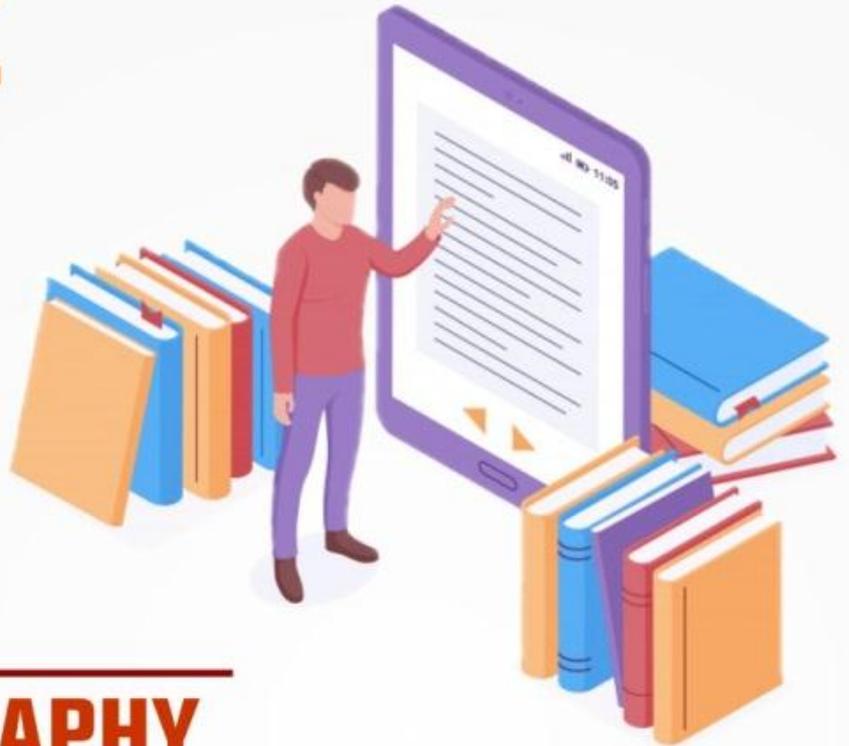


Reliable & Responsible Institute  
Competent and Unparalleled Team

# Quick Digest - 2020

## CURRENT AFFAIRS

(July 2019 to August 2020)



**Subject : GEOGRAPHY**

**Recent Phenomena**



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This is beyond the traditional exploitative orthodox coaching of Delhi  
for IAS Preparation.

We, the team SAMYAK, has been providing you some  
more exciting results.....with our smart work.

Footprints of our sharpness - we have trapped

**23 out of total 100 questions**

with just a lean booklet of 70+ paged for Current Affairs, named

## Quick Digest IAS

(May 2018-April 2019) PRE- 2019

PAPER SERIES 'C'			
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Thanks to team **Samyak**

An Institute For Civil Services

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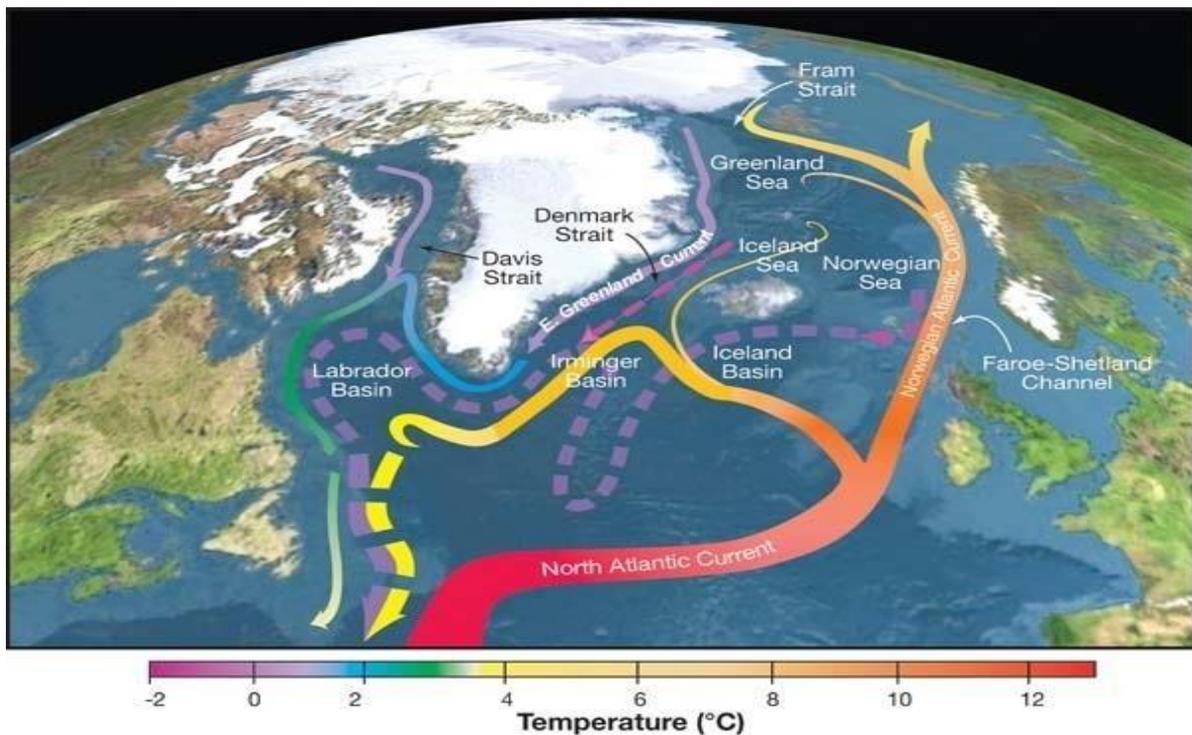
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## 1. AMOC-

**Q-** What is an AMOC?

**Ans-** Atlantic Meridional Overturning Current is the large system of ocean currents operating in the Atlantic Ocean.

- It circulates the waters between the north and the south.
- It ensures the oceans are continually mixed, and heat and energy are distributed around Earth.
- Warming as a result of climate change, the Indian Ocean is causing a series of cascading effects that is providing AMOC a “jump start”.



**Q-** How AMOC works?

**Ans-** As warm water flows northwards in the Atlantic, it cools, while the evaporation increases its salt content.

- *Low temperature and high salt content raise the density of the water, causing it to sink deep into the ocean.*
- *The cold, dense water deep below slowly spreads southward.*
- *Eventually, it gets pulled back to the surface and warms again and, the circulation is complete.*
- This continual mixing of the oceans, and distribution of heat and energy around the planet, contribute to global climate.
- Another oceanic system, which is more frequent, is the El Niño-Southern Oscillation (ENSO).
- This involves temperature changes of 1°-3°C in the central and eastern tropical Pacific Ocean, over periods between 3 and 7 years.
- El Niño refers to warming of the ocean surface and La Niña to cooling, while “Neutral” is between these extremes.
- This alternating pattern affects rainfall distribution in the tropics and can have a strong influence on weather in other parts of the world.

