

LiDAR Product Description Document

Terrain Metrics

Product Name: **DEM_Mosaic_1m**

Alias: 1m resolution Digital Elevation Model raster

Description: DEM rasters are generally used as inputs for other GIS processing. This mosaic DEM was used as an input for all 1m products listed below. The DEM can also be used as the base for any Visual Impact Assessment modelling.

Recommended Classification Symbology: N/A

Product Name: **DEM_Mosaic_20m**

Alias: 20m resolution Digital Elevation Model raster

Description: DEM rasters are generally used as inputs for other GIS processing. This mosaic DEM was used as an input for all 20m products listed below.

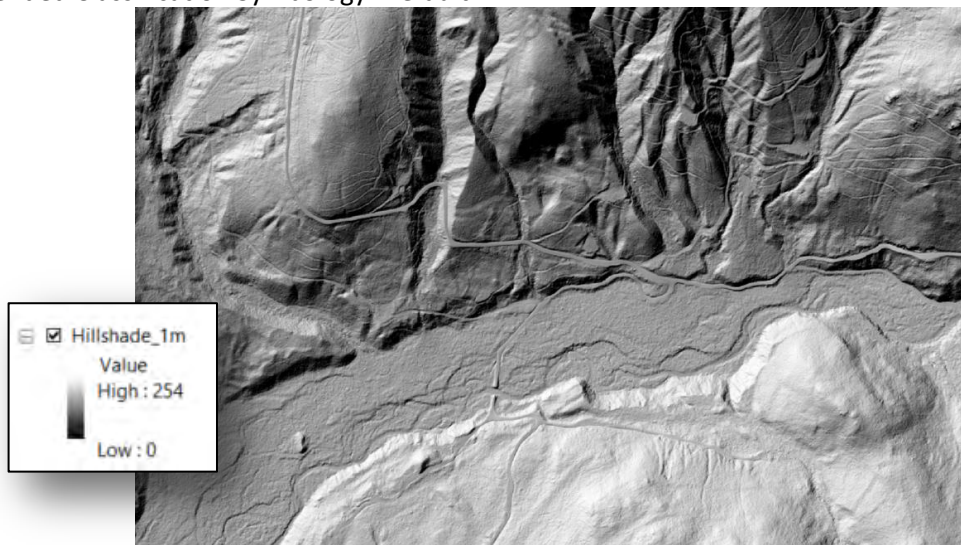
Recommended Classification Symbology: N/A

Product Name: **Hillshade_1m**

Alias: 1m resolution Hillshaded digital elevation model

Description: Created from the 1m DEM above, this is a shaded relief raster based on an illumination source angle and shadows. The illumination source for this product was at an azimuth of 315 degrees and altitude angle of 45 degrees. This product is only a visual representation of the DEM and can only be used for mapping. It does not have any DEM values.

