

Exercise 7 – Site Feasibility Analysis: Vector Approach 30 Points

Introduction

This exercise is intended to give you the opportunity to explore some of the ways in which one addresses questions that involve multiple datasets in a GIS. This particular exercise will take advantage of vector-based analyses. Later, you will be introduced to similar approaches using raster data. Although this exercise involves only a limited number of datasets, the same techniques can be used with many datasets. These techniques are described in Tutorial 7: Vector Data Analysis. However, you will have to think about the exact ways in which you apply them.

Note: Before beginning the exercise, please COPY the Lab7 archive to your server folder and unpack it. Don't forget to create a default file geodatabase for your new files.

Data

This exercise requires you to use several different shapefiles that are georeferenced in UTM Zone 18N NAD 1927 coordinates. These shapefiles include:

1. **hamaquifer** - Aquifer conditions for the Town of Hamilton, NY (The attribute "ID" describes the aquifer type. If ID=1, then the area is not located over an aquifer)
2. **hamtownhydro** - Surface hydrology for the Town of Hamilton, NY
3. **hamlandcover** - USGS land cover for the Town of Hamilton, NY. The attribute "LU" describes the land use type. The definitions of LU are described at the end of this document.
4. **hamroads** – Town of Hamilton roads
5. **ColgateParcelsUTM27** - A polygon shapefile showing Colgate-owned properties.

Objective

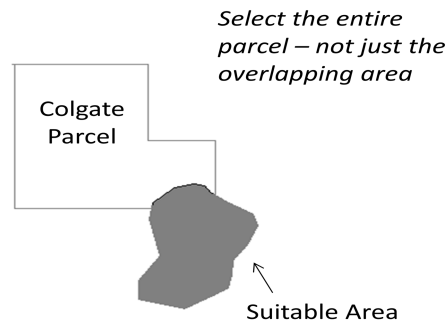
We are trying to find a location to build a compost facility for Colgate University. The location of this facility must meet the following criteria:

- 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

One can identify such locations using buffer, union, clip, erase and/or select-by-attribute techniques. However, this is not all we need to think about.

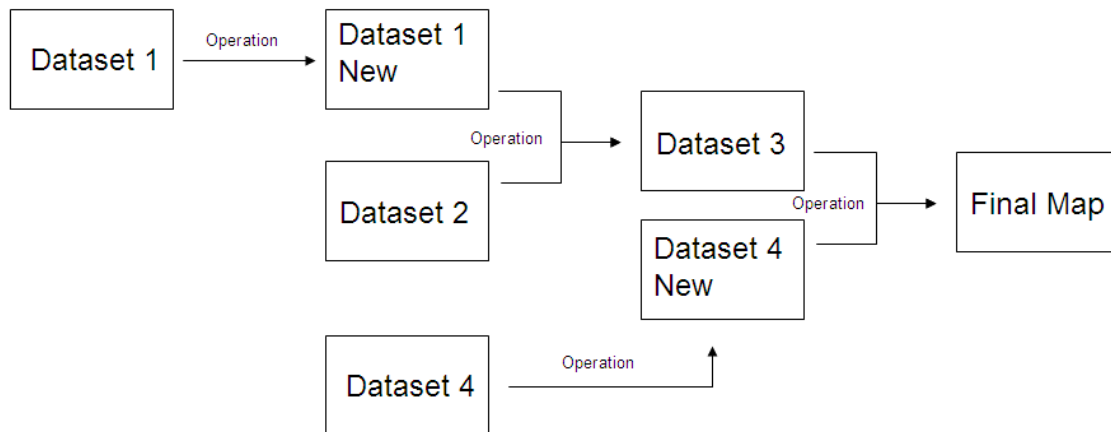
Further considerations:

- The order in which the data are processed. (Will this affect my results?)
- Are any of the select areas Colgate-owned? Identify and choose ***entire Colgate property parcels*** that contain the appropriate conditions.
- Road access to transport the compost materials. Identify those Colgate parcels (which meet the all conditions above) that are within 40 meters of a road. In other words, (any) part of the Colgate parcel must be 40 meters or less to a road.
- Hint: You might consider a select-by-location approach for these considerations. Remember that you are identifying ***entire Colgate parcels that contain the appropriate conditions somewhere within the parcel***. See figure below:

