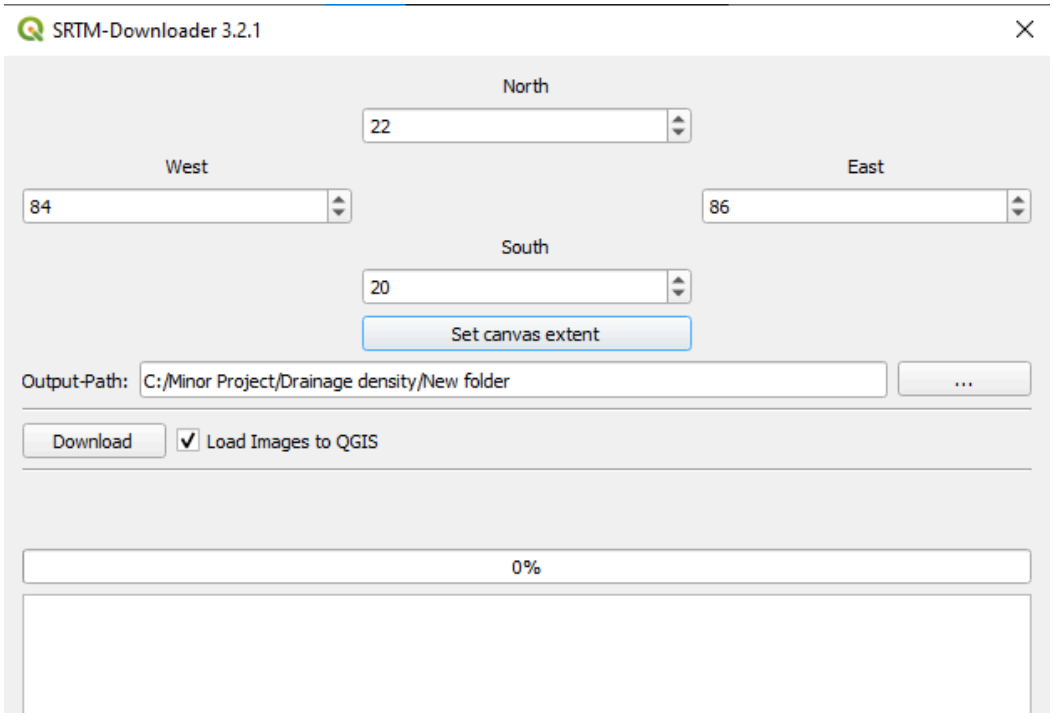
How to compute Drainage Lines with stream orders?

Step-1: Start QGIS GUI, upload the shapefile and download SRTM data.

- Go to Plugins > SRTM-Downloader > SRTM Downloader
- Click on “Set canvas extent” , set the output path and click on download.

