

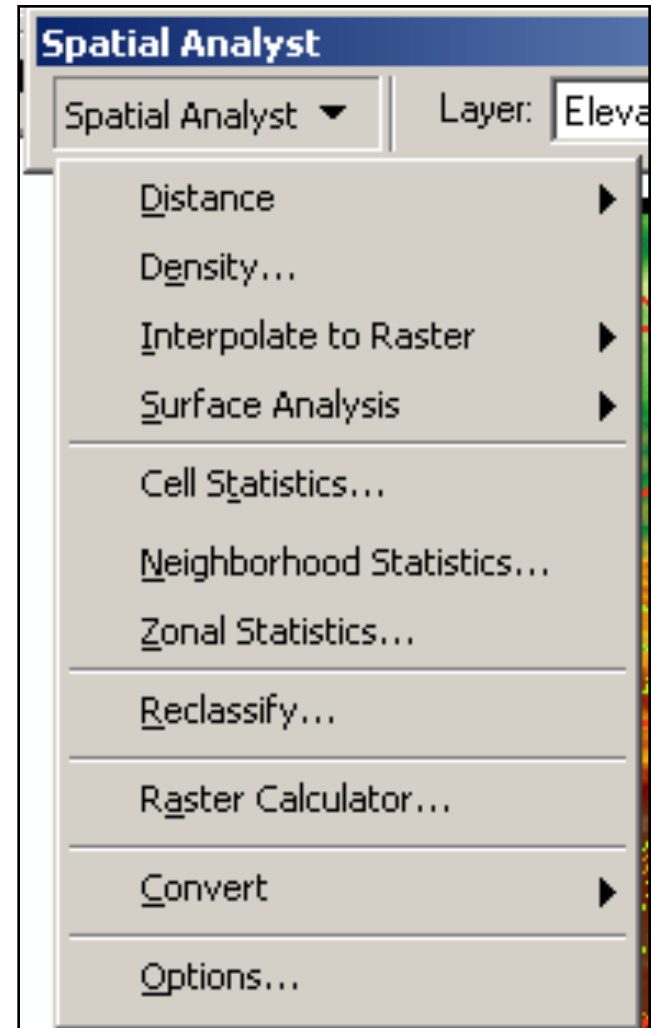
# Raster Analysis—Part 2

# Desired Learning Objectives

- Describe application of the following raster functions:
  - Reclassification
  - Surface functions
  - Distance functions
  - Density functions
  - Interpolation
  - Neighborhood functions
  - Zonal functions

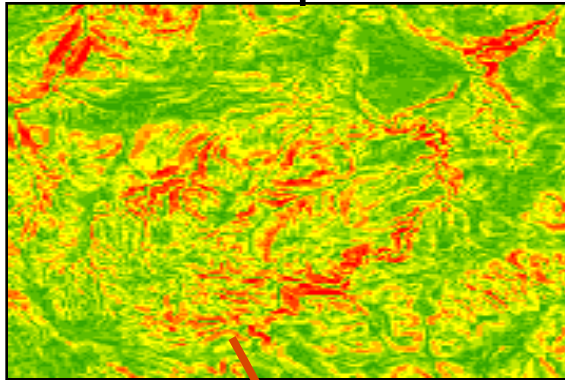
# Other raster analysis techniques

- Reclassification
- Surface functions
- Distance functions
- Density functions
- Interpolation
- Neighborhood functions
- Zonal functions

