Download Sentinel-1 Import Download Srtm3V4 Sample Selection

Version 1.0

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General Information

Examples of SARscape Modeler workflows can be find in the installation folder (C:\Program Files\SARMAP SA\SARscape\examples\modeler_examples). We suggest keeping the already set parameters to obtain the results shown in this tutorial.

The main steps of this tutorial are described by a number. Steps that are not characterized by a number are not mandatory.

This symbol  specify a practical step that the user should perform in order to proceed with the tutorial.

Steps that are not identified by this symbol must not be modified. If parameters will be modified results obtained in this tutorial are not guarantee.

Download Sentinel-1 Import Download SRTM3V4 Sample Selection

This model allows users to download Sentinel-1 data, to import the downloaded images; to download the SRTM3 V4 DEM based on the imported reference images; to extract a spatial subset using a geographic region or geographic coordinates.

To perform this tutorial a specific geographic region, or geographic coordinates, are necessary. Users has to set an area; the tutorial leads to results without specifying any geographic region. Since not only Sentinel-1 Download task requires a spatial reference, but also Import Sentinel-1 and Slant Sample Selection, it is necessary to clarify that two options are possible, depending on geographic region or geographic coordinates:

-in case geographic region is included, the download Sentinel-1 tool downloads all acquisitions inside or intersecting this geographic region, the Import tool imports only the bursts intersecting this region; the Sample Selection tool subsamples the imported images;

-in case geographic coordinates are specified, only the Download Sentinel-1 tool and the Sample selection tool considers the defined box.

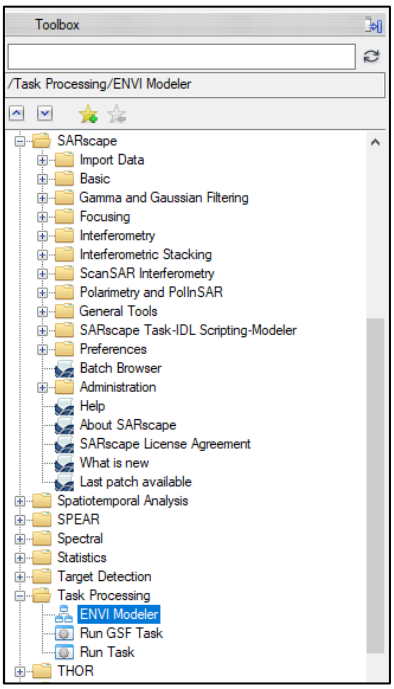

Figure 1 ENVI Modeler in ENVI Toolbox.

Start ENVI Modeler (Figure 1). Click the Open button in the ENVI menu bar, navigate to the examples folder in your SARscape installation path (i.e.: C:\Program Files\SARMAP SA\SARscape\examples\modeler_examples) and select the "DownloadSentinel1ImportDownloadSrtm3V4SampleSelection". The model opens in an ENVI Layout window, the model will appear as in Figure 2.

