

Wildfire Greece 2018

First exercise: detecting wildfire on S2 image

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Wildfire around the village of Kineta, near Athens, 23-24 July, 2018

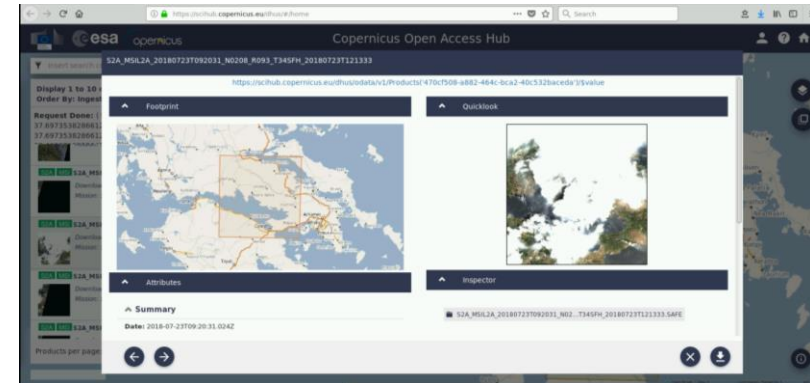
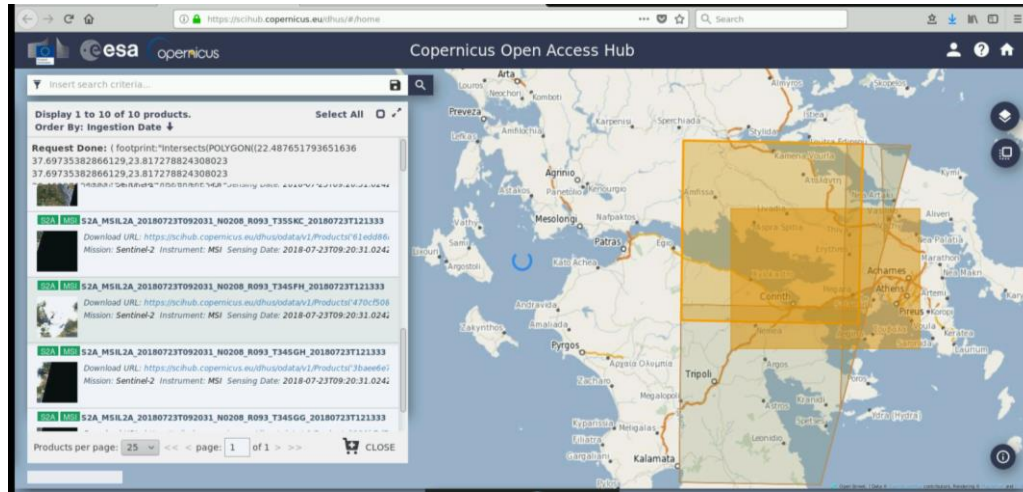


Geraneia mountains near Kineta



Getting S2 data

- Copernicus Open Access Hub:



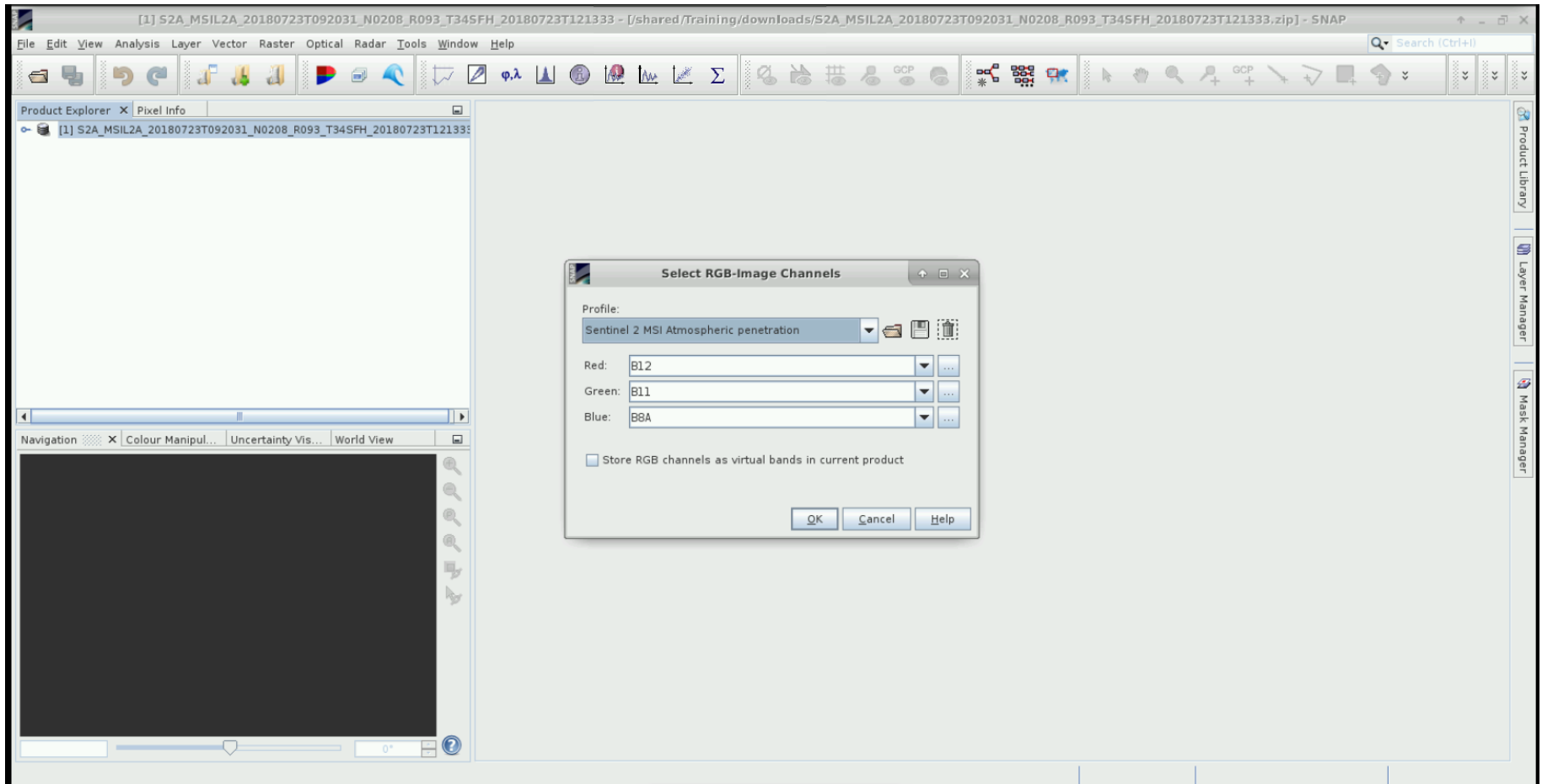
S2A_MSIL2A_20180723T092031_N0208_R093_T34SFH_20180723T121333.SAFE

