Working with Environmental Data

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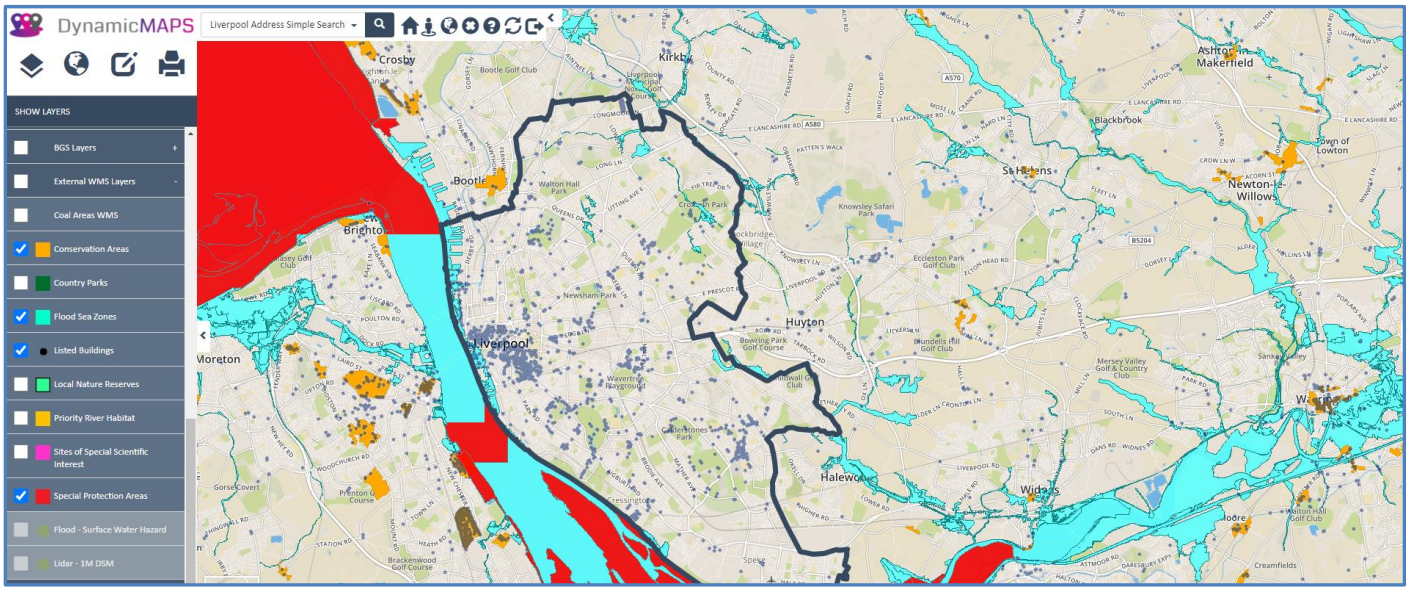
One of the most common questions that I am asked when delivering **Cadline's GIS Training courses** is **where** and **how** can I get the data you are showing? This is often the case when I show delegates **Environmental Layers** within our WebGIS – **MapThat.**

For example, using a **Web Map Service (WMS)** you can connect both your desktop GIS (e.g. **QGIS**) or WebGIS to environmental datasets at the touch of a button, without the need to even download those datasets.



Have a look at these types of Environmental Layers in our online WebGIS - TryMapThat

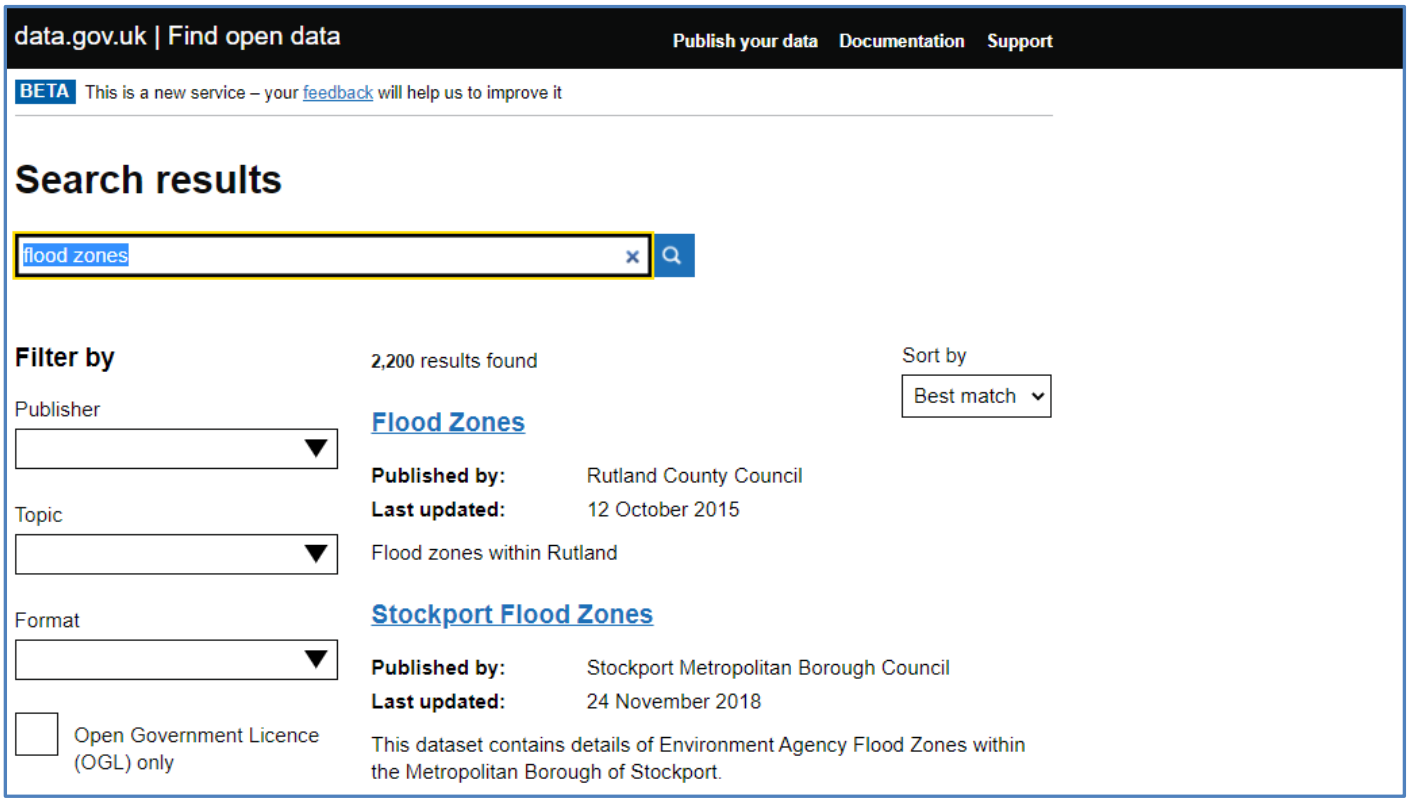
In this Cadline blog we will explore the following tasks:

- **Searching** for Environmental Datasets
- Utilising a **Web Map Service** (WMS) within your desktop GIS - QGIS
- **Downloading** spatial datasets and uploading to a spatial database – PostGIS

