REMOTE SENSING LAB

RSLab

Διαθεσιμότητα των δορυφορικών δεδομένων και εργαλεία επεξεργασίας τους

FORTH
FOUNDATION FOR RESEARCH AND TECHNOLOGY - HELLAS

Νεκτάριος Χρυσουλάκης
Εργαστήριο Τηλεπισκόπησης | ΙΥΜ | http://rslab.gr

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Πηγές δορυφορικών δεδομένων και εργαλεία επεξεργασίας

RSLab ΤΜΗΜΑ ΦΥΣΙΚΗΣ ΦΥΣ-338

Αρχική Σελίδα | Διδακτέα Ύλη | Ομαδικές Εργασίες | Βιβλιογραφία | Δορυφορικά Δεδομένα

Δορυφορικά Δεδομένα

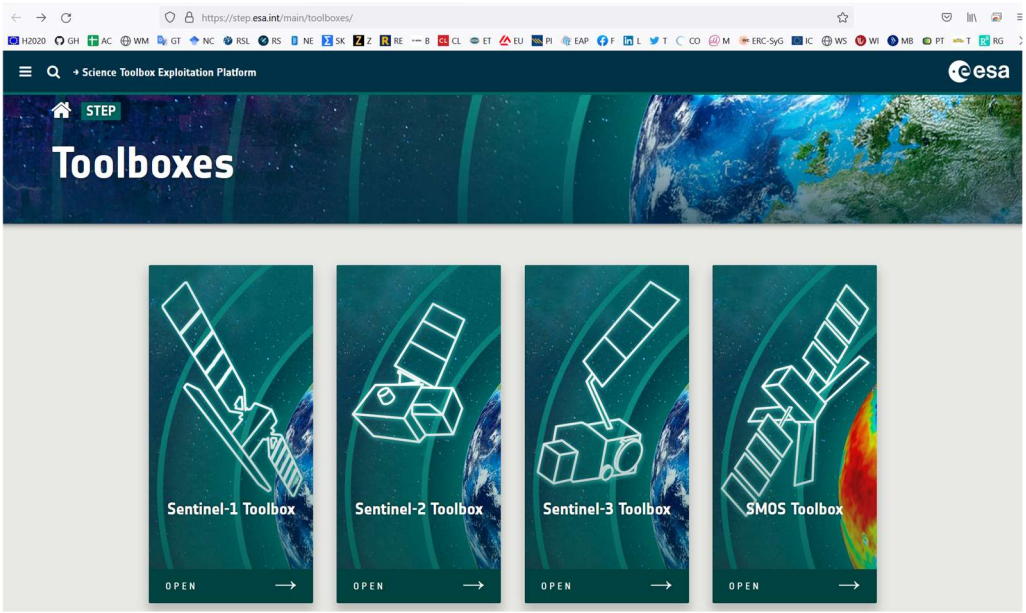
Εργαλεία Επεξεργασίας Δορυφορικών Δεδομένων

- ESA Toolboxes
- SNAP download
- Developers corner
- QGIS
- Google Earth Engine

Πηγές Δορυφορικών Δεδομένων

- USGS - Earth Explorer
- Copernicus Open Access Hub
- Planet Explorer
- Sentinel Hub
- European Space Agency
- European Association of Remote Sensing Laboratories
- NASA Earth Observatory
- National Oceanic and Atmospheric Administration

Εργαλεία επεξεργασίας



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Εργαλεία επεξεργασίας

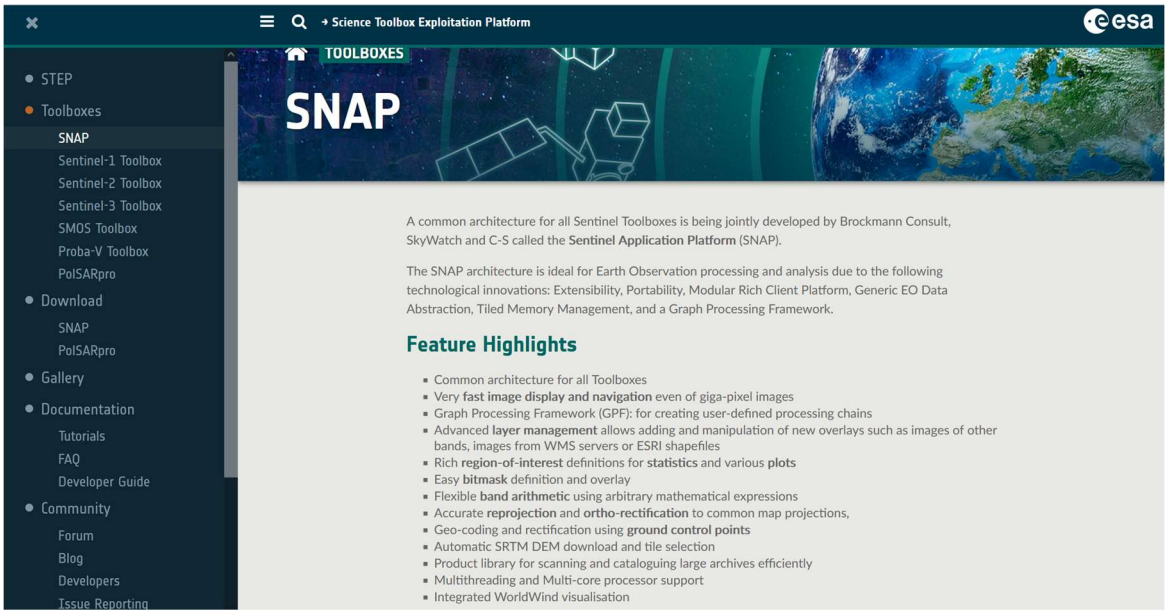
Supported Products

- Sentinel-2 L1B, L1C, L2A and L3, Landsat-8, Spot 1 to Spot 7, Spot4 Take5, Spot5 Take5, RapidEye, Deimos

Processors

- Sen2Cor for Atmospheric Correction
- Sen2Three level-3 processor for Spatio-Temporal Synthesis of bottom of atmosphere corrected Sentinel-2 level 2a images
- L2B biophysical processor (LAI, fAPAR, ...) from this ATBD
- Reflectance to Radiance Processor
- Radiometric Indices
  - Vegetation indices : DVI, RVI, PVI, IPVI, WDVI, TNDVI, GNDVI, GEMI, ARVI, NDI45, MTCI, MCARI, REIP, S2REP, IRECI, PSSRa
  - Soil indices : SAVI, TSAVI, MSAVI, MSAVI2, BI, BI2, RI, CI
  - Water indices : NDWI, NDWI2, MNDWI, NDPI, NDTI
- MCI Processor: Maximum Chlorophyll Index by exploiting the height of a measurement over a specific baseline.
- OTB tools: MultivariateAlterationDetector, Pansharpening-bayes, Pansharpening-lmvm, Pansharpening-rcs, Rasterization-image, Rasterization-manual, Segmentation-cc, Segmentation-meanshift, Segmentation-mprofiles, Segmentation-watershed and SFSTextureExtraction

