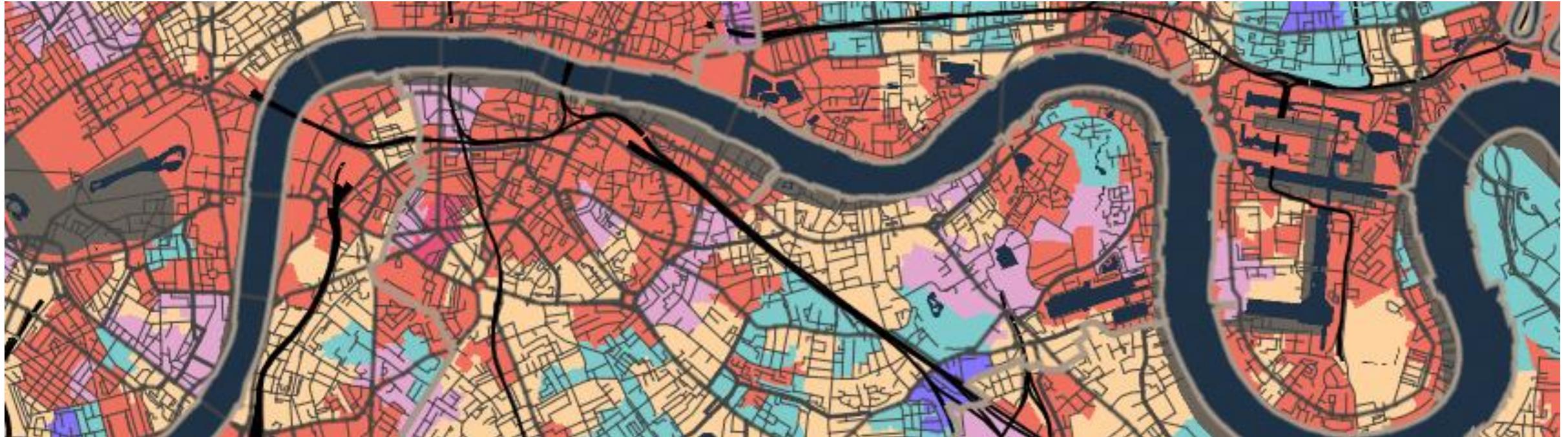


SA-TIED Geospatial Analysis Workshop

Overview



 Dr Justin van Dijk
 j.t.vandijk@ucl.ac.uk



Objectives

We will explore the following topics:

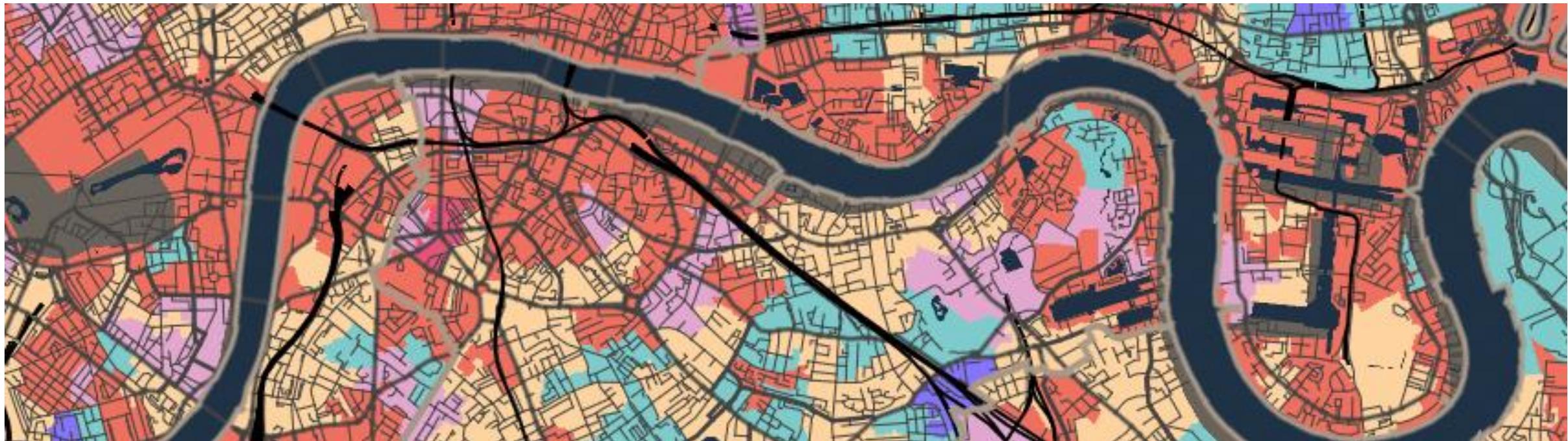
- Fundamentals of using R for data analysis .
- Creating thematic maps using R.
- Quantifying the degree of spatial dependence in a dataset.
- Incorporating space into statistical models.

Schedule

Day 1 - Morning	R for Data Analysis
Day 1 - Afternoon	R for Spatial Analysis
Day 2 - Morning	Spatial Autocorrelation
Day 2 - Afternoon	Spatial Models

SA-TIED Geospatial Analysis Workshop

S02 – R for Spatial Analysis



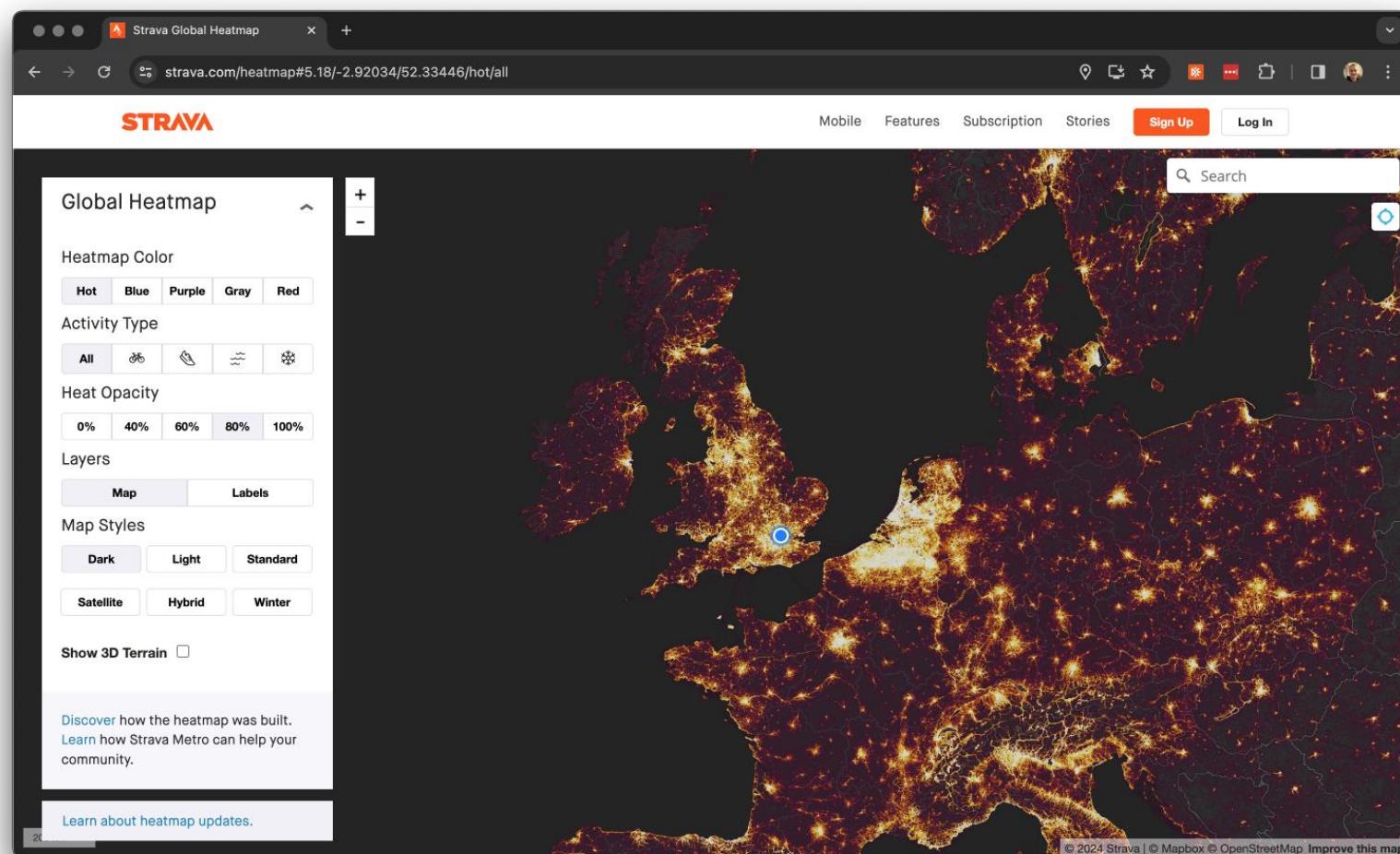
This session

- Why is mapping important?
- How do GIScience and spatial analysis fit in?
- Some examples: Mapping [Contemporary] London

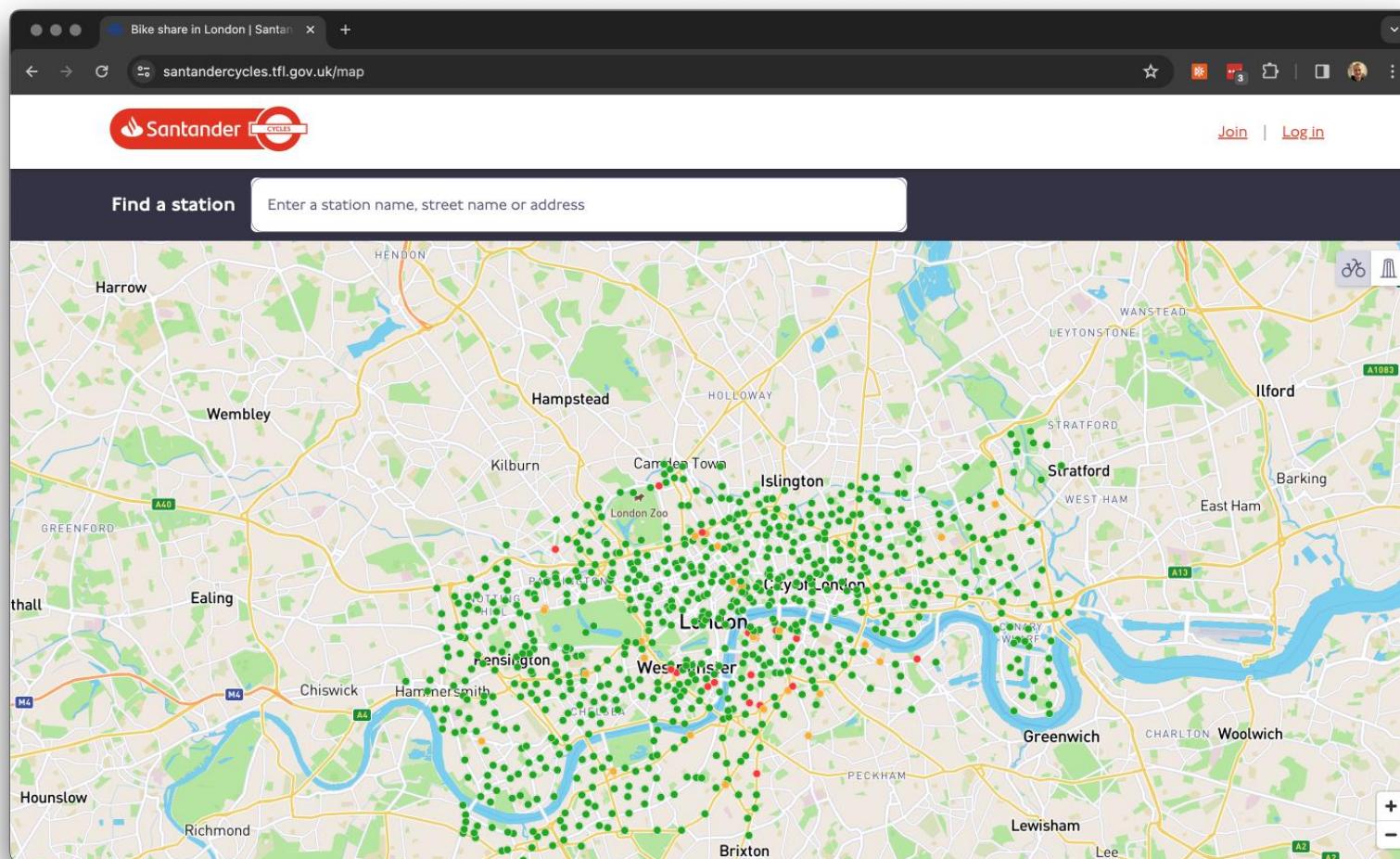
Why is mapping important?

- Many challenges and problems are inherently geographical.
- Almost all data is tied to specific locations and exhibits spatial variability.
- Helps answer the question: What is this place like compared to other places?
- Translates numerical data into a format that is more intuitively understood by the human brain.