Recommended Classification Symbology: Default

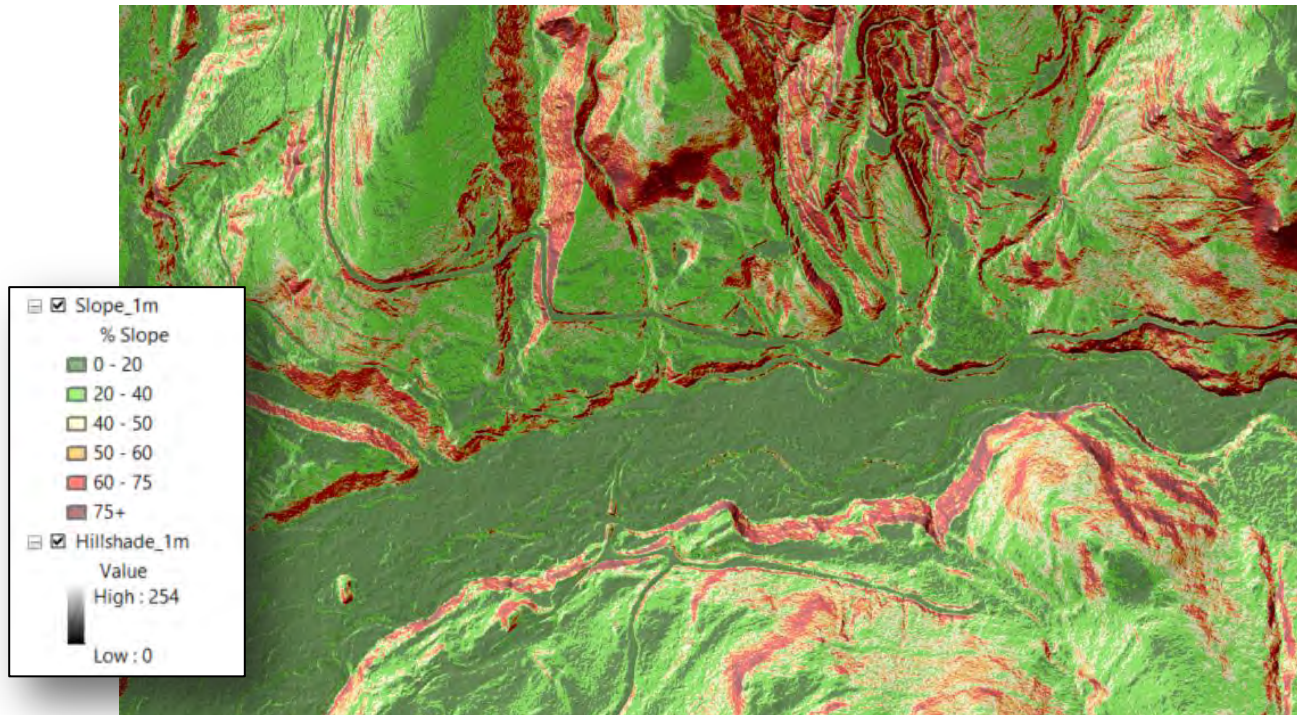


Product Name: **Slope_1m**

Alias: 1m resolution slope raster

Description: Measure of percent (%) slope gradient (rate of maximum change in z-value) in each cell of the raster.

Recommended Classification Symbology: Classified into slope categories/ranges. Two layer files have been provided that can be used for classification. For maximum visual effect, display the slope raster with 50% transparency on top of the Hillshade.



Product Name: **Slope_20m**

Alias: 20m resolution slope raster

Description: Measure of percent (%) slope gradient (rate of maximum change in z-value) in each cell of the raster.

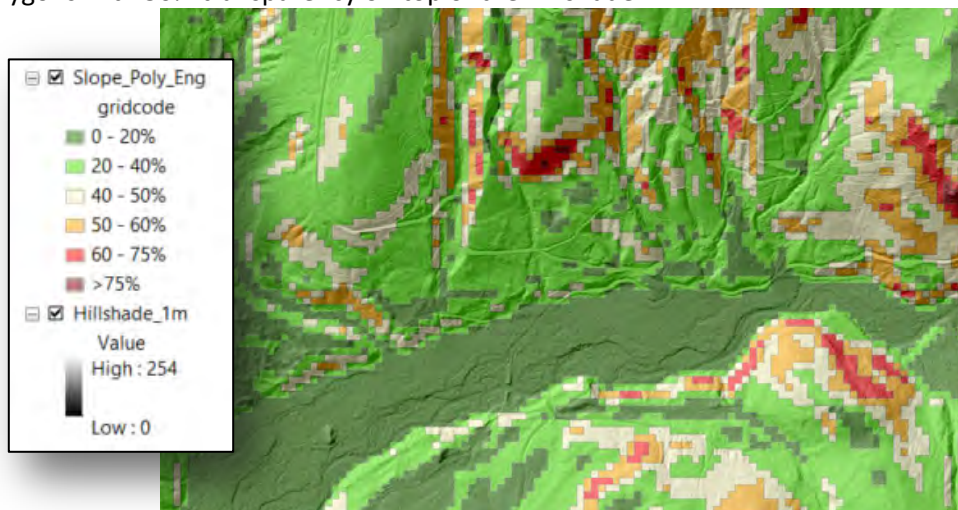
Recommended Classification Symbology: Classified into slope categories/ranges. Two layer files have been provided that can be used for classification. For maximum visual effect, display the slope raster with 50% transparency on top of the Hillshade.

