NIHR | Applied Research Collaboration South West Peninsula

@penCHORD_UoE
@peninsula_ARC

Module 5 : Geographic Modelling & Visualisation

Session 5D : GeoPandas

Elliott Coyne

"Smart flies Aer Lingus"

HSMA 5

#hsma5isalive

Agenda for Today

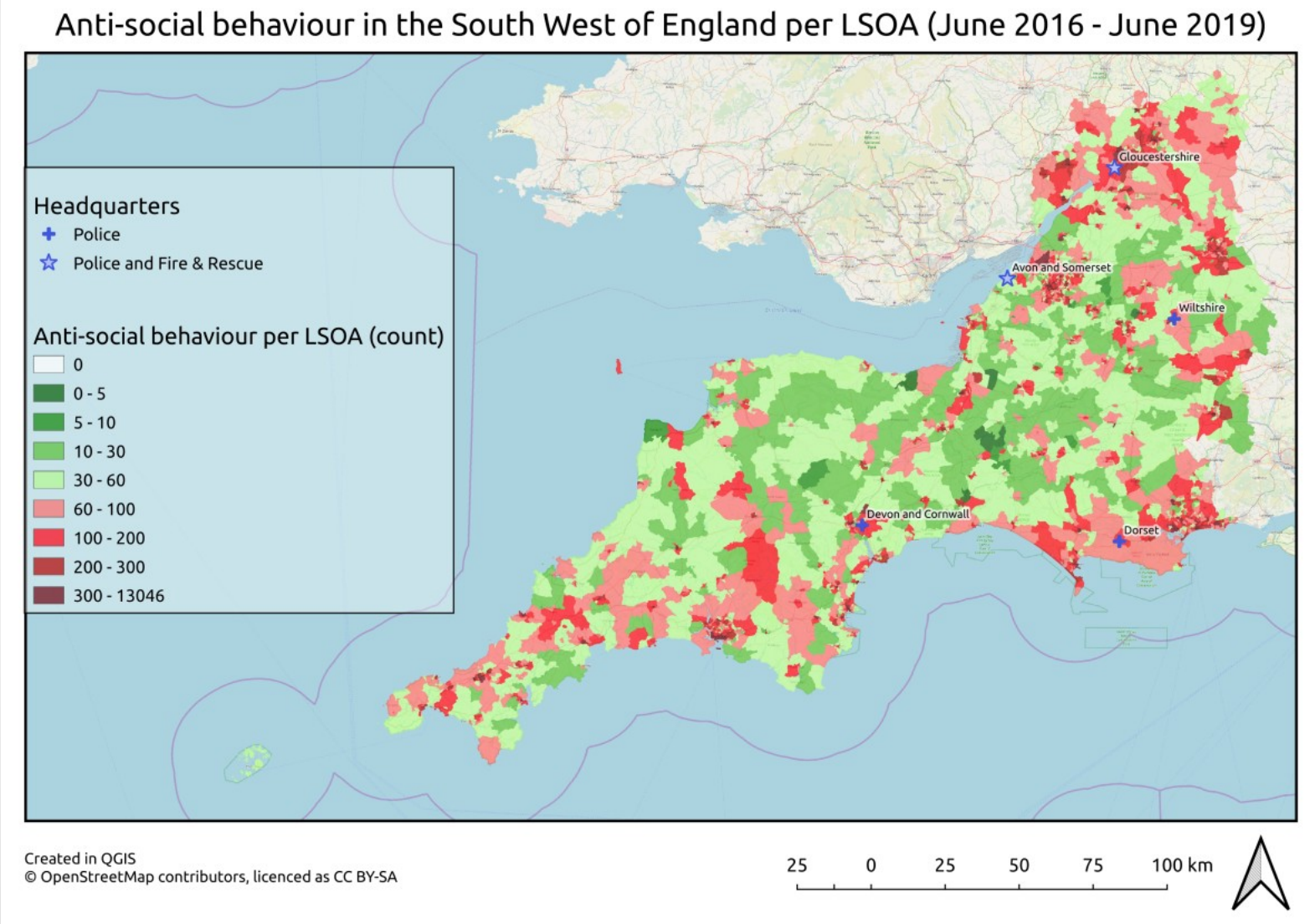
Welcome to QGIS 3
Resources
Files & Assets
Base Maps & Navigation
PSG Follow Along (Chapters 2, 3, 4)

