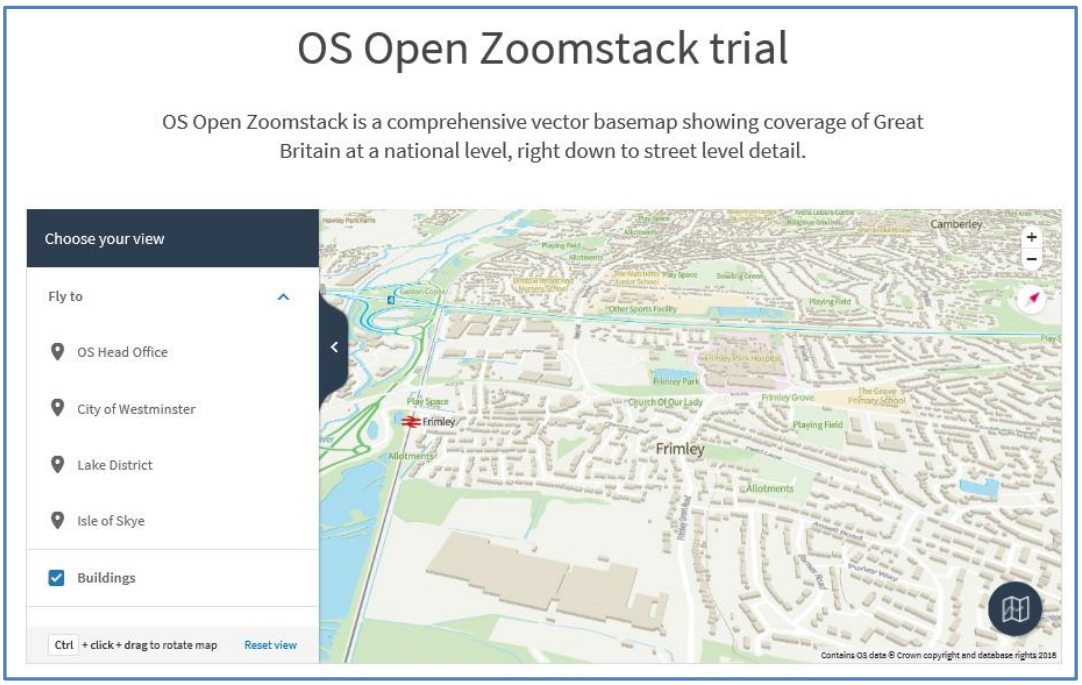
In this White Paper we will explore how to download, access and then style the new **OS Zoomstack** from the Ordnance Survey. This paper explores how to access OS Zoomstack as vector geometry from a PostGIS Database and as a WMS layer served from a GeoServer instance.

Objectives

- Download OS Zoomstack data – PostGIS Dump
- Restore into a PostGIS database
- Connect QGIS to the OS Zoomstack data – Using PostGIS DB Connection
- Apply OS Styling using QML Files
- Utilising GeoServer to publish OS Zoomstack as a WMS
- Connect QGIS to the OS Zoomstack data – as a WMS Service

1 - Download OS Zoomstack data:

At the time of writing this paper (Dec 2018) the OS Zoomstack data was available as a trial download from - [OS Open Zoomstack trial]



Before getting started these help and **support guides** published by the Ordnance Survey are very useful:

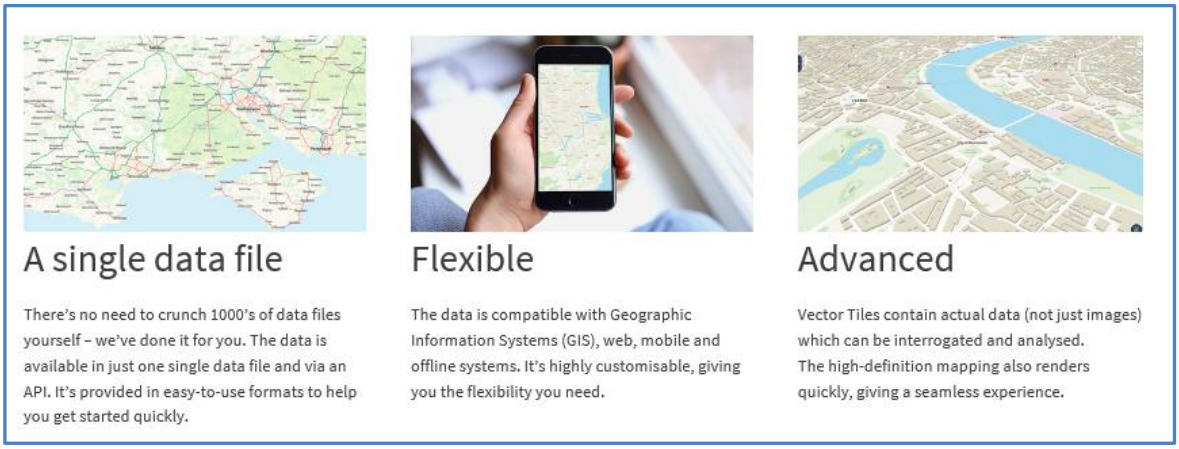
- OS Zoomstack Vector Tiles - https://www.ordnancesurvey.co.uk/docs/user-guides/os-open-zoomstack-vector-tiles.pdf
- OS Zoomstack PostGIS Vector File - https://www.ordnancesurvey.co.uk/docs/user-guides/os-open-zoomstack-vector-tiles.pdf
- OS Zoomstack GeoPackage - https://www.ordnancesurvey.co.uk/docs/user-guides/os-open-zoomstack-vector-tiles.pdf

This White Paper will utilise the OS Zoomstack PostGIS download.

Note – much of this paper has been sourced from the advice available in the first OS guide above –
"A guide to getting started with the OS Open Zoomstack PostGIS Export File"

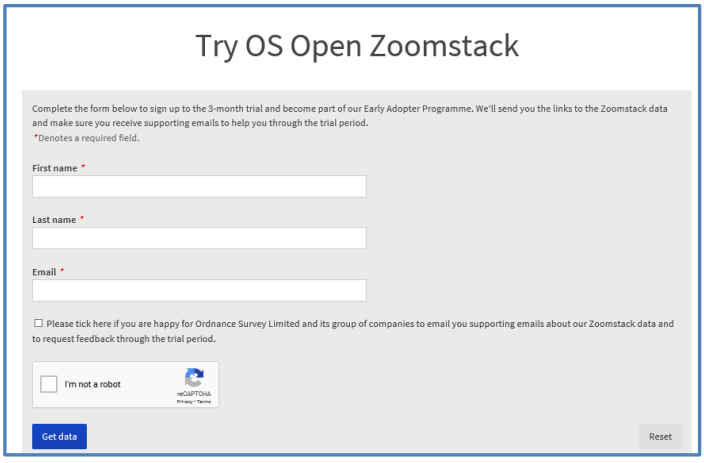
What are the benefits? ….. the Ordnance Survey list these as:

- Ease of use – Easy to integrate Ordnance Survey mapping into your application
- Zero data management – We manage all the data, you just use it
- Automatic updates – Data will be refreshed seamlessly (unlikely to happen during the trial period)
- Web and mobile ready – Pixel perfect maps on any device
- Seamless user experience – Vector Tiles pan, zoom, tilt and pitch beautifully
- 4 beautiful cartographic styles – Choose the map which best fits your requirements

