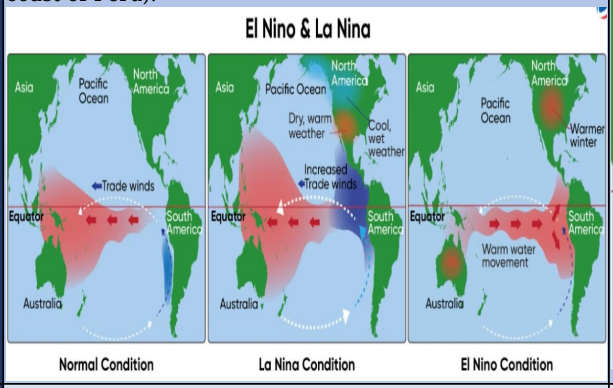
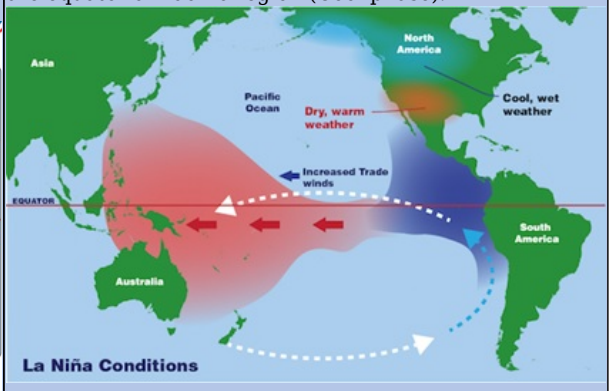
La Nina & its impact on global weather

Why in news?

The India Meteorological Department (IMD) forecasted above-normal rain in the upcoming monsoon season in India, with “favourable” La Nina conditions expected to set in by August-September.

What is ENSO?

- El Nino and La Nino together called as El Nino Southern Oscillation which affects weather events across the world.

Key aspects	El Nino	La Nina
Meaning	It is a loose translation of “little boy” or “Christ child” in Spanish.	It is called as “Little girl” in Spanish which is the opposite of El Niño.
About	It is the warming of sea waters in Central-east Equatorial Pacific that occurs every few years (Warm phase off the coast of Peru). 	It sees cooler than average sea surface temperatures in the equatorial Pacific region (Cool phase). 
Trade winds	It weakens in the western Pacific which cause warmer waters in the East.	It becomes stronger than normal ans cause warmer waters in the west.
Sea surface temperature	It increases across the Eastern Pacific by 6-8°C.	It reduces across the Eastern Pacific by 3-5°C.
Impact	It *disrupts normal upwelling*, reducing the rise of cold, nutrient-rich water from the ocean depths.	It *enhances upwelling*, bringing cold, and nutrient-rich water to the surface near South America.
Impact on India	It has the impact of suppressing monsoon rainfall, can cause **droughts**, adversely affecting agriculture and water supply.	It is associated with *good rainfall* during the monsoon season.
Frequency	It occurs every 3-7 years	It occurs half the amount of time El Nino events do.
Fish population	Reduced upwelling of deep nutrient rich waters leads to reduction in fish populations along South America coast.	Enhanced upwelling of nutrient rich waters increasing fish populations along South American coast.

How La-Nina will impact global weather?

- **Asia and the Indian Subcontinent**- It brings above-average rainfall, benefiting regions like India by *enhancing the monsoon*.
- **Water shortage**-However, eastern and north-eastern India may receive *below-average rainfall*, potentially leading to water shortages.
    - Increased thunderstorms and lightning during La Niña years pose risks, especially during peak agricultural seasons.

- **Southeast Asia-** Countries such as Indonesia, the Philippines, and Malaysia often experience *increased rainfall*, leading to flooding risks.
- **North America**- Southern regions, including the *southern U.S.,* face drier and warmer conditions, potentially causing *droughts*.
    - Conversely, the *Pacific Northwest and Canada* can experience *heavier rainfall* and flooding.
- **Africa-** Southern Africa generally sees higher rainfall, while eastern regions might suffer from drought.
- **Atlantic Ocean-** La Niña years see heightened hurricane activity, with more frequent and intense storms.

Recent ENSO trends
• **2020-2023 La Niña event**- The period from 2020 to 2023 experienced the longest La Niña event of the century, which typically brings above-average monsoon rains to India. • **Transition to El Niño**- Following the prolonged La Niña, ENSO neutral conditions developed and gave way to an El Niño by June 2023. This El Niño has been weakening since December 2023. • **Potential Shift to La Niña**: According to meteorological experts, this transition from El Niño back to La Niña is a natural and recurring process.

How the climate change is impacting ENSO?

- **Increased frequency**- Studies suggest global warming could lead to more frequent and intense El Niño events.
- **Extreme weather events**- This would affect weather patterns and climatic conditions globally, exacerbating extreme weather events.
- **Shifts in ocean conditions-** Warming oceans can alter the baseline conditions, potentially triggering more pronounced ENSO cycles.
- **WMO warning-** The World Meteorological Organization (WMO) suggests that climate change is likely to increase the intensity and frequency of extreme weather events such as severe heatwaves, droughts and storms associated with both El Niño and La Niña.

Quick facts

Indian Metrological Department

• **Launch year-** 1875
• **Nodal ministry**- Ministry of Earth Science
• **About**- It is the national meteorological service of the country and the principal government agency in all matters relating to meteorology and allied subjects.
• **Mausam app**- It is designed by IMD to communicate the weather information and forecasts to the general public.
• **Meghdoot agro app**-It is a joint initiative of India Meteorological Department (IMD), Indian Institute of Tropical Meteorology (IITM) and Indian Council of Agricultural Research (ICAR) that aims to deliver critical information to farmers through a simple and easy to use mobile application.
• **Damini app**- It was developed by IITM-Pune that monitors all lightning activity happening over India and alert the person if lightning is happening near the person by GPS notification under 20 km and 40 km radius.
• **UMANG**- Unified Mobile Application for New-age Governance is a Government of India *all-in-one single, unified, secure*, multi-channel, multi-platform, multi-lingual, multi-service mobile app, powered by a robust back-end platform providing access to high impact services (Current weather, city forecast, tourism forecast etc.,) of various organization

References

1. Indian Express- Impact of La-Nina
2. IMD- History of Meteorological services in India