Geoinformatics | Course Remote Sensing (1)

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Practice 2: Archives for search, visualization and download of Remote Sensing data

Overview

Objectives: Familiarize with some of the most importants archives for search, visualization and download of Remote Sensing (RS) data. Discuss about functionalities for each archive.

Data: For this practice, use the following file:

- Vector file: Shapefile (AOIs.shp, id_1.shp, id_2.shp, id_3.shp and associated files)
- Raster product: L1C_T32UPU_A021326_20190723T101347

Pre-requisites: Register AND/OR activate an account in the following websites at least one week before this practice.

- LDBV (http://geoportal.bayern.de/geoportalbayern/) http://geoportal.bayern.de/geoportalbayern/
- DLR (https://geoservice.dlr.de/egp/) https://geoservice.dlr.de/egp/
- ESA (https://scihub.copernicus.eu/dhus/) https://scihub.copernicus.eu/dhus/
- USGS (https://earthexplorer.usgs.gov/) https://earthexplorer.usgs.gov/
- JAXA (https://auig2.jaxa.jp/ips/home) https://auig2.jaxa.jp/ips/home
- MDA (https://gsiportal.mdacorporation.com/) https://gsiportal.mdacorporation.com/
- EUSI (http://www.euspaceimaging.com/) http://www.euspaceimaging.com/

Tasks: Create an overview of the available remote sensing data for:

- a given area
- a certain period of time
- and a possible application

Summarize in the Table A the characteristics of the data that you can find in each Website.

Table A. Summary of data products available in diverse archives

Archive	Which type of data is available?	Sensors available (for raster)	Price/costs	Applications
USGS				
ESA				
JAXA				
EUSI				
DLR				
LDBV				
MDA				

Procedure

1. Search by input criteria

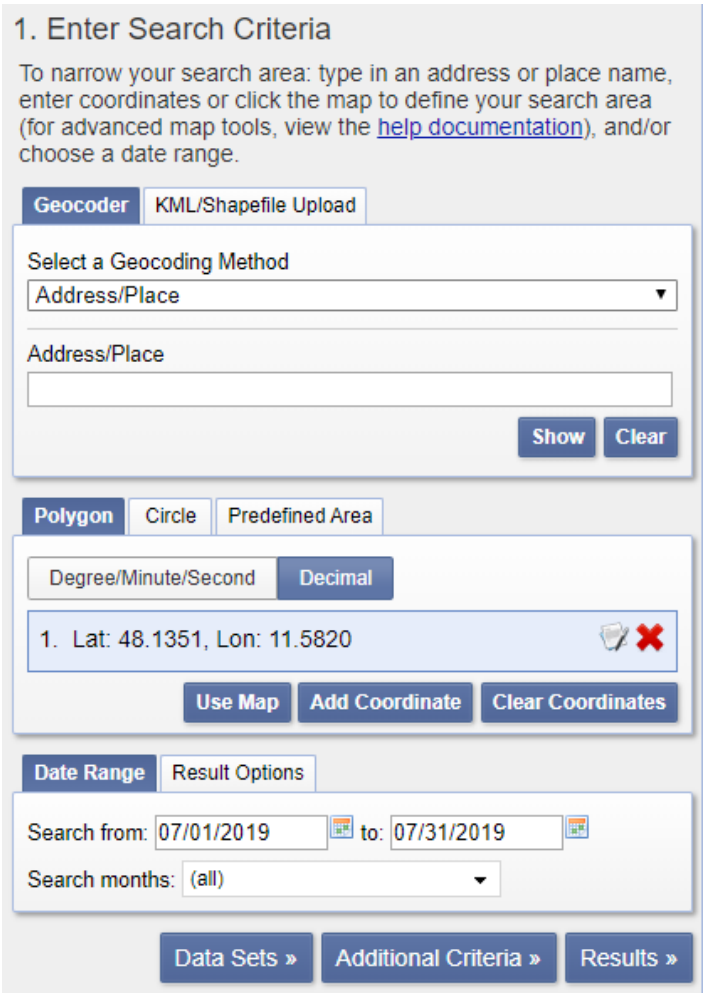
Login in [Earth Explorer (https://earthexplorer.usgs.gov/)](https://earthexplorer.usgs.gov/) and enter the following criteria:

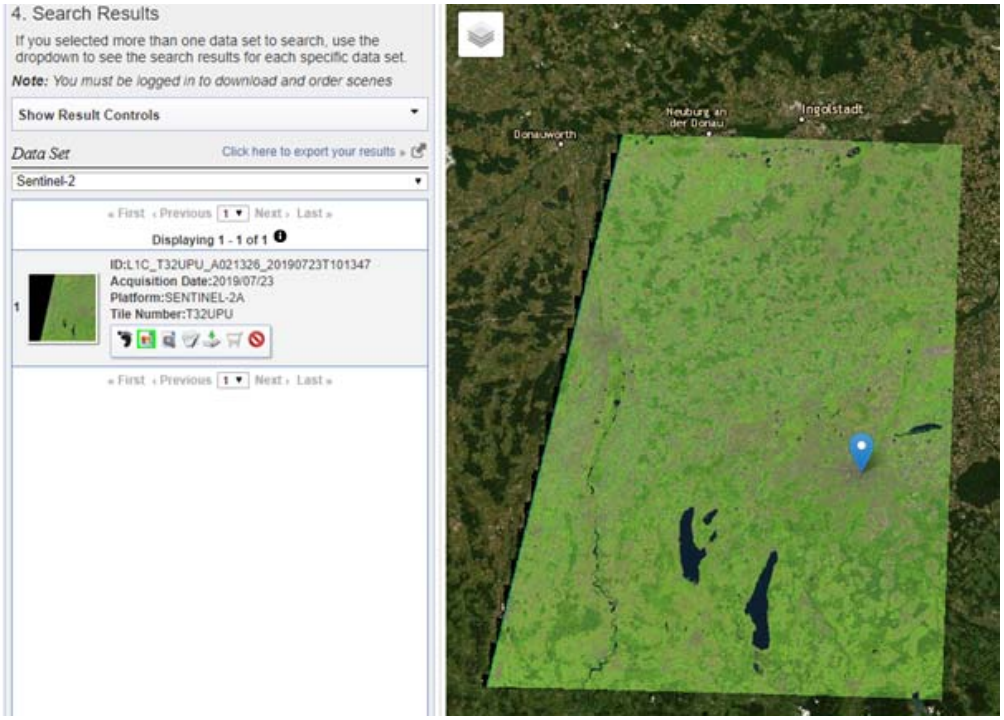
- Coordinate from Munich: Latitude: 48.1351 ; Longitude: 11.5820
- Date: July of 2019
- Data Set: Sentinel-2

Additional Criteria:

- Cloud cover: less than 10%

Explore the resultant image.





