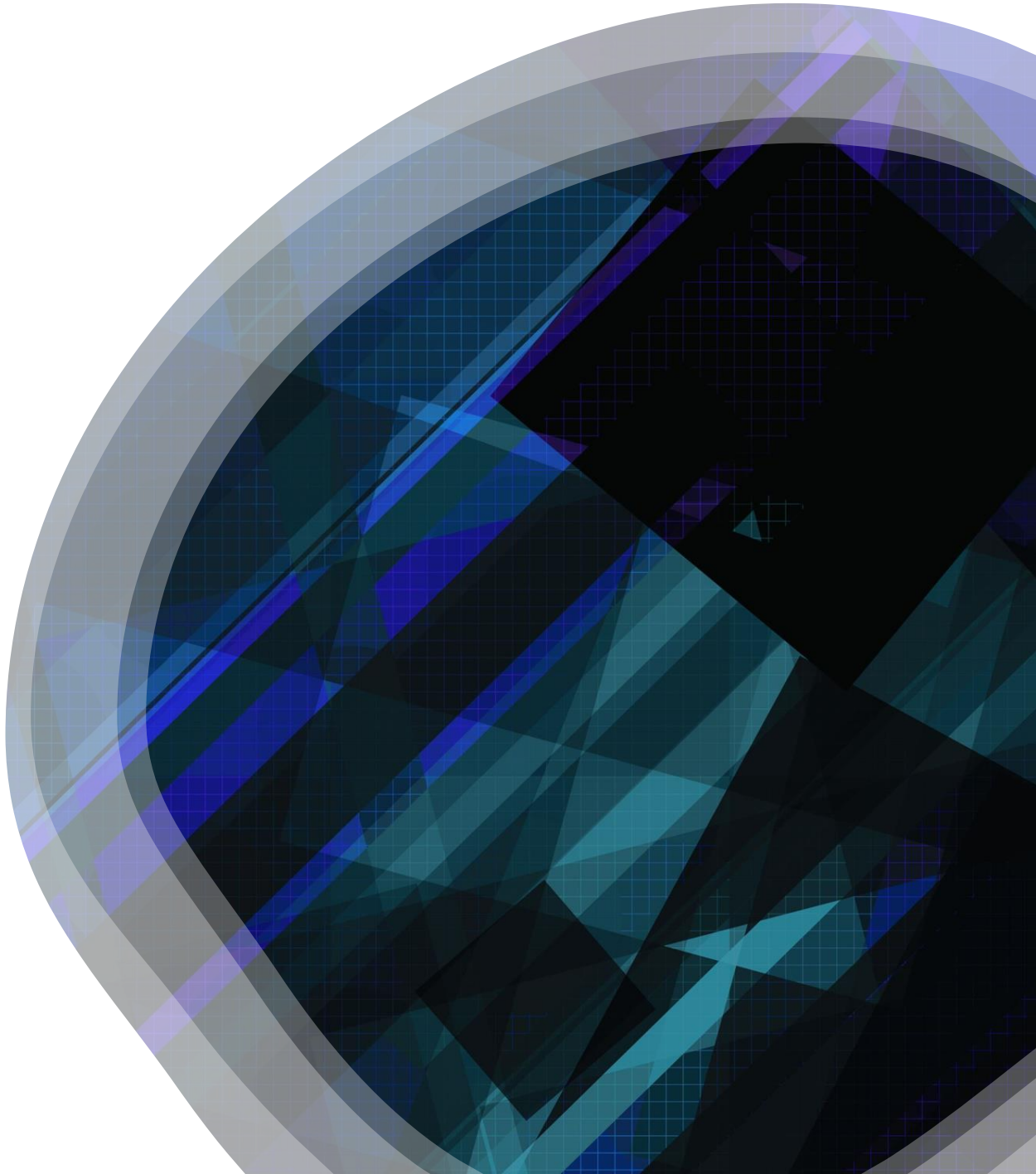
Digital Earth: Big Earth Data Concepts

+

Sample assignments

Creating Graphs

E08_assignment_GEE



Temperature time series

Task

https://code.earthengine.google.com/d845783a6e6b9188132ec453b2895c41

Scripts | Docs | Assets

Filter scripts... NEW

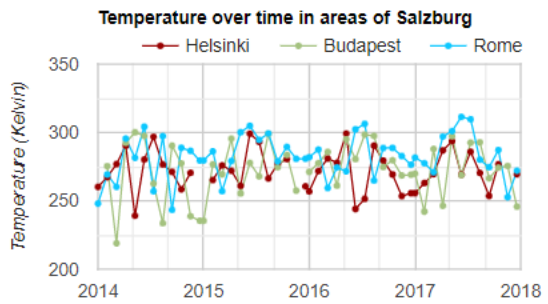
- Owner (2)
  - users/turkimdhia/BEBDcourse
    - Folder
      - This folder is empty.
    - E08_Assignment_GEE
    - UntitledFile
  - users/turkimdhia/NDVI_Sentinel
    - NDVI_sentinel_
    - NDVI_sentinel_grd_sfx
    - ndvi_graph
    - supclass_accuracy
    - supclass_grdtn
    - supervisedclass
- Writer
  - No accessible repositories. Click Refresh to check again.
- Reader (5)
  - projects/gee-edu/book
    - Part A - Applications
    - Part F - Fundamentals
  - users/mrtiede/DE_lecture_GEE_II
    - 0 - JavaScript intro
    - 01_Visualize_images (check collection...
    - 02_Visualize_image(one)
    - 03_Visualize_images (Sentinel-2)
    - 03_Visualize_images (Sentinel-2)_Andes
    - 04_NDVI(Sentinel-2)
    - 04_NDVI(Sentinel-2)_reduce
    - 05_Reduce_Sentinel-2
    - 06_temperature through time Salzburg...
    - 07_widgets_split_panel
  - users/nclinton/ICIMOD2017-training

