



**LandTasmania**

# 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 - URLs

The Land Information System Tasmania (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

The highly versatile 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;
- 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.

## LIST datasets

LIST datasets are available via two web service portals:

- **ArcGIS** – delivering REST services, predominately used by (but not limited to) Esri software; and
- **GeoServer** – providing Open Geospatial Consortium (OGC) compliant web services, supported by most spatial applications and systems.

## Why are there two LIST web service portals?

The ArcGIS Server services are not always accessible via non-Esri products. Whilst some of the ArcGIS Server services also support ‘Open Geospatial Consortium’ (OGC) compliant web services (such as WMTS or WMS) there are services that do not support OGC protocols.

GeoServer services provide WMS and restricted WFS web services that ArcGIS Server may not supply. This allows users to consume the LIST Web Services in a variety of applications and platforms.

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

## ArcGIS server

The ArcGIS REST API, short for Representational State Transfer, provides a simple, open web interface to ArcGIS. All resources and operations exposed by the REST API are accessible through a hierarchy of endpoints or Uniform Resource Locators (URLs) for each GIS service published with ArcGIS for Server. When using the ArcGIS services portion of the REST API, you typically start from a well-known endpoint, which represents the server catalog. The REST API is stateless, which means that REST does not keep track of transactions from one request to the next. Each request must contain all the information necessary for successful processing.

Esri ArcGIS Resources (5 April 2015) retrieved from  
<http://resources.arcgis.com/en/help/arcgis-rest-api/index.html>

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

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

## 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 (limited as not all services support 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)

## **GeoServer services**

GeoServer is a Java-based software server that allows users to view and edit geospatial data. Using open standards set forth by the Open Geospatial Consortium (OGC), GeoServer allows for great flexibility in Map creation and data sharing. GeoServer is an OGC compliant implementation of a number of open standards such as Web Feature Service (WFS), Web Map Service (WMS), and Web Coverage Service (WCS)

GeoServer (2014) retrieved from  
<http://geoserver.org/>

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

<http://services.thelist.tas.gov.au/geoserver/web/>

## Supported protocols

### **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 (restricted access)**

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 Creative Commons licensing and as such will be attributed with one of the license agreements outlined below. These licensing agreements 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>).

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

## No visible license agreement

Where neither 'Creative Common Attribution Only' or 'Creative Commons Attribution, Non Commercial and No Derivatives' licensing is visible, please contact [LIST Help Desk](#) on **(03) 6165 4444** or via email [listhelp@dipwe.tas.gov.au](mailto:listhelp@dipwe.tas.gov.au) to clarify licensing before usage.

## Metadata

LIST datasets have detailed metadata records that can be searched by category, keyword, location, date or custodian and contains information about the licensing agreement applicable to the dataset.

Please refer to [LISTdata](#) (available via [www.thelist.tas.gov.au](http://www.thelist.tas.gov.au)) to search for specific data, view metadata and discover the web service URLs.

For any additional enquiries, contact the [LIST Help Desk](#) via phone on **(03) 6165 4444** or via email [listhelp@dpipwe.tas.gov.au](mailto:listhelp@dpipwe.tas.gov.au).

## 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 guide

## 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](#), followed by [WMS](#).

**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, otherwise use a [WMS](#) service.

**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](#)
- **MapInfo** - [Adding WMS services to MapInfo](#)
- **QGIS** - [Adding WMS 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 navigation pane shows "Home > services". Below the navigation, there are links for "JSON | SOAP". The main content area starts with "Folder: /" and "Current Version: 10.11". It includes a link "View Footprints In: [ArcGIS.com Map](#)". Under "Folders:", there is a list: "AerialPhotoViewer", "Basemaps", "Public", "Raster", and "Utilities". Under "Services:", it says "None". At the bottom, it lists "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 navigation pane shows "Home > services > Basemaps > Topographic (ImageServer)". Below the navigation, there are links for "JSON | SOAP | WMS | WMTS". The main content area has a heading "Basemaps/Topographic (ImageServer)". It includes a link "View In: [ArcGIS JavaScript](#) [ArcGIS.com Map](#) [Google Earth](#) [ArcMap](#)".

- A non-basemap service URL containing numerous layers 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](http://services.thelist.tas.gov.au/arcgis/rest/services/Public/TopographyAndRelief/MapServer). The page title is "ArcGIS REST Services Directory". The main content area displays the "Public/TopographyAndRelief (MapServer)" service. It includes links for "View In:" (ArcGIS JavaScript, ArcGIS.com Map, Google Earth, ArcMap, ArcGIS Explorer) and "View Footprint In:" (ArcGIS.com Map). A "Service Description" section contains the text: "Service for Topographic feature typically found on a map such as roads, contours, ridges, depressions, etc.". There are also "JSON", "SOAP", and "WMS" links at the bottom.

- 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 main content area displays the "Layer: Facilities (ID: 0)" service. It includes a "Name: Facilities" link.

## URLs for ArcGIS server WMS or WMTS services

- Only certain services have either WMTS or WMS capabilities under <http://services.thelist.tas.gov.au/arcgis/rest>. To see which service has either 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 a web browser displaying the ArcGIS REST Services Directory. The URL in the address bar is [services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer](http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer). The page title is "ArcGIS REST Services Directory". The navigation path is "Home > services > Basemaps > Topographic (ImageServer)". Below the path, there are tabs for "JSON", "SOAP", "WMS", and "WMTS". The "WMTS" tab is highlighted with a red box and an arrow pointing to it. The main content area is titled "Basemaps/Topographic (ImageServer)". It includes a "View In:" button and a "View Full XML" link. The XML content is shown in a red box, starting with the XML declaration and the root element <Capabilities>.

```
<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_Topographic</ows:Title>
```

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

The screenshot shows a web browser displaying the ArcGIS REST Services Directory. The URL in the address bar is [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 navigation path is "Home > services > Public > TopographyAndRelief (MapServer)". Below the path, there are tabs for "JSON", "SOAP", and "WMS". The "WMS" tab is highlighted with a red box and an arrow pointing to it. The main content area is titled "Public/TopographyAndRelief (MapServer)". It includes a "View In:" button and a "View Full XML" link. The XML content is shown in a red box, starting with the XML declaration and the root element <WMS\_Capabilities>.

```
<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&request=GetSchemaExtension">
```

## URLs for GeoServer WMS services

- The following URL is generally enough for the majority of applications listed in this document to access the GeoServer WMS service layers:  
<http://services.thelist.tas.gov.au/geoserver/PUBLIC/wms?> Entering this basic URL will give access to all the WMS layers contained within via the applications navigation pane.

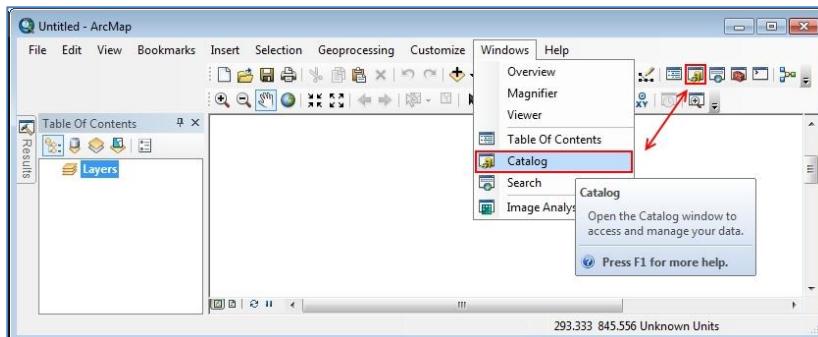
# Adding services in common GIS platforms

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.

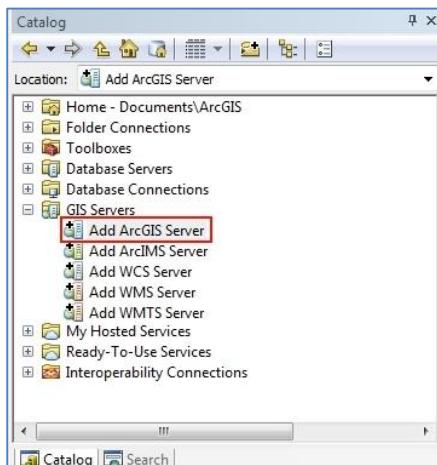
## How to add services in ArcMap Version 10.3

### Adding ArcGIS REST services to ArcMap

- 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 press **Next**



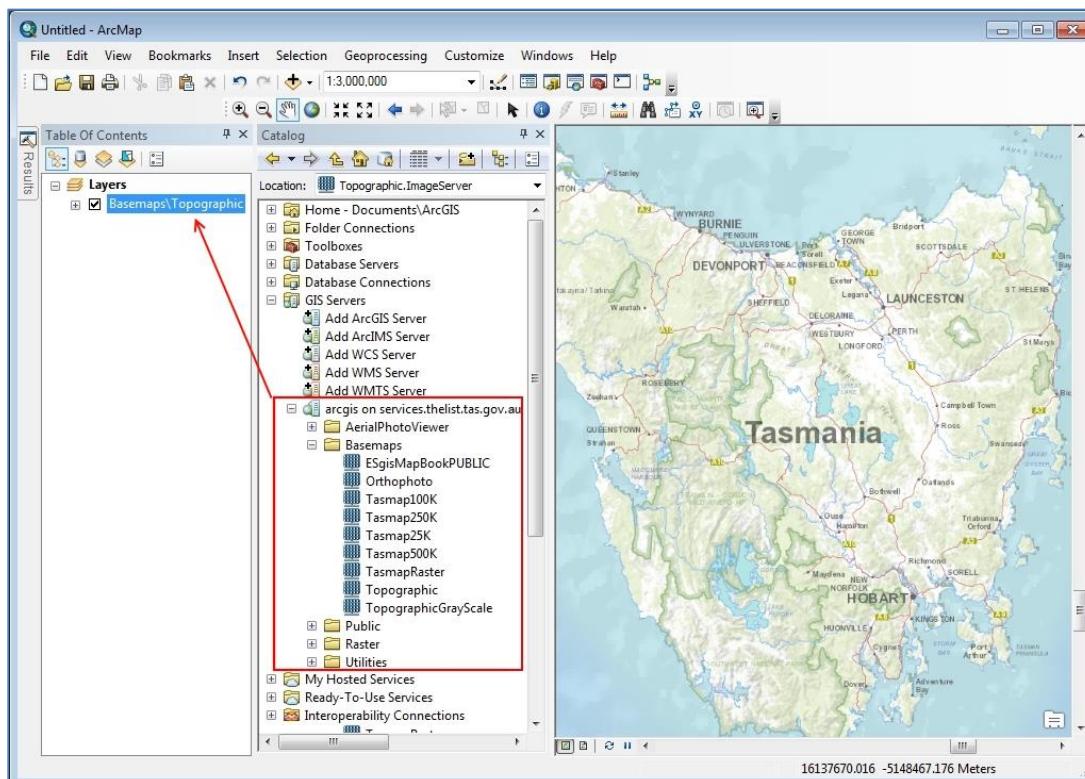
- In the **Service URL** box type in the following URL  
**http://services.thelist.tas.gov.au/arcgis** and leave the **User Name** and **Password** blank then press **Finish**



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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

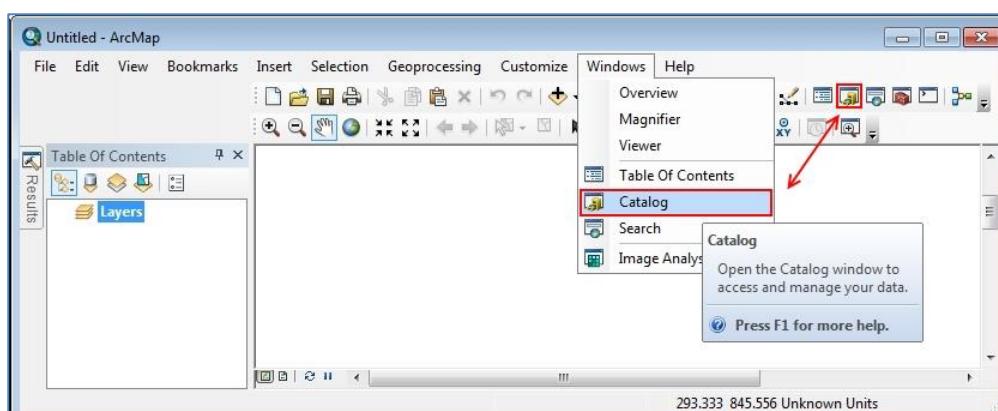


## Adding WMTS services to ArcMap

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>.

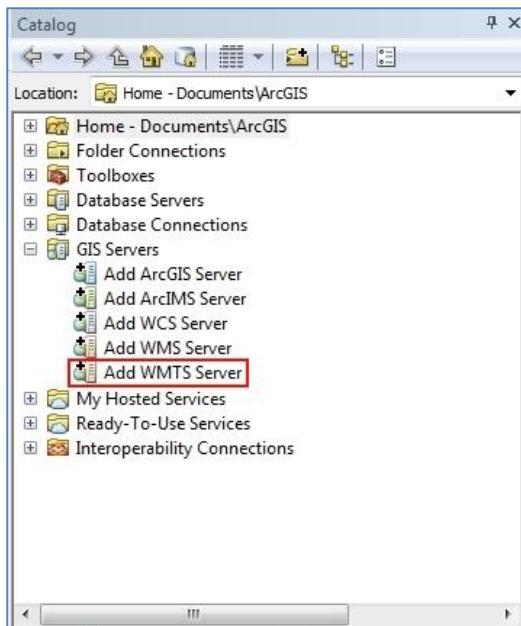
- Within ArcMap, if the catalog pane is not already open, click on the open **Catalog** button or click on the **Windows** menu and select **Catalog** to view the pane



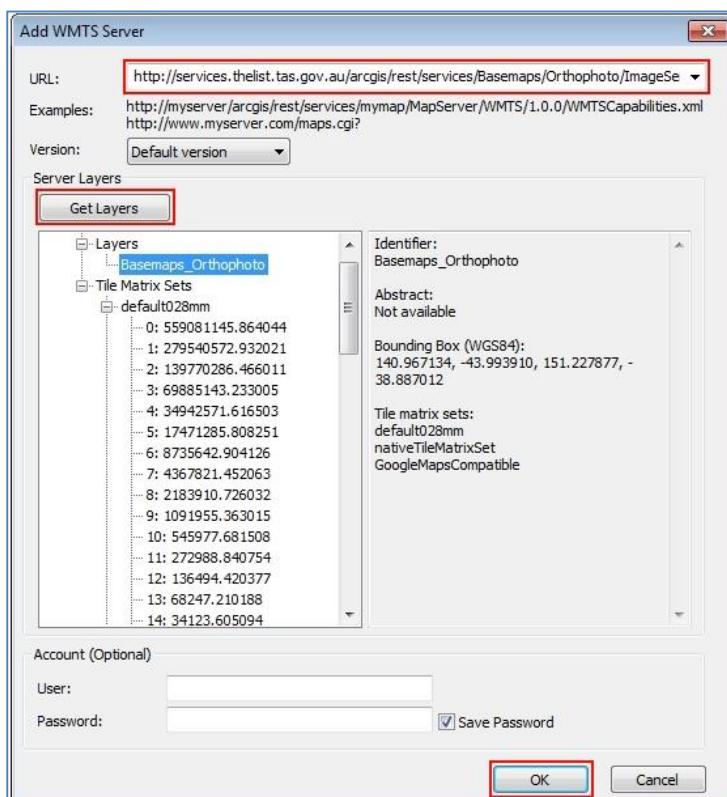
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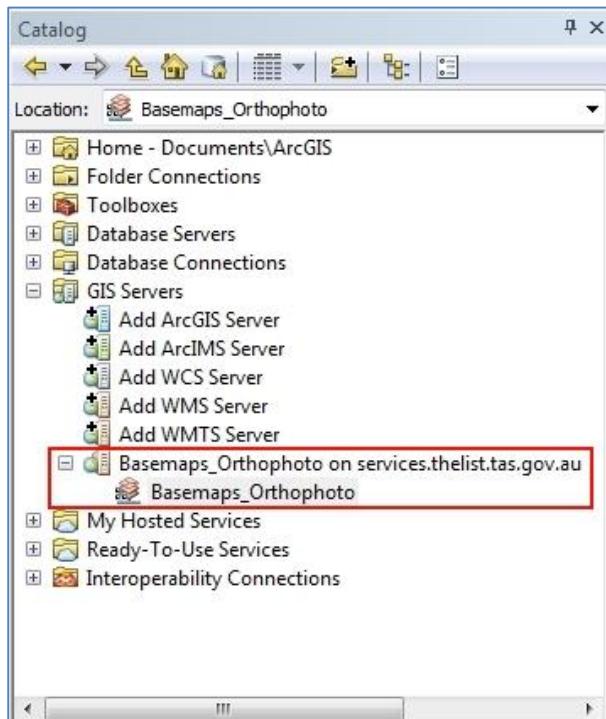
- In your Catalog pane expand **GIS Servers** then click on **Add WMTS Server**



