

Assignment

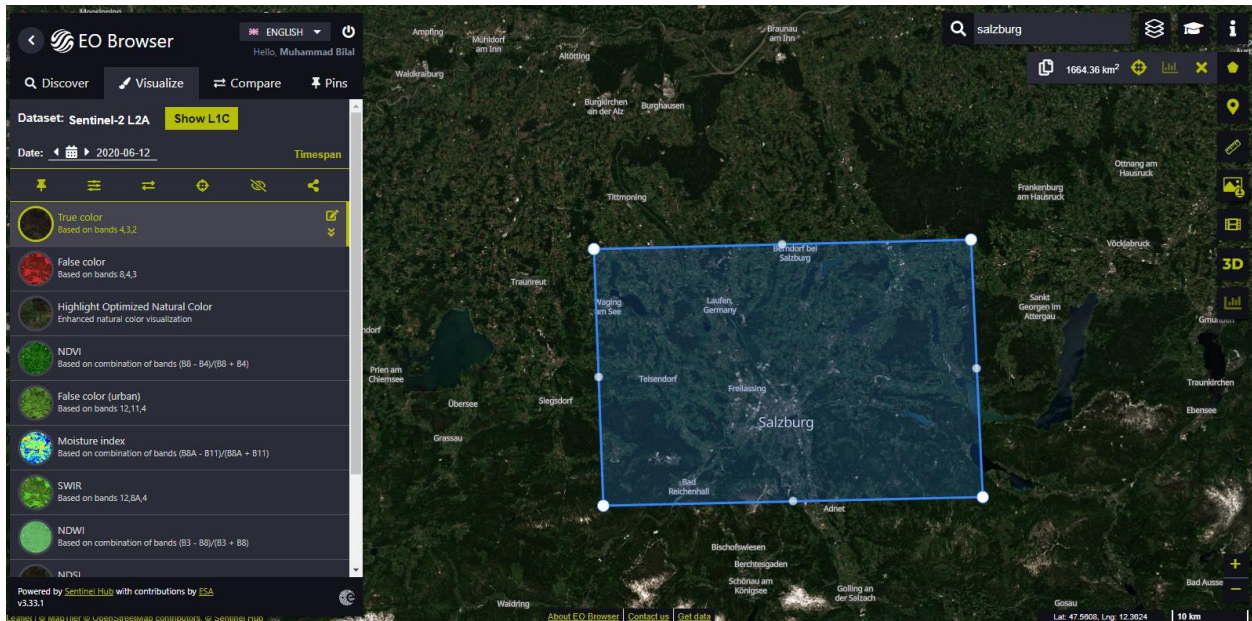
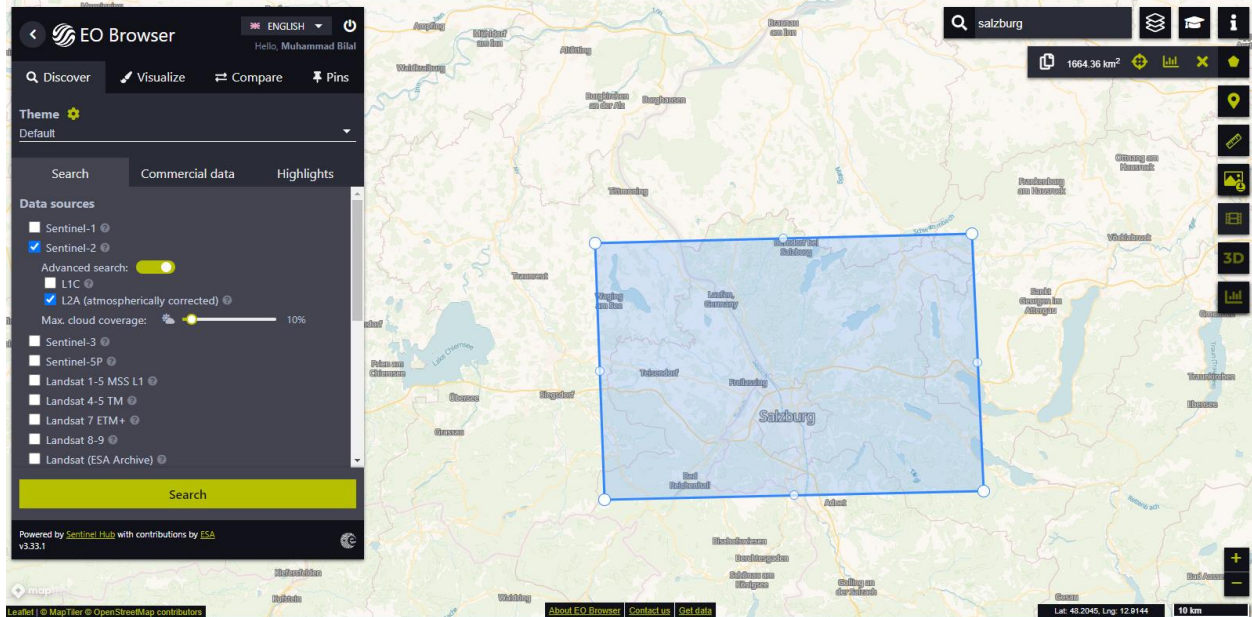
EO-Browser Custom Script

