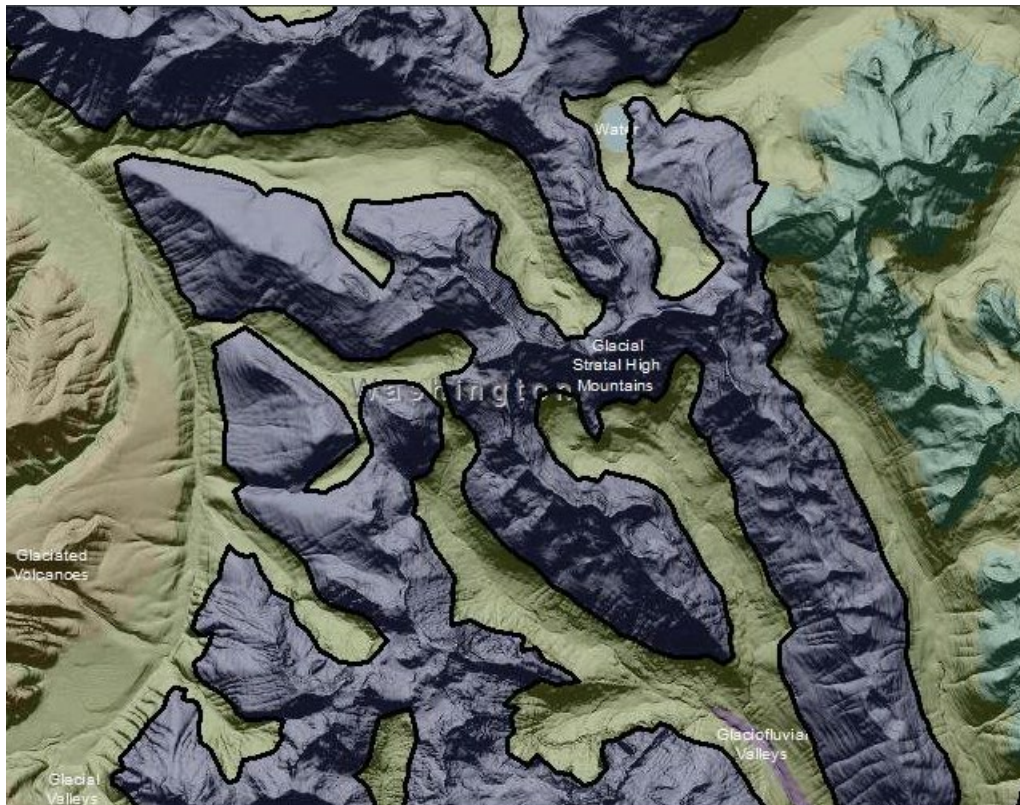


## Cascades Glacial Stratal High Mountains

**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 Stratal High Mountains



**Glacial Stratal 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. These areas have morphologies which reflect the underlying rock structure, which is exposed as a

consequence of degradation or denudation of an upland area by glacial and, to a lesser extent, hillslope processes. Glacial sculpting of the mountains reveals obvious layering of the underlying rock structure principally expressed as dip and anti-dip slopes. Synonymous terms used for these features are cuesta and cuestaform. Anti-dip slopes are benchy, rocky and relatively steep slopes. Following the colluvium downhill on an anti-dip slope you find a repeating pattern of bedrock outcrops with intervening areas of accumulated sediment. Habitat and vegetation distribution corresponds to this pattern. Dip slopes, on the other hand, are broad plains with shallow soils and broad expanses of exposed rock. Water routing across this Landform Association is chiefly sheetwash that is slope dependent. Potential vegetation and habitat are sparse across the sloping plains on rock, whereas vegetation is dense in the cirques and small valleys.

This Landform Association has a limited 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	Mean % Slope	Minimum Elevation (m)	Maximum Elevation (m)	Mean Elevation (m)	% Northerly Aspect (226° - 134°)	% Southerly Aspect (135° - 225°)
<b>Glacial Stratal High Mountains</b>	<b>60</b>	<b>926</b>	<b>1627</b>	<b>1291</b>	<b>71%</b>	<b>29%</b>
Glacial Stratal High Mountains, Mountain Hemlock	52	1254	1699	1495	87%	13%
Glacial Stratal High Mountains, Mountain Hemlock - Pacific Silver Fir	53	1094	1789	1487	90%	10%
Glacial Stratal High Mountains, Pacific Silver Fir	62	917	1687	1330	77%	23%
Glacial Stratal High Mountains, Pacific Silver Fir - Western Hemlock	58	1001	1695	1362	63%	37%
Glacial Stratal High Mountains, Parkland - Mountain Hemlock	64	1246	1798	1587	87%	13%
Glacial Stratal High Mountains, Western Hemlock	61	743	1479	1100	63%	37%

**Climate:**

Landtype Association	Mean Annual Precipitation (mm)	Mean Annual Temperature °C	AET/PET Ratio July, Aug, Sept
<b>Glacial Stratal High Mountains</b>	<b>1791</b>	<b>6</b>	<b>0.53</b>
Glacial Stratal High Mountains, Mountain Hemlock	1832	5	0.53
Glacial Stratal High Mountains, Mountain Hemlock - Pacific Silver Fir	1757	5	0.53
Glacial Stratal High Mountains, Pacific Silver Fir	1819	6	0.52
Glacial Stratal High Mountains, Pacific Silver Fir - Western Hemlock	1749	5	0.55
Glacial Stratal High Mountains, Parkland - Mountain Hemlock	1814	5	0.48
Glacial Stratal High Mountains, Western Hemlock	1791	6	0.53

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 1 means that the Actual Evapotranspiration is below potential based on this climatic zone (Ringo, et. al. 2016 in draft).