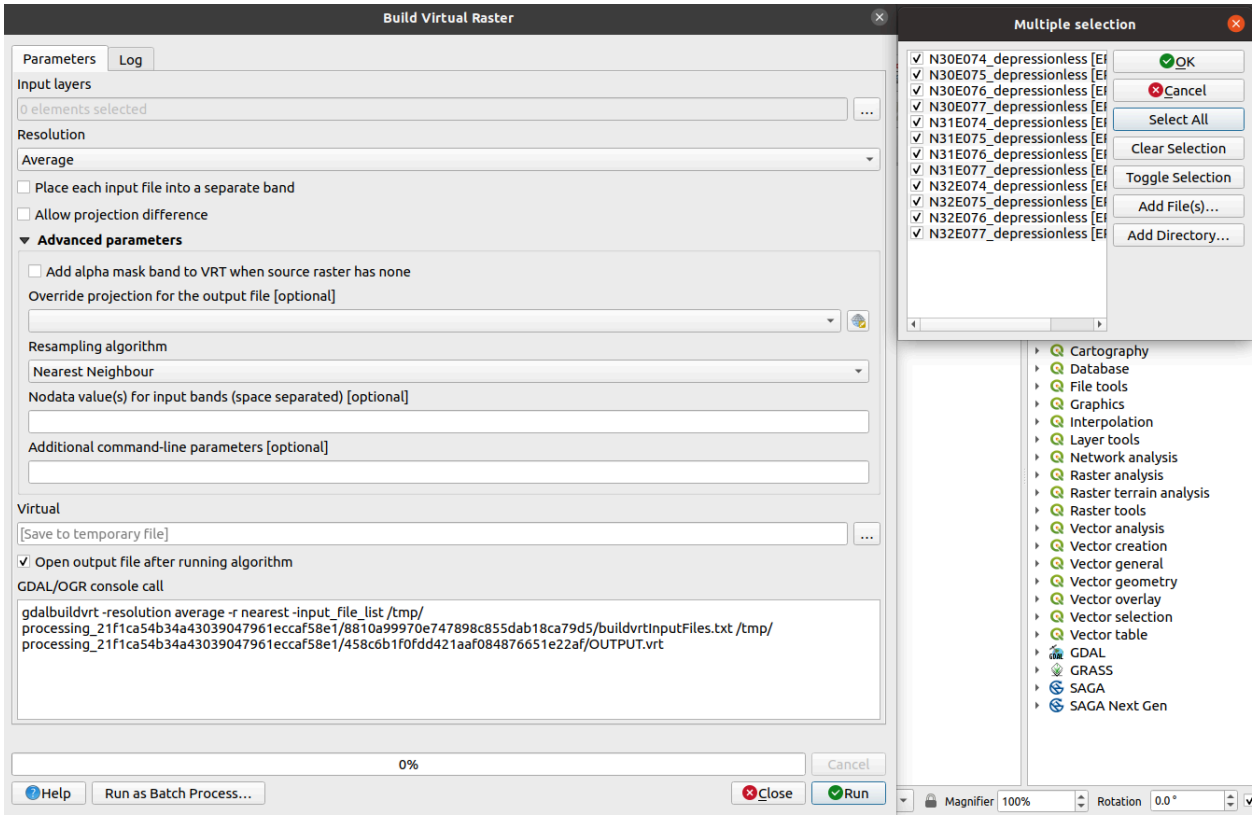


> Pop up window for login will appear to start download. Login using Earthdata credential.(Register if new user)

Step-2: Compute the depression less dem using this python script.
Update these variables in the code(Line no. 26-28).
Shapefile_path: >update your shapefile path.
Output_folder: >update your output directory path.
Srtm_directory: >update the path of the directory containing SRTM tiles.

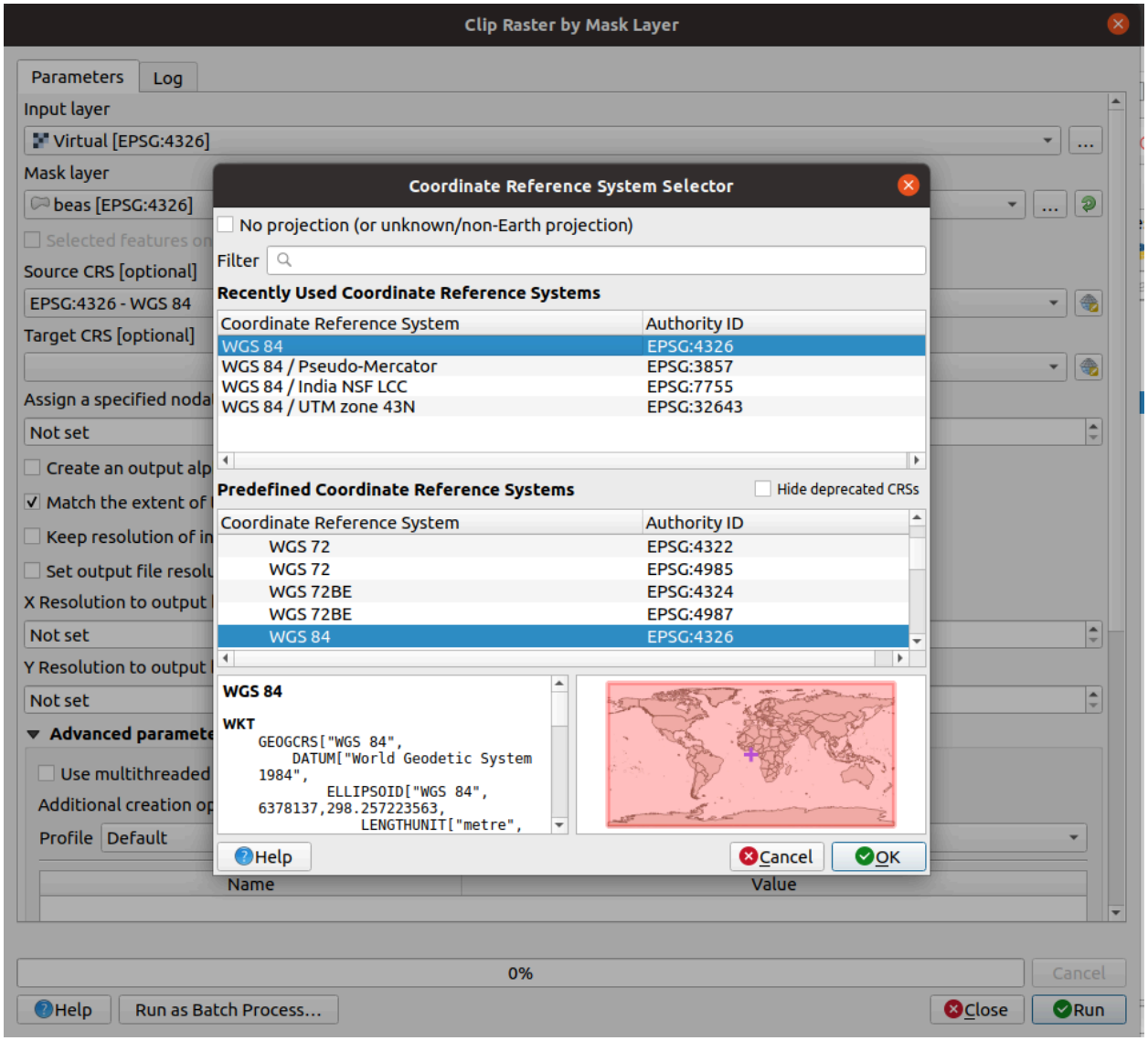
Step-3: Import the Depressionless dem tiles (.tif files) from the output directory on qgis and build a virtual raster.