Muhammad Bilal

S1093347

Study Area

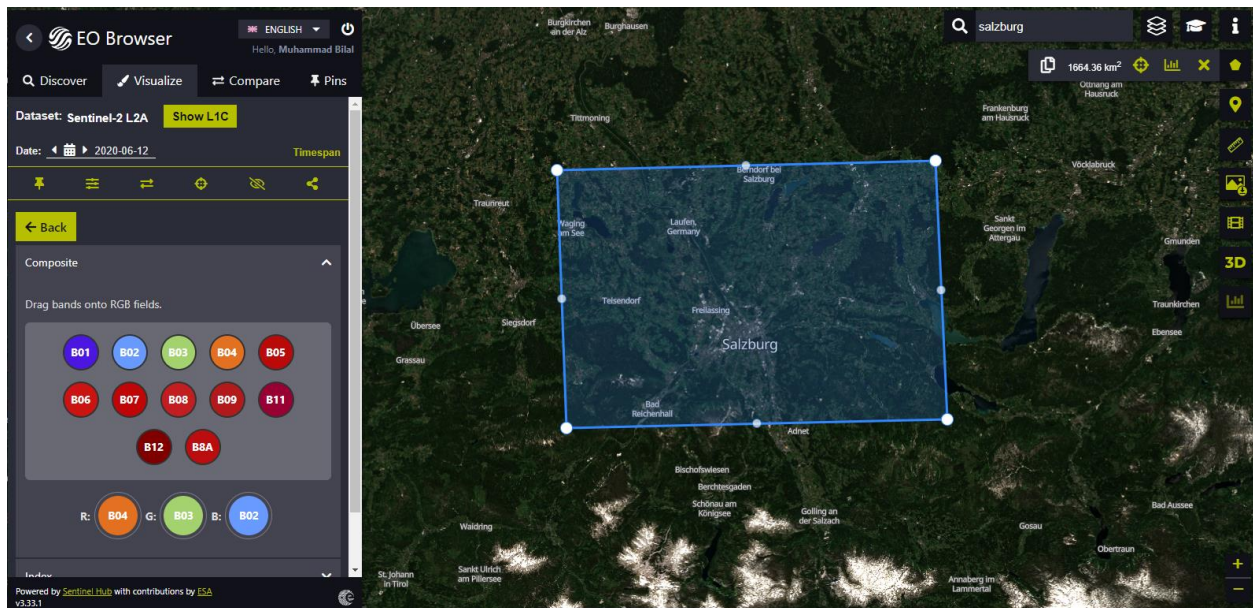
For this exercise sentinel 2 L2A product image is selected for the region of Salzburg with less than 10 percent cloud coverage



