

# LIST Spatial Web Services

## User Guide

*This document demonstrates how LIST Web Services can be added to commonly used spatial applications (including ArcMap, MapInfo, QGIS, ArcGIS Online, ArcGIS Pro, OruxMaps, MotionX-GPS and AutoCAD Civil 3D)*

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# LIST Spatial Web Services

## What is the LIST?

The Land Information System Tasmania (the LIST) is a whole-of-government online infrastructure that helps you find and use information about land and property in Tasmania. The LIST can be accessed by visiting [www.thelist.tas.gov.au](http://www.thelist.tas.gov.au). The LIST is comprised of a number of components, which are briefly summarised below:

- The **Properties and Titles** search facility of the LIST enables you to find and obtain a range of property and title documents and information, including land titles, survey plans, government valuations, property reports and sales data
- **LISTmap** is a free, easy to use, online map application that allows you to view, create and share your own customised maps of Tasmania
- **LISTdata** is a free, easy to use online data portal that helps you discover, use and reuse a wide range of Tasmanian location-based information, and provides a central access point to connect to or download authoritative government data, including Open Data
- **LISTservices** are free web service endpoint(s) that can be integrated into your business systems and applications via spatial web services

## What are spatial web services?

A web service is a software system which supports communication between one computer and another computer over a network. The LIST web services enable users to access and use authoritative spatial datasets from the Department of Primary Industries, Parks, Water and Environment (DPIPWE) in a variety of ways, through standard internet protocols.

This document details ways in which users can connect to the spatial web services using the most common GIS applications and tools.

## LIST web services

- Allow users to access and use core authoritative spatial datasets while eliminating a lot of the management overhead for the provision, storing and maintenance of that data;
- Allow users to receive ongoing current and dynamic feeds of public and basemap data into their business system;
- Can be consumed in mobile applications;
- Can be used for development purposes; and
- Can be used directly in numerous spatial systems or Geographical Information System (GIS) platforms, some of which are covered in this document.

## How to access LIST spatial web services

LIST datasets can be accessed via the following web service portal:

- **ArcGIS** - delivering REST services, predominantly used by (but not limited to) Esri software. ArcGIS also provides Open Geospatial Consortium (OGC) compliant web services, supported by most spatial applications and systems. The LIST ArcGIS REST and OGC services can be accessed via the following URL:

**<http://services.thelist.tas.gov.au/arcgis/rest>**

## Why are there multiple LIST spatial web service protocols?

The **ArcGIS Server REST services** are not always accessible via non-Esri products so support for ‘Open Geospatial Consortium’ (OGC) compliant web services (such as WMTS, WMS or WFS) have also been enabled.

Additional information and links to these supported protocols can be found below.

## ArcGIS server and supported protocols

The LIST **ArcGIS REST** services can be accessed via the following URL:

<http://services.thelist.tas.gov.au/arcgis/rest>

### What is an ArcGIS server?

ArcGIS Server is the core server geographic information system (GIS) software made by Esri. ArcGIS Server is used for creating and managing GIS Web services, applications, and data. ArcGIS Server is typically deployed on-premises within the organization's service-oriented architecture (SOA) or off-premises in a cloud computing environment.

Wikipedia (28 May 2015) retrieved from

[https://en.wikipedia.org/wiki/ArcGIS\\_Server](https://en.wikipedia.org/wiki/ArcGIS_Server)

### Supported protocols

#### **REST**

Representational State Transfer (REST) is a software architecture style consisting of guidelines and best practices for creating scalable web services. REST is a coordinated set of constraints applied to the design of components in a distributed hypermedia system that can lead to a more performant and maintainable architecture. RESTful systems typically, but not always, communicate over the Hypertext Transfer Protocol with the same HTTP verbs (GET, POST, PUT, DELETE, etc.) used by web browsers to retrieve web pages and send data to remote servers.

Wikipedia (20 May 2015) retrieved from

[http://en.wikipedia.org/wiki/Representational\\_state\\_transfer](http://en.wikipedia.org/wiki/Representational_state_transfer)

#### **WMTS (limited as not all services support WMTS)**

A Web Map Tile Service (WMTS) is a standard protocol for serving pre-rendered georeferenced map tiles over the Internet. The specification was developed and first published by the Open Geospatial Consortium in 2010.

Wikipedia (14 August 2014) retrieved from

[http://en.wikipedia.org/wiki/Web\\_Map\\_Tile\\_Service](http://en.wikipedia.org/wiki/Web_Map_Tile_Service)

As WMTS provides better performance for the end user, it is recommended to use WMTS over WMS if available.

## WMS

A Web Map Service (WMS) is a standard protocol for serving georeferenced map images over the Internet that are generated by a map server using data from a GIS database. The specification was developed and first published by the Open Geospatial Consortium in 1999.

Wikipedia (20 April 2015) retrieved from

[http://en.wikipedia.org/wiki/Web\\_Map\\_Service](http://en.wikipedia.org/wiki/Web_Map_Service)

## WFS (limited as not all services support WFS)

The Open Geospatial Consortium Web Feature Service Interface Standard (WFS) provides an interface allowing requests for geographical features across the web using platform-independent calls. One can think of geographical features as the ‘source code’ behind a map, whereas the WMS interface or online tiled mapping portals like Google Maps return only an image, which end-users cannot edit or spatially analyze.

Wikipedia (5 April 2015) retrieved from

[http://en.wikipedia.org/wiki/Web\\_Feature\\_Service](http://en.wikipedia.org/wiki/Web_Feature_Service)

# Licensing and usage

All LIST data is subject to copyright, and a range of licence conditions also govern the use of the data. These licensing conditions must be adhered to when using LIST web services. Before accessing the LIST web services, please read the [LIST Web Services Terms and Conditions](http://listdata.thelist.tas.gov.au/public/LISTWebServicesTermsConditions.pdf) (<http://listdata.thelist.tas.gov.au/public/LISTWebServicesTermsConditions.pdf>).

The licence that applies to a particular dataset is identified at the Service and Layer levels of LIST web services, under Copyright Text.

The screenshot shows the ArcGIS REST Services Directory interface. At the top, there's a navigation bar with links for Home, services, Public, TopographyAndRelief (MapServer), and Hydrographic Points. On the right side of the header, there are links for Login | Get Token, Help, and API Reference. Below the header, the main content area displays information for the 'Layer: Hydrographic Points (ID: 2)'. The 'Name' is listed as 'Hydrographic Points', 'Display Field' as 'NAME', 'Type' as 'Feature Layer', and 'Geometry Type' as 'esriGeometryPoint'. A detailed 'Description' follows, explaining the data set's purpose and legal context. Under 'Definition Expression', it says 'N/A'. The 'Copyright Text' field contains the text 'the LIST © State of Tasmania' next to a Creative Commons Attribution license logo (CC BY). Other visible parameters include 'Default Visibility: false' and 'MaxRecordCount: 2000'.

**Note:** It is important to check the Copyright Text for both the Service and the Layer, as the multiple layers within a service may have different licence conditions.

## Creative Commons Attribution Only



### What you can do

Under 'Creative Common Attribution Only' you are free to:

- Share - copy and redistribute the material in any medium or format
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- Non-Commercial - you may not use the material for commercial purposes.
- No Derivatives - if you remix, transform, or build upon the material, you may not distribute the modified material.
- No additional restrictions - you may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

Please see <http://creativecommons.org/licenses/by-nc-nd/3.0/au/> for full details.

## Standard Government Copyright Statement

Where the standard LIST copyright text appears (see below), the Data is subject to Crown Copyright provisions as defined by the *Copyright Act 1968*. The Data is to be used internally within your organisation to support the execution of your usual business activities.

Copyright Text: [the LIST](#) State of Tasmania

However, if the Data will be incorporated into another product, distributed or on-sold in any way, you must contact [LIST Help Desk](#) on **(03) 6165 4444**, or via email [listhelp@dpipwe.tas.gov.au](mailto:listhelp@dpipwe.tas.gov.au), to obtain permission before use. Please note that a fee may be applicable.

## No visible license agreement

Where there is no Copyright Text visible for a particular dataset, you must assume that Creative Commons does not apply, and the dataset is not available for free under Open Data. Please contact the LIST Help Desk on **(03) 6165 4444**, or via email [listhelp@dpipwe.tas.gov.au](mailto:listhelp@dpipwe.tas.gov.au), to clarify licensing before usage.

## Metadata

LIST datasets have detailed metadata records that provide further information about the datasets. You can access these via LISTdata: [data.thelist.tas.gov.au](http://data.thelist.tas.gov.au)

LISTdata is a free, easy to use online data portal that helps you discover, use and reuse a wide range of Tasmanian location-based information, and provides a central access point to connect to or download authoritative government data, including [Open Data](#).

## Spatial reference systems

The following is a list of the supported spatial reference systems (SRS) for the LIST web services.

- **EPSG:3857** – WGS84 Web Mercator (Auxiliary Sphere) – default SRS for all of the LIST's spatial web services
- **EPSG:4326** – WGS84 Longitude-Latitude
- **EPSG:102100** – ESRI's Web Mercator
- **EPSG:28355** – GDA94 / MGA Zone 55
- **EPSG:4283** – GDA94 Longitude-Latitude

# Quick Access Guide

The LIST ArcGIS REST services can be accessed via the following URL:

<http://services.thelist.tas.gov.au/arcgis/rest>

## Adding a basemap

The most common task for most spatial applications is to load an initial context map or basemap.

There are a variety of basemaps supplied via the [LIST REST Web Services](http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps) (<http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps>).

Where possible, and if the application supports, use the [REST](#) service for optimal performance.

The next best option is [WMTS](#), then [WMS](#) followed by [WFS](#).

**To add a basemap in your application please refer to the following sections:**

- [ArcMap - Adding ArcGIS REST Services to ArcMap](#) or [Adding WMTS Services to ArcMap](#)
- [MapInfo - Adding REST Tile Services to MapInfo](#)
- [QGIS - Adding WMTS Services to QGIS](#)
- [ArcGIS Online - Adding ArcGIS REST Services to ArcGIS Online](#)
- [ArcGIS Pro - Adding ArcGIS REST Services to ArcGIS Pro](#)
- [OruxMaps - Adding REST Tile Services \(Basemaps\) to OruxMaps](#)
- [MotionX-GPS - Adding REST Tile Services \(Basemaps\) to MotionX-GPS](#)
- [AutoCAD Civil 3D - Adding ArcGIS REST Services to AutoCAD Civil 3D](#)

## Adding services other than basemaps

Where possible, use the [REST](#) services for vector based datasets for optimal performance. The next best option is [WMS](#), followed by [WFS](#).

**To add a vector based service to your application, please refer to the following sections:**

- [ArcMap - Adding ArcGIS REST services to ArcMap](#) or [Adding WMS services to ArcMap](#) or [Adding WFS services to ArcMap](#)
- [MapInfo - Adding WMS services to MapInfo](#) or [Adding WFS services to MapInfo](#)
- [QGIS - Adding WMS services to QGIS](#) or [Adding WFS services to QGIS](#)
- [ArcGIS Online - Adding ArcGIS REST services to ArcGIS Online](#) or [Adding WMS services to ArcGIS Online](#)

- **ArcGIS Pro** - [Adding ArcGIS REST services to ArcGIS Pro](#)
- **OruxMaps** - [Adding WMS services to OruxMaps](#)
- **AutoCAD Civil 3D** - [Adding ArcGIS REST services to AutoCAD Civil 3D](#) or [Adding WMS services to AutoCAD Civil 3D](#)

# How to get the correct web service URL

## URLs for ArcGIS server REST services

- In a web browser, enter the following URL: <http://services.thelist.tas.gov.au/arcgis/rest>. This URL is often all that is required for many applications that support ArcGIS server REST services. Entering this basic URL will give access to all the folders and services contained within via the applications navigation pane

The screenshot shows a web browser window with the URL <http://services.thelist.tas.gov.au/arcgis/rest/services> in the address bar. The page title is "ArcGIS REST Services Directory". The main content area displays the following information:

- Folder:** /
- Current Version:** 10.11
- View Footprints In:** [ArcGIS.com Map](#)
- Folders:**
  - [AerialPhotoViewer](#)
  - [Basemaps](#)
  - [Public](#)
  - [Raster](#)
  - [Utilities](#)
- Services:**
  - None

At the bottom, it says **Supported Interfaces:** [REST](#) [SOAP](#) [Sitemap](#) [Geo Sitemap](#).

- To enter specific REST end points, drill down through the folders and services then copy the URL found in the web browsers address bar
- A basemap URL will look like the following:

The screenshot shows a web browser window with the URL <http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer> in the address bar. The page title is "ArcGIS REST Services Directory". The main content area displays the following information:

- Home > services > Basemaps > Topographic (ImageServer)**
- JSON | SOAP | WMS | WMTS**
- Basemaps/Topographic (ImageServer)**
- View In:** [ArcGIS JavaScript](#) [ArcGIS.com Map](#) [Google Earth](#) [ArcMap](#)

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- A non-basemap service URL containing numerous layers will look like this:

The screenshot shows a web browser window with the URL [services.thelist.tas.gov.au/arcgis/rest/services/Public/TopographyAndRelief/MapServer](http://services.thelist.tas.gov.au/arcgis/rest/services/Public/TopographyAndRelief/MapServer). The page title is "ArcGIS REST Services Directory". The breadcrumb navigation shows "Home > services > Public > TopographyAndRelief (MapServer)". Below the navigation, there are links for "JSON | SOAP | WMS". The main content area is titled "Public/TopographyAndRelief (MapServer)". It includes "View In:" links for "ArcGIS JavaScript", "ArcGIS.com Map", "Google Earth", "ArcMap", and "ArcGIS Explorer". There is also a "View Footprint In:" link for "ArcGIS.com Map". A "Service Description:" section is present but empty.

- An individual layer or REST end point URL will look like the following:

The screenshot shows a web browser window with the URL [services.thelist.tas.gov.au/arcgis/rest/services/Public/TopographyAndRelief/MapServer/0](http://services.thelist.tas.gov.au/arcgis/rest/services/Public/TopographyAndRelief/MapServer/0). The page title is "ArcGIS REST Services Directory". The breadcrumb navigation shows "Home > services > Public > TopographyAndRelief (MapServer) > Facilities". Below the navigation, there is a "JSON" link. The main content area is titled "Layer: Facilities (ID: 0)". It includes a "Name: Facilities" section.

## URLs for ArcGIS server WMS, WMTS or WFS services

- The majority of services have WMS capabilities but only certain services have WMTS capabilities under <http://services.thelist.tas.gov.au/arcgis/rest>. WFS is available via one service: <http://services.thelist.tas.gov.au/arcgis/rest/services/Public/OpenDataWFS/MapServer>. To see which service has either WMS or WMTS enabled, drill down to the service level and look for either WMTS or WMS in the top left hand corner of the page
- If they are enabled, click on the links

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- For **WMTS** copy the URL up to and including the first WMTS, for example:

The screenshot shows the ArcGIS REST Services Directory interface. The URL in the address bar is `services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer`. The 'WMTS' tab is highlighted with a red box. Below it, the service name 'Basemaps/Topographic (ImageServer)' is displayed. A red box highlights the XML content area, which contains the following XML code:

```
<Capabilities xmlns="http://www.opengis.net/wmts/1.0" xmlns:ows="http://www.opengis.net/ows/1.1" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:gml="http://www.opengis.net/gml" xsi:schemaLocation="http://www.opengis.net/wmts/1.0 http://schemas.opengis.net/wmts/1.0/wmtsGetCap">
  <!-- Service Identification -->
  <ows:ServiceIdentification>
    <ows:Title>Basemaps_Topo</ows:Title>
```

- For **WMS** copy the URL up to and including WMSServer, for example:

The screenshot shows the ArcGIS REST Services Directory interface. The URL in the address bar is `services.thelist.tas.gov.au/arcgis/rest/services/Public/TopographyAndRelief/MapServer`. The 'WMS' tab is highlighted with a red box. Below it, the service name 'Public/TopographyAndRelief (MapServer)' is displayed. A red box highlights the XML content area, which contains the following XML code:

```
<WMS_Capabilities xmlns="http://www.opengis.net/wms" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:esri_wms="http://www.esri.com/wms" version="1.3.0" xsi:schemaLocation="http://www.opengis.net/wms http://schemas.opengis.net/wms/1.3.0/capabilities_1_3_0.xsd http://www.esri.com/wms http://services.thelist.tas.gov.au/arcgis/services/Public/TopographyAndRelief/MapServer/WmsServer?version=1.3.0&service=WMS%26request=GetSchemaExtension">
```

- For **WFS** copy the URL up to and including WFSServer, for example:

The screenshot shows the ArcGIS REST Services Directory interface. The URL in the address bar is `services.thelist.tas.gov.au/arcgis/rest/services/Public/OpenDataWFS/MapServer`. The 'WFS' tab is highlighted with a red box. Below it, the service name 'Public/OpenDataWFS (MapServer)' is displayed. A red box highlights the XML content area, which contains the following XML code:

```
<WFS_Capabilities xmlns="http://www.opengis.net/wfs/2.0" xmlns:fes="http://www.opengis.net/fes/2.0" xmlns:ogc="http://www.opengis.net/ogc" xmlns:gml="http://www.opengis.net/gml/3.2" xmlns:ows="http://www.opengis.net/ows/1.1" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:Public_OpenDataWFSS="http://cradle130.thelist.tas.gov.au:6080" version="2.0.0" xsi:schemaLocation="http://www.opengis.net/gml http://schemas.opengis.net/gml/3.2.1/gml.xsd http://schemas.opengis.net/filter/2.0/filter.xsd http://www.opengis.net/ows/1.1 http://schemas.opengis.net/ows/1.1/filter.xsd http://schemas.opengis.net/wfs/2.0/wfs.xsd http://www.opengis.net/fes/2.0 http://schemas.opengis.net/filter/2.0/filter.xsd">
```

# Adding services in common GIS platforms

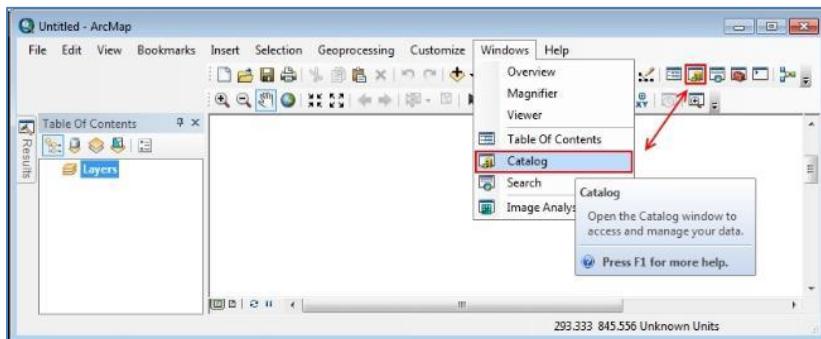
The following instructions are provided as a guide only. For more detailed instructions please refer to the vendor's online help or click on the reference links found under [References for spatial applications](#) at the end of this document.

## How to add services in ArcMap Version 10.3

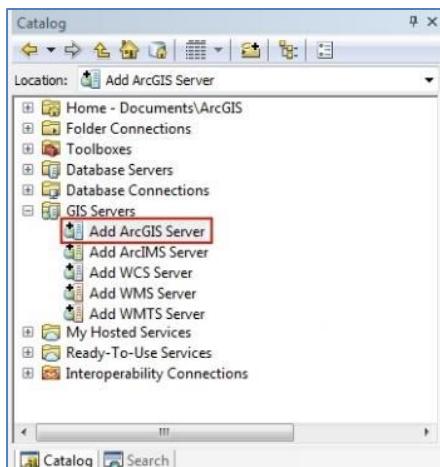
### Adding ArcGIS REST services to ArcMap

**Note:** Please refer to [Clear Display Cache in ArcMap](#) before adding a LIST basemap

- Within ArcMap, if the catalog pane is not already open, click on the open **Catalog** button or click on the **Windows** menu and select **Catalog** to view the pane



- In your Catalog pane expand **GIS Servers** then click on **Add ArcGIS Server**



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- Select **Use GIS services** then click **Next**



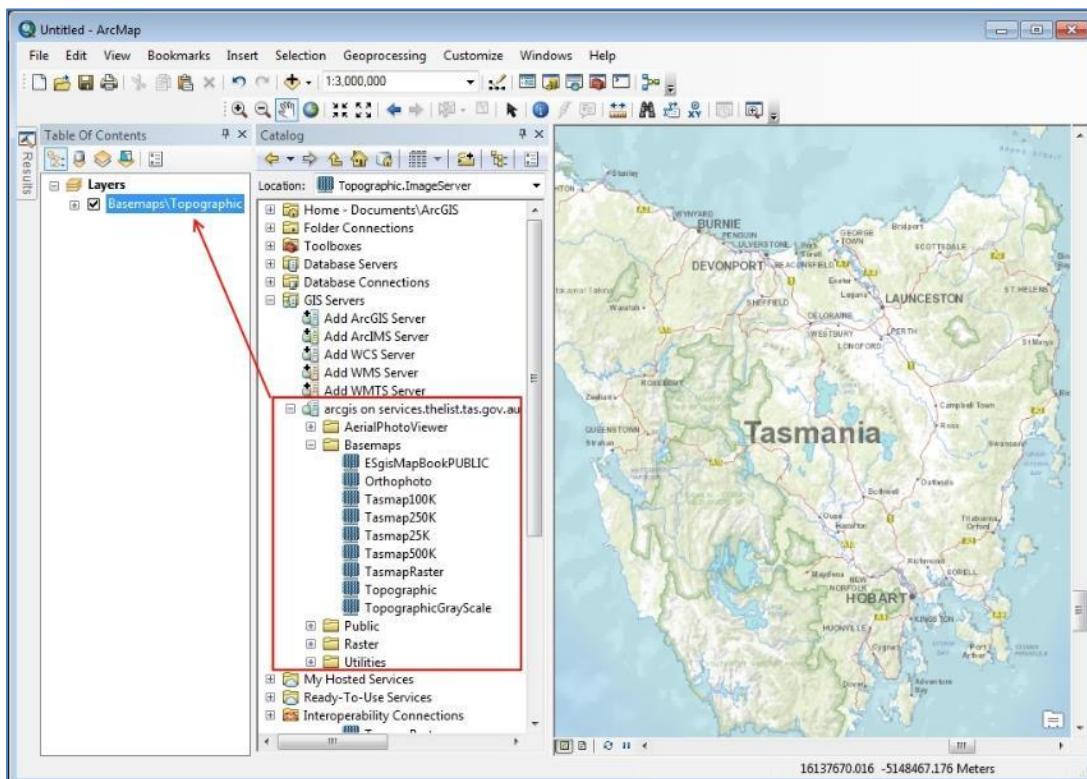
- In the **Service URL** box type in the following URL  
**http://services.thelist.tas.gov.au/arcgis** and leave the **User Name** and **Password** blank then click **Finish**



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- Expand the folders to see the available services and click and drag the service into your mxd (or ArcMap document) to load all the layers for that service

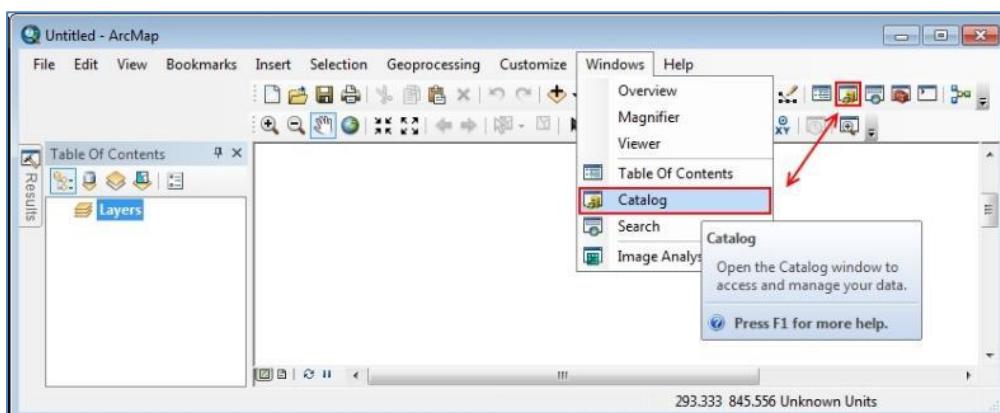


## Adding WMTS services to ArcMap

For the best performance, it is recommended to use the ArcGIS REST services as detailed in [Adding ArcGIS REST Services to ArcMap](#). WMTS is only available on some of the LIST basemap services found under

<http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps>.