Image is also available in folder:

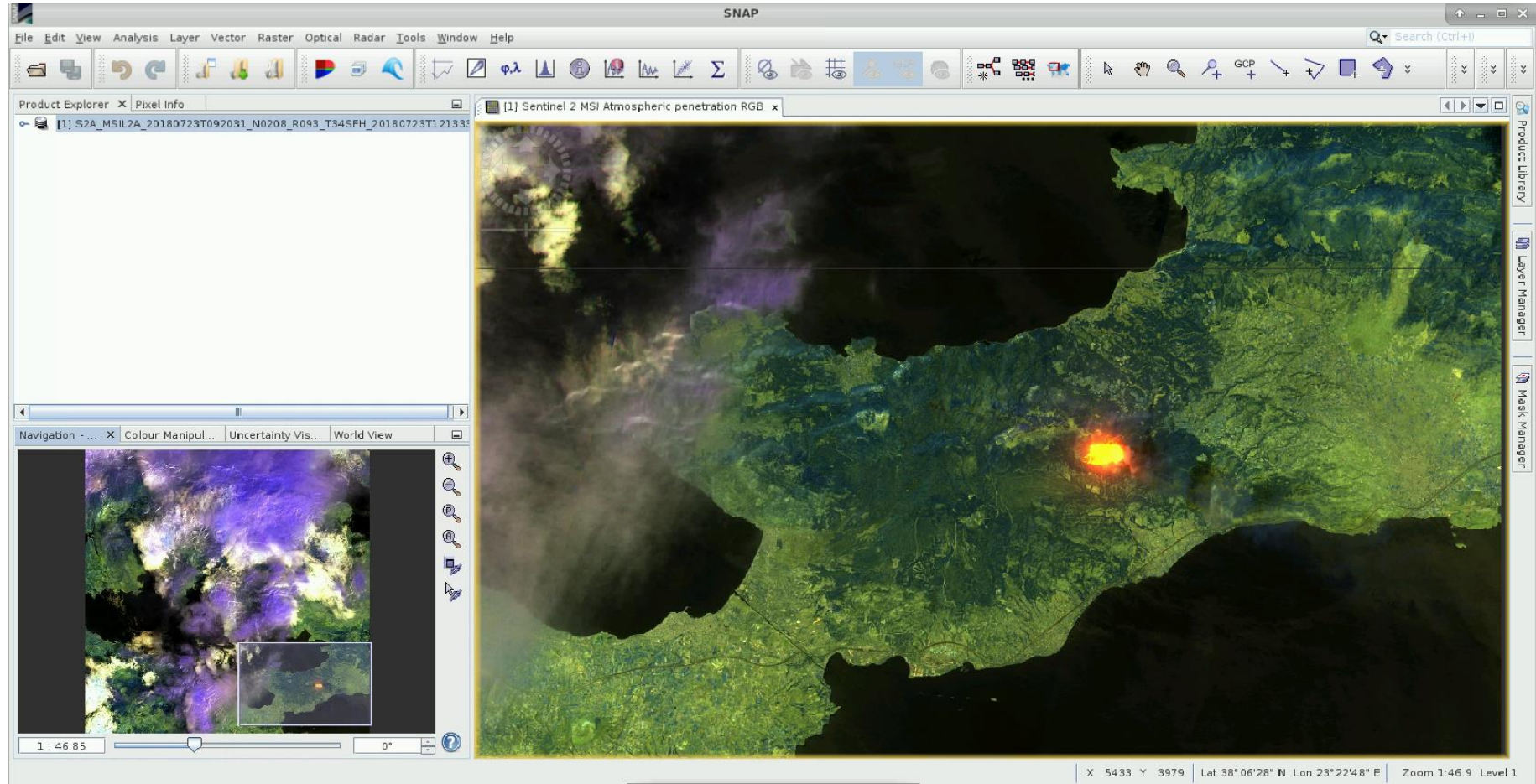
PECS_Slovakia/Fires/S2_L2A_images

Load the S2 zip file in SNAP:

- Open **RGB Image Window**:
- Select: **MSI Atmospheric penetration (Red: B12; Green: B11; Blue: B8A)**