Product Name: **Slope_Poly_Eng**

Alias: Slope polygons – Engineering classification

Description: A vectored version (polygons) of the above 20m Slope Raster. This has been created and classified based on the provided “engineering slope categories” of 0-20%, 20-40%, 40-50%, 50-60%, 60-75%, and >75%.

Recommended Classification Symbology: Classify by unique value based on the gridcode attribute. A layer file has been provided that can be loaded to automate this classification. For maximum visual effect, display the slope polygons with 50% transparency on top of the Hillshade.

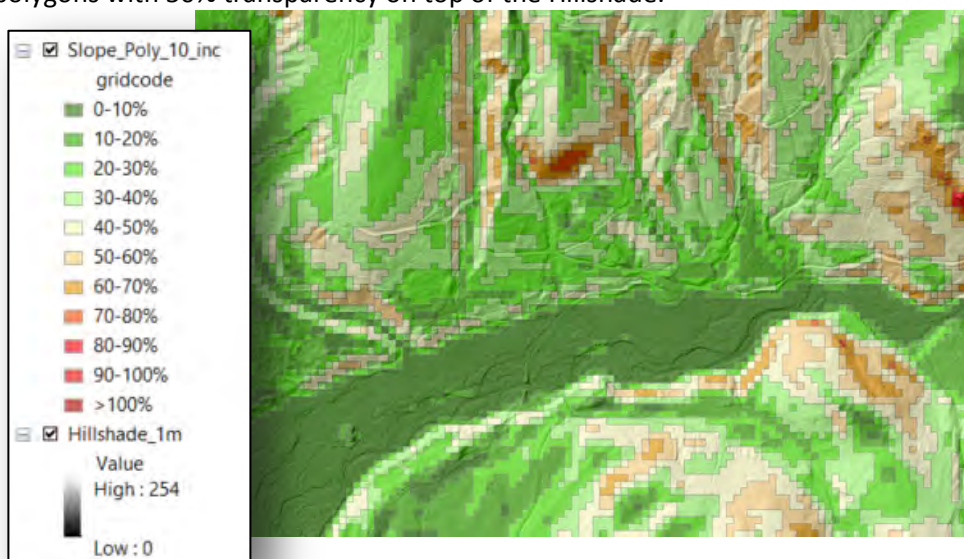


Product Name: **Slope_Poly_10_inc**

Alias: Slope polygons – Classified at 10% increments

Description: A vectored version (polygons) of the above 20m Slope Raster. This has created and classified based on the provided “10% slope increments” of 0-10%, 10-20%, 20-30%..... 90-100%, and >100%.

Recommended Classification Symbology: Classify by unique value based on the gridcode attribute. A layer file has been provided that can be loaded to automate this classification. For maximum visual effect, display the slope polygons with 50% transparency on top of the Hillshade.



Product Name: **Aspect_20m**

Alias: 20m resolution topography aspect raster

Description: The aspect identifies the downslope direction of the maximum rate of change in value from each cell to its neighbors. Aspect can be thought of as the slope direction. The values of the raster are the compass directions of the aspect.

Recommended Classification Symbolology: Default. A layer file has been provided that defines the aspect by compass direction.