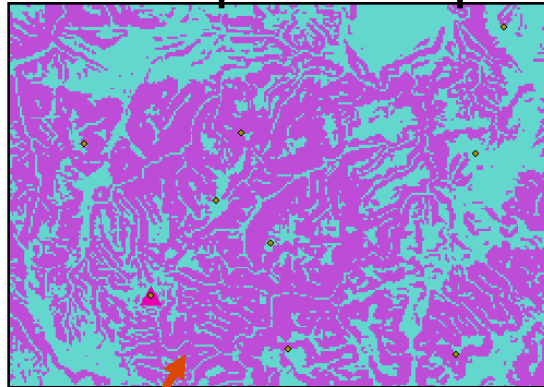


# Reclassify

Slope



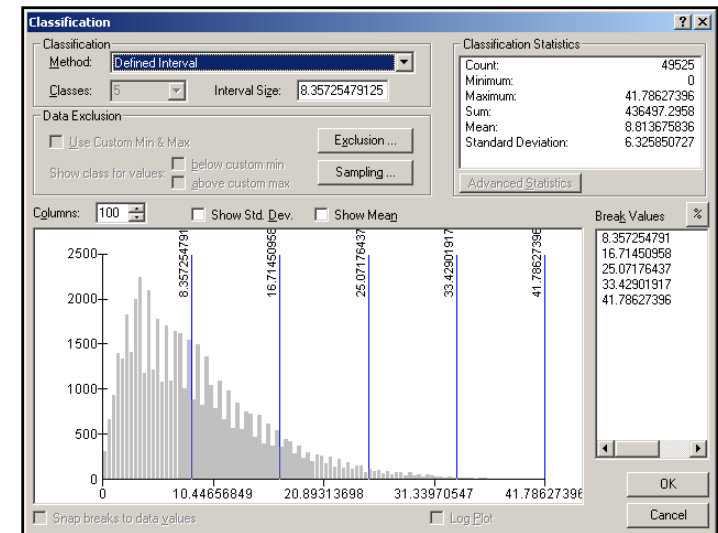
Hi slope/lo slope



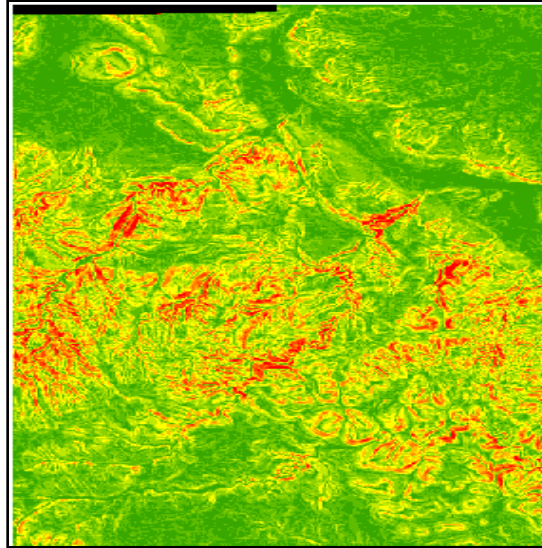
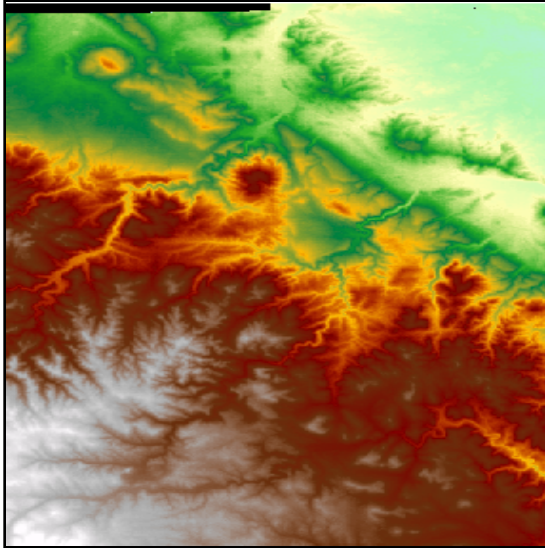
Convert one set of grid values to another

Manual or classify

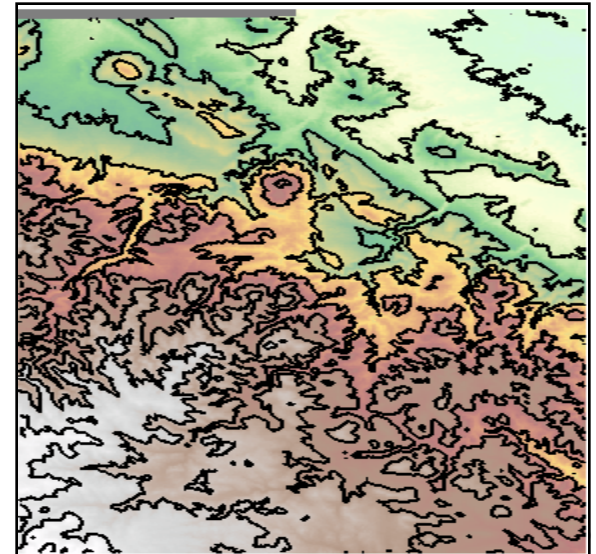
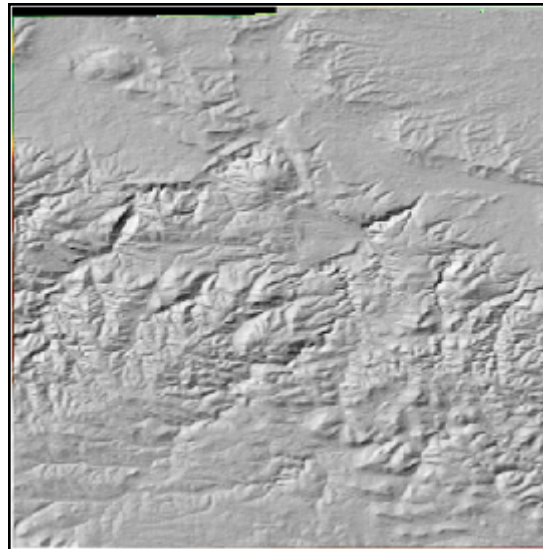
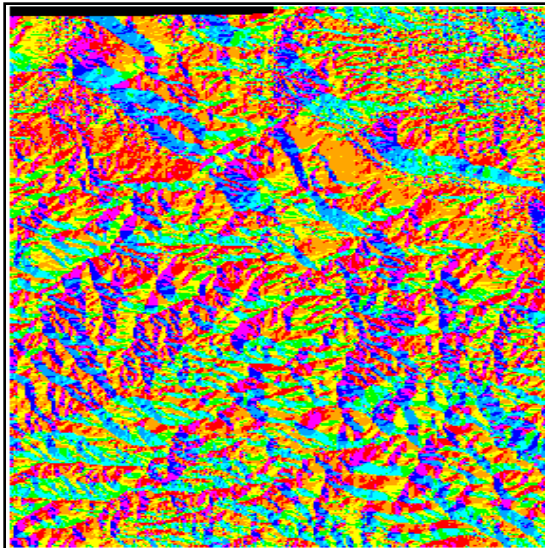
Old values	New values
0 - 10	1
10 - 90	0
NoData	NoData