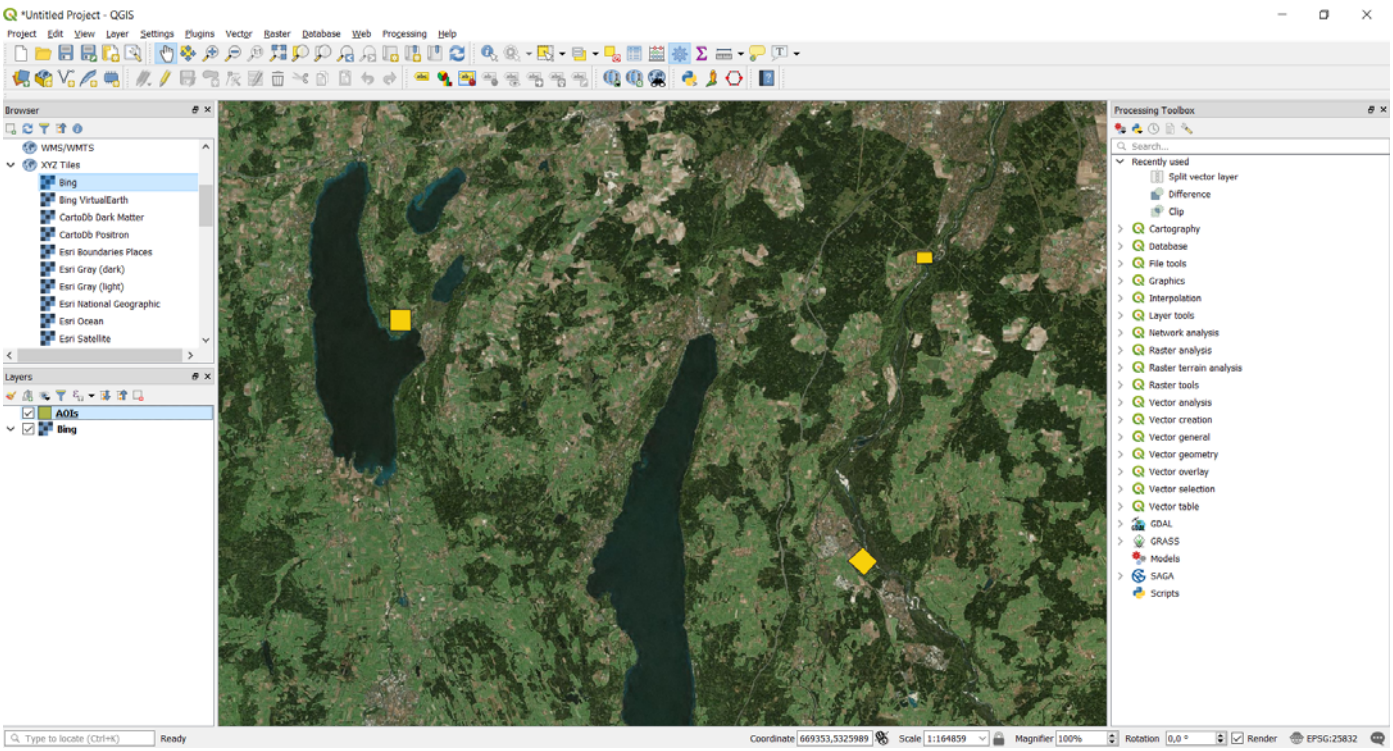
2. Search by input polygons

Go back to the Home Page of Earth Explorer (https://earthexplorer.usgs.gov/). In the search panel under `Search Criteria > KML/Shapefile Upload` , load the vector file assigned for this practice, i.e. "AOIs.shp". Discuss the following questions:

- Which format has the vector file, "Shapefile" or "KML/KMZ"?
- What is the difference?
- What are the requirements for searching an area by vector file?

Compare the resultant image from section 1. How different are they? What does this mean in terms of methods for searching data?

Load the corresponding AOIs.shp. As raster files, you have 2 options: a predefined Bing/Google Earth/etc image or the product L1C_T32UPU_A021326_20190723T101347. To load the first, search the XYZ Tiles in Browser Panel. To load the second, search for the *.TCI layer (TCI = True color image) and add it to the Layers Panel.



Finally, with the information about the raster file available in USGS (L1C_T32UPU_A021326_20190723T101347), fill in the following Table B.

Table B. Characteristics of the searched raster file

Date?	
Name of sensor?	
Which recording mode?	
What is the coverage of the image?	
Which channels in which spatial resolution?	
Which product variants are available?	
What is the refresh rate?	
How reliable/predictable?	
What does it cost?	