Product Name: **Curvature_20m**

Alias: 20m resolution terrain curvature raster

Description: This represents the curvature of the surface on a cell-by-cell basis, as fitted through that cell and its eight surrounding neighbors. A positive curvature indicates the surface is upwardly convex at that cell. A negative curvature indicates the surface is upwardly concave at that cell. A value of 0 indicates the surface is flat. The units are one hundredth (1/100) of a z-unit.

Recommended Classification Symbolology: N/A

Product Name: **Plan_Curve_20m**

Alias: 20m resolution planimetric terrain curvature raster

Description: Same as above, however, the plan curvature is calculated perpendicular to the direction of the maximum slope. A positive curvature indicates the surface is upwardly convex at that cell. A negative curvature indicates the surface is upwardly concave at that cell. A value of 0 indicates the surface is flat. The units are one hundredth (1/100) of a z-unit.

Recommended Classification Symbolology: N/A

Product Name: **Profile_Curve_20m**

Alias: 20m resolution profile terrain curvature raster

Description: Same as above, however, the profile curvature is calculated based on the direction of the maximum slope. A positive curvature indicates the surface is upwardly convex at that cell. A negative curvature indicates the surface is upwardly concave at that cell. A value of 0 indicates the surface is flat. The units are one hundredth (1/100) of a z-unit.