1 – Searching for Environmental Datasets

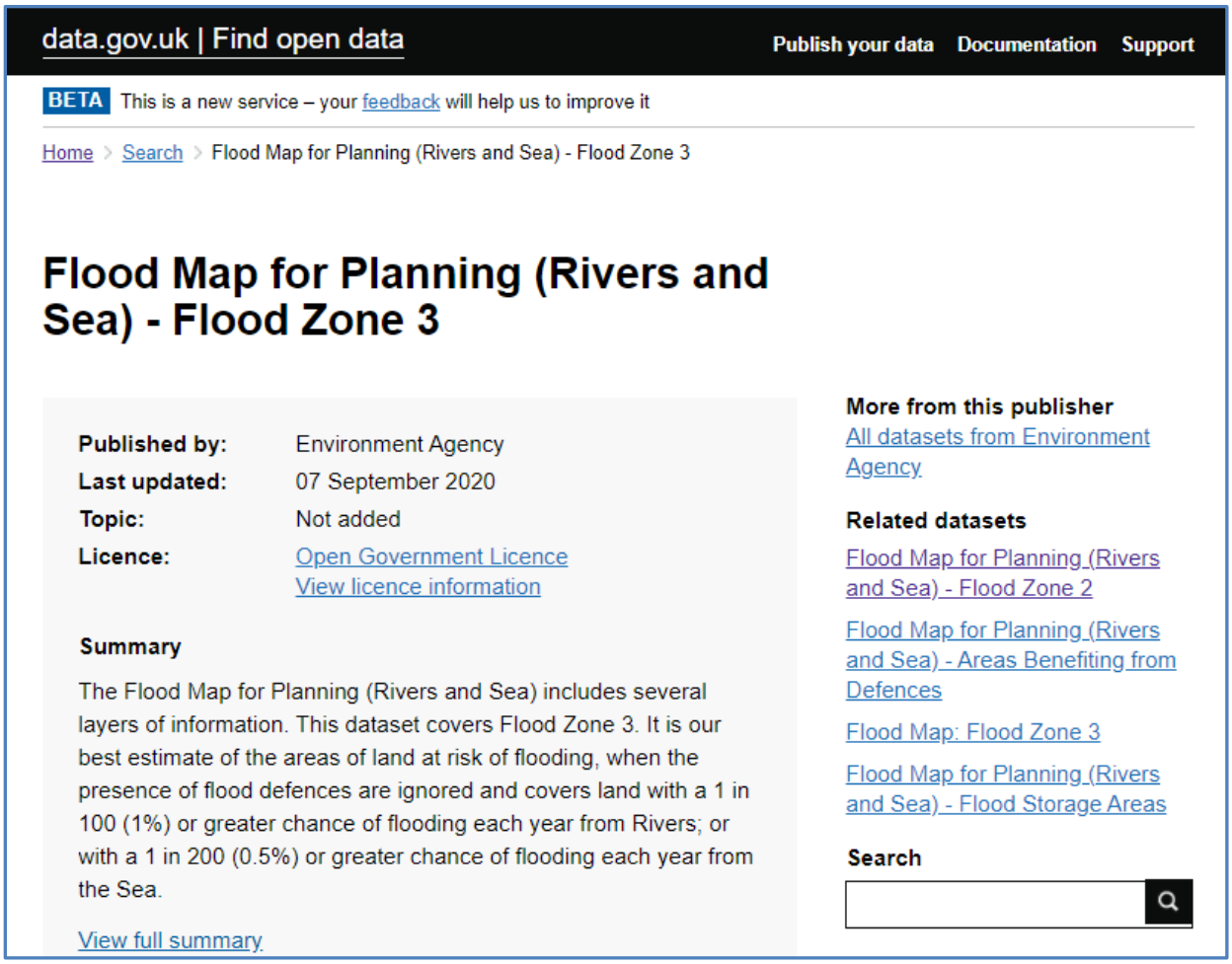
Bookmarks are great! Once you have found a site to provide you the spatial datasets you need – bookmark that page! A great source for Environmental Datasets, especially in England and Wales, is the **Data.Gov** website - https://data.gov.uk/

From this site you can now simply run a **SEARCH** to find the data that you are looking for e.g. **Floods** and the page returns likely options for you.



If you choose a suitable example e.g. the **Flood Map for Planning – Flood Zone 3**, the page will update to show you the details for that dataset, including:

- A **Title**
- Who **Publishes** the data
- Last **Updated Date**
- **Licensing** Details
- A **Summary** of the Dataset



data.gov.uk | Find open data

Publish your data Documentation Support

BETA This is a new service – your feedback will help us to improve it

Home > Search > Flood Map for Planning (Rivers and Sea) - Flood Zone 3

Flood Map for Planning (Rivers and Sea) - Flood Zone 3

Published by: Environment Agency
Last updated: 07 September 2020
Topic: Not added
Licence: Open Government Licence
View licence information

Summary

The Flood Map for Planning (Rivers and Sea) includes several layers of information. This dataset covers Flood Zone 3. It is our best estimate of the areas of land at risk of flooding, when the presence of flood defences are ignored and covers land with a 1 in 100 (1%) or greater chance of flooding each year from Rivers; or with a 1 in 200 (0.5%) or greater chance of flooding each year from the Sea.

View full summary

More from this publisher
All datasets from Environment Agency

Related datasets
Flood Map for Planning (Rivers and Sea) - Flood Zone 2
Flood Map for Planning (Rivers and Sea) - Areas Benefiting from Defences
Flood Map: Flood Zone 3
Flood Map for Planning (Rivers and Sea) - Flood Storage Areas

Search

Below those details will often be links to **Download** and possibly **Preview** the dataset. *However be warned - not all layers in the Data.Gov website have previews and not all the WMS or Data Download links will work.*

Data links

Link to the data	Format	File added	Data preview
FloodMapForPlanningRiversAndSeaFloodZone3_Download	N/A	07 September 2020	Not available
FloodMapForPlanningRiversAndSeaFloodZone3_WMS	N/A	07 September 2020	Not available
FloodMapForPlanningRiversAndSeaFloodZone3_WFS	N/A	07 September 2020	Not available

This Flood Zone dataset has multiple options for accessing the layer, including:

- Direct **Download**
- Access to a Web Feature Service – **WFS**
- Access to a Web Map Service - **WMS**
- A REST Service for **ESRI**

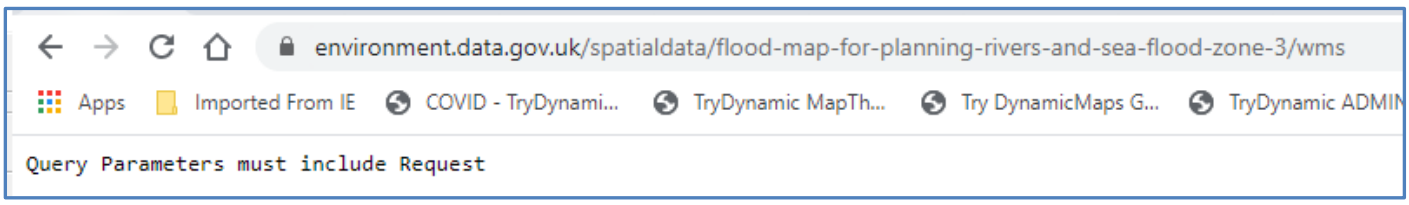
In this example we will copy the **Web Map Service (WMS)** that is being published and utilise it later in QGIS to connect directly to that Web Service.

To copy the Web Map Service (WMS) URL, simply click on the WMS link in the **Data Links** section:

Data links

Link to the data	Format	File added	Data preview
FloodMapForPlanningRiversAndSeaFloodZone3_Download	N/A	07 September 2020	Not available
FloodMapForPlanningRiversAndSeaFloodZone3_WMS	N/A	07 September 2020	Not available

Having clicked on the WMS link a new page will open, and it's the **URL** in the **address bar** that we need to now copy:



Here is the copied URL for this Flood Zone 3 Dataset – we will use this later in QGIS.

https://environment.data.gov.uk/spatialdata/flood-map-for-planning-rivers-and-sea-flood-zone-3/wms