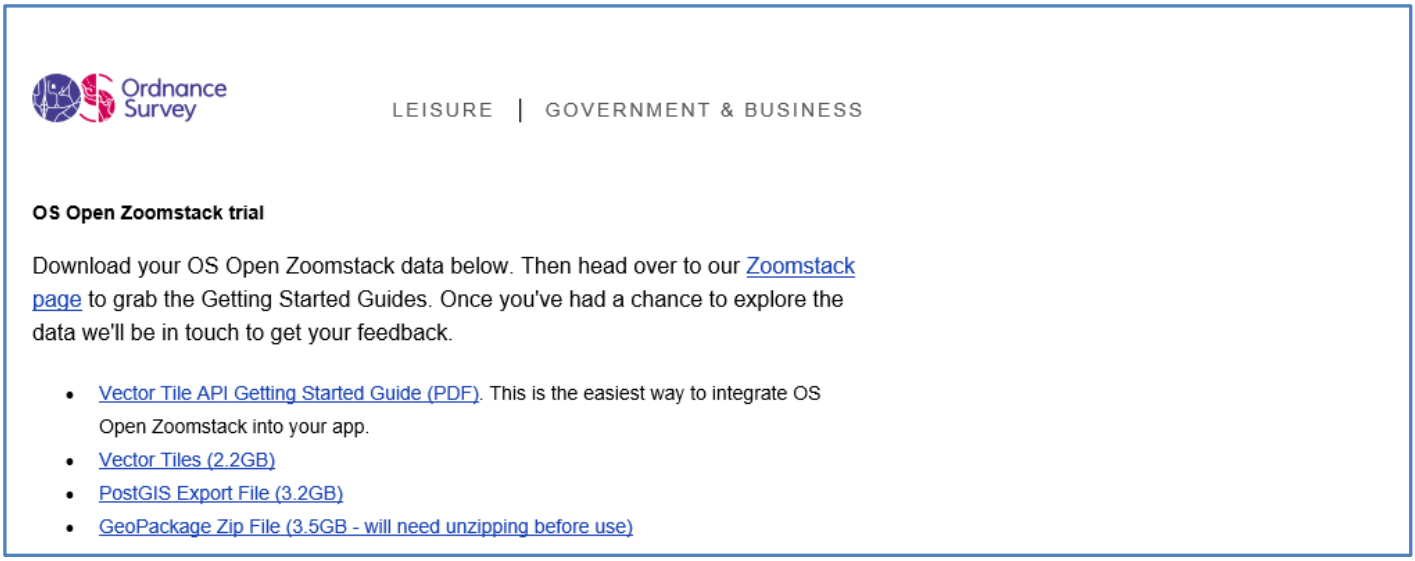


This means that the OS Zoomstack can be accessed in both a desktop and webGIS without the need to process and manage 1000's of data files!

To download the latest OS Zoomstack Vector Tiles simply **sign up to the trial** using the online form:



Once signed up you will receive an **email** with links to the datasets:


Ordnance Survey

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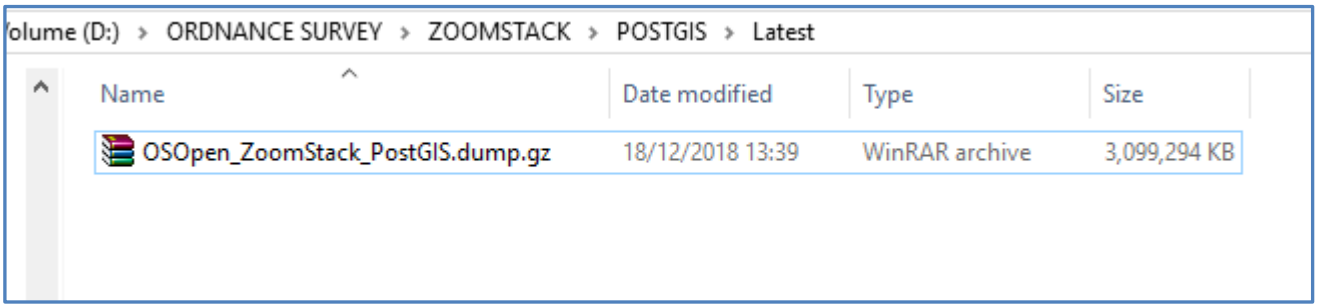
OS Open Zoomstack trial

Download your OS Open Zoomstack data below. Then head over to our Zoomstack page to grab the Getting Started Guides. Once you've had a chance to explore the data we'll be in touch to get your feedback.

- Vector Tile API Getting Started Guide (PDF). This is the easiest way to integrate OS Open Zoomstack into your app.
- Vector Tiles (2.2GB)
- PostGIS Export File (3.2GB)
- GeoPackage Zip File (3.5GB - will need unzipping before use)

Using the **links provided** you can then download the source files. In this paper we will download and utilise the **PostGIS export**. Once downloaded copy the files to a shared folder location where your PostGIS instance can access them.

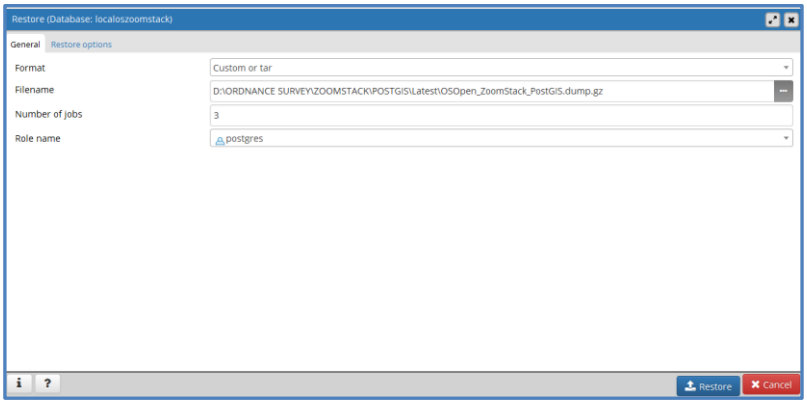


2 – Restore into a PostGIS database

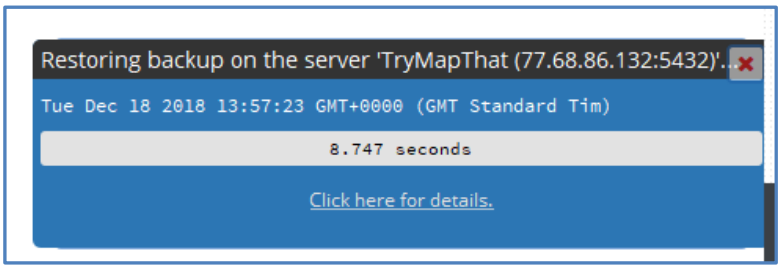
Firstly, in PostGIS create a **new database** to store the OS Zoomstack data within. Here I have created a new DB called oszoomstack. Ensure that the new database has the PostGIS spatial extension:

'CREATE EXTENSION postgis;'

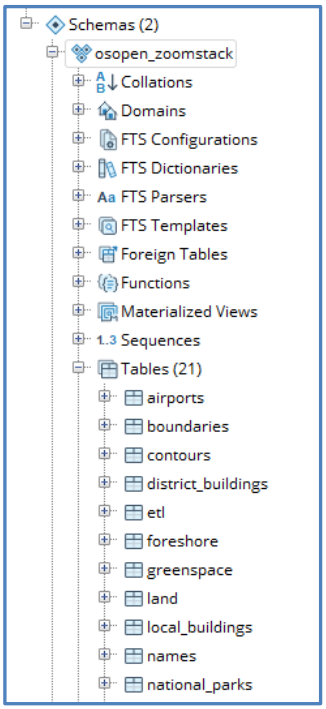
Once you have created the new database, select it, right click and choose **Restore**:



The Restore progress will start.

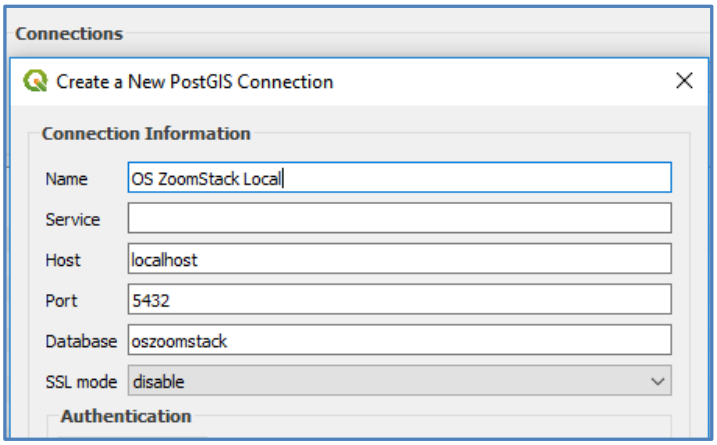


Once the Restore is complete you will see that the OS zoomstack data has now been uploaded into the PostGIS database. It creates a new **SCHEMA** and loads all the individual tables.