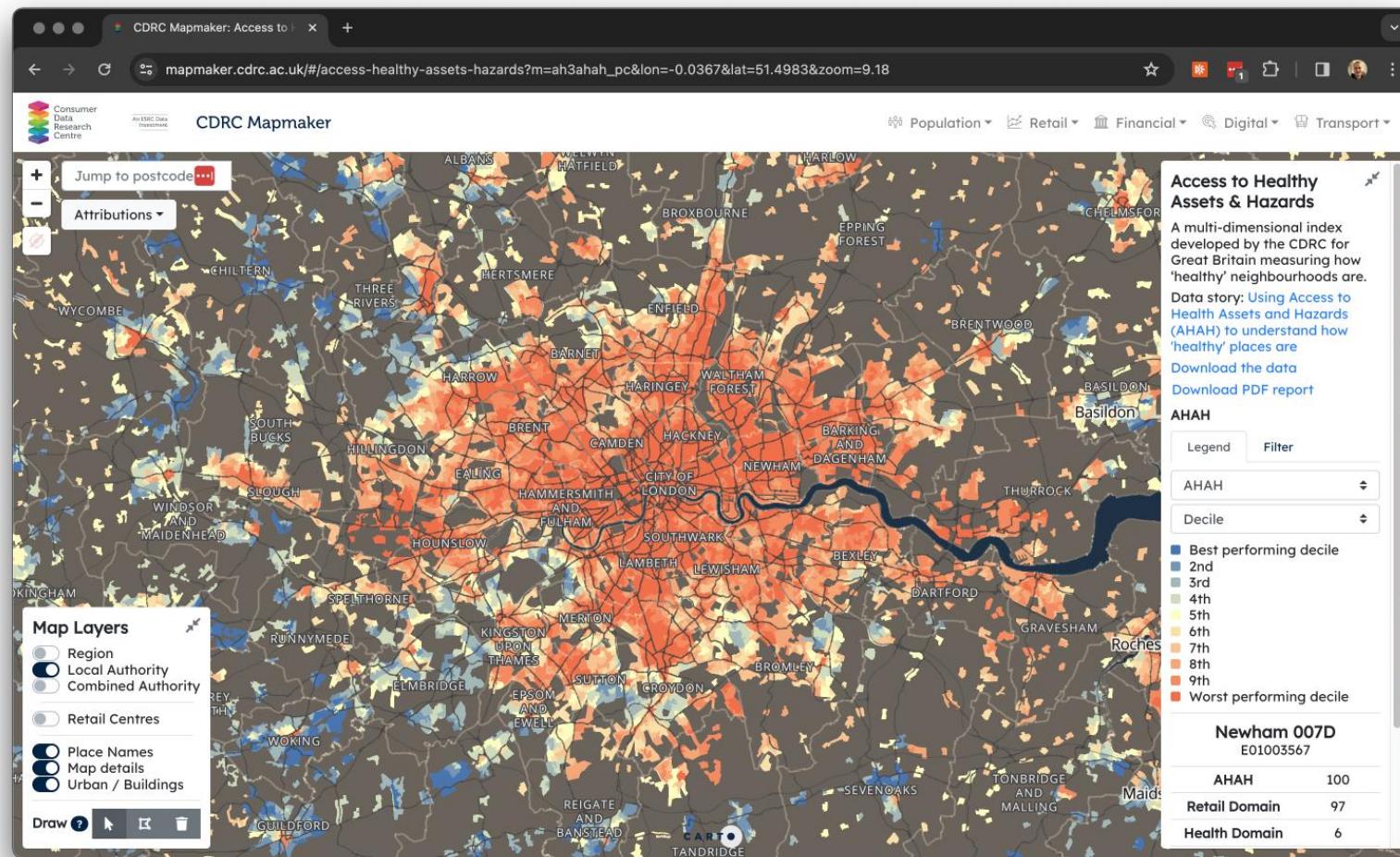
Running in Western-Europe



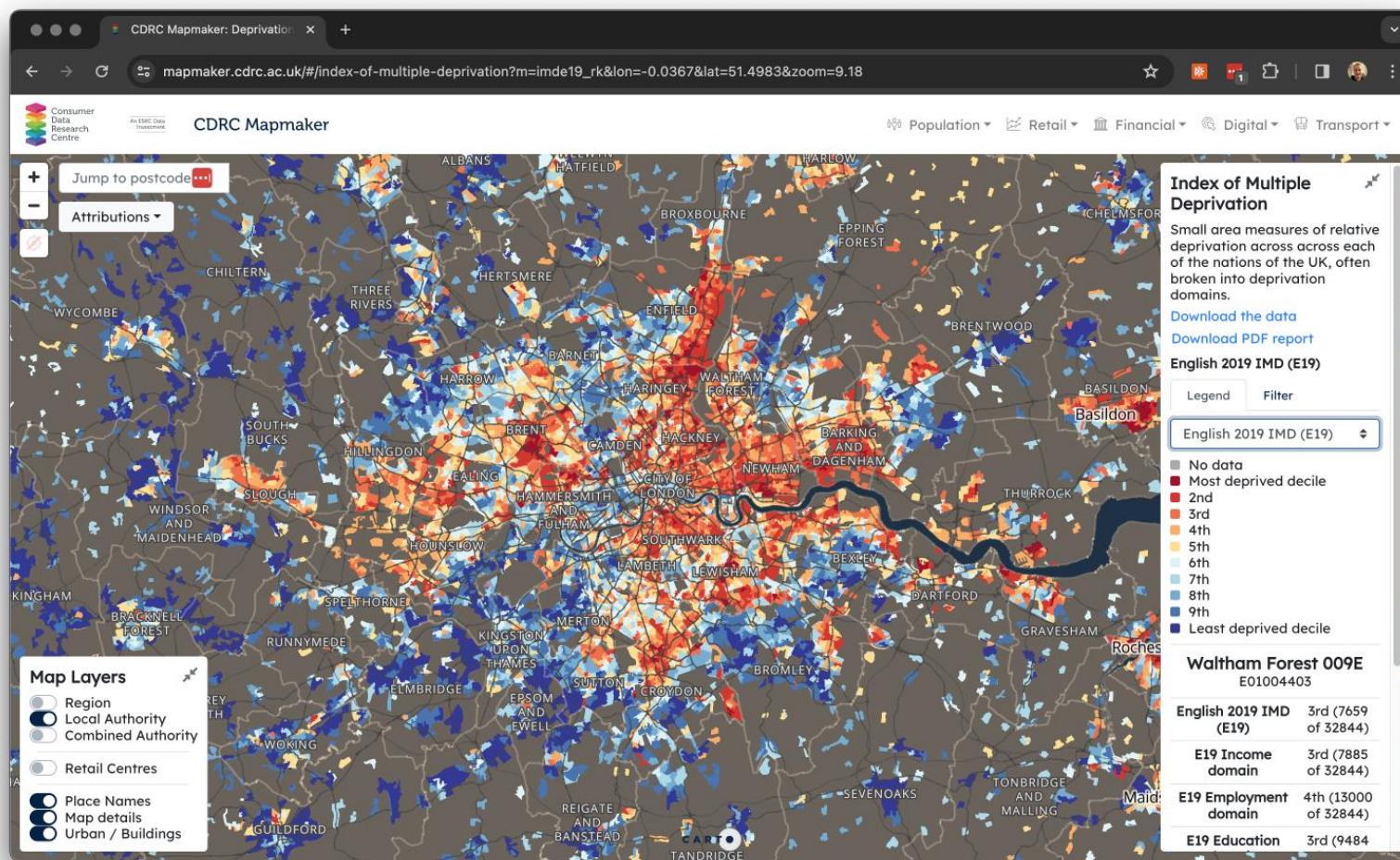
Bicycle docking stations in London



Access to Healthy Assets and Hazards in the UK



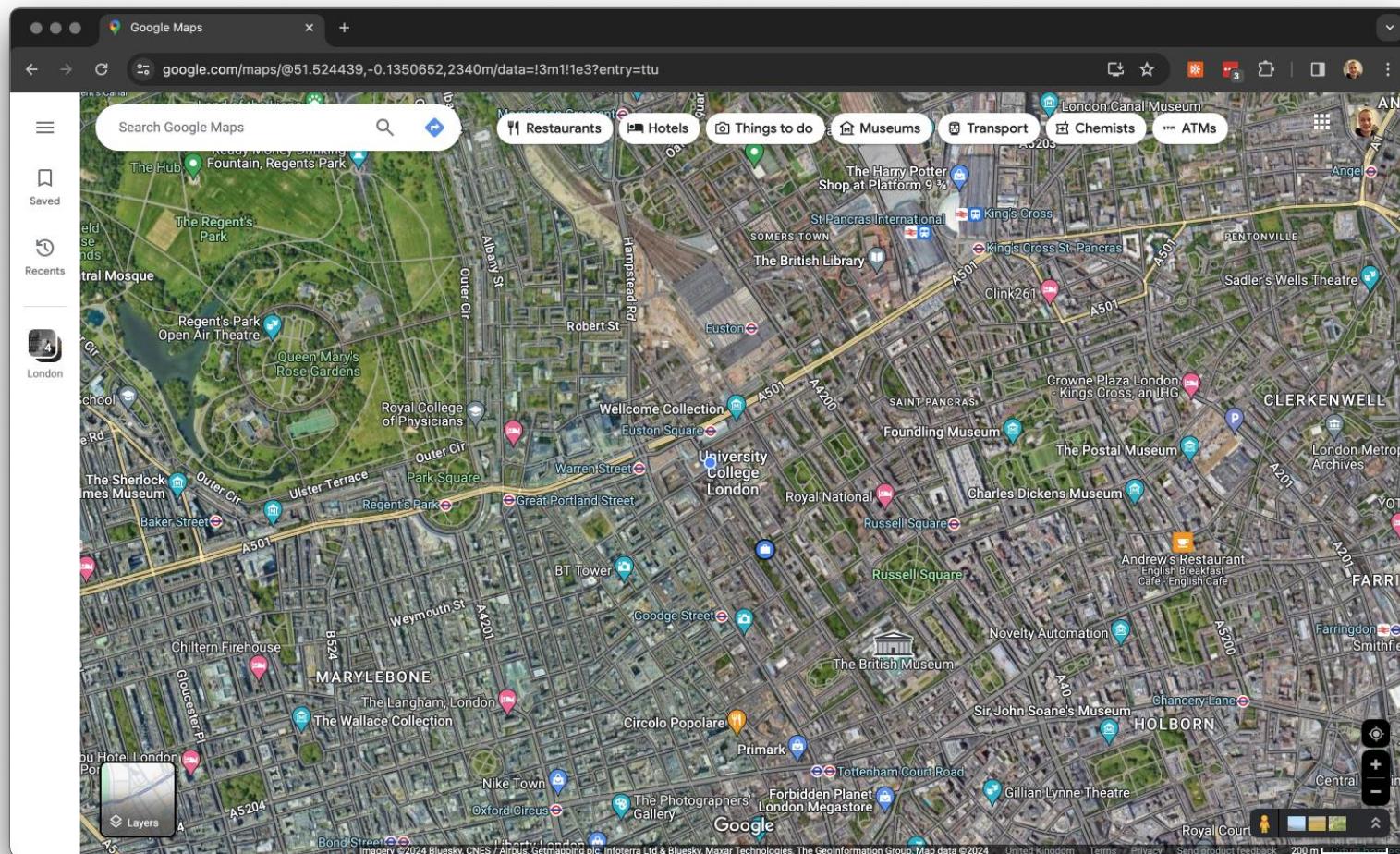
Index of Multiple Deprivation in England