E08_Assignment_GEE * | Get Link | Save | Run | Reset | Apps

```
// Define a FeatureCollection: regions of Salzburg.
var regions = ee.FeatureCollection([
 ee.Feature( // Helsinki.
 ee.Geometry.Point(24.945831,60.192059), {label: 'Helsinki'}),
 ee.Feature( // Budapest.
 ee.Geometry.Point(19.040236,47.497913), {label: 'Budapest'}),
 ee.Feature( // Rome.
 ee.Geometry.Point(12.496366,41.902782), {label: 'Rome'})
]);
// Load Landsat 8 collection
var temps2013 = ee.ImageCollection('LANDSAT/LC08/C01/T1_32DAY_TOA')
 .filterDate('2013-12-25', '2017-12-25')
 .select('B11');
// Create a time series chart.
var tempTimeSeries = ui.Chart.image.seriesByRegion(
 temps2013, regions, ee.Reducer.mean(), 'B11', 200, 'system:time_start', 'label')
 .setChartType('ScatterChart')
 .setOptions({
 title: 'Temperature over time in areas of Salzburg',
 vAxis: {title: 'Temperature (Kelvin)'},
 lineWidth: 1,
 pointSize: 2,
 series: {
 0: {color: '#990000'}, // red
 1: {color: '#a4c27f'}, // green
 2: {color: '#0cc8ff'} // blue
}});
// Display.
print(tempTimeSeries);
```

Inspector | Console | Tasks

Use `print(...)` to write to this console.



2°C Ciel couvert | Recherche | 22:03 01/12/2022

Code (Temperature time series)

```
// Define a FeatureCollection: regions of Salzburg.
var regions = ee.FeatureCollection([
 ee.Feature( // Helsinki.
 ee.Geometry.Point(24.945831,60.192059), {label: 'Helsinki'}),
 ee.Feature( // Budapest.
 ee.Geometry.Point(19.040236,47.497913), {label: 'Budapest'}),
 ee.Feature( // Rome.
 ee.Geometry.Point(12.496366,41.902782), {label: 'Rome'})
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 .setOptions({
 title: 'Temperature over time in areas of Salzburg',
 vAxis: {title: 'Temperature (Kelvin)'},
 lineWidth: 1,
 pointSize: 2,
 series: {
 0: {color: '#990000'}, // red
 1: {color: '#a4c27f'}, // green
 2: {color: '#0cc8ff'} // blue
}});
// Display.
print(tempTimeSeries);
```

User-defined points

Dynamic approach ((work in progress)

https://code.earthengine.google.com/a316cd63ea7a974e3029644c62b975b7

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    - Part F - Fundamentals
  - users/mrtiede/DE_lecture_GEE_II
    - 0 - JavaScript intro
    - 01_Visualize_images (check collection...

UntitledFile * | Get Link | Save | Run | Reset | Apps

Imports (3 entries)
var geometry1: Point (2.27, 48.82)
var geometry2: Point (48.46, 47.85)
var geometry3: Point (21.92, 39.75)

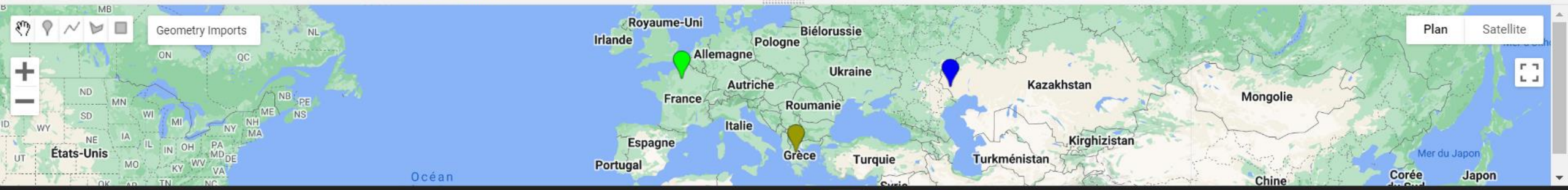
```
var x1=ee.Geometry((geometry1.coordinates().get(0)));
var y1=ee.Geometry((geometry1.coordinates().get(1)));

var x2= ee.Geometry((geometry1.coordinates().get(0)));
var y2= ee.Geometry((geometry1.coordinates().get(1)));

var x3= ee.Geometry((geometry1.coordinates().get(0)));
var y3= ee.Geometry((geometry1.coordinates().get(1)));

// Define a FeatureCollection: points.
var regions = ee.FeatureCollection([
 ee.Feature( // 1.
 ee.Geometry.Point(x1,y1), {label: '1'}),
 ee.Feature( // 2.
 ee.Geometry.Point(x2,y2), {label: '2'}),
 ee.Feature( // 3.
 ee.Geometry.Point(x3,y3), {label: '3'})
]);
// Load Landsat 8 collection
var temps2013 = ee.ImageCollection('LANDSAT/LC08/C01/T1_32DAY_TOA')
 .filterDate('2013-12-25', '2017-12-25')
 .select('B11');
// Create a time series chart.
var tempTimeSeries = ui.Chart.image.seriesByRegion(
 temps2013, regions, ee.Reducer.mean(), 'B11', 200, 'system:time_start', 'label')
 .setChartType('ScatterChart')
 .setOptions({
```

Inspector | Console | Tasks

Use print(...) to write to this console.

Error generating chart: Projection: Argument 'crs': Invalid type. Expected type: String. Actual type: Float. Actual value: 48.81788925995156

Projection: Argument 'crs': Invalid type. x2
Expected type: String.
Actual type: Float.
Actual value: 48.81788925995156



2°C Ciel couvert

Recherche

22:14 01/12/2022

Extra

NDVI graph (work in progress)

Code (NDVI time series)

