CNHEAT: CONVERTING BDC EXPORTS TO RASTER KMZ

USING QGIS TO VIEW GEOPACKAGE OR SHAPEFILE COVERAGE POLYGONS AND CONVERT TO A RASTER KMZ

CONTENTS

INTRODUCTION

Google Earth supports two types of layers. (Vector and Raster)

Vector layers allow for geometric objects where key information (i.e. points, vertices, line segments,…) is stored in the file and must be parsed, processed, and rendered to display on the screen. In comparison Raster layers store RGB values for each pixel with no embedded information to parse.

When vector layers are simple then Google Earth has no issue rendering them, but as they become more complex it sometimes requires a true GIS tool (e.g. ArcGIS, QGIS,…) to properly render vector layers.

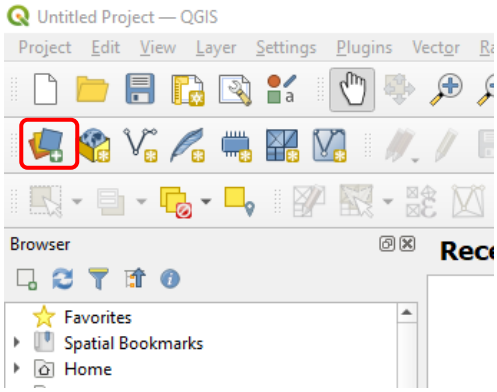
In this walkthrough we discuss using QGIS to convert the cnHeat BDC Exports (which are polygon-vector files) to a raster layer.

ADDING LAYERS TO QGIS

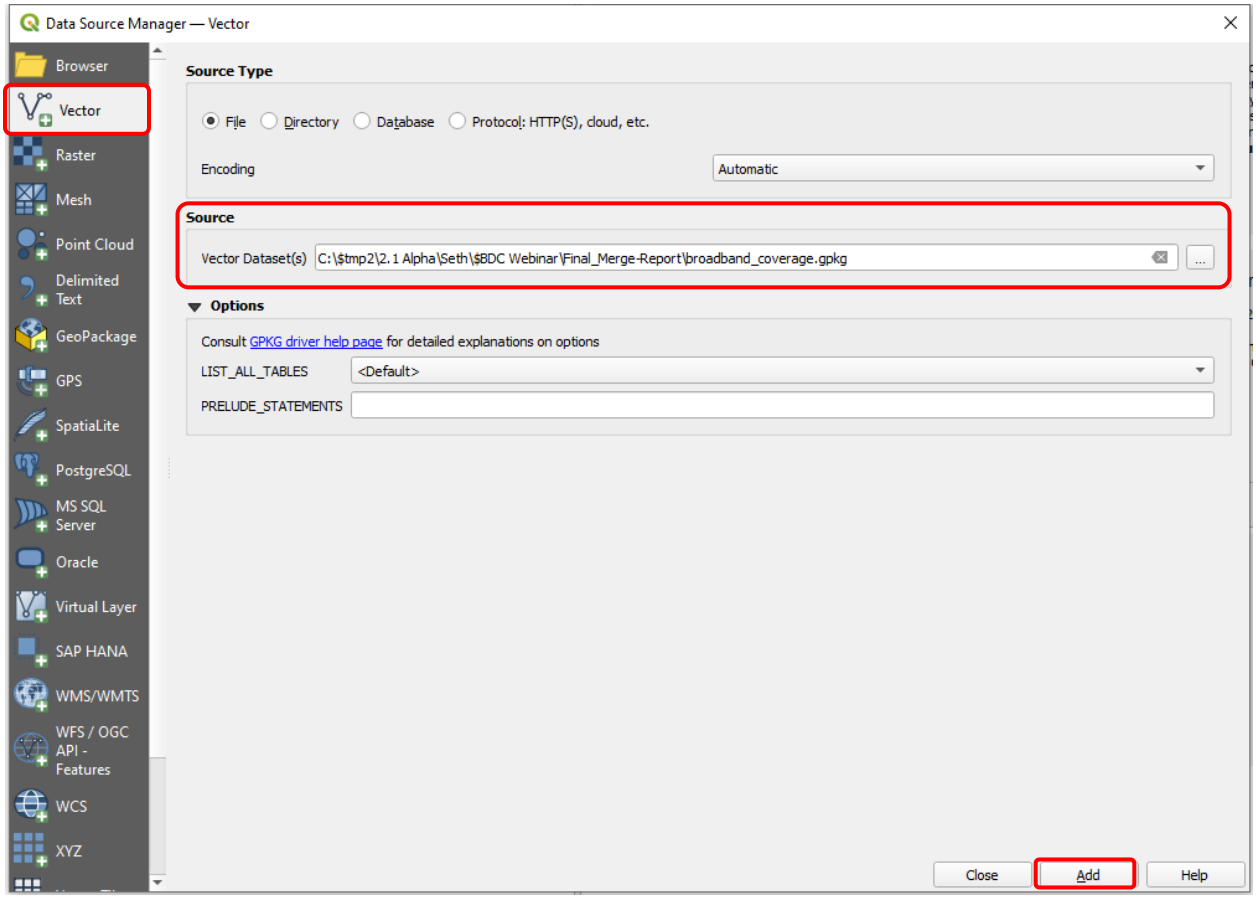
Note: cnHeat has four steps under the Export > Coverage (477/BDC) feature. Steps 3 and 4 offer the ability to download coverage polygons. Unzipping these files will present a .gpkg and (sometimes) a .zip (shapefile) of polygon coverage. We recommend using the GeoPackage (.gpkg) for this exercise.