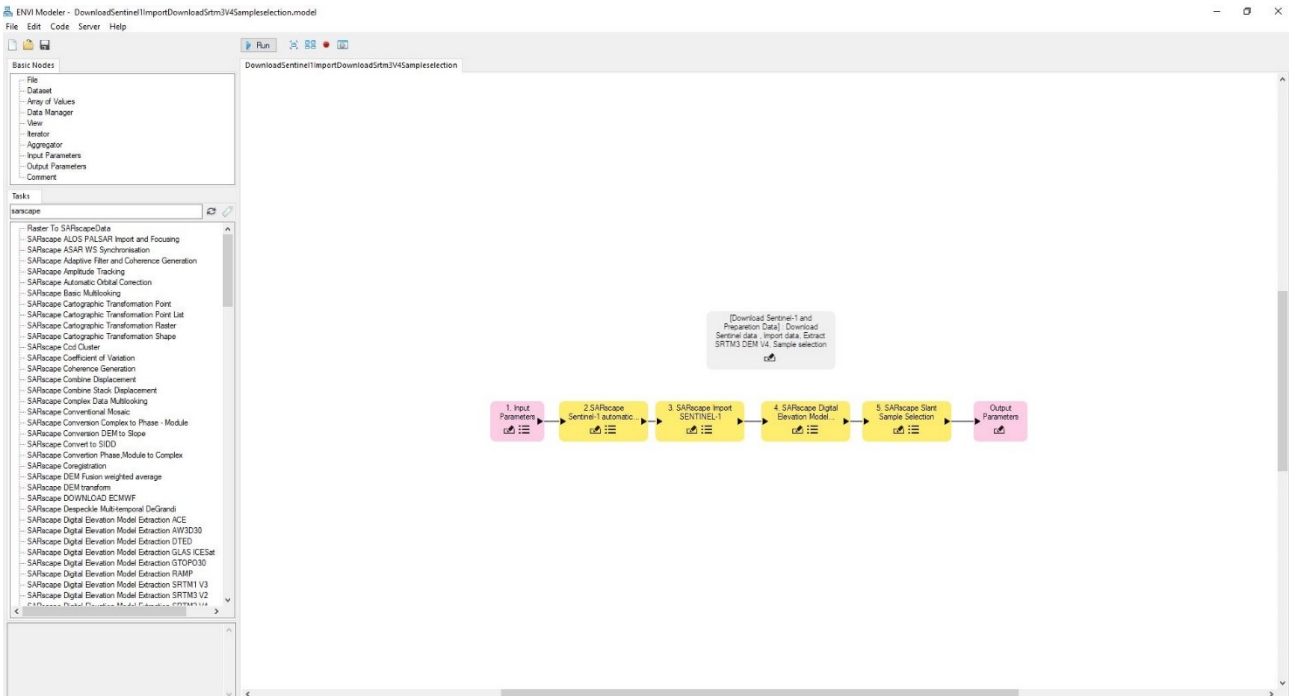

Figure 2 The example model in ENVI Modeler.

This task can be run as it is, each parameter is set to properly work.

✍ Click the Run button in ENVI Modeler window to run the model.

Step 1 Input Parameters

✍ Fill out the fields in the dialog box as in Figure 3 including:

- Geographical Region: set the area of interest;
- WEST/NORTH/EAST/SOUTH: set the box coordinates in case the Geographical Region was not specified in the dedicated box;
- From: set the starting date of the sensing period;
- To: set the last date of the sensing period;
- Platform Name: set Sentinel-1 platform name;
- Preview Only: set the Preview for data;
- Orbit Direction: set orbit direction (Ascending, Descending, ALL)
- Product Type: set the product type;
- Acquisition Mode: set the acquisition mode;
- Relative Orbit Number: set the relative orbit to the selected one;
- Polarization Mode: set the polarization mode;

- Login Username and Password: set the Username and Password of Sentinel Scientific Hub login credentials.
- Polarization: set the polarization;
- Out Cartographic System: set the DEM Cartographic System;
- Skip Sample Selection: set it to No to avoid the creation of a subsample of the imported data (it can be set to Yes in case a subsample is not needed).
- Common URI for outputs: set the filename to create the output, which is not mandatory. In this case it means that output files will be saved in the ENVI temporary folder.

Please, make sure to fill out the Common URI for outputs, otherwise results will be created in the ENVI temporary folder.

Once the model is set the completed task will appear in green color and a progress bar will describe and show the progression of that step.

