ALTAMiRA
INFORMATION

Title	RASOR FloodMap plugin User Guide

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RASOR

Contents

1. INTRODUCTION

The RASOR flood map plugin is a QGIS (Quantum GIS) open-source plugin capable of extracting a flood map from a couple of Sentinel-1 images with change detection techniques. The plugin uses other open-source software components such as SNAP and Orfeo Toolbox in order to make the analysis.
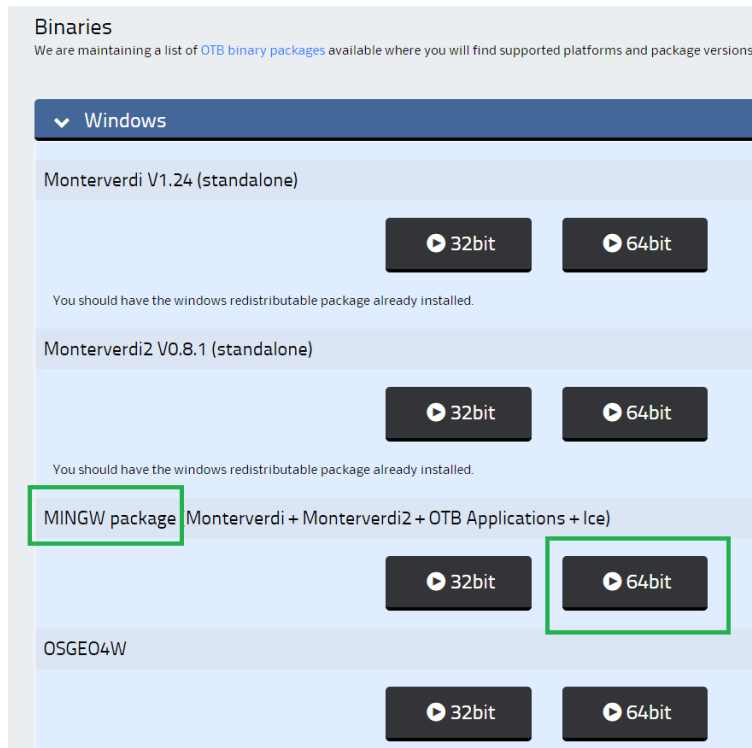
2. INSTALLATION

2.1. Requirements (SW/HW)

The plugin works on x86_64 architectures with at least **8GB RAM** that run QGIS (2.6 or higher) that can be downloaded from the following URL:

- QGIS 2.X: http://www.qgis.org/es/site/
- Orfeo-Toolbox MINGW package: https://www.orfeo-toolbox.org/download/
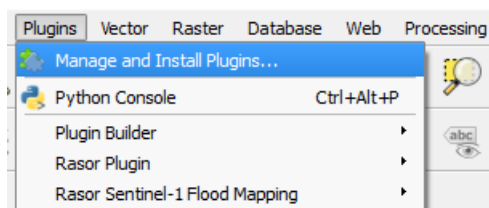