LOAD THE CNHEAT COVERAGE POLYGON

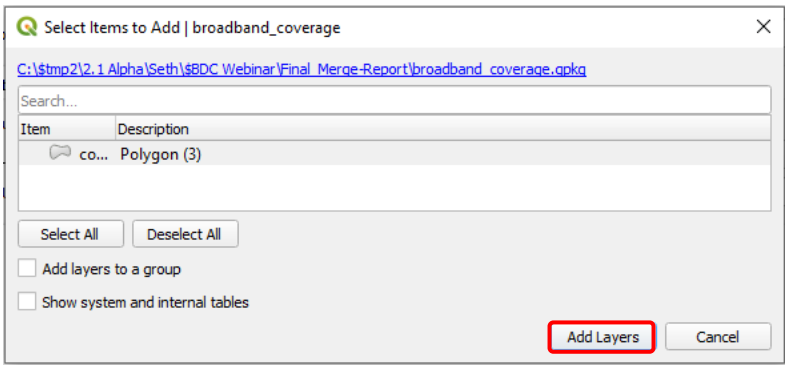
- Open the 'Data Source Manager' with either Ctrl+L or by clicking this icon in the toolbar.



- Make sure ‘Vector’ is selected from the left and load the .gpkg file downloaded in Step 3 or 4 of the cnHeat Coverage Export tool.
- Click ‘Add’.

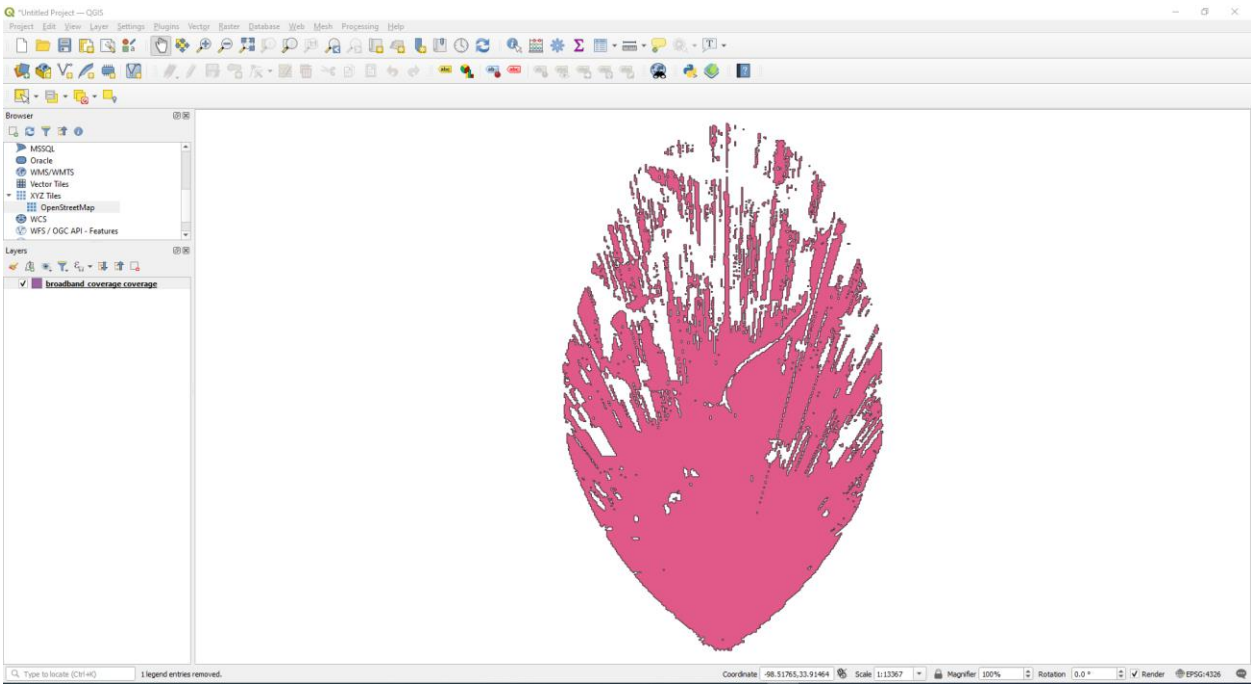


- Click ‘Add Layers’.



- Click ‘Close’ to close the Data Source Manager dialogue to be taken back to the map view.