- Within ArcMap, if the catalog pane is not already open, click on the open **Catalog** button or click on the **Windows** menu and select **Catalog** to view the pane

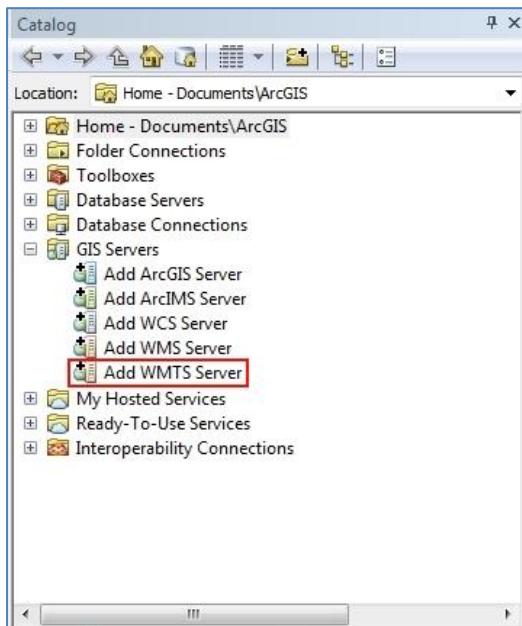


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- In your Catalog pane expand **GIS Servers** then click on **Add WMTS Server**



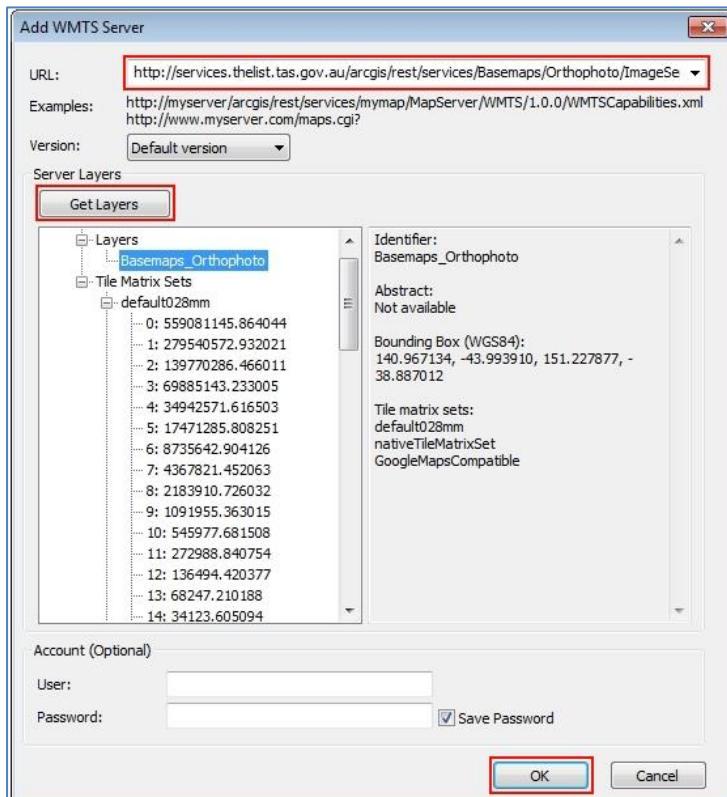
- In the **URL** text box, type in a valid URL such as  
**http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Orthophoto/Image Server/WMTS**. (Please refer to <http://services.thelist.tas.gov.au/arcgis/rest/> to see what services have WMTS enabled and look for WMTS in the top left corner)



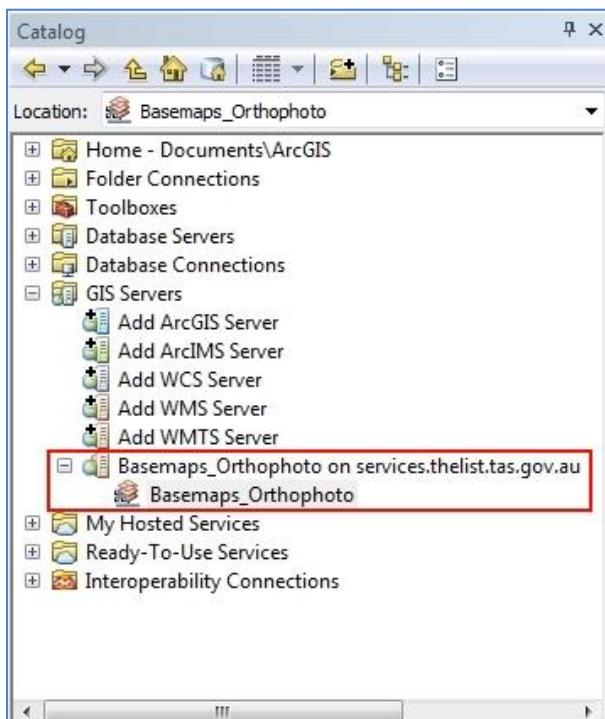
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- Click **Get Layers** to make sure the URL is valid, and if it is, click **OK** to add the service to the catalog pane.



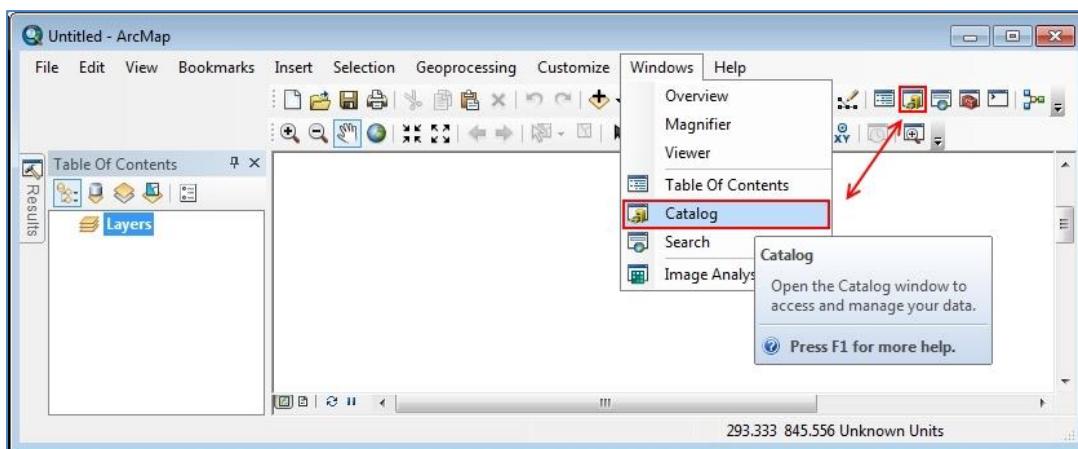
- Expand the folders to see the available services and click and drag the layer to add it to your mxd (or ArcMap document)



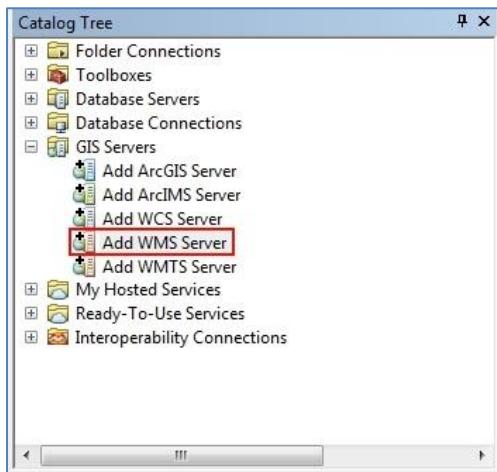
## Adding WMS services to ArcMap

For the best performance, it is recommended to use the **ArcGIS REST services** as detailed in [Adding ArcGIS REST Services to ArcMap](#). WMS is only available on most of the LIST services found under <http://services.thelist.tas.gov.au/arcgis/rest/services> but not all.

- Within ArcMap, if the catalog pane is not already open, click on the open **Catalog** button or click on the **Windows** menu and select **Catalog** to view the pane



- In your Catalog pane expand **GIS Servers** then click on **Add WMS Server**



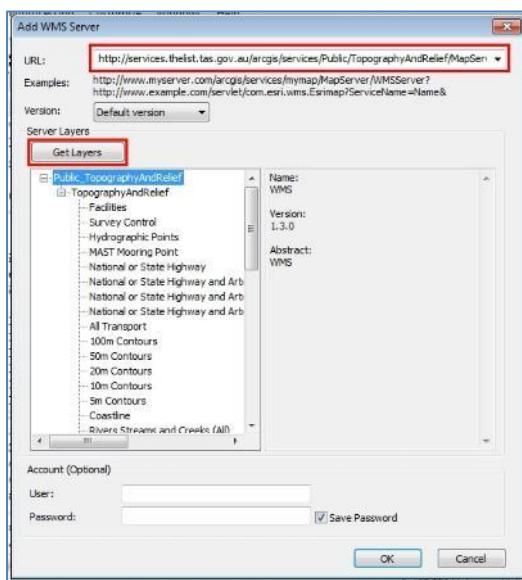
## LIST Spatial Web Services

### User Guide

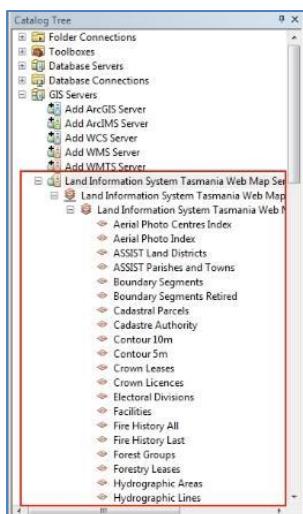
- In the **URL** box type in the following URL  
**http://services.thelist.tas.gov.au/arcgis/services/Public/TopographyAndRelief/MapServer/WMServer** then click **Get Layers** to see what is available followed by the **OK** button. Check the LIST's [ArcGIS REST web services](#) to see if WMS is enabled on a service (look for WMS in the top left corner)



- For example, the following URL will also allow you to add the topographic basemap:  
**http://services.thelist.tas.gov.au/arcgis/services/Basemaps/Topographic/ImageServer/WMServer?**



- Expand the folders to see the available services and click and drag the layer to add it to your mxd (or ArcMap document)

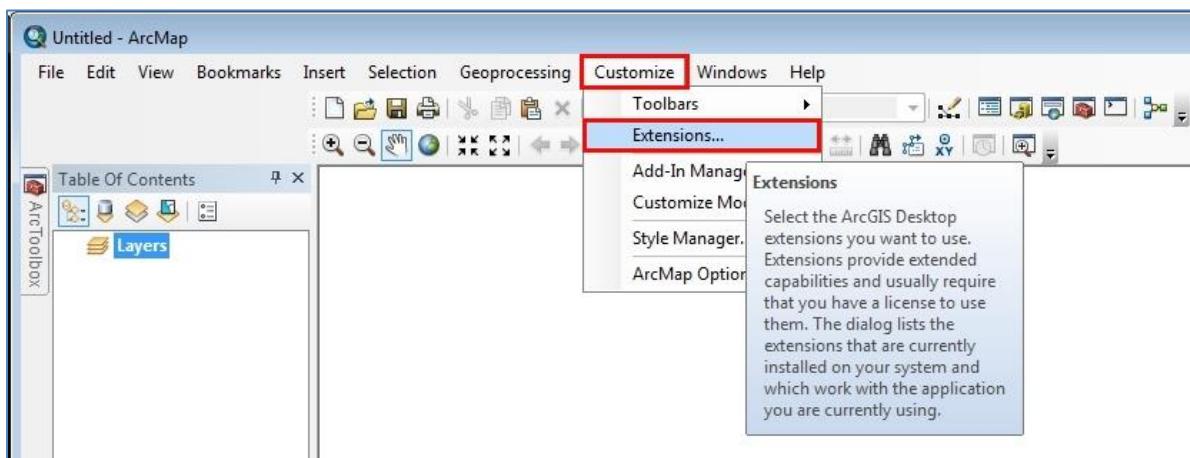


## Adding WFS services to ArcMap

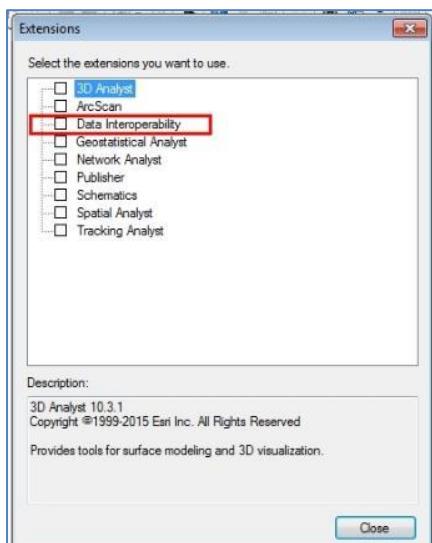
**For the best performance, it is recommended to use the ArcGIS REST services as detailed in [Adding ArcGIS REST Services to ArcMap](#). WFS is only available via the following URL**

(<http://services.thelist.tas.gov.au/arcgis/rest/services/Public/OpenDataWFS/MapServer>).

- In order to use WFS in ArcMap, the ArcGIS Interoperability Extension for Desktop must be installed but doesn't need to be enabled. To check if you have this extension installed, from within your ArcMap document, click on the **Cutomize** menu option then the **Extensions...** menu option.



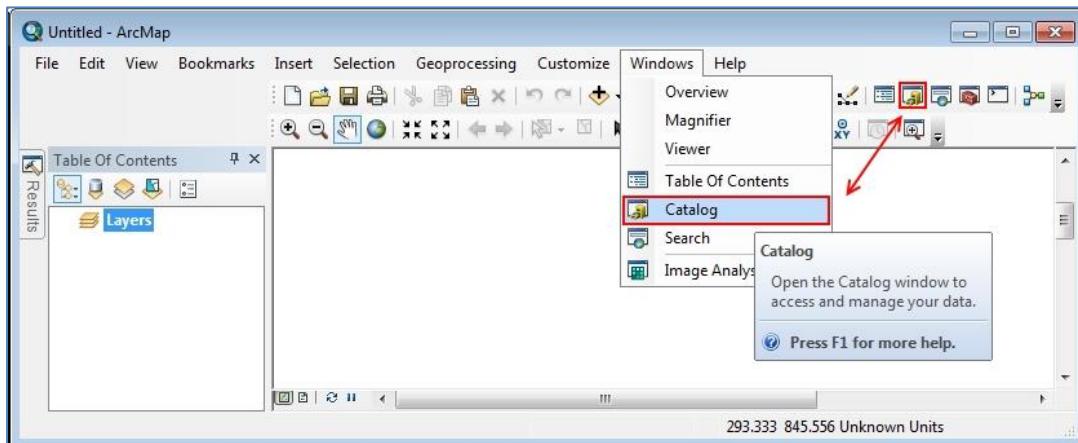
- If the extension has been installed, there will be a **Data Interoperability** option in the list of extensions. It does not need to be enabled to proceed but it does have to be in the list of extensions.



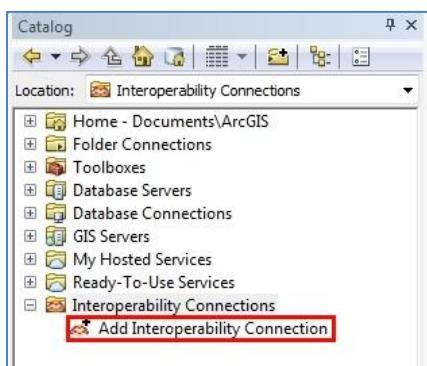
## LIST Spatial Web Services

### User Guide

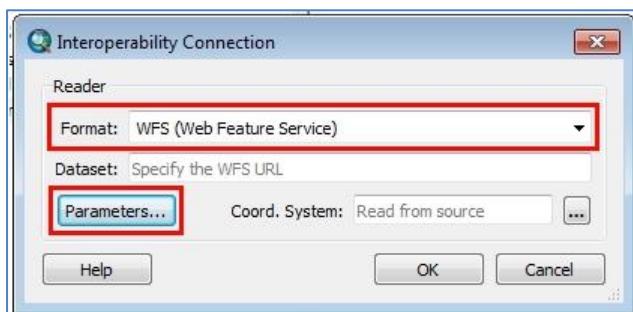
- Within ArcMap, if the catalog pane is not already open, click on the open **Catalog** button or click on the **Windows** menu and select **Catalog** to view the pane



- In your Catalog pane expand **Interoperability Connections** then click on **Add Interoperability Connection**



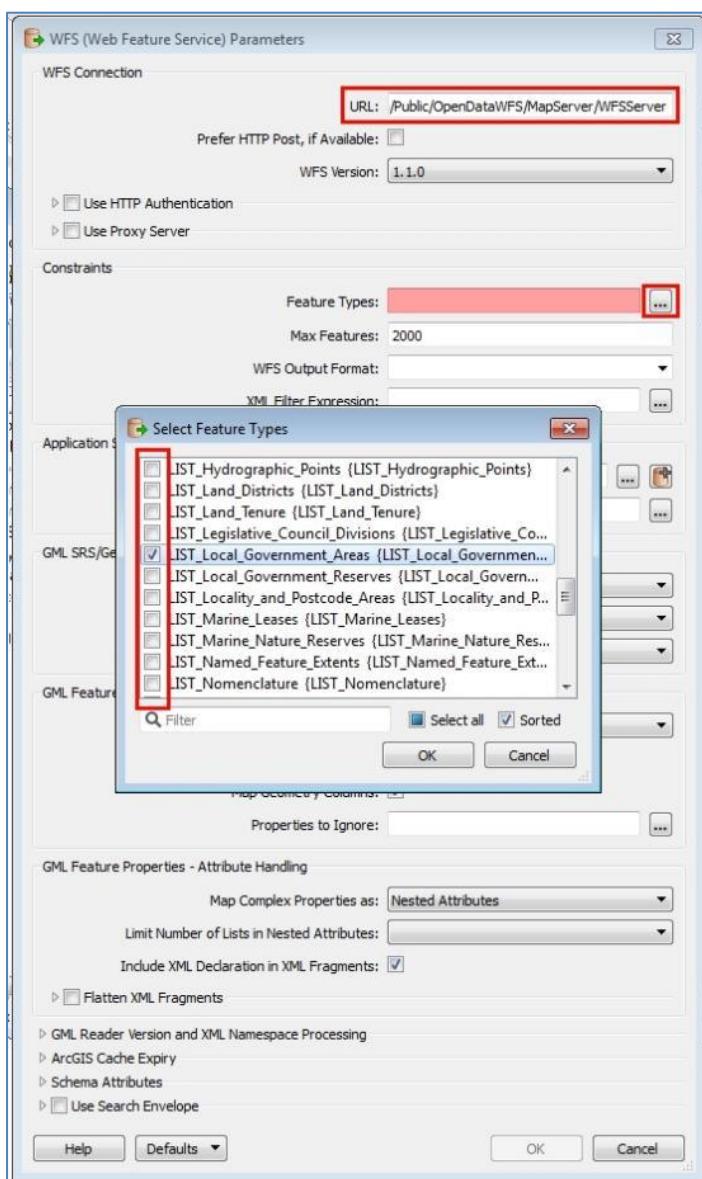
- Select **WFS (Web Feature Service)** from the drop down list next to **Format:**, then click on the **Parameters...** button



## LIST Spatial Web Services

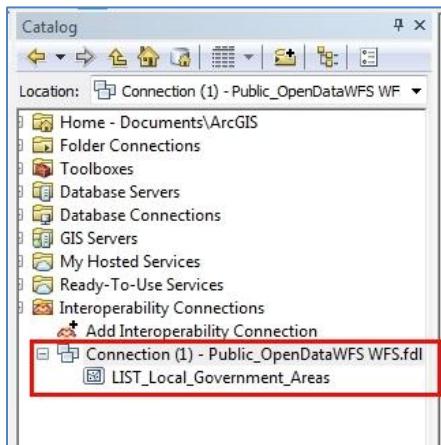
### User Guide

- In the **URL** box type in the following URL  
**http://services.thelist.tas.gov.au/arcgis/services/Public/OpenDataWFS/MapServer/WFSServer** then click the three dots button next to **Feature Types** and click on the check box next to the desired layer. Please be aware that this service has a 2,000 maximum feature limit on each layer for performance requirements. To see more than the first 2,000 records, an XML Filter Expression needs to be included, however, formatting such a request is not covered in this document.



- After selecting the desired layer or layers, click **OK** on all the open windows

- Expand the new connection in ArcCatalog and click and drag the layer to add it to your mxd (or ArcMap document)



## Clear Display Cache in ArcMap

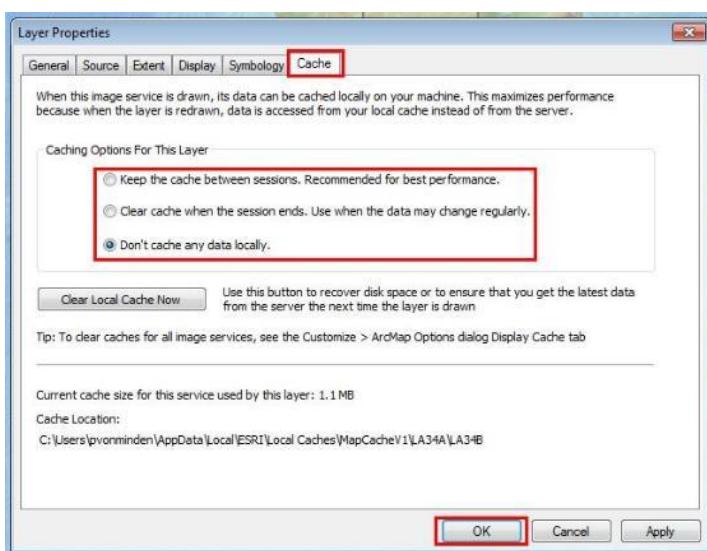
When regularly using the LIST basemaps

(<http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps>) it is good practice to clear the ArcMap display cache as it may mask any updates carried out on those basemaps.