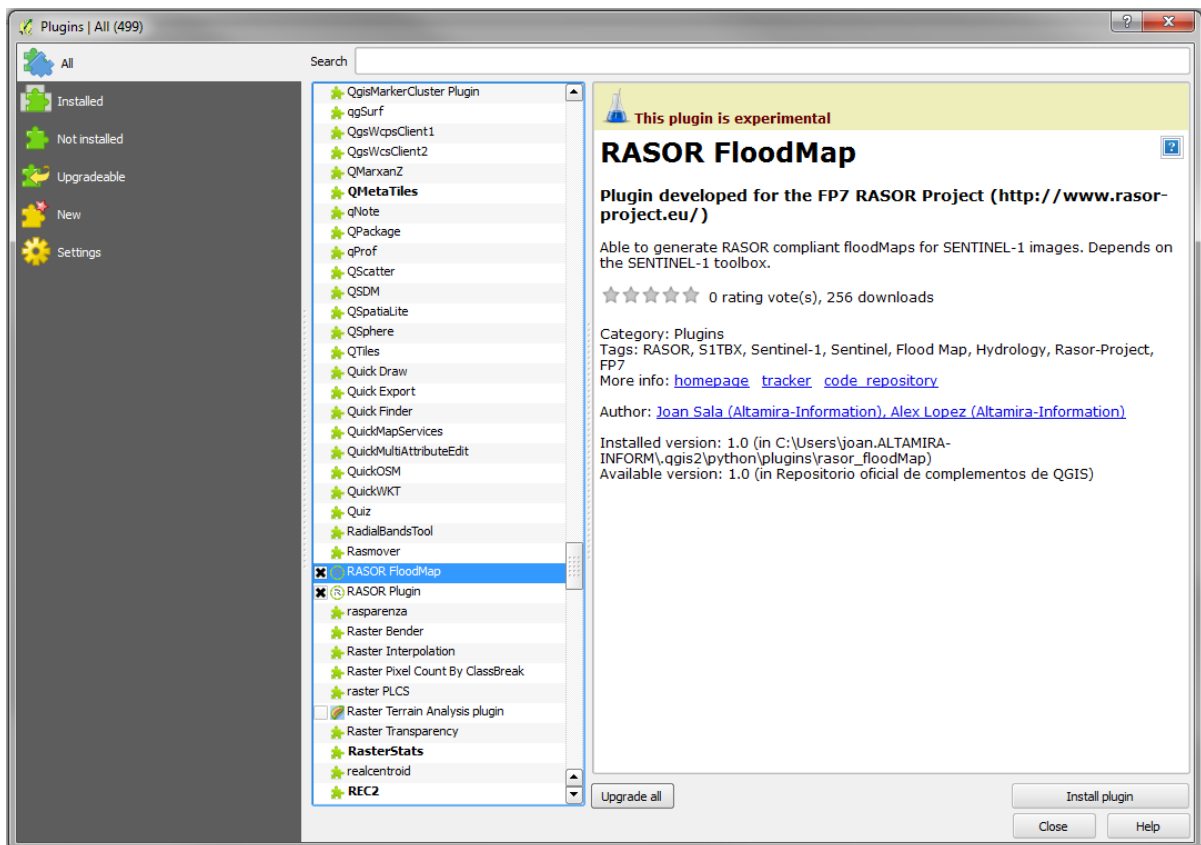- SNAP 2.0: http://step.esa.int/main/download/

2.2. Installation

The plugin can be directly installed from QGIS plugin repository following the steps:

1. Access the plugin repository:

2. Search for "RASOR FloodMap", and click install plugin.

3. If you already had the plugin installed and want to upgrade it to the last version it is recommended to re-install by uninstall plugin and install plugin again.

3. USAGE

The interface is divided in 4 tabs. Each tab corresponds to a processing step of the flow, being the first one the general configuration (CONFIG).

3.1. Configuration tab

In this tab we need to specify the folders where the binaries are located (Orfeo-Toolbox and SNAP) in order to execute the following processing steps. In particular the tool uses the following binaries:

- SNAP - gpt.exe

- OTB - otbApplicationLauncherCommandLine.exe
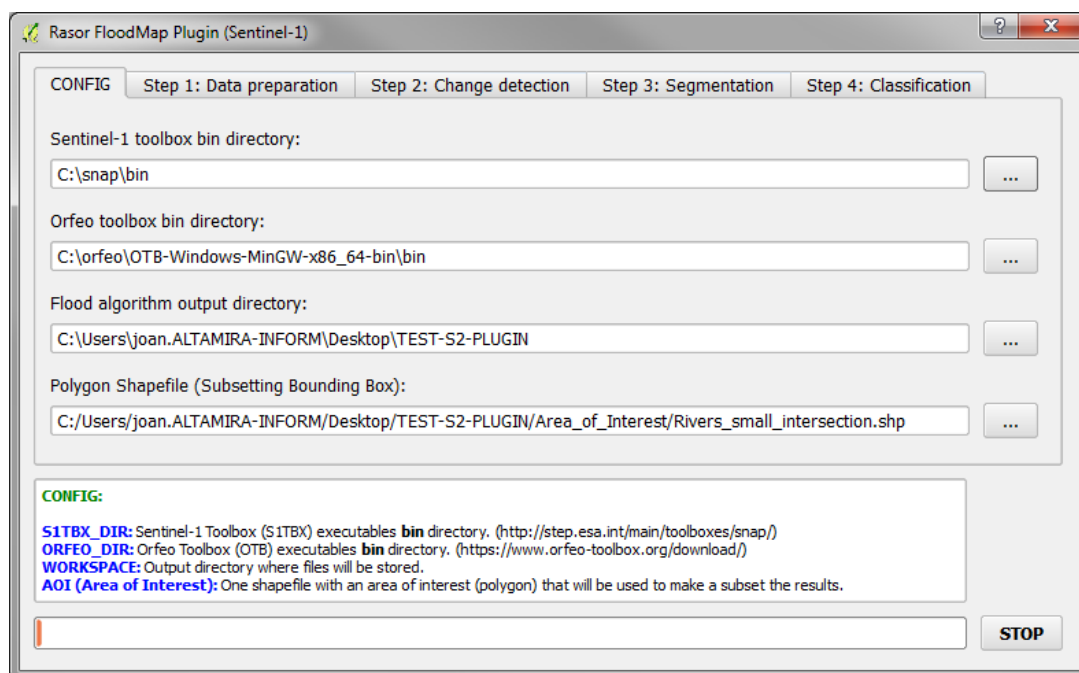
In this tab we also need to provide the workspace directory where the files will be stored and the Area of interest (AOI) we are going to process. The AOI must be an ESRI Shapefile in LatLon projection (EPSG: 4236).
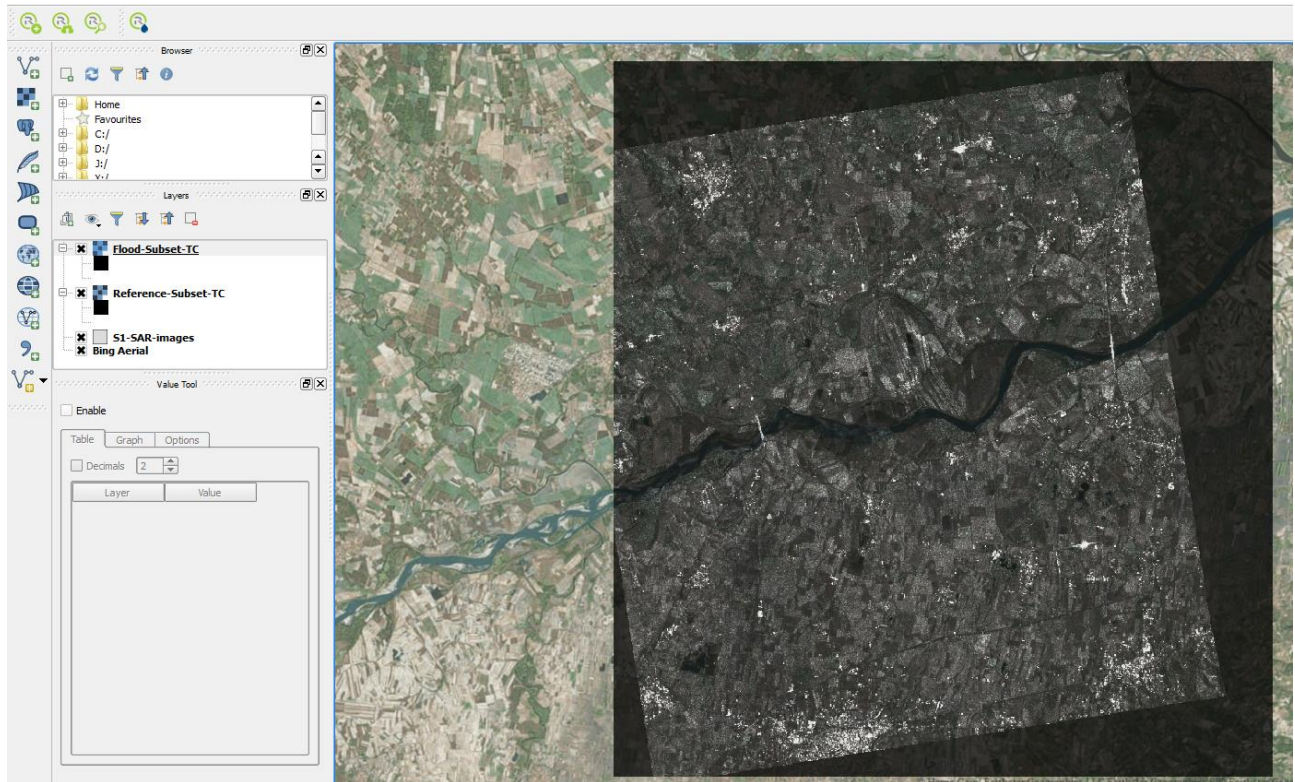
3.2. Data preparation