Results should look something like this.:

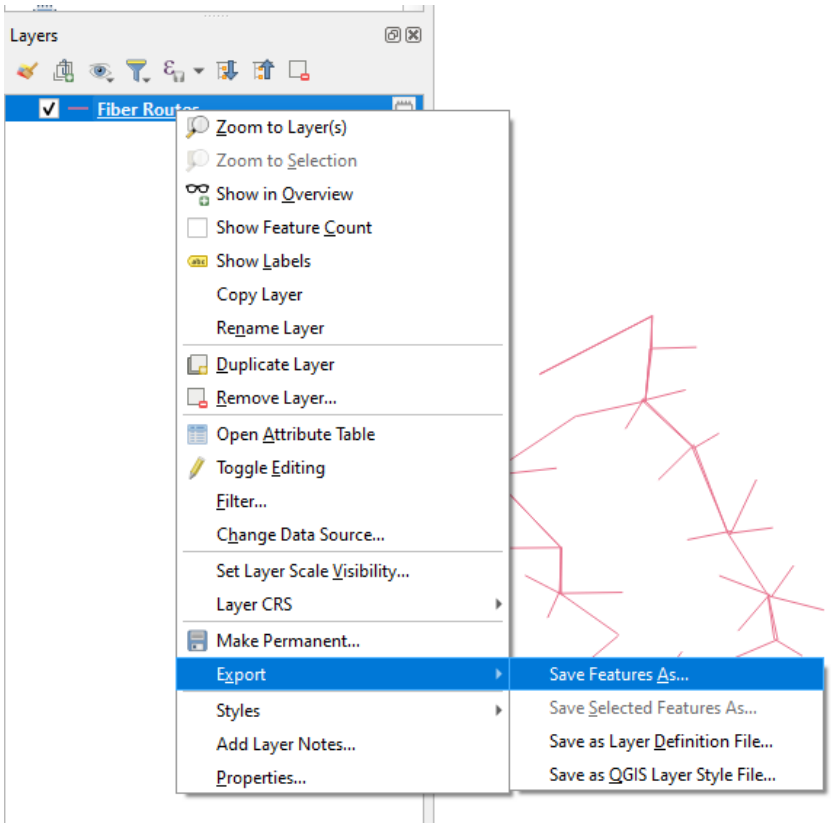


CONVERT LAYER FROM VECTOR TO RASTER

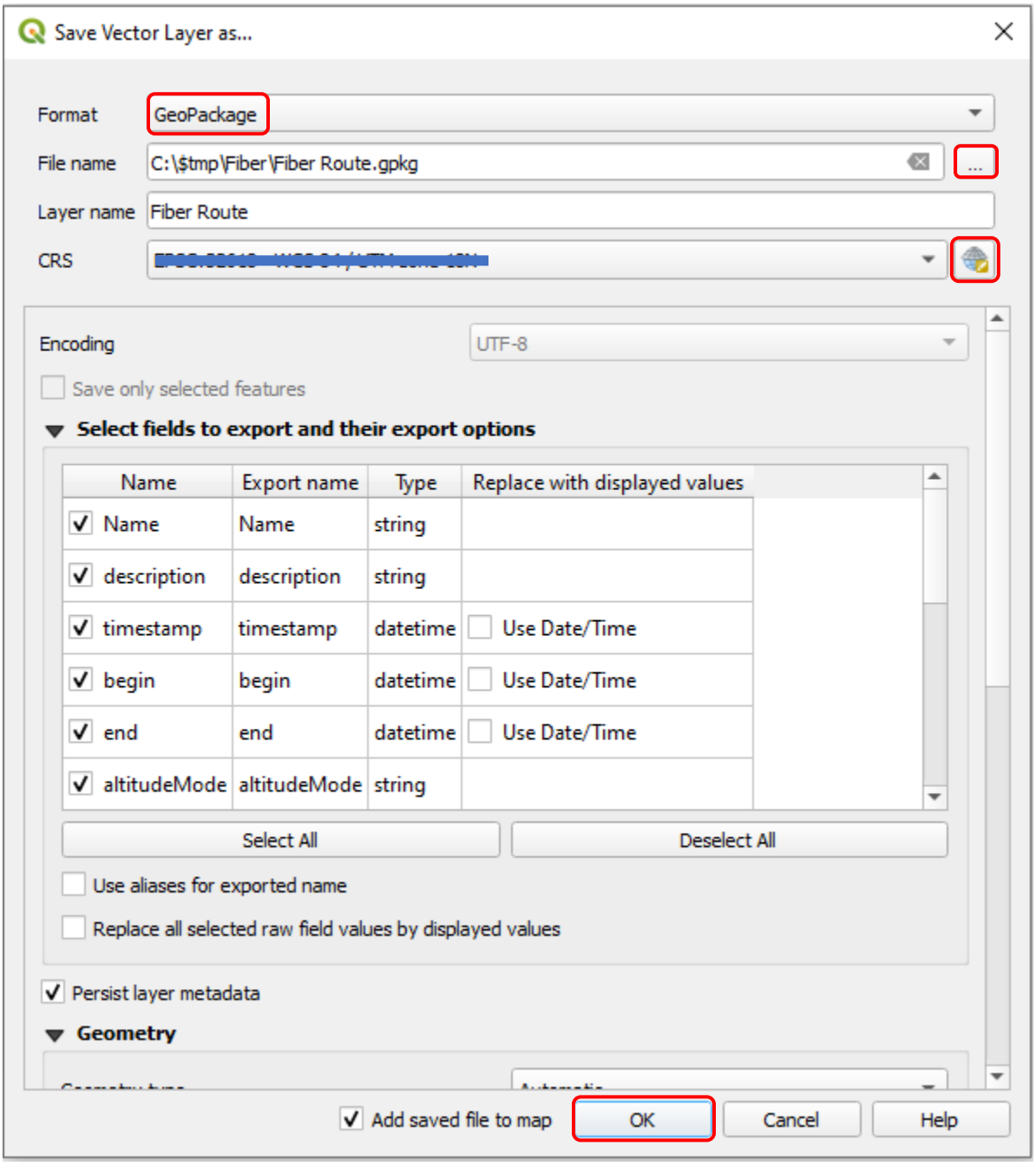
CONVERT LAYER TO A PROJECTED COORDINATE REFERENCE SYSTEM

BDC Exports will be encoded in a Geographic Coordinate System. (The units of measure will be in decimal degrees per the BDC specification.) In our process to convert to raster we need to be working in meters. This requires transforming the layer to a Projected Coordinate Reference System.