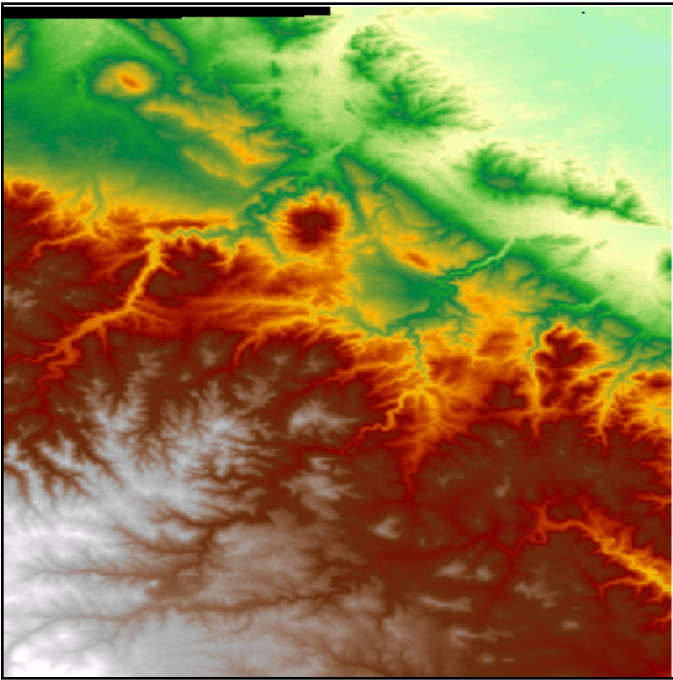
# Surface analysis



DEM  
Slope  
Aspect  
Hillshade  
Contouring



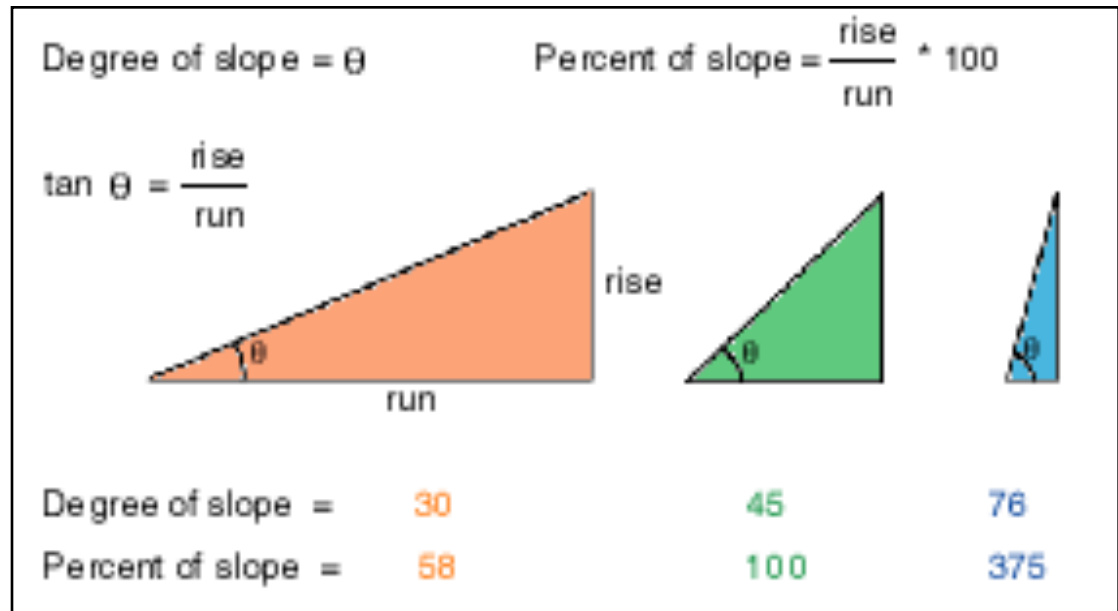
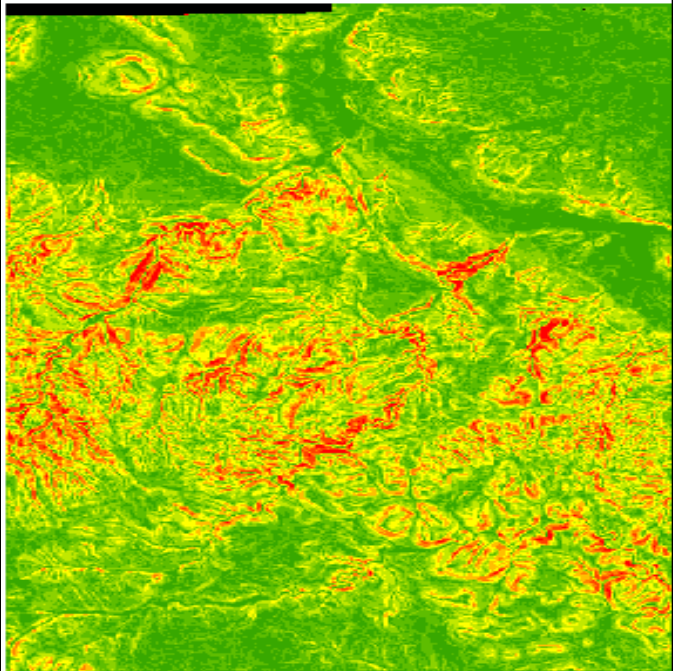


