

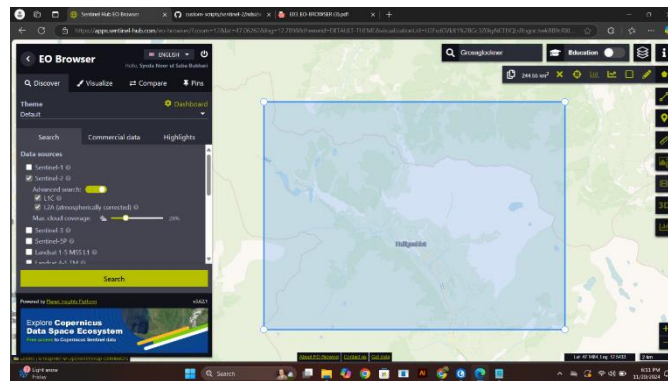
EO Browser

Steps:

Following are the steps involved.

Browsing

- Navigated to the Grossglockner (47.074184, 12.694290).
- Selected an area that covering the mountain and important surrounding water bodies and glaciers.



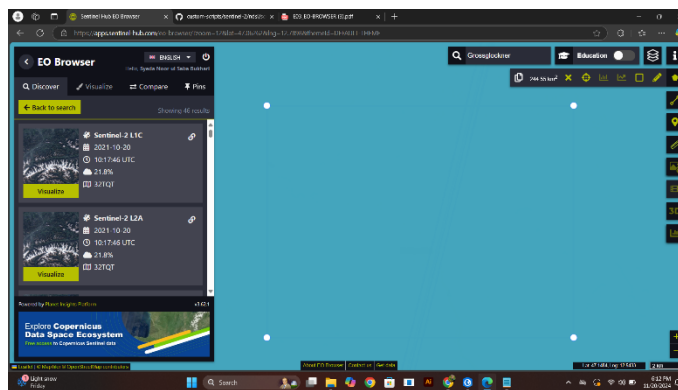
Applying Search Filters

Navigated to the search interface on the left side.

- filtered to retrieve Sentinel-2 Level-1C images
- filtered to retrieve images with less than **28%** cloud cover.
- filtered to retrieve images during the period (July-October) 2021
- “Searched”

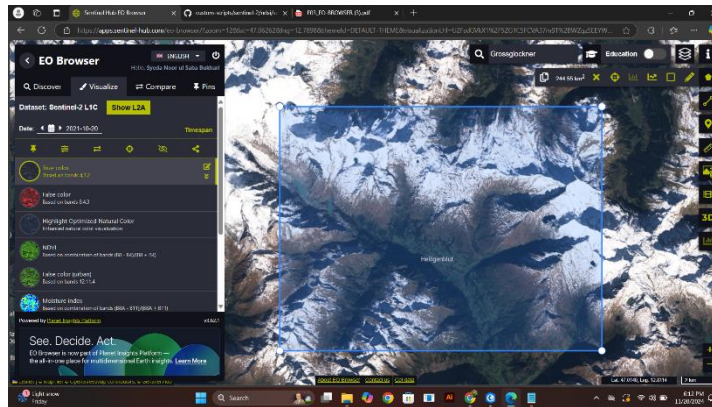
Browsing through results

After that I browsed through the results and checked the image footprints. Image with the cloud coverage of 21% was considered.



Web-based image visualization

Tried different band combination and visualize the changing results.



Code Block 1

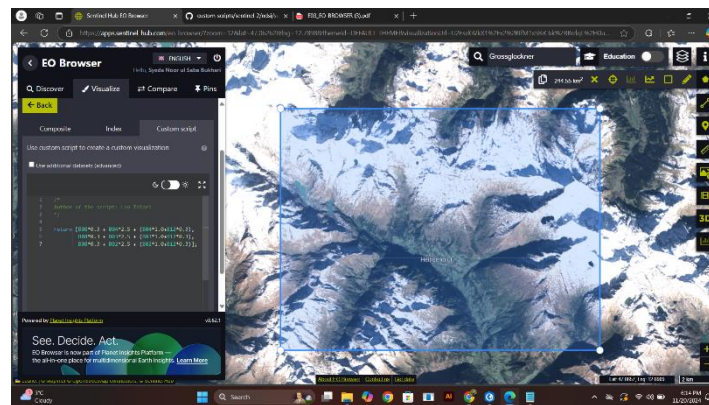
Code Block 1 was used in this exercise.

/*

Author of the script: Leo Tolari

*/

```
return [B08*0.3 + B04*2.5 + (B04*1.0+B12*0.3),  
        B08*0.3 + B03*2.5 + (B03*1.0+B12*0.3),  
        B08*0.3 + B02*2.5 + (B02*1.0+B12*0.3)];
```



NDSI

Sentinel-2 NDSI Script is selected to see the results of Snow Cover.

NDSI is a Landsat Collection 2 Normalized Difference Snow Index (NDSI) is the normalized difference between green (G) spectral bands and the shortwave infrared (SWIR).

NDSI Calculation

$$(G - SWIR1) / (G + SWIR1)$$

In Landsat 4-7, NDSI = (Band 2 – Band 5) / (Band 2 + Band 5)

In Landsat 8-9, NDSI = (Band 3 – Band 6) / (Band 3 + Band 6)

NDSI Script

```
//VERSION=3
```

```
//Reference: https://earth.esa.int/web/sentinel/technical-guides/sentinel-2-msi/level-2a/algorithm
```

```
function setup() {  
  return {  
    input: ["Bo3", "B11", "Bo4", "Bo2", "dataMask"],  
    output: { bands: 4 }  
  };  
}  
  
function evaluatePixel(samples) {  
  let val = index(samples.Bo3, samples.B11);  
  
  if (val > 0.42)  
    imgVals = [0, 0.8, 1, samples.dataMask];  
  else  
    imgVals = [2.5 * samples.Bo4, 2.5 * samples.Bo3, 2.5 * samples.Bo2,  
samples.dataMask];  
  
  return imgVals  
}
```

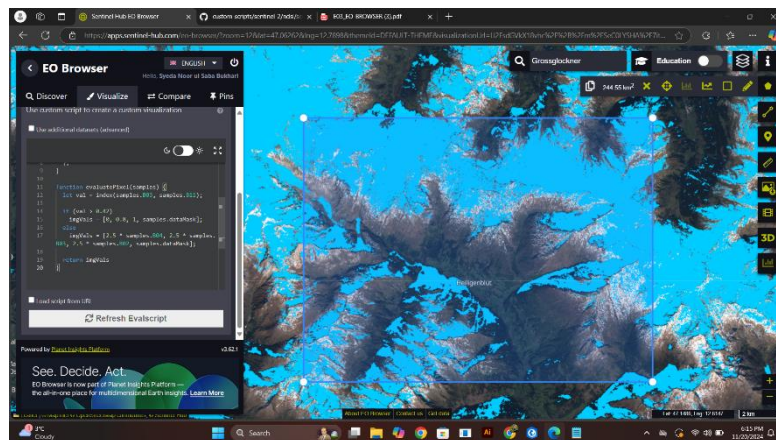


Image Evaluation

The map clearly shows bright blue areas representing snow-covered regions, while the non-blue areas indicate exposed land or vegetation. The visualization is straightforward and effectively highlights the snow-covered zones. The script seems well-designed, using appropriate band combinations and threshold values to detect snow accurately. The cloud coverage, at 21%, is within an acceptable range and does not significantly affect the clarity or reliability of the results.

References

Sentinel Hub EO Browser

<https://github.com/sentinel-hub/custom-scripts>