- To convert the layer, right-click the layer name and select 'Expor't > 'Save Feature As…'



- Select ‘GeoPackage’ as the Format type.
- Click the ‘…’ to select the location and file name.
- Click the globe icon to select the Coordinate Reference System. (See below for more instructions.)



It is recommended to use UTM projection with a WGS 84 datum.

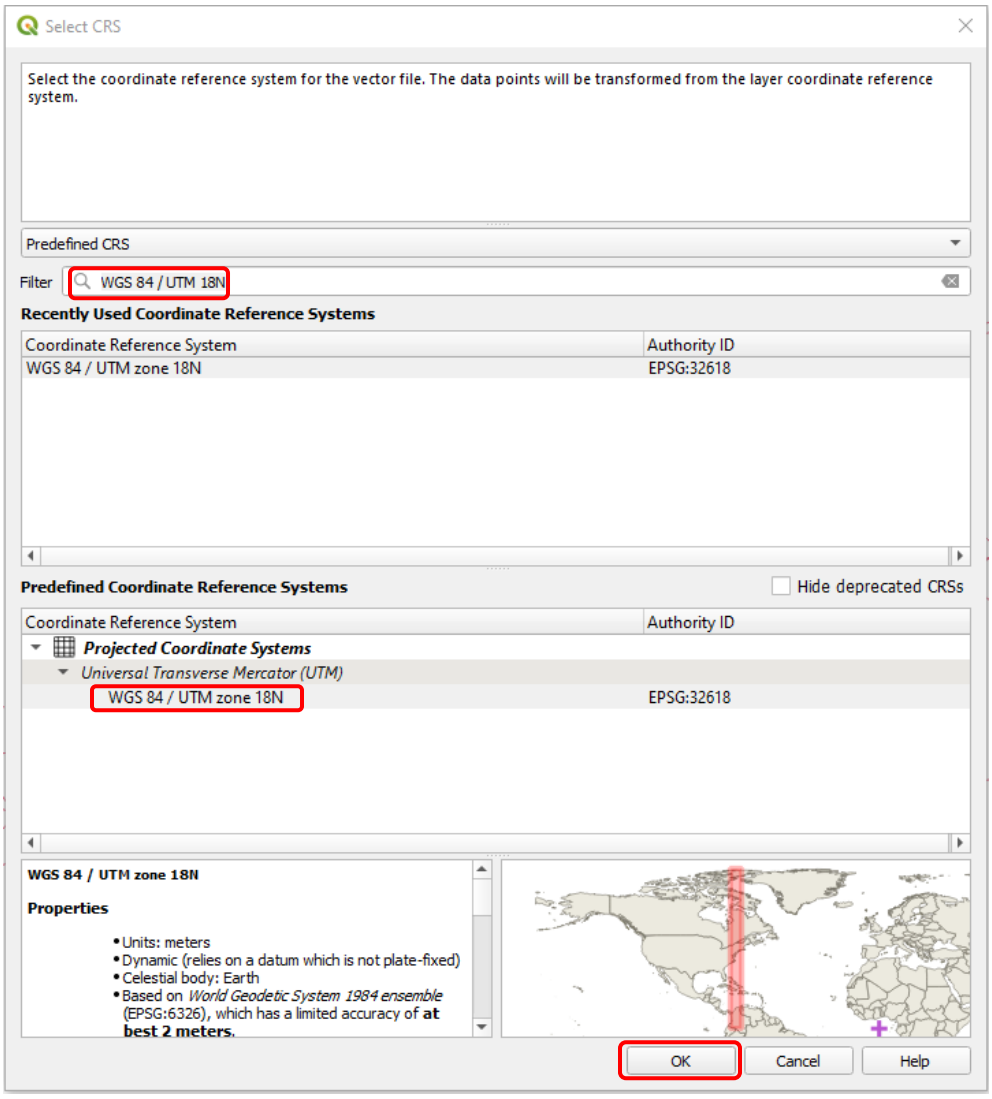
To calculate the Zone:

- Identify the longitude of a relative center point of the network. (This approach will not work if the network spans a large number of states East to West.)
- Add 180 to the longitude.
- Divide by 6.
- Round

Example: -71.75 (Longitude) => (-71.75 + 180) / 6 = 18.04167 => Rounded to “18”

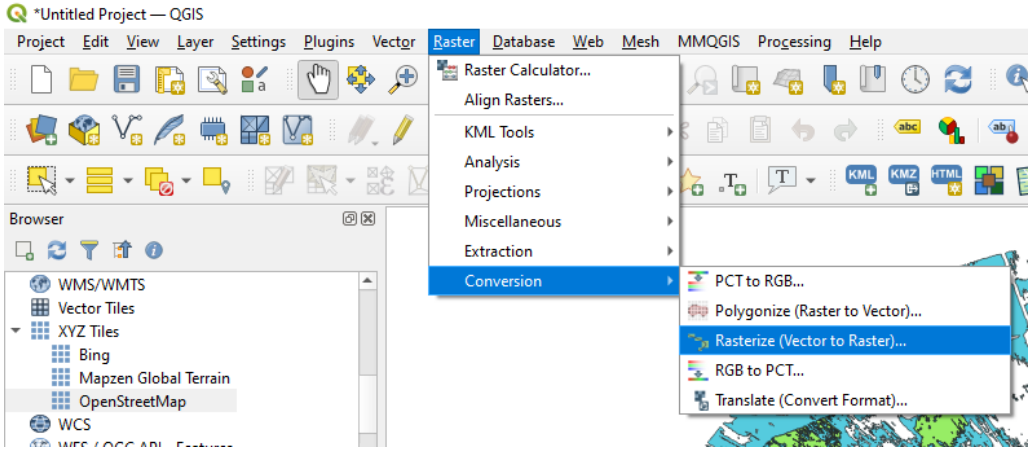
Based on this example located in the North Hemisphere the search should be “WGS 84 / UTM 18N”.

- Click the provided CRS and click ‘OK’.

