

Assignment 5: Raster Analysis

(60 Points Total)

Data available under [Resources>UK Data](#).

The following raster layers have been provided for the entire extent of the United Kingdom. Both grids have been resampled to a 100 m cell size to reduce processing time.

[uk_lc.tif](#): land cover grid derived from the CORINE 2018 land cover product (<https://land.copernicus.eu/pan-european/corine-land-cover/clc2018>)

[uk_dem100m.tif](#): digital elevation model with units in meters (<https://www.eea.europa.eu/data-and-maps/data/copernicus-land-monitoring-service-eu-dem>)

The provided [uk_data.gpkg](#) GeoPackage contains the United Kingdom country boundaries and are from the United Kingdom Data Service.

[countries_bound](#): boundaries of England, Wales, Scotland, and Northern Ireland

Description of Problem

An invasive plant species is threatening the United Kingdom. The plant is known to occur:

1. At [elevations](#) less than **600 meters**
2. On [slopes](#) less than **20 degrees**
3. In [agricultural land cover](#)
4. Within **20 kilometers** of [urban](#) or [developed land cover](#).

Using raster analysis techniques, create a binary output where all cells that meet all for criteria are coded to 1 and all other cells are coded to 0. The results should cover the full spatial extent of the United Kingdom and have a cell size of 100 meters.

Some hints:

1. In the [land cover](#) data codes 12 through 21 represent agricultural lands. Codes 1 through 11 represent urban areas.
2. The entire analysis can be completed using just the raster data and raster analysis techniques.

Deliverables

- Provide a write up that clearly explains the methods that you used to create the model. A reader should be able to replicate your process from the write up. **(20 Points)**
- Create a map layout of your results exported to PDF format. The layout should: **(20 Points Total)**
 - Have areas that were identified as being at risk clearly identified. **(4 Points)**

- Contain a descriptive legend. (4 Points)
 - Include the boundaries for England, Scotland, Wales, and Northern Ireland. (2 Points)
 - Be masked to the extent of the United Kingdom. (2 Points)
 - Include a scale bar, north arrow, and title. (4 Points)
 - The map should be overall neat, well organized, and use the space well. (4 Points)
- Summarize the results for each country to calculate the land area and percentage of potentially threatened land in each country. Present your results as a table. (20 Points)