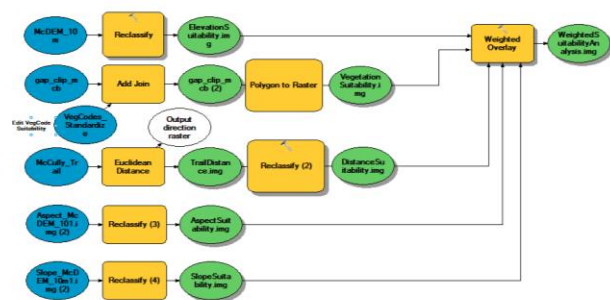


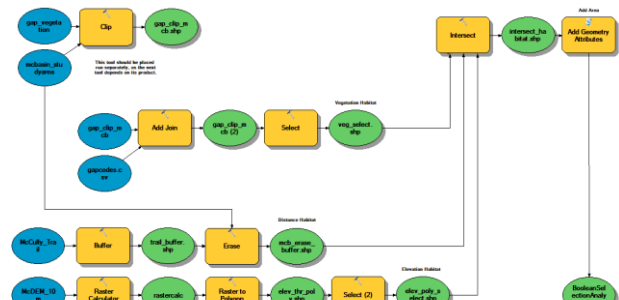
# Comparison of Analysis Methods

## Weighted Overlay and Boolean Selection

Over the last two labs, we used Model Builder within ArcMap 10.5 to construct a series of analysis models to determine site suitability for wolverine dens in the Eagle Cap Wilderness Area in Oregon, focusing on the region surrounding McCully Basin Trail. The two methods used were a Boolean model, which created using a series of queries and analysis to provide a simple yes or no answer of suitability, and a Weighted Overlay model that ranked how well each aspect contributed to suitability and how much it contributed.



1Weighted Overlay Model

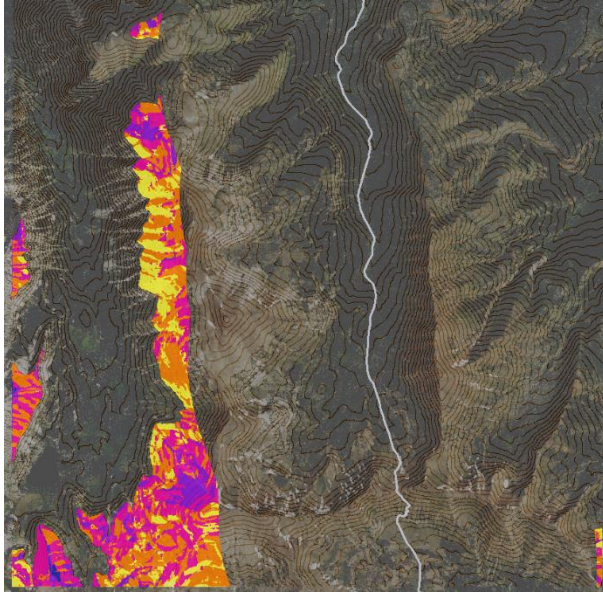


Boolean Selection Model

The Boolean model required that potential sites were at a minimum elevation of 8000 ft, were a minimum of 1.5 mi from the nearby trail, and that they would be located within the acceptable landcover types: Alpine-fell Snowfields or Subalpine Grasslands. While this model met the minimum requirements for likely denning habitat, it fails to provide detailed information of which habitats wolverine dens would thrive.

By using the Weighted Overlay method, we could obtain a more nuanced analysis. This model applied classifications to the input layers used in the Boolean model, in addition to including slope and aspect to better simulate the wolverines' denning preferences. Point values from 1-10 were assigned and then weighted to balance the importance of each contributing piece, then an intersect overlay is taken:

- Vegetation: Prefer Alpine Fell-Snowfield, then Subalpine Grassland and Montane Conifer (30%)
- Slope: Not less than 5 degrees, prefer between 10-30 degrees (30%)
- Aspect: Prefer N/NE, avoid S/SW (20%)
- Elevation: At least 8000 ft, prefer higher (10%)
- Distance: A minimum of 1.5 mi from trail, prefer greater (10%)



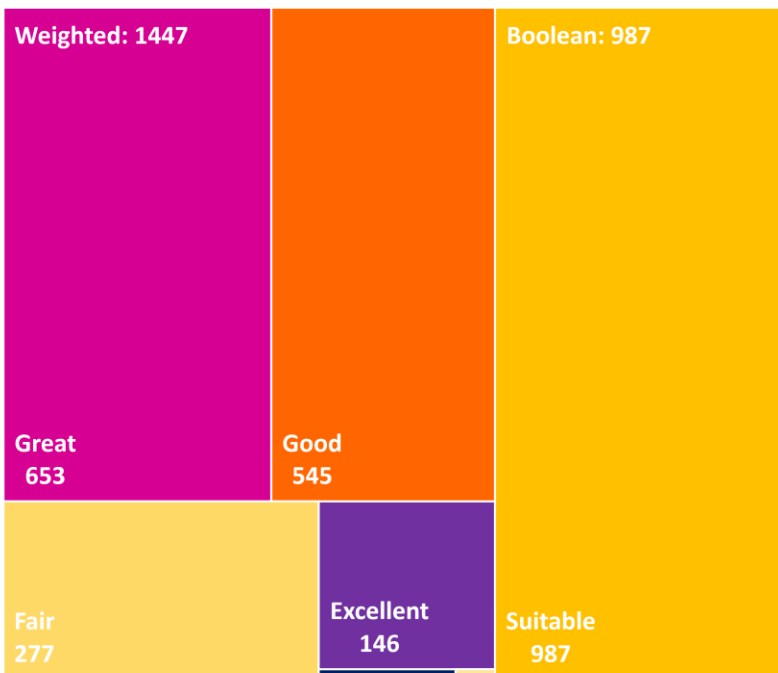
Weighted Overlay Output



Boolean Selection Output

The resulting outputs show similar characteristics – suitable habitat lies primarily on the ridge west of the trail, with small regions farther west and to the north. Much of the shape of the output remains the same, however the Weighted Overlay captures a larger area thanks to the addition of vegetation type.

## ACREAGE OF SUITABLE HABITATS



Further, the weighted overlay now delineates between various levels of suitability, indicated by progressively darker hues.

In total, the Weighted model captured 1447 acres of suitable habitat, in contrast with 987 using the Boolean model. The Weighted model can be divided into its parts, providing the area for each level of suitability. The category with the largest portion of land coverage is the third from highest, deemed “Great” (4) at 653 acres. “Good” (3) is next at 545, followed by “Fair” (2), 277 and “Excellent” (5), 146 acres. The two smallest levels are “Superior” (6) and “Minimal” (1) at 7 and 2 respectively.