NEXTGEOSS

European Data Hub and Platform

NextGEOSS Biodiversity Pilot 6.2.1:

Generating Remote Sensing- enabled Essential Biodiversity Variables using high-resolution data

What are EBVs?

Essential Biodiversity Variables (EBVs) have been proposed by GEO BON as a layer between biodiversity observation and biodiversity indicators used in the policy formulation. However, the biodiversity community still lacks a global observing system that revolves around the monitoring of a set of agreed variables essential to the tracking of changes in biological diversity on Earth. Therefore, there is an urgent need for remote sensing for EBVs to fill the spatial and temporal gaps between in situ observation data of biodiversity.

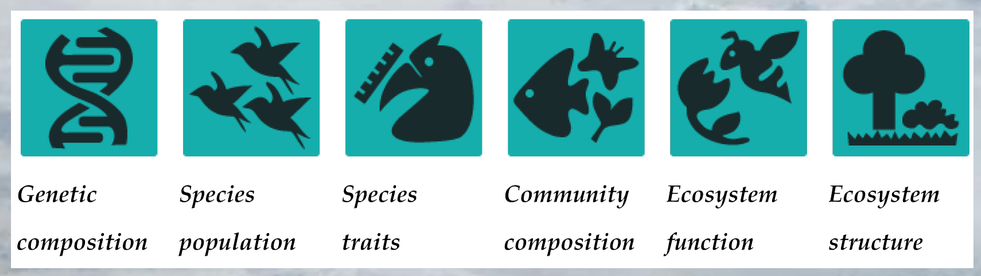

Fig. 1. Essential biodiversity variables classes which suggested by GEO BON community.

In NextGEOSS Biodiversity Pilot WP 6.2.1, we focus on:

Generating RS-enabled EBVs using high-resolution satellite data (Sentinel-2). From the RS-enabled EBVs, which were initially proposed to be derived from high-resolution satellite data, leaf area index (LAI) was selected as one of the most important vegetation biophysical parameters as well as the EBVs.

The Terradue cloud platform was used for the implementation of the data processing algorithm, and the product was deposited at ITC server (Faculty of Geo-Information Science and Earth Observation, University of Twente, the Netherlands). The product is available in Geo TIFF format and will be removed from the server after 48h.

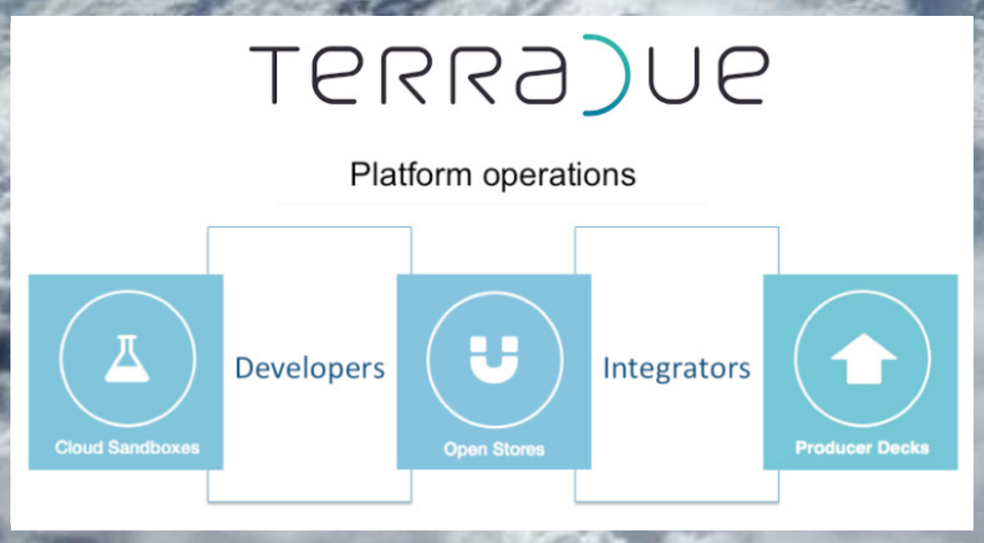

Fig. 2. The cornerstone of Terradue's cloud platform operations (Caumont et al. 2014)

