

GEOG0186: Foundations of Geography I

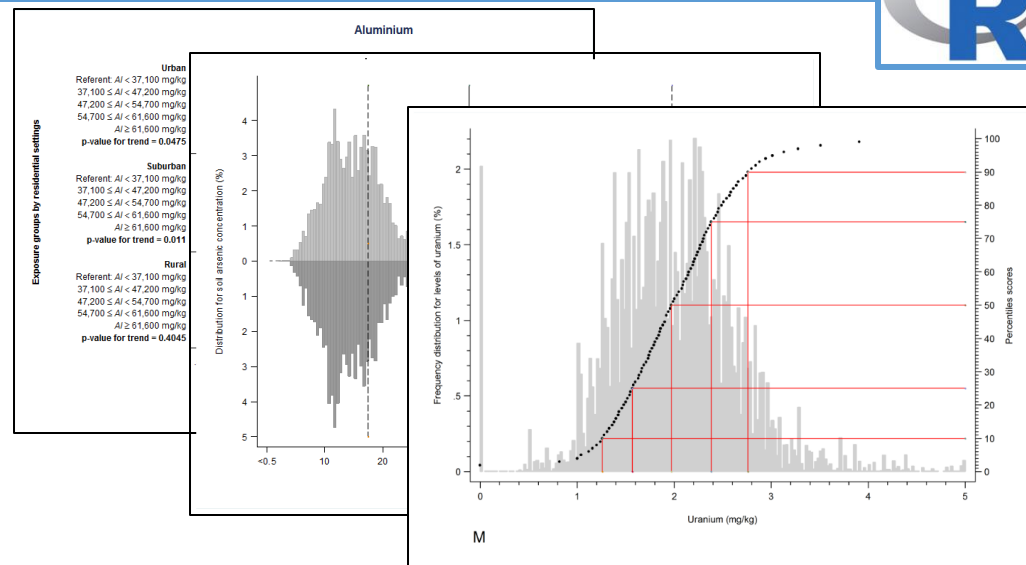
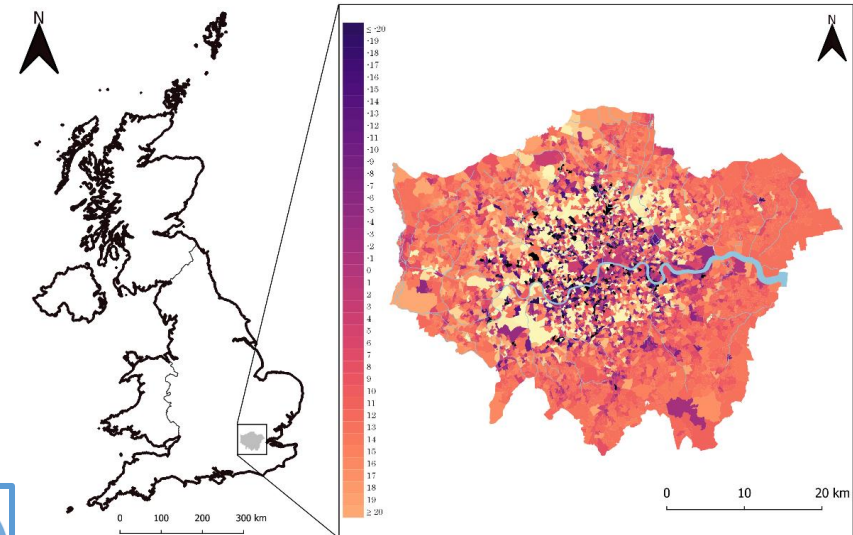
Quantitative Skills

RStudio and Downloading it

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What is RStudio?

