UNIVERSITY OF COPENHAGEN

DEPARTMENT OF GEOSCIENCES AND NATURAL RESOURCE MANAGEMENT

FOREST AND LANDSCAPE COLLEGE

QGIS – 2.14.2 – April/2016

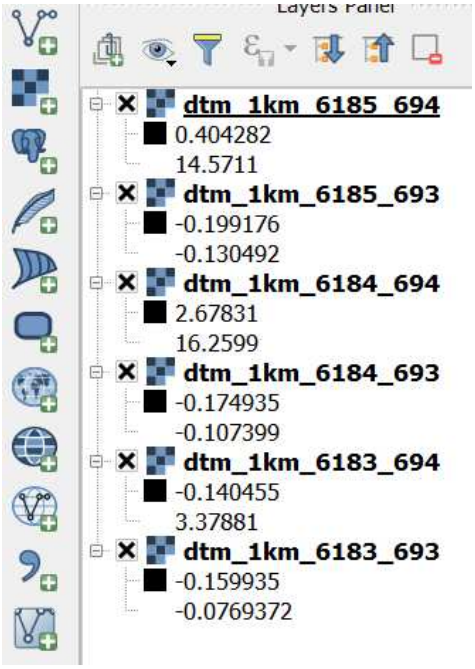
Virtual Raster and Pyramids

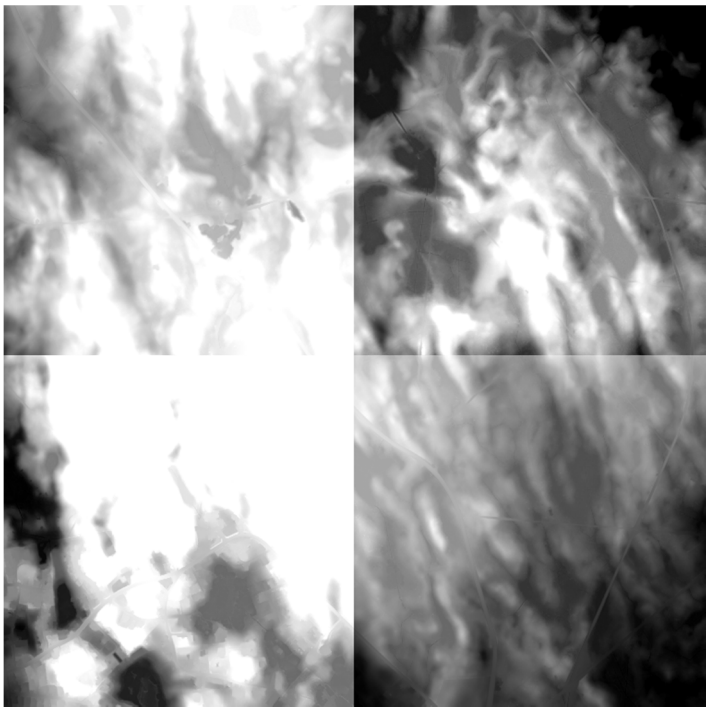
Build a Virtual Raster

Data from http://download.kortforsyningen.dk is 1*1 km blocks with 0.4 * 0,4 m pixels.

Each file contains 2500 pixels * 2500 pixels = 6.250.000 pixels. The file type is GeoTIFF.
Each file is geo-referenced and opened in GIS at the specified location.
Each file has a size of 6-15 MB. The small area of 9 km^2 to be used in this task is 105 MB.

