

# Vegetation Monitoring Solutions Benchmarking (prospective Initiative) Reporting

*Project supported by ESA Network of Resources Initiative  
June 2021 / July 2022*

*Project Status: in progress*

# Summary

❖ Purpose & Objectives	3
❖ Partners	4
❖ Description of tools & achievements	5
❖ Reference entities testing	6
❖ Thematic analysis	36
❖ Business aspects	38
❖ Land Restoration Use-Case with Planet company	40
❖ European « Vegetation Pulse » Use-Case with EUMETSAT	44
❖ Irrigated Area Use-Case with Planet company	45
❖ Making-of Gallery	46

## Purpose & Objectives

The purpose is to setup and maintain a synthetic and updated benchmarking of the operational Vegetation Monitoring solutions. This prospective initiative is based on a partnership with the different major actors developing and proposing monitoring solutions. Several representative entities are tested: Annual crop fields, Forestation restoration and Littoral ecosystem. The result is a permanent reporting on the state-of-art, and the capacity to propose and implement the more relevant solution to address specific monitoring demands.

+ contribution to a Global Farmer&Field network under construction, including reference fields in various context of the world (crop, region, climate ...) as a permanent sample monitoring infrastructure, gathering some field observations (CROP, YIELD, LAIs ...) on a yearly basis, and earth-observation imagery series flow access (so far mainly Sentinel2, via SentinelHub).

### Deliverables

Synthetic & permanent reporting on the state-of-art.

Potentially a powerful material for Vegetation Conditions services benchmarking, and very useful as well for R&D activities (proof of concept ...), smart material for promotion of Copernicus services towards final users , ...).

Our initiative is matching with,

- the NoR 3rd general objective (Demonstrate pre-operational services).
- 2 of the Application and Pre-operational objectives: T1 Reinforcing collaborative research environments and Virtual Laboratories & T4 Definition and testing of innovative pre-operational and pre-commercial services.

### Schedule and success criteria

12 months process

Milestone -1 (after 6 months): all reference "Vegetation targets" entities implemented

Milestone -2 (after 12 months): Significant vegetation conditions monitoring activities achieved, analysed, reported.

# Partners



**SENTINEL** Hub  
by SINERGISE



WORLD  
RESOURCES  
INSTITUTE



**RESOURCEWATCH**



# Description of tools & achievements

## Implementation of the reference “Vegetation targets” entities

Several representative entities (polygons) have been defined and tested: (1) Annual crop fields in Europe (2) Annual crop fields in Argentina (3) Annual crop fields in Mali (4) Forest Restoration in Indonesia (5) Littoral Ecosystem in Comoros (6) Other Vegetation entities targets (depending on analytics demands, local partnership opportunities, ...).

## Vegetation conditions monitoring activities

For the 1<sup>st</sup> phase of the project ( year 1 = 2021-2022) the priority was given to the reference Monitoring platform, i.e. SentinelHub, sponsored by ESA-NoR, developed by Sinergise.

The basic analysis scenario is to use the multi-year (5 years) NDVI temporal profile – cloud-free functionality, proposed by the SentinelHub service.

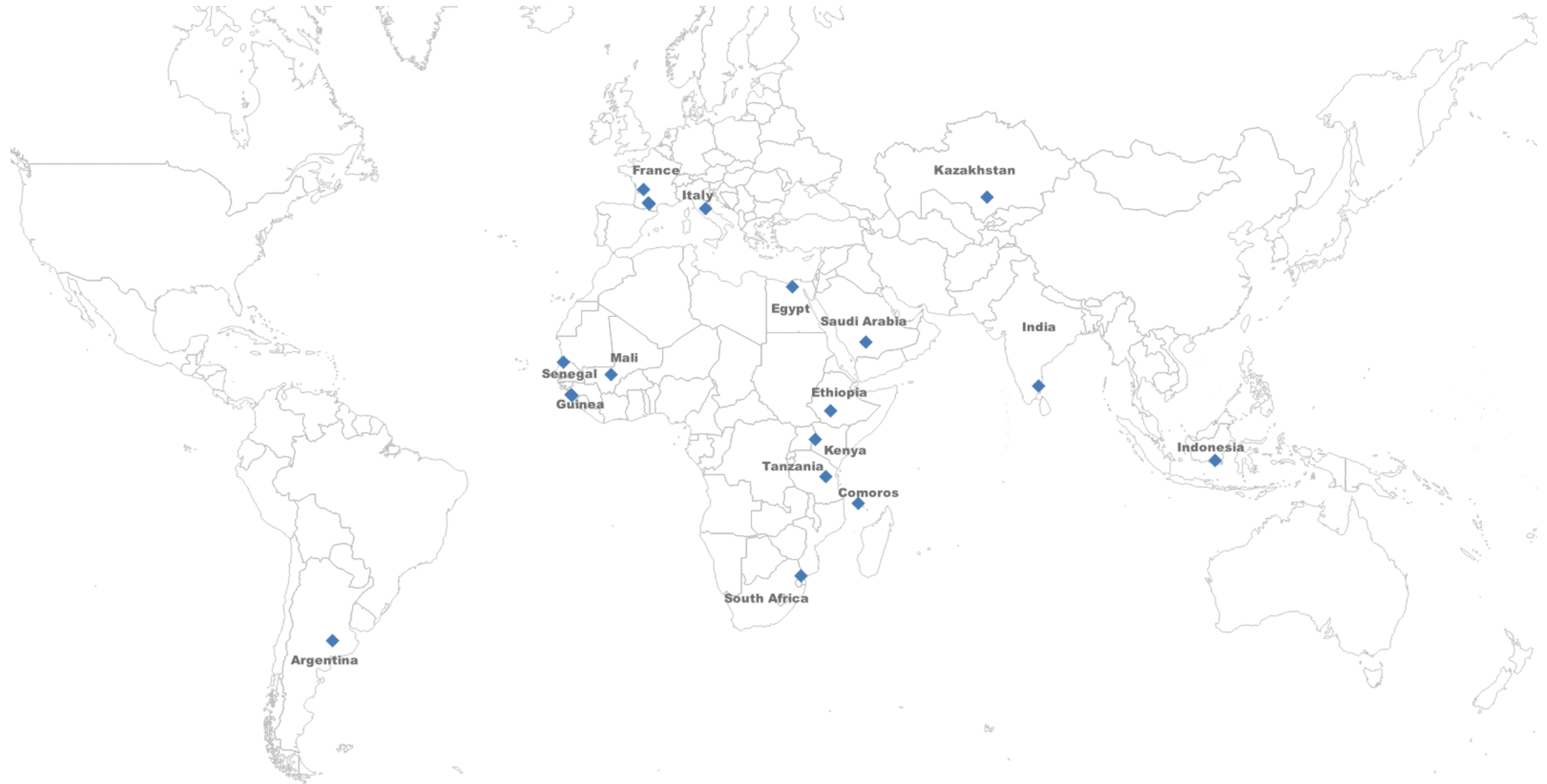
A preliminary analysis is done based on the temporal profile displayed via the service interface: annual vegetation cycles identification, level of vegetation activity/biomass (which can be related to the type of crop/land-cover ..., specific conditions ...), ...

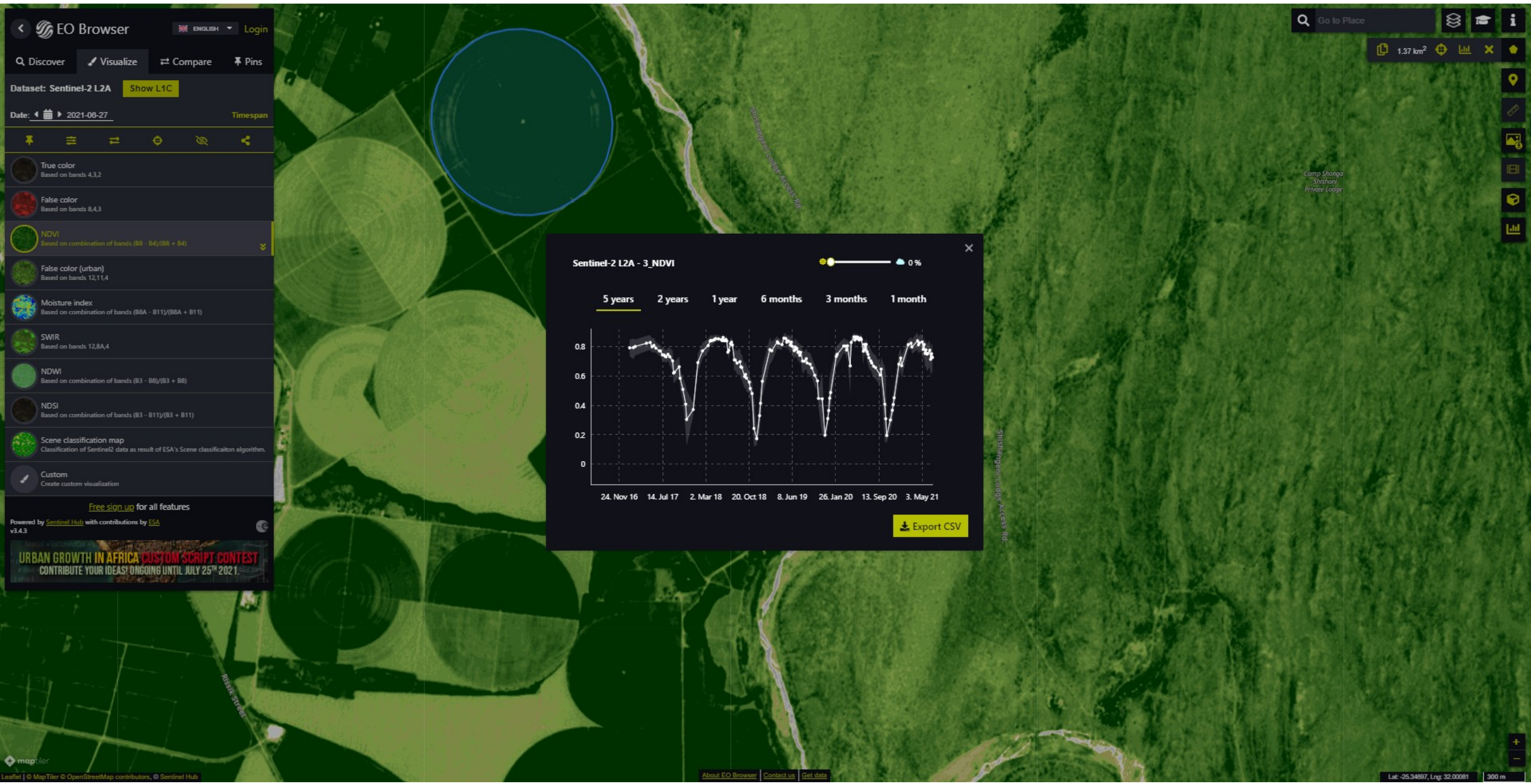
In a 2<sup>nd</sup> step, the graphic data are downloaded (.csv format). Thus these NDVI values per date can be analysed more precisely, and can be used for further analyses. We propose here a visualisation of 2 parameters via EXCEL graphic: NDVI-Mean curve and NDVI-StDev (as variability indicator), in some cases we use NDVI-Median parameter.

Beside the monitoring activities core module (SentinelHub), 3 alternative monitoring activities are mentioned: one at regional scale, “European Vegetation Pulse” experimented with EUMETSAT, two at local scale, experimented with Planet.

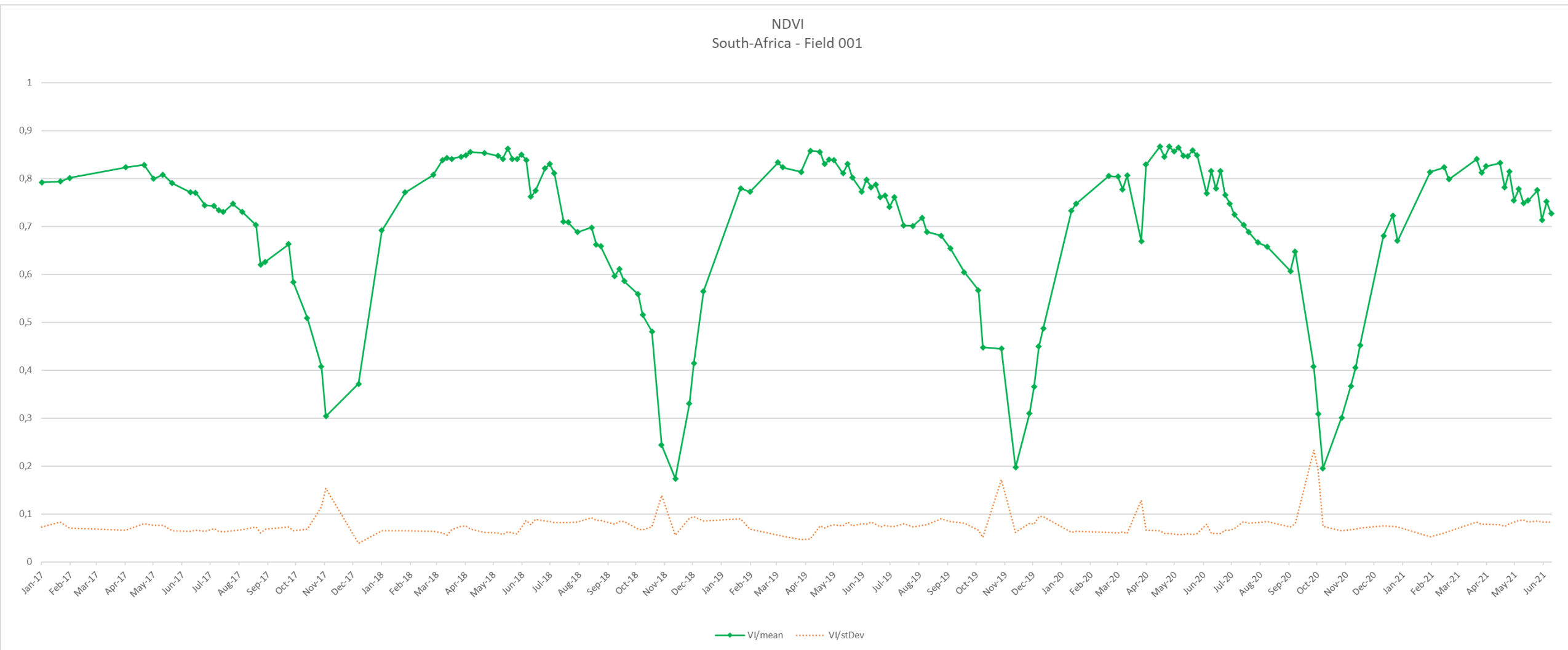
# Reference entities testing

## Overview of the reference entities – Location









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Dataset: Sentinel-2 L2A [Show L1C](#)