- Go to Raster> Miscellaneous > Create Virtual Raster
- Select all the .tif files in the Input layer
- Untick the “Place each input file into separate band” and run



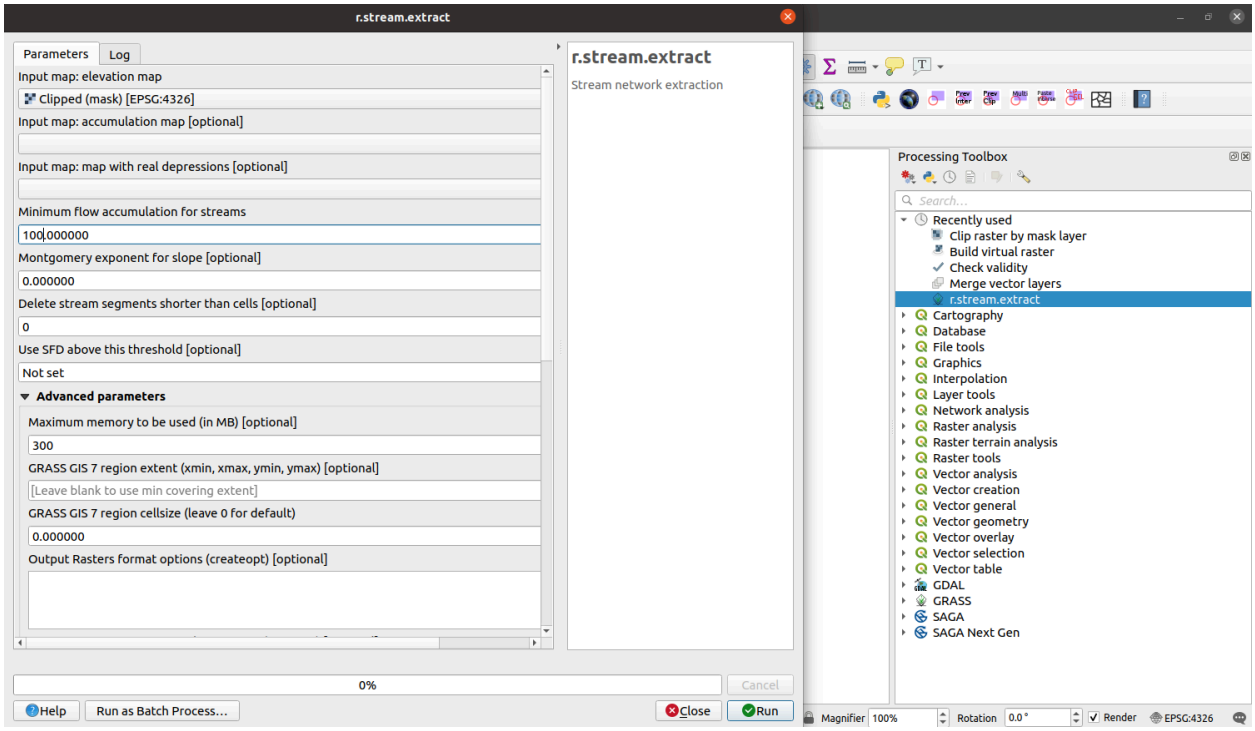
Step-4: Clip the virtual raster using your shapefile as mask layer and set the source and target crs=4326.