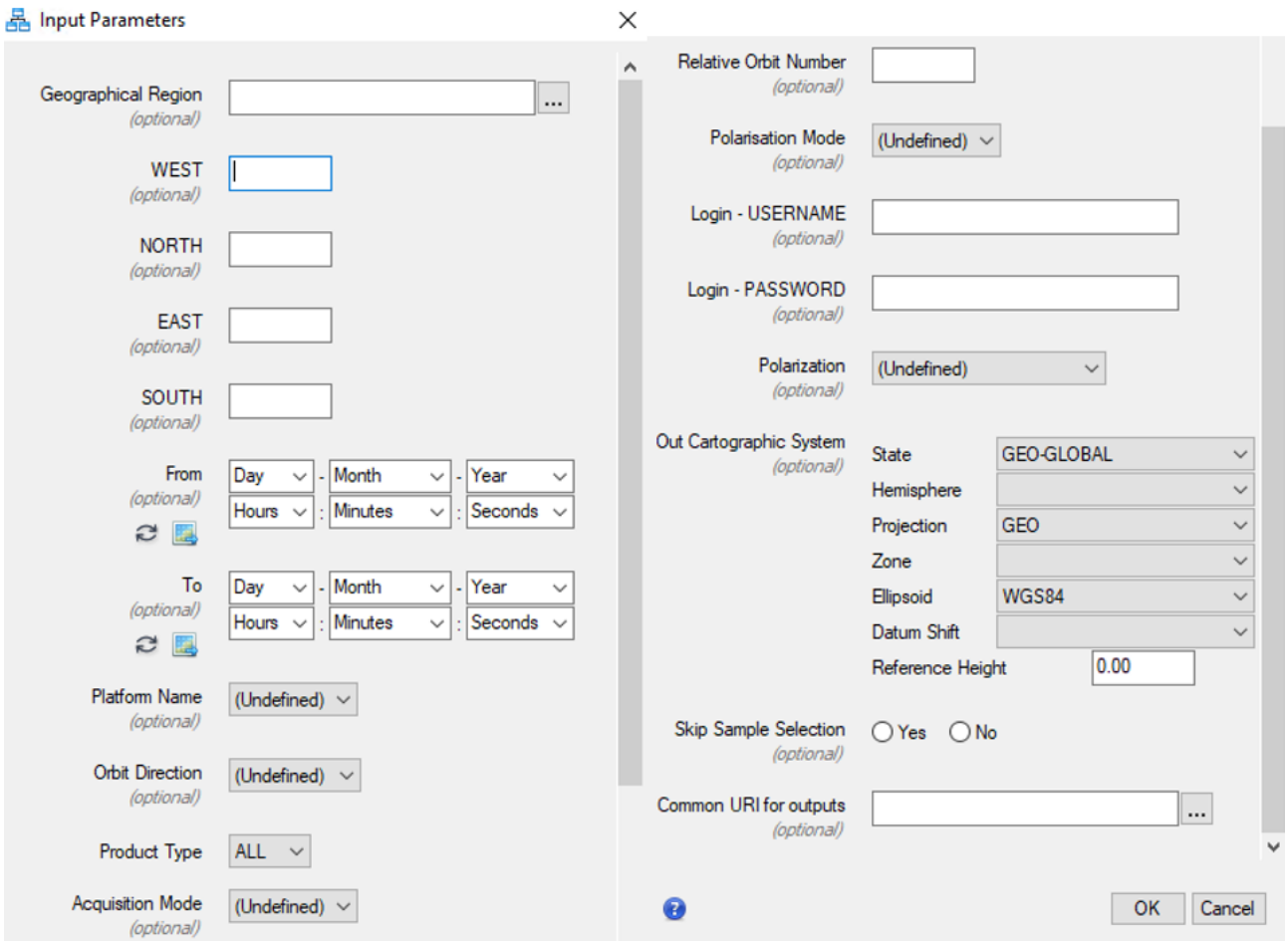

Figure 3 Input parameters task panel.

This model can be run as it is, each parameter is set to properly work.

Click the Run button in ENVI Modeler window to run the model.

Step 2 SARscape Sentinel-1 automatic download.

This task will download Sentinel-1 data (Error! Reference source not found.). All the parameters set in the panel have been autocompleted based on the Input Parameters. Please, set proxy information if needed. The downloaded data are saved in the output as set in *Common URI for outputs*.

Note: Once a parameter has been already set in a previous step, as in this case Login USERNAME and PASSWORD, the corresponding field will be autocompleted. Please, create an account with login credentials as reported in Sentinel Data Download tool Help.