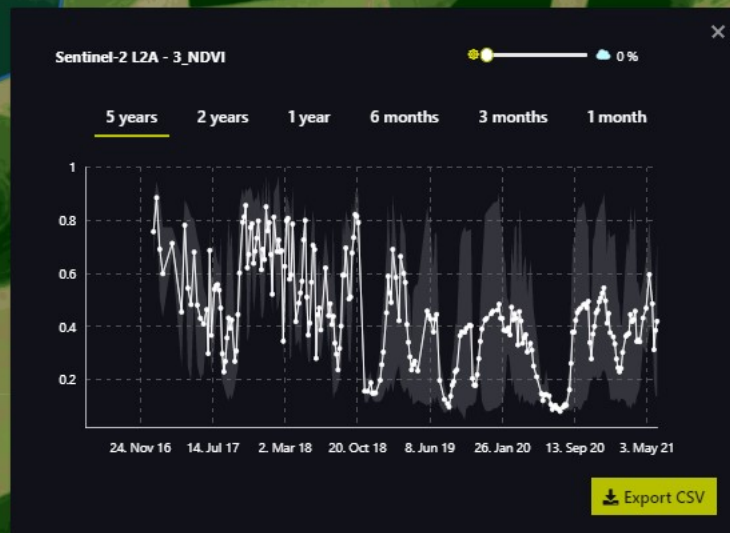
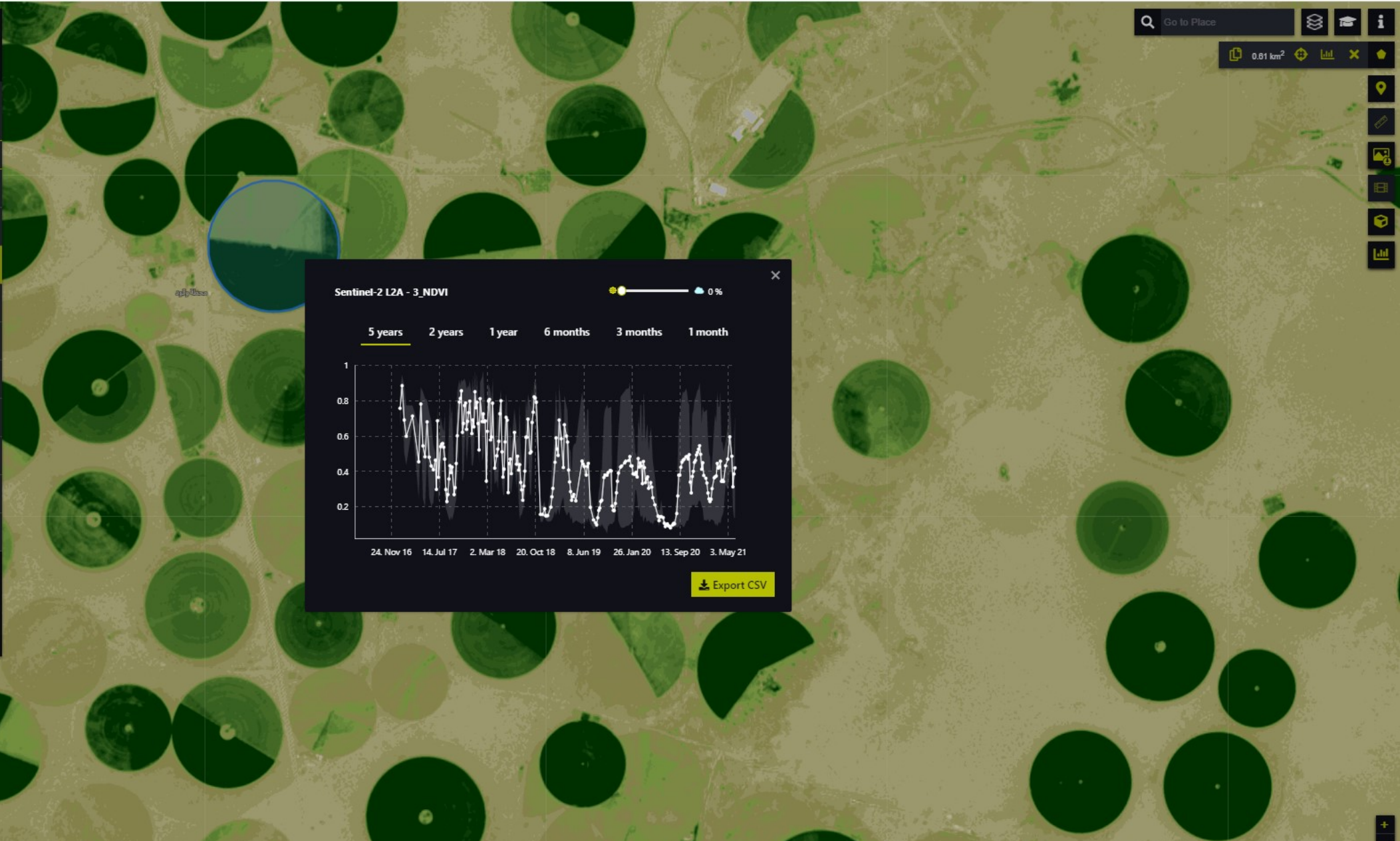
Date: 2021-06-04 Timespan

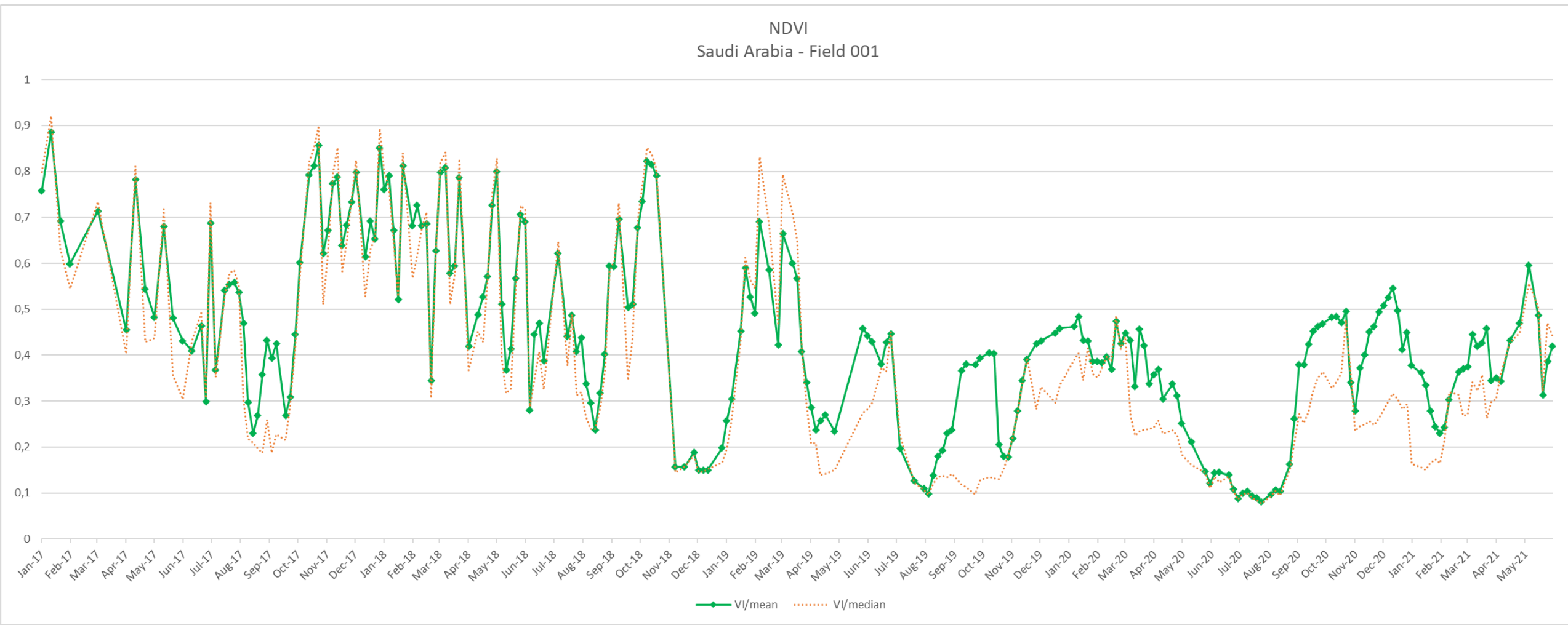
- True color  
Based on bands 4,3,2
- False color  
Based on bands 8,4,3
- NDVI**  
Based on combination of bands (B8 - B4)/(B8 + B4)
- False color (urban)  
Based on bands 12,11,4
- Moisture index  
Based on combination of bands (B6A - B11)/(B8A + B11)
- SWIR  
Based on bands 12,8A,4
- NDWI  
Based on combination of bands (B3 - B8)/(B3 + B8)
- NDSI  
Based on combination of bands (B3 - B11)/(B3 + B11)
- Scene classification map  
Classification of Sentinel2 data as result of ESA's Scene classification algorithm.
- Custom  
Create custom visualization

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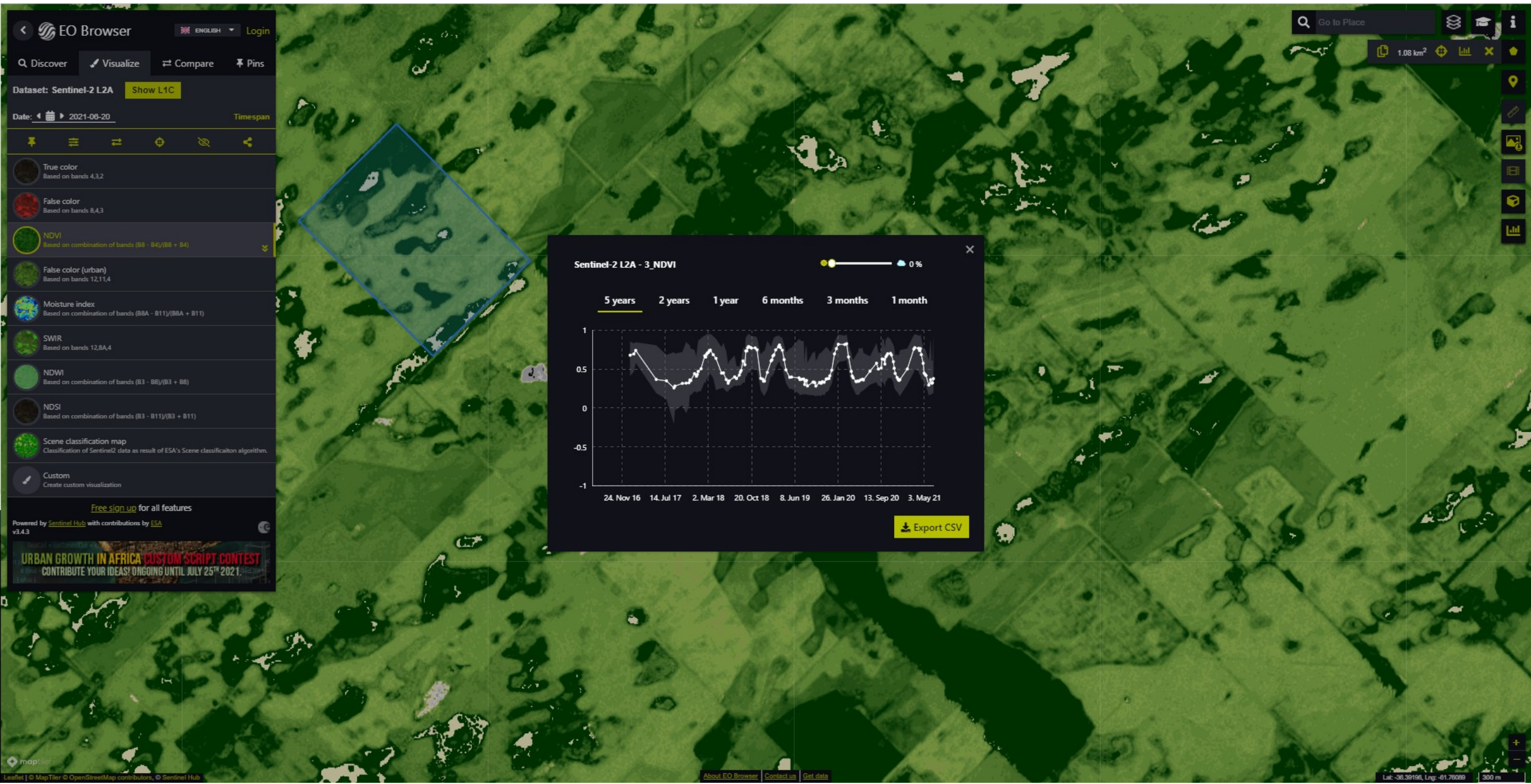
Powered by [Sentinel Hub](#) with contributions by [ESA](#)  
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Dataset: Sentinel-2 L1C Show L2A

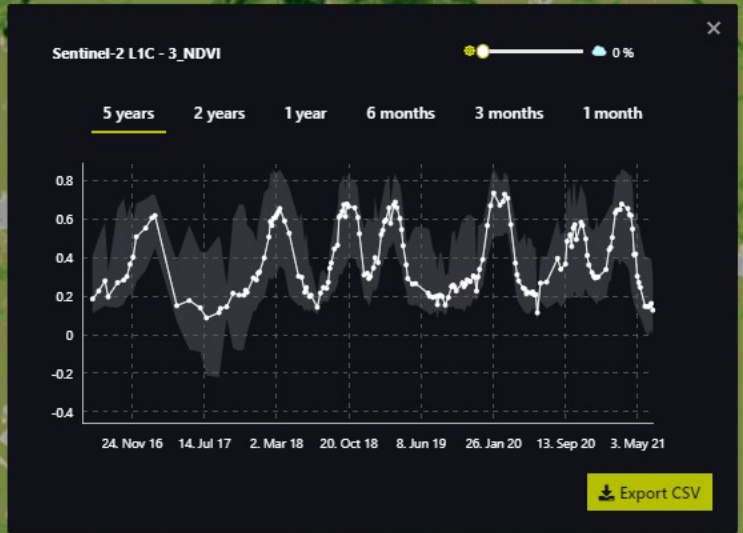
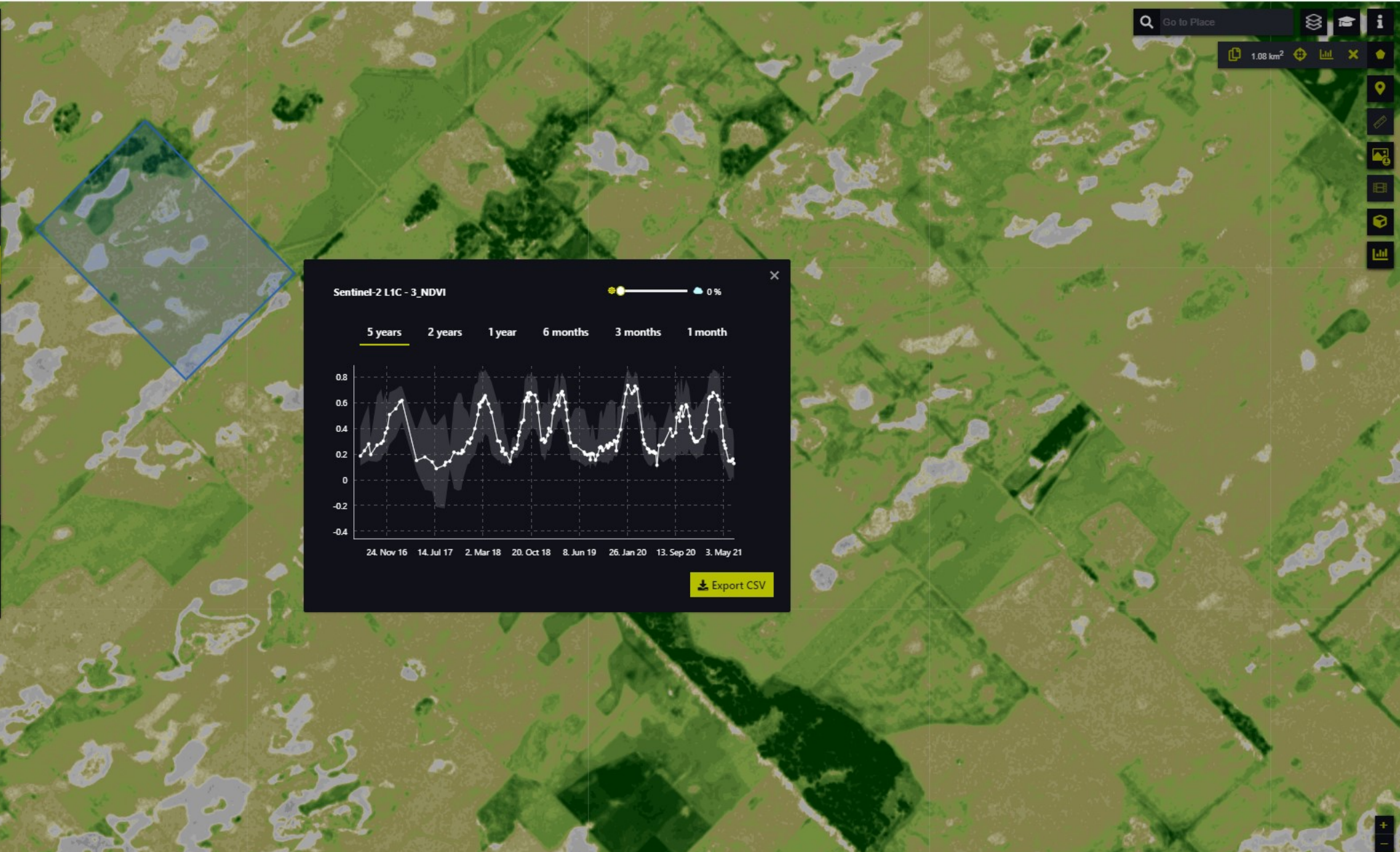
Date: 2021-06-20 Timespan