Εργαλεία επεξεργασίας



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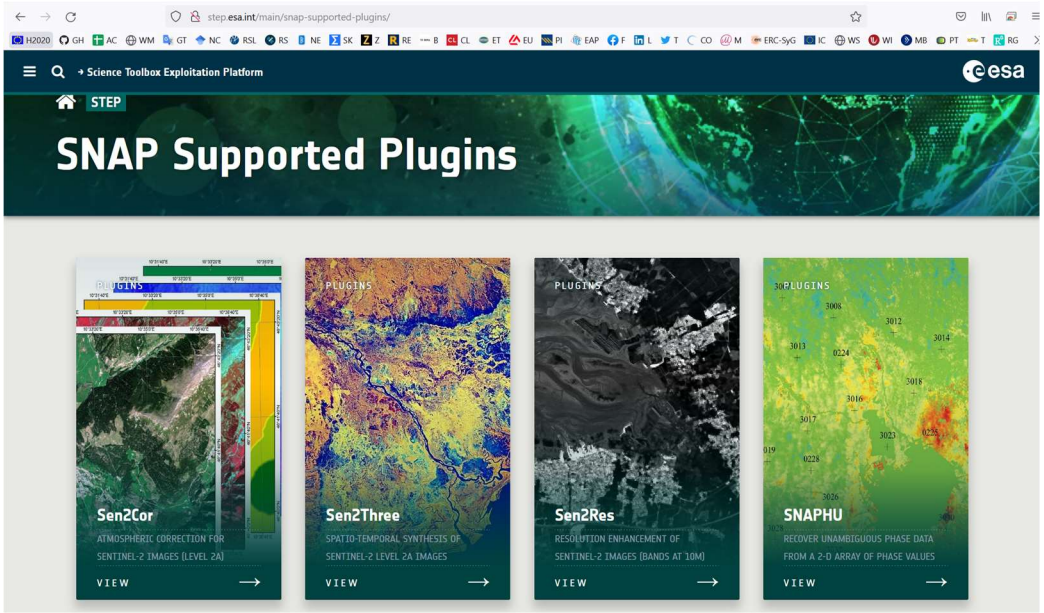

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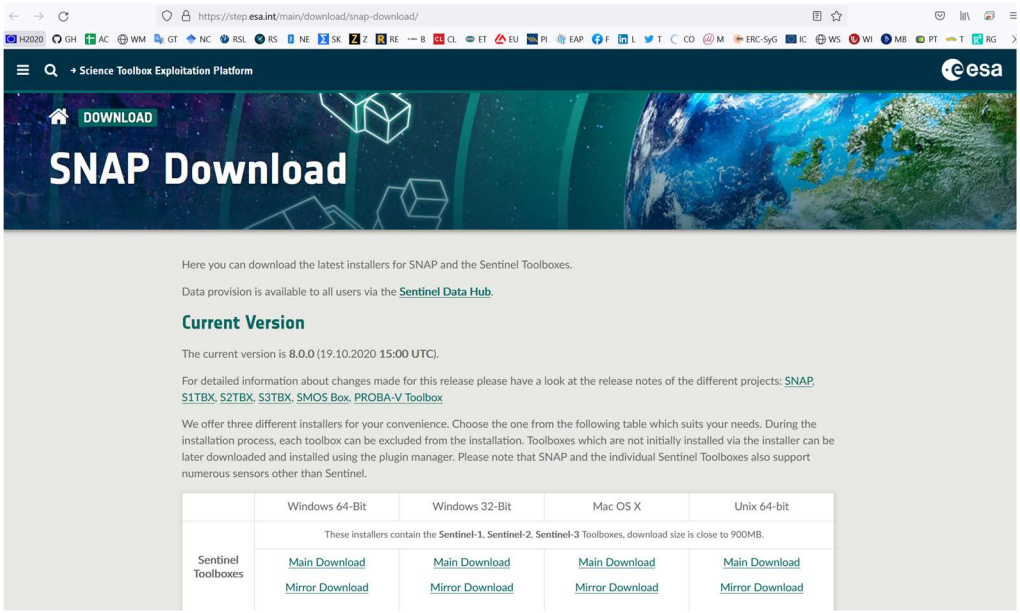

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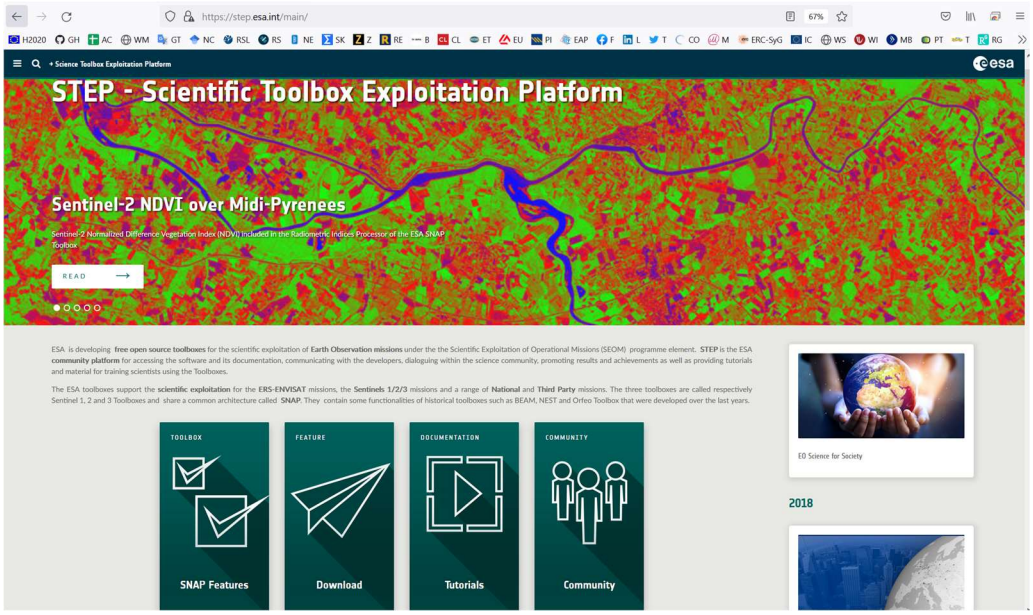

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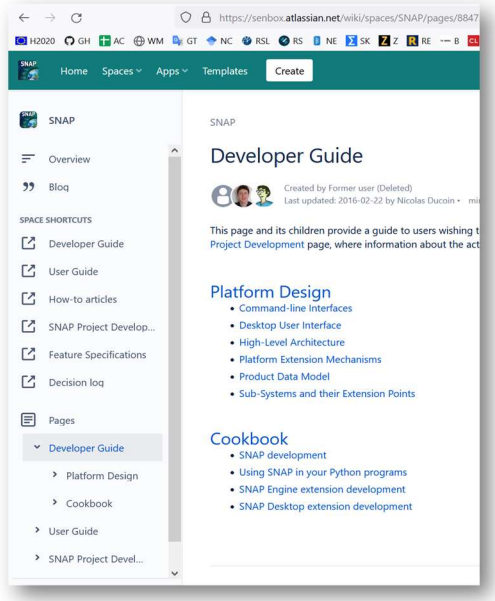

