

living planet symposium | BONN

23-27 May
2022

TAKING THE PULSE
OF OUR PLANET FROM SPACE



Leading the way to digital CAP monitoring:
A fully operational national-scale monitoring system in Denmark

Dr. Kenneth Grogan, DHI, Denmark
Julie Borch Friderichsen, Danish Agricultural Agency



VeriCAP

The logo for VeriCAP consists of a green checkmark inside a green circle, followed by the text 'VeriCAP' in a grey, sans-serif font.

...a flexible digital service for verification of the Common Agricultural Policy



Ploughing

Harvest

Catch crop

Crop classification

Parcel boundary

Grassland activity

Parcel-based data

PostgreSQL

Grid-based data

<https://github.com/DHI-GRAS/terraccotta>

Satellite data processing

Data storage

Customized Toolbox

Interactive Web viewer

https://github.com/DHI-GRAS/terracotta

☰ README.md ✎

Tests passing docs passing codecov 99% release v0.7.5 pypi v0.7.5 license MIT python 3.6 | 3.7 | 3.8 | 3.9



TERRACOTTA

A light-weight, versatile XYZ tile server

Terracotta is a pure Python tile server that runs as a WSGI app on a dedicated webserver or as a serverless app on AWS Lambda. It is built on a modern Python stack, powered by awesome open-source software such as [Flask](#), [Zappa](#), and [Rasterio](#).

[Read the docs](#) | [Explore the API](#) | [Satlas, powered by Terracotta](#)

About



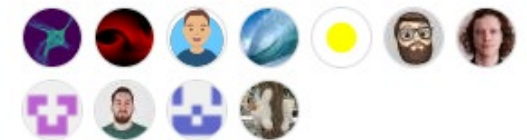
A light-weight, versatile XYZ tile server, built with Flask and Rasterio 🌍

terracotta-python.readthedocs.org

- python
- serverless
- tileserver
- xyz
- rasterio
- cloud-optimized-geotiff

- 📖 Readme
- 📄 MIT license
- ★ 468 stars
- 👁️ 14 watching
- 🍴 49 forks

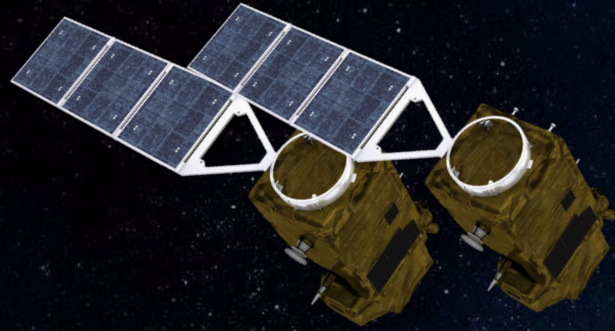
Contributors 18



+ 7 contributors



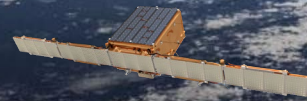
Sentinel-1 A & B
RADAR



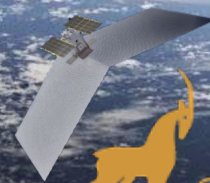
Sentinel-2 A & B
Optical



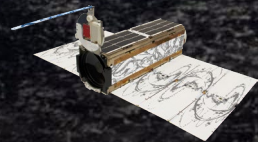
Landsat-8 & 9
Optical



ICEYE



 Capella Space







TERRASAR-X





Timeline

Crop classification

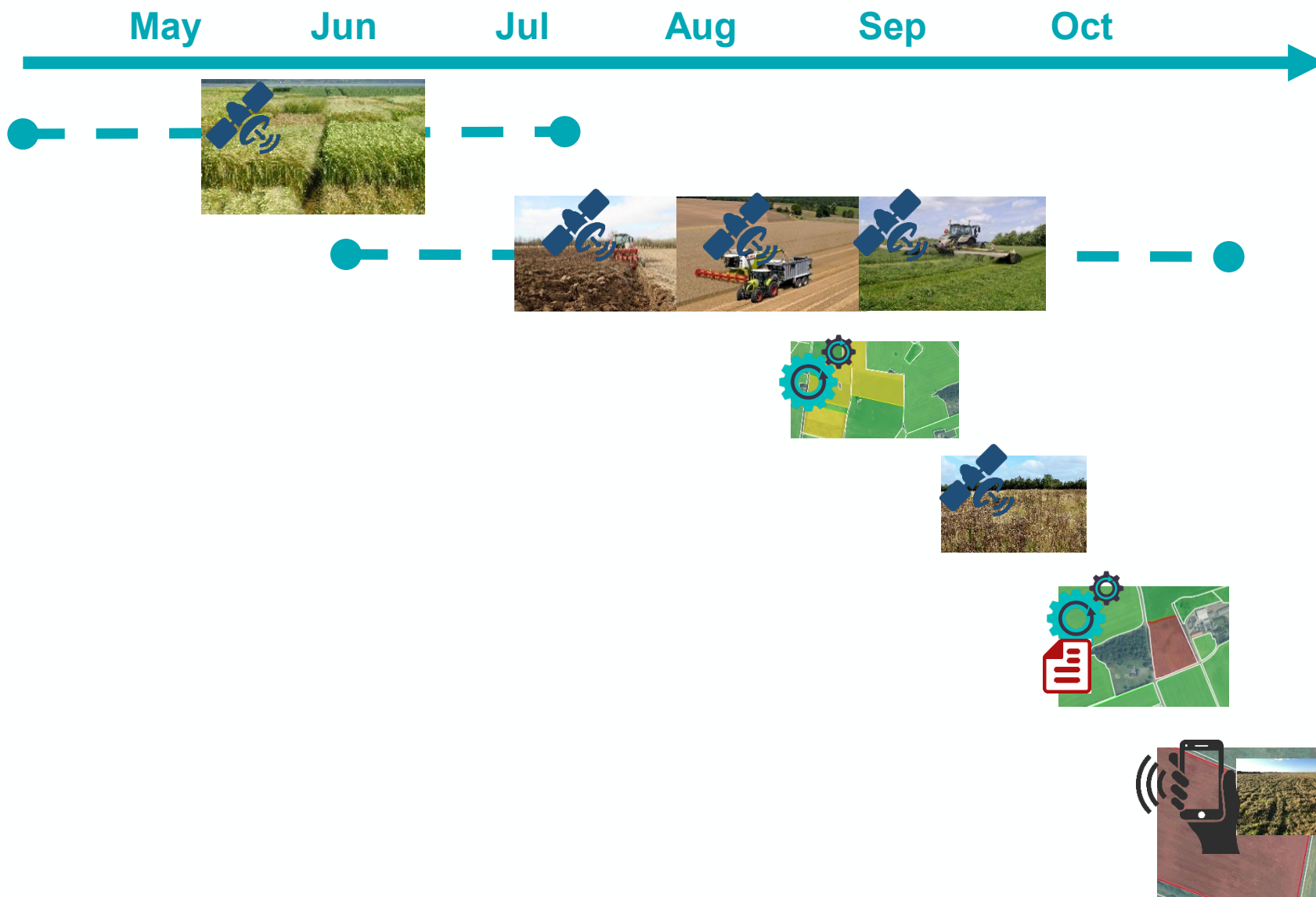
Continuous ploughing, harvest
and mowing detection