- True color Based on bands 4,3,2
- False color Based on bands 8,4,3
- NDVI Based on combination of bands (B8 - B4)/(B8 + B4)
- False color (urban) Based on bands 12,11,4
- Moisture index Based on combination of bands (B8A - B11)/(B8A + B11)
- SWIR Based on bands 12,8A,4
- NDWI Based on combination of bands (B3 - B6)/(B3 + B6)
- NDSI Based on combination of bands (B3 - B11)/(B3 + B11); values above 0.42 are regarded as snowy
- Custom Create custom visualization

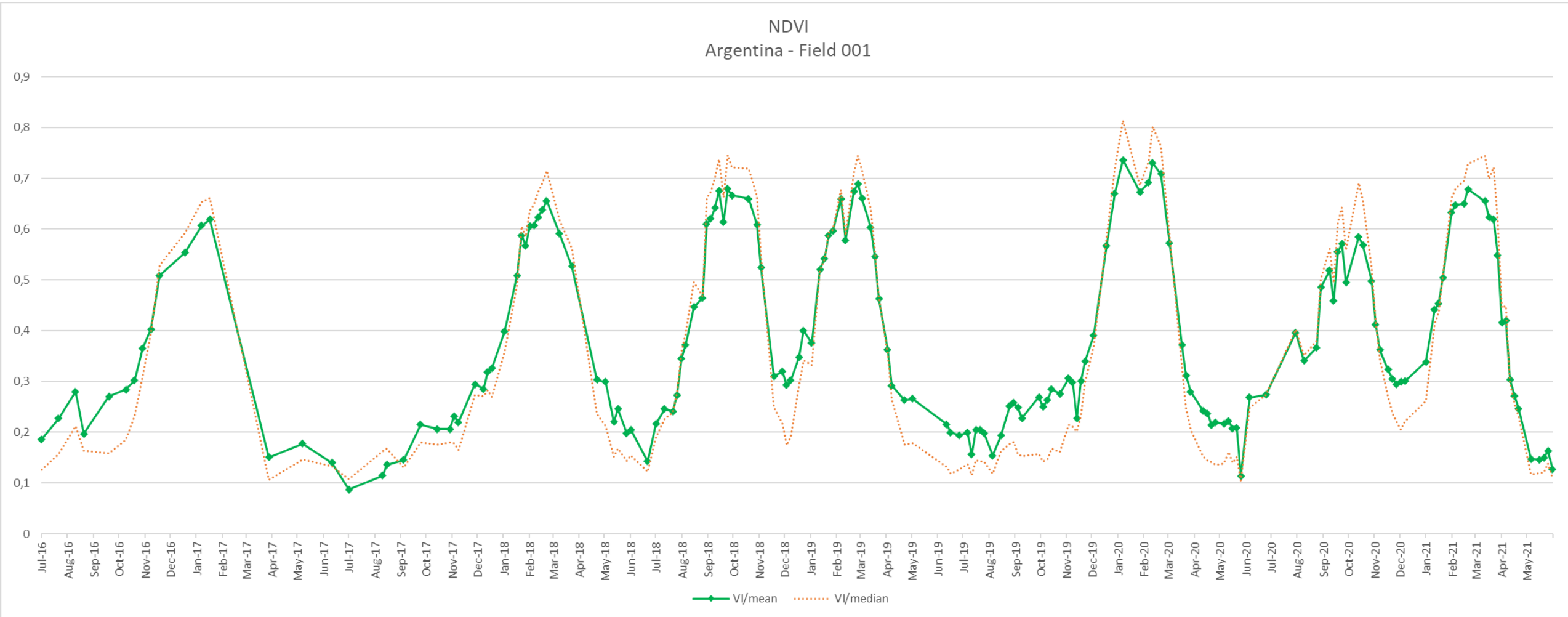
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Dataset: Sentinel-2 L1C [Show L2A](#)

Date: 2021-08-09 Timespan

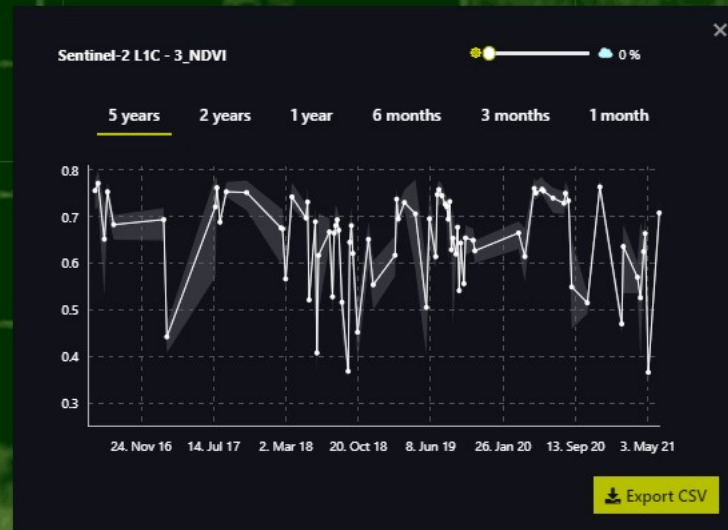
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Based on bands 4,3,2
- False color  
Based on bands 8,4,3
- NDVI**  
Based on combination of bands (B8 - B4)/(B8 + B4)
- False color (urban)  
Based on bands 12,11,4
- Moisture index  
Based on combination of bands (B6A - B11)/(B6A + B11)
- SWIR  
Based on bands 12,8A,4
- NDWI  
Based on combination of bands (B3 - B8)/(B3 + B8)
- NDSI  
Based on combination of bands (B3 - B11)/(B3 + B11); values above 0.42 are regarded as snowy
- Custom  
Create custom visualization

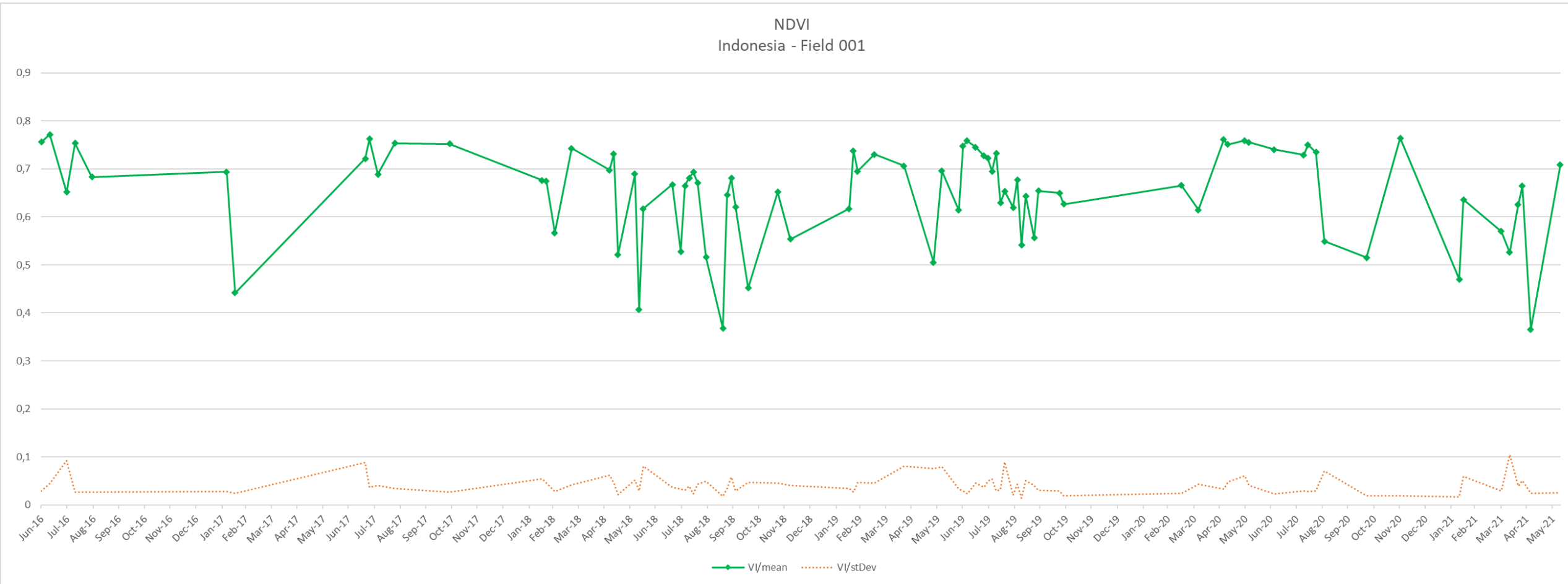
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Dataset: Sentinel-2 L2A Show L1C

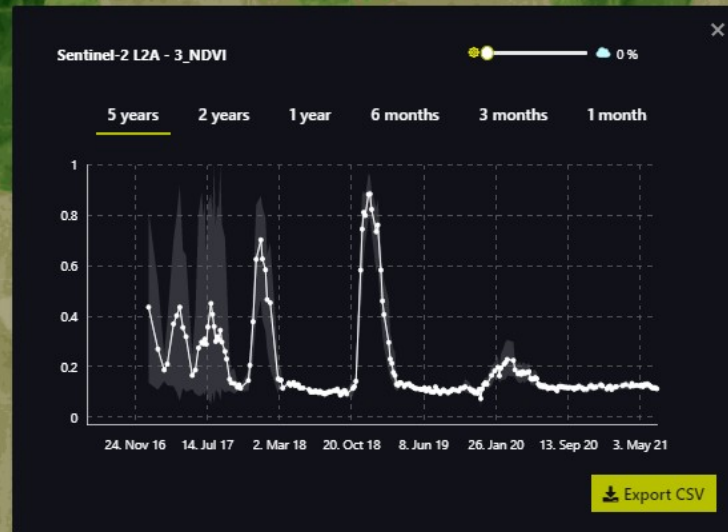
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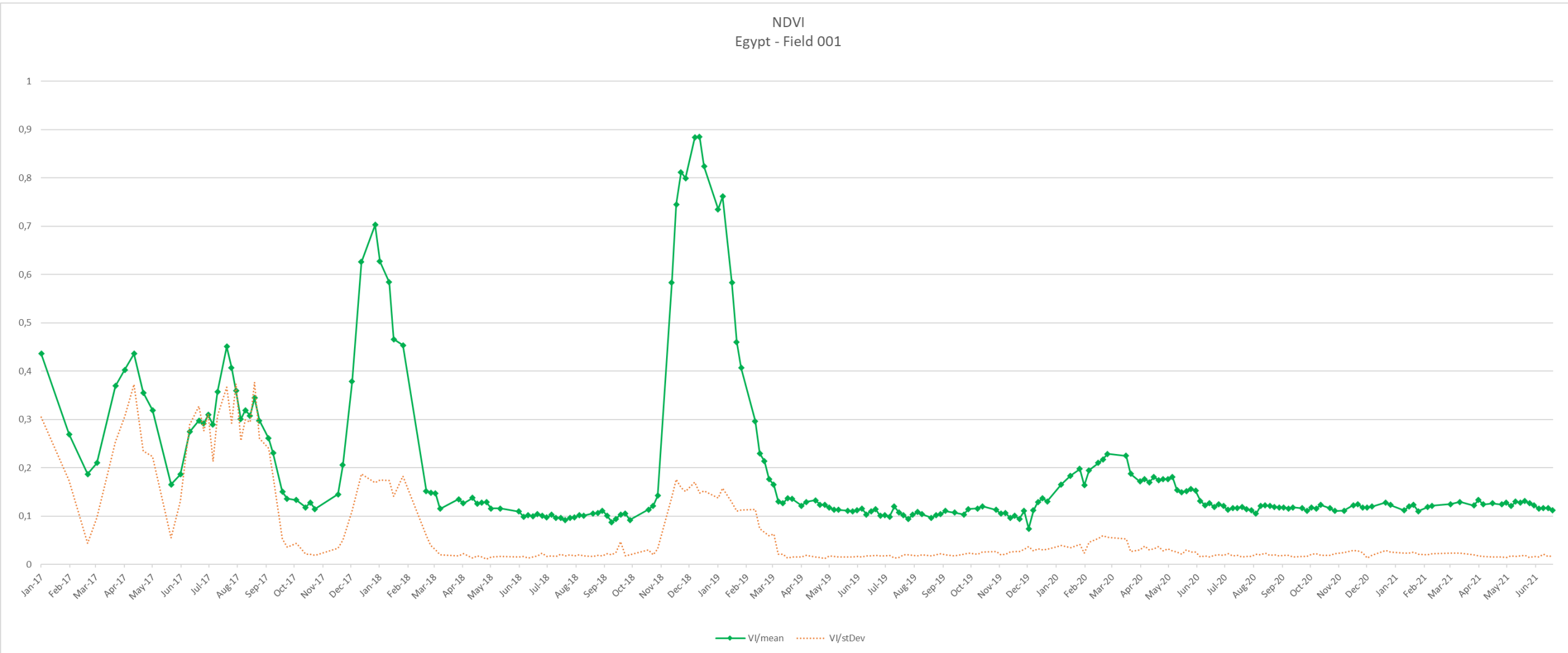
- True color Based on bands 4,3,2
- False color Based on bands 8,4,3
- NDVI Based on combination of bands (B8 - B4)/(B8 + B4)
- False color (urban) Based on bands 12,11,4
- Moisture index Based on combination of bands (B8A - B11)/(B8A + B11)
- SWIR Based on bands 12,8A,4
- NDWI Based on combination of bands (B3 - B8)/(B3 + B8)
- NDSI Based on combination of bands (B3 - B11)/(B3 + B11)
- Scene classification map Classification of Sentinel2 data as result of ESA's Scene classification algorithm.
- Custom Create custom visualization

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Dataset: Sentinel-2 L2A **Show L1C**

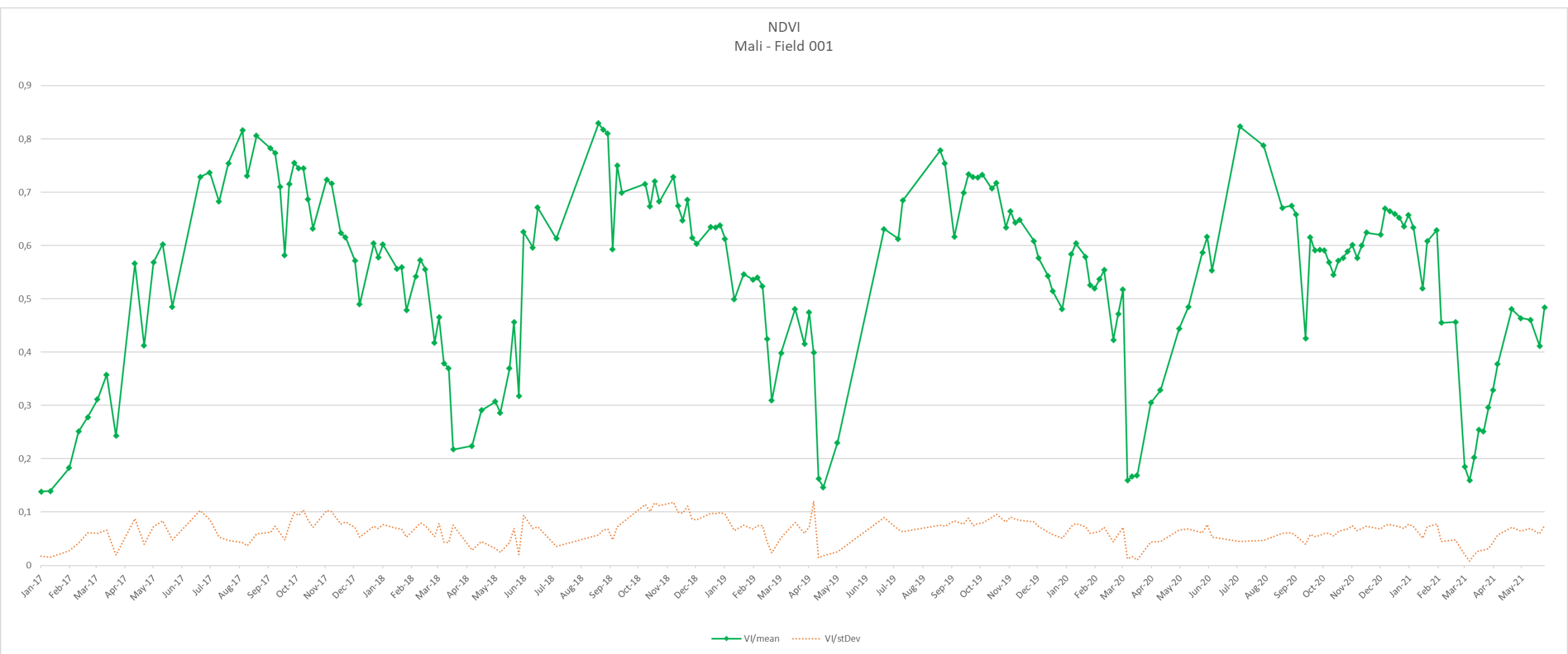
Date: 2021-06-19 Timespan

- True color (Based on bands 4,3,2)
- False color (Based on bands 8,4,3)
- NDVI (Based on combination of bands (B8 - B4)/(B8 + B4))**
- False color (urban) (Based on bands 12,11,4)
- Moisture index (Based on combination of bands (B8A - B11)/(B8A + B11))
- SWIR (Based on bands 12,8A,4)
- NDWI (Based on combination of bands (B3 - B6)/(B3 + B6))
- NDSI (Based on combination of bands (B3 - B11)/(B3 + B11))
- Scene classification map (Classification of Sentinel2 data as result of ESA's Scene classification algorithm.)
- Custom (Create custom visualization)