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



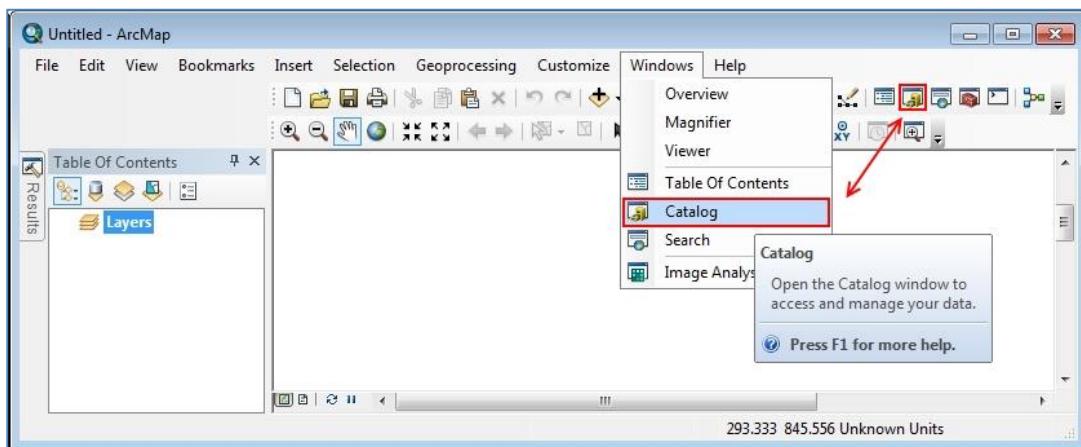
- Expand the folders to see the available services and click and drag the layer to add it to your mxd (or ArcMap document)



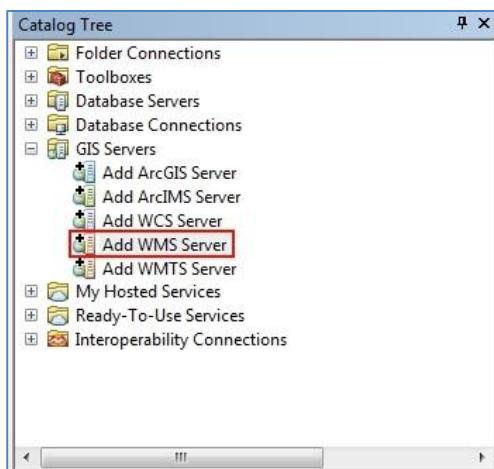
## Adding WMS services to ArcMap

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 some of the LIST services found under <http://services.thelist.tas.gov.au/arcgis/rest/services>.

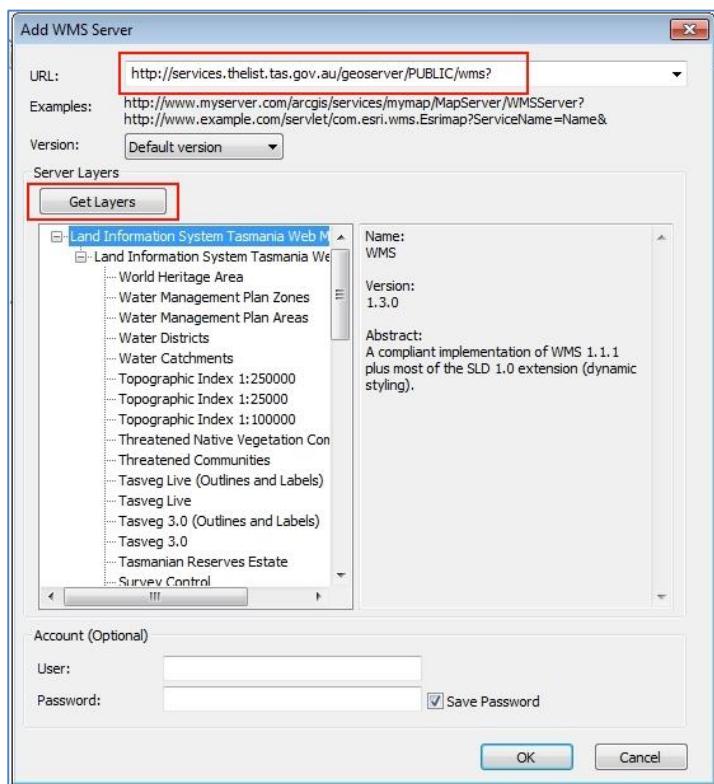
- Within ArcMap, if the catalog pane is not already open, click on the open **Catalog** button or click on the **Windows** menu and select **Catalog** to view the pane



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



- In the **URL** box type in the following URL  
**http://services.thelist.tas.gov.au/geoserver/PUBLIC/wms?** then press **Get Layers** to see what is available followed by the **OK** button. Alternatively, check the LIST's [ArcGIS REST web services](#) to see if WMS is enabled on a service, 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?**

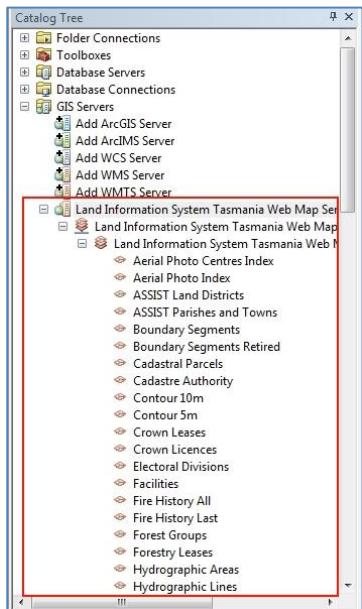


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- Expand the folders to see the available services and click and drag the layer to add it to your mxd (or ArcMap document)



## 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 © State of
Tasmania</AttributionText>
</TileServerInfo>
```

- Save the above file as **ListTopoBasemap.xml**
- Then in a new blank document, type in the following text:

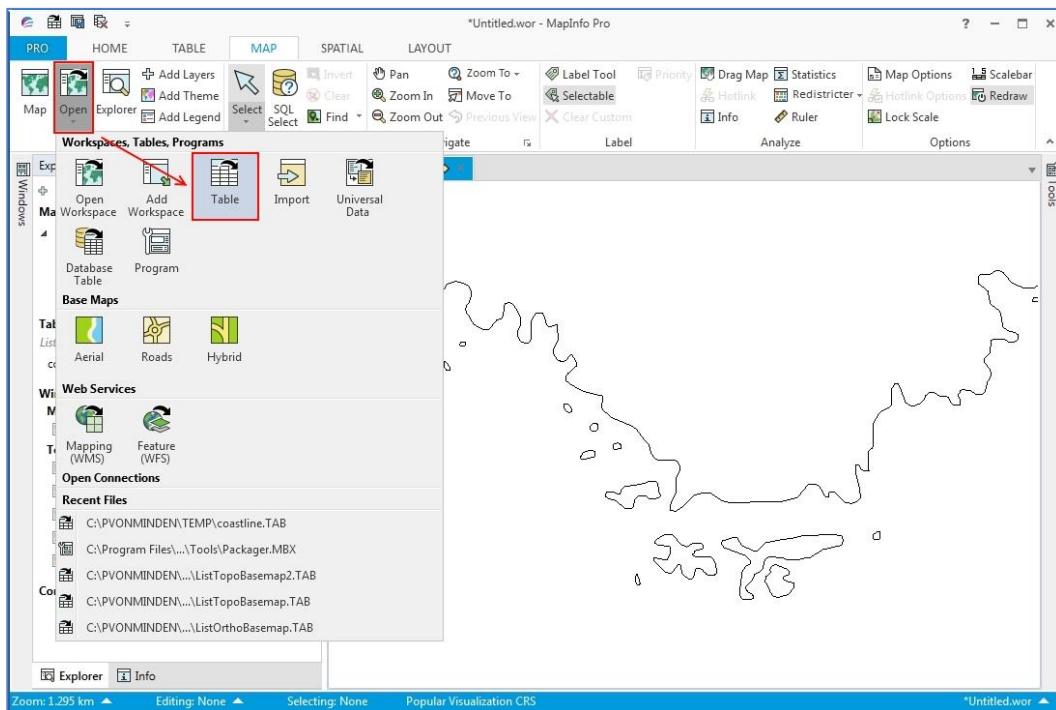
```
!table
!version 1050
!charset WindowsLatin1

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

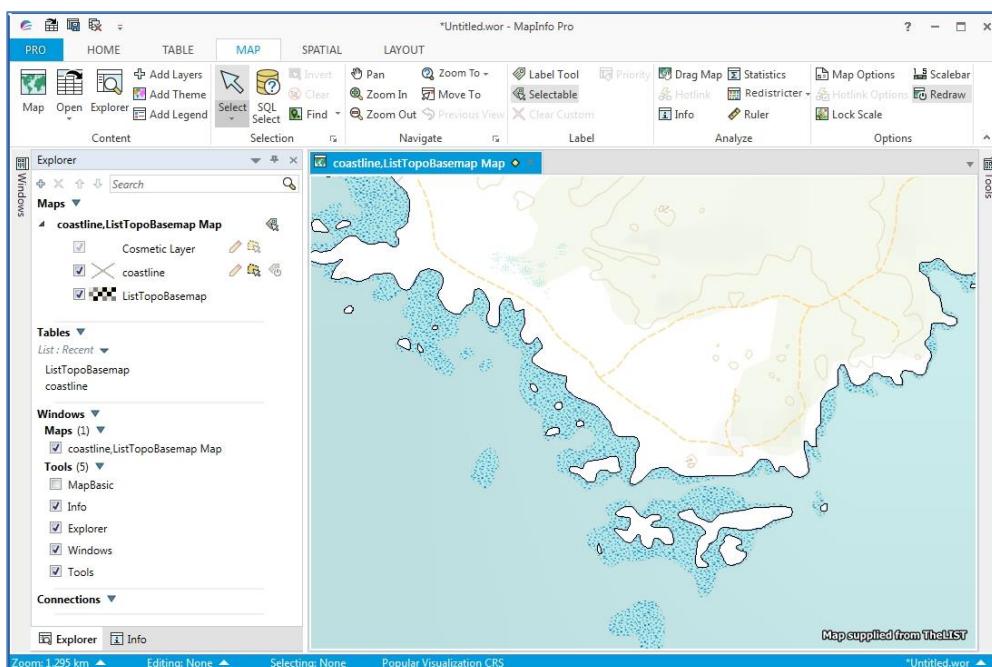
## LIST Web Services

### User Guide

- Save the above file as **ListTopoBasemap.TAB** in the same location as **ListTopoBasemap.xml**
- 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 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 © State of Tasmania</AttributionText>
</TileServerInfo>
```

- Save the above file as **ListOrthoBasemap.xml**
- Then in a new blank document, type in the following text:

```
!table
!version 1050
!charset WindowsLatin1

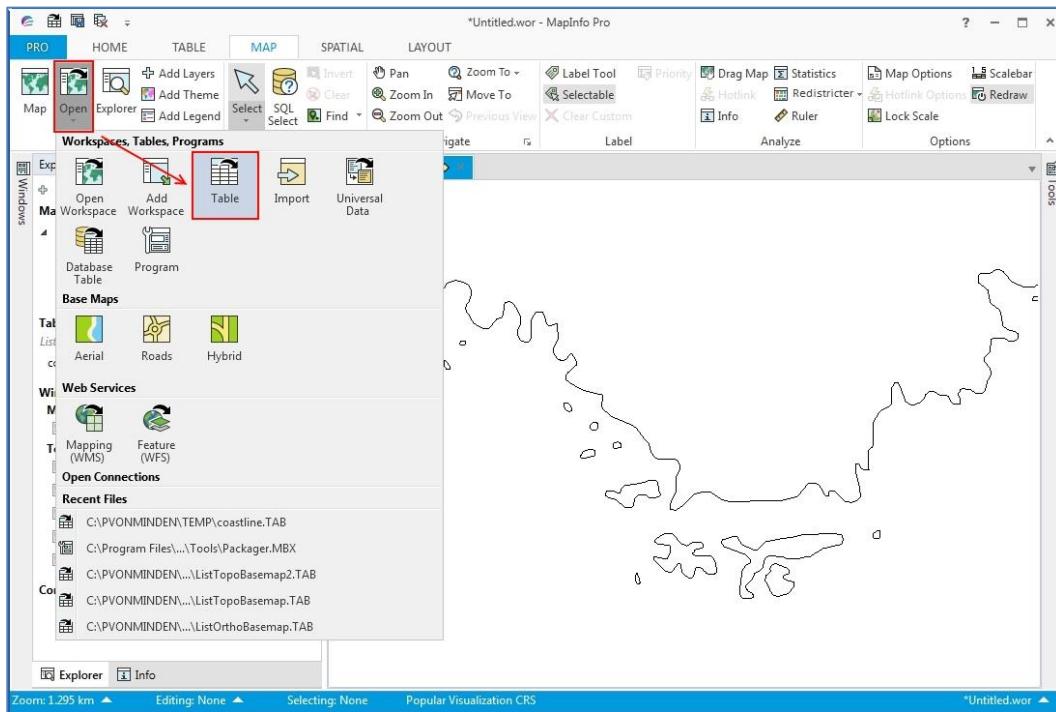
Definition Table
File "ListOrthoBasemap.xml"
Type "TILESERVER"
CoordSys Earth Projection 10, 157, "m", 0 Bounds (-20037508.3428, -20037508.343)
(20037508.3428, 20037508.343)
ReadOnly
```

- Save the above file as **ListOrthoBasemap.TAB** in the same location as **ListOrthoBasemap.xml**

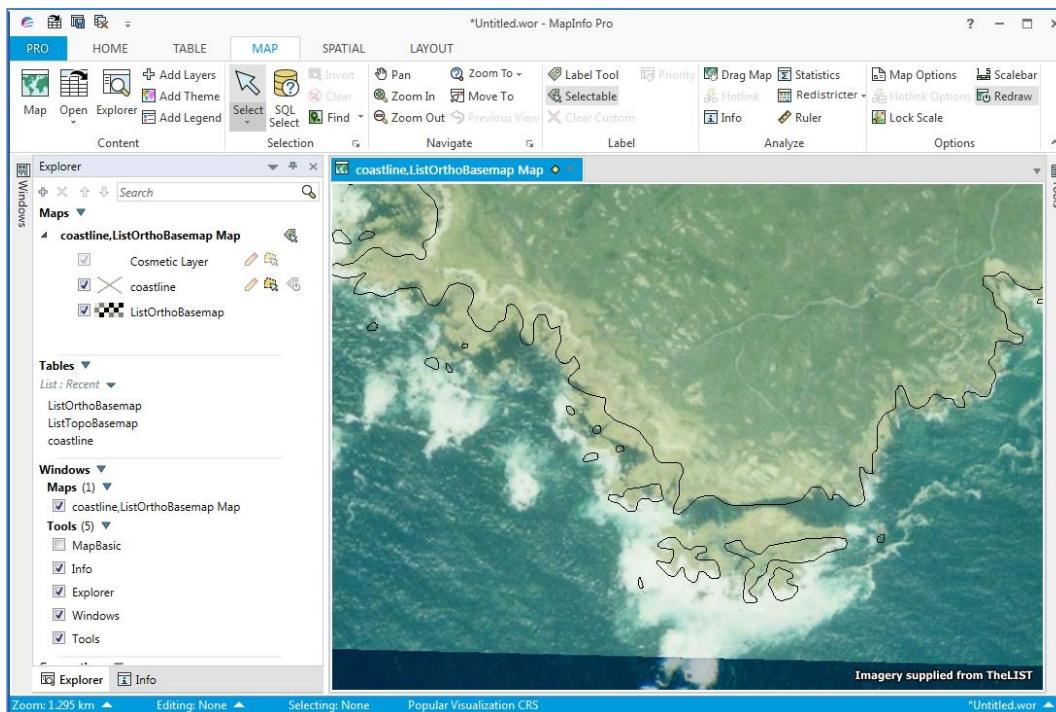
## LIST Web Services

### 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**

