# NIWA Quantum Map HowTo

Create a complex map with defined symbology, using both remote and local layers.

Introduction.

This document will show how to use NIWA Quantum map to create a relatively complex map. You can download NIWA Quantum Map from: https://www.niwa.co.nz/software/quantum_map

The map we will create here will include WMS and WFS layers from NIWA web services and a dataset downloaded from a web site and stored as a local file. We will use the transparency capability to enable one layer to be seen through another and set up the symbology of point layers to clearly show different types of features (as well as the dataset permits). We will save the project, so all the settings are saved, & the project can be reopened as desired.

Users can create exactly the same map, or choose their own symbols, etc. The techniques shown here can be applied to other datasets as desired, so this is very much an example of some of what Quantum Map can do.
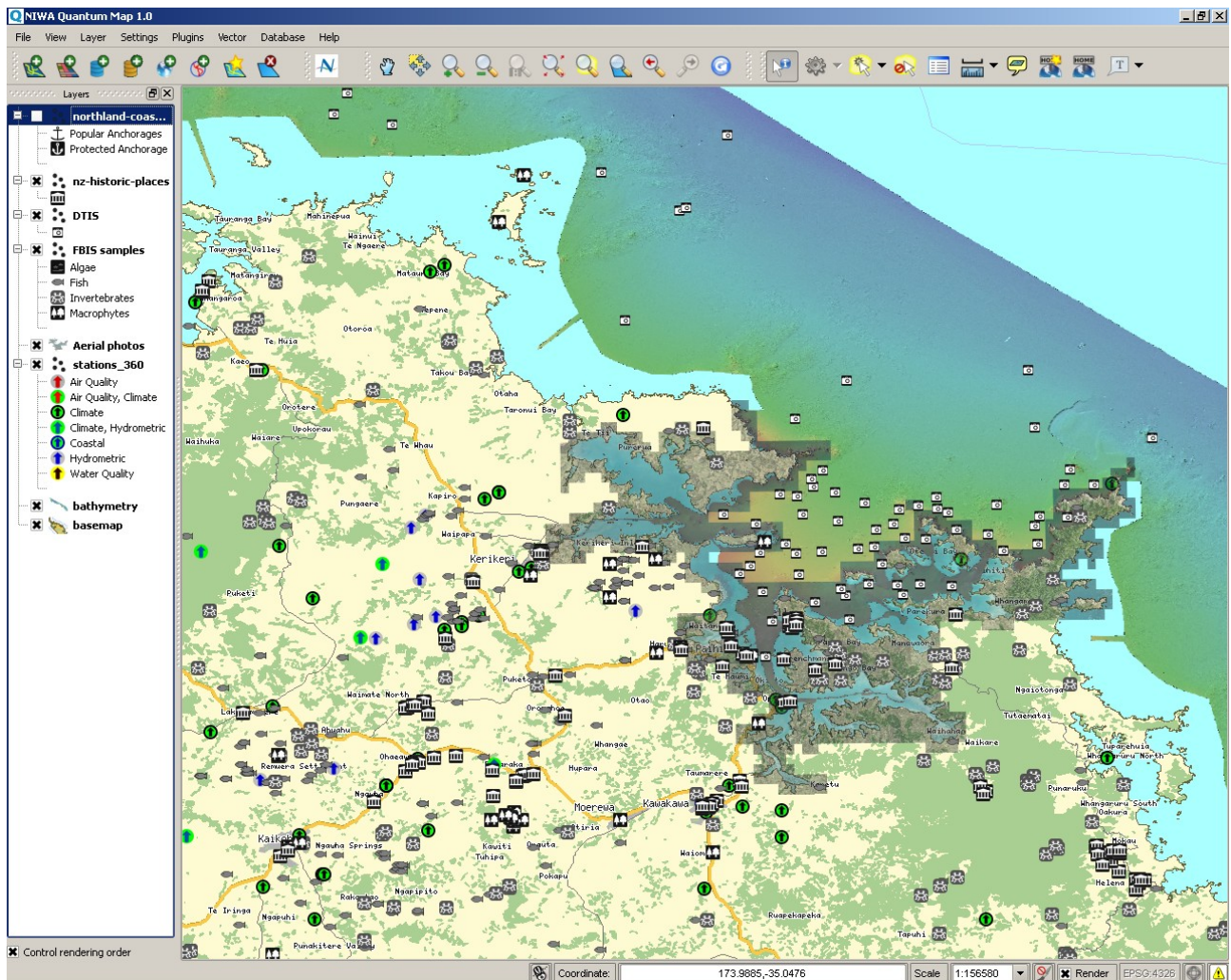
This shows the final map, zoomed in around the Bay of Islands. Sites of seabed photographs are shown with a camera symbol, historic sites are shown with the building symbol, freshware biodiversity observations are shown using different symbols for fish, invertebrates, algae and macrofauna, and NINWA's climate and hydrometric observation sites are shown, using different symbols to identifty the various types of station. The aerial photography will be made partially transparent, so the land and the seabed bathymetry layers can be seen through it. The map background colour will be set to a colour representing the sea, rather than the

