Assignment9: Sen2Cube.at

Introduction

The assignment aim is to create a new inference with Sen2Cube.at and represent it in 3 different areas of interest. Sen2Cube.at is a data cube of Sentinel-2 images ready to use. Foremost this data cube has some defined spectral categories defined with the Satellite Image Automatic Mapper (SIAM) facilitating the query and analysis process.

The three Areas Of Interest (AOI) chosen are, Seewalchen am Attersee, Millstätter See in Austria and Yarseli Bajaji In turkey near to the border with Syria.

Methodology

Using the platform sen2cube it will be created and inference to analyse specific parts of the spectrum, on the following lines it is explained the steps to generate it Figure 1.

1. First of all, we select and Area of interest.
2. Date selection.
3. Inference selection or design of inference.
4. Make sure that you are applying the inference to the correct dataset.
5. Start the inference.

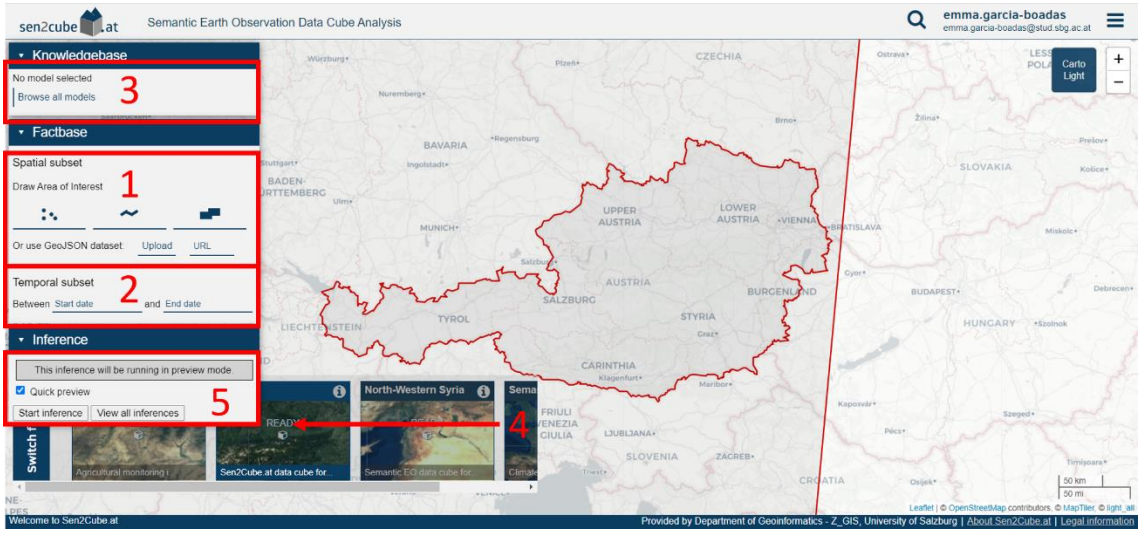

Figure 1: Main panel, steps to follow to execute one inference.

This concrete procedure on the third step (3- Inference selection or design of inference) designs a new inference. For the design of the inference first of all we click on create a new model in a bouton with a + sign, it will appear a panel with the model editor ready to customize your algorithm Figure 2.

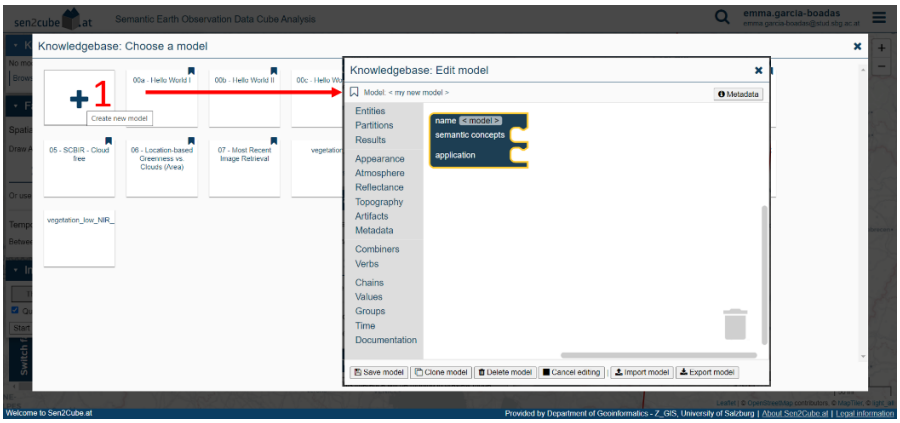

Figure 2: Steps to create the model inference from scratch.

