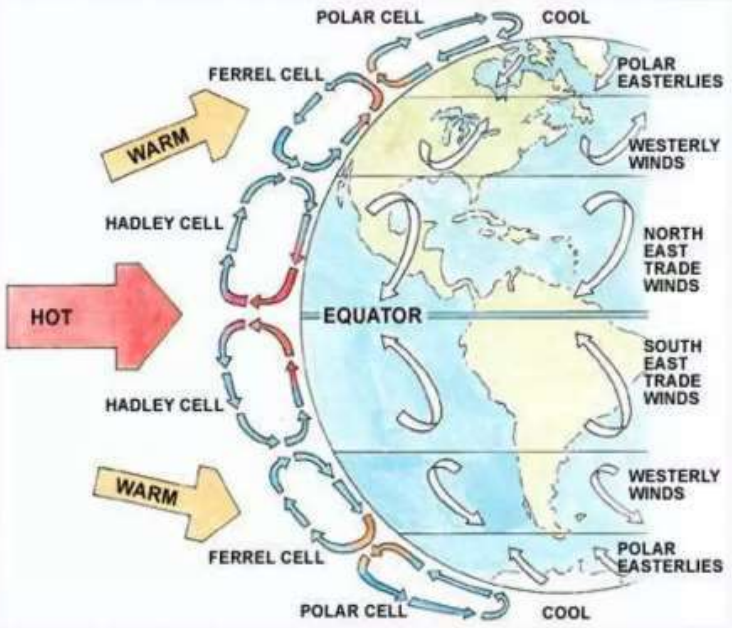
Hadley cell

The Hadley cell, named after George Hadley, is a global scale tropical atmospheric circulation that features air rising near the equator, flowing poleward at 10–15 kilometers above the surface, descending in the subtropics, and then returning equatorward near the surface. This circulation creates the trade winds, tropical rain-belts and hurricanes, subtropical deserts and the jet streams.



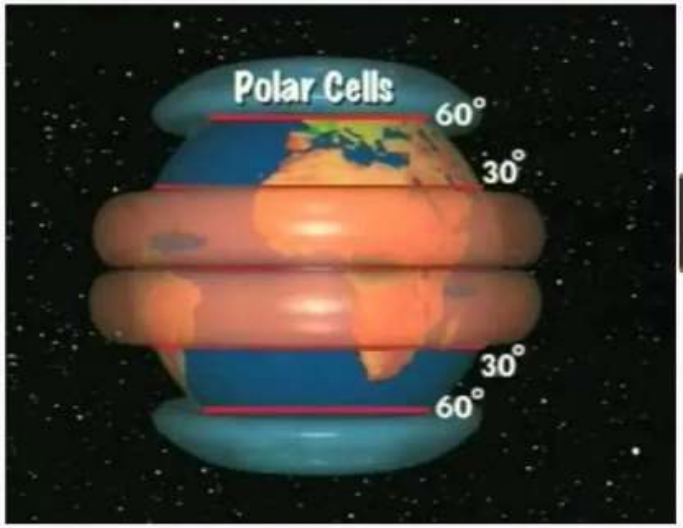
Ferrel cell

The Ferrel cell occurs between 30 and 60 degrees north and south. The Ferrel cell is dependent for its existence upon the Hadley cell and the Polar cell. It comes about as a result of the high and low pressure areas of the mid-latitudes. For this reason it is sometimes known as the "zone of mixing." In this cell at higher levels the wind blows equatorward and in a westerly direction and pole wards and in an easterly direction on the surface.



