Challenge 3: Weighted Overlay

Overview

Create a weighted overlay model to determine the most suitable habitat for a bird in West Virginia. This specific bird prefers the following:

1. Evergreen forests

2. High Elevations

3. Shallow slopes

4. Near major rivers

5. Limestone geology

You will need to do the following:

1. Rescale the continuous variables from 0 to 1 where 1 represents most suitable and 0 represents least suitable.

2. Code the land cover as follows: Evergreen Forests (42) = 1, Mixed Forest (43) = 0.5, Deciduous Forest = 0.3, all other land cover = 0.

3. Rescale the geology as follows (use TYPE field): Limestone = 1, dolostone = 0.9, shale/ls or ss/ls = 0.8, shale = 0.6, sandstone = 0.5, Quartzite = 0.4, all other types = 0.1.

4. Create the weighted overlay model using the following weights: Forest Type = .3, Elevation = 0.2, Geology Type = 0.2, Slope = 0.1, Distance from Rivers = 0.2,

The model should be produced as a 30 by 30 meter grid surface for the entire state.

Here I will provide a description of the data layers made available. You will be able to create the model 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. Create a map layout showing your product. The map layout should have the following:
    1. A legend that clearly explains the weighted overlay model
    2. An appropriate scale bar and north arrow
    3. A descriptive title
    4. Your name
    5. Use space well and is overall neat and well organized

Question 2. Explain the methods used to create the model.

Question 3. Explain any errors or uncertainties in the model.

Question 4. What county contains the highest average suitability score?