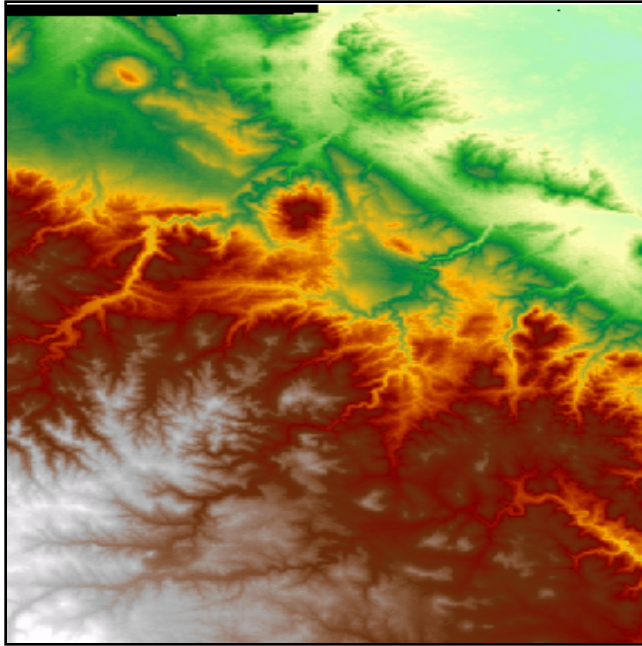


# Slope function

Calculates slope of the surface based on surrounding cells

Can be expressed in degrees or percent



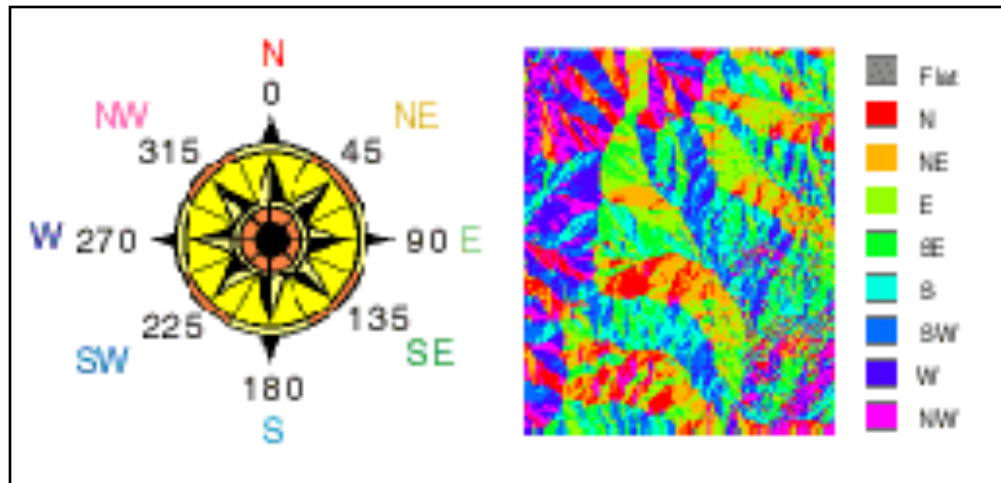
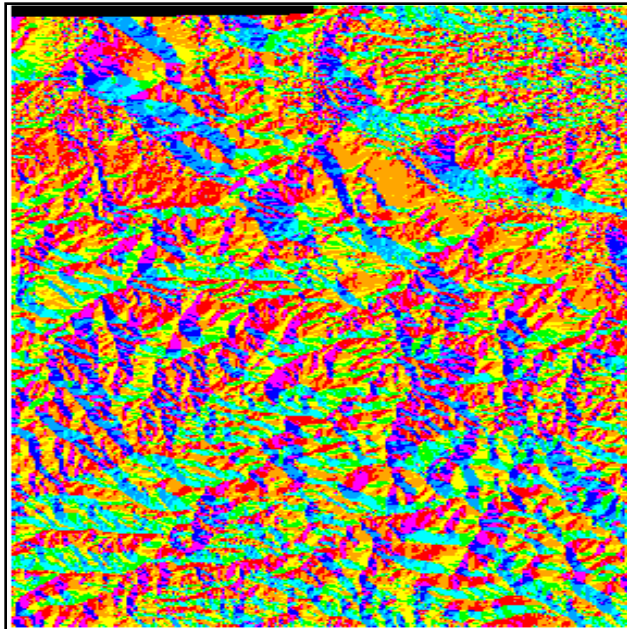


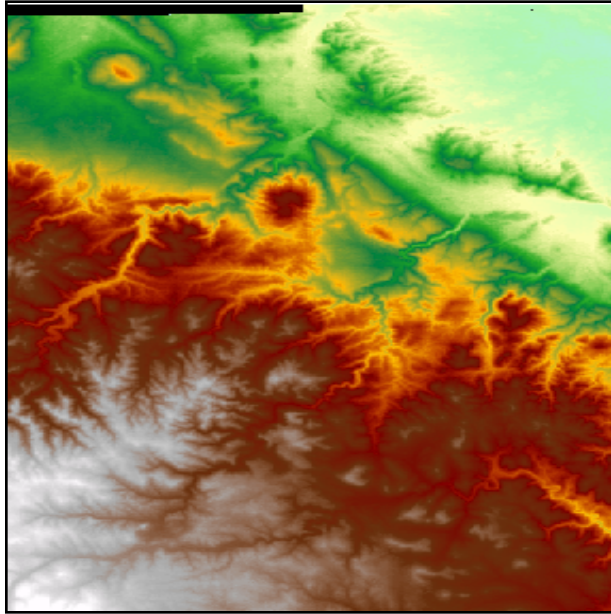
# Aspect function

Calculates direction of steepest slope, e.g. which way the slope “faces”

Value represents direction from 0 degrees to 360 degrees, where 0/360 is North

Flat areas are assigned a -1 value

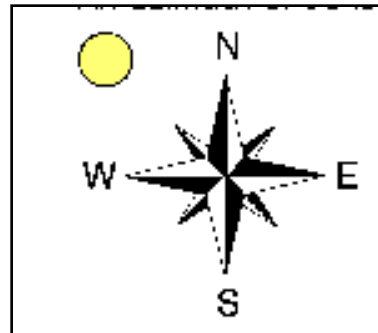
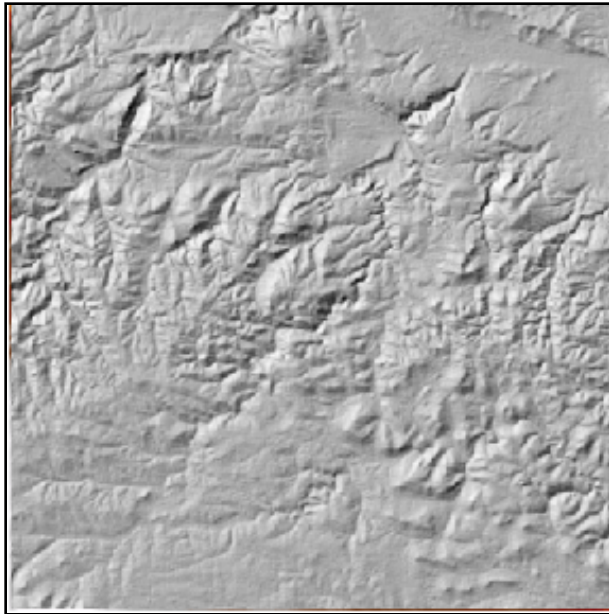