**Q- What is happening now?**

**Ans-** AMOC has been stable for thousands of years. Data since 2004 and projections are cause for concern. It is not clear whether the signs of slowing in AMOC are a result of global warming or only a short-term anomaly.

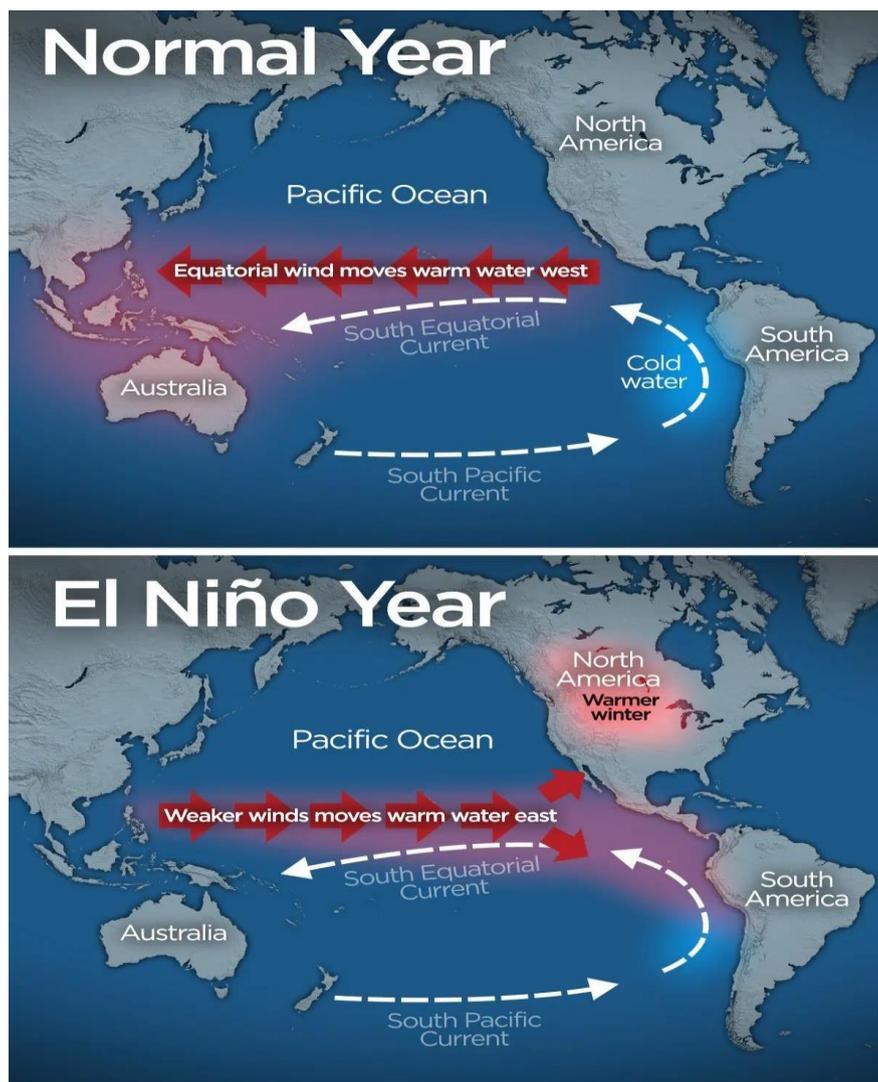
- Yale University research - AMOC had weakened substantially 17,000 to 15,000 years ago.
- The new study, by Fedorov and Shineng Hu of Scripps Institution of Oceanography, appears in Nature Climate Change.

**The role of Indian Ocean?**

- Warming in the Indian Ocean generates additional precipitation, which, in turn, draws more air from other parts of the world, including the Atlantic.
- The higher level of precipitation in the Indian Ocean will reduce precipitation in the Atlantic and increase salinity in the waters.

## 2. IPCC Report on El-Niño-

**News-** Increased temperatures, further acidification, marine heat waves, more frequent extreme El Niño and La Niña events, according to IPCC report named "The Ocean and Cryosphere in a Changing Climate".



## Observations-

- A- It is virtually certain that the global ocean has warmed unabated since 1970 and has taken up more than 90% of the excess heat in the climate system (high confidence).
- B- Since 1993, the rate of ocean warming has more than doubled.
- C- Marine heat waves have very likely doubled in frequency since 1982 and are increasing in intensity.

## Major Impacts on Hindu-Kush Himalayan region-

- A- Floods will become more frequent and severe in the mountainous and downstream areas of the Indus, Ganges and Brahmaputra river basins.
- B- Because of an increase in extreme precipitation events... the severity of flood events is expected to more than double towards the end of the century.”
- ✓ There is a shift in El Niño behaviour since the late 1970s, so, climate change effects have shifted the El Niño onset location from the eastern Pacific to the western Pacific, and caused more frequent extreme El Niño events.
- ✓ Read El-NINO carefully from basics of Geography.

## 3. MITRA CRATER-

**NEWS-** While passing over North Polar Region of moon Chandrayan images of various crafters. Among them one was named “Mitra” on the name of Sisir Kumar Mitra.

**Q- Who was Mitra?**

**Ans-** A leading Indian physicist who helped established the first radio science course at the Calcutta universities

- ✓ He also set up the first Ionosphere field station at Haringhata near Kolkata.
- ✓ The creation of crafters on lunar moons.

**SISIR KUMAR MITRA**  
(October 24, 1890 - August 13, 1963)

Known for his seminal work on ionosphere.

The ionosphere, that extends from about 60 km to several thousand kilometres high in the atmosphere, plays a major role in long distance radio communications.

Awards:

- Padma Bhushan in 1962
- Fellowship of the Royal Society
- Joy Kissen Mukherjee Gold Medal of the Indian Association for the Cultivation of Science in
- Science Congress (Calcutta) Medal of the Asiatic Society in 1956.

Introduced 'wireless' to the post-graduate course in physics at the Calcutta University. This marked the beginning of radio science teaching in India.

He established the first ionospheric field station at Haringhata, about 45 km north of Kolkata for ionospheric investigations in 1950.

**The Doyen of Radio Science in India**

 /AkashvaniAIR

- ✓ There are thousands of craters which were once thought to be seas.
- ✓ The giant craters called as “Mare” are bowl shaped craters formed by two process
- A. Volcanism
- B. Cratering
- ✓ As we all know there is a lack of atmosphere water and tectonic plates the chances of erosion or craters are very little

**Q- How the craters are renamed?**

**Ans-** Following are the criteria's –

- i. Firstly an image of the surface obtained with Higher Resolution.
- ii. A task group suggest a name to the working group for planetary system. {Nomenclature of IAU}.
- iii. Finally International Astronomical union take final decision on the name .