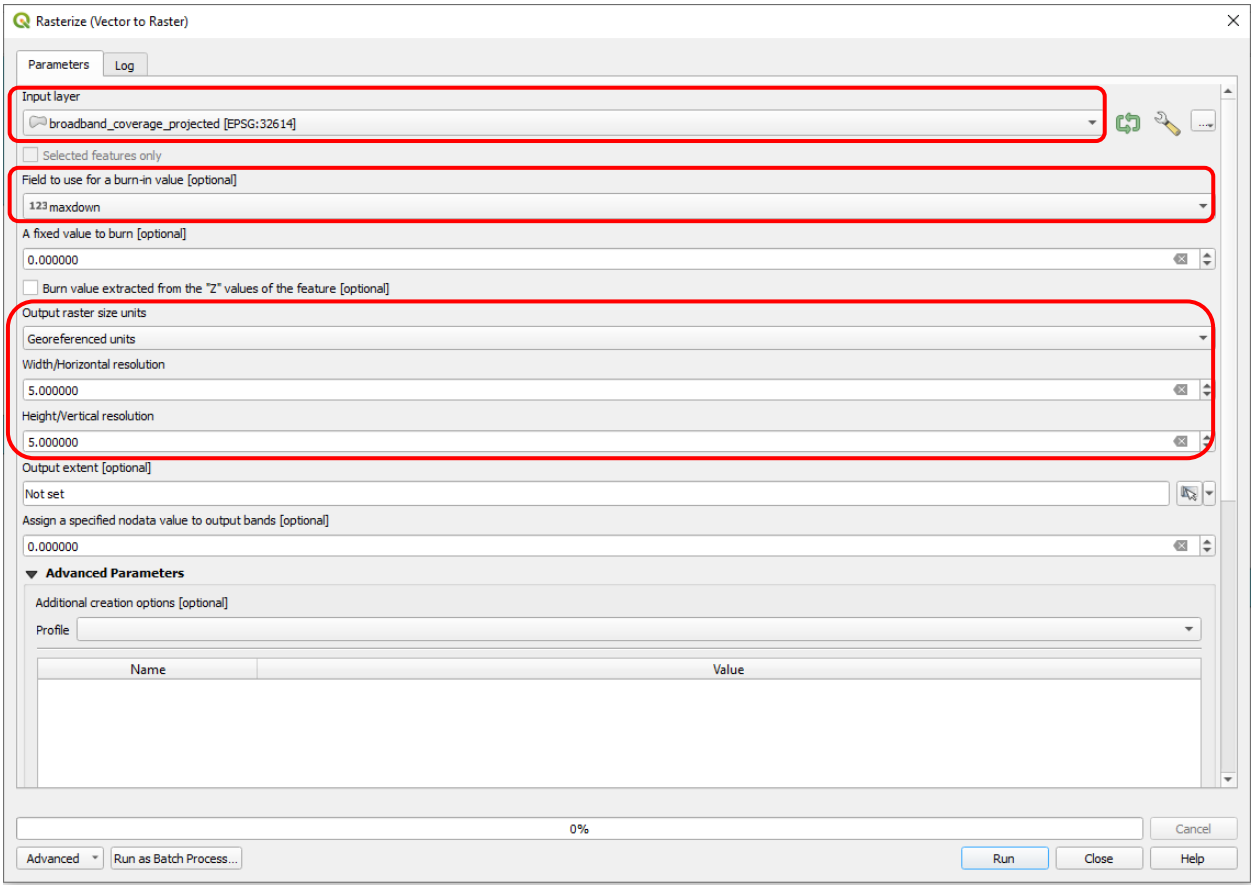


RASTERIZE PROJECTED LAYER

- Click ‘Raster’ > ‘Conversion’ > ‘Rasterize (Vector to Raster)…’



- Select the projected layer from the ‘Input Layer’ drop-down and populate the dialog box as shown.



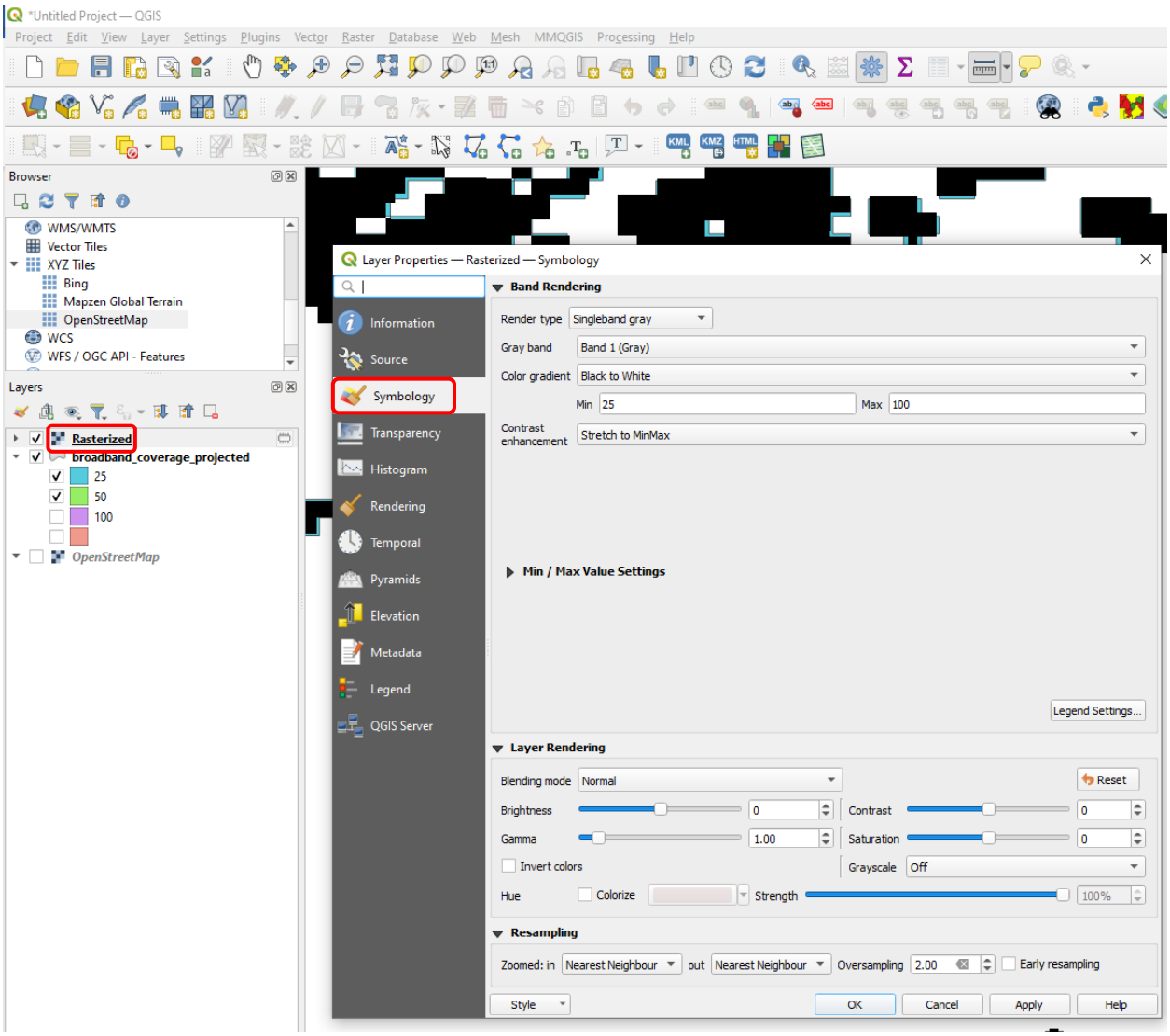
Note: The ‘burn-in value’ is the field that determines when pixels should receive a different color.