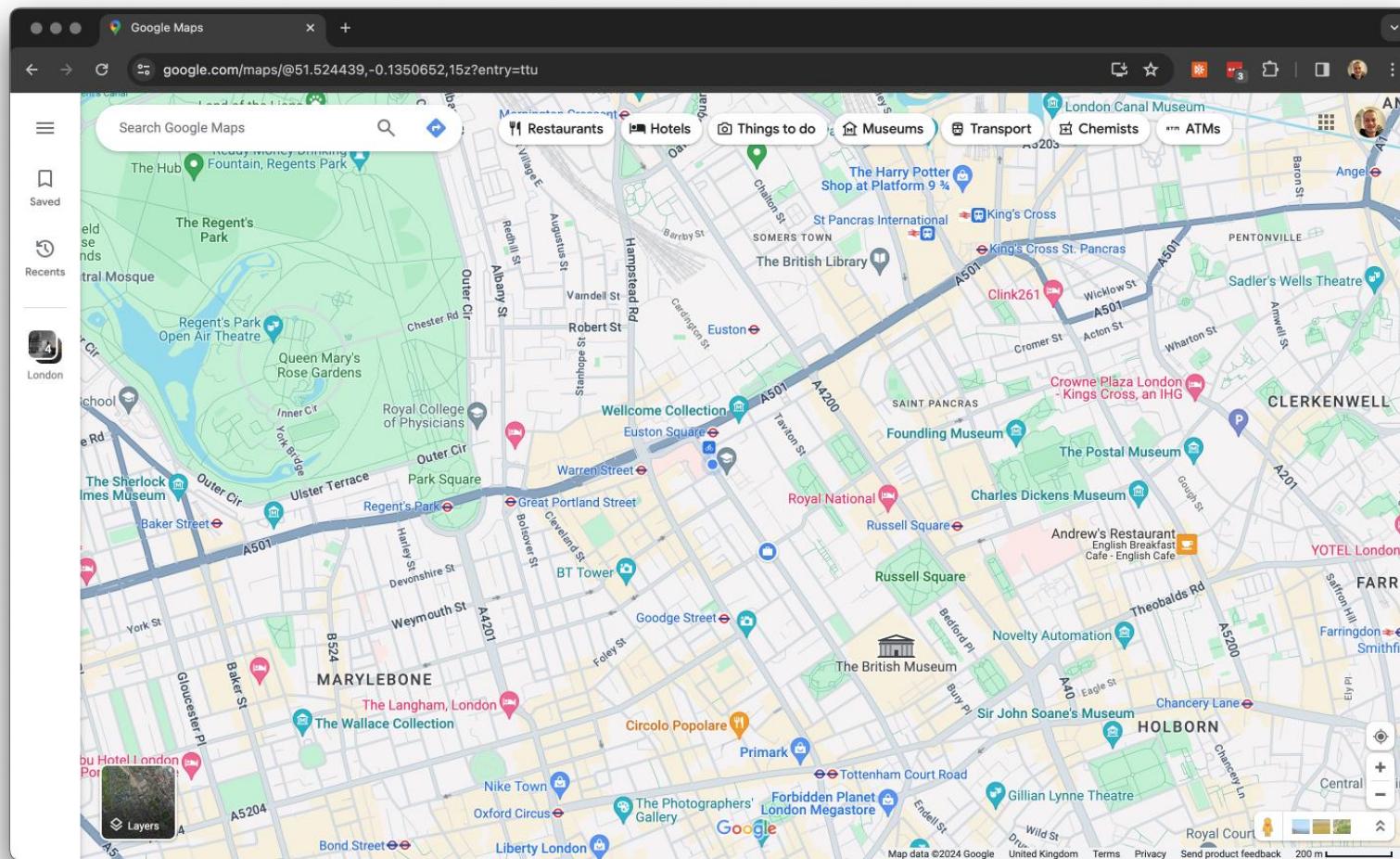
Requirements

- GIScience: theory
- GISystems: methods and tools

GIScience



GIScience

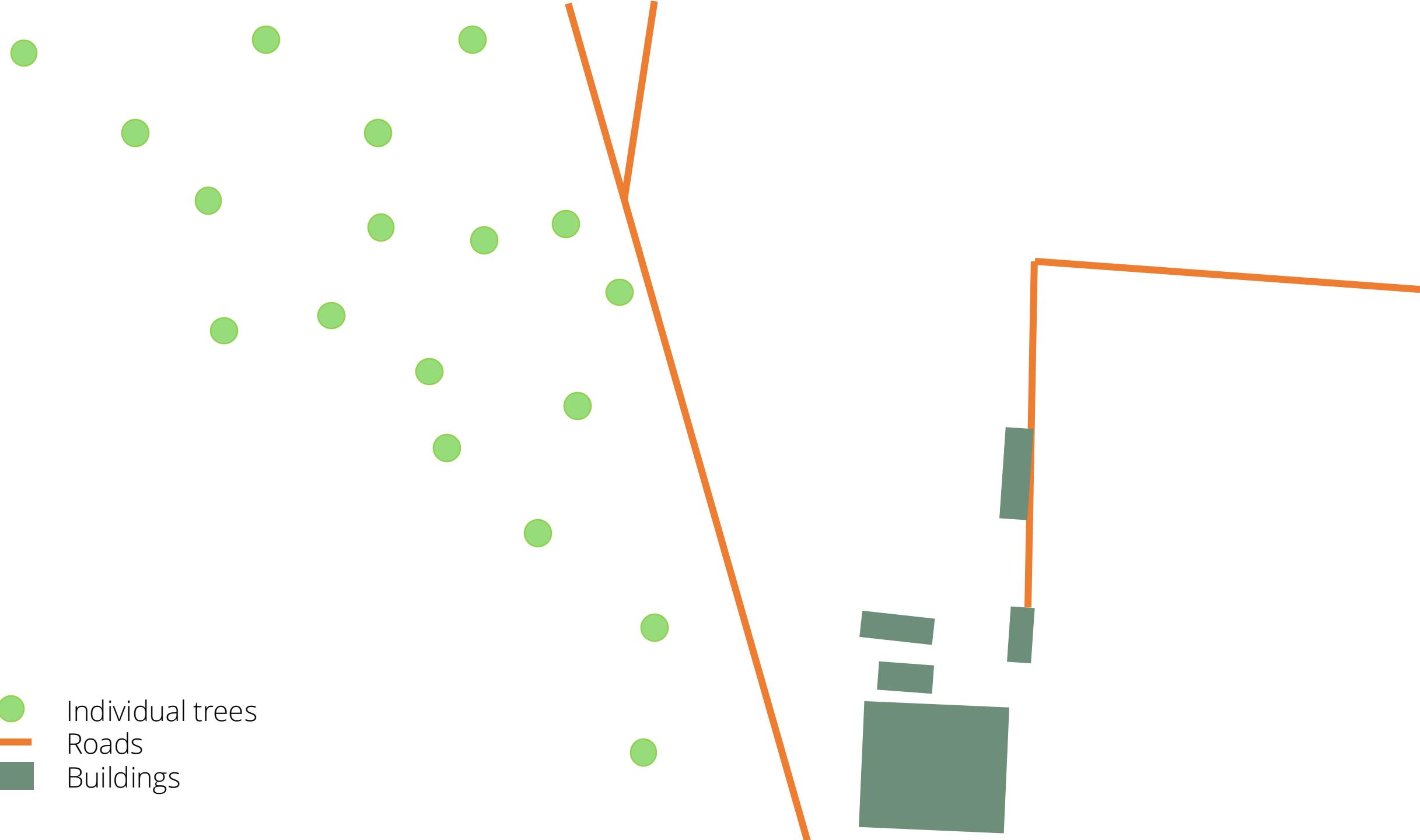






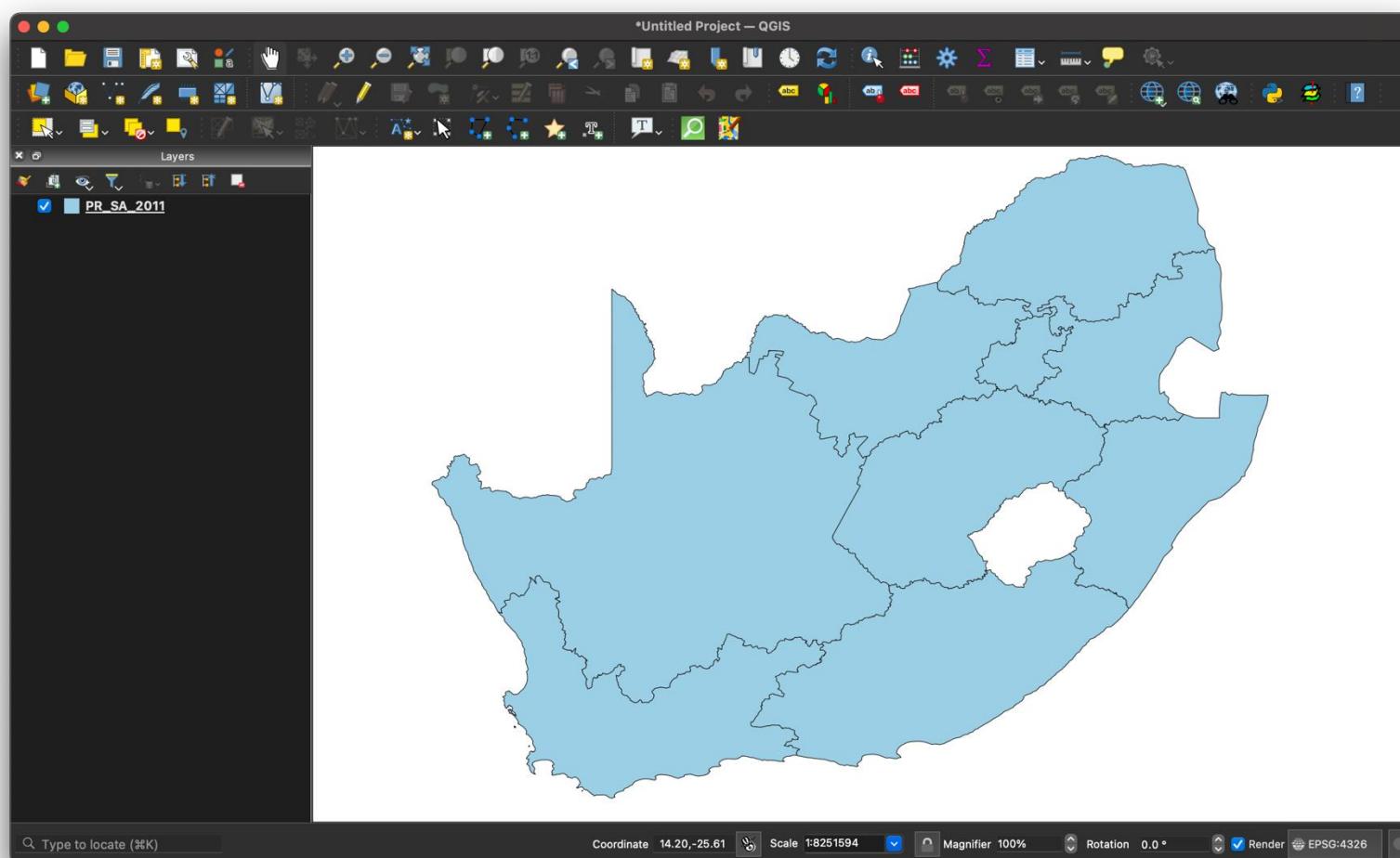




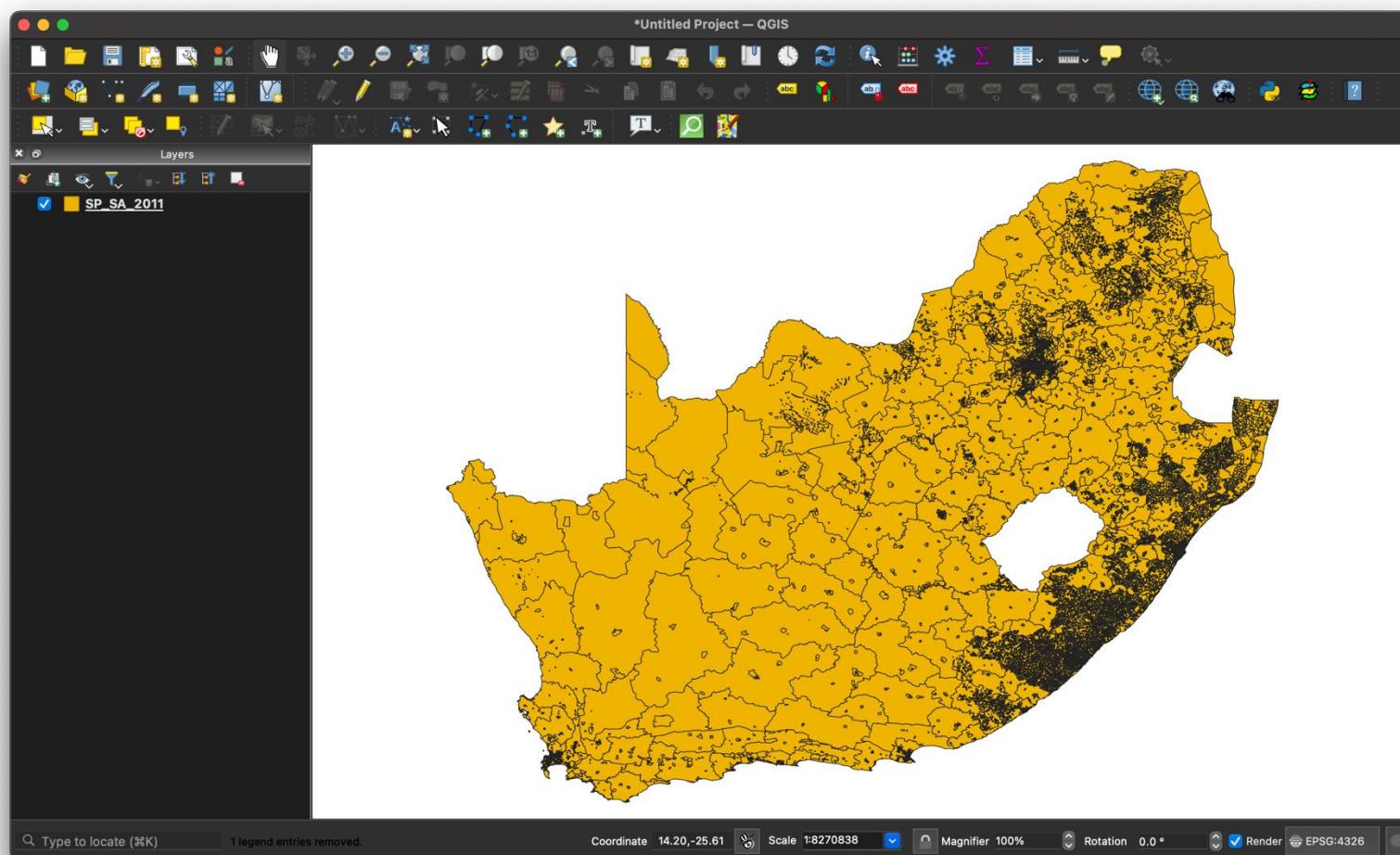


- Individual trees
- Roads
- Buildings

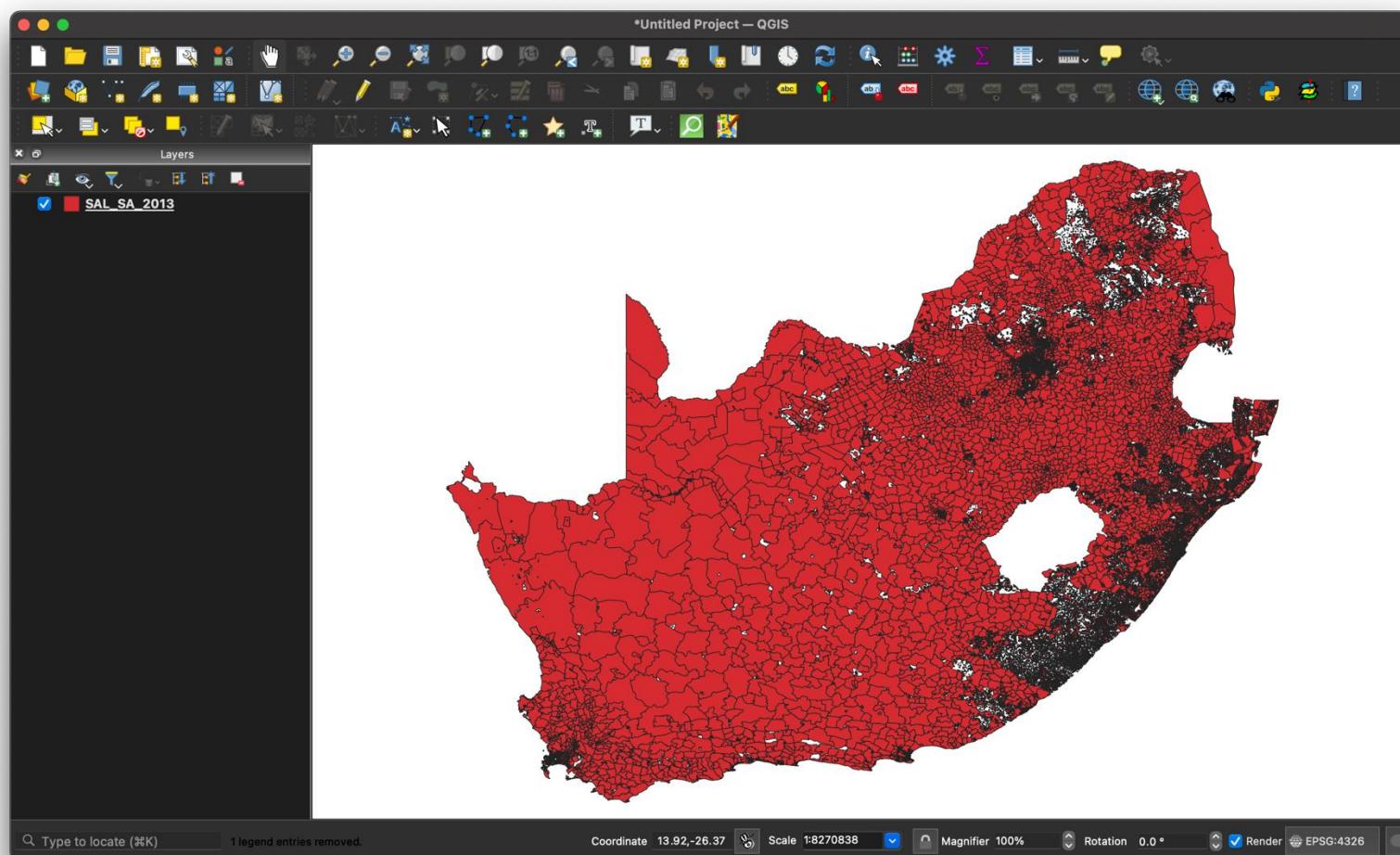
GIScience



GIScience



GIScience



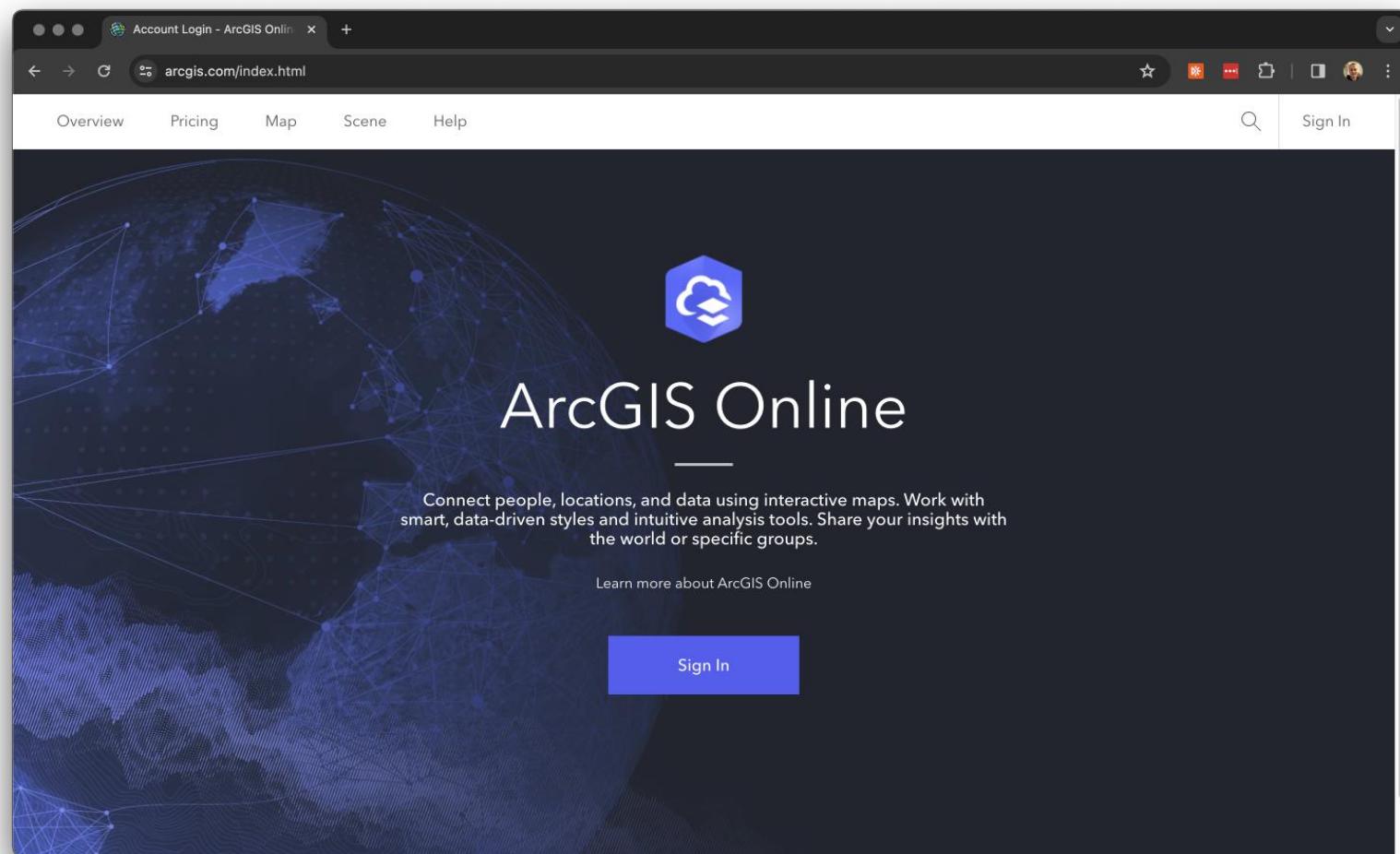
Father of GIS

- Roger F. Tomlinson (1933-2014)
- Ph.D. dissertation: "*The application of electronic computing methods and techniques to the storage, compilation, and assessment of mapped data*" (1962, UCL).