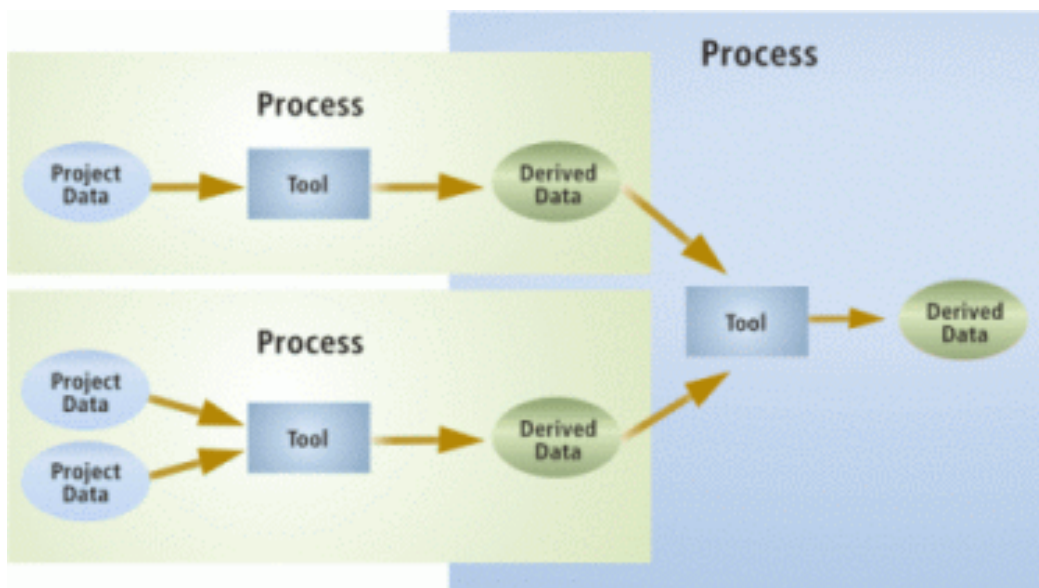


Using the shapefiles contained in the Lab7 archive, use a **vector** approach to produce a map showing Colgate properties that are candidates for the compost facility. You should produce a well-designed map that shows (at minimum) Hamilton roads and all relevant Colgate properties (use your best judgment), with those suitable for the compost site filled in one color and all others in another color.

Don't forget the other necessary map elements, such as scale, north arrow, etc. Also, construct a flow chart showing the steps you used to arrive at your answer. I use PowerPoint to construct such flow charts, but you may use any program you are comfortable with. A simple example of a flow chart is shown below. Submit this diagram with your final map.



Or:



GEOG 245: Geographic Information Systems

Lab 07

Land use and land cover classification system

	LU	
1 Urban or Built-up Land	11	Residential.
	12	Commercial and Services.
	13	Industrial.
	14	Transportation, Communications, and Utilities.
	15	Industrial and Commercial Complexes.
	16	Mixed Urban or Built-up Land.
	17	Other Urban or Built-up Land.
2 Agricultural Land	21	Cropland and Pasture.
	22	Orchards, Groves, Vineyards, Nurseries, and Ornamental Horticultural Areas.
	23	Confined Feeding Operations.
	24	Other Agricultural Land.
3 Rangeland	31	Herbaceous Rangeland.
	32	Shrub and Brush Rangeland.
	33	Mixed Rangeland.
4 Forest Land	41	Deciduous Forest Land.
	42	Evergreen Forest Land.
	43	Mixed Forest Land.
5 Water	51	Streams and Canals.
	52	Lakes.
	53	Reservoirs.
	54	Bays and Estuaries.
6 Wetland	61	Forested Wetland.
	62	Nonforested Wetland.
7 Barren Land	71	Dry Salt Flats.
	72	Beaches.
	73	Sandy Areas other than Beaches.
	74	Bare Exposed Rock.
	75	Strip Mines. Quarries, and Gravel Pits.
	76	Transitional Areas.
	77	Mixed Barren Land.
8 Tundra	81	Shrub and Brush Tundra.
	82	Herbaceous Tundra.
	83	Bare Ground Tundra.
	84	Wet Tundra.
	85	Mixed Tundra.
9 Perennial Snow or Ice	91	Perennial Snowfields.
	92	Glaciers.