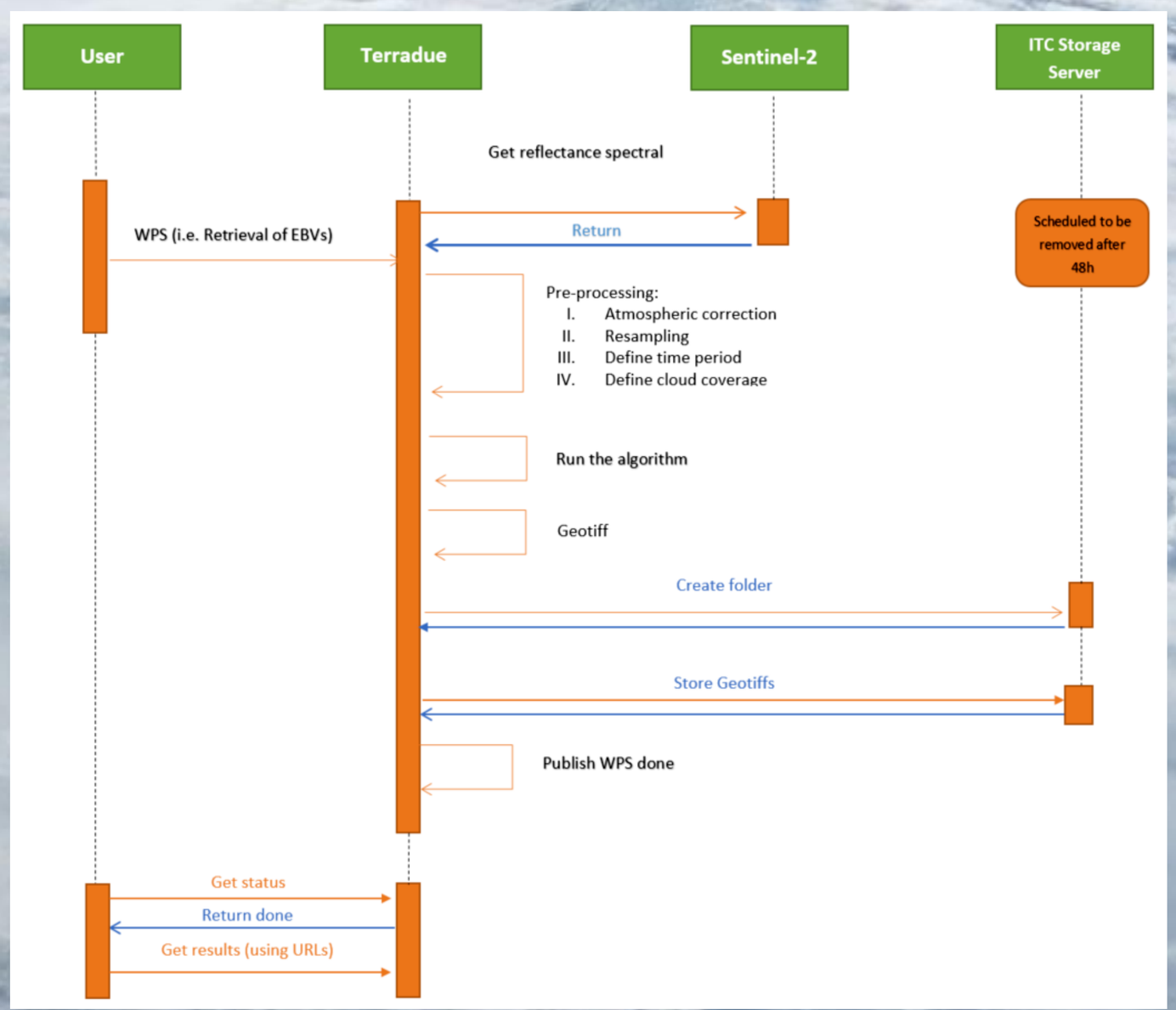

Fig. 3. The integration process for data processing for the prediction of the RS-enabled EBVs LAI over the Netherlands on Terradue cloud platform.