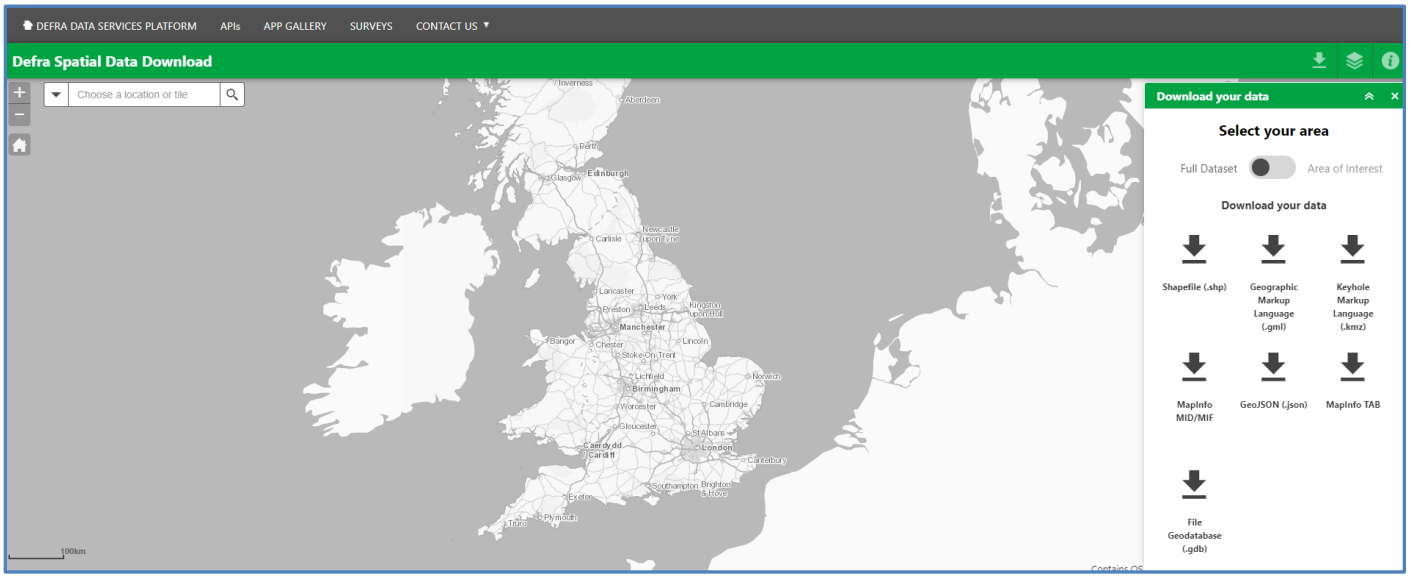
Alternately, instead of using a Web Map Service (WMS) to view the live data from source, you can also **Download** a spatial version of the layer and then open that data into your GIS or import it into your own **spatial database** to then update and manage yourself.

This time we will click on the **DOWNLOAD** link in the **Data Links** section:

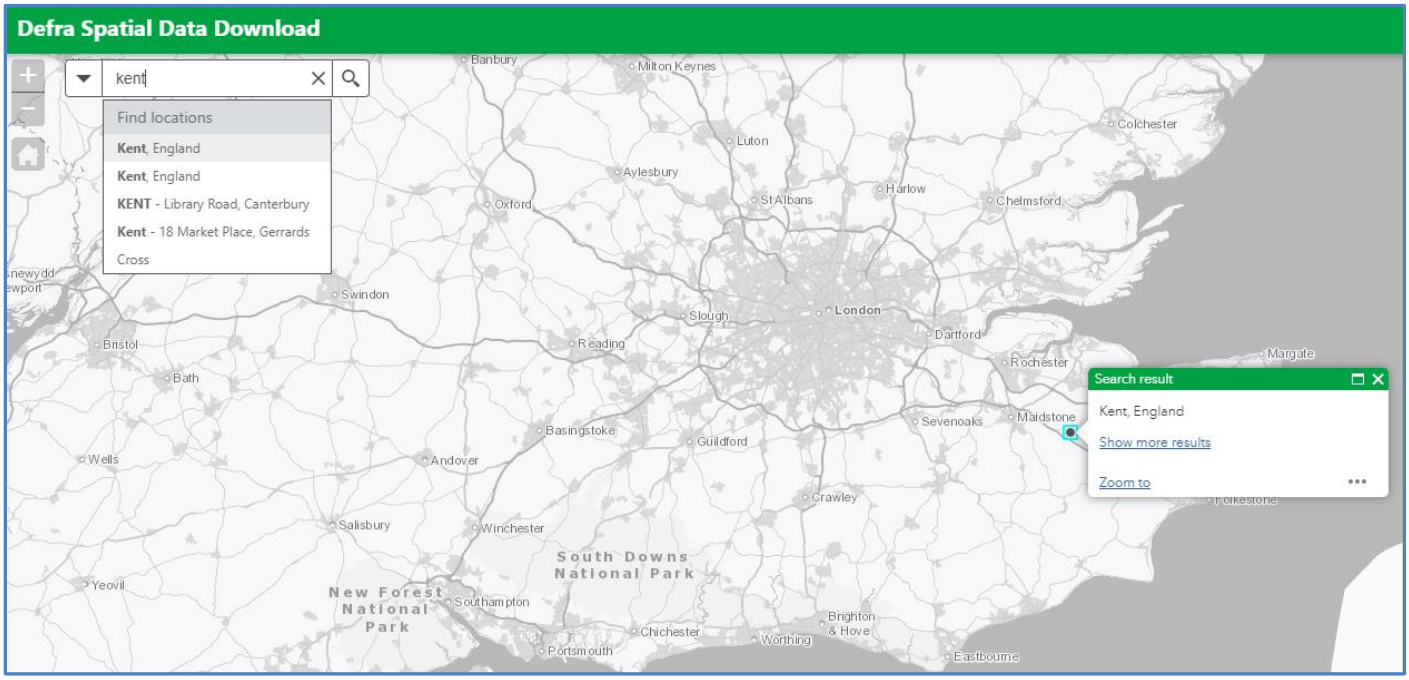
Data links

Link to the data	Format	File added	Data preview
FloodMapForPlanningRiversAndSeaFloodZone3_Download	N/A	07 September 2020	Not available

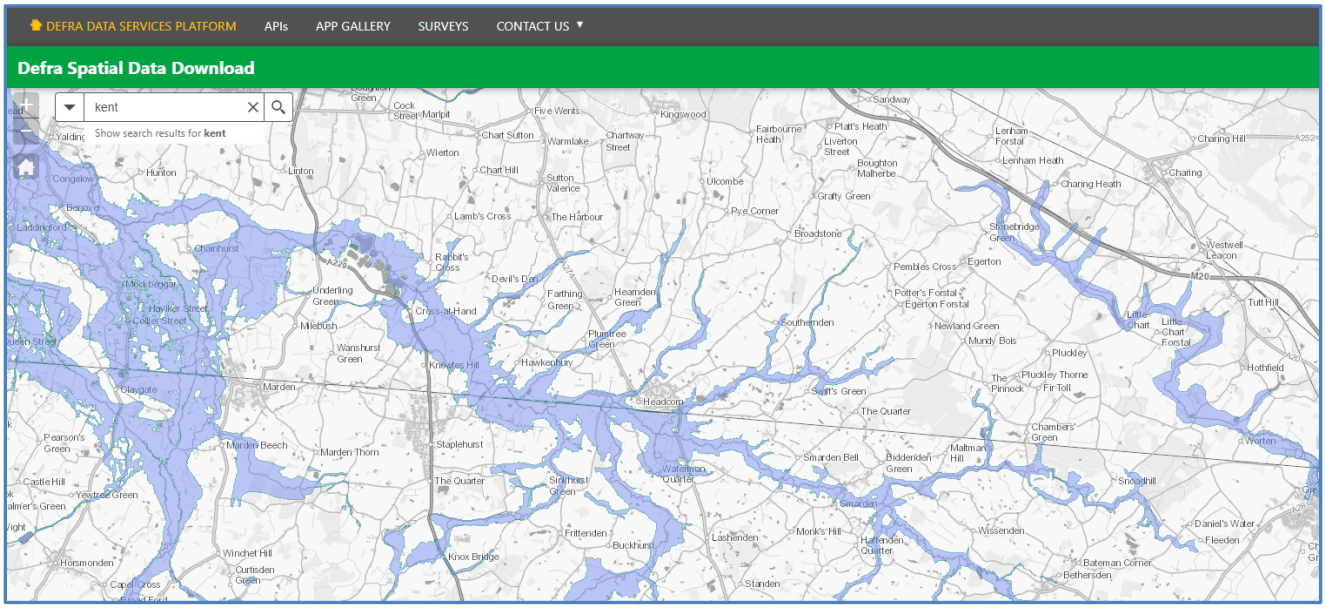
Having clicked on the Download link a new page will open which provides you access to the **DEFRA DATA SERVICES PLATFORM.**



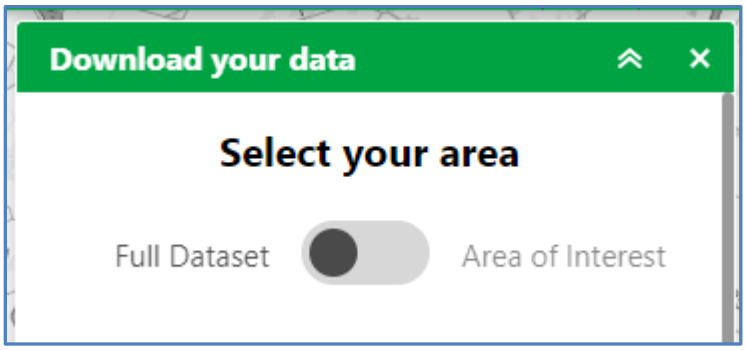
There is a simple **Search** tool that allows you to easily find the location that you wish to download data for. For example, here we have searched for **Kent.**