# What is RStudio?



```

181 raster_file <- raster(file)
182 recife_temperature_cropped <- crop(raster_file, recife_extent)
183 recife_temperature_masked <- mask(recife_temperature_cropped, bra_recife_outline)
184 recife_temperature_masked <- projectRaster(recife_temperature_masked, crs=pcr)
185 recife_temp_aggr <- extract(recife_temperature_masked, bra_recife_areas, fun=mean,
186                             colnames(recife_temp_aggr)[1] <- "fid"
187                             colnames(recife_temp_aggr)[2] <- "temperature"
188                             colnames(recife_temp_aggr)[3] <- "district_id"
189                             recife_temp_aggr$year <- i
190                             recife_temp_aggr$month <- j
191                             recife_temperature <- recife_temp_aggr[,c(1,3,4,5,2)]
192 }
193 else {
194   file <- paste0("/Users/anwarmusah/Desktop/AM_Zika2019/Data/Brazil/Climatic/Temperature")
195   raster_file <- raster(file)
196   recife_temperature_cropped <- crop(raster_file, recife_extent)
197   recife_temperature_masked <- mask(recife_temperature_cropped, bra_recife_outline)
198   recife_temperature_masked <- projectRaster(recife_temperature_masked, crs=pcr)
199   recife_temp_aggr <- extract(recife_temperature_masked, bra_recife_areas, fun=mean,