```
!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**

- 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 © State of
Tasmania</AttributionText>
</TileServerInfo>
```

- Save the above file as **ListScannedTASMAPbasemap.xml**

```
!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
```

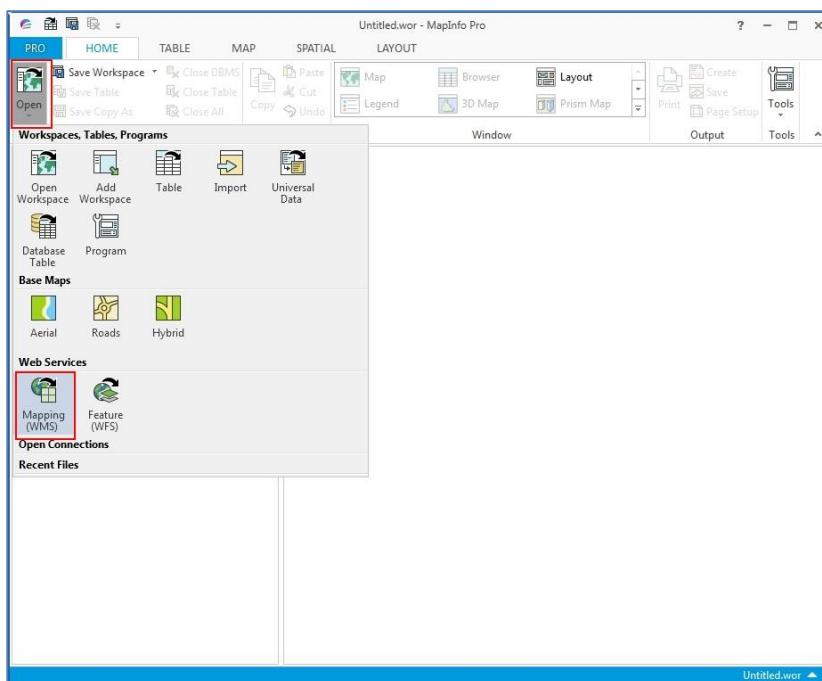
- Save the above file as **ListScannedTASMAPbasemap.TAB** in the same location as **ListScannedTASMAPbasemap.xml**

## LIST Web Services

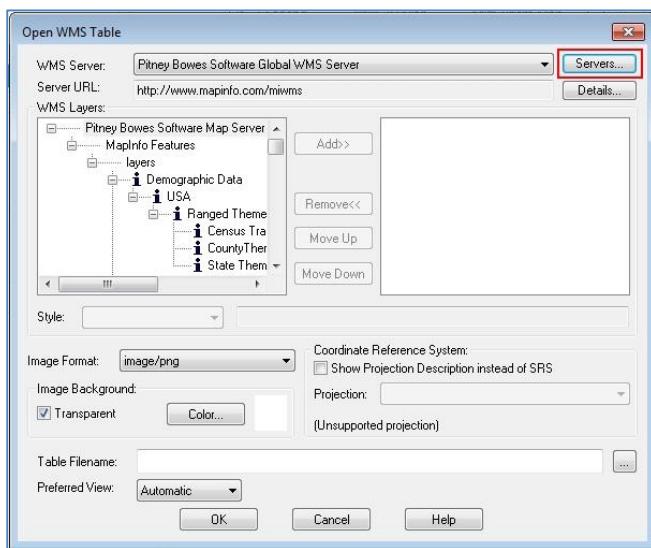
### User Guide

## Adding WMS services to MapInfo

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



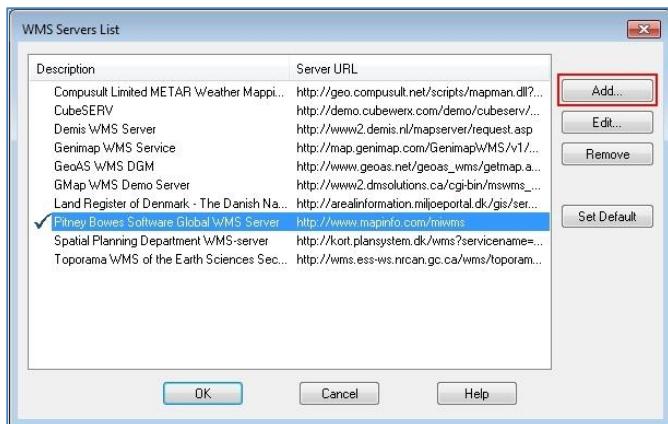
- Click on the **Servers** button



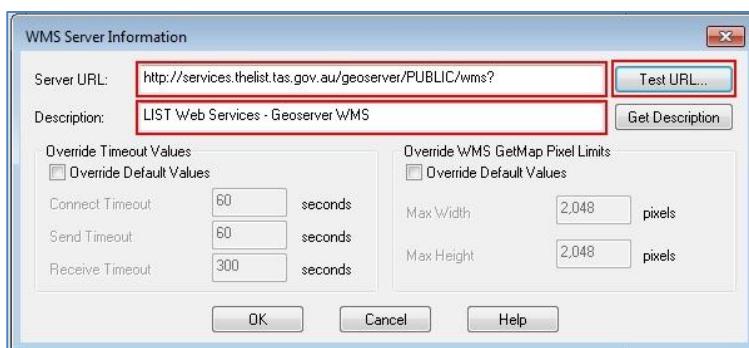
## LIST Web Services

### User Guide

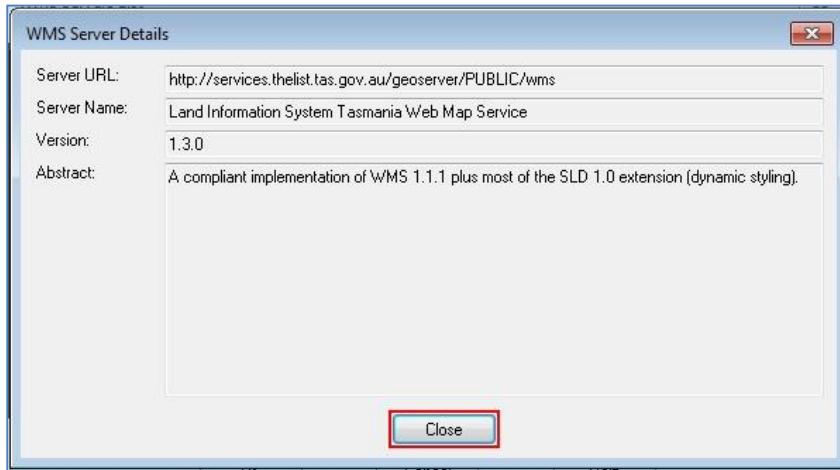
- Then click on **Add...** to create a new connection to LIST Web services



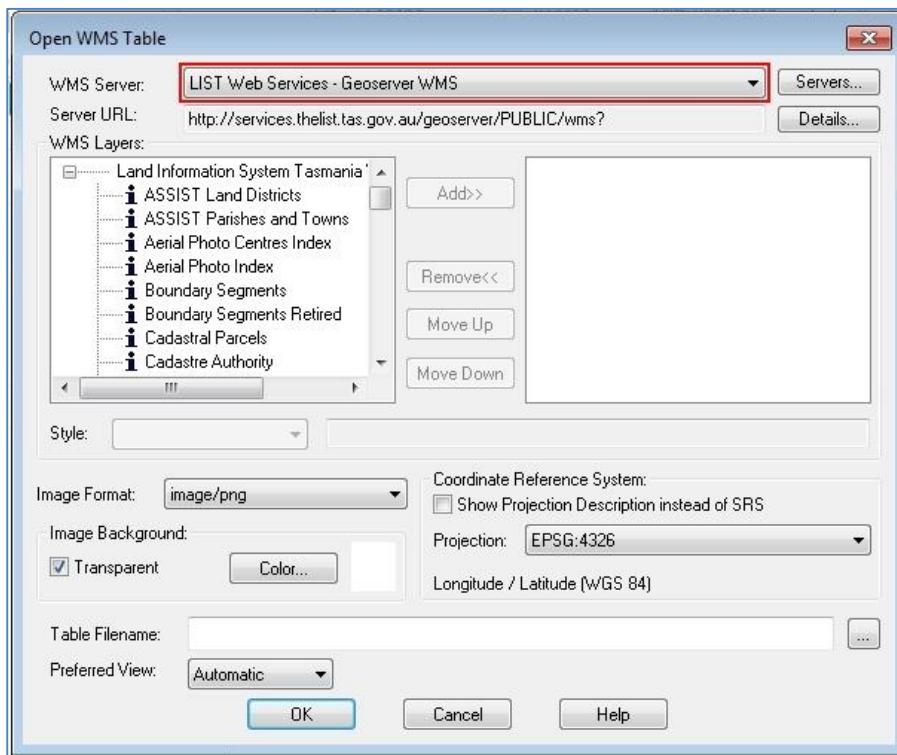
- Type into the **Server URL** the following URL  
**http://services.thelist.tas.gov.au/geoserver/PUBLIC/wms?** And add a meaningful **Description** then press the **Test URL** button to see if you can connect. Alternatively, check the LIST's [ArcGIS REST web services](#) to see if WMS is enabled on a service, 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?**



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



- Then press **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.

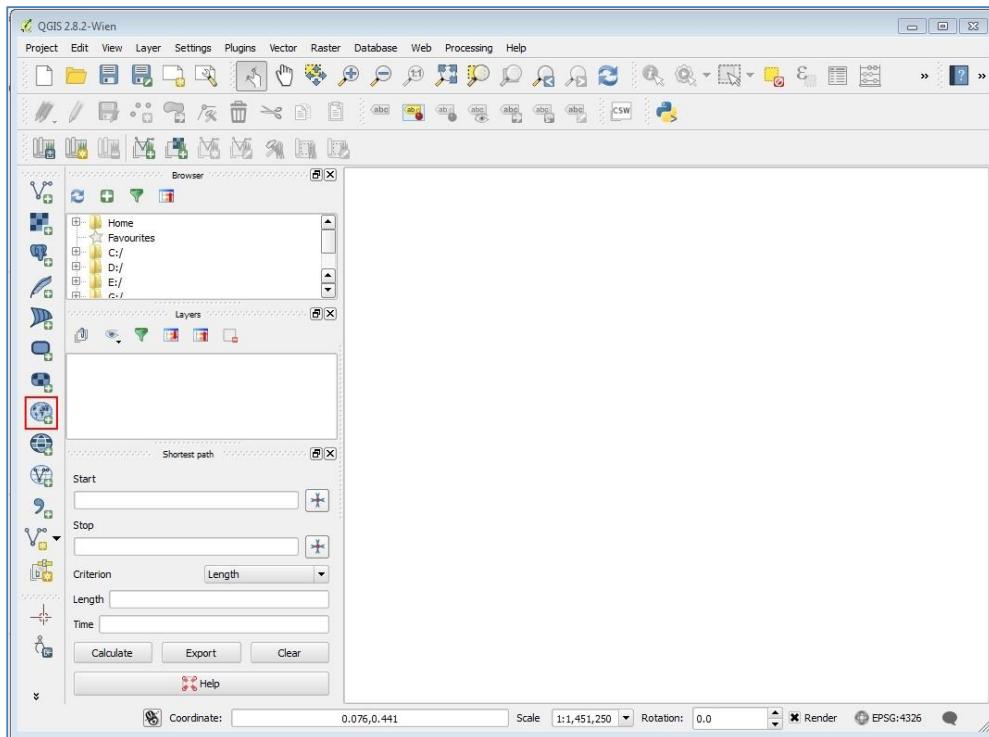


## How to add services in QGIS Version 2.8.2

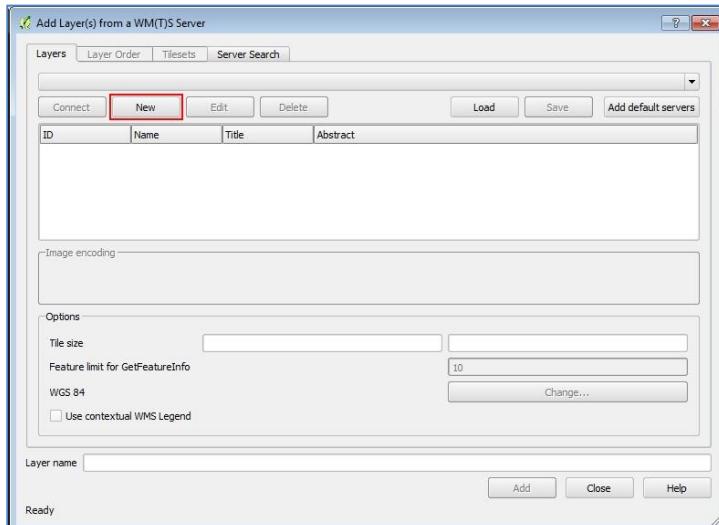
### Adding WMTS services to QGIS

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

- To add a WMTS layer to QGIS, 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**



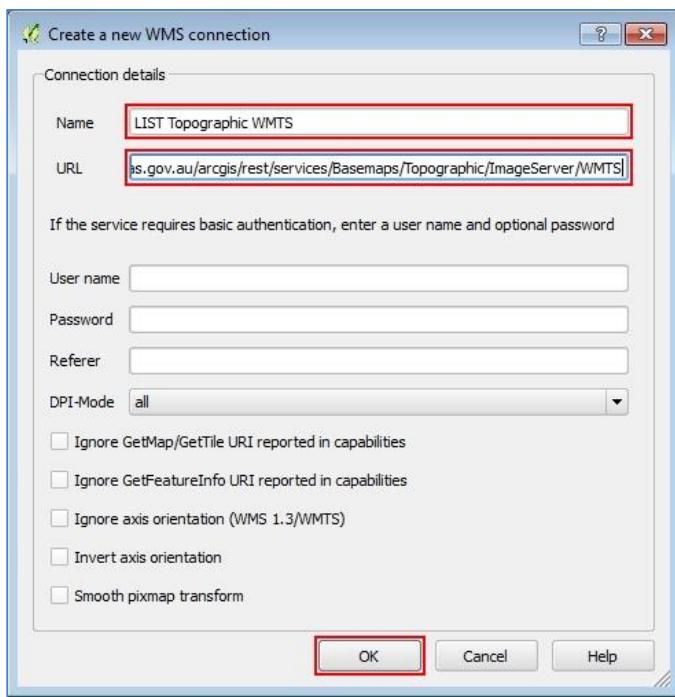
- For a new connection click on the **New** button



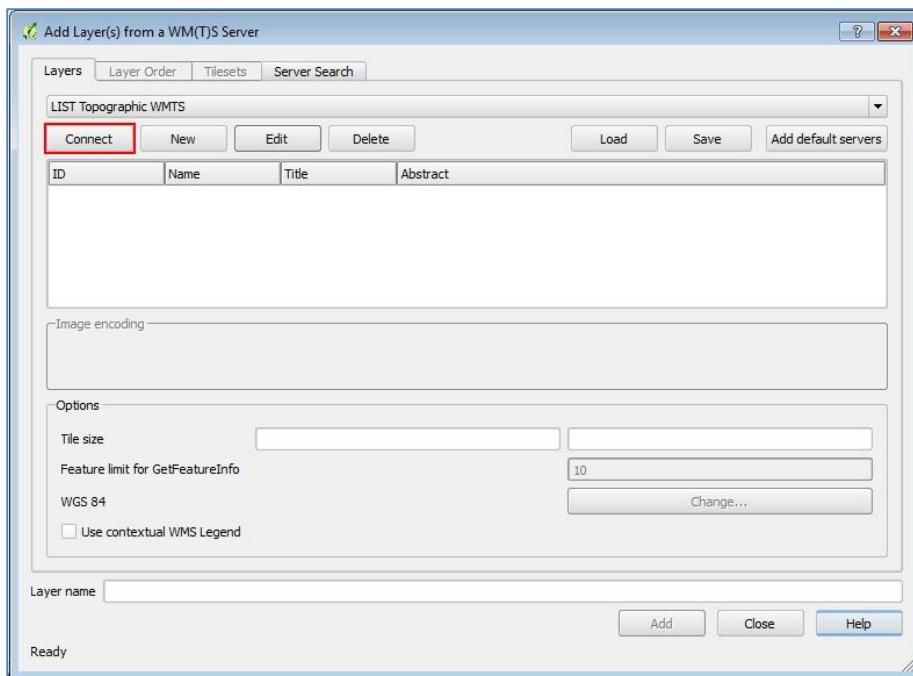
## LIST Web Services

### 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. For example, <http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/ImageServer/WMTS> and then press **OK**.



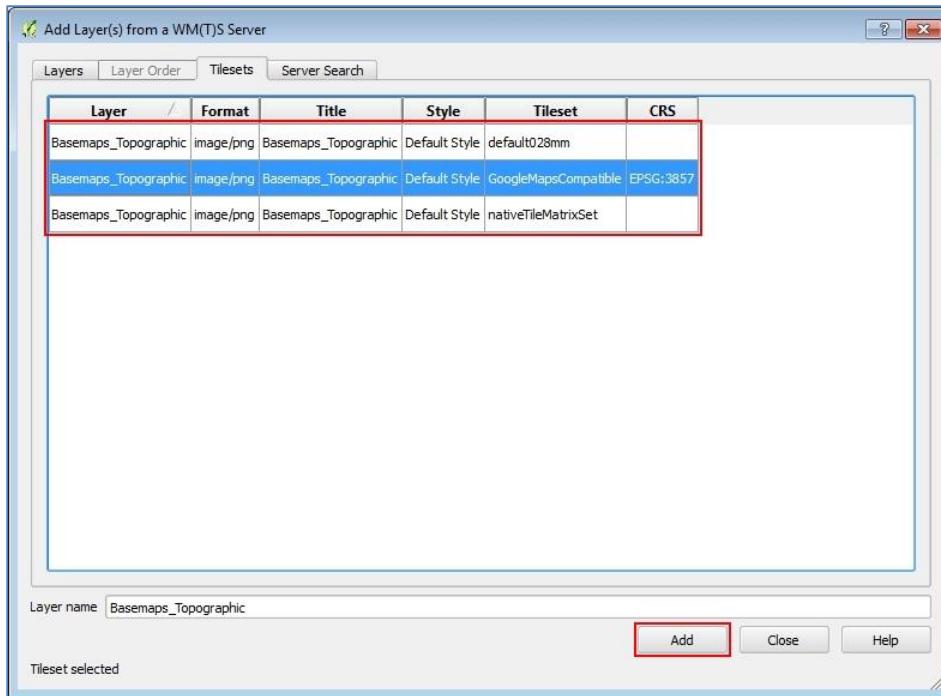