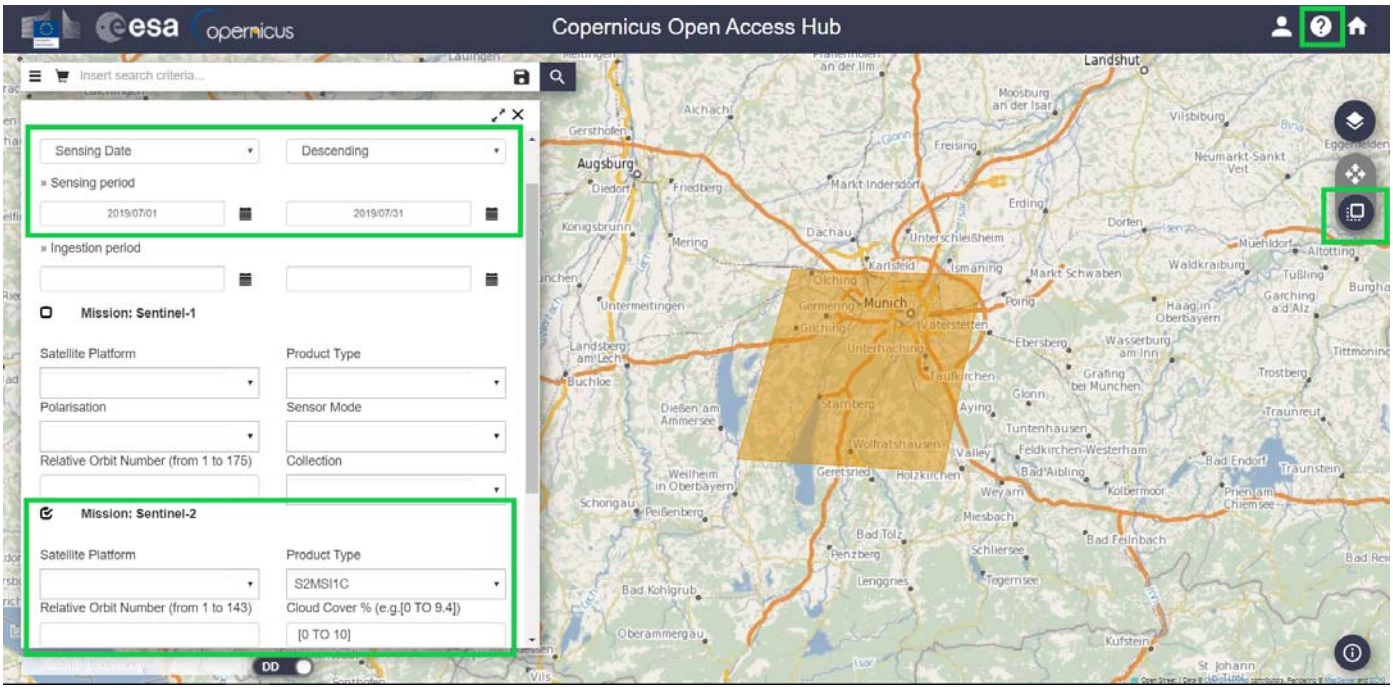
3. Search in other RS archives

Copernicus Open Access Hub

Login in the Home Page of ESA (https://scihub.copernicus.eu/dhus/). This is the website of the Copernicus Remote Sensing Program. Using the input data from Section 1, search for the same Sentinel 2 Product.

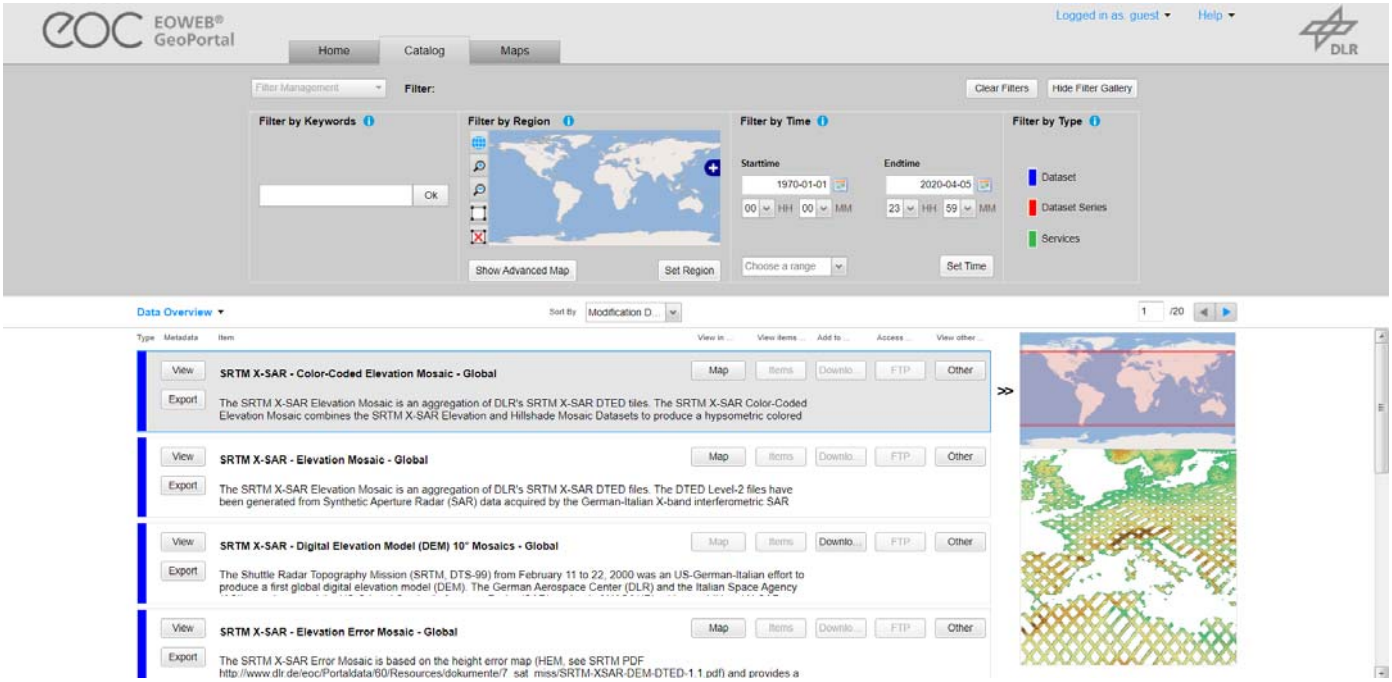
- On the top right under ？ you will find all related information about the Sensors available, its characteristics, as well as a manual to navigate through this website.
- On the left side, you find a Panel for searching products. The products are organized first date: Sensing Date and Ingestion Date. What is the difference?
- Afterwards, there are sections for searching Sentinel 1, Sentinel 2 and Sentinel 3 Products. To search an image in the Munich area, you can use the polygon drawing tool on the right side.