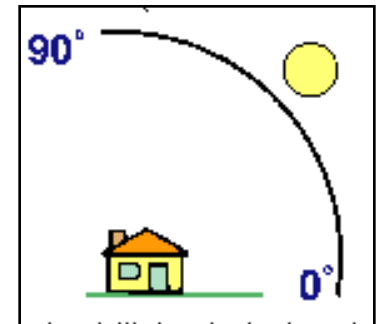
# Hillshade

Calculates the brightness or illumination of a surface from a specified light source

Applications include terrain display and modeling satellite reflectance



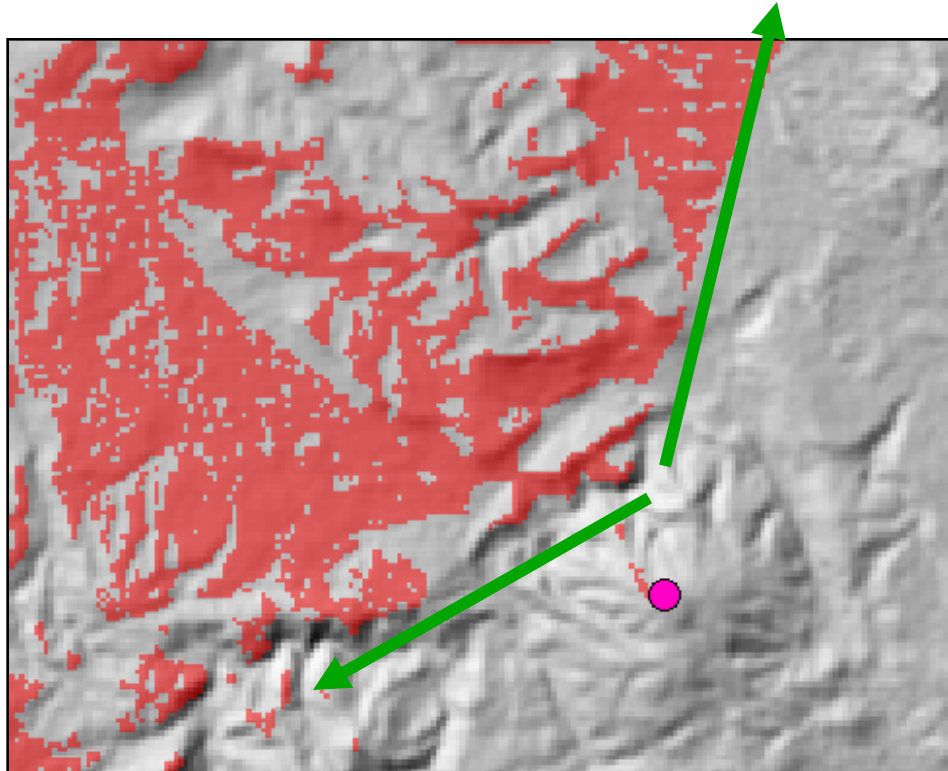
**Azimuth** is direction of illumination source (315 by default)



**Altitude** is the angle of the source above the horizon (45 deg)



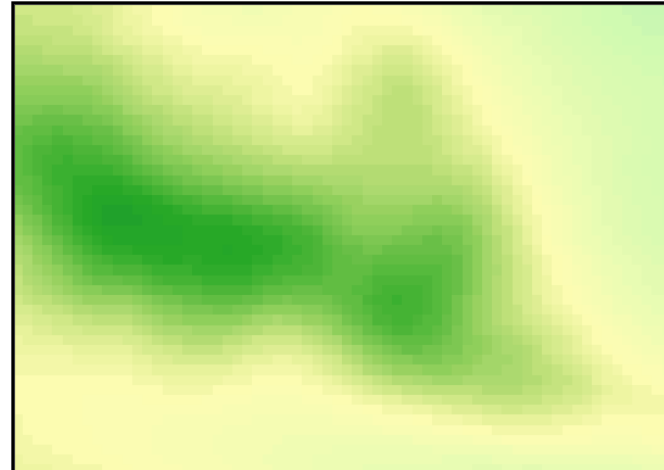
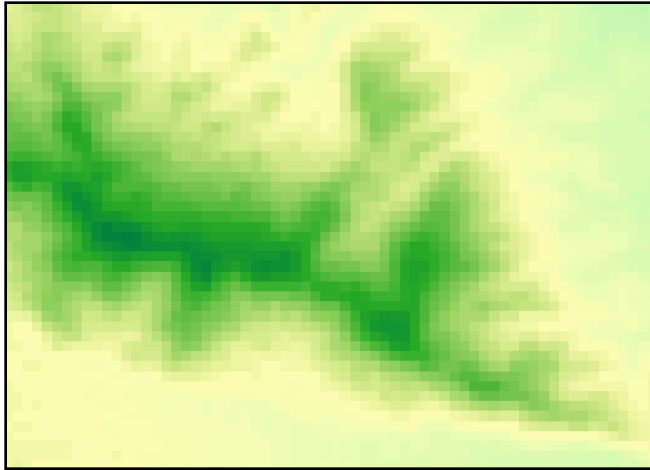
# Viewshed analysis



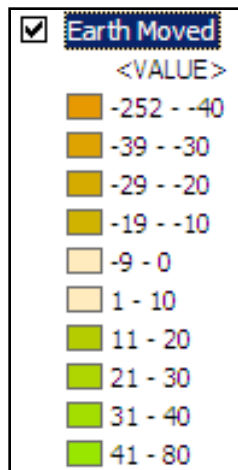
- Calculate areas visible from a set of observation points