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Dataset: Sentinel-2 L2A **Show L1C**

Date: **2021-08-25** Timespan

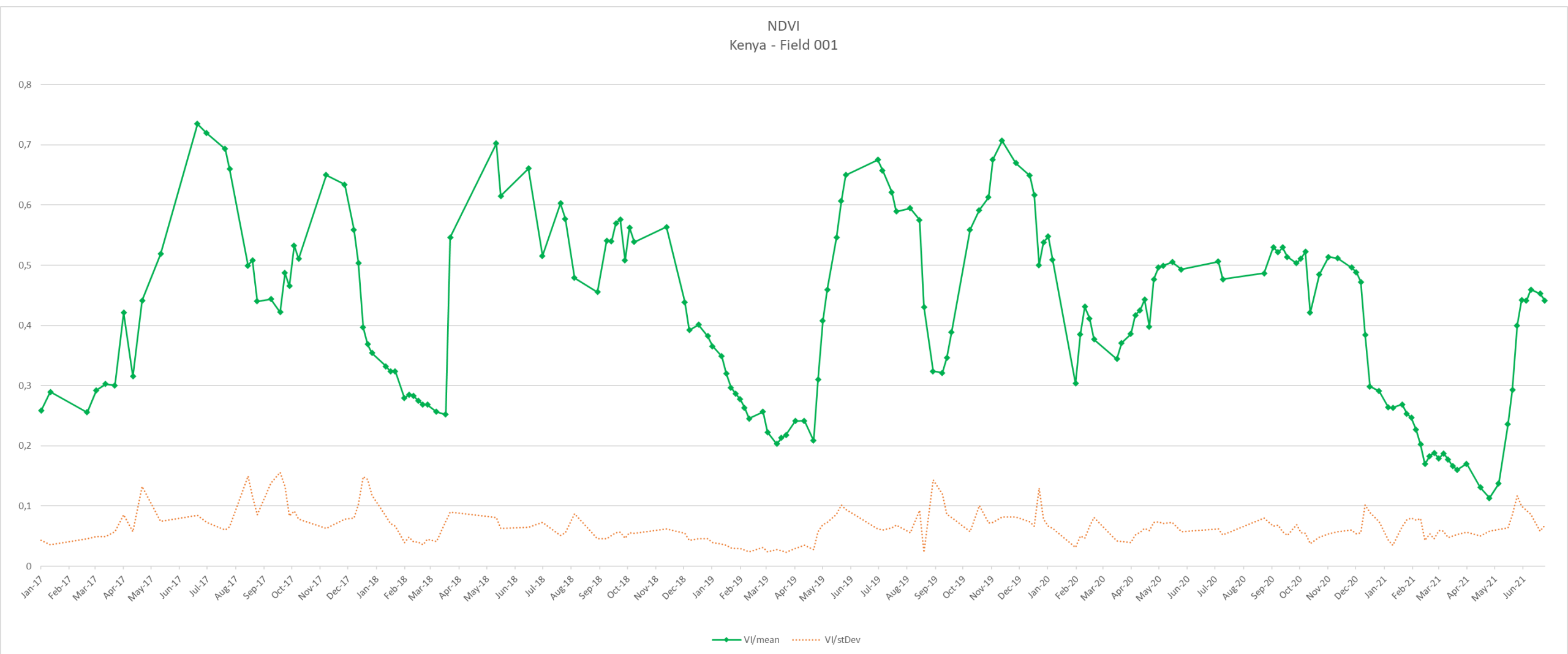
- True color  
Based on bands 4,3,2
- False color  
Based on bands 8,4,3
- NDVI**  
Based on combination of bands (B8 - B4)/(B8 + B4)
- False color (urban)  
Based on bands 12,11,4
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- SWIR  
Based on bands 12,8A,4
- NDWI  
Based on combination of bands (B3 - B6)/(B3 + B6)
- NDSI  
Based on combination of bands (B3 - B11)/(B3 + B11)
- Scene classification map  
Classification of Sentinel2 data as result of ESA's Scene classification algorithm.
- Custom  
Create custom visualization

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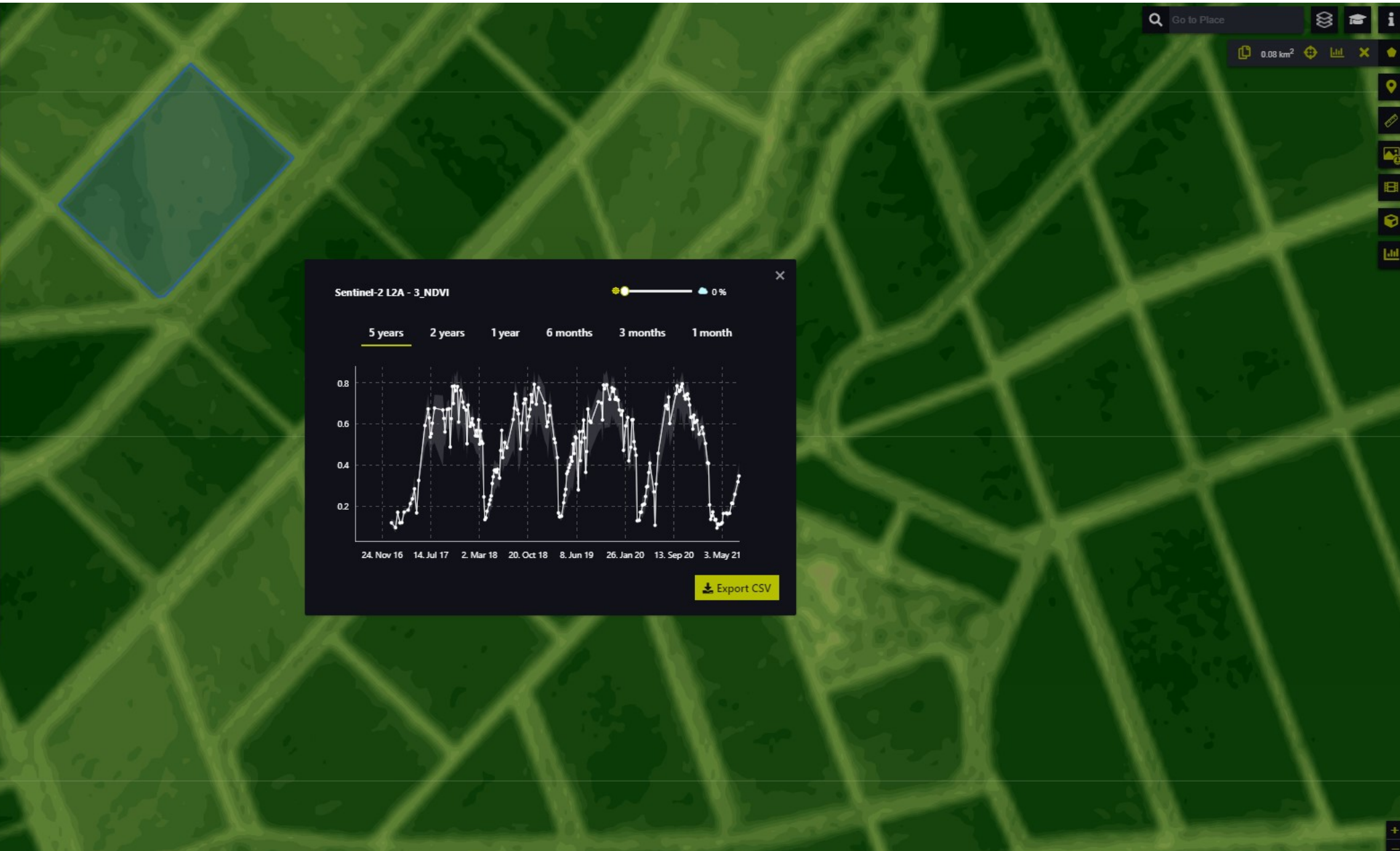
Dataset: Sentinel-2 L2A **Show L1C**

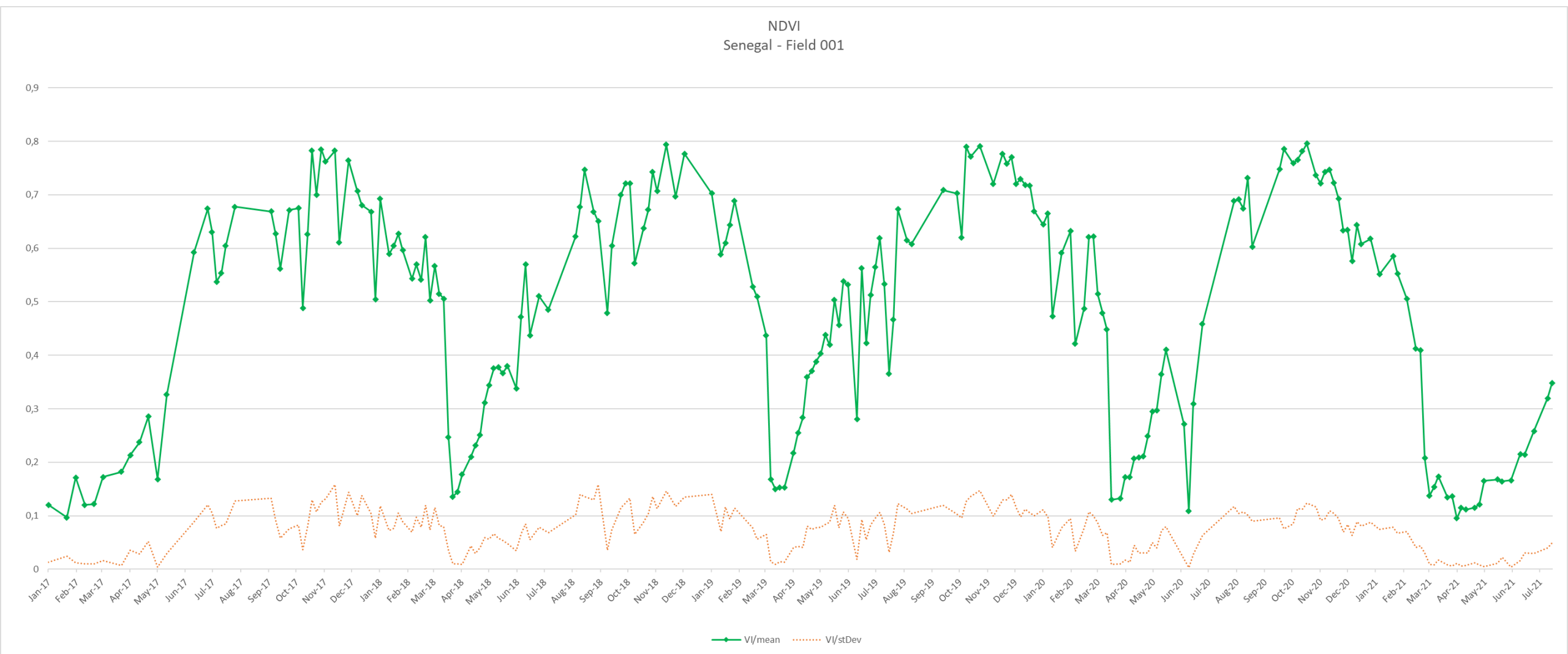
Date: 2021-07-21 Timespan

- True color  
Based on bands 4,3,2
- False color  
Based on bands 8,4,3
- NDVI**  
Based on combination of bands (B8 - B4)/(B8 + B4)
- False color (urban)  
Based on bands 12,11,4
- Moisture index  
Based on combination of bands (B8A - B11)/(B8A + B11)
- SWIR  
Based on bands 12,8A,4
- NDWI  
Based on combination of bands (B3 - B6)/(B3 + B6)
- NDSI  
Based on combination of bands (B3 - B11)/(B3 + B11)
- Scene classification map  
Classification of Sentinel2 data as result of ESA's Scene classification algorithm.
- Custom  
Create custom visualization

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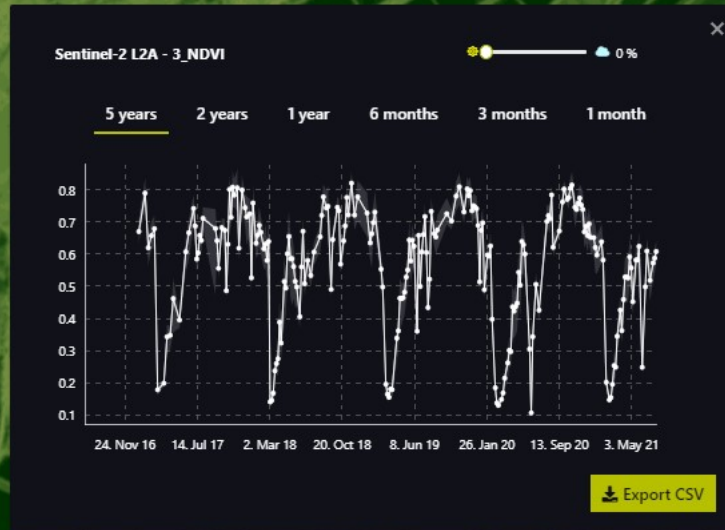
Dataset: Sentinel-2 L2A [Show L1C](#)

Date: 2021-07-21 Timespan

- True color  
Based on bands 4,3,2
- False color  
Based on bands 8,4,3
- NDVI**  
Based on combination of bands (B8 - B4)/(B8 + B4)
- False color (urban)  
Based on bands 12,11,4
- Moisture index  
Based on combination of bands (B8A - B11)/(B8A + B11)
- SWIR  
Based on bands 12,8A,4
- NDWI  
Based on combination of bands (B3 - B8)/(B3 + B8)
- NDSI  
Based on combination of bands (B3 - B11)/(B3 + B11)
- Scene classification map  
Classification of Sentinel2 data as result of ESA's Scene classification algorithm.
- Custom  
Create custom visualization

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Dataset: Sentinel-2 L2A **Show L1C**

Date: 2021-11-28 Timespan

- True color  
Based on bands 4,3,2
- False color  
Based on bands 8,4,3
- NDVI**  
Based on combination of bands (B8 - B4)/(B8 + B4)
- False color (urban)  
Based on bands 12,1,4
- Moisture index  
Based on combination of bands (B8A - B11)/(B8A + B11)
- SWIR  
Based on bands 12,BA,4
- NDWI  
Based on combination of bands (B3 - B6)/(B3 + B6)
- NDSI  
Based on combination of bands (B3 - B11)/(B3 + B11)
- Scene classification map  
Classification of Sentinel2 data as result of ESA's Scene classification algorithm.
- Custom  
Create custom visualization

