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 ≥ 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.

```
/*
Author of the script: Carlos Bentes
*/

// Normalized Difference Vegetation Index
var ndvi = (B08-B04)/(B08+B04);

// Threshold for vegetation
var veg_th = 0.4;

// Simple RGB
var R = 2.5*B04;
var G = 2.5*B03;
var B = 2.5*B02;

// Transform to Black and White
var Y = 0.2*R + 0.7*G + 0.1*B;
var pixel = [Y, Y, Y];

// Change vegetation color
if(ndvi >= veg_th)
  pixel = [0.1*Y, 1.8*Y, 0.1*Y];

return pixel;
```

Figure 1 Script

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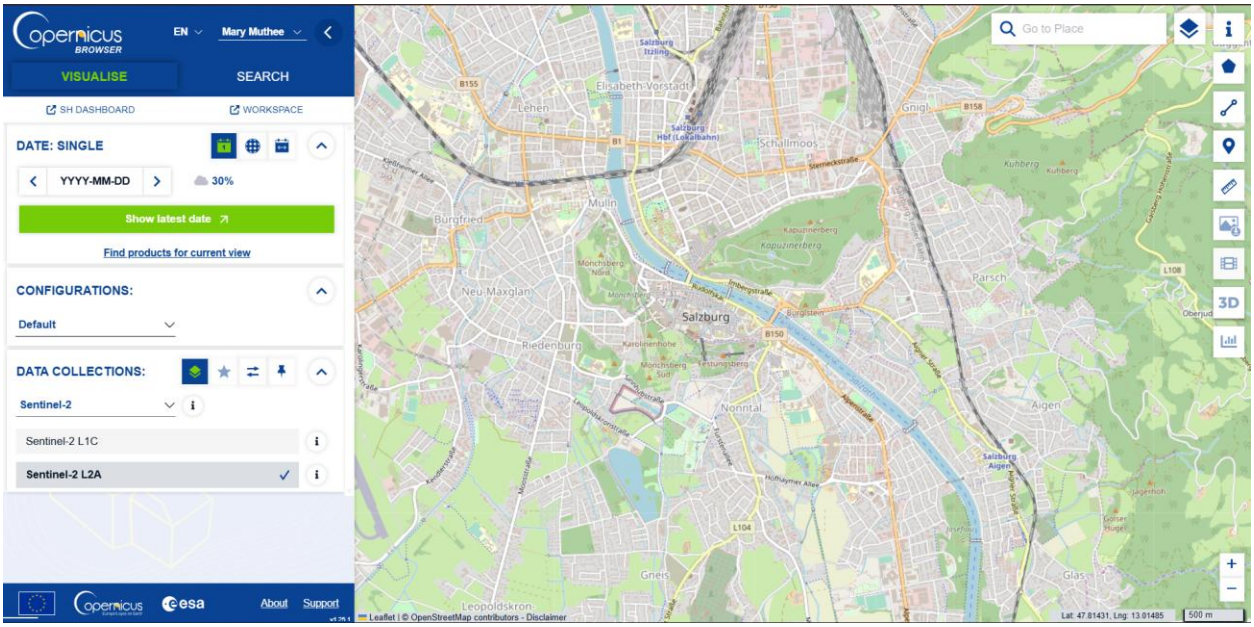
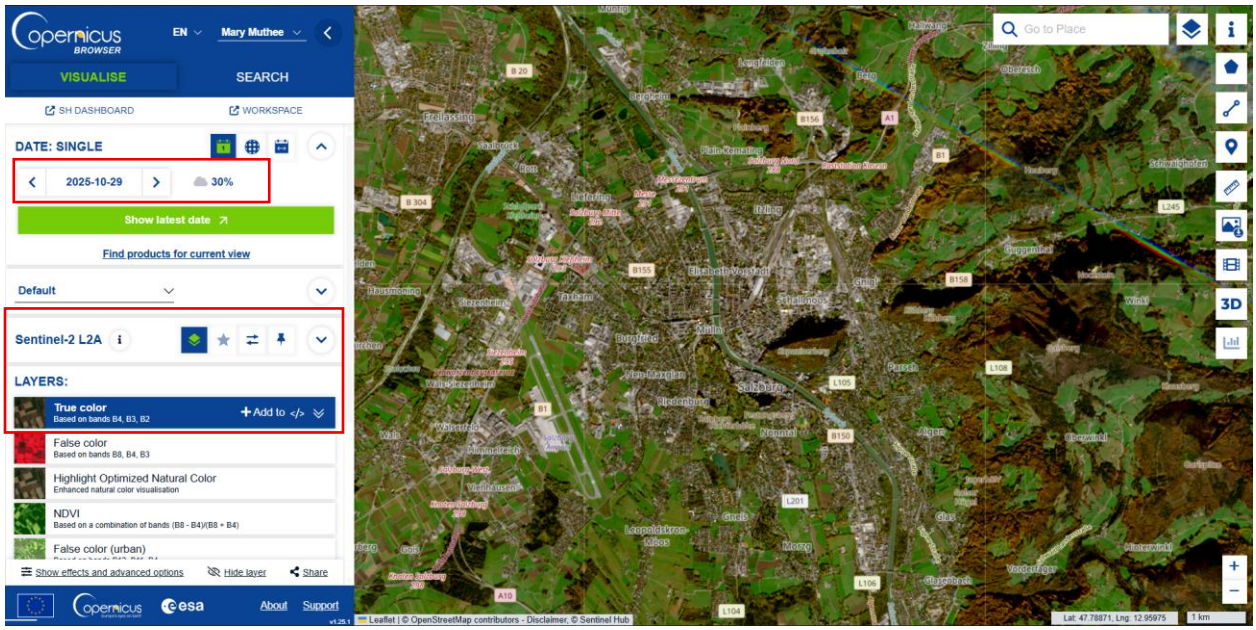
STEPS

