

Subsetting TerraColor® NextGen GeoTIFF Tiles Using QGIS

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This document explains how to use the QGIS software to copy subsets of TerraColor NextGen 1x1 degree GeoTIFF image tiles from one folder to another using a map display to select the tiles. This method can be useful if you want to copy only specific tiles from a larger set, copy a complex subset of tiles, or copy all the tiles covering a specific geographic area (like a country).

Note: This document is written for Windows users, but you can modify the syntax of the batch file described in the **Add Text to Create the DOS Batch (.bat) File** section for Linux, etc. (QGIS runs on many platforms.)

QGIS is a free and open-source vector Geographic Information System (GIS) application with a wide range of functionality. We used QGIS release 3.28 'Firenze' for testing. Before beginning this procedure, download and install the latest version of QGIS from:

<https://qgis.org/en/site/>

After installing QGIS, download and unzip the TerraColor Global Tile Index Map from our website at:

<https://www.terracolor.net/ordering/>

The NextGen imagery is normally provided to users in 1x1 degree tiles in GeoTIFF format. The index map is a vector file in Shapefile format that shows the name and location of all the NextGen 1x1 degree tiles in the complete global coverage. You can use this file as a starting point even if you have purchased a smaller area of NextGen imagery. The index map is provided in the same datum and map projection as the NextGen imagery (WGS84 datum and Geographic projection, or EPSG: 4326).

In summary, the basic procedure is this:

- Display the TerraColor Global Tile Index Map in QGIS
- Select the group of tiles you want to copy, then save them to a new Shapefile that contains only those tiles
- Perform edits on the new layer to build a DOS batch (.bat) file that will copy all the selected files to a designated new folder in batch

Display the Index Map in QGIS

1. Start QGIS Desktop.
2. Select Layer->Add Layer->Add Vector Layer to open the Data Source Manager | Vector dialog box.
3. Click the Browse button on the right side of the Vector Dataset(s) field, load the TC_NextGen_1x1_Tile_Index.shp file, then click Add and then Close. The global index map displays on-screen showing all the tiles available in the NextGen complete global coverage.
4. Under Layers in the lower-left, right-click on the TC_NextGen_1x1_Tile_Index layer and select Styles->Edit Symbol.
5. Under Fill at the top, click on Simple Fill. For Fill Style, select No Brush. For Stroke Color, select any desired color for the polygon outlines. For Stroke Width, enter 0.1 millimeters. Click OK. This displays all the tile index polygons with a transparent fill so any other images or layers you load will show through. (You can change any of these if desired by repeating the same steps.)
6. Optionally, if you have other vector files that would help determine which tiles to select (like a map of countries or a bounding box), load it now using steps 2 and 3.

Select the Subset of Tiles and Save Them to a New Layer

1. If needed, use the Zoom In tool on the main toolbar and drag to zoom into your area of interest.
2. Click the Select Features by Area or Single-Click button, then drag a box around the tiles you want to copy to select them. To select additional tiles or de-select any tiles, hold down the Shift key and click on those tiles.
3. When you have your final set selected, right-click on the TC_NextGen_1x1_Tile_Index layer and select Export->Save Selected Features As. For Format, select ESRI Shapefile, then use the Filename Browse button to select the name and location to save the file. Also, be sure that "Add saved file to map" is selected at the bottom.
4. Click OK to save the selected features as an independent Shapefile and display it in a new layer on top of the global index map layer. This layer contains the base filenames of all the tiles you selected (e.g., N27-W106, etc.).
5. Right-click on the subset layer and select Open Attribute Table. The tile names in your subset appear on the left side of the table. Next you will modify this layer and use it to create another layer needed to build the final batch file.

Increase the Size of the Attribute Fields in the Subset File

Right now, the size of the attribute fields in your subset file are only eight characters long because it was only made to store the short 8-character tiles names (e.g., N27-W106). Next, we need to increase the field size so we have room to add all the additional text before and after the tile names needed to build the final batch file. We will use a function in QGIS called "refactor fields" to do this.

1. Right-click on your subset layer and select Toggle Editing to make the layer editable (a pencil symbol should now appear next it).
2. If the Processing Toolbox is not already displayed on the right side of the QGIS window, select Processing->Toolbox on the main toolbar to display it.
3. In the search bar of the Processing Toolbox, type "refactor fields" and press Enter to open the Refactor fields dialog.
4. For Input layer, select your subset layer (if it is not already selected).
5. Under Fields mapping, click on Type and select Text (string) below it.
6. In the Length field that appears, change the 8 to 100, then click Run. A new layer named Refactored is created. The Refactored layer now allows up to 100 characters in the attribute fields, and we will use it for the next step. Close the Refactor fields dialog.