- Within ArcMap, remove any basemaps from the document then click on the **Customize** menu option, then click on **ArcMap Options**.
- Click on the **Display Cache** tab and then click on **Clear Cache**. This may take some time if the display cache is large. Click **OK** to dismiss the window when the cache has been cleared.



- The cache options for any added basemap can also be altered by right clicking on the basemap within the ArcMap document and clicking on **Properties**.
- Within the **Properties** dialog window, click on the **Cache** tab and select the desired caching option, then click **OK** to apply those settings.



## How to add services in MapInfo Pro Version 12.5

### Adding REST tile services to MapInfo

MapInfo does not directly support REST tile services but if you follow the steps below, it can be added indirectly. Please note that **this is the best way to access the LIST basemaps in MapInfo** as it offers better performance than simply accessing the WMS service for the same basemaps. Any error messages can be mitigated by zooming into the extent of Tasmania or preloading a layer into MapInfo.

#### **Adding the topographic basemap**

- In a text editor such as Notepad or Notepad++ type in the following lines:

```
<?xml version="1.0" encoding="utf-8"?>
<TileServerInfo Type="LevelRowColumn">

<Url>http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer/tile/{LEVEL}/{COL}/{ROW}.png</Url>
<MinLevel>3</MinLevel>
<MaxLevel>18</MaxLevel>
<TileSize Height="256" />
<AttributionText Font="Font ("Tahoma",257,8,16777215,0)">the LIST &#169; State of Tasmania</AttributionText>
</TileServerInfo>
```

- Save the above file as **ListTopoBasemap.xml**. Alternatively, download the file from <https://github.com/DPIPWE/list-spatial-web-service-examples/tree/master/MapInfo>.
- Then in a new blank document, type in the following text:

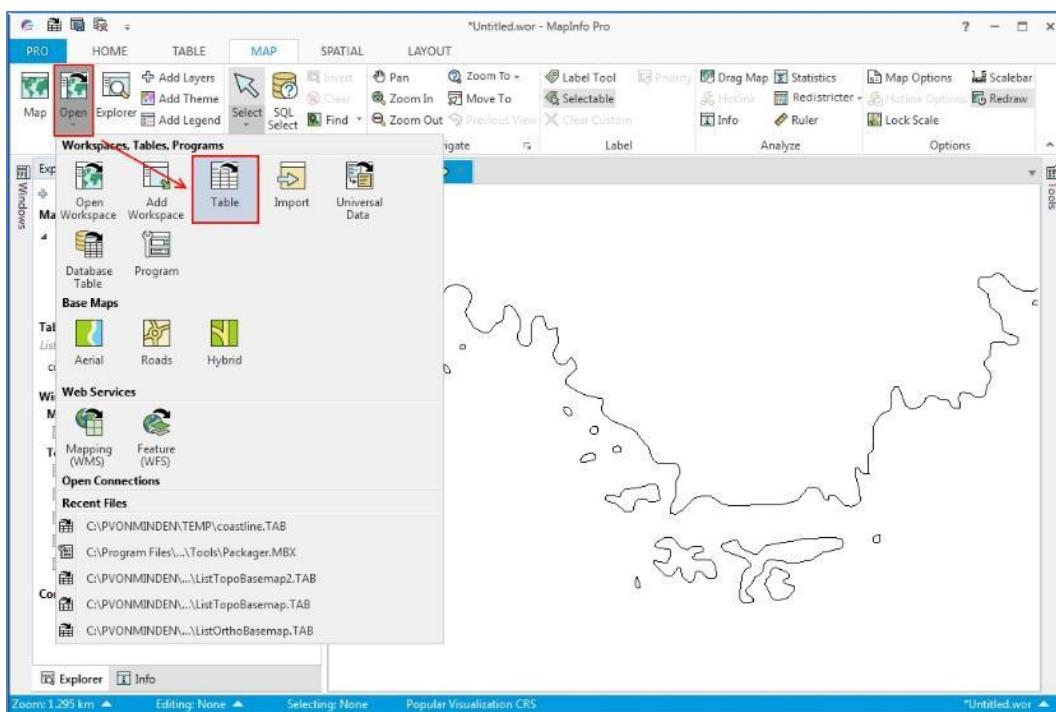
```
!table
!version 1050
!charset WindowsLatin1

Definition Table
File "ListTopoBasemap.xml"
Type "TILESERVER"
CoordSys Earth Projection 10, 157, "m", 0 Bounds (-20037508.3428, -20037508.343)
(20037508.3428, 20037508.343)
ReadOnly
```

## LIST Spatial Web Services

### User Guide

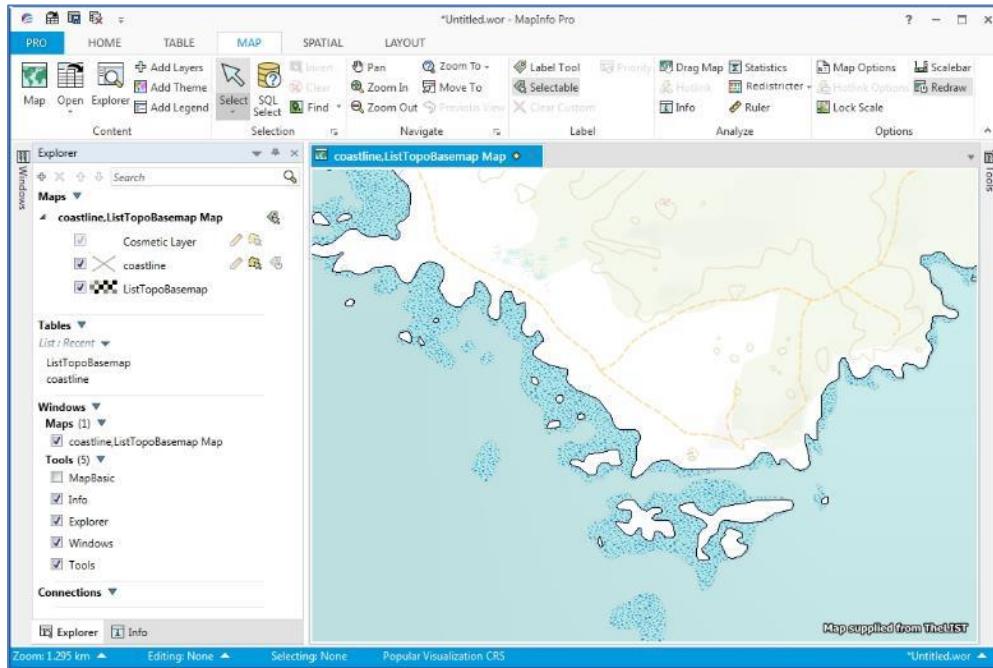
- Save the above file as **ListTopoBasemap.TAB** in the same location as **ListTopoBasemap.xml**. Alternatively, download the file from <https://github.com/DPIPWE/list-spatial-web-service-examples/tree/master/MapInfo>.
- To view the REST tile service in MapInfo, click on the **Open** button then on the **Table** button and navigate to where you saved the .xml and .TAB files.



- To avoid drawing errors and decrease waiting time for the data to load, pre-load another layer and zoom into a section of it.

## LIST Spatial Web Services

### User Guide



### Adding the orthophoto basemap

- In a text editor such as Notepad or Notepad++ type in the following lines:

```
<?xml version="1.0" encoding="utf-8"?>
<TileServerInfo Type="LevelRowColumn">

<Url>http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Orthophoto/ImageServer/tile/{LEVEL}/{COL}/{ROW}.png</Url>
<MinLevel>6</MinLevel>
<MaxLevel>19</MaxLevel>
<TileSize Height="256" />
<AttributionText Font="Font ("Tahoma",257,8,16777215,0)">the LIST &#169; State of Tasmania</AttributionText>
</TileServerInfo>
```

- Save the above file as **ListOrthoBasemap.xml**. Alternatively, download the file from <https://github.com/DPIPWE/list-spatial-web-service-examples/tree/master/MapInfo>.

- Then in a new blank document, type in the following text:

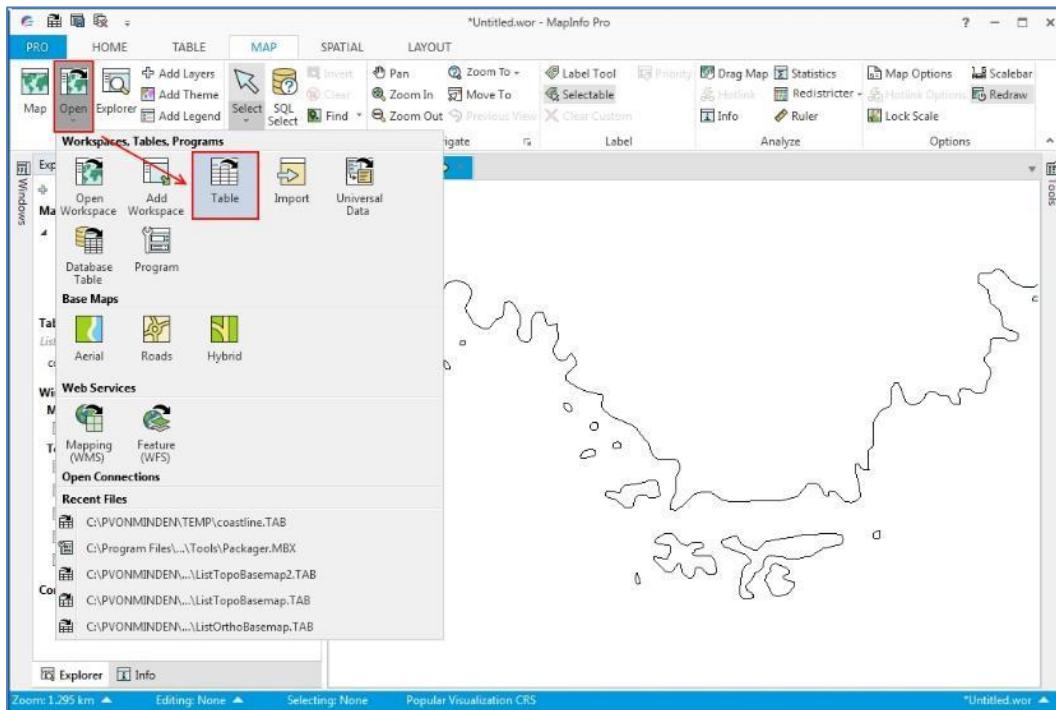
```
!table  
!version 1050  
!charset WindowsLatin1  
  
Definition Table  
File "ListOrthoBasemap.xml"  
Type "TILESERVER"  
CoordSys Earth Projection 10, 157, "m", 0 Bounds (-20037508.3428, -20037508.343)  
(20037508.3428, 20037508.343)  
ReadOnly
```

- Save the above file as **ListOrthoBasemap.TAB** in the same location as **ListOrthoBasemap.xml**. Alternatively, download the file from <https://github.com/DPIPWE/list-spatial-web-service-examples/tree/master/MapInfo>.

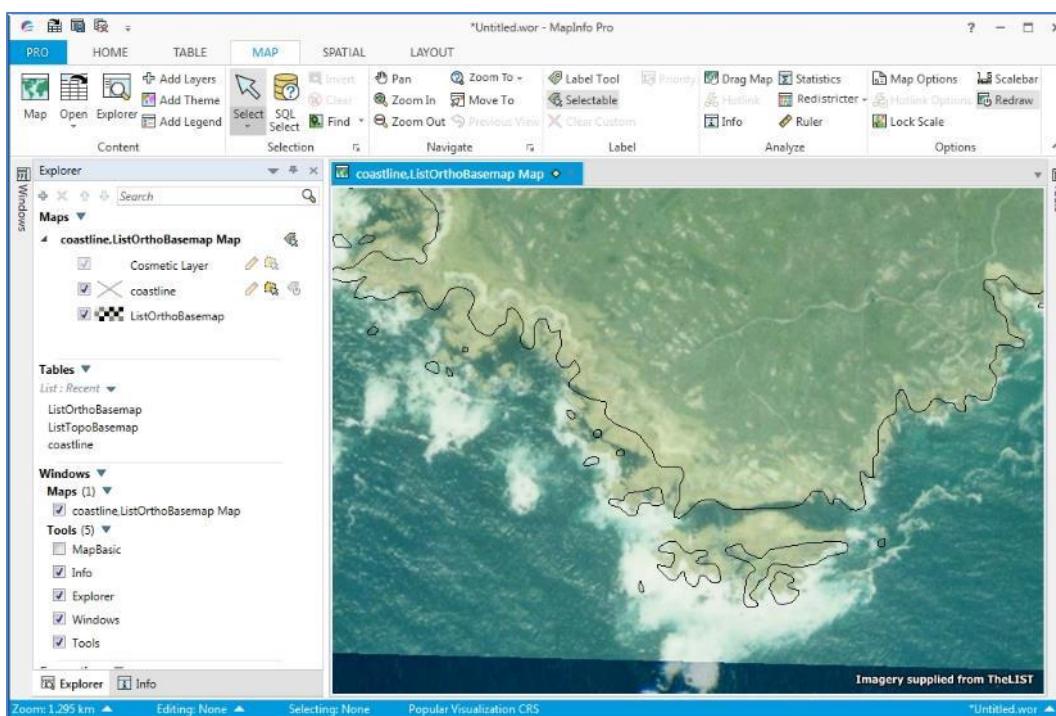
## LIST Spatial Web Services

### User Guide

- To view the REST tile service in MapInfo, click on the **Open** button then on the **Table** button and navigate to where you saved the .xml and .TAB files.



- To avoid drawing errors and decrease waiting time for the data to load, pre-load another layer and zoom into a section of it.



### Adding other basemaps

- For the [Topographic Gray Scale basemap](#), follow the steps above but create the following files first:

```
<?xml version="1.0" encoding="utf-8"?>
<TileServerInfo Type="LevelRowColumn">

<Url>http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/TopographicGrayScale/ImageServer/tile
/{LEVEL}/{COL}/{ROW}.png</Url>
<MinLevel>3</MinLevel>
<MaxLevel>18</MaxLevel>
<TileSize Height="256" />
<AttributionText Font="Font ("Tahoma",257,8,16777215,0)">the LIST &#169; State of
Tasmania</AttributionText>
</TileServerInfo>
```

- Save the above file as **ListTopoGrayBasemap.xml**. Alternatively, download the file from <https://github.com/DPIPWE/list-spatial-web-service-examples/tree/master/MapInfo>.

```
!table
!version 1050
!charset WindowsLatin1

Definition Table
File "ListTopoGrayBasemap.xml"
Type "TILESERVER"
CoordSys Earth Projection 10, 157, "m", 0 Bounds (-20037508.3428, -20037508.343)
(20037508.3428, 20037508.343)
ReadOnly
```

- Save the above file as **ListTopoGrayBasemap.TAB** in the same location as **ListTopoGrayBasemap.xml**. Alternatively, download the file from <https://github.com/DPIPWE/list-spatial-web-service-examples/tree/master/MapInfo>.

- For the scanned [TASMAP basemap](#), follow the steps above but create the following files first:

```
<?xml version="1.0" encoding="utf-8"?>
<TileServerInfo Type="LevelRowColumn">

<Url>http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/TasmapRaster/ImageServer/tile/{LEVEL}
}/{COL}/{ROW}.png</Url>
<MinLevel>6</MinLevel>
<MaxLevel>16</MaxLevel>
<TileSize Height="256" />
<AttributionText Font="Font ("Tahoma",257,8,16777215,0)">the LIST &#169; State of
Tasmania</AttributionText>
</TileServerInfo>
```

- Save the above file as **ListScannedTASMAPbasemap.xml**. Alternatively, download the file from <https://github.com/DPIPWE/list-spatial-web-service-examples/tree/master/MapInfo>.

```
!table
!version 1050
!charset WindowsLatin1

Definition Table
File "ListScannedTASMAPbasemap.xml"
Type "TILESERVER"
CoordSys Earth Projection 10, 157, "m", 0 Bounds (-20037508.3428, -20037508.343)
(20037508.3428, 20037508.343)
ReadOnly
```

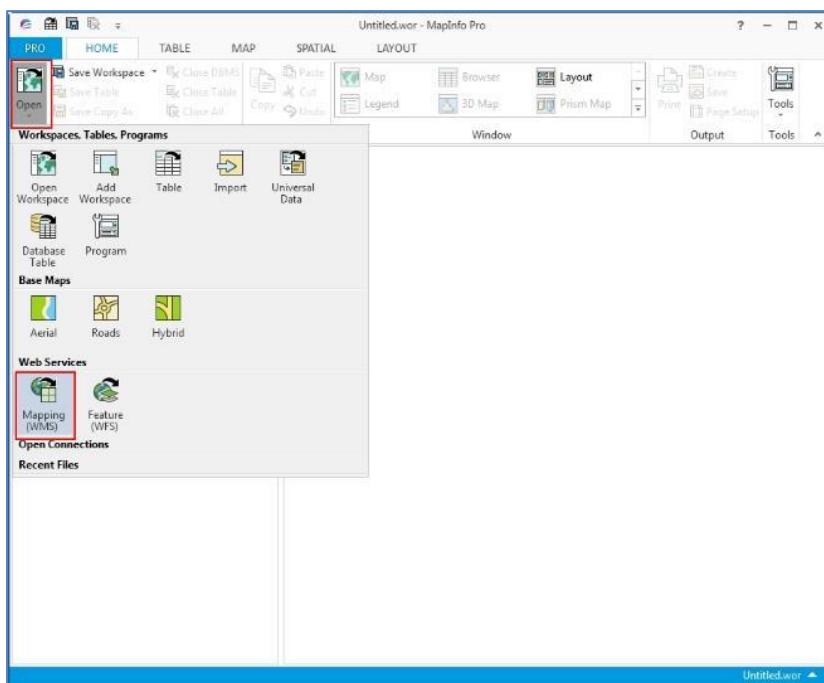
- Save the above file as **ListScannedTASMAPbasemap.TAB** in the same location as **ListScannedTASMAPbasemap.xml**. Alternatively, download the file from <https://github.com/DPIPWE/list-spatial-web-service-examples/tree/master/MapInfo>.

## LIST Spatial Web Services

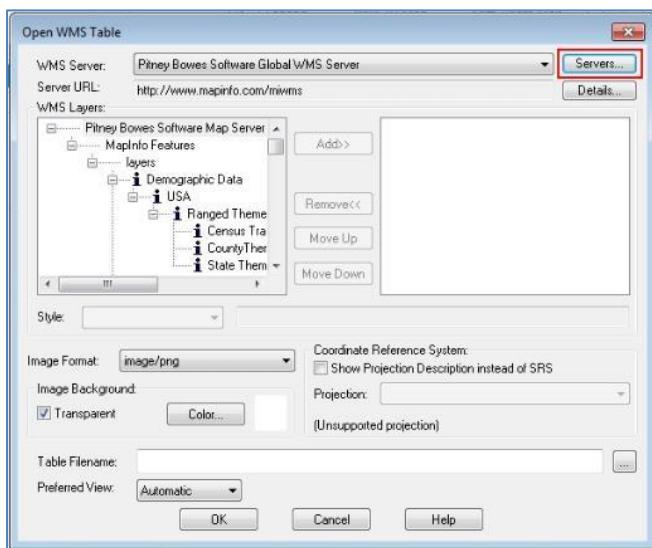
### User Guide

## Adding WMS services to MapInfo

- After opening MapInfo click on **Open** then select **Mapping (WMS)** under **Web Services**



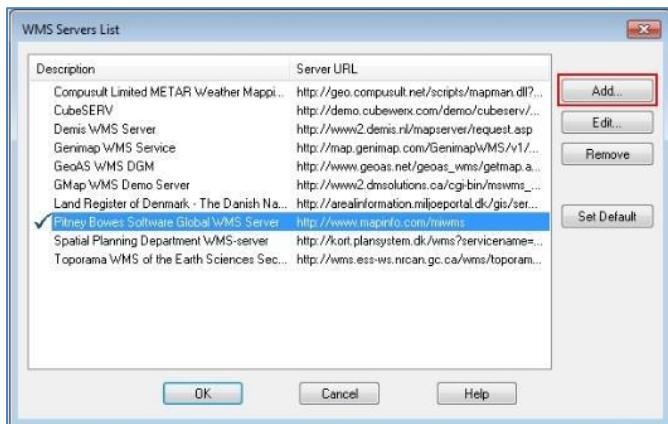
- Click on the **Servers** button



## LIST Spatial Web Services

### User Guide

- Then click on **Add...** to create a new connection to LIST Web services



- Type the following into the **Server URL:**

**http://services.thelist.tas.gov.au/arcgis/services/Public/TopographyAndRelief/MapServer/WMSServer**

- Add a meaningful **Description**, then click the **Test URL** button to see if you can connect. Check the LIST's [ArcGIS REST web services](#) to see if WMS is enabled on a service (look for WMS in the top left corner)



For example, the following URL will also allow you to add the topographic basemap:

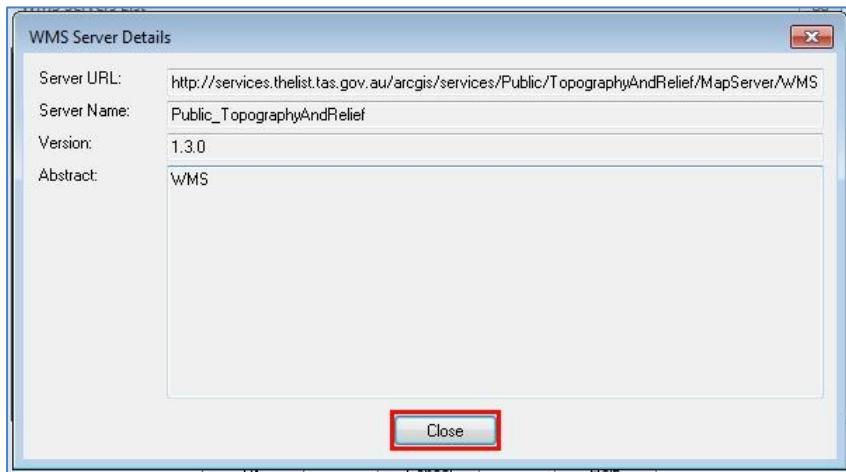
**http://services.thelist.tas.gov.au/arcgis/services/Basemaps/Topographic/ImageServer/WMSServer?**



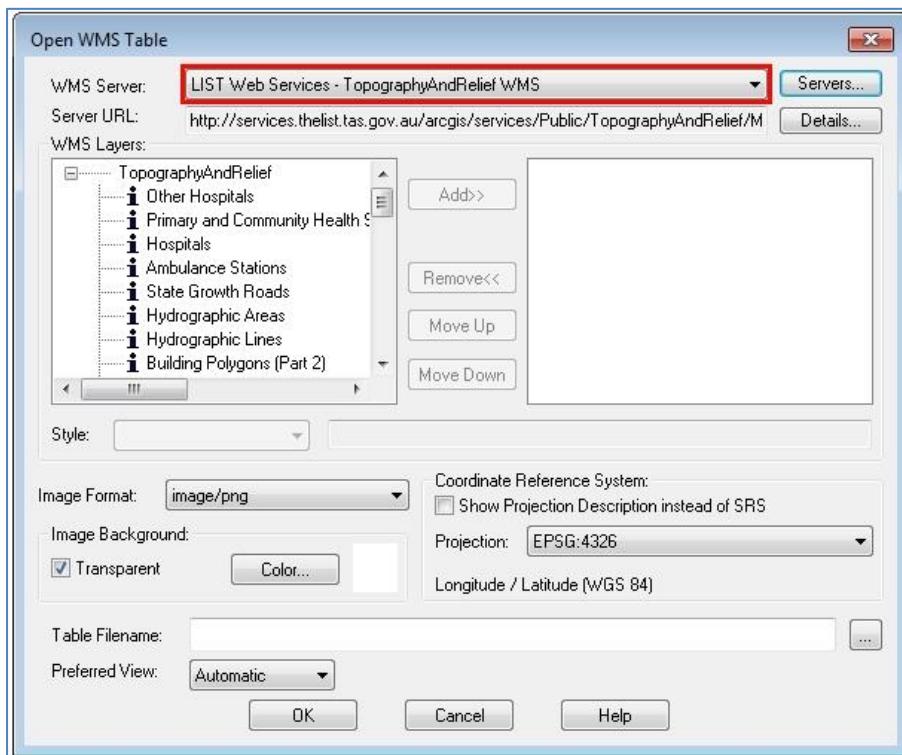
## LIST Spatial Web Services

### User Guide

- A working valid connection will return a window similar to the one below. Click **Close** to dismiss the window



- Then click **OK** to create the connection
- From here, you can now access the layers and add them into MapInfo provided you select the new WMS Server from the drop down list.

