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Deep Water Circulation

The scientists have reconstructed the Deep Water Circulation record of the Indian Ocean for the period from Miocene era to Pleistocene era.

- Global overturning circulation (GOC) is the equatorward transport of cold, deep waters and the poleward transport of warm, near-surface waters.
- It controls ocean heat distribution and atmospheric carbon dioxide levels, thus playing a critical role in global climate.
- The deep-ocean currents are driven by differences in the water's density leading to Deep Water Circulation (DWC).

Global Thermohaline Circulation

The Global Thermohaline Circulation (THC) is a constantly moving system of deep-water circulation driven by temperature (thermo) and salinity (haline). It is also known as global ocean conveyor belt and Meridional Overturning Circulation.



- **Tectonic impacts on GOC** - Tectonically driven changes in the ocean gateways had a dramatic impact on the circulation.
- Example - **The Panama Hypothesis**: The closure of the Central American Seaway, a body of water that once separated North America from South America.
- The modern form of GOC, evolved from the closure of the Central American Seaway which led to the formation of the North Atlantic and Antarctic Bottom Water (AABW).
- These formulations are made from the records that are available are from near the deep-water formation regions.
- **Deep water formation** - Deep water formation is an important feature of the thermohaline circulation (THC).
- The deep-water formation regions mostly from the Pacific and the Atlantic Oceans.
- The Indian Ocean does not have any major deep-water formations of its own but acts as a host for NCW and AABW.

Deep-water formation regions

- The densest ocean water is formed in two primary locations near the poles, where the water is very cold and highly.
- The densest deep water mass formed in the Weddell Sea of Antarctica becomes the Antarctic Bottom Water (AABW).
- Similarly the North Atlantic Deep Water (NADW) is produced in the Greenland Sea.

Atlantic Meridional Circulation (AMOC)

- The Atlantic meridional overturning circulation (AMOC) is part of a global thermohaline circulation in the Atlantic Ocean.
- The AMOC consists of AABW and NADW formed near the polar regions of the Atlantic Ocean.
- **Near Poles** - AABW sinks to the bottom in the Weddell Sea and then moves north along the bottom into the Atlantic, and east through the Southern Ocean.
- At the same time NADW is sinking in the Greenland Sea and moves southward.
- **Near Equator** - NADW is less dense than AABW and tends to form a layer above the AABW as it flows across the equator to the south.



- As the NADW moves towards the Antarctic continent, it is brought to the surface.
- Near Antarctica there is the Antarctic divergence, where surface waters move horizontally away from each other, and are replaced by deep water upwelling.
- Since polar water has a weak thermocline, there isn't much of a density difference preventing the deep water from reaching the surface, so some NADW rises as part of the upwelling process

References

1. [The Hindu - Reconstructing past deep-water circulations of Indian Ocean](#)

Pineapple Express

California and other parts of the West Coast of the US have been hit with a series of 'true Pineapple Express'.

- Atmospheric rivers are a part of Earth's ocean water cycle.
- They are long, narrow regions in the atmosphere that transport most of the water vapour outside the tropics.
- Atmospheric rivers carry impressive amounts of water vapour that bring dangerous floods and heavy snow when the moisture begins to interact with land.
- Atmospheric rivers come in different shapes and sizes.
- 'Pineapple Express' is an example of a strong atmospheric river.



- **Pineapple Express** - The moisture builds up in the tropical Pacific around Hawaii and can wallop the US and Canada's West Coasts with heavy rainfall and snow.
- It is named the Pineapple Express due to the storm originating in Hawaii, where pineapples are grown.
- **True Pineapple Express** - The location of an atmospheric river is an important criteria to be a "true Pineapple Express".
- The tail end, where the moisture is pulled into the atmosphere, must start near Hawaii.
- Then the river must stretch continuously through the atmosphere to the U.S. West Coast.

References

1. [Indian Express - What is the 'Pineapple Express' phenomenon](#)
2. [First Post - What is Pineapple Express phenomenon?](#)
3. [NOAA - National Ocean Service - Pineapple Express](#)

Lokur Committee

The Office of the Registrar-General of India (RGI) is following the set of criteria set out by the Lokur Committee to define any new community as a Scheduled Tribe.

- As per the procedure for scheduling tribes, the Office of the Registrar-General of India's (RGI) nod is mandatory for the inclusion of any community in ST lists.
- For defining a community as a tribe, The Office of RGI consults the criteria laid out by the Lokur Committee report (1965).
- The Advisory Committee on the revision of the lists of Scheduled Castes and Scheduled Tribes is known as 'Lokur Committee'.

The criteria set out by the Lokur Committee for defining a community as a tribe are:

Indications of primitive traits, distinctive culture, geographical isolation, shyness of contact with the community at large, backwardness.

- **Task Force** - In February 2014, the Union government constituted a task force on the Scheduling of Tribes.
- **Issues identified** - The task force noted that the procedure is 'obsolete', 'cumbersome', 'condescending' and follows a 'rigid and dogmatic approach'
- The task force also noted that this is hindering the inclusion of over 40 communities under the ST lists across the country.
- **Recommendation** - The task force had recommended changes to the criteria set out by the Lokur Committee.

The task force came up with new criteria:

- Socio-economic, including educational, backwardness, vis-a-vis, the rest of the population of the state;
- Historical geographical isolation which may or may not exist today;
- Distinct language/dialect;
- Presence of a core culture relating to life-cycle, marriage, songs, dance, paintings, folklore;
- Endogamy, or in case of exogamy, marital relationship primarily with other STs

References

1. [The Hindu - 'Obsolete' criteria followed for scheduling of tribes](#)
2. [The Wire - Centre Still Employs 'Obsolete' Criteria to Categorise Groups Under ST Lists](#)

Permanent Commission to women officers

The Indian Army has begun the process for selection of women officers for command postings in the rank of Colonel.

- The Indian Army has granted Permanent Commission (PC) to women officers with an aim to provide equal opportunities to women.
- This flows from the [Supreme Court judgment](#) granting permanent commission as well as command postings to women officers in all arms and services other than combat.
- A Permanent Commission (PC) means a career in the army until one retires.
- If one gets selected through PC, one has the option to serve the country up to the full age of retirement.
- **Earlier Status** - The induction of women officers in the Army started in 1992 through Women Special Entry Scheme (WSES).
- Under WSES they were commissioned for a period of 5 years in certain chosen streams such as the Army Education Corps, Corps of Engineers, etc.
- In 2006, the WSES scheme was replaced with the Short Service Commission (SSC) scheme, under which they could serve only up to 14 years.

References

1. [The Hindu - Women officers in command soon](#)
2. [Indian Express - 108 women officers to be Colonels](#)

Mahabali Frog

Mahabali Frog is waiting to be elevated as the State Frog of Kerala by the State Wildlife Advisory Board of Kerala.

- The Mahabali frog (*Nasikabatrachus sahyadrensis*) is also known as Purple Frog.
- **Distribution** - It is endemic to the Western Ghats.
- **Habitat** - These frogs prefer loose, damp and well-aerated soil close to ponds and ditches or streams.
- **Appearance** - The purple frog has a bloated body with short stout limbs and is dark purple to greyish in colour.
- It has a small head, an unusually pointed snout and short and muscular forelimbs to burrow underground.



- **Specific Trait** - Unlike other frogs, it has very short hind legs, which does not allow it to leap from one spot to another.
- It remains underground most of the year except for 2-3 weeks during the monsoon when it comes out to mate.
- The frog was named after the mythical King Mahabali, as the king visits his people once a year from the underneath world only on the Thiruvonam day.
- **Significance** - The conservation of Mahabali Frog will also help in conserving the aquatic ecosystems in the Western Ghats.
- **Threats** - Construction, quarrying and pollution.
- **Conservation Status** - IUCN - Near Threatened

References

1. [The Hindu - Mahabali frog waiting for official recognition](#)

2. [IUCN - Purple frog](#)
3. [WWF India - Purple Frog](#)