- Then click on the **Connect** button to view the available tile sets



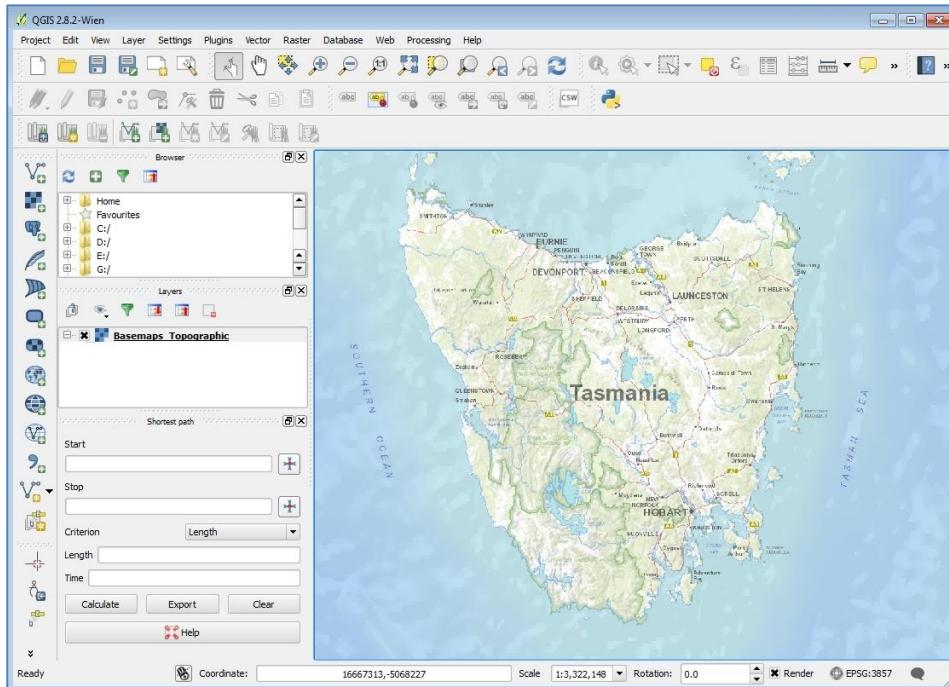
## LIST Web Services

### User Guide

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

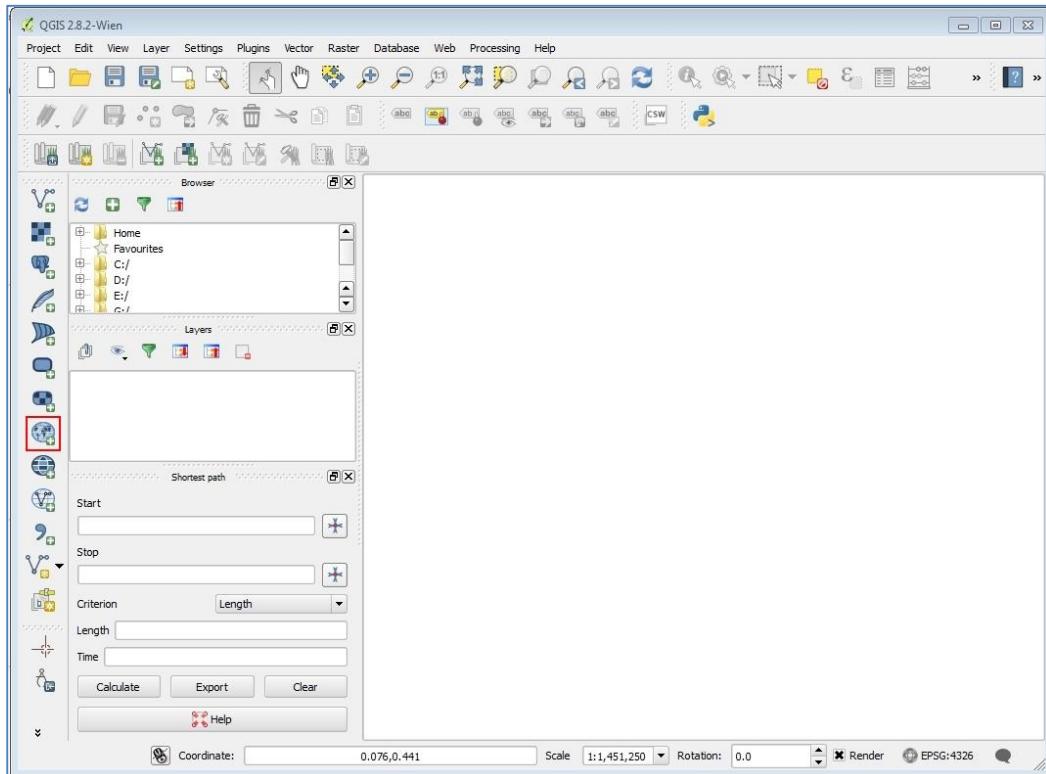


- The results of which are then loaded into QGIS

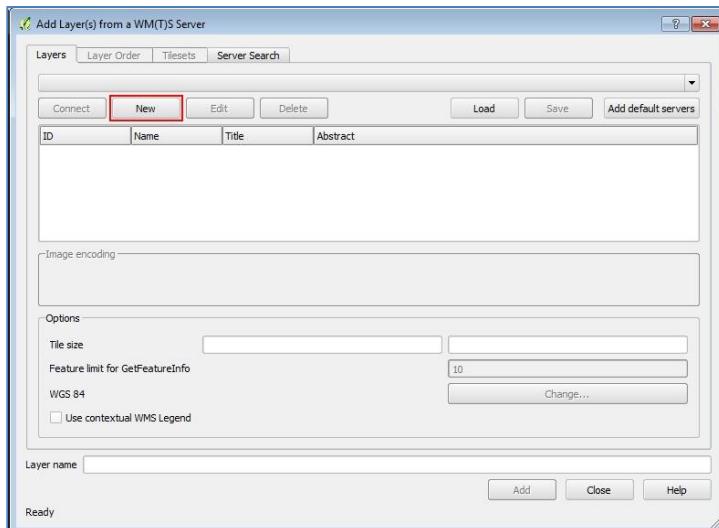


## Adding WMS services to QGIS

- 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 Web Services

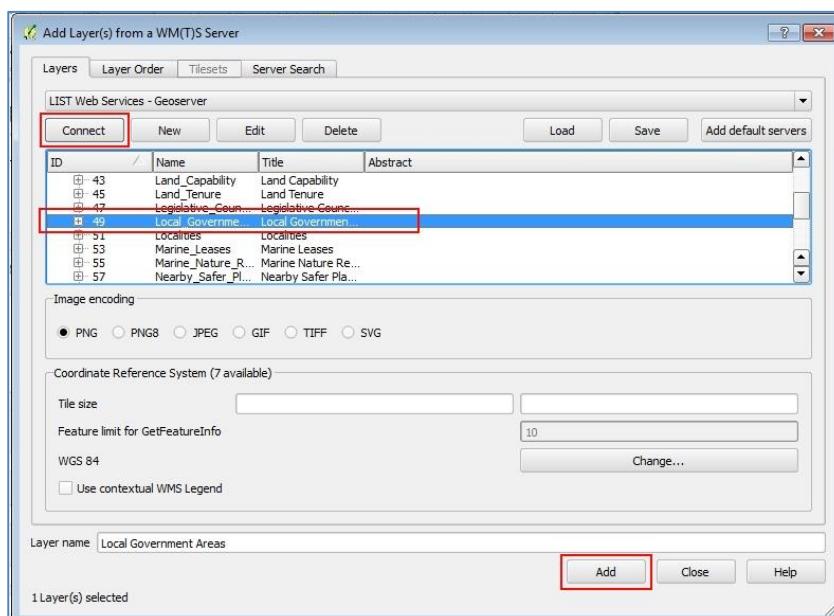
### User Guide

- Type in a meaningful name in the **Name** text box then type in the following URL for GeoServer WMS layers **http://services.thelist.tas.gov.au/geoserver/PUBLIC/wms?** and press **OK**. Alternatively, check the LIST's [ArcGIS REST web services](#) to see if WMS is enabled on a service, 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?**



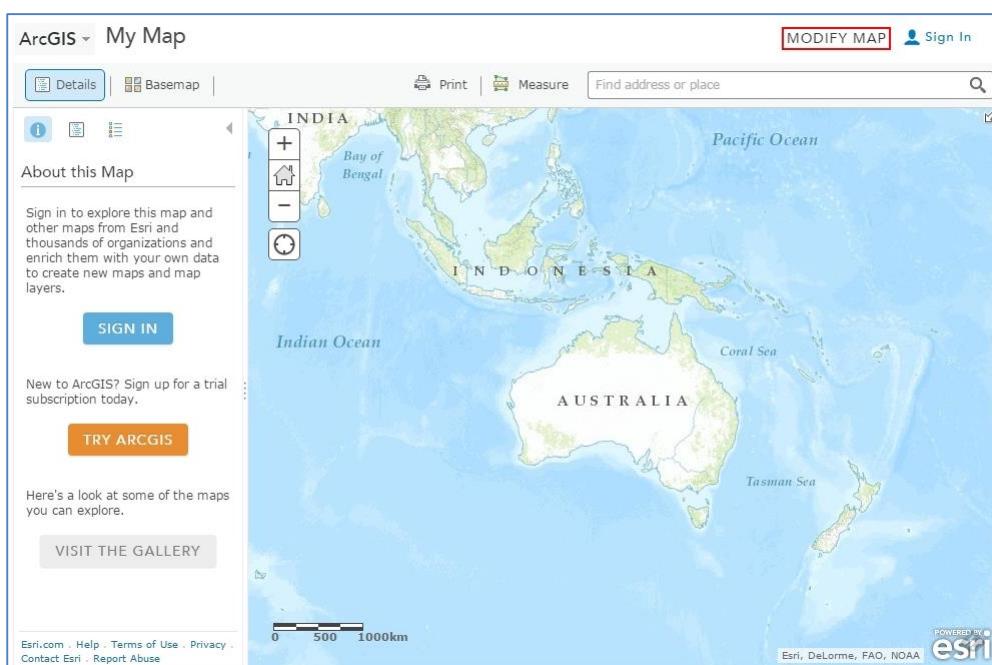
- Then click on the **Connect** button to view the available layers, highlight a layer, change the coordinate system if required and press **Add** to add the layer to the map. This window will stay open if you want to add more layers or simply press the **Close** button to dismiss the window.



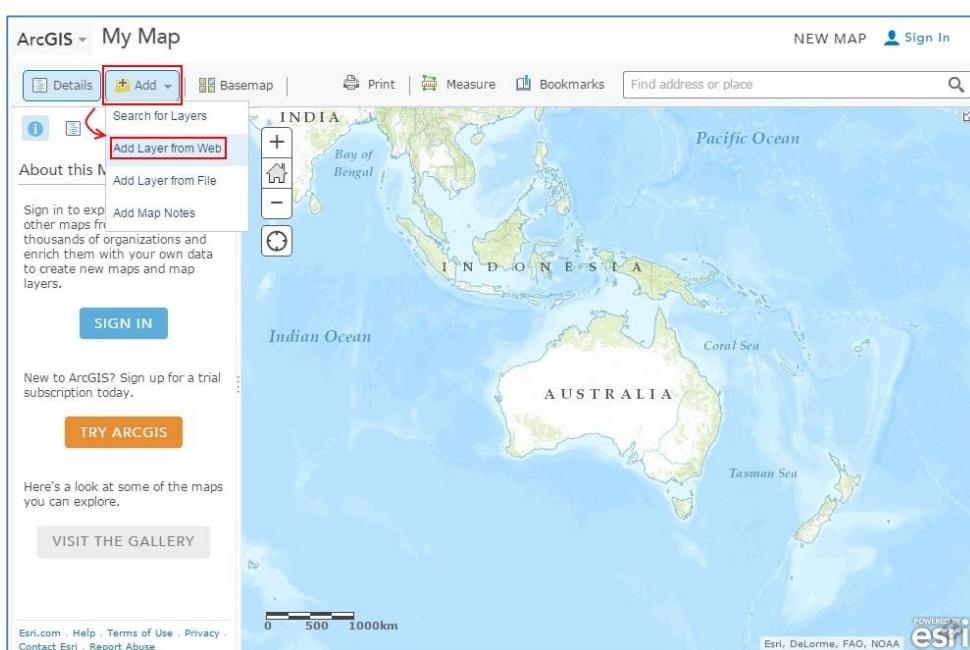
## How to add services in ArcGIS Online

### 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



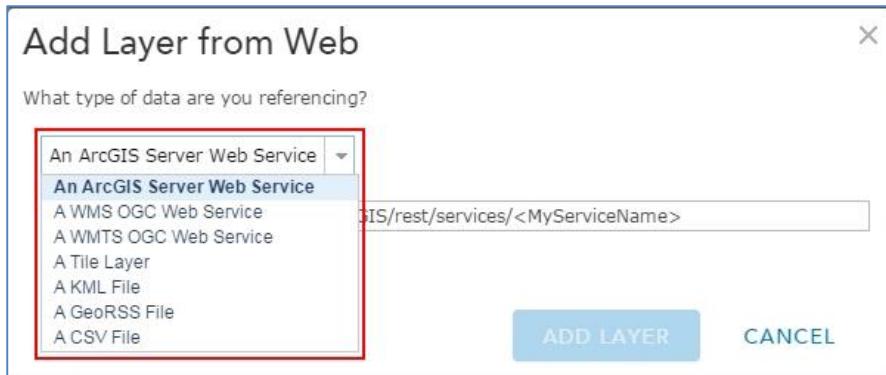
- Then click on **Add – Add Layer from Web**



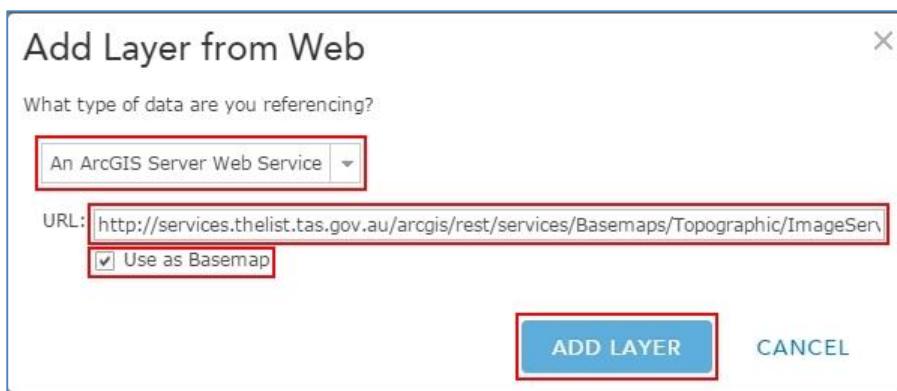
## LIST Web Services

### User Guide

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



- Then type in your desired LIST ArcGIS REST Service found under <http://services.thelist.tas.gov.au/arcgis/rest> such as **http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Topographic/Image Server**. 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**



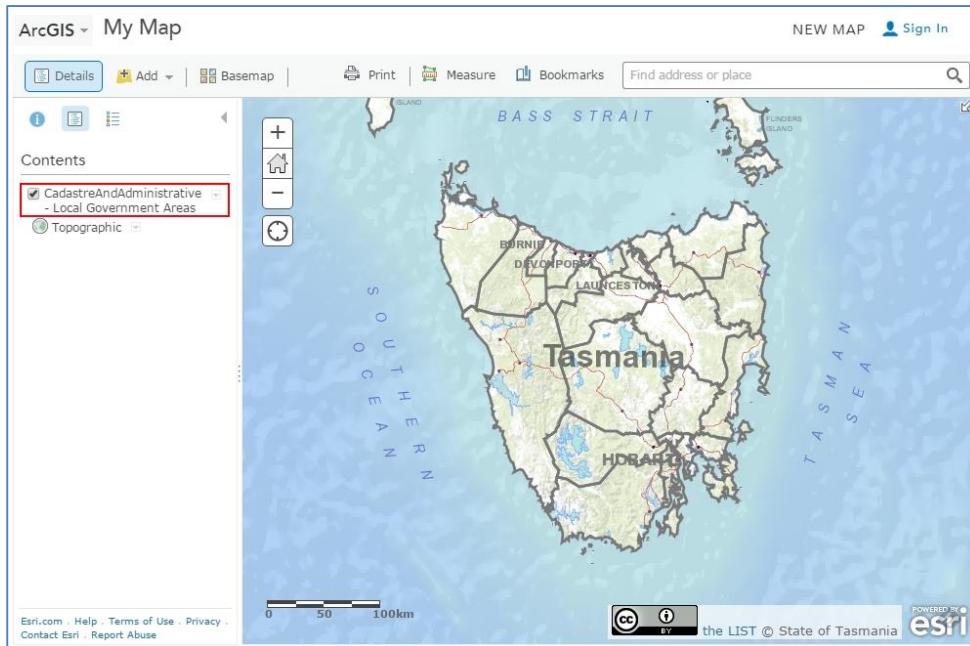
