ForestChangeS2 Service

Note this service was originally developed with the Forestry-Thematic Exploitation Platform (F-TEP) project.

Service description

Forest clearance causes substantial changes in visible and near infrared reflectance. This is evident when investigating the various spectral bands of Sentinel-2 satellite images. Due to the reduction of photosynthetically active vegetation in logging operations, especially if bare ground is exposed, red reflectance rises significantly. This increase in red reflectance can be used as a simple indicator for potential forest clearance. The ForestChangeS2 service produces the ratio of red reflectance between to input images (i.e. "*before*" and "*after*" images). The service computes a red-reflectance ratio layer, which can then be further analysed e.g. in the QGIS application service together with other products (forest or land cover maps).
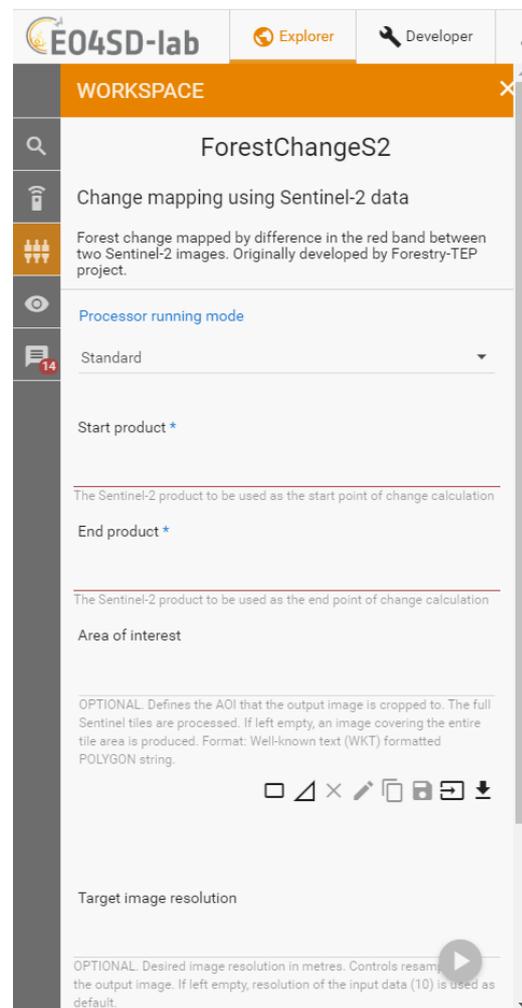
Selecting the service

The ForestChangeS2 service is selected by clicking on the services 📡 icon on the left of the screen on the *Explorer pane*. This opens up the service portfolio list, which can be filtered by service type (such as application or processor). Scroll down or type into the search interface the name of the service and after selection the *WorkSpace* panel will open.

Input data

The service requires as its input data two Sentinel-2 L1C image tiles. The correct Sentinel-2 data format can be recognized by file names that begin with "*S2A_MSIL1C*" or "*S2B_MSIL1C*". The images must cover the same area (i.e. the same Sentinel-2 tile). Cloud masking is performed with the cloud masks included in the Sentinel-2 L1C products. However, note that some clouds may have passed through the L1C cloud masking procedure, causing errors in the change detection. This has to be taken into account when interpreting the results. For the best results, both of the input images should be completely cloud-free.

Parameters

- **Processor Running Mode:** The Processors can be run in two modes **standard** or **systematic**. Most users will just require standard processing i.e. processing of one or more products in a single processing run. For advanced users, systematic processing allows the service to be run periodically if the platform identifies input data that matches the user-defined criteria.
- **Start product:** The first input Sentinel-2 image, which has been acquired before the assumed forest change. Drag the input Sentinel-2 image from a search results listing or from databasket contents at the bottom of the screen, by grabbing from the horizontal lines in front of its name.
- **End product:** Select the second image in the same way and drag it here.

- **Area of interest:** This OPTIONAL allows the user to define the area of interest (AOI) that the output image is cropped to. Note that full Sentinel-2 tiles are processed regardless of this setting. If left empty, an image covering the entire tile area is produced. The AOI can be copied from the area drawn on the map by clicking the *'Copy From Map'* icon. Alternatively, it can be specified in the Well-Known Text (WKT) POLYGON format. An example of a valid specification is: POLYGON((-92.906633 16.190411,-92.066559 16.188383,-92.070266 15.376645,-92.907004 15.378567,-92.906633 16.190411)).

- **Target image resolution:** This field is OPTIONAL. It specifies the desired image resolution in metres, controlling resampling of the output image (pixel spacing). If left empty, resolution of the input data (10) is used as default. For Sentinel-2 optical data, feasible values are between 10 and 100 (meters).

- **Label: OPTIONAL.** An OPTIONAL field for free form tagging for later identification of this processing job.

Service Execution

After all input fields have been filled in, the service is launched by clicking the round play button at the bottom right corner of the input dialogue area. The processing can typically take 25 minutes. The resulting output is GeoTIFF file that can be downloaded, re-used or visualised in the Geobrowser. Further analysis can be undertaken in one of the GUI applications, such as SNAP, QGIS or Monteverdi. Soon after desired application process (e.g. QGIS) is started, a *'Go to GUI'* icon appears in the job description. The desired GUI application can then be accessed by clicking this icon, which opens the GUI in another browser tab. The image below shows the red ratio result opened in QGIS, with some potential clearings visible (in white).