Spatial Database Final Project Time spent in the project: 10 hrs

Subject:

Identifying natural and accessible areas using weighted overlay analysis

Source: ESRI ArcGIS

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■ Research concept	■ Research concept
□ Collection and/or assembly of data	■ Collection and/or assembly of data
■ Programming	□ Programming
■ Data analysis and interpretation	■ Data analysis and interpretation
■ Writing the article	■ Writing the article

Identifying natural and accessible areas using weighted overlay analysis

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***Abstract*—Please provide a short abstract of 200 words maximum.**

Many people love to travel, such as The Grand Canyon、Florida、Canadian Rockies etc. but many scenic areas are difficult to reach, so we decide to figure out where is suitable for people to visit.

I. INTRODUCTION

A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. And now have too many commercial software can be used. For example: ArcGIS. The ArcGIS is a GIS for working with maps and geographic information. So now we can use this software to get more information to provide people's travel judgment.

Many people vacation to scenic areas free from everyday noise and congestion. So we set the three criteria to identify natural and accessible areas using weighted overlay analysis.

(1) Elevation

(2) Steepness of the terrain

(3) Degree of human alteration of the landscape

II. ARCHITECTURE OF THE PROPOSED MODEL

We use weighted overlay analysis to identify natural and accessible areas. The weighted overlay is a standard GIS analysis technique often used for solving multi-criteria problems. And we also match raster analysis and raster arithmetic can be used to perform such analysis to solve spatial problems. The figure 1 to explain the logic behind weighted overlay. We consider the upper left cell. The values for the two inputs become (2 * 0.75) = 1.5 and (3 * 0.25) = 0.75. The sum of 1.5 and 0.75 is 2.25. Because the output raster from Weighted Overlay is integer, the final value is rounded to 2.

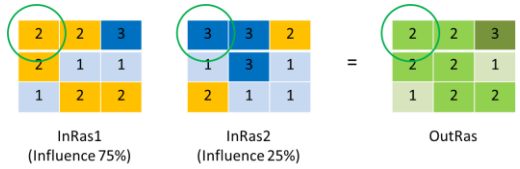


Figure 1 Weighted Overlay

We have three step :

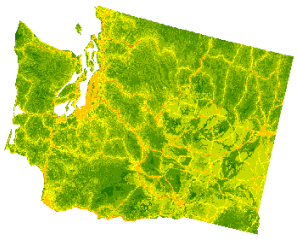
Step 1: Normalize the input datasets.

Step 2: Assign weights to the normalized input datasets based on their relative importance.

Step 3: Calculate the sum of the weighted input datasets.

III. EXPERIMENTAL RESULTS

We'll use map algebra to apply the following weights to the criteria of this study:



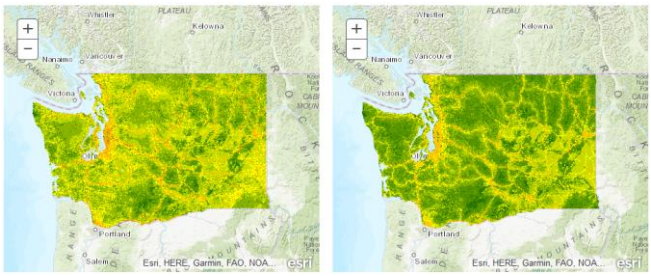
A. *Dataset*

State of Washington

B. *Enviroment and setting*

Jupyter Python3 Arcgis

C. *Results*



The result output is quite similar to the on-the-fly if we use the weight of 0.6,0.25,0.15

IV. CONCLUSION

Raster functions apply processing directly to the pixels of imagery and raster datasets. There are many functions that can be used for radiometric correction, geometric correction, data management, visualization, and for analysis. The analysis results from on-the-fly processing are not identical to those from Raster Analysis on Portal for ArcGIS. With on-the-fly processing, each time the map is re-drawn, the analysis is executed at the resolution of the visible screen pixels, which are resampled from the pixels in the source data to lower resolutions as you zoom out to smaller map scales. This dynamic resampling behavior is a feature of on-the-fly processing that enables raster functions to maintain a consistent level of high performance over a broad range of map scales. In contrast, with Raster Analysis on Portal for ArcGIS, the analysis is run by default at the full resolution of the source data. Therefore the differences in the two results become less pronounced as you zoom in to larger map scales.