- https://code.earthengine.google.com/ff58e77bcebcba77fcf939a27c1646b0

Feedback

- s1093354@stud.sbg.ac.at
- Blackboard

Thank you

Using Sen2Cube to attempt detecting **change in urban & bare land** areas

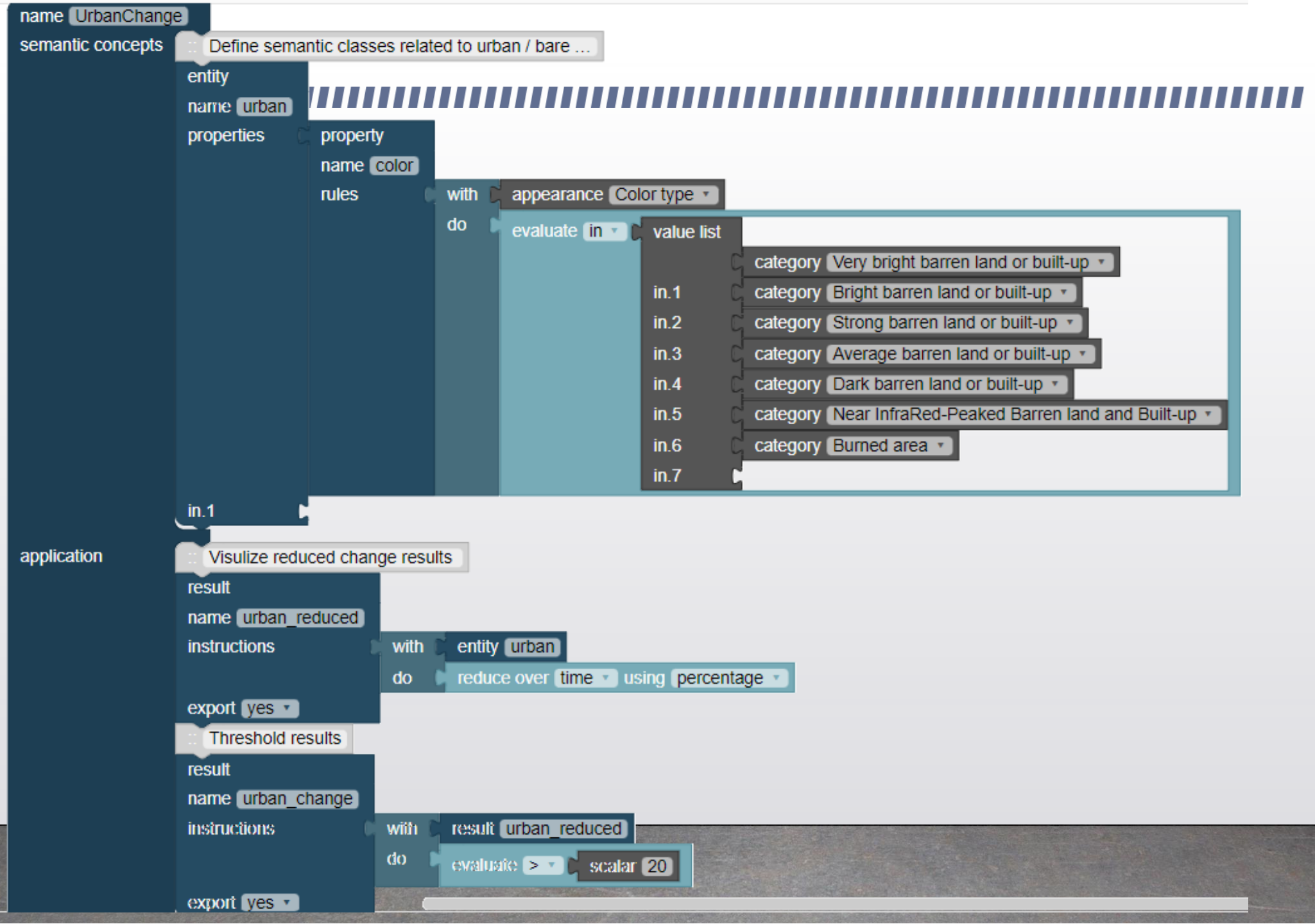
Mohamed Dhia TURKI

Purpose

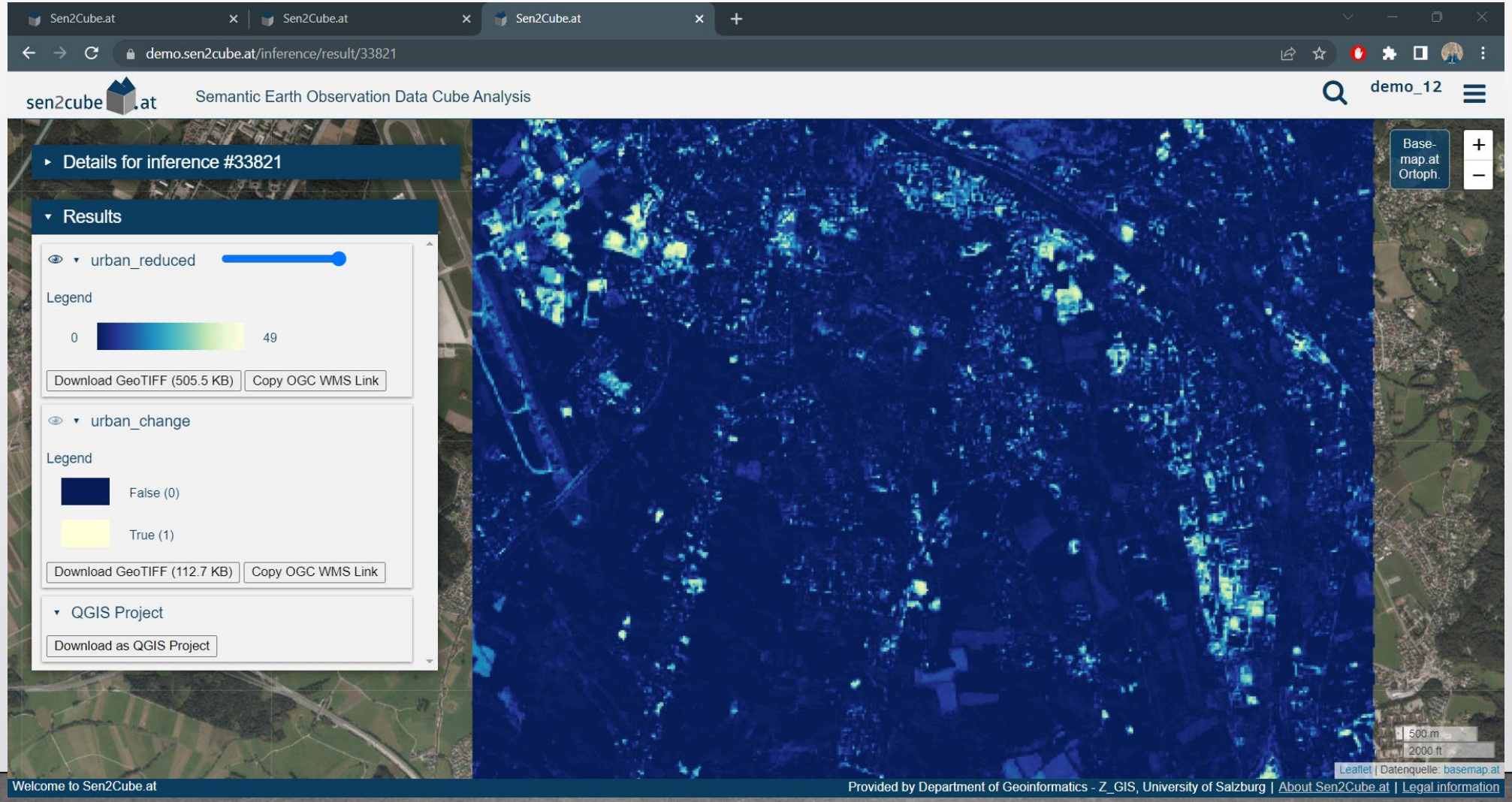
- The model aims to detect change happening in the semantic categories related to urban and/or bare land areas. A thresholding will apply to the result to detect zones where change happened.