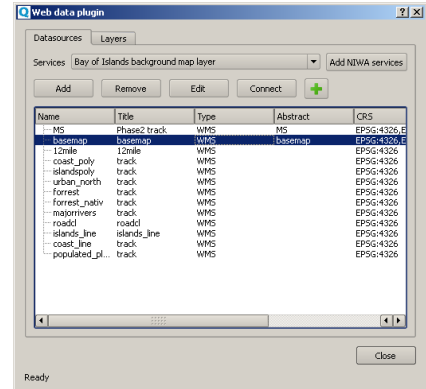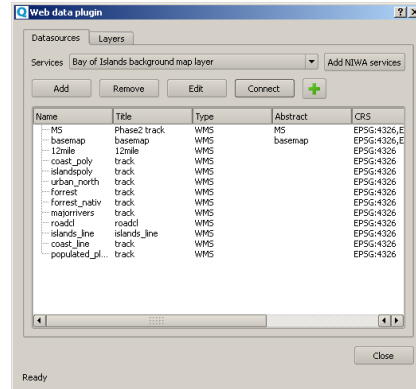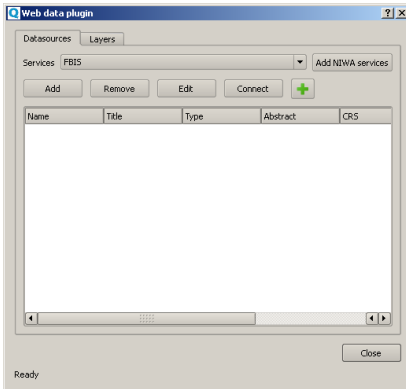white default.

Managing symbology.

Assuming you have successfully downloaded and installed Quantum Map, follow these instructions to create the map.

Start Quantum Map by clicking on the desktop icon: This will start the program with a blank map.

Start the NIWA plugin ( ) to locate and select the NIWA data layers you want to use:

1. Open the Datasources tab, and click "Add NIWA services". This will take a few seconds. The tool is connecting to the NIWA web site to download the current list of available services.

2. Click the Services bar, choose Bay of Islands Background and click "Connect" to connect to the web service and see what layers are available from the service.

3. Click the basemap layer to select it, then the ⊞ button to add this to your layers list

4. Repeat steps 2 and 3 to add the following layers from the specified services in the same way:

Service:	Layer:
Bay of Islands Aerial Photos	NZOIDATA.OS2020_BOI_AERIALPHOTO_COLOUR
FBIS	Samplingevents (this may take some time to download all the data)
SIMS station dataset	stations_360
Bay of Islands bathymetry	bathymetry
OS2020 Bay of Islands survey stations positions	DTIS

Note: DTIS is NIWA's Deep Towed Imaging System, used for seabed photographic and video transects.

5. Click the "Layers" tab in the NIWA tool, to see the list of layers you just selected. This list is stored so you do not need to repeat these steps every time you need to open a layer.

6. Select the basemap layer and click the "Add to map" button. Repeat for the bathymetry, "0" (aerial photos) layer, sampling events, stations_360 and DTIS layers. Each layer will be added to your map, with the data being automatically retrieved from the NIWA web service as required. The map is looking very cluttered, and the points are shown as simple coloured circles, so we will now change the map & layer symbologies.