In this tab we need to specify two valid manifest XML **metadata** files describing two SLC (Single Look Complex) GRD (Ground Range Detected) Sentinel-1 images. Once we specify these xml files, the dates and coverage of this images will appear in the blue boxes. The reference S1 image has to be a **non-flooded image**.
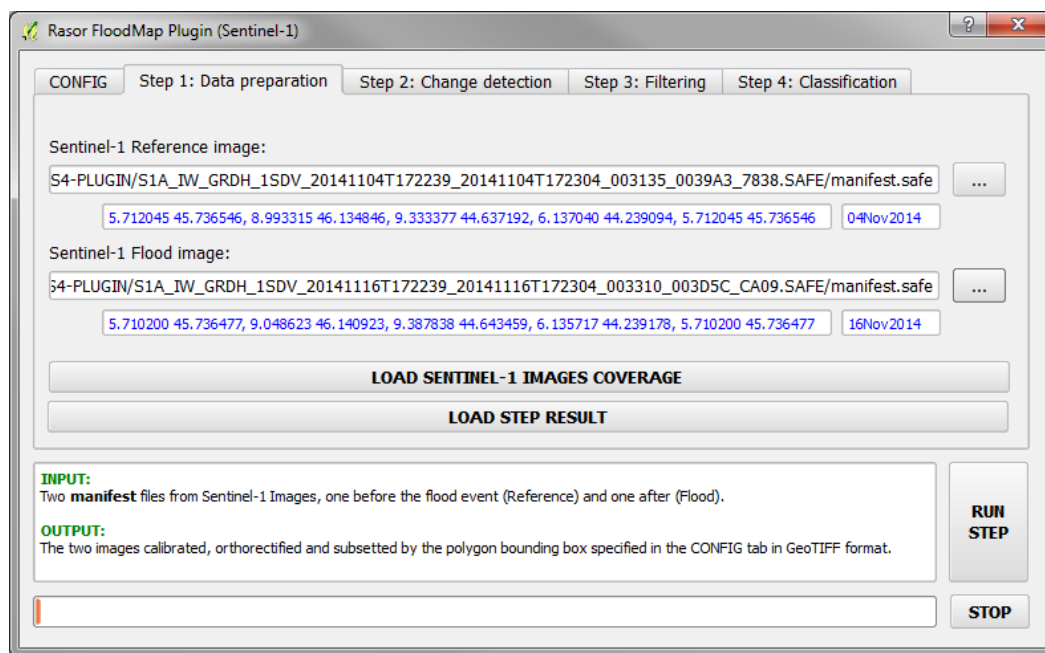
With the LOAD SENTINEL-1 IMAGES COVERAGE button we will be able to see the coverage of the images. They should cover the same area. It is recommendable to load a basemap first (Ex: Bing Aerial)