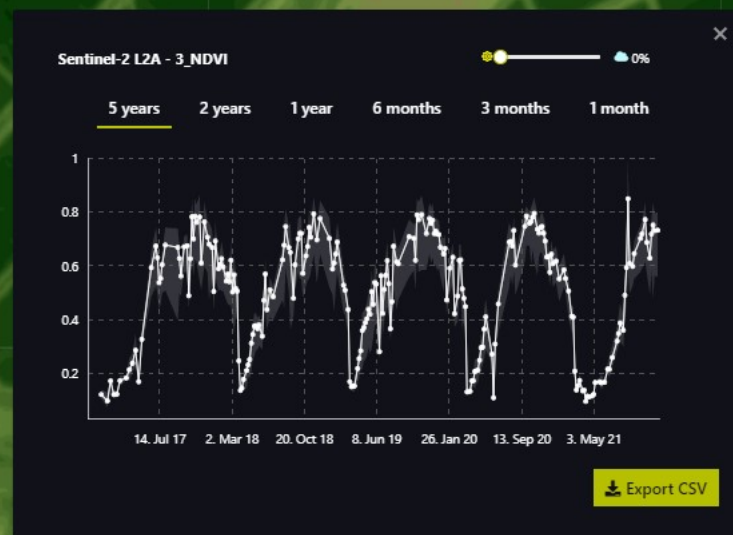
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Go to Place

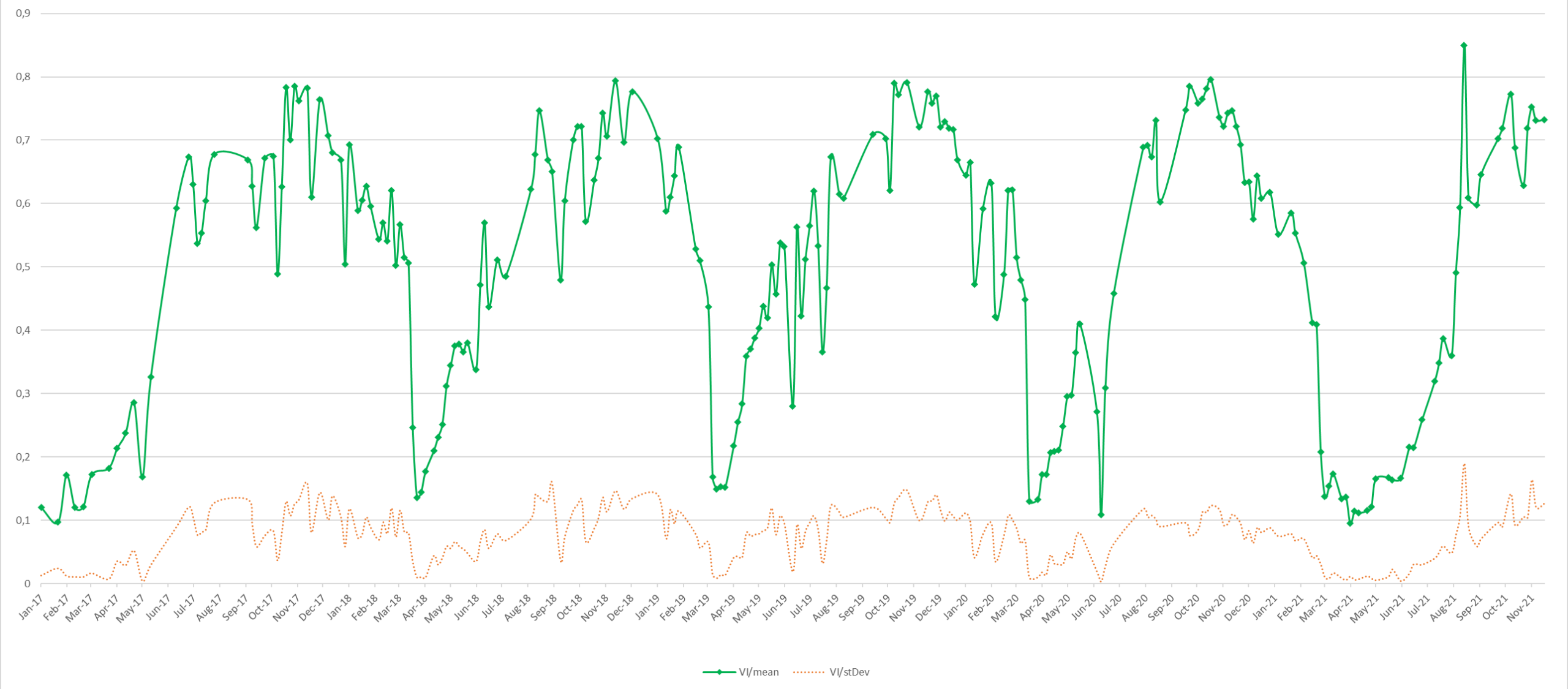
0.08 km<sup>2</sup>

0%

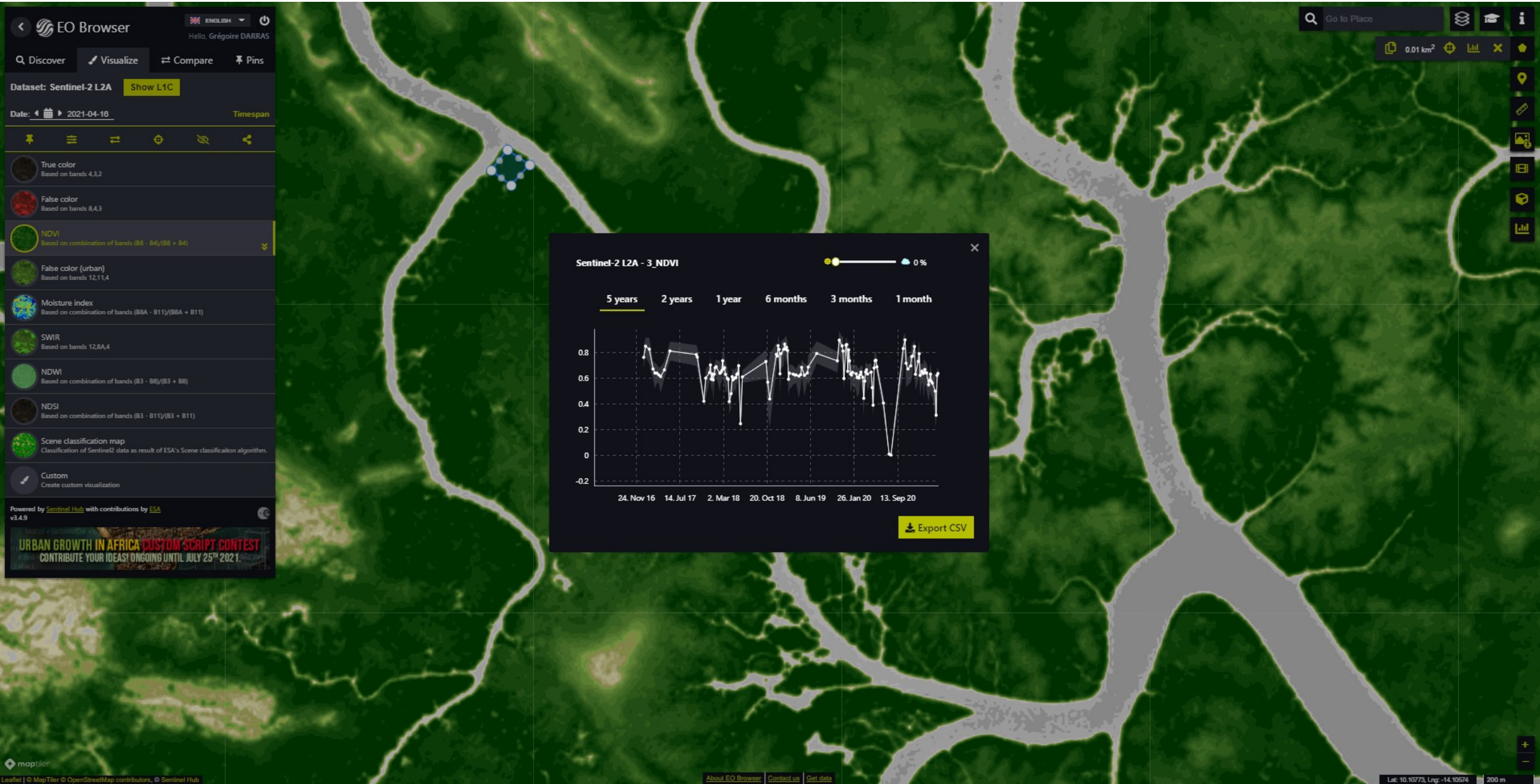
3D



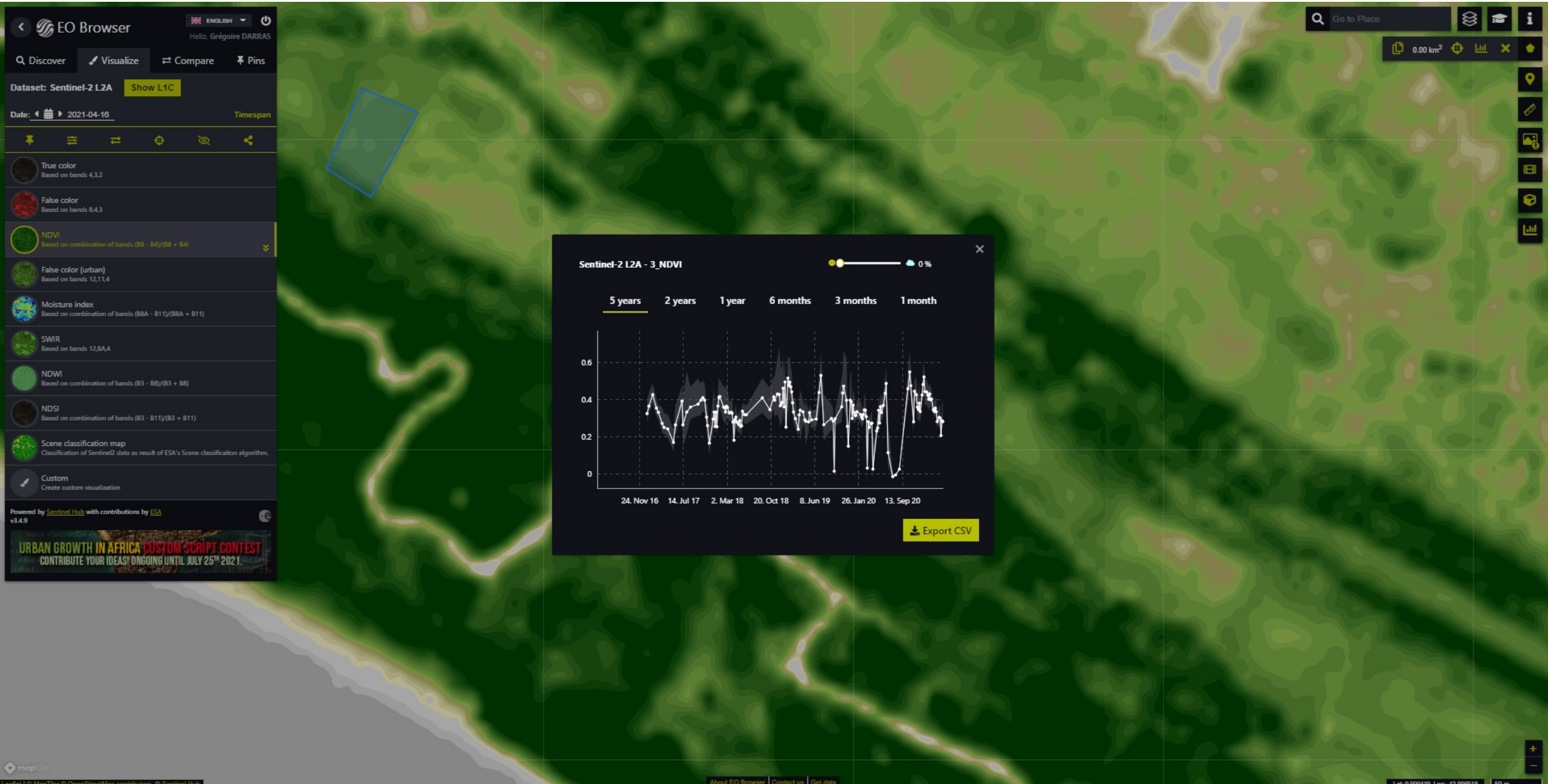
NDVI  
Senegal - Field 001 - update











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Dataset: Sentinel-2 L2A **Show L1C**

Date: 2021-04-16 Timespan

- True color (Based on bands 4,3,2)
- False color (Based on bands 8,4,3)
- NDVI (Based on combination of bands (B8 - B4)/(B8 + B4))**
- False color (urban) (Based on bands 12,11,4)
- Moisture index (Based on combination of bands (B6A - B11)/(B8A + B11))
- SWIR (Based on bands 12,8A,4)
- NDWI (Based on combination of bands (B3 - B8)/(B3 + B8))
- NDSI (Based on combination of bands (B3 - B11)/(B3 + B11))
- Scene classification map (Classification of Sentinel2 data as result of ESA's Scene classification algorithm.)
- Custom (Create custom visualization)

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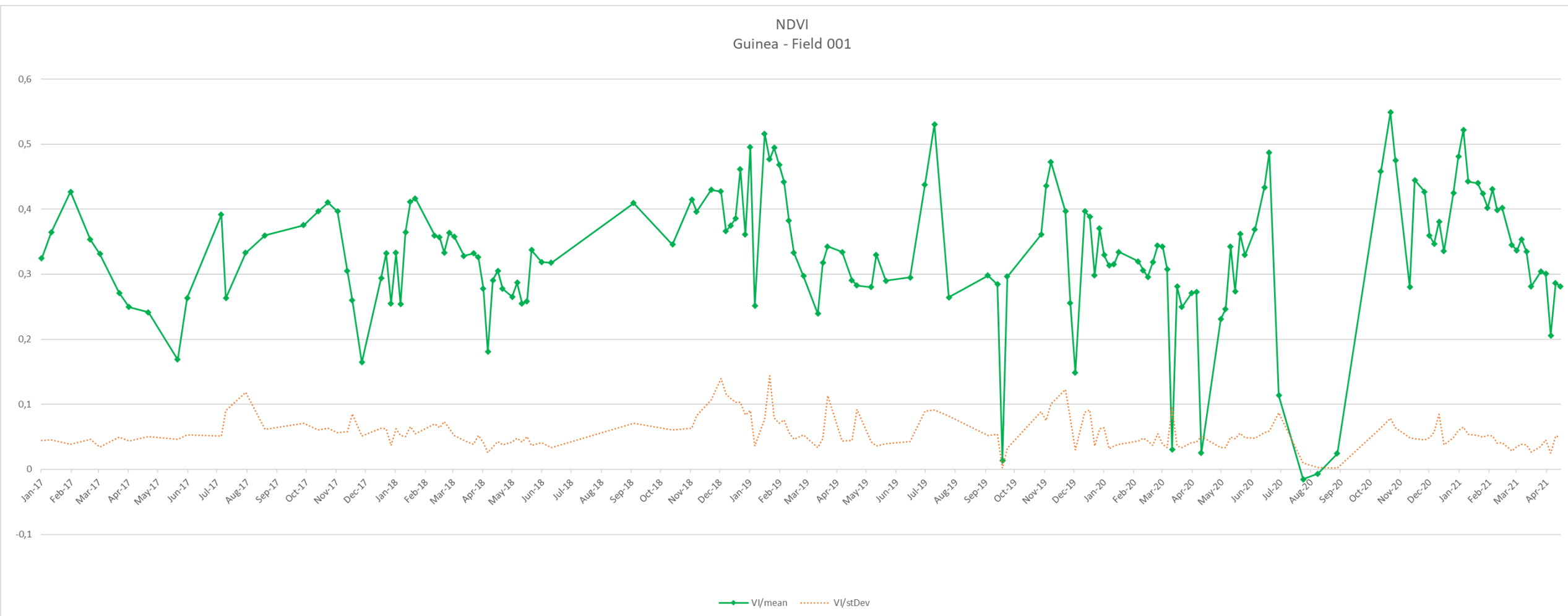
0.00 km<sup>2</sup>