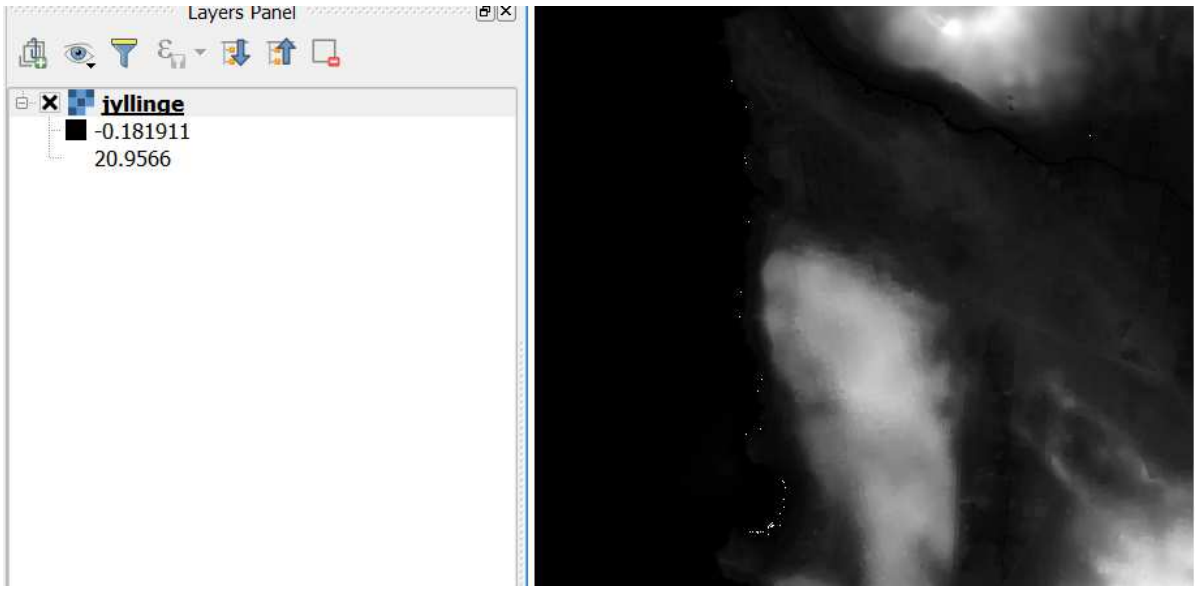
When you open a file, it will appear as a single square. When you open multiple files, they also appear as squares. In layer panel displayed as individual files.
If you need to colorize, calculate or perform actions ex. creating a Hillshade, this must be done for every single file..





To make the work with raster files manageable, we create a virtual raster file.
A virtual raster file, is a text file that gather information about the individual files.
The original raster preserved untouched, but "assembled" and displayed as a whole in a virtual file.

```
<VRTDataset rasterXSize="5000" rasterYSize="7500">LF
  <SRS>PROJCS["ETRS89 / UTM zone 32N",GEOGCS["ETRS89",DATUM["European_Terrestr
  <GeoTransform> 6.9300000000000000e+005, 3.9999999999999997e-001, 0.000000000
  <VRTRasterBand dataType="Float32" band="1">LF
    <Metadata>LF
      <MDI key="STATISTICS_MAXIMUM">23.82165145874</MDI>LF
      <MDI key="STATISTICS_MEAN">3.0456858653131</MDI>LF
      <MDI key="STATISTICS_MINIMUM">-0.25413793325424</MDI>LF
      <MDI key="STATISTICS_STDDEV">5.2835691497707</MDI>LF
    </Metadata>LF
    <NoDataValue>0</NoDataValue>LF
    <ColorInterp>Gray</ColorInterp>LF
    <Histograms>LF
      <HistItem>LF
        <HistMin>-0.2661758279502392</HistMin>LF
        <HistMax>23.83368935343623</HistMax>LF
        <BucketCount>1000</BucketCount>LF
        <IncludeOutOfRange>0</IncludeOutOfRange>LF
        <Approximate>1</Approximate>LF
        <HistCounts>1|89|8984|19083|78774|169863|86401|25422|4764|7880|4483|42
      </HistItem>LF
    </Histograms>LF
```