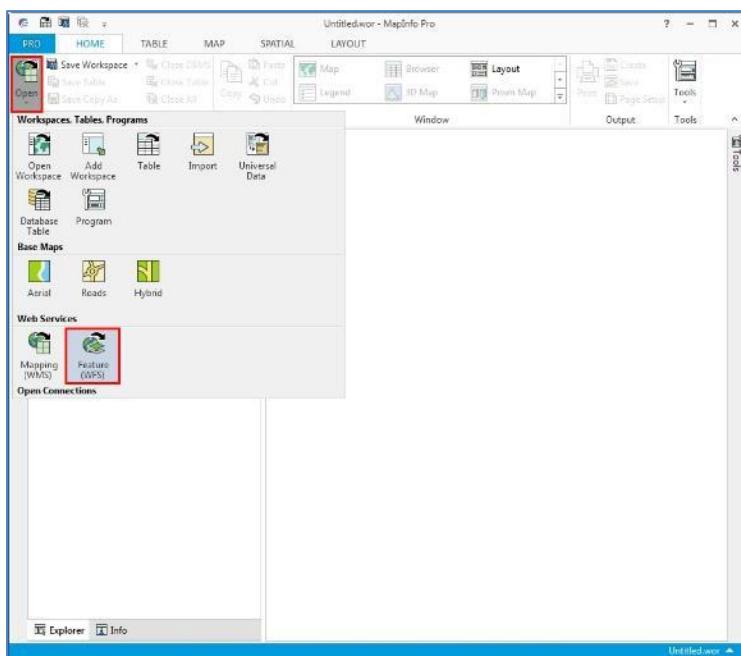


## LIST Spatial Web Services

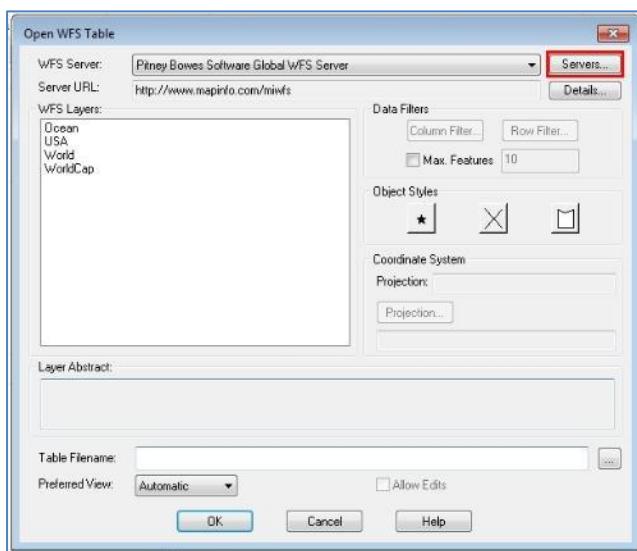
### User Guide

## Adding WFS services to MapInfo

- After opening MapInfo click on **Open** then select **Feature (WFS)** under **Web Services**



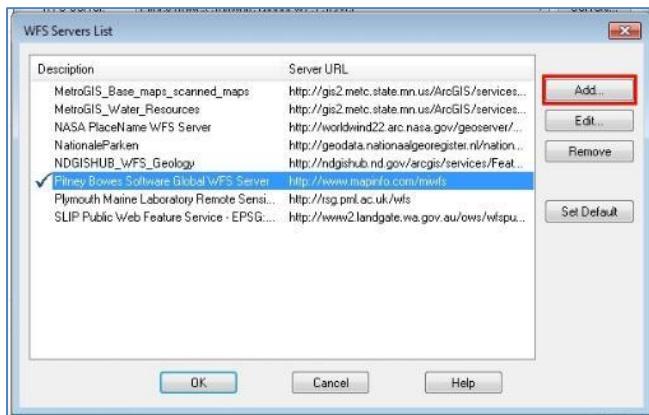
- Click on the **Servers** button



## LIST Spatial Web Services

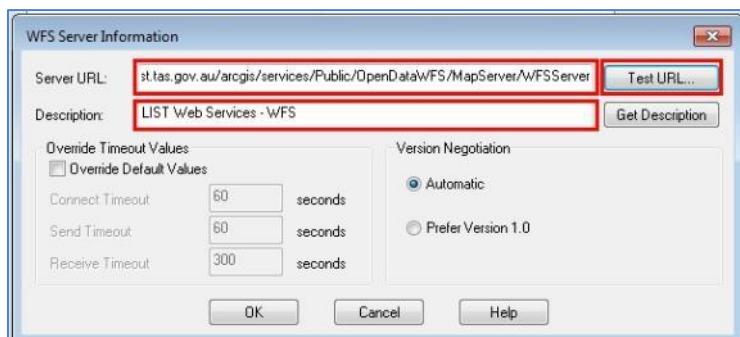
### User Guide

- Then click on **Add...** to create a new connection to LIST Web services

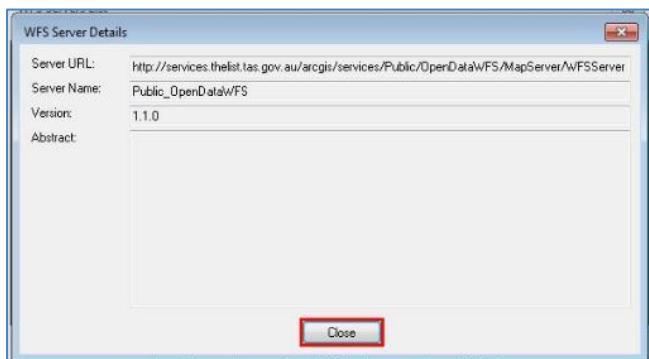


- Type the following into the **Server URL:**

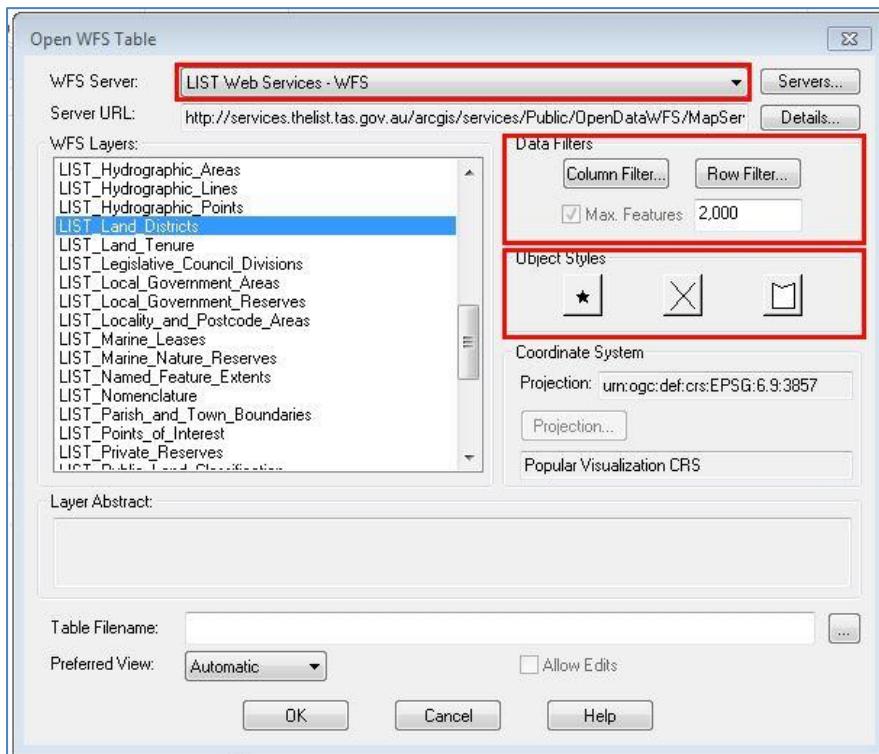
**http://services.thelist.tas.gov.au/arcgis/services/Public/OpenDataWFS/MapServer/WFSServer** and add a meaningful **Description**, then click the **Test URL** button to see if you can connect.



- A working valid connection will return a window similar to the one below. Click **Close** to dismiss the window



- Then click **OK** to create the connection
- From here, you can now access the layer and add it into MapInfo provided you select the new WFS Server from the drop down list. Use the **Data Filters** options to customise the data being accessed as well as the **Object Styles** to change the symbology. Please note that there is a 2,000 maximum feature limit on each layer for performance requirements for the LIST WFS service (<http://services.thelist.tas.gov.au/arcgis/rest/services/Public/OpenDataWFS/MapServer>).

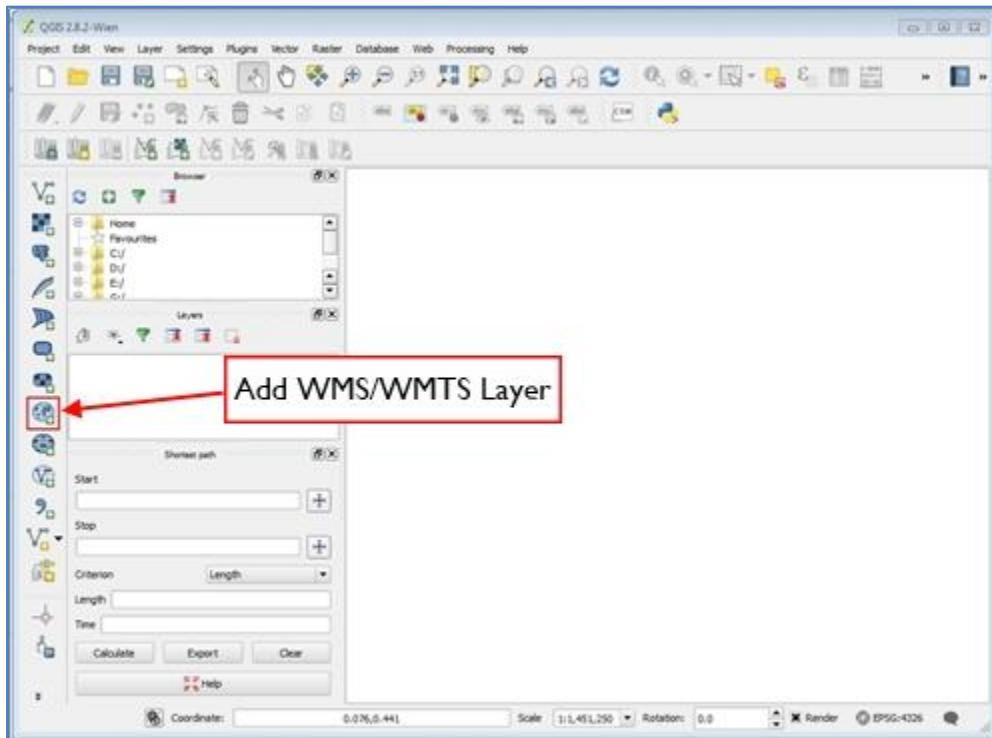


## How to add services in QGIS Version 2.8.2

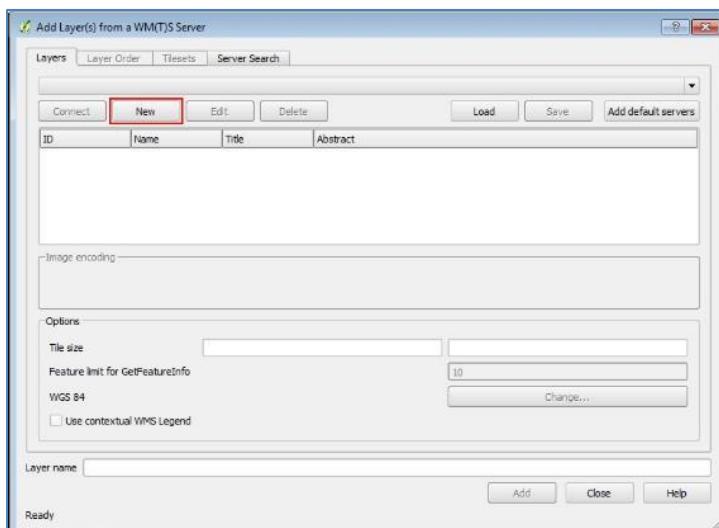
### Adding WMTS services to QGIS

**For basemap services WMTS is the recommended format where available**

- To add a WMTS layer to QGIS, click on the **Add WMS/WMTS Layer** button as shown in the image below
- Alternatively go to the **Layer** menu, select **Add Layer**, then **Add WMS/WMTS Layer**



- For a new connection click on the **New** button



## LIST Spatial Web Services

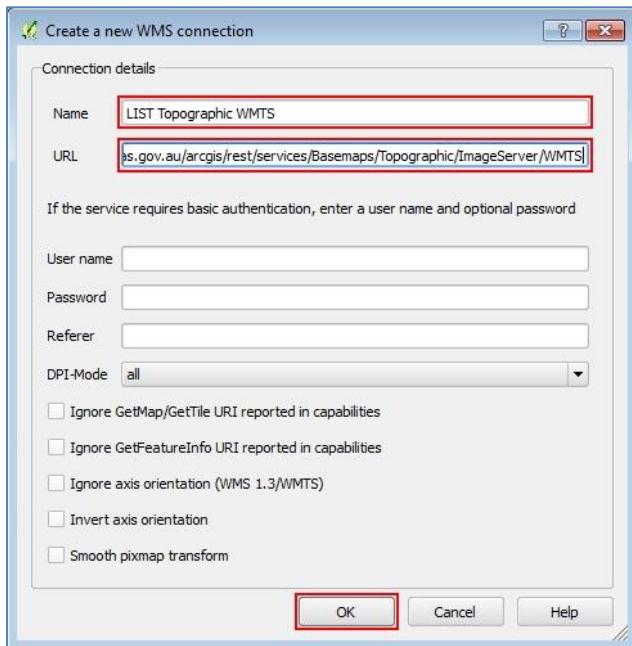
### User Guide

- Type in a meaningful name in the **Name** text box then type in a URL from the LIST's [ArcGIS REST web services](#) that has WMTS enabled (look for WMTS in the top left corner)

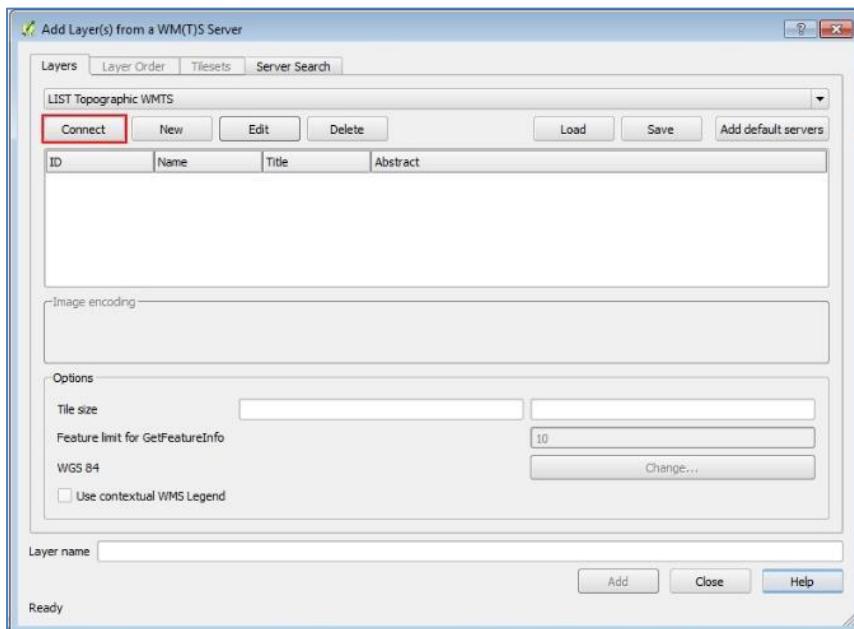
A screenshot of the ArcGIS REST Services Directory interface. At the top, it shows the path: Home > services > Basemaps > Topographic (ImageServer). Below this, there are links for JSON, SOAP, WMS, and WMTS. The WMTS link is highlighted with a red box.

For example,

<http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer/WMTS> and then click **OK**.



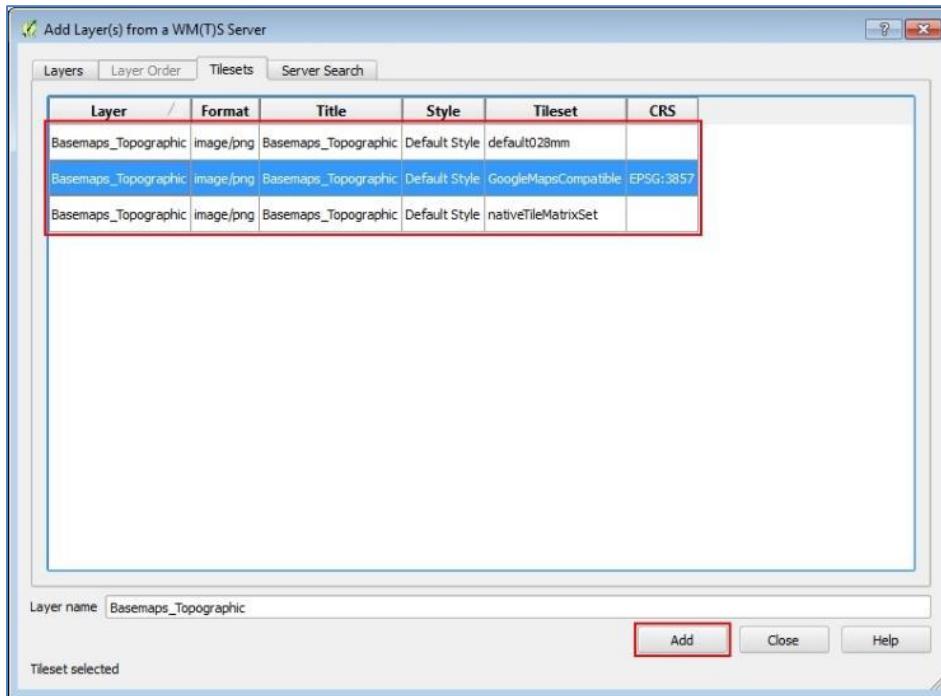
- Then click on the **Connect** button to view the available tile sets



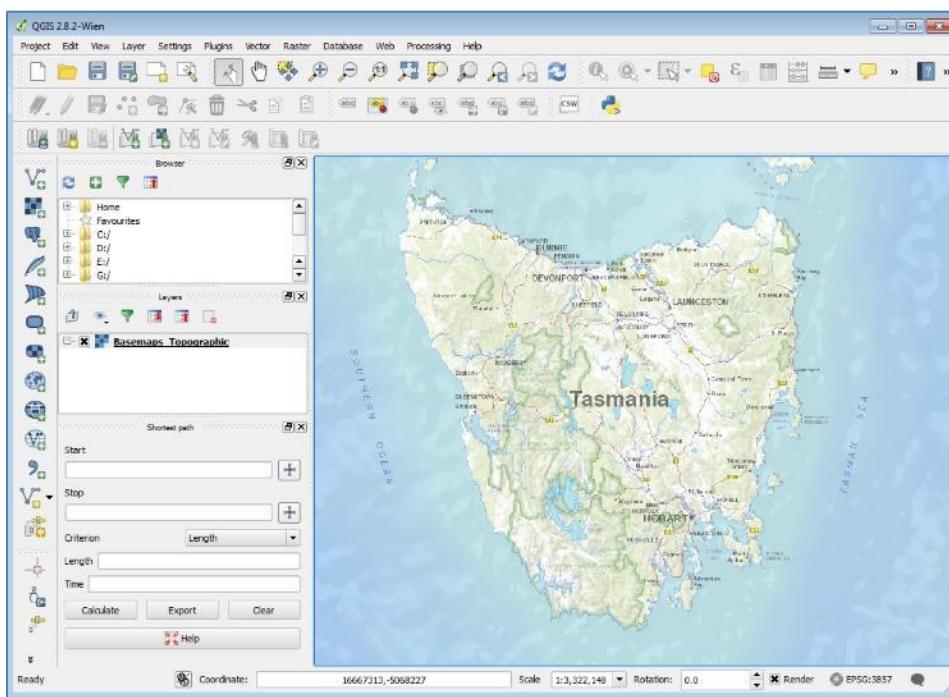
## LIST Spatial Web Services

### User Guide

- Highlight a tile set that you wish to use and click **Add**

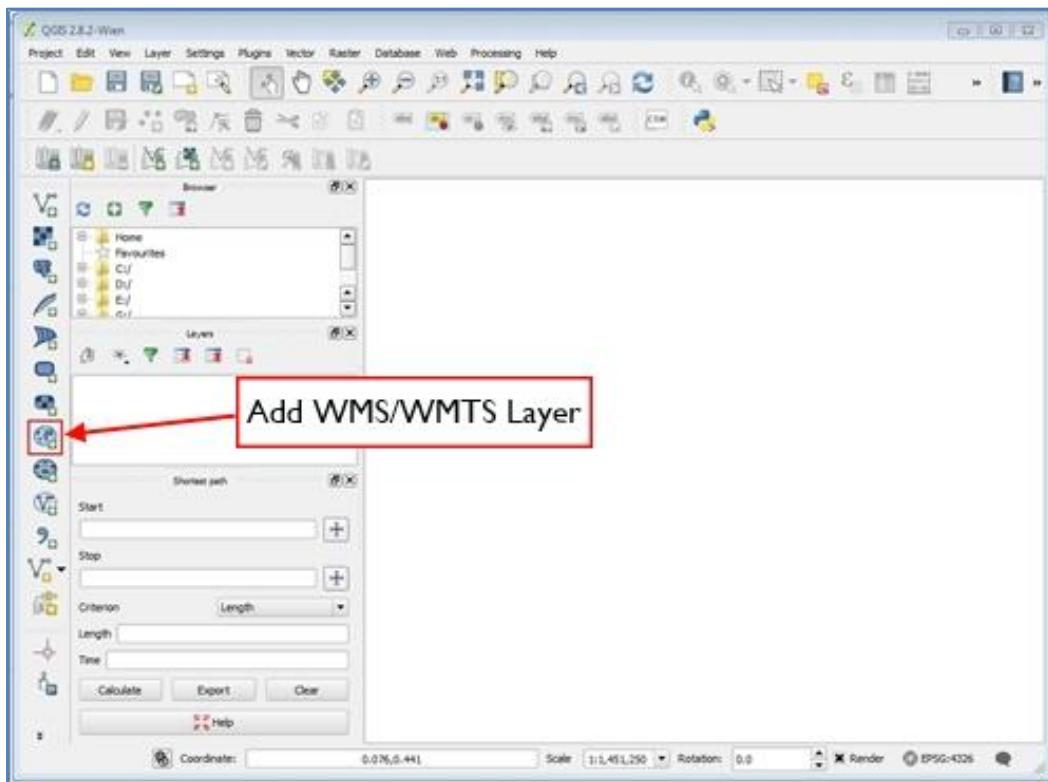


- The results are then loaded into QGIS. Please be aware that the initial extent may not be initially zoomed in to Tasmania.