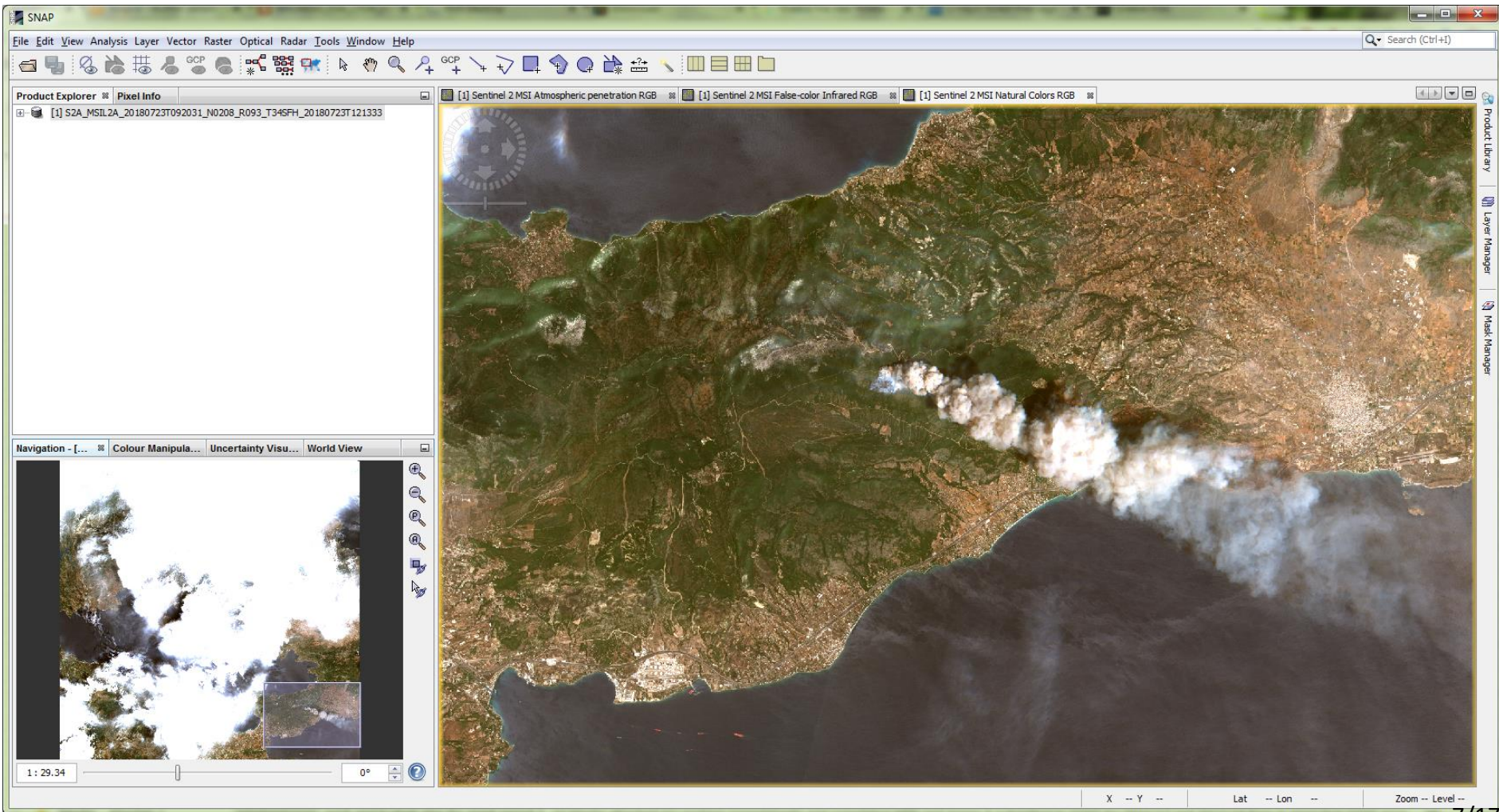


In the Navigation window, zoom in to the wildfire region, near Kineta



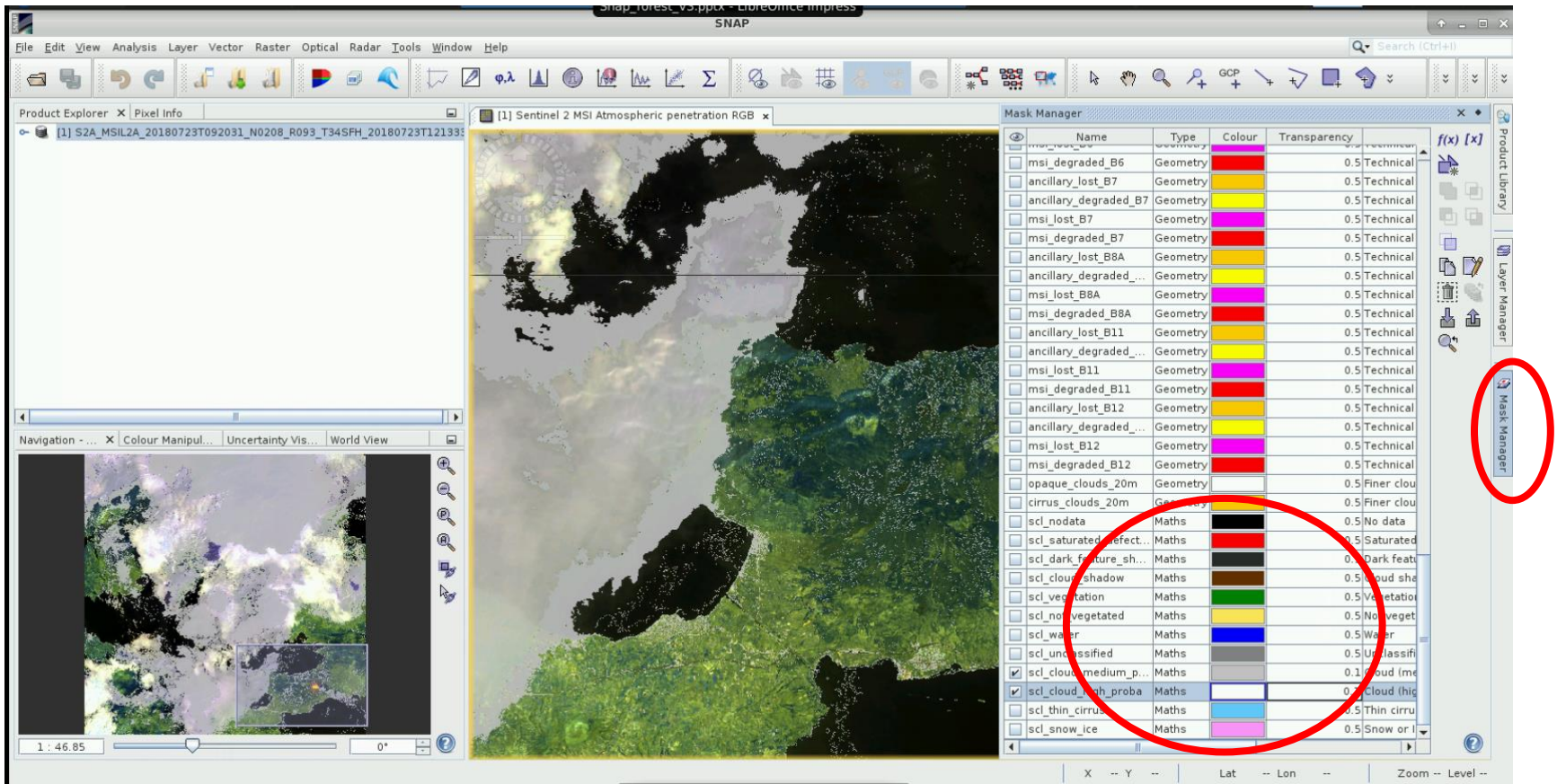
The same in real color, after color manipulation

- Open RGB Image Window:
- Select: MSI Natural colors (Red: B4; Green: B3; Blue: B2)
- Apply color manipulation (stretching) for RGB