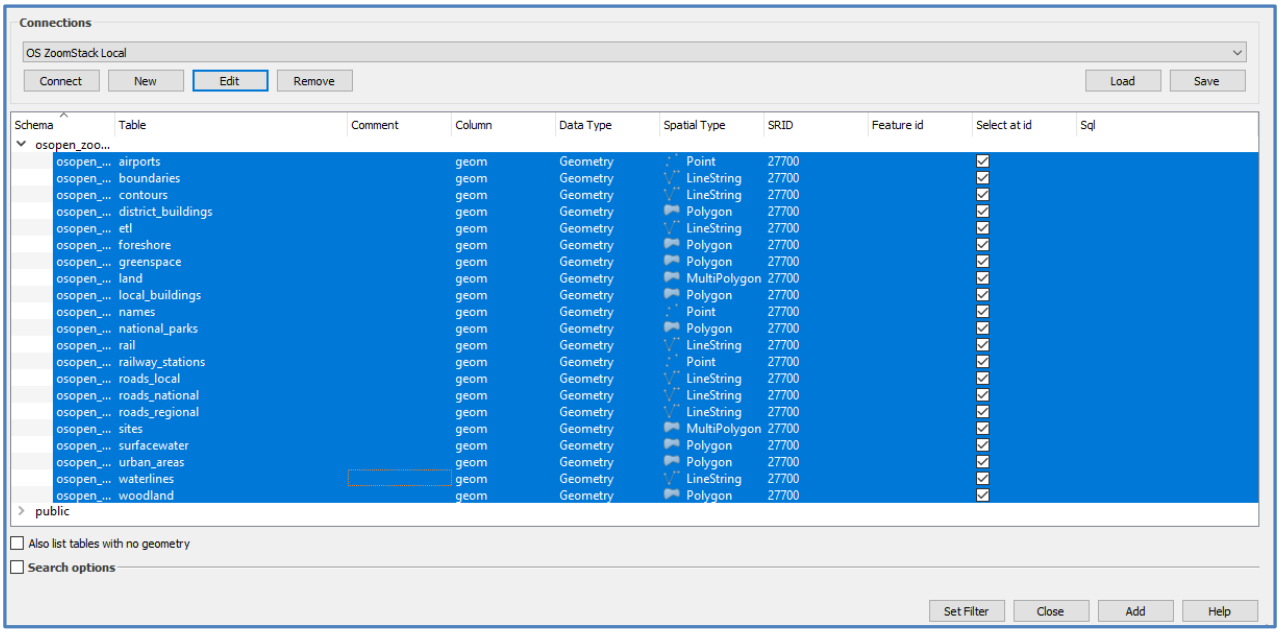


3 – Connect QGIS to the OS Zoomstack data – Using PostGIS DB Connection

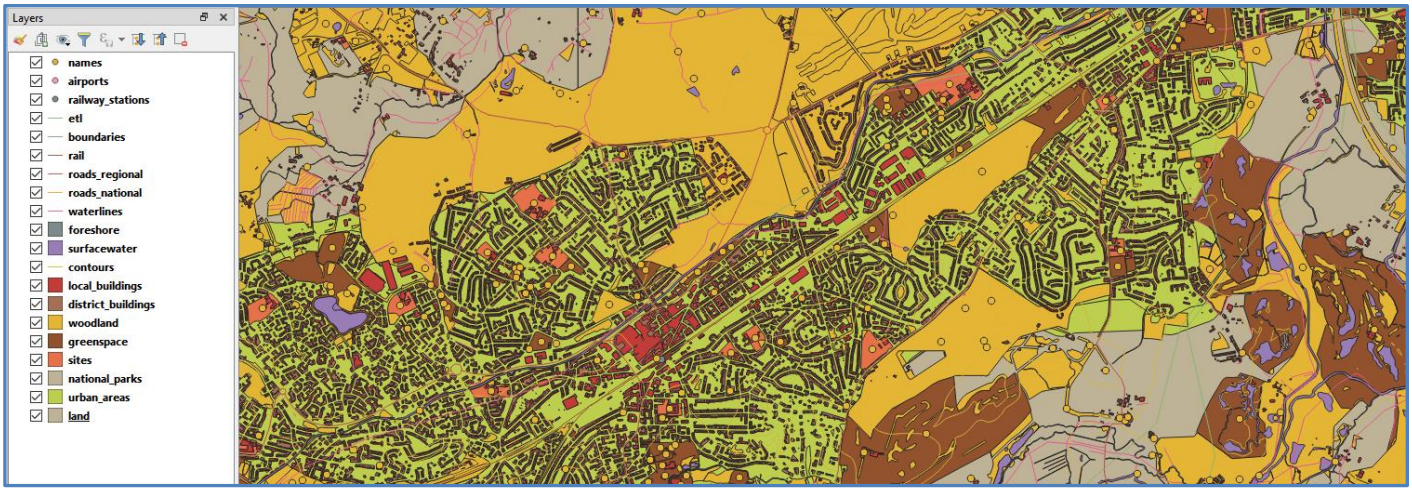
To view the OS Zoomstack data within QGIS you will need to create a **New Connection** to this PostGIS database. Enter a **Name** for the Connection, choose the **Host** (PC or Server Name) and the **Database** must be the exact spelling of the oszoomstack PostGIS DB that you created.



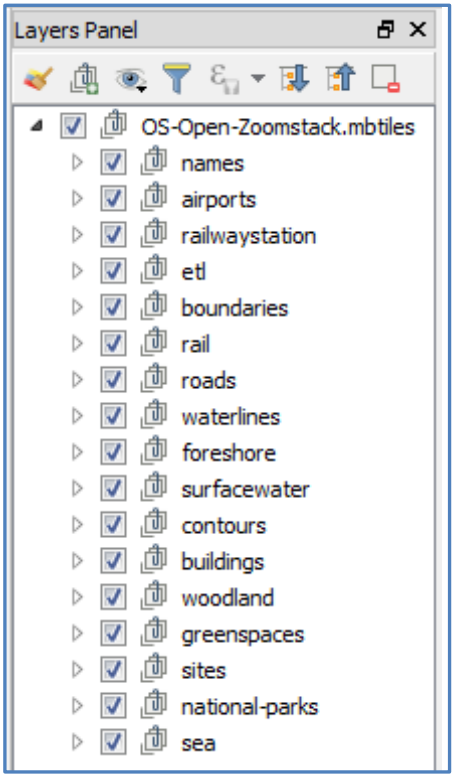
Once Connected you can then **Add** all of the layers from the PostGIS database into the QGIS map.



The OS Zoomstack PostGIS tables are then added to your map window – ***unstyled.***



Re-Order the layers, with the OS suggesting the optimum order being:

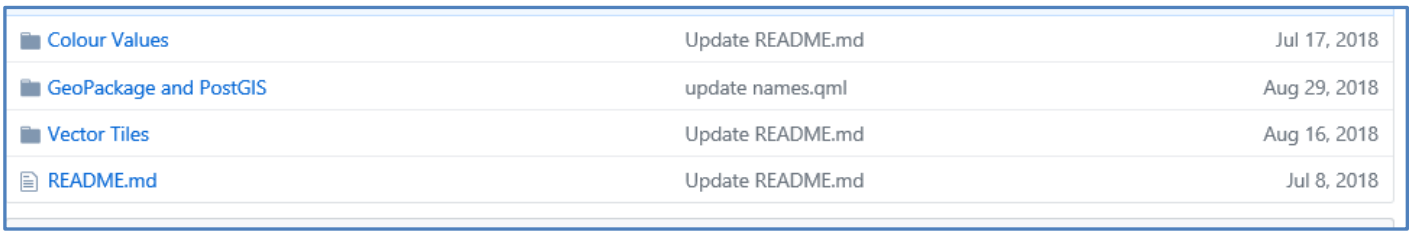


4 - Apply OS Styling using QML Files:

The following web page provides a download link to access the **OS Zoomstack Style Files** for QGIS:

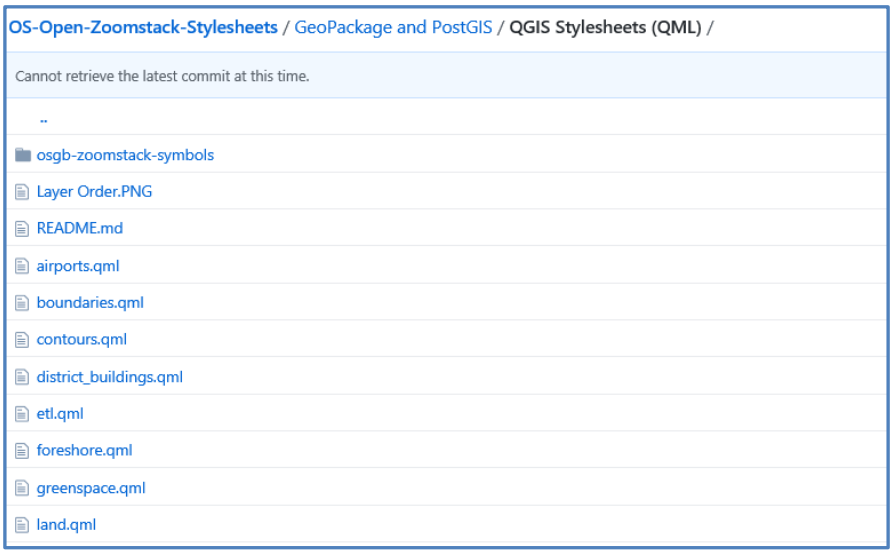
https://github.com/OrdnanceSurvey/OS-Open-Zoomstack-Stylesheets