If you want to change the order the layers are plotted, you can click on one of the layers listed in the left hand frame and simply drag it up or down, to wherever you prefer. You can also use the navigation tools to pan or zoom in and out. The mouse wheel can also be used (when the cursor is in the map canvas) to zoom in and out. By clicking on the X beside each layer, you can turn the layer off or on.
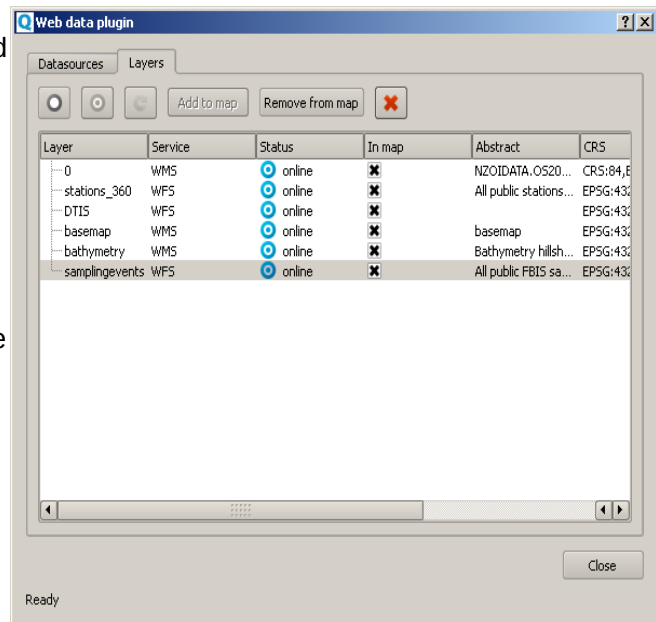
7. We will now change the background colour from the default white to a more appropriate colour for the ocean, which is really the background of this map. Click "Settings" in the top menu bar, then choose "Project Properties". There is a white bar beside the "Background color" text. Click this bar and choose the new colour to use. Click OK to set this. Note that until the map redraws, the colour will not actually change.
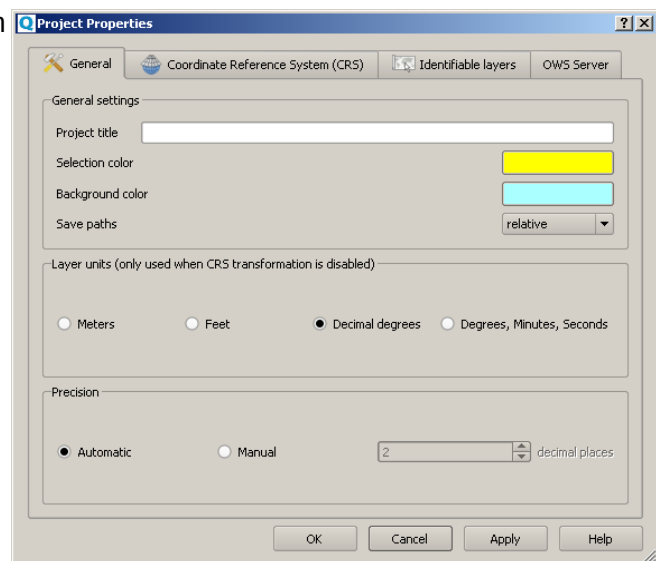
NOTE: At any stage in the process described in this document, you can click "File" in the top menu (or press CTRL-S) and save the project, using a name you choose. This creates a file describing all the layesr and Quantum Map configuration, so you can reuse the same project, exactly as it is on screen, to be reopened whenever desired.

8. We will now make the aerial photo layer partly transparent, so the land and seabed layers can be seen through it, but the photo detail is still visible.

Double click the "0" layer (aerial photos) in the left frame, to bring up the layer properties dialogue.

Use the transparency slider control to set transparency for this layer to about 45%, or whatever value you believe is appropriate.

You can move the window and click "Apply" to try different values before clicking "OK" to set the level of transparency.
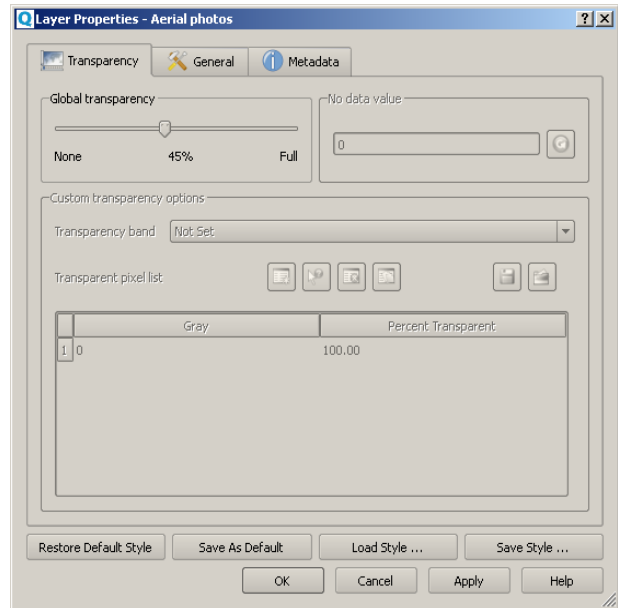
9. The simple points used to represent features do not convey much information about each point, we will now change the symbology of the point layers to use more meaningful icons. Double click the stations_360 entry in the layer list to bring up the layer properties menu for this layer.