After RUN STEP the images will be co-registered (same geometry) and subsetted (same cut by the provided Shapefile) and we will be able to load two previews with the LOAD STEP RESULT button (Flood and Reference images):

With the Sentinel-1 Frame and the Area of Interest shapefile we provided:

After RUN STEP the images will be co-registered (same geometry) and subsetted (same cut by the provided Shapefile) and we will be able to load two previews with the LOAD STEP RESULT button (Flood and Reference images):
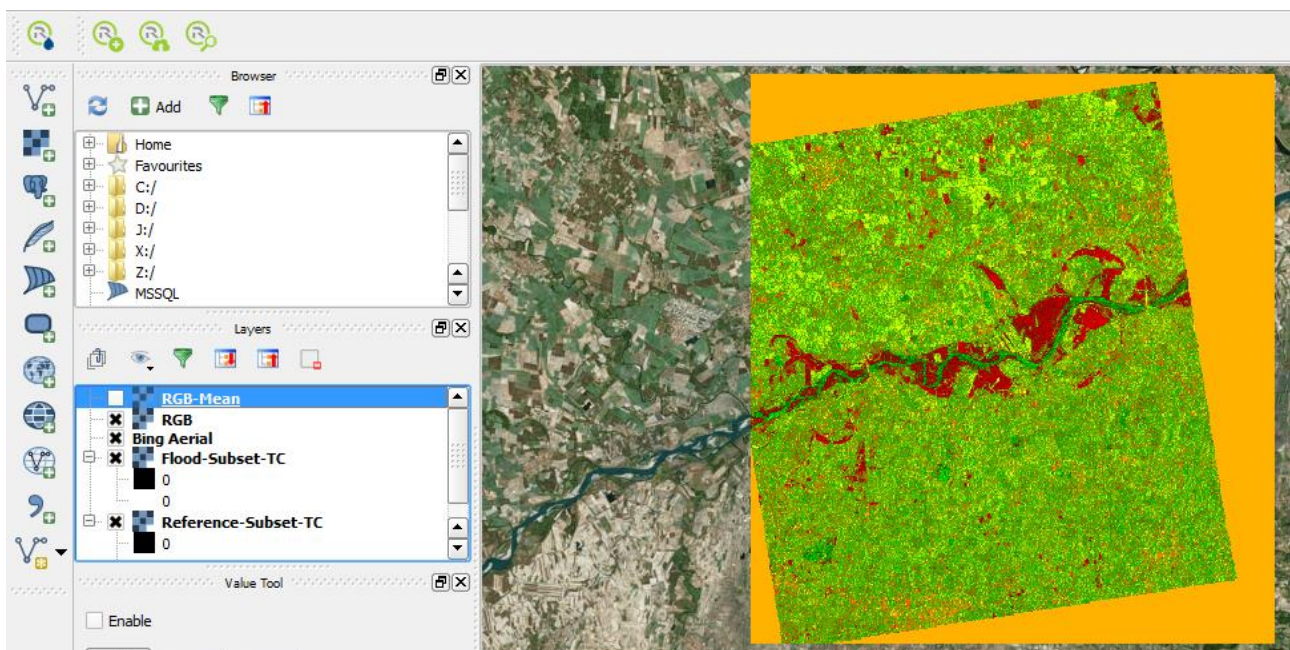
3.3. Change detection