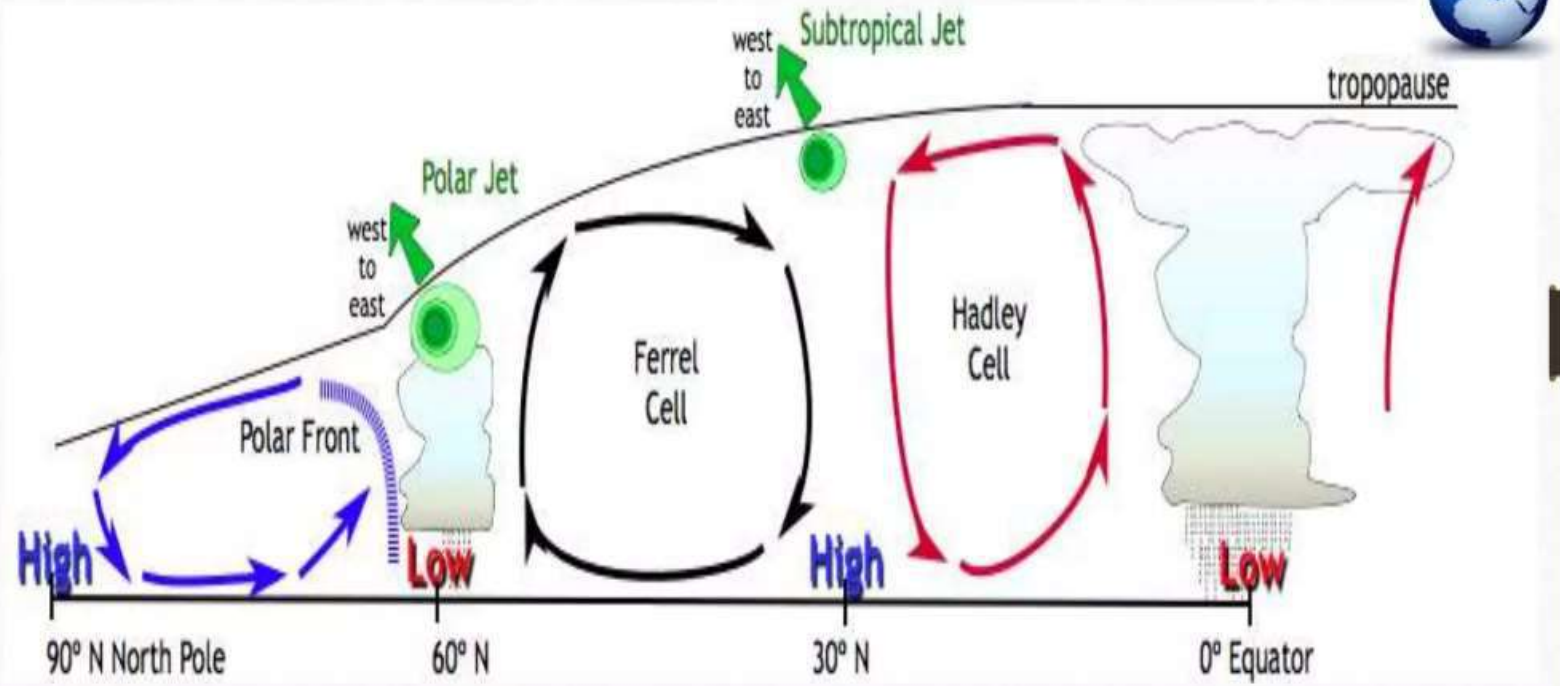
Polar Cell

This cell occurs at 60 degrees north and south. The air has been warmed up and rises upwards, creating a zone of low pressure. Though cool and dry relative to equatorial air, air masses are still sufficiently warm and moist to undergo convection. When the air reaches the polar areas, it has cooled considerably, and descends as a cold, dry high pressure area, moving away from the pole along the surface.