- Conceived the idea of analysing multiple layers of spatial data within a single environment as well how to represent such spatial data in a digital format.

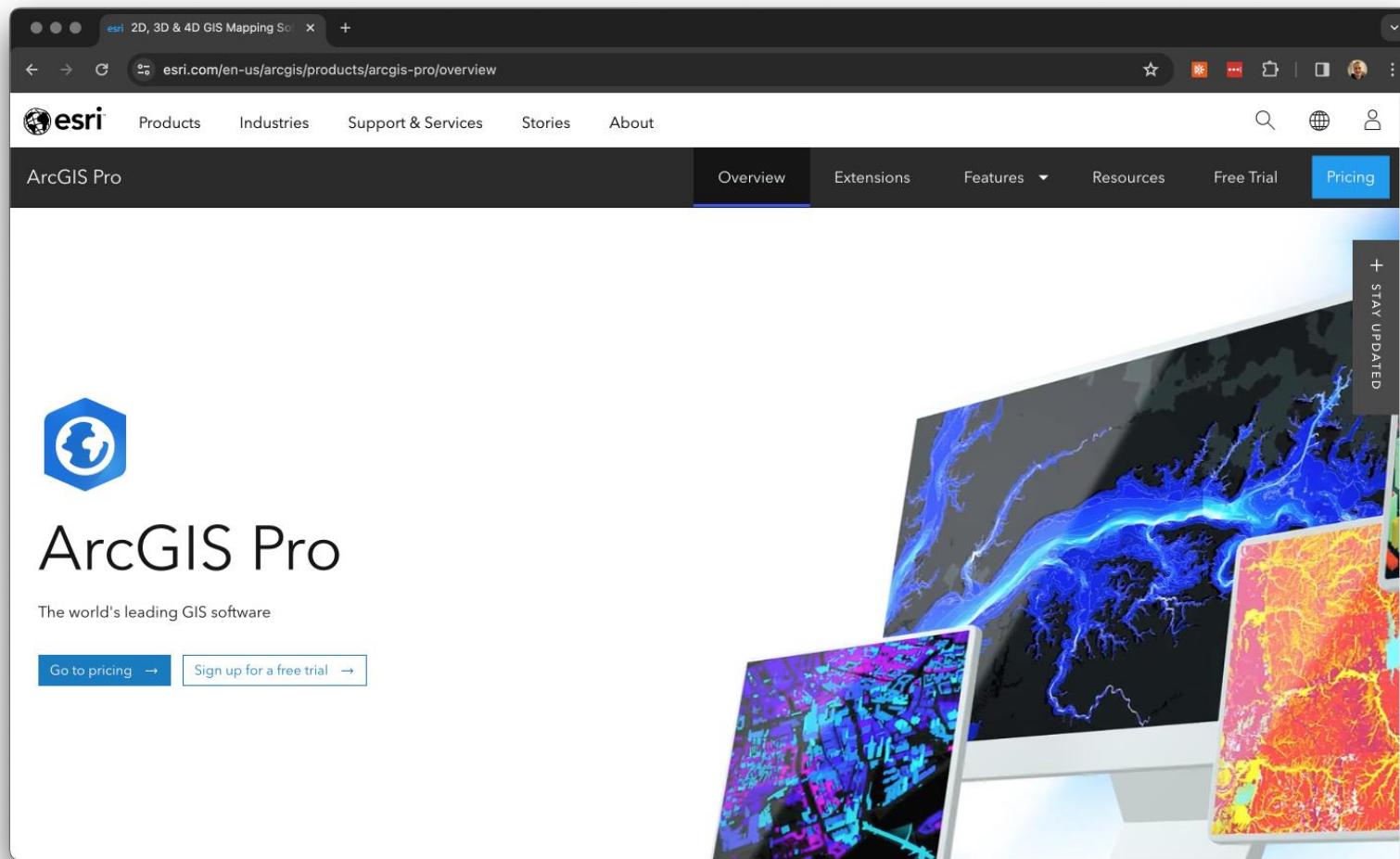
Geographic Information Systems

- To effectively handle spatial information, we need tools that can:
 - Collect spatial data
 - Store spatial data
 - Analyse spatial data
 - Present spatial data
- Geographic Information Systems help us to manage spatial data: collection, storage, organisation, presentation