Quantum Map provides several ways to depict how features are rendered in the map. Only one is shown here, you can experiment to see what else is available, or see the full QGIS documentation at: http://qgis.org/en/documentation/manuals.html
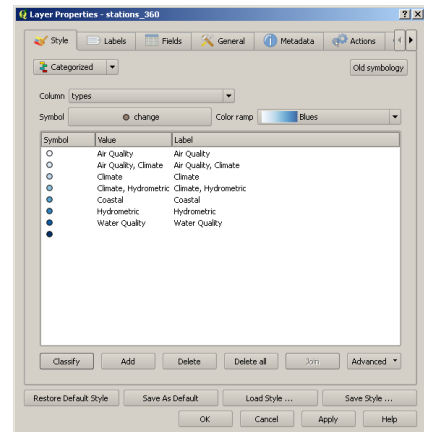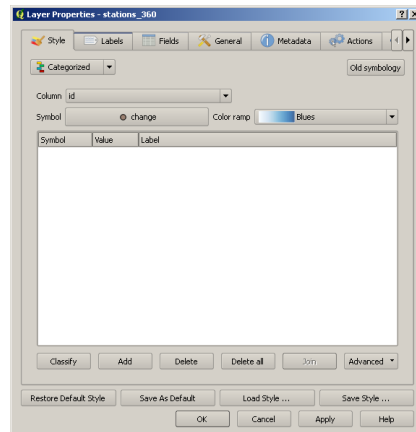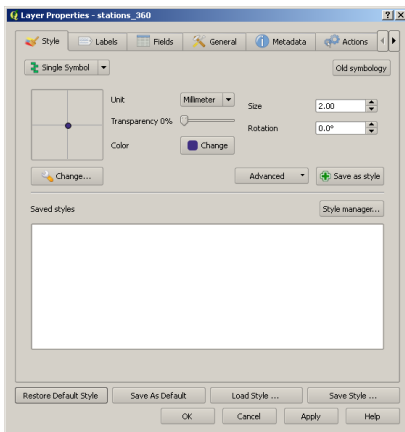
10. Click on the "Single symbol" button and change the style to "Categorised". This allows you to divide the features of a selected layer into classes, based on attributes of the features.

11. The options cjhange to allow you to define the categories. Click the "Column" bar and select "type" as the attibute to use to classify the data.

12. Click "Classify" and Quantum Map will assign a symbol to each value in the "type" column. Initially this uses a colour ramp, as above, but we will change that for this layer. Double click the top symbol shown (Air Quality Station).
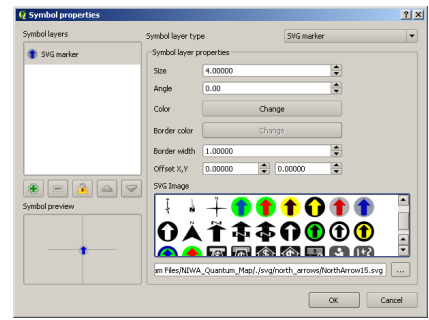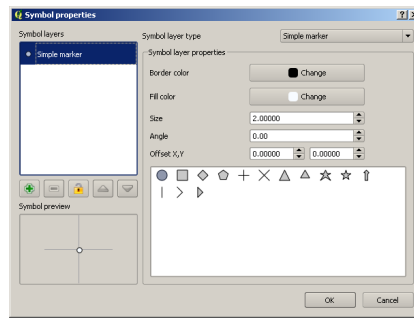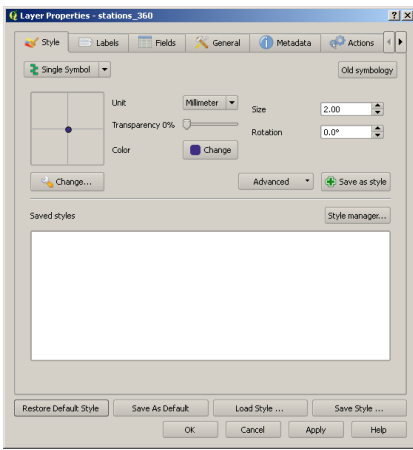
13. You can now set the symbol used for this class of features in this layer, as above

14. Click on the Symbol layer type list and select SVG marker. Quantum Map comes with a set of symbols that can be selected.