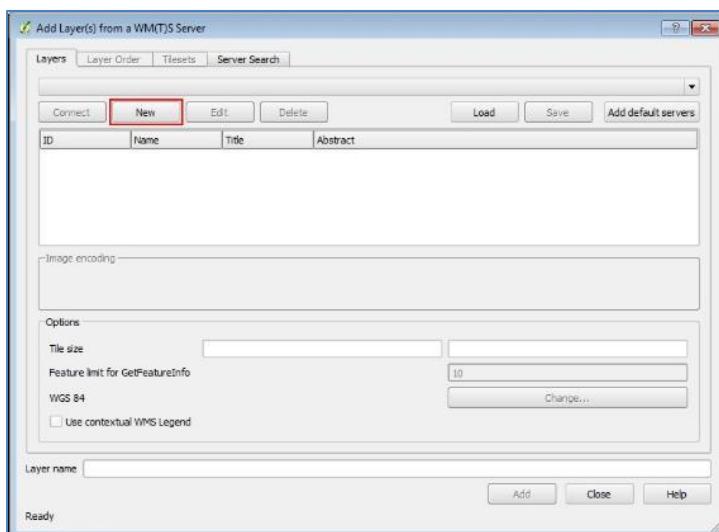


## Adding WMS services to QGIS

- To add a WMS layer to QGIS, either click on the **Add WMS/WMTS Layer** button as shown in the image below or go to the **Layer** menu select **Add Layer** then **Add WMS/WMTS Layer**



- For a new connection click on the **New** button



## LIST Spatial Web Services

### User Guide

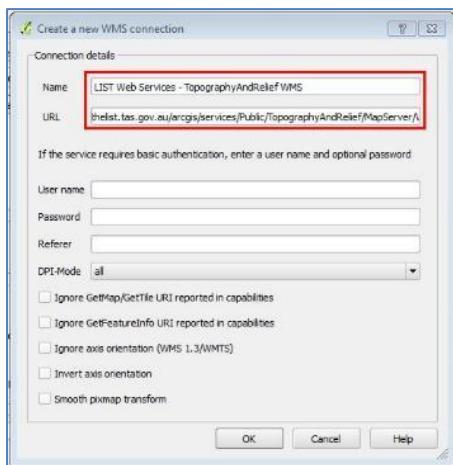
- Type a meaningful name in the **Name** text box then type in the URL for the desired WMS layers:

**http://services.thelist.tas.gov.au/arcgis/services/Public/TopographyAndRelief/MapServer/WMServer/WMS** and click **OK**. Alternatively, check the LIST's [ArcGIS REST web services](#) to see if WMS is enabled on a service (look for WMS in the top left corner)

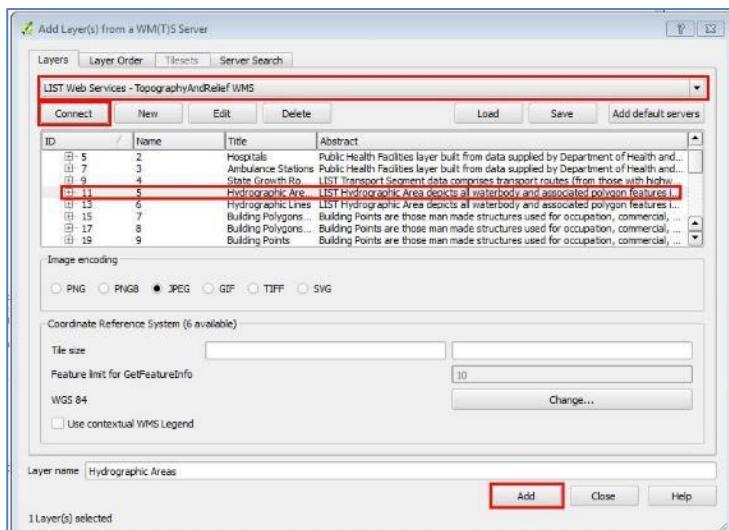


For example, the following URL will also allow you to add the topographic basemap:

**http://services.thelist.tas.gov.au/arcgis/services/Basemaps/Topographic/ImageServer/WMServer/WMS**

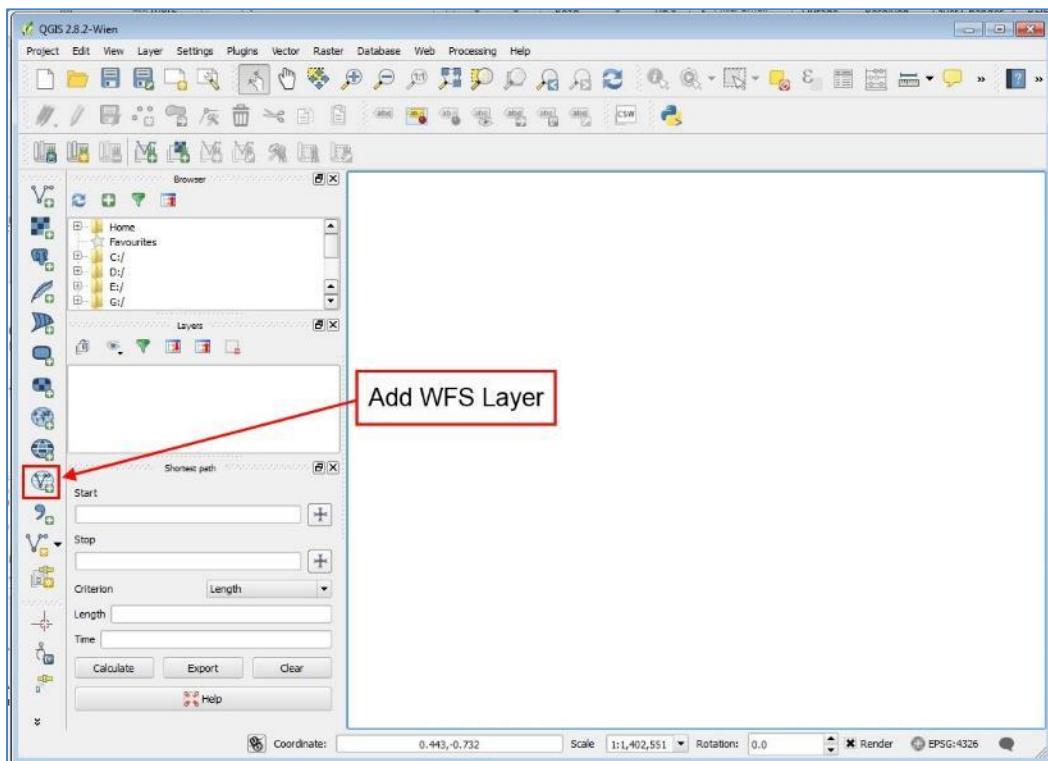


- Ensure that you have the correct connection selected from the drop down list then click on the **Connect** button to view the available layers, highlight a layer, change the coordinate system if required and click **Add** to add the layer to the map. This window will stay open if you want to add more layers or simply click the **Close** button to dismiss the window.

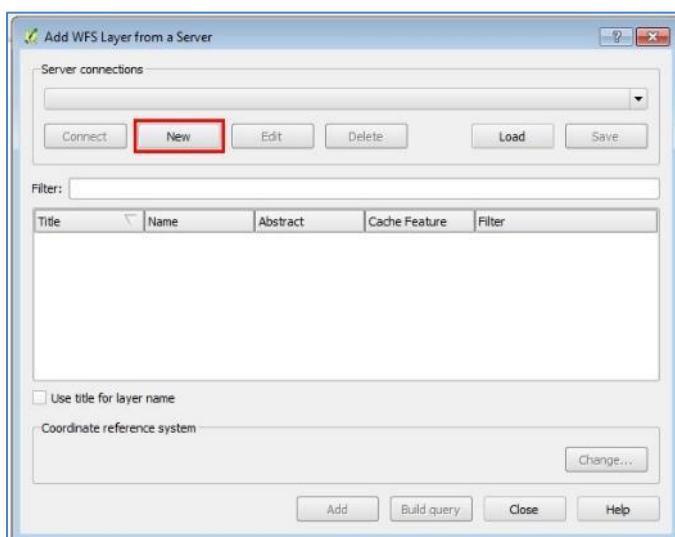


## Adding WFS services to QGIS

- To add a WFS layer to QGIS, either click on the **Add WFS Layer** button as shown in the image below or go to the **Layer** menu select **Add Layer** then **Add WFS Layer**



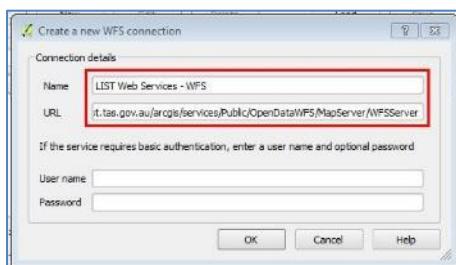
- For a new connection click on the **New** button



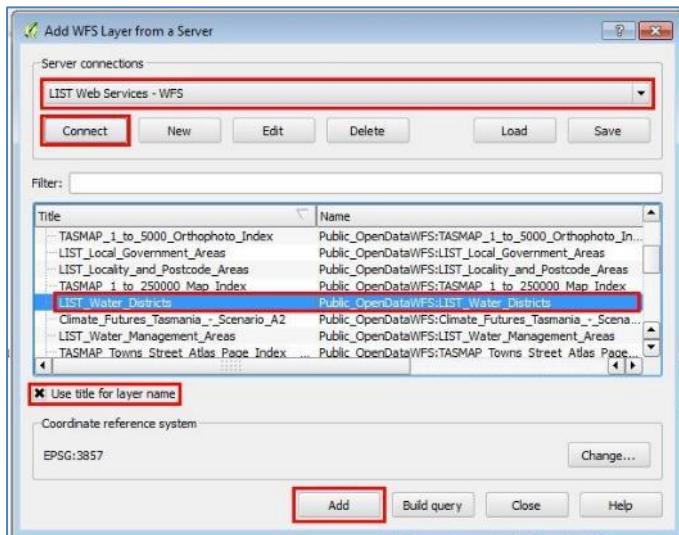
## LIST Spatial Web Services

### User Guide

- Type a meaningful name in the **Name** text box then type in the following URL:  
**http://services.thelist.tas.gov.au/arcgis/services/Public/OpenDataWFS/MapServer/WFSServer** and click **OK**.



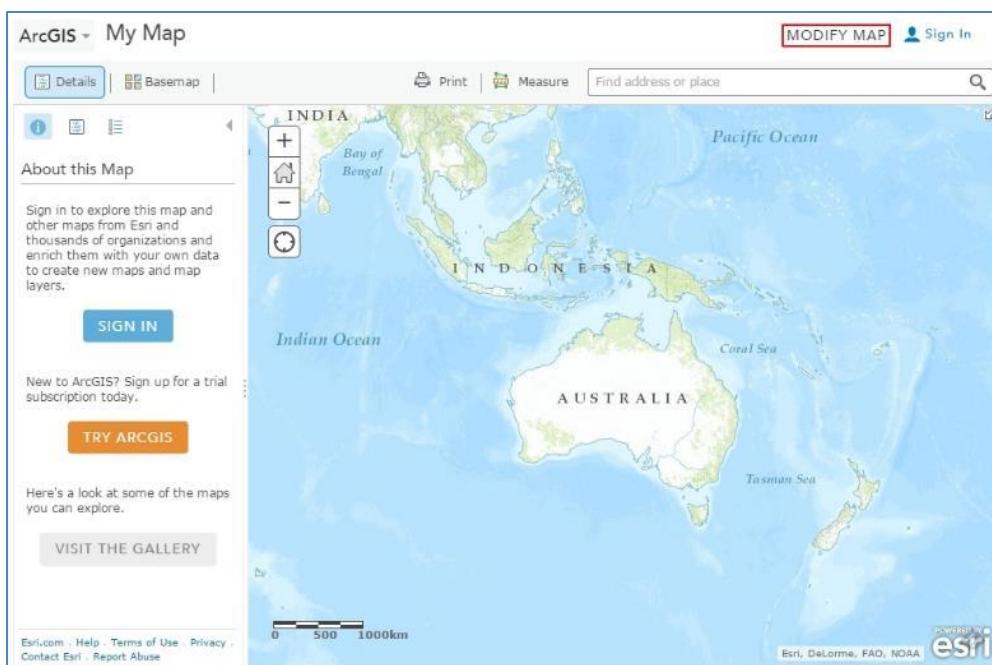
- Ensure that you have the correct connection selected from the drop down list then click on the **Connect** button to view the available layers, highlight a layer, double click on it to add a filter expression if required, enable **Use title for layer name** and click **Add** to add the layer to the map. This window will stay open if you want to add more layers or simply click the **Close** button to dismiss the window. Please note that there is a 2,000 maximum feature limit on each layer for performance requirements for the LIST WFS service (<http://services.thelist.tas.gov.au/arcgis/rest/services/Public/OpenDataWFS/MapServer>).



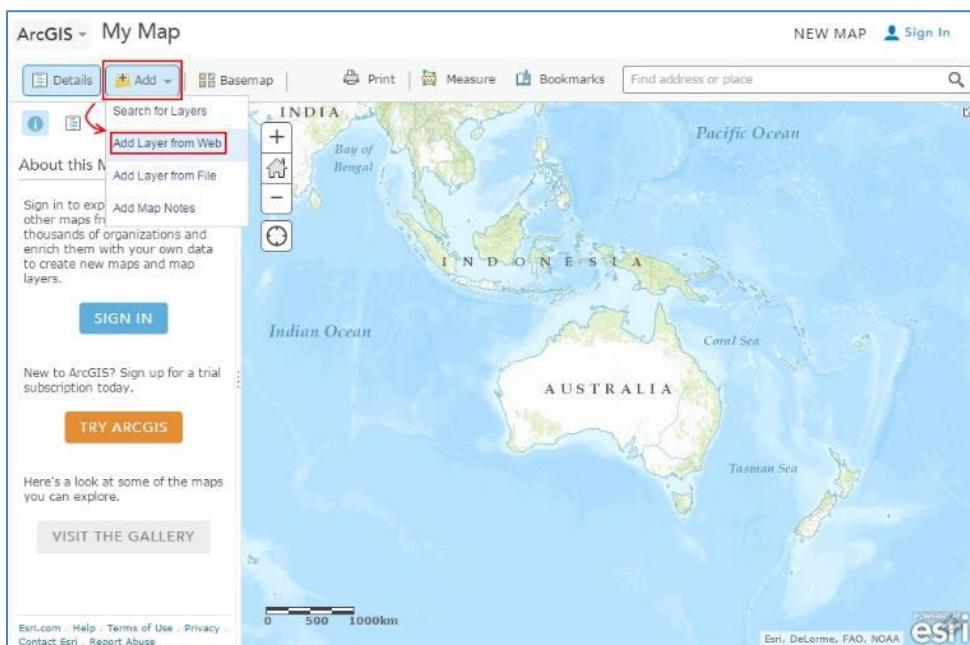
## How to add services in ArcGIS Online

### Adding ArcGIS REST services to ArcGIS Online

- Open ArcGIS Online within your preferred internet browser via the following URL:  
<http://www.arcgis.com/home/webmap/viewer.html>
- Click on **Modify Map** in the top right hand corner



- Then click on **Add – Add Layer from Web**



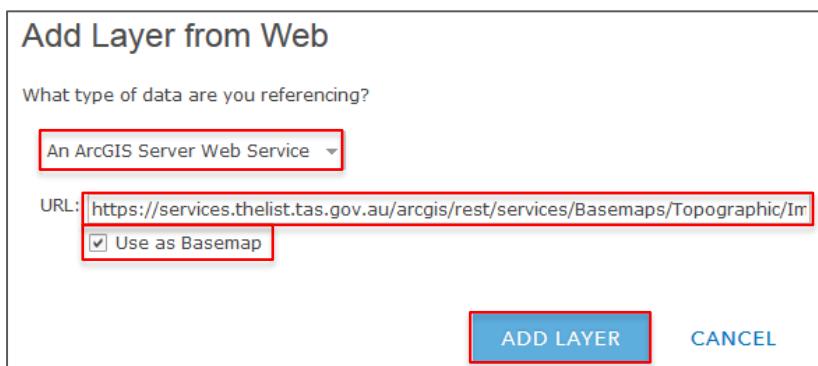
## LIST Spatial Web Services

### User Guide

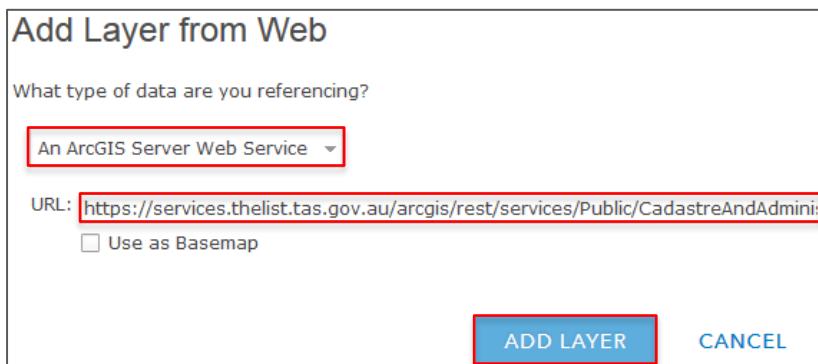
- Select An ArcGIS Server Web Service from the drop down list



- Then type in your desired LIST ArcGIS REST Service found under <https://services.thelist.tas.gov.au/arcgis/rest> such as <https://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer>. In this example, we are using the Topographic LIST basemap so it is possible to replace the default ESRI basemap by selecting Use as Basemap then click Add Layer



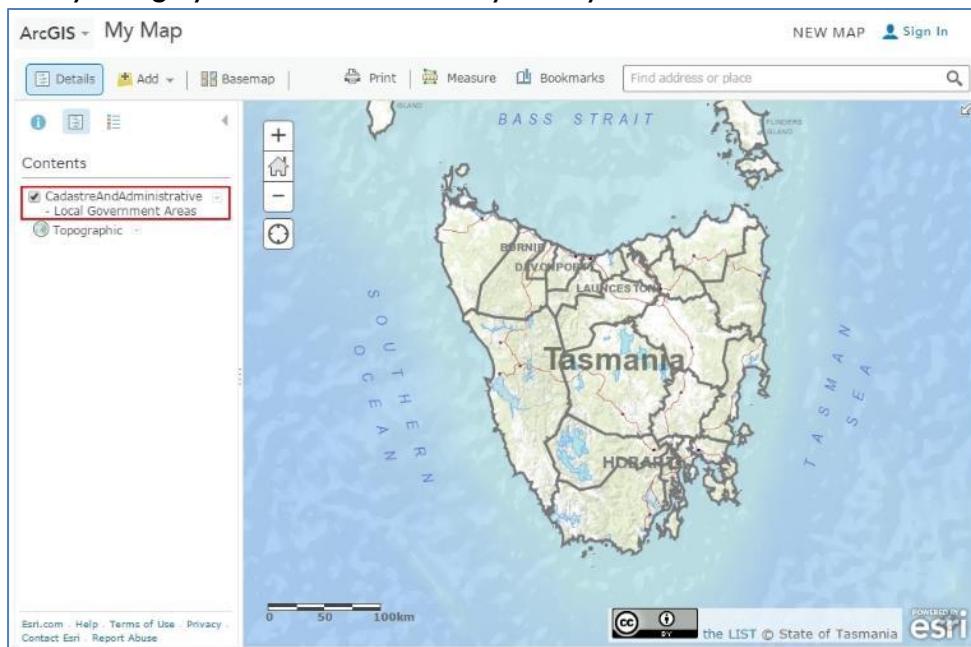
- With ArcGIS Online, you can either add an entire service that contains multiple layers or just an individual layer. For example, type in the following URL for an individual layer <https://services.thelist.tas.gov.au/arcgis/rest/services/Public/CadastreAndAdministrative/MapServer/4> or this URL for every layer in the service <https://services.thelist.tas.gov.au/arcgis/rest/services/Public/CadastreAndAdministrative/MapServer>