- With ArcGIS Online, you can either add an entire service that contains multiple layers or just an individual layer. For example, type in the following URL for an individual layer **http://services.thelist.tas.gov.au/arcgis/rest/services/Public/CadastreAndAdministrative/MapServer/4** or this URL for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



## LIST Web Services

### User Guide

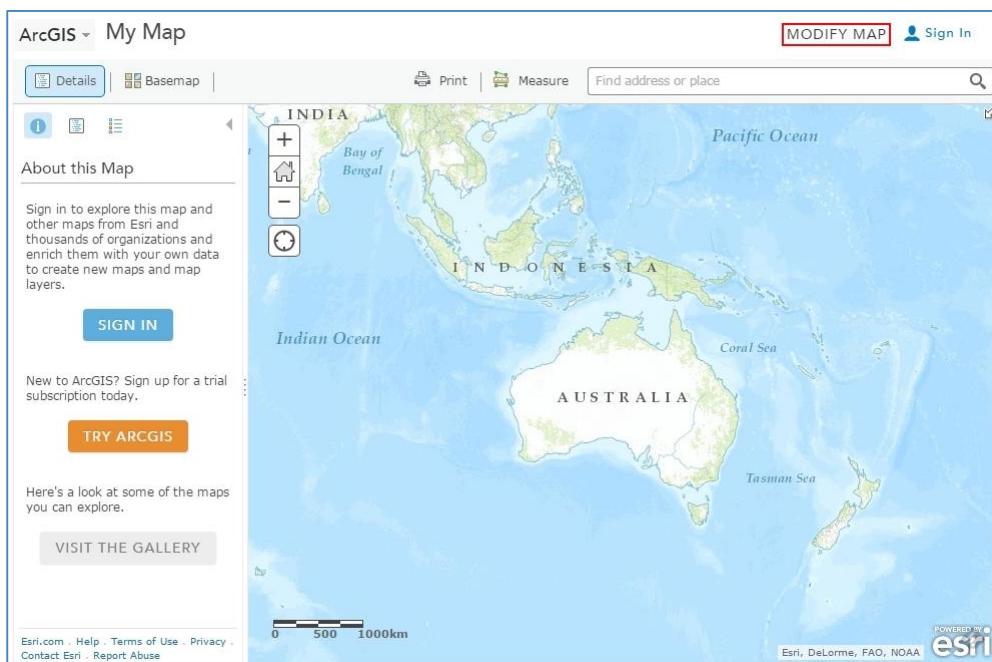
- If a layer is gray in the contents area, you may need to zoom further to see it on the map



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

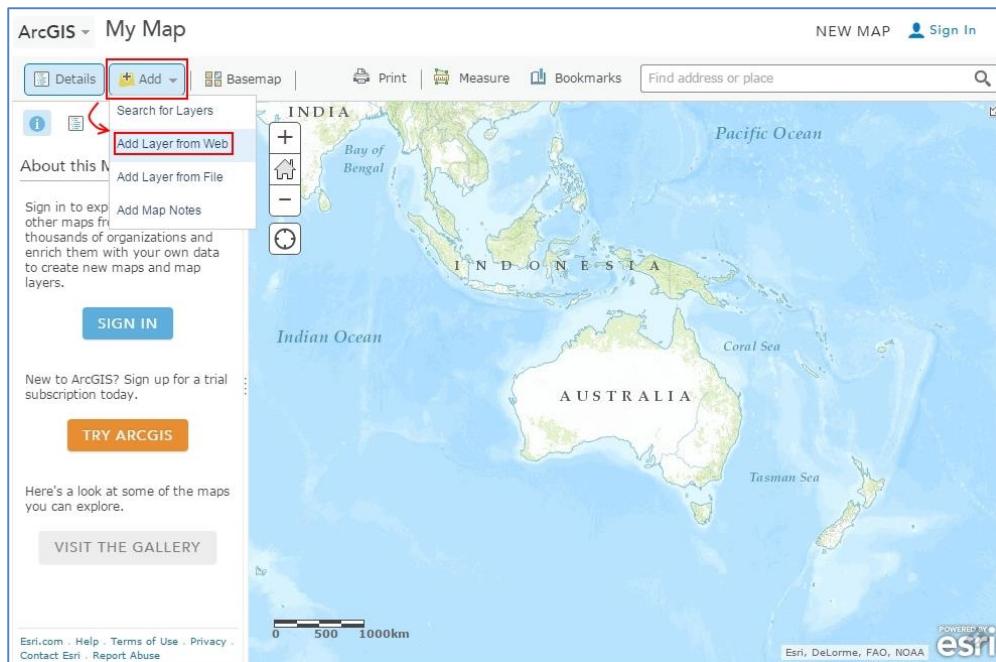
- Open ArcGIS Online within your preferred internet browser via the following URL:  
<http://www.arcgis.com/home/webmap/viewer.html>
- Click on **Modify Map** in the top right hand corner



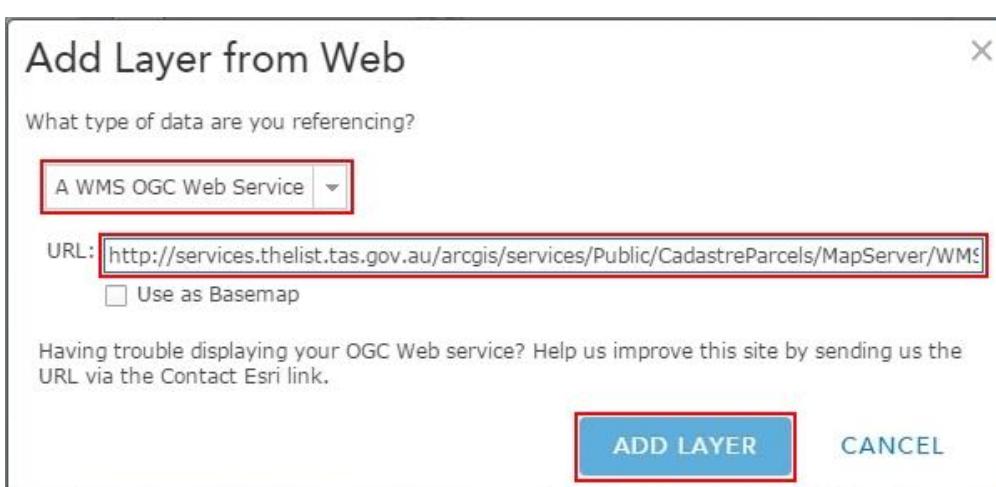
## LIST Web Services

### User Guide

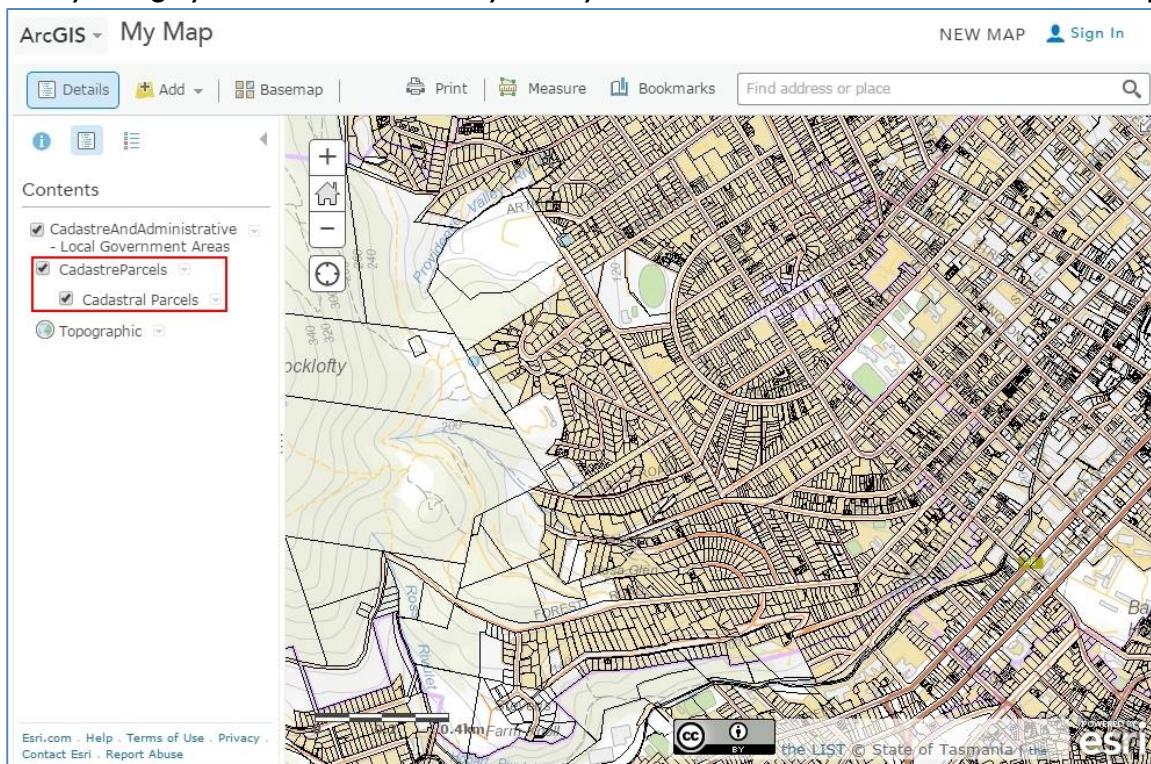
- Then click on **Add – Add Layer from Web**



- Select **A WMS OGC Web Service** from the drop down list and type in a valid WMS URL, (Please refer to <http://services.thelist.tas.gov.au/arcgis/rest> to see what services have WMT enabled). for example:  
**http://services.thelist.tas.gov.au/arcgis/services/Public/CadastreParcels/MapServer/WMSServer**



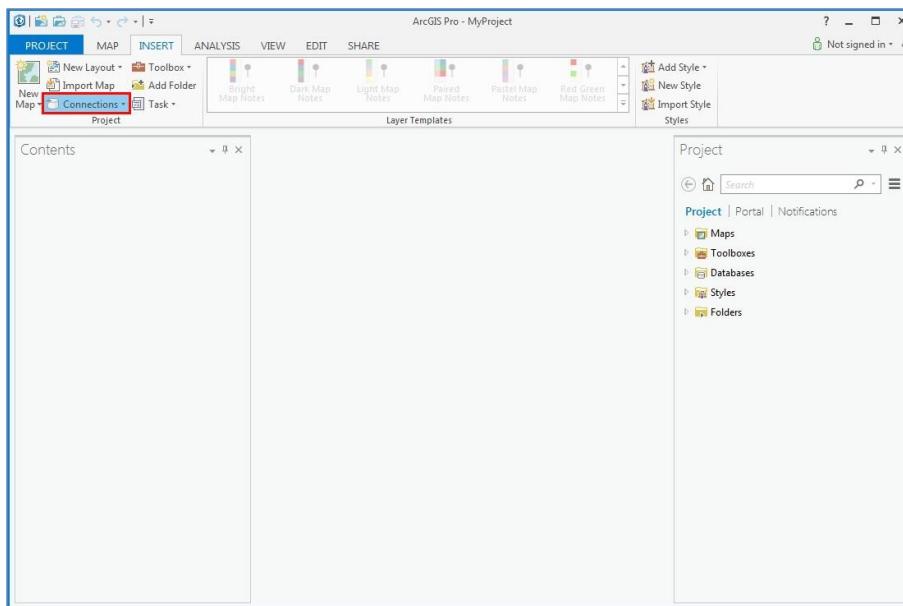
- If a layer is gray in the contents area, you may need to zoom further to see it on the map



## 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 **New ArcGIS Server**



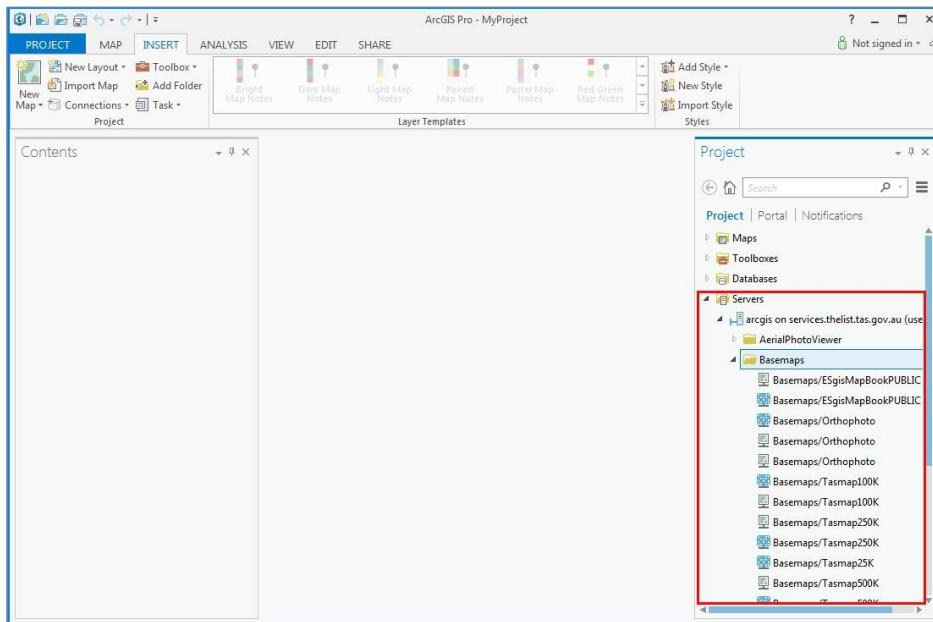
- Enter in the LIST rest services URL next to Adding ArcGIS REST services **Server URL** <http://services.thelist.tas.gov.au/arcgis/rest/services> and press **OK**



## LIST Web Services

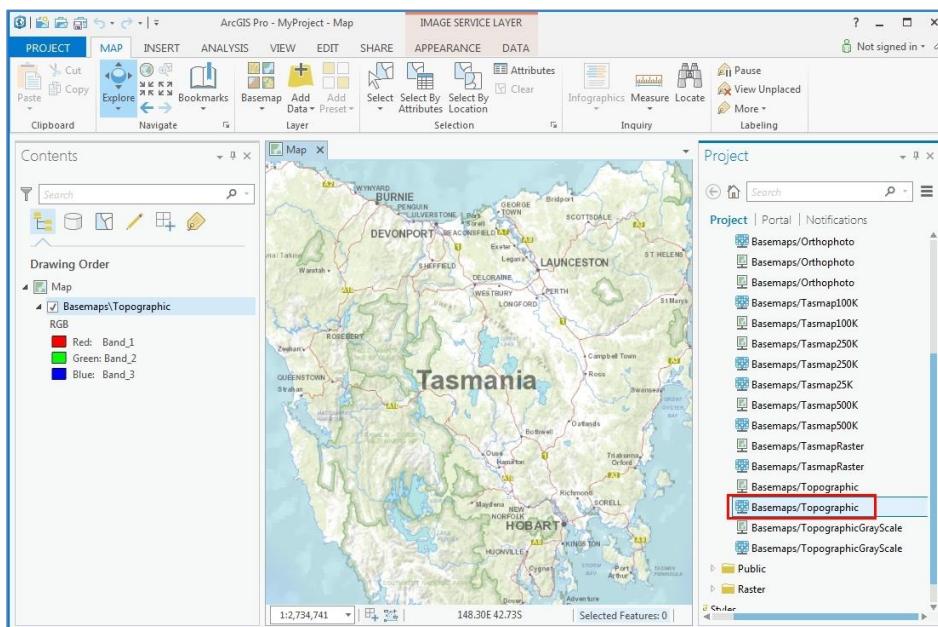
### User Guide

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



- To add a service, simply right click on it and 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 press 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 `</onlinemapsources>`. **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>
```