Additional parameters are available for the tool version, such as the horizontal angle included

# Cut and fill on a site



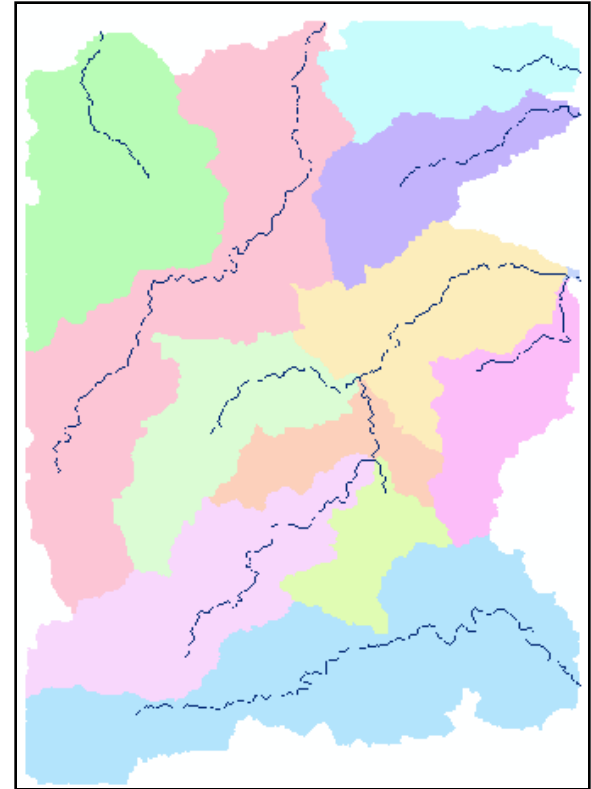
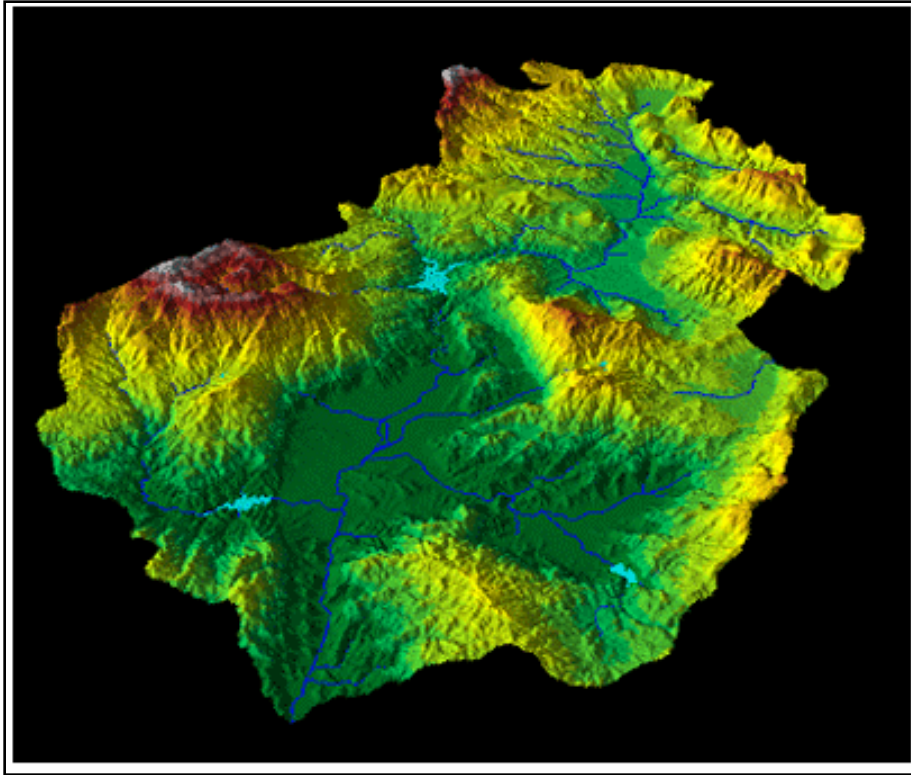
[Initial surface] – [final surface]