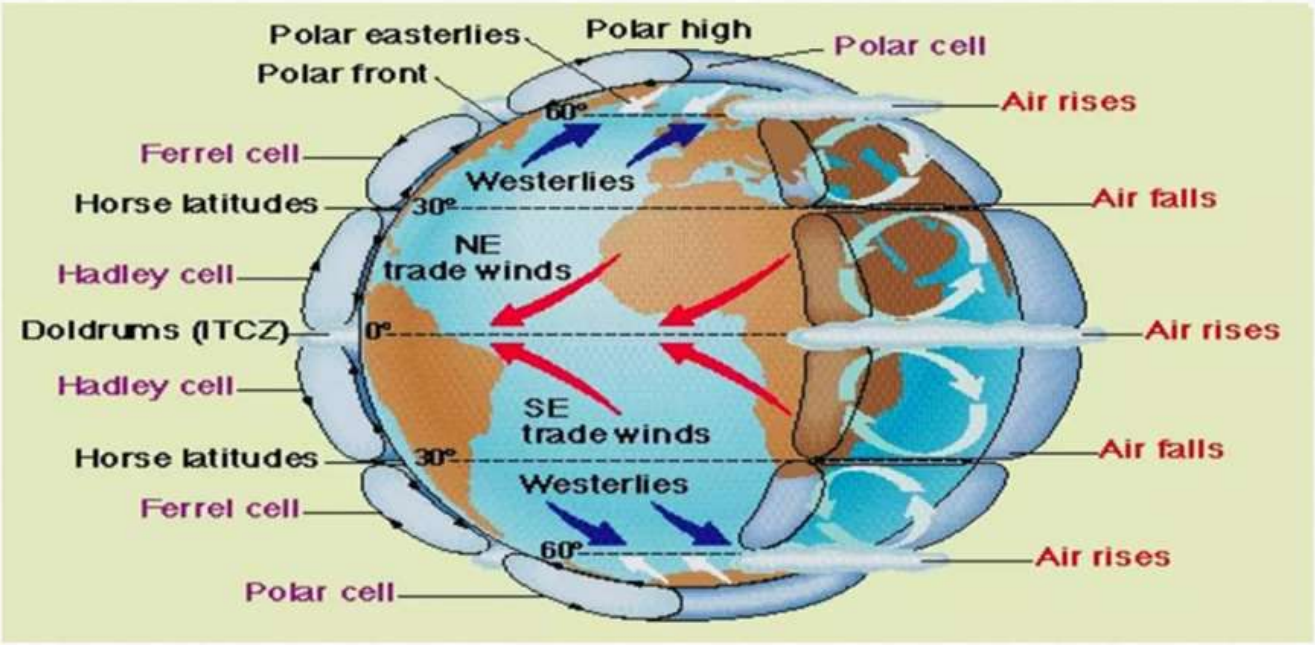
Polar cell

Interaction with each other cells



Describe atmospheric circulation with picture

The Patterns in Global Air Circulation



Trade winds, Westerlies, Polar Easterlies

Trade Winds

Trade winds blow in a belt lying between 5N-30S in the southern hemisphere.