0 %

5 years 2 years 1 year 6 months 3 months 1 month

Export CSV





EO Browser

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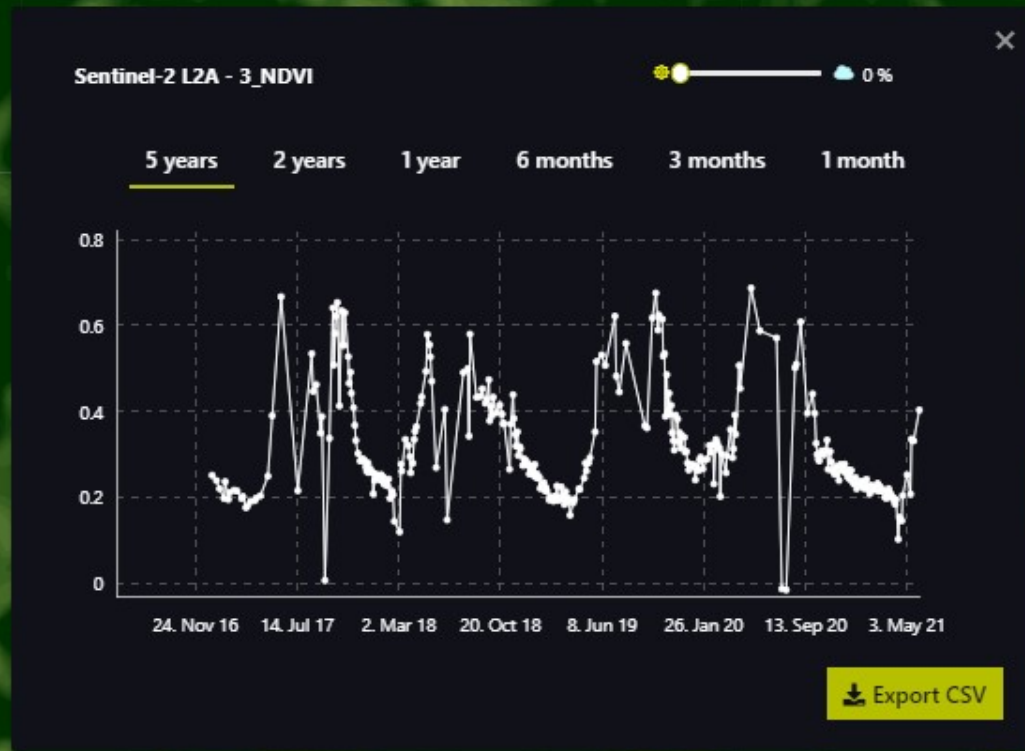
Dataset: Sentinel-2 L2A **Show L1C**

Date: 2021-05-31 Timespan

- True color  
Based on bands 4,3,2
- False color  
Based on bands 8,4,3
- NDVI**  
Based on combination of bands  $(B8 - B4)/(B8 + B4)$
- False color (urban)  
Based on bands 12,11,4
- Moisture index  
Based on combination of bands  $(B8A - B11)/(B8A + B11)$
- SWIR  
Based on bands 12,8A,4
- NDWI  
Based on combination of bands  $(B3 - B8)/(B3 + B8)$
- NDSI  
Based on combination of bands  $(B3 - B11)/(B3 + B11)$

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THE DEADLINE IS EXTENDED TO SEPTEMBER 5<sup>TH</sup> 2021!



The screenshot displays the SentinelHub EO Browser interface. The main map shows a satellite image of a bush area in Kazakhstan, with a blue polygon highlighting a specific region. The interface includes a left sidebar with various visualization options, a top navigation bar, and a right sidebar with map controls. A time-series graph is overlaid on the map, showing NDVI values over time for the selected area.

**Dataset:** Sentinel-2 L2A **Show L1C**

**Date:** 2021-10-16 **Timespan**

**Visualization Options:**

- True color (Based on bands 4,3,2)
- False color (Based on bands 8,4,3)
- NDVI (Based on combination of bands  $(B8 - B4)/(B8 + B4)$ )**
- False color (urban) (Based on bands 12,11,4)
- Moisture index (Based on combination of bands  $(B8A - B11)/(B8A + B11)$ )
- SWIR (Based on bands 12,8A,4)
- NDWI (Based on combination of bands  $(B3 - B6)/(B3 + B6)$ )
- NDSI (Based on combination of bands  $(B3 - B11)/(B3 + B11)$ )
- Scene classification map (Classification of Sentinel2 data as result of ESA's Scene classification algorithm.)
- Custom (Create custom visualization)

**Time-series Graph: Sentinel-2 L2A - 3\_NDVI**

Time period: 5 years (selected), 2 years, 1 year, 6 months, 3 months, 1 month

Y-axis: NDVI values (0 to 0.4)

X-axis: Dates (24. Nov 16, 14. Jul 17, 2. Mar 18, 20. Oct 18, 8. Jun 19, 26. Jan 20, 13. Sep 20, 3. May 21)

**Export CSV**



The screenshot displays the SentinelHub EO Browser interface. On the left, a sidebar contains various visualization options for Sentinel-2 L2A data, including True color, False color, NDVI, and Scene classification map. The main map area shows a satellite view of a park area in Toulouse, France, with a blue polygon highlighting a specific region. A time-series plot window is open, showing NDVI values from July 2017 to December 2021. The plot includes a legend for the selected area, a scale bar, and a 'Export CSV' button. The bottom of the interface features a footer with map data sources and a contest banner.

**EO Browser**  
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Dataset: Sentinel-2 L2A **Show L1C**

Date: 2022-05-10 **Timespan**

True color  
Based on bands 4,3,2

False color  
Based on bands 8,4,3

Highlight Optimized Natural Color  
Enhanced natural color visualization

**NDVI**  
Based on combination of bands (B8 - B4)/(B8 + B4)

False color (urban)  
Based on bands 12,11,4

Moisture index  
Based on combination of bands (B8A - B11)/(B8A + B11)

SWIR  
Based on bands 12,8A,4

NDWI  
Based on combination of bands (B3 - B8)/(B3 + B8)

NDSI  
Based on combination of bands (B3 - B11)/(B3 + B11)

Scene classification map  
Classification of Sentinel2 data as result of ESA's Scene classification algorithm.

Custom  
Create custom visualization

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**Sentinel-2 L2A - 3\_NDVI**

5 years 2 years 1 year 6 months 3 months 1 month

1 0.8 0.6 0.4 0.2 0 -0.2

14. Jul 17 2. Mar 18 20. Oct 18 8. Jun 19 26. Jan 20 13. Sep 20 3. May 21 20. Dec 21

**Export CSV**

0.01 km<sup>2</sup>

Go to Place

0.01 km<sup>2</sup>

3D

maptiler

Leaflet | © MapTiler © OpenStreetMap contributors, © Sentinel Hub

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Lat: 43.583912, Lng: 1.443063 30 m

Acq date: 2021-06-25

Browser

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- ▶ Spatial Bookmarks
- ▶ Project Home
- ▶ Home
- ▶ C:\
- GeoPackage
- SpatialLite
- PostGIS
- MSSQL
- Oracle
- DB2
- WMS/WMTS

Layers

- Monitoring\_VEGET
  - field\_indonesia\_001
  - field\_France\_001
  - field\_France\_002
  - field\_italy\_001
  - field\_egypt\_001
  - field\_south-africa\_001
  - Field\_Locations\_001
  - field\_mali\_001
  - field\_kenya\_001
  - digi\_compil\_001
  - digi\_compil\_000
  - digi\_comoros\_001
  - digi\_indonesia\_001
  - digi\_kenya\_001
  - digi\_mali\_001
  - digi\_saudi-arabia\_001
  - digi\_south-africa\_001
  - bersee\_plotes\_001
  - digi\_egypt\_001
  - digi\_italy\_001
  - digi\_france\_001
- Monitoring\_SNOW
- REF\_layers
- THEMA
- SentinelHub
  - Sentinel S2 - L1C - Agriculture (WMS, 2021-06-25)**
- IMAGERY
- BACKGROUND



field\_kenya\_001

SentinelHub plugin v2.0.0

Login Create Download

Configuration: Simple WMS template

Service type: WMS

Layer: Agriculture

CRS: EPSG: 3857

Time range: 2021-06-25 - 2021-07-01

Use exact date

July 2021						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	30	1	2	3
4	5	6	7	8	9	10

Create new WMS layer: Create

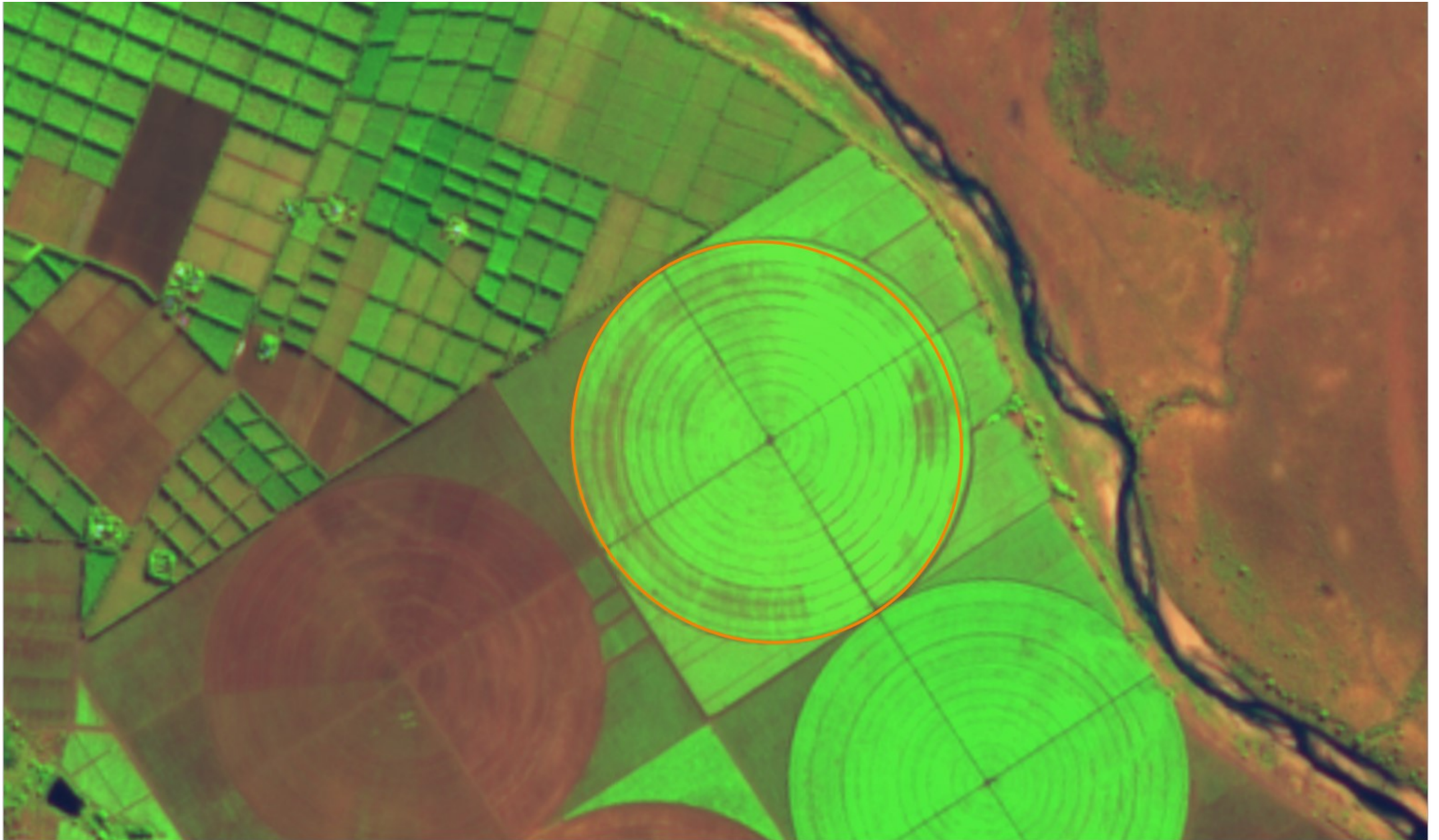
Update existing layer: Sentinel S2 - L1C - Agriculture (WMS, 2021-06-25/2021-06-25) Update



The screenshot displays the QGIS desktop environment. The main map area shows a satellite view of agricultural fields, with several circular fields highlighted in green. One of these circular fields is circled in orange. The interface includes a menu bar at the top with options like Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, HCMGIS, Processing, and Help. Below the menu bar is a toolbar with various icons for map navigation and editing. On the left side, there are two panels: the Browser panel, which shows a file system tree with folders like GeoPackage, SpatialLite, PostGIS, MSSQL, Oracle, DB2, WMS/WMTS, XYZ Tiles, WCS, WFS, and OWS; and the Layers panel, which lists various layers including Monitoring\_VEGET, field\_saudi-arabia\_001, field\_comoros\_001, field\_argentina\_001, field\_indonesia\_001, field\_France\_001, field\_France\_002, field\_italy\_001, field\_egypt\_001, field\_south-africa\_001, digi\_compil\_001, digi\_compil\_000, digi\_comoros\_001, digi\_indonesia\_001, digi\_kenya\_001, digi\_mali\_001, digi\_saudi-arabia\_001, digi\_south-africa\_001, bersee\_plotes\_001, digi\_egypt\_001, digi\_italy\_001, digi\_france\_001, Monitoring\_SNOW, REF\_layers, THEMA, SentinelHub, Sentinel S2 - L1C - Agriculture (WMS, 2021-01-01/2021-07-01, 100%, mostRecent), IMAGERY, and BACKGROUND. The status bar at the bottom shows the coordinate (3550204, -2920887), scale (1:25377), magnifier (100%), rotation (0.0°), and other settings.

