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Derecho

States of Nebraska, Minnesota and Illinois in the United States of America were hit by 'derecho' storm system. As the storm hit, it turned the skies green.

- A derecho is a widespread, long-lived, **straight-line windstorm** that is associated with a "band of rapidly moving showers or thunderstorms".
- Derechos or straight-line storms are those in which **thunderstorm winds have no rotation** unlike a tornado or hurricane.
- **Characteristics** - For a storm to be classified as a derecho, it must have wind gusts of at least 93 km per hour; wind damage swath extending more than 400 km.
- The time gap between successive wind damage events should not be more than 3 hours.
- **Occurrence** - Being a **warm-weather phenomenon**, a derecho generally - not always - occurs during summertime beginning May, with most hitting in June and July.
- However, they occur rarely as compared to other storm systems.
- The derechos mostly occur across central and eastern parts of the USA.
- Derechos have also been documented in Russia, Germany, Finland, Bulgaria and Poland.
- **Sky turned green** - Severe thunderstorms result in a 'green sky' due to light interacting with the huge amount of water they hold.
- The big raindrops and hail scatter away all but the blue wavelengths due to which primarily blue light penetrates below the storm cloud.
- This blue then combines with the red-yellow of the afternoon or the evening sun to produce green, the report said.
- **Three types of derechos -** A progressive derecho is associated with a short line of thunderstorms that may travel for hundreds of miles along a relatively narrow path. It is a summer phenomenon.
- A serial derecho, on the other hand, has an extensive squall line - wide and long - sweeping across a large area. It usually occurs during spring or fall.
- Hybrid ones have the features of both progressive and serial derechos.

Reference

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G7 Climate Club

At the 48th G7 summit, hosted by Germany, the leaders decided to form an international "climate club" for nations that want to take more decisive climate action and combat global warming.

The Group of Seven (G7) group of developed nations are the US, the UK, Canada, France, Germany, Italy and Japan.

- **Origin** - The concept of a climate club was developed by Yale economist William Nordhaus in 2015.
- The club he proposed would exempt its members from climate-related trade tariffs to which non-members will be subjected.
- **G7's Climate Club** - The G7's Climate Club is expected to be established by the end of the year 2022.
- It will be an intergovernmental forum of high ambition that will be "open and inclusive in nature" to those committed to follow the Paris climate agreement 2015.

The Paris Climate Accord aims to limit global warming to below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

- The club will aim to promote collaboration, help maintain competitiveness and make climate protection a competitive advantage.
- **Pillars** - The climate club will be built on three pillars,
    1. Focus on advancing transparent policies to achieve climate neutrality (reducing all greenhouse gases as much as possible),
    2. Transforming industries to accelerate decarbonisation, and
    3. Facilitating partnerships and cooperation to encourage climate action and unlock socio-economic benefits of climate cooperation.
- **Implementation** - This open, collaborative club will set joint minimum standards, drive climate action that is internationally coordinated.
- This will ensure that climate action makes a country more competitive at the international level.

Reference

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2. https://sdg.iisd.org/news/g7-agrees-to-establish-climate-club-amid-energy-security-concerns/

Laser Interferometer Gravitational-wave Observatory

The Laser Interferometer Gravitational-wave Observatory is scheduled to begin its fourth run of operations in March 2023 after over two years of maintenance work and upgrades.

- The Laser Interferometer Gravitational-wave Observatory (LIGO) is the world's largest gravitational wave observatory.
- It comprises of two massive laser interferometers that are located about 3,000 km apart - Hanford (Washington) and Livingston (Louisiana).
- It is used to detect and understand the origins of gravitational waves.
- Interferometers can calculate very small measurements that cannot be done using conventional equipment.
- During its latest operational run, LIGO and its two detectors will work in tandem with the Virgo Interferometer (Italy) and KAGRA observatory (Japan).
- With its latest upgrades, LIGO is calibrated to be sensitive enough to detect gravitational

waves from two neutron stars colliding over 619 million light-years.
- LIGO is designed to detect the gravitational waves released when two neutron stars or black holes spiral into each other or when a stellar core collapses and causes a Type II supernova.
- **Related Links** - LIGO-India

Gravitational Waves

- Gravitational waves are space-time ripples caused by the most explosive and energetic processes in the universe.
- Their existence was initially predicted by **Albert Einstein** in 1916 in his general theory of relativity.
- According to the General Theory of Relativity, the curvature of space-time is determined by the distribution of masses, while the motion of masses is determined by the curvature.
- The theory posits that massive accelerating objects like neutron stars would disrupt the space-time continuum and send 'waves' in all directions.
- These gravitational waves would travel at the speed of light and they would also carry information about what caused them, along with information that could help scientists understand the nature of gravity.

Reference

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National Investment And Infrastructure Fund

Indian government-promoted National Investment and Infrastructure Fund (NIIF) has made its single largest investment of USD 300 million or Rs 2,250 crore for a 22.5% stake in Hindustan Ports, a local arm of UAE's DP World.

- The National Investment and Infrastructure Fund (NIIF) is India's first-ever Sovereign Wealth Fund (SWF).
- It is a state-owned fund set up by the Department of Economic Affairs, Government of India in 2015.
- The NIIF is an alternative for providing long-term capital for the infra-related projects.
- It is registered under the Securities and Exchange Board of India (SEBI) under Category II Alternative Investment Fund.
- It is a **collaborative investment platform** for both international and Indian investors.
- The NIIF manages over USD 4.3 billion assets under management through its three funds.

Types of NIIF Funds	Purpose
Master Fund	1. Primarily invests in infra-related projects such as roads, ports, airports, and power. 2. Invests in well-established enterprises that are into a long-term agreement and are operating in a regulated environment with a good history. 3. Acts as a hedge at times of inflation and offers stable cash inflow.

Fund of Funds	1. Invests in funds managed by the renowned fund managers having an excellent track record. 2. Invests as anchor investors in order to accumulate more funds from the institutional investors. 3. May also enter into joint ventures with the fund managers (based on their track record, investment strategies, and risk management.)
Strategic Fund	1. Invests primarily in equity and equity-linked instruments. 2. Registered as an Alternative Fund II under the SEBI in India.

Sovereign Wealth Fund

- A sovereign wealth fund (SWF) is a state-owned fund. It is mostly formed from the country's reserves.
- It is used to invest in capital assets such as real estate, metals, stocks, and bonds.
- The main objective of the SWFs is to allocate funds for the betterment of the country's economy.
- SWFs also invest in alternative investments such as private equity funds and hedge funds. Some SWFs invests in the global avenues.

Reference

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2. https://www.niifindia.in/about
3. https://cleartax.in/s/niif-national-investment-infrastructure-fund

Bharat New Car Assessment Program

The Union Ministry of Road, Transport and Highways approved a Draft GSR Notification seeking comments from varied stakeholders on a proposal to introduce the Bharat New Car Assessment Program (BNCAP).

- The Bharat New Car Assessment Program (BNCAP) would be the Indian adaptation of the Global New Car Assessment Program (GNCAP).
- [GNCAP serves as a globally-followed paradigm to ascertain the safety of a vehicle in the event of a crash.]
- The BNCAP would entail giving vehicles a **star rating** based on their performance in crash tests.
- The **voluntary** programme aligns existing test regulations at home with global crash testing protocols.
- It is applicable on Type Approved motor vehicles of category M1 with gross vehicle weight less than 3.5 Tonnes.
- [M1 is motor vehicles used for the carriage of passengers, comprising not more than eight seats, in addition to driver's seat.]
- They are intended to increase the export-worthiness of vehicles and competition on safety parameters among manufacturers, as well as to instill consumer confidence in a vehicle's safety.
- **Evaluation** - Bharat NCAP would assign vehicles between one and five stars on parameters such as Adult Occupant Protection (AOP), Child Occupant Protection (COP) and Safety Assist Technologies (SAT).
- It would study frontal impact, side impact and the possibility of a door opening up after a

crash.

- The potential impact of a collision is studied with the help of dummies placed inside the vehicle.
- The car is crashed into an aluminium deformable barrier such that there is a 40% overlap. The test is also conducted in an offset position.
- The barrier impersonates an identical vehicle of the same dimension to simulate the same force as that observed in a crash.
- **Change proposed** - The major change proposed with the Bharat NCAP is the speed for frontal offset crash testing - at 64 kmph in comparison to the existing tests conducted at 56 kmph.
- Offset collisions are those where one side of a vehicle's front end and not the full width hits the barrier.

Global NCAP

- The Global NCAP is a standardised platform establishing cooperation and coordination among new car assessment programs (NCAPs) globally for universal adoption of the UN' standards for vehicular safety.
- It provides reliable information about the crash safety of a vehicle based on certain common criteria and procedures.
- In turn, this helps the vehicle acquire a foothold in international markets.
- The United States National Highway Traffic Safety Administration was the first to come up with an NCAP in 1978.
- The Global NCAP was established in 2011 and is a project of the U.K.-based Towards Zero Foundation.
- Regional NCAPs take into account the specific local conditions to determine the durability of vehicles in crash tests.
- Additionally, the nature of the market too has a role to play - there are markets where cars are made with reduced safety specifications because there is a greater insistence on affordability.

NCAPs are separate from country-specific motor standards in the sense that the latter assesses 'roadworthy' vehicles whereas the former evaluates their 'crashworthiness'.

Reference

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