

Carbon Storage in Canada's Boreal Forest



Permafrost Extent in Boreal Canada

Permafrost is permanently frozen soil, sediment, or rock that remains at or below zero degrees Celsius (32 degrees Fahrenheit) for at least two years. Nearly 25% of the earth's land surface is covered by permafrost, including about 50% of Canada's land area. Carbon is stored under the frozen ground through a slow freeze-thaw process that progressively moves organic matter deeper into the ground where it is sealed off from decomposition by the cold temperature.

As indicated by the map, northern portions of Canada's Boreal Forest, particularly the western Boreal region, are occupied by vast areas of carbon-rich permafrost. Although often overlooked in global carbon accounting, permafrost regions worldwide store an estimated 400 billion metric tons of carbon. The thawing of permafrost dramatically increases the decomposition of organic matter contained in it, with a resultant release of carbon into the atmosphere.

For more information on the creation of the original map, and citing these data, see: Brown, J, O.J. Ferrians, Jr, JA Heiginbottom, and ES Melkinov. 1998, revised February 2001. Circum-arctic map of permafrost and ground ice conditions. Boulder, CO: National Snow and Ice Data Center/World Data Center for Glaciology. Digital Media.