Using Excel files to geolocate data in ArcGIS

Data collected during geographical fieldwork often has a spatial element to it - different points along a transect may, for example, display different survey scores, or different sites along a river's course may show measurements in any number of variables. Secondary data equally may be spatial in nature, such as census data that tells us about the average household income for different wards.

Presenting spatial data alongside numerical data is very often best done by using a map and GIS packages such as ArcGIS provide a quick, editable and visually effective means of creating maps. One of the simplest ways of projecting data onto a GIS map is to use numerical data that has been pre-processed in an Excel file.

The nature of the data

In order to create maps with data located on them, the data itself has to have locational references in it. ArcGIS can automatically detect various spatial data formats within a table created in Excel. These formats include:

- Longitudes and Latitudes
- Addresses
- Localities
- Postal codes
- Postal towns
- Counties
- ISO Country codes

When collecting and processing your data therefore, it is important that you collect the locational data at the same time. For most students in the field, because they are dealing with a fairly small total spatial area (such as the footprint of one town) it is best to deal in latitude and longitude when siting their data. This can be done using simple GPS apps on a smart phone - in Google maps, simply dropping a pin will give you a latitude and longitude as a decimal fraction with west and south coordinates being denoted by a minus symbol.

E.g. Sandown has a latitude and longitude of	50°39'18.36' N	1°09'14.76' W
or a decimal fraction of	50.6551	-1.1541

The format of the data

In general, it is best for students to keep their data in as simple an Excel table as possible. They should start with the locational data in columns and then add additional columns to show the data at those points. If they are using latitude and longitude data, latitude should be written in the first column and longitude in the second. The data should then be saved as a CSV file (with the suffix .csv).

Making the map

This could not be simpler - once you have your CSV file populated with field data all you need to do is digitally drag the file onto a blank map that is open in ArcGIS. The data will automatically be detected and in most cases, a proportional shape map will be produced. From there, students can start to manipulate the way the data is presented (see the island geographer guide 26) and print or save their map when they are ready.

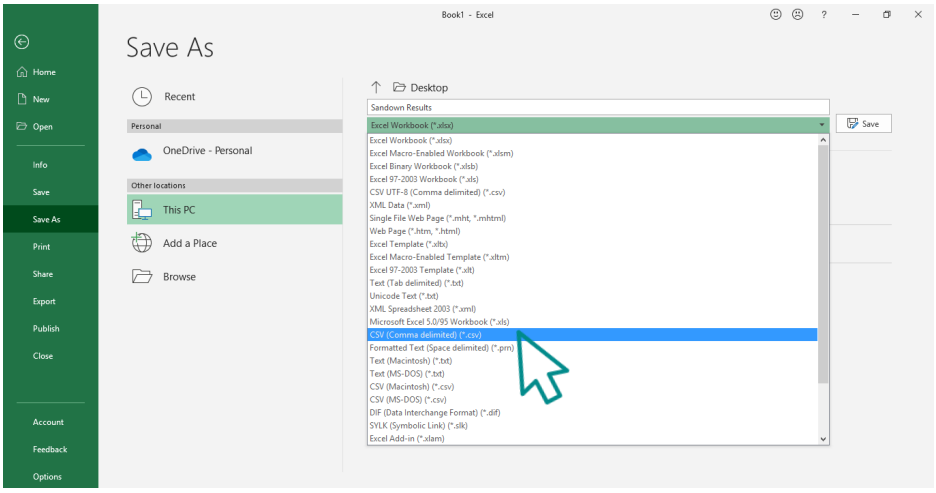
Worked example

A student collects data at different locations along four different transects in Sandown. Along each transect, data is collected at four locations, giving the student 16 different data locations in total. They collect an environmental quality score at each point and a decibel reading, as well as the exact location (latitude and longitude) of each data collection using a GPS based app on their smart phone.

After the fieldwork, they produce the following Excel table. This was then saved as a CSV file.

	A	B	C	D
1	Latitude	Longitude	EQS Score	Decibel reading
2	50.655660	-1.150913	2	68
3	50.655102	-1.152136	1	65
4	50.654545	-1.153552	3	65
5	50.653796	-1.155483	4	63
6	50.656531	-1.151793	2	65
7	50.657007	-1.153595	2	63
8	50.657633	-1.154947	4	59
9	50.657959	-1.156192	4	55
10	50.656912	-1.150312	1	62
11	50.657959	-1.150248	2	60
12	50.659156	-1.150441	3	60
13	50.660448	-1.151192	5	55
14	50.656517	-1.148638	3	58
15	50.657129	-1.146772	4	60
16	50.657809	-1.144926	5	54
17	50.658694	-1.143017	4	45
18				
19				

Sheet1



After opening ArcGIS through https://www.arcgis.com/home/index.html and logging in using their school's username and password, the student then opened a fresh map by selecting 'Map' from the toolbar at the top of the page. They then dragged the CSV file icon onto the map and the results were populated onto the base map as a layer of data.