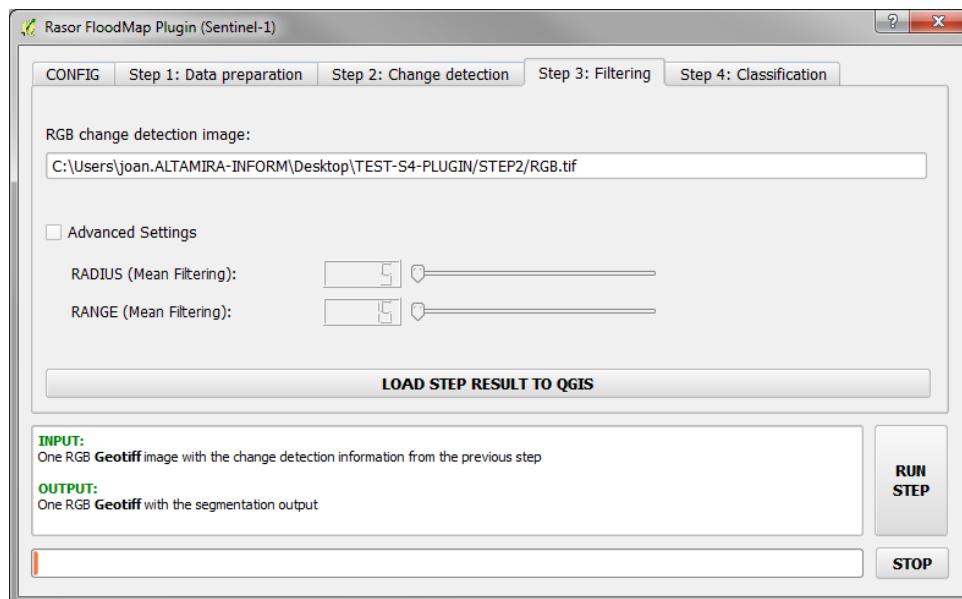In this tab the resulting GeoTiff images of the previous step are auto-selected:
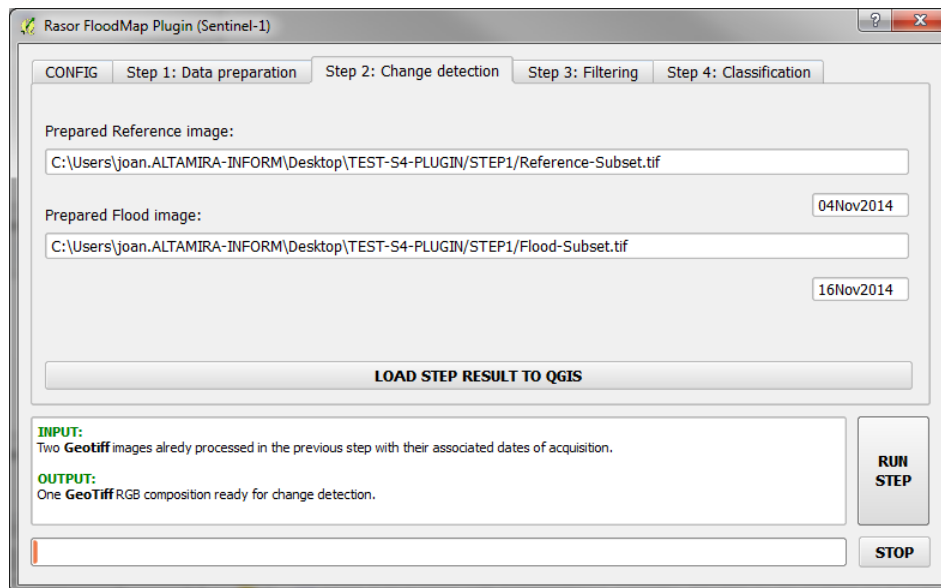
After RUN STEP the images used to make a RGB composition with the change detection LOAD STEP RESULT TO QGIS button:
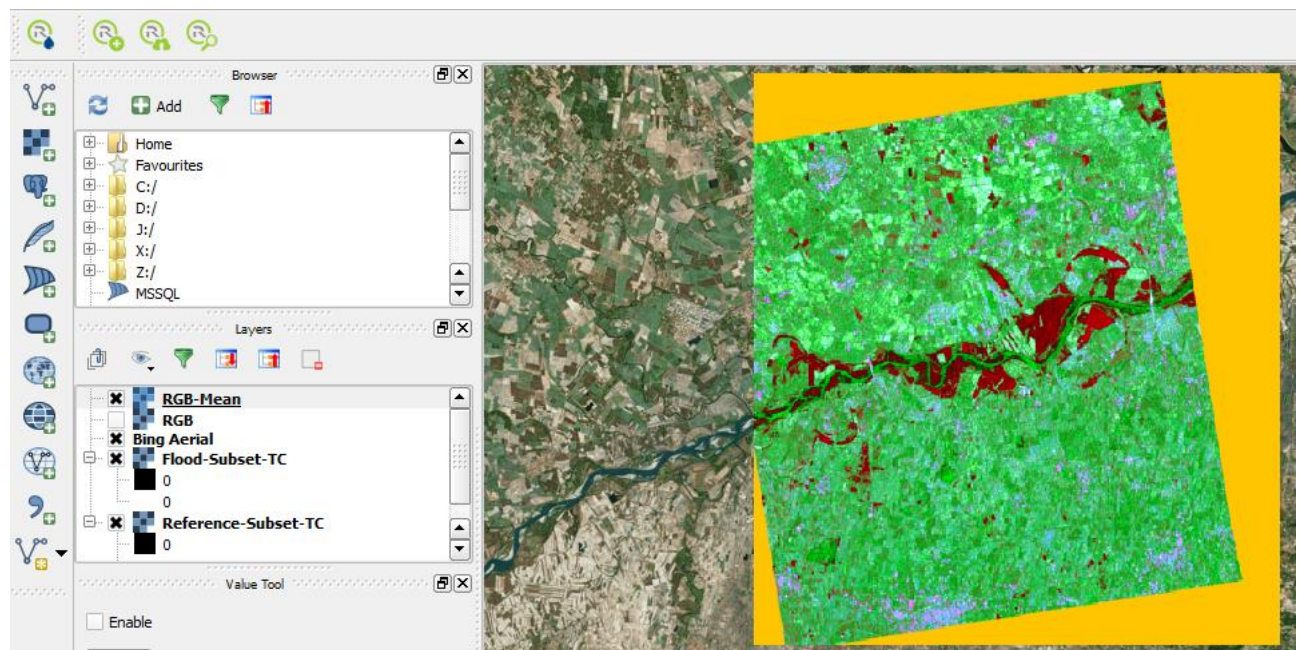
3.4. Filtering