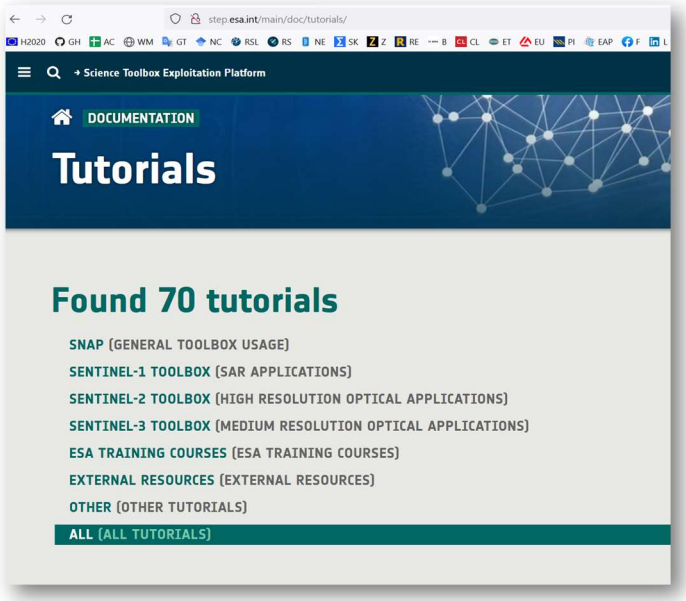

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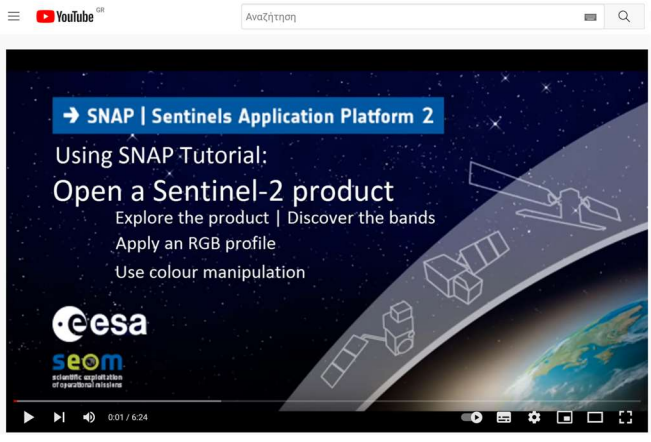
Εργαλεία επεξεργασίας



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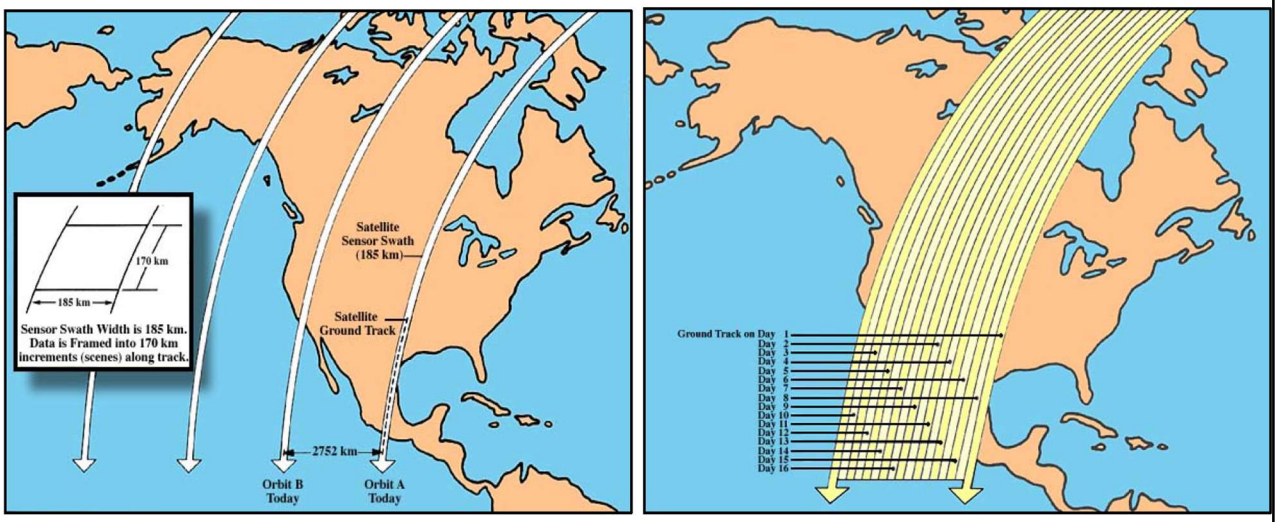
Σάρωση Landsat



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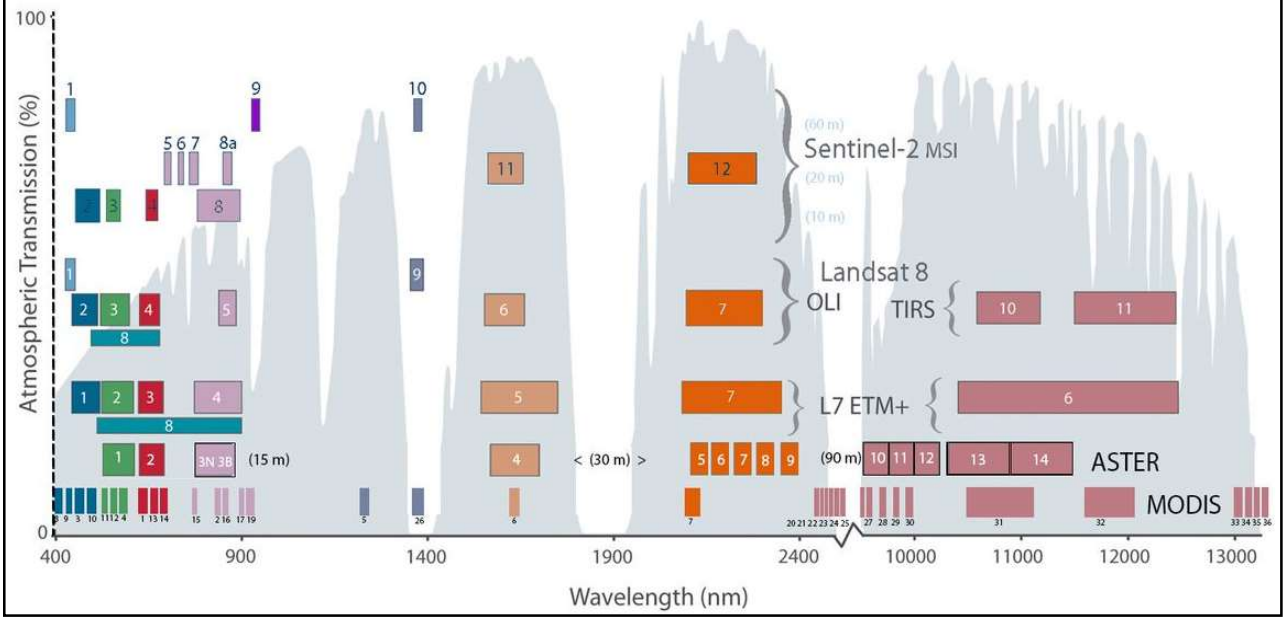
Φασματικά κανάλια Landsat vs Sentinel 2



Δομή δεδομένων Landsat

Landsat Collection 2

Landsat Collection 2 Level-1 and Level-2 scene-based products are processed and delivered from a commercial cloud environment. Additional functionalities, tools and services relating to the commercial cloud environment will be included on this web page as they become available.

Landsat Collection 2 Data Access Portals

	Level-1 Scenes (Global)	Level-2 Scenes (Global)	U.S. Landsat Analysis Ready Data Tiles (U.S.)
Products Available/ Format	Digital Numbers	Surface Reflectance - Surface Temperature	Top of Atmosphere (TOA) Reflectance - TOA Brightness Temperature - Surface Reflectance - Surface Temperature - Pixel Quality Assessment

Landsat 8 File Naming Convention LXSS_LLLL_PPPRRR_YYYYMMDD_yyyymmdd_CC_TX	
L	Landsat
X	Sensor ("C" = OLI/TIRS combined, "O" = OLI-only, "T" = TIRS-only)
SS	Satellite ("08" = Landsat 8)
LLLL	Processing correction level (L1TP/L1Gt/L1Gs)
PPP	WRS path
RRR	WRS row
YYYYMMDD	Acquisition year (YYYY)/Month(MM)/Day(DD)
yyyymmdd	Processing year (yyyy)/ Month (mm)/ Day (dd)
CC	Collection number (01, 02…)
TX	Collection category ("RT" = Real-Time, "T1" = Tier 1, "T2" = Tier 2)
Example:	**LC08_L1GT_029030_20151209_20160131_01_T1**

Appendix C Metadata File (MTL.txt)

The MTL.txt file is included with all L8 Level 1 Data Products. Landsat MTL files contain beneficial information for the systematic searching and archiving practices of data. Information about data processing and values important for enhancing Landsat data (such as conversion to reflectance and radiance) are also included in this file.

Data Format Control Books (DFCBs) define and describe Landsat metadata. DFCBs for all sensors are located at https://www.usgs.gov/land-resources/nli/landsat/landsat-project-documents.

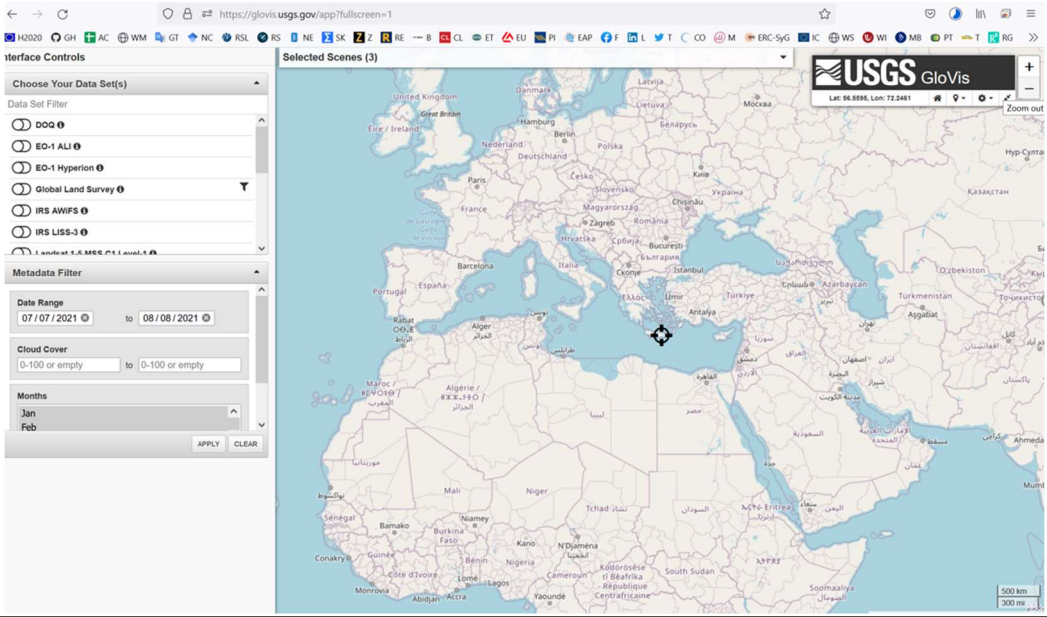
Sample L8 MTL.txt file:

```
GROUP = L1_METADATA_FILE
  GROUP = METADATA_FILE_INFO
    ORIGIN = "Image courtesy of the U.S. Geological Survey"
    REQUEST_ID = "0701809117441_00014"
    LANDSAT_SCENE_ID = "LC80330282018251LGN00"
    LANDSAT_PRODUCT_ID =
"LC08_L1TP_033028_20180908_20180912_01_T1"
    COLLECTION_NUMBER = 01
    FILE_DATE = 2018-09-12T22:00:27Z
    STATION_ID = "LGN"
    PROCESSING_SOFTWARE_VERSION = "LPGS_13.1.0"
  END_GROUP = METADATA_FILE_INFO
  GROUP = PRODUCT_METADATA
    DATA_TYPE = "L1TP"
    COLLECTION_CATEGORY = "T1"
    ELEVATION_SOURCE = "GLS2000"
    OUTPUT_FORMAT = "GEOTIFF"
    SPACECRAFT_ID = "LANDSAT_8"
    SENSOR_ID = "OLI_TIRS"
    WRS_PATH = 33
    WRS_ROW = 28
    NADIR_OFFNADIR = "NADIR"
    TARGET_WRS_PATH = 33
    TARGET_WRS_ROW = 28
    DATE_ACQUIRED = 2018-09-08
    SCENE_CENTER_TIME = "17:35:18.0691869Z"
    CORNER_UL_LAT_PRODUCT = 47.09933
    CORNER_UL_LON_PRODUCT = -103.71778
    CORNER_UR_LAT_PRODUCT = 47.02553
    CORNER_UR_LON_PRODUCT = -100.69517
    CORNER_LL_LAT_PRODUCT = 45.00187
    CORNER_LL_LON_PRODUCT = -103.76543
    CORNER_LR_LAT_PRODUCT = 44.93325
    CORNER_LR_LON_PRODUCT = -100.85461
```


Landsat data

https://earthexplorer.usgs.gov

https://glovis.usgs.gov



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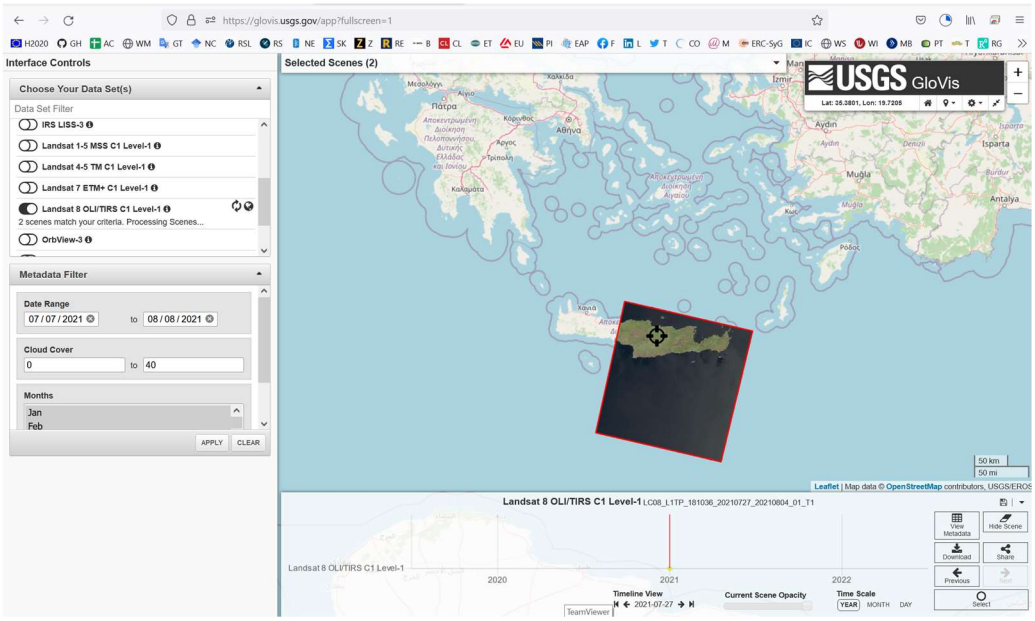
Landsat data



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Landsat data

Metadata for LC08_L1TP_181036_20210727_20210804_01_T1

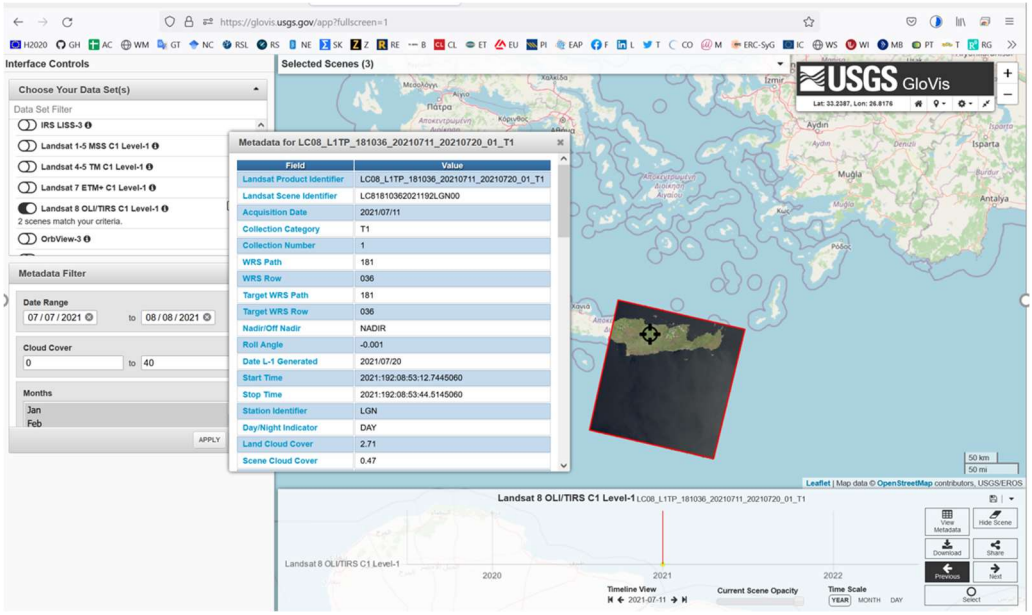
Field	Value
Landsat Product Identifier	LC08_L1TP_181036_20210727_20210804_01_T1
Landsat Scene Identifier	LC81810362021208LGN00
Acquisition Date	2021/07/27
Collection Category	T1
Collection Number	1
WRS Path	181
WRS Row	036
Target WRS Path	181
Target WRS Row	036
Nadir/Off Nadir	NADIR
Roll Angle	-0.001
Date L-1 Generated	2021/08/04
Start Time	2021:208:08:53:19.3567640
Stop Time	2021:208:08:53:51.1267640
Station Identifier	LGN
Day/Night Indicator	DAY
Land Cloud Cover	0.03
Scene Cloud Cover	0.01

Download Options for LC08_L1TP_181036_20210727_202108...

DOWNLOAD	LandsatLook Natural Color Image (2.19 MB)
DOWNLOAD	LandsatLook Thermal Image (1.18 MB)
DOWNLOAD	LandsatLook Quality Image (460.45 KB)
DOWNLOAD	LandsatLook Images with Geographic Reference (3.82 MB)
DOWNLOAD	Level-1 GeoTIFF Data Product (792.50 MB)

CLOSE

Landsat data



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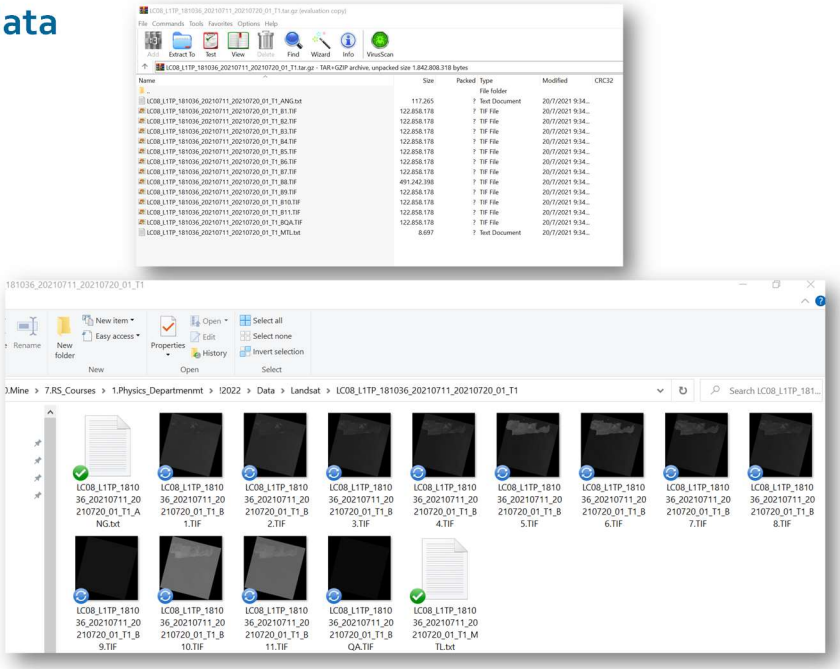

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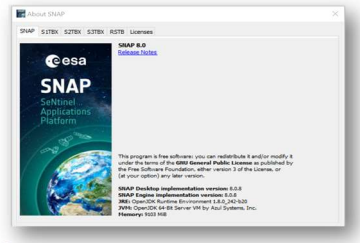

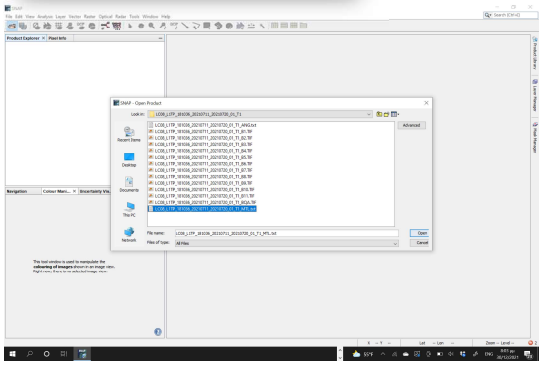

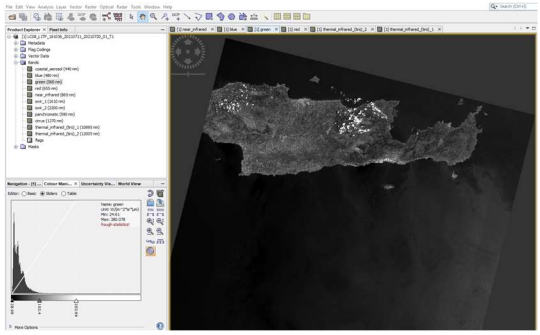

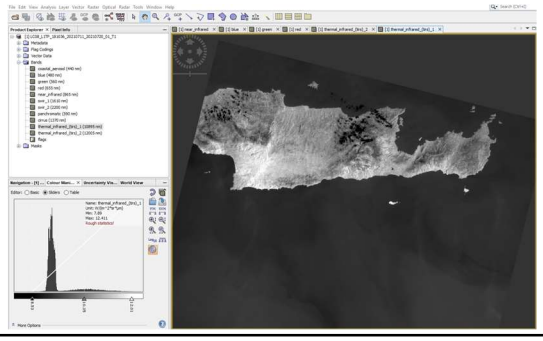

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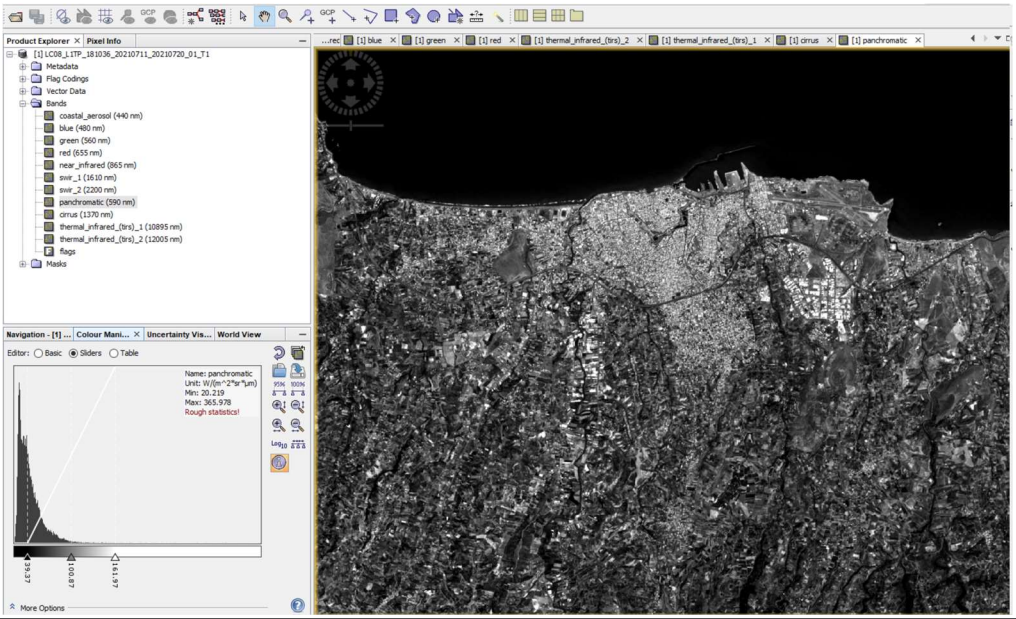

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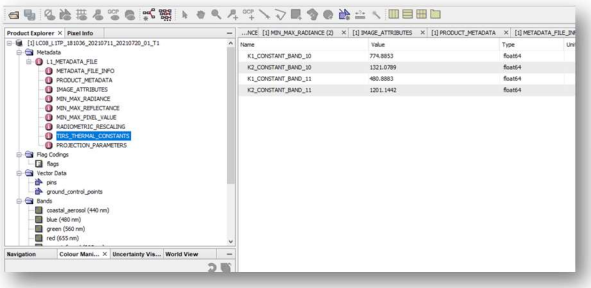

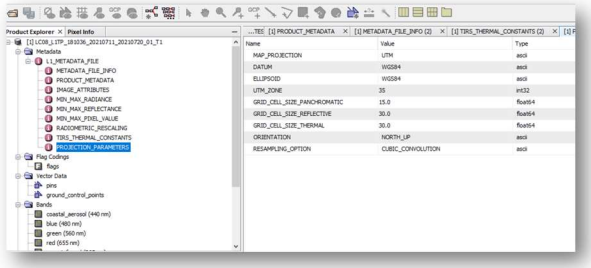

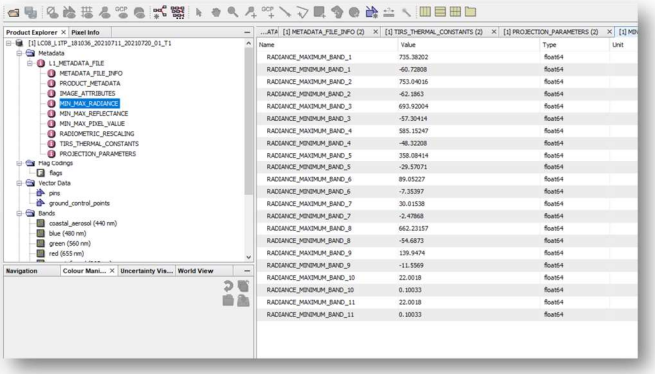

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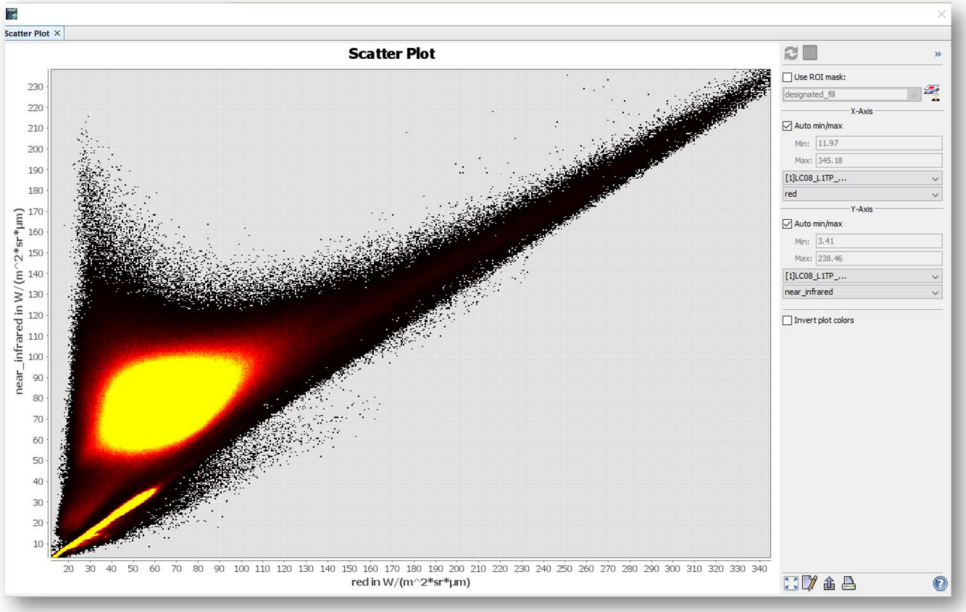

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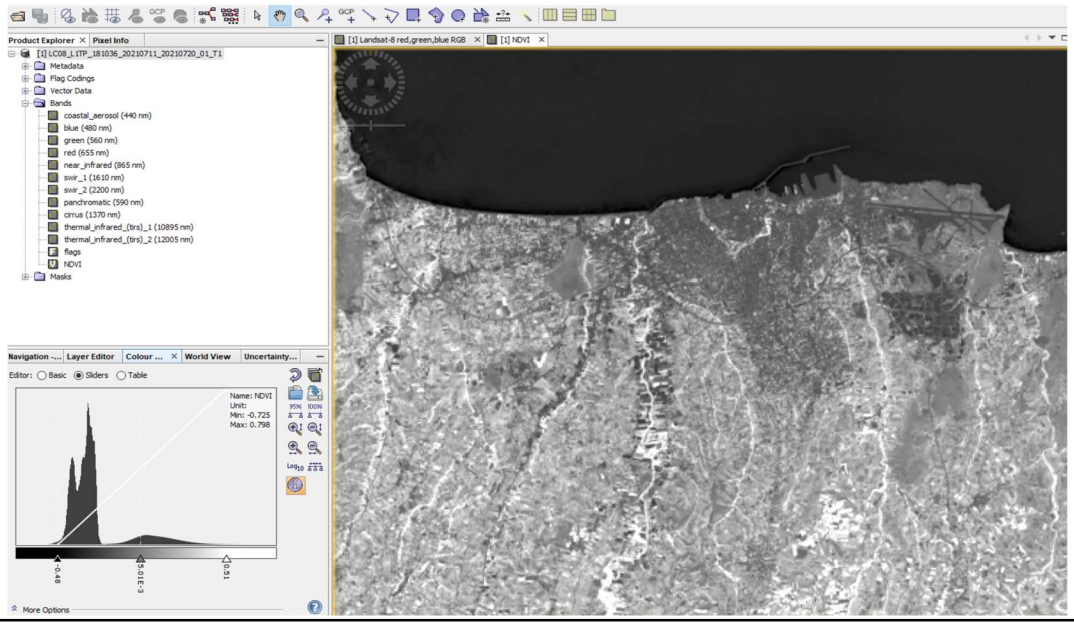
Landsat data



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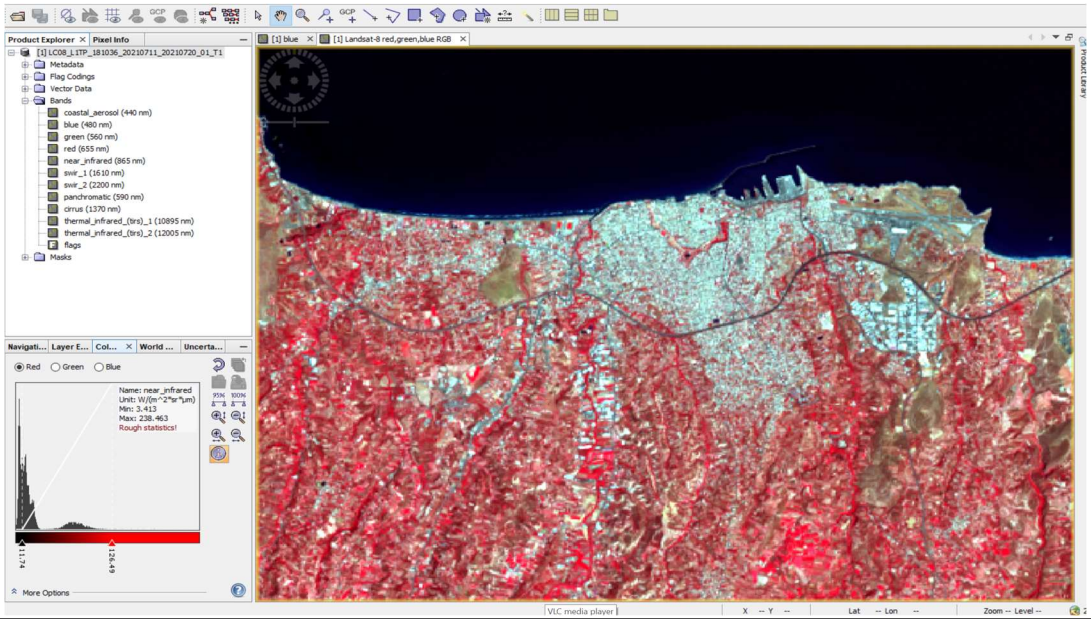
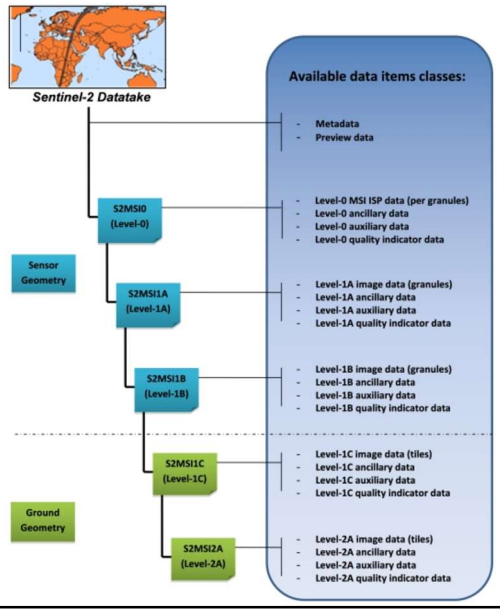
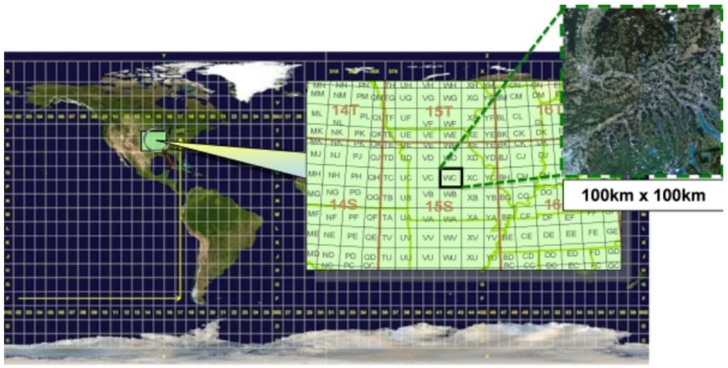


Δομή δεδομένων Sentinel 2



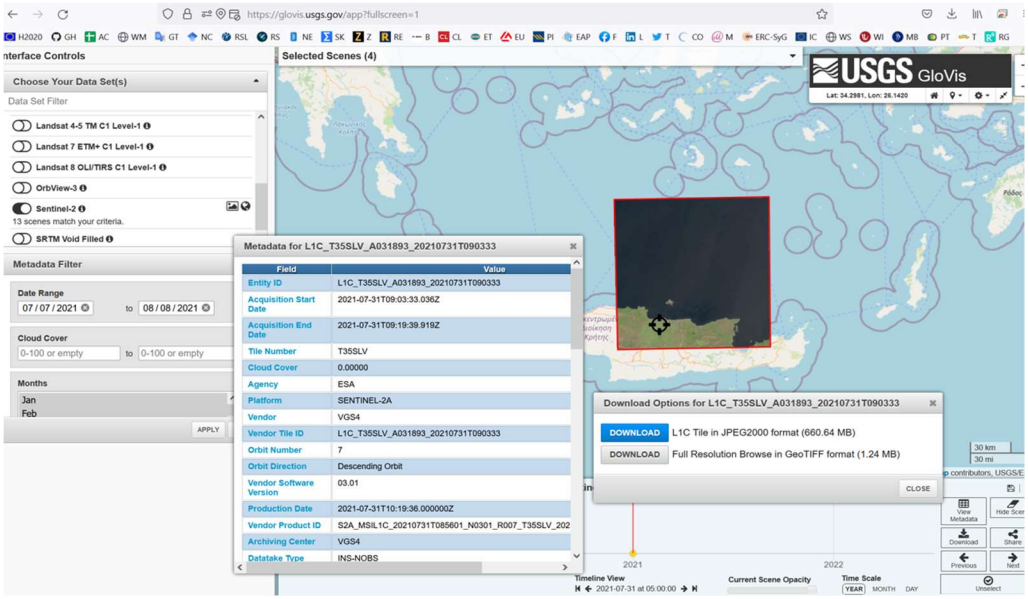
Name	High-level Description	Production & Distribution	Data Volume
Level-1C	Top-of-atmosphere reflectances in cartographic geometry	Systematic generation and on-line distribution	600 MB (each 100x100 km2)
Level-2A	Bottom-of-atmosphere reflectance in cartographic geometry	Systematic generation and on-line distribution and generation on user side (using Sentinel-2 Toolbox)	800 MB (each 100x100 km2)



Level-1C product tiling

Sentinel 2 data

https://browser.dataspace.copernicus.eu/



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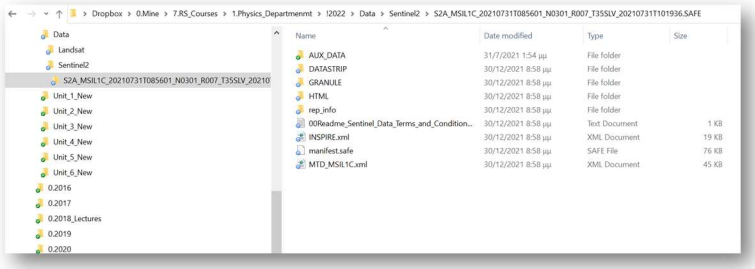