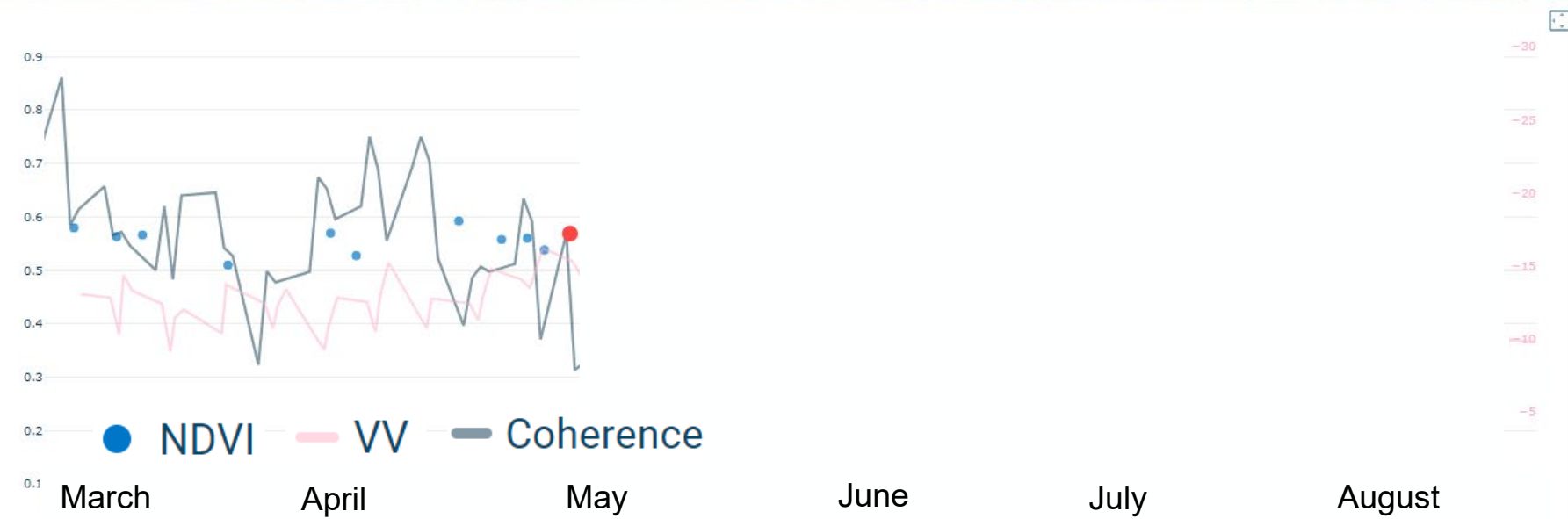
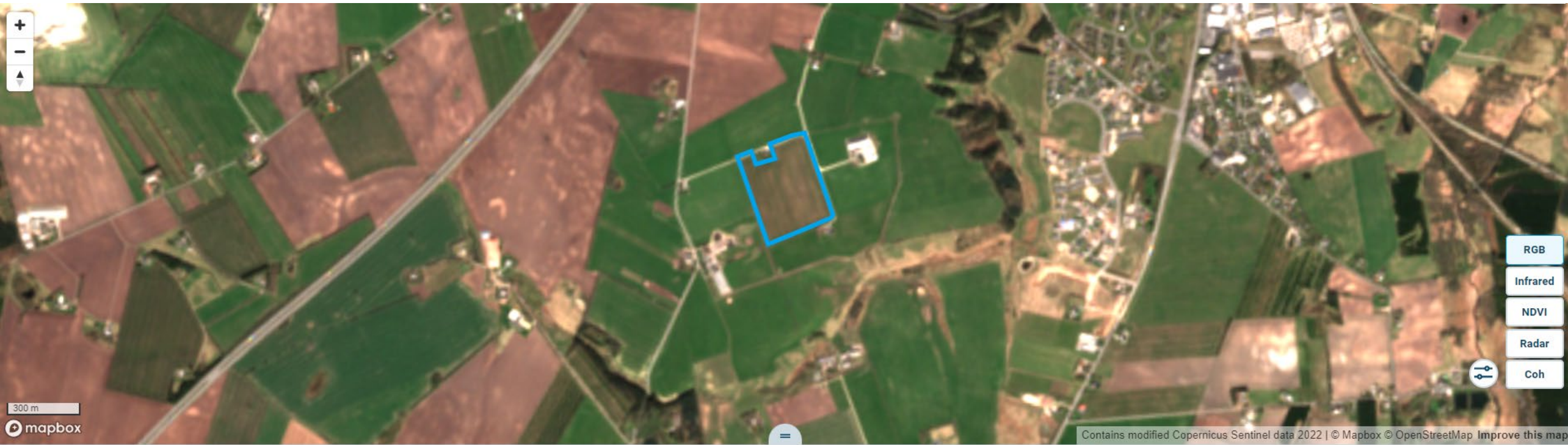
First traffic light on display