Cut

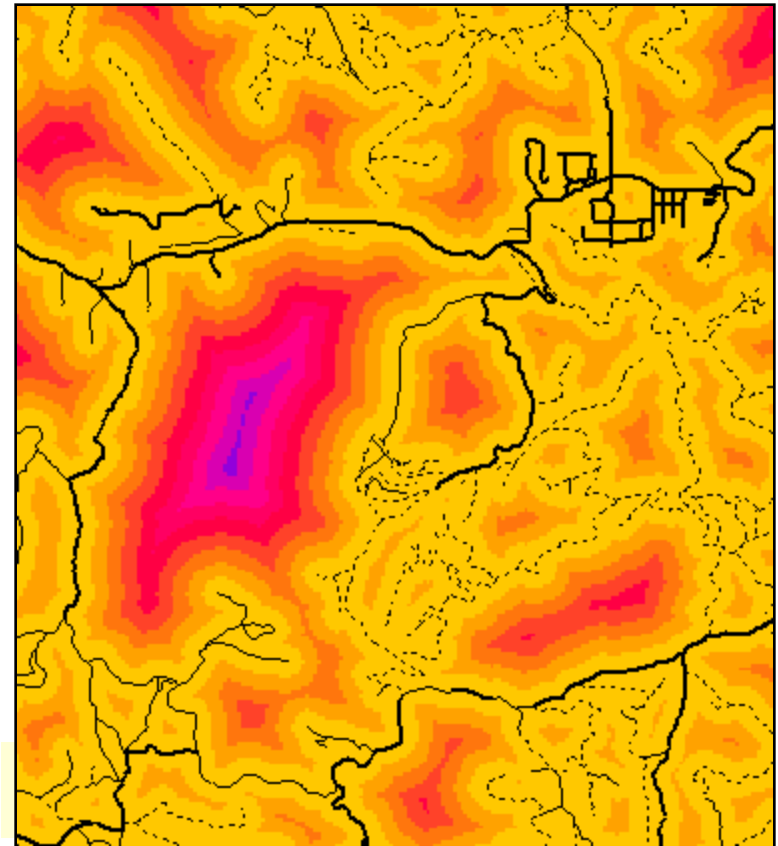
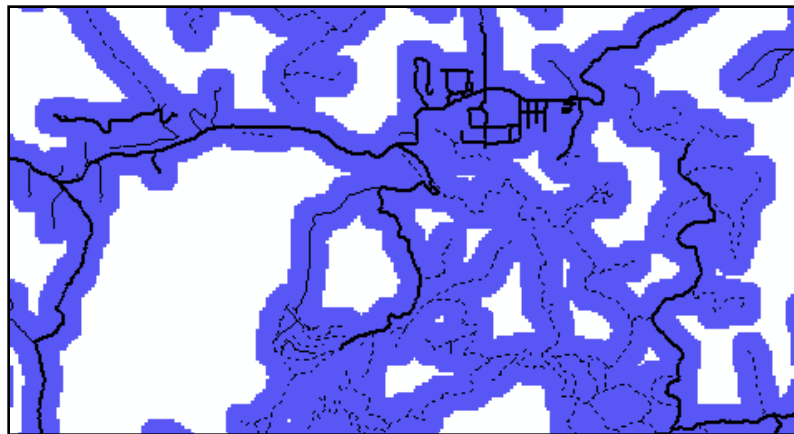
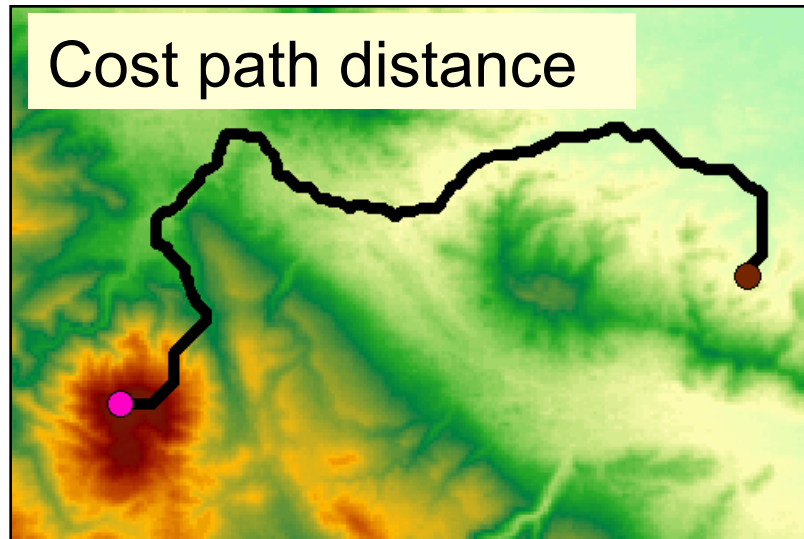
Fill

# Hydrologic functions



Derive streams, watersheds, and other hydrologic features based on analysis of a DEM.

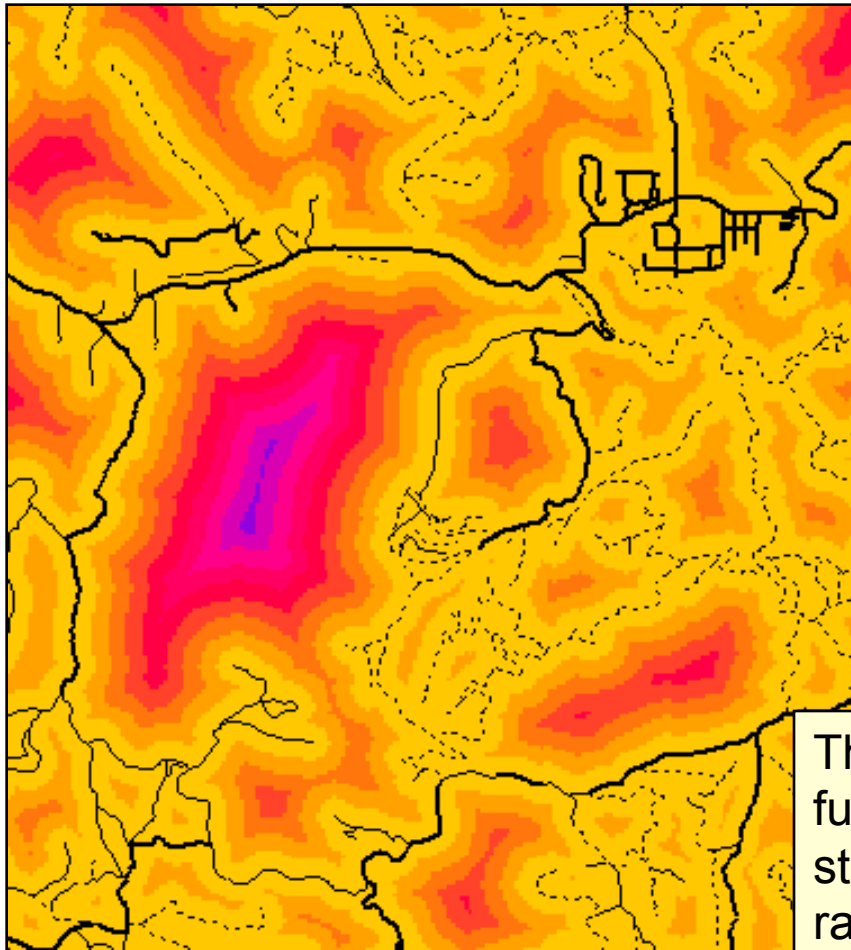
# Distance functions





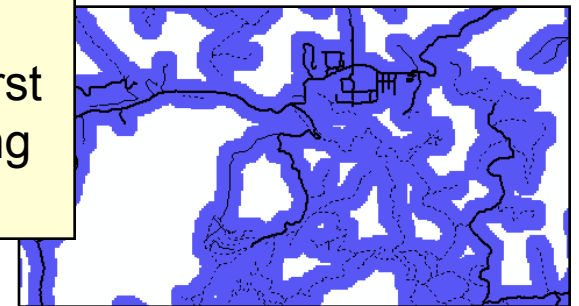
# Straight line distance

- Starts from a set of features (points, lines, polygons)
- Creates a grid where each cell represents distance to the closest of the features
- Distance units are given in coordinate system map units

