Coast Range Glacial High Mountains

Terrain Class: Mountains - No one process responsible for construction of mountains. They can be uplifted, tectonic, subduction of plates, folding, uplift, up and down warping of the mantle, inflation of molten lower crustal (batholiths), etc. Erosion of mountain systems occurs over time. The rate of erosion is dependent on the geomorphic process, the underlying rock structure, and the climate, including both freeze thaw and the amount and intensity of precipitation and runoff. Mountains are further defined and distinguished based on morphology, including the pattern and density of drainages, depth of drainages, overall morphology of the area between the drainages, evidence of a strong imprint of a surficial process such as glaciation, and presence of visible underlying rock structure.

Mountains have simple to very complex forms that have arisen due to inherited rock structure, rock history, and are the net result of local to regional spatial scales of competing rates of upbuilding/uplift and downgrading/erosion. Mountains will have an inherited history from weathering and degradation of the underlying stack of earth materials that forms them. Vegetation, habitat, water interception, collection and transport will share a similar history in the same type of uplift and rock.

Landform Association: Glacial High Mountains

Glacial High Mountains are areas entirely shaped by present and past glaciers. High mountains have significant relief above a local base. These are the most prominent ridge systems in the landscape. Active glaciers are still present within this map unit, as well as icefields, permanent snowfields, and widespread evidence of nivation features which include erosion of the ground beneath and at the sides of a snow banks, mainly as a result of alternate freezing and thawing. The terrain is glacially scoured, with hanging valleys, large U-shaped valleys, with vertical to near-vertical slopes in bedrock common throughout.

A variety of soil types are present in Glacial High Mountain Landform Associations. Soils range from shallow soils to rock or exposed rock. In many locations ice has cleared out all sediment. Only in the glacial valleys do you get deep glacial soils. Shallow glacial soils are droughty even in rainy areas. What keeps them from drying out is replenishment from precipitation. These landscapes are most vulnerable to climate change. With a reduction in precipitation the glacial soils behave like ones in an arid climate.

This Landform Association has an abundant spatial extent on National Forest System Lands.

Landtype Associations: Landtype Associations are formed by intersecting vegetation series or groups of vegetation series with Landform Associations.

Topography:
The following tables represent the average conditions for the Landform Association. Only lands within and adjacent to National Forest System Lands were mapped by this project. The entire EPA Level III Ecoregion is not covered by this mapping.

The percent of Landform Association (% of LfA) in bold in the table below refers to the percent of the Ecoregion represented by that Landform Association. The (% of LfA) numbers not in bold in the table below refer to the percent of each Landtype Association within the Landform Association.

Landform Association/Landtype Association	**% of LfA**	**Mean % Slope**	**Minimum Elevation (m)**	**Maximum Elevation (m)**	**Mean Elevation (m)**	**% Northerly Aspect (226° - 134°)**	**% Southerly Aspect (135° - 225°)**
Angulate Glacial Mountains	**2.2%**	**66**	**709**	**1419**	**1065**	**75%**	**25%**
Angulate Glacial Mountains, Douglas-Fir	0.1%	115	908	1382	1151	16%	84%
Angulate Glacial Mountains, Douglas-Fir - Subalpine Fir	0.0%	65	1022	1155	1078	40%	60%
Angulate Glacial Mountains, Mountain Hemlock	2.8%	68	1055	1573	1314	90%	10%
Angulate Glacial Mountains, Mountain Hemlock - Western Hemlock	0.4%	77	763	1447	1144	54%	46%
Angulate Glacial Mountains, Pacific Silver Fir	4.9%	58	699	1324	1010	86%	14%
Angulate Glacial Mountains, Pacific Silver Fir - Douglas-Fir	0.5%	62	763	1346	1088	79%	21%
Angulate Glacial Mountains, Parkland	0.1%	89	1138	1671	1387	63%	37%
Angulate Glacial Mountains, Parkland - Subalpine Fir	0.5%	70	793	1675	1456	86%	14%
Angulate Glacial Mountains, Subalpine Fir - Parkland - mix	0.3%	55	771	1343	1057	81%	19%
Angulate Glacial Mountains, Western Hemlock	89.5%	63	277	1396	776	65%	35%
Angulate Glacial Mountains, Western Hemlock - Mountain Hemlock	0.9%	77	812	1615	1331	91%	9%

Climate:

Landtype Assocation	Mean Annual Precipitation (mm)	Mean Annual Temperature °C	AET/PET Ratio July, Aug, Sept
Glacial High Mountains	**2716**	**6**	**0.55**
Glacial High Mountains, Douglas-Fir	1189	7	0.61
Glacial High Mountains, Mountain Hemlock	3387	5	0.52
Glacial High Mountains, Mountain Hemlock - Pacific Silver Fir - mix	2256	5	0.52
Glacial High Mountains, Pacific Silver Fir	2749	7	0.56
Glacial High Mountains, Pacific Silver Fir - Rock	3408	5	0.45
Glacial High Mountains, Parkland	2976	5	0.51
Glacial High Mountains, Subalpine Fir	1491	6	0.44
Glacial High Mountains, Subalpine Fir - Pacific Silver Fir	1416	6	0.49
Glacial High Mountains, Subalpine Fir - Western Hemlock	1342	6	0.52
Glacial High Mountains, Western Hemlock	2684	8	0.58
Glacial High Mountains, Western Hemlock - Mountain Hemlock	3502	6	0.61
Glacial High Mountains, Western Hemlock - Pacific Silver Fir	3858	7	0.60

The ratio of Actual Evapotranspiration to Potential Evapotranspiration (AET/PET) is used as a broad-scale indicator of potential drought stress. We obtained modeled actual and potential evapotranspiration datasets from the Numerical Terradynamic Simulation Group at the University of Montana (http://www.ntsg.umt.edu/project/mod16) for a 30 year climate average. AET/PET ratio in the table above is based on a scale of zero to one. A value closer to 1 means the vegetation is transpiring close to its potential. A value farther from 1means that the Actual Evapotranspiration is below potential based on this climatic zone (Ringo, et. al. 2016 in draft).