field\_south-africa\_001





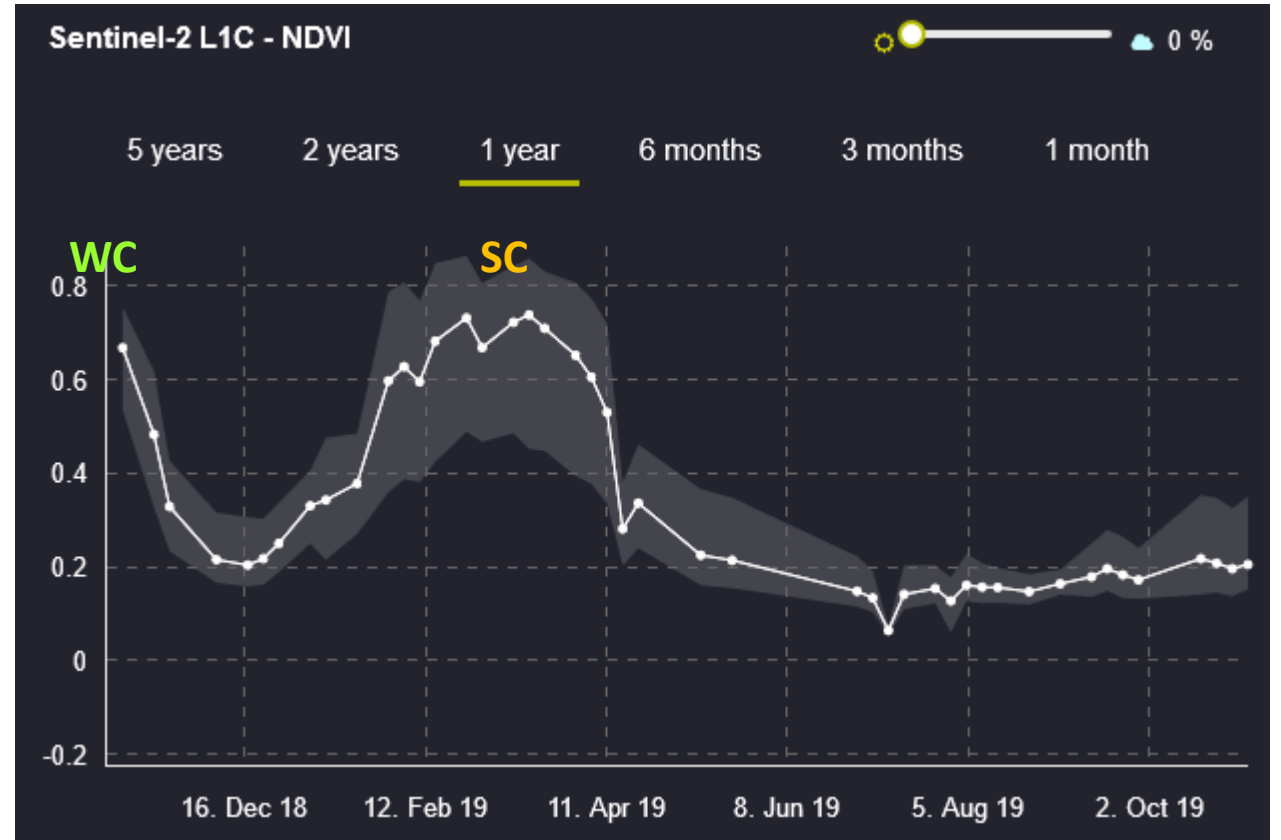
field\_south-africa\_001



# Thematic analysis

Argentina – Case-Study – Field « Lote 11 » profile

## EO browser

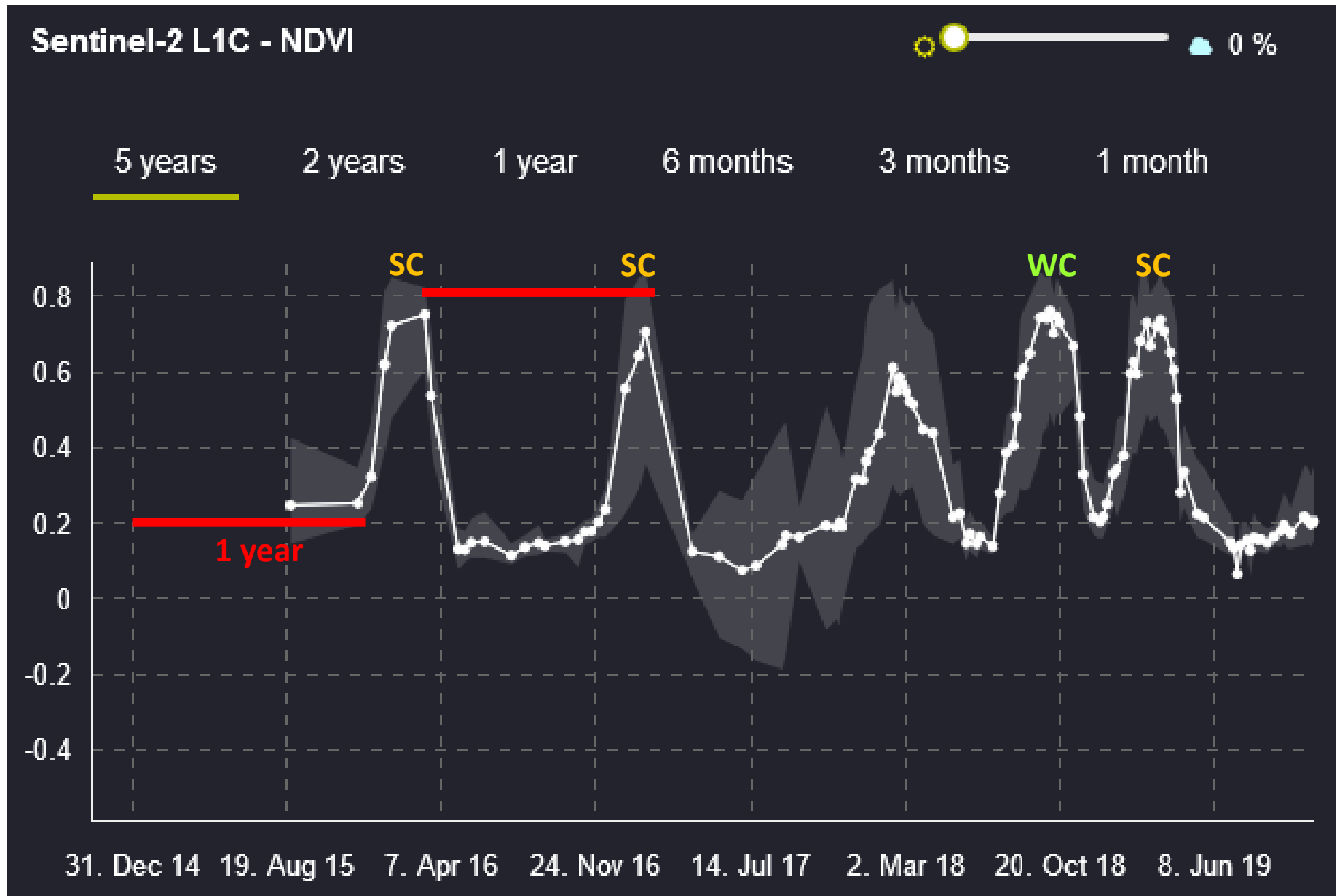


2019 campaign: **Summer Crop (SC)** – maize | soya ...

2018 campaign: **Winter Crop (WC)** – wheat | barley | oat ...

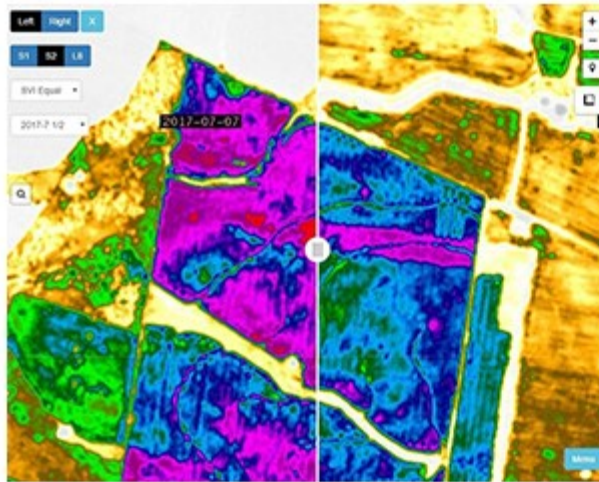


Argentina – Case-Study – Field « Lote 11 » profile



## Agriculture Monitoring applications using SentinelHub

Examples of applications and services using Sentinel Hub:



### SataMap

<https://www.satamap.com.au>

“A web based platform designed for farmers, consultants and other professionals that want to excel at decision making in agriculture and the environment.”

<https://www.sentinel-hub.com/explore/industries-and-showcases/agriculture>



### CropWatch

<http://cropwatch.co.za/>

“Services for early detection of Southern Africa’s invasive pest species, pest monitoring, and precision agriculture.”



### NDVI Max Service

[http://sentinel-hub.com/max\\_service](http://sentinel-hub.com/max_service)

The NDVI Max service is a simple, yet powerful tool with various application possibilities in the framework of land monitoring and land use.



## Pricing

	GET STARTED	INDIVIDUAL NON-COMMERCIAL USE	INDIVIDUAL COMMERCIAL USE	APP DEVELOPERS & ENTERPRISE
Price	<b>0 €</b>	<b>13.59 € / month</b> <small>(billed as 163.11 € / year, + VAT)</small>	<b>83.25 € / month</b> <small>(billed as 999.00 € / year, + VAT)</small>	from <b>500 € / month</b> <small>(Click for details)</small>
Download analytical data with EO Browser	✓	✓	✓	✓
OGC standard WMS / WCS / WMTS / WFS		✓	✓	✓
API for advanced features		✓	✓	✓
Configuration utility tool		✓	✓	✓
Rate limit		300 req/min (30,000 processing units per month)	500 req/min (50,000 processing units per month)	600 req/min (200,000 processing units per month) .. ∞
Non-commercial use	✓	✓	✓	✓
Commercial use			✓	✓
Number of users	1	1	1	∞
Web and mobile applications				✓
Machine-to-machine services				✓
Community support	✓	✓	✓	✓
Priority e-mail support				✓
Attribution	 This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.	 This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.	 This work is licensed under a Creative Commons Attribution 4.0 International License.	Individual license
	<a href="#">SIGN UP</a>	<a href="#">SUBSCRIBE</a>  <a href="#">START 30-DAYS TRIAL</a> <small>Free accounts available</small>	<a href="#">SUBSCRIBE</a>  <a href="#">START 30-DAYS TRIAL</a>	<a href="#">START 30-DAYS TRIAL</a>  <a href="#">CONTACT US</a> <small>Revenue sharing option available</small>

## SentinelHub | EO browser | ESA-NoR sponsorship

### Context of the Planet company Land Restoration initiative

See <https://www.planet.com/pulse/seeing-african-restoration-from-space-planet-and-justdiggit-enable-nature-based-solutions-to-regreen-the-land/>

### Preliminary thematic analysis

The next 3 slides illustrate the potential Land Restoration monitoring capacities provided via the SentinelHub service.

The temporal profiles (NDVI and Moisture Index) along the last 5 years show actually a positive impact, visible for the last 3 years.

Stay tuned on the Restore-IT initiative, and future contributions within the restoration/monitoring process (<https://www.decadeonrestoration.org/>)

Next work on (1) identification of new potential areas to restore (2) initiate local partnership to set-up the action (3) contribute to support the action (4) contribute to run EO monitoring & promote.

VEGETATION RESTORATION • Pembamoto, Tanzania



May 27, 2018



May 28, 2020



May 11, 2022

*Cf. PLANET & Justdiggit | Restore-IT  
| Vegetation restoration -  
Pembamoto, Tanzania*

*PlanetScope imagery from May 27, 2018 through May 11, 2022 captured Justdiggit's vegetation restoration in Pembamoto, Tanzania. The site of the bunds can be seen outlined in white in 2018. This region shows a dramatic change in vegetation growth in the following years thanks to the creation of the bunds. © 2022, Planet Labs PBC. All Rights Reserved.*



Comments: level L2A – True Color

The screenshot displays the SentinelHub EO Browser interface. The main area shows a satellite image of a landscape with a blue polygon overlay. The interface includes a left sidebar with visualization options, a top navigation bar, and a right sidebar with search and map controls.

**Left Sidebar:**

- EO Browser
- Language: ENGLISH
- Discover, Visualize, Compare, Pins
- Dataset: Sentinel-2 L2A (Show L1C)
- Date: 2022-11-14 (Timespan)
- Visualization options:
  - True color (Based on bands 4,3,2)
  - False color (Based on bands 8,4,3)
  - Highlight Optimized Natural Color (Enhanced natural color visualization)
  - NDVI (Based on combination of bands (B8 - B4)/(B8 + B4))
  - False color (urban) (Based on bands 12,11,4)
  - Moisture index (Based on combination of bands (B8A - B11)/(B8A + B11))
  - SWIR (Based on bands 12,8A,4)
  - NDWI (Based on combination of bands (B3 - B6)/(B3 + B6))
  - NDSI (Based on combination of bands (B3 - B11)/(B3 + B11))
  - Scene classification map (Classification of Sentinel2 data as result of ESA's Scene classification algorithm.)
  - Custom (Create custom visualization)
- Powered by Sentinel Hub with contributions by ESA v3.34.0

**Top Bar:**

- Go to Place
- 0.65 km<sup>2</sup>
- Map controls (Layers, Home, Info, etc.)

**Right Sidebar:**

- Map controls (Layers, Home, Info, etc.)
- 3D
- Map scale: 200 m

**Bottom Bar:**

- maptiler
- Leaflet | © MapTiler © OpenStreetMap contributors, © Sentinel Hub
- Lat: -6.26747, Lng: 36.79239
- 200 m



Comments: level L2A – Vegetation index **NDVI**

EO Browser

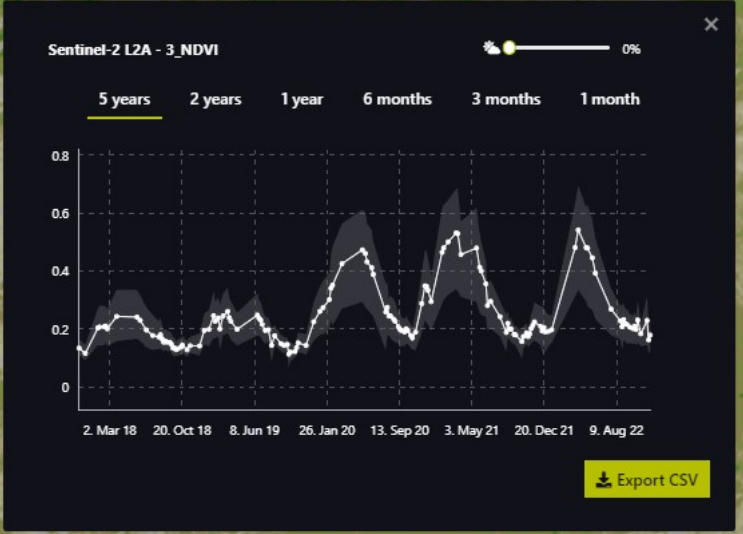
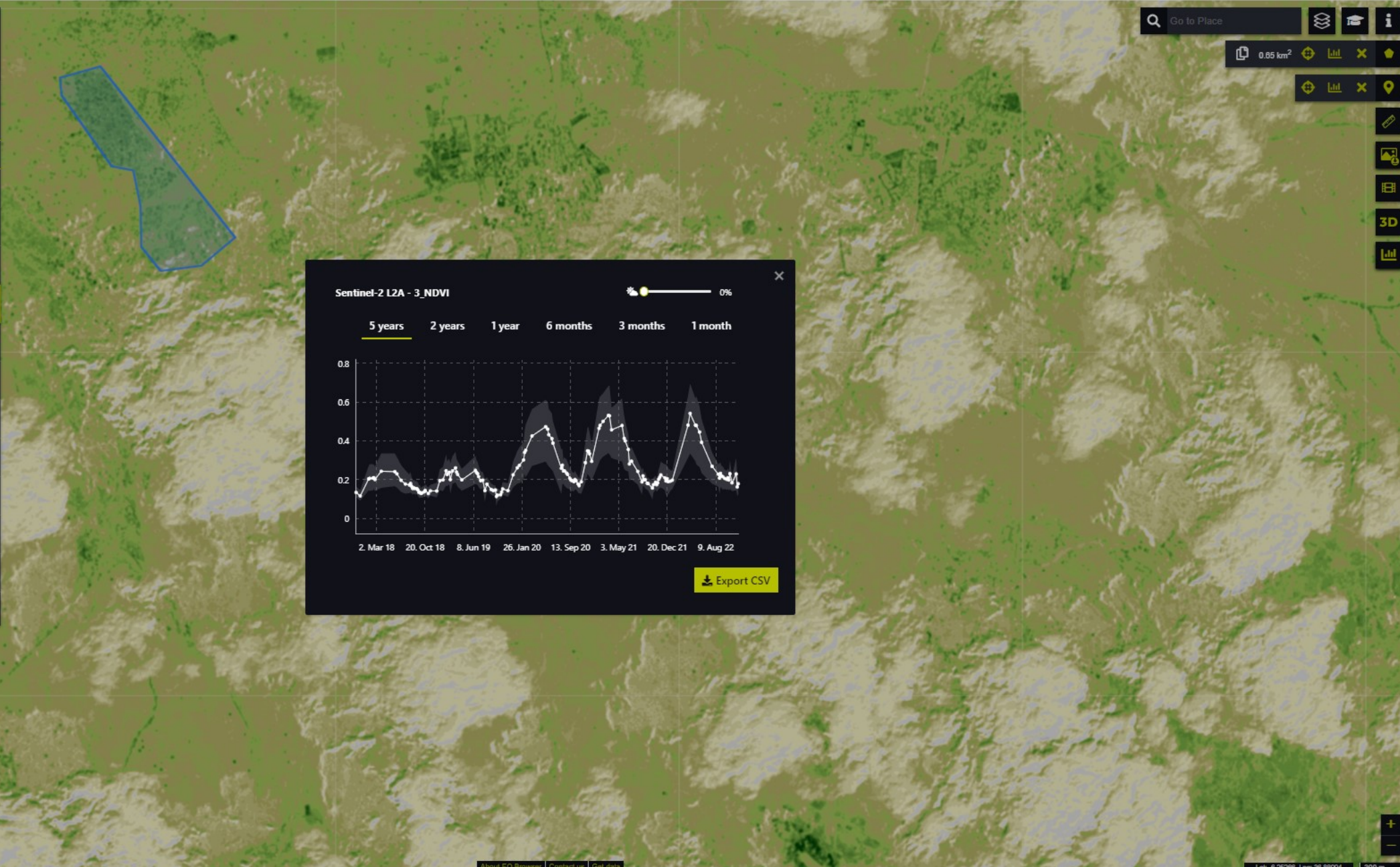
Discover Visualize Compare Pins