Build Virtual Raster

Click **Raster>Miscellaneous>Build Virtual Raster Catalog**

Enable **Choose input directory…**

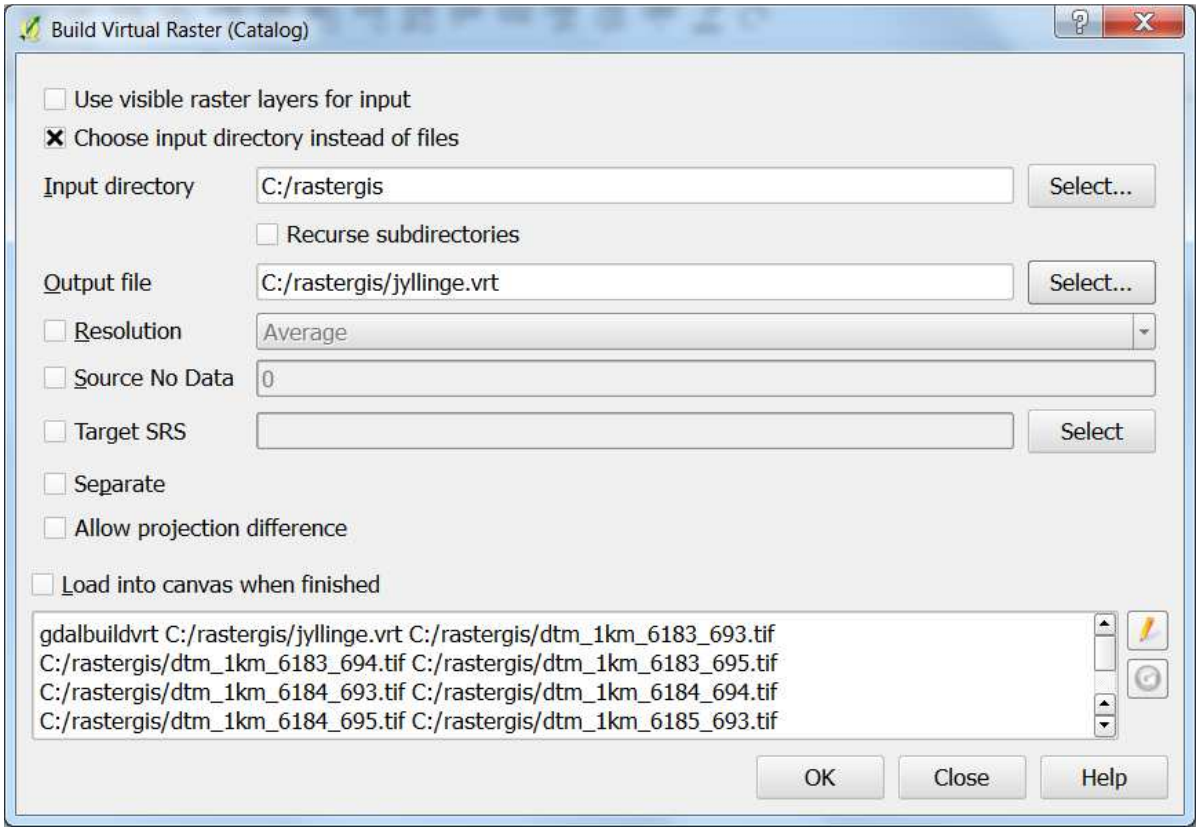
Click **Select.** Choose the folder with data. Click **Choose**

*Data is contained in a single folder. If it was single files in the folder diable '**Choose input directory…**' and select the single files.*

For Output file click **Select** write a filename and click **Save**

Disable **Load into canvas when finished**

Click **OK**



Click **OK – OK – Close**

The file created has the file extension .VRT

To open a .vrt file

Click **Add Raster Layer** 
Choose the created file
Click **Open**

In this version of the program, the range of data values is not showed correct.

