



COPERNICUS DATA SPACE BROWSER

Digital Earth: Big Earth Data Concepts



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GREEN CITY SCRIPT

For my study, I explored the green city script created by Carlos Bentes. This custom script is designed to make vegetation areas stand out clearly. It does this by using the Normalized Difference Vegetation Index (NDVI). The script first calculates NDVI using two Sentinel-2 bands: the near-infrared band (B08) and the red band (B04), which plants absorb during photosynthesis.

After that, it sets a threshold value of 0.4 hence any pixel with NDVI above 0.4 is considered vegetation. The image is first displayed in normal natural colors (red, green, blue), but then it's converted into black and white so that the background areas (like roads, buildings, and bare soil) look neutral. Then, wherever vegetation is detected ($NDVI \geq 0.4$), those parts are recolored in bright green.

The final result is an image where everything is grayscale except the vegetation, which pops out in green. This makes it really easy to see where vegetation is concentrated around AOI.

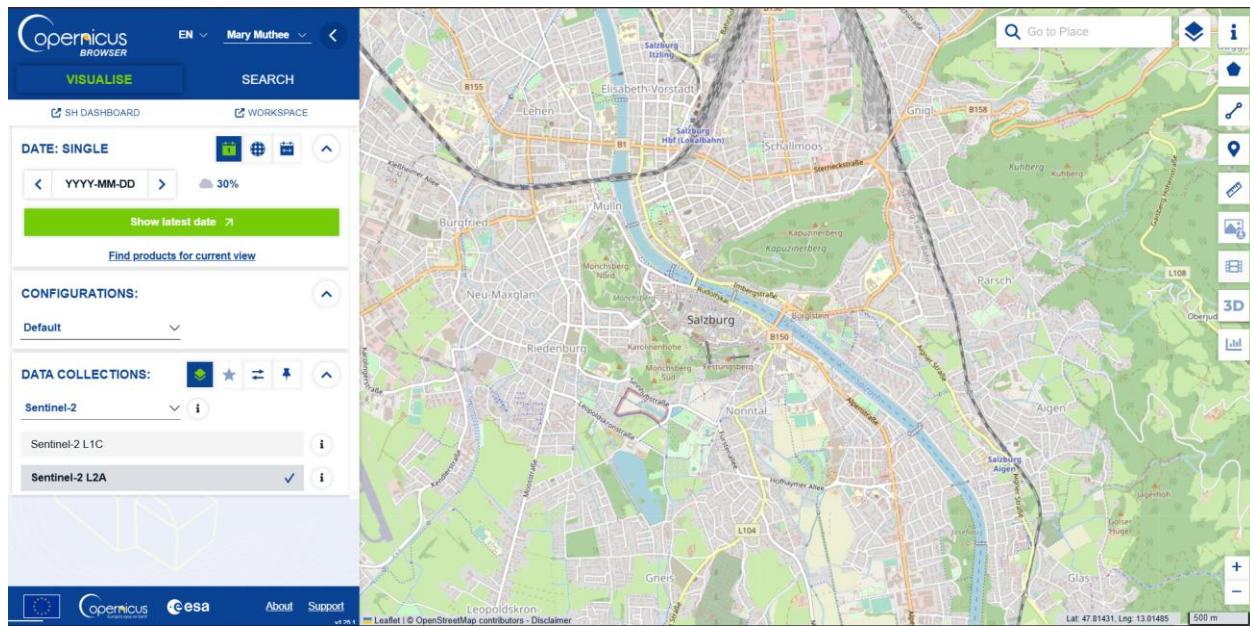
```
1  /*
2  Author of the script: Carlos Bentes
3  */
4
5 // Normalized Difference Vegetation Index
6 var ndvi = (B08-B04)/(B08+B04);
7
8 // Threshold for vegetation
9 var veg_th = 0.4;
10
11 // Simple RGB
12 var R = 2.5*B04;
13 var G = 2.5*B03;
14 var B = 2.5*B02;
15
16 // Transform to Black and White
17 var Y = 0.2*R + 0.7*G + 0.1*B;
18 var pixel = [Y, Y, Y];
19
20 // Change vegetation color
21 if(ndvi >= veg_th)
22     pixel = [0.1*Y, 1.8*Y, 0.1*Y];
23
24 return pixel;
```