Workflow

- The model starts by defining the classes related to urban/bare land areas,
- We create a first result in which the change in each pixel is assessed through a reduction over time over the selected period,
- We apply a threshold to produce a second (more comprehensible) visualization of pixels that have changed beyond that threshold.

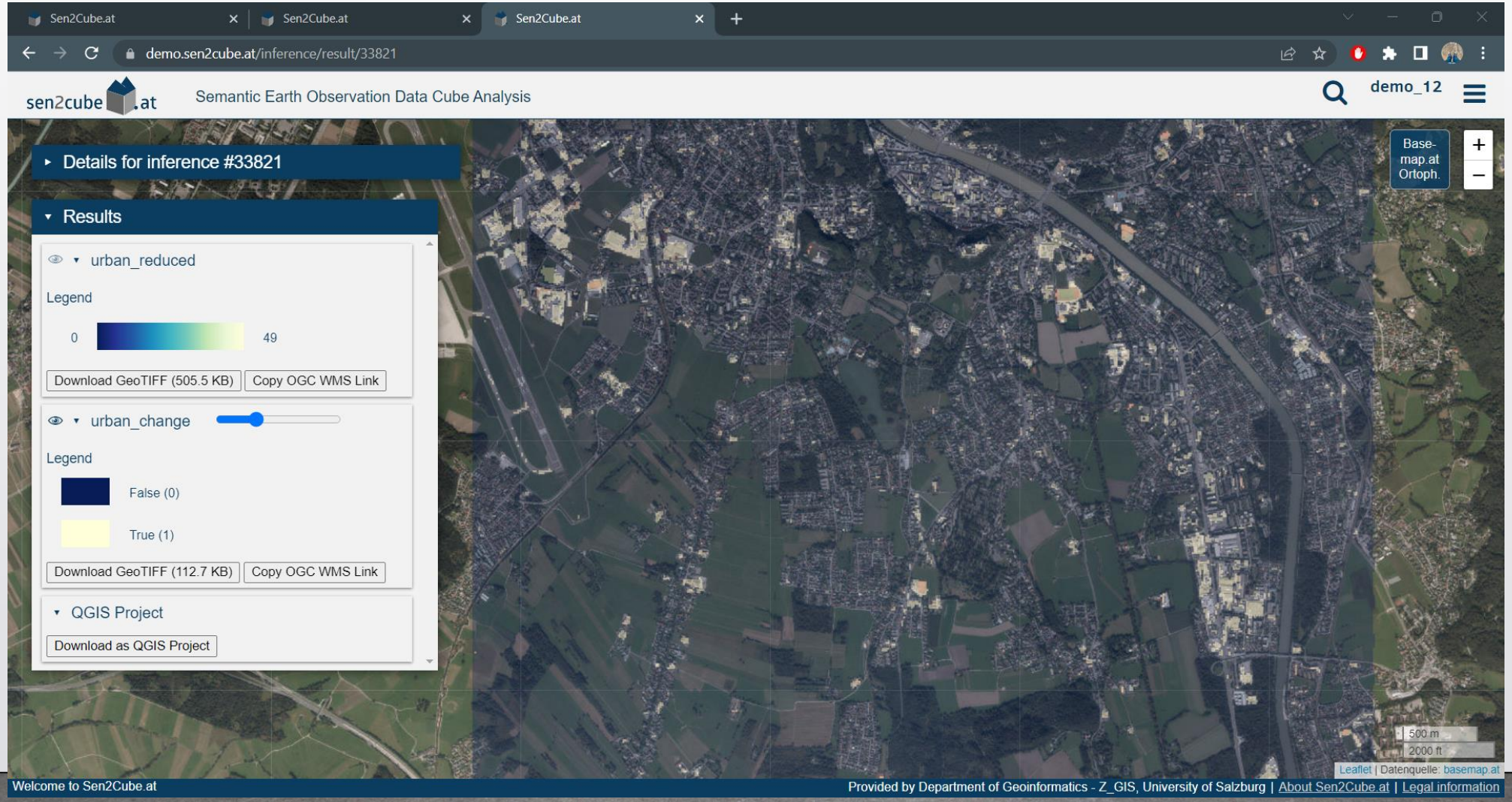

name UrbanChange
semantic concepts
Define semantic classes related to urban / bare ...
entity
name urban
properties
property
name color
rules
with
appearance Color type
do
evaluate in
value list
category Very bright barren land or built-up
in.1
category Bright barren land or built-up
in.2
category Strong barren land or built-up
in.3
category Average barren land or built-up
in.4
category Dark barren land or built-up
in.5
category Near InfraRed-Peaked Barren land and Built-up
in.6
category Burned area
in.7
in.1
application
Visulize reduced change results
result
name urban_reduced
instructions
with
entity urban
do
reduce over time using percentage
export yes
Threshold results
result
name urban_change
instructions
with
result urban_reduced
do
evaluate >
scalar 20
export yes

