

PERMAFROST IN SVALBARD

A TICKING TIME BOMB BENEATH OUR FEET

Svalbard: A land of ice



100% 61 045 km² of Svalbard is covered by permafrost.



Permafrost is a thick subsurface layer of soil that remains frozen throughout the year, and occurs in Svalbard and mostly in polar regions.

- Combination of soil, rocks, and sand held together with ice
- Ground has to have been frozen for **two years** straight to be called permafrost
- Organic material found in upper layers of permafrost and minerals found in lower.
- **Active layer** of soil above the permafrost layer stays unfrozen all year long.

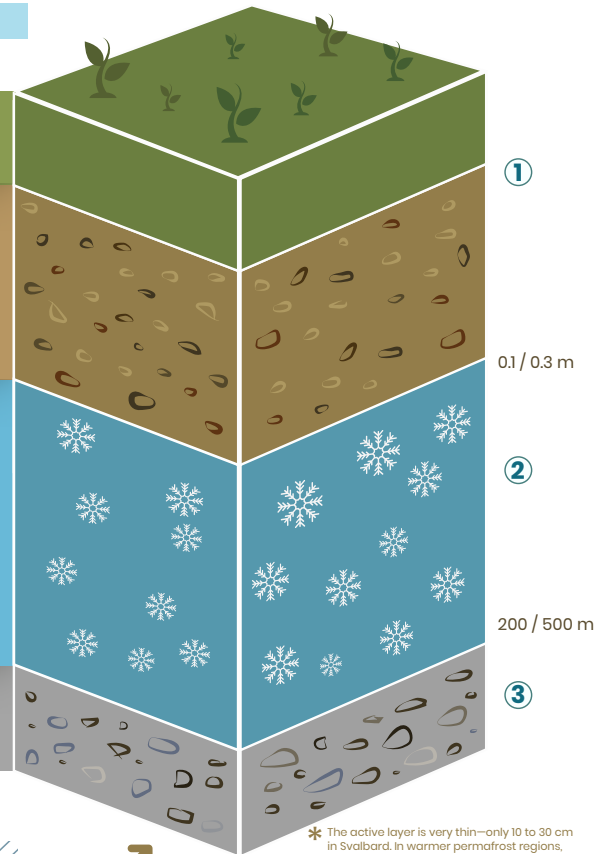
WHAT IS PERMAFROST MADE OF?

Organic Materials such as vegetation or peat can cover the **active layer**, acting as insulation for the permafrost.

The **Active Layer** thaws and refreezes annually. ^{*} Its thickness is dependent on the temperature of the ground surface, but can also be effected by overlying organic materials.

Permafrost is ground that has been at or below 0 C° for two or more consecutive years. It is a thick subsurface layer of soil that remains frozen throughout the year, and occurs mostly in polar regions, like Svalbard.

Permafrost is underlain by unfrozen ground.



^{*} The active layer is very thin—only 10 to 30 cm in Svalbard. In warmer permafrost regions, the active layer can be several meters thick.

RIISING TEMPERATURES ARE MELTING PERMAFROST

HOW WILL THIS CHANGE IMPACT HUMANS &/OR WILDLIFE IN THE NEAR FUTURE



Makes surface water flows unpredictable affecting water quality and quantity.



Disruption to an ecosystem's balance can change traditional ways of obtaining food and resources.



This releases greenhouses such as CO₂ and methane.



Bacteria from hundreds of thousands of years ago can resurface, potentially causing illness in both humans and animals.



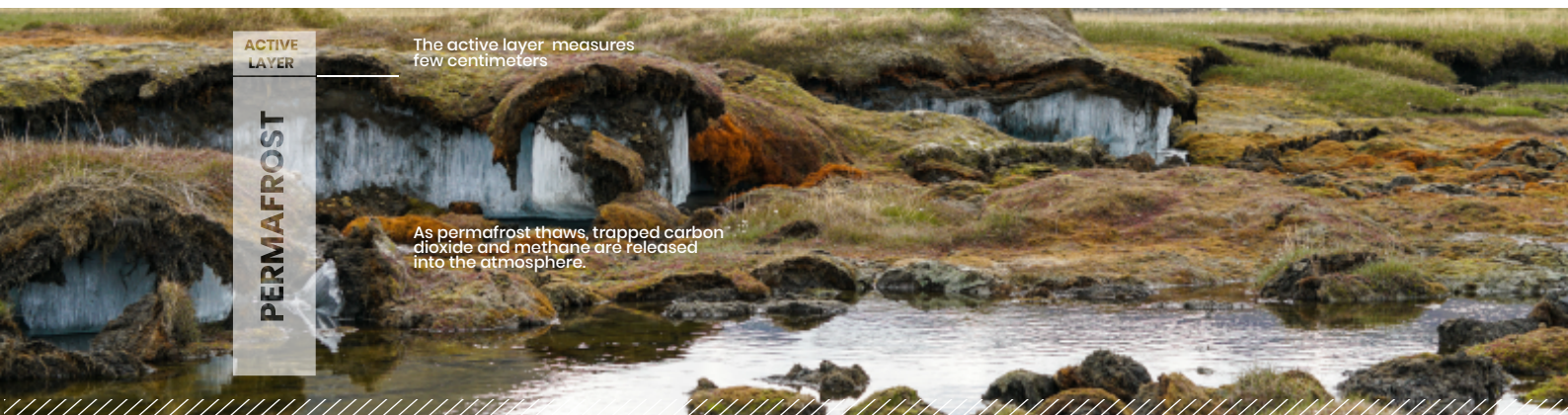
Infrastructure built atop thawing permafrost may fail. Shifting buildings / Cracked foundations.



Creates costly need for regular maintenance.



Seed vault risks infrastructure damage.



ACTIVE LAYER

The active layer measures few centimeters

PERMAFROST

As permafrost thaws, trapped carbon dioxide and methane are released into the atmosphere.

A quarter of the Northern Hemisphere has permafrost under the land. | 15 000 000 km²

- In Siberia 7.8 millions km²
- In Canada 5 millions km²
- In Alaska 0.5 millions km²
- In Tibetan mountain
- In Greenland
- In Scandinavia
- In mountain ranges, Alps, Rockies
- Under Oceans

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