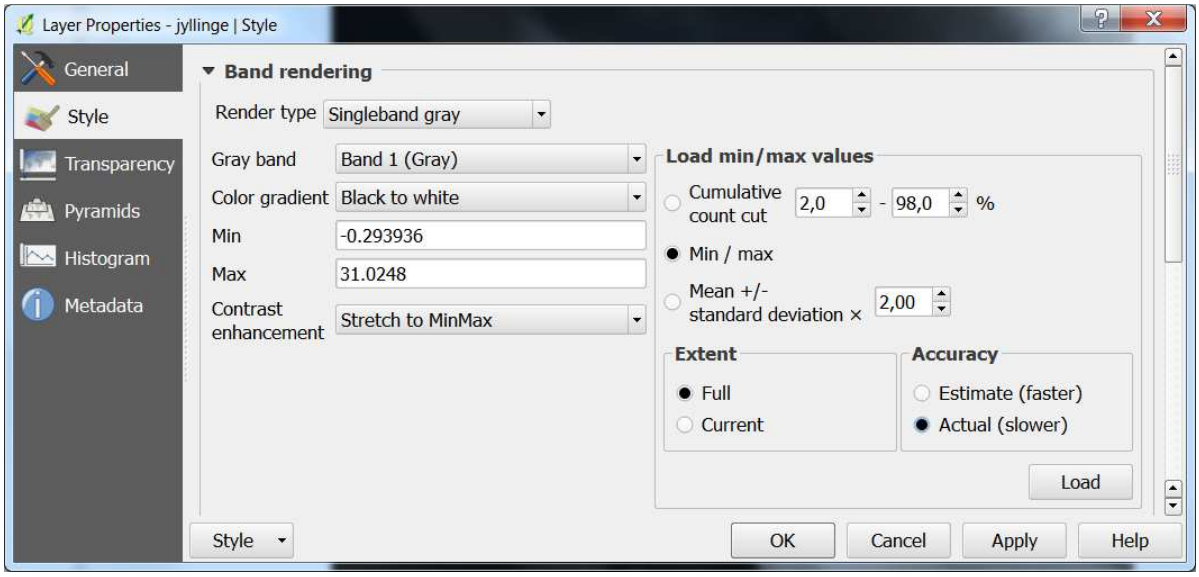
To load the right values

Double Click on the layer. Choose **Style**

Click **Min/max >Actual (slower)**

Click **Load**

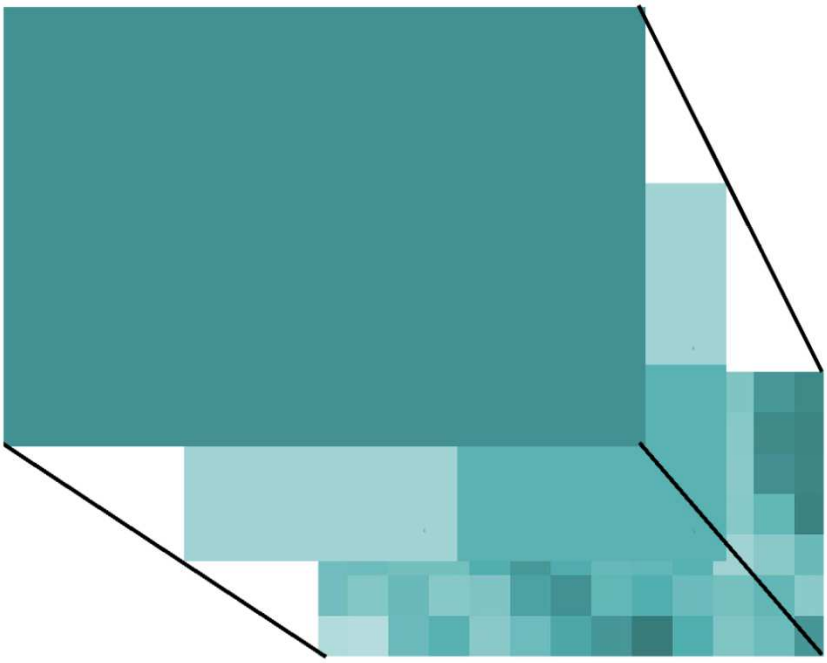
Click **OK**



Build Overview / Pyramids

In this tutorial the data is only 105 MB. Depending on the computer it can be slow to get the data viewed when zooming in or out. Try it !