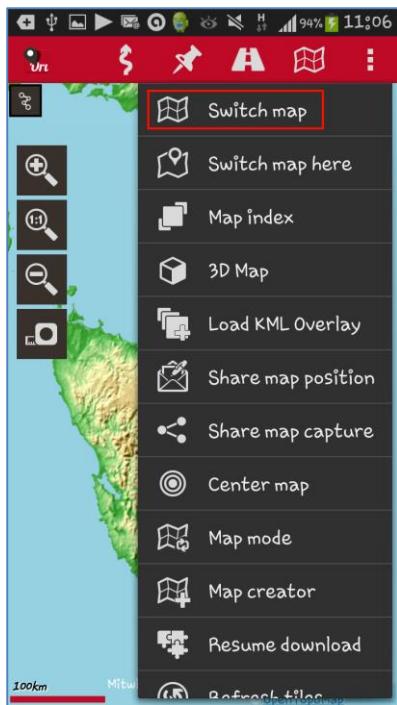
```
<website><![CDATA[<a href="http://services.thelist.tas.gov.au/arcgis/rest/services/Basemaps/Orthophoto/ImageServer" target="_blank">LIST Orthophoto Basemap</a>]]></website>
<minzoom>6</minzoom>
<maxzoom>19</maxzoom>
<projection>MERCATORESFERICA</projection>
<servers></servers>
<httpparam name=""></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>
```