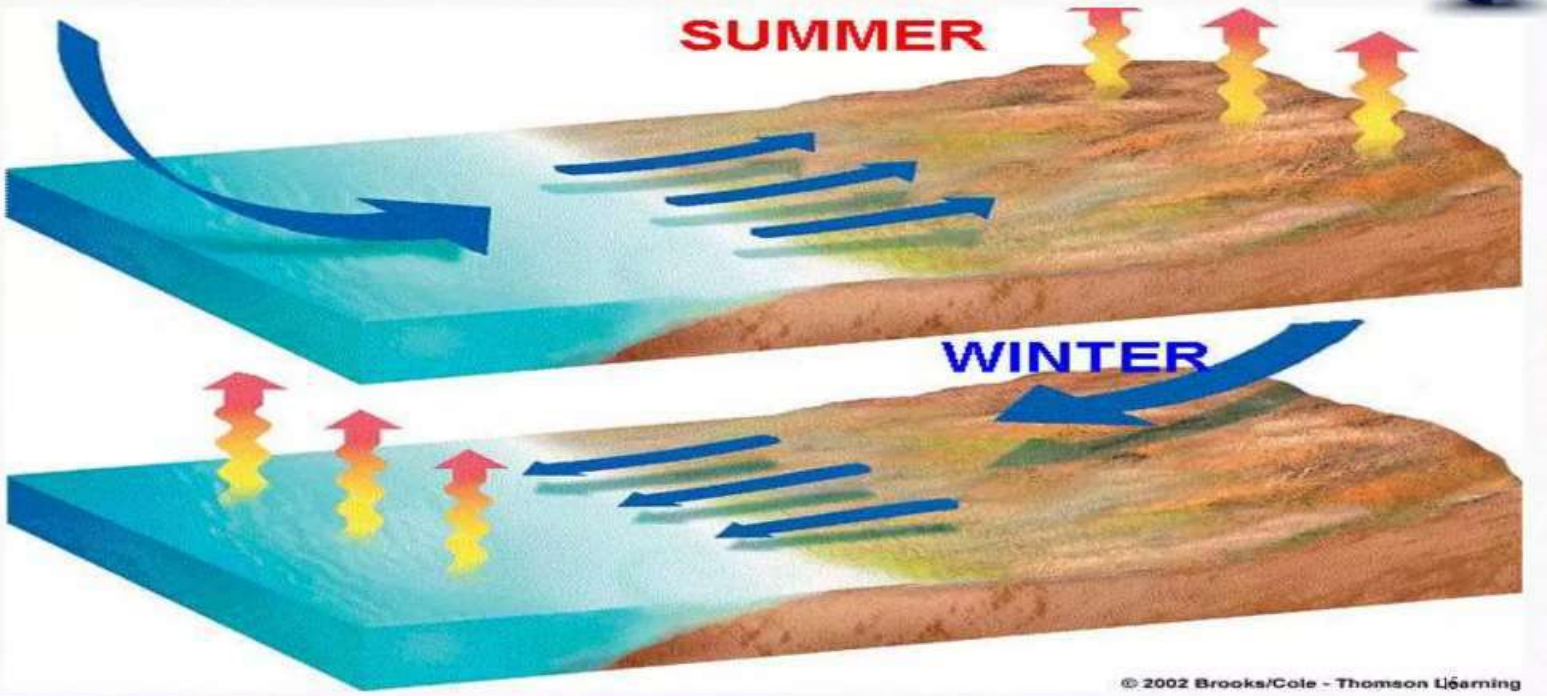
Polar Easterlies

The polar easterlies blow from the polar high pressure area to the temperature low pressure area.

Westerlies

The westerlies winds blow across latitudes 35-60 of both hemisphere.