Moreover, discuss how the geographical input data is being entered in each website:
- in the case of USGS, you can use Coordinates, Vector files, and Path/Row;
- in the case of ESA, you can draw a polygon or enter the Relative Orbit Number.
What is the difference between Path/Row and Relative Orbit Number?



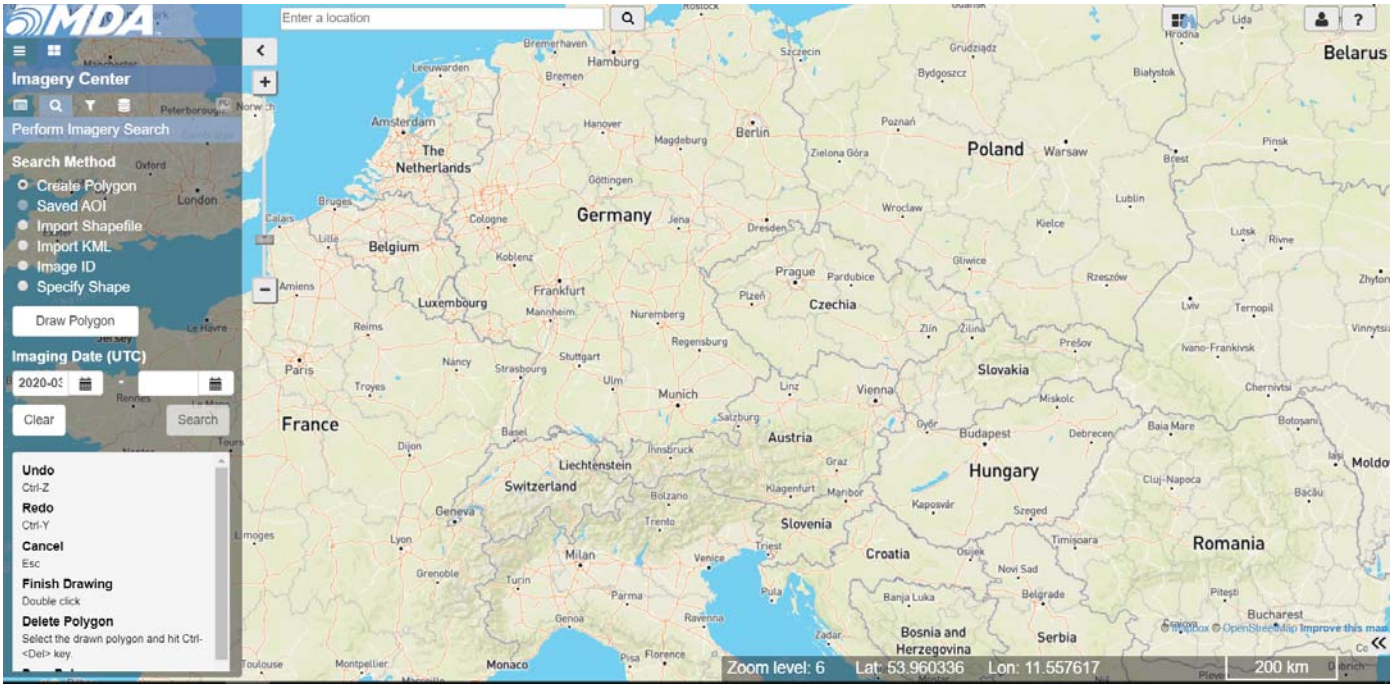
Deutsches Zentrum für Luft- und Raumfahrt