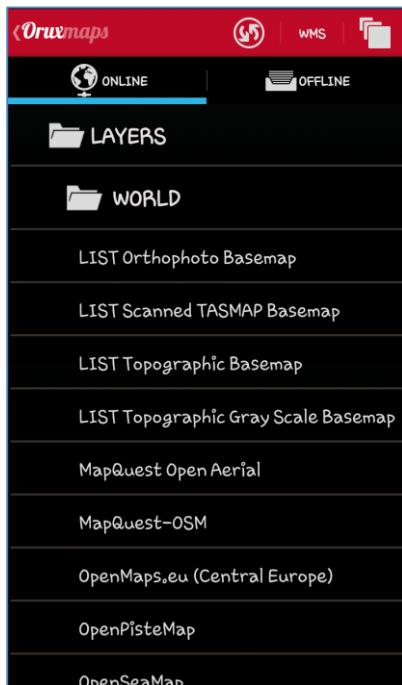
- By adding the above text to the xml file, you will have access to the LIST's Topographic, Topographic Gray Scale, Orthophoto and Scanned TASMAP basemaps. Save the file then copy and paste it back into your mobile device under ...**oruxmpas\mapfiles**
- Open OruxMaps then zoom into Tasmania before pressing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



- Then select the **Switch Map** icon



- Choose a basemap from the list



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



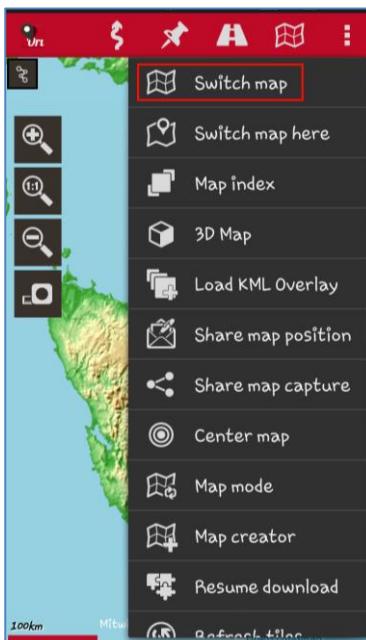
## Adding WMS services to OruxMaps

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.

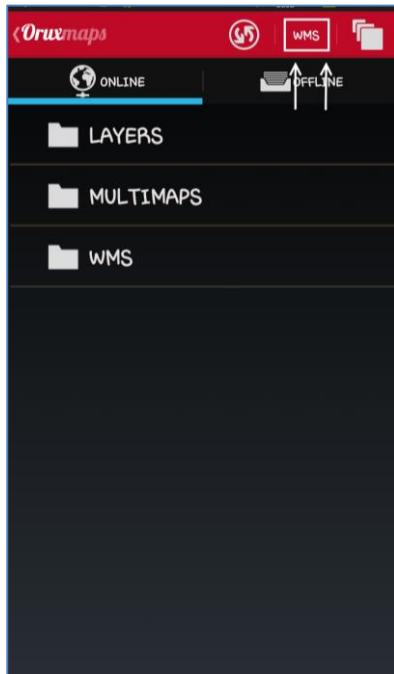
- Open OruxMaps then zoom into Tasmania before pressing the **Switch Map** button in the top right of the screen. Please note that you want to zoom in further than just the extent of Tasmania as some layers have zoom dependencies and may not show at this extent.



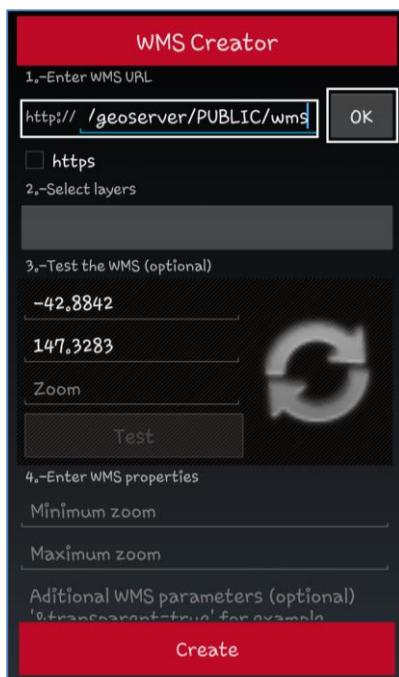
- Then select the **Switch Map** icon



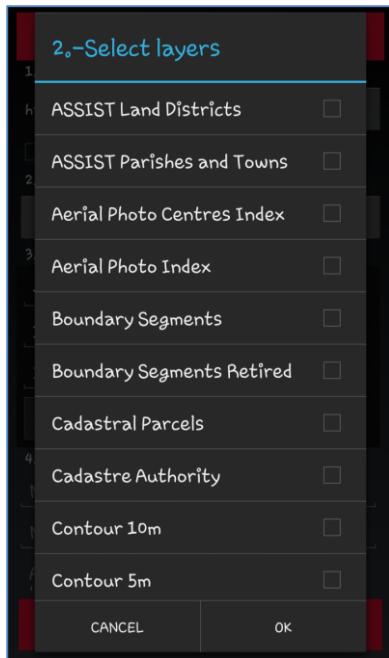
- In the top right hand corner, click on the white **WMS** text



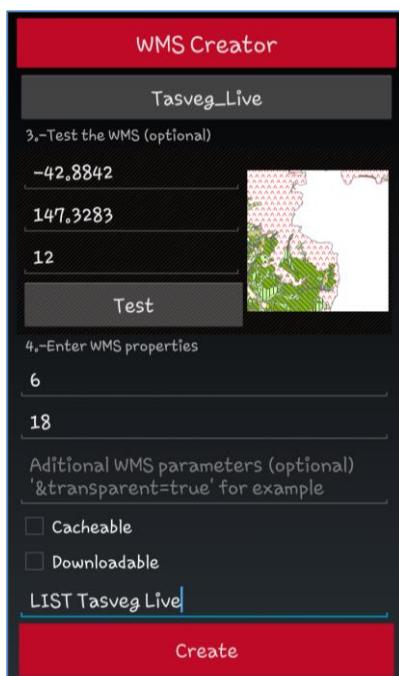
- Type in a valid URL such as the LIST GeoServer WMS services  
<http://services.thelist.tas.gov.au/geoserver/PUBLIC/wms> or check [LIST ArcGIS Server](#) for services that support WMS capabilities then press **OK**



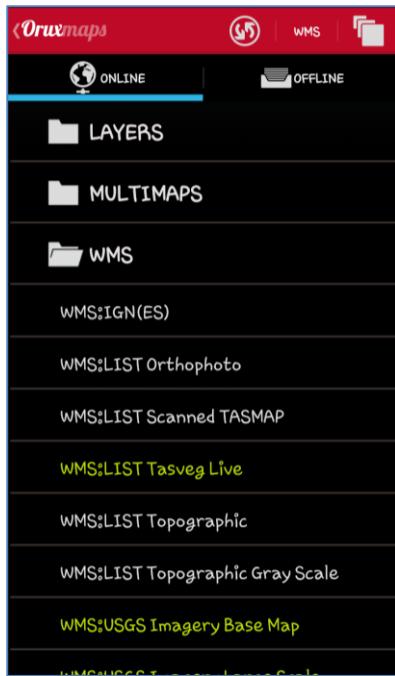
- Select a layer from the available list then press **OK**



- 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 little 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 press **Create**



- 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 press 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\_services>** and **</wms\_services>** 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.**

