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PRELIMS 2026

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COVERAGE

JUNE 2025 TO FEB2026

This file has month wise CA in compiled format.

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TOPICS COVERED -

- **Kawal Tiger Reserve – Telangana** – Tiger reserve along Godavari, part of Deccan Peninsula-Central Highlands; tiger corridor to Tadoba-Andhari named Kumram Bheem Conservation Reserve.
- **Perito Moreno Glacier – Argentina** – UNESCO World Heritage glacier, freshwater source, called 'White Giant'; retreating due to climate change; major tourist & research site.
- **Birch Glacier – Switzerland** – Alpine glacier advancing unusually due to rockfall accumulation; recent ice collapse caused village destruction; studied for glacial dynamics.
- **Coringa Wildlife Sanctuary – Andhra Pradesh** – Mangrove-dominated wetland; habitat for Fishing Cats, Olive Ridley turtles; collared cats for research; estuarine ecosystem.
- **Kalvarayan Hills – Tamil Nadu** – Part of Eastern Ghats; tribal habitation, deciduous forests, waterfalls; separates Kaveri & Palar basins; biodiversity hotspot.
- **Indravati National Park – Chhattisgarh** – Tiger reserve linked to Kawal, Tadoba, Kanha; houses rare wild buffalo; moist & dry deciduous forests; ecological and hydrological importance.
- **Pokkali Paddy – Kerala** – Salt-tolerant rice variety integrating fish farming; GI-tagged; sustainable traditional farming preserving biodiversity; Vyttila-11 is modern high-yield variant.
- **China's Dams & Brahmaputra Flow** – Projects like Medog Hydro may reduce India-Bangladesh inflow, affect flood cycles, irrigation, wildlife; water security concern.
- **Brahmaputra River System** – Origin: Tibet; flows through Arunachal Pradesh & Assam to Bangladesh; major tributaries include Lohit, Subansiri, Manas; holds 30% of India's water resources.
- **Asiatic Lion – Gir Forest, Gujarat** – Panthera leo persica; IUCN Endangered; population 891 in 2025; Project Lion & International Big Cats Alliance for conservation.
- **Indian Grey Wolf – Kadbanwadi, Pune** – Canis lupus pallipes; grassland apex predator; population declined due to feral dogs, disease, urbanisation; maintains ecosystem balance.
- **Upper Bhavani Pumped Storage Project – Nilgiris, Tamil Nadu** – 1000 MW pumped storage hydro project; uses Bhavani River; near Mukurthi NP; Western Ghats biodiversity hotspot; EIA approved.
- **Cloudburst** – Sudden, intense rainfall ≥100 mm/hour; causes flash floods and landslides in hilly regions; due to orographic lifting, convection, and valley convergence.
- **WMO State of Climate in Asia 2024** – Faster sea-level rise on India's coasts; Himalayan glacial retreat; extreme weather; recommends coastal management, emission reduction, early warning systems.
- **Urban Drainage Crisis in India** – Frequent urban flooding due to outdated drains, unplanned urbanisation, extreme rainfall; govt initiatives include AMRUT 2.0, Jal Shakti Abhiyan, GIS-based planning.

GEOGRAPHY

SOURCE – THE HINDU

KAWAL TIGER RESERVE

Recent Context: Telangana government declared the tiger corridor connecting Kawal Tiger Reserve with Tadoba-Andhari Tiger Reserve as **'Kumram Bheem Conservation Reserve'**, strengthening wildlife protection.

About Kawal Tiger Reserve:

1. **Location:** Telangana, along the **Godavari River**, part of the **Deccan Peninsula-Central Highlands**.
2. **Declared Tiger Reserve:** 2012.
3. **Hydrology:** Catchment for **Godavari** and **Kadam** rivers.
4. **Connectivity:** Linked to **Tadoba-Andhari (Maharashtra)** and **Indravati (Chhattisgarh)** Tiger Reserves.
5. **Flora:** Dominated by **Teak**, **Bamboo**, **Anogeissus latifolia**, **Terminalia arjuna**, **Butea monosperma**.
6. **Conservation Initiative:** Tiger corridor area designated as **Kumram Bheem Conservation Reserve**.
7. **Significance:** Supports tiger population movement and biodiversity conservation across states.

PERITO MORENO GLACIER

Recent Context: Perito Moreno Glacier in Argentina, a major freshwater source, is among glaciers **disappearing faster due to climate change**, raising conservation concerns.

About Perito Moreno Glacier:

1. **Location:** Argentina, **Andes Mountains**, within **Los Glaciares National Park (UNESCO World Heritage Site)**.
2. **Nickname:** Called the **'White Giant'**.
3. **Formation:** Originated during the **last Ice Age (~18,000 years ago)**.
4. **Hydrology:** Major source of freshwater for Argentina.
5. **Tourism:** Popular glacier with natural ice ruptures attracting visitors.

6. **Environmental Concern:** Part of glaciers **retreating rapidly due to global warming**.
7. **Scientific Significance:** Monitored for climate change studies and glaciology research.

BIRCH GLACIER

Recent Context: A massive portion of **Birch Glacier** in Switzerland broke off recently, causing extensive destruction to an Alpine village; advance likely triggered by **rockfall accumulation**.

About Birch Glacier:

1. **Location: Lotschental Valley**, northern Switzerland, in the **Alpine region**.

2. **Unique Feature:** Only Swiss glacier **advancing rather than retreating**.
3. **Recent Event:** Large ice mass collapse caused **destruction in nearby Alpine village**.
4. **Cause of Advance:** Likely due to **rockfall accumulation from neighboring mountain**.
5. **Country Significance:** Switzerland is a **landlocked Alpine country** with the **highest number of glaciers in Europe**.
6. **Environmental Importance:** Indicator of **glacial dynamics and climate variability** in the Alps.
7. **Tourism & Research:** Studied for **glaciology and disaster risk management**; attracts researchers and visitors.

Coringa Wildlife Sanctuary

Recent Context -:

Experts from the Wildlife Institute of India (WII) collared three Fishing Cats in Andhra Pradesh's Coringa Wildlife Sanctuary for the first time, enhancing research on this elusive, vulnerable wetland predator.

About Coringa Wildlife Sanctuary:

1. **Location:** Andhra Pradesh, at the confluence of Coringa River and Bay of Bengal.
2. **Ecosystem:** 40% sea-backwaters, rest intermingled creeks with tidal inundation.
3. **Vegetation:** Mangroves (Rhizophora spp., Avicennia spp., Sonneratia spp.) and dry deciduous tropical forests.
4. **Fauna:** Smooth Indian otter, Jackal, Fishing Cat, and Olive Ridley Turtles (breeding ground, IUCN: Vulnerable).
5. **Fishing Cat Status:** IUCN Vulnerable, WPA 1972 Schedule I, CITES Appendix II.
6. **Habitat:** Wetlands, swamps, marshes, tidal creeks, mangrove forests; elusive and nocturnal.
7. **Conservation Efforts:** Collaring of Fishing Cats for research and monitoring by WII.

Kalvarayan Hills

Recent Context -:

Kalvarayan Hills, part of Tamil Nadu's Eastern Ghats, are noted for tribal habitation, deciduous forests, and waterfalls. They play a role in river basin separation and regional water resources.

About Kalvarayan Hills:

1. **Location:** Eastern Ghats, Tamil Nadu; separates Kaveri River basin from Palar River basin.
2. **Height:** Ranges between 2000–3000 feet.
3. **Sections:** Divided into Chinna (northern, "little") and Periya (southern, "big") Kalrayans.
4. **Vegetation:** Deciduous forests and shola patches.
5. **Water Features:** Megam and Periyar waterfalls; Gomukhi Dam at foothills.
6. **Tribal Population:** Inhabited by Malayan tribes.
7. **Ecological Significance:** Supports biodiversity, forest resources, and regional hydrology.

Indravati National Park

Recent Context -:

Indravati National Park in Chhattisgarh, along the Indravati River, forms a key tiger reserve network and conserves rare wildlife, including one of the last populations of wild buffalo.

About Indravati National Park (7 points relevant for UPSC Prelims):

1. **Location:** Chhattisgarh, along Indravati River; northern boundary borders Maharashtra.
2. **Connectivity:** Linked to Kawal (Telangana), Tadoba (Maharashtra), and Kanha (Madhya Pradesh) tiger reserves.
3. **River:** Indravati River originates in Dandakaranya range, Odisha; tributary of Godavari.
4. **Forest Types:** Moist Mixed Deciduous Forest (with and without teak) and Southern Dry Mixed Deciduous Forest.
5. **Flora:** Includes teak, achar, karra, kullu, shisham, semal, haldu, arjun, bel, and jamun.
6. **Fauna:** Home to rare wild buffalo populations.
7. **Ecological Significance:** Important biodiversity hotspot and tiger conservation landscape.

Pokkali Paddy

Recent Context -:

Pokkali paddy, a salt-tolerant rice variety of Kerala, integrates seasonal rice cultivation with fish farming, maintaining traditional agricultural biodiversity. Vyttila-11 is a new high-yield Pokkali variety.

About Pokkali Paddy :

1. **Location:** Coastal districts of Kerala — Alappuzha, Ernakulam, and Thrissur.
2. **Saltwater Resistance:** Can grow in saline water-logged fields.
3. **GI Tag:** Received Geographical Indication (GI) in 2008.
4. **Agriculture-Fisheries Integration:** Rice alternates with fish farming season; called "Pokkali" in Kerala.
5. **Other Regional Names:** Known as "Bheries" (West Bengal), "Gajani" (Karnataka), and "Khazaan" (Goa & Maharashtra).
6. **Varieties:** Traditional Pokkali and modern variety Vyttila-11.
7. **Cultural & Environmental Significance:** Ancient sustainable farming practice preserving soil fertility and biodiversity.

SOURCE – DRISHTI MONTHLY

China's Dams and Brahmaputra Flow

Why in News:

- China's hydroelectric projects (e.g., **Medog Hydro Project**) on the Brahmaputra may affect flow into India → water security concern.

Possible Impacts:

- **Alteration of water flow:** Reduced inflow to India & Bangladesh; may cause water scarcity.
- **Ecological disruption:** Affects flood cycles, irrigation, fish migration, wildlife habitats (e.g., **Kaziranga NP**).
- **Hydropower:** Medog project projected to generate **3× the power of Three Gorges Dam**.

Brahmaputra River System

Origin & Course:

- Origin: **Chemayungdung Glacier**, Kailash Range, Tibet (**Yarlung Tsangpo**).
- India Entry: Arunachal Pradesh (**Siang/Dihang**).
- Flows → Assam → Bangladesh → joins Ganges (**Padma**) → Meghna → **Bay of Bengal**.
- Total length: 2,900 km; in India: 916 km.

Tributaries:

- **Right bank:** Lohit, Dibang, Subansiri, Jiabharali, Dhansiri, Manas, Torsa, Sankosh, Teesta.
- **Left bank:** Burhidihing, Desang, Dikhow, Dhansiri, Kopili.

Drainage & Basin:

- Spans: **Tibet, Bhutan, India, Bangladesh**.
- Indian catchment: Arunachal Pradesh, Assam, West Bengal, Meghalaya, Nagaland, Sikkim.

Geography & Ecology:

- Holds **30% of India's water resources**, **41% hydropower potential**.
- Forests: mostly **deciduous**.
- Wildlife sanctuaries: **Kaziranga, Manas**.

Unique Features:

- **Majuli:** world's largest river island.
- **Umananda:** smallest river island.

Asiatic Lion – Gir Forest, Gujarat

Recent Context :

Asiatic lion population reached **891** in **2025**, up from **674** in **2020**. Many lions are outside **protected areas**, increasing **human-wildlife conflict**. Conservation efforts continue under **Project Lion** and **international collaborations**.

ABOUT

1. Subspecies: **Panthera leo persica**.
2. Habitat: **Gir Forest**, **Saurashtra**, **Gujarat** – only natural habitat.
3. Conservation Status: **IUCN Endangered**; **CITES Appendix I**; **WPA 1972 Schedule I**.
4. Census Method: **Direct beat verification**, **camera traps**, **GPS collars**.
5. Threats: **Habitat isolation**, **human-lion conflict**, **diseases** (**Canine Distemper Virus**).
6. Conservation Initiatives: **Project Lion (2020)**, **International Big Cats Alliance (2023)**.
7. Gir forest ecosystem: **Dry deciduous forest**; supports diverse **prey species**.

Indian Grey Wolf – Kadbanwadi Grasslands, Pune, Maharashtra

Recent Context :

Indian grey wolves in **Pune's Kadbanwadi Grasslands** declined from ~**70** to **6 adults** over 10 years. Threats include **feral dogs**, **Canine Distemper Virus**, shrinking **prey**, and **habitat disruption**.

ABOUT

1. Species: **Canis lupus pallipes** (**Indian Grey Wolf**).
2. Habitat: **Kadbanwadi Grasslands**, **Pune**, **Maharashtra** – 2000 hectares.
3. Conservation Status: **IUCN Endangered**; **CITES Appendix I**; **WPA 1972 Schedule I**.
4. Apex predator: Controls populations of smaller **predators** and **herbivores**.
5. Threats: **Feral dog attacks**, **CDV transmission**, **genetic dilution**, **urban encroachment**.
6. Ecosystem Role: Maintains **grassland health** and **biodiversity**.
7. Fauna of Kadbanwadi: **Bengal fox**, **striped hyena**, **Brahminy kite** also present.

Upper Bhavani Pumped Storage Project – Nilgiris, Tamil Nadu

Recent Context :

MoEFCC approved **EIA** for the **1000 MW Upper Bhavani Pumped Storage Project** in the **Nilgiris**. Project harnesses **Bhavani River** waters near **Mukurthi National Park**, amid **Western Ghats biodiversity hotspot**.

ABOUT

1. Location: **Nilgiris, Tamil Nadu**; near **Upper Bhavani Dam** and **Avalanche-Emerald reservoirs**.
2. Project Type: **Pumped Storage Hydropower**, uses **gravity-based water cycling** between **upper and lower reservoirs**.
3. Installed Capacity: **1000 MW**.
4. River: **Bhavani River**, tributary of **Cauvery**, flows through **Kerala** and **Tamil Nadu**.
5. Biodiversity: Located in **Western Ghats**, hosts **Shola forests**, **rare and endangered species**.
6. Operation Principle: **Water pumped to upper reservoir during off-peak hours**, released for **power generation at peak demand**.
7. Environmental Assessment: Requires **Environmental Impact Assessment (EIA)** as per **MoEFCC guidelines**, considering **protected areas** and **ecological sensitivity**.

SOURCE – INSIGHTS

Cloudburst

Recent Context: Kangra and Kullu districts, Himachal Pradesh experienced cloudbursts, causing flash floods, killing 2 people, and leaving over a dozen missing.

About Cloudburst :

1. Sudden, intense rainfall ≥100 mm/hour over ~10 km².
2. Common in hilly/mountainous regions, triggering flash floods and landslides.
3. **Orographic lifting:** Moist winds rise over steep terrain forming cumulonimbus clouds.
4. **Strong convection currents:** Vertical air motion (60–120 km/h) stores vast water content.
5. **Localized convergence zones:** Wind traps moisture in valleys, increasing rainfall density.
6. **High latent heat release:** Warm air holds ~7% more moisture per 1°C rise (Clausius-Clapeyron law).
7. Causes major infrastructural damage and poses disaster management challenge

WMO's State of the Climate in Asia 2024 Report

Recent Context: India's eastern and western coasts are experiencing faster-than-average sea level rise, threatening livelihoods, infrastructure, and increasing flood risks.

About the Report :

1. **Sea Level Rise:** Arabian Sea rising 3.9 ± 0.4 mm/year; Bay of Bengal 4.0 ± 0.4 mm/year, exceeding global average of 3.4 mm/year.
2. **Coastal & Livelihood Impact:** Low-lying regions face submergence risk; fishing, agriculture, and urban infrastructure are threatened.

3. **Glacial Retreat:** 23 of 24 Central Himalayan glaciers are losing mass, increasing glacial lake outburst flood (GLOF) risks.
4. **Extreme Weather Events:** 2024 saw prolonged heatwaves causing 450+ deaths and lightning incidents killing 1300 people in India.
5. **Asia-wide Trends:** Asia warming at twice the global rate; frequent floods, droughts, and landslides observed.
6. **Causes of Sea Level Rise:** Thermal expansion, melting ice sheets, GHG emissions, and ocean current variability.
7. **Recommended Measures:** Coastal zone management, emission reductions, early warning systems, international cooperation, and local adaptive capacity building.

Urban Drainage Crisis in India

Recent Context: Indian cities like Delhi, Mumbai, and Bengaluru face frequent urban flooding due to outdated drainage, rising concretisation, and extreme rainfall events.

About Urban Drainage Crisis:

1. **Definition:** Urban drainage systems manage rainwater to prevent flooding but are failing in many Indian cities.
2. **Recent Trends:** Over 70% of urban areas lack planned stormwater drains; cities experience rainfall far exceeding drainage capacity.
3. **Natural Causes:** Intensifying rainfall due to climate change and low-lying topography in cities like Mumbai and Bengaluru exacerbate flooding.
4. **Man-made Causes:** Unplanned urbanisation, poor design standards, illegal constructions, and sewage infiltration reduce drainage efficiency.
5. **Government Initiatives:** Manual on Stormwater Drainage (2019), AMRUT 2.0, Jal Shakti Abhiyan, Atal Bhujal Yojana, MBBL 2016, Amrit Sarovar Mission, GIS-based drainage mapping.
6. **Infrastructure Solutions:** Integrated stormwater networks, rainwater harvesting, underground storage tanks, and rejuvenation of urban waterbodies.

