Challenge 2: Raster and Vector Spatial Analysis

Overview

You will be asked to answer a variety of questions relating to West Virginia using GIS data and a variety of spatial analysis tasks. For each question, answer it and provide a short description of how it was answered.

Here I will provide a description of the data layers made available. You will be able to answer these questions using just these data layers. You will not need to find or use additional layers. The data have been provided in the **Data_for_Project** folder.

Vector Layers:

airport_locations: point locations of mapped airports in the state
hospitals: point locations of mapped hospitals in the state
interstates: line features representing the major interstates in the state (not all roads)
major_rivers: line features representing large rivers in the state (not all rivers or streams)
public_land: extent of public (state and federal) land in the state
counties_detailed: polygon features representing West Virginia county boundaries
geology: polygon features representing bedrock geology in the state
lakes: polygon features representing major lakes in the state (does not include small water bodies)

Raster Layers:

nlcd_2011: categorical raster land cover layer from the 2011 National Land Cover Database (NLCD)
wv_elev: continuous raster of elevation measurements as a digital elevation model (DEM) in meters

Question 1. How many counties in the state have an average or mean elevation greater than 700 meters?

Question 2. Which county has the longest length of major interstates?

Question 3. Which county has the longest length of major rivers?

Question 4. What county contains the largest area of evergreen forest (Code 42)?

Question 5. What county has the largest percentage of its land area as evergreen forest?

Question 6. What county has the highest recorded maximum topographic slope?

Question 7. What county contains the largest land area of forest over 1200 meters in elevation (forests are codes 41, 42, and 43)?

Question 8. What county has the largest percentage of its land area of forest over 1200 meters in elevation?

Question 9. A tree tends to grow in areas of limestone geology and on east facing slopes (67.5°-112.5°). What county has the largest land area of this potential habitat?

Question 10. A tree tends to grow in areas of limestone geology and on east facing slopes (67.5°-112.5°). What county has the largest percentage of its land area as this potential habitat?