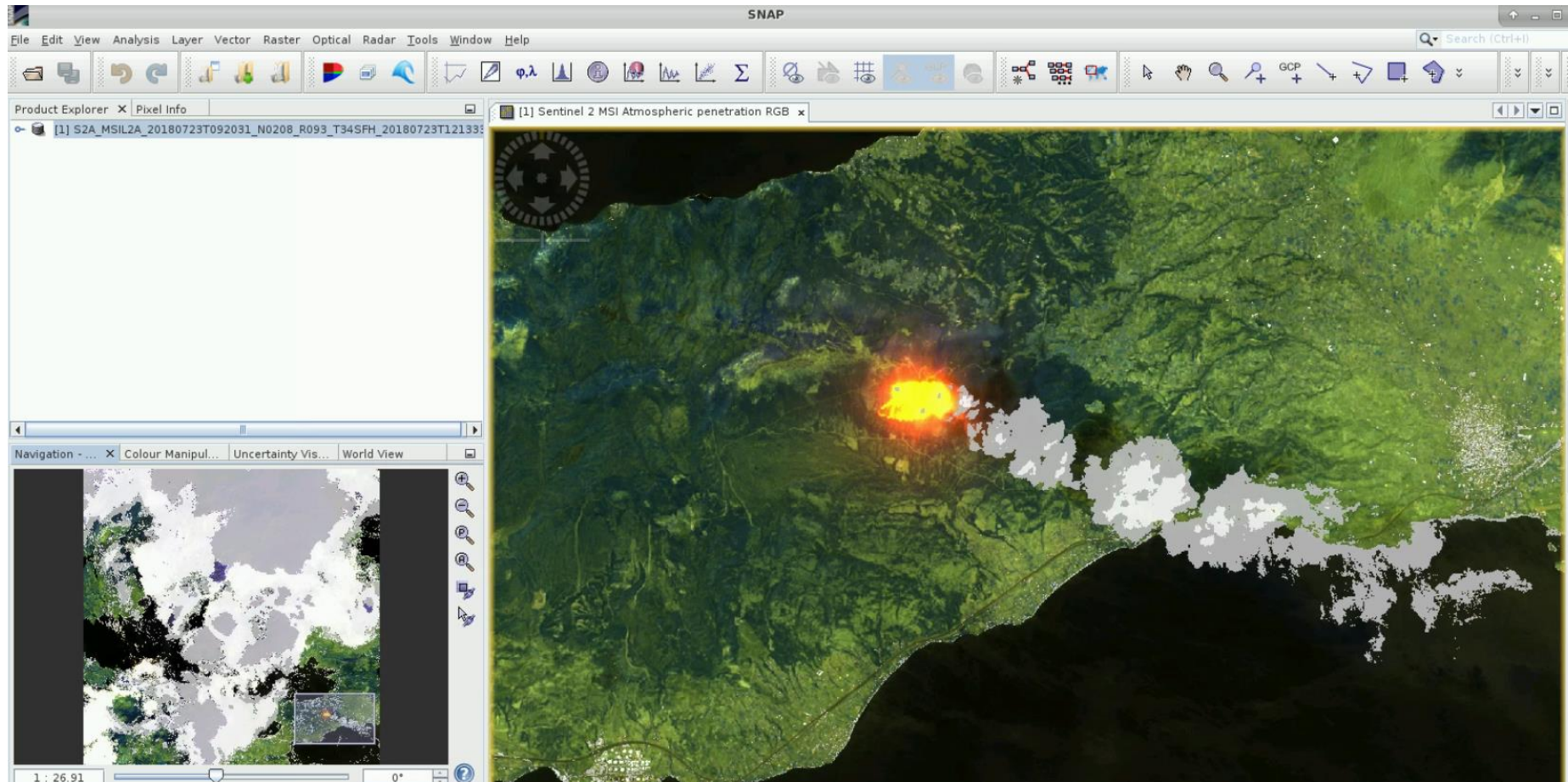


Let's try to detect the smoke plume

- Go to **Mask Manager**, and scroll down to the **Maths masks**
- Select: cloud medium & cloud high probability
- To visualize the masked areas better, lower the transparency (e.g. 0.1)




Fire + cloud plume map

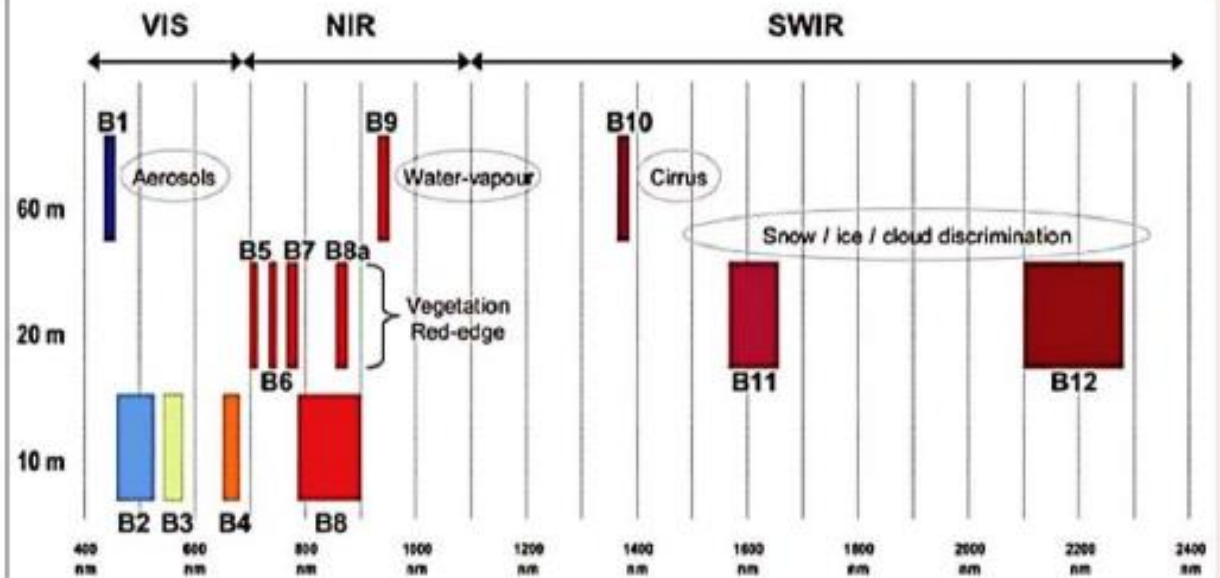


Let's export this View as an image and save as a GeoTIFF

Because of multiple S2 spatial sizes, we first have to resample the data.