For the Model Vegetation_ high_NIR_mask_water design it has been defined the spectral category for two entities the first entity is vegetation (Strong vegetation with high Near Infra Read (NIR) and Average vegetation with high NIR) and the second is water (Deep water or shadow, Sallow water or shadow, Turbid water or shadow and Salty Shallow Water) as shown in the Figure 3 and Figure 4. Foremost it has been generated another Model called Vegetation_ low_NIR_mask_water just changing the first entity vegetation for different spectral categories as Strong vegetation with low NIR and Average vegetation with low NIR.

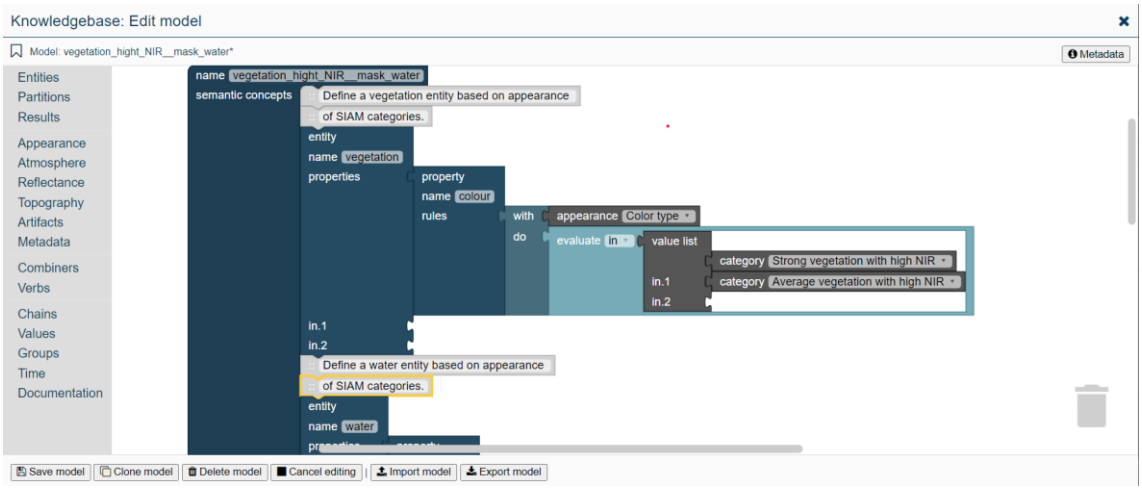

Figure 3: Definition of the first entity vegetation high NIR.

