

Exploratory Data Analysis and Visualization - MSc AIDA UoM

Professor George Evaggelidis

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You are given a raster file (30n000e_20101117_gmted_mea300.tif) with altitude data of the Mediterranean that includes Greece. The file was retrieved from USGS Earthexplorer) to the “Working with Terrain Data” tutorial of “QGIS Tutorials and Tips”. Additionally, you are provided with shapefiles for the prefectures of Greece (GRC_adm2.shp from source), the capitals of the prefectures (poleis.shp from source) and locations in Greece (places.shp from Open Street Map).

Tasks:

1. Create a new raster file that only contains Greece.
2. Calculate the altitude for each capital of Greece. Provide a map showing the prefectures of Greece and the capitals where the size of the point corresponding to each capital is proportional to the altitude of the capital.
3. Calculate the average altitude and standard deviation of altitude for each prefecture in Greece. Provide two choropleth maps of the prefectures of Greece, one based on average altitude and one based on the standard deviation of altitude.
4. For each prefecture, calculate the absolute difference between the average altitude of the prefecture and the altitude of its capital and provide the corresponding choropleth map.
5. Who are the top 10 prefectures in terms of average altitude, and who are the top 10 prefectures in terms of altitude standard deviation?
6. Calculate the altitude for each location (places.shp) in Greece. Create a map showing the locations that are above 1500 meters along with their names. Locations that are inhabited places should appear in a different color.
7. Reclassify the raster file you created in step 1 into 6 categories: 0-500, 500-1000, 1000-1500, 1500-2000, 2000-2500, 2500-3000 meters, and create the corresponding map.
8. Take the straight line that connects Veria with Kozani and calculate the altitude profile along this line (according to the example of Section 5.4.2 of the book “Geocomputation with R”). Try the same for two other cities or points of your choice on the map.
9. Search and find other shapefiles and raster files for Greece and create three (3) interesting maps that result from operations on vector and raster data similar to those of Sections 3 to 5 of the book Geocomputation with R.