15. You can choose a symbol & set the size, etc. here.

16. Click OK once you have chosen and set up the symbol you want, click OK to confirm this in the previous window, and repeat steps 12 to 15 for each of the classes. Finally click OK to confirm the symbologies for all the classes in the layer have been set, and your map will have symbols for each type of station in the layer. Remember to save the project at regular intervals, so your settings are saved.

17. In the left hand layer list, to the left of the stations_360 layer name, there is now a "+" symbol. Click this and the layer list will display the classes for the layer, providing a map key for the displayed symbols.

18. Repeat steps 9 through 17 for the FBIS layer, but choose the "sample_types" column to classify the data. Choose symbols for fish, invertebrates, algae and large plants (macrofauna).

19. Choose the "Info" tool on the tool bar and click the stations_360 layer in the list (make this the active layer). Now click on one of the stations on the map. You will see a wondow with a list of the attributes for the selected feature, in the example here, a NIWA station capturing climate and hydrometric data which has been running since 1990.
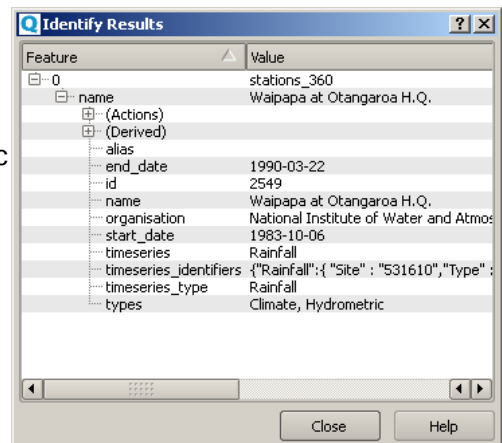
That is all for the NIWA data and symbology HowTo. The second part of the document illustrates how to download data, store it locally and add this to your map as a new layer.

Displaying local data.

Various users may have their own data they want to see on the map. Quantum Map can open and display data stored in many different formats, from text files with point coordinates, to ESRI shapefiles & Mapinfo files, to directly accessing spatial databases. This example will cover downloading a spatial dataset over the internet, and adding this as a layer to your map. If you already have a local dataset, in this case a shapefile, you can use this instead of downloading another one.

1.The website we will get our dataset from is https://koordinates.com. You need to create an account on this website to download data, but much of the data available there is available with no charge. Some datasets, especially larger ones, do incur a fee. In your web browser, connect to the Koordinates website and create your account.

2.   Once you have your account (which requires a working email address) you can search for and download a wide range of datasets, mostly around New Zealand, but some from other countries.

Type "historic" in the search bar, as shown and start the search. Several datasets are found. We will use the "NZ Historic Places" dataset provided by Ollivier and Co.

Click on the dataset name to see a description of what it contains.

Click the orange "Add" button to see the data on the Koordinates map.

Click the green "Download or Order" button to obtain a copy.

To avoid having to deal with data in different projections, we will download a version with coordinates in latitude/longitude degrees (the same as the NIWA data), in the ESRI shapefile format (a very common format for spatial data). Despite being called a shapefile, the "shapefile" actually comprises at least three separate files, including a .shp file with the spatial feature information, and a .dbf file with the attribute information for each feature.

Your download window will look much like this. Make sure the Map Projection is set to "WGS84 (EPSG:4326 Lat/Long)", and the "Vector/tables as" is set to Shapefile, then click the "Accept terms and create download" button. Koordinates will automatically create the shapefile for you, and send you an email with a link where you can download the file.