Examples



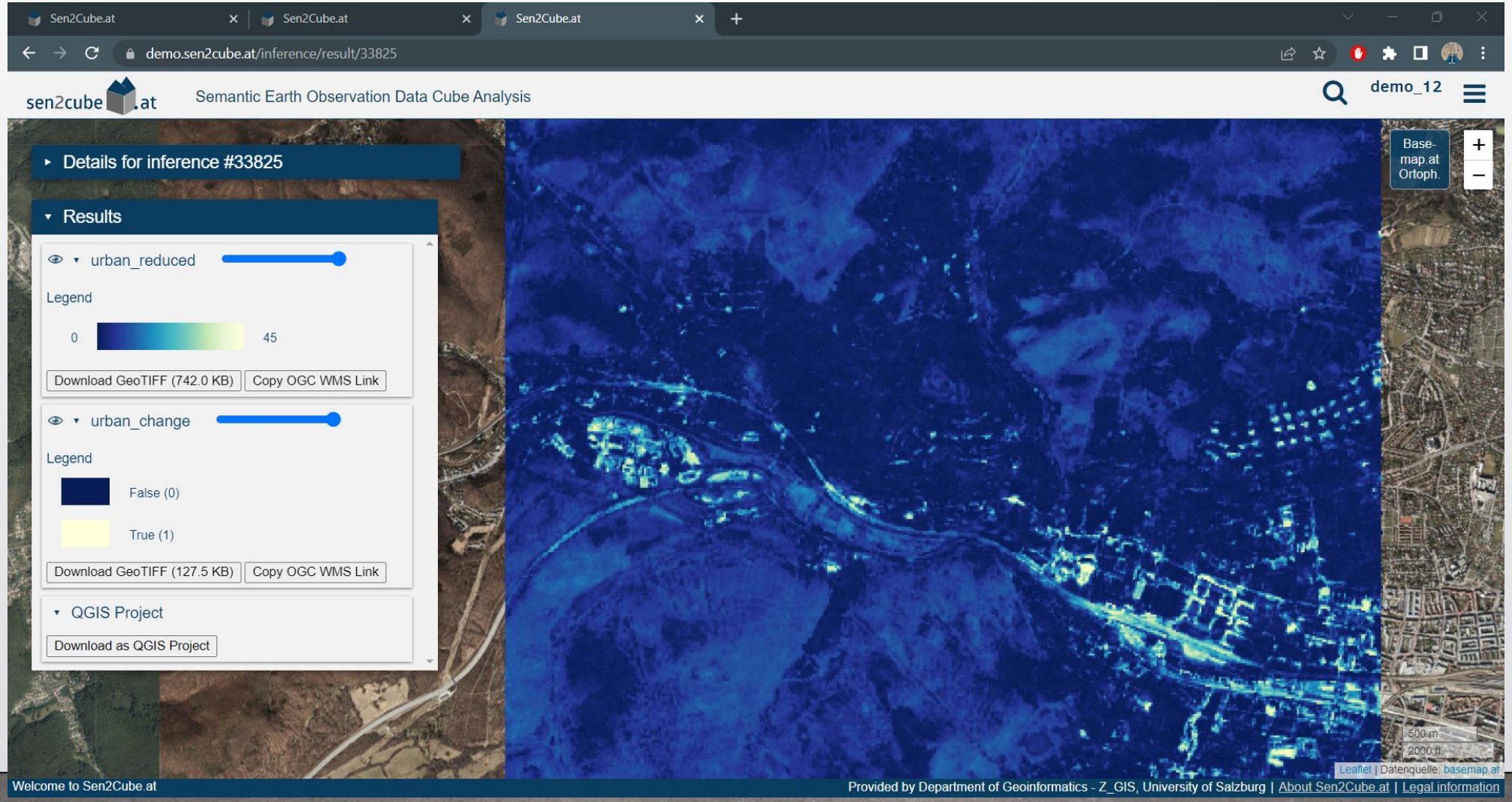
- South-west Salzburg
- Inference #33821

Examples



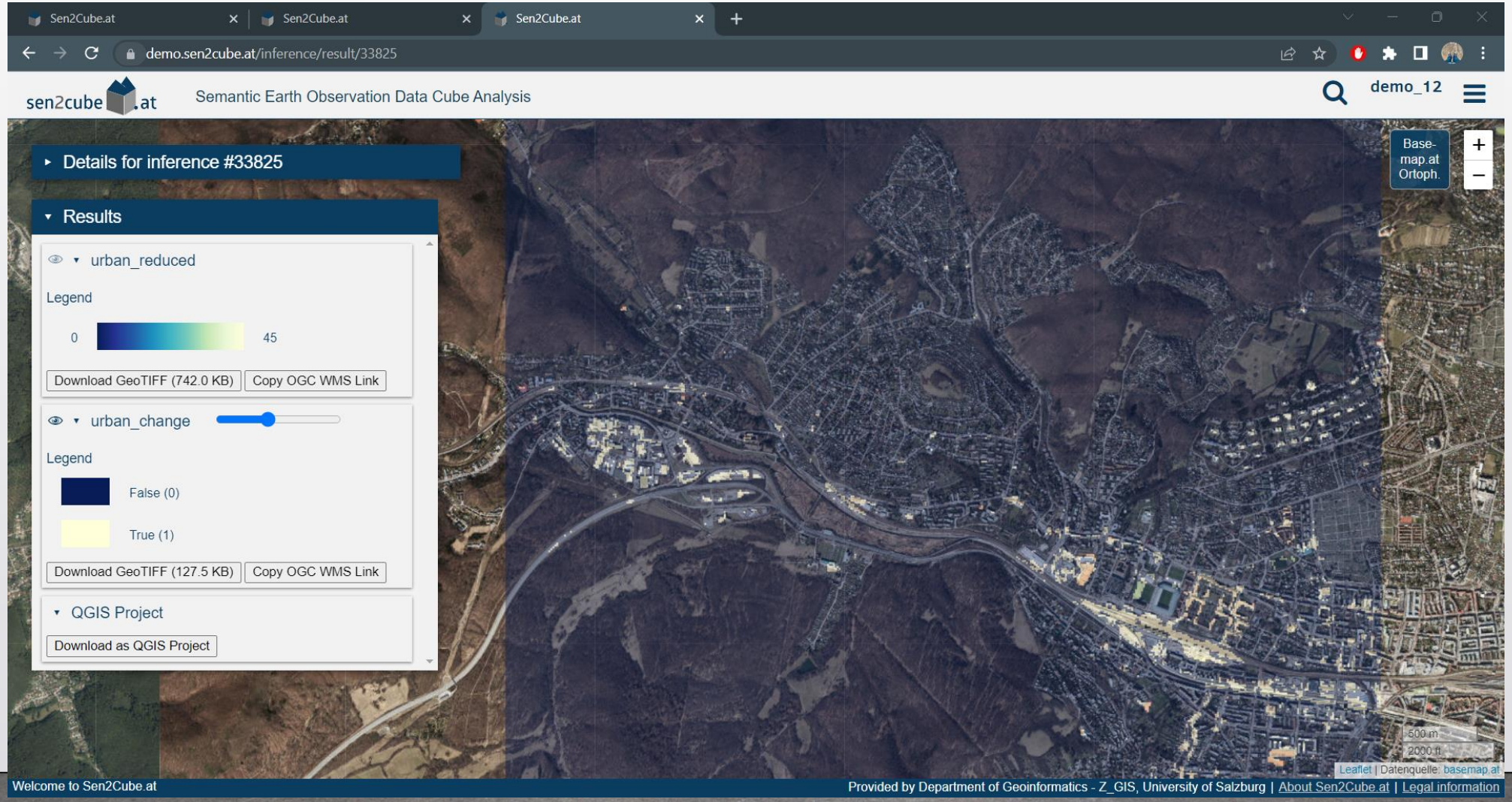
- South-west Salzburg
- Inference #33821