The links will provide access to download the style files in several formats, including SLD (GeoServer), MapBox GL Styles, and QML for QGIS:



Colour Values	Update README.md	Jul 17, 2018
GeoPackage and PostGIS	update names.qml	Aug 29, 2018
Vector Tiles	Update README.md	Aug 16, 2018
README.md	Update README.md	Jul 8, 2018

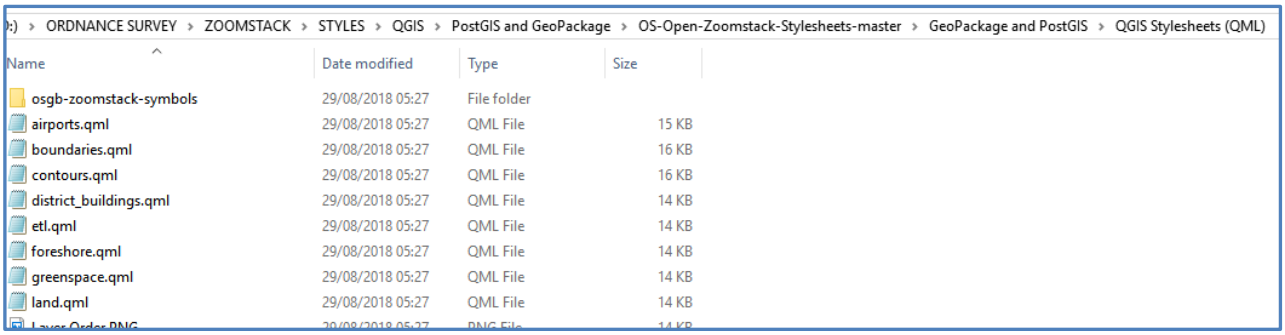
Downloading the **GeoPackage and PostGIS** > **QGIS Stylesheets** will provide all the required QML style files:



OS-Open-Zoomstack-Stylesheets / GeoPackage and PostGIS / **QGIS Stylesheets (QML)** /

Cannot retrieve the latest commit at this time.

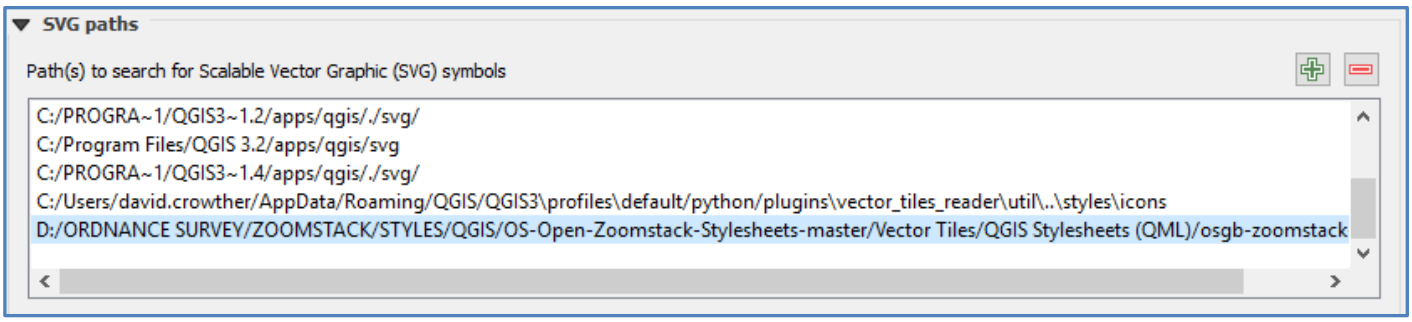
..
osgb-zoomstack-symbols
Layer Order.PNG
README.md
airports.qml
boundaries.qml
contours.qml
district_buildings.qml
etl.qml
foreshore.qml
greenspace.qml
land.qml



ORDNANCE SURVEY › ZOOMSTACK › STYLES › QGIS › PostGIS and GeoPackage › OS-Open-Zoomstack-Stylesheets-master › GeoPackage and PostGIS › QGIS Stylesheets (QML)

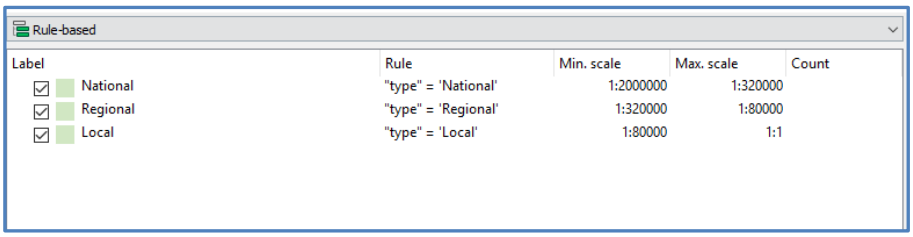
Name	Date modified	Type	Size
osgb-zoomstack-symbols	29/08/2018 05:27	File folder	
airports.qml	29/08/2018 05:27	QML File	15 KB
boundaries.qml	29/08/2018 05:27	QML File	16 KB
contours.qml	29/08/2018 05:27	QML File	16 KB
district_buildings.qml	29/08/2018 05:27	QML File	14 KB
etl.qml	29/08/2018 05:27	QML File	14 KB
foreshore.qml	29/08/2018 05:27	QML File	14 KB
greenspace.qml	29/08/2018 05:27	QML File	14 KB
land.qml	29/08/2018 05:27	QML File	14 KB

For more complicated styling QGIS uses **SVG files** to render textures within polygon features (e.g. woodland features in OSMM) and to show images for points of interest (e.g. rail stations). To utilise these SVG files ensure that you copy the folder of SVGs called 'osgb-zoomstack-symbols' into your **QGIS SVG paths:**

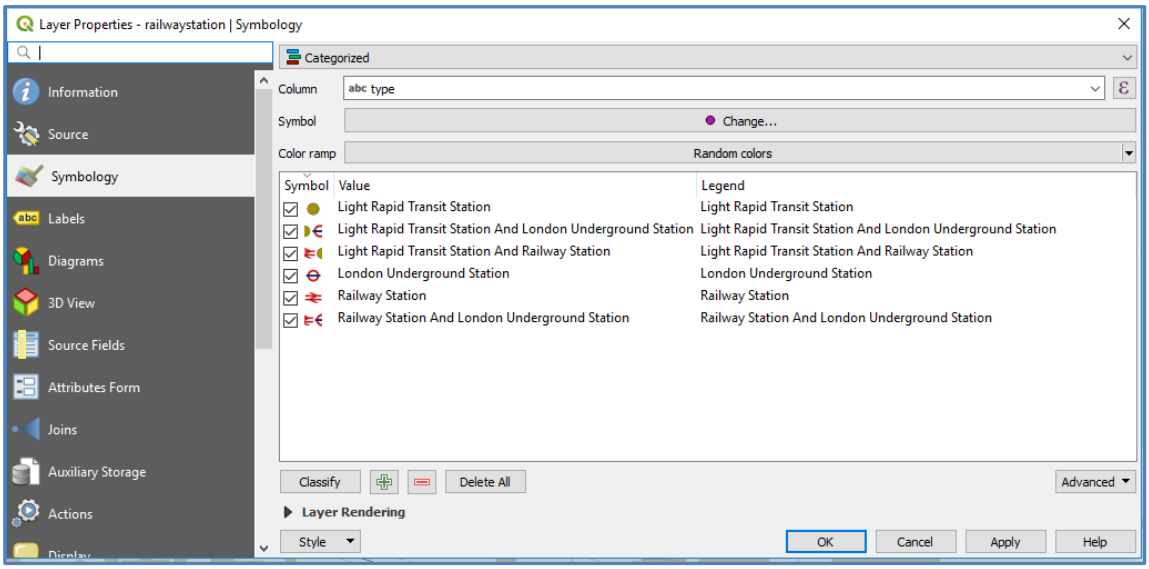


Now in QGIS, choose each of the OS Zoomstack layers from the layers panel in turn and select the **Properties** Tab**.** In the **STYLE** tab choose Style > **Load Style** > **Load from File** > selecting each of the QML files that relate to that layer.