## 4. BIOLOGICAL CARBON PUMP-

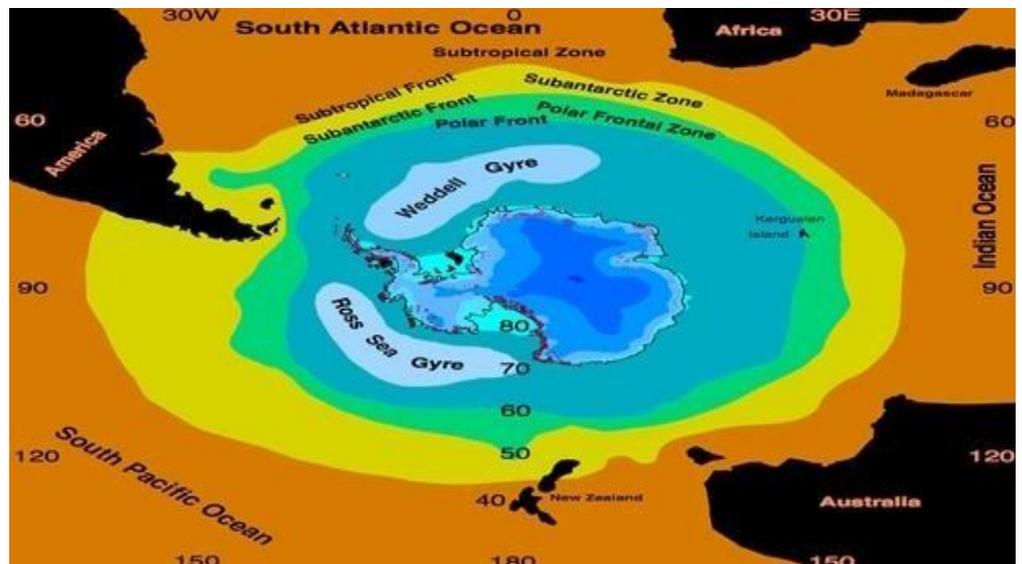
**NEWS-** A recent study, named ANDREC project (Antarctica Deep Water Rates of Export) observed new facts about Ocean circulation and Carbon concentration in the Southern Ocean.

**NEW OBSERVATION-**

- ✓ Seas are the most important factors determining how the ocean absorbs Carbon-Dioxide, contrary to existing assumptions of biological process.
- ✓ The Southern ocean plays a critical role in how the CO<sub>2</sub> –
- A. Taken out of the Atmosphere.
- B. Role in dramatic climate transitions like ice age.
- ✓ In the Weddell Gyre, researchers observed that process of update of CO<sub>2</sub> from the atmosphere and its removal to the deep ocean included the role of Phytoplankton's.
- ✓ Biological carbon pump- when Phytoplankton's grow and sink they remove carbon from the surface of ocean.

**Significance of the new study-**

- i. How the high latitude Southern Ocean influence atmospheric carbon and global climate.
- ii. Understanding about climate transitions.
- iii. Projections of future climatic change.



## 5. OZONE HOLE

**NEWS-** The Ozone hole was smallest during its peak season from September-October 2019.

- The world Ozone day is observed on September 16 every year.
- "Ozone for Life"- slogan for 2020

**Q- Where does the layer exist?**

**Ans-** In the Stratosphere from 1 to 50 kms above the surface of earth.

**Q- What does it mean by a hole in the layer?**

**Ans-** In each spring over America, atmosphere is destroyed by chemical process called "Hole" the region.

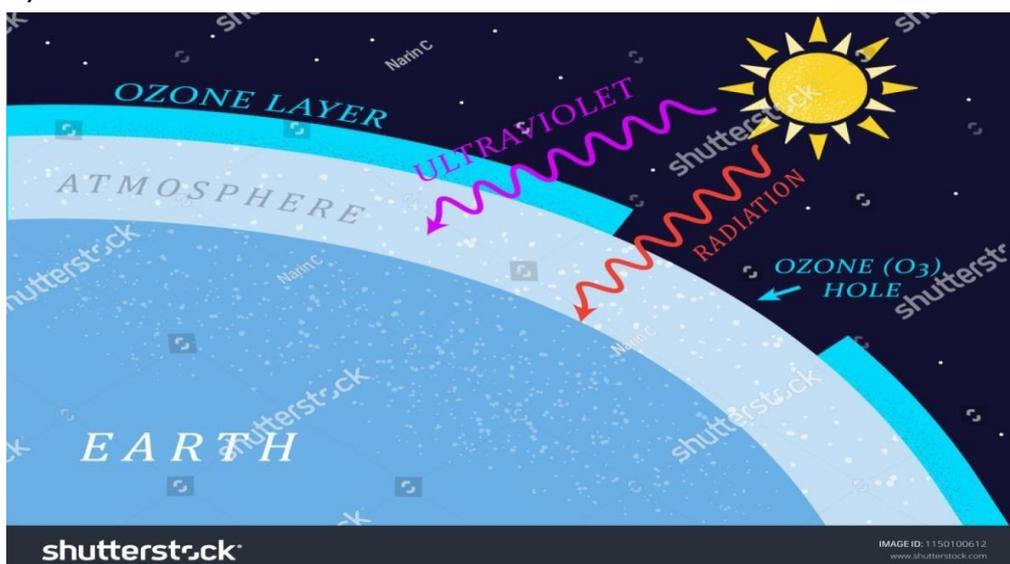
**Q- Why does the Hole is smaller than?**

**Ans-** it was smallest since its discovery.

- ✓ It was around 3.9m sq. miles (6.3m sq. miles normally).

**Reasons for sinking of Ozone hole-**

- ✓ First, the sinking warmed the Antarctic lower stratosphere, minimizing the formation and persistence of the polar stratospheric clouds that are a main ingredient in the ozone-destroying process.
- ✓ Second, the strong weather systems brought ozone-rich air from higher latitudes elsewhere in the Southern Hemisphere to the area above the Antarctic ozone hole.
- ✓ These two effects led to much higher than normal ozone levels over Antarctica compared to ozone hole conditions usually present since the mid- 1980s.
- ✓ Largest Ozone Hole Ever Recorded over North Pole Has Now 'Healed Itself' and Closed dur to lockdown. The cause of the formation of the hole is attributed to the unusual weather at the poles.
- ✓ The polar vortex has been recorded to be extremely powerful, and temperatures inside it have been very cold.



The unique cocktail of the powerful vortex and low temperatures generates stratospheric clouds that react with CFCs and destroy the Ozone layer in the process.

