CNHEAT: CONVERTING BDC EXPORTS TO RASTER KMZ

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

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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'.

🔇 Data Source Manag	iger — Vector	×
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Vector	File Directory Database Protocol: HTTP(S), doud, etc.	
Raster	Encoding Automatic	•
Mesh	Source	
Point Cloud	Vector Dataset(s) C: \\$tmp2\2.1 Alpha\Seth\\$BDC Webinar\Final_Merge-Report\broadband_coverage.gpkg	
● Delimited ■ Text	▼ Options	
GeoPackage	Consult <u>GPKG driver help page</u> for detailed explanations on options	
🐫 GPS	LIST_ALL_TABLES 	-
SpatiaLite	PRELUDE_STATEMENTS	
PostgreSQL		
MS SQL Server		
Qracle		
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WFS / OGC API - Features		
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• Click 'Add Layers'.

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C:\\$tmp2\2.1	Alpha\Seth\\$BDC Webinar\Final_Merge-Report\broadband_coverage.gpkg	
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Item	Description	
🟳 со	Polygon (3)	
Select All	Deselect All	
Add layers	to a group	
Show syste	em and internal tables	
	Add Layers Cancel]

• 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.)

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		_			
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		Select All		Deselect	All
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Persist la Geome	ayer metad e try	ata			
				Automotio	
		✓	Add saved	file to map OK	Cancel Help

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'.

-				
Q Select CRS				×
Select the coordinate reference system for the vector file. The data poi system.	nts will be trar	nsformed from the	e layer coordinat	e reference
Predefined CRS				-
Filter WGS 84 / UTM 18N				
Recently Used Coordinate Reference Systems				
Coordinate Reference System		Authority ID		
WGS 84 / UTM zone 18N		EPSG:32618		
Predefined Coordinate Reference Systems			Hide de	precated CRSs
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Universal Transverse Mercator (UTM)		EDSC-22619		
		2.0002010		
4				۱.
WGS 84 / UTM zone 18N Properties Units: meters Dynamic (relies on a datum which is not plate-fixed) Celestial body: Earth Based on <i>World Geodetic System 1984 ensemble</i> (EPSG:6326), which has a limited accuracy of at best 2 meters. V		N.		
		ОК	Cancel	Help

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.

Q Rasterize (Vector to Raster)	×
Parameters Log	
Input layer	
broadband_coverage_projected [EPSG:32614]	- 4
Selected features only	
Field to use for a burn-in value [optional]	
123 maxdown	-
A fixed value to burn [optional]	
0.000000	
Burn value extracted from the "Z" values of the feature [optional]	
Output raster size units	
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Output extent [optional]	
	m3 •
Assign a specified nodata value to output bands [optional]	
Advanced Parameters	
Additional creation options [optional]	
Profile	▼
Name Value	
	-
0%	Cancel
Advanced * Run as Batch Process	Run Close Help

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.

Project Edit View Layer Settings Plugins Vector Raster Database Web McMQGIS Processing Help Project Edit View Layer Settings Plugins Vector Raster Database Web McMQGIS Processing Help Project Edit View Layer Settings Plugins Vector Raster Database Web McMQGIS Processing Help Project Edit View Layer Settings Plugins Vector Raster Database Web McMQGIS Processing Help Project Edit View Layer Settings Plugins Vector Raster Database Web McMQGIS Processing Help Project Edit View Layer Settings Plugins Vector Raster Database Web McMQGIS Processing Help Project Edit View Layer Settings Plugins Vector Raster Database Web McMQGIS Processing Help Project Edit View Layer Settings Plugins Vector Raster Database Web McMQGIS Processing Help Prove Plugins Plugins Vector Raster Database Vector
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Legend Settings
▼ Layer Rendering
Blending mode Normal 👻
Brightness 0 💠 Contrast 0 🛊
Gamma - 1.00 🗘 Saturation - 0
Invert colors Grayscale Off
Hue Colorize Strength
▼ Resampling
Zoomed: in Nearest Neighbour 👻 out Nearest Neighbour 👻 Oversampling 2.00 🚳 💠 🗆 Early resampling
Style * OK Cancel Apply Help

• 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.

Q Layer Properties — Rast	erized — Sym	bology							×
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	Band	Band 1 (Gray)							-
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• 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'.

	ter Layer as	Dender-1			>		
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Layer name							
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IMPORT TO GOOGLE EARTH

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

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		Open Cancel

• Select 'Scale' from the pop-up.

Soog	gle Earth X
?	The imported image is larger than the maximum size supported by the hardware. If you want to create a super overlay from the source image, press "Create Super
	Overlay" If you want to view the whole image, rescaled to the maximum supported size, press "Scale"
	If you want to view only a full resolution subset of the image, press "Crop"
	Create Super Overlay Scale Crop Cancel

• Adjust 'Transparency' as desired and click 'OK'.

