



The word 'tundra' originates from the Saami word *tūndar*, meaning treeless plain. The tundra is a vast, flat, treeless landscape found in the high latitudes surrounding the polar regions, primarily in Alaska, Canada, Russia, Greenland, Finland, Norway and Sweden. The region's long, dry winters feature months of total darkness and extremely low temperatures. Most precipitation falls in the form of snow during the winter, and soils tend to be acidic and saturated with water when not frozen. Soils are affected by freezing and often have a perennially frozen subsoil, known as permafrost. During the summer, the permafrost thaws, but because of the permanently frozen subsoil, the water cannot drain away and soils become waterlogged, forming a distinctive wetland habitat.

The tundra can also be found at high altitudes where the soil temperature is below freezing for large parts of the year and usually at night in the summer. Vegetation cover is very similar to high-latitude tundra, but soils tend to be well drained. The landscape is generally devoid of trees, because plant growth and survival are limited by short, cold growing seasons, and the lack of suitable substrates and nutrients. Therefore, the vegetation is composed of dwarf shrubs, sedges, grasses and mosses.

Due to the harsh climate, tundra has seen little human activity with reindeer herding being one of the most extensive forms of human interactions. Herding and grazing have significant impacts on tundra vegetation and, consequently, on soil-living organisms. Furthermore, these regions are continuously being developed for their natural resources, such as oil and uranium. Therefore, in the past years new settlements have been developing in many parts of Alaska and Russia. Tourism in these remote areas is also expanding, which needs to be carefully managed. Despite all the adverse environmental and human factors, varied communities of organisms are active in tundra soils.

Tundran soil biodiversity is strongly influenced by physical characteristics, such as the extreme seasonality and the presence of permafrost. Nevertheless, all main groups of soil organisms can be found in this environment. The Arctic Biodiversity Assessment 2013 evaluated above- and below ground biodiversity in the Arctic region, thus also taking into account soil-dwelling organisms. Densities of bacteria were lower than in temperate soils, but can still reach substantial numbers. Interestingly, recent DNA-based analyses revealed that, during the transition from a frozen to a thawed (winter-summer) state of soil permafrost, there are rapid shifts in microbial abundances, with an increase in actinobacterial populations. Unfortunately, data on archaea and protists remain limited. Much more is known about the presence and abundance of fungal species in tundra soils and can maintain activity and growth at low temperatures, even when soils are frozen. It has been estimated that more than 11 000 species of fungi live in the Arctic region. Among them, about 2 600 have been described, belonging to all the main fungal phyla. Another group of well-established organisms in the tundra are lichens. More than 1 700 species of lichens have been found in this environment with 231 species being reported in Greenland. More than 73 genera of nematodes, 200 species of tardigrades, 85 species of enchytraeids, 400 species of collembolans, 600 species of mites and two species of earthworms have been described in tundra's soils.

Soil Lovers say: Despite Tundra Being Cold, Flat And Treeless There Is Significant Life In The Tundra Biome