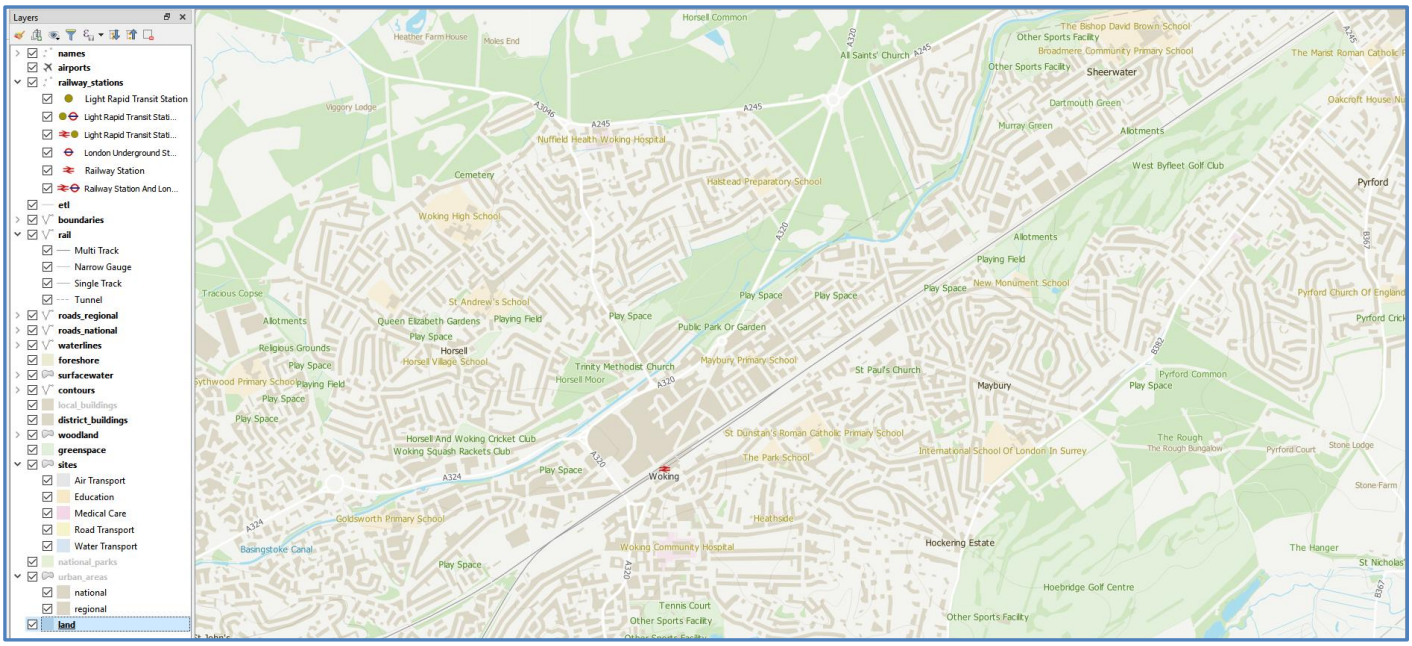
The QML style file may simply render one type of fill colour, or in some cases apply **Rule Based** styling so that the features change as the user zooms in and out of the map.



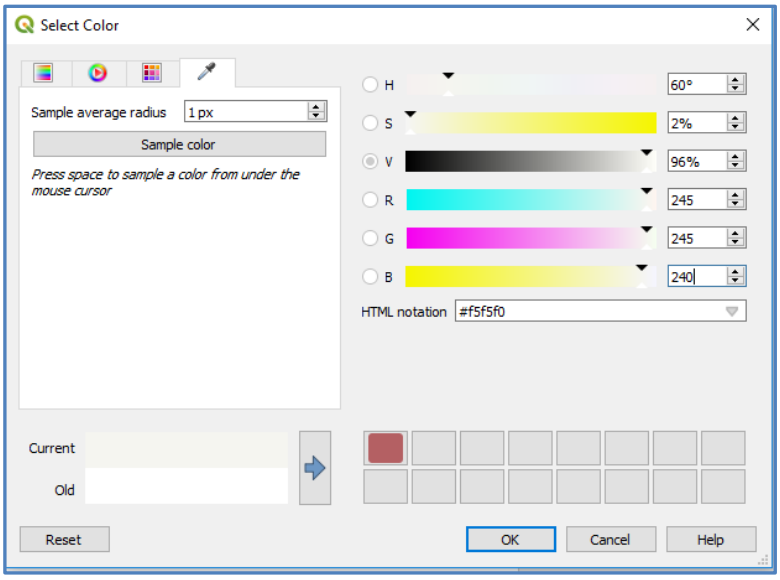
In the case of the Railways Stations the **SVG images** are used to define railway stations, tube stations etc…



Once you have loaded the QML notice how QGIS auto styles the OS Zoomstack data into each **Feature Type**.



To add a land tint to your map, from the top menu select **Project** > **Project Properties** and change the background colour to **R245 G245 B240.**

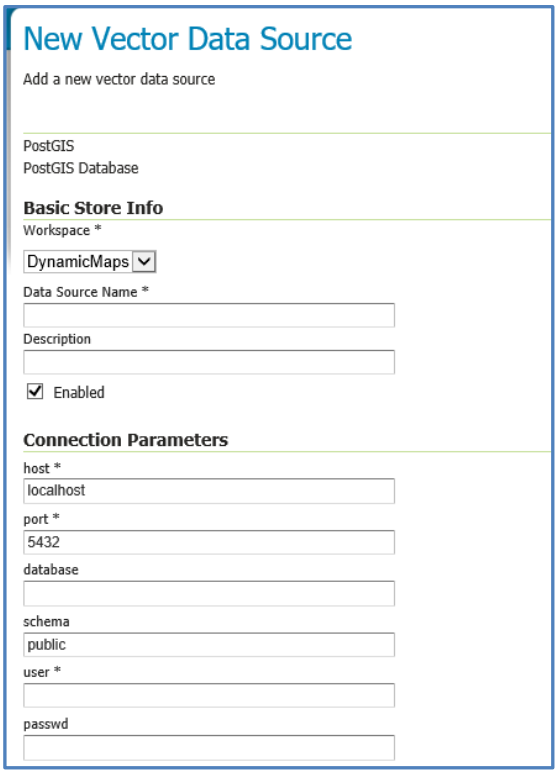


5 – Utilising GeoServer to publish OS Zoomstack as a WMS:

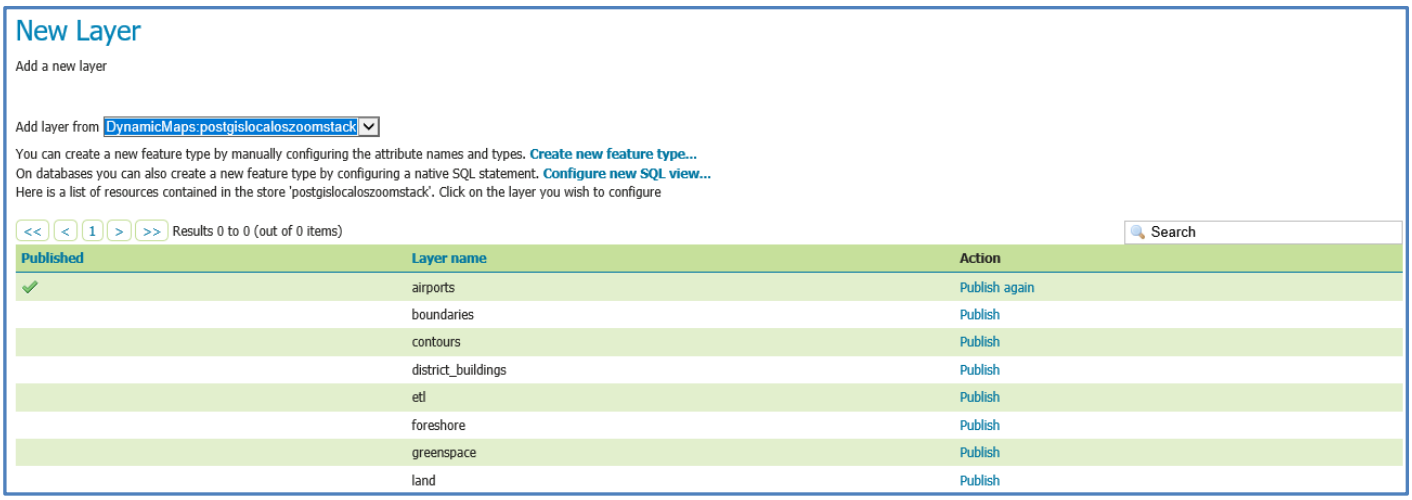
In addition to loading OS Zoomstack directly from PostGIS as vector geometry, you can also use an application such as G**eoServer** to publish the same datasets as a Web Map Service (WMS), which can then be consumed within your desktop GIS or web mapping application for faster and more stylised rendering.

In GeoServer make a **Connection** to your PostGIS Database using the **STORE** options.