Let's resample to highest spatial resolution: 10 m (e.g. B2).

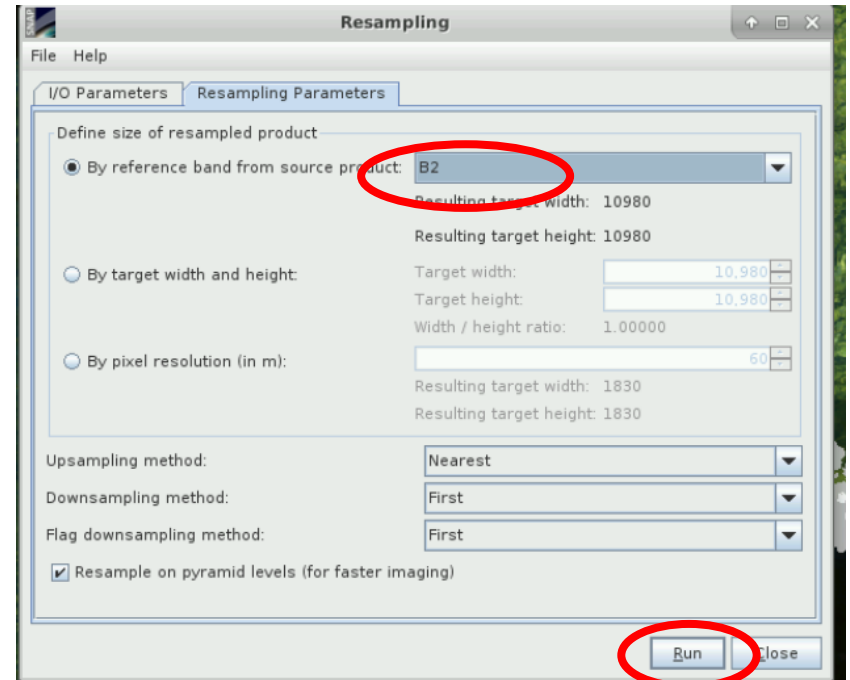
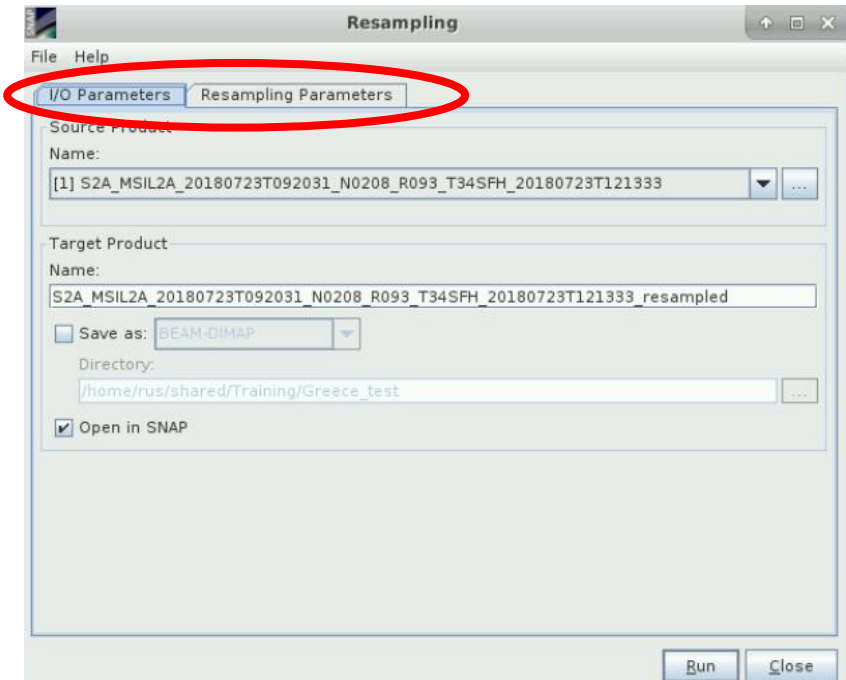
 **NOTE 1:** The input product contains 13 spectral bands in 3 different spatial resolutions (The surface area measured on the ground and represented by an individual pixel). When we open the RGB view all our input bands have 20 m resolution, however, the view is displayed in the full 10 m resolution.



Credits: ESA 2015

Resample:

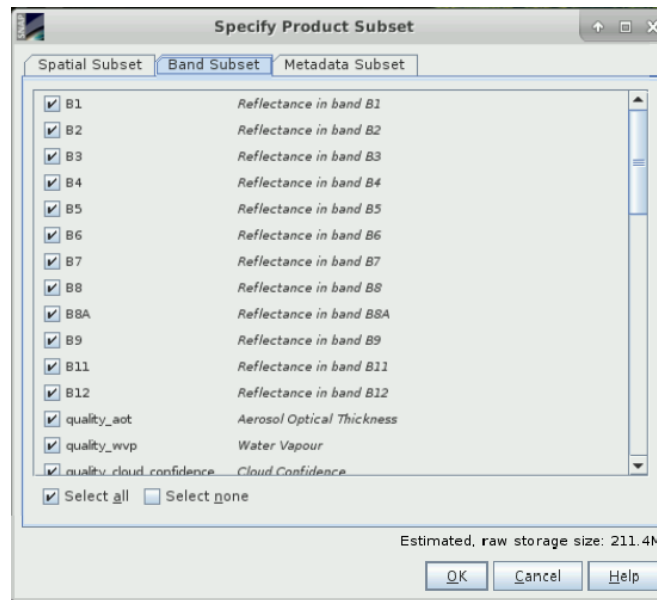
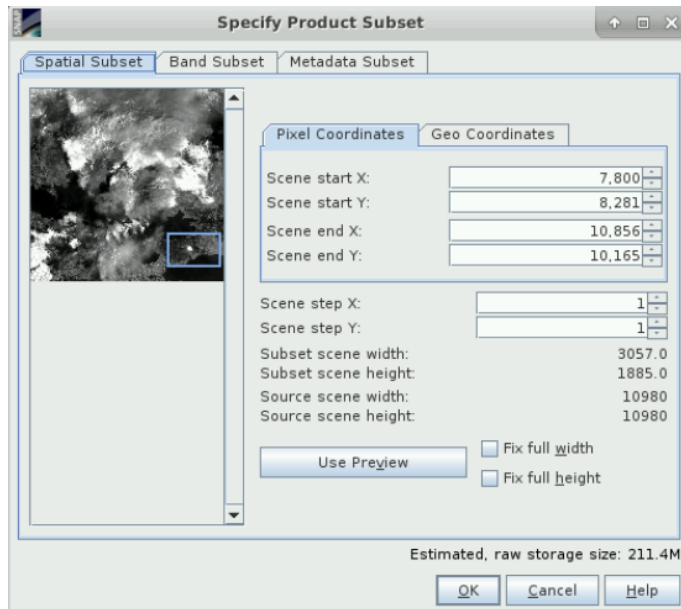
- Raster->Geometric Operations->Resampling
- We keep I/O names
- In Resampling Parameters, we select B2 (10 m)



Nearest neighbor or bilinear interpolation?