Recap on Projections
Save Features as a New Layer
Symbology
PSG Follow Along (Chapters 6, 7, 8)

Opening CSV Files
Adding Point Data & Labels
PSG Follow Along (Chapters 9, 11, 12)

Adding Shape Files
Table Joins
Export Layer Style File
Exporting Map
PSG Follow Along (Chapters 13, 14, 15, 16)

What you’re aiming for...



Part 1

Welcome to QGIS 3
Resources
Files & Assets
Base Maps & Navigation
Exercise 1 *(Chapters 2, 3, 4, 5)*

QGIS 3.26 – Buenos Aires

Hands on session!

Refer to accompanying PDF file for detailed instructions.
Official User Guide HERE.

Considerations
Often using a **combination of files** to produce a final map. These can include files with **numerical values** (i.e., 'number of bicycle thefts per LSOA') in addition to polygon Shapefiles (i.e., LSOA boundaries.

LSOA: Approx. 1,500 residents or 650 households
Polygon: Flat two-dimensional shape with straight sides that are fully closed

Shapefile

Use preferred web-search engine just *beware of usage Terms & Conditions!*

Examples of sources…
- data.gov.uk
- statistics.gov.uk (geoportal)
- statistics.gov.uk (geoportal)
- digimap (May require organisational access)