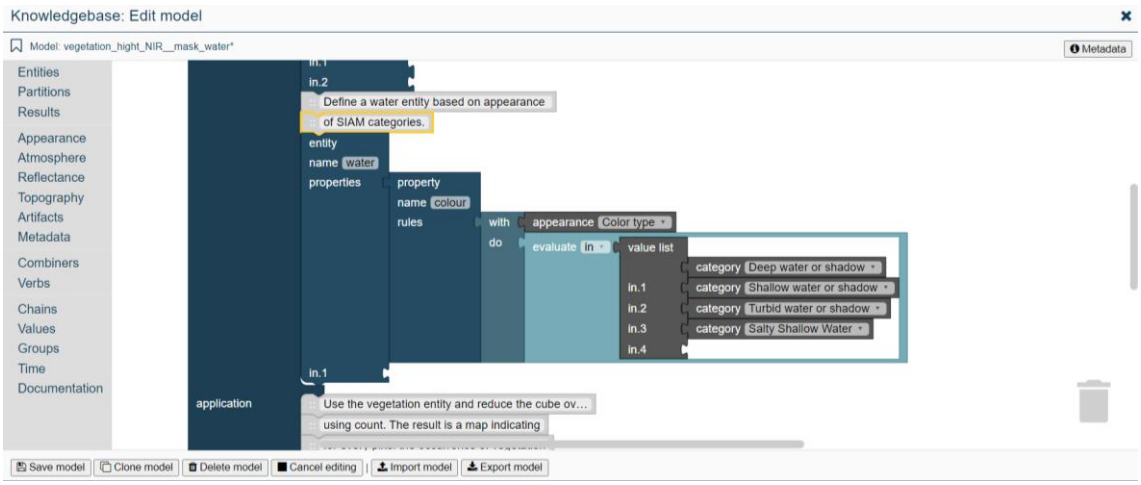

Figure 4: Definition of the second entity Water.

These two categories will be combined to create a visualization of all the vegetation high NIR reflectance during a certain period of time with a water mask *Figure 5*. To crate the final map result, we reduce the images over time and count all of the images spectral properties. After, is mask the water with a scalar threshold. Finally the model is safe and ready to start the inference.

Figure 5: Definition of the result with the water mask.

Result

The dates selected for the inference are from 01/04/2018 to 30/06/2018 on the three AOI.

First AOI Seewalchen am Attersee, Austria

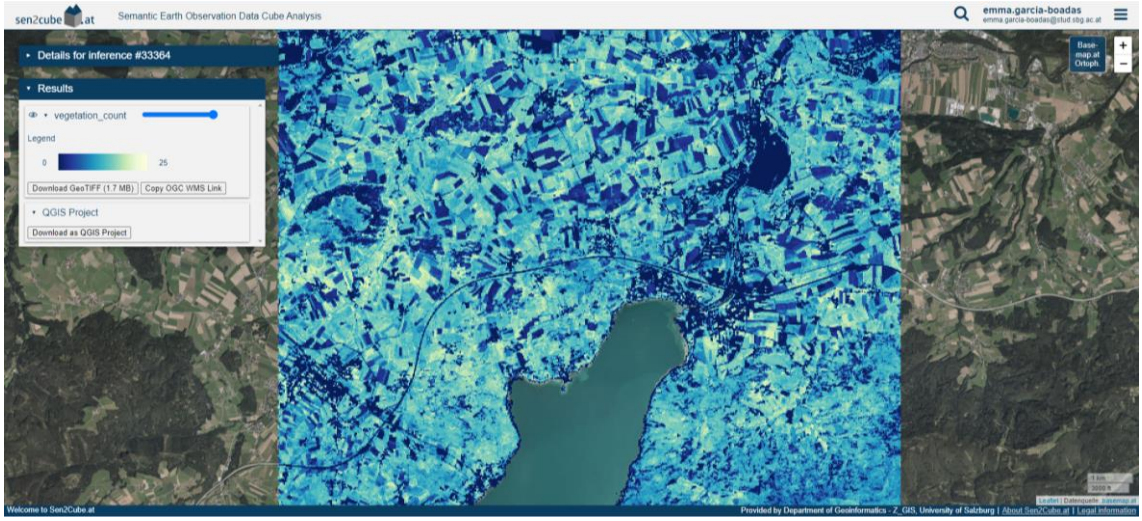

Figure 6: AOI Seewalchen am Attersee, vegetation high NIR and water mask inference.