To make this work faster, building an Overview /Pyramid is a solution.



When zoomed out the layer will be shown in a lower resolution.

Zoom in to a higher resolution.

In this tutorial pyramids are being built for 1:2, 1:8 and 1:32

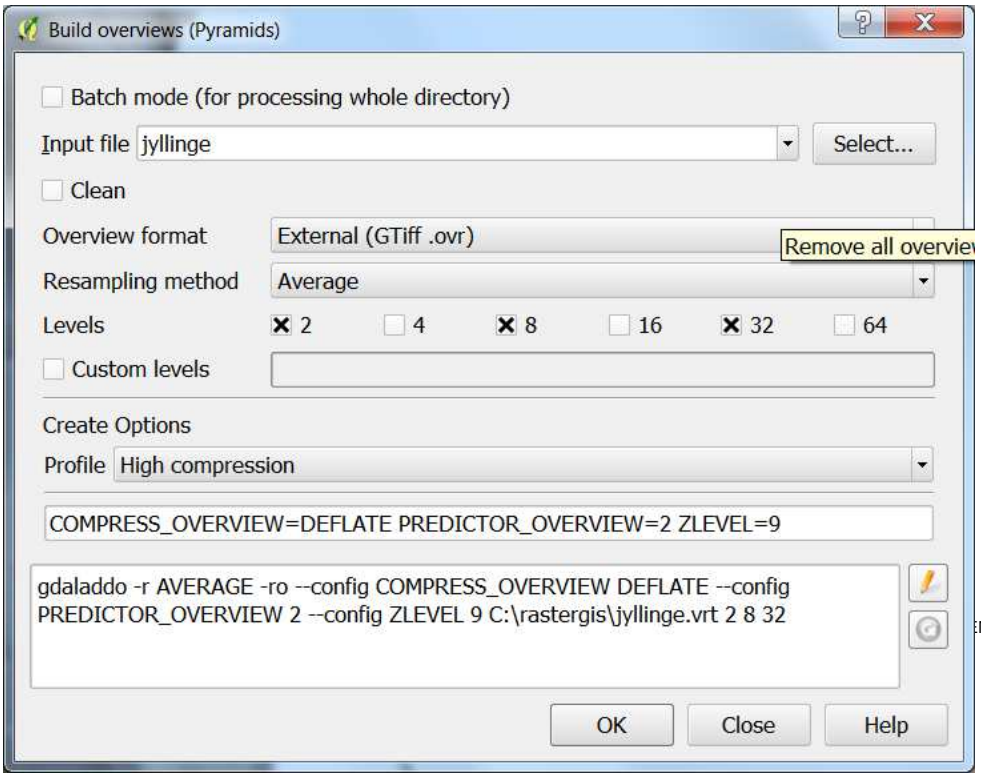
Click **Raster> Miscellaneous>Build Overviews (Pyramids)**

Click **Select** choose the .VRT file

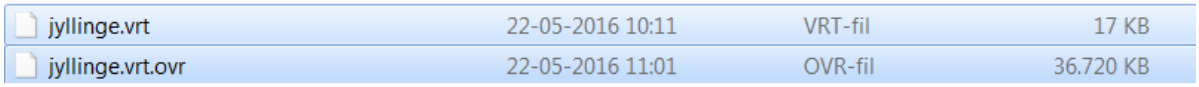
Choose levels 2, 8, 32

Profile **High compression**

Click **OK**



The file created gets the extension **.ovr**



Open Properties and see in the tab for Pyramids

At the canvas - Try to zoom again and see if the render speed has improved.