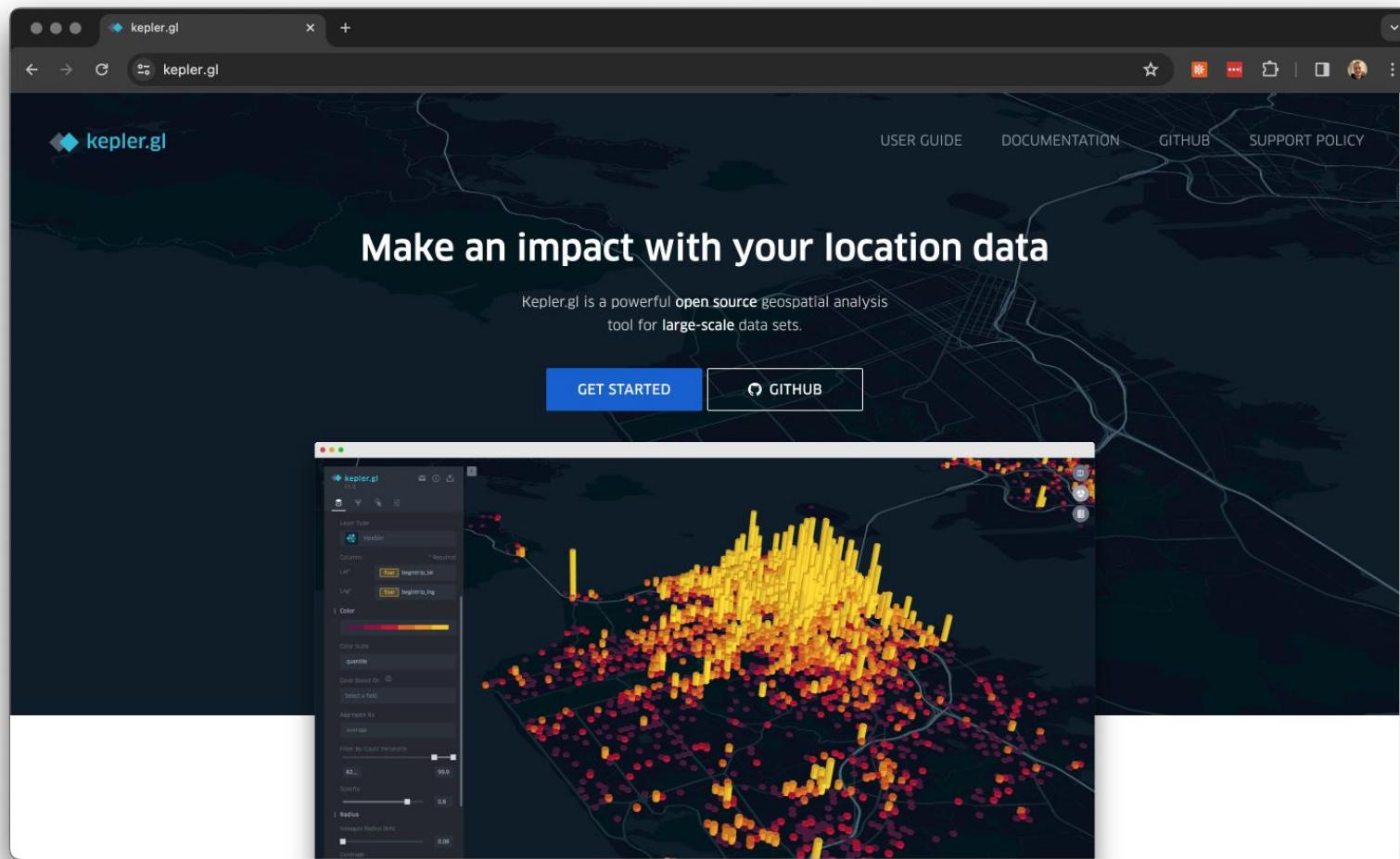
Geographic Information Systems



Geographic Information Systems



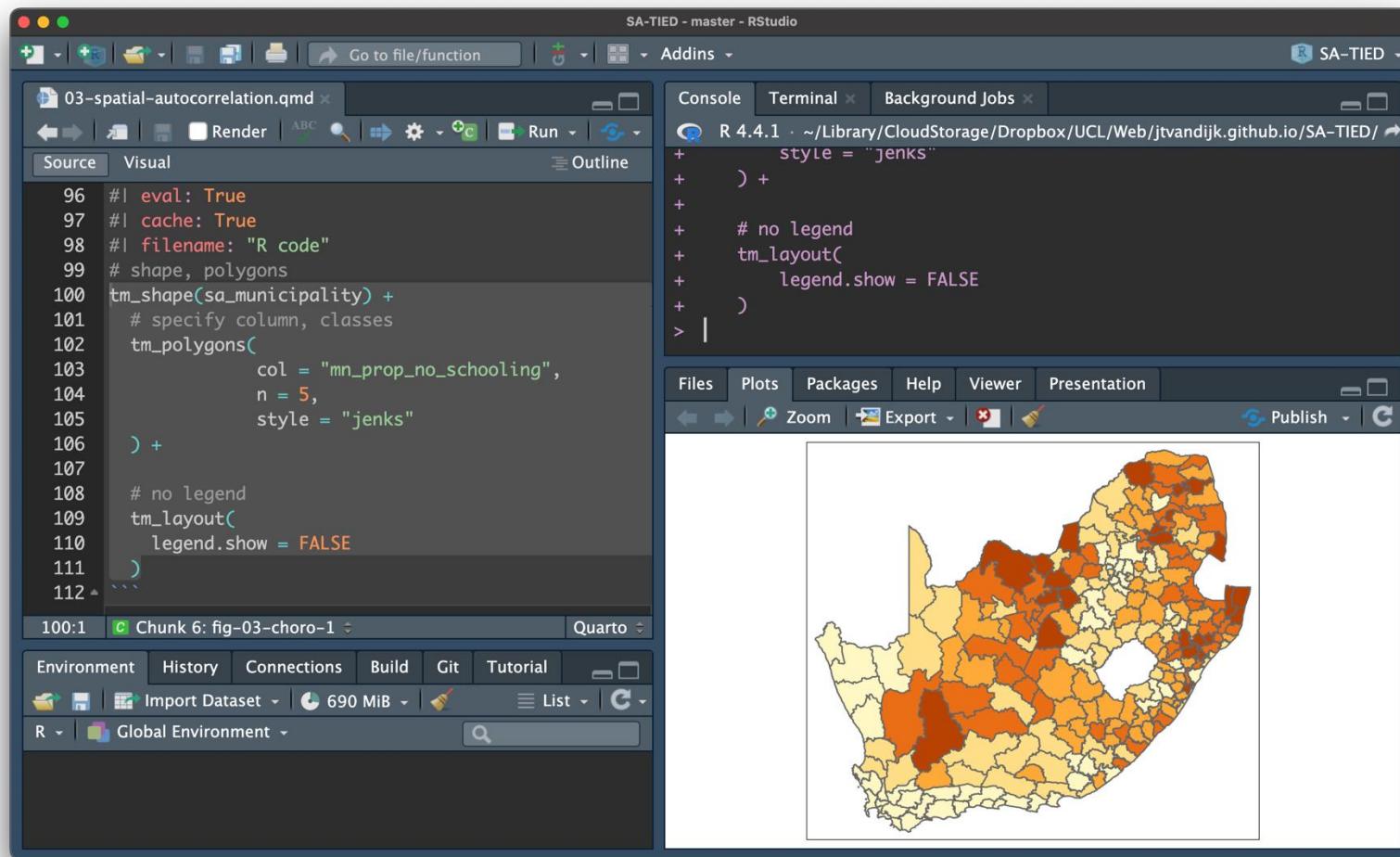
Geographic Information Systems



Geographic Information Systems



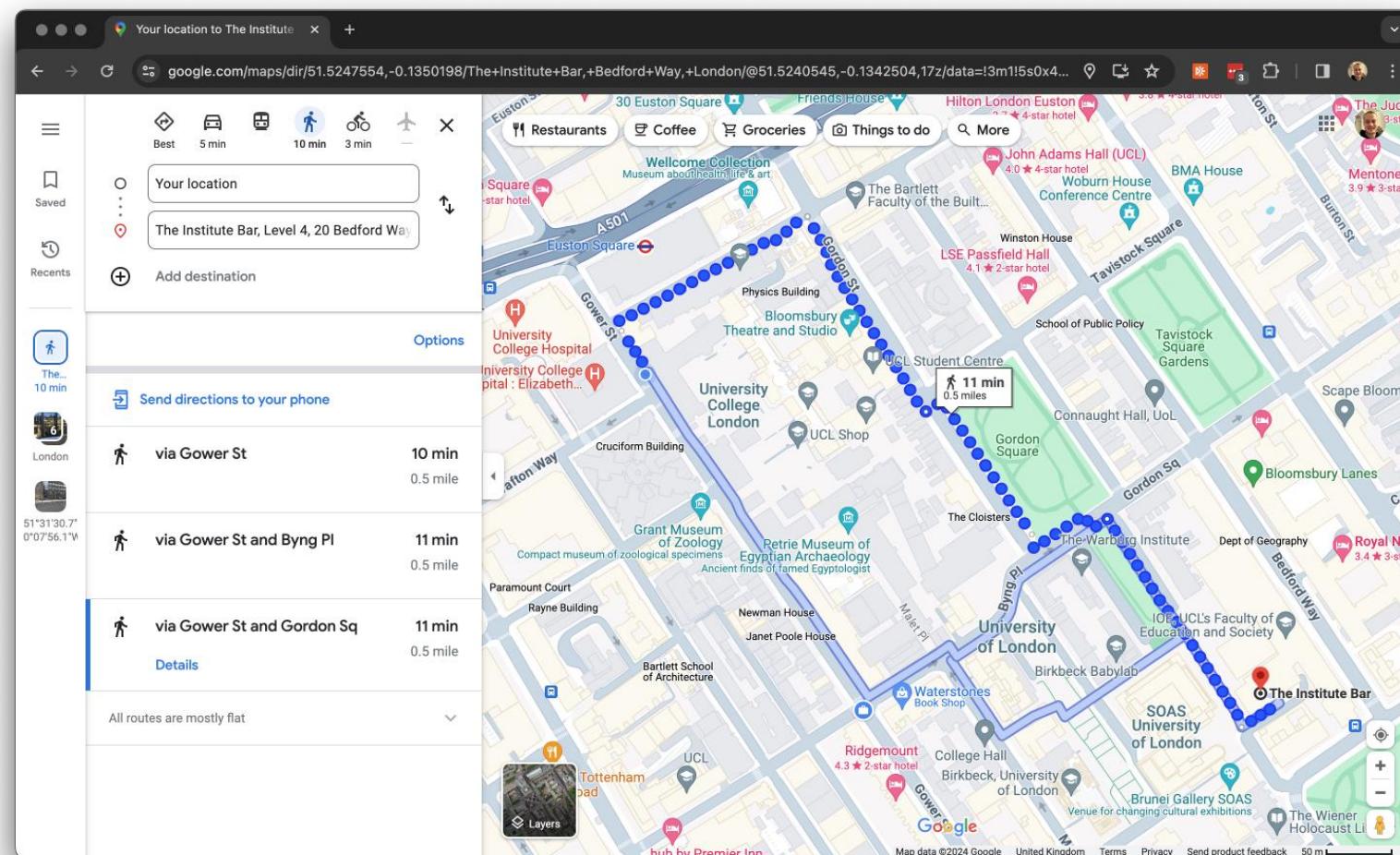
Geographic Information Systems



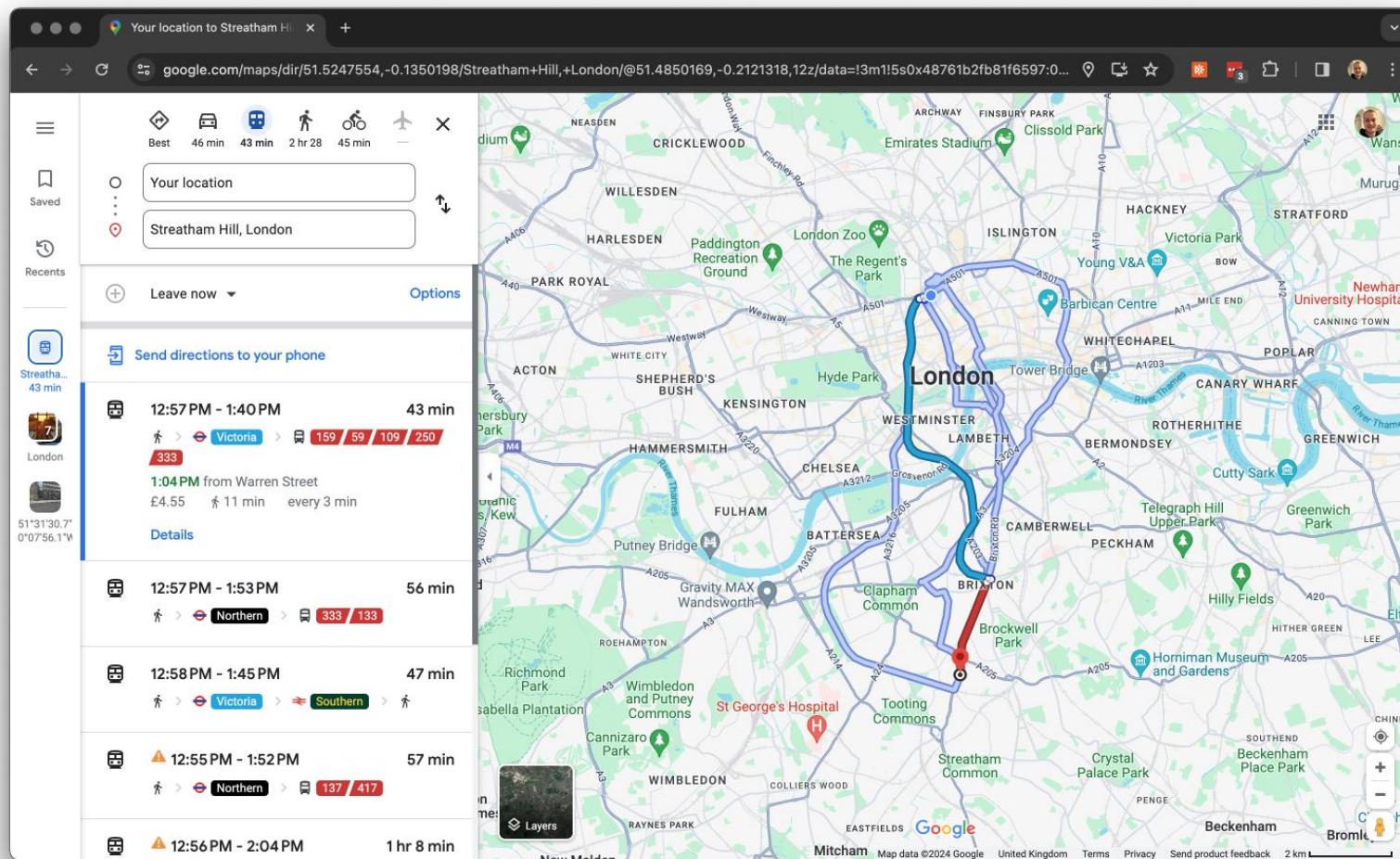
Spatial analysis

- We can GIScience and GISystems to convert spatial data into actionable information by quantifying elements such as distributions and spatial processes.