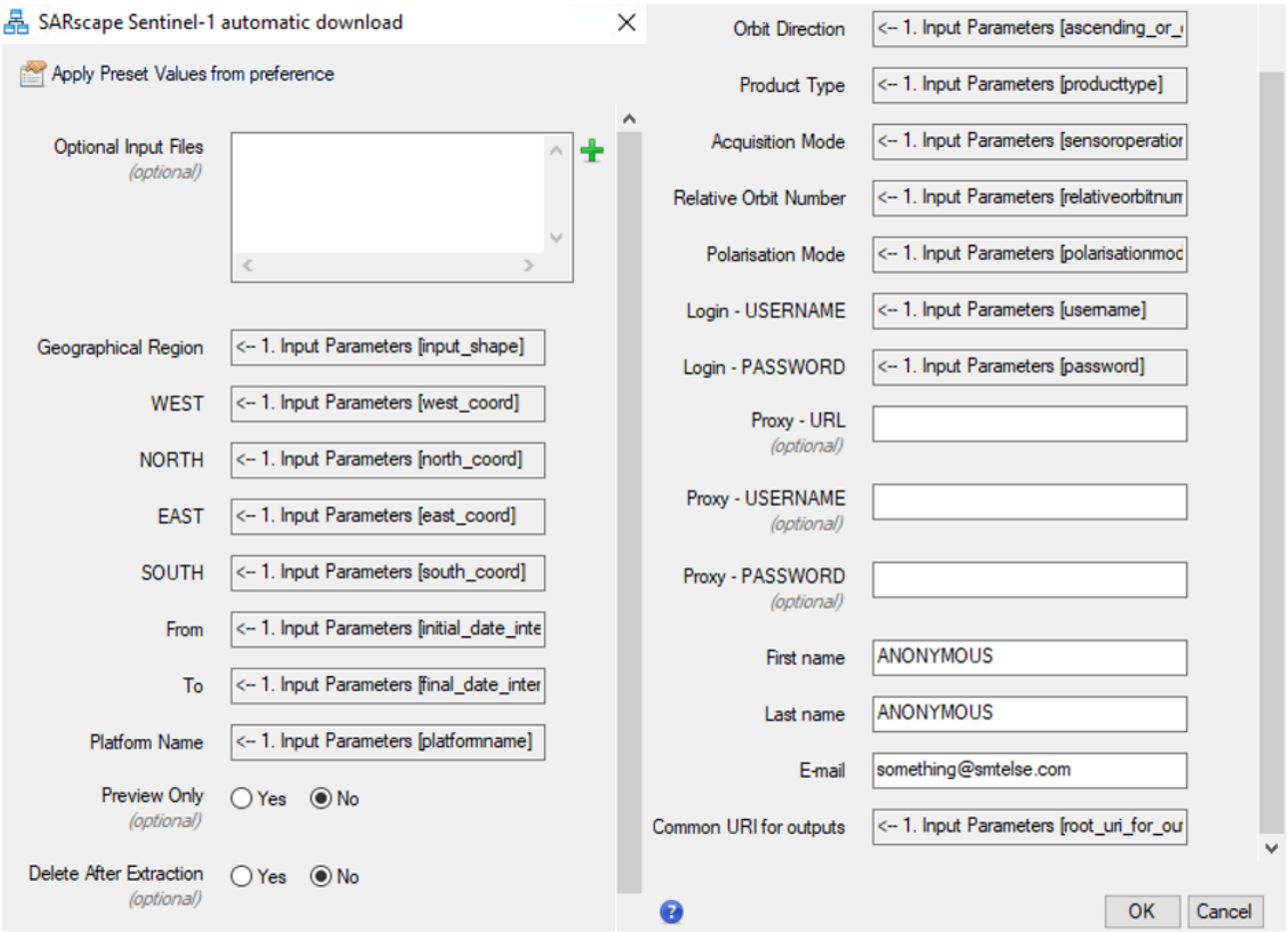

Figure 4 SARscape Sentinel automatic panel.