Assessment of
Non-compliance

Parcels with high non-compliance
probability turns red

Deadline for sending geo-tagged
images or withdrawal of application



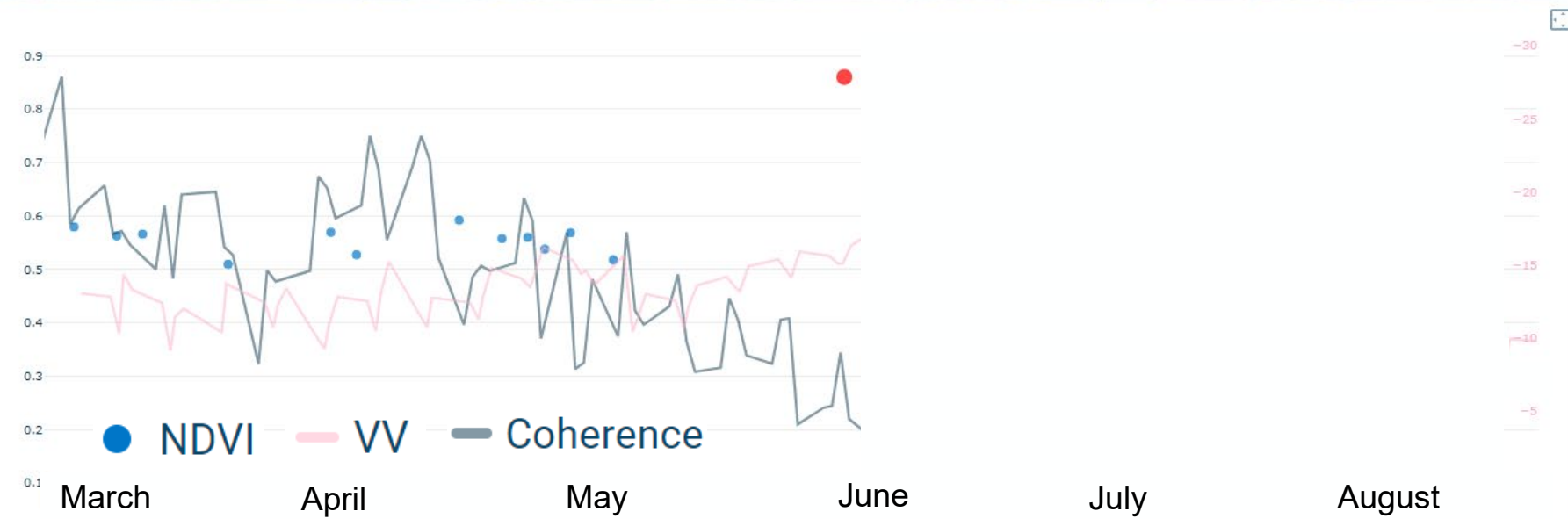


Declared: Winter Wheat

Predicted: Winter Wheat

Probability:

0.42

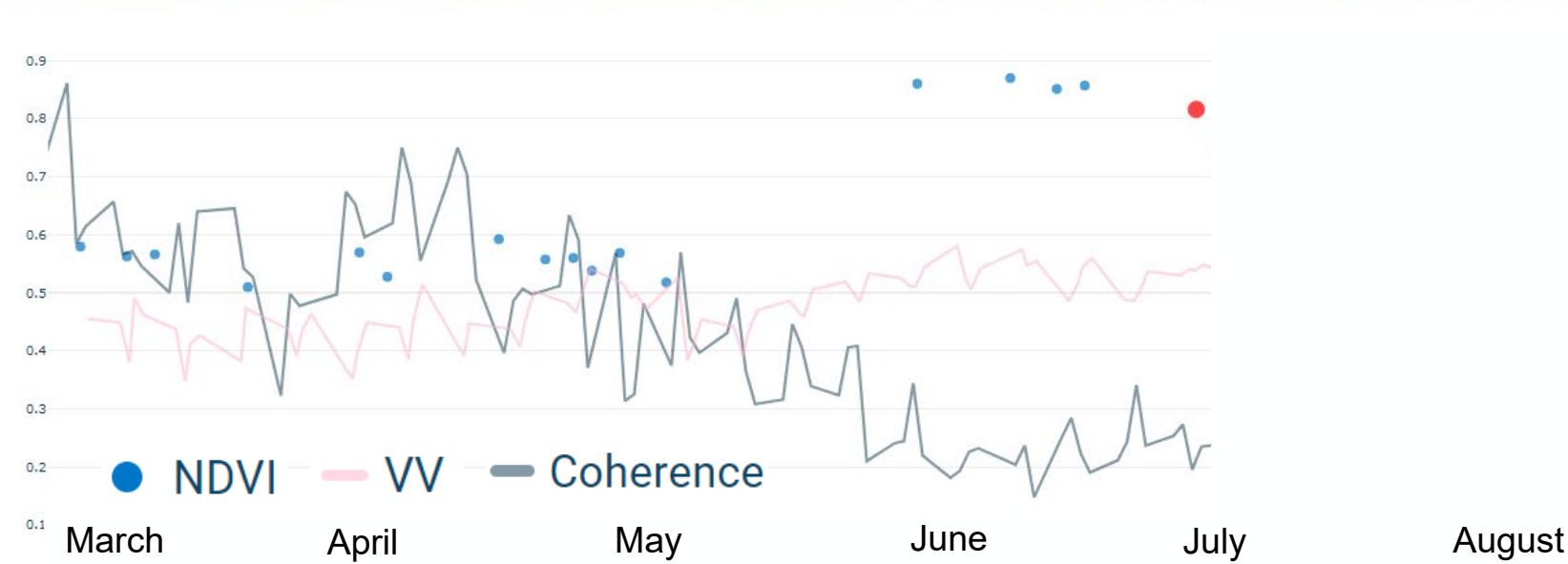
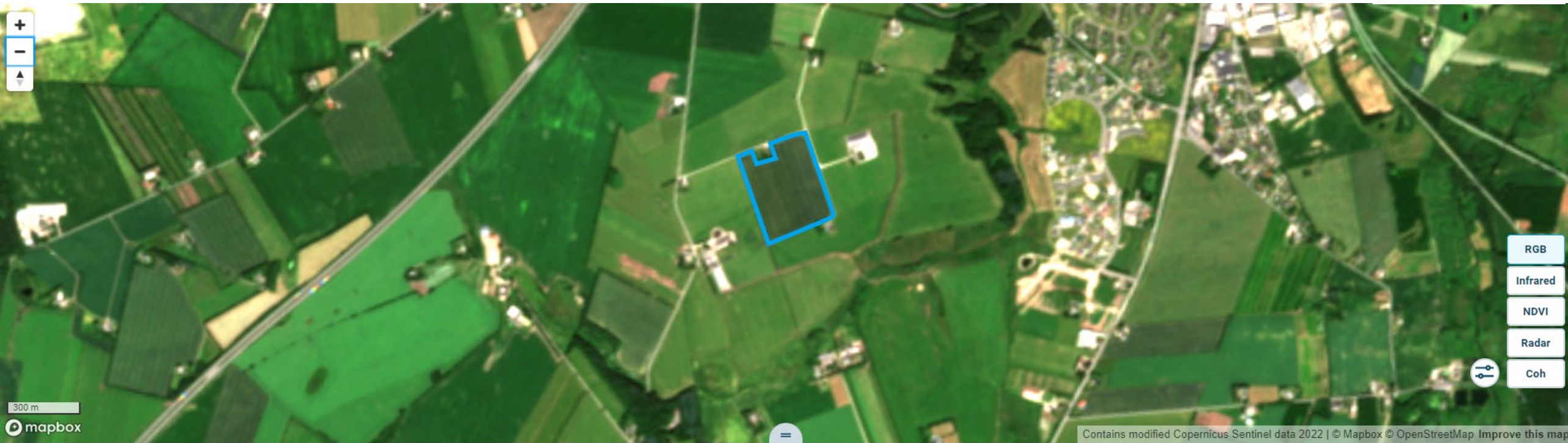


