Noah Tigner

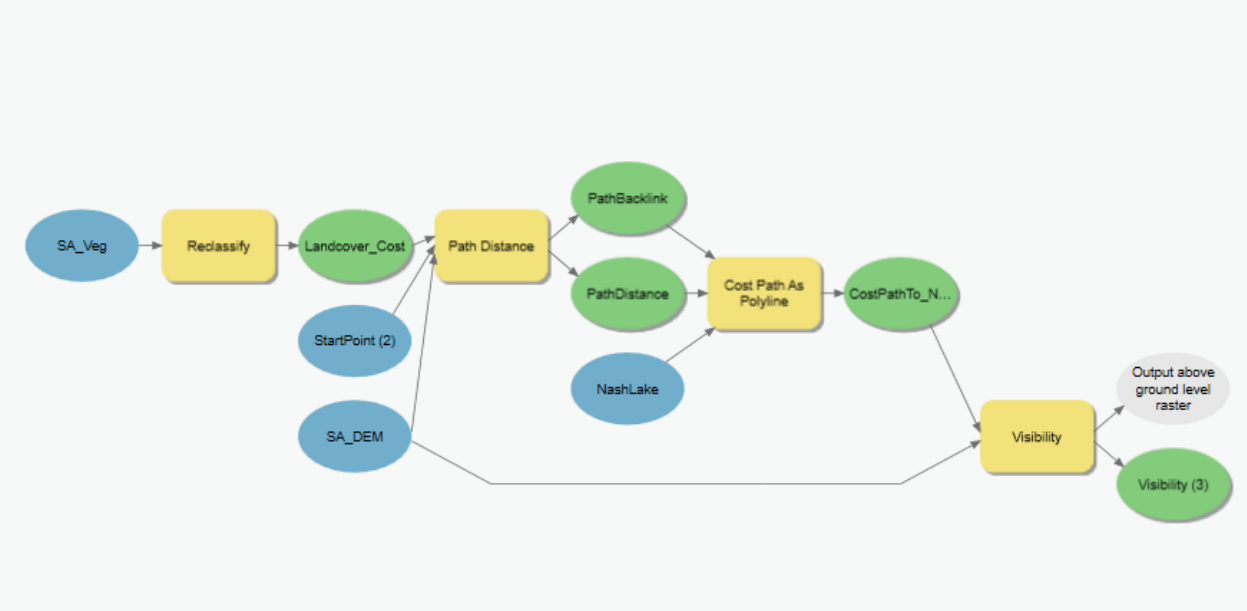
GIS II

06/02/20

Lab 4

1. The DEM layer shows the elevation of the Three Sisters area. The cell size is 32.79’ x 32.79’. Cell size is important because it defines how granular our analyses and graphics can be, as well as how much space and processing power are required. Thee are 6143 columns and 4952 rows in this dataset. This information can be found by looking at Layer Properties > Source > Raster Information in ArcGIS.
2. The combination of elevation information, slope information, and our vegetation cost surface is enough to represent how difficult it is to travel in an area (or across grid cells). Surfaces that are most difficult to cross include bodies of water, cliffs, steep ridges, dense forest, etc. These factors are all reflected in the information provided.
3. Since we used the frequency type of analysis for the visibility tool, the attribute table for the output raster tells us the number of times that each cell location in the input raster (SA_DEM) can be seen by the observation line (CostPathTo_NashLake). Cells with the highest Value are visible the most frequently.
4. Trail 3330 – Walter Creek and Tail 3529 – Olallie (near and to the south of the path to Nash Lake) should be searched, because they either run along or bisect the areas of highest visibility. USDA Willamette National Forest Road with the ID 67 bisects the path to Nash Lake and is in an area of moderately high visibility. Additionally, Trail 3527 – Nash Lake should be searched, because it runs along an area of relatively high visibility and ends at the anticipated end location of Nash Lake.

5. I would prioritize searching the area directly west of the mushroom hunter's last known location. This area has the highest density of highly-visible land, as shown in the Basemap and Visibility map. The next place to search would be along the Nash Lake Trail, which runs parallel to the Least Cost path to the hiker's expected end location, as shown by the Visibility Map. The Least Cost Path Map shows that the least cost path primarily runs through Forest and Shrublands. High places with less forest cover are therefore good places to search, which is reflected by the Visibility Map.
6. After data was collected, the first step in this analysis was to reclassify the land cover dataset, placing a higher cost value on bodies of water and a moderate cost on types of land deemed more difficult to cross. This was then fed into a Path Distance tool which created a Least Cost Path, the path most that the terrain and elevation data suggests the mushroom hunter is most likely to take. We then ran a visibility analysis on the DEM and Least Cost path in order to find which areas had the most visibility along the path. These areas are both places that the mushroom hunter might choose to go, and places that Search and rescue might want to begin their search. One limitation of the data used is that the land cover data might not reflect the season in which the mushroom hunter was lost. For example, if the mushroom hunter was lost in the winter, the land cover dataset would be of little use, since the Three Sisters Area would be almost completely covered in snow and ice. This could be remedied by using more topical data, or by comparing the analysis results with Google Earth or current satellite imagery.



Analysis Model Diagram

Value	New
Water	400
Recreation - Developed Open Space	0
Low Density Residential	0
Developed, Medium Intensity	0
Pasture/Hay	0
Cultivated Crops	0
Rock or Lava	50
Emergency Herbaceous Freshwater Wetlands	50
Deciduous Forest	10
Evergreen Forest	10
Mixed Forest	10
Perennial Grasslands/Herbaceous	0

Mixed Forest	10
Perennial Grasslands/Herbaceous	0
Short Shrubland	0
Tall Shrubland	0
Shrub Steppe	0
Burn	50
Transitional Forest	10
Riparian Forest or Tall Shrubland	10
Palustrine Forested Wetland	20
Wetlands	20
Perennial Ice/Snow	50
NODATA	0

Remap Table for Vegetation reclassification