Examples



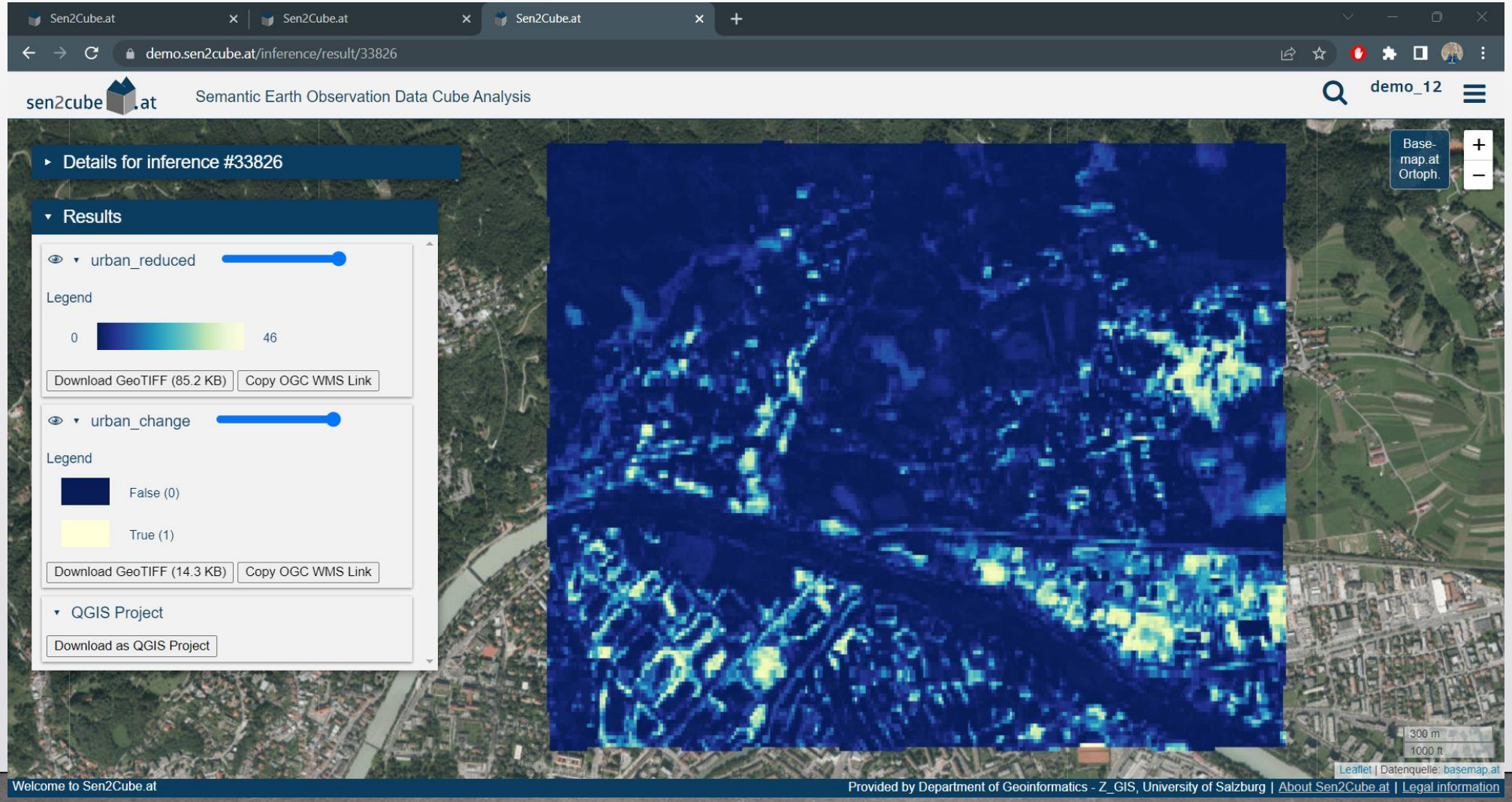
- West Vienna
- Inference #33825

Examples



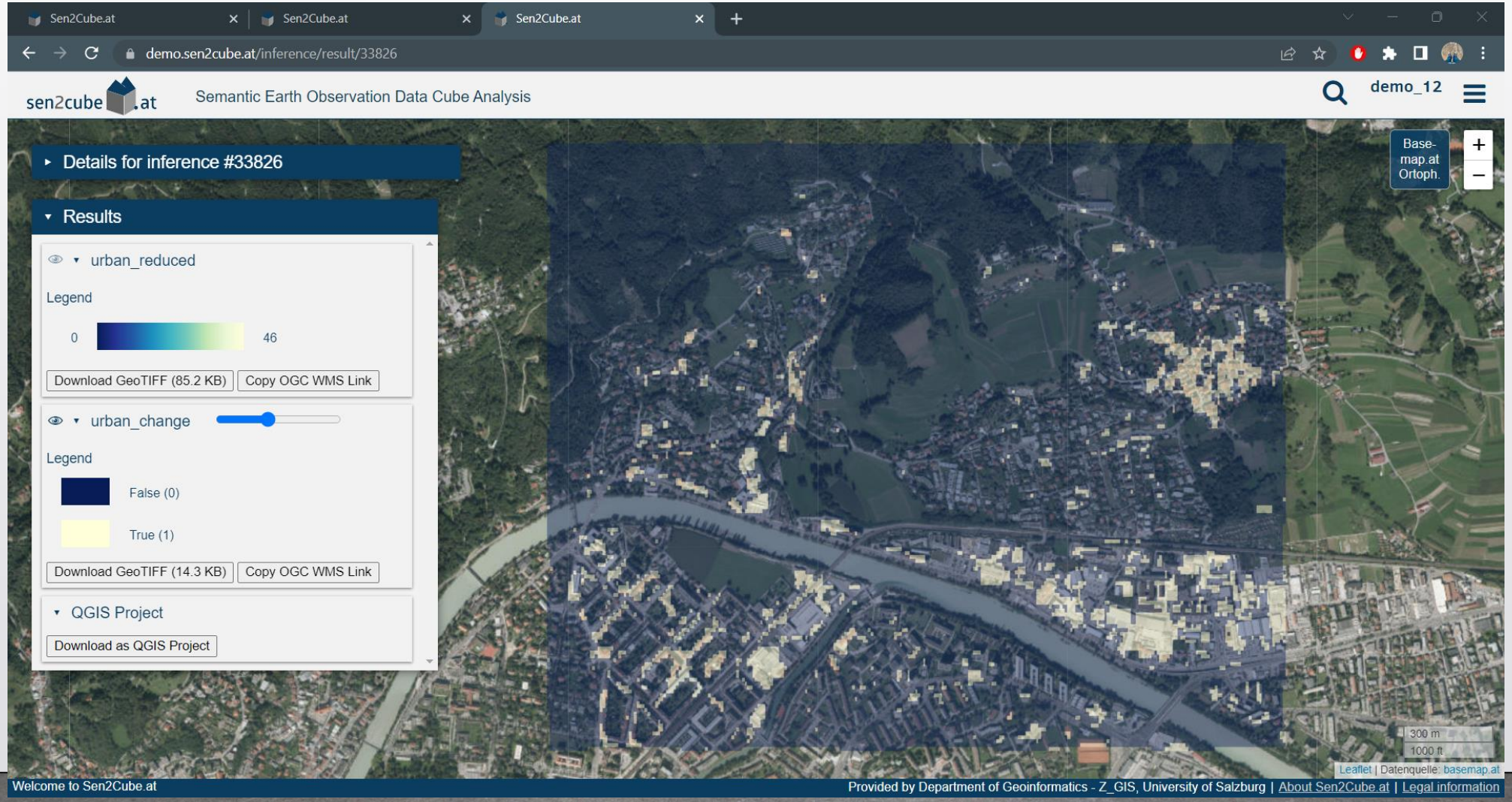
- West Vienna
- Inference #33825

Examples



- North-east Innsbruck
- Inference #33826

Examples



- North-east Innsbruck
