



Zombie Fire

Why in News

According to a new study, the **fire regimes in the Arctic are changing** rapidly, with 'zombie fires' becoming more frequent in addition to fires occurring in the once-frozen tundra.

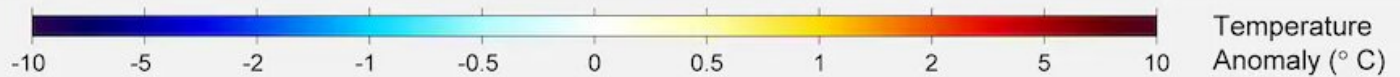
Key Points

▪ Features:

- **Zombie Fire:** It is a fire from a previous growing season that can **smoulder under the ground** which is made up of carbon-rich peat. When the weather warms, the fire can reignite. These are also known as **holdover fires**.
- The fires in the Arctic spreading to areas which were formerly fire-resistant is a more worrying feature.
 - The **tundra** is drying up and vegetation there like moss, grass, dwarf shrubs, etc are starting to catch fire.
 - The tundra is a cold region of treeless level or rolling ground found mostly north of the Arctic Circle or above the timberline on mountains.
- In 2019 and 2020, burning occurred well above the Arctic Circle, a region not normally known to support large wildfires. Wildfires on permafrost in Siberia south of the Arctic are not uncommon.

January to April
2020

Relative to 1951-1980 average



- **Reasons:** The reason for this anomaly is that temperatures in winter and spring were warmer than usual during 2019-20.
 - Temperature in Siberia in 2020 had gone through the roof, with the region recording a severe **heatwave**.
 - Nearly all of this year's fires inside the Arctic Circle occurred on continuous permafrost, with over half of these burning on ancient carbon-rich peat soils.
- **Impact:**
 - The fires and record temperatures had the potential of **turning the carbon sink into a carbon source** and increasing **global warming**.
 - The Arctic region has a **cold body of water and permafrost**, it naturally acts as a carbon sink. On average it absorbs 58 megatons of CO₂ a year in its cold water.
 - Soils in areas of permafrost contain twice as much carbon as there is currently in the atmosphere.
 - As the climate and permafrost soils have warmed, **microbes** have started to **break down this organic carbon**, which has been frozen and fixed in the permafrost. That has led to a rise in land emissions of **CO₂** and **methane**.
 - Also there will be less absorption of carbon by water with rising temperature.
 - It will be a **feedback loop**: As peatlands release more carbon, global warming increases, which thaws more peat and causes more wildfires.
 - Arctic fires will affect the global climate over the **long term** depending on what they burnt. That's because peatlands, unlike boreal forest, do not regrow quickly after a fire, so the carbon released is permanently lost to the atmosphere.

Arctic Region



- The Arctic region, or the Arctic, is a geographic region spreading around the North Pole.
- The Arctic Circle (66° 33'N) delimits the Arctic in terms of solar radiation.
- Based on temperature, the **monthly average temperature** in the Arctic is **below + 10°C** throughout the year, even in summer.
- The Arctic contains vast stores of carbon and other planet-warming **greenhouse gases** in its soils, in **peat** as well as **frozen soil** that can be freed up through combustion.
- **Peatlands** are wetlands that contain ancient, decomposed and partially decomposed organic matter.
 - Nearly half the world's peatland-stored carbon lies between 60 and 70 degrees north, along the Arctic Circle.
- **Arctic Permafrost:** It is ground that remains completely frozen at 0 degrees Celsius or below for **at least two years** and is defined solely based on temperature and duration.
 - It is composed of rock, sediments, sand, dead plant and animal matter, soil, and varying degrees of ice and is believed to have formed during glacial periods dating several millennia.
 - It is mainly found near the polar zones and regions with high mountains covering parts of **Greenland, Alaska, Russia, Northern Canada, Siberia and Scandinavia.**
 - Permafrost is the most threatened by climate change, Arctic regions are **warming twice as fast compared to the rest of the planet**, its current rate of temperature change being the highest in 2,000 years.

Way Forward

- There is an **urgent need to understand the nature of fires** in the Arctic which are evolving and changing rapidly.
- This study has urged global cooperation, investment and action in monitoring fires. It has called for **learning from the indigenous peoples of the Arctic** about how fire was traditionally used.
- **New permafrost- and peat-sensitive approaches** to wildland firefighting are needed to save the Arctic.

[Source DTE](#)

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