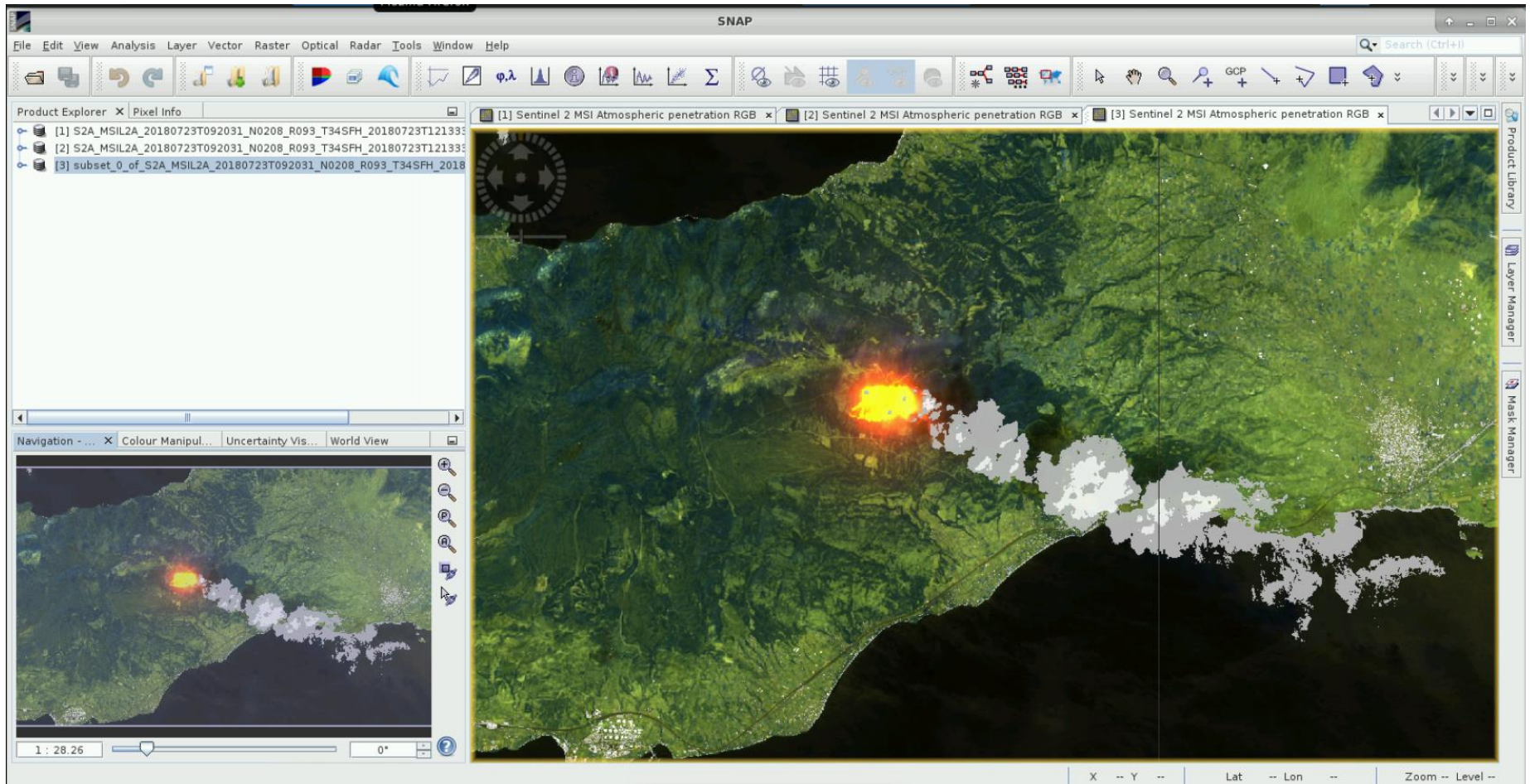
Let's create a subset based on the current view

- Display the image. Note that now many more color options are available. Select **MSI Atmospheric penetration**
- Make a zoom and add the cloud masks
- Right-mouse button -> **Spatial Subset from View**



