



PERMAFROST

- ZONE OF CONTINUOUS PERMAFROST
- Southern limit of continuous permafrost zone¹
- ZONE OF DISCONTINUOUS PERMAFROST
- Widespread permafrost
- Scattered permafrost
- Southern limit of permafrost
- Patches of permafrost observed in peat bogs south of permafrost limit
- Permafrost areas in the Cordillera²
- + 50 Thickness of permafrost (in feet)
- Localities in which pingos occur³
- 15 Mean annual air temperature (°F)⁴
- Glaciers

DEFINITION OF PERMAFROST
 Permafrost is a term used to describe the thermal condition of earth materials, such as soil and rock, when their temperature remains below 32°F (0°C) continuously for more than one year. Between the permafrost or perennially frozen earth material, and the surface is an 'active layer' also composed of soil or rock, which thaws in summer and freezes in winter. Vegetation grows above permafrost throughout much of the permafrost region.

¹The southern limit of continuous permafrost is arbitrarily taken as the 23°F (-5°C) isotherm of average annual sub-surface temperature, at a level just below the depth at which no seasonal change of temperature occurs.

²Permafrost in the Cordillera is part of the permafrost region but on the map is differentiated by colour. At the northern limit of the Cordilleran permafrost, as shown on the map, permafrost occurs in valley bottoms. Southward to about latitude 54°30'N the lower altitudinal limit of permafrost is about 4,000 feet above sea level, with only scattered occurrences in particular types of terrain at lower elevations. Southward from 54°30'N the lower altitudinal limit has been estimated to rise steadily to about 7,000 feet at the forty-ninth parallel.

³The most spectacular landforms associated with permafrost are 'pingos'. These are typically symmetrical hills composed of material uplifted by a core of ice. They may be more than 100 feet high with a base diameter of up to one quarter of a mile. The map shows their known distribution in generalized form.

⁴A broad relationship exists between air temperature and permafrost temperature. In general the temperature of the permafrost ranges from two to ten degrees Fahrenheit warmer than the average annual air temperature at a given locality. The southern limit of permafrost shown on the map coincides approximately with the 30°F average annual isotherm of air temperature.

$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$

Modified from 'Permafrost in Canada' (Map 1246A, Geological Survey of Canada, 1967) prepared by R.J.E. Brown, National Research Council of Canada.