- Inference #33826

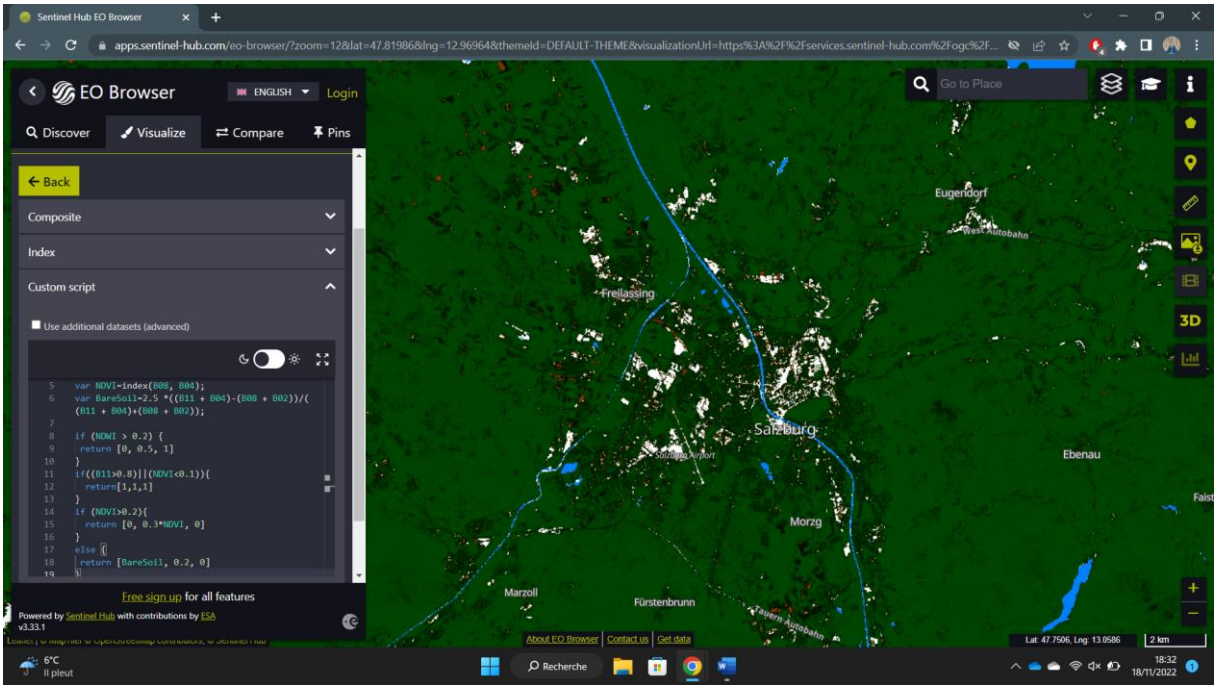
Evaluation

- The model produces acceptable results in the areas where it has been tested.
- The reliability of the results leaves more to be desired as the model confuses between buildings and bare soil