Figure 1 Script

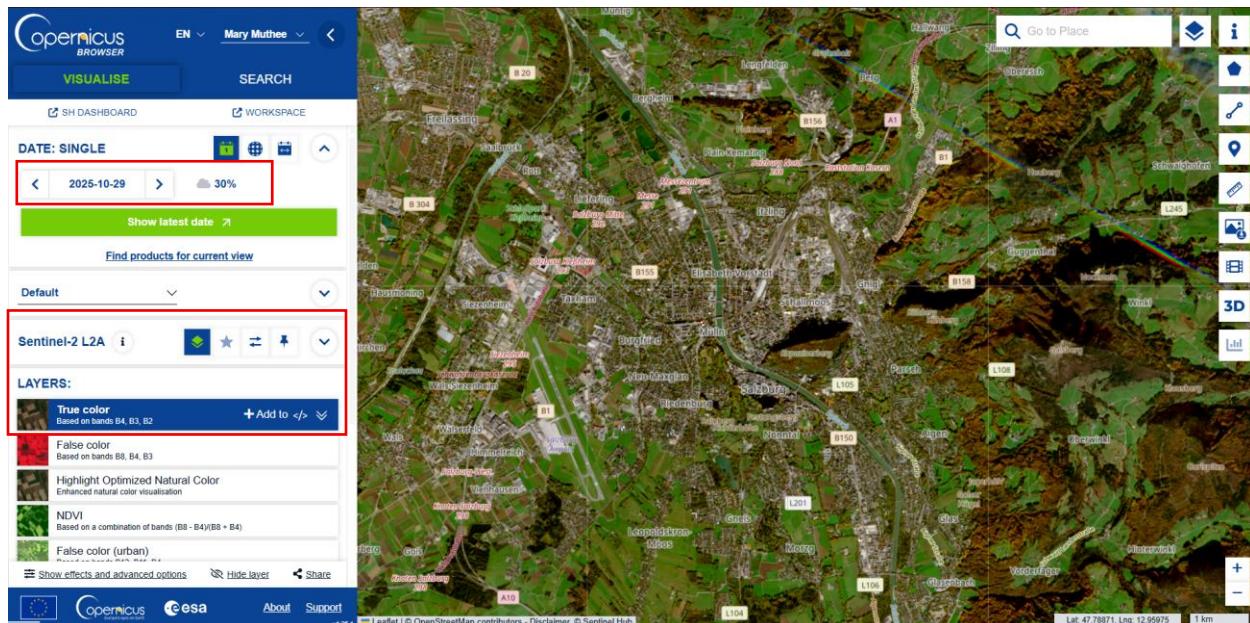


STEPS

1. Log in to the browser



2. Date selection and adding true color image



3. Running the Script

The screenshot shows the Copernicus Browser interface. On the left, there is a code editor window titled "SH DASHBOARD" containing a JavaScript script for calculating NDVI and applying a vegetation color threshold. The script uses variables for R, G, and B bands and applies a threshold of 0.4. On the right, there is a map viewer showing a satellite image of a rural area with various locations labeled, such as "Hausberg", "Schönthal", "Bergfeld", "Wald", "Gärten", and "Vorderlager". The map includes a scale bar and a compass rose.

```
1 /*  
2  Author of the script: Carlos Bentes  
3 */  
4 // Normalized Difference Vegetation Index  
5 var ndvi = (B08-B04)/(B08+B04);  
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7 // Threshold for vegetation  
8 var veg_th = 0.4;  
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11 var R = 2.5*B04;  
12 var G = 2.5*B03;  
13 var B = 2.5*B02;  
14  
15 // Transform to Black and White  
16 var Y = 0.2*R + 0.7*G + 0.1*B;  
17 var pixel = [Y, Y, Y];  
18  
19 // Change vegetation color  
20 if(ndvi >= veg_th)  
21     pixel = [0.1*Y, 1.8*Y, 0.1*Y];  
22  
23 return pixel;
```

4. Final product

The screenshot shows the Copernicus Browser interface with the "WORKSPACE" tab selected. It displays a processed satellite image of the same area shown in the previous screenshot, with the vegetation appearing in a distinct yellow-green color where the NDVI threshold was applied. The map includes a scale bar and a compass rose.

5. Creating a timelapse animation to show how greenness has changed from 2018 to 2025 within the month of October for all years.

Timelapse

2018-10-31 - 2025-10-29

Filter by months

Jan Feb Mar Apr
May Jun Jul Aug
Sep Oct Nov Dec

Min. tile coverage: 0%
Max. cloud coverage: 30%

Select All

Select 1 image per:
 orbit day week month year

Sentinel-2 L2A: Custom

Search Add layers from pins

Visualisations

2018-10-31 2019-10-01
Sentinel-2 L2A Custom
Coverage: 100%
Cloud cover: 5%

2020-10-25 2021-10-30
Sentinel-2 L2A Custom
Coverage: 100%
Cloud cover: 7%

2022-10-25 2023-10-26
Sentinel-2 L2A Custom
Coverage: 100%
Cloud cover: 19%

1 km

2018-10-31 2019-10-01

Copernicus Data Space Ecosystem

Speed: 1 fps Transition: None 1 / 5 Download