Declared: Winter Wheat

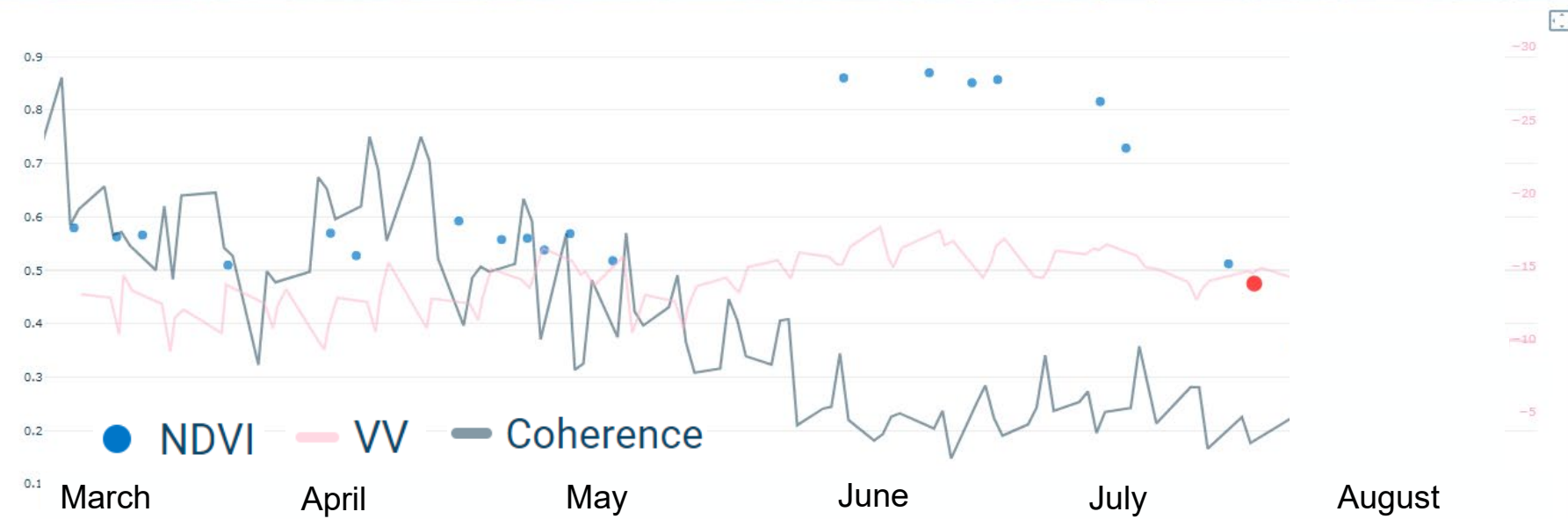
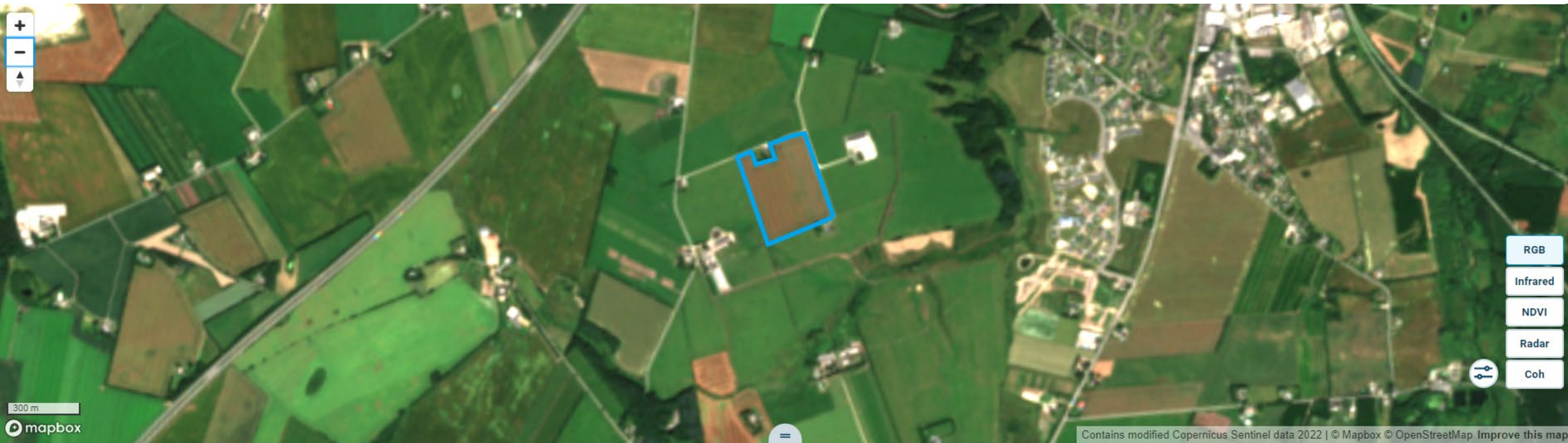
Predicted: Winter Wheat