The Website of DLR (https://geoservice.dlr.de/egp/) provides an archive with data from German sensors. Which are they? Use the input data from Section 1 to search for raster files and fill your results in the Table A.



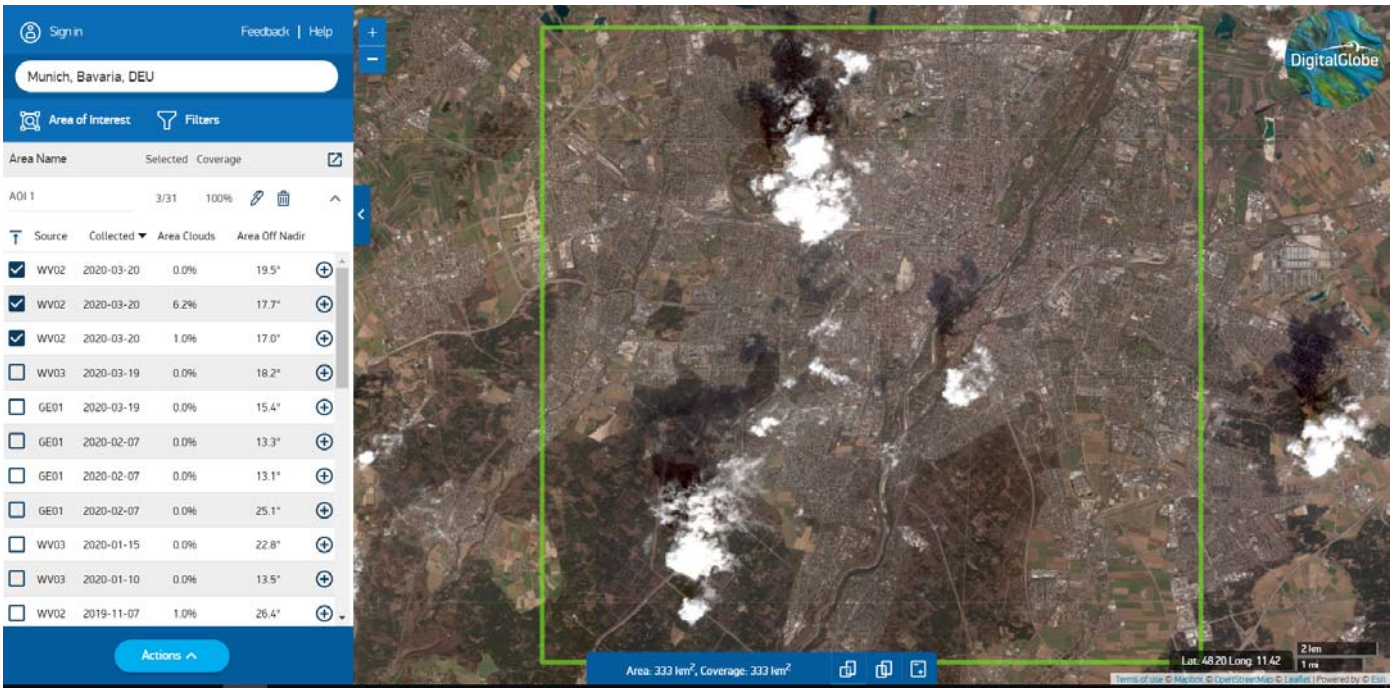
MDA

The MDA (https://gsiportal.mdacorporation.com/) corporation also provides some imagery (curiosity: search for the meaning of the name!). Use the input data from Section 1 to search for raster files and fill your results in the Table A.