See https://en.wikipedia.org/wiki/Shapefile

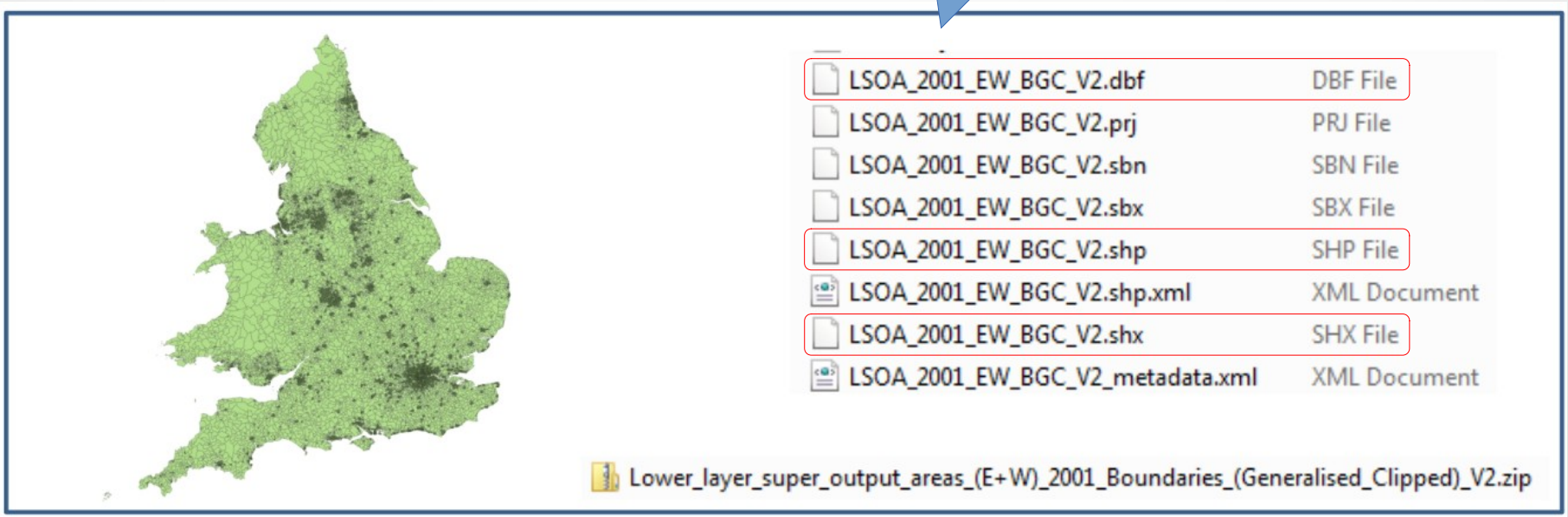


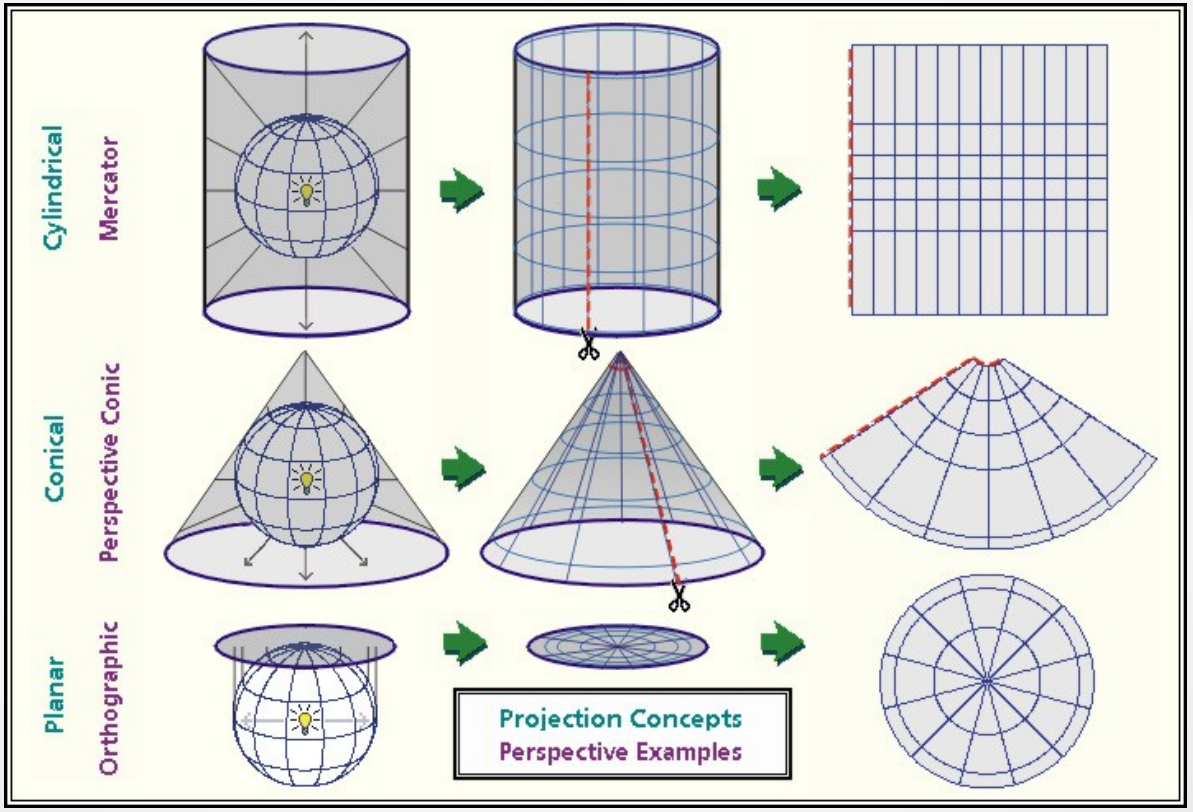
Table Joins

Sometime you may have various sources of data that you want to link to your shapefiles.

This of this like a Vlookup (Excel) of Join (SQL)

Before We Begin...

"You know nothing about earth…"



Projections

Coordination Reference Systems:

- EPSG:27700 OSGB 1936 / British National Grid - United Kingdom Ordnance Survey. Co-ordinates are in Eastings (X) and Northings (Y).

- **EPSG:4326** WGS 84 - World Geodetic System 1984. Co-ordinates are in Longitude (X) and Latitude (Y).