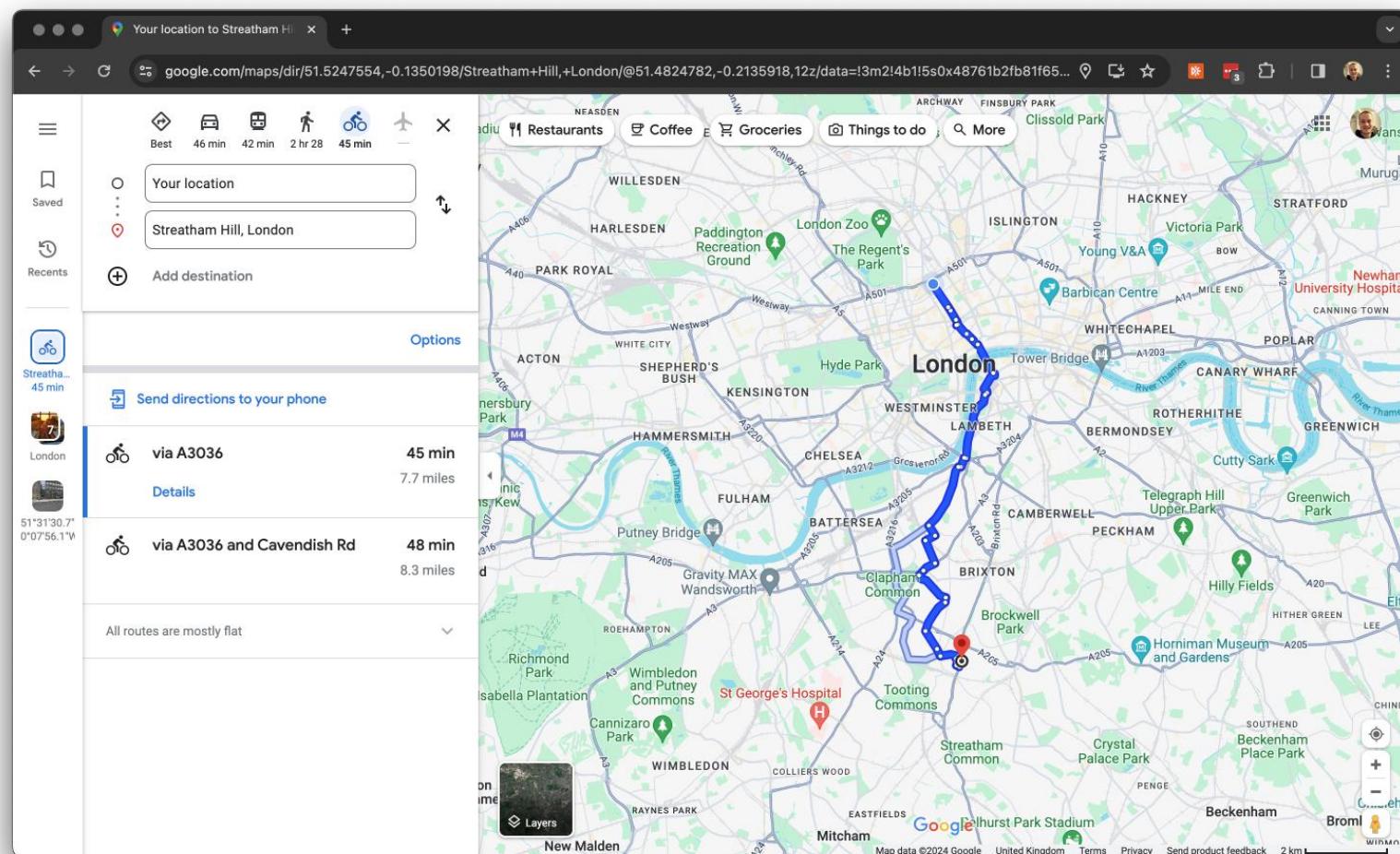
Spatial analysis



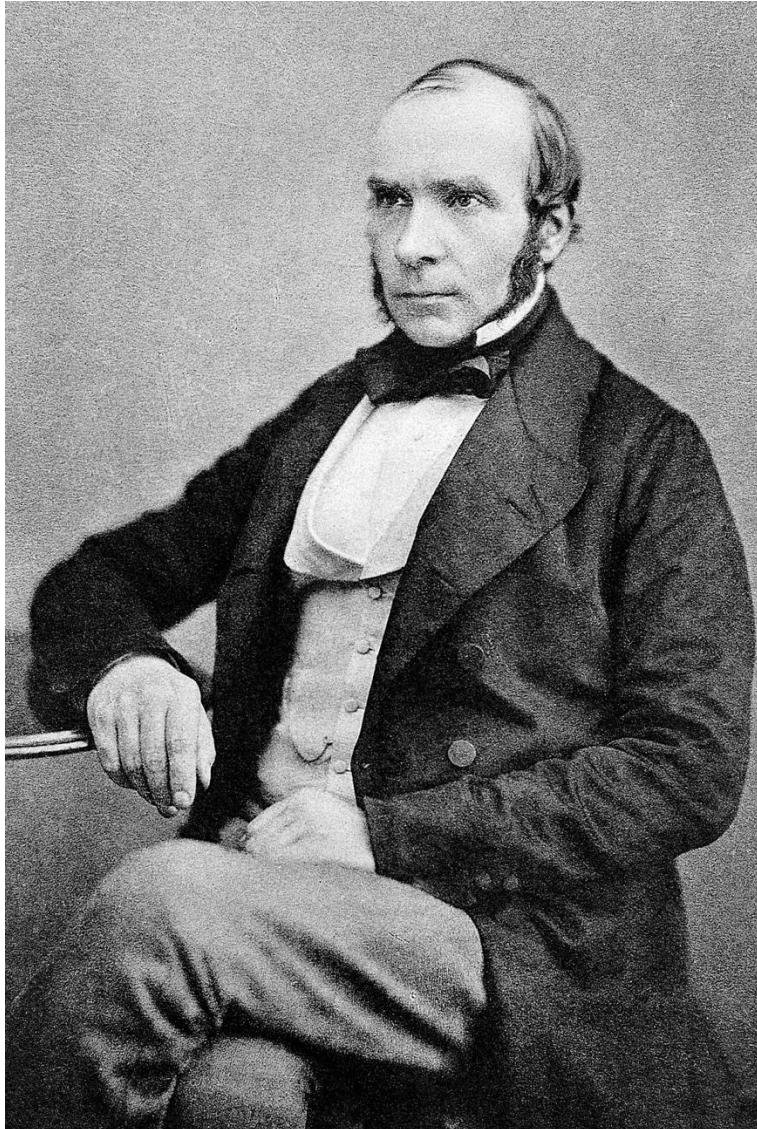
Spatial analysis



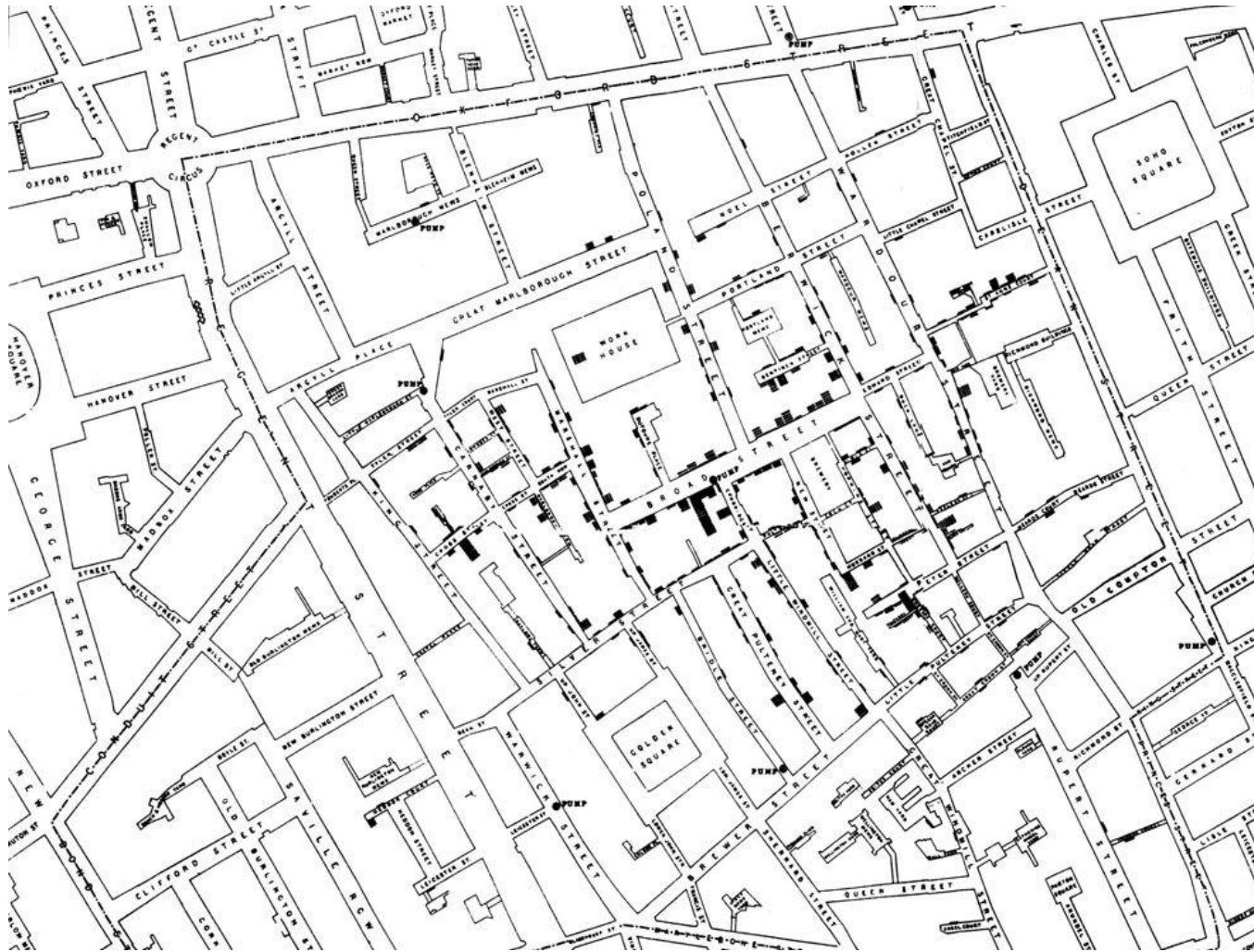
Spatial analysis



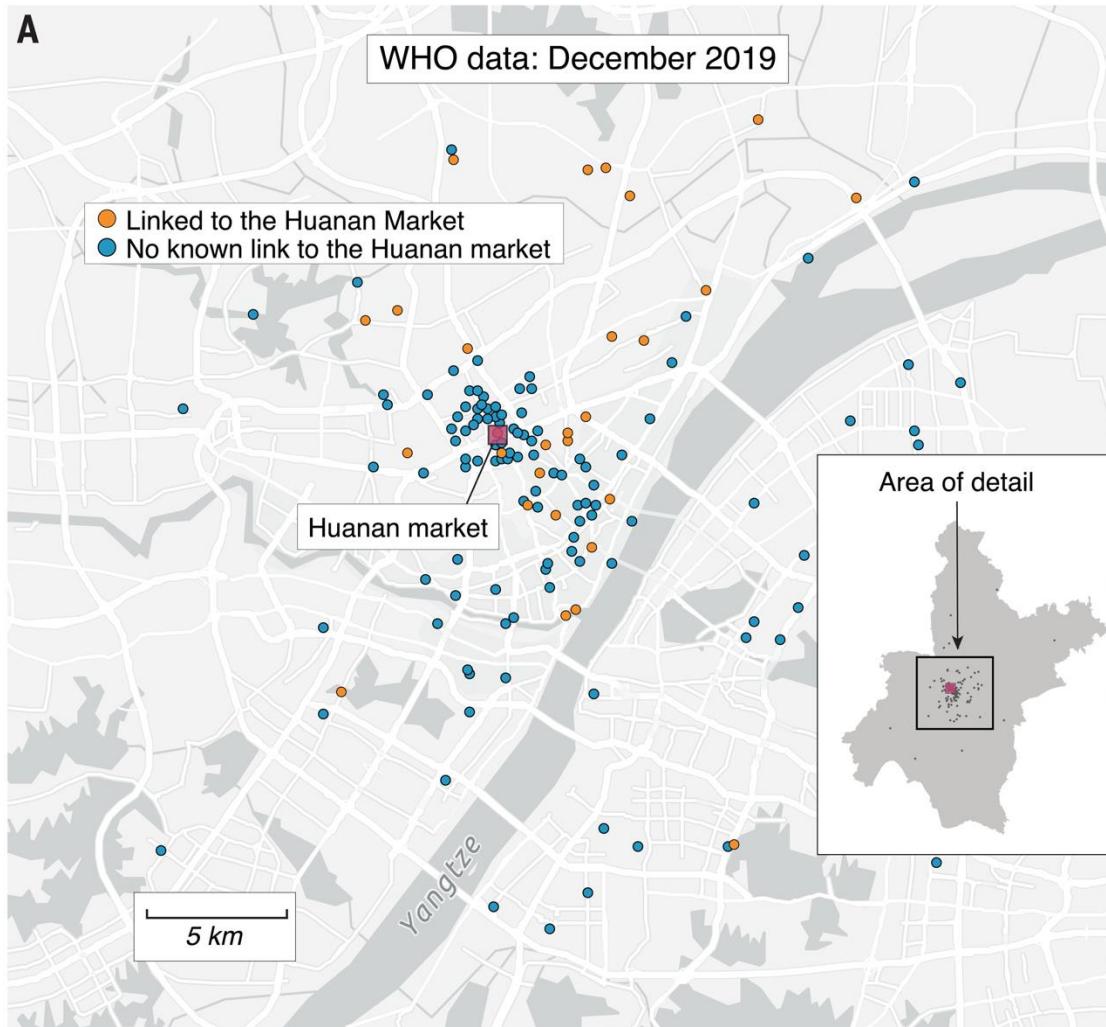
Spatial analysis



Spatial analysis

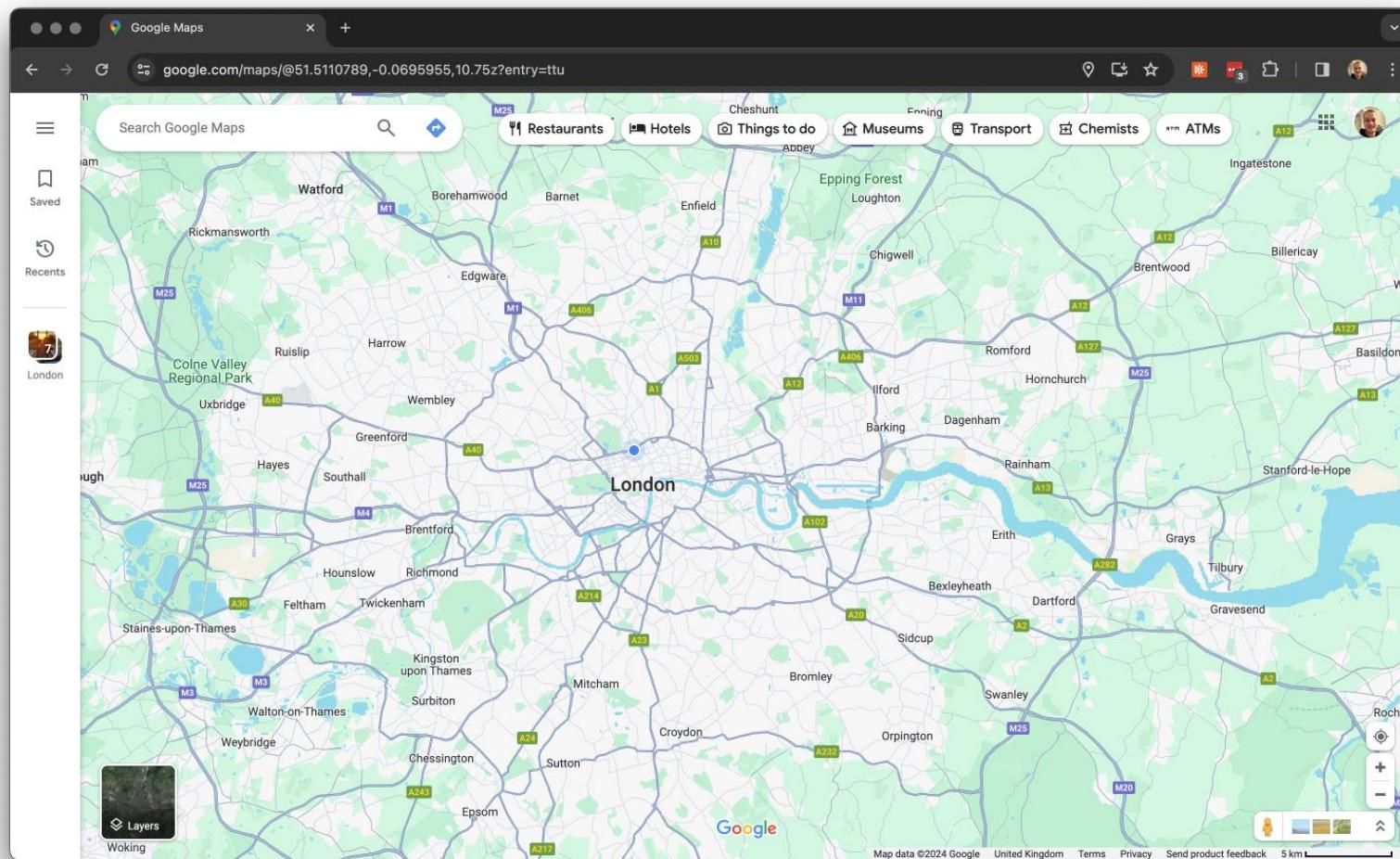


Spatial analysis

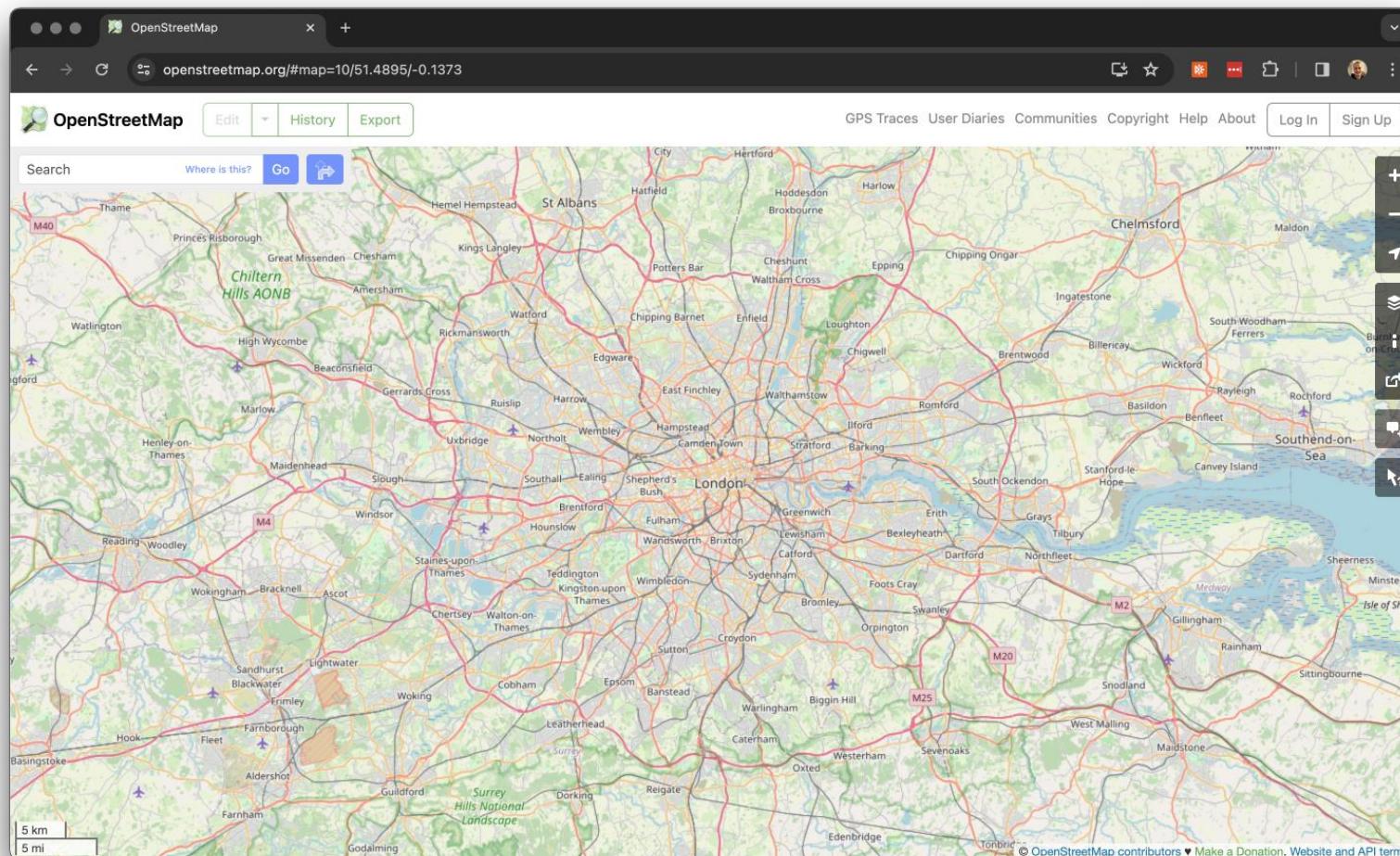


Worobey *et al.* 2022

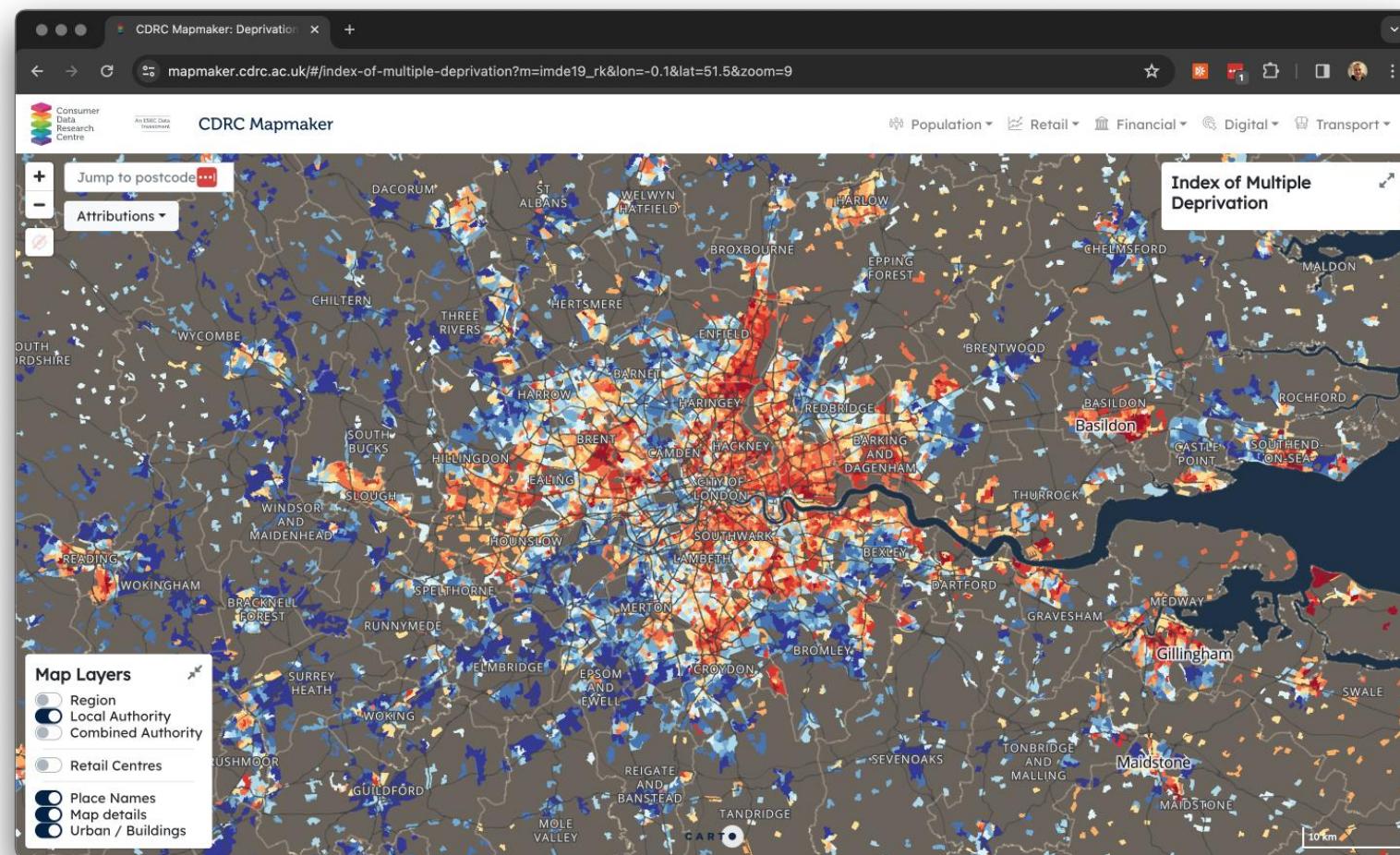
Mapping London



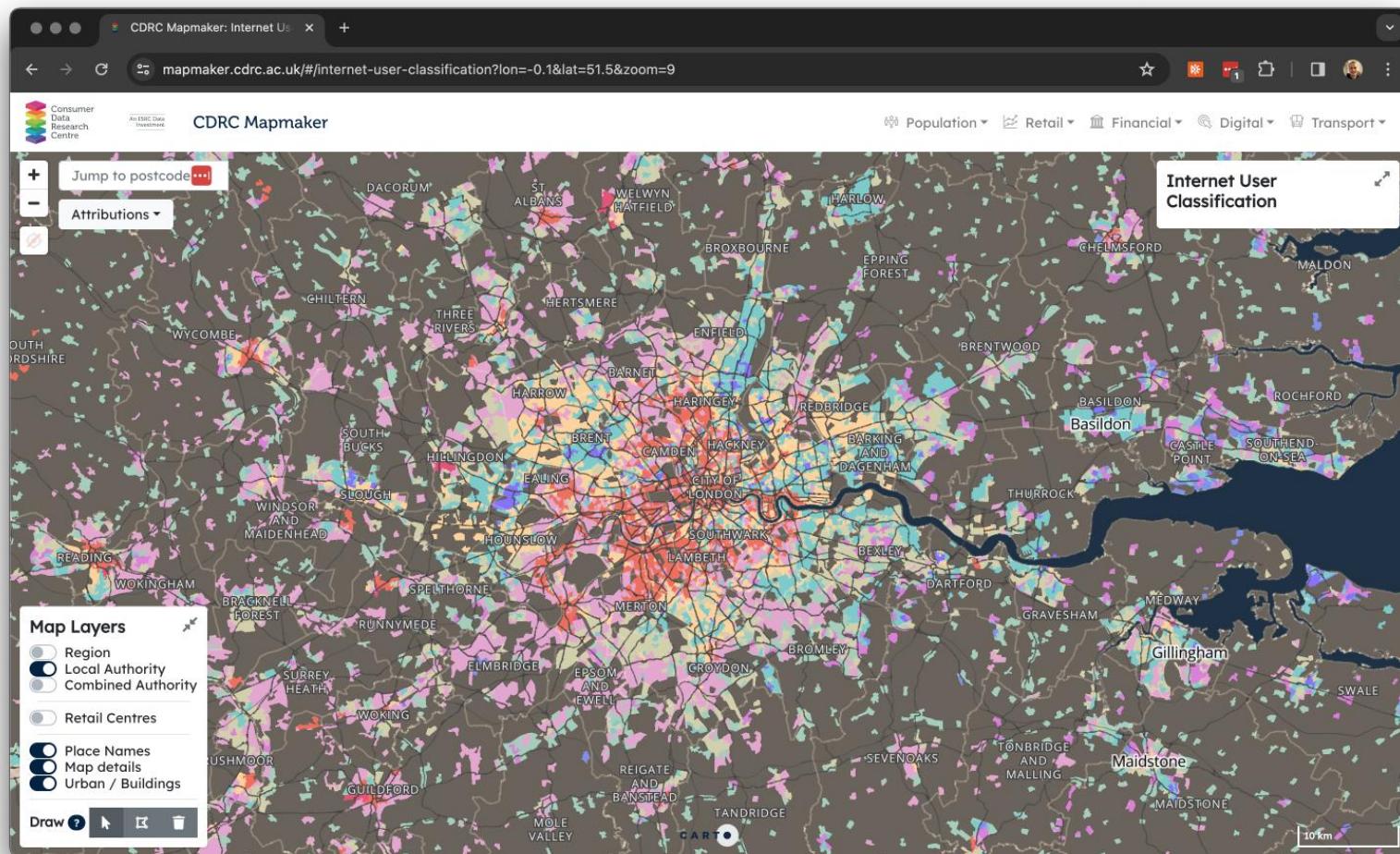
Mapping London



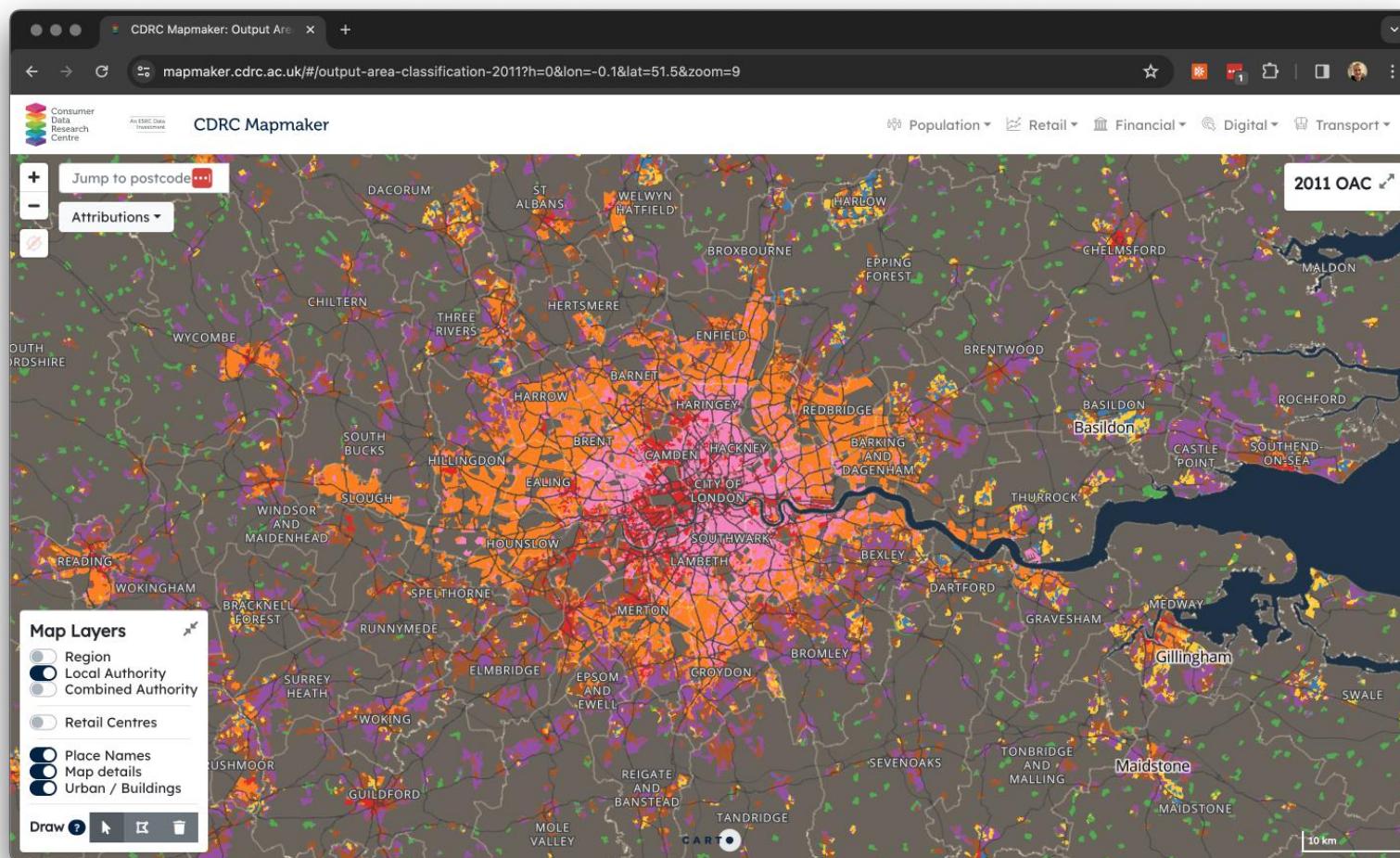