Download the file and unzip it onto your computer, noting where the unzipped files are stored.
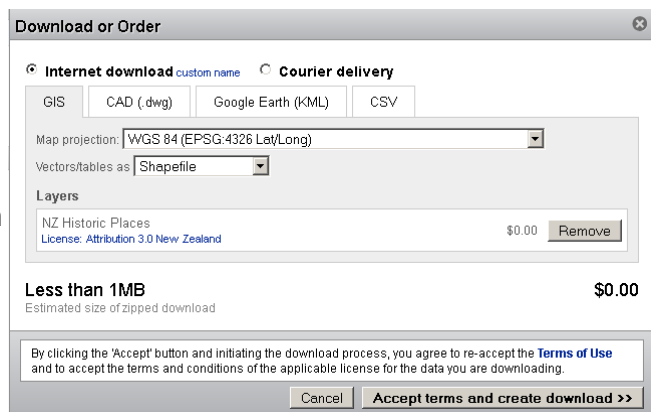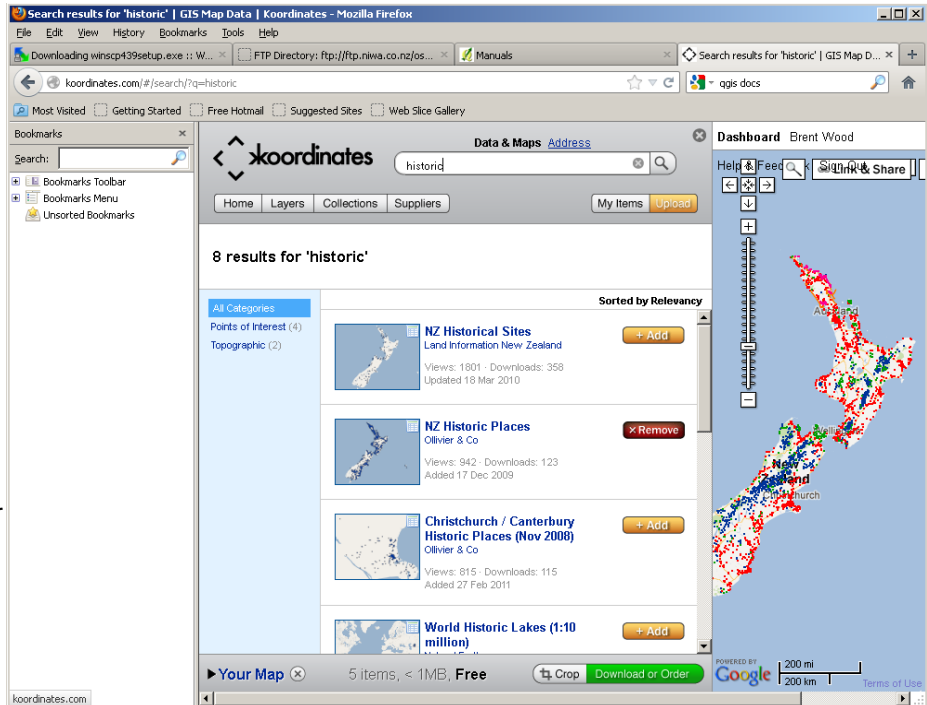
3. You now have some local data to can add to your map. Click the "Add vector data" icon on the Quantum Map toolbar (or use the Layer menu item).

Ensure "File" is selected, then click "Browse". You will get a typical file browser window, navigate to where you extracted your shapefile, select it and open it in your map.
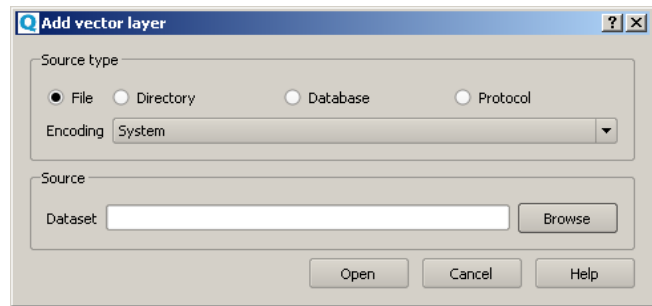
4. You now have another layer, overlayed on the NIWA layers, but rather than coming from the internet, this is a local dataset on your own computer. As far as the map is concerned, this does not make much difference. Note that this dataset does not have a useful column to classify the features by, so you need not carry out the classification steps, just change the simple symbol to an SVG symbol and pick a symbol appropriate for "historic places".

5. Click "File" and "Save as image" to save a copy of the map as it is on screen which you can add to a document or print. Click "File" then "Print composer" for a tool to add maps, legends, etc to a page for printing.

You now have a map, with WMS layers, WFS layers and a local shapefile. You can turn layers off or on using the layer list, which allows you to have several layers immediately available, but not necessarily displayed, to reduce clutter and make the map less "noisy". You have chosen symbols to make you map more informative, and can click on features to see information about them. The entire project is saved, so you can reopen it with all the selected layers, specified symbology and map extent shown as they were when you saved it. You can find and download other data from the internet, and add it to your map, and tiy can save the map as an image to use in other applications or print.