Choosing **ZOOM TO,** in the Search Result box, will auto zoom you to that location and at a specific zoom level your spatial dataset will be shown – in this case the **Flood Zones 3.**

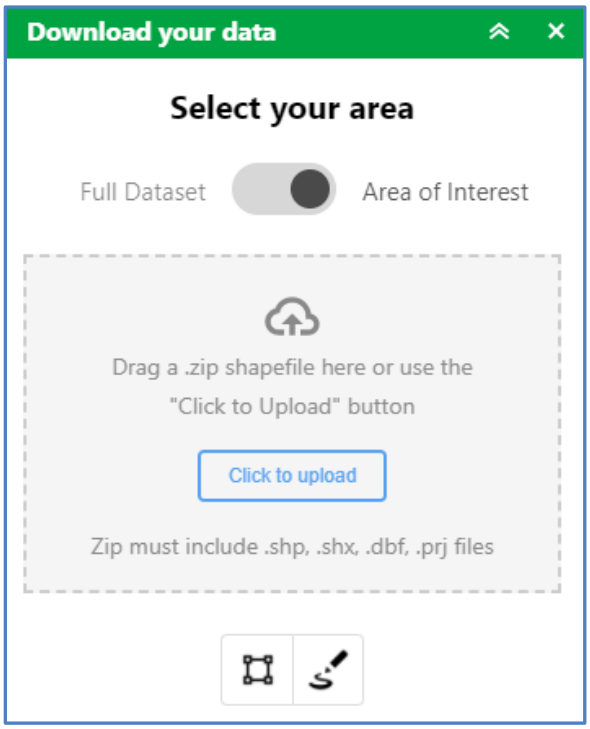


You now have options to choose the **Area of Extents** that you would like to download. This can be either a **Full Dataset** or a chosen **Area of Interest**.

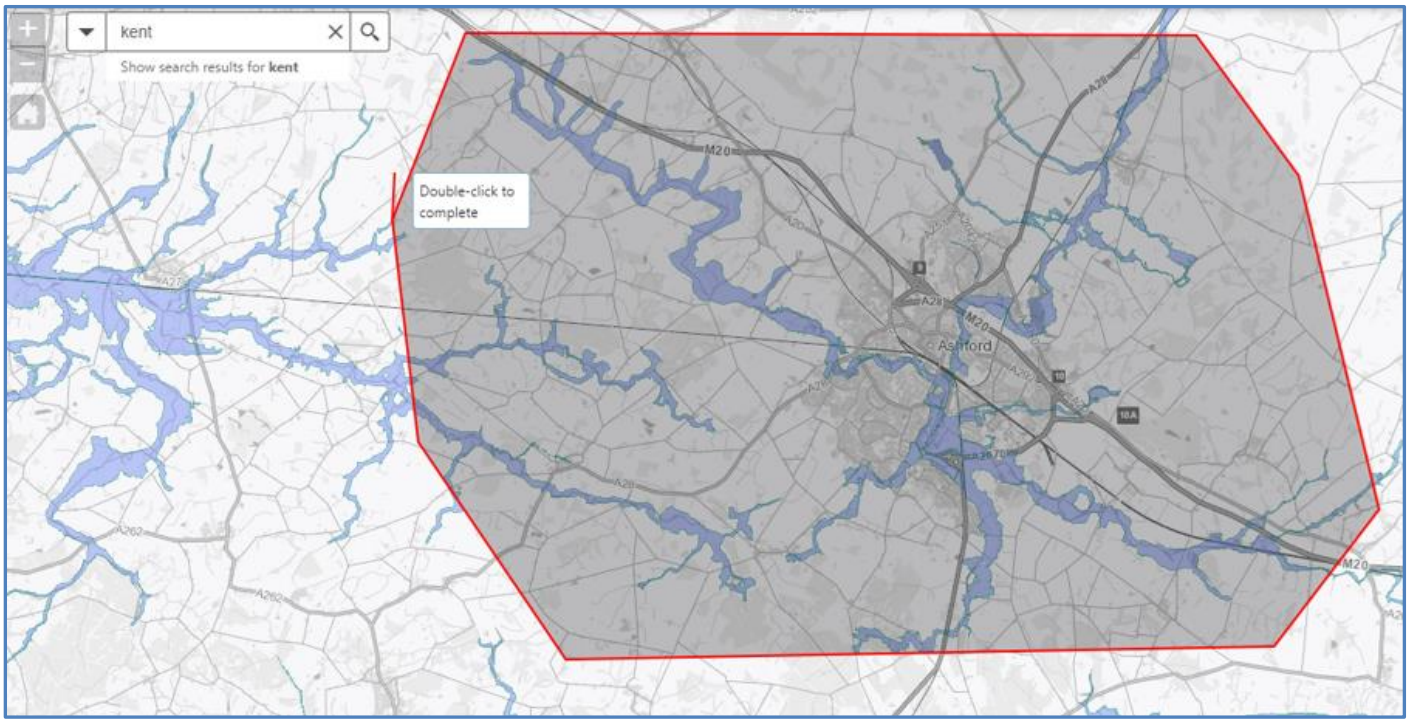


In our example we will choose the **Area of Interest.**

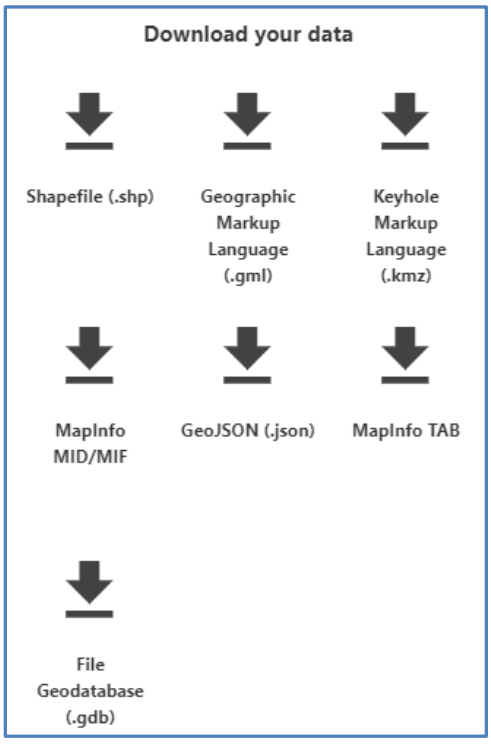
Here you can **upload** your own GIS file containing the boundary of the Area of Interest or you can use the **Drawing** tools to digitise your own area interactively.



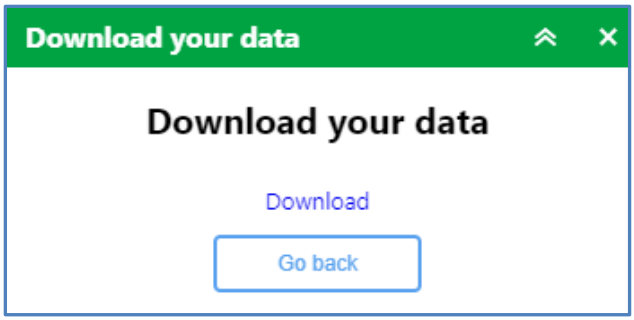
You can digitise your Area of Interest either as a **Freehand** object or as a **Polygon**, by left clicking to define the shape.