In this tab the resulting RGB image of the previous step are auto-selected. The user can select the range and radius parameters for the mean filtering in advanced mode:
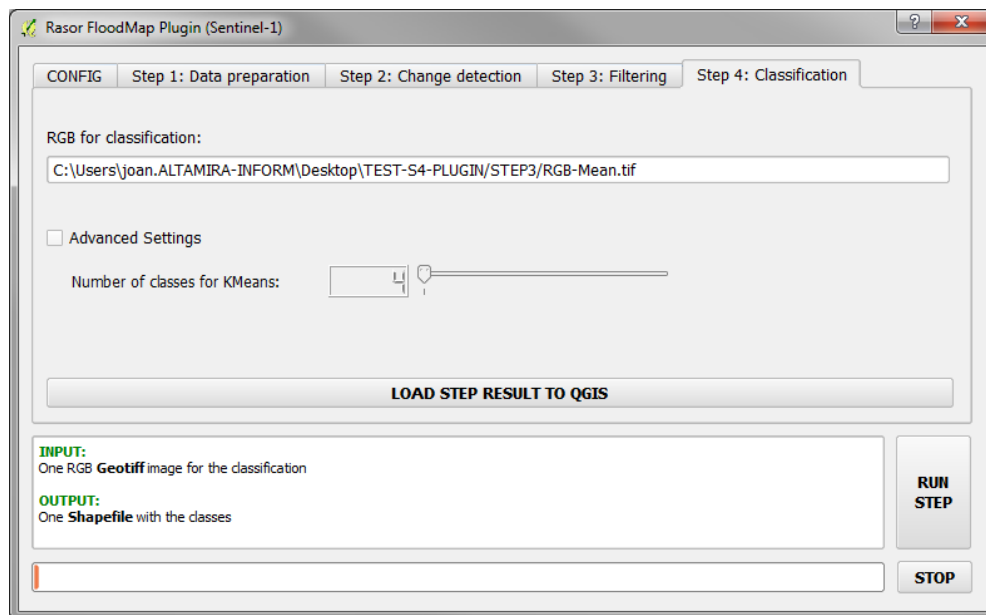