Probability:

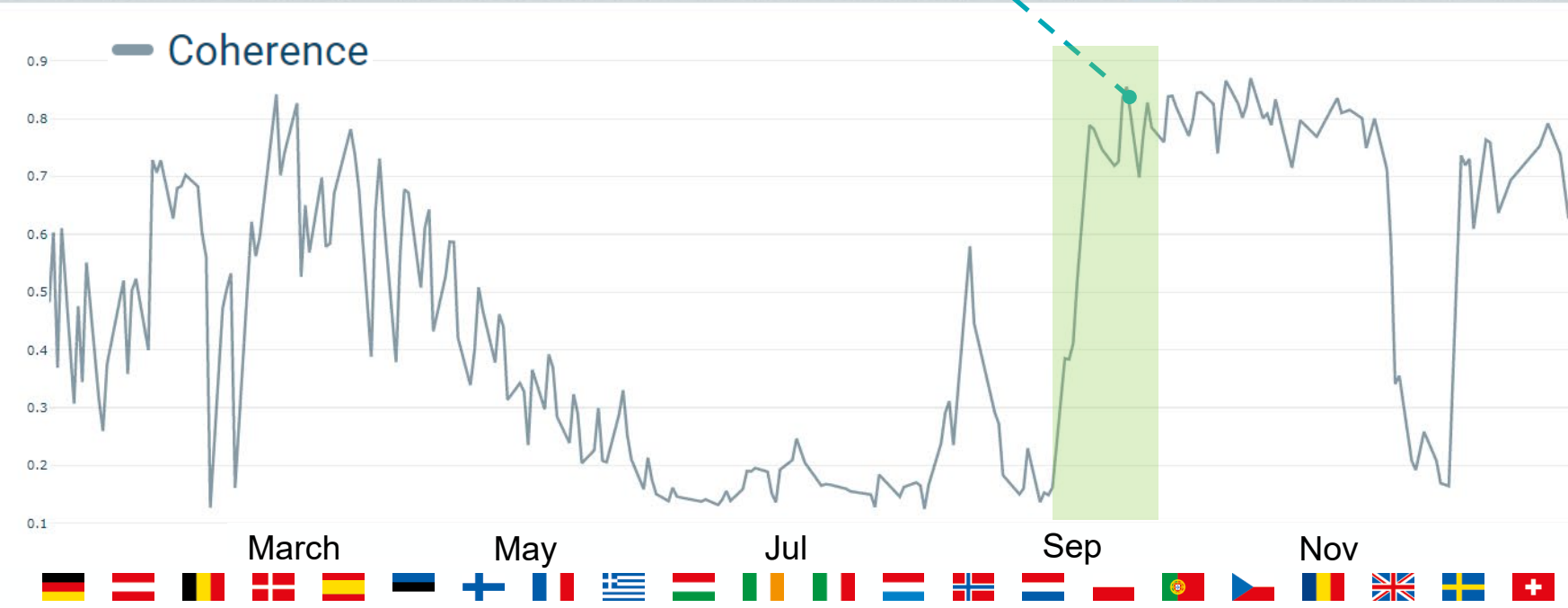
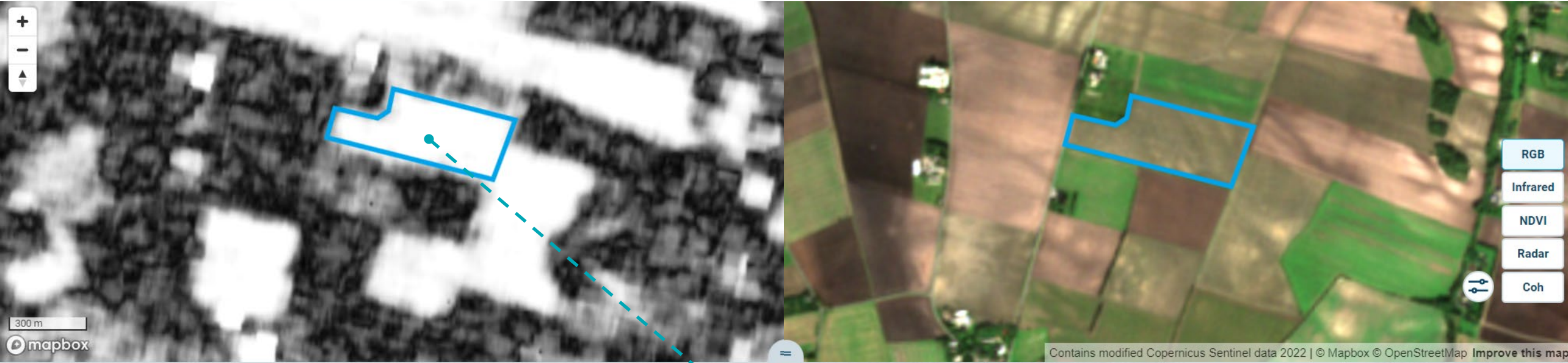
0.67