## LIST Spatial Web Services

### User Guide

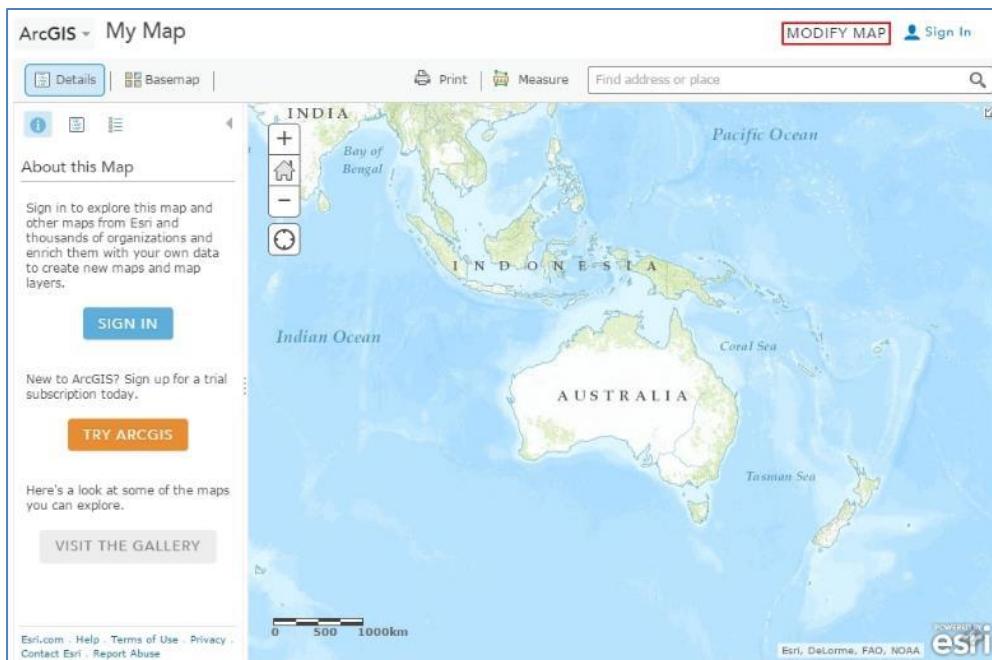
- If a layer is grey in the contents area, you may need to zoom further in to see it on the map



## Adding WMS services to ArcGIS Online

**For the best performance, it is recommended to use the ArcGIS REST services as detailed in [Adding ArcGIS REST Services to ArcGIS Online](#). WMS is only available on some of the LIST services found under <https://services.thelist.tas.gov.au/arcgis/rest/services>.**

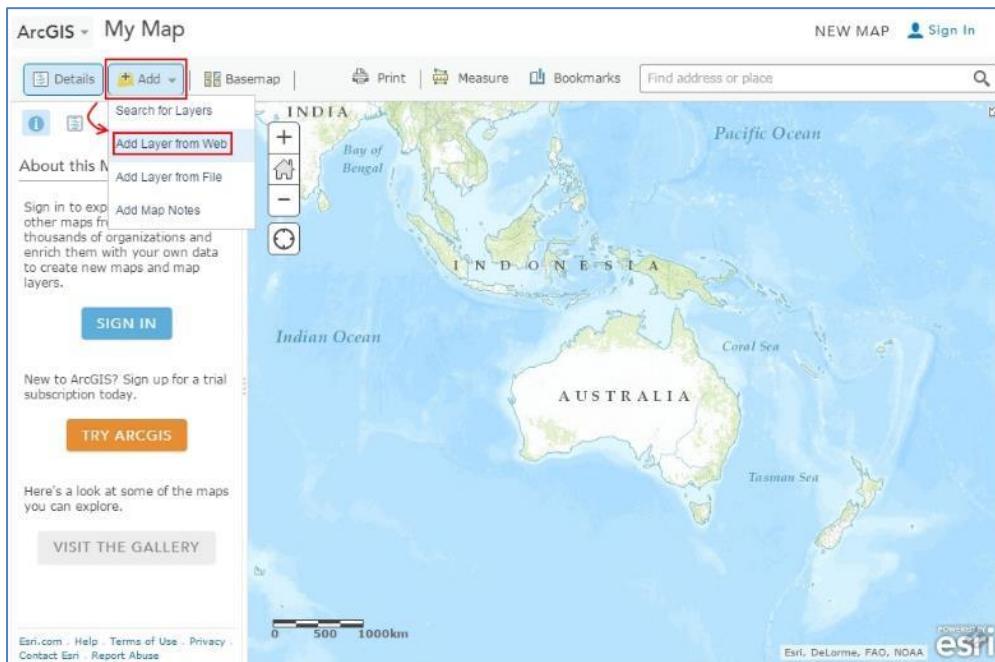
- Open ArcGIS Online within your preferred internet browser via the following URL:  
<http://www.arcgis.com/home/webmap/viewer.html>
- Click on **Modify Map** in the top right hand corner



## LIST Spatial Web Services

### User Guide

- Then click on **Add and Add Layer from Web**



- Select **A WMS OGC Web Service** from the drop down list and type in a valid WMS URL, (Please refer to <https://services.thelist.tas.gov.au/arcgis/rest> to see what services have WMS enabled, look for WMS in the top left corner)

ArcGIS REST Services Directory
<a href="#">Home</a> > <a href="#">services</a> > <a href="#">Basemaps</a> > <a href="#">Topographic (ImageServer)</a>
<a href="#">JSON</a>   <a href="#">SOAP</a>   <a href="#">WMS</a>   <a href="#">WMST</a>

For example:

<https://services.thelist.tas.gov.au/arcgis/services/Public/CadastreParcels/MapServer/WMSServer>

Add Layer from Web

What type of data are you referencing?

A WMS OGC Web Service

URL: <https://services.thelist.tas.gov.au/arcgis/services/Public/CadastreParcels/MapServer/WMSServer>

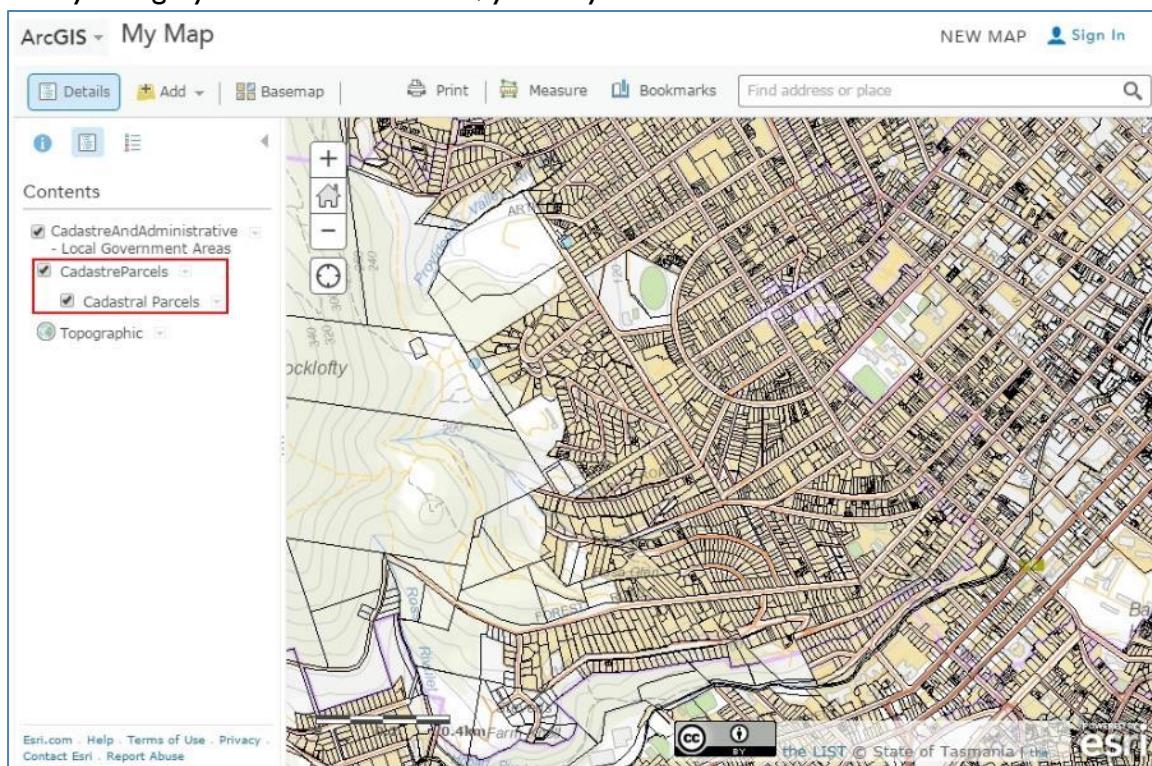
Use as Basemap

**GET LAYERS**

Having trouble displaying your OGC Web service? Help us improve this site by sending us the URL via the Contact Esri link.

**ADD LAYER**      **CANCEL**

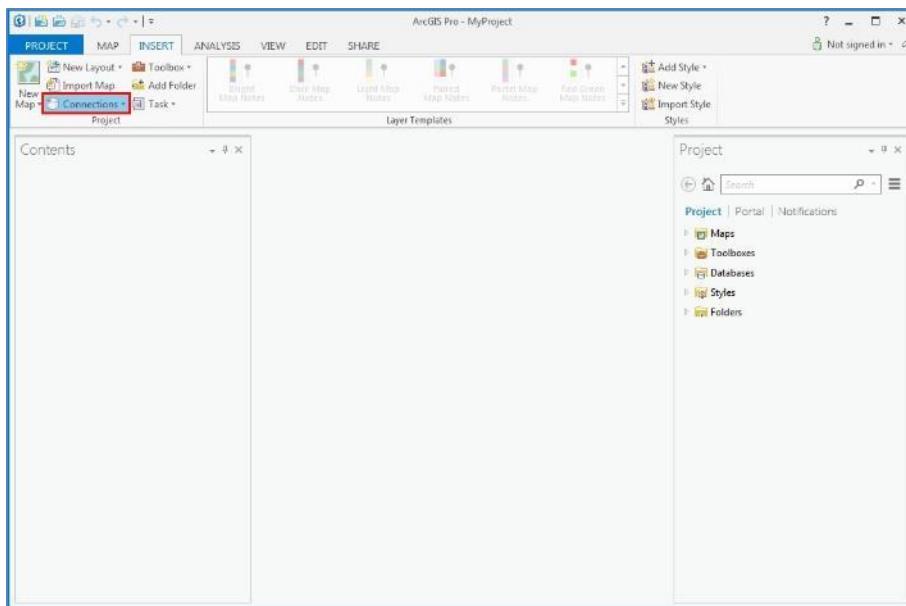
- If a layer is grey in the contents area, you may need to zoom further in to see it on the map



## How to add services in ArcGIS Pro Version 1.0

### Adding ArcGIS REST services to ArcGIS Pro

- To add an ArcGIS Server connection to your ArcGIS Pro project, select the **INSERT** tab and click on the **Connections** drop down list, then select **New ArcGIS Server**



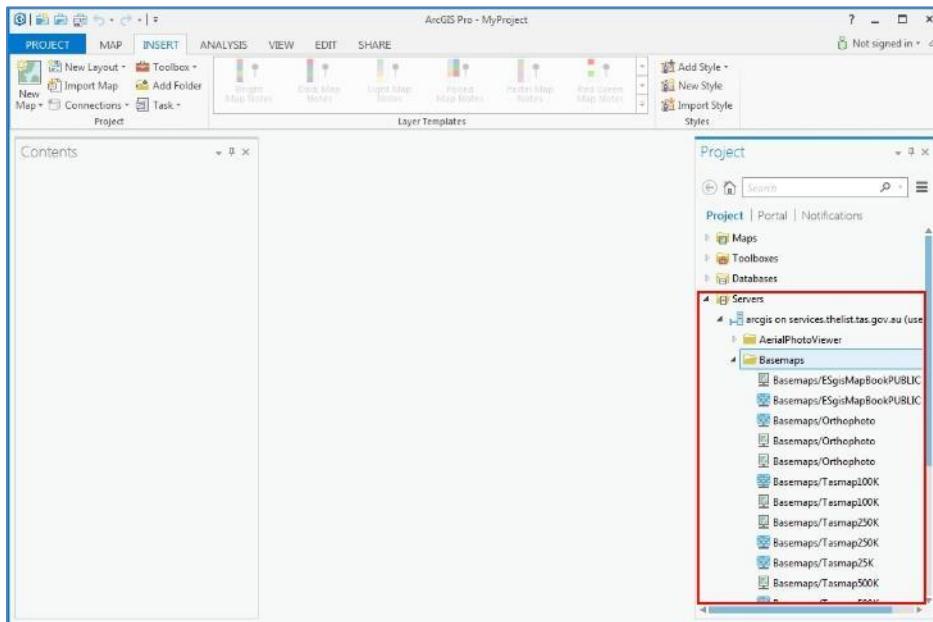
- Enter <http://services.thelist.tas.gov.au/arcgis/rest/services> as the **Server URL** and click **OK**



## LIST Spatial Web Services

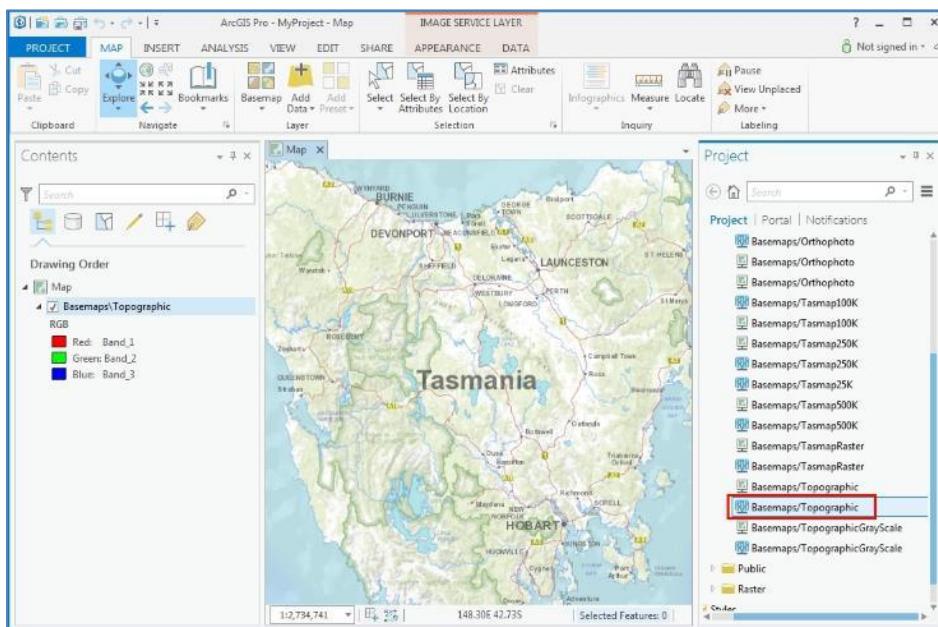
### User Guide

- Under the **Project** pane, expand the **Servers** folder then the recently created LIST REST server.



- To add a service, simply right click on. Select **Add To New Map** if a map did not already exist in the project, otherwise select **Add To Current Map**.

**Please be aware that you may need to zoom into the extent of Tasmania before the data is visible.**



## How to add web services in the mobile application OruxMaps (for Android)

### Adding REST tile services (basemaps) to OruxMaps

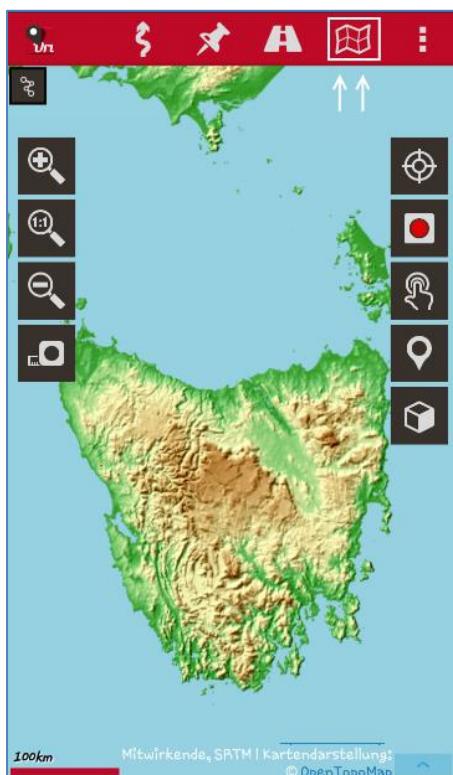
- After installing the OruxMaps application on your Android mobile device, connect the mobile device to a computer and navigate to ...**oruxmpas\mapfiles**. To find the exact location, first open the OruxMaps application on your device, then click the Maps button in the top right, then **Map settings**. The exact location can be found under the **Maps directory** section
- Copy the file called **onlinemapsources.xml** to your computer, and then open that file using a text editor such as notepad++ or notepad
- Scroll down to the bottom of the file and insert the following text after the last `</onlinemapsource>` tag and before the last line with the tag `</onlinemapsource>`. **Be sure to include all the text below, noting that it continues over three pages.**

```
<onlinemapsource uid="701">
<name>LIST Topographic Basemap</name>
<url><![CDATA[http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer/tile/{$z}/{$y}/{$x}.png]]></url>
<website><![CDATA[<a href="http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer" target="_blank">LIST Topographic Basemap</a>]]></website>
<minzoom>3</minzoom>
<maxzoom>18</maxzoom>
<projection>MERCATORSFERICA</projection>
<servers></servers>
<httpparam name=""></httpparam>
<cacheable>1</cacheable>
<downloadable>0</downloadable>
<maxtilesday>0</maxtilesday>
<maxthreads>0</maxthreads>
<xop></xop>
<yop></yop>
<zop></zop>
<qop></qop>
<sop></sop>
</onlinemapsource>
<onlinemapsource uid="702">
<name>LIST Orthophoto Basemap</name>
<url><![CDATA[http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Orthophoto/ImageServer/tile/{$z}/{$y}/{$x}.png]]></url>
```

```
<website><![CDATA[<a href="http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Orthophoto/ImageServer" target="_blank">LIST Orthophoto Basemap</a>]]></website>
<minzoom>6</minzoom>
<maxzoom>19</maxzoom>
<projection>MERCATORESFERICA</projection>
<servers></servers>
<httpparam name=""></httpparam>
<cacheable>1</cacheable>
<downloadable>0</downloadable>
<maxtilesday>0</maxtilesday>
<maxthreads>0</maxthreads>
<xop></xop>
<yop></yop>
<zop></zop>
<qop></qop>
<sop></sop>
</onlinemapsource>
<onlinemapsource uid="703">
<name>LIST Topographic Gray Scale Basemap</name>
<url><![CDATA[http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/TopographicGrayScale/ImageServer/tile/{$z}/{$y}/{$x}.png]]></url>
<website><![CDATA[<a href="http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/TopographicGrayScale/ImageServer" target="_blank">LIST Topographic Gray Scale Basemap</a>]]></website>
<minzoom>6</minzoom>
<maxzoom>19</maxzoom>
<projection>MERCATORESFERICA</projection>
<servers></servers>
<httpparam name=""></httpparam>
<cacheable>1</cacheable>
<downloadable>0</downloadable>
<maxtilesday>0</maxtilesday>
<maxthreads>0</maxthreads>
<xop></xop>
<yop></yop>
<zop></zop>
<qop></qop>
<sop></sop>
</onlinemapsource>
<onlinemapsource uid="704">
<name>LIST Scanned TASMAP Basemap</name>
<url><![CDATA[http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/TasmapRaster/ImageServer/tile/{$z}/{$y}/{$x}.png]]></url>
<website><![CDATA[<a href="http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/TasmapRaster/ImageServer" target="_blank">LIST Scanned TASMAP Basemap</a>]]></website>
<minzoom>6</minzoom>
```

```
<maxzoom>19</maxzoom>
<projection>MERCATORSFERICA</projection>
<servers></servers>
<httpparam name=""></httpparam>
<cacheable>1</cacheable>
<downloadable>0</downloadable>
<maxtilesday>0</maxtilesday>
<maxthreads>0</maxthreads>
<xop></xop>
<yop></yop>
<zop></zop>
<qop></qop>
<sop></sop>
</onlinemapsource>
```

- By adding the above text to the xml file, you will have access to the LIST's Topographic, Topographic Grey Scale, Orthophoto and Scanned TASMAP basemaps. Save the file then copy and paste it back into your mobile device under ...**oruxmpas\mapfiles**
- Open OruxMaps and zoom into Tasmania, then click the **Switch Map** button in the top right of the screen

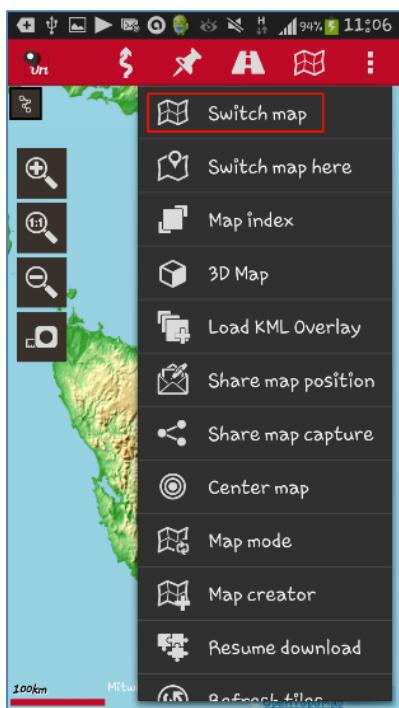


## LIST Spatial Web Services

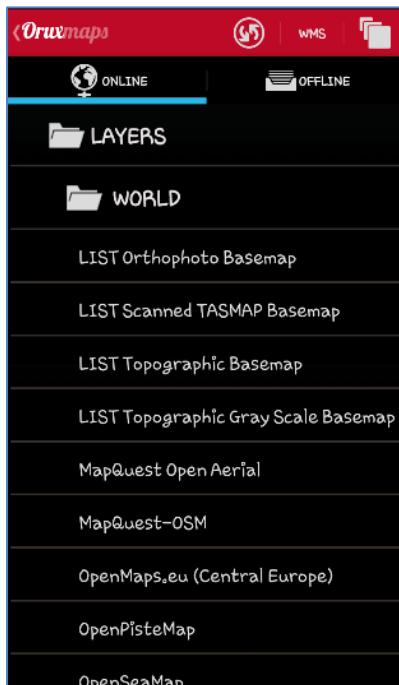
### User Guide

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- Then select the **Switch Map** icon



- Choose a basemap from the list



- If the text was copied correctly, the LIST basemap should now be displayed in OruxMaps



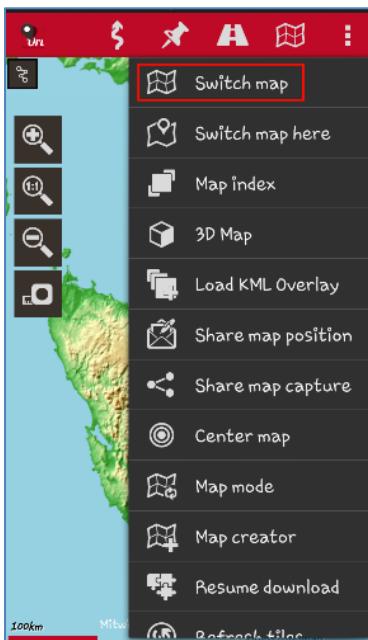
## Adding WMS services to OruxMaps

If you are wanting to load the LIST basemaps, please use the method defined under [Adding REST Tile Services to OruxMaps](#). By adding a WMS service in OruxMaps you may notice performance issues.

- Open OruxMaps then zoom into Tasmania, then press the **Switch Map** button in the top right of the screen. Please note that you will need to zoom in further than the extent of Tasmania, as some layers have zoom dependencies and may not show at this extent.