After RUN STEP the images used to make a RGB composition with the K-Means mean filtering LOAD STEP RESULT TO QGIS button:
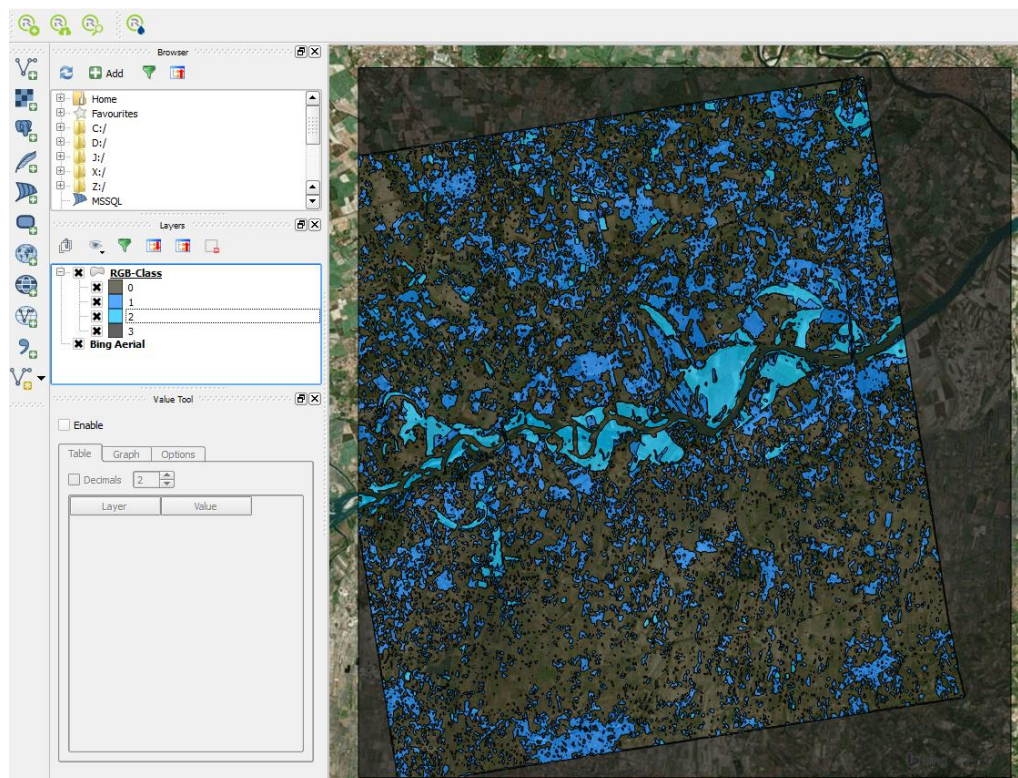
3.5. Classification

In this tab the resulting RGB filtered image of the previous step is auto-selected. The interface allows the user to select the number of classes used in the polygonize (advanced mode):

After RUN STEP a SHP with automatic legend is created with the classes resulting of the analysis. It can be loaded with the button LOAD STEP RESULT TO QGIS button:

The user can inspect it and decide which is the relevant class for flooded areas and whereas it has to be run again with more classes: