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# «SNAP» հավելվածի ներկայացում

Աղավնի Հարությունյան

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**AUA** ACOPIAN CENTER  
for the ENVIRONMENT



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**Նկարագրություն` Sentinel Application Platform (SNAP)-ը բաց կոդով ծրագիր է, որն իր մեջ ընդգրկում է բոլոր Sentinel Toolboxes-երը: Այն իդեալական է երկրի դիտարկման տվյալների վերլուծության համար:**

**Ծրագրի տեսակը` Desktop image processing (remote sensing software - raster data)**

**Վեբկայքը` <http://step.esa.int/main/toolboxes/snap/>**

**Հասանելիությունը` Install only**

**Computer System` Windows, MacOSX, Linux**

**Գործառույթները` Պատկերների վերլուծություն, մոդելավորում, վիզուալիզացիա**



## Ընդհանուր ակնարկ

Sentinel Application Platform-ը (SNAP)  
միավորում է բոլոր Sentinel Toolboxes-ը:

Հիմնական գործառույթը ներառում է.

- բացել արբանյակային պատկերը
- ուսումնասիրել պատկերի կոմպոնենտները՝ օրինակ բենդերը





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# Ընդհանուր ակնարկ

*The common architecture for all Sentinel Toolboxes and SMOS Toolbox is called Sentinel Application Platform (SNAP)*



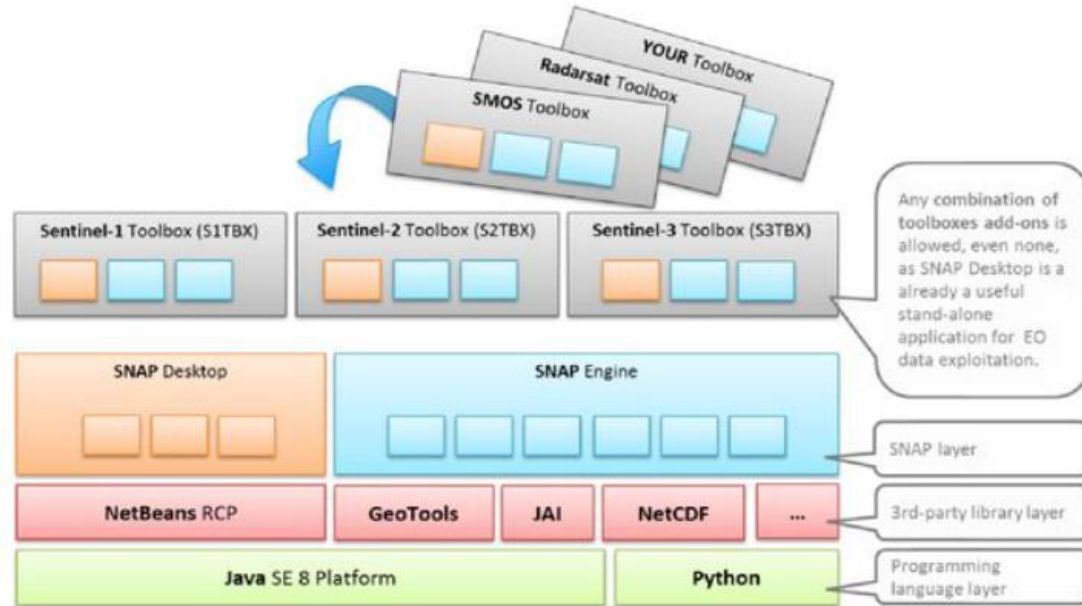


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# Առավելություններ

- ✓ *Developed as open source software*
- ✓ *Common Java core framework*
- ✓ *Joint development plan for Sentinel toolboxes*
- ✓ *Interchangeable Java/Python plugins*
- ✓ *Portable engine to Cloud infrastructure*
- ✓ *Single installer*







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# Ընդհանուր ֆունկցիաները

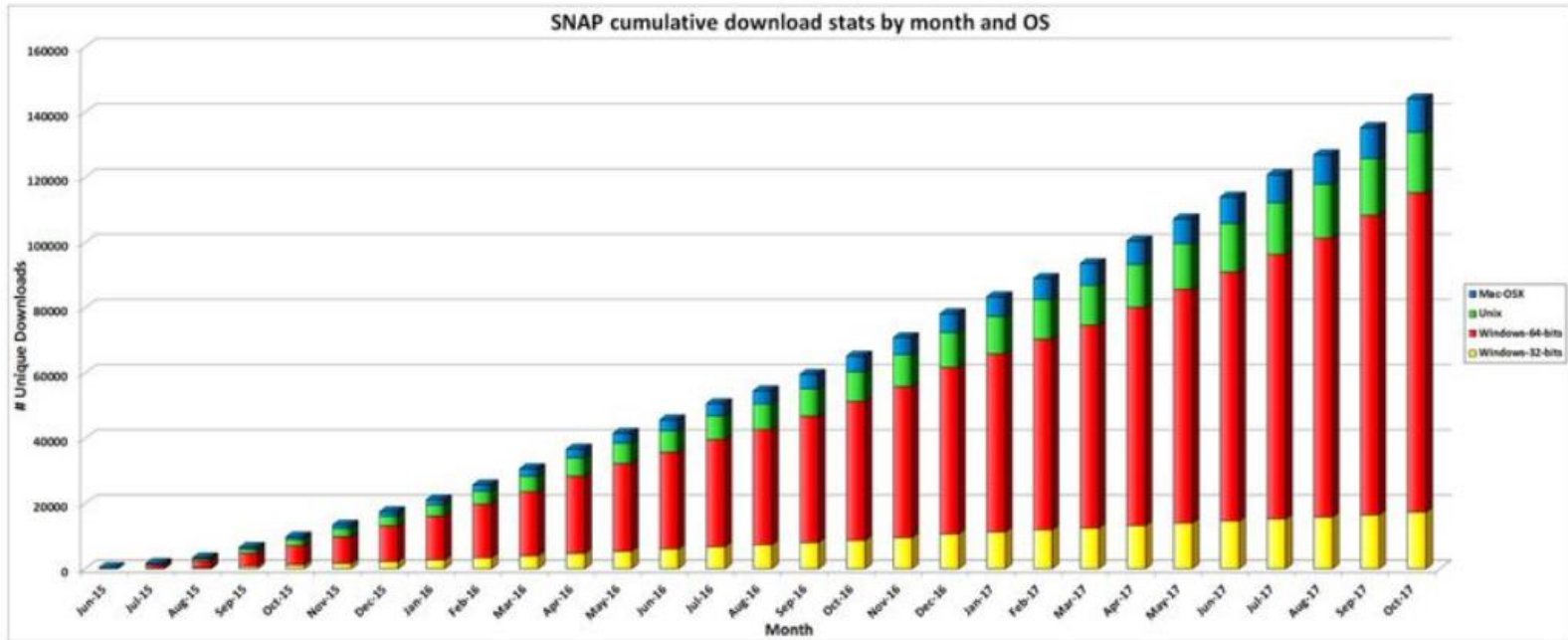
- **Common architecture and data model for all Toolboxes**
  - ✓ Develop your own application (cli or gui)
- **Very fast image display and navigation even of giga-pixel images**
  - ✓ Advanced layer management allows adding and manipulation of new overlays such as images of other bands, images from WMS servers or ESRI shapefiles
- **Graph Processing Framework (GPF)**
- **Generic Operators**
  - ✓ Flexible **band arithmetic** using arbitrary mathematical expressions
  - ✓ **Reprojection** to common map projections
  - ✓ **Resampling**
  - ✓ **Subset**
- **Supervised classification algorithms**
  - ✓ Random Forrest, KNN, KDTree KNN, Maximum Likelihood, Minimum Distance
- **Automatic SRTM DEM download and tile selection**
- **Multithreading and Multi-core processor support**



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# Ներբեռնման ցուցանիշները



**SNAP download exceeded 140.000 from June 2015 until today**



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## Sentinel-2 Toolbox Overview

The SNAP extension for HR data

Sentinel-2 data readers: L1B, L1C, L2A

Multi-mission: new land-products readers

- ✓ Landsat, Spot 1-7, RapidEye, Deimos
- ✓ More to come in the future: UK-DMC, Pleiades, Ingenio/SEOSAT, EnMAP, ...

Sentinel-2 oriented scientific processors

- ✓ Sen2Cor: Atmospheric correction for S2-MSI L1C
- ✓ Sen2Three: multi-temporal synthesis of L1C/L2A
- ✓ L2B processor: biophysical products from L2A
- ✓ Reflectance to Radiance Processor
- ✓ IdePix Processor (pixel classification)
- ✓ Radiometric Indices (vegetation, soil and water)
- ✓ Water processors (FLH/MCI)
- ✓ Deforestation detection processor
- ✓ Maximum Chlorophyll Index Processor

中国科学院







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### *Vegetation indices*

- *DVI, RVI, PVI*
- *NDVI, WDV, TNDVI, GNDVI*
- *SAVI, TSAVI, MSAVI, MSAVI2*
- *GEMI*
- *ARVI*
- *NDI45*
- *MTCI, MCARI, PSSRa*
- *S2REP, REIP, IRECI*

### *Soil indices*

- *BI*
- *BI2*
- *RI*
- *GEMI*

### *Water indices*

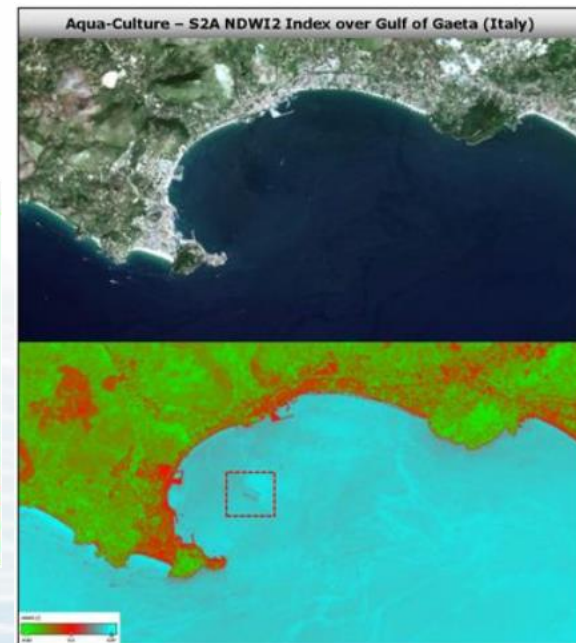
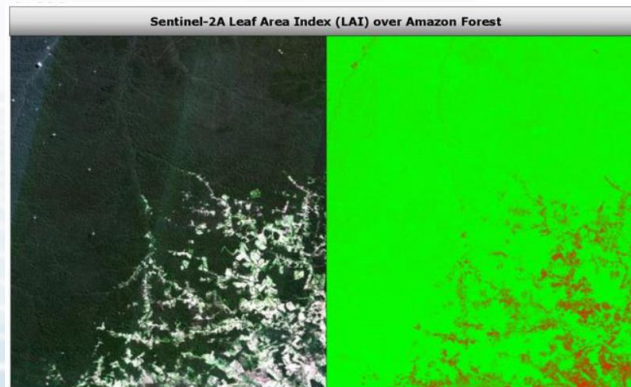
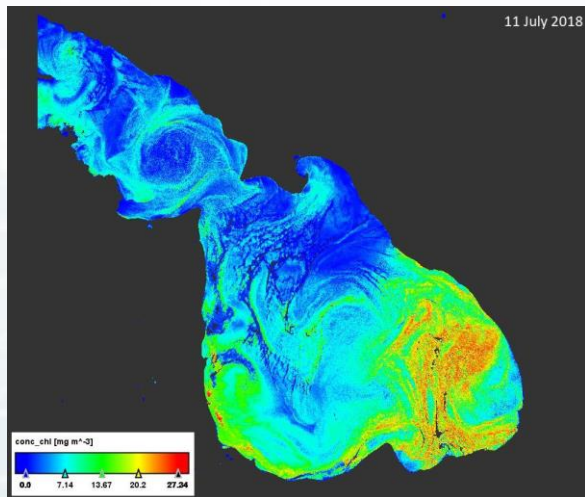
- *NDWI*
- *NDWI2*
- *MNDWI*
- *NDPI*
- *NDTI*