- **EPSG:3857** - projection for displaying lat/long as a flat map

Further Reading

1)https://www.esri.com/arcgis-blog/products/arcgis-pro/mapping/gcs_vs_pcs/
2)https://www.earthdatascience.org/courses/use-data-open-source-python/intro-vector-data-python/spatial-data-vector-shapefiles/geographic-vs-projected-coordinate-reference-systems-python/
3)https://docs.qgis.org/3.22/en/docs/gentle_gis_introduction/coordinate_reference_systems.html

Exercise 1 – 20 mins

Become familiar with the relationship between the representation of the layer on the map canvas and in the attribute table.

Work through the notes from Chapters 2 - 5 to become familiar with the QGIS environment.

1) Add the suggested toolbars
2) Add the suggested panels
3) Add the world basemap
4) Practice your map navigation skills
5) Open & dock the attribute table for world layer
6) Practice identifying a specific row in the attribute table with the corresponding polygon in the map canvas, and vice versa.
7) Save project. Close QGIS. Reopen QGIS your project.

At the end this exercise your QGIS project should show the useful toolboxes and panels, a single layer (world) listed in the layers panel, the world layer in full zoom on the map canvas, and the world layer's attribute table docked to the bottom of the map canvas.

Part 2

Recap on Projections
Save Features as a New Layer
Symbology
PSG Follow Along (Chapters 6, 7, 8)

Exercise 2 – 25 mins inc. Comfort Break

Extract some features from the world layer, and save them as a new shapefile. Become familiar with the Layers Styling panel in order to change the appearance of the layer using simple symbology.

Work through the notes from Chapter 6 - 8 to save a new shapefile (just the UK) and add simple styling. The steps that you will cover are:

1) Change the project projection to EPSG: 32630 (see Chapter 6).
2) From the world layer, select polygons for UK. These are now your ”selected features” (see Chapter 7).
3) Export selected features to new shapefile called ”UK.shp” (see Chapter 7).
4) Play with the order of the two layers in the layers panel (world and UK). Toggle between having both/one/none selected (please end with the UK being the only one selected, and zoom to this layer)
5) Customise the simple symbology for the UK shapefile (follow Chapter 8).

At the end this exercise your QGIS project should show the UK as land and coast.

Part 3

Opening CSV Files
Adding Point Data & Labels
PSG Follow Along (Chapters 9, 11, 12)

Exercise 3 – 10 mins

Add point data from a delimited text file (.csv) and style the points using categorised symbology

Exercise 3A: Follow Chapter 11. Add your Police HQ point data and style each point to represent whether the site is also a Fire and Rescue HQ.

Exercise 3B: Follow Chapter 12. Add a label to each point to state the site's location (using field "Head quarters").

At the end this exercise your QGIS project should show the UK basemap, with 5 points for the locations of the Police headquarters, points styled based on site type, and a label showing the site name.

Part 4

Adding Shape Files
Table Joins
Export Layer Style File
Exporting Map
PSG Follow Along (Chapters 13, 14, 15, 16)

Exercise 4 – 30 mins

Become familiar with joining your own data (.csv file) to a corresponding shapefile in order to visualise your data. Use continuous symbology to style the layer

Exercise 4A: Follow notes from Chapter 13 & 14 to

i) add delimited text file
ii) add shapefile and
iii) create a table join.

Exercise 4B: Using the information covered in Chapter 15, choose two columns from the street crime dataset and style them using graduated symbology. Duplicate the layer so that a separate layer is displaying each column (rename each layer).

At the end this exercise your QGIS project should show LSOA crime data for the SW, styled to represent a data field, together with a UK basemap & the 5 locations of the Police headquarters.

Demo Only

Print layout

Practice makes perfect...

Use the files provided in the folder entitled ‘Liverpool’ to produce a similar style map.

Files:

- *fire_police_stations.csv*
- *merseyside_police.csv*
- *Lower_Layer_Super_Output_Areas_December_2011_Generalised_Clipped__Boundaries_in_England_and_Wales.**