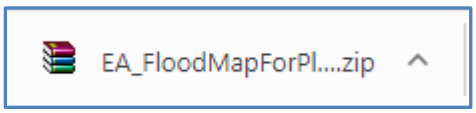
Now that we have defined the Area of Interest, you can choose the **Download Option** for the GIS file format that you need. Download options include SHP,TAB,KML,GeoJSON, GML etc.…

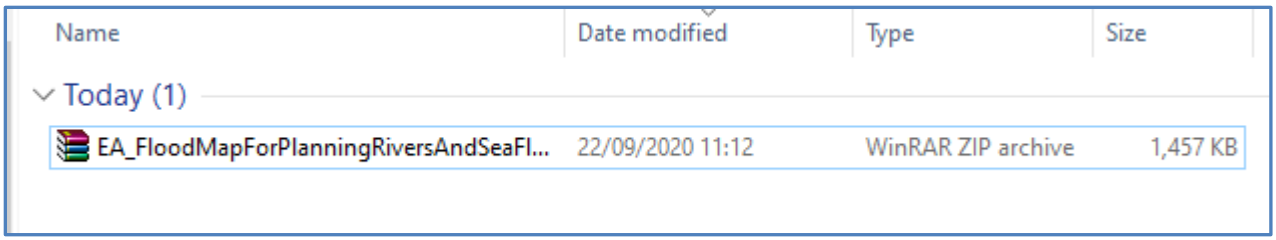


In this example we will choose the **GeoJson** file format. Once you have clicked the data type you would like, the download will be prepared and ***this may take a few seconds***. Once the data is ready, you will have a link to download the data.

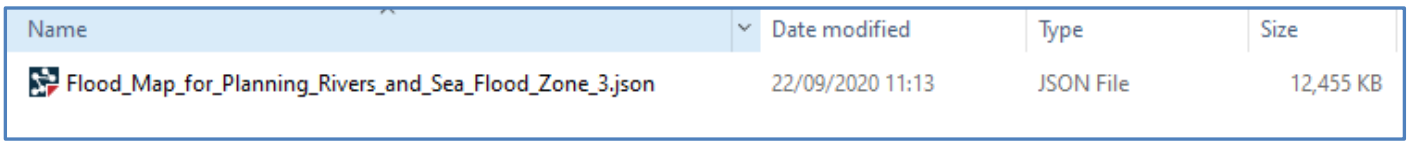


Choose **Download** and the data is saved to your computer.





Once **unzipped** the spatial data files will be shown.



We will use this data download later in this blog when we choose to upload the data to a spatial database so that we can open it in our desktop GIS or WebGIS.

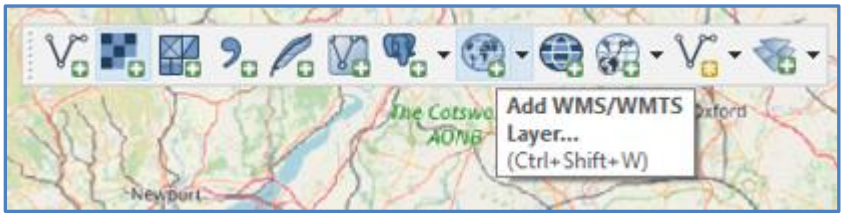
2 – Utilising a Web Map Service

Using **QGIS** we will now connect to the Web Map Service (WMS) that we identified earlier. Here is a reminder of the URL:

https://environment.data.gov.uk/spatialdata/flood-map-for-planning-rivers-and-sea-flood-zone-3/wms

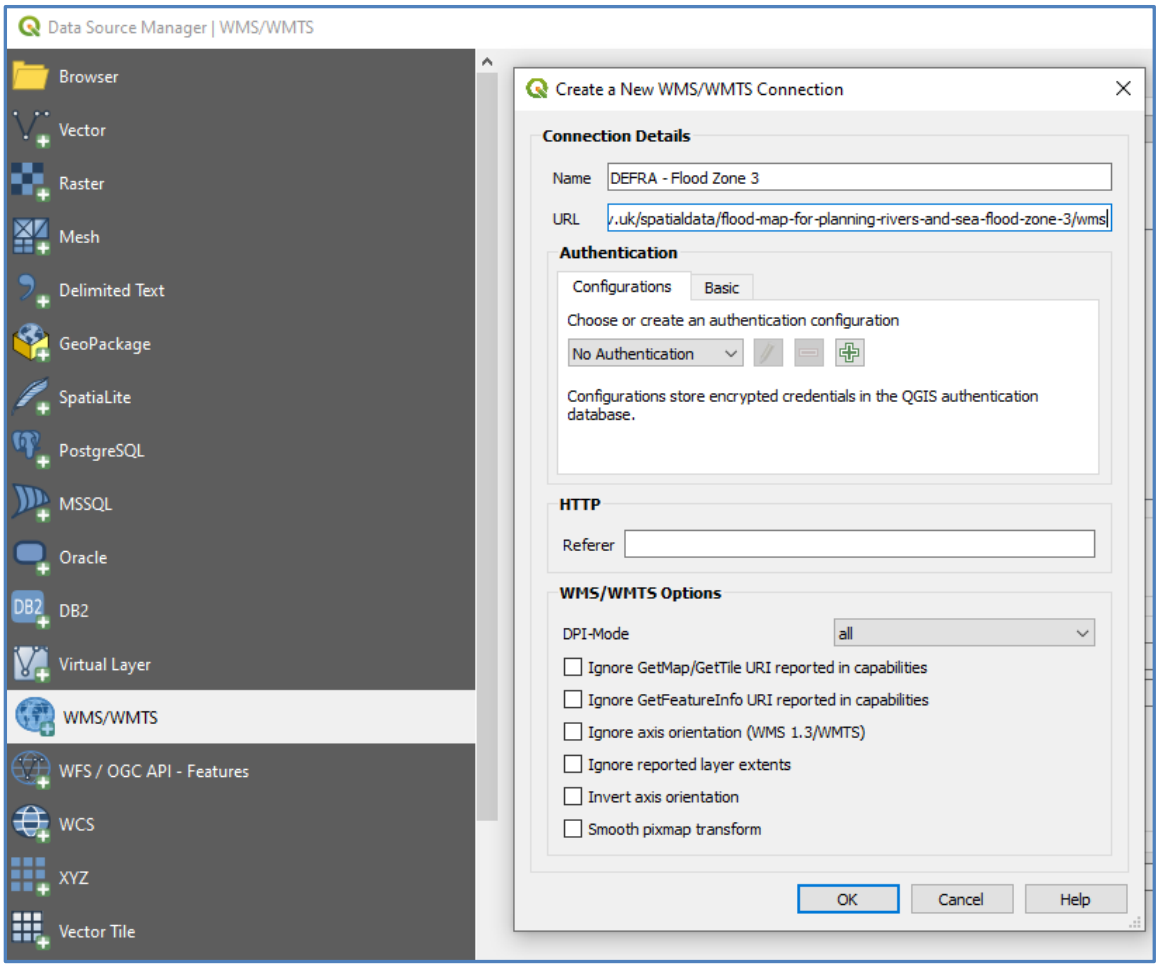
In QGIS we have already added **OpenStreetMap** as a basemap so we can see the outline of the UK.

Using the **Manage Layers Toolbar,** we can choose the **Add Web Map Service** (WMS) button to connect to our WMS Layer.

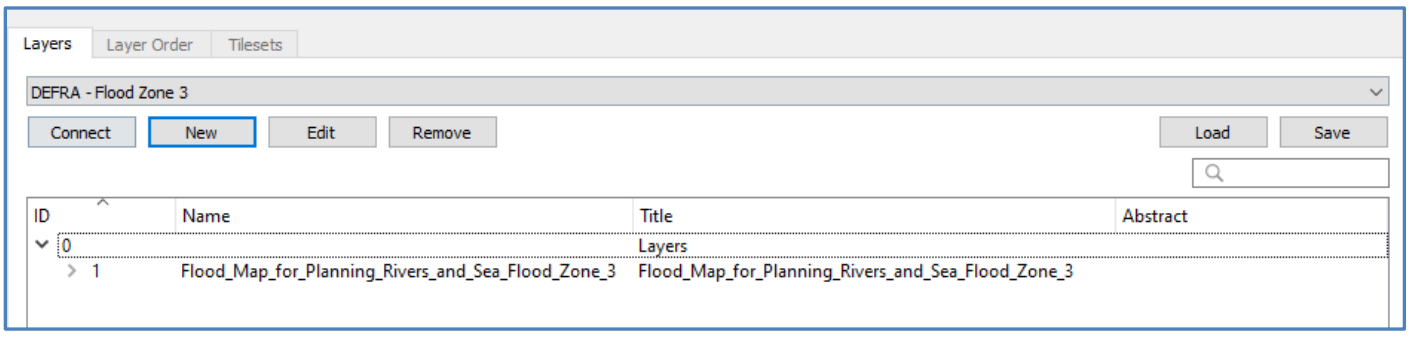


In the **Data Source Manager** > **WMS/WMTS** tab, choose **NEW Connection** and a window will open where you should enter the following details:

- **Name** – a useful name to remember the WMS connection
- **URL** – simply paste in the WMS URL



Once you have entered the New WMS details, press **OK** and then in the Data Source Manager choose the New WMS connection from the list and choose **Connect.**



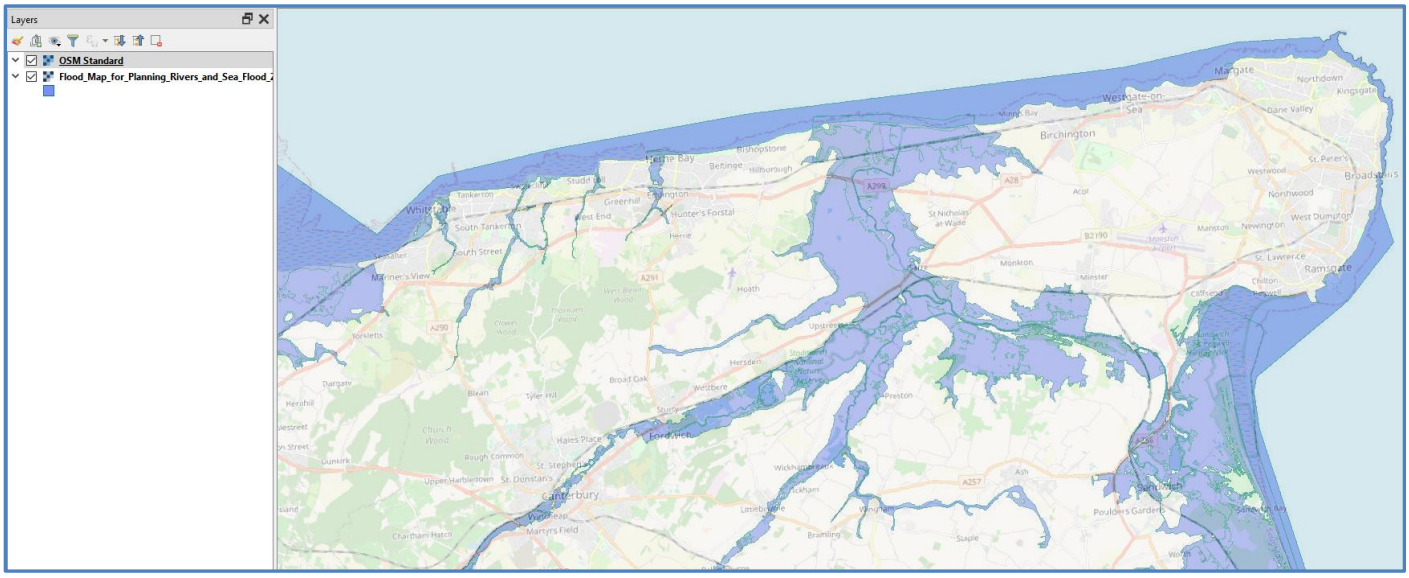
Once connected the WMS Service will list any layers that are provided for you to view. In this instance there is the one Layer – **Flood Map for Planning Rivers and Sea Flood Zone 3**.

Select the Layer and click **ADD** to open the WMS into QGIS. The WMS Layer will be added to the **Data Layers** panel on the left and shown as a layer in the **map window.**

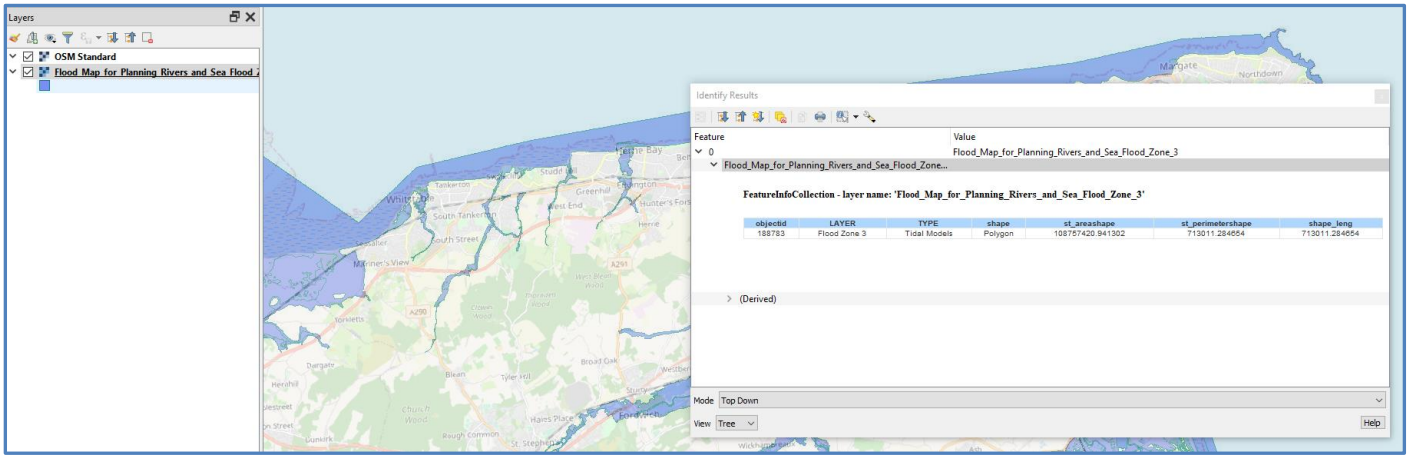
In this example, I experienced the following issues:

1 – the WMS layer wasn't **transparent;** it had a white box for the areas that were not flood zones.

2 – the WMS layer rendered quite slowly, so I could only see it at lower map scales.



WMS layers are often **lightweight** and **quick** to render for such complex geometry and they can also be **interrogated** feature by feature using an **identify tool.**

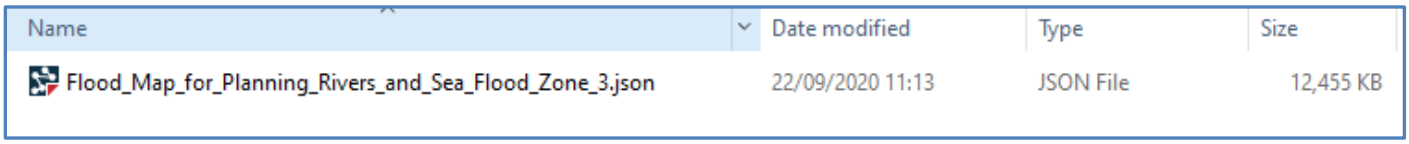


So, while this specific WMS feed was quite slow at rendering, it may be that for similar WMS layers you may well find that these issues don't occur.

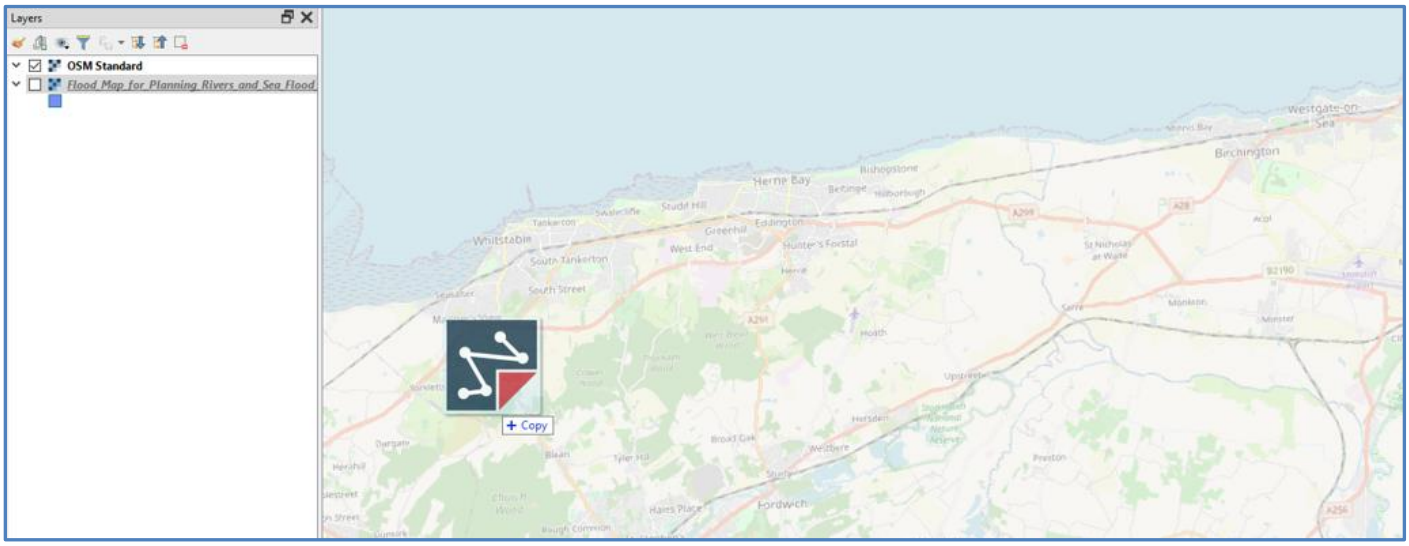
However, if you are looking to **store**, **manage** and **manipulate** these datasets you may decide to use the spatial data we downloaded earlier instead of the live WMS link.