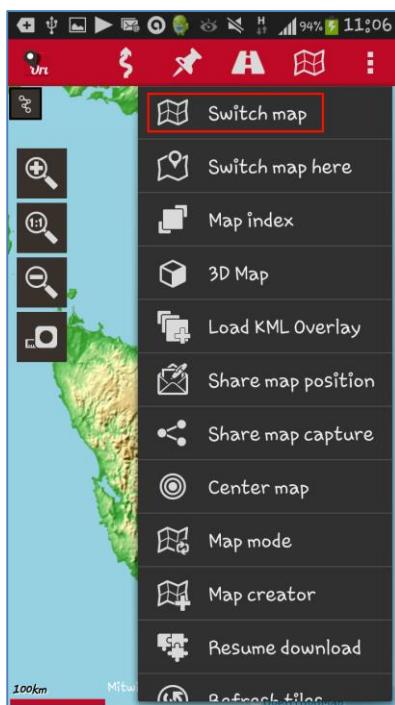
```
<wms>
<name>LIST Orthophoto</name>
<uid>751</uid>
<desc>LIST Orthophoto</desc>
<minzoomlevel>6</minzoomlevel>
<maxzoomlevel>19</maxzoomlevel>
<url>http://services.thelist.tas.gov.au/arcgis/services/Basemaps/Orthophoto/ImageServer/WMSServer?</url>
<format>image/png</format>
<coordinatesystem>EPSG:4326</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

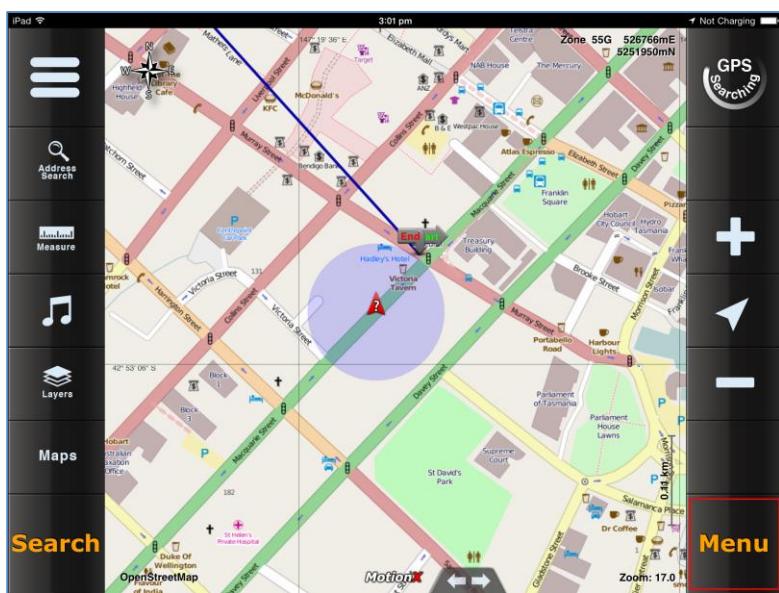


- Under the **WMS** folder choose a one of the newly added services from the list

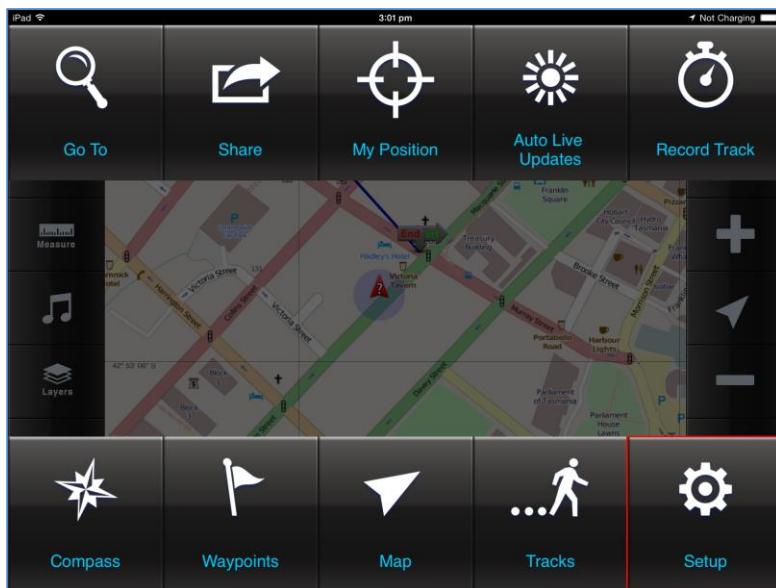
## How to add web services in the mobile application MotionX-GPS (for Apple's iOS)

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

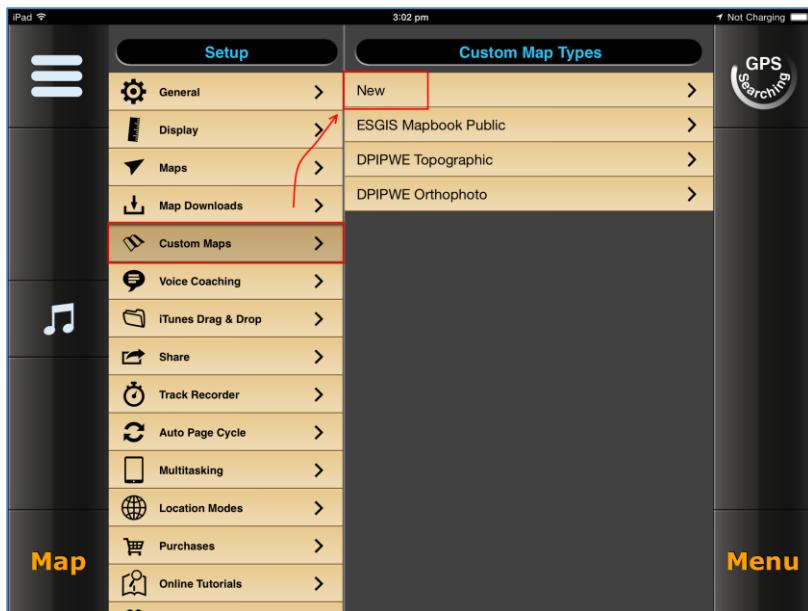
- After installing the MotionX-GPS application on your Apple mobile device, open the application and press on the **Menu** button in the bottom right of the screen



- Then press on the **Setup** button



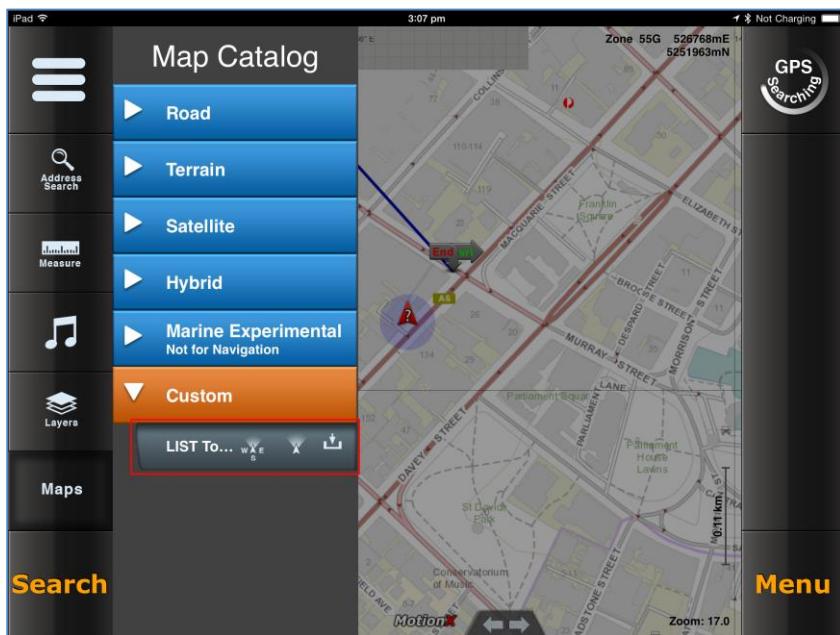
- Under **Custom Maps**, select **New**



- 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 **Yes** 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

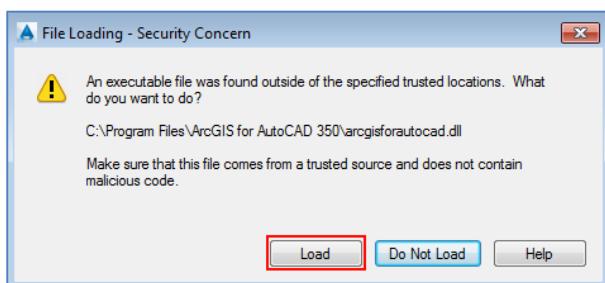
### Download and install autocad service packs and ArcGIS for AutoCAD plugin

- 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.



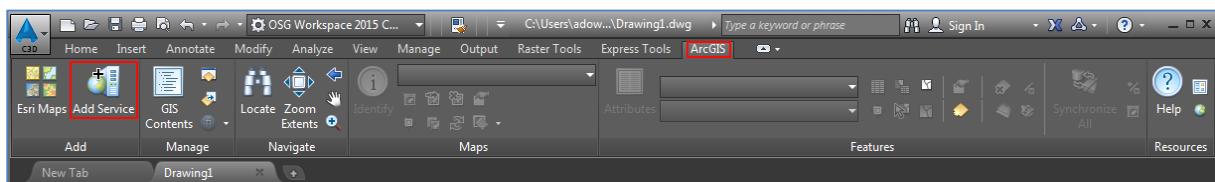
- As the service extents of some services cover the mainland of Australia, it is recommended that the zoom limits of your AutoCAD drawing file are restricted to the zoom level of Tasmania prior to adding services.

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

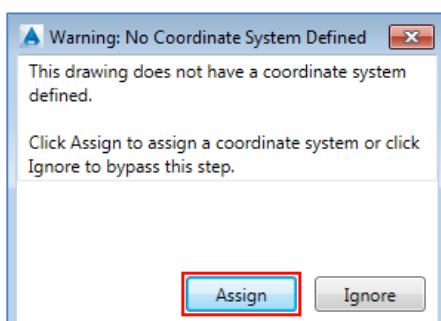
The settings applied will enable the user to enter the command **ZL** (Zoom Limits) into the command line to display at the zoom level of Tasmania.

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

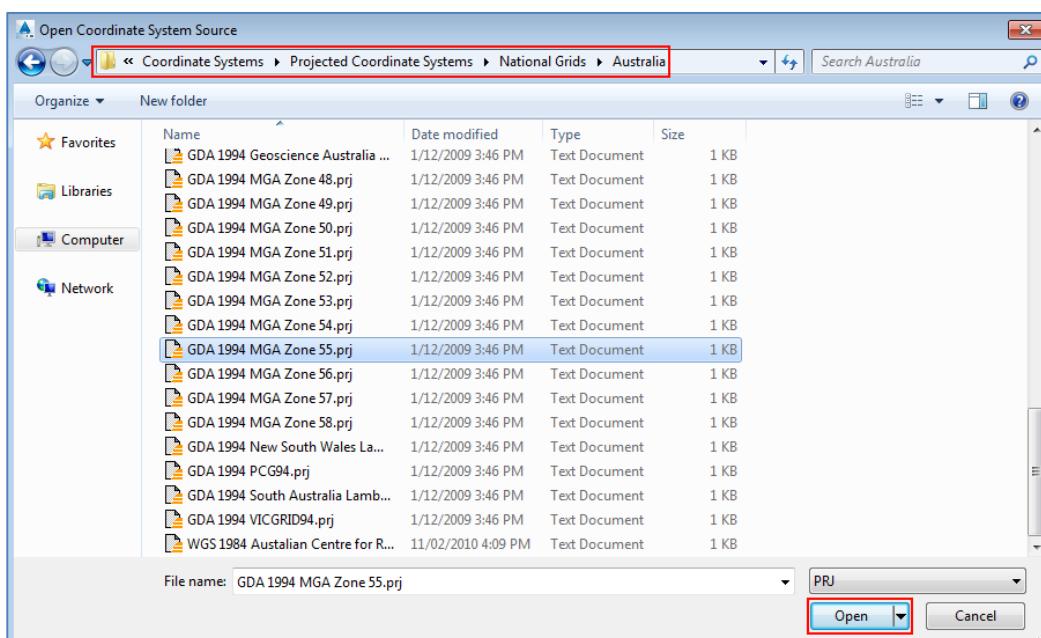
- Select the **ArcGIS** ribbon and click the **Add Service** button



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



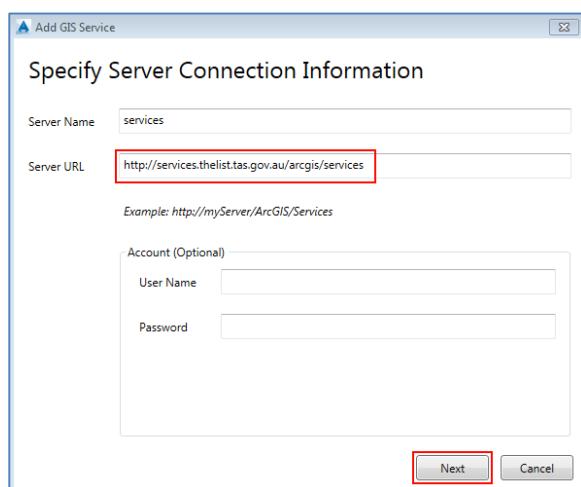
- Select a coordinate system from the available options (e.g. GDA 1994 MGA Zone 55). Click the **Open** button. The selected coordinate system is used by ArcGIS for AutoCAD to project ArcGIS web services on the fly in AutoCAD.



- 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/services** and hit the **Tab** key. Leave the User Name and Password text boxes blank and click the **Next** button.

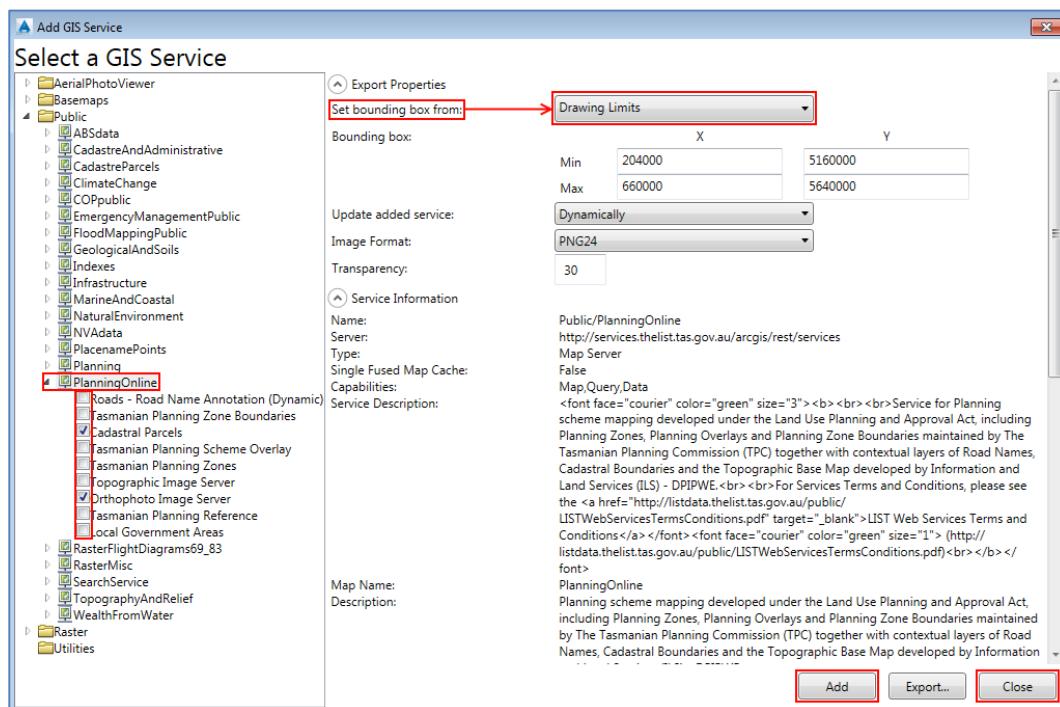


- Expand the folders in the **Select a GIS Service** dialog box to see the available services. Expand the categories to see the available layers within each service. The layers to be added to the drawing can be selected by clicking in the **Check Box** adjacent to each layer name.

## LIST Web Services

### User Guide

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



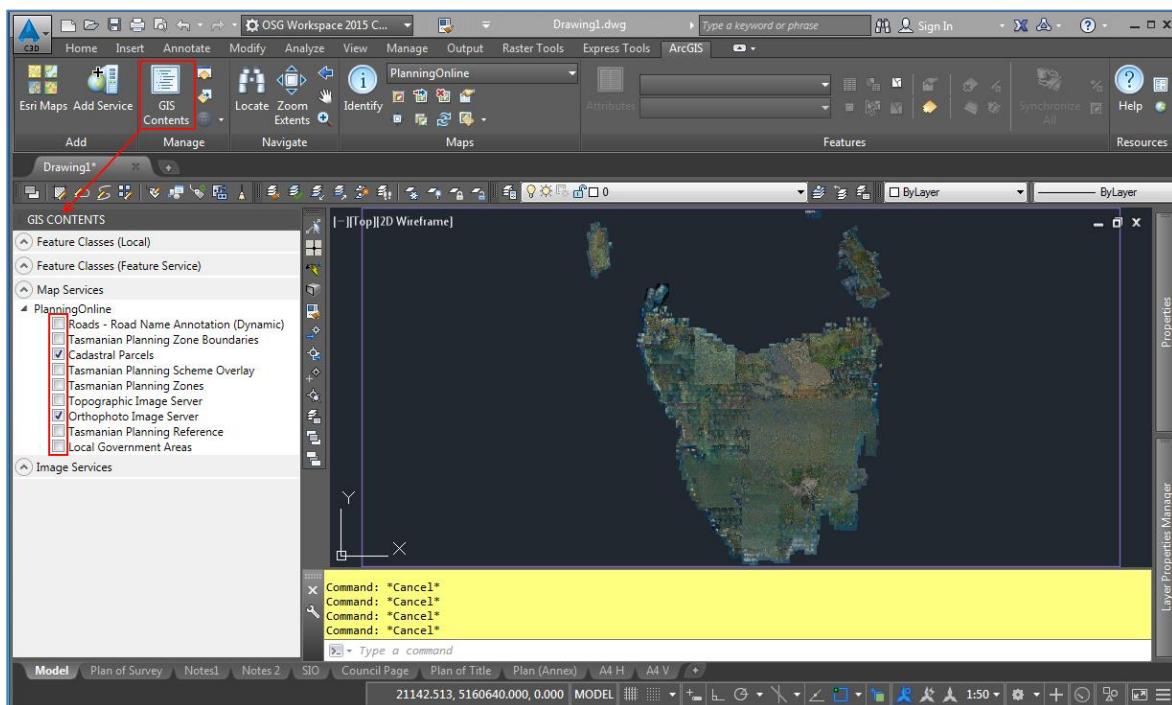
- Type **ZL** (Zoom Limits) into the command line. The service is now displayed at the zoom level of Tasmania.

**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 Web Services

### User Guide

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



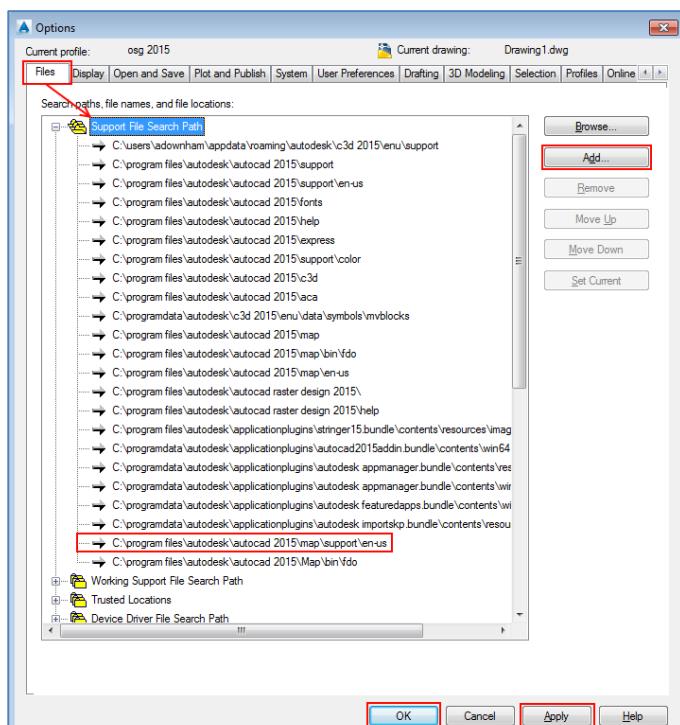
## Adding WMS services to AutoCAD Civil 3D

**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.

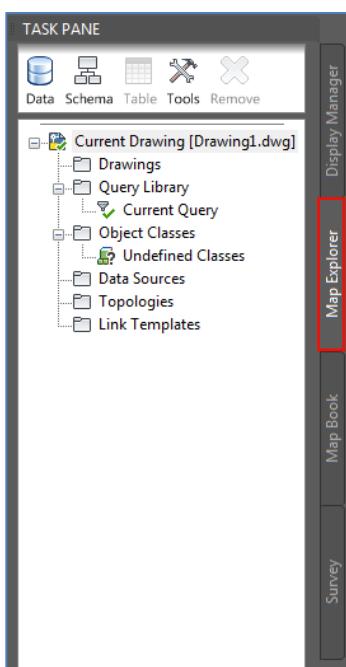
- Within AutoCAD type the command **OP** into the command line and press **Enter** (Options dialog box is opened)
- Select the **Files** tab and expand the **Support File Search Path** section
- Click the **Add...** button and add the path: **C:\program files\autodesk\autocad 2015\map\support\en-us**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



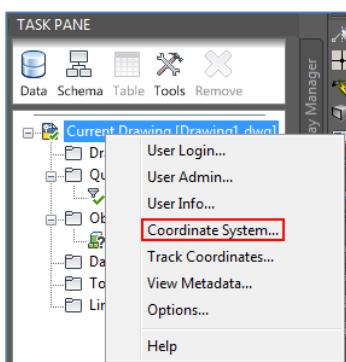
### Assigning a global coordinate system to your AutoCAD Drawing

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 press **Enter**. Press **Enter** again to select the **On** option and activate the Task Pane.
- Select the **Map Explorer** tab on the **Task Pane**



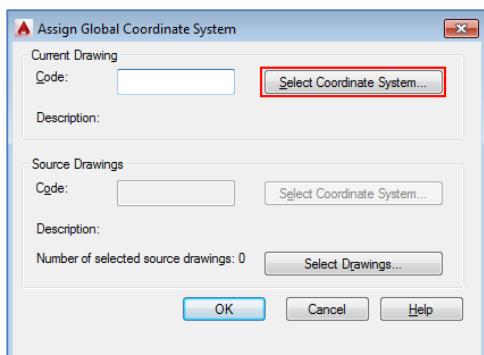
- Right-click on the **Current Drawing** text and select **Coordinate System...**



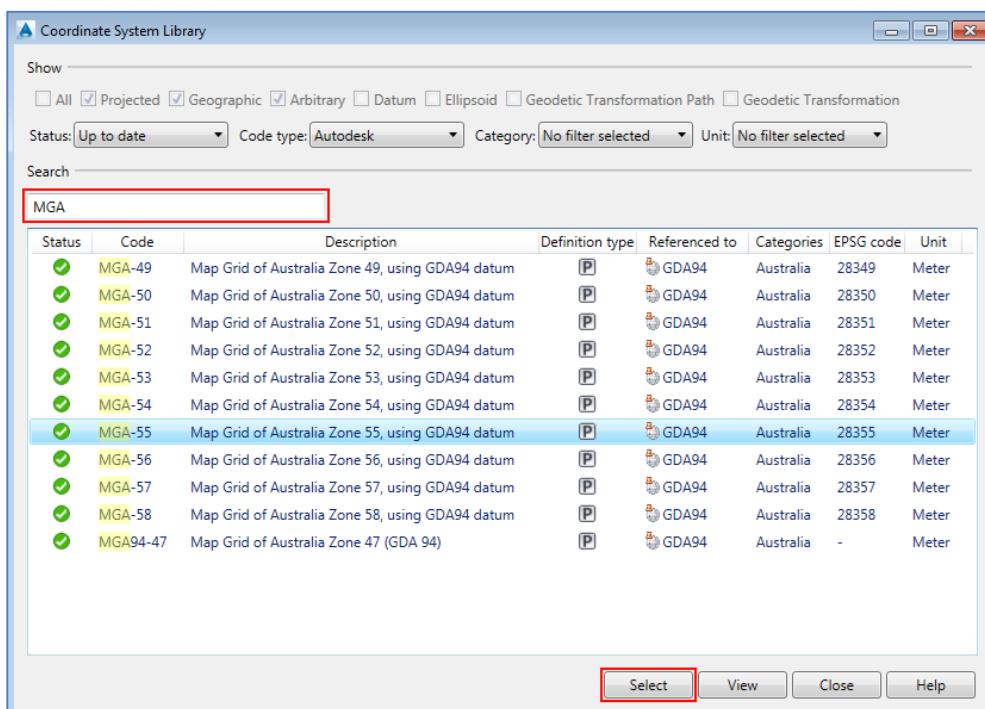
## LIST Web Services

### User Guide

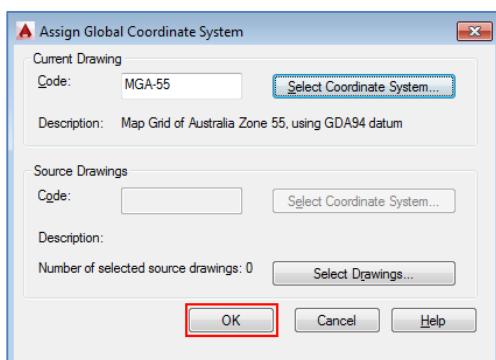
- Click the **Select Coordinate System...** button



- 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.

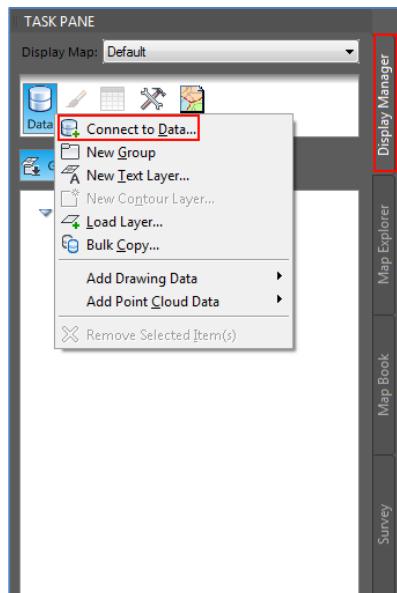


- Click the **OK** button to accept the global coordinate system.

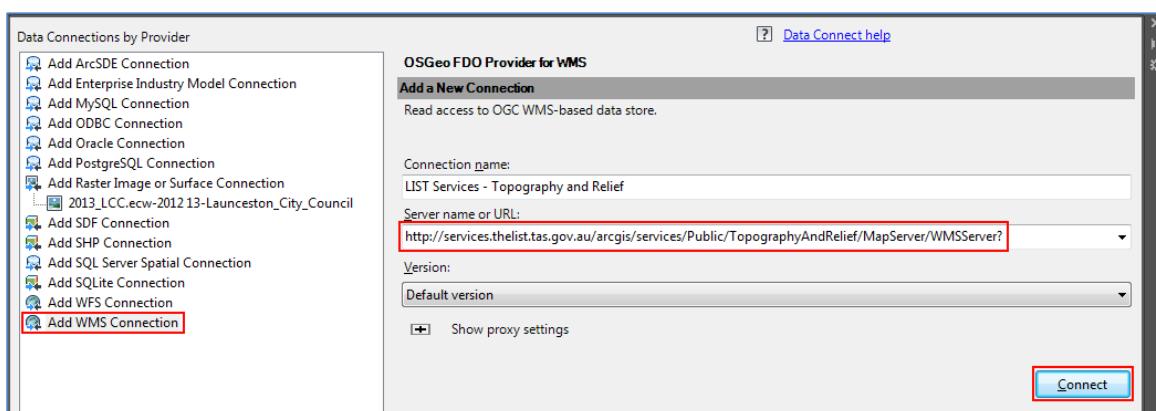


## Adding WMS services to AutoCAD Drawing

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



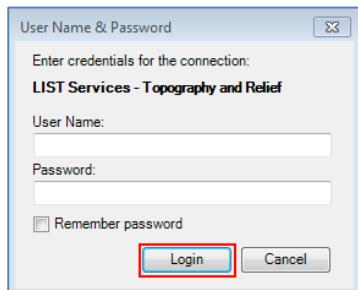
- In the Data Connections by Provider list select **Add WMS Connection** then in the URL box, type in a valid URL such as **<http://services.thelist.tas.gov.au/arcgis/services/Public/TopographyAndRelief/MapServer/WMServer?>** Click the **Connect** button.



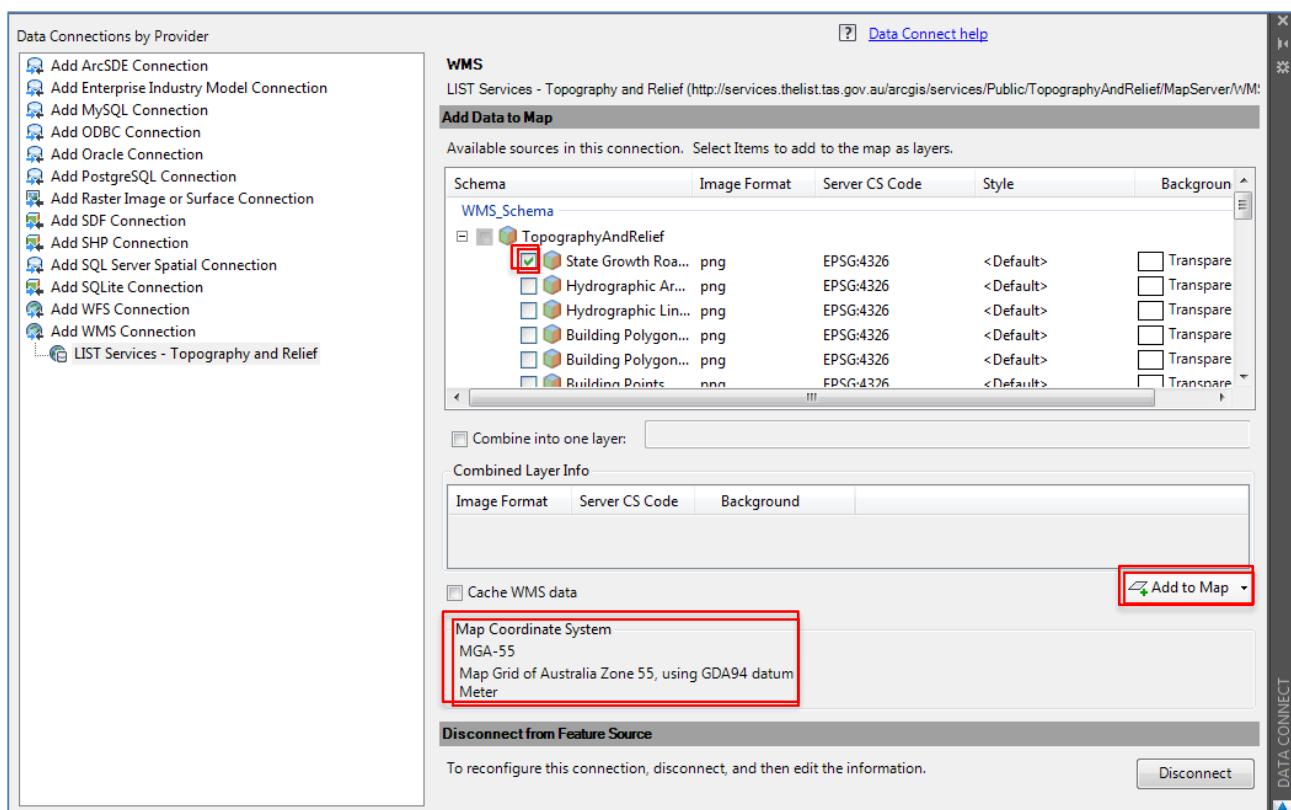
## LIST Web Services

### 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)