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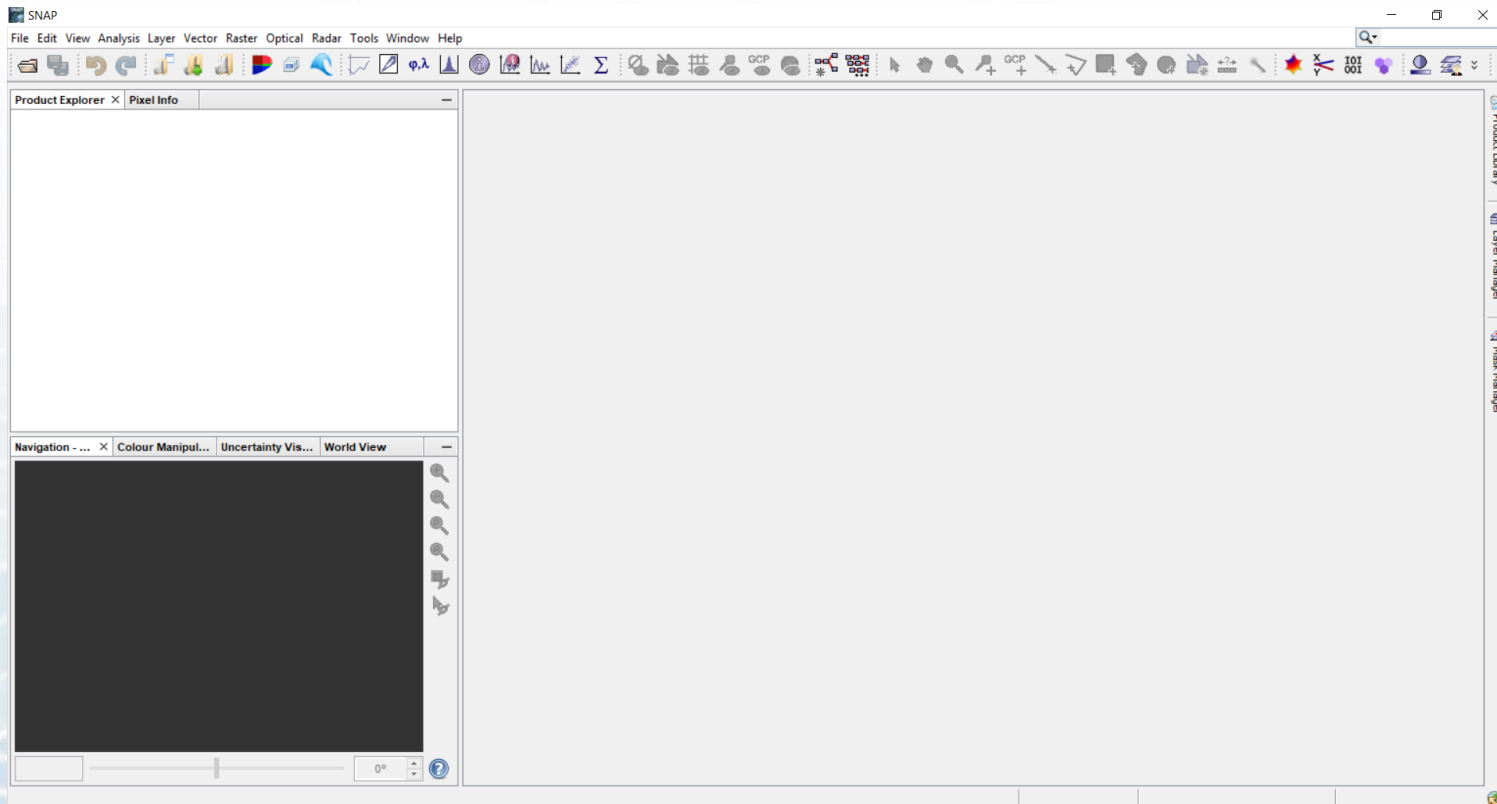