3 – Working with Spatial Datasets

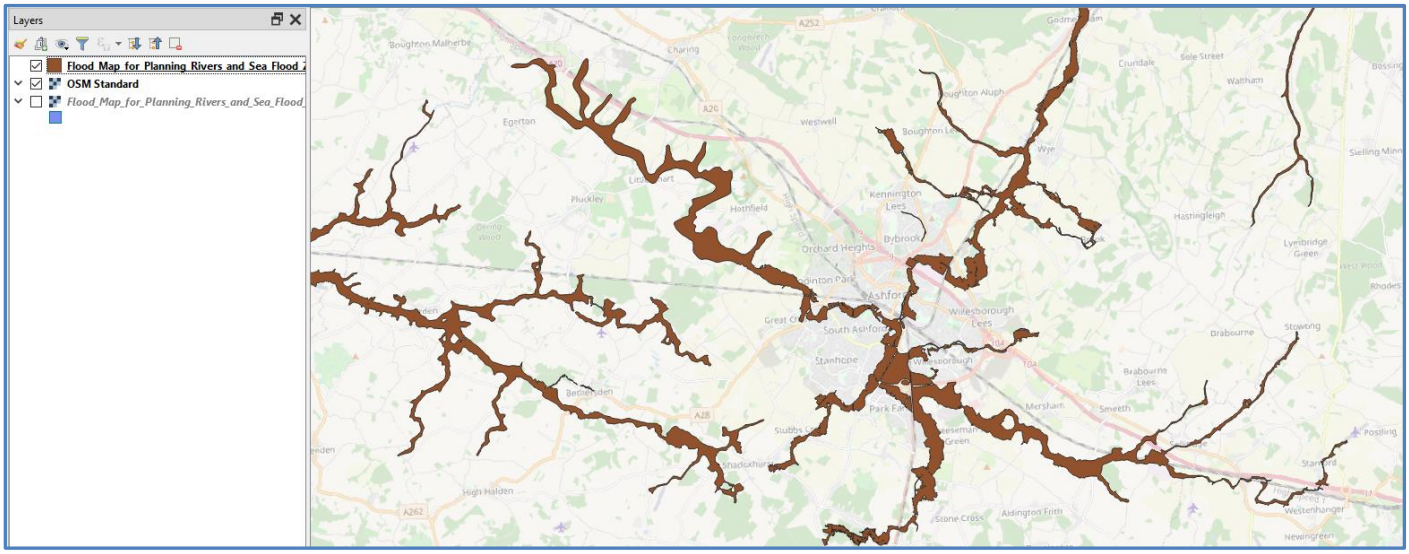
In this second example we will utilise the spatial data that we downloaded from the **DEFRA DATA SERVICES PLATFORM.**



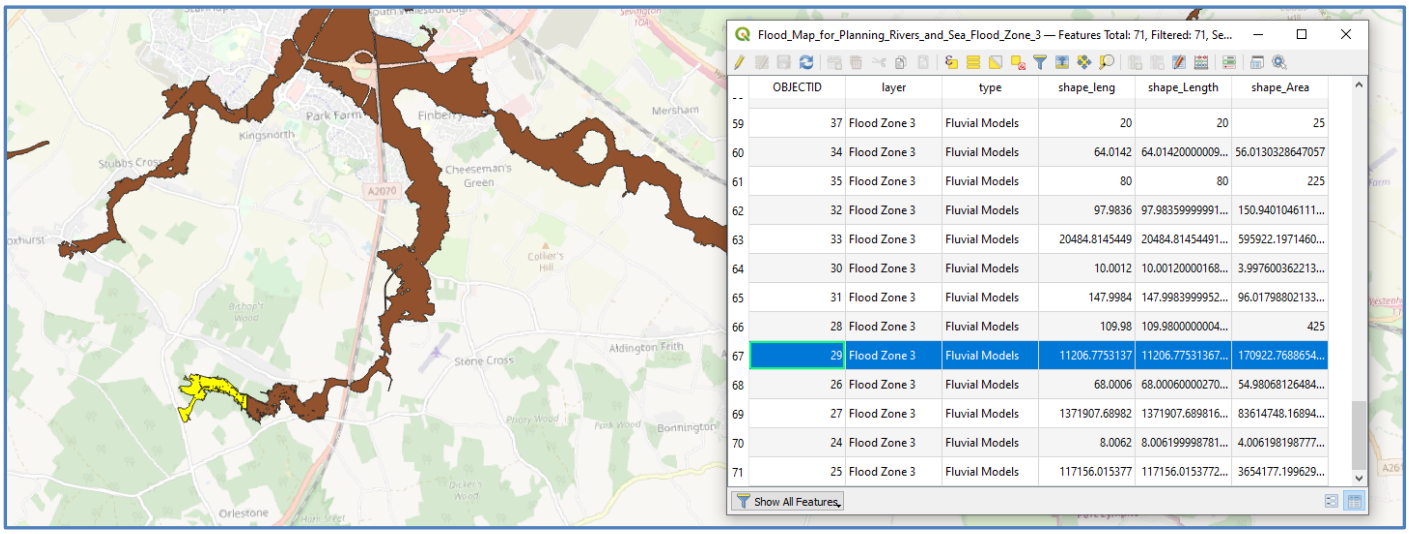
Firstly, we will open this spatial layer by simply **dragging** and **dropping** the file into the **QGIS** map window.



Once the **Flood Zone 3** layer has been added the layer will draw in the map window, with the features auto coloured.