E05 - EO Browser

Used script : Urban Classified Script

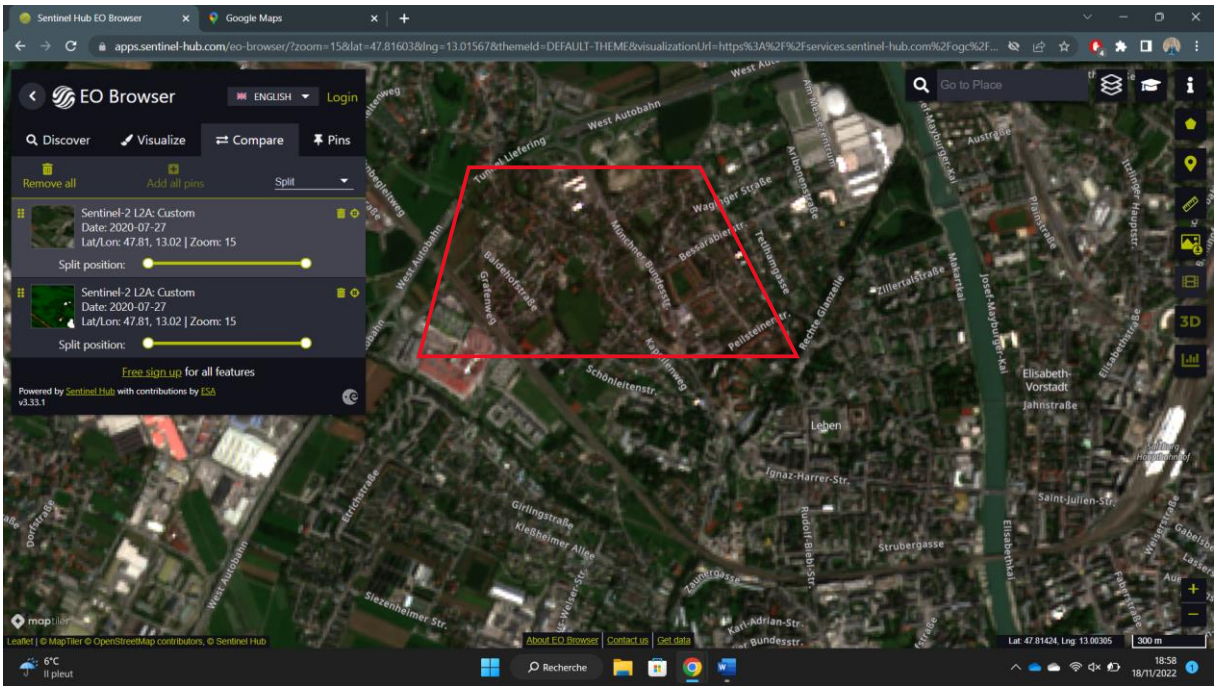
The script classifies water, built-up areas, bare regions, and vegetated areas using the NDWI, NDVI, Bare Soil, and B11 SWIR band. Water is depicted in the script as being blue, vegetation as being green, built-up regions as being white, arid soil as being brown, and all other pixels as being dark green.



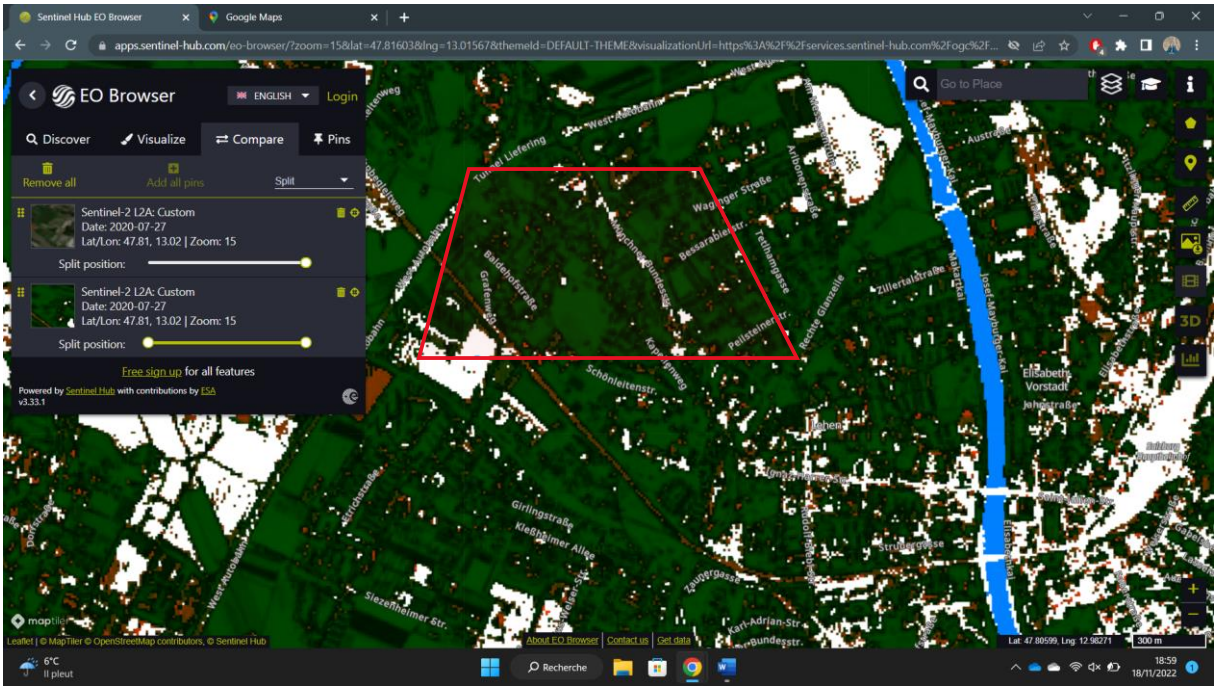
1 Urban classification script output – Salzburg Area – Sentinel image from July 27th 2020

Water pixels are defined as those with NDWI values greater than 0.2. Pixels with B11 values greater than 0.8 or NDVI values less than 0.1 will be built up areas. Pixels with NDVI values greater than 0.2 will be classified as vegetation. The remaining pixels will be classified as bare soil or as other.

The script performs rather well but fails to accurately distinguish built up areas from vegetation in places where there's an alternating variation of vegetation and buildings (North West Lehen)



2 Sentinel-2 Image in true color composite



3 Sentinel-2 image classified with Urban Classified script