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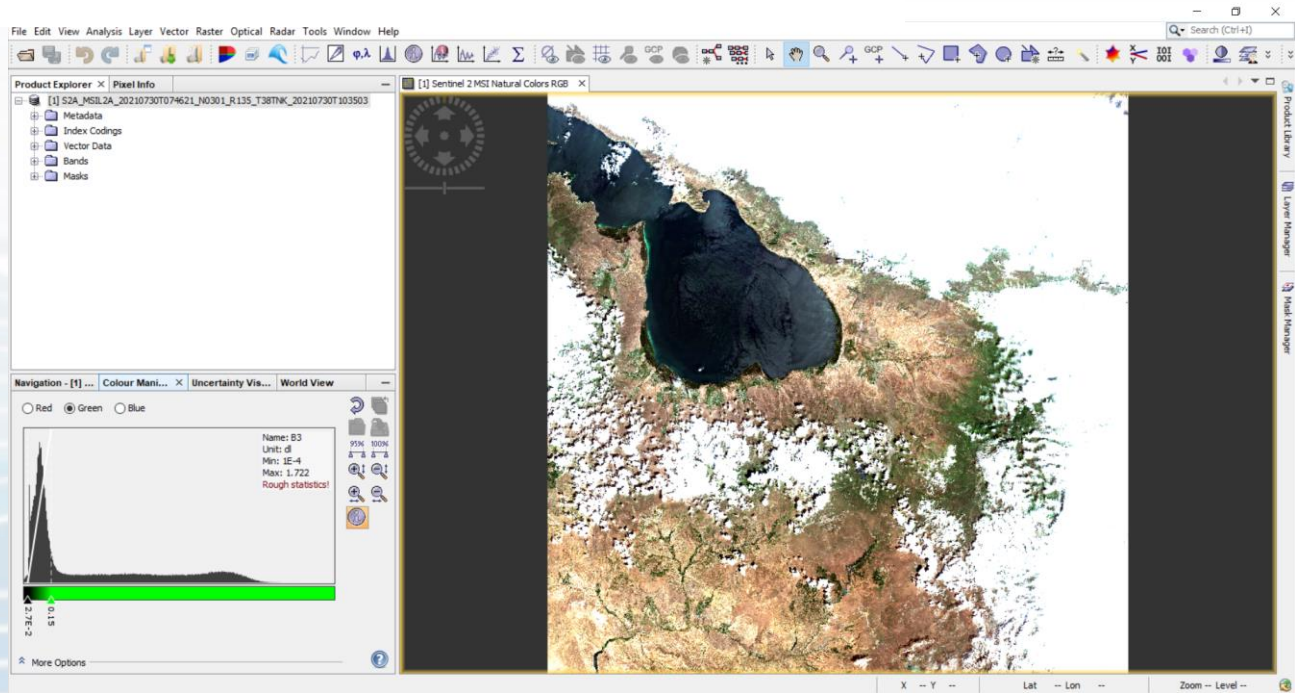


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# Բացել նկարը

1. Windows
2. Open RGB Image Window







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Co ions.

Sentinel-2 bands	Spatial resolution (m)
Band 1 – Coastal aerosol	60
Band 2 – Blue	10
Band 3 – Green	10
Band 4 – Red	10
Band 5 – Vegetation red edge	20
Band 6 – Vegetation red edge	20
Band 7 – Vegetation red edge	20
Band 8 – NIR	10
Band 8A – Narrow NIR	20
Band 9 – Water vapour	60
Band 10 – SWIR – Cirrus	60
Band 11 – SWIR	20
Band 12 – SWIR	20

