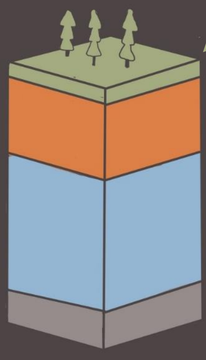
THE FUTURE OF PERMAFROST IN A CHANGING WORLD

WHAT IS PERMAFROST?

Permafrost is ground that has been at or below 0 degrees Celsius for two or more consecutive years [1].

Permafrost is underlain by Unfrozen ground.



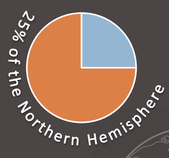
Organic Materials such as vegetation or peat can cover the active layer, acting as insulation for the permafrost [2].

The Active Layer thaws and re freezes annually. It's thickness is dependent on the temperature of the ground surface, but can also be effected by overlying organic materials [2].

WHERE IS PERMAFROST?

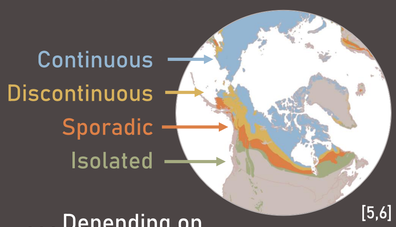
Permafrost is found at high latitudes and altitudes[2].

Permafrost covers...



[3]

Permafrost can be classified as . . .



[5,6]

. . . Depending on the percentage of ground permafrost covers [4].

A THAWING WORLD

Global warming is resulting in permafrost warming, thaw and the thickening of the active layer [1].

[7]

In the high arctic, permafrost is increasing in temperature up to 0.5 degrees Celsius a decade [4].

As permafrost thaws, GHG is released into the atmosphere [1].

The thawing of permafrost and the melting of ground ice can result in instability and erosion [2].

Melting ground ice can result in lake formation or collapses of surface features [1].

[8]

HOW WILL THIS IMAPCT CANADIANS?

Ground instability and subsidence threatens Canadians safety, and the long term viability of many communities[1].

Communities situated on continuous, ice rich permafrost will experience the most HAZARDS AND DAMAGES as Northern Canada warms [9] .

Thermal Erosion

Shifting buildings

Cracked foundations

Expensive infrastructure damage

Damage to roads

Sinkholes

Increased risk of landslides

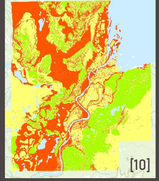
[9]

In vulnerable communities like TASIUJAQ, QUEBEC Hazard mapping and GIS are being used to aid in land use planning [9].

[10]

Risk factors in ground subsidence such as ice content, sediment type, slope, and drainage are mapped and ranked [9].

The final map identifies high risk land and is used in determining areas for safe future development [9].



[10]

Coastal communities experience coastal erosion up to 40m a year [11].

Want to learn more? Check out the references!