Mapping London



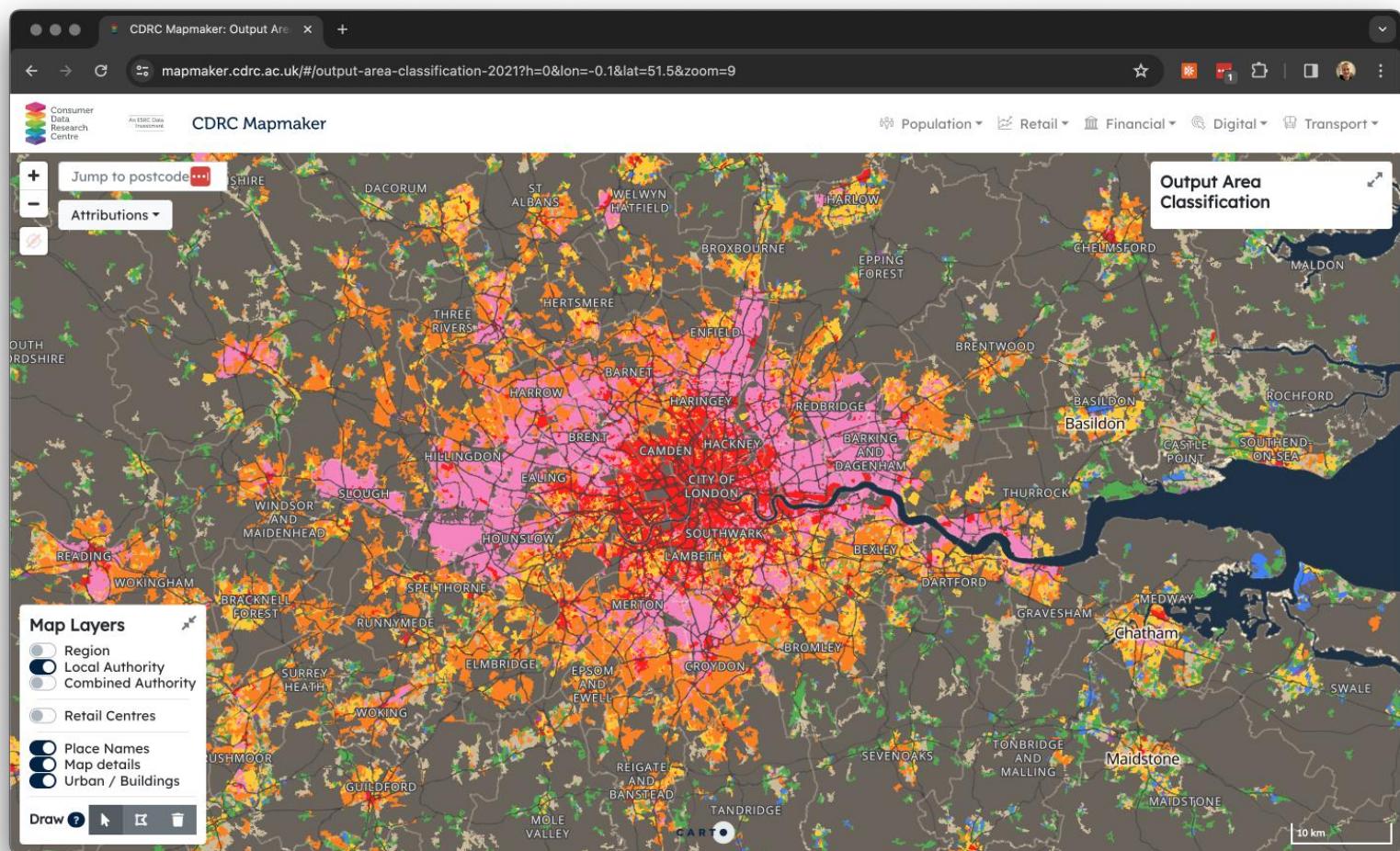
Mapping London



Mapping London



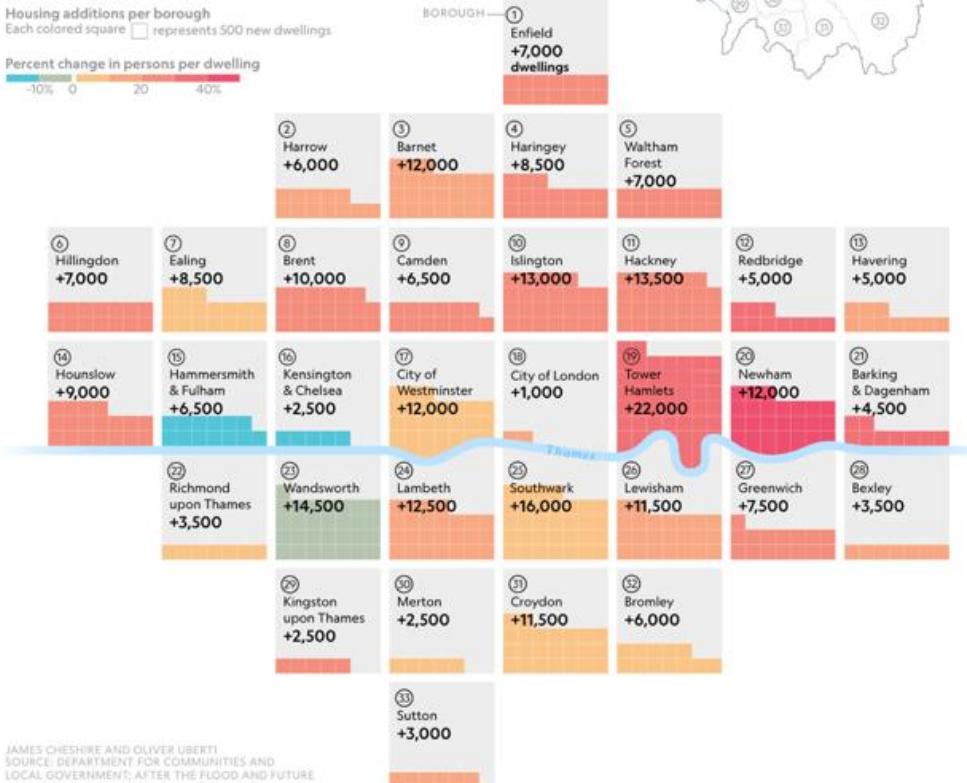
Mapping London



Mapping London

Rising Residential Areas

London's population grew by 1.2 million between 2006 and 2016. Tower Hamlets is the fastest-growing borough, particularly around Canary Wharf, Blackwall, and Cubitt Town on the Isle of Dogs. The borough also draws a diverse group of international migrants; in the most recent census, 43 percent of its residents were born outside Britain. In boroughs with some of the highest real estate prices, such as Kensington and Chelsea, more residents are moving out than in.



National Geographic. How. London became the centre of the world.
<https://www.nationalgeographic.com/environment/article/london-population-city-planning>

Conclusion

- Maps are important tools to effectively convey information.
- At least two things are required: GIScience and GISystems.
- There is no one map to rule them all.

Questions

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