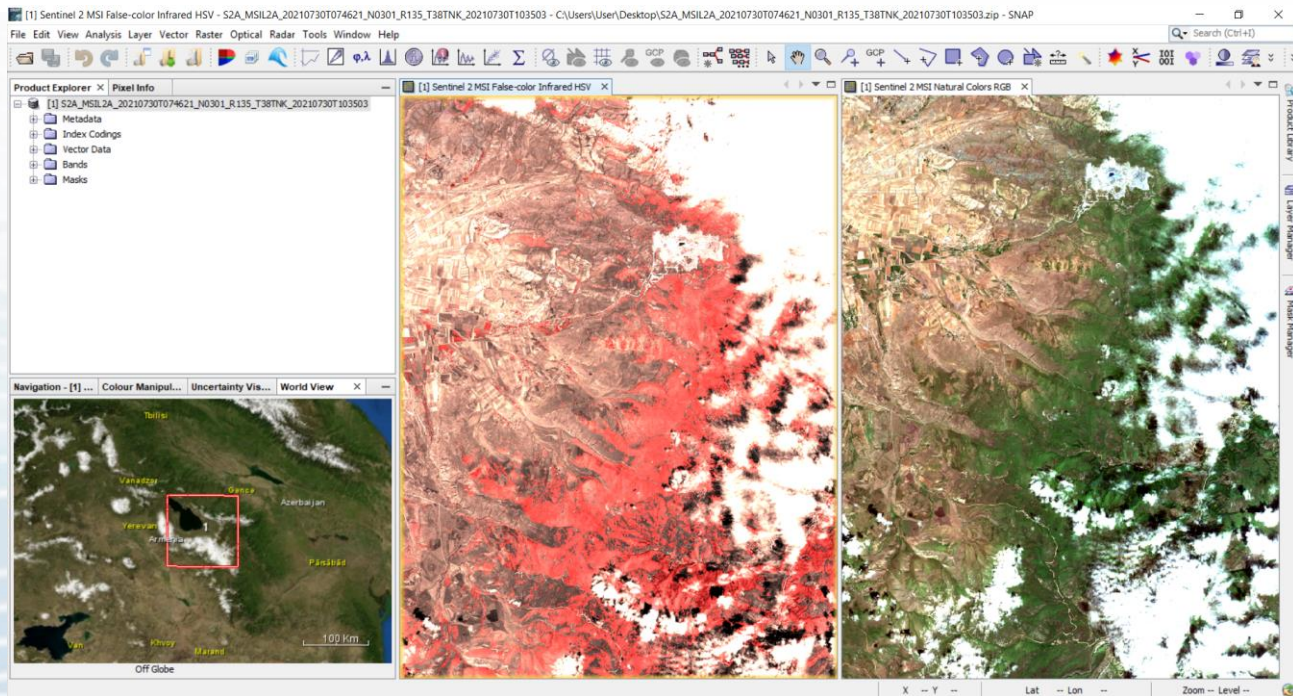


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# Բացել նկարը

1. Windows
2. Tile Horizontally

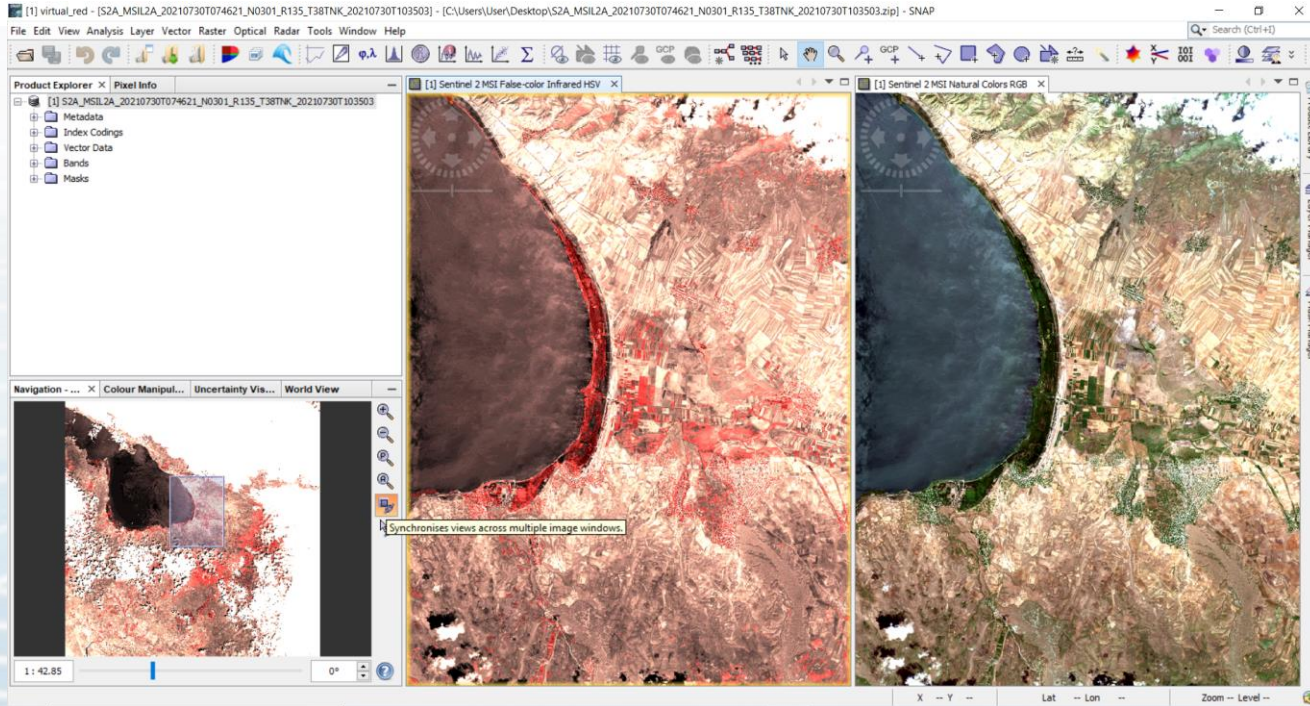




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# Սինխրոնիզացնել բացված նկարների շարժը







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# Subset

The screenshot displays the SNAP (Sentinel Application Platform) software interface. The main window shows a satellite image of a coastal area with a large dark water body. The 'Raster' menu is open, and the 'Subset...' option is highlighted. The 'Product Explorer' on the left shows a tree structure with the following items: [1] S2A\_MSIL2A\_20210730T074621\_N0301\_R135\_T38TNC\_20210730T103503.zip, [2] subset\_0\_of\_S2A\_MSIL2A\_20210730T074621\_N0301\_R135\_T38TNC\_20210730T103503.zip, Metadata, Index Codings, Vector Data, Bands, and Masks. The 'Navigation' panel at the bottom left shows a histogram for the selected band, with a value of 1.17E-2. The status bar at the bottom indicates 'X -- Y --', 'Lat -- Lon --', and 'Zoom -- Level --'.





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# Resampling

The screenshot displays the SNAP (Sentinel Application Platform) software interface. The main window shows a satellite image of a coastal area with a large dark landmass. A context menu is open over the image, with the 'Geometric' option selected, and a sub-menu showing 'Resampling' as the active choice. Other options in the sub-menu include Level-3 Binning, Mosaicking, Reprojection, and Collocation. The 'Product Explorer' on the left shows a tree view of data products, including 'subset\_0\_of\_S2A\_MSIL2A\_20210730T074621\_N0301\_R135\_T38TNK\_20210730T103503\_resampled'. The 'Navigation' panel at the bottom left shows a histogram for a band named 'B2' with a minimum value of 0.003 and a maximum of 1.643. The histogram has a blue selection bar at the bottom. The status bar at the bottom of the window shows 'X -- Y -- Lat -- Lon -- Zoom -- Level --'.





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# Help



The screenshot displays the SNAP software interface with the Help window open. The Help window title is "Help" and it contains the following content:

**SAVI Operator** SNAP  

The SAVI Processor calculates the Soil Addjusted Vegetation Index from a given product.

[SAVI Algorithm Specification](#)

[Back to Radiometric Indices Complete List](#)

The interface also shows the Product Explorer on the left, the Contents pane with a tree view of the software's structure, and the Navigation pane at the bottom left with a message: "This tool window is used to manipulate the colouring of images shown in an image view. Right now, there is no selected image view."



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