```



**R (Standard)**

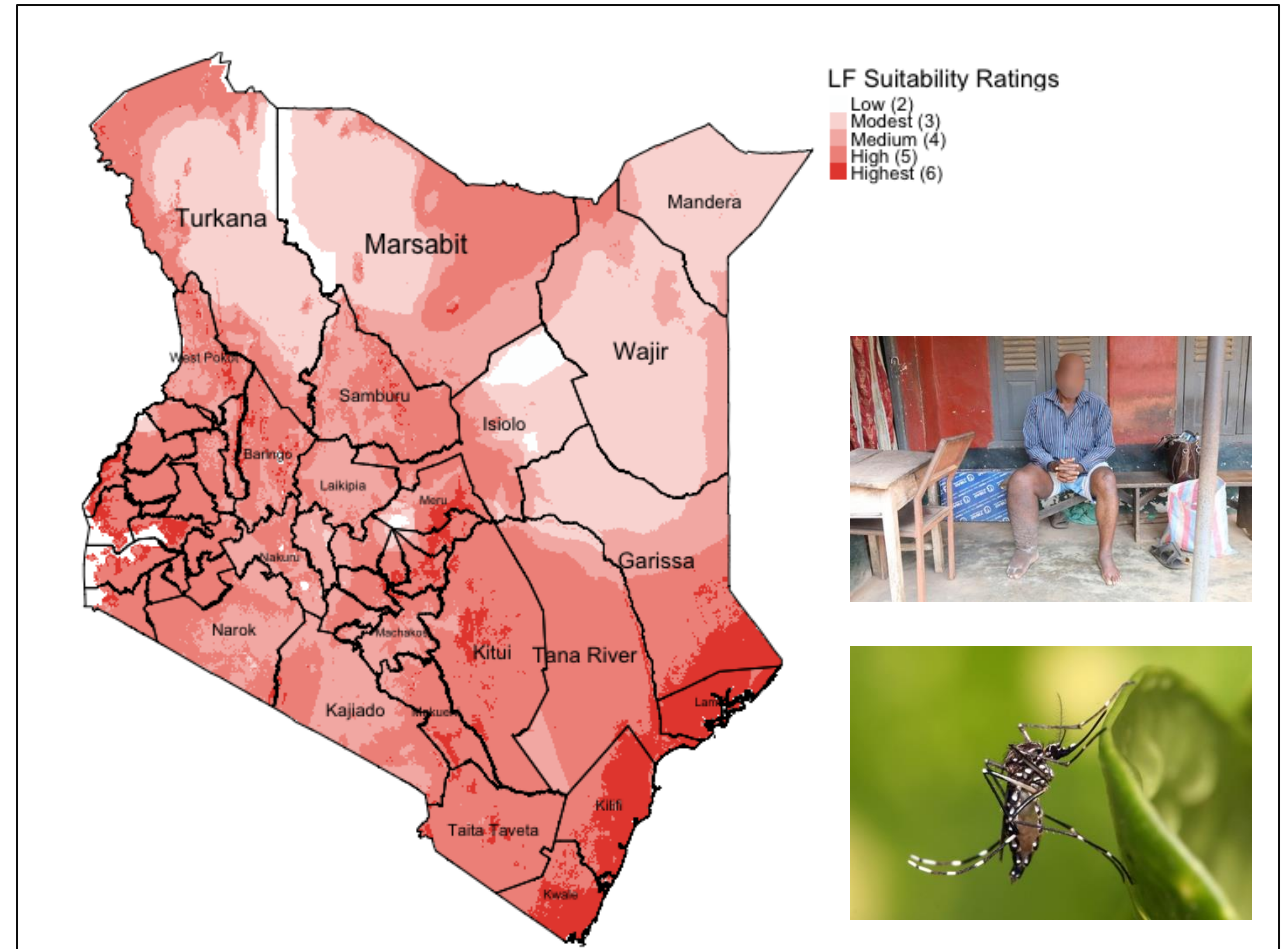


**RStudio (Best)**

There are two version of the software: 1.) R, and 2.) **RStudio**; The second is much preferred as its straightforward and intuitive.

# Why are we teaching RStudio?

1. Flexible and provides access to powerful packages for analysis
2. Impressive graphs, visualizations and maps
3. Excellent statistical capabilities too



**Example: Map generated in R to illustrate areas that are environmentally suitable for the spread of neglected tropical disease called 'Lymphatic Filariasis (LF)' in Kenya.**

Sources:

1. Global Atlas for Helminths Infection (<http://www.thiswormyworld.org>)
2. ESPEN (<https://espen.afro.who.int>)

# ... and why learn how to code in RStudio?

## 1. Efficiency

- Automated tasks and data managing
- Can recycle & reuse code scripts for new projects

## 2. Fosters good scientific practice

- Transparency and replication (AKA reproducible research)
- Creates log so anyone can follow in your footsteps (i.e., github, gitlab etc.,)

You can literally pull-off some really creative stuff like generating websites, accessing tools via APIs etc.

The image shows a GitHub repository for 'UCLPG-MSC-SGDS / GEOG0114-PSA-WK8' and an RStudio interface. The RStudio window displays a script for 'GEOG0114: Principles of Spatial Analysis' with the following R code:

```
## class : RasterLayer
## dimensions : 1090, 892, 972280 (nrow, ncol, ncell)
## resolution : 1000, 1000 (x, y)
## extent : 3774798, 4666798, -526069.9, 563930.1 (xmin, xmax, ymin, ymax)
## crs : +proj=merc +a=6378137 +b=6378137 +lat_ts=0 +lon_0=0 +x_0=0 +y_0=0 +units=m +nadgrids=@null +wktext +no_defs
## source : memory
## names : layer
## values : 3.2741, 7.4973 (min, max)
```

Below the code, the text 'Finally, visualize the output:' is followed by a map of Kenya showing suitability for 'LF' (Lumpy Fever) using a 'spectral' color palette. The map is titled 'LF Suitability (AHP WLC)' and includes a legend, scale bar, and north arrow. The map shows regions with varying suitability, with higher suitability (yellow/orange) in the north and lower suitability (green/blue) in the south.

IMPORTANT NOTES: The suitability ranges are estimated to be from 3.27 to 7.49 (weighted on a scale with an upper limit of 10). The highest suitability for LF are regions with values closest to 7.49 and vice versa.

Example: Working in RStudio and synchronising it with GitHub to not only use as a cloud back-up, but to generate a website through RStudio and GitHub for teaching MSc Students.

Sources:

1. GitHub (<https://github.com>)





**Base R coding style**



**Tidyverse coding style**

# Instructions for Downloading RStudio