- Go to Raster > Extraction > Clip raster by mask layer
- Input layer : virtual raster
- Mask layer: your shapefile
- Source CRS: select “EPSG:4326”
- Target CRS: select “EPSG:4326”

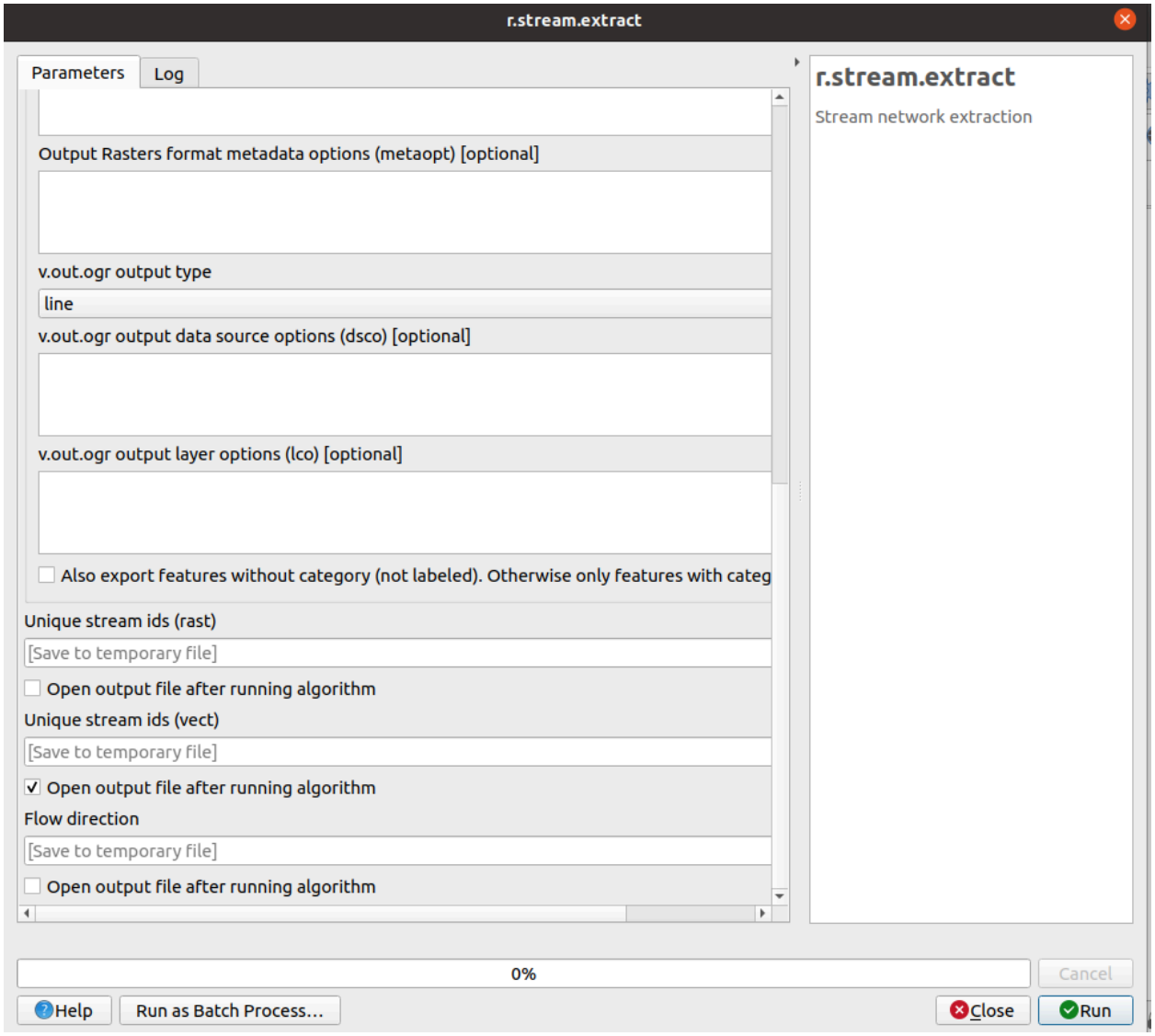


Step-5: Extract drainage lines by using “r.stream.extract” in QGIS, set the flow accumulation threshold to 100 and geometry to line. Output only the vector shapefile.

- Go to Processing > Toolbox > Search “r.stream.extract”
- Input Map(elevation map) : Clipped output
- Min flow accumulation for streams: 100

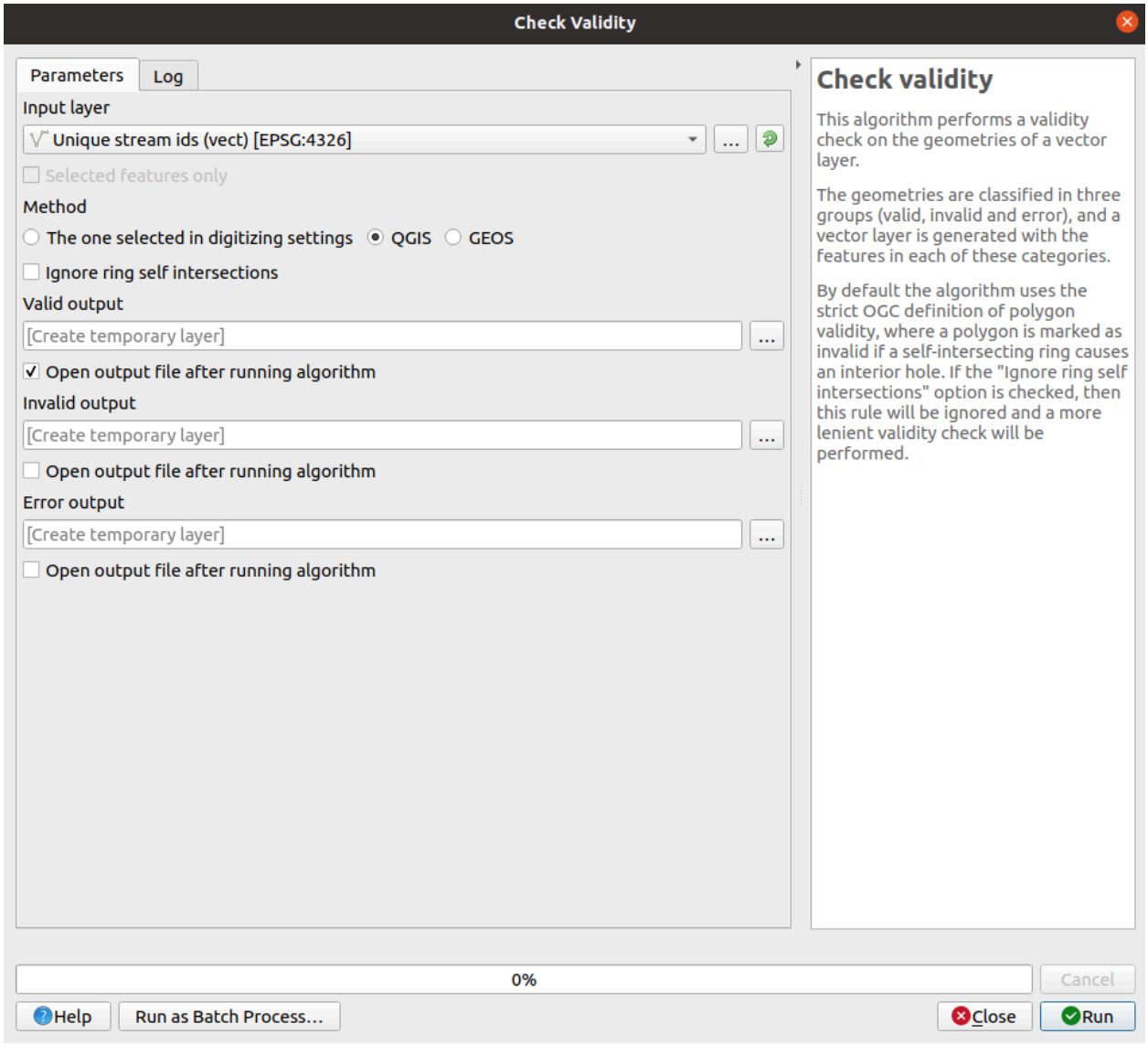


- Advanced parameters > output type : select “line”
- Only Click Output “unique stream ids (vect)” and run.



Step-6: Run the “Check validity” on QGIS to remove the improper geometry in drainage lines.

- Go to Processing > Toolbox > Search “Check Validity”
- Input layer: unique stream ids result
- Method : qgis
- Only click on “valid output”



- Export the valid output as shapefiles.

Step-7. Assign stream order using this python script.

Update these variables in the code.(Line 6 & 7)

- Dl_dir: path of the directory containing drainage lines
- So_dir: path to the output directory where drainage lines with stream order will be stored.