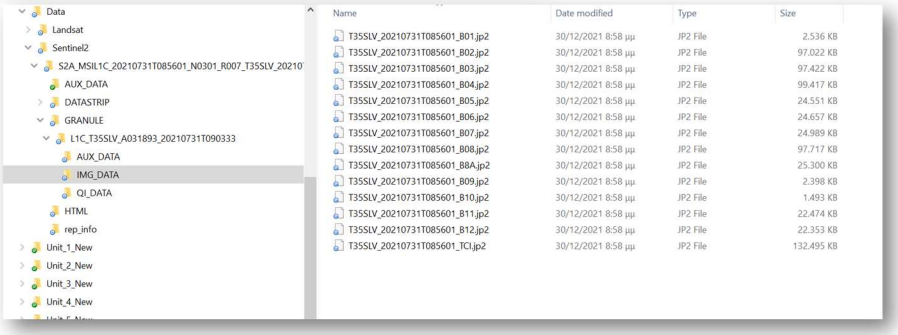

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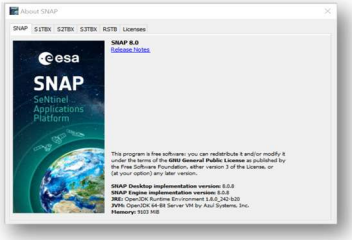

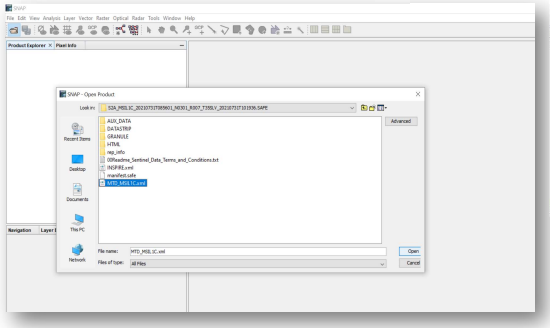

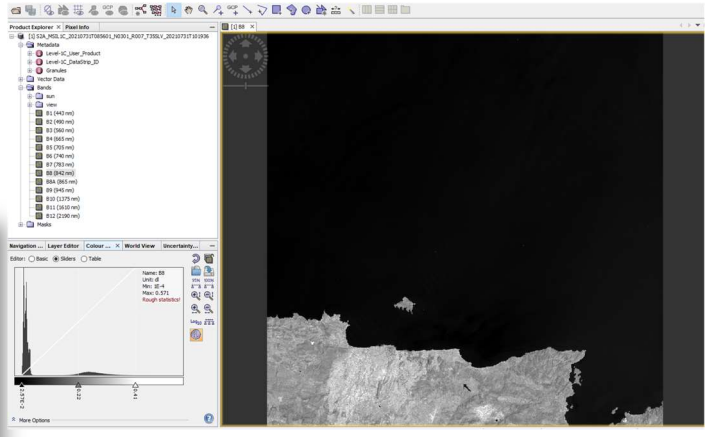

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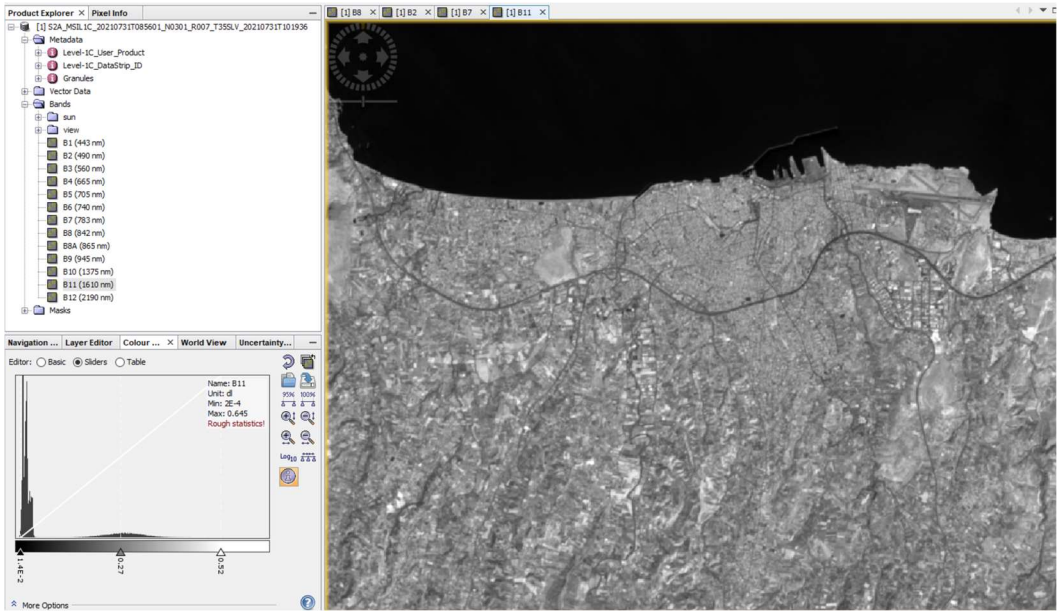

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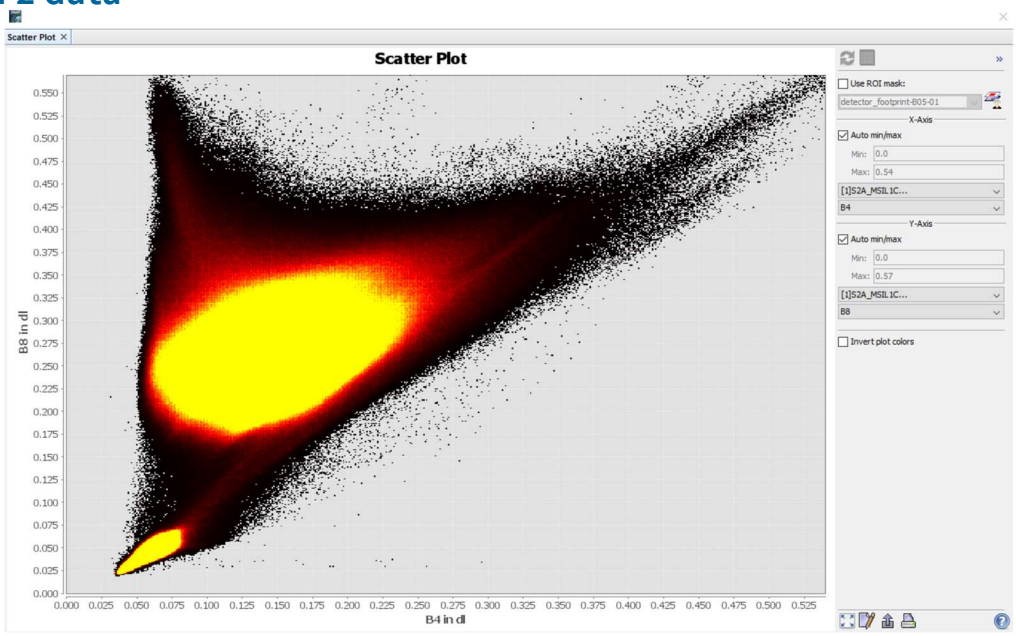

Sentinel 2 data