Recommended Classification Symbolology: N/A

Hydrology

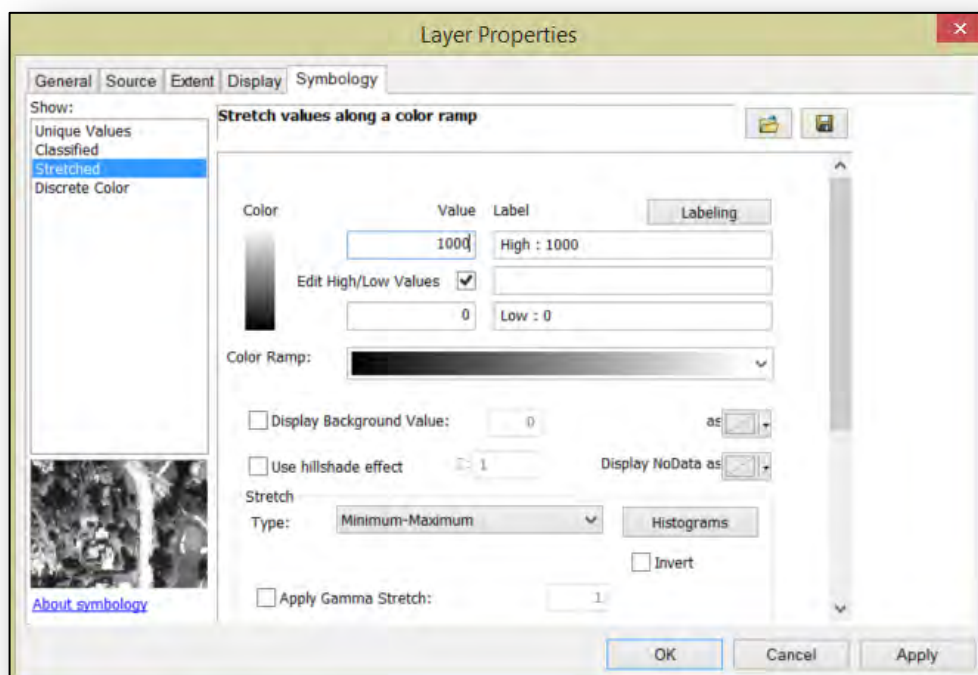
Product Name: **Accum_1m**

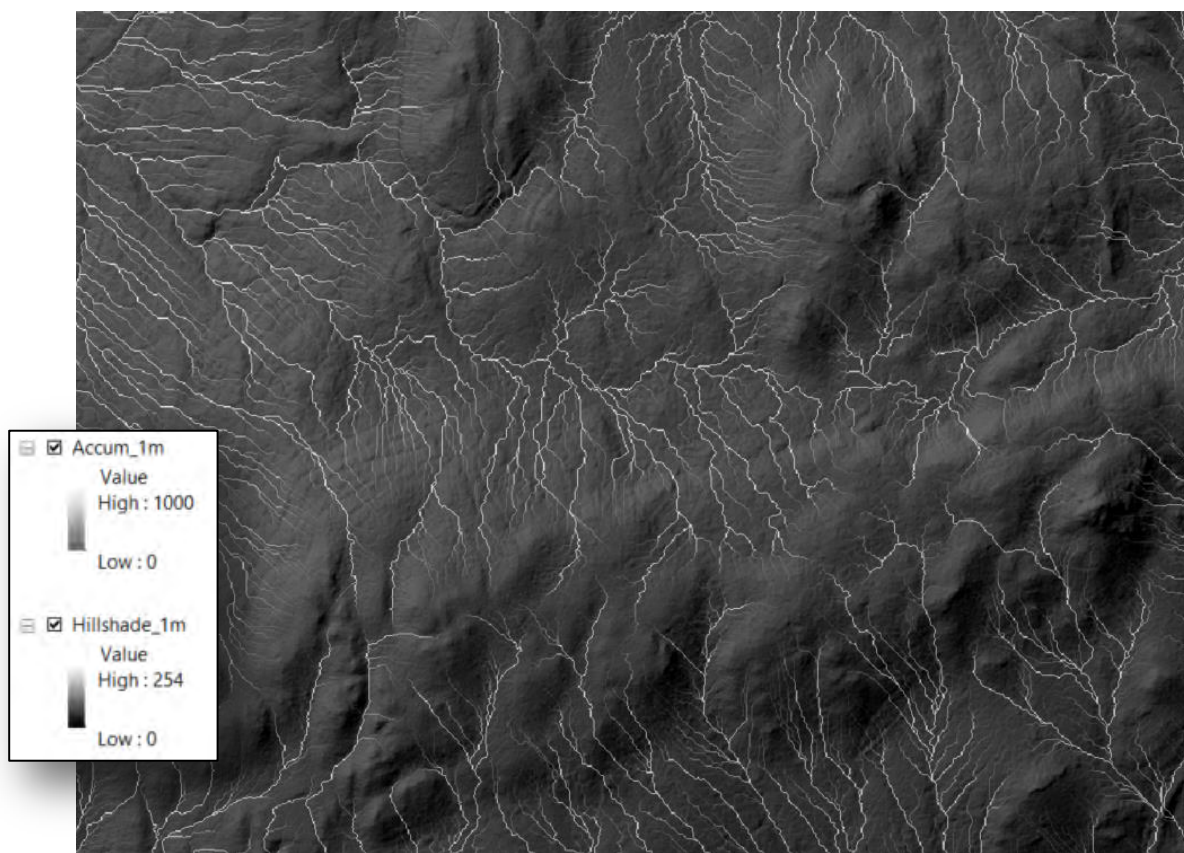
Alias: 1m resolution flow accumulation raster

Description: This is a raster of accumulated flow to each cell, as determined by accumulating the weight for all cells that flow into each downslope cell. The accumulated flow is based on the number of cells flowing into each cell in the output raster. Output cells with a high flow accumulation are areas of concentrated flow and can be used to identify stream channels. Output cells with a flow accumulation of zero are local topographic highs and can be used to identify ridges.

