Exercise 8 – Site feasibility analysis: Combined Raster and Vector Approach 30 Points

Introduction

This exercise is intended to give you the opportunity to explore, in more detail, some of the ways in which one addresses questions that involve multiple maps in a GIS. This exercise builds on last week and takes advantage of raster-based analyses. You will be working with a variety of maps, many of which can be processed using either vector or raster analyses. The raster techniques you will need are described in the "Raster Analysis" tutorial. However, you will have the think about the exact ways in which you apply them and how to incorporate your work from last week.

Data

In addition to the data used in the tutorial, the Lab8 archive also contains:

1. A study area boundary (*bnd.shp*)

2. A USGS 7.5 minute series (10m) DEM mosaic (*dem* – an ArcGIS grid)

3. A viewpoint shapefile (*viewpoint.shp*)

All of these files are georeferenced in UTM Zone 18N NAD 1927 coordinates.

The Lab8 data archive also contains the data you used in Exercise 7.

Objective

Let's continue to imagine that we are trying to find a location to build a compost facility. We learned last week that Colgate does own a few properties that contain appropriate conditions. This week, we will not limit ourselves to Colgate property. Furthermore, in addition to the environmental criteria from last week, which were:

- Must be greater than 250 meters from a surface water feature
- Must not be located over an aquifer
- Must be on either forested or agriculture land

the location of this facility will be further restricted by adding the following criteria:

- Must be located on shallow slopes (0 – 10°)
- Must be located on southern slopes (150 – 210 degrees)
- Must not be located within sight of campus (as defined by viewpoint.shp)
- Must be within 300 meters of a road

The final map must show **all feasible compost areas in the study site, but the five largest feasible (contiguous) areas must be highlighted in a different color**. On the map, number each of the top five areas, and include a table showing their sizes in hectares [ha].

Produce a well-designed map that shows Hamilton roads and these feasible areas. Please display these layers on top of a hillshade model for the study area. Don't forget the other necessary map elements, such as scale, north arrow, etc. Finally, please create a flow chart describing how you performed your analysis.

HINT – We recommend that you maintain a 10 meter grid size throughout the exercise as this is the size of the DEM you are using.

Think about your analytical strategy before diving in.