Add Text to Create the DOS Batch (.bat) File

Next you will construct a text string for the DOS "copy" command in the Windows Notepad text editor, then use the QGIS Field Calculator to add it to all the tile names. This text string will contain the location from which to run the "copy" command, your folder to copy files from, and your folder to copy them to. This text will be inserted around all the tile names in the Refactored layer to create a command string that will copy each file from one folder to the other. Note that the backslash character normally used in folder names (C:\Folder01\) must be notated with a double backslash (C:\\Folder01\\) because the QGIS field calculator needs this format to understand it properly. (So, if you have folders inside other folders, use the \\ at each level.)

Here is an example below. (We suggest that you copy and paste our example and edit it as needed to show your drive and folder names.) The quotes and double backslashes must be added to tell QGIS exactly where to put the text. The text to be inserted is contained within pairs of single quotes. The syntax must be exactly right, so pay careful attention to all the spaces, single quotes, and double quotes (this will all be on one line).

```
'C:\\WINDOWS\\system32\\cmd.exe /c copy  
F:\\Source_TIFFs\\', "Filename", '.tif E:\\Copy_TIFFs\\'
```

where:

- 'C:\\WINDOWS\\system32\\cmd.exe /c copy is the location of the Windows cmd.exe file. (Note: C:\\WINDOWS\\system32\\ is a typical location so you can try using the default above. You can change it later if Windows does not find cmd.exe in that folder.)
- F:\\Source_TIFFs\\', is the folder containing the TIFFs to copy from, so replace it with your drive letter and folder name
- "Filename", is the name of the tile taken from the fields in the Refactored layer
- '.tif E:\\Copy_TIFFs\\' is the .tif extension to add and folder to copy the files to, so replace it with your drive letter and folder name

When you have finished this, make a copy of the string and add "concat(" before the other text and a close parenthesis ")" after the other text. So, it would now look like this:

```
concat('C:\\WINDOWS\\system32\\cmd.exe /c copy  
F:\\Source_TIFFs\\', "Filename", '.tif E:\\Copy_TIFFs\\')
```

The "concat" (short for concatenate) QGIS function is used to add text to existing fields. This is the exact string you will copy and paste into QGIS.

1. In the search bar of the Processing Toolbox, type "field calculator" and press Enter to open the Field Calculator dialog.
2. Select "Refactored" for the Input Layer (if not already selected).
3. In the Field Name field enter "Filename" (without quotes).
4. Copy the final text string (with the "concat" added) you created in Notepad.
5. Under Formula, select Expression, then paste the text string into the field below it.
6. Click Run to execute the operation. (If you get an error message then check the syntax for missing spaces, quotes, or other errors.) A new layer named "Calculated" is created.
7. Right-click on the Calculated layer and select Open attribute table. You should now see a full valid DOS copy command on each line (widen the Expression field if needed), for example (these will all be on one line):

```
C:\\WINDOWS\\system32\\cmd.exe /c copy F:\\Source_TIFFs\\S26-E135.tif  
E:\\Copy_TIFFs\\
```

Notice that the double backslashes and quotation marks have been deleted when QGIS edited the fields because they were just needed to tell it where and how to place the new text. Also, "Filename" has been replaced by the actual tile names like S26-E135 and the file extension ".tif" has been added. Close the Attribute table window.

8. Right-click on the Calculated layer and select Export->Save Features As. Select Comma Separated Value for Format, then select an output file name below it. Click OK to save the file.
9. The last step is to edit the first line in the file. In Windows Explorer, right-click on the CSV file and select Open With->Notepad to open the file in the Notepad text editor. Change the first line from "Filename," to "@echo on" So this:

```
Filename,  
C:\WINDOWS\system32\cmd.exe /c copy F:\Source_TIFFs\...
```

now looks like this:

```
@echo on  
C:\WINDOWS\system32\cmd.exe /c copy F:\Source_TIFFs\...
```

The "@echo on" will display the copying files messages in the DOS command window while the copy process is underway.

10. In Wordpad save the file as type Text Document (.txt), with a file extension of ".bat". Double-click on the .bat file to run it and copy the files to their new location. The DOS command window that opens to show the status will close when the copy process is complete.

If you have any questions or suggestions for improving this procedure or document, email us at terracolor@es-geo.com.

NOTES:

1. This procedure only copies the NextGen GeoTIFF (.tif) files from one location to another. If you also need to copy the World (.tfw) files that are provided with NextGen, make a copy of the batch file, and replace all occurrences of "tif" with "tfw" then save it and run it.
2. If it is helpful, we can provide you with a low-resolution (overview) file of the NextGen imagery to use as a background image for selecting tiles. You can load this into QGIS using Layer->Add Layer->Add Raster Layer.