## Effects of Polar Vortex:

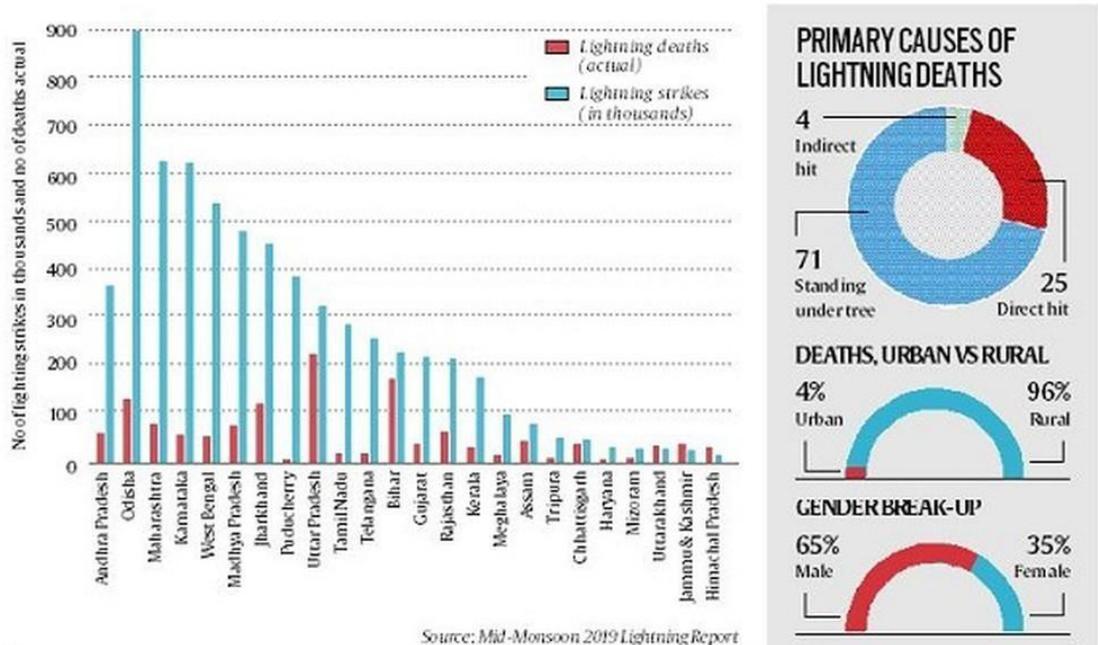
- ✓ The split higher up in the atmosphere can give rise to both, sudden and delayed effects, much of which involves declining temperatures and extreme winter weather in the eastern US along with northern and western Europe.
- ✓ A sudden stratospheric warming also leads to a warm Arctic not only in the stratosphere but also in the troposphere as well.
- ✓ A warmer Arctic, in turn, favours more severe winter weather in the Northern Hemisphere mid-latitudes including the eastern US.

## 6. IMD'S DATA ABOUT LIGHTENING

### NEWS-

- A. Climate resilient monitoring systems promotion council (CROSPC) of Indian metrological Dept., first time released the data on total lightning strikes across the country.
- B. It is three years "Lightning India Resilient Campaign".

### MOST STRIKES IN ODISHA, MOST DEATHS IN UP



### Key points-

1. It provides data about lightning strikes between April- July 2019.
2. Highest number of lightning's –Odisha
3. Lowest numbers – J&K.
4. Maximum strikes in a district – East Singhbhum , Jharkhand.
5. July witnessed the highest days, while the number of lightning's on each day have been increasing every month.

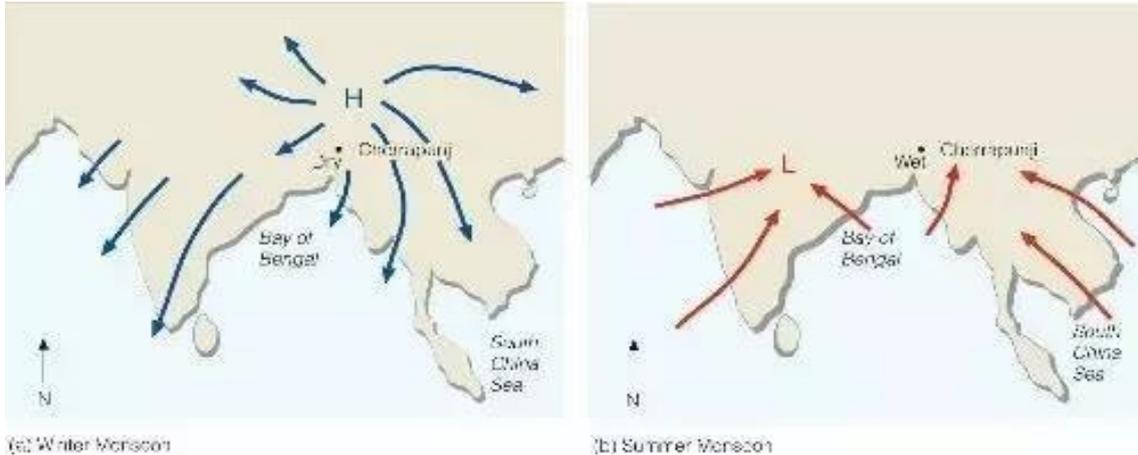
### Lightning strikes in India:

- Bihar is second after Uttar Pradesh with the maximum number of deaths due to lightning.
- At least 170 people died in Bihar due to lightning in 2019 between April 1 and July 31.
- 3. The number of lightning days across India have been increasing significantly every month.
- 4. Lightning strikes kill more people in India than any other extreme weather event.
- ✓ Read the basic phenomenon about lightning.

## 7. MONSOON OUT –MONSOON IN : A RARE METEOROLOGICAL EVENT

**Q- What was rare this year?**

**Ans-** The southwest, or summer, monsoon, finally withdrew from the country, having overstayed and delayed its retreat by a record time. The same day, the northeast, or winter, monsoon made its onset, on time.



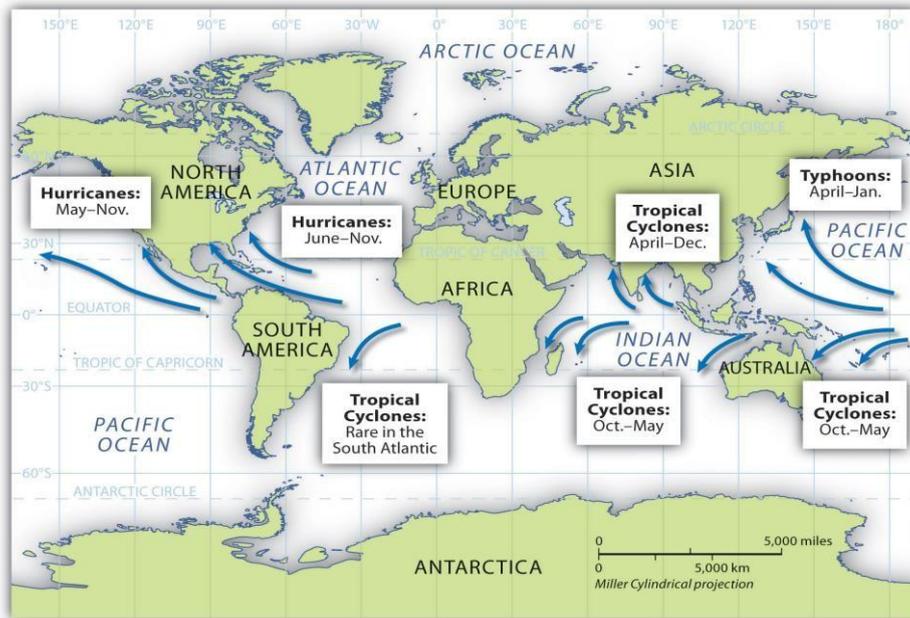
**Some crucial statements to remember-**

- A. The northeast monsoon is permanent feature of Indian subcontinent.
- B. Time (ASIMD) – October to December.
- C. Rainfall area – Tamil Nadu, Andhra & Kerala (mostly), Telangana and Karnataka (partially).
- D. The name gets its name due to the direction in which it travels.
- E. Both the summer and winter monsoon moves exactly in the opposite direction.
- F. any parts of North India also receive some rain like Gangetic plains, Punjab, Haryana, and North Rajasthan but remember that it is not due to Northeast monsoon, it is by Western disturbances.
- G. Percentage of rains
  - i. 75% summer monsoon.
  - ii. 11% winter monsoon.
  - iii. Non monsoon events like Mavata, snow etc.