Note: BDC Exports have a 10m resolution. In this example we are oversampling to 5m resolution to account for any shift in pixels between the two reference systems.

When Rasterizing is complete, click the ‘Close’ button of the Rasterize (Vector to Raster) pop-up.

APPLY STYLING

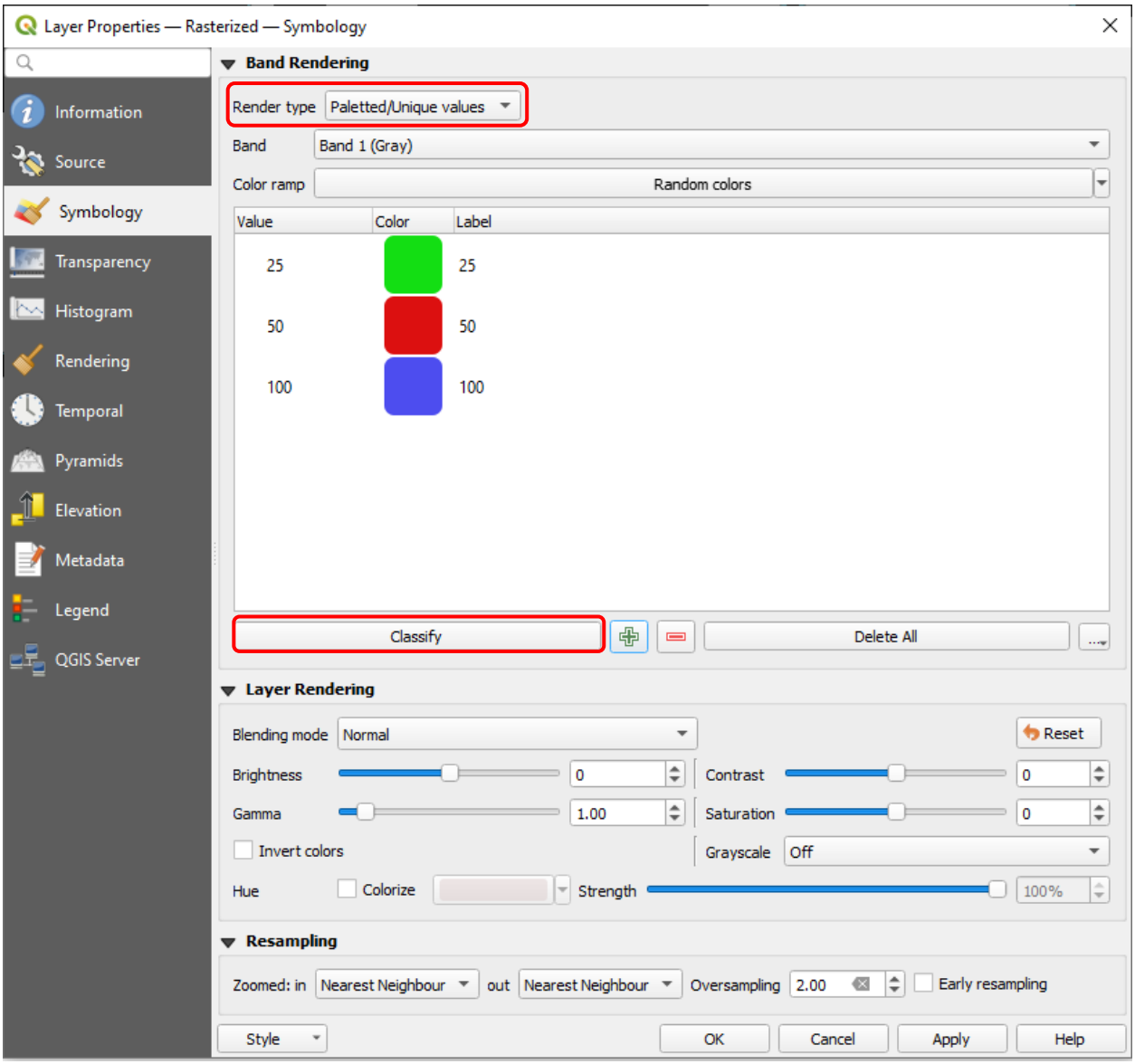
- Double-click the ‘Rasterized’ layer from the Layers menu to bring up properties for the layer.
- Select Symbology from the Layer Properties menu.



- Select ‘Paletted/Unique values’ from the ‘Render Type’ and click the ‘Classify’ button to assign colors to each possible value.