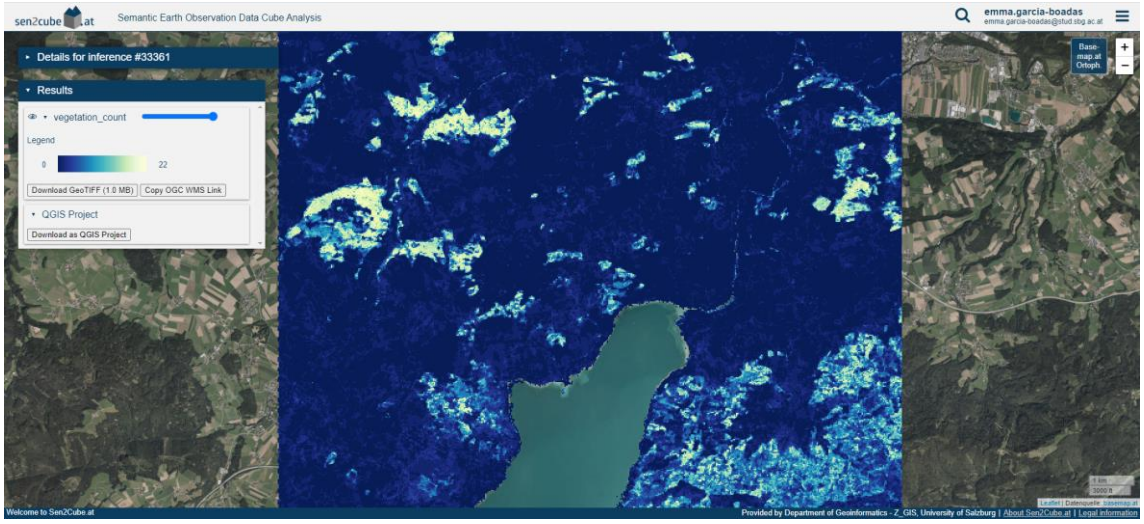

Figure 7: AOI Seewalchen am Attersee, vegetation low NIR water mask inference.

Second AOI Millstätter See, Austria

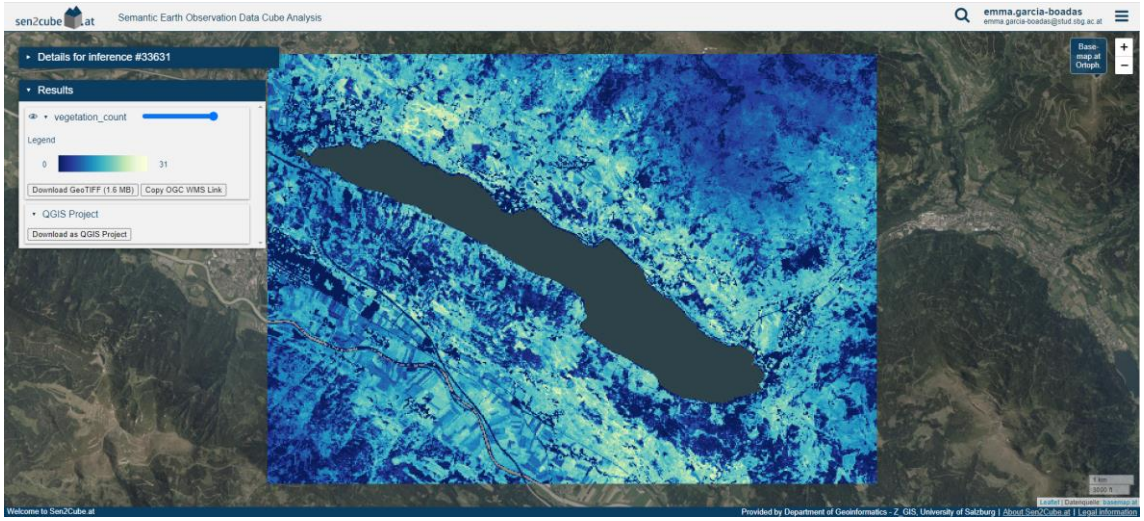

Figure 8: AOI Millstätter See, vegetation high NIR and water mask inference.

