Glaciers

General Description

The *Glaciers* zone is an area containing over 11,000 km² of high elevation ice fields, alpine glaciers and summit outcrops in southwestern Yukon. This zone includes the highest mountains in Canada and represents the Canadian portion of the largest expanse of nonpolar ice fields in the world, extending west into Alaska. The northern maritime alpine climate is characterized by wind, high snowfall and cold temperatures. Rock, ice and snow constitute the dominant landcover; vegetation cover is minimal.

Vegetation

Vegetation covers <5% of the zone, and consists of sparse cover of lichens, bryophytes, herbs and dwarf shrubs growing on exposed bedrock and colluvium above the surface of permanent ice.

Vascular plant species include polar willow (*Salix polaris*), net-veined willow (*S. reticulata*), northern rough fescue (*Festuca altaica*), white mountain heather (*Cassiope mertensiana*), Alaska moss heather (*Harrimanella stelleriana*), icegrass (*Phippsia algida*), pygmy buttercup (*Ranunculus pygmaeus*), Alaska mountain avens (*Dryas alaskana*), mouse-tail bog sedge (*Carex myosuroides*) and several species of saxifrage (*Saxifraga* spp.).

Lichens are an important component of the vegetation, including crustose lichens (e.g. firedot lichens [*Caloplaca* spp.] and map lichens [*Rhizocarpon* spp.]) on exposed rock surfaces. Common terricolous species include crinkled snow lichen (*Flavocetraria nivalis*), curled snow lichen (*Flavocetraria cucullata*), frosted finger lichen (*Dactylina ramulosa*), green witch's hair lichen (*Alectoria ochroleuca*) and whiteworm lichen (*Thamnolia vermicularis*).

Mosses include curly heron's-bill moss (*Dicranum fuscescens*), juniper haircap moss (*Polytrichum juniperinum*), red-stemmed feathermoss [*Pleurozium schreberi*), mountain groove moss (*Aulacomium turgidum*), ribbed bog moss (*A. palustre*) and sidewalk screw moss (*Syntrichia ruralis*).

Climate

The *Glaciers* zone lies in the transition between the moist northern maritime macroclimate of southern Alaska and the drier continental boreal macroclimate of west-central Yukon. It is subject to very heavy orographic snowfall from wet Pacific air masses. Extensive ice fields develop on the windward southwestern side of the zone, but ice cover is restricted to valley glaciers on the leeward northeastern side.

Temperatures and precipitation vary according to elevation, as well as location relative to the St. Elias Mountains. Mean annual temperatures at 2500 mASL on the windward side of the mountains are estimated to be -10°C, and on the leeward side, -8°C. Mean annual precipitation on the windward side and at the highest elevations can be significantly greater than 1000 mm per year, mostly as snow. Precipitation drops off toward the northeastern

boundary of the zone, amounting to approximately 400 mm annually.

Physiography, Geology, Topography, Soils and Land Cover

This zone contains the highest elevations of the St. Elias Mountains, including 26 of the 30 highest peaks in Canada, all exceeding 3700 mASL. The lower elevation of the zone lies at approximately 1000 mASL.

The St. Elias Mountains are geologically young, resulting from tectonic uplift at the edge of the North American Plate. Although there are some rocks of volcanic origin, the geology is mostly faulted and folded Mesozoic and Tertiary sedimentary rocks.

Active glaciation dominates surficial processes. The southwestern portion of the zone consists of a virtually continuous ice sheet. To the north, numerous valley glaciers emerge from the high elevation ice cap. Surface materials are dominated by ice and snow, with exposed bedrock and colluvial deposits on nunataks (isolated peaks protruding from their surrounding ice sheets) and cliff faces of mountain summits.

Notes

To the east and north, the *Glaciers* zone borders the *Western Boreal Alpine Tundra*. To the south and west, it continues into Alaska.

Although alpine glaciers exist in many high elevation locations within Canada, they cover relatively minor proportions of the vegetation zones within which they occur, and the dominant vegetation is arctic or alpine tundra.