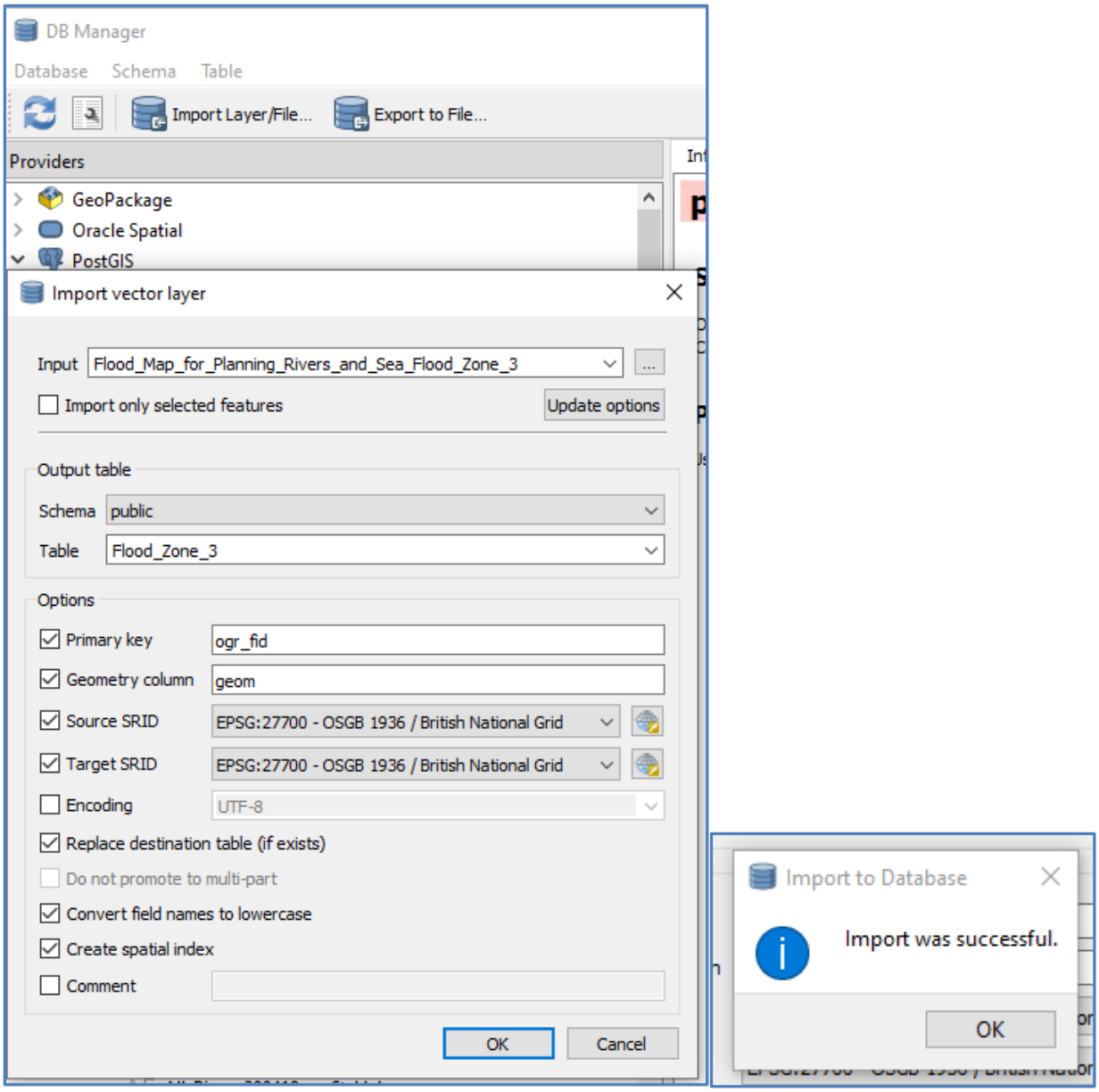
As this is spatial data, we can now also open the full **Attribute Table** for each of the map features.



	OBJECTID	layer	type	shape_leng	shape_Length	shape_Area
59	37	Flood Zone 3	Fluvial Models	20	20	25
60	34	Flood Zone 3	Fluvial Models	64.0142	64.01420000009...	56.0130328647057
61	35	Flood Zone 3	Fluvial Models	80	80	225
62	32	Flood Zone 3	Fluvial Models	97.9836	97.98359999991...	150.9401046111...
63	33	Flood Zone 3	Fluvial Models	20484.8145449	20484.81454491...	595922.1971460...
64	30	Flood Zone 3	Fluvial Models	10.0012	10.00120000168...	3.997600362213...
65	31	Flood Zone 3	Fluvial Models	147.9984	147.9983999952...	96.01798802133...
66	28	Flood Zone 3	Fluvial Models	109.98	109.9800000004...	425
67	29	Flood Zone 3	Fluvial Models	11206.7753137	11206.77531367...	170922.7688654...
68	26	Flood Zone 3	Fluvial Models	68.0006	68.00060000270...	54.98068126484...
69	27	Flood Zone 3	Fluvial Models	1371907.68982	1371907.689816...	83614748.16894...
70	24	Flood Zone 3	Fluvial Models	8.0062	8.006199998781...	4.006198198777...
71	25	Flood Zone 3	Fluvial Models	117156.015377	117156.0153772...	3654177.199629...

We now have a spatial version of the same Flood Zone layer, which we can update and use for **spatial analysis** – e.g. which Properties fall within a Flood Area?

However, in order to better share this spatial dataset with other users we would always suggest that the data is uploaded into a **spatial database**. In this example we will use the **Database Manager** tool inbuilt within QGIS to upload the data to a **PostGIS** database.



Based on the import options chosen, the PostGIS spatial table will have a **Projection** set and **Indexes** and a **Primary Key** applied.

Flood_Zone_3

General info

Relation type:	Table
Owner:	postgres
Pages:	7
Rows (estimation):	71
Rows (counted):	71
Privileges:	select, insert, update, delete

PostGIS

Column:	geom
Geometry:	POLYGON
Dimension:	2
Spatial ref:	OSGB 1936 / British National Grid (27700)
Estimated extent:	556020.00000, 133125.56250, 613684.06250, 158290.00000
Extent:	(unknown) (find out)

Fields

#	Name	Type	Length	Null	Default	Comment
1	ogr_fid	int4	4	N	nextval('"Flood_Zone_3_ogr_fid_seq"'::regclass)	
2	geom	geometry (Polygon, 27700)		Y		
3	objectid	int4	4	Y		
4	layer	varchar		Y		
5	type	varchar		Y		
6	shape_leng	float8	8	Y		
7	shape_length	float8	8	Y		
8	shape_area	float8	8	Y		

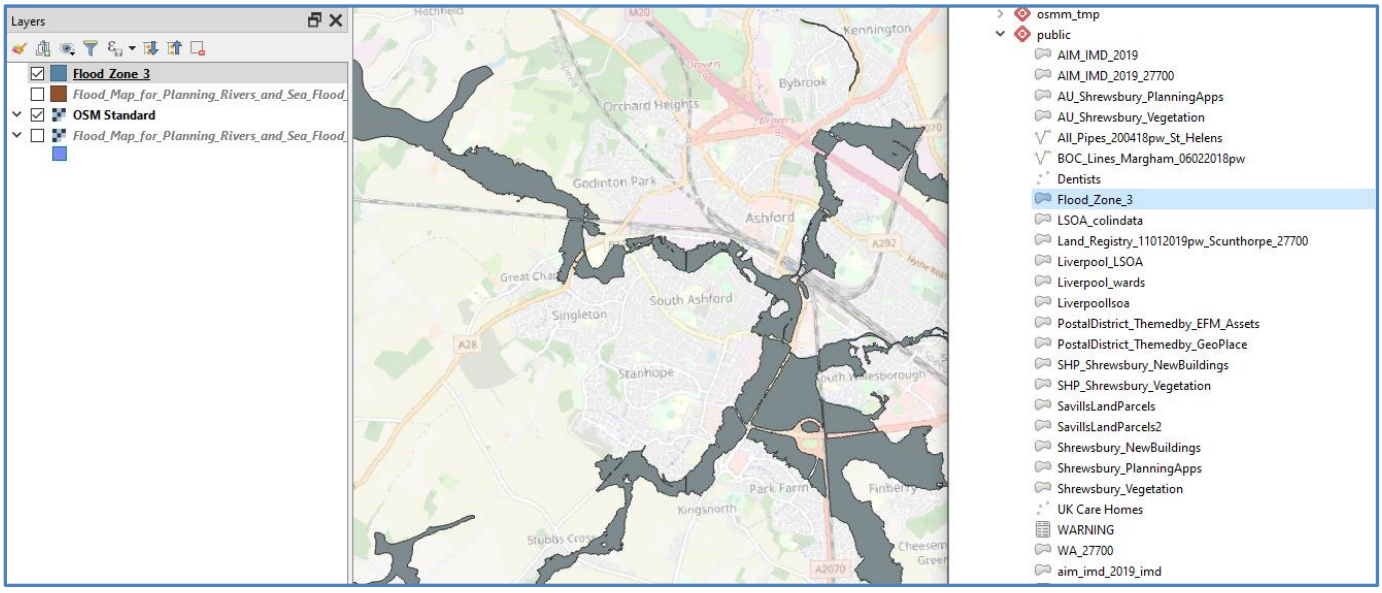
Constraints

Name	Type	Column(s)
Flood_Zone_3_pkey	Primary key	ogr_fid

Indexes

Name	Column(s)
sidx_Flood_Zone_3_geom	geom

Once the spatial data has successfully been uploaded to the PostGIS database, you can now simply **drag** the file from PostGIS into QGIS and any updates made to that file will automatically be published for all users to see.



We have now successfully been able to **search** for **Environmental Layers**, identify and utilise a suitable **Web Map Service (WMS)** and also **download** spatial data to then upload into our spatial database.

Try using these tips and tricks yourself to search for datasets relevant to you and then access those as either WMS feeds or from within your own spatial database.