

## **User Instructions**

This document explains how to install the **Deepness-Plugins** in **QGIS** so that the **Model** can be used to segment noise barrier walls.

The *Deepness QGIS-Plugin* has a simple user interface so that users can easily process the raster data with the provided segmentation model. Further documentation on the plugin itself can be found at the following URL:

https://qgis-plugin-deepness.readthedocs.io/en/latest/

## Requirements

The Deepness QGIS plugin can be downloaded from the following URL: <u>https://plugins.gqis.org/plugins/deepness/version/0.6.1/download/</u>

We assume that QGIS is already installed on your system. At the time of testing the plugin and model, the following version of QGIS was used:

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Datenanbieter Entwickler Mitwirkende Entwicklerkarte Übersetzer Spender Lizenz	QGIS-Version Qt-Version Python-Version GDAL-Version PROJ-Version PSG-Registraturdatenbankversion GEOS-Version SQLite-Version PDAL-Version PostgreSQL-Client-Version SpatiaLite-Version QWT-Version QWT-Version	3.34.3-Prizren 5.15.3 3.9.18 3.8.3 9.3.1 v10.098 (2023-11-24) 3.12.1-CAPI-1.18.1 3.41.1 2.6.0 15.2 5.1.0 6.1.6 2.13.4	QGIS-Codeversion	<u>47373234ac</u>			
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		https://www.gnu	.gnu.org/licenses				
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## **Plugin Installation**

The plugin can be installed directly within QGIS by clicking *Plugins*  $\rightarrow$  *Manage and Install Plugins*...  $\rightarrow$  *Install from ZIP* click and select the downloaded ZIP file. If the plugin is successfully installed, you should be able to see the following icon in the QGIS toolbar:



## Using the model to segment noise barriers

The following process describes using the model on a raster layer to make new predictions:

- Load the raster layers into QGIS by clicking Layer → Add layers → Add raster layer.
   Click and select one or more .tif files you want to run inference on.
- 2) Click on the Deepness icon to open the plugin control panel on the right (see screenshot below).
- 3) Click below the section *ONNX Model* on *Browse* and select the specified model path (the model file should have a .onnx extension).
- 4) Click on *Load default parameters to* load the correct parameters to use the model.
- 5) Make sure the following parameters are set:
  - a) The resolution (*Resolution*) is set to 20.
  - b) The overlap of the tiles (*Tiles Overla*p) is set to 0.



	Deephess					
	▼ Input data:					
	Input layer: # dop20_rgb_32427_5645_1	-				
	Processed area mask: Visible part	sible part 👻				
	▼ ONNX Model					
	Model type: Segmentor					
A State of the sta	Model file path: data/zippy-salmon-worm_2024-02-19_16-34-32.onnx Brow	se				
The second secon	Reload Model Load default parameters					
	Model info: Input shape: [1, 3, 1000, 1000] = [BATCH_SIZE * CHANNELS * SIZE * SIZE]					
	Input channels mapping     Processing parameters	Input channels mapping     Processing parameters				
NOTE: These options may be a fixed value for som						
	Resolution [cm/px]: 20.00					
The second secon	Tile size [px]:					
	Batch size:					
	Process using local cache					
	Tiles overlap:					
	• [%] • [px] •					
	<ul> <li>Segmentation parameters</li> </ul>					
	NOTE: Applicable only if a segmentation model is used	only if a segmentation model is used				
a color of the second	✓ Argmax (most probable class only)					
	✓ Apply class probability threshold: 0.50	-				
month and a side of the	Remove small segment areas (dilate/erode size) [px]:	-				
	Output format					
	Training data export					
	Run					

6) Additionally, the plugin allows two different ways of using the model, via the *Input data menu.* 

If you choose "*Visible part*", the model will only make predictions on the part of the layer that is currently visible via the user interface, i.e. that you have just zoomed in on. This can save time because the model has less data to process.

▼ Input data:		
Input layer:	F dop20_rgb_32427_5645_1	-
Processed area mask:	Visible part	•

If you choose "*Entire layer*", the model makes predictions for the entire added layer. Depending on the size of the layer, this may take more time. The approximate runtime for a single 5000×5000 px layer is between 3-10 minutes depending on the hardware.



7) Finally click *Run* to start calculation and inference. Once the model is finished calculating, you should be able to see the model's output by inspecting the newly created layer, as shown in the screenshot below.