Band Combinations

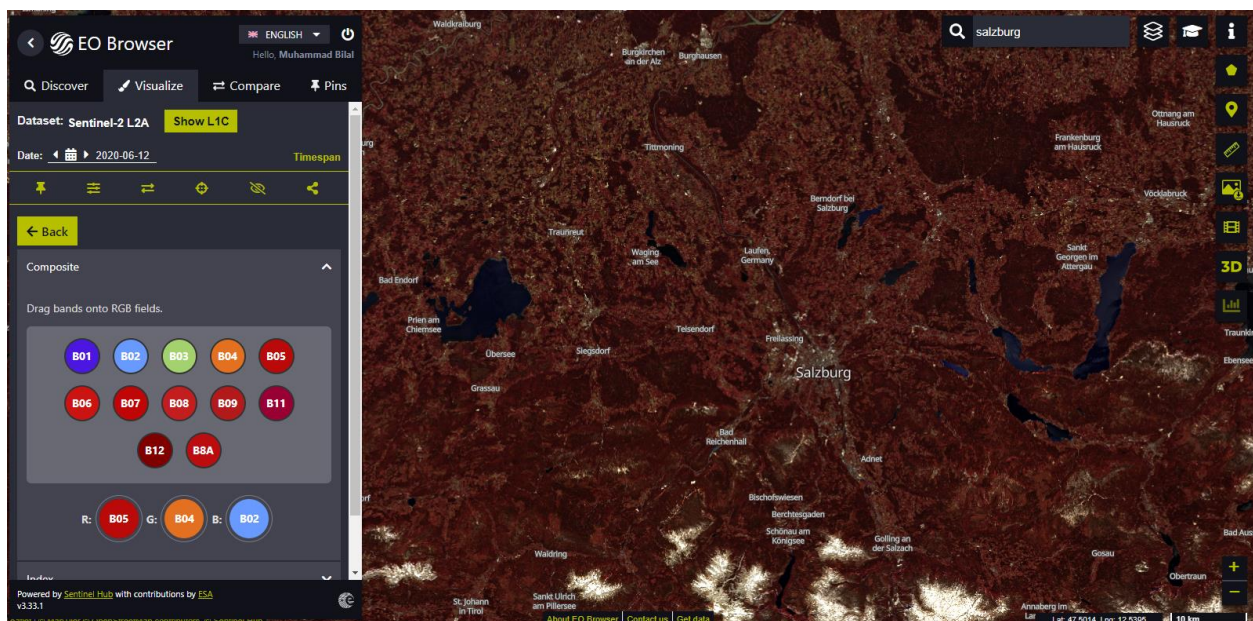
True Color Image

In this combination I used bands 4, 3, 2 to visualize image as same that can be seen by human eye. Our Human eye only see things that is the combination of blue green and red bands.