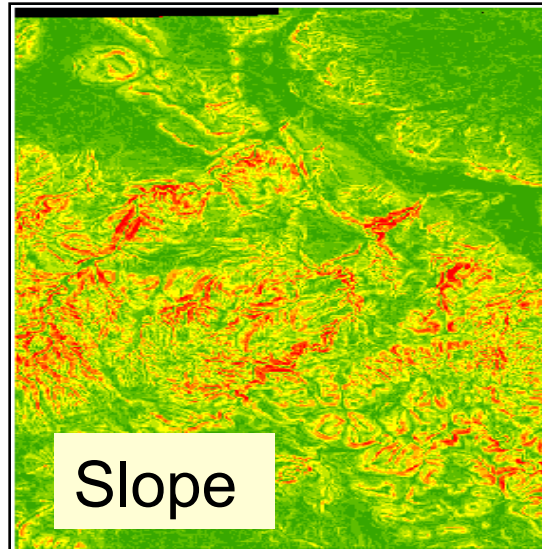
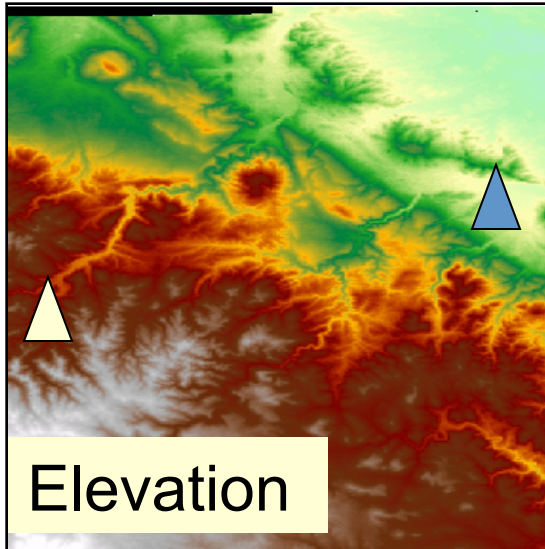


Distance to roads (meters)

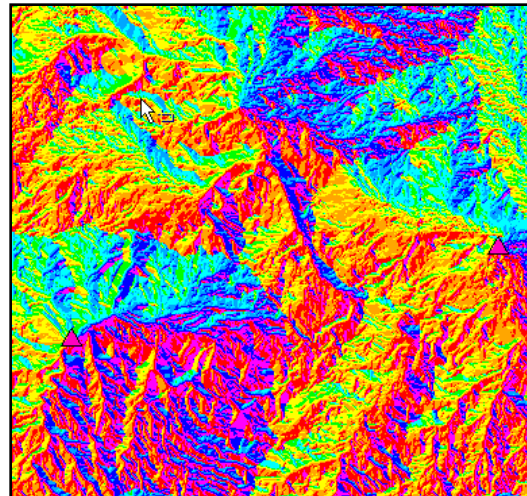
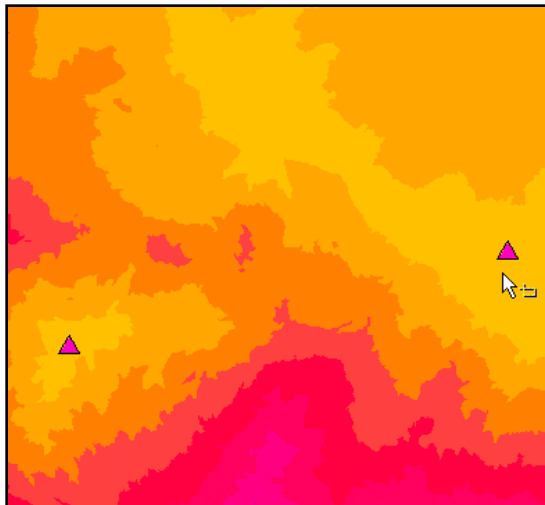
The distance function is the first step in creating raster buffers.



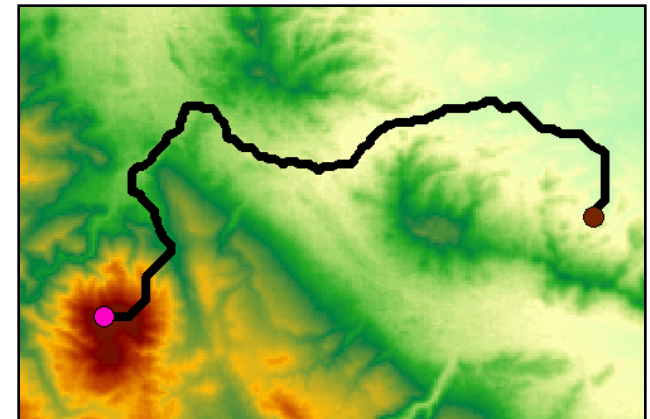
# Lowest cost path



1. Create start/stop shapefiles
2. Create cost grid
3. Calculate cost distance grid and cost direction grid



4. Find lowest cost path



# Raster Analysis— End of Part 2