- Then select the **Switch Map** icon

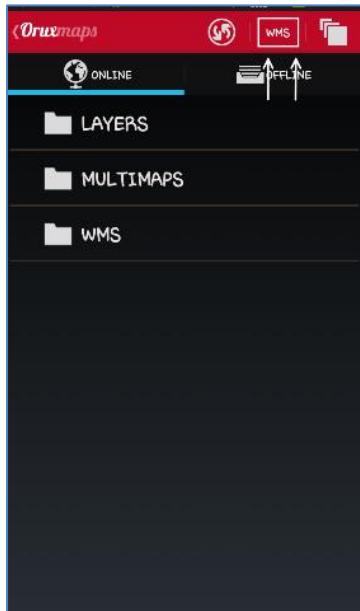


## LIST Spatial Web Services

### User Guide

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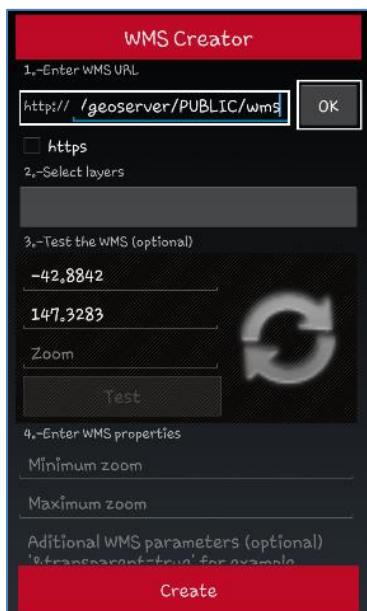
- In the top right hand corner, click on the white **WMS** text



- Type in a valid URL for example <http://services.thelist.tas.gov.au/arcgis/services/Public/CadastreAndAdministrative/MapServer/WMServer>, or check [LIST ArcGIS Server](#) for other services that support WMS capabilities (look for WMS in the top left corner)



Then click **OK**

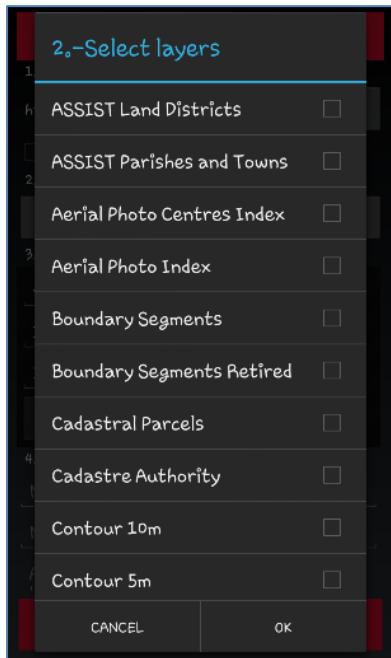


## LIST Spatial Web Services

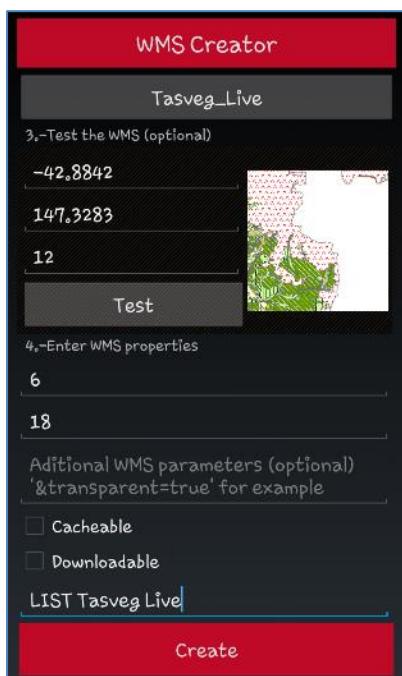
### User Guide

---

- Select a layer from the available list then click **OK**



- To test the layer, enter in a zoom level such as 12. If 12 does not bring up a test image, try higher zoom levels to zoom in a bit further. After successfully testing the service, enter in the required zoom levels (6 and 18 is enough to cover Tasmania) then type in a meaningful name and click **Create**

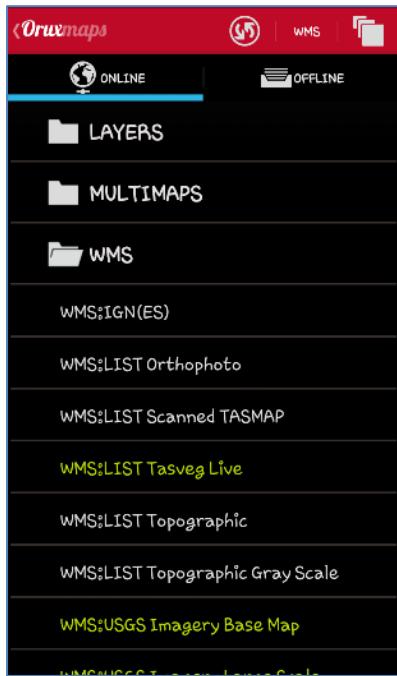


## LIST Spatial Web Services

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- To add the WMS service, simply select the newly created layer from the WMS folder



- If the layer does not show up within a couple of minutes, you may need to zoom in a little closer to view the data



- An alternative way to add WMS services is to edit the **wms\_services.xml** file located in ...**oruxmaps\mapfiles** on the mobile device. To find the exact location, first open the OruxMaps application on your device, then click the Maps button in the top right, then **Map settings** ... the exact location can be found under the **Maps directory** section.
- Simply connect the mobile device to a computer, copy the file from ...**oruxmaps\mapfiles** and paste it somewhere on the computer. Open the file in a text editor such as notepad++ or notepad and add the following code between the <wms> and </wms> tags, making sure that you do not delete any existing text. **Be sure to include all the text below noting that it continues over two pages.**

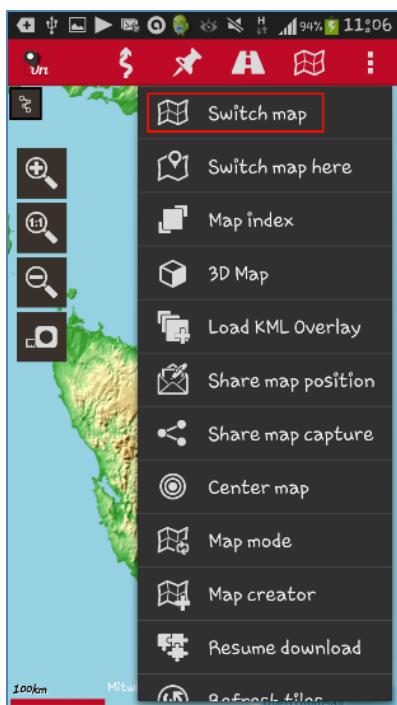
```
<wms>
<name>LIST Orthophoto</name>
<uid>751</uid>
<desc>LIST Orthophoto</desc>
<minzoomlevel>6</minzoomlevel>
<maxzoomlevel>19</maxzoomlevel>
<url>http://services.thelist.tas.gov.au/arcgis/services/Basemaps/Orthophoto/ImageServer/WMSServer?</url>
<format>image/png</format>
<coordinatesystem>EPSG:4326</coordinatesystem>
<version>1.1.1</version>
</wms>
<wms>
<name>LIST Topographic</name>
<uid>752</uid>
<desc>LIST Topographic</desc>
<minzoomlevel>3</minzoomlevel>
<maxzoomlevel>18</maxzoomlevel>
<url>http://services.thelist.tas.gov.au/arcgis/services/Basemaps/Topographic/ImageServer/WMSServer?</url>
<format>image/png</format>
<coordinatesystem>EPSG:4326</coordinatesystem>
<version>1.1.1</version>
</wms>
<wms>
<name>LIST Topographic Gray Scale</name>
<uid>753</uid>
<desc>LIST Topographic Gray Scale</desc>
<minzoomlevel>3</minzoomlevel>
<maxzoomlevel>18</maxzoomlevel>
<url>http://services.thelist.tas.gov.au/arcgis/services/Basemaps/TopographicGrayScale/ImageServer/WMSServer?</url>
<format>image/png</format>
<coordinatesystem>EPSG:4326</coordinatesystem>
<version>1.1.1</version>
```

```

</wms>
<wms>
<name>LIST Scanned TASMAP</name>
<uid>754</uid>
<desc>LIST Scanned TASMAP</desc>
<url>http://services.thelist.tas.gov.au/arcgis/services/Basemaps/TasmapRaster/ImageServer/WMServer?</url>
<minzoomlevel>6</minzoomlevel>
<maxzoomlevel>16</maxzoomlevel>
<format>image/png</format>
<coordinatesystem>EPSG:4326</coordinatesystem>
<version>1.1.1</version>
</wms>

```

- The above code will add the basemaps as a WMS service. For performance reasons, it is recommended to use the REST tile services when consuming the basemaps, as detailed in [Adding REST Tile Services to OruxMaps](#). By editing the above examples you can add any of the LIST's WMS services in this manner. Save the file, then copy and paste it back into the mobile device under ...oruxmaps\mapfiles. To add the WMS (if the code was entered correctly), select the **Switch Map** icon within OruxMaps

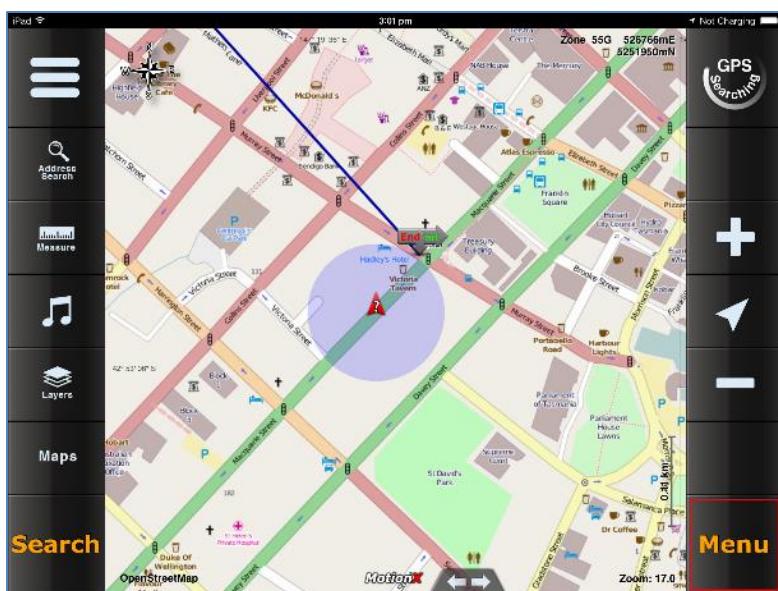


- Under the **WMS** folder choose one of the newly added services from the list

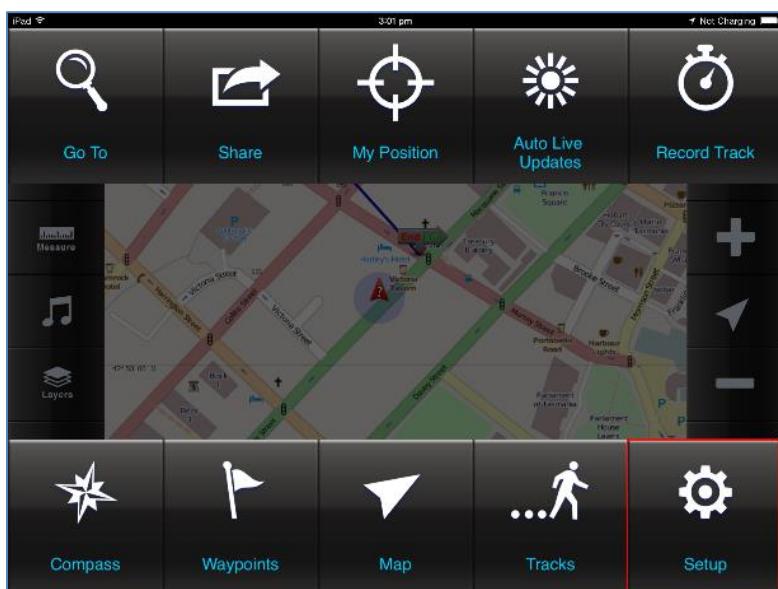
## How to add web services in the mobile application MotionX-GPS (for Apple's iOS)

### Adding REST tile services (basemaps) to MotionX-GPS

- After installing the MotionX-GPS application on your Apple mobile device, open the application and click on the **Menu** button at the bottom right of the screen



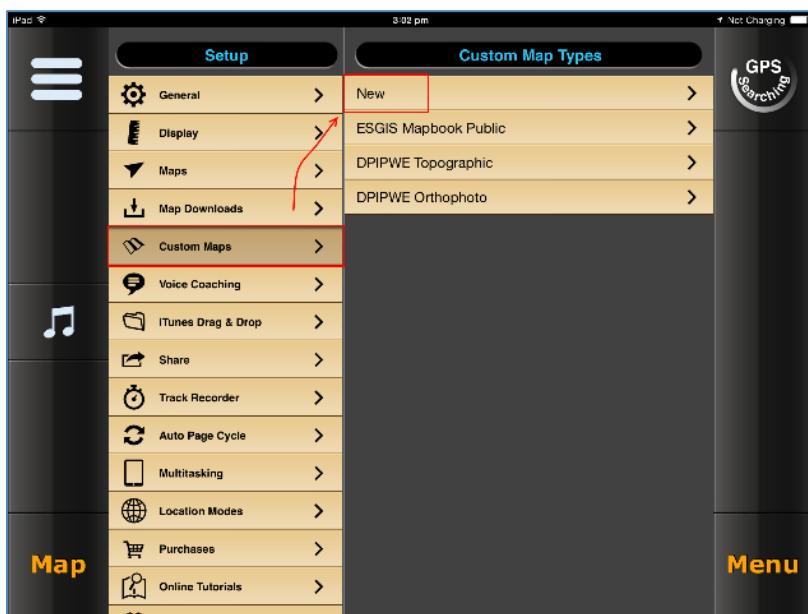
- Then click on the **Setup** button



## LIST Spatial Web Services

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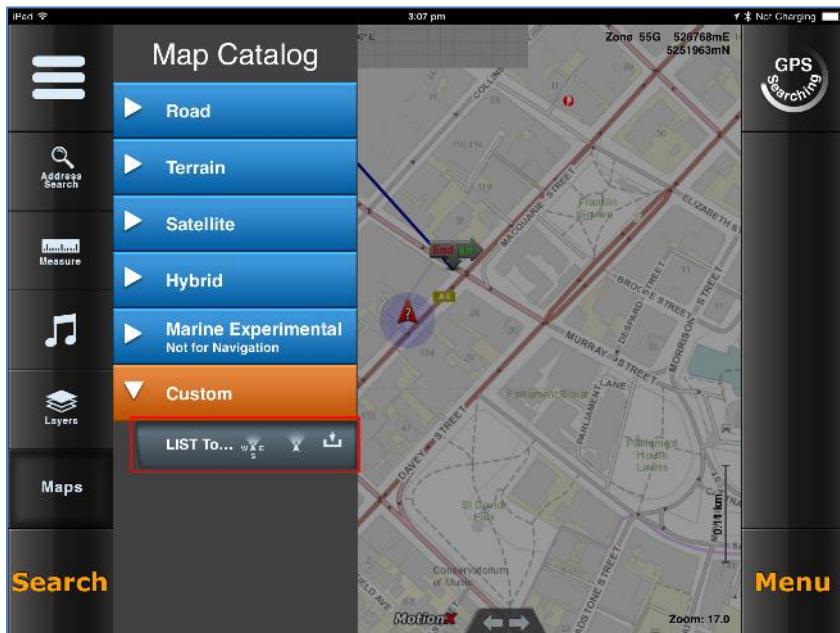
- Under **Custom Maps**, select **New**



- Type in a valid name for the service you want to add (in this example the [LIST's Topographic Basemap](#)) and then a valid URL, for example:  
[http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer/tile/\[Z\]/\[Y\]/\[X\]?.png](http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer/tile/[Z]/[Y]/[X]?.png).
- To enable local caching for offline use, change the **Download map for offline use** setting to '**ON**' and ignore any warnings



- To set the new basemap in the application, select **Maps**, then under the **Custom** map catalog, select the new basemap service



## How to add services to AutoCAD Civil 3D 2015

Adding ArcGIS REST services to AutoCAD Civil 3D

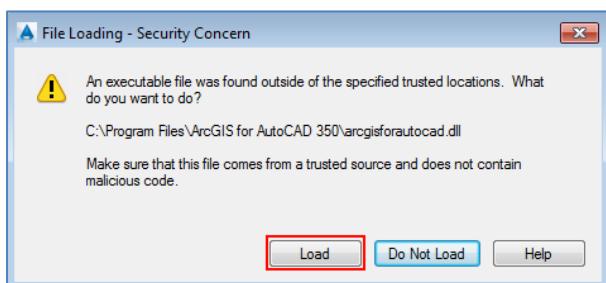
### Download and install AutoCAD service packs and ArcGIS for AutoCAD plugin

- Download and install the most current Service Packs for **AutoCAD Civil 3D** and **AutoCAD Map 3D** from <http://knowledge.autodesk.com/support>
- Download and install the **ArcGIS for AutoCAD** plugin from <http://www.esri.com/software/arcgis/arcgis-for-autocad/download>

**IMPORTANT NOTE:** A software bug has been detected in the ArcGIS for AutoCAD 350 software which results in REST Image Services not re-projecting in the coordinate system defined by the user. As a result, the Basemap Image Services are currently not available. A workaround exists for the Orthophoto and Topographic Basemaps by inserting them as a REST Map Service using the below processes.

### Setting drawing limits prior to adding services

- The ArcGIS for AutoCAD installation will add a shortcut to your Start menu called **ArcGIS for AutoCAD 350**. Select this shortcut to begin your AutoCAD Civil 3D session.
- A security concern warning may be displayed, as AutoCAD does not automatically trust the recently installed ArcGIS for AutoCAD dll file. Click the **Load** button.



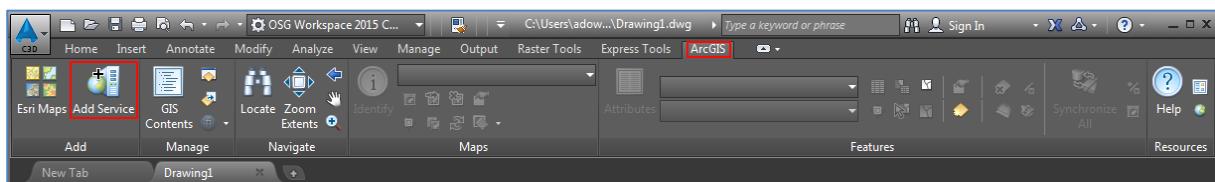
- As the service extents of some services cover the mainland of Australia, it is recommended that the zoom limits of your AutoCAD drawing file are restricted to the zoom level of Tasmania prior to adding services.

- Type **LIMITS** into the command line and click **Enter**
- Type **204000,5160000** into the command line and click **Enter** (coordinates are in GDA 1994 MGA Zone 55)
- Type **660000,5640000** into the command line and click **Enter** (coordinates are in GDA 1994 MGA Zone 55)
- Type **LIMITS** into the command line and click **Enter**
- Type **ON** into the command line and click **Enter**

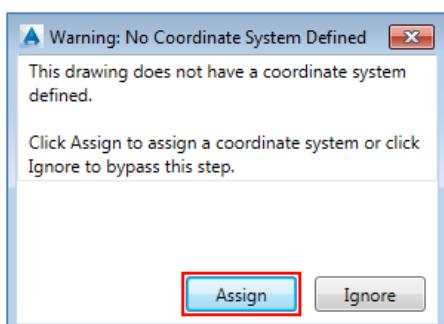
The settings applied will enable the user to enter the command **ZL** (Zoom Limits) into the command line to display at the zoom level of Tasmania.

#### Adding ArcGIS REST services using ArcGIS for AutoCAD plugin

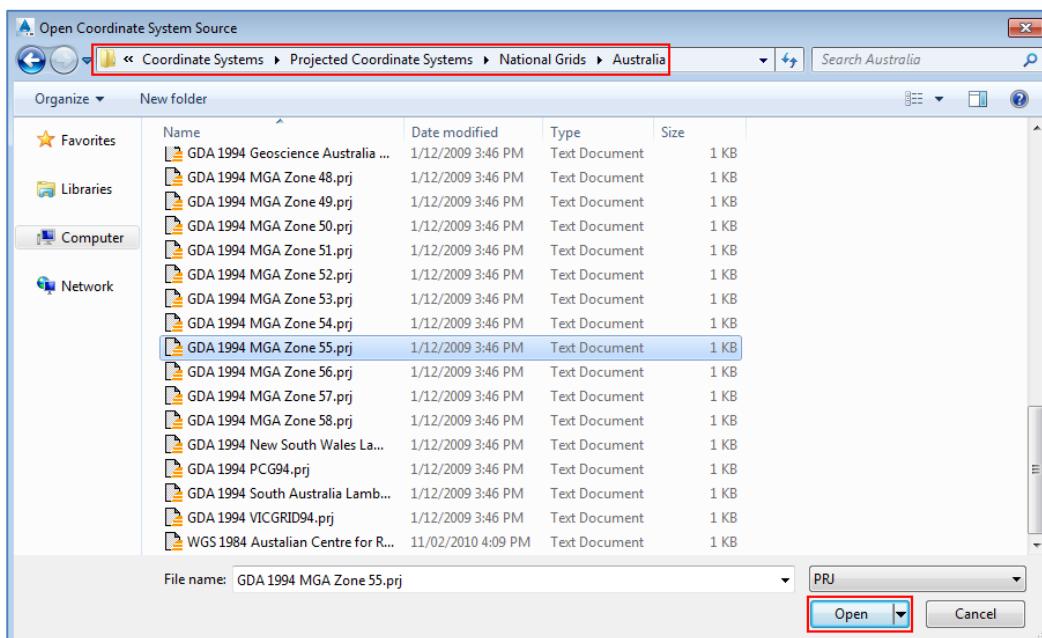
- Select the **ArcGIS** ribbon and click the **Add Service** button



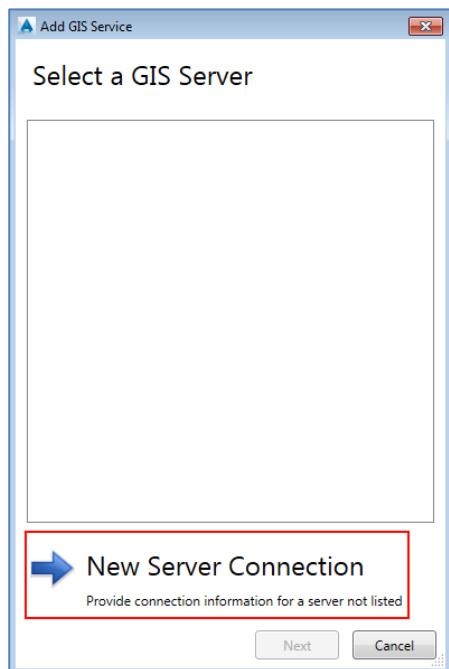
- A warning will be displayed to indicate that a coordinate system has not been defined. Click the **Assign** button



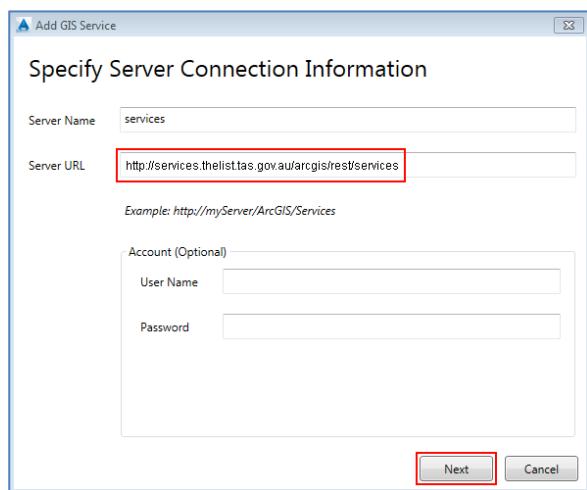
- Select a coordinate system from the available options (e.g. GDA 1994 MGA Zone 55). Click the **Open** button. ArcGIS for AutoCAD uses the selected coordinate system to project ArcGIS web services on the fly in AutoCAD.



