Spatial data and R

What?

Spatial data relates to location. Spatial data can be split into two types: vector and raster. Vector data can be points, lines or polygons and examples include addresses, roads and administrative boundaries. Raster data is gridded data, where each grid cell represents a value. These values could be climate model output, population density or simply colour values for an Ordnance Survey map.

Why?

Nearly everything in our lives happens in a time and place. We often incoporate time in our analysis, but forget about space. Understanding where something has happened or how something relates to the things around it should improve our knowledge and help reduce analysis uncertainty.

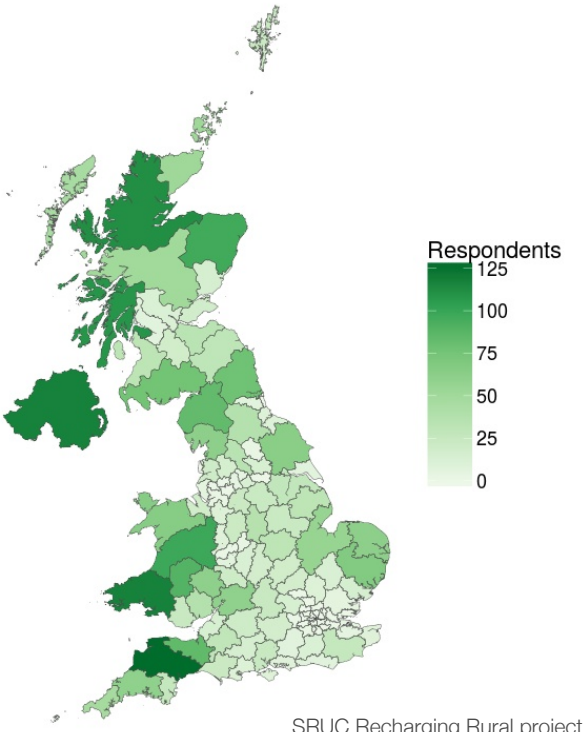
When?

When should you use R to work with spatial data? When you have a repetitive workflow, code can help ease this. For one-off cartography work, GIS software like QGIS is probably easier. When you need to scale your workflow, processing spatial data in R is slow. Using a GIS engine like GRASS will rapidly speed up your analysis. QGIS and GRASS interface with R and are open source, making your work reproducible and portable.

How?

The rgdal package is the ideal starting point for loading and working with spatial data. The sf package works with a tidy-data spatial format for analysis (and uses gdal to read data in the background). When you need to scale your work use rgrass7 to control GRASS GIS.

Agree an output level for your project and work towards that by aligning datasets. This will help avoid on-the-fly, computationally expensive, interactive R spatial analysis.



SRUC Recharging Rural project
Created using R, rgdal and ggplot
Contains Ordnance Survey and ONS data (Crown Copyright)

Links

https://gis.stackexchange.com/

https://r-spatial.github.io/sf/

https://qgis.org/en/site/

https://grass.osgeo.org/

https://grasswiki.osgeo.org/wiki/R_statistics/rgrass7

https://scottishsnow.wordpress.com/tag/r/

https://geocompr.robinlovelace.net/

https://www.maths.lancs.ac.uk/~rowlings/Teaching/UseR2012/cheatsheet.html

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About

The Land Economy, Environment and Society (LEES) Research Group is one of the largest groupings of economists and social scientists working in the rural, agricultural and land based sectors in the UK. Our vision is to be recognised as one of the leading centres for agricultural and wider rural economic and social research globally, benefiting the land use sector, the environment and rural communities.

SRUC exists to deliver comprehensive skills, education and business support for land-based industries, founded on world class and sector-leading research, education and consultancy. The integration of these three complementary knowledge exchange services is of significant value to all with an interest in land-based activities – be they learners, businesses, communities or policy-makers.

SRUC is part of SEFARI (Scottish Environment, Food and Agriculture Research Institutes). SEFARI aims to deliver 'Leading Ideas for Better Lives', reflecting that publicly funded research in Scotland must ultimately deliver positive impact for individuals, whether in Scotland or elsewhere. As a collective, we collaborate to deliver the Scottish Government funded Strategic Research Programme 2016-2021 on agriculture, environment, food and land.

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