Step 3: SARscape Import Sentinel-1

This task imports data that have been downloaded using the Sentinel-1 automatic download task.

Note: Imported data will be saved in the output folder since the common URI for outputs is set.

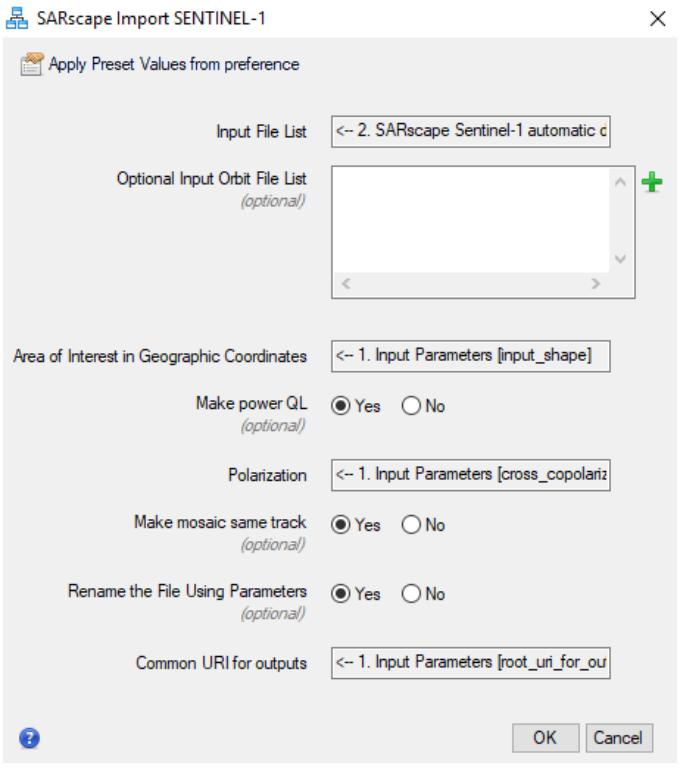

Figure 5 SARscape Import Sentinel-1 task panel.

Step 4 SARscape Digital Elevation Model Extraction SRTM3 V4

The Digital Elevation Model SRTM3 v4 is extracted. A *Reference* image from the Import Sentinel-1 task is used (Figure 6).

Note: The DEM will be saved in the output folder since the common URI for outputs is set.

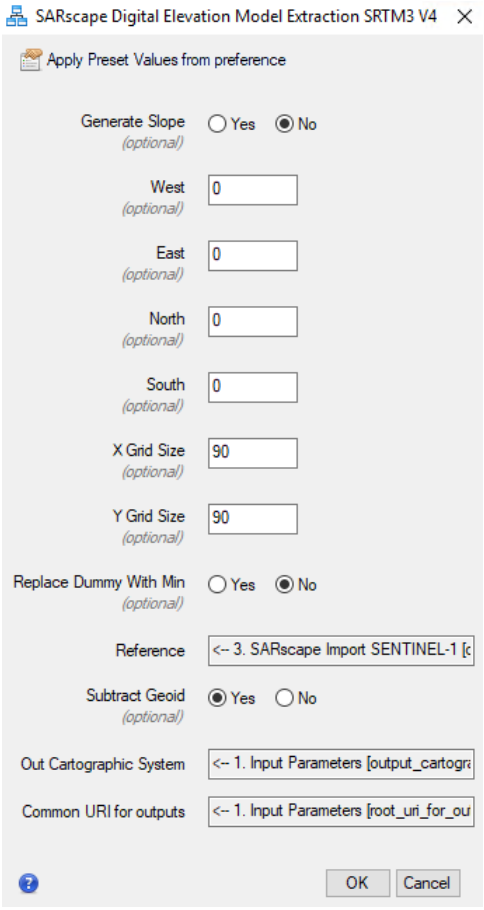

Figure 6 SARscape DEM Model Extraction SRTM3 V4 task panel.