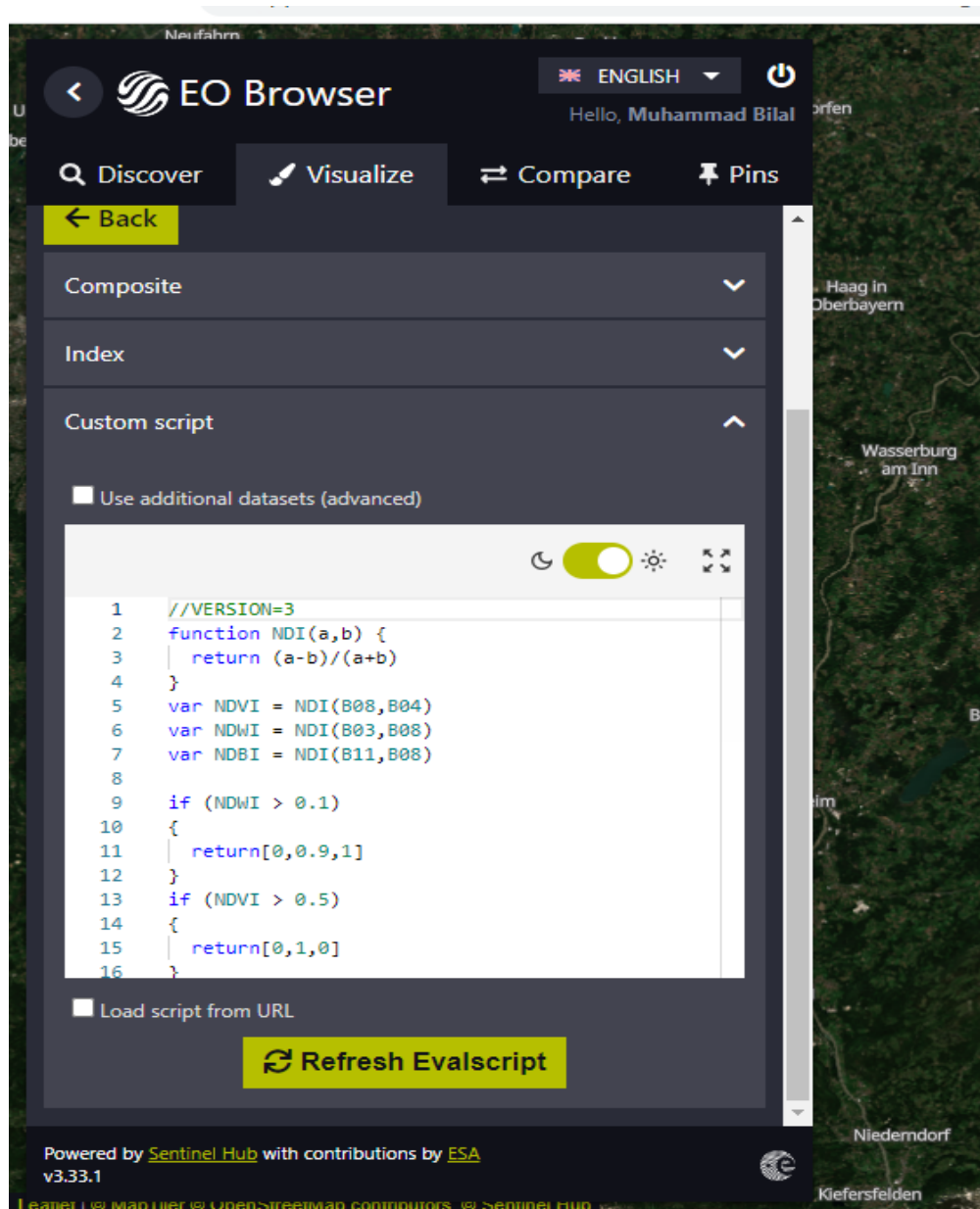
False Color Image

In this combination band 5,4,3 is used to detect feature that can't be seen by human eye. In this I used infrared red with two visible bands to detect water bodies and Vegetation areas visually.



Feature Detection Analysis Using EO- Custom Scripts

EO browser allows to write custom script in JavaScript language for different kind of image analysis for example like Forest Fire Detection, Agriculture Growth, Landslide and Flood Assessment etc. In this exercise I applied NDVI, NDWI, NDBI indices Script on Sentinel 2 image to make a classified map that represent different features like water, Vegetation and Urban area on an image. Below an Image shows where is the script written in EO Browser.



Script Detail

```
function NDI(a,b) {  
    return (a-b)/(a+b)  
}
```

In this I created a function named **Normalize Difference Index (NDI)** that takes two parameters a and b that represent bands and inside a function I used **return** for output of difference formula that is used to detect specific feature in an image. I created function because it saves time for creating same difference formula for each indices.

```
var NDVI = NDI (B08, B04)
```

Normalized Difference Vegetation Index (NDVI) variable is created and then NDI function is called passed with two parameters that is band 8 (NIR) and band 4 (Red). Vegetation feature shows greater reflectance in Near-Infrared band than red band.

```
var NDWI = NDI (B03, B08)
```

Normalized Difference Water Index (NDWI) variable is created and then NDI function is called passed with two parameters that is band 3 (Green) and band 8 (NIR). Water body shows slight reflectance in Green band and absorption in Infrared band

```
var NDBI = NDI (B11, B08)
```

Normalized Difference Builtup Index (NDBI) variable is created and then NDI function is called passed with two parameters that is band 11 (SWIR) and band 8 (NIR). NDBI highlights urban areas with higher reflectance in the shortwave-infrared band, compared to the Near-Infrared band.

```
if (NDWI > 0.1)
```

```
{  
    return[0,0,1]  
}
```

First If statement shows that if wetness index values is greater than 0.1 then return the water feature in an image with blue color. The values range between -1 to 1 most probably values greater than 0 represent water body more accurately. In return parameter 3 values represent red green and blue band values.

```
if (NDVI > 0.5)
```

```
{
```



```

return[0,1,0]
}

```

Second If statement shows that if Vegetation threshold values is greater than 0.5 then return the vegetation feature in an image with green color. The values ranges between -1 to 1 most probably values greater than 0.5 represent healthy vegetation more accurate.

```

if (NDBI > 0)
{
    return[1,0,0]
}

```

Third If statement shows that if built-up threshold values is greater than 0 then return the built-up areas in an image with red color. The values ranges between -1 to 1 most probably values greater than 0 represent built-up area more accurate

```

else
{
    return[2.5*B04,2.5*B03,2.5*B02]
}

```

Else statement shows that remaining features can be representing as true color image. The 2.5 value multiplied by each band to enhance the pixel value of each band. Final result shown below

