

2 VLSM: Vector-based Landscape Metrics in QGIS

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1 Vignette Info

Most common landscape metrics are calculated on a raster-basis. However, sometimes landscape information come along in vector-formats. For the calculation of landscape metrics, one must perform a vector-to-raster-transformation often resulting in a loss of information. In **VLSM** we implemented various landscape metrics based on vector data in R. However, sometimes it is easier to process data with only few clicks using a desktop GIS. Therefore, we created compatible R scripts being accessible in the open-source desktop GIS **QGIS**. In the following, a quick manual on how to use these functions in **QGIS**. If you want to use these functions via R, please refer to here.

2 Packages and Software Utilities

The open-source desktop GIS **QGIS** enable the possibility to integrate R-scripts. However, **QGIS** does not except the standard .R-format, instead we developed R-scripts which are compatible to **QGIS** and can easily be loaded in with only few clicks. You can find the **VLSM** R-scripts for **QGIS** here.

We tested our implementation on Windows with the following software and packages: * Before integrating R into **QGIS**, one must have installed R (download-page). Our implementation was tested using *R version 3.5.2 (2018-12-20) – “Eggshell Igloo”*. Furthermore, we recommend to install the necessary packages sf, sp, raster, link2GI, rgrass7, RSAGA, dplyr, and of course VLSM via R. * **QGIS 3.6 Noosa**: We recommend **QGIS> 3.x** which can easily be installed by the OSGeo-installer. In **QGIS** one must enable the option for R-processing, first. An comprehensive instruction can be found here, or here. It may be that R is not visible or included in the setting menu. If that is the case the **Processing R Provider** must be installed as plug-in (see here for help).

Note: One can set R's library directory in **QGIS**. Installing necessary packages may be better done inside R. When the setup of the setting was successfull, the **QGIS** desktop should look similiar to the following screenshot:

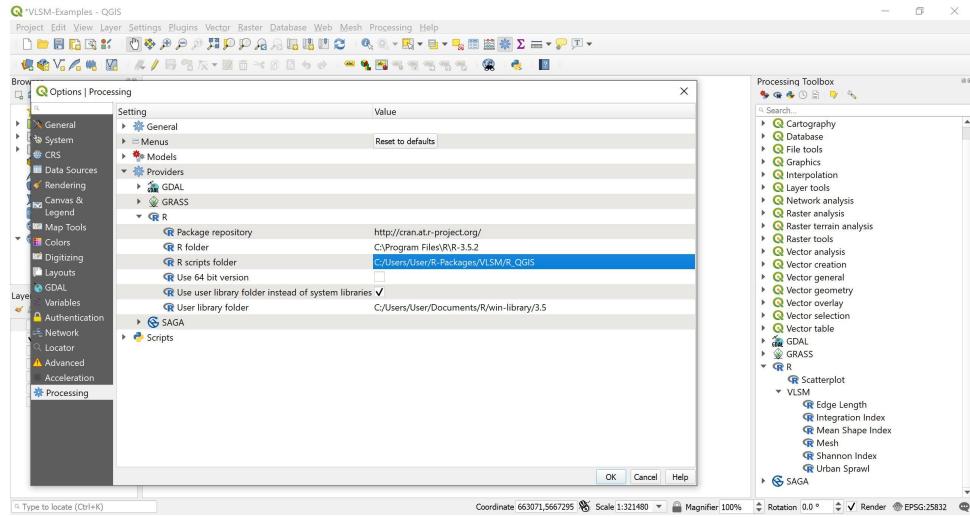


Figure 1: QGIS setting to access R functions

3 Calculation of Landscape Metrics

We use Corine Land Cover (CLC) data, which are detailed explained in the R-vignette of this package.

3.1 Example 1: Effective Mesh Size

The *effective mesh size* is calculated with the tool *Mesh*. The output delivers a table with the corresponding mesh sizes [ha].

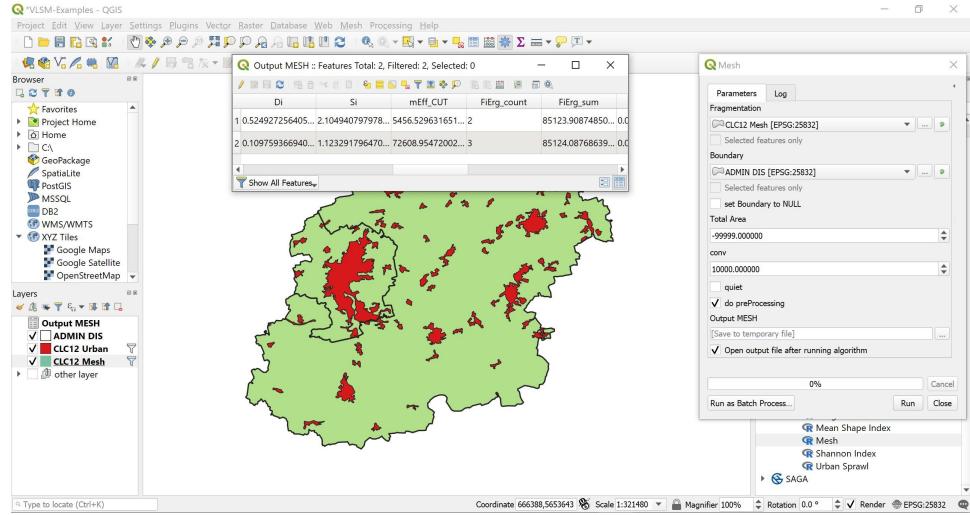


Figure 2: Calculation of Effective Mesh Size in QGIS

3.2 Example 2: Urban Sprawl

The *Urban Sprawl* is calculated with the tool *Urban Sprawl*. The output delivers a table with the corresponding degree of urban sprawl [%], and a geometry showing the grid lines, which were used for calculation.

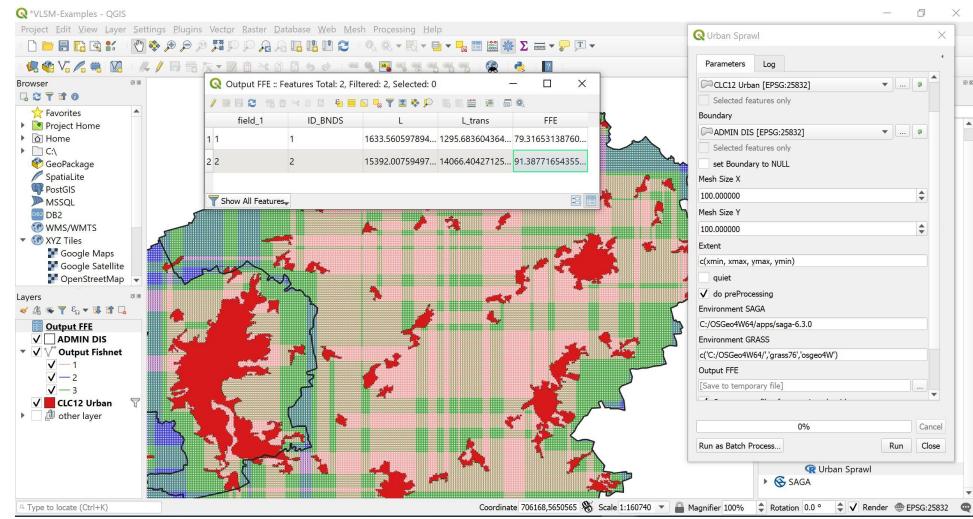


Figure 3: Calculation of Urban Sprawl in QGIS