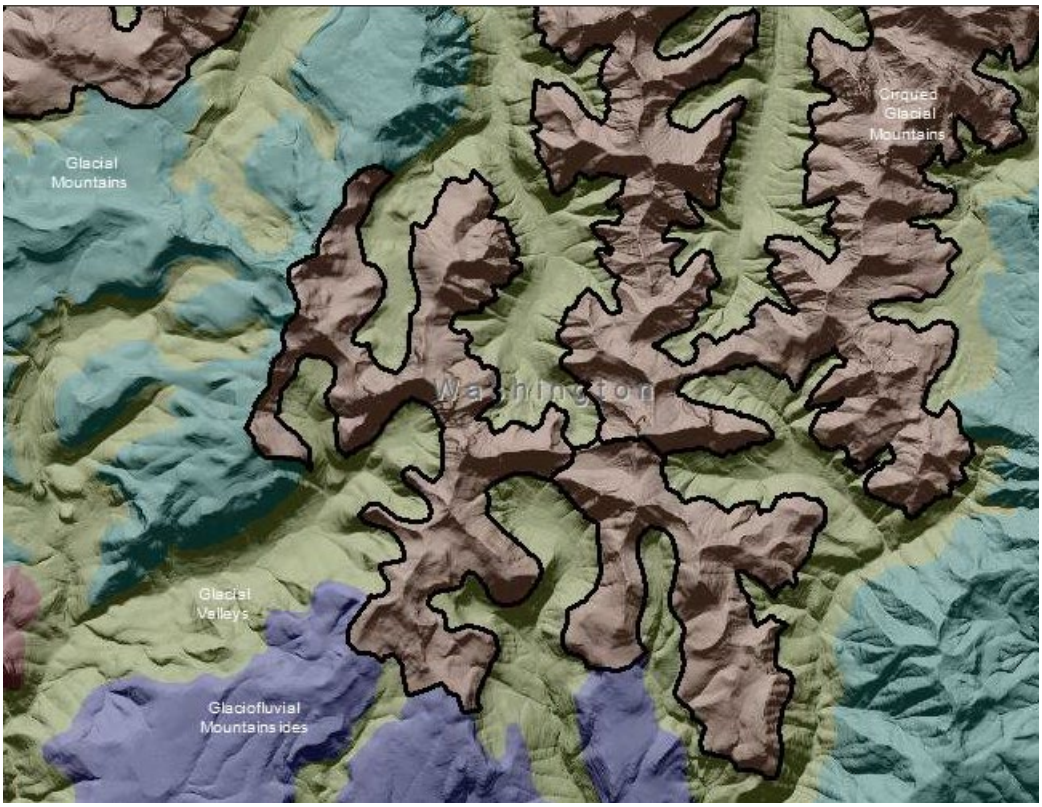
East Cascades Cirqued Glacial High Mountains

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: Cirqued Glacial Mountains



Cirqued Glacial Mountains are mountainous areas with lower relief than Cirqued Glacial High Mountains. They have obviously been sculpted by both current and past glaciation. Cirque features are semi-circular bowl like excavation in a hanging valley or the head of a valley. An aerial view of a cirque shows a horseshoe like shape with the open end of the shoe pointing away from the steep headwall and

surrounding side slopes. In the Cirqued Glacial Mountain Landform Associations, adjacent cirques have failed to coalesce into a basin and have formed spectacular arêtes and impressive relief in the sculpted mountainsides. These areas will lack the cirque lakes and meadows found in closed cirque basin landscapes.

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	**% of LfA**	**Mean % Slope**	**Minimum Elevation (m)**	**Maximum Elevation (m)**	**Mean Elevation (m)**	**% Northerly Aspect (226° - 134°)**	**% Southerly Aspect (135° - 225°)**
Cirqued Glacial Mountains	**0.1%**	**40**	**1276**	**1614**	**1450**	**66%**	**34%**
Cirqued Glacial Mountains, Grand Fir	12.4%	40	1122	1547	1353	60%	40%
Cirqued Glacial Mountains, Mountain Hemlock	75.2%	34	1362	1782	1582	74%	26%
Cirqued Glacial Mountains, Pacific Silver Fir - Mountain Hemlock	0.2%	44	1148	1365	1223	100%	0%
Cirqued Glacial Mountains, Pacific Silver Fir - Subalpine Fir	1.4%	44	1241	1673	1453	52%	48%
Cirqued Glacial Mountains, Parkland - Subalpine Fir	3.6%	28	1772	1957	1887	56%	44%
Cirqued Glacial Mountains, Western Hemlock	4.9%	52	1101	1460	1259	52%	48%
Cirqued Glacial Mountains, Western Hemlock - Pacific Silver Fir	2.3%	38	1311	1507	1431	72%	28%

Climate:

Landtype Assocation	**Mean Annual Precipitation (mm)**	**Mean Annual Temperature °C**	**AET/PET Ratio July, Aug, Sept**
Cirqued Glacial Mountains	**1015**	**5**	**0.37**
Cirqued Glacial Mountains, Grand Fir	1015	5	0.36
Cirqued Glacial Mountains, Mountain Hemlock	1015	4	0.33
Cirqued Glacial Mountains, Pacific Silver Fir - Mountain Hemlock	1012	5	0.42
Cirqued Glacial Mountains, Pacific Silver Fir - Subalpine Fir	1049	5	0.35
Cirqued Glacial Mountains, Parkland - Subalpine Fir	1008	3	0.31
Cirqued Glacial Mountains, Western Hemlock	996	5	0.42
Cirqued Glacial Mountains, Western Hemlock - Pacific Silver Fir	1023	5	0.38

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).