Sentinel-2 data (Level-2A product) was used and further LAI was retrieved using the relationship between LAI and Enhanced Vegetation Index established by Boegh et al. (2002).

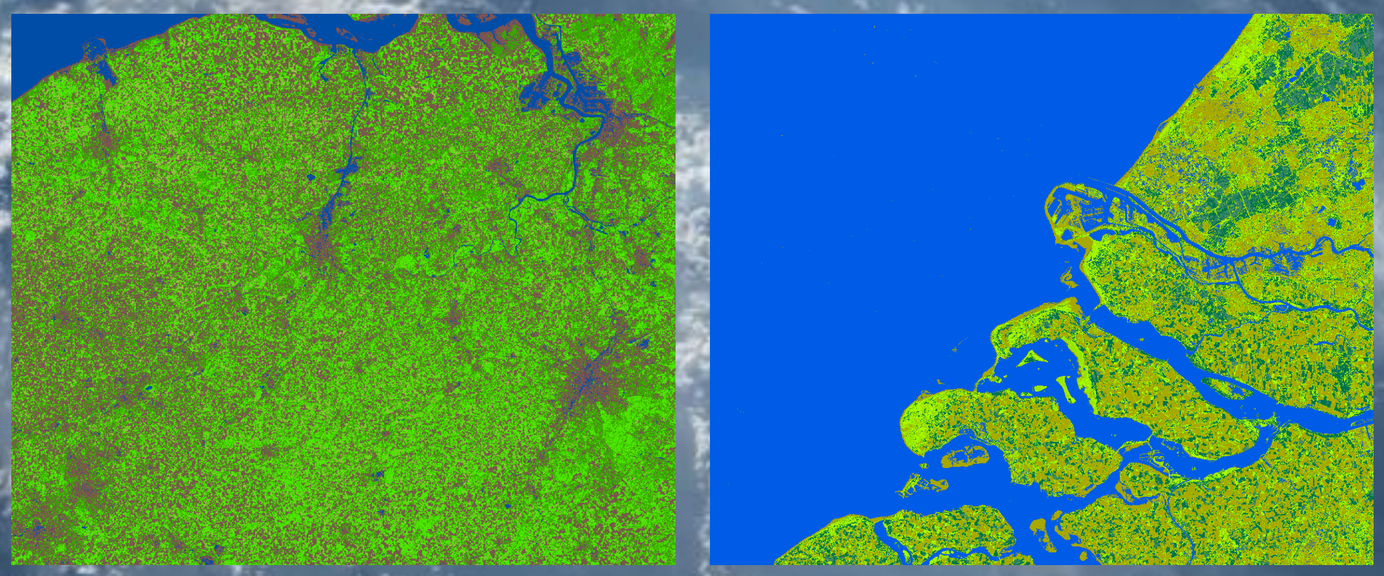

Fig. 4. Leaf area index predicted over the Netherlands using Sentinel-2 data, on 6th May 2018 in NextGEOSS biodiversity pilot.

The potential use of the NextGEOSS Biodiversity pilot to generate EBVs for GEO Community

- The unique value of using EBVs community portal is that users can retrieve and compute the critical EBVs using high-resolution remotely sensed data (Sentinel-2.)
- This service facilitates the monitoring of biodiversity and provides the first level of concept between low-level primary observation and high-level indicators of biodiversity as required for researchers, science institutions, stakeholders, and decision-makers.

References

Boegh, E., Søgaard, H., Broge, N., Hasager, C., Jensen, N., Schelde, K., & Thomsen, A. (2002). Airborne multispectral data for quantifying leaf area index, nitrogen concentration, and photosynthetic efficiency in agriculture. Remote Sensing of Environment, 81, 179-193

Caumont, H., Brito, F., & Boissier, E. (2014). Big Earth Sciences & the new 'Platform economy. In, Big Data From Space Conference, Frascati, Italy: Citeseer

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