## 8. NEW NAME LIST for CYCLONES : IMD

**NEWS-** After 2004, for the first time the IMD has released new name list for future tropical cyclones.

- There are five tropical cyclone regional bodies, i.e. ESCAP/WMO Typhoon Committee, WMO/ESCAP Panel on Tropical Cyclones, RA-I Tropical Cyclone Committee, RA-IV Hurricane Committee, and RA-V Tropical Cyclone Committee.
- In general, tropical cyclones are named according to the rules at a regional level.
- It has 13 names from India out of 169 total by WMO/ESCAP a group of 8 Bay of Bengal and Arabian countries.



- These eight countries are – **Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka and Thailand.**

**Q- Why there is a need to name a Cyclone?**

**Ans-** Appending names to cyclones make it easier for the media to report on these cyclones, heightens interest in warnings, and increases community preparedness.

- Names are easier to remember than numbers and technical terms and hence can reach greater masses.
- If public wants to suggest the name of a cyclone to be included in the list, the proposed name must meet some fundamental criteria. The name should be short and readily understood when broadcast. Further, the names must not be culturally sensitive and should not convey any unintended and potentially inflammatory meaning.

**Naming of cyclones:**

- Each Tropical Cyclone basin in the world has its own rotating list of names.
- For cyclones in the Bay of Bengal and Arabian Sea, the naming system was agreed by eight member countries of a group called WMO/ESCAP and took effect in 2004.

## 9. SUPER CYCLONES-

**Context-** Cyclone **Amphan** had intensified from category 1 to category 5 in 18 hours

Category	Wind Speed	Expected Damage
1	74 - 95 mph 64 - 82 knots	<ul style="list-style-type: none"> <li>• Minor damage to exterior of homes-</li> <li>• Topped tree branches, uprooting of smaller trees-</li> <li>• Extensive damage to power lines, power outages</li> </ul>
2	96 - 110 mph 83 - 95 knots	<ul style="list-style-type: none"> <li>• Extremely dangerous winds will cause extensive damage.</li> <li>• Major damage to exterior of homes.</li> <li>• Uprooting of small trees and many roads blocked.</li> <li>• Guaranteed power outages for long periods of time—days to weeks</li> </ul>
3	111 - 129 mph 96 - 113 knots	<ul style="list-style-type: none"> <li>• Devastating damage will occur.</li> <li>• Extensive damage to exterior of homes.</li> <li>• Many trees uprooted and many roads blocked.</li> <li>• Extremely limited availability of water and electricity</li> </ul>
4	130 - 156 mph 114 - 135 knots	<ul style="list-style-type: none"> <li>• Catastrophic damage will occur- Loss of roof structure and/or some exterior walls.</li> <li>• Most trees uprooted and most power lines down.</li> <li>• Isolated residential due to debris pile up.</li> <li>• Power outages lasting for weeks to months.</li> </ul>
5	Greater than 156 mph Greater than 135 knots	<ul style="list-style-type: none"> <li>• Catastrophic damage will occur.</li> <li>• A high percentage of homes will be destroyed.</li> <li>• Fallen trees and power lines isolate residential areas.</li> <li>• Power outages lasting for weeks to months.</li> <li>• Most areas will be uninhabitable.</li> </ul>

- Useful factors which are responsible for an origin of cyclones in Bay of Bengal-
  - Pre-existing low pressure.
  - Low level cyclonic circulation with a higher temperature than  $27^{\circ}$  c..
  - Presence of Coriolis force with small variations in the vertical wind speed.
  - Upper divergence above the sea level system.
- ✓ **Unusual factors which are responsible for intensification of cyclones in Bay of Bengal-**
  - Global warming, record fossil fuel emissions that have increased the sea surface temperature.
  - Result of lockdown – fewer Pm (particulate emissions) during curfews created fewer aerosols that are responsible to reflect sunlight and heat away from the surface.
- ✓ Arabian sea is less prone to Cyclonic storms in comparison with Bay of Bengal due to multiple factors.

## 10. EARTH'S SEISMIC NOISE AND LOCKDOWN-

**NEWS-** British Geological survey has observed about the reduced level of seismic noise in the coronavirus lockdown.

**Q-** What does it mean by Seismic noise?

**Ans-** According to geological theories it is a relatively persistent vibration of the ground due to a multitude of reasons like human activities.

**Q- Why does it matter?**

**Ans-** Apart from Geological studies Seismic noise is also useful in other fields like earthquake engineering, oil exploration etc.

- In usual times the geologist detect beneath the surface of 100 metres depth. But this time in the lack of human activities they can easily observe it at the surface itself.
- Now they hope they could detect smaller Seismic movements and tremors etc.

## 11. Solar Corona mystery cracked by MWA (Murchison wide field Array) Telescope-

**News-** A group of India scientists have recently discovered tiny flashes of radio light emanating from all over the Sun, which they say could help in explaining the long-pending coronal heating problem.

**Q- What has the mystery been?**

**Ans-** The corona's high temperatures are a bit of a mystery. Astronomers have been trying to solve this mystery for a long time.

**Q- What is Corona of the Sun?**

**Ans-** The corona is in the outer layer of the Sun's atmosphere—far from its surface. Yet the corona is hundreds of times hotter than the Sun's surface

**Highlights of the observation-**

- ✓ The scientists have likened the flashes to smoking guns of small magnetic explosions, which according to the researchers, is the first evidence of its existence.
- ✓ They have discovered tiny flashes of radio light emanating from all over the Sun.
- ✓ These radio lights or signals result from beams of electrons accelerated in the aftermath of a magnetic explosion on the Sun.
- ✓ These weak radio flashes are 'smoking guns' or the evidence for the same and hence bring us closer to explaining the coronal heating problem



### Electron Acceleration in the Solar Corona

Gottfried Mann  
Astrophysikalisches Institut Potsdam, D-14482 Potsdam  
e-mail: GMann@aip.de



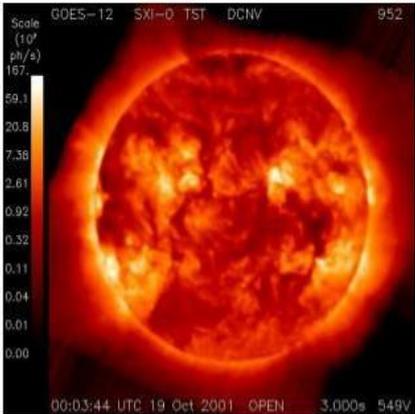
**The Sun is an active star.**

flare

- heating the coronal plasma
- mass motions (jets, CMEs)
- enhanced emission of electromagnetic radiation (radio, visible, X-ray,  $\gamma$ -ray)
- energetic electrons
- energetic protons

**energetic electrons**

→ non-thermal radio and X-ray radiation



**Significance of the observation-**

- ✓ These observations are the strongest evidence till date that the tiny magnetic explosions originally referred to as 'Nano flares' by eminent American solar astrophysicist Eugene Parker.
- ✓ It is the possible phenomena that could be heating up the corona (the aura of plasma that surrounds the sun and other stars).
- ✓ What about The Murchison Wide field Array (MWA)-

- ✓ The phenomenon of coronal heating has been known for the last 70 years, the availability of cutting edge data from the Murchison Wide field Array (MWA) radio telescope proved to be a game-changer.
- ✓ The MWA is a low-frequency radio telescope, located at the Murchison Radio-astronomy Observatory (MRO) in Western Australia.
- ✓ The MWA has been developed by an international collaboration, including partners from Australia, New Zealand, Japan, China, India, Canada and the United States.