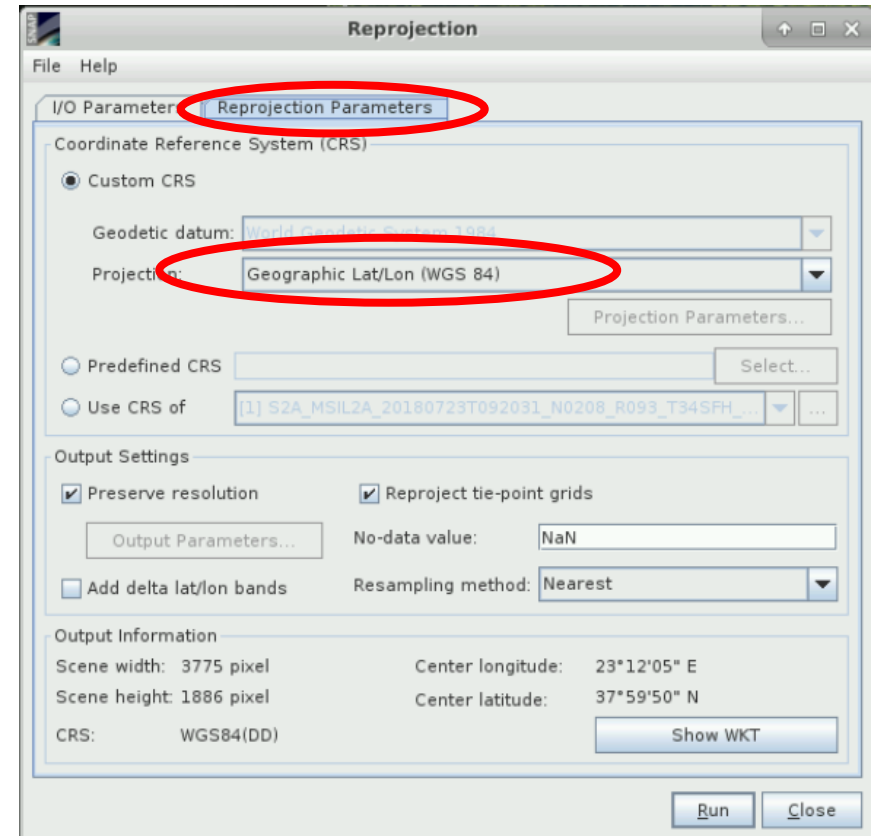
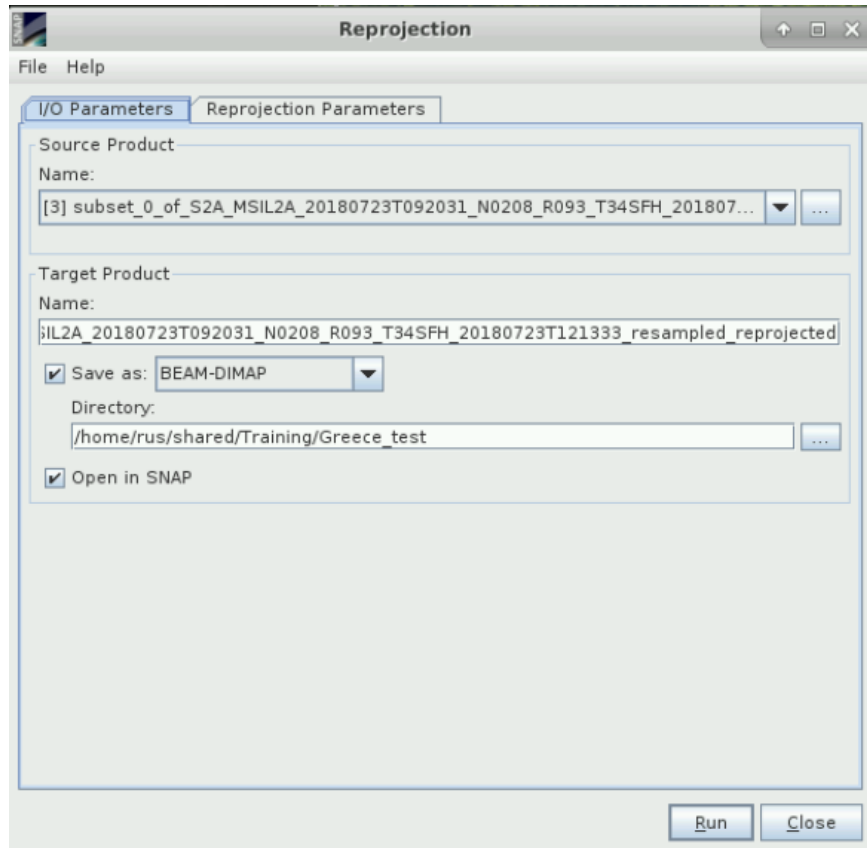
Geometry from WKT
WKT from Geometry
Export Transect Pixels
Export Mask Pixels
Export View as Google Earth KMZ
Export View as Image
Export Colour Palette as File
Export Colour Legend as Image
Spatial Subset from View...
Copy Pixel-Info to Clipboard