TOPICS COVERED -

- **Complex Greenhouse Gas Dynamics in the Central Himalayas** – High-resolution study of CO_2, CH_4, and CO trends to improve climate modeling and inform policy.
- **India's Preparedness Against Glacial Lake Outburst Floods (GLOFs)** – Monitoring and mitigation strategies to reduce sudden flood risks from glacial lakes.
- **Mahisagar (Mahi) River** – West-flowing river in central India; highlights infrastructure safety and ecological significance.
- **Medog Dam – China's Brahmaputra Hydropower Project** – 60 GW upstream dam posing strategic, environmental, and geopolitical concerns for India.
- **Roll Cloud** – Rare horizontal tube-shaped cloud formed by interaction of contrasting air masses.
- **Tsunami** – Fast-moving sea waves from undersea seismic activity; emphasizes need for early warning systems.
- **Kalu River (Malshej Ghat)** – Monsoon-fed river in Maharashtra prone to flash floods; ecotourism and safety considerations.
- **Mount Cilo (Turkey)** – Glacial retreat of 50% over 40 years due to climate change, affecting regional water cycles.
- **Klyuchevskoy Volcano (Russia)** – Eurasia's tallest active volcano; monitored for eruption risks after seismic activity.
- **Parametric Insurance for Disaster Risk Reduction** – Automated payouts triggered by weather/disaster parameters to mitigate financial losses.
- **National Crisis Management Committee (NCMC) & Disaster Management Act, 2025** – Apex body coordinating India's disaster preparedness and statutory response framework.

GEOGRAPHY

SOURCE – PIB

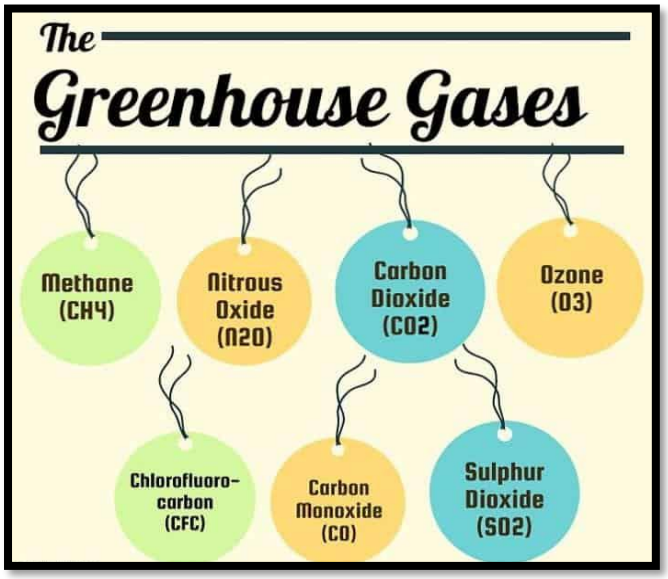
Complex Greenhouse Gas Dynamics in the Central Himalayas

Context -

ARIES-Nainital conducted first high-resolution, 5-year observations (2014–2018) of CO_2, CH_4, and CO in the Central Himalayas, filling a regional data gap and aiding climate modelling and policy.

About -

1. **Key Gases Monitored:** CO_2, CH_4, CO; CO_2 rising +2.66 ppm/year, CH_4 +9.53 ppb/year, CO declining –3.15 ppb/year.
2. **Diurnal Patterns:** CO_2 lowest daytime (photosynthesis); CH_4 & CO peak daytime, transported by upslope winds.
3. **Seasonal Patterns:** Spring CO_2 spikes (biomass burning); Autumn CH_4 peaks (rice cultivation); late Spring CO peaks (fires/pollution).
4. **Meteorological Influence:** Solar radiation, temperature, and boundary layer height shape GHG variations.
5. **Global & Policy Relevance:** Supports satellite data validation, strengthens India's NAPCC, SDG 13 compliance, and GHG emission inventories.
6. **Mitigation Insights:** CH_4 spikes → alternate wetting & drying in rice; CO trends → National Carbon Market baselines; biomass burning → preemptive policies.



India's Preparedness Against Glacial Lake Outburst Floods (GLOFs)

Recent Context -

Frequent GLOFs in Nepal and India, including South Lhonak (2023) and Kedarnath (2013), expose vulnerability of 7,500+ high-altitude lakes in the Indian Himalayan Region, aggravated by climate change and extreme rainfall.

About -

1. **Definition:** Sudden flood from glacial lake due to moraine or ice dam failure.
2. **Causes:** Climate-induced glacial retreat, cloudbursts, avalanches, landslides, seismic activity, weak moraines, unregulated infrastructure.
3. **Types of Lakes:** Supraglacial (on glacier surface) & Moraine-dammed (near glacier snout, structurally weak).
4. **Vulnerability:** 28,000+ Himalayan lakes; 7,500 in India above 4,500 m; difficult terrain limits monitoring.
5. **Past Events:** 2013 Kedarnath disaster, 2023 South Lhonak GLOF destroyed hydropower project and increased flood risk.
6. **Mitigation Measures:** NDMA's programme for 195 high-risk lakes; use of bathymetry, UAVs, ERT, SAR, AWWS for monitoring.
7. **Community & Disaster Finance:** ITBP trained for manual warnings; local participation; parametric insurance; NCMC coordinates national disaster response; Disaster Management Act 2025 strengthens preparedness.

SOURCE – VISION MONTHLY

Mahisagar (Mahi) River

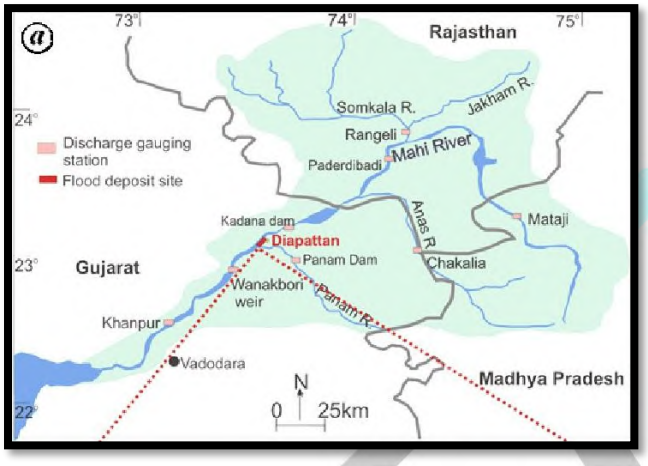
Context -

On 9 July 2025, a section of the Gambhira bridge near Mujpur, Vadodara, collapsed, causing vehicles to fall into the Mahisagar River, resulting in nine deaths and highlighting infrastructure safety concerns.

About -

1. **Origin:** Minda village, Dhar district, Madhya Pradesh; ~500 m above sea level in Vindhya Range.

2. **Flow Path:** Madhya Pradesh → Rajasthan → Gujarat; empties into Arabian Sea via Gulf of Khambhat.
3. **Length & Basin:** 583 km; drainage basin 34,842 sq. km.
4. **Major Dams:** Mahi Bajaj Sagar (Rajasthan), Kadana (Gujarat), Wanakbori Weir.
5. **Cities Along Course:** Dhar, Ratlam (MP); Banswara (Rajasthan); Mahisagar, Vadodara, Kheda (Gujarat).
6. **Unique Features:** West-flowing river; crosses Tropic of Cancer twice; cultural significance with temples along banks.
7. **Ecological Significance:** Supports turtles, crocodiles, and island ecosystems in dam backwaters.



Medog Dam – China's Brahmaputra Hydropower Project

Context -

China approved a 60 GW mega-dam at the Great Bend of Yarlung Zangbo (Brahmaputra) in Tibet, raising strategic, ecological, and geopolitical concerns for India, Bhutan, and Bangladesh.

About -

1. **Location:** Medog County, Tibetan Autonomous Region, at Great Bend of Yarlung Zangbo → becomes Brahmaputra in Arunachal Pradesh.
2. **Capacity & Scale:** Planned 60,000 MW; world's largest hydroelectric project.
3. **Geopolitical Significance:** Upstream control gives China leverage over India; adds hydro-political dimension to border disputes.
4. **Environmental Risks:** Seismic zone; GLOF risk; impacts irrigation, sediment transport, and groundwater recharge.
5. **Livelihood Concerns:** Downstream agropastoral economies in Assam and Bangladesh affected by flow regulation.
6. **Biodiversity Threats:** Altered aquatic habitats, wetlands, and fish migration routes.

SOURCE – INSIGHTS

Roll Cloud

Recent Context: A rare roll cloud appeared over Portugal's coast during the European heatwave, caused by cool Atlantic air meeting hot, dry continental air, fascinating beachgoers and scientists.

About -

1. Low-level, horizontal, tube-shaped cloud.
2. Detached from thunderstorms (non-vortical).
3. Forms via interaction of contrasting air masses.
4. Often aligned with sea breeze or nocturnal wind.
5. Can stretch hundreds of km.
6. Appears to roll horizontally ("morning glory").
7. Primarily visual, indicates lower atmospheric instability.

Tsunami

Recent Context: An 8.8 magnitude earthquake off Russia's Kamchatka Peninsula triggered tsunamis affecting Russia, Japan, Hawaii, and New Zealand, highlighting global early warning importance.

About -

1. Series of long-wavelength sea waves caused by seafloor disturbance.
2. Waves travel fast (800–900 km/h) in deep ocean, low height (30–50 cm).
3. Drawback effect precedes first wave.
4. Amplifies near coast due to friction, forming high waves.
5. Multiple waves can arrive over hours.
6. Causes fatalities, infrastructure damage, environmental loss.

7. Early warning via seismic networks, DART buoys, tide gauges.

Kalu River (Malshej Ghat)

Recent Context: 300+ trekkers rescued after flash floods in Kalu River region due to heavy rainfall, exposing gaps in eco-tourism safety protocols.

About -

1. Monsoon-fed river in Sahyadri ranges, Maharashtra.
2. Origin: Tolar Khind near Harishchandragad Peak.
3. Flows west, forms Kalu Falls (~1200 ft).
4. Joins Ulhas River, draining into Arabian Sea.
5. Passes through wildlife-rich zones.
6. Flash floods pose tourist hazards.
7. Highlights need for water diversion and safety protocols.

Mount Cilo (Turkey)

Recent Context: Glaciers of Mount Cilo have lost 50% of ice in 40 years; heatwaves and climate change accelerate melt, threatening regional water cycles.

About -

1. Second-highest peak in Turkey (4,135 m).
2. Located in East Taurus Mountains, Hakkâri Province.
3. Glacier retreat ~50% since 1980s.
4. Melting alters rivers, waterfalls, and water cycles.
5. Rugged terrain with cliffs, gorges, valleys.
6. Region faces rising heatwaves and reduced rainfall.
7. UN projects 30% less rainfall, +5–6°C rise by 2100.

Klyuchevskoy Volcano (Russia)

Recent Context: After the Kamchatka earthquake, Klyuchevskoy volcano, Eurasia's tallest active volcano, remains a critical monitoring site due to potential eruptions.

About -

1. Stratovolcano, steep conical shape
2. Height: 4,750 m; tallest in Northern Hemisphere.
3. Almost constant activity since 1697.
4. Located on Kamchatka Peninsula, part of "Ring of Fire".
5. UNESCO World Heritage site.
6. Kamchatka: 127 volcanoes, geysers, harsh sub-Arctic climate.
7. Vegetation: tundra mosses, forested lowlands with birch, larch.

SOURCE – DRISHTI MONTHLY

Parametric Insurance for Disaster Risk Reduction

Recent Context -

India faced over 20 flash floods in Himachal Pradesh (2019–2023), highlighting climate disaster unpredictability; parametric insurance emerges as a fast, automated tool to reduce climate-related financial risks.

About -

1. **Definition:** Insurance with automatic payouts triggered when predefined parameters (rainfall, temperature, wind speed, seismic activity) cross set thresholds.
2. **Difference from Traditional Insurance:** No post-loss assessment needed; enables fast, hassle-free compensation.
3. **Global Examples:** Africa, Pacific Islands, UK; covers droughts, floods, cyclones, wind, and flood depths.
4. **India Case Studies:** Rajasthan & UP – drought protection for women farmers; Nagaland – multi-year cover for landslides/extreme rainfall.
5. **Integration in Disaster Risk Reduction:** State disaster plans, agriculture, renewable energy, transport, MSMEs; reduces cascading economic losses.
6. **Climate-Linked Microfinance:** Loans auto-covered during extreme weather; protects smallholder farmers and vulnerable borrowers.

National Crisis Management Committee (NCMC) & Disaster Management Act, 2025

Recent Context -

The amended Disaster Management Act, 2025, granted statutory backing to NCMC, making it the apex body for disaster response coordination and strengthening national and state-level disaster preparedness.

About -

1. **Constitution:** Formally under Section 8A(2) of Disaster Management Act, 2005; NCMC now has statutory status.
2. **Chairperson:** Headed by the Cabinet Secretary; can co-opt experts/officers from central/state governments.
3. **Composition:** Includes Union Home Secretary, Defence Secretary, Secretary (Coordination), NDMA head, and Cabinet Secretariat members.
4. **Functions:** Assesses national disaster preparedness, issues directions, coordinates central & state disaster response efforts.
5. **Disaster Management Act, 2025:** Provides statutory status to NCMC & High-Level Committee; empowers NDMA & SDMAs to prepare disaster plans directly.
6. **Urban & State Mechanisms:** Enables Urban Disaster Management Authorities (UDMAs) in major cities; allows states to form State Disaster Response Forces (SDRFs).

SOURCE – THE HINDU

Parametric Insurance for Disaster Risk Reduction

Recent Context -

Himachal Pradesh faced flash floods and landslides, highlighting climate disaster unpredictability. India is promoting parametric insurance for faster, automated payouts to enhance financial resilience against weather-related losses.

About -

1. **Definition:** Insurance providing automatic payouts when predefined triggers (rainfall, temperature, wind speed) exceed set thresholds.
2. **Advantage:** Faster, hassle-free compensation; no post-disaster loss assessment required.
3. **Indian Examples:** Rajasthan & UP – drought protection for women farmers; Nagaland – multi-year cover for landslides/extreme rainfall.
4. **Global Use:** Africa, Pacific Islands, UK – covers droughts, floods, cyclones, and flood depths.
5. **Integration in DRR:** Part of State Disaster Plans, linked with SDRF/DMF funds.
6. **Sectoral Expansion:** Agriculture, renewable energy, transport, MSMEs; reduces cascading economic shocks.
7. **Financial Innovation:** Climate-linked microfinance products and public-private partnerships for proactive disaster management.

National Crisis Management Committee (NCMC)

Recent Context -

Disaster Management (Amendment) Act, 2025, gave statutory backing to NCMC, making it the apex body for national disaster preparedness, coordination, and monitoring of response efforts across India.

About -

1. **Constitution:** Formed under Section 8A(2) of the Disaster Management Act, 2005; statutory status granted in 2025.
2. **Headed by:** Cabinet Secretary; includes Union Home Secretary, Defence Secretary, NDMA head, and other key officers.
3. **Co-option:** Experts or officers from central/state governments can be co-opted based on crisis nature.
4. **Functions:** Assess disaster preparedness, issue directions, coordinate central & state response, and monitor disaster management efforts.
5. **Coordination:** Works with NDMA, central & state governments, and other agencies for unified disaster management.
6. **Amendment Act Impact:** Clarifies roles of national/state committees, strengthens disaster response, and introduces Urban Disaster Management Authorities (UDMAs).

7. **State Empowerment:** Enables states to form State Disaster Response Forces (SDRFs) and improve urban disaster preparedness.

TOPICS COVERED-

1. **India Achieves 50% Non-Fossil Fuel Power Capacity** – India reaches 50% electricity capacity from renewables, hydro, and nuclear, ahead of 2030 target.
2. **Wildfires in Europe** – Mediterranean Europe faces massive wildfires in 2025 due to heatwaves and climate change.
3. **ICJ Climate Ruling** – Advisory opinion declares climate action a legal obligation, holding nations accountable for emissions.
4. **Ambrosia Beetle Threat to Kerala Rubber** – Invasive beetle spreading fungi threatens Kerala's rubber plantations and latex production.
5. **Kaziranga Tiger Reserve Updates** – Kaziranga records high tiger density and conducts first AI-based grassland bird census.
6. **Environment Protection (Management of Contaminated Sites) Rules 2025** – Legal framework for identifying, assessing, and remediating contaminated lands in India.
7. **Mines and Minerals (Development and Regulation) Amendment Bill, 2025** – Modernises India's mineral sector, secures critical minerals, and promotes sustainable mining.
8. **Typhoon Kajiki** – Powerful tropical cyclone hits central Vietnam, causing evacuations and flood warnings.
9. **Mahanadi River Water Dispute** – Odisha and Chhattisgarh move towards amicable resolution of Mahanadi water sharing.
10. **Tawi River (Jammu, J&K)** – Flood alerts issued; river has cultural, economic, and strategic significance.
11. **Mercator Projection Map** – AU campaign to replace Mercator map highlights Africa's true size and corrects distortions.
12. **Gulf of Mannar** – Coral bleaching mitigation through artificial reefs in India-Sri Lanka marine biosphere reserve.
13. **Lipulekh Pass** – India rejects Nepal's objection to resumption of border trade via historic trade route.
14. **Dardanelles Strait** – Forest fires in northwest Turkey cause temporary closure, affecting global maritime traffic.
15. **Preah Vihear & Prasat Ta Muen Thom** – Thailand and Cambodia agree to ceasefire near UNESCO-listed border temples.
16. **Tuvalu Climate Migration** – Tuvaluans to migrate to Australia due to rising sea levels, marking first planned climate migration.
17. **Dibru-Saikhowa National Park (DSNP)** – Invasive plants threaten native species and ecosystem balance in Assam's wetland reserve.
18. **Maratha Military Landscapes (UNESCO WHS)** – 12 forts inscribed as UNESCO site, showcasing Maratha military heritage.
19. **Mount Lewotobi Laki Laki (Indonesia)** – Active volcano eruption sends ash 18 km high, affecting nearby villages.

GEOGRAPHY

SOURCE – THE HINDU

India Achieves 50% Non-Fossil Fuel Power Capacity

Recent Context:

As of **June 2025**, India reached **50% installed electricity capacity from non-fossil fuels (242.8 GW)**, achieving its **2030 target five years ahead**, through **renewables, hydro, and nuclear power**.

ABOUT-

1. **Installed Capacity:** Total **484.8 GW**; **Non-Fossil Fuel**: 242.78 GW (50.08%), **Thermal**: 242.04 GW (49.92%).
2. **Renewables Contribution:** Includes **solar**, **wind**, and **large hydro**; **24 GW solar** added in 2024.
3. **Nuclear Power:** Current capacity **8.78 GW**; 10 reactors under construction to reach **~17 GW by 2030**.
4. **Electricity vs Total Energy:** Electricity **~22% of total energy consumption**; non-fossil share in generation **~28%**, or 6% of total energy.
5. **NDC Commitments (Paris Agreement):** 50% non-fossil capacity by 2030; **GDP emission intensity -45%** by 2030; additional carbon sink **2.5–3 billion tonnes CO_2**.
6. **Flagship Programs: PM-KUSUM**, **PM Surya Ghar**, **Solar Parks**, **Wind-Solar Hybrid Policy** promote renewable adoption.

Wildfires in Europe

Recent Context:

In **2025**, wildfires burned **over 2.2 lakh hectares** in Mediterranean Europe due to **heatwaves**, **climate change**, and **drier soils**, forcing mass evacuations.

ABOUT-

1. **Affected Countries: Spain, France**; wildfire incidents **double historical average**.
2. **Climate Factor:** Mediterranean warming **twice the global average** since 1980s.
3. **Geography: Hot, dry summers**, strong winds, and dry vegetation spread fires.
4. **Arctic Feedback:** Europe warms faster due to **Arctic warming**, altering local climate.
5. **Jet Stream Effect: Double jet streams** create high-pressure zones, causing extreme heat.
6. **Mediterranean Climate:** Hot, dry summers; mild, wet winters; vegetation adapted to conserve water.
7. **Implication:** Climate change intensifies **frequency and severity of heatwaves and wildfires** in Europe.

ICJ Climate Ruling

Recent Context:

The **ICJ advisory opinion (2025)** states that **climate action is a legal obligation**, holding countries accountable for **GHG emissions** and potential **liability for climate damages**.

ABOUT-

1. **Legal Status: Advisory opinion**, non-binding but **authoritative interpretation of climate law**.
2. **Annex I Countries:** Rich industrialized nations must **lead in emissions reduction**.
3. **Private Actors:** States may be liable for **corporate or private emissions** if due diligence fails.
4. **Compensation:** Affected nations can seek **full reparation** for climate impacts.
5. **Loss & Damage:** Ruling endorses **financial and technical support** from developed countries.
6. **Paris Agreement Link:** Confirms climate targets are **legal obligations, not policy choices**.
7. **Significance:** Strengthens **developing nations' negotiating power**, potential lawsuits against corporate polluters.

Ambrosia Beetle Threat to Kerala Rubber

Recent Context:

Kerala's **rubber plantations** face threat from **invasive Ambrosia Beetle**, which spreads **Fusarium ambrosia and Fusarium solani fungi**, affecting latex yield and tree health.

ABOUT-

1. **Invasive Species:** Native to **Central & South America**, first reported in India (Goa, 2012).

2. **Fungal Association: Mutualistic relationship** with Fusarium species; weakens wood.
3. **Damage Mechanism:** Fungi block **xylem**, causing tree **drying and death**.

4. **Affected Plants:** Rubber, cashew, coconut, coffee, mango, teak.
5. **Economic Impact:** Kerala produces **90% of India's rubber**; latex production drops.
6. **Control Methods: Antagonistic fungi**, microbial consortia, removal of infected parts, GM plants.
7. **Research: Kerala Forest Research Institute (KFRI)** monitors spread and mitigation strategies.

Kaziranga Tiger Reserve Updates

Recent Context:

Kaziranga Tiger Reserve (Assam) records **third-highest tiger density in India**; first-ever **grassland bird census** conducted using **AI acoustic monitoring**.

ABOUT-

1. **Tiger Density:** 18.65 tigers/100 km²; total **148 tigers**.
2. **Top Reserves:** Bandipur (19.83), Corbett (19.56).
3. **Monitoring Tools: M-STrIPES, Drones, Electronic Eye**, habitat tracking.
4. **UNESCO Site:** Kaziranga also hosts **2613 one-horned rhinos**.
5. **Grassland Bird Census:** Recorded **43 species**, including **1 Critically Endangered, 2 Endangered**.
6. **Methodology: Passive acoustic recording**, spectrograms, **AI Birdnet** identification.
7. **Threats:** Habitat loss (~70% in Assam), **overgrazing, cultivation, climate change, ecological succession**.

Environment Protection (Management of Contaminated Sites) Rules 2025

Recent Context:

Union Ministry of Environment notified **EP (Management of Contaminated Sites) Rules 2025**, India's first legal framework to **identify, assess, and remediate contaminated lands**.

ABOUT-

1. **Legal Framework:** Under **Environment Protection Act, 1986**.
2. **Scope:** Landfills, waste storage, spill sites, chemical waste handling.
3. **Current Status:** 103 contaminated sites identified; remedial work started at **7 sites**.
4. **Responsibilities: District administration**, **State Board**, and **reference organizations** oversee assessment and remediation.
5. **Polluter Pays:** Those responsible must **fund remediation**; Centre/State cover if unidentified.
6. **Process: Half-yearly reports, preliminary assessment (90 days), detailed survey (3 months)**.
7. **Legal Liability:** Criminal penalties under **Bharatiya Nyaya Sanhita 2023** if contamination causes loss of life/damage.

SOURCE – INDIAN EXPRESS

Mines and Minerals (Development and Regulation) Amendment Bill, 2025

Recent Context:

Parliament passed the **MMDR Amendment Bill, 2025** to **modernise India's mineral sector**, secure **critical minerals** for **economic security and green transition**, and improve **transparency and global competitiveness**.

ABOUT-

1. **Legislation:** Amends **Mines and Minerals (Development and Regulation) Act, 1957**.
2. **Aim:** Ensure **domestic availability** of **critical and strategic minerals**, promote

sustainability, and boost **investment and jobs**.

3. **Multiple Minerals Lease:** Leaseholders can add **lithium, cobalt, gold**, with relaxed payment rules for **critical minerals**.
4. **NMEDT: National Mineral Exploration and Development Trust** funds **domestic and overseas exploration**; contribution rate **3% of royalty**.
5. **Captive Mines:** Sale cap removed; mines can sell **100% of production** after meeting **end-use obligations**.
6. **Deep-Seated Minerals:** Lease area can expand **10–30%** for minerals found **below 200 metres**.
7. **Mineral Exchanges & Community Participation:** Promotes **regulated electronic trading** and **local welfare initiatives**.

Typhoon Kajiki

Recent Context:

Typhoon Kajiki, a powerful **tropical cyclone**, approached **central Vietnam** in 2025 with winds up to **166 km/h**, prompting **mass evacuations, airport closures**, and flood warnings.

ABOUT-

1. **Definition:** Tropical cyclone formed over **West Pacific Ocean**, powered by **latent heat from warm seawater**.
2. **Regional Naming: Typhoon:** West Pacific; **Hurricane:** Atlantic/East Pacific; **Cyclone:** Indian Ocean/Australia.
3. **Impact:** Causes **strong winds, heavy rainfall, floods, storm surges, landslides**.
4. **Affected Area:** Expected landfall between **Thanh Hoa and Nghe An** provinces.
5. **Wind Speed:** Up to **166 km/h**, comparable to **Typhoon Yagi (2024)**.
6. **Evacuations:** Over **500,000 people relocated**, boats ashore, airports shut.
7. **Energy Source vs Synoptic Cyclones:** Powered by **ocean heat**, unlike **weather-front dependent cyclones**.

Mahanadi River Water Dispute

Recent Context:

After years of litigation, **Odisha and Chhattisgarh** agreed in 2025 to explore an **amicable settlement** over **Mahanadi River water sharing**, with **CWC-led joint committee guidance**.

ABOUT-

1. **River Facts:** East-flowing river, **~900 km**, drains into **Bay of Bengal**, basin area **~1.32 lakh sq km**.
2. **Origin: Nagri Sihawa Hills, Dhamtari district, Chhattisgarh**, altitude ~442 m.
3. **States Covered: Chhattisgarh, Odisha**, minor parts of **Jharkhand, Maharashtra, Madhya Pradesh**.
4. **Tributaries: Left bank:** Seonath, Hasdeo, Mand, Ib; **Right bank:** Ong, Tel, Jonk.
5. **Key Infrastructure: Hirakud Dam** (flood control, irrigation, hydropower), **Satkosia Gorge** (ecological zone).
6. **Delta System:** Supports **agriculture, fisheries, ports**; rich **biodiversity**.
7. **Significance:** Model for **cooperative federalism**, inter-state **river dispute resolution**.

Tawi River (Jammu, J&K)

Recent Context:

India issued **flood alerts for Tawi River** in 2025, emphasizing **humanitarian cooperation** with Pakistan despite **Indus Waters Treaty suspension** after Pahalgam terror attack.

ABOUT-

1. **Origin: Kalpas Kund, Seo Dhar, Bhaderwah, Doda district, J&K** (Himalayas).
2. **Course:** Flows **southwest**, bisects **Jammu city**, joins **Chenab River** in Pakistan.
3. **Cultural Significance:** Known as **Surya Putri**, rituals performed on its **ghats**.
4. **Economic Role:** Provides **drinking water**, supports **agriculture and irrigation**.
5. **Bridges:** Major bridges include **Gumat-Vikram Chowk**, **Gujjar Nagar-Bahu Fort**, **Nagrota Bypass**.
6. **Strategic Importance:** Tributary of **Chenab**, geopolitically significant under **IWT**.
7. **Environmental Note:** Supports **local ecology and biodiversity** in Jammu region.

SOURCE – VISION MONTHLY

Mercator Projection Map

Recent Context:

In 2025, the **African Union (AU)** endorsed a **global campaign** to replace the **Mercator projection** with one showing **Africa's true size**, correcting historical distortions.

ABOUT-

1. **Definition:** Cylindrical projection (1569) by **Gerardus Mercator** for **maritime navigation**.
2. **Navigation Feature: Rhumb lines (loxodromes)** allow **straight-line compass bearings**.
3. **Grid Structure: Meridians** equally spaced; **parallels** horizontal, distance increases from **Equator**.
4. **Scale:** True along **Equator**; distortion increases toward **poles**.
5. **Conformality:** Preserves **shapes and angles**, useful for navigation.
6. **Distortion: Africa & South America** appear smaller; **Europe, North America, Greenland** appear larger.
7. **Significance:** Highlights **Eurocentric bias**, important for **geographical education and mapping equity**.

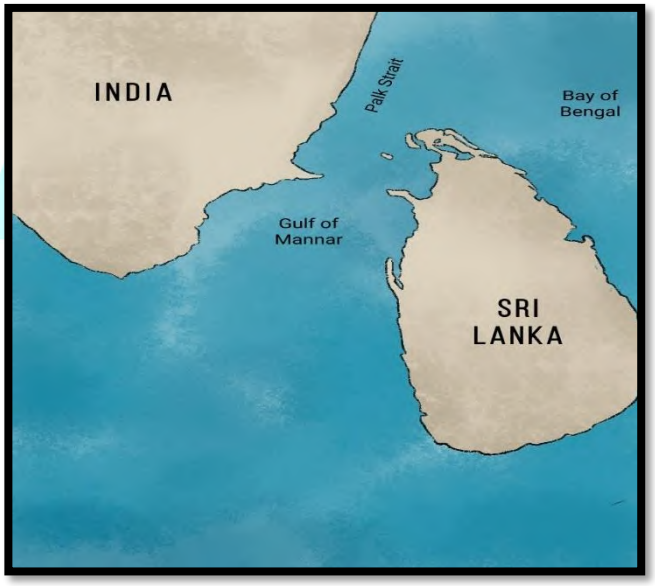
Gulf of Mannar

Recent Context:

The **Gulf of Mannar** is impacted by **coral bleaching**; artificial reef restoration is being implemented using **triangular and trapezoidal modules** underwater.

ABOUT-

1. **Location:** Between **southeast India** and **northwest Sri Lanka**, part of **Laccadive Sea**.
2. **Islands & Boundaries:** Comprises **21 islands**, bounded by **Rameswaram, Adam's Bridge, Mannar Island**.
3. **Rivers:** Receives **Tamraparni (India)** and **Malvathu Oya (Sri Lanka)**.



4. **Economic Importance:** Hosts **Tuticorin port**, known for **pearl banks** and **sacred chank**.
5. **Biosphere Reserve: Gulf of Mannar BR**, established 1989, **UNESCO recognition 2001**; first **marine BR** in South & SE Asia.
6. **Marine National Park:** Established **1982**, supports **biodiversity conservation**.
7. **Restoration:** Artificial reefs deployed to **combat coral bleaching** and promote **marine biodiversity**.

Lipulekh Pass

Recent Context:

India rejected **Nepal's objections** to the resumption of **India-China border trade** through **Lipulekh Pass**, a historic trade route.

ABOUT-

1. **Location: Kumaon, Uttarakhand**, trijunction of **India, Nepal, China**.
2. **Historical Importance:** Ancient **trade route** connecting Indian subcontinent to **Tibetan plateau**.
3. **Border Trade Posts:** India opened **1992**; **Shipki La (1994), Nathu La (2006)**.
4. **Significance:** Facilitates **bilateral trade**, enhances **regional connectivity**.
5. **Dispute:** Nepal claims **territorial ownership**, rejected by India.
6. **Strategic Role:** Close to **India-China border**, important for **geopolitical and economic reasons**.
7. **Tourism & Economy:** Promotes **mountain trade tourism** and **local livelihoods**.

Dardanelles Strait

Recent Context:

Forest fires in **northwest Turkey** led to temporary closure of **Dardanelles Strait**, affecting **maritime traffic**.

ABOUT-

1. **Location:** Separates **Gallipoli Peninsula** (Europe) from **Asian mainland**.
2. **Connectivity:** Links **Aegean Sea → Sea of Marmara → Bosporus → Black Sea**.
3. **Historical Significance: Persian invasion (480 BCE), Gallipoli Campaign (WWI)**.
4. **Economic Role:** Key **maritime trade and navigation route**.
5. **Closure Impact:** Affects **shipping, trade, and energy supply routes**.
6. **Strategic Importance:** NATO and global trade **geopolitically sensitive**.
7. **Ecological Aspect:** Coastal fires can affect **marine and terrestrial ecosystems**.

Preah Vihear & Prasat Ta Muen Thom

Recent Context:

Thailand and Cambodia agreed to **ceasefire** near **Preah Vihear and Prasat Ta Muen Thom**, following long-standing border disputes.

ABOUT-

1. **Location: Emerald Triangle**—Thailand, Cambodia, Laos.
2. **Preah Vihear:** Hindu shrine, **11th century**, built by Khmer kings **Suryavarman I & II**, dedicated to **Lord Shiva**.
3. **Status: UNESCO World Heritage Site**, ICJ ruling **1962/2013** favors **Cambodia**.
4. **Prasat Ta Muen Thom:** 12th-century temple, adapted from **Hindu to Buddhist use**.
5. **Architecture: Angkorian style**, includes **Prasat Ta Muen & Prasat Ta Muen Tot**.
6. **Dispute Cause: Colonial-era borders**, cultural claims unresolved by Thailand.

SOURCE – DRISHTI MONTHLY

Tuvalu Climate Migration

Recent Context:

Tuvaluans to migrate to **Australia** under **Falepili Union Treaty (2023)** due to **sea-level rise**, marking first **planned climate migration**.

ABOUT-

1. **Population Relocation:** Australia accepts **280 people annually**, with full **rights to healthcare, education, housing, jobs**.
2. **Threat:** Average elevation **2 m above sea level**, NASA predicts submergence **by 2050**.
3. **Location:** South Pacific Ocean, between **Australia and Hawaii**; capital **Funafuti**.
4. **Independence:** From **UK in 1978**.

5. **Tuvalu Trust Fund:** Funded by **Australia, New Zealand, UK, Japan, S. Korea**.
6. **Significance:** First **climate-induced international migration**.
7. **Climate Challenge:** Vulnerable to **floods, storms, coastal erosion, rising seas**.

Dibru-Saikhowa National Park (DSNP)

Recent Context:

Ecological changes observed due to **invasive plants** (Chromolaena, Parthenium) affecting native species in **Assam's DSNP**.

ABOUT-

1. **Location:** Assam, bounded by **Brahmaputra & Lohit rivers**.
2. **Vegetation: Semi-evergreen, deciduous**, largest **Salix swamp forest** in NE India.
3. **Climate: Tropical monsoon**.
4. **Key Species: Feral horses**, **Bengal florican (CR)**, **hog deer (EN)**, **swamp grass babbler (EN)**.
5. **Protected Status: Biosphere Reserve (1997)**, **Important Bird Area (IBA)**.
6. **Threats: Invasive species**, habitat degradation, climate change.
7. **Significance:** Critical for **wetland biodiversity, migratory birds, and ecosystem balance**.

Maratha Military Landscapes (UNESCO WHS)

Recent Context:

12 Maratha forts in Maharashtra and Tamil Nadu inscribed as **UNESCO WHS**, India's **44th site**.

ABOUT-

1. **Composition: 12 forts**, primarily in **Maharashtra**, one in **Tamil Nadu**.
2. **Cultural Significance:** Represents **Maratha military architecture & heritage**.
3. **UNESCO WHS Session:** 47th World Heritage Committee.
4. **India & UNESCO:** Joined **1972 Convention**, member of WH Committee **2021-25**.
5. **Global Ranking: 6th globally**, **2nd in Asia-Pacific** for WHS sites.
6. **Previous WHS:** Moidams of **Charaideo, Assam (2024)**.
7. **Significance:** Highlights **India's military heritage and cultural legacy**.

Mount Lewotobi Laki Laki (Indonesia)

Recent Context:

Mount Lewotobi, one of Indonesia's **most active volcanoes**, erupted in 2025, sending ash **18 km high**, affecting nearby villages.

ABOUT-

1. **Location:** Flores island, Indonesia, part of **Pacific Ring of Fire**.
2. **Twin Peaks: Lewotobi Laki Laki (man)** & **Lewotobi Perempuan (woman)** stratovolcanoes.
3. **Crater Distance:** Less than **2 km apart**.
4. **Activity:** Frequent **eruptions and seismic activity**.
5. **Hazards: Ashfall, lava, pyroclastic flow, village damage**.

GEOGRAPHY

SOURCE: DOWN TO EARTH

DISASTER ZONE: HIMALAYAN CRISIS UNFOLDING DAILY

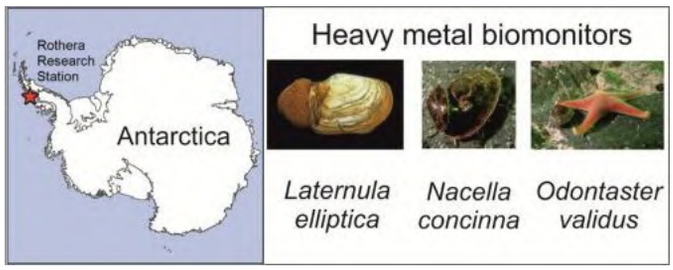
RECENT UPDATE: The Himalayan region is witnessing **frequent extreme weather events** in 2025, with **over 630 deaths** due to floods, landslides, and cloudbursts.

ABOUT:

1. The **Himalayan states and Union Territories** are increasingly hit by **floods and landslides**, notably in **Uttarakhand** and **Himachal Pradesh**.
2. **Western disturbances** active during summer are intensifying rainfall by interacting with the **monsoon trough**.
3. **14 disturbances** between June–August 2025 lasted up to **seven days**, far above normal.
4. **Deforestation and unplanned development** have reduced the region's **natural resilience**.
5. Urban sprawl in **Chamoli, Mandi, and Kishtwar** increases vulnerability.
6. Calls grow for **climate-integrated planning** and **ecosystem restoration**.
7. **Early warning systems** and **sustainable infrastructure** are critical going forward.

ANTARCTIC HEAVY METAL POLLUTION SOARS TENFOLD IN 40 YEARS

RECENT UPDATE: A **Nature Sustainability study** reveals a **tenfold rise** in **lead, mercury, and cadmium** in Antarctic snow since 1980.



ABOUT:

1. **Ice core samples** show lead up **900%** in 40 years.
2. **Research stations and tourism** are main contributors.
3. **Diesel emissions** and **waste mismanagement** add toxins.
4. Contamination has reached **remote inland zones** via **atmospheric transport**.
5. Tourist visits now exceed **100,000 annually**.
6. Bases like **McMurdo and Rothera** record high **arsenic levels**.
7. Scientists warn of **long-term ecological and health consequences** despite Antarctic Treaty safeguards.

GLOBAL GLACIER EROSION

RECENT UPDATE: A **Nature Geoscience report** finds **99% of glaciers** eroding globally, reshaping landscapes and nutrient cycles.

ABOUT:

1. Study of **185,000 glaciers** including **Gangotri and Siachen** found **23 gigatonnes** of material moved annually.
2. Erosion rates range from **0.02–2.68 mm per year**.
3. Influenced by **precipitation, geology, latitude, and elevation**.
4. **Velocity** plays a smaller role than expected.
5. **Hotspots:** Alaska, Andes, Scandinavia, Central Asia.
6. Impacts **carbon cycles** and **sediment transport** globally.
7. Underlines glaciers' **vital role in Earth's geomorphology**.

FRAGILE RECOVERY OF EARTH'S OZONE LAYER

RECENT UPDATE:
An **MIT-led study** reveals that the **ozone layer's recovery** is progressing slower than expected due to **emerging industrial pollutants**.

ABOUT:

1. The **ozone layer**, a thin shield in the **stratosphere (10–50 km)**, blocks most of the Sun's **UV-B radiation**.
2. **CFCs and halons**, once used in aerosols and refrigerants, destroyed ozone, forming the **Antarctic ozone hole** discovered in **1985**.
3. Global treaties — **Vienna Convention (1985)** and **Montreal Protocol (1987)** — phased out **~100 ozone-depleting substances (ODS)**.
4. India has actively implemented the **India Cooling Action Plan**, cutting **HFC emissions** and celebrating **World Ozone Day** each **September 16**.
5. **WMO (2024)** reported the ozone hole as **smaller than recent years**, predicting full recovery by **mid-century**.
6. However, **chlorinated very-short-lived substances (Cl-VSLS)** — unregulated industrial gases — are **slowing recovery**.
7. Rising **Cl-VSL emissions**, especially in **Asia**, are preventing expected declines in **stratospheric chlorine**.

NEW SCIENTIFIC WARNINGS

RECENT UPDATE:
Scientists warn that **unregulated chemicals** and **climate interactions** could delay ozone recovery beyond **2050**.

ABOUT:

1. **Cl-VSLs** have **short lifespans (~6 months)** but reach the stratosphere via **tropical convection and monsoon systems**.
2. Though smaller in impact than **CFCs**, they **slow ozone recovery** and alter **stratospheric composition**.
3. **Nitrous oxide (N_2O)**, a greenhouse gas, poses a growing risk by **changing stratospheric circulation**.
4. Lack of **long-term satellite funding** threatens **atmospheric monitoring continuity**.
5. **Wildfires and volcanic aerosols** are adding further chemical stress to the ozone layer.
6. **Expanding the Montreal Protocol** to include **Cl-VSLs** is now a key global recommendation.
7. Stronger **climate action and atmospheric research investment** are vital to secure ozone recovery by 2100.

SOURCE: THE HINDU

PHYTOSAUR FOSSIL

RECENT UPDATE:
Ancient fossilised remains discovered in **Megha village, Jaisalmer**, possibly a **Phytosaur fossil** dating back to the **Late Triassic–Jurassic period**.

ABOUT PHYTOSAUR FOSSIL:

1. **Phytosaurs** are **extinct, large, semi-aquatic reptiles** resembling modern crocodiles, belonging to the order **Phytosauria**.
2. They thrived during the **Late Triassic** and possibly **Early Jurassic**, with features like **long snouts, heavy armour**, and **diverse feeding adaptations**.
3. **Recent suspected fossil** found in **Megha village, Fatehgarh, Jaisalmer, Rajasthan**.
4. **Earlier finds** include **Akal and Thaiyat** (confirmed dinosaur remains), and **shark and marine fossils** in the region.
5. Fossil specimen measures **~6–7 feet long**, with **spine structure visible**, possibly of **Jurassic age**.
6. Morphological diversity: **long-snouted (fish-eating)**, **short-snouted (terrestrial prey)**, **high-snouted (generalist feeders)**.
7. Fossils reported from **India, Europe, North America, Brazil, Morocco, Thailand, Madagascar**.

LAND SUBSIDENCE

RECENT UPDATE:
Severe **land subsidence** in **Chamoli's Nanda Nagar, Uttarakhand**, has destroyed **seven buildings**, leaving **16 at risk** and forcing evacuations.

ABOUT LAND SUBSIDENCE:

1. **Land subsidence** is the **gradual settling or sudden sinking** of the Earth's surface due to movement of **underground materials**.
2. It can occur **naturally** or due to **human activities**.
3. **Regions affected:** Globally (**US, China, Indonesia, Iran**), in India (**Joshimath, Chamoli, Himachal Pradesh, Delhi NCR**).
4. **Tectonic Setting:** In Himalayas, **active plate convergence** (Indian Plate into Eurasian Plate) creates **unstable bedrock**, allowing sinking.
5. **Lithology: Fine-grained soils, loess, unconsolidated sediments** compact when water is removed; **clay-rich layers** are most prone.
6. **Hydrology: Over-extraction of groundwater** lowers **water table**, reduces **pore pressure**, causing **soil compression**.
7. **Geomorphic Processes: Heavy rainfall, floods, glacial meltwater** destabilise slopes, reducing **shear strength** and triggering subsidence.

MINI CLOUDBURSTS

RECENT UPDATE:
IMD reports that **mini cloudbursts** are increasing in India, though there is no rising trend in major cloudbursts.

ABOUT MINI CLOUDBURSTS:

1. A **mini cloudburst** is a sudden, **high-intensity rainfall** event (≥5 cm/hr) over **small areas (~20–30 sq km)**.
2. **Criteria:** Rainfall intensity ≥5 cm/hr, **localized area**, short-lived but **extremely intense**.
3. More frequent than **full cloudbursts**; **short-range prediction** is currently impossible.
4. Often **unrecorded** due to **lack of ground stations**; **satellite imagery** has limited precision.
5. **Regions affected:** Himalayan states (**Himachal, Uttarakhand, J&K, Ladakh**), urban hotspots (**Chennai, Mumbai, Delhi NCR**), orographic regions.
6. Leads to **flash floods, landslides, and urban waterlogging**.

NATURAL GAS NEAR ANDAMAN ISLAND

RECENT UPDATE:
Natural gas reserves discovered in **Vijayapuram-2 exploratory well** under **Open Acreage Licensing Policy (OALP)** with **87% methane content**.

ABOUT INDIA DISCOVERS NATURAL GAS:

1. Located **17 km from Andaman east coast**, water depth **295 m**, drilling depth **2,650 m**.
2. Gas has **commercial potential** after further testing.
3. **Andaman Islands:** Archipelago of 300+ islands, part of **Andaman & Nicobar UT**, rich in **biodiversity, rainforests, mangroves, coral reefs**.
4. Major islands: **North, Middle, South Andaman (Great Andaman)**, **Little Andaman**, **Nicobars** further south.
5. **Topography:** Dome-shaped hill ranges; **Saddle Peak (737 m)** is highest.
6. Home to **indigenous tribes**: Sentinelese, Jarawa, Onge, Great Andamanese.
7. Strategic **offshore location** for India's **energy security**.

BARREN ISLAND VOLCANO

RECENT UPDATE:
India's only active volcano at **Barren Island** had **mild eruptions on 13 & 20 September 2025**.

ABOUT BARREN ISLAND VOLCANO:

1. Only **active volcano in India** and **South Asia**.
2. **Uninhabited**, with **volcanic cones, ash deposits**, sparse vegetation.
3. Located **138 km northeast of Port Blair** in **Andaman Sea**.
4. Formed at **convergent boundary** of **Indian and Burmese plates**.
5. **Oldest lava flows ~1.6 million years old**, oceanic crust ~106 million years.
6. Monitors **volcanic activity** for **safety and research**.

NILGIRI TEA

RECENT UPDATE:
Nilgiris tea growers face a **cost-price crisis** due to

low green leaf prices, overproduction, and weak auction mechanisms.

ABOUT NILGIRI TEA:

1. Variety of **Camellia sinensis var. sinensis**, grown in **Nilgiris, Tamil Nadu**.
2. Known for **brisk, fragrant, full-bodied liquor**, often blended into **iced tea, masala chai, global brands**.
3. Region: **Nilgiris district**, smaller areas in **Kerala and Karnataka**; **GI-tagged since 2008**.
4. Produces **orthodox rolled teas** and **CTC teas**.
5. Flavour: **citrus and floral notes**, **light yet full-bodied**, retains clarity when cooled.
6. **Geographic conditions:** Altitude **1,000–2,500 m**, two monsoons, lateritic loam soil.
7. Frequent plucking (~32 times/year); first harvest ("**frost tea**") after winter dormancy.

ALUMINIUM

RECENT UPDATE:
India's **aluminium industry** under stress due to **shift to UPVC** in construction and **cheap imports from ASEAN**.

ABOUT ALUMINIUM:

1. Used for **window frames, kitchen items, doors, roofs, automotive parts**.
2. Installed **aluminium extrusion capacity**: 3 million tonnes; actual utilisation: **1.2 million tonnes**.
3. Imports exceed **1.5 million tonnes**, driven by **price differences and FTAs**.
4. India's **per capita consumption**: ~4 kg (global average: 11 kg).
5. Competes with countries like **China (25 kg)**, **US (18 kg)**.
6. Rising **plastic substitution** in construction threatens demand.

ALMATTI DAM

RECENT UPDATE:
Karnataka proposes **raising Almatti Dam height** from 519.60 m to **524.256 m**, expanding **capacity from 173 TMC to 300 TMC**.

ABOUT ALMATTI DAM:

1. Part of **Upper Krishna Irrigation Project**, **hydroelectric and irrigation purposes**; commissioned in 2005.
2. Installed power capacity: **290 MW**.
3. Located in **Bijapur (Vijayapura), Karnataka**; submergence in **Bagalkot**.
4. Built across **Krishna River**, one of South India's major rivers.
5. Gross storage: **123.08 TMC at 519 m MSL**; planned expansion: 300 TMC at 524.256 m MSL.
6. Supplies water downstream to **Narayanpur reservoir** for irrigation.

7. Other major Krishna River dams: **Narayanpur, Srisailam, Nagarjuna Sagar, Jurala, Pulichintala, Prakasam Barrage**.

BEAS AND SUTLEJ RIVERS

RECENT UPDATE:
Rising water levels in **Beas and Sutlej rivers** threaten **Marar village, Tarn Taran (Punjab)**, causing **erosion and risk to homes**.

ABOUT BEAS AND SUTLEJ RIVERS:

1. **Beas River:** Origin near **Rohtang Pass, Himachal Pradesh**, length ~460–470 km, flows entirely in India.
2. Beas passes through **Kullu, Mandi, Kangra**, enters Punjab → meets **Sutlej at Harike**.
3. Basin area ~20,300 sq km; also known as **Vipasa (Vedic)**, **Hyphasis (Greek)**.
4. **Sutlej River:** Origin **Mansarovar–Rakastal Lakes, Tibet**, length ~1,450 km (1,050 km in India).
5. Sutlej flows NW → enters Punjab plains at **Rupnagar**, joins Beas at **Harike**, then merges with **Indus**.
6. Important structures: **Bhakra Dam, Naina Devi Dhar**, provides water for irrigation and hydropower.
7. Tributaries include **Beas and Ravi**; forms **~120 km India–Pakistan boundary** in Punjab.

GEOTAGGING OF BUILDINGS IN CENSUS

RECENT UPDATE:
Census 2027 will introduce **geotagging of all buildings** during **Houselisting Operations (HLO) 2026**.

ABOUT GEOTAGGING OF BUILDINGS IN CENSUS:

1. **Geotagging** assigns **latitude–longitude coordinates** to buildings on **GIS**.
2. Provides **digital identity** to each structure.
3. Ensures **accurate counting** of buildings and households.
4. Improves **workload management** for enumerators; removes **manual sketch map discrepancies**.
5. Enumerators use **smartphones with Census mobile app**, marking buildings as **residential, non-residential, mixed-use, landmark**.
6. Data on **Census Houses and Households** recorded simultaneously.
7. First-ever **digital mapping of all structures** in India.

THE APATANIS TRIBE

RECENT UPDATE:
Apatani women of **Ziro Valley, Arunachal Pradesh** are the **last generation** to wear **traditional facial tattoos and wooden nose plugs**.

ABOUT THE APATANIS TRIBE:

1. **Apatani (Tanw, Apa Tani, Apa)** are an indigenous tribal group of **Arunachal Pradesh**,

known for **cultural identity and ecological knowledge**.

2. Primarily inhabit **Ziro Valley, Lower Subansiri district**, eastern Himalayas.
3. **Facial tattoos** were a protection strategy against **raids and abductions**.
4. Evolved into a **marker of identity and cultural pride** for women.
5. **Wooden nose plugs** made women appear **less attractive** to outsiders.
6. Symbolizes **honour, dignity, and tribal belonging**.
7. Tattoos are part of **tribal beauty standards**, despite being unusual to outsiders

SOURCE: THE HINDU

THE HINDU SUCCESSION ACT, 1956

RECENT UPDATE:
The **Supreme Court of India** will **move cautiously** while examining petitions challenging provisions of the **Hindu Succession Act, 1956**, stressing the need to **balance women's rights** with **preserving Hindu social structure**.

ABOUT THE HINDU SUCCESSION ACT, 1956:

1. **What It Is:**
    - An **Act to codify and amend Hindu law** relating to **intestate succession** (succession without a will).
    - Came into force on **17 June 1956**, applying across India **except Jammu & Kashmir** at that time.
2. **Aim:**
    - Ensure **uniformity and clarity** in **property succession** among Hindus.
    - Remove **gender-based discrimination** and **gradually ensure women's rights** in inheritance.
3. **Coverage:**
    - Applies to **Hindus, Buddhists, Jains, and Sikhs**.
    - Excludes **Muslims, Christians, Parsis, and Jews** unless historically governed by Hindu law.
    - Does **not apply to Scheduled Tribes** unless notified by the **Central Government**.

KURMIS

RECENT UPDATE:
Kurmis in **West Bengal, Jharkhand, and Odisha** have **revived agitation** demanding **Scheduled Tribe (ST) status** and **inclusion of Kurmali language** in the **Eighth Schedule of the Constitution**.

ABOUT KURMIS:

1. **What It Is:**
    - **Kurmi/Kudmi Community:** Historically **agrarian and peasant** community; presently mostly classified as **OBC**.
    - **Demand:** Recognition as a **Scheduled Tribe** and codification of their **Sarna (nature-worshipping) religion**.
2. **Region Found In:**
    - **West Bengal:** Jhargram, Bankura, Paschim Medinipur, Purulia (**Junglemahal region**).
    - **Jharkhand:** Palamu, Kolhan, North & South Chotanagpur.
    - **Odisha:** Mayurbhanj and adjoining areas.
    - **Bihar:** Purnia, Katihar, Araria districts (linked to OBC Kurmis).
3. **Historical Background:**
    - **1931 Census:** Listed as **Scheduled Tribes**.
    - **Post-Independence:** Excluded from ST list in 1950 **without formal notification**.

4. **Freedom Struggle Contribution:** Played major roles in **Chuar Rebellion, Indigo Rebellion, Santhal Uprising, Quit India Movement**; leaders like **Raghunath Mahato, Gopal Mahato**.
5. **British Era Recognition: Gazette notifications (1913 & 1931)** identified them as **"Notified Tribe"** with distinct **customary inheritance practices**.

DE-NOTIFIED, NOMADIC AND SEMI-NOMADIC TRIBES (DNTS)

RECENT UPDATE:
DWBDNC members wrote to the **Prime Minister** seeking **permanent commission status, staff, funds**, and **financial powers** for welfare of **De-notified, Nomadic and Semi-Nomadic Tribes**.

ABOUT DE-NOTIFIED, NOMADIC AND SEMI-NOMADIC TRIBES (DNTS):

1. **Who They Are:**
    - **De-notified Tribes (DNTs):** Communities once listed under **Criminal Tribes Act, 1871**, branded as **"born criminals"**.
    - **Nomadic Tribes (NTs):** Groups practicing **seasonal or continuous migration** for livelihood (**salt trading, animal rearing, folk entertainment**).
    - **Semi-Nomadic Tribes (SNTs):** Follow **shorter, less frequent migrations** than nomads.
2. **Historical Background:**
    - **1871–1947:** ~200 communities notified as **criminal** under the Act.
    - **1952:** Act repealed; communities officially **"de-notified"**.
    - **2008: Renke Commission** listed DNTs and highlighted **extreme marginalisation**.
3. **Population:** Around **10% of India's population (~13 crore people)**.
4. **Spread:** ~**150 DNT groups** and ~**500 nomadic communities** across states.
5. **Cultural & Social Character:**
    - Rich **cultural traditions, deities, festivals, oral literature, dispute-resolution systems**.
    - Traditionally moved in **groups of 5–20 families**; **annual camps** for reunions, marriages, cattle trade.

Geography

JHELUM RIVER

Recent Update: Featured in recent hydrological assessments concerning Himalayan river systems.

About:

1. Known as **Vyeth** (Kashmiri), **Vetesta** (Sanskrit), **Hydaspes** (Greek).
2. Originates from **Verinag Spring** at the foothills of Pir Panjal, J&K.
3. Total length approx **725 km**, flowing through Wular Lake near Srinagar.
4. Major tributaries include **Kishanganga** (largest), Kunhar, Sandran, Bringi and Arapath rivers.
5. Largest and westernmost of the **five rivers of Punjab**.
6. Joins **Chenab River**, later merging into the **Indus system** in Pakistan.
7. Home to major irrigation systems like **Upper and Lower Jhelum Canals**.

SHIPRA RIVER

Recent Update: Madhya Pradesh began riverfront redevelopment to rejuvenate the **Shipra/Kshipra** in Ujjain.

About:

1. **Shipra (Kshipra)** is a **perennial river** in **Madhya Pradesh**.
2. Originates from **Kakri-Tekdi hill** in the Vindhyas near Ujjain.
3. Considered **sacred**, associated with **Kumbh Mela (Simhastha)** at Ujjain.
4. Flows across **Malwa Plateau** before joining the **Chambal River**.
5. Important for religious tourism and urban water needs.
6. Known historically in ancient texts as a seat of learning and culture.
7. Supports agricultural activities in its basin.

BEAS RIVER

Recent Update: Water allocation review ongoing under the **Indus Waters Treaty** context.

About:

1. Originates at **Beas Kund**, near **Rohtang Pass** in Himachal Pradesh.
2. Historic name: **Vipas** ("unfettered river").
3. Flows **470 km** before joining the **Sutlej at Harike (Punjab)**.
4. Tributaries include **Bain, Uhal, Banganga, Chakki, Gaj, Luni** etc.
5. Forms iconic **Kullu and Kangra valleys**.
6. Houses **Pong Dam** (Beas Dam) — a major hydropower and irrigation source.
7. Allocated to **India** under the **Indus Waters Treaty (1960)**.

BHIL TRIBE

Recent Update: Bhil cultural mapping initiated across western India to preserve **art and oral traditions**.

About:

1. Largest tribal group in India — **38% of ST population** (2011 Census).
2. Present in **Rajasthan, MP, Gujarat, Maharashtra, Tripura, Chhattisgarh, Jharkhand, Bihar**.
3. Known for **Pithora painting**, **Ghoomar dance**.
4. Speak **Bhili**, an Indo-Aryan language.
5. Associated with **Shabari** (Ramayana) and **Eklavya** (Mahabharata).
6. Faced colonial oppression under **Criminal Tribes Act, 1871**.

7. Resistance movements: **Bhagat Movement**, **Mangarh massacre**, **Eki Andolan**.

EVIA ISLAND

Recent Update: Greece announced new ecological restoration plans for wildfire-affected **Evia Island**.

About:

1. Located in **Central Greece**, in the **Aegean Sea**.
2. Second-largest Greek island (after Crete) and third-largest in Europe.
3. Separated from mainland Greece by the **Euboean Strait**.
4. Notable mountains: **Dyrfi, Kandili, Ohi**.
5. Known for historical settlements and strategic location.
6. Features Mediterranean climate with tourism-driven economy.
7. Vulnerable to **wildfires and seismic activity**.

SIACHEN GLACIER

Recent Update: New logistics upgrades initiated to support troops at the **world's highest battlefield**.

About:

1. Located in **eastern Karakoram range**, north of **Nubra Valley**.
2. Second-longest **non-polar glacier** in the world.
3. Entire glacier lies under **Indian administration (Ladakh)**.
4. **Nubra River** originates from Siachen meltwaters.
5. **Shyok River** flows through the region linking to the Indus system.
6. Over 6,000 m altitude — extreme temperatures reaching −50°C.
7. Vital for India's **strategic dominance** over Saltoro Ridge.

TIWA (LALUNG) TRIBE

Recent Update: Tiwa cultural festivals received heritage recognition in Assam.

About:

1. Indigenous tribe of **Assam**, also found in **Meghalaya, Arunachal Pradesh, Manipur**.
2. Part of **Tibeto-Burman linguistic family**, closely linked to Bodo-Naga groups.
3. Recognised as **Scheduled Tribe in Assam** (excluding autonomous districts).
4. Celebrations include **Langkhon dance** and **Moinari Khanthi**.
5. Major festivals: **Sokra Misawa** and **Yangli**.
6. Traditionally agrarian with shifting cultivation practices.
7. Speak the **Tiwa language**, influenced by Assamese and Tibeto-Burman dialects.

BIRHOR TRIBE

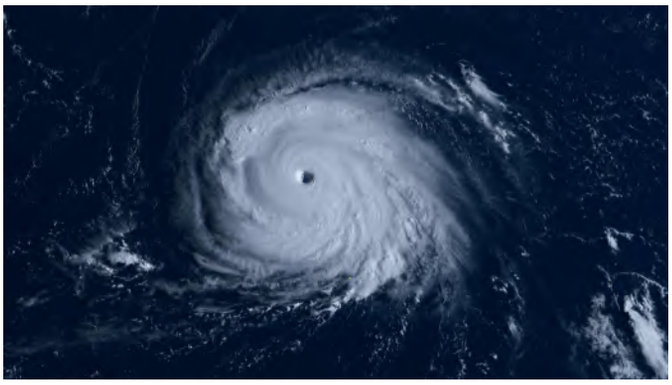
Recent Update: Surveys conducted on welfare programmes for Birhor PVTG.

About:

1. Semi-nomadic tribe of **Jharkhand**; also in Chhattisgarh, Odisha, Bengal.
2. Listed as **PVTG** in Jharkhand.
3. Traditionally forest-based: rope-making, hunting, gathering.
4. Divided into: **Uthlus (nomadic)** & **Janghis (settled)**.
5. Speak **Birhor language** (Munda group).
6. Cultural links with **Santal, Munda, Ho** tribes.
7. High vulnerability in health, education, livelihood.
8. Focus of government's **PVTG Mission**.

SUPER TYPHOON RAGASA (2025)

Recent Update: Category 5 typhoon caused destruction in **Philippines, Taiwan & southern China**.



About:

1. Locally called **Typhoon Nando**.
2. Formed over **western Pacific Ocean**.
3. Intensified due to **warm waters & low wind shear**.
4. Category 5 = winds above **250 kmph**.
5. Triggered strong **storm surges, flooding & landslides**.
6. Followed typical west Pacific **typhoon trajectory**.
7. Demonstrates rising **extreme climate events**.
8. Monitored by **JTWC, PAGASA & global weather agencies**.

TN-SHORE MISSION

Recent Update: World Bank approved the **₹1,675-crore TN-SHORE coastal restoration project**.

About:

1. Tamil Nadu's major **coastal economy & resilience mission**.
2. Restores **1,000 ha of mangroves** across 14 districts.
3. Improves **coastal habitats, seascapes & biodiversity**.
4. Targets restoration of **30,000 ha of seascapes**.
5. Protects **dugongs, turtles & endangered marine fauna**.
6. Enhances **livelihoods of coastal communities**.
7. Strengthens disaster resilience against **cyclones & erosion**.
8. Supported under **World Bank funding**.

YUDH KAUSHAL 3.0

Recent Update: Conducted by the Indian Army in high-altitude Arunachal Pradesh.

About:

1. A major **high-altitude military exercise** in Kameng region.
2. Focus: assessing preparedness for **next-generation Himalayan warfare**.
3. Marked debut of **ASHNI platoons** integrating advanced technology with infantry.
4. Tested drone systems, surveillance grids & AI-enabled combat tools.
5. Strengthens India's combat readiness near the LAC.
6. Enhances joint operational coordination in mountainous terrain.
7. Reinforces India's defensive posture against evolving security threats.

SAMUDRA PRADAKSHINA (2025)

Recent Update: India launched world's **first all-women tri-service circumnavigation** mission.

About:

1. Voyage on **IASV Triveni**, a 50-ft indigenous yacht.
2. Crew: **10 women officers** from Army, Navy, Air Force.
3. Led by **Lt. Col. Anuja Varudkar**.
4. Duration: **9 months**, covering **26,000 nautical miles**.
5. Crosses Equator twice; rounds **Cape Horn, Cape Leeuwin, Cape of Good Hope**.
6. Major port calls: **Fremantle, Lyttelton, Buenos Aires, Cape Town**.
7. Builds on Navika Sagar Parikrama expeditions (2017–18 & 2024–25).

INS ANDROTH

TOPICS COVERED-

1. **Strategic Vulnerabilities of Global Critical Mineral Supply Chains**
2. **Rare Earth Hypothesis**
3. **India Revised Earthquake Design Code 2025**
4. **Hayli Gubbi Volcano**
5. **Afghanistan Earthquake 2025**
6. **Dark Stars**
7. **Pulicat Lake**
8. **Coral Triangle**
9. **Supermoon**
10. **Atacama Desert**
11. **Cistanthe longiscapa**
12. **Taftan Volcano**
13. **Maitri II Station**
14. **South Atlantic Anomaly**
15. **Gulf of Kutch**
16. **Mount Etna**
17. **Solar Cycle**
18. **Betelgeuse**
19. **Sunni Dam Hydroelectric Project**
20. **Loktak Lake**
21. **Taal Volcano**
22. **Oceanic Niño Index**
23. **World Drought Atlas**
24. **Hokersar Wetland**
25. **Cloud Seeding**
26. **Axial Seamount**
27. **Mount Kilimanjaro**

STRATEGIC VULNERABILITIES OF GLOBAL CRITICAL MINERAL SUPPLY CHAINS

Recent Update: Recent export restrictions by China on antimony and other strategic minerals have exposed deep vulnerabilities in global supply chains critical for defence, clean energy and semiconductor industries.

About:

1. Critical minerals are **strategic non-fuel minerals** essential for clean energy, semiconductors, defence systems and advanced manufacturing.
2. Key minerals include **lithium, cobalt, nickel, rare earth elements, gallium, germanium and antimony**.
3. Global supply chains are highly **concentrated geographically**, with China dominating processing and refining stages.
4. Rising geopolitical tensions have led to **export controls and resource nationalism**, increasing supply risks.
5. Demand for critical minerals has surged due to **EVs, renewable energy and digital technologies**, rising over 300% in a decade.
6. Price volatility has increased sharply, as seen in the spike in antimony prices after export restrictions.
7. Countries are now pursuing **strategic stockpiling, friend-shoring and mineral alliances** to reduce dependency and enhance resilience.

THE RARE EARTH HYPOTHESIS

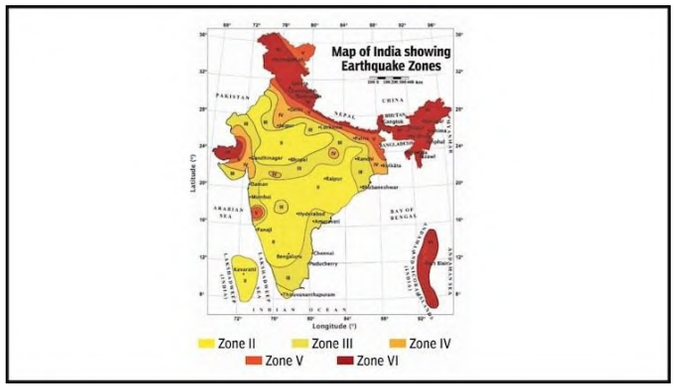
Recent Update: New findings from the James Webb Space Telescope have revived interest in the Rare Earth Hypothesis by highlighting the rarity of Earth-like planetary conditions.

About:

1. The Rare Earth Hypothesis proposes that **complex life is extremely rare in the universe**, despite the abundance of planets.
2. It was formulated by **Peter Ward and Donald Brownlee** to challenge the Copernican assumption of mediocrity.
3. It argues that complex life requires a rare combination of **stable orbit, magnetic field, plate tectonics and atmosphere**.
4. The presence of a large stabilising moon and protective gas giants like **Jupiter** is considered crucial.
5. Long-term climate stability through **carbon–silicate cycles** is essential for sustaining life.
6. The hypothesis influences modern **astrobiology and exoplanet exploration strategies**.
7. It suggests that microbial life may be common, but intelligent life is extremely rare.

INDIA REVISED EARTHQUAKE DESIGN CODE 2025

Recent Update: India released a revised Earthquake Design Code in 2025 introducing a new high-risk seismic zone for the Himalayan region.



About:

1. The code is issued by the **Bureau of Indian Standards (BIS)** under IS 1893.
2. It introduces **Zone VI**, classifying the entire Himalayan belt as extremely high seismic risk.
3. Over **61% of India** now falls under moderate to high seismic hazard categories.
4. The revision uses **Probabilistic Seismic Hazard Assessment (PSHA)** methods.
5. It accounts for **fault rupture propagation and plate boundary dynamics**.
6. Border regions are assigned higher risk if adjacent to active fault zones.
7. The code aims to improve **earthquake-resilient infrastructure and disaster preparedness**.

HAYLI GUBBI VOLCANO

Recent Update: A major eruption of Ethiopia's Hayli Gubbi volcano sent ash plumes toward India, disrupting aviation routes.

About:

1. Hayli Gubbi is a **shield volcano** located in Ethiopia's Afar Depression.
2. It lies within the **East African Rift System**, an active tectonic zone.
3. The volcano last erupted around **10,000 years ago** before the recent event.
4. The eruption produced a **sub-Plinian ash column** reaching up to 45,000 feet.
5. Volcanic ash consisted of **basaltic particles, glass shards and sulphur dioxide**.
6. Ash dispersion affected air routes across the Red Sea and Arabian Peninsula.
7. The eruption highlights risks associated with **rift-related volcanism** in East Africa.

AFGHANISTAN EARTHQUAKE 2025

Recent Update: A magnitude 6.3 earthquake struck northern Afghanistan, intensifying concerns over seismic vulnerability in the region.

About:

1. The earthquake originated near **Mazar-e-Sharif** due to movement along active fault lines.
2. Afghanistan lies at the **collision zone of the Indian and Eurasian plates**.
3. Seismic activity results from compressional stress and fault slippage.
4. The quake generated **foreshocks, a mainshock and multiple aftershocks**.
5. Ground shaking was amplified by **shallow hypocentral depth**.
6. Weak infrastructure and limited preparedness increased damage risk.
7. The event highlights the need for **seismic resilience and disaster readiness** in tectonically active regions.

DARK STARS

Recent Update: Astronomers have found evidence suggesting that some of the **earliest luminous objects** in the universe may have been **dark stars**.

About:

1. **Dark stars** are **hypothetical early-universe stars** powered by **dark matter annihilation**, not by **nuclear fusion**.
2. They are believed to represent the **earliest phase of stellar evolution**.
3. These stars could have been **gigantic**, ranging from **400–200,000 times wider than the Sun**.
4. Their mass may have been **500–1,000 times greater than the Sun**.
5. Despite the name, dark stars are **not actually dark** but shine brightly outside the **visible spectrum**.
6. Being powered by **dark matter heating**, they are **cooler and less compressed** than fusion-powered stars.
7. They resemble **giant, puffy, luminous clouds** rather than compact stars.

8. A single dark star could shine as brightly as an **entire early galaxy**, emitting **gamma rays, neutrinos and antimatter**, yet remaining undetected due to minimal visible light emission.

PULICAT LAKE

Recent Update: Pulicat Lake fishermen have demanded a **long-term solution** as **heavy siltation** threatens livelihoods.

About:

1. **Pulicat Lake** is a **large, shallow brackish lagoon** along the **Bay of Bengal**.
2. It is **India's second-largest brackish lagoon**, after **Chilika Lake**.
3. The lake spans **Andhra Pradesh and Tamil Nadu**.
4. It is separated from the sea by **Sriharikota Island**.
5. It is fed by the **Aarani River (south)** and **Kalangi River (northwest)**.
6. The **Buckingham Canal** passes through the lake.
7. Declared a **Ramsar Site in 2002**, it forms a rich **ecotone**.
8. It supports **200+ bird species**, **seagrass beds**, **oyster reefs**, and migratory birds like **greater flamingos and bar-tailed godwits**.

CORAL TRIANGLE

Recent Update: The **Philippines** will host **Southeast Asia's first coral larvae cryobank** within the **Coral Triangle**.

About:

1. The **Coral Triangle**, called the **"Amazon of the seas"**, spans **Indonesia, Malaysia, Papua New Guinea, Singapore, Philippines, Timor-Leste and Solomon Islands**.
2. It contains **over 75% of the world's coral species**.
3. Nearly **one-third of global reef fish species** are found here.
4. The region supports **six of the world's seven marine turtle species**.
5. It sustains the **food security and livelihoods of 120+ million people**.
6. Major threats include **climate change, coral bleaching, destructive fishing and pollution**.
7. Corals are **sessile marine animals** living in colonies of identical **polyps**.
8. Polyps share a **symbiotic relationship with zooxanthellae algae**, which provide nutrients through **photosynthesis**.

SUPERMOON

Recent Update: A **rare celestial supermoon** was recently observed across the world.

About:

1. A **supermoon** occurs when a **full or new moon** coincides with the Moon's **perigee**.
2. Perigee is the **closest point of the Moon to Earth** in its

elliptical orbit.

3. The Earth–Moon distance varies by about **50,000 km each month**.
4. At perigee, the Moon appears **14% larger** and **30% brighter** than at apogee.
5. The term **"supermoon"** was coined by **Richard Nolle (1979)**.
6. Scientifically, it refers to a moon within **90% of its closest approach**.
7. Supermoons enhance **tidal forces**, causing **perigean spring tides**.
8. These tides can **worsen coastal flooding** when combined with **storm surges**.

ATACAMA DESERT

Recent Update: The Atacama continues to be studied for its **extreme aridity and astrobiological significance**.

About:

1. The **Atacama Desert** is the **driest desert on Earth**.
2. It is located in **northern Chile**, between the **Andes Mountains** and the **Pacific Ocean**.
3. It stretches for nearly **1,000 km** along Chile's coast.
4. Some areas receive **no recorded rainfall**, with an average of **~1 mm per year**.
5. Temperatures are mild, averaging around **18°C**.
6. The desert is rich in **sodium nitrate deposits**, historically used in **fertilisers and explosives**.
7. It contains the **Chinchorro mummies**, the **oldest artificially mummified humans**.
8. Its extreme conditions make it a **Mars analogue** for space research.

CISTANTHE LONGISCAPA

Recent Update: This species is studied for insights into **drought resilience**.

About:

1. **Cistanthe longiscapa** is a **resilient flowering plant** of the **Atacama Desert**.
2. Locally known as **"pata de guanaco"**.
3. It blooms during rare rainfall events, causing the **"desierto florido"** phenomenon.
4. The plant can switch between **C3 and CAM photosynthesis**.
5. Under stress, it adopts **CAM metabolism** to conserve water.
6. When conditions improve, it reverts to **C3 photosynthesis**.
7. This flexibility allows survival under **intense sunlight and salinity**.
8. It is a **model species** for studying **climate-resilient crops**.

TAFTAN VOLCANO

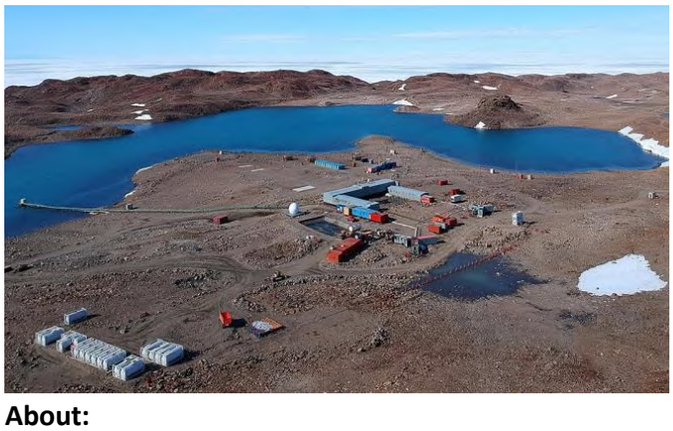
Recent Update: Taftan continues to show **geothermal activity without recorded eruptions**.

About:

1. **Taftan Volcano** is a **semi-active stratovolcano** in **southeastern Iran**.
2. It lies near the **Pakistan border**.
3. It is part of the **Makran continental volcanic arc**.
4. The arc formed due to **subduction of the Arabian plate under the Eurasian plate**.
5. Taftan hosts an active **hydrothermal system**.
6. Strong **sulfur-emitting fumaroles** are present.
7. The volcano has two summits: **Narkuh and Matherkuh**.
8. No confirmed eruptions exist in **recorded human history**.

MAITRI II STATION

Recent Update: Maitri II, India's new Antarctic station, is planned for completion by **January 2029**.

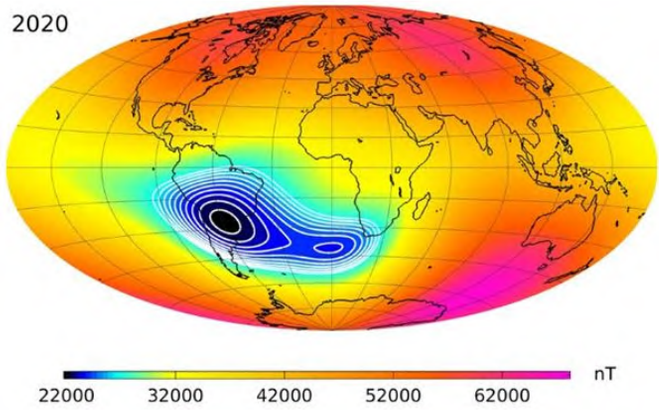


About:

1. **Maitri II** will be India's **newest research station** in **eastern Antarctica**.
2. It will replace and expand upon **Maitri I**.
3. The station will function as a **green, renewable-energy-powered base**.
4. It will use **solar and wind energy**.
5. Automated instruments will collect and transmit data even when **unmanned**.
6. The nodal agency is the **National Centre for Polar and Ocean Research (NCPOR)**.
7. NCPOR functions under the **Ministry of Earth Sciences (MoES)**.
8. The project strengthens India's **long-term Antarctic presence**.

SOUTH ATLANTIC ANOMALY (SAA)

Recent Update: The SAA continues to pose risks to **satellites and spacecraft electronics**.



About:

1. The **South Atlantic Anomaly** is a region where **Earth's magnetic field is unusually weak**.
2. It lies **southeast of South America** and **southwest of Africa**.
3. The **inner Van Allen radiation belt** dips closest to Earth here.
4. This allows **high-energy charged particles** to penetrate deeper.
5. The anomaly disrupts **navigation systems and satellite electronics**.
6. Earth's magnetic field normally **traps solar particles**, providing shielding.
7. The **outer Van Allen belt** traps solar particles, while the **inner belt** arises from cosmic rays.
8. Particle intensity is strongest near the **equator** and weakest near the **poles**.

GULF OF KUTCH

Recent Update: Concerns have emerged about the **long-term survival of dugongs** in the Gulf of Kutch.

June 18, 2005

About:

1. The **Gulf of Kutch** is an inlet of the **Arabian Sea** along **Gujarat's west coast**.
2. It divides the **Kutch and Kathiawar peninsulas**.
3. The region contains **coral reefs around 32 islands**.
4. It has one of India's **highest tidal ranges**.
5. Strong tidal currents make it ideal for **tidal energy generation**.
6. Extensive **mudflats and mangroves** line the coast.
7. India's **first Marine National Park** is located here.
8. It is among India's **most biodiverse coastal ecosystems**.

MOUNT ETNA

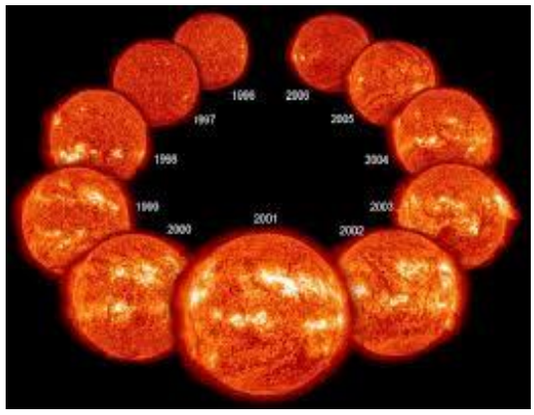
Recent Update: Studies show changes in **earthquake patterns** under Mount Etna correlate with eruptions.

About:

1. **Mount Etna** is an **active stratovolcano** on **Sicily, Italy**.
2. It lies above the **African–Eurasian plate boundary**.
3. It is the **tallest active volcano in Europe**.
4. Etna has an eruptive history of nearly **500,000 years**.
5. More than **2,700 years** of eruptions are historically documented.
6. Earthquake ratios beneath Etna predict **eruptive behaviour**.
7. The volcano has deep **cultural significance** since ancient Greek times.
8. It is a **UNESCO World Heritage Site**.

SOLAR CYCLE

Recent Update: The Sun is approaching a **solar maximum**, increasing space-weather activity.



About:

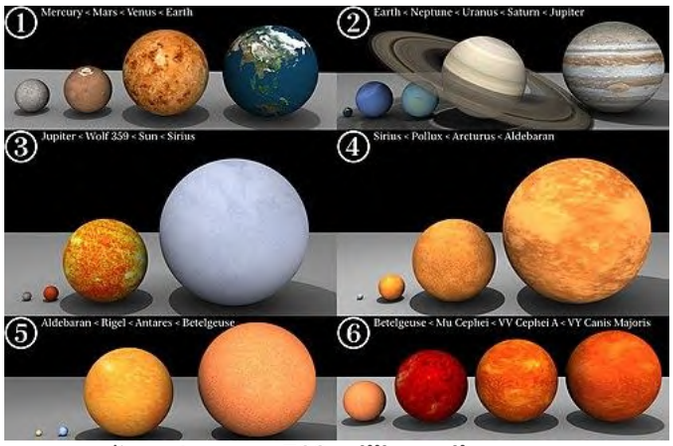
1. The **solar cycle** is an approximately **11-year cycle** of magnetic activity.
2. The Sun's **magnetic field reverses polarity** every cycle.
3. Sunspots are key indicators of the cycle.
4. Activity peaks during **solar maximum**.
5. Solar flares and **coronal mass ejections** intensify during maxima.
6. These events can cause **auroras**.
7. They may disrupt **radio communication and power grids**.
8. The cycle influences **space weather and Earth's magnetosphere**.

BETELGEUSE

Recent Update: Betelgeuse continues to show unusual **dimming and brightening patterns**.

About:

1. **Betelgeuse** is a **red supergiant star** in the **Orion constellation**.
2. It lies about **650 light-years from Earth**.
3. It is among the **largest known stars**, with a



diameter over **700 million miles**.

4. The star is nearing a **supernova explosion**.
5. It exhibits two pulsation cycles: **one-year and six-year**.
6. The longer cycle is linked to its companion star **"Betelbuddy"**.
7. Red supergiants form when massive stars **exhaust hydrogen fuel**.
8. They have **short lifespans** of only a few million years.

SUNNI DAM HYDROELECTRIC PROJECT (HEP)

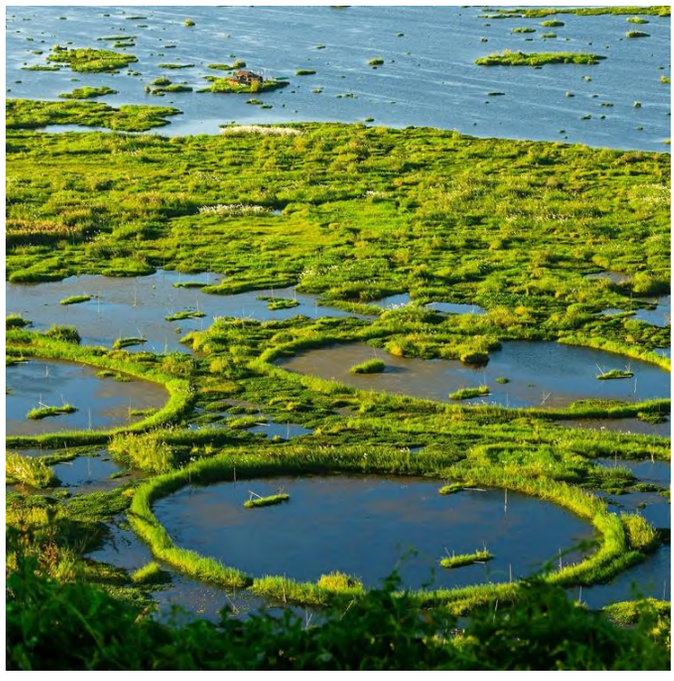
Recent Update: The **National Green Tribunal (NGT)** has taken cognisance of complaints regarding **illegal muck dumping** into the **Satluj River** during blasting activities.

About:

1. **Sunni Dam HEP** is a **382 MW run-of-the-river hydropower project** on the **Satluj River**.
2. It is located in **Shimla and Mandi districts** of **Himachal Pradesh**.
3. The project is owned by **Satluj Jal Vidyut Nigam (SJVN)**.
4. **SJVN** is a **joint venture** between the **Government of India** and the **Government of Himachal Pradesh**.
5. The project involves construction of a **concrete gravity dam** across the Satluj.
6. An **underground powerhouse** is being built on the **right bank** of the river.
7. Being a **run-of-the-river project**, it has limited storage but depends on river discharge.
8. Environmental concerns include **river pollution**, **slope instability**, and **ecosystem disturbance**.

LOKTAK LAKE

Recent Update: A recent study highlights that **land-use change and agriculture** are degrading **water quality** of inflowing rivers, threatening **biodiversity and livelihoods**.



About:

1. **Loktak Lake** is located in **Manipur** and is the **largest freshwater lake in Northeast India**.
2. It is famous for floating biomass called **phumdis**.
3. The lake includes **Keibul Lamjao National Park**, the **only floating national park in the world**.

4. It is the habitat of the endemic **brow-antlered deer (Sangai)**.
5. Loktak is fed by rivers such as **Imphal, Iril, Thoubal, Nambul and Kongba**.
6. It was designated a **Ramsar Site in 1990**.
7. It was placed on the **Montreux Record in 1993** due to ecological degradation.
8. The lake supports **hydropower, fisheries, transport, tourism**, and hosts **130+ plant and 400+ animal species**.

TAAL VOLCANO

Recent Update: Three eruption events were recently reported by monitoring agencies.

About:

1. **Taal Volcano** is located in **Batangas province**, south of **Manila, Philippines**.
2. It is classified by **PHIVOLCS** as a **complex (compound) volcano**.
3. It consists of **multiple vents and stratovolcano cones**, not a single peak.
4. It is one of the **most active volcanoes**, with **38 eruptions in the last 450 years**.
5. The volcano lies within a massive **prehistoric caldera** formed between **140,000 and 5,380 BCE**.
6. A **volcanic island with a crater lake** lies within a larger caldera lake.
7. Eruptions originate from **multiple cones, craters and fissures**.
8. Its activity poses **high volcanic risk** to nearby densely populated areas.

OCEANIC NIÑO INDEX (ONI)

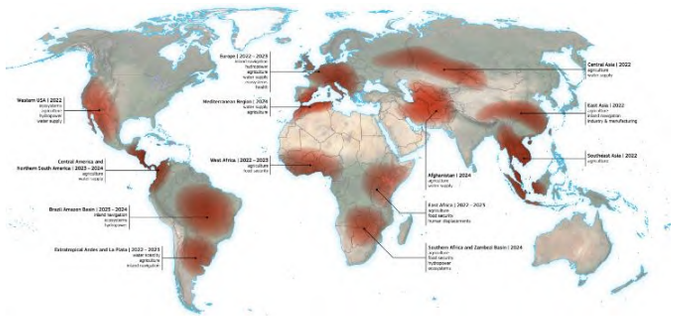
Recent Update: ONI continues to guide global monitoring of **El Niño–La Niña conditions**.

About:

1. **ONI** is the **primary ENSO monitoring indicator** used by **NOAA**.
2. It tracks **3-month average sea-surface temperature anomalies**.
3. The monitored region is the **east-central tropical Pacific (120°–170°W)**.
4. An **ONI ≥ +0.5°C** indicates **El Niño** conditions.
5. An **ONI ≤ –0.5°C** indicates **La Niña** conditions.
6. ENSO events typically occur every **2–7 years**.
7. Events usually last **9–12 months**.
8. ENSO phases strongly influence **global rainfall, droughts, cyclones, ecosystems and economies**.

WORLD DROUGHT ATLAS

Recent Update: The atlas underscores that **all countries** are vulnerable to **systemic drought risk**.



About:

1. The **World Drought Atlas** was launched by **UNCCD** with the **European Commission Joint Research Centre**.
2. It links **worsening drought risk** to **human activities and climate change**.
3. The atlas assesses impacts on **water supply, agriculture, hydropower, navigation and ecosystems**.
4. It includes **21 global case studies** across continents.
5. It highlights that drought vulnerability is **independent of GDP or latitude**.
6. Governance measures include **early warning systems and microinsurance**.
7. Land-based solutions include **restoration and agroforestry**.

8. Water management solutions include **wastewater reuse and groundwater recharge**.

HOKERSAR WETLAND

Recent Update: Conservation focus has increased due to its role as a **critical bird habitat**.

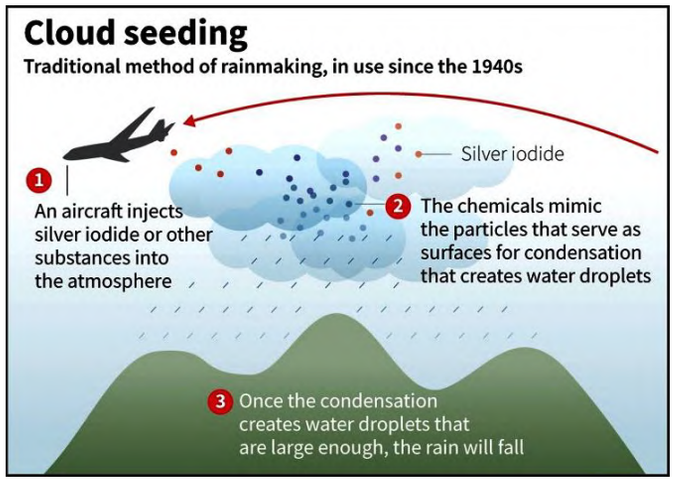
About:

1. **Hokersar Wetland** is a **Ramsar Site** located in **Srinagar, Jammu & Kashmir**.
2. It is known as the **Queen Wetland of Kashmir**.
3. The wetland is a **natural perennial wetland** linked to the **Jhelum basin**.
4. It is fed primarily by the **Doodhganga River**.
5. It lies in the **northwest Himalayan biogeographic province** behind the **Pir Panjal range**.
6. It is the **only remaining reedbed ecosystem** in Kashmir.
7. The wetland supports **68 species of waterfowl**, including the **endangered white-eyed pochard**.
8. It acts as a **breeding ground for birds** and a **spawning nursery for fishes**.

CLOUD SEEDING

Recent Update: A **cloud seeding trial** was conducted in **Delhi** using a **Cessna 206H aircraft**.
About:

1. **Cloud seeding** is a **weather-modification technique** to enhance rainfall.
2. It involves dispersing **seed particles** into suitable clouds.
3. Common seeding agents include **silver iodide, potassium iodide and sodium chloride**.



4. Delivery is done using **aircraft or ground-based generators**.
5. Clouds must have **adequate moisture and vertical thickness**.
6. **Favourable winds** are required to carry particles to the target area.
7. **Strong updrafts** help distribute particles within clouds.
8. Effectiveness varies and depends heavily on **atmospheric conditions**.

AXIAL SEAMOUNT

Recent Update: Axial Seamount continues to provide **real-time volcanic data** through ocean observatories.
About:

1. **Axial Seamount** is an **underwater shield volcano** in the **Pacific Ocean**.
2. It is located off the **Oregon coast**.
3. The volcano lies on the **Juan de Fuca Ridge**.
4. It formed due to a **hotspot** at the **Pacific–Juan de Fuca plate boundary**.
5. It is the **most active submarine volcano in the Northeast Pacific**.
6. Recorded eruptions occurred in **1998, 2011 and 2015**.
7. It hosts **hydrothermal vents** supporting **chemosynthetic life**.
8. It is part of the **Ocean Observatories Initiative** and aids marine volcanology research.

MOUNT KILIMANJARO

Recent Update: Studies show significant **loss of native plant species** on lower slopes due to **land-use change**.

About:

1. **Mount Kilimanjaro** is located in **northeastern Tanzania**, near **Kenya**.
2. It is **Africa's tallest mountain** and the **world's largest free-standing mountain**.
3. It is a **stratovolcano** with three cones: **Kibo, Mawenzi and Shira**.
4. **Kibo** is dormant, while **Mawenzi and Shira** are extinct.
5. **Uhuru Peak** on Kibo is the **highest point in Africa**.
6. The mountain shows distinct **altitudinal vegetation zones**.
7. **Kilimanjaro National Park** is a **UNESCO World Heritage Site (1987)**.
8. It is important for prelims due to its **volcanic origin, zonation pattern and conservation issues**.

TOPICS COVERED

1. **Semeru Volcano**
2. **Kwar Hydroelectric Project**
3. **National Institute of Ocean Technology (NIOT)**
4. **State of the Cryosphere 2025 Report**
5. **Coronal Mass Ejection (CME)**
6. **Volcanic Lightning**
7. **Umngot River**
8. **Youngest Rhynchosaur Fossil Discovery (Macrocephalosaurus mariensis)**
9. **Fog (Types and Formation)**
10. **El Niño**
11. **Gandikota Canyon**
12. **Bondi Beach**

SEMERU VOLCANO

Recent Update: Semeru Volcano remains active in **East Java, Indonesia**, drawing continuous monitoring attention.

About

1. Semeru, also known as **Mahameru**, is an **active stratovolcano** located on Java Island.
2. It is the **highest peak on Java**, making it geologically and culturally significant.
3. The volcano lies along the **Pacific Ring of Fire**, a zone of intense seismic and volcanic activity.
4. It is part of the **Sunda Arc**, formed due to plate tectonic interactions.
5. Semeru was created by the **subduction of the Indo-Australian Plate beneath the Eurasian Plate**.
6. The volcano exhibits **frequent explosive eruptions**, posing hazards to nearby populations.
7. It highlights the **tectonic instability of Southeast Asia's convergent plate boundaries**.

KWAR HYDROELECTRIC PROJECT

Recent Update: The **Kwar Hydroelectric Project** continues construction in **Jammu and Kashmir**.

About

1. Kwar is a **540 MW run-of-river hydropower project**.
2. It is located in **Kishtwar district** of Jammu and Kashmir.
3. The project is built on the **Chenab River**, a major Indus tributary.
4. It is being implemented as a **joint venture project**.
5. Partners include **J&K State Power Development Corporation and NHPC Limited**.
6. The project enhances **renewable energy capacity in the Himalayan region**.
7. It contributes to **regional power security and economic development**.

NATIONAL INSTITUTE OF OCEAN TECHNOLOGY (NIOT)

Recent Update: NIOT continues to play a central role in **deep-sea and ocean engineering research** under India's blue economy initiatives.

About

1. The **National Institute of Ocean Technology** was established in **1993** as an **autonomous society**.
2. It functions under the **Ministry of Earth Sciences**, Government of India.
3. NIOT's primary objective is to develop **indigenous ocean technologies** for India's Exclusive Economic Zone (EEZ).
4. It focuses on **engineering challenges** related to harvesting **living and non-living marine resources**.
5. NIOT contributes to **deep-sea mining, underwater robotics, and ocean observation systems**.
6. It supports national missions like **Deep Ocean Mission** and **ocean energy development**.
7. The headquarters of NIOT is located in **Chennai, Tamil Nadu**.

STATE OF THE CRYOSPHERE 2025 REPORT

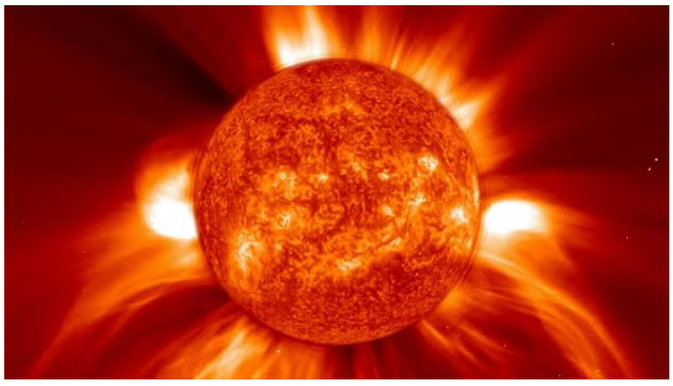
Recent Update: The **State of the Cryosphere 2025 Report** warned of **rapid and irreversible ice loss worldwide**.

About

1. The report is released by the **International Cryosphere Climate Initiative (ICCI)**.
2. It assesses changes in **five cryosphere components—ice sheets, glaciers and snow, polar oceans, sea ice, and permafrost**.
3. **Greenland and Antarctic ice sheet losses** have **quadrupled since the 1990s**.
4. **Sea ice extent and thickness** have declined by **40–60% at both poles since 1979**.
5. Cryosphere degradation contributes directly to **accelerated sea-level rise**.
6. Melting ice amplifies **climate feedback loops**, worsening global warming impacts.
7. The report highlights severe risks to **coastal regions, polar ecosystems, and global climate stability**.

CORONAL MASS EJECTION (CME)

Recent Update: Aditya-L1 successfully captured **Coronal Mass Ejections during a major solar storm in 2024**.



About

1. A **Coronal Mass Ejection (CME)** is a **massive eruption of solar plasma** embedded with **strong magnetic fields**.
2. CMEs originate during **powerful solar flares or filament eruptions** on the Sun's surface.
3. They consist mainly of **protons, electrons, and magnetic field lines** expelled into space.
4. CME frequency varies with the **11-year solar cycle**, increasing sharply during **solar maximum**.
5. **Halo CMEs** are **Earth-directed events**, appearing as **ring-like structures** in coronagraph images.
6. When Earth-bound, CMEs can trigger **geomagnetic storms**, disrupting **satellites, power grids, and communication systems**.
7. CME studies are vital for **space weather prediction** and protecting **space-based infrastructure**.

VOLCANIC LIGHTNING

Recent Update: Volcanic eruptions worldwide continue to document **rare but intense volcanic lightning events**.

About

1. **Volcanic lightning** is a **spectacular electrical phenomenon** occurring during **volcanic eruptions**, not thunderstorms.
2. It is caused by **violent collisions between ash particles** inside the volcanic plume.
3. These collisions generate **electrical charge separation**, leading to lightning discharges.
4. The phenomenon is most common during **explosive eruptions with dense ash clouds**.
5. Volcanic lightning helps scientists **monitor eruption intensity in real time**.
6. It can be detected remotely using **electromagnetic sensors and satellites**.

7. The phenomenon enhances understanding of **eruption dynamics and ash plume behaviour**.

UMNGOT RIVER

Recent Update: The **Umngot River** was recently in news due to concerns over **rising pollution levels**.

About

1. **Umngot River**, popularly known as the **Dawki River**, flows through **Meghalaya**.
2. It originates from the **Eastern Shillong Plateau** and flows through **West Jaintia Hills**.
3. The river is famous for its **crystal-clear waters**, creating the illusion of floating boats.
4. It acts as a **natural divider between Ri-Pnar (Jaintia Hills) and Hima Khyrim (Khasi Hills)**.
5. The river also forms part of the **India–Bangladesh international boundary**.
6. Tourism pressure and waste dumping pose a **serious ecological threat** to the river system.

BRAZIL IDENTIFIES THE YOUNGEST RHYNCHOSAUR

Recent Update: Brazilian palaeontologists discovered the youngest rhynchosaur hatchling fossil in South America.

About

1. **Macrocephalosaurus mariensis** is a **rhynchosaur species**, belonging to **beaked, herbivorous, archosaur-like reptiles** of **Rhynchosauridae**.
2. The fossil represents the **youngest recorded hatchling**, giving insights into **early reptilian growth stages**.
3. Specimens were recovered from the **Santa Maria Formation** of **Brazil**, dating to the **Triassic Period**.
4. Rhynchosaurs were **dominant terrestrial herbivores** across **Gondwana ecosystems**.
5. The skull had a **keratinous beak** and **plant-grinding dentition**, suited for **tough vegetation**.
6. **Multiple tooth rows** showed **heavy wear in adults**, indicating **intensive herbivory**.
7. Diagnostic traits include **single maxillary sulcus**, **two dentary rows**, and **infraorbital foramen**.
8. The hatchling skull measured **< 2.5 cm** with **unworn teeth**, suggesting **death soon after hatching**.

FOG

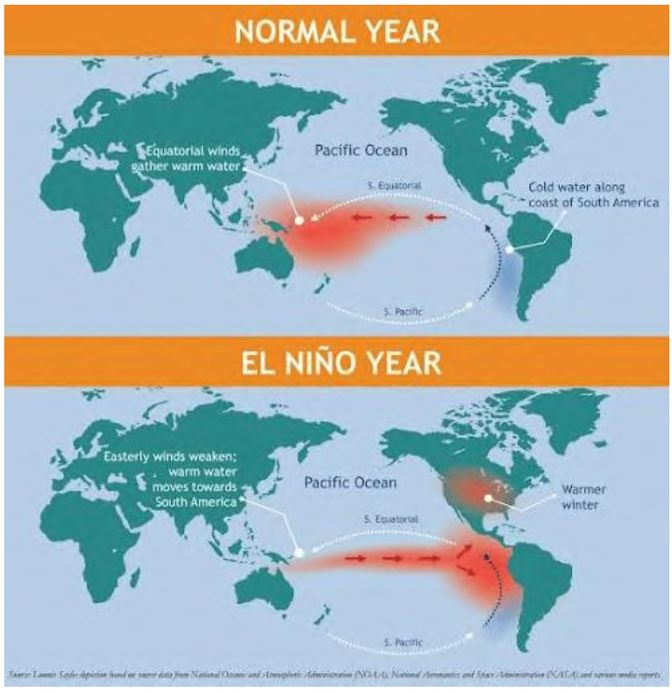
Recent Update: India Meteorological Department issued Red Alert for dense fog across north India.

About

1. **Fog** is a **meteorological phenomenon** where **tiny water droplets/ice crystals** suspend near the surface, reducing **visibility below 1 km**.
2. It forms when air reaches the **dew point** through **cooling or moisture increase**, causing **condensation**.
3. **Radiation fog** develops on **clear, calm nights** due to **surface heat loss**, common in **winter plains**.
4. **Advection fog** occurs when **warm moist air moves over colder surfaces**, persisting even in **daytime**.
5. **Valley fog** forms as **cold dense air settles in depressions**, making fog **denser and longer lasting**.
6. **Freezing fog** contains **supercooled droplets** that freeze on contact, creating **icy hazardous surfaces**.
7. **Upslope and evaporation fogs** arise from **orographic lifting or mixing of moist air**, frequent near **hills/water bodies**.
8. **Calm winds, high humidity, inversions, and long nights** favour **persistent fog formation**.

EL NIÑO

Recent Update: Climate models indicate possible return of El Niño conditions by 2026 due to Pacific warming.



About

1. **El Niño** is the **warm phase of ENSO**, marked by **abnormal warming of eastern–central equatorial Pacific waters**.
2. It recurs **every 2–7 years**, often causing **global temperature spikes**.
3. Declared when **SST anomaly ≥ +0.5°C** persists for **five consecutive overlapping seasons**.
4. Characterised by **weakening/reversal of trade winds** and **disruption of Walker Circulation**.
5. Influenced by **trade wind strength**, **subsurface heat content**, and **ocean–atmosphere coupling**.
6. Leads to **global warming boosts**, making many **record-hot years**.
7. **India** faces **weaker monsoons and drought risk**, impacting **agriculture and water security**.
8. Causes **floods in South America** and **droughts/heatwaves in Australia & Southeast Asia**.

GANDIKOTA CANYON

Recent Update: State tourism plans aim to promote Gandikota as a major eco-heritage destination.

About

1. **Gandikota Canyon** lies in **Kadapa district, Andhra Pradesh**, within the **Erramala Hills**.
2. Carved by the **Penna River**, forming a **~200-metre deep gorge** with dramatic cliffs.
3. Often called the **"Grand Canyon of India"** for its **red sandstone and quartzite formations**.
4. Overlooks the historic **Gandikota Fort (1123 CE)** built under **regional dynasties**.
5. Ruled successively by **Kakatiyas, Vijayanagara rulers, Qutb Shahis, Mughals, Mysore, and British**.
6. Contains **temples, Jama Masjid, granaries, step wells, jail, and gun foundry**, showing **syncretic architecture**.
7. Offers **trekking, camping, kayaking, sunrise–sunset viewpoints**, boosting **eco-tourism potential**.
8. Represents a blend of **geomorphology + history + heritage tourism value**.

BONDI BEACH

Recent Update: Security concerns rose after a terror-linked shooting incident during a public festival.

About

1. **Bondi Beach** is a **world-famous ocean beach and suburb** in **Sydney**.

2. Located **7 km east of CBD**, within the **Eastern Suburbs under Waverley Council**.
3. Name derives from **Dharawal word "Bondi"**, meaning **waves crashing sound**.
4. Known for **surf culture, swimming, coastal recreation**, and **international tourism appeal**.
5. Major contributor to **Sydney's tourism economy and global coastal identity**.
6. Featured in global shows like **Bondi Rescue and Bondi Vet**, enhancing **cultural visibility**.
7. Historically **multicultural**, with **strong Jewish and migrant communities**.
8. Raises issues of **public safety, urban security, and counter-terrorism in open public spaces**.

2. They were instituted in **1950 for wartime gallantry** and later expanded in **1952 to include peacetime gallantry awards**.
3. Wartime gallantry decorations include **Param Vir Chakra, Maha Vir Chakra and Vir Chakra**.
4. Peacetime gallantry awards include **Ashoka Chakra, Kirti Chakra and Shaurya Chakra**.
5. **Param Vir Chakra** is the **highest military decoration awarded for the most conspicuous bravery in the face of the enemy**.
6. **Ashoka Chakra** is the **highest peacetime gallantry award for acts of courage away from the battlefield**.
7. Recommendations for awards are submitted by the **Armed Forces and Ministry of Home Affairs to the Ministry of Defence**.
8. Gallantry awards are **announced twice a year on Republic Day and Independence Day**.

HARVEST FESTIVALS OF INDIA

Recent Update: Various **traditional harvest festivals are being celebrated across India**, marking the **harvest season and the Sun's northward movement (Uttarayana)**.

About

1. Harvest festivals celebrate the **completion of the agricultural cycle and express gratitude for a successful crop season**.
2. These festivals often coincide with the **Sun's transition into Capricorn (Makara), marking the beginning of Uttarayana**.
3. **Makar Sankranti** in Maharashtra celebrates the **Sun's transition into Capricorn and the start of the harvest season**.
4. **Uttarayana in Gujarat and Rajasthan** is widely known for **kite flying celebrations symbolizing the arrival of longer days and new beginnings**.
5. **Pongal in Tamil Nadu** is a **four-day harvest festival including Bhogi, Thai Pongal, Mattu Pongal and Kaanum Pongal**, centred around gratitude to nature and cattle.
6. **Lohri in Punjab** is celebrated with **bonfires, folk songs and dances such as Bhangra and Gidda**, marking the harvest of Rabi crops.
7. **Magh Bihu (Bhogali Bihu) in Assam** marks the **end of harvesting with community feasts, traditional games and bonfires called Meji**.

DYNAMIC GROUND WATER RESOURCE ASSESSMENT REPORT, 2024

Recent Update: The Ministry of **Jal Shakti** reported improved groundwater recharge and reduced long-term extraction compared to 2017 levels.

About

1. The report indicates a **net improvement in groundwater recharge** across several assessment units nationwide.
2. Groundwater depletion has been largely driven by **agriculture-based over-extraction**, especially for water-intensive crops.
3. India's **highly seasonal monsoon rainfall** creates mismatch between recharge periods and continuous withdrawal.
4. Extensive **hard-rock geological formations** limit sustainable groundwater storage in many regions.
5. Subsidised or free electricity has encouraged **excessive groundwater pumping** in several states.
6. Rapid urbanisation and industrialisation have increased **non-agricultural groundwater demand** significantly.
7. Key interventions include **Atal Bhujal Yojana and NAQUIM 2.0**, promoting scientific aquifer management.
8. Initiatives like **Jal Shakti Abhiyan and PMKSY** emphasise recharge structures and efficient irrigation.

GLOBAL WATER BANKRUPTCY REPORT

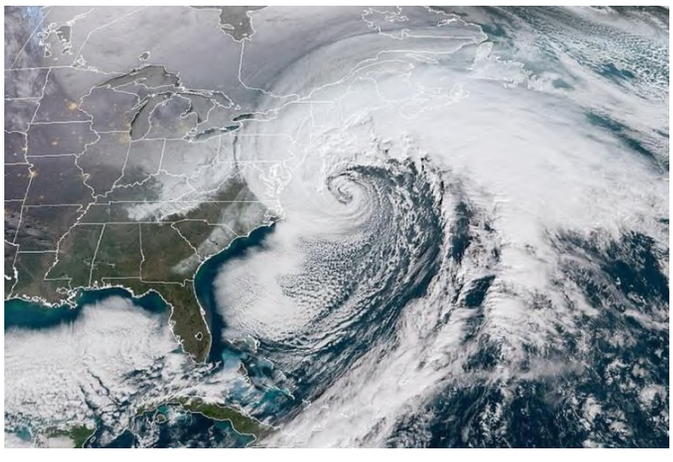
Recent Update: The **UNU-INWEH** released a report warning that many regions are living beyond their hydrological limits.

About

1. The report defines water bankruptcy as **long-term water use exceeding renewable inflows and safe depletion limits**.
2. It argues that traditional terms like **"water stress" and "water crisis"** no longer capture systemic collapse.
3. Persistent over-pumping and weak regulation have caused **slow-onset depletion of groundwater reserves**.
4. Large dams and inter-basin transfers have enabled **growth beyond sustainable hydrological capacity**.
5. Wetland destruction and deforestation have led to **ecological liquidation and reduced natural recharge**.
6. Climate change has intensified glacier melt and rainfall variability, worsening **climate-amplified overshoot**.
7. Chronic water scarcity threatens **food security and agricultural productivity** in major breadbaskets.
8. Inequitable allocation deepens **social injustice, migration pressures, and urban "Day Zero" risks**.

BOMB CYCLONE

Recent Update: Winter Storm Ezra intensified into a bomb cyclone over the United States, disrupting holiday travel.

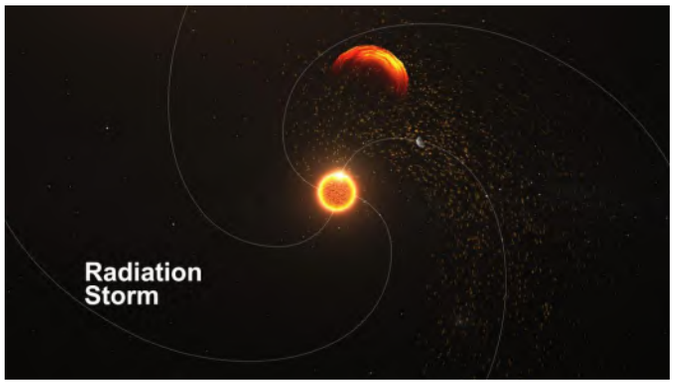


About

1. A bomb cyclone is a mid-latitude storm undergoing **explosive cyclogenesis with rapid pressure drop**.
2. It forms when **cold polar air collides with warm, moisture-rich air**, typically over oceans.
3. A defining feature is a pressure fall of **24 millibars or more within 24 hours**.
4. The intense pressure gradient produces **blizzards, flooding rainfall, and hurricane-force winds**.
5. Sharp temperature drops of **40–50°F within hours** often accompany its passage.
6. Such storms can disrupt **aviation, road transport, shipping routes, and electricity networks**.
7. Bomb cyclones cover vast areas, affecting **multiple states or regions simultaneously**.
8. They reflect extreme atmospheric instability rather than gradual storm development.

SOLAR RADIATION STORM

Recent Update: NOAA recorded an **S4 (Severe) solar radiation storm**, the strongest in over two decades.



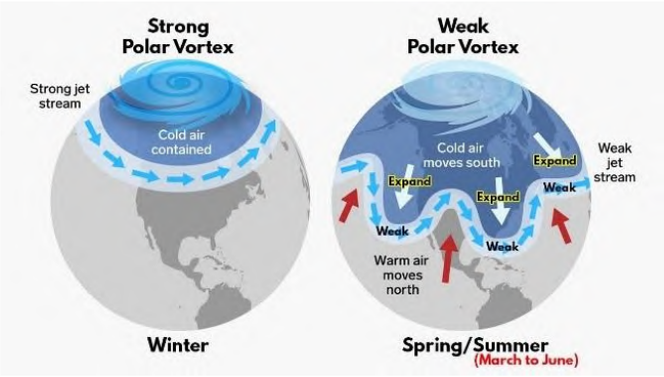
About

1. A solar radiation storm occurs when the Sun ejects **high-energy charged particles towards Earth**.
2. These particles are usually triggered by intense **X-class solar flares and coronal mass ejections**.
3. Charged protons travel nearly **150 million kilometres**, reaching Earth within minutes to hours.
4. Storms are classified on the **NOAA Space Weather Scale (S1–S5)**.
5. S4 storms are rare and were last comparable during the **Halloween Storms of 2003**.
6. They increase **radiation exposure risks for astronauts and high-altitude aviation routes**.

7. Satellites may experience **electronic damage, navigation errors, and orbital disturbances**.
8. Severe storms generate vivid **auroras far beyond traditional polar regions**.

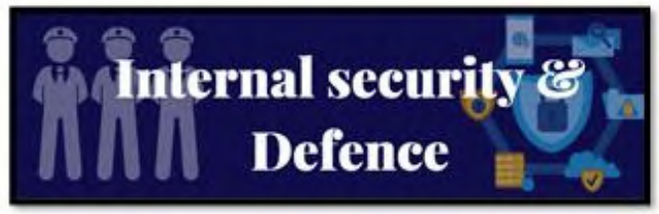
POLAR VORTEX

Recent Update: A polar vortex–driven winter storm brought sub-zero temperatures across multiple US states.



About

1. The polar vortex is a large region of **low pressure and extremely cold air** around the poles.
2. It exists in both the **troposphere and stratosphere**, strongest during winter months.
3. Reduced solar heating at the poles strengthens **cold air circulation and fast-moving winds**.
4. A weakened vortex can cause the **jet stream to become wavy**, allowing Arctic air southward.
5. Sudden Stratospheric Warming events may **split or destabilise the vortex structure**.
6. Arctic amplification reduces temperature gradients, increasing **vortex instability and disruptions**.
7. Local impacts include **extreme cold waves, heavy snowfall, and power grid stress**.
8. Globally, vortex shifts contribute to **weather volatility and contrasting extreme conditions**.



BHAIRAV BATTALION

Recent Update: The Indian Army has operationalised the **Bhairav Battalion** as a rapid-response hybrid warfare combat unit.

About

1. Bhairav Battalion is a high-speed **offensive combat formation** designed for hybrid and special operations.
2. It functions under **Corps and Division-level formations** within the Indian Army structure.
3. These battalions are positioned along **sensitive borders like Rajasthan, Jammu, Ladakh and the Northeast**.
4. The unit bridges the gap between **Para Special Forces and regular infantry units**.
5. Each battalion consists of about **200–250 highly trained soldiers** for compact effectiveness.
6. It specialises in **drone warfare, reconnaissance, rapid raids and electronic disruption**.
7. Designed for hybrid warfare, it integrates **ground action with cyber-electronic support systems**.
8. It is linked to the Army's expanding **one lakh-plus drone operator ecosystem**.

LONG-RANGE ANTI-SHIP HYPERSONIC GLIDE MISSILE (LRASHM)

Recent Update: DRDO is advancing trials of the **LRASHM** to enhance India's maritime deterrence capability.

About

1. LRASHM is an indigenous **hypersonic glide missile** designed for long-range naval strike missions.
2. It is developed by **DRDO for the Indian Navy** to meet maritime strike requirements.
3. The missile enhances **Anti-Access/Area Denial (A2/AD) capability** in the Indian Ocean Region.

CONTINENTAL MANTLE EARTHQUAKES

Recent Update: New research highlights **rare deep earthquakes beneath continental regions**

About

1. **Continental mantle earthquakes** are **rare seismic events originating deep within the mantle beneath continents**.
2. Unlike crustal earthquakes (10–29 km), these occur **at depths greater than 80 km below the Moho discontinuity**.
3. They are found in **tectonically active regions like the Himalayas and Bering Strait**.
4. Caused by **stress transfer from continental collision and deep tectonic processes**.
5. Subduction zones may allow **brittle behaviour of plates even at great depths**.
6. Identified using **seismic wave differences like Sn (mantle) and Lg (crustal waves)**.
7. Usually cause **minimal surface damage due to great depth**.
8. Provide insights into **Earth's interior, stress distribution, and mountain-building processes**.

EL NIÑO

Recent Update: Study shows **ocean salinity can intensify El Niño by ~20%**

About

1. **El Niño** is a **climate phenomenon involving abnormal warming of central and eastern Pacific Ocean waters**.
2. It is the **warm phase of the El Niño–Southern Oscillation (ENSO)** cycle.
3. Occurs every **2–7 years due to weakening of trade winds along the equator**.
4. Causes **eastward movement of warm water, disrupting global atmospheric circulation**.
5. Influenced by factors like **thermocline depth, ocean-atmosphere coupling, and Kelvin/Rossby waves**.
6. Leads to **global climate impacts such as floods, droughts, and extreme weather events**.
7. In India, it causes **weak monsoon, drought risk, heatwaves, and food inflation**.
8. Plays a crucial role in **climate forecasting and agricultural planning**.

SANGTAM COMMUNITY

Recent Update: Community resolution passed for **pangolin conservation efforts**

About

1. **Sangtam tribe** is a recognised **Naga community primarily inhabiting Kiphire and Tuensang districts of Nagaland**.
2. Belongs to the **larger Naga ethnic group with strong customary governance traditions**.
3. Origin traced through **migration from Myanmar regions based on oral traditions**.
4. Organised into **six major clan groups (Shuh) reflecting lineage-based social structure**.
5. Governed by **village councils and apex tribal bodies regulating community affairs**.
6. Live in **biodiversity-rich forest regions practising shifting cultivation**.
7. Community decisions play a **key role in natural resource conservation and social regulation**.
8. Reflect integration of **indigenous governance with environmental sustainability practices**.

OL CHIKI SCRIPT

Recent Update: 100 years completed; Constitution translated into **Santhali using Ol Chiki (2025)**

About

1. **Ol Chiki** is the **official script of the Santhali language**, designed specifically for its phonetics.
2. Developed in **1925 by Pandit Raghunath Murmu (Guru Gomke)**.
3. It is a **scientifically designed script, unlike borrowed scripts like Devanagari or Bengali**.
4. Santhali belongs to the **Austroasiatic (Munda) language family**.
5. Widely spoken in **Jharkhand, Odisha, West Bengal, Assam, and Bihar**.

6. First major literary work was **"Bidu Chandan" / early texts like High Serena (1936)**.
7. Santhali was added to the **Eighth Schedule in 2003 (92nd Amendment)**.
8. Promotes **linguistic identity, cultural preservation, and democratic inclusion**.

UNESCO ASIA-PACIFIC AWARDS FOR CULTURAL HERITAGE CONSERVATION

Recent Update: Vasai Cathedral (Maharashtra) won Award of Merit (2025)

About

1. The **UNESCO Asia-Pacific Awards** recognise **excellence in heritage conservation across the region**.
2. Established in **2000 to promote best practices in preserving cultural heritage**.
3. Focuses on **technical excellence, authenticity, sustainability, and community participation**.
4. Open to **public, private, and public-private conservation projects**.
5. Covers **historic buildings, towns, archaeological sites, and cultural landscapes**.
6. Requires projects to be **completed within the last 10 years**.
7. Has recognised **300+ projects across 27 countries in Asia-Pacific region**.
8. Encourages **adaptive reuse and long-term sustainable preservation of heritage sites**.