## 12. New research about Zealandia

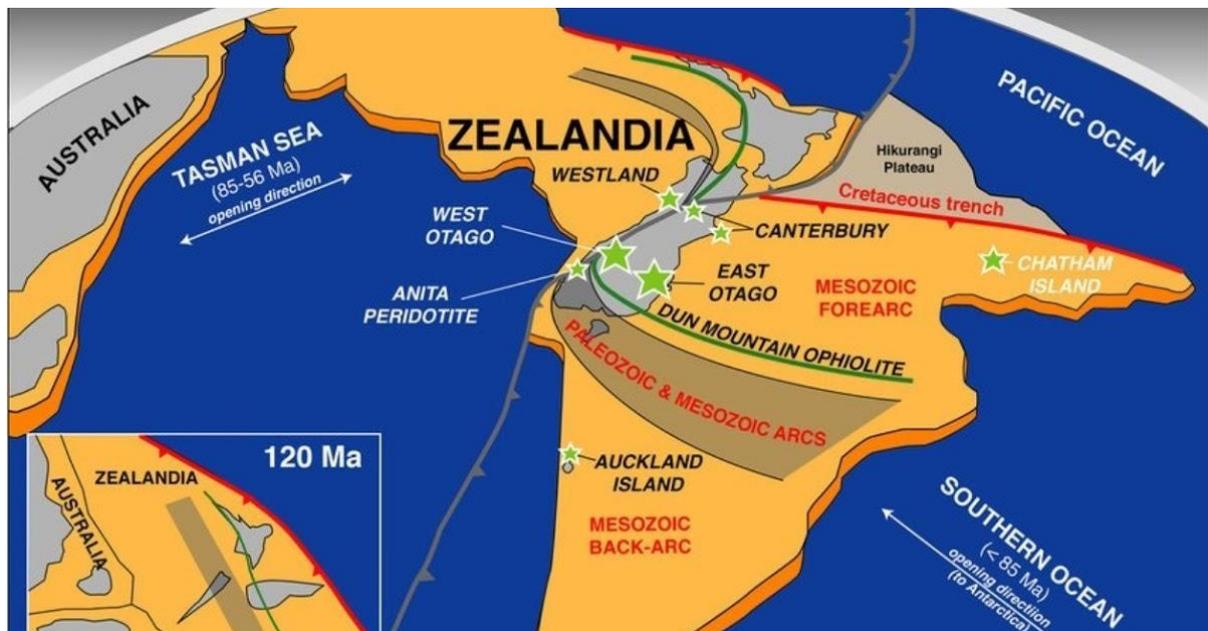
**News-** A recent project by the New Zealand research group GNS Science released a fantastic interactive platform to explore and examine different layers of information and imagery over Zealandia which collectively help tell the story of the continent's origins.

**Q-** What does it mean by Lost continent?

**Ans-** Till 2017, Zealandia was classified as a "micro continent," much like the island of Madagascar.

The landmass has "clearly defined boundaries, occupies an area greater than 386,000 square miles (1 million square kilometres), is elevated above the surrounding ocean crust, and has a continental crust thicker than that oceanic crust.

- Zealandia's total area has been mapped to be nearly 2 million square miles (5 million square kilometres).
- At this measure, Zealandia is about half the size of Australia, however, only 6% of the continent is above sea level.



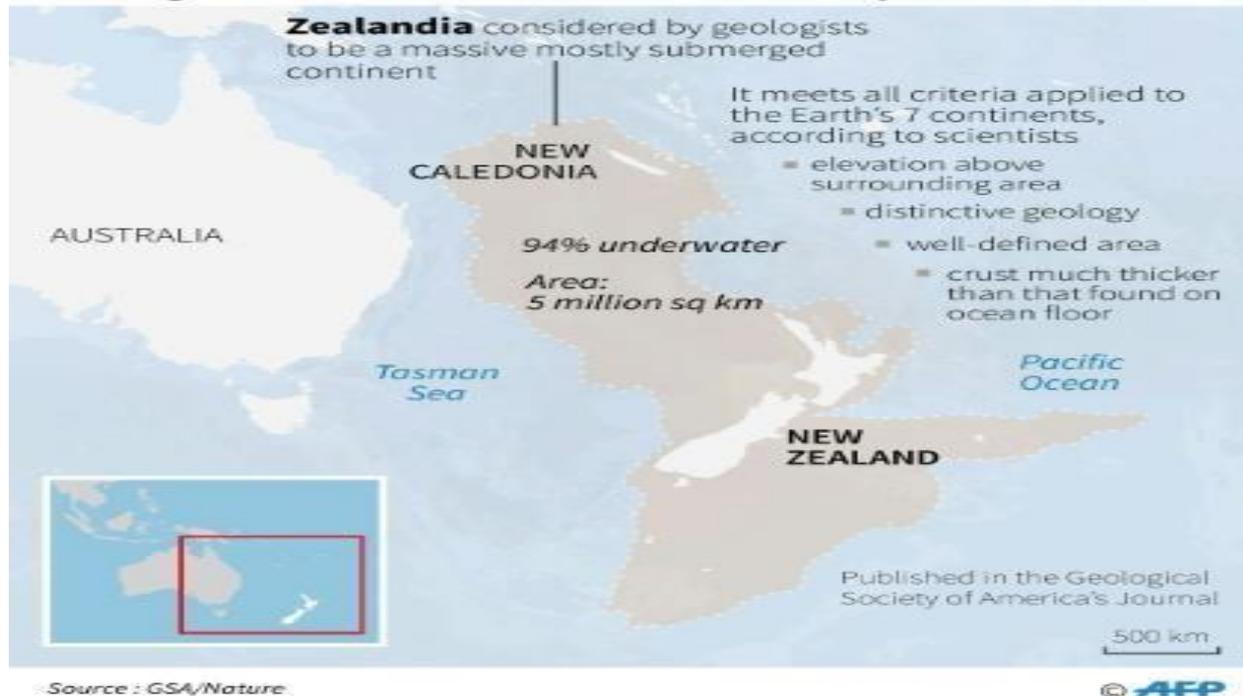
**Q-** What is the new research?

**Ans-** Considered to be a lost 'eighth continent' that got submerged underwater millions of years ago, the land mass is called Zealandia.

- Researchers from GNS Science in New Zealand have now mapped the shape and size of the continent with utmost detail.

## Zealandia ‘lost continent’

New Zealand is part of a previously unknown continent mostly submerged in the South Pacific, scientists said Friday



- For the mapping, the researchers analysed the bathymetry — the shape and depth of the ocean floor — around Zealandia.
- In addition, they studied its tectonic profile to accurately locate Zealandia across tectonic-plate boundaries.
- The newly created maps bring to light previously unknown information about the formation of Zealandia.

### About Zealandia:

- Zealandia is spread over an area of five million square kilometres and a small part of the continent is on land, with the rest under the sea.
- It is a huge mass of land that has now sunk to the ocean bed below New Zealand.
- New Zealand comprises the largest part of Zealandia that is not submerged, followed by the main island (Grande-Terre) of New Caledonia.
- A continent is two-thirds the size of Australia which has been found beneath the south-west Pacific Ocean.
- Zealandia has remained undiscovered for a long time and it includes land that is mostly submerged.

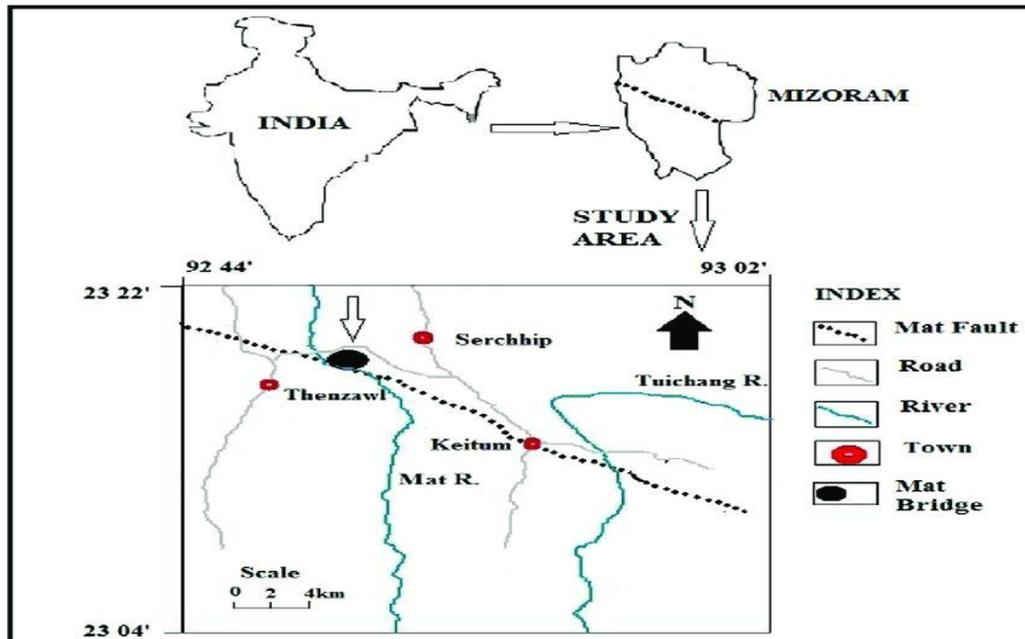
## 13. Mizoram Quake Zone: A Subterranean Fault-

**News-** 7 tremors in 15 days send earthquake-prone Mizoram into a tizzy. It is caught between two geological faults. These are the **Churachandpur Mao Fault** and the **Mat Fault**.

**Q-** What is meant by a Fault in geography?

➤ **Ans-** A fault is a fracture or zone of fractures between two blocks of rock. Faults allow the blocks to move relative to each other.

- This movement may occur rapidly, in the form of an earthquake - or may occur slowly, in the form of creep.
- Faults may range in length from a few millimeters to thousands of kilometers.
- Most faults produce repeated displacements over geologic time. During an earthquake, the rock on one side of the fault suddenly slips with respect to the other.
- The fault surface can be horizontal or vertical or some arbitrary angle in between.



### Some other observations in the field –

- An oil and gas exploration company has helped geologists discover a series of faults at the foot of the Himalaya.
- This fault system lies in the south eastern region of Nepal and has the potential to cause earthquakes in the densely populated country.

### Significance of these findings-

- This network of faults shows that the Himalayan deformation reaches further [about 40 kilometres further south] than we previously thought.
- It highlights the need to look below the surface, and further afield, to fully understand earthquakes and structures within the Himalaya.

## 14. Hurricane Hanna-

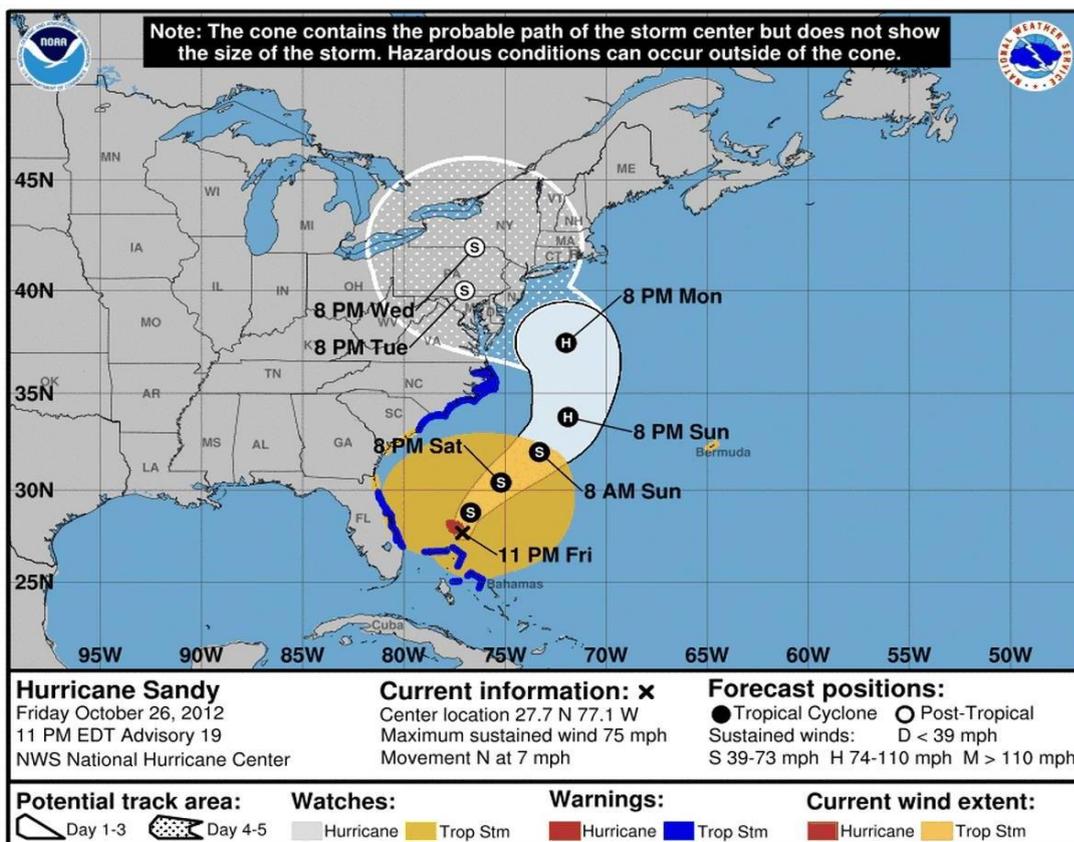
**Context-** Texas has faced another hardship apart from being one of the largest hotspots for Covid-19 in the U.S., as Hurricane Hanna has made landfall.

**Q-** What are hurricanes and how do they form?

**Ans-** Tropical cyclones or hurricanes use warm, moist air as fuel and therefore form over warm ocean waters near the equator.

- When the warm, moist air rises upward from the surface of the ocean, it creates an area of low air pressure below.

- When this happens, the air from the surrounding areas, which has higher pressure, enters this space, eventually rising when it becomes warm and moist too.
- As the warm and moist air continues to rise, the surrounding air will keep entering the area of low air pressure.
- When the warm air rises and cools off, the water in the air forms clouds and this system of clouds and winds continues to grow and spin, fueled by the ocean's heat and the water that evaporates from its surface.
- As such storm systems rotate faster and faster, an eye forms in the center.
- Storms that form towards the north of the equator rotate counter clockwise and those that form south of the equator spin clockwise because of the rotation of the Earth on its axis (Coriolis effect).



**Q- What Makes Hurricanes Form?**

**Ans-**

1. Warm ocean waters provide the energy a storm needs to become a hurricane. Usually, the surface water temperature must be 26 degrees Celsius (79 degrees Fahrenheit) or higher for a hurricane to form.
2. Winds that don't change much in speed or direction as they go up in the sky. Winds that change a lot with height can rip storms apart.

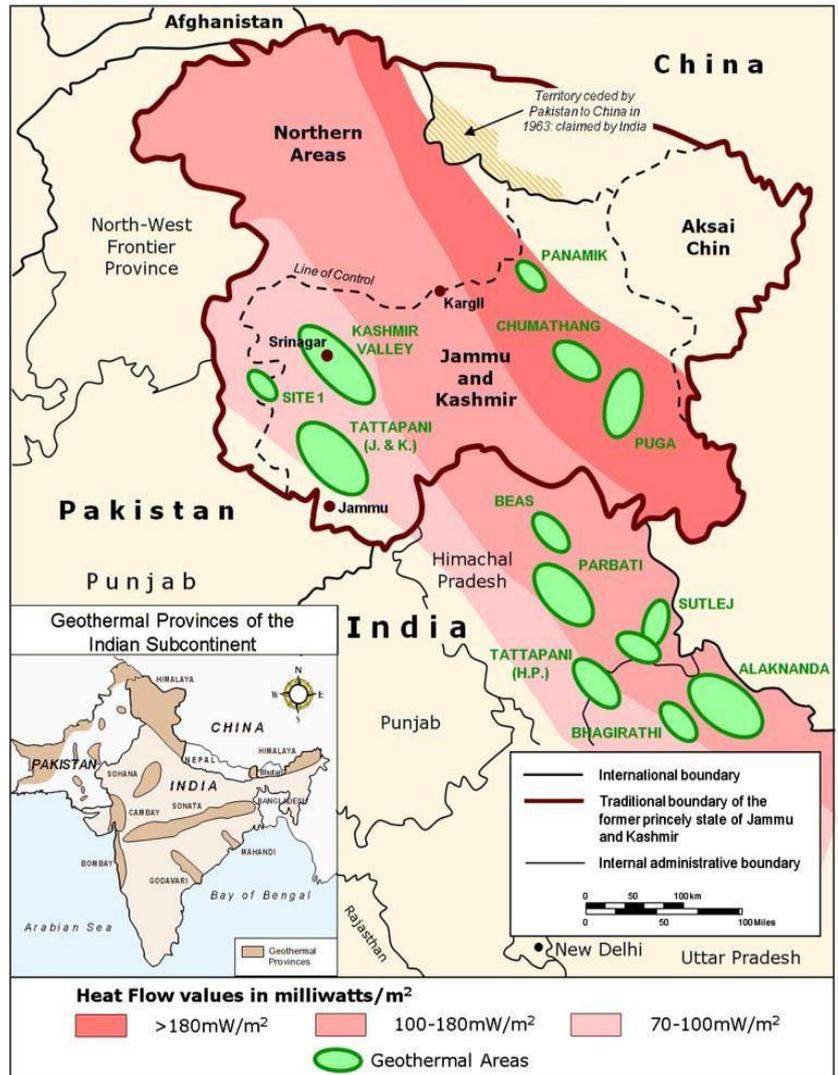
## 15. Himalayan Geothermal Springs : Carbon outflux-

**Context-** Himalayan geo-thermal springs spew carbon dioxide, play role in global warming'.

**Q- What is a geothermal spring?**

**Ans-** Water that percolates into the porous rock is subjected to intense heat by the underlying hard rock which is in contact with hot magma in the mantle or the lower part of the crust.

- Under the influence of intense heat, the water in the capillaries and narrow roots in the porous rock undergoes intense expansion and gets converted to steam resulting in high pressure.
- When this steam or water at high pressure finds a path to the surface through narrow vents and weak zones, appears at the surface as geysers and hot water springs, also known as geothermal springs.



### Findings from the study:

- The team of scientists carried out detailed chemical and stable isotope analysis of water samples collected from 20 geothermal springs from major fault zones of Garhwal Himalaya.
- The carbon dioxide released from the thermal springs is sourced from metamorphic decarbonation of carbonate rocks, magmatism and oxidation of graphite. These rocks are present in the deep Himalayan core.
- The Geothermal rocks in the region are dominated by evaporation and weathering of silicate rocks.
- The Isotopic analyses further point towards a meteoric source for geothermal water.

## 16. Mount Sinabung-

**Context-** Mount Sinabung on the Indonesian island of Sumatra blasted volcanic ash as high as 4.2 kilometers on Wednesday.

**Q- What is Mount Sinabung?**

**Ans-** Mount Sinabung is one of more than 120 active volcanoes in Indonesia, which is prone to seismic activity on the Pacific "Ring of Fire," a ring of volcanoes and moving fault lines that surround the ocean.

- Mount Sinabung had been inactive for centuries until it erupted again in 2010. It has been active ever since, occasionally erupting.
- An eruption in 2014 killed 16 people, while seven died in a 2016 eruption. Tens of thousands of people have been forced to leave their homes around the active volcano over the past few years.



**Q- When are volcanoes are explosive?**

**Ans-** Not all volcanic eruptions are explosive, since explosivity depends on the composition of the magma.

- When the magma is runny and thin, gases can easily escape it, in which case, the magma will flow out towards the surface.
- On the other hand, if the magma is thick and dense, gases cannot escape it, which builds up pressure inside until the gases escape in a violent explosion.

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