Subset, with cloud mask

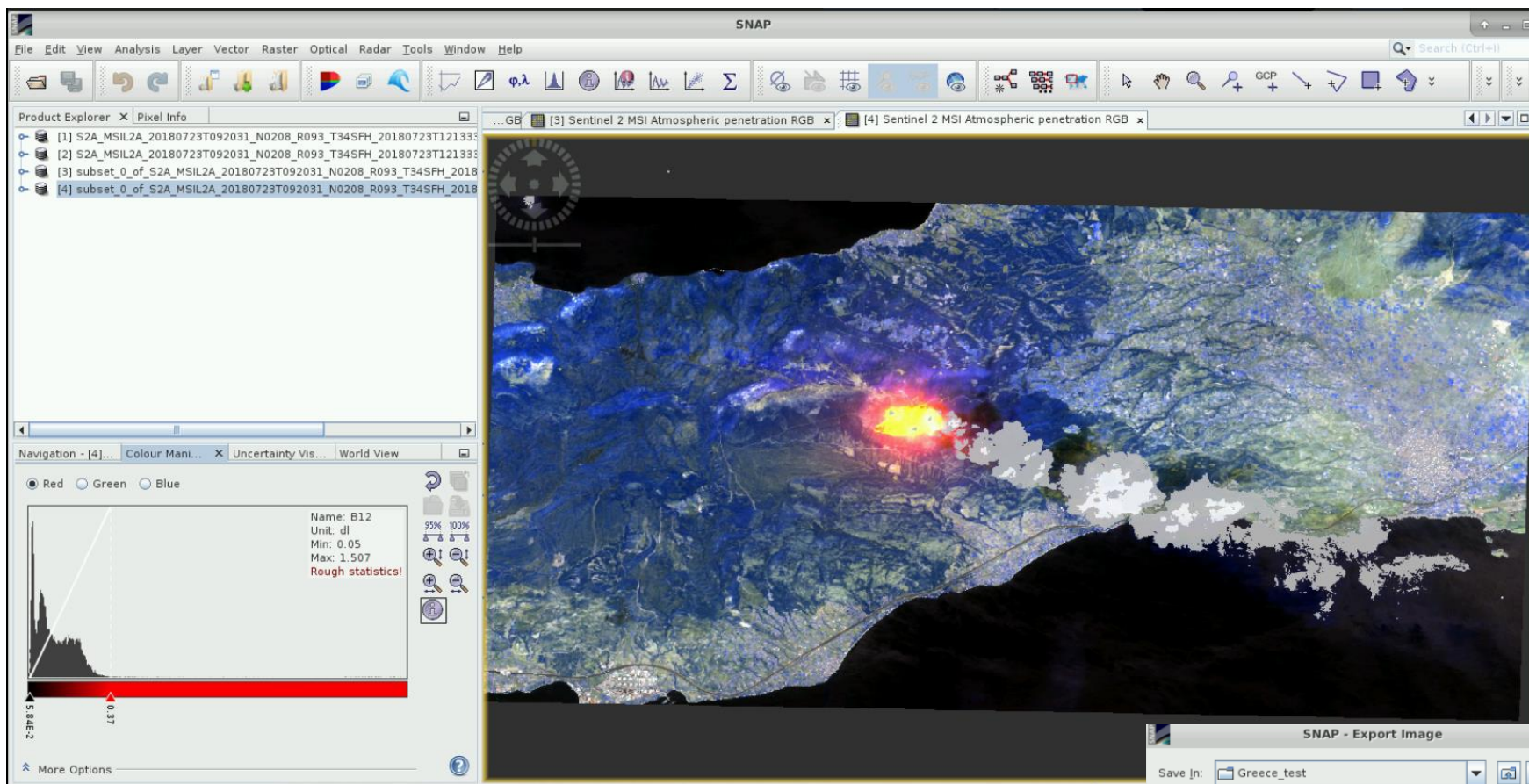


Let's reproject the image in Latitude & Longitude coordinates

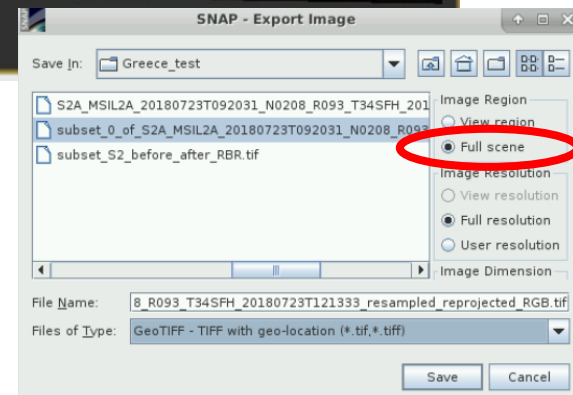
- Raster->Geometric Operations->Reprojection
- Select the default: Geographic Lat/Lon (WGS 84)



Now we can export View as GeoTiff

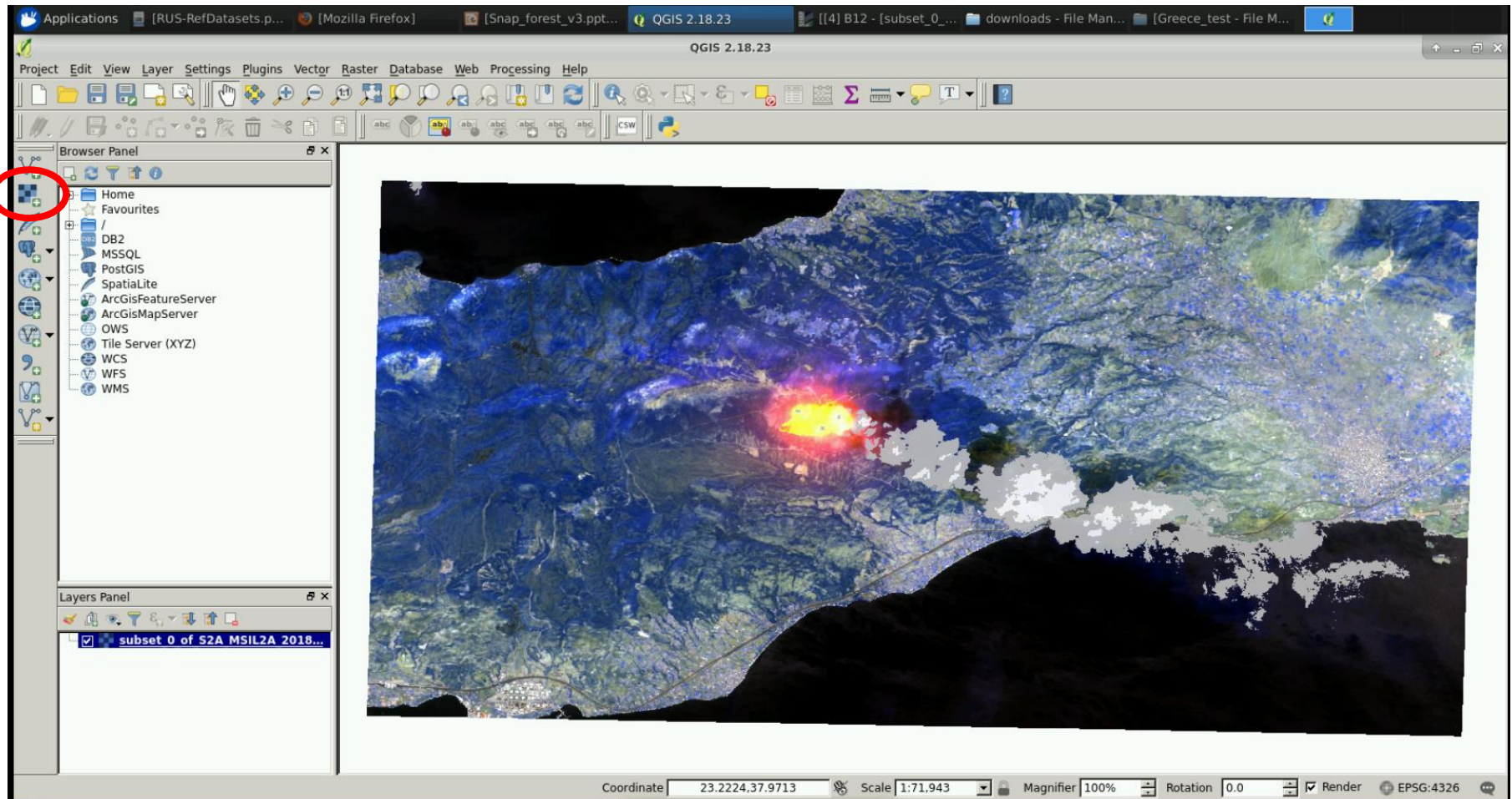


Right mouse button: **Export View as Image**
Select: Full scene, GeoTIFF
Manipulate the colors



Now we open QGIS

NOTE 5: In case the OpenLayers plugin is not installed, click on Plugins -> Manage and Install Plugins. Select the 'All' tab on the right side panel and write "OpenLayers plugin" on the search box. Select the plugin on the list and click 'Install Plugin'. Restart QGIS to finalize the installation.



We can overlay it to Google Satellite:

- **Web->OpenLayers plugin->Google Maps->Google Satellite**
- **Move the Subset above the satellite**
- **Play with Transparency: Properties->Transparency (e.g. 50%)**

Final map