Declared: Winter Wheat
Predicted: Winter Wheat
Probability:
0.86

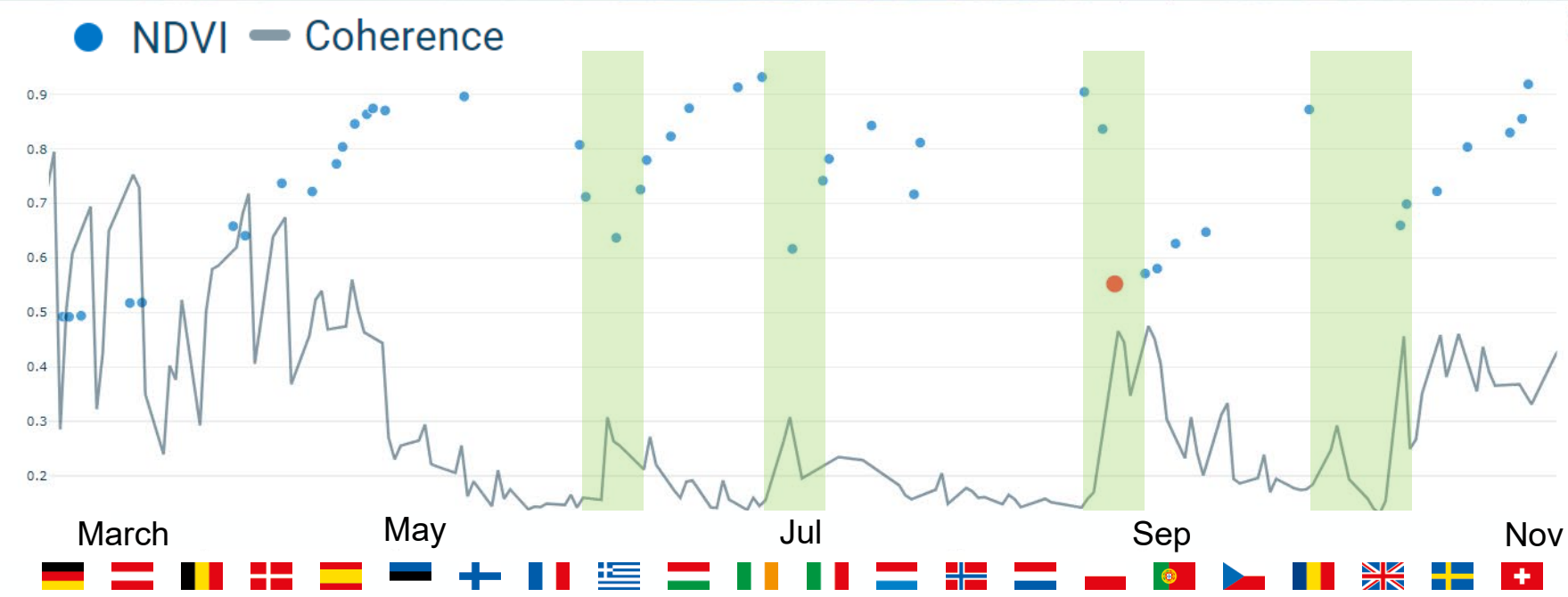
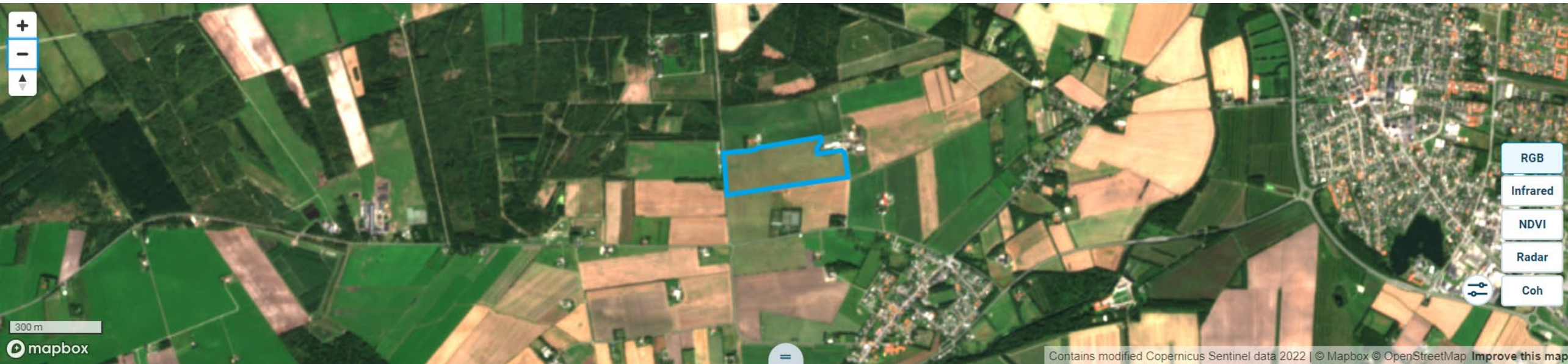


Declared: Winter Wheat
Predicted: Winter Wheat
Probability:
0.97



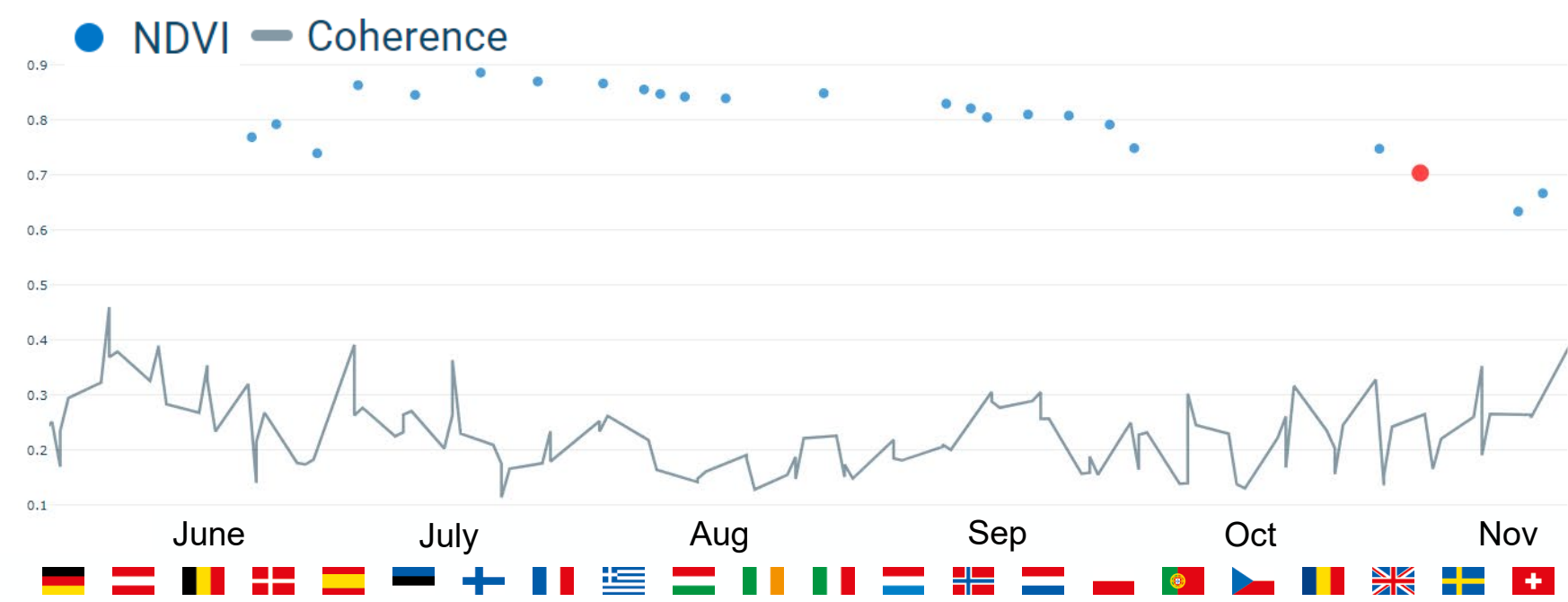
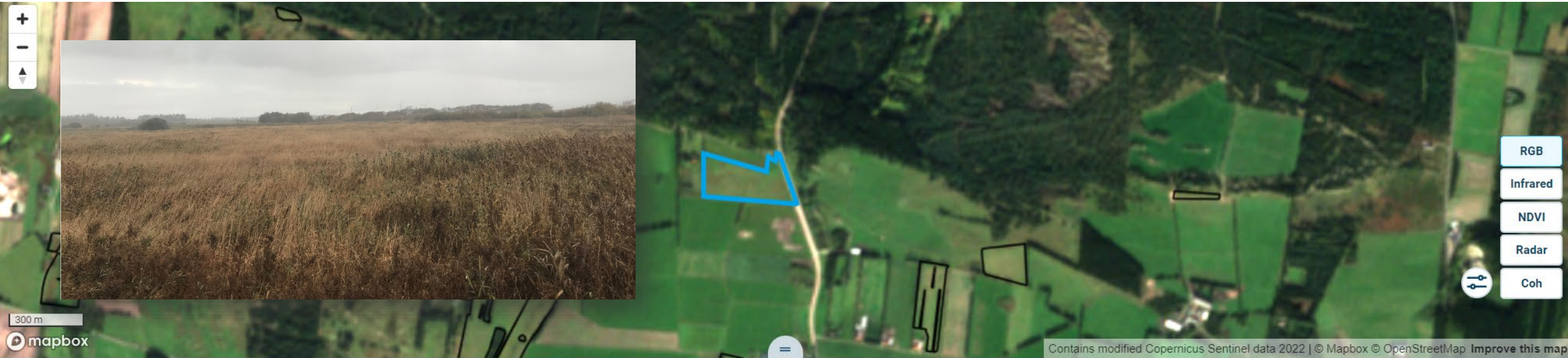
Ploughing
Events detected

1



Grassland Activity
Events detected

4

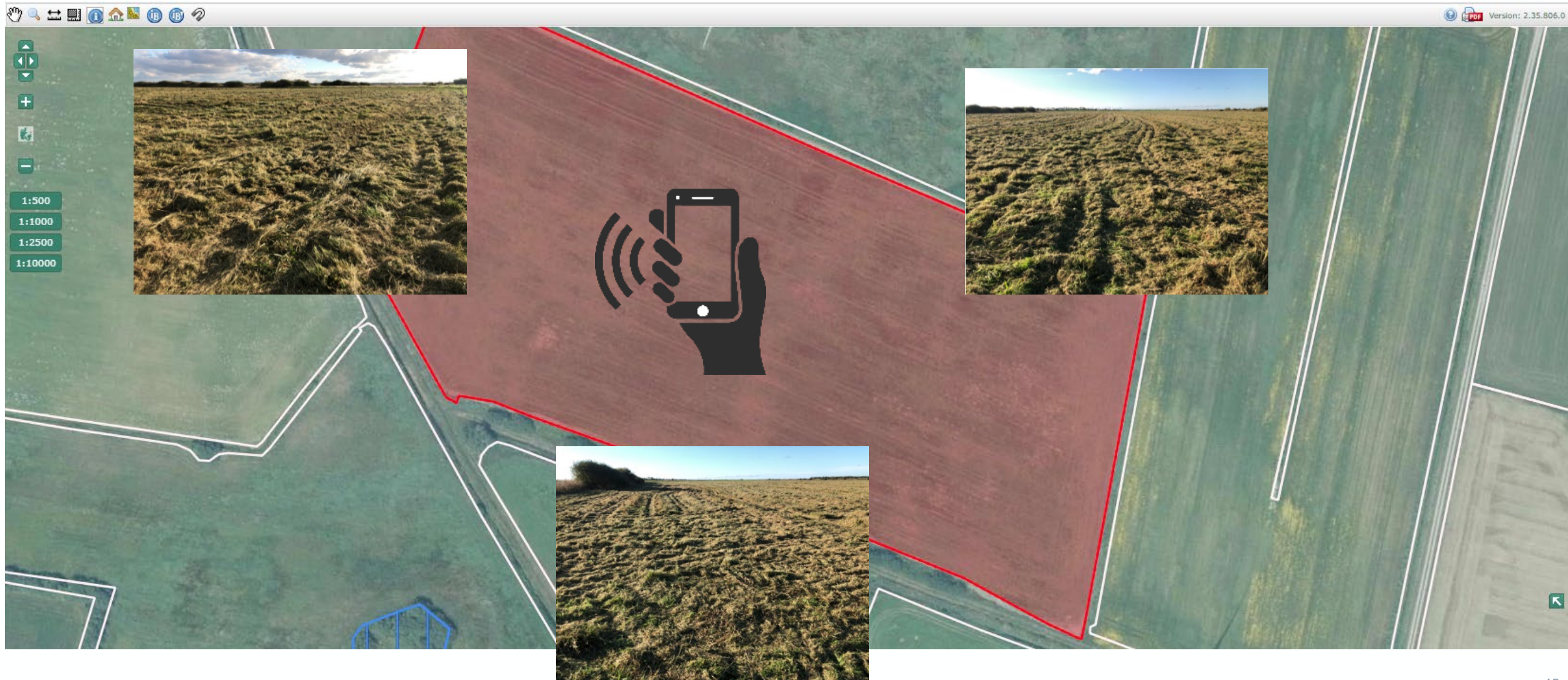


Grassland Activity
Events detected

0



Smart phone app used to send evidence of compliance



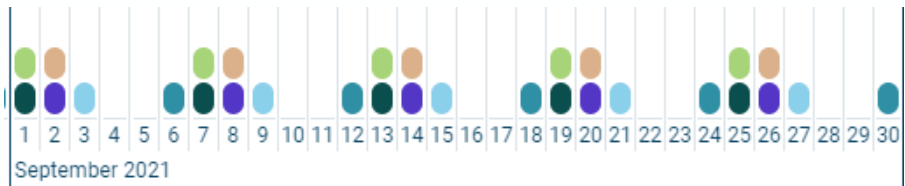
Statistics for 2021 season

- ≈ 550,000 parcels monitored using VeriCap
- ≈ 1,340 parcels turned red - notified in early October
- ≈ 440 parcels: events detected after notification
- ≈ 600 parcels: sent in geotagged photo
- ≈ 300 parcels: withdrew application / lost support

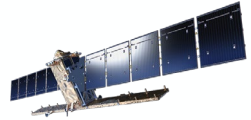
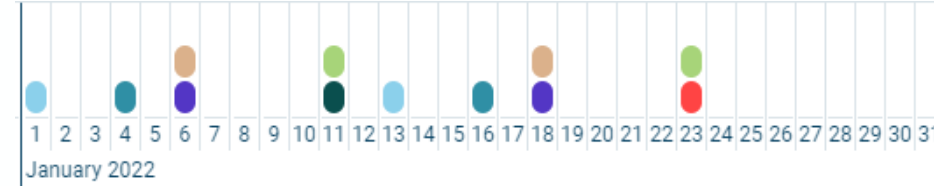


Negative impact of missing Sentinel-1B

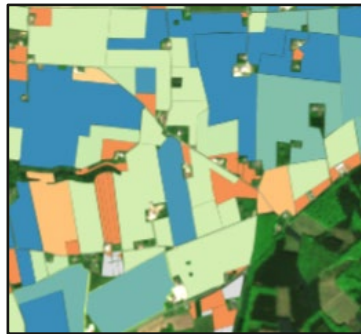
Sentinel-1 A & B



Sentinel-1 A only

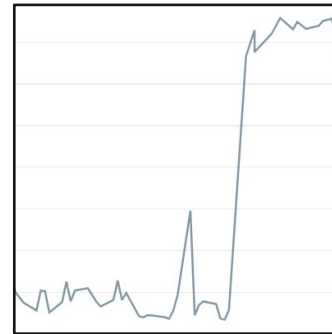


Crop Classification



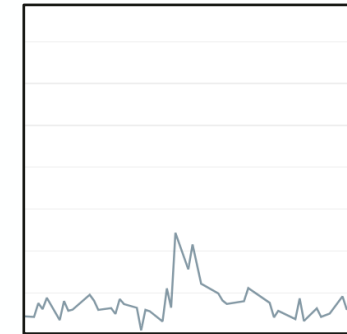
Low Impact

Ploughing



Medium Impact

Grassland Activity



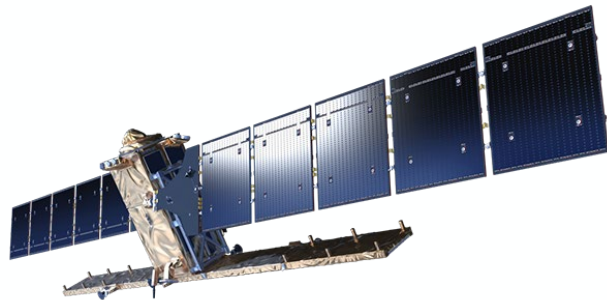
High Impact

Copernicus Sentinel-1A satellite hit by space particle

31/08/2016 50187 VIEWS 326 LIKES

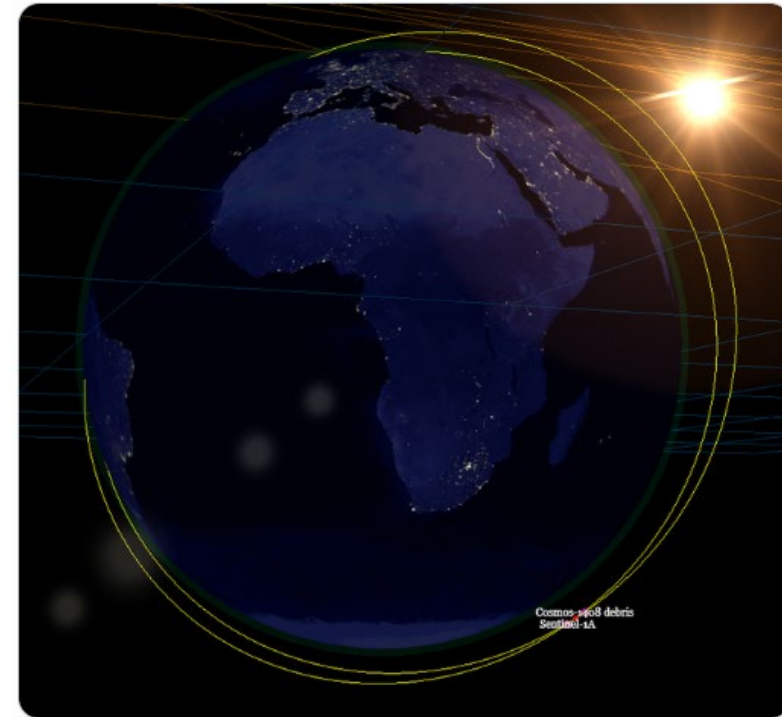
ESA / Applications / Observing the Earth / Copernicus / Sentinel-1

ESA engineers have discovered that a solar panel on the Copernicus Sentinel-1A satellite was hit by a millimetre-size particle in orbit on 23 August. Thanks to onboard cameras, ground controllers were able to identify the affected area. So far, there has been no effect on the satellite's routine operations.



On Monday, for the first time, we performed a set of manoeuvres to avoid a high-risk collision w. [#SpaceDebris](#) created in the [#Cosmos1408](#) anti-satellite test last year.

This was a difficult [#CollisionAvoidance](#) manoