

15 November, 2023

## Effect of Climate change on Animal brains

**Context:** Warming waters pose a threat to marine mammals by causing habitat and food loss, warns the National Oceanic and Atmospheric Administration researchers.

### ➤ Sensory Adaptations to Climate Change:

- Animals **perceive temperature changes through receptor proteins** in their nervous systems, aiding in habitat selection.
- Climate change **disrupts environmental cues animals rely on**, impacting behaviors such as finding food and selecting mates.
- Temperature shifts **affect the ability of disease-transmitting animals, like mosquitoes, to orient themselves** in their environment.

### ➤ Communication Challenges:

- **Chemical signals used by animals** for communication or competition **are complex and sensitive** to temperature changes.
- **Seasonal changes in daylight lose their predictability**, affecting plant and animal behaviors like hibernation and migration.

### ➤ Brain Development and Cognitive Effects:

- Rising temperatures can **disrupt the development and function of animal brains**, potentially hindering adaptation to new environments.
- Temperature extremes **alter individual neurons and the overall organization of the brain**.
- **Ocean acidification**, linked to climate change, affects marine animals' cognitive performance and sensory abilities.

### ➤ Behavioural Responses to Climate Adversity:

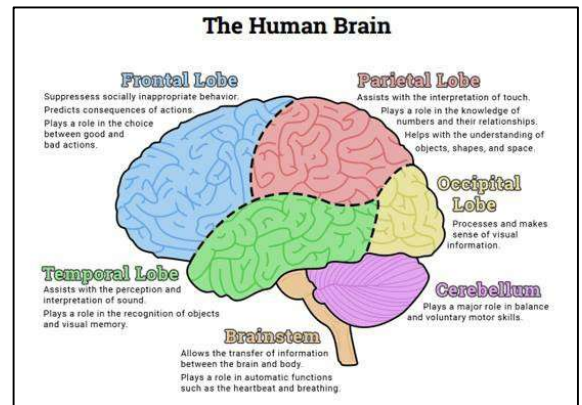
- **Animals respond to climate changes by shifting locations**, altering daily activity periods, and changing seasons.
- Shifts in behaviour can **lead to exposure to new environmental stimuli, affecting interactions with food sources**, competitors, predators, and pathogens.
- **Fish in warming seas, for instance, move to deeper, cooler waters** with different light intensity, impacting their visual systems.

### ➤ Plasticity and Evolution of Nervous Systems:

- Animal brains are flexible and can adapt to environmental experiences.
- Studies suggest **strong environmental effects on brain evolution, with nervous systems evolving to match species-specific sensory environments**.
- **Genetic adaptations** may lose their edge with climate change, paving the way for new adaptive solutions and the evolution of sensory or cognitive abilities.

### ➤ Predicting the Impact of Climate Change:

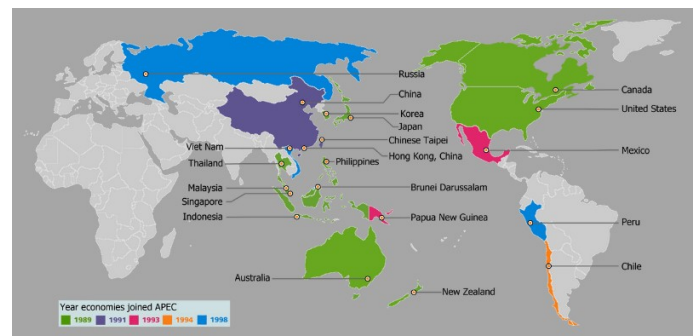
- Understanding how animal nervous systems adapt to changing environments is crucial for predicting the impact of climate change on all species.
- Different parts of the nervous system show varying degrees of adaptability, with some constrained by genetics and others more responsive to environmental conditions.



## Asia-Pacific Economic Cooperation

**Context:** APEC Leaders' Week in San Francisco, United States, started on November 11 and will conclude with the Economic Leaders' Retreat on November 17.

- **Established in 1989**, the Asia-Pacific Economic Cooperation (APEC) is a **regional economic forum**.
- APEC consists of **21 member countries**, seeking to **enhance regional prosperity through balanced, inclusive, sustainable, innovative, and secure growth**.
- The forum aims to accelerate economic integration in the Asia-Pacific region.
- APEC's member countries collectively **contribute to nearly 50% of global trade and about 57% of global GDP**.
- **India, though not a member, was invited as an observer** in November 2011 and **has applied for membership**.
- **Objectives**



## Face to Face Centres



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- **Discussion Platform:** APEC facilitates economic discussions and cooperation among market-oriented economies in the Asia-Pacific region.
- **Cooperation and Integration:** APEC stimulates the flow of goods, services, capital, and technology, endorsing a liberalized trade regime and encouraging private investment.
- **Regional Economic Integration:** APEC actively promotes and accelerates regional economic integration among member countries.
- **Human Security Enhancement:** APEC focuses on enhancing human security for a sustainable business environment in the Asia-Pacific region.
- **APEC's Focus:** APEC concentrates on **simplifying regulatory arrangements, reducing barriers to foreign trade and investment**, and fostering economic openness, dialogue, and cooperation.
- **India's Interest and Request:**
  - India **expressed interest in APEC in the late 1990s** but faced **rejection due to a moratorium on new members initiated in 1997**.
  - The **moratorium was lifted in 2010, opening the possibility** for India to join.
- **Regional Connectivity Significance:** Integrating India's sizable economy into APEC would be a significant step toward enhancing regional connectivity in the Asia-Pacific.
- **Foreign Investment in India:**
  - India has been a **significant destination for foreign direct investment (FDI) from APEC economies**, including Singapore, Japan, and the United States.
  - Improved investment-friendly policies contributed to India becoming the world's top greenfield FDI destination in 2015.
- **Reasons for India's Non-Membership:**
  - India was **denied APEC membership in 2007, citing concerns about its economy's lack of integration into the global system**.
  - Challenges included the **lack of consensus on admitting new members, fears of disrupting consensus procedures, and India's extra-regional status** potentially undermining APEC's geographic focus.
  - India's large trade deficit, and concerns among APEC members about India's politics and policies hindering regional integration and trade options, were additional factors.

## GWP100 or GWP\*

**Context:** Major industrial meat and dairy companies are endorsing a novel methane emissions metric called GWP\* (pronounced as GWP star).

- Industrialized meat and dairy companies **propose a new metric, GWP\***, for measuring methane emissions, claiming it provides a more accurate assessment of greenhouse gas (GHG) impact.
- The **2015 Paris Agreement uses GWP100** as the standard metric for measuring the global warming potential of gases over a 100-year period.
- **GWP100 focuses on absolute levels of emissions**, measuring the warming effect of non-CO2 GHGs relative to an equal amount of CO2 emitted at a specific point in time.
- **GWP\*, in contrast, emphasizes changes in emissions over decadal timescales rather than absolute levels.**
- The report "**Seeing Stars**" contends that adopting GWP\* allows high-polluting countries and companies to manipulate GHG emissions, falsely claiming climate neutrality.
- **By using GWP\* with current methane emission levels as a baseline, minor reductions can be presented as negative emissions or cooling.**
- Companies could claim climate neutrality with minimal annual emissions reductions (1.4% and 1.7%) using GWP\*.
- **GWP\* faces criticism for potentially rewarding historically high-polluting countries** and penalizing those with historically low methane emissions.
- Lobbying efforts seek to incorporate GWP\* into government policy, international standards, and private carbon counting initiatives.
- GWP\* was **developed in 2016 by Oxford University** researchers and **introduced in 2018 at the 24th Conference of Parties (COP24)** to the United Nations Framework Convention on Climate Change.
- **Global Warming Potential:**
  - **Definition and Calculation:**
    - GWP measures the infrared thermal radiation absorption of a greenhouse gas over a specific timeframe, relative to the absorption of the same mass of carbon dioxide (CO2).
    - GWP is calculated as GWP times the mass of the gas, providing a common scale for comparing climate effects of different gases.
  - **Carbon Dioxide Equivalent (CO2e):**

### Case Studies:

- With a 30% emissions reduction by 2030, **Tyson** could claim a reduction of around 82.6 million tonnes of CO2 equivalent using GWP\*, compared to 58.5 million tonnes using GWP100.
- **Fonterra** could claim negative emissions of minus 19 million tonnes using GWP\* with a 30% reduction, while GWP100 shows responsibility for 21.6 million tonnes.

## Face to Face Centres

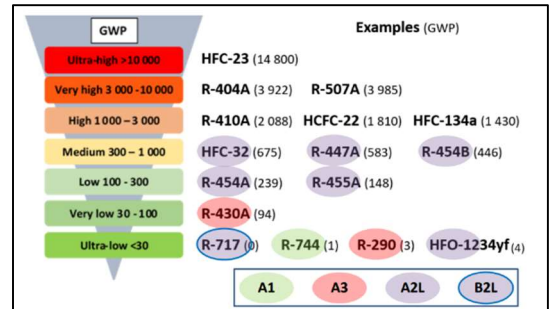


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- CO<sub>2</sub>e is derived from GWP and represents the mass of CO<sub>2</sub> that would have an equivalent warming effect to the mass of another gas.
- It offers a standardized measurement for comparing the climate impacts of various gases.

➤ **GWP Values and Lifetimes:**

- GWP values for various gases are assessed over 20, 100, and 500 years.
- Examples include hydrogen, methane, nitrous oxide, HFC-134a, CFC-11, carbon tetrafluoride, HFC-23, and sulphur hexafluoride (SF<sub>6</sub>).



## NEWS IN BETWEEN THE LINES

### Active and Passive Equity Funds



Recently, the mutual fund industry recorded net inflows of approximately Rs 51,000 crore in Q2 of FY24 and active equity funds led the way with net inflows of about Rs 74,000 crore.

**About:**

**Active Funds:**

- It is actively managed by fund managers who decide on buying, holding, or selling securities and stock selection.
- The expense ratio for active funds is generally higher due to the active trading and management involved.
- These funds aim for potentially higher returns, leveraging the expertise of fund managers, making them more volatile.
- Risk in active funds can vary, with, for example, active equity funds being potentially riskier than active debt funds.

**Passive Funds:**

- Passive funds follow a minimalistic approach, with the fund manager playing a negligible role, aiming to replicate benchmark returns.
- The expense ratio for passive funds is generally lower, providing a cost-effective investment option for investors.
- These funds aim to replicate benchmark returns, subject to minimal tracking error, offering stability in returns.
- Risk management in passive funds is achieved by eliminating unsystematic risks through a rule-based approach based on benchmark weights.

### Zaglossus Attenboroughi



Recently, an elusive echidna named 'Zaglossus attenboroughi,' once feared extinct after disappearing for six decades, has been rediscovered in a remote region of Indonesia.

**About Zaglossus Attenboroughi:**

- Zaglossus Attenboroughi, commonly known as Attenborough's long-beaked echidna or Sir David's Long-beaked Echidna, is an elusive species.
- It belongs to the group of egg-laying mammals known as monotremes, which includes the platypus.
- It is found only in the extremely remote Cyclops Mountains of Indonesia's Papua region.

**Physical Features:**

- It is smallest known species of long-beaked echidna, weighing 5 to 10 kilograms.
- It had five claws on each foot; adult males have non-venomous spurs on ankles.
- Unique fur: short, fine, dense, raw umber brown in color.

**Conservation Status:** It listed as Critically Endangered on the IUCN Red List.

### Dudhwa National Park



Dudhwa National Park recently slashed its tariff rates by 33% and upgraded amenities to offer a more affordable and improved experience for visitors, effective from today.

**About Dudhwa National Park:**

- Dudhwa National Park is situated on the Indo-Nepal border in the Lakhimpur-Kheri district of Uttar Pradesh.
- It was established in 1965 as a sanctuary and later declared a tiger reserve in 1987 under the Project Tiger initiative.
- Dudhwa serves as a crucial link for the migration of elephants and other wildlife between Dudhwa and Laljhari, facilitating movement from Nepal.

**Flora:** It comprises Sal, Asna, Shisham, Lagerstroemia parviflora (Asidha), Adina cordifolia (Haldu), Mitragyna parviflora (Faldu), Gmelina arborea (Gahmhar), Holoptelea integrifolia (Kanju), Jamun, Gular, Sehore and Bahera.

**Fauna:** Major mammals include Guldar, Tiger, Fishing cat, Monkey, Langur, Mongoose, Small Indian Mongoose, Small Indian Civet, Jackal, etc. are found here.

**Rivers:** Tributaries of the Ghagra River (Suheli and Mohana), flow through Dudhwa National Park.

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## Arrow 3 Missile System



Recently, Israel confirmed the deployment of its Arrow 3 missile interceptor against Iran-backed Houthi rebels.

**About:**

- Arrow-3 is an exo-atmospheric anti-ballistic missile defense system designed for engaging long-range threats.
- It was jointly developed by Israel Aerospace Industries and the US Missile Defence Agency.
- Arrow-3 (initially developed in 2017) serves as the top layer of Israel's advanced air-defense network.
- It is specially engineered to intercept ballistic missiles while they are still outside of the Earth's atmosphere.
- The system employs two-stage solid-fueled interceptors, comprising a launcher, radar and battle management system to ensure comprehensive threat engagement.
- With a range of 2,400km, Arrow-3 demonstrates long-distance threat engagement capabilities, enhancing Israel's defensive posture.
- The system operates on hit-to-kill technology, involving a vertically launched missile whose direction is altered toward the estimated interception point.
- Arrow-3 employs a high-resolution electro-optical sensor for accurate target acquisition, ensuring the successful destruction of the incoming missile's warhead.

## Place in News

### Iceland

Recently, emergency has declared over Fagradalsfjall volcano eruption in Iceland due to escalating concerns.

**Location:** Iceland is located at the confluence of the North Atlantic and Arctic Oceans, east of Greenland and within the Arctic Circle. To the west, it shares proximity with Greenland.

**Geographical Region:**

The country is divided into eight main regions, including Capital Region, Southern Peninsula, West, Westfjords, Northwest, Northeast, East and South.

**Physical Features:**

- **Major Rivers:** The longest river in Iceland is Þjórsá, spanning a length of 230 km.
- **National Parks:** Notable national parks include Vatnajökull, Snæfellsjökull, and Þingvellir.
- **Volcanic Activity:** Iceland is home to around 30 active volcanic systems, with notable volcanoes such as Hekla, Eldgjá, Katla, and the infamous Eyjafjallajökull, which erupted in 2010.



## Personality in News

### Birsa Munda

Today, the Prime Minister, Shri Narendra Modi has paid tributes to Bhagwan Birsa Munda on his birth anniversary.

**Birsa Munda (15 November 1875 – 9 June 1900)**

- Birsa Munda was a tribal icon belonging to the Munda tribe.
- He led a tribal mass movement in Bihar and Jharkhand during the early 19th century under British rule.
- He fought against forceful land grabbing by the British to prevent tribal exploitation and poverty.
- He declared "Ulgulan" or revolt in 1894 against the British and outsiders, opposing the Zamindari system.
- He established the 'Birsait' faith to foster unity and identity among the tribal community.
- He was known as 'Dharti Abba' or Earth Father, emphasized the importance of studying tribal religion and preserving cultural roots.
- His struggle resulted in the passing of the Chotanagpur Tenancy Act in 1908, restricting the transfer of tribal land to non-tribals.



**State Creation:** Jharkhand state was created on his birth anniversary in 2000, recognizing his contribution to the national movement.

**Janjatiya Gaurav Divas:** November 15, his birth anniversary, was declared 'Janjatiya Gaurav Divas' by the Central Government in 2021.

## POINTS TO PONDER

- Who is the singer of 'Abundance in Millets' song, which has been nominated for the Grammy award? - **Falguni Shah**
- Which Union Ministry released the 'Digital Advertisement Policy, 2023'? - **Ministry of Information and Broadcasting**
- Coronation Food Project, which was seen in the news, is associated with which country? - **UK**
- Which state passed a Bill, which increases the total reservation in the state to 75%? - **Bihar**
- What is the name of world's first robot CEO? - **Mika**

## Face to Face Centres