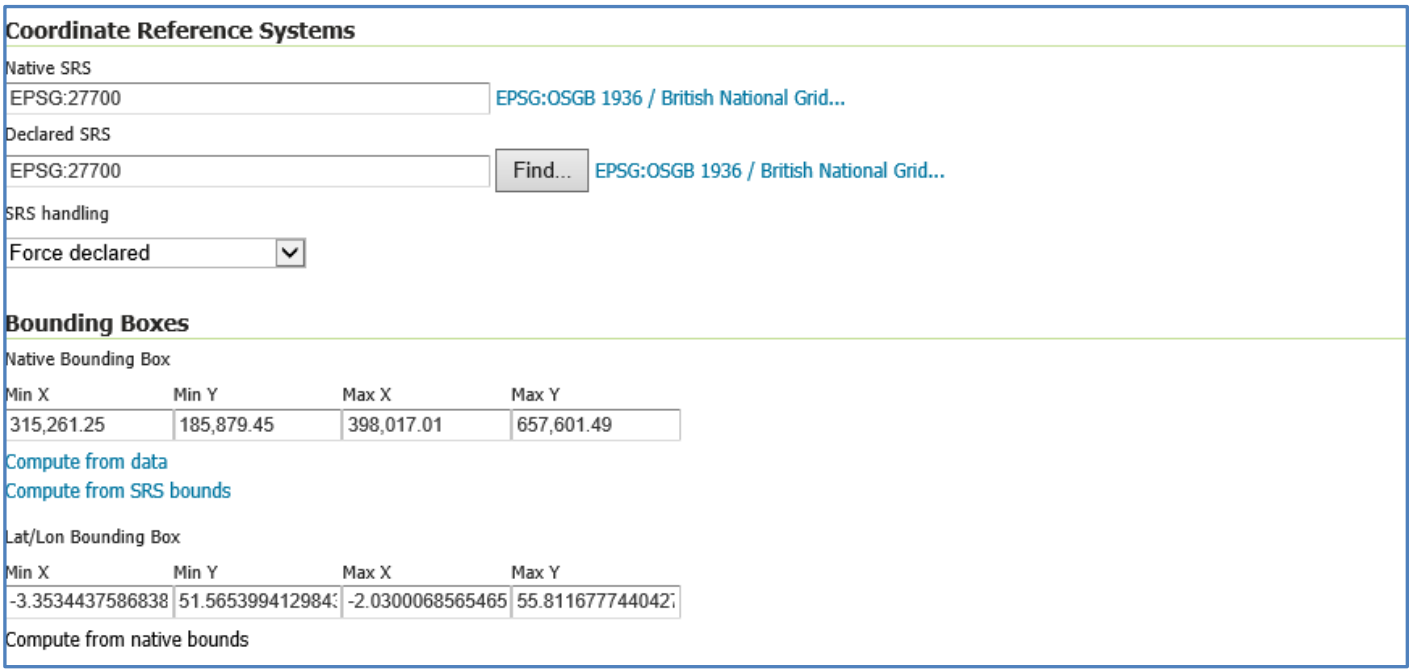
- The **host** is the name of the computer/server
- The database is the exact name of the database where the OS Zoomstack data is stored
- And the **Schema** is the schema in that database where the tables are



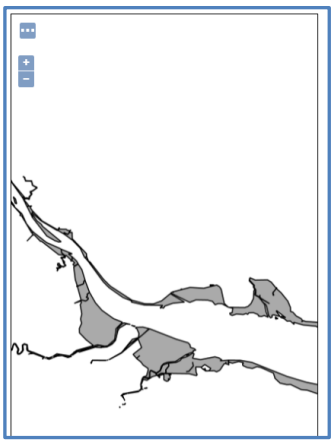
Once you have made a connection to your OS Zoomstack PostGIS Database, you can then **Publish** each layer one by one.



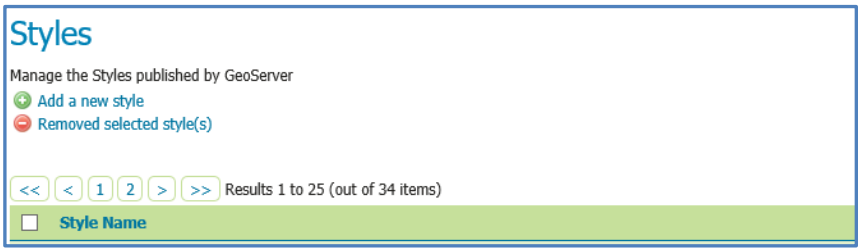
Ensuring that you specify in the **CRS section** to specify the **Native Bounding Box** and **Lat/Long Values**:



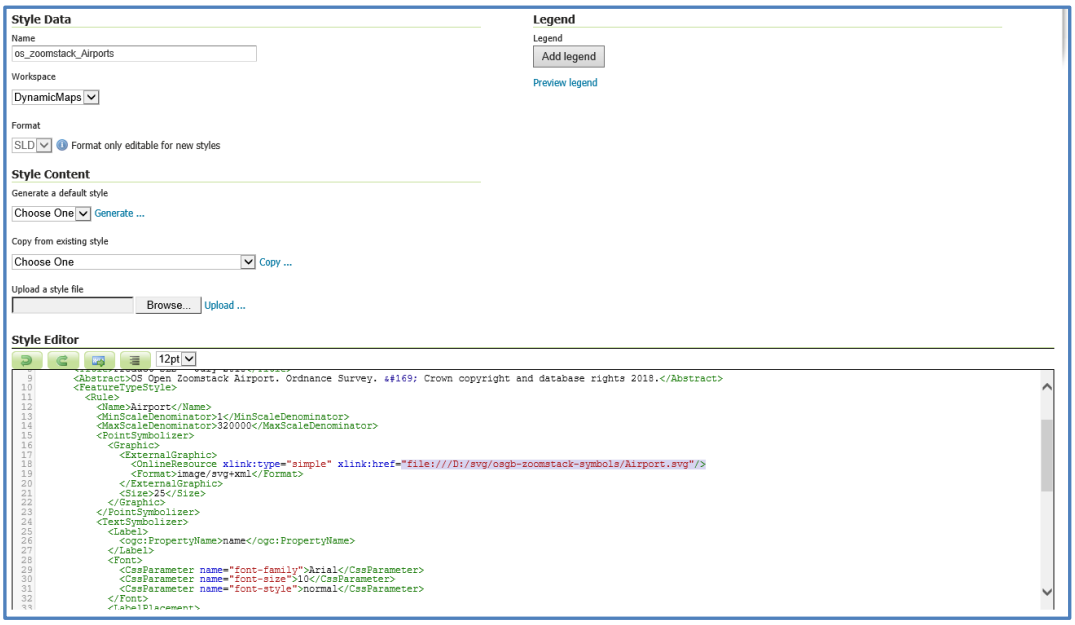
Once a Layer is published it can be viewed as a WMS using the **OpenLayers preview**. Notice that the layer will initially be unstyled:



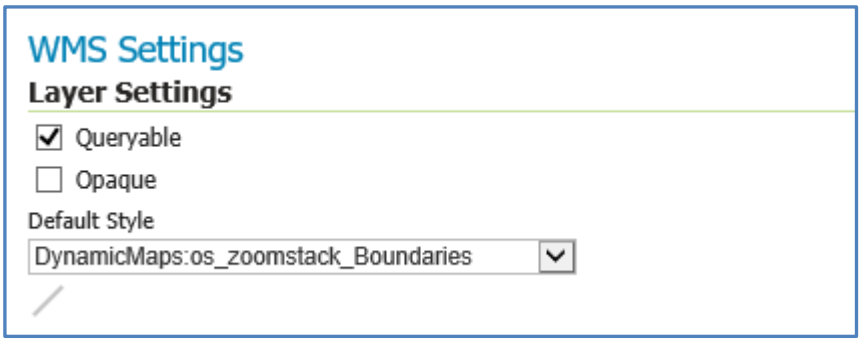
Publish all the Layers from the PostGIS database and then we create **STYLES** for each new layer.



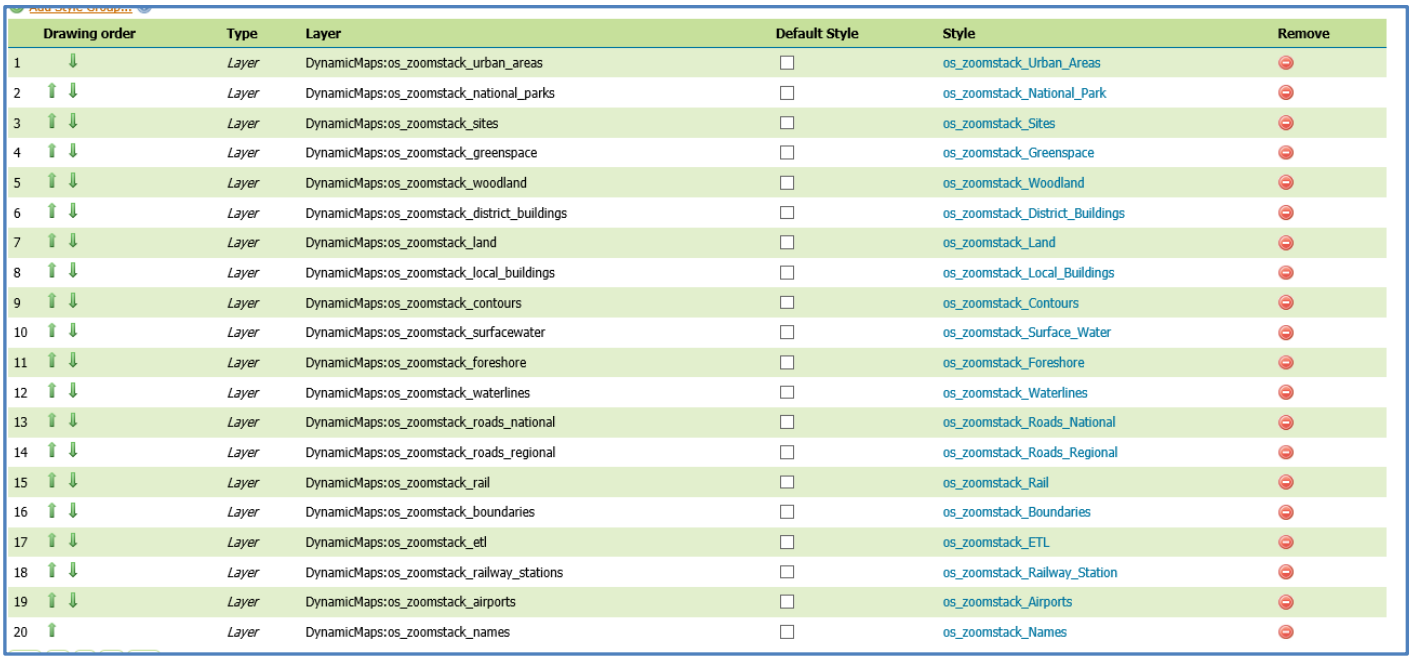
From the **STYLES** section in GeoServer, choose to create a **New Style** for each of the layers. Here you can simply **browse** and **Upload** the **SLD styles** files downloaded from the GitHub pages. Ensure that any references to the **SVG image files** are correct with the SLD – e.g. the Airports SVG images.



Once each STYLE has been created ensure that you update the WMS **Layer - Publishing** settings for each layer to utilise the new Style:



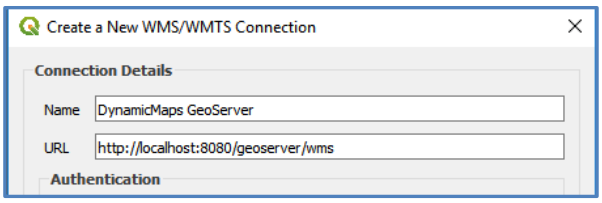
Finally, so that we can view the OS Zoomstack as one WMS layer, we can use the Layer Group tool to create a Group layer with all individual WMS layers loaded using their Styles.



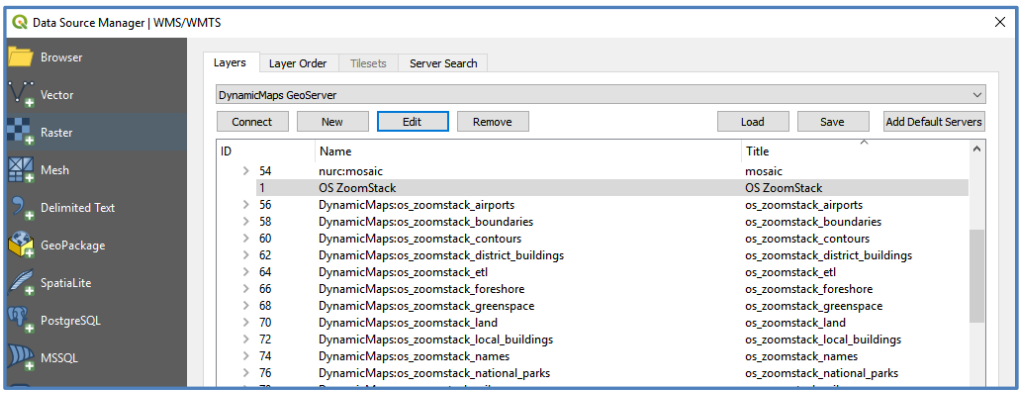
	Drawing order	Type	Layer	Default Style	Style	Remove
1		*Layer*	DynamicMaps:os_zoomstack_urban_areas	☐	os_zoomstack_Urban_Areas	
2		*Layer*	DynamicMaps:os_zoomstack_national_parks	☐	os_zoomstack_National_Park	
3		*Layer*	DynamicMaps:os_zoomstack_sites	☐	os_zoomstack_Sites	
4		*Layer*	DynamicMaps:os_zoomstack_greenspace	☐	os_zoomstack_Greenspace	
5		*Layer*	DynamicMaps:os_zoomstack_woodland	☐	os_zoomstack_Woodland	
6		*Layer*	DynamicMaps:os_zoomstack_district_buildings	☐	os_zoomstack_District_Buildings	
7		*Layer*	DynamicMaps:os_zoomstack_land	☐	os_zoomstack_Land	
8		*Layer*	DynamicMaps:os_zoomstack_local_buildings	☐	os_zoomstack_Local_Buildings	
9		*Layer*	DynamicMaps:os_zoomstack_contours	☐	os_zoomstack_Contours	
10		*Layer*	DynamicMaps:os_zoomstack_surfacewater	☐	os_zoomstack_Surface_Water	
11		*Layer*	DynamicMaps:os_zoomstack_foreshore	☐	os_zoomstack_Foreshore	
12		*Layer*	DynamicMaps:os_zoomstack_waterlines	☐	os_zoomstack_Waterlines	
13		*Layer*	DynamicMaps:os_zoomstack_roads_national	☐	os_zoomstack_Roads_National	
14		*Layer*	DynamicMaps:os_zoomstack_roads_regional	☐	os_zoomstack_Roads_Regional	
15		*Layer*	DynamicMaps:os_zoomstack_rail	☐	os_zoomstack_Rail	
16		*Layer*	DynamicMaps:os_zoomstack_boundaries	☐	os_zoomstack_Boundaries	
17		*Layer*	DynamicMaps:os_zoomstack_etl	☐	os_zoomstack_ETL	
18		*Layer*	DynamicMaps:os_zoomstack_railway_stations	☐	os_zoomstack_Railway_Station	
19		*Layer*	DynamicMaps:os_zoomstack_airports	☐	os_zoomstack_Airports	
20		*Layer*	DynamicMaps:os_zoomstack_names	☐	os_zoomstack_Names	