Atmospheric Circulation is difference in Seasonally

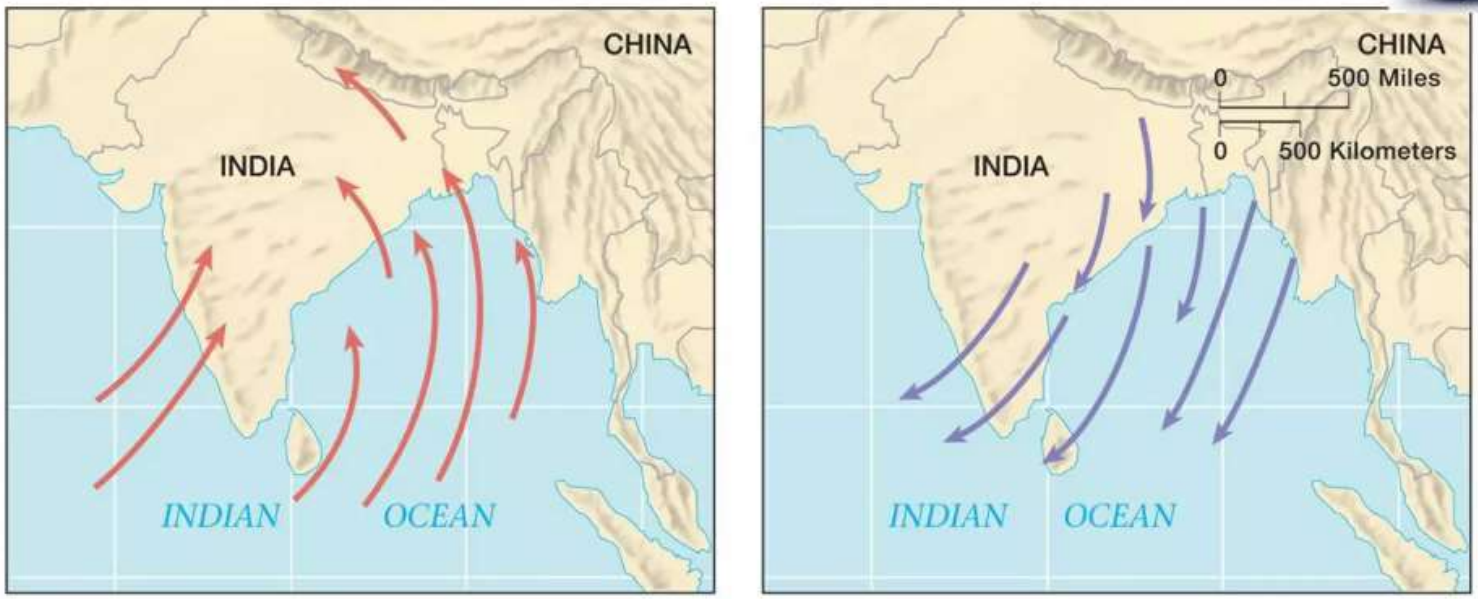


Monsoon

Monsoon is traditionally defined as a seasonal reversing wind accompanied by corresponding changes in precipitation, but is now used to describe seasonal changes in atmospheric circulation and precipitation associated with the asymmetric heating of land and sea.

Rain

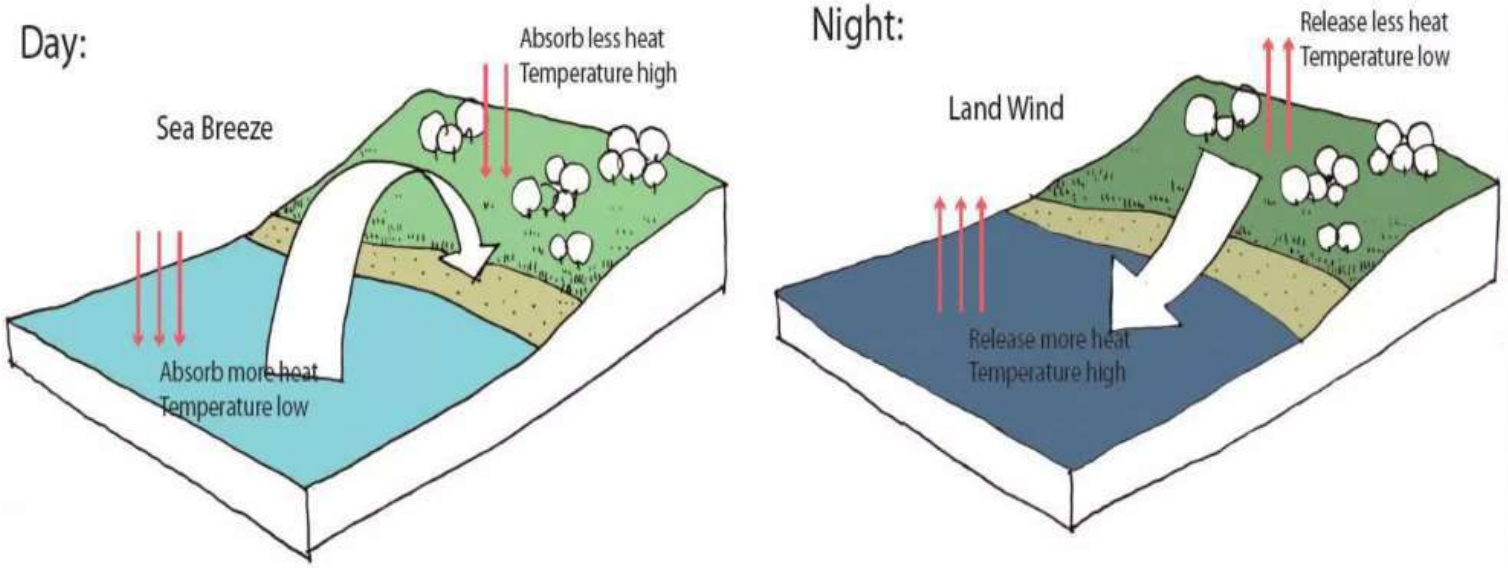
Example



Summer

Winter

Diurnal Wind Change in Coastal Area



Conclusion

Atmospheric circulation is the large-scale movement of air by which heat is distributed on the surface of the Earth. The circulation of wind in the atmosphere is driven by the rotation of the earth and the incoming energy from the sun. Without atmospheric circulation earth is static.

Further Read

- *www.google.com*
- *www.wikipedia.com*
- *www.sciencedaily.com/terms/atmospheric_circulation.htm*
- *https://www.youtube.com/watch?v=WXuGYSM2D8k*
- *www.dictionary.com*
- *www.britannica.com*
- *Class Lecture*