Step 5 SARscape Slant Sample Selection

This task creates a subsample of the imported data. The imported data, the DEM, the Area of Interest or the coordinates are used as input for the Slant Sample Selection (see also Sample Selection SAR Geometry Data tool Help).

Note: This task output will be saved in the output folder since the common URI for outputs is set.

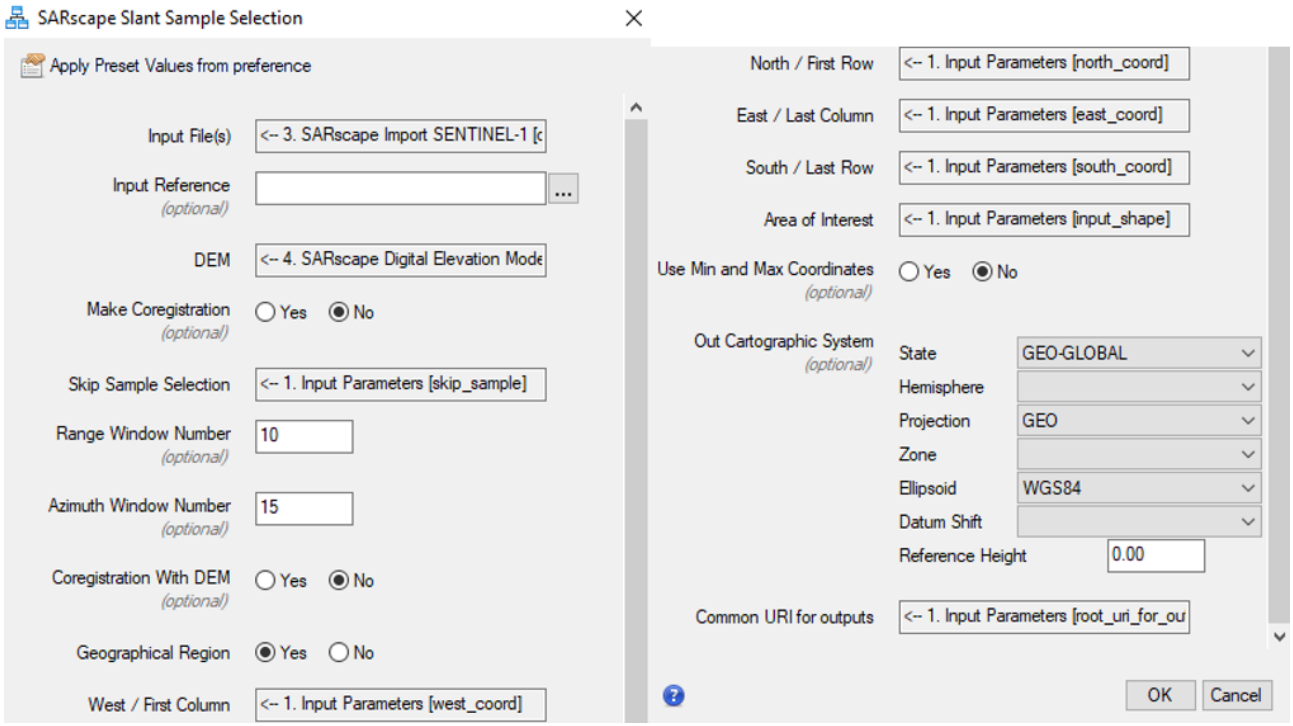

Figure 7 SARscape Slant Sample Selection task panel.

SARscape Output Parameters

The SARscape Output Parameters allows defining the outputs in order to collect them for a potential Metatask.

Once the process is created the model can be saved and used as a function for further processing using Edit> Create task from model.

The model can be used also as MetaTask and saved on disk to be recall in the future from the Task Panel every time users will need it in ENVI Modeler. To save it use Code> Genarate Metatask. It has be saved in ENVI installation folder as .task.

Both the model and task can be shared with other users. Metatasks have to be saved in the disk.

Models can be saved as IDL script in Code > Generate IDL Program.

Note: Please, note that this model allows users to skip the Sample Selection step.