

# Permafrost

September 14, 2021

**In news-** The latest IPCC report has warned that increasing global warming will result in reductions in Arctic permafrost and the thawing of the ground is expected to release greenhouse gases like methane and carbon dioxide.

## ***Immediate effects as permafrost melts due to increasing global temperatures-***

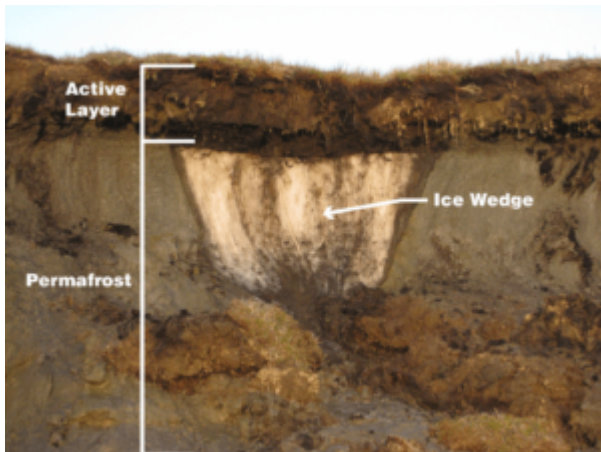
- The first impacts that are very rapid will affect countries where roads or buildings were constructed on permafrost. E.g. The Russian railways
- If the ground begins to thaw, the organic material, which is now entombed and frozen in the ground material will become available for microbiota to break down.
- In some environments, the biota will release carbon dioxide methane and hence is a considerable concern.
- The total quantity of carbon that is now buried in the permafrost is estimated at about 1500 billion tonnes and the top three meters of the ground has about 1000 billion tonnes.

## ***About Permafrost-***

- Permafrost is defined as ground that remains **at or below zero degree Celsius for at least two consecutive years.**
- These permanently frozen grounds are most common in regions with high mountains and in **Earth's higher latitudes – near the North and South Poles.**
- It is spread across an area of over 23 million square kilometers, **covering about 15% of the land area of the globe.**
- It is made of a **combination of soil, rocks and sand** that are held together by ice.
- Near the surface, permafrost soils also contain large quantities of organic carbon – a material leftover from

dead plants that couldn't decompose due to the cold.

- Lower permafrost layers contain soils made mostly of minerals.
- Although the ground is frozen, permafrost regions **are not always covered in snow.**



- A layer of soil on top of permafrost does not stay frozen all year. This layer, called the **active layer**, thaws during the warm summer months and freezes again in the fall.
- In warmer permafrost regions, the active layer can be several meters thick.