6 – Connect QGIS to the OS Zoomstack data – as a WMS Service

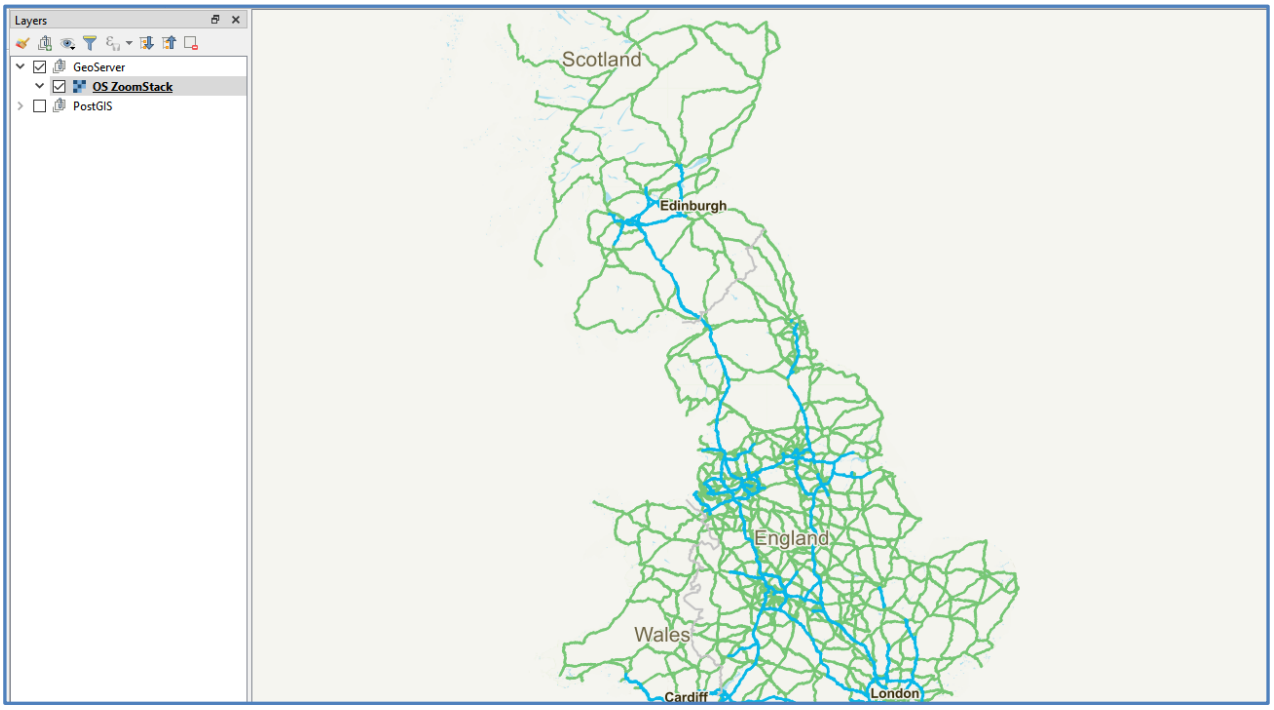
In **QGIS** choose to Add layer via a **WMS** and create a **New Connection**. Give the Connection a **Name** and then paste in the **URL** that connects to your GeoServer Instance.

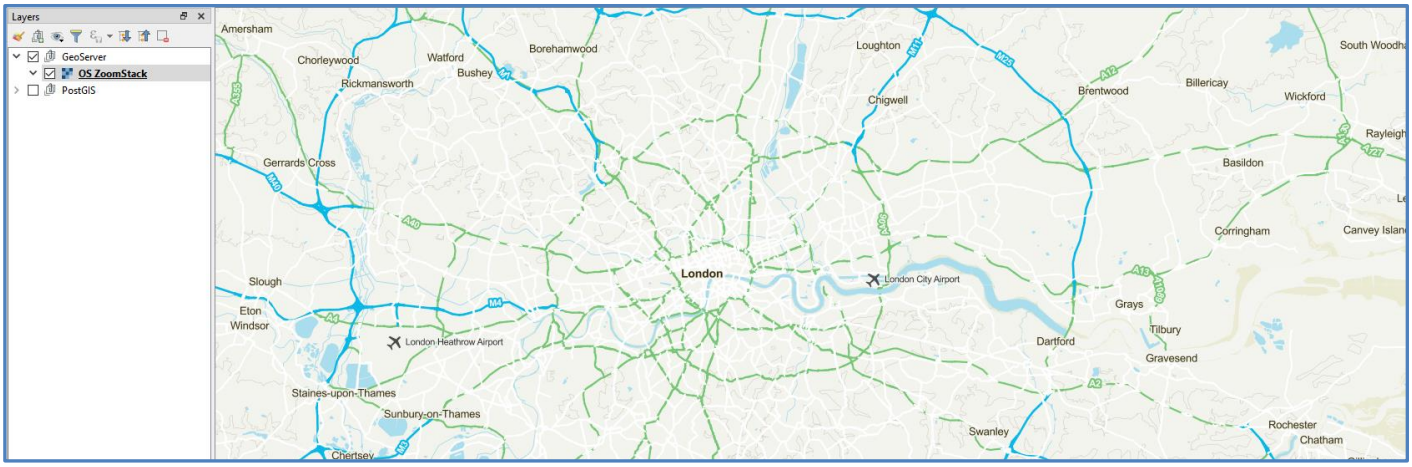


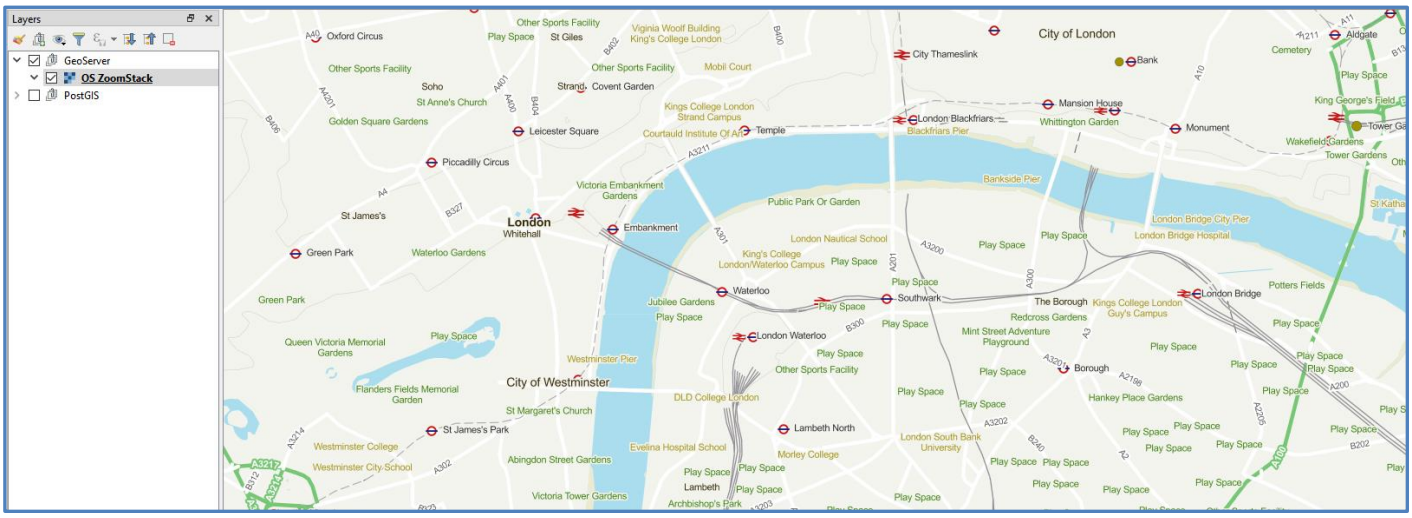
Press **Connect** and QGIS will then list all the layers in your GeoServer Instance.



Select the Group Layer – OS Zoom Stack and **Add** to the QGIS map window. Your OS Zoomstack data is now in QGIS as a **WMS** service being published and styled by GeoServer.




Layers
GeoServer
OS ZoomStack
PostGIS
Amersham
Chorleywood
Rickmansworth
Watford
Bushey
Borehamwood
Loughton
Chigwell
Brentwood
Billericay
Wickford
South Woodh
Rayleigh
Gerrards Cross
Basildon
Corringham
Canvey Islan
Slough
Eton
Windsor
London
London City Airport
London Heathrow Airport
Grays
Tilbury
Gravesend
Dartford
Staines-upon-Thames
Sunbury-on-Thames
Chertsey
Swanley
Rochester
Chatham


Layers
GeoServer
OS ZoomStack
PostGIS
City of London
City Thameslink
Bank
Aldgate
Cemetery
Oxford Circus
Other Sports Facility
St Giles
Soho
St Anne's Church
Golden Square Gardens
Leicester Square
Piccadilly Circus
Strand
Covent Garden
Kings College London
Strand Campus
Temple
London Blackfriars
Blackfriars Pier
Mansion House
Whittington Garden
Monument
Wakefield Gardens
Tower Gardens
Victoria Embankment Gardens
St James's
London
Whitehall
Embankment
Green Park
Waterloo Gardens
Public Park Or Garden
Bankside Pier
London Bridge City Pier
London Bridge Hospital
London Nautical School
King's College London/Waterloo Campus
Play Space
Waterloo
Southwark
London Bridge
Potters Fields
Jubilee Gardens
The Borough
Kings College London Guy's Campus
Redcross Gardens
Mint Street Adventure Playground
London Waterloo
Queen Victoria Memorial Gardens
Westminster Pier
Other Sports Facility
Borough
Flanders Fields Memorial Garden
City of Westminster
DLD College London
Hankey Place Gardens
St Margaret's Church
St James's Park
Lambeth North
Westminster College
Westminster City School
Abingdon Street Gardens
Evelina Hospital School
Morley College
London South Bank University
Victoria Tower Gardens
Lambeth
Archbishop's Park


Layers
GeoServer
OS ZoomStack
PostGIS
Westminster
A3211
A3214
City of Westminster
A302
Parliament Square Garden
St Margaret's Church
A2212