

# Prelim Bits 20-01-2023 | UPSC Daily Current Affairs

# **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. Thermohaline Circulation deep water formation deep water formation Salinity (PSS) 32 34 36 38

- **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

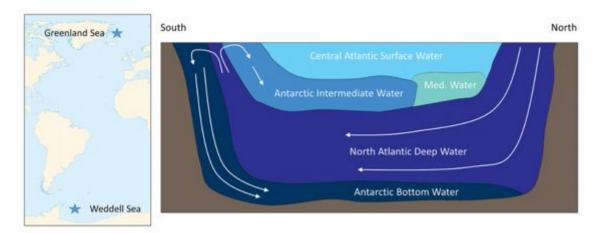
- thermohaline circulation (THC).
- The deep-water formation regions mostly from the Pacific and the Atlantic Oceans.
- The Indian Ocean does not have any major deep-water formations of its own but acts as a host for NCW and AABW.

# **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 <u>Supreme Court judgment</u> 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 prefers 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