Dataset: Sentinel-2 L2A **Show L1C**

Date: 2022-11-24 Timespan

- True color
- False color
- Highlight Optimized Natural Color
- NDVI**
- False color (urban)
- Moisture index
- SWIR
- NDWI
- NDSI
- Scene classification map
- Custom

Powered by Sentinel Hub with contributions by ESA v3.34.0





Comments: level L2A – Moisture Index **NDMI**

EO Browser

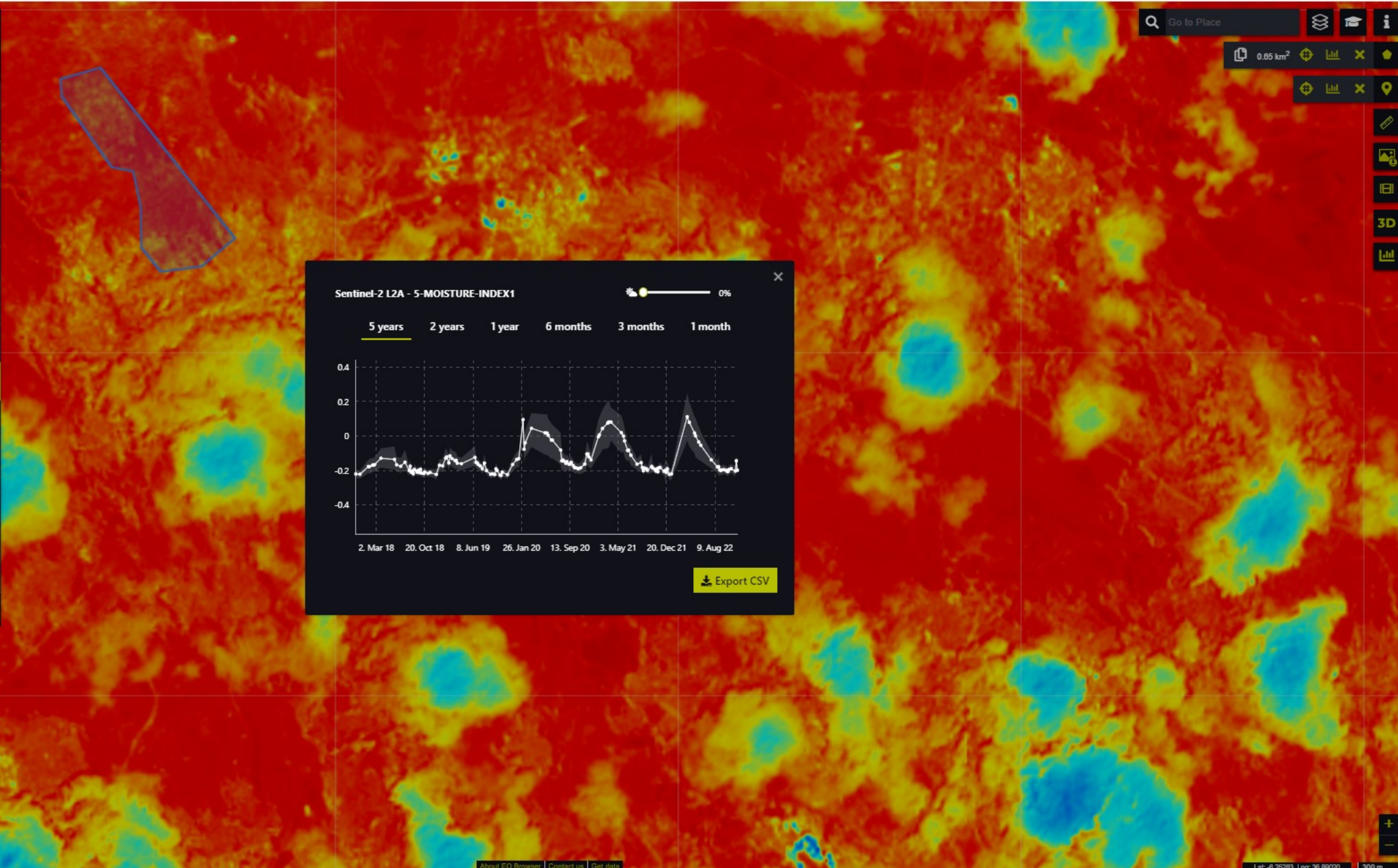
Discover Visualize Compare Pins

Dataset: Sentinel-2 L2A Show L1C

Date: 2022-11-24 Timespan

- True color Based on bands 4,3,2
- False color Based on bands 8,4,3
- Highlight Optimized Natural Color Enhanced natural color visualization
- NDVI Based on combination of bands (B8 - B4)/(B8 + B4)
- False color (urban) Based on bands 12,11,4
- Moisture index** Based on combination of bands (B8A - B11)/(B8A + B11)
- SWIR Based on bands 12,8A,4
- NDWI Based on combination of bands (B3 - B8)/(B3 + B8)
- NDSI Based on combination of bands (B3 - B11)/(B3 + B11)
- Scene classification map Classification of Sentinel2 data as result of ESA's Scene classification algorithm.
- Custom Create custom visualization

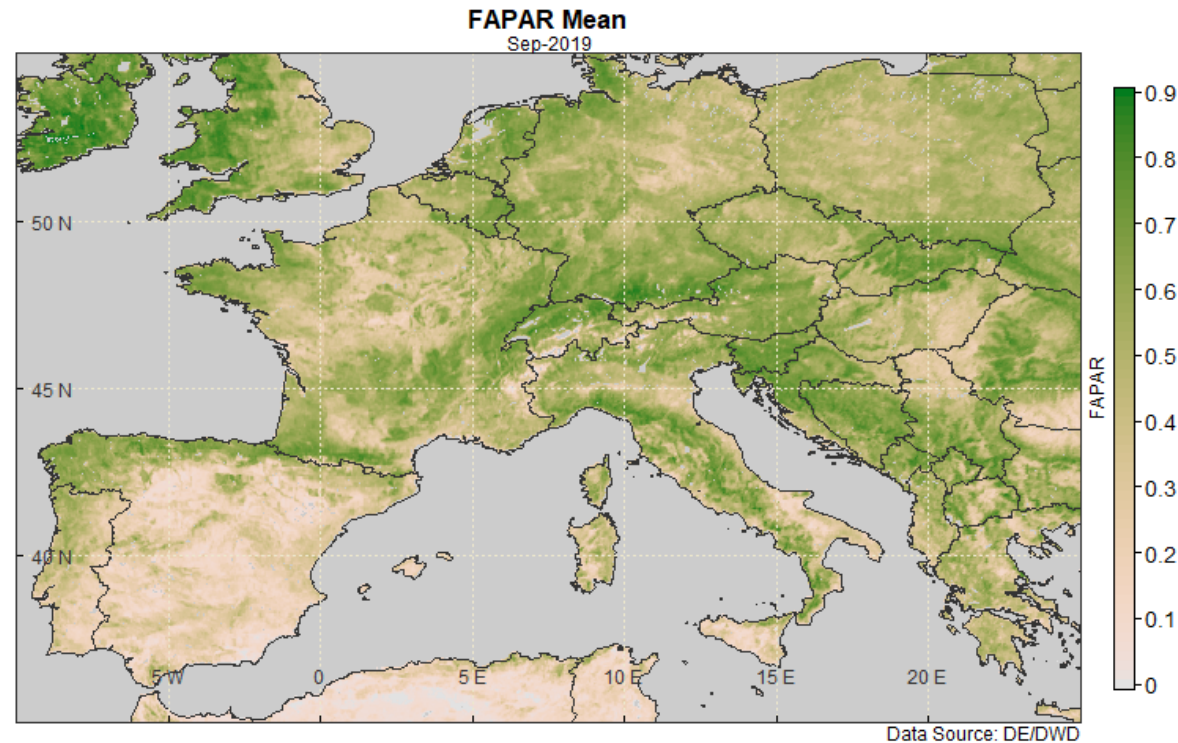
Powered by Sentinel Hub with contributions by ESA v3.34.0



## European « Vegetation Pulse » Use-Case with EUMETSAT

The proposition here is to consider a view of the European territory by satellite over a year, by animating the visualization of the FAPAR Vegetation indicator along the year, based on a synthetic observation series every month.

Such animated observation mode (Vegetation variations loop) may visually reveal phenomena and constitute a precious didactic material to develop dedicated case-studies.

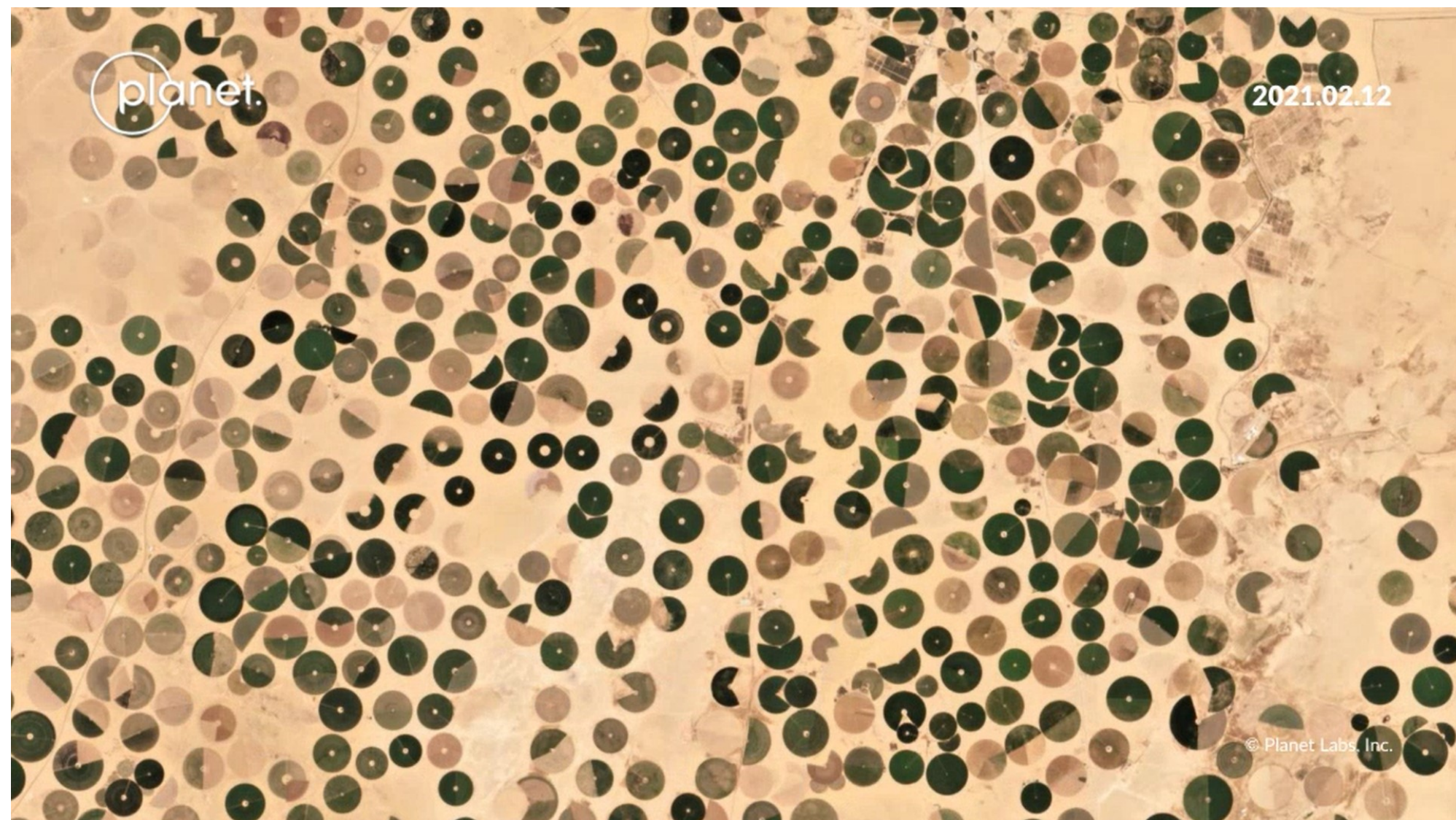


**WhatAbout&HowTo**



# Irrigated Area Use-Case with Planet company

Wadi Ad Dawasir, Riyadh, KSA – “Year 2021 pivot area vegetation activity” - Movie





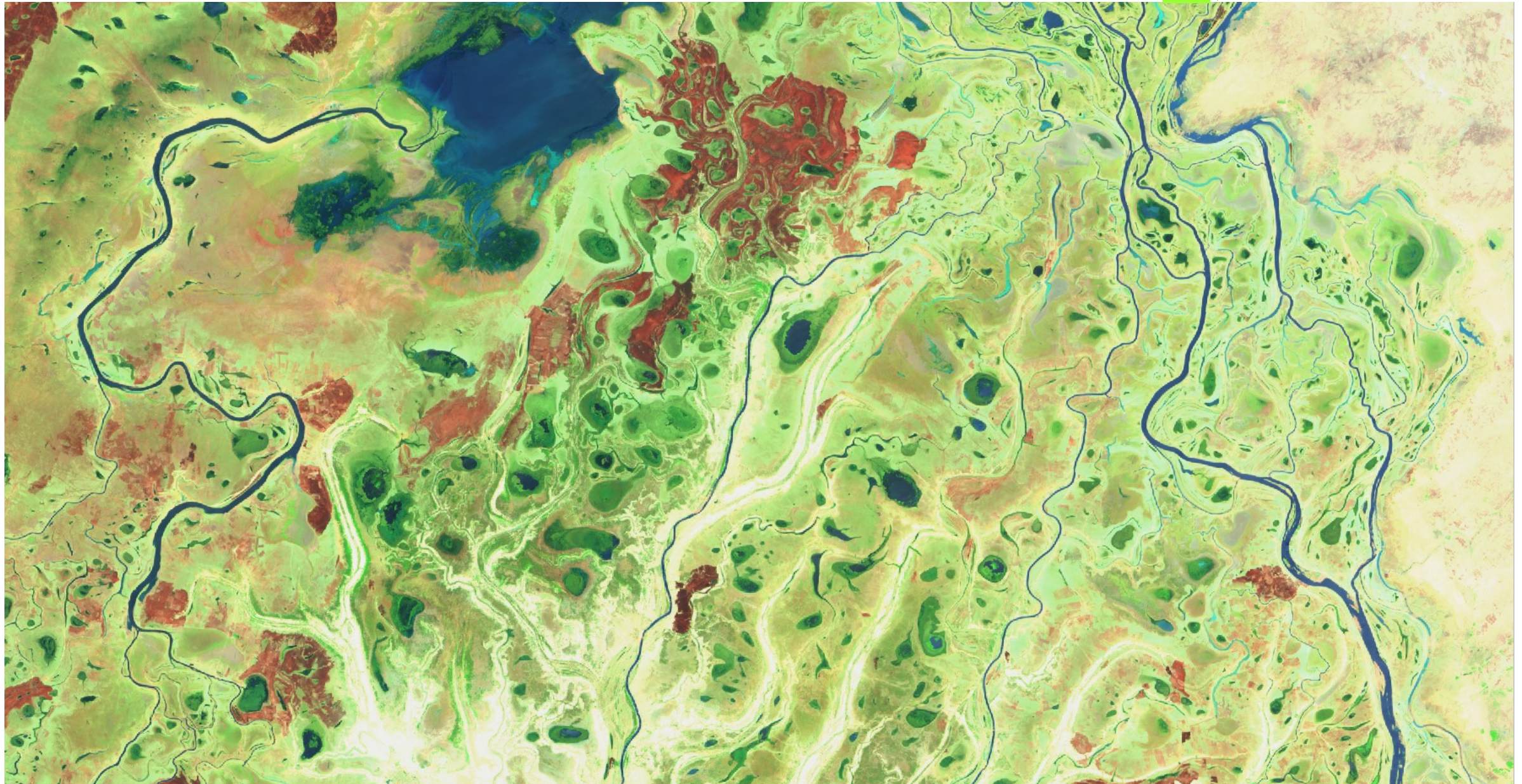
We will not sulk our visual pleasure ... Find here some Happy Screenshots!

*Sentinel2 S2\_KZ\_2021-10-16*





Sentinel S2 - L1C - SWIR (WMS, 2020-06-01/2021-07-01)





Sentinel S2

