

THE ARCTIC REGIONS: SITTING ON PERMAFROST

Permafrost is the term given to frozen ground that never completely thaws in summer, sometimes remaining frozen as far as hundreds of metres down. The Arctic permafrost covers millions of square kilometres from Alaska to the northern reaches of Russia and China. In summer, because only the surface thaws and the deeper layers stay frozen, melt-water is not absorbed by the ground and it stagnates, creating vast marshland zones (wetland ecosystems).

A LAND FROZEN HARD

When the ground in the Arctic freezes it contracts and splits in geometric patterns, often polygons. Where water has seeped into rocks, it expands when it freezes and splits the rock. Elsewhere, the rocks are worn by the incessant wind. Sometimes, ice expansion due to underground water freezing lifts up great stretches of ground, forming steep embankments that are quickly colonised by the Arctic vegetation in summer.

EXTENSION DU PERGELISOL ARCTIQUE



Telle est l'immense surface terrestre affectée, autour de l'Arctique, par le gel permanent du sous-sol (pergélisol).

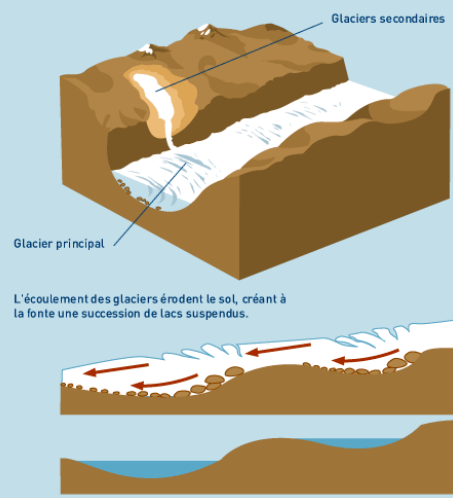
■ pergélisol continu
■ pergélisol discontinu

LANDSCAPES SHAPED BY THE THAW TOO

In summer, the ground thaws but only on the surface. The water mingles with the surface layer forming mud that slides down the slightest slope. The thaw causes major erosion along the banks of rivers, lakes and even on the shores of the Arctic Ocean.

GLACIERS ET EROSION

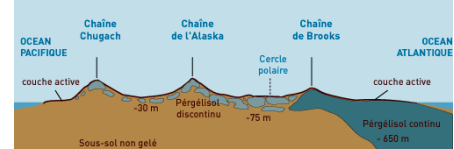
Les glaciers sculptent les reliefs des montagnes arctiques, creusant auge et vallées en U.



BEARING WITNESS TO PAST ICE AGES

Ice ages always leave traces on the landscape, and these physical traces can tell us much about the climate in the past. For example, glaciers deposit moraines, leave tell-tale scratches in the rock and carve U-shapes into lakes and valleys. Along coasts, geologists sometimes find fossilised terraces and beaches well above the present sea level, showing how the sea level has changed as ice ages came and went.

COUPE DU PERGELISOL



Sur cette coupe du sous-sol de l'Alaska, on voit que le pergélisol continu laisse progressivement place à un phénomène discontinu; mais toujours, en surface, gel et dégel créent une couche de sol dite "active" de 0,5 à 3 mètres d'épaisseur selon les endroits.