- Click the **New Server Connection** button



- In the **Server URL** text box, type in a valid URL such as <http://services.thelist.tas.gov.au/arcgis/rest/services>, and hit the **Tab** key. Leave the User Name and Password text boxes blank, and click the **Next** button.

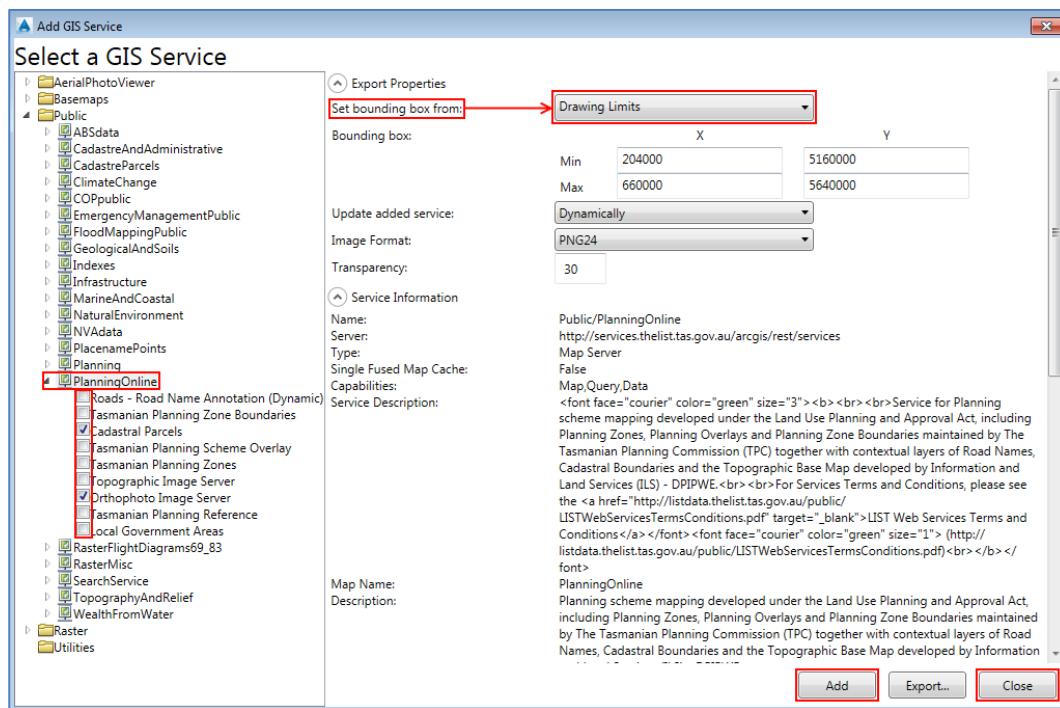


- Expand the folders in the **Select a GIS Service** dialog box to see the available services. Expand the categories to see the available layers within each service. Select the layers to add to the drawing by clicking in the **Check Box** adjacent to each layer name.

## LIST Spatial Web Services

### User Guide

- Select the **Service** (e.g. Planning Online) and then to **Set bounding box from:** select **Drawing Limits** from the drop down list. Click the **Add** button followed by the **Close** button.

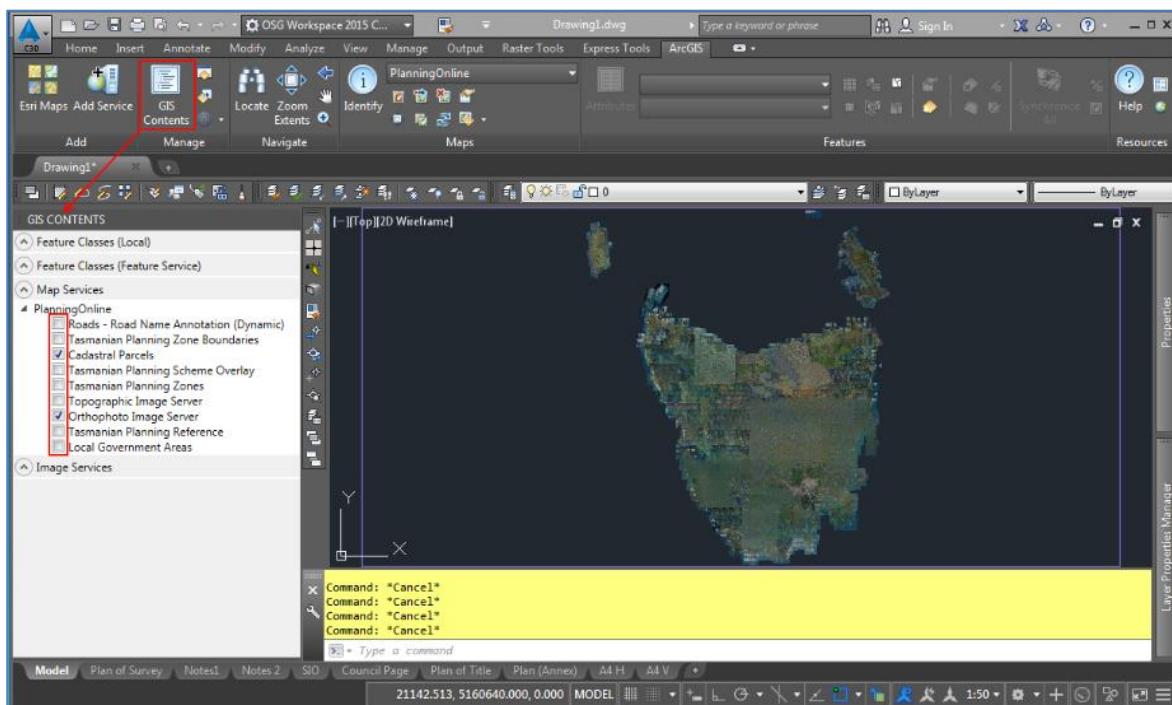


- Type **ZL** (Zoom Limits) into the command line. The service is now displayed at the zoom level of Tasmania.  
**NOTE:** The zoom level visibility and colour properties of each layer is defined by the service and cannot be modified. Additional zooming will be required to view some layers, and depending on the AutoCAD background colour, some layers may be difficult to view (e.g. cadastral boundaries are set to display as black). When panning, and zooming, services may take several seconds to refresh, depending on internet connection speeds.

## LIST Spatial Web Services

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- Layers within each service can be toggled on and off using the check boxes within the **GIS Contents** dialog box.



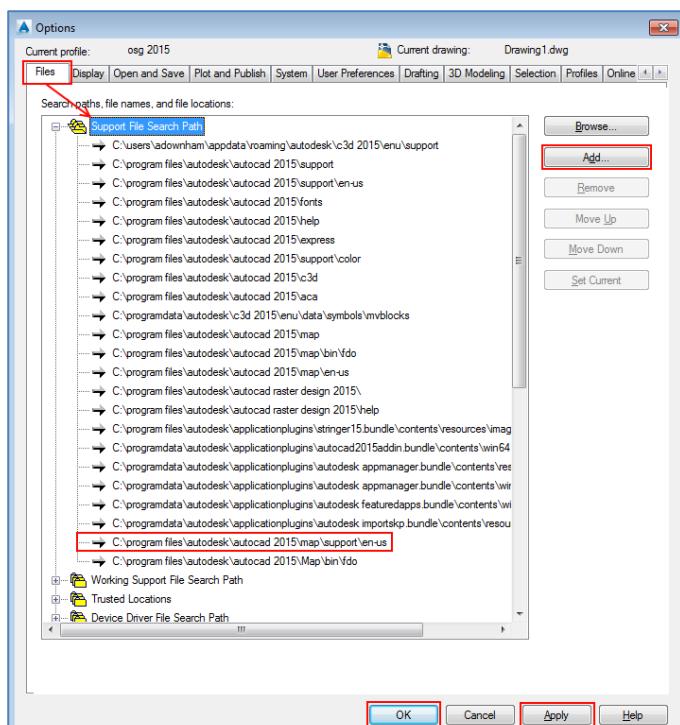
## Adding WMS services to AutoCAD Civil 3D

**For better performance, it is recommended to use ArcGIS REST services rather than WMS. Please see [Adding ArcGIS REST services to AutoCAD Civil 3D](#) for more details.**

### ***Fix for dialog window display issue in AutoCAD Civil 3D 2015***

An issue exists in AutoCAD Civil3D 2015 where dialog windows are not displayed when executing some AutoCAD Map 3D commands. The following process will permanently correct this issue for future AutoCAD Civil 3D sessions.

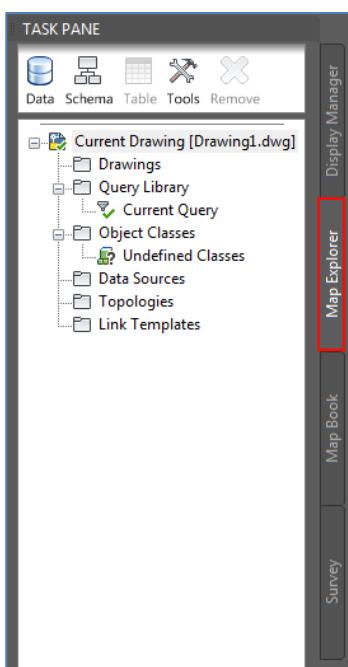
- Within AutoCAD type the command **OP** into the command line, and click **Enter** (Options dialog box is opened)
- Select the **Files** tab and expand the **Support File Search Path** section
- Click the **Add...** button and add the path: **C:\Program Files\autodesk\autocad 2015\map\support\en-us**
- Click the **Apply** button, followed by the **OK** button
- **Restart AutoCAD Civil 3D** (a restart is required for changes to take effect)



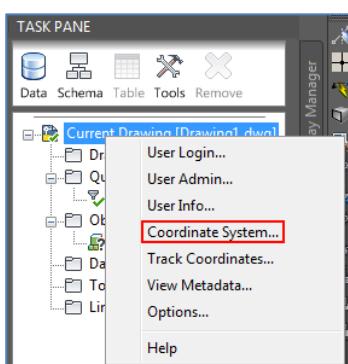
### **Assigning a global coordinate system to your AutoCAD Drawing**

In order to add WMS services to AutoCAD in a consistent coordinate system, it is recommended that a Global Coordinate System is assigned to your AutoCAD Drawing prior to adding any services. (NOTE: If a coordinate system is not defined by the user prior to adding WMS services, the coordinate system of first service added will be assigned to the Drawing automatically).

- Within AutoCAD, type the command **MAPWSPACE** into the command line, and click **Enter**. Click **Enter** again to select the **On** option and activate the Task Pane.
- Select the **Map Explorer** tab on the **Task Pane**



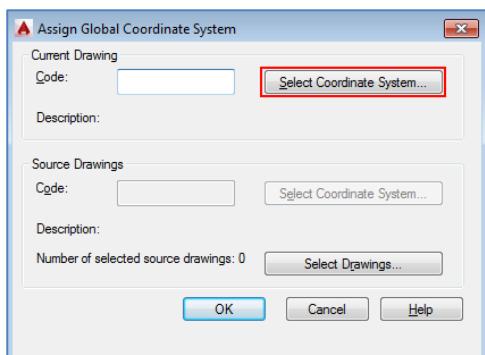
- Right-click on the **Current Drawing** text and select **Coordinate System...**



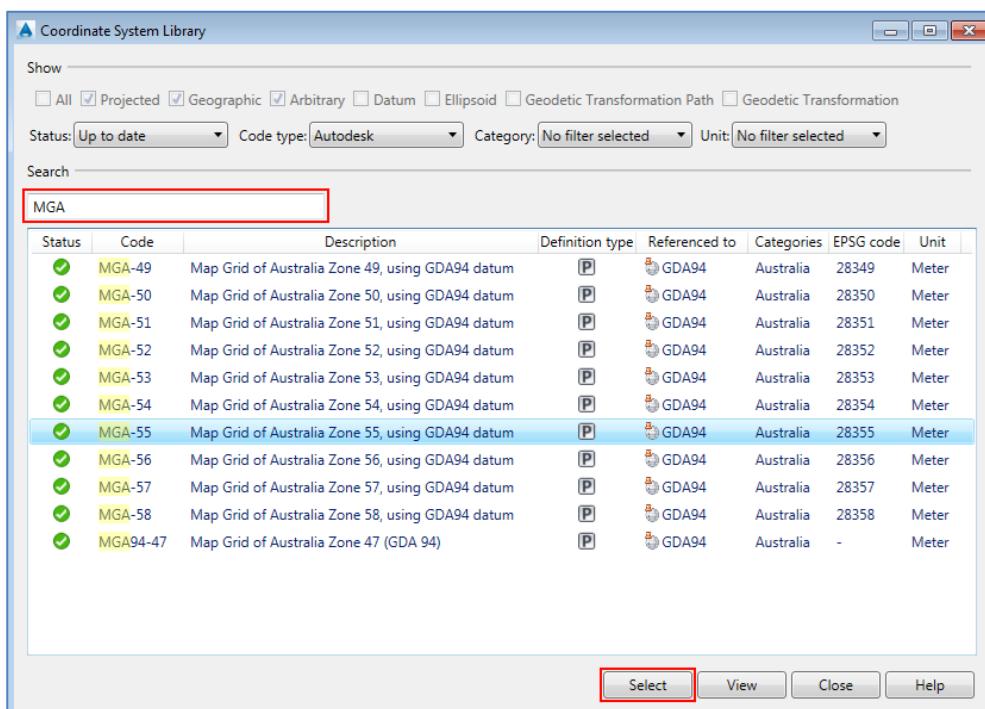
## LIST Spatial Web Services

### User Guide

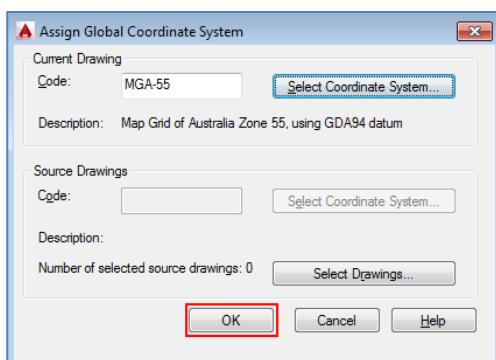
- Click the **Select Coordinate System...** button



- In the **Search text box** type in the name of the desired coordinate system (e.g. MGA). Click on the chosen coordinate system name (e.g. MGA-55) and click the **Select** button.

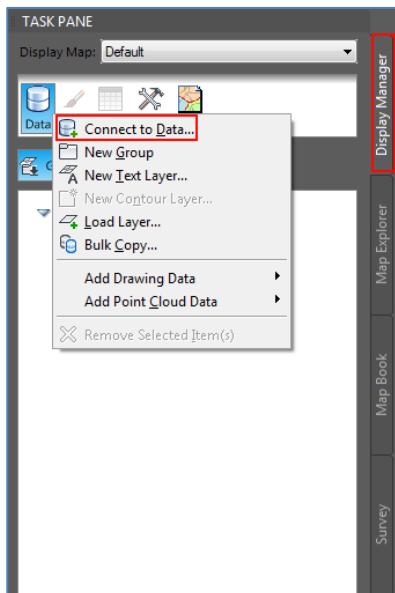


- Click the **OK** button to assign the global coordinate system.



## Adding WMS services to AutoCAD Drawing

- In the Task Pane, select the **Display Manager** tab, click the **Data** button and select **Connect to Data...**



In the Data Connections by Provider list, select **Add WMS Connection**. In the URL box, type in a valid URL, such as:

**http://services.thelist.tas.gov.au/arcgis/services/Public/TopographyAndRelief/MapServer/WMSServer** Click the **Connect** button.

Please refer to [LIST ArcGIS Server](#) for services that support WMS capabilities (look for WMS in the top left corner)

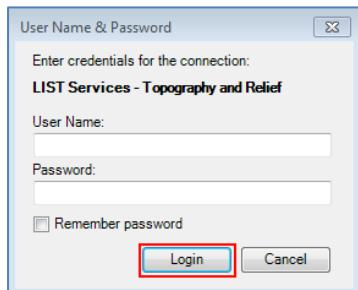
The screenshot shows the 'ArcGIS REST Services Directory' interface. It displays a navigation path: Home > services > Basemaps > Topographic (ImageServer). Below the path, there are four links: JSON, SOAP, WMS, and WMST. The 'WMS' link is highlighted with a red box.

The screenshot shows the 'Data Connections by Provider' dialog. On the left, a list of connection types is shown, including 'Add ArcSDE Connection', 'Add Enterprise Industry Model Connection', 'Add MySQL Connection', 'Add ODBC Connection', 'Add Oracle Connection', 'Add PostgreSQL Connection', 'Add Raster Image or Surface Connection', 'Add SDF Connection', 'Add SHP Connection', 'Add SQL Server Spatial Connection', 'Add SQLite Connection', 'Add WFS Connection', and 'Add WMS Connection'. The 'Add WMS Connection' option is highlighted with a red box. On the right, a specific configuration window for 'OSGeo FDO Provider for WMS' is open, titled 'Add a New Connection'. It has fields for 'Connection name:' (set to 'LIST Services - Topography and Relief'), 'Server name or URL:' (set to 'http://services.thelist.tas.gov.au/arcgis/services/Public/TopographyAndRelief/MapServer/WMSServer?'), 'Version:' (set to 'Default version'), and a 'Connect' button at the bottom which is also highlighted with a red box.

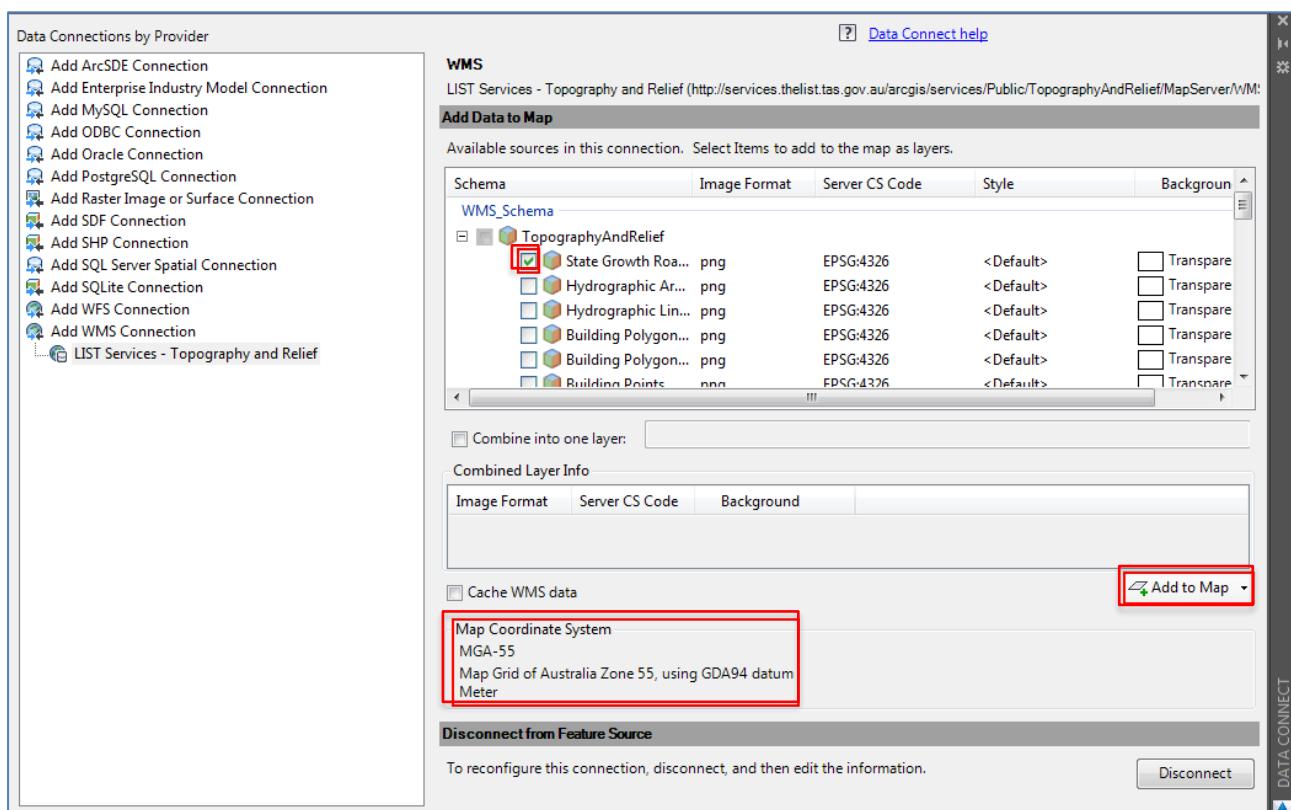
## LIST Spatial Web Services

### User Guide

- Leave the user name and password fields blank, and click the **Login** button.



- Select the layers to be added to your Drawing by clicking in the **Check Box** to the left of each layer name. Note that the previously set Global Coordinate System (referred to as Map Coordinate System) is listed near the bottom of the Data Connect dialog box.
- Click the **Add to Map** button.



# References for spatial applications

- [ArcMap 10.3](#) (Google Search)
- [MapInfo Pro 12.5](#) (Google Search)
- [QGIS 2.8.2](#) (Google Search)
- [ArcGIS Online](#) (Google Search)
- [ArcGIS Pro 1.0](#) (Google Search)
- [OruxMaps](#) (Google Search)
- [MotionX-GPS](#) (Google Search)
- [AutoCAD Civil 3D 2015](#) (Google Search)

# Further support

## LIST Helpdesk

Feel free to contact our helpful Client Services team by:

- **Phone:** (03) 6165 4444 or
- **Email:** [listhelp@dipwe.tas.gov.au](mailto:listhelp@dipwe.tas.gov.au)