Siberian High

Prelims: *Current events of national and international importance | Geography*

Why in News?

The Siberian High has recently drawn attention due to its strong winter activity, influencing cold weather conditions across parts of Asia, including India.

- **Siberian High –** It is an intense, robust system of ***cold, dry air and high atmospheric pressure*** that controls winter weather across Eurasia.
- **Location –** Centered near Lake Baikal in Siberia, it's also known as the ***Asiatic High or Siberian anticyclone.***
- **Intensity –** It is the strongest semi-permanent high-pressure system in the Northern Hemisphere, with pressure often exceeding 1040 millibars.
- **Vertical Extent -** It is a shallow system, rarely persisting above altitudes of 3,000 meters (10,000 feet).
- **Nature of Air –** It is extremely cold and dry air.
- **Formation – Radiative Cooling -** The high forms due to intense cooling of the Earth's surface over the vast Asian landmass.
- During the long winter nights, heat escapes into space, causing the air near the surface to become dense, heavy, and cold.
- **Winter Peak -** It reaches its maximum strength in midwinter (January/February) and drives the northeast monsoon in East and South Asia.
- **Summer Dissipation-** In the summer months, the system is replaced by the Asiatic Low, which brings the summer monsoon.
- **Climatic Drivers of Variability - Arctic Oscillation (AO) –** Arctic Oscillation (AO) / North Atlantic Oscillation (NAO)
  - Negative AO → stronger Siberian High.
  - Positive AO → weaker high.
- **ENSO (El Niño–Southern Oscillation)**
  - El Niño years may weaken the Siberian High; La Niña can strengthen it (not always consistent).
- **Eurasian Snow Cover -** Greater autumn snow cover → stronger winter Siberian High.

- **Climate Change -** Arctic amplification may reduce temperature gradients, potentially weakening the Siberian High, though episodic extreme cold events may persist.
- **Impact on India –** Siberian High drives *cold northerly winds towards India.*
- It is a key reason for cool winters in North India.
- The Himalayas generally block the most extreme cold associated with the Siberian High.
- During *La Niña conditions*, the Siberian High can overcome the Himalayan barrier and move southward.

Reference

The Hindu | Siberian High