In this example QGIS is applying green to the 25Mbps signal strength, red to the 50Mbps signal strength, and blue to the 100Mbps signal strength. Double-clicking the individual colors will allow the user to customize the selection.

- Click ‘OK’ when the colors are acceptable.

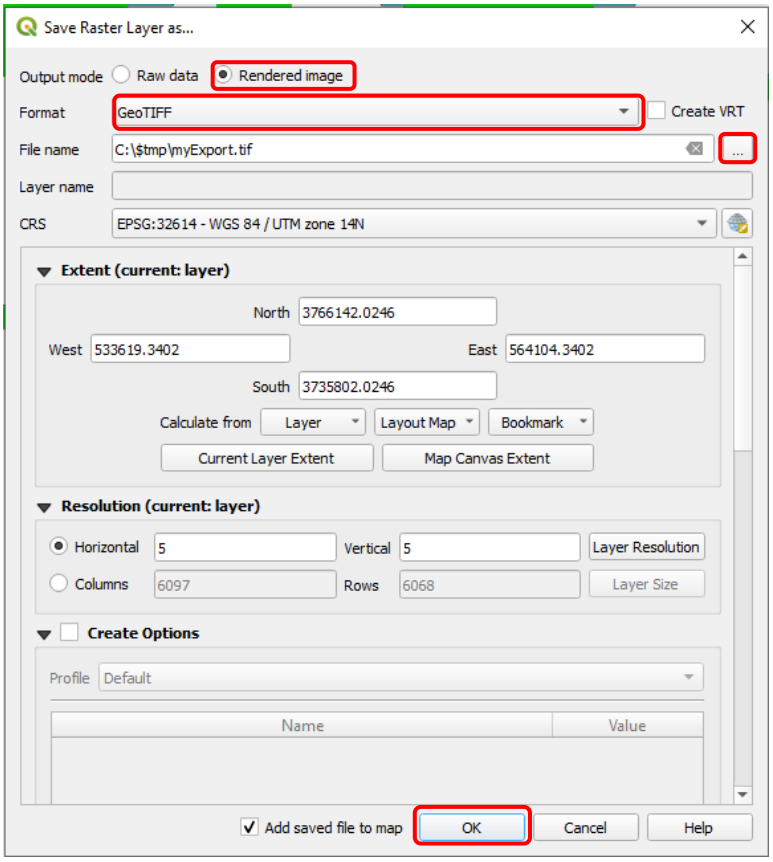


EXPORT TO GEOTIFF

- Right-click the ‘Rasterized’ layer and select Export > Save Feature As…

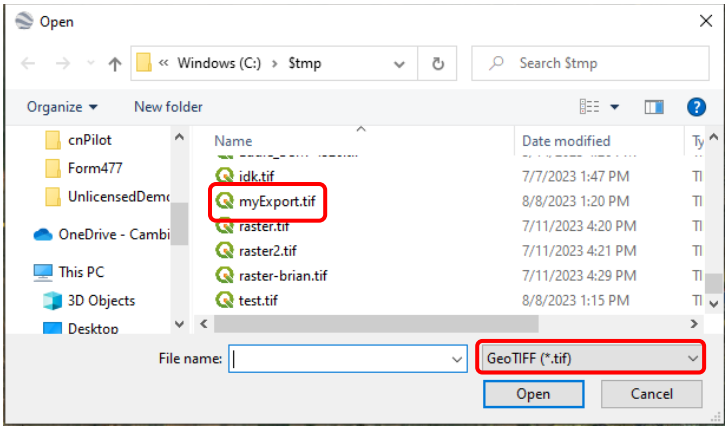
In the ‘Save Raster Layer as…” pop-up,…

- Select ‘Rendered image’ for ‘Output mode’.
- Select “GeoTIFF” as the Format type.
- Click the “…” to select the location and file name.
- Click ‘OK’.

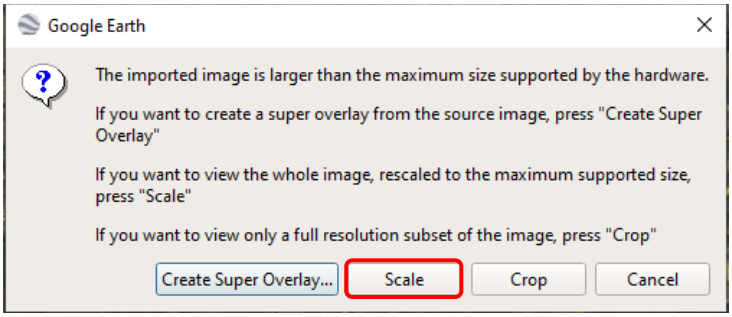


IMPORT TO GOOGLE EARTH

- Open Google Earth Pro and select ‘File’ > ‘Import…’
- Select and open the GeoTIFF saved from the previous step.



- Select ‘Scale’ from the pop-up.



- Adjust ‘Transparency’ as desired and click ‘OK’.