1.Log in to the browser



2. Date selection and adding true color image



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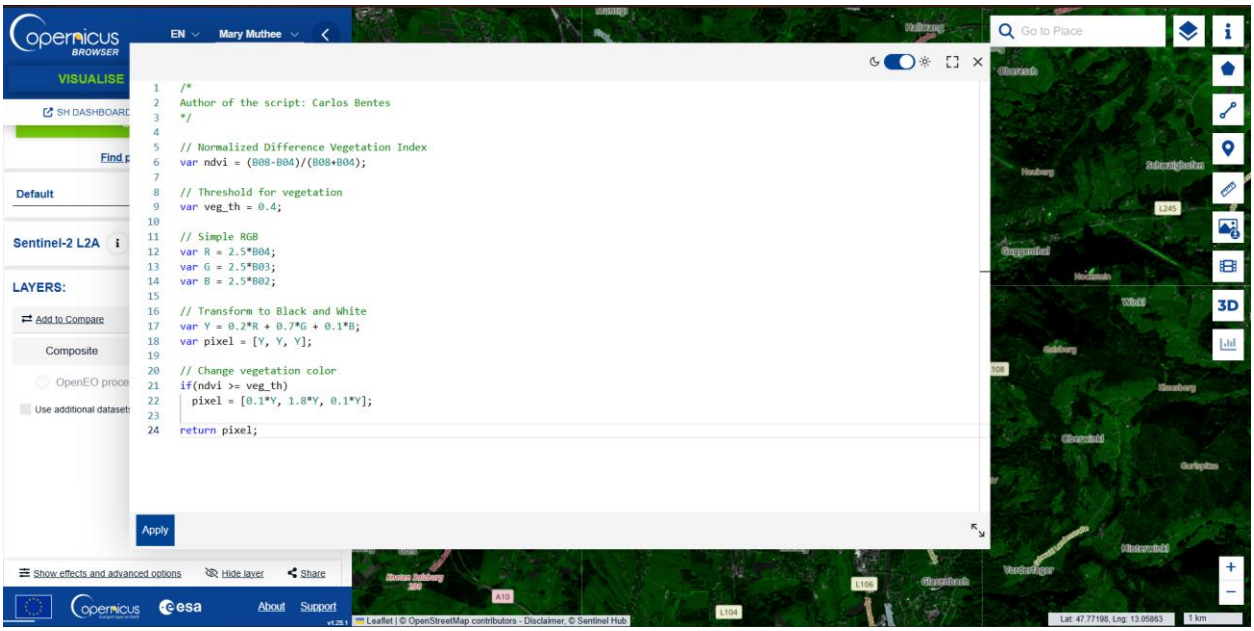
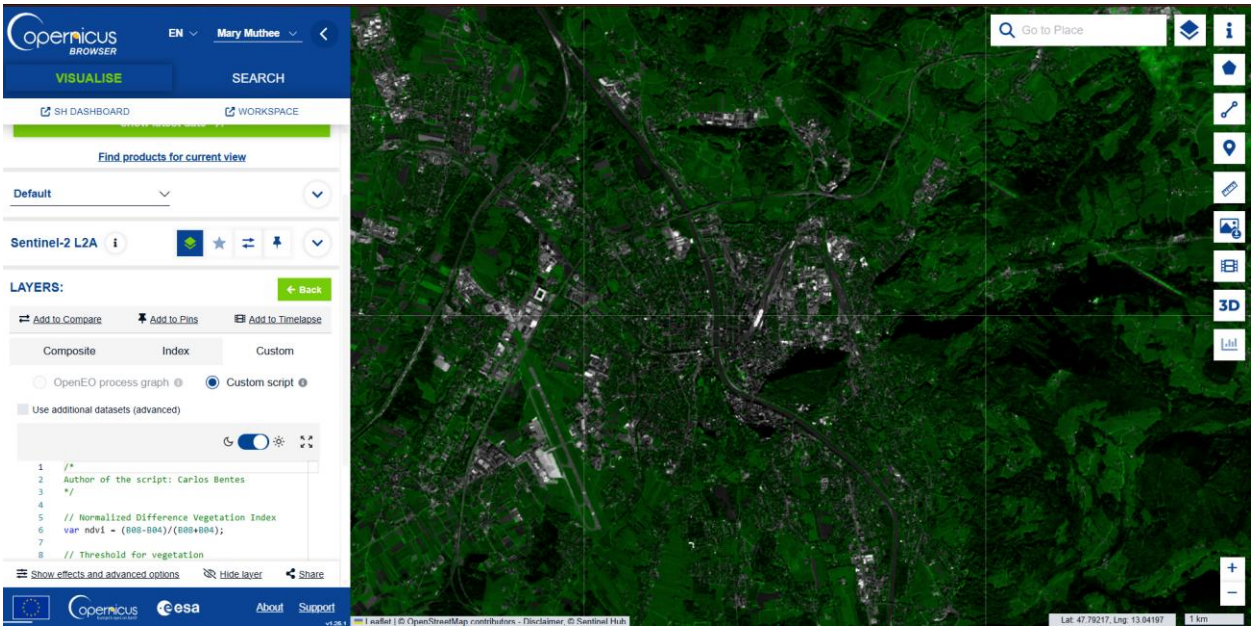
3. Running the Script