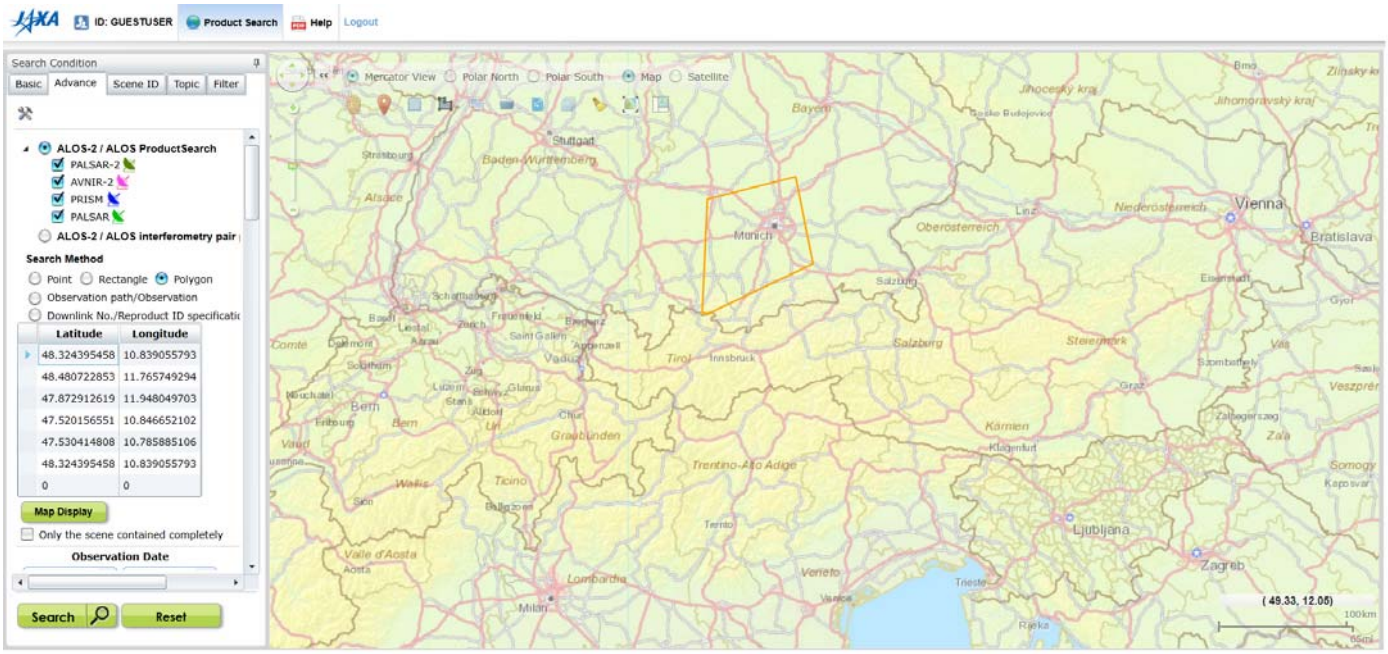
European Space Imaging

The website of the EUSI (http://www.euspaceimaging.com/) redirects to their archive: digitalglobe. Use the input data from Section 1 to search for raster files and fill your results in the Table A.



Japan Aerospace Exploration Agency

The Website of JAXA (https://auig2.jaxa.jp/ips/home) offers diverse products. Which ones? What do they have in common?



Geoportal Bayern

The Website of [Geoportal Bayern (http://geoportal.bayern.de/geoportalbayern/)](http://geoportal.bayern.de/geoportalbayern/) offers georesources from the "Geodateninfrastruktur Bayern (GDI-BY)". Under Anwendungen , you can find diverse products and their providers. How they differ from the raster files fouund with all the previous archives?

Extra task: On the Website of `Geoportal Bayern > Dienste > Digitales Orthophoto 80 cm Bodenauflösung - Web Map Service > Detailinformationen` . Copy the URL given there (https://geoservices.bayern.de/wms/v2/ogc_dop80_oa.cgi?). On QGIS, go to `Layer > Add Layer > Add WMS/WMTS` . On the new window, go to `Layers > New` . Fill in the data required (Name, URL) and click OK.

Click `Connect` , and select the multicolored layer. `Add` it to QGIS. Compare this layer with the Bing/Google Earth image and the Sentinel-2 TCI layer. What are the differences?

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