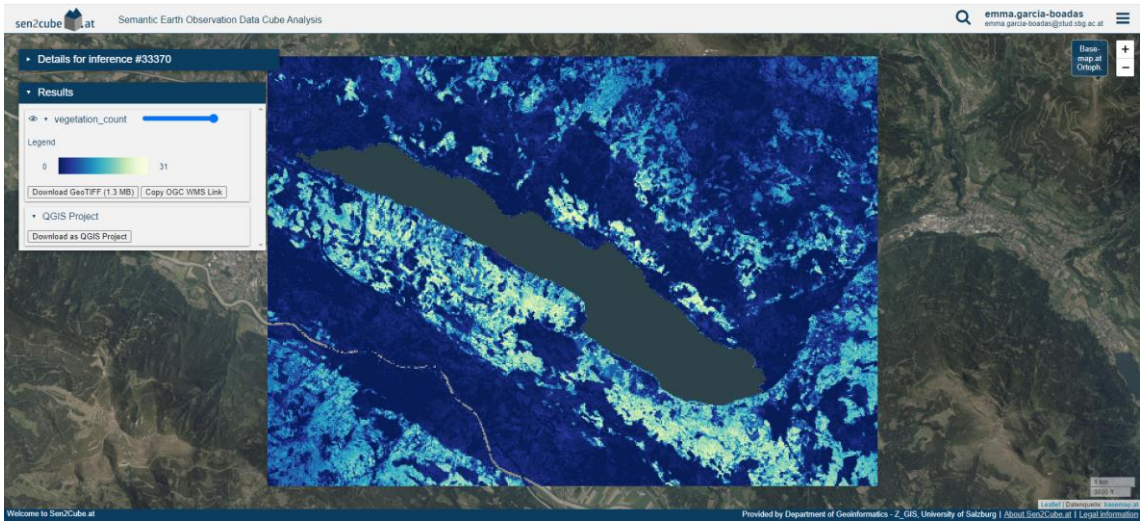

Figure 9: AOI Millstätter See, vegetation low NIR water mask inference.

Third AOI Yarseli Bajaji, Syria data

Figure 10: AOI Yarseli Bajaji, vegetation low NIR water mask inference.

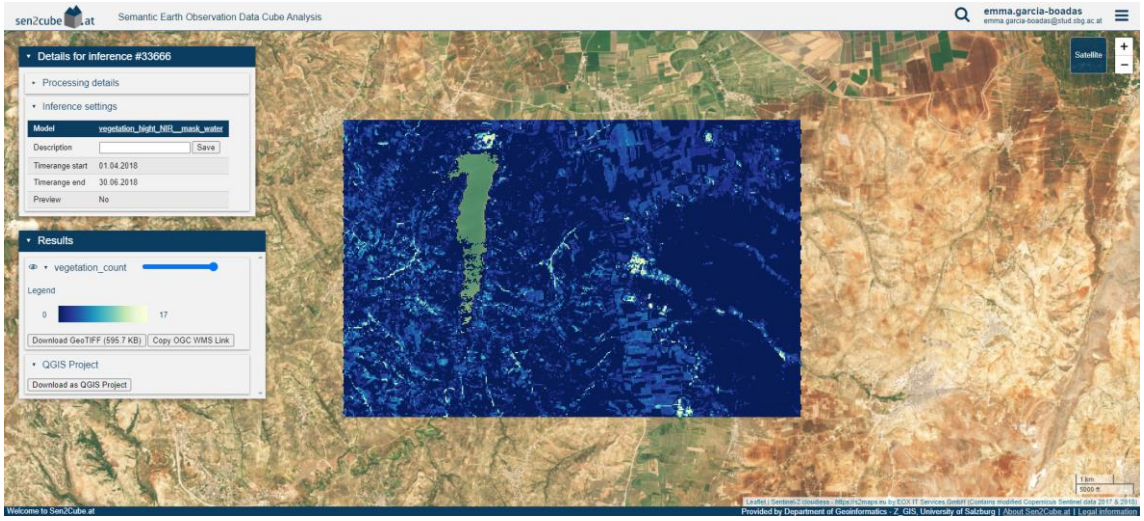

Figure 11: AOI Yarseli Bajaji, vegetation hight NIR water mask inference.

Discussion

The results obtained in the data cube from Austria have consistency through the different areas. The algorithm is capable to mask the water for the different areas. On the other hand, the same algorithm in the data cube of Syria is not masking properly the water Figure 12. The spectral characteristics from the water in Austria and the water in Syria are different. We could adjust the algorithm parameters of filtering for the Syria data cube but they would not feet well for the Austrian data cube.

To sum up we can say that the data cube is a great tool to analyse and do more user friendly models.

Figure 12: Water mask in Syria data cube, AOI Yarseli Bajaji.