

Open DEM: SRTM DSM Processing

This Howto explains how to derive a void free SRTM dataset of the original SRTM 2.1 dataset. Voids occur in regions where no data could be recorded by the SRTM Synthetic Aperture Radar System.

Software:

- GRASS 6.4.0
- FWTools 2.4.6

Download

First Download the original dataset. Version 2.1 is the most advanced dataset:

USGS → SRTM 3: http://dds.cr.usgs.gov/srtm/version2_1/

Import with GRASS

It is possible to import SRTM .hgt Data direct in GRASS (Data → Import Raster Data → SRTM (.hgt) Import), but in Version 6.4.0 there is a Problem with the Unpack function. A ticket is on the way and the bug should be dissolved in future versions of GRASS.

Import - Workaround with GDAL

Unpack

Unpack ZIP Archiv via 7-Zip for example: <http://www.7-zip.org/>

Convert

You can convert the USGS .hgt datasets to a common raster format via FWTools → FWToolsShell

http://www.gdal.org/gdal_translate.html

Example:

```
gdal_translate -of GTiff PathToYourDataset/Dataset.hgt PathToOutputFile/OutputFile.tif
```

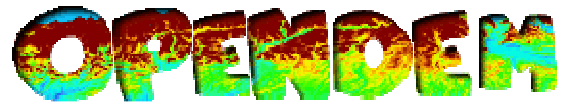
Mosaic

One way to mosaic the tif images is to use Gdal Wrap: <http://www.gdal.org/gdalwarp.html>

Example:

```
gdalwarp PathToYourDataset/Dataset1.tif PathToYourDataset/Dataset2.tif  
PathToYourDataset/Resulting.tif
```

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Fill Voids (if necessary)

If voids (empty Pixels) occur in your raster image (value -32.768 in most GIS software packages, but value “*” in GRASS) it is necessary to fill the empty pixels with real height values or interpolated values.

The best way is to use additional height information. Usually voids occur in mountainous regions through the technique of the side looking radar. You can download additional height data from ViewFinderPanoramas (<http://www.viewfinderpanoramas.org/dem3.html>). The map sources are Local 1:25.000 and 1:50.000 and a Russian 1: 100.000. It is allowed to use the datasets for this aim. Thanks a lot to Jonathan de Ferranti for that.

Download the desired dataset with 3” resolution if available. To guarantee a homogeneous database (SRTM) fill only the void pixels with the ViewFinderPanorama data.

Import the datasets in GRASS

Data → Import Raster Data → Import Raster Data

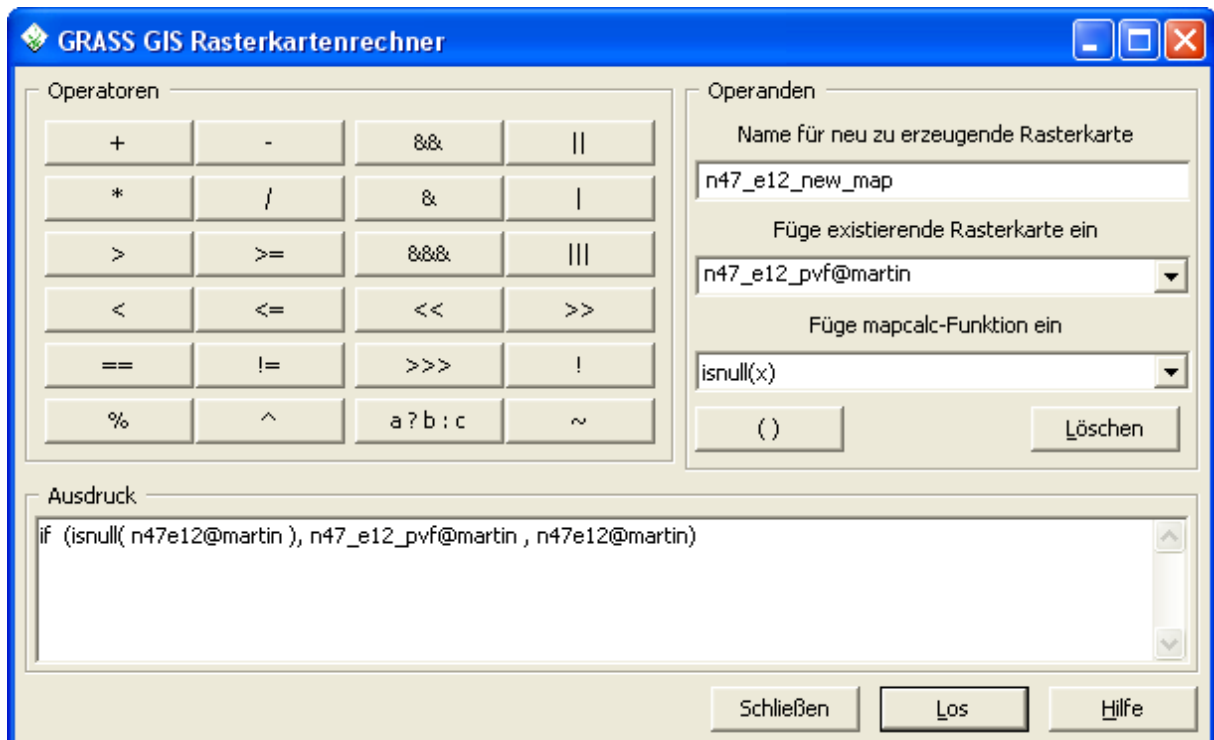
Choose your Tif Dataset

To work with the dataset set the region:

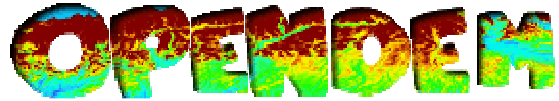
```
g.region rast=your_dataset
```

Calculate a new Raster with filled voids by ViewFinderPanorama data

Open Raster → Raster Calculator



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Expression:

if (isnull(name_of_the_original_dataset), name_of_the_ViewFinderPanorama_dataset, name_of_the_original_dataset)

If the value of the original dataset is “null” the pixel is filled with the value of the ParoramaViewFinder dataset. If the value is not “null” the value of the original dataset is taken.

Calculate a new Raster with filled voids by interpolation

There are also sometimes voids in non mountainious regions. To fill that voids use the GRASS r.fillnulls operation

r.fillnulls: Fills no-data areas in raster maps using v.surf.rst splines interpolation

r.fillnulls input=your_input_dataset output=your_output_dataset

The computation could take a while.

Finally you got a void free SRTM dataset. ☺

Set negative values to zero

This step is not really necessary, but negative values occur mostly in mining areas which are very dynamic. The SRTM dataset was recorded in 2000 and the mining area will change since that point of time. This is the reason why all negative values were set to zero.

Use the GRASS Raster Calculator

Expression:

if (name_of_the_original_dataset < 0, 0, name_of_the_original_dataset)

If the value of the original dataset is less than zero, “0” is set for this Pixel. Else the original value is taken.

Export data

You can Export the GRASS dataset to many common raster formats.

Data → Export Raster