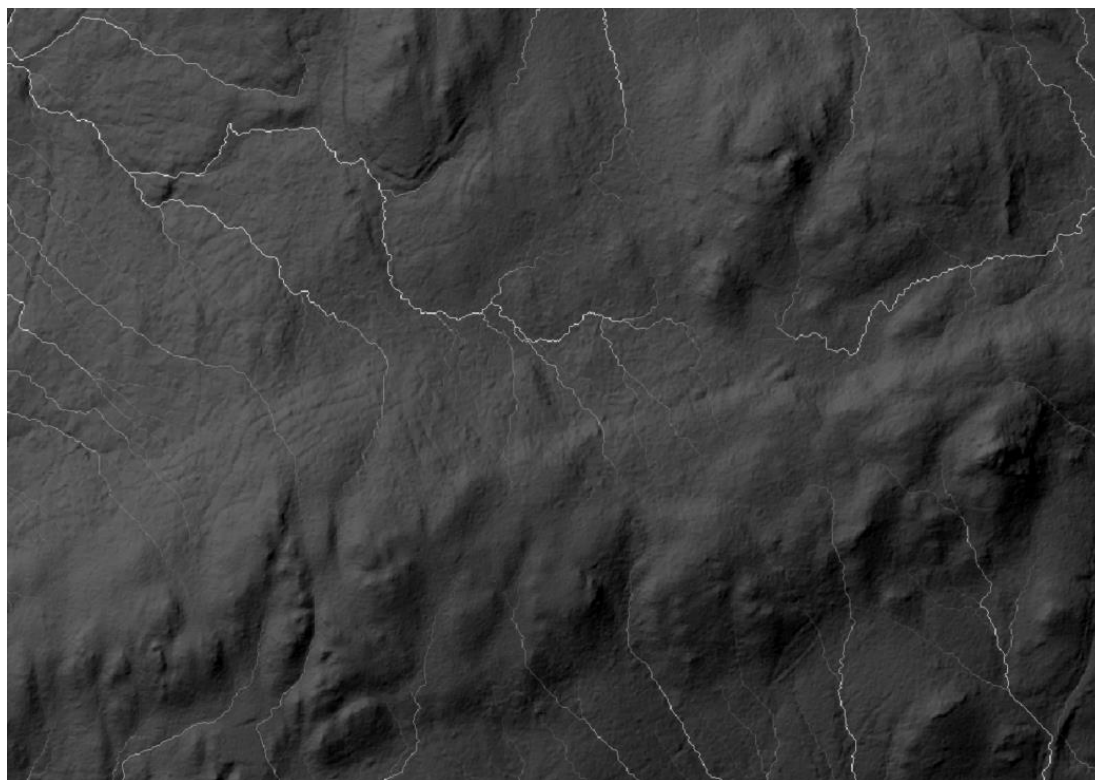
This product can also be a surrogate for catchment area. The raster resolution is 1m, thus, a cell with 10000 cells of accumulation could be considered to have a catchment area of 1 ha ($10000\text{m}^2 = 1\text{ha}$).

Recommended Classification Symbolology: Using a min-max stretched raster symbology, you can easily define how much 'flow' will be visible by adjusting the maximum value. A low number will display more 'flow', while a higher number will display less. For maximum visual effect, display the slope polygons with 50% transparency on top of the Hillshade.





1000 max value (0.1 ha catchment)



20000 max value (2 ha catchment)

Product Name: **Stream_Polyline**

Alias: Stream Polylines

Description: Potential stream locations based on the 1m Accumulation Raster with a defined catchment of 2ha's (20000 cells). It is important to understand that these are not field verified stream locations and are subject to error and will yield different results based on the local area geomorphology.

Recommended Classification Symbology: N/A

Product Name: **HWI**

Alias: 20m resolution Hillslope Wetness Index raster

Description: Concave, low gradient areas will gather water (low HWI values), whereas steep, convex areas will shed water (high HWI values). The Hillslope Wetness index uses Flow Direction and Flow Accumulation rasters as inputs. HWI values are unitless and will vary by landscape and DEM, but they typically range from 5 (very dry cells) to greater than 20 (very wet cells).

Recommended Classification Symbology: Threshold values are applied to the output raster, via classification, based on local knowledge, field characteristics, and observations of the local terrain's response to heavy precipitation and overland flow. Customized classifications and weighting schemes can be devised to better represent relative wetness of hillslopes in your study area.