4. Final product



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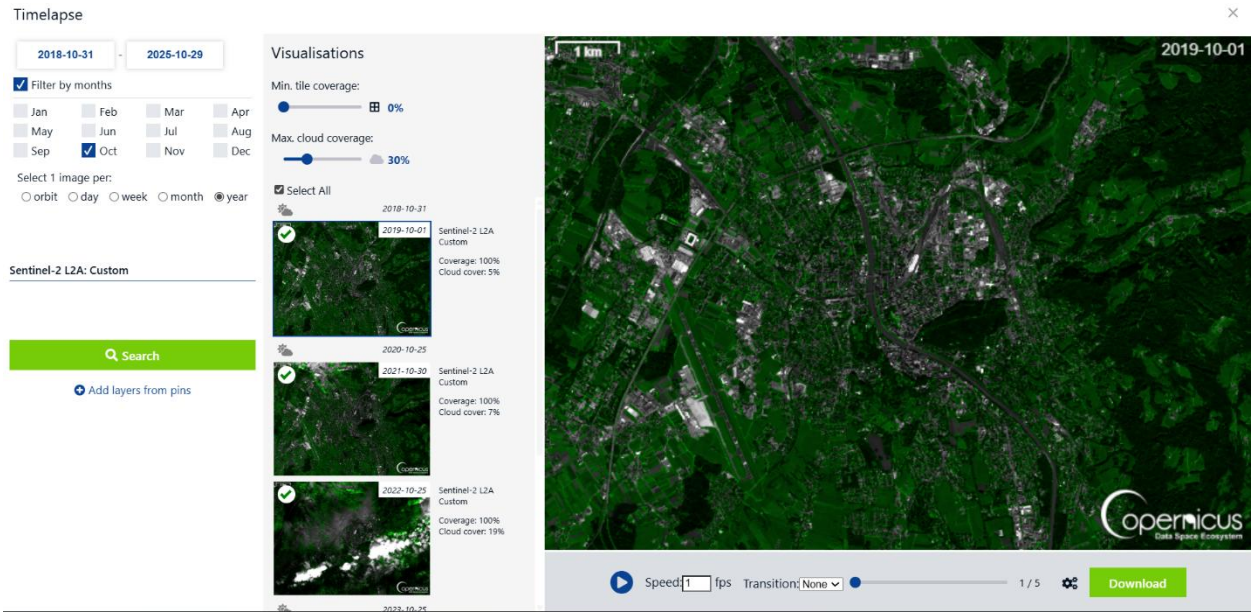
5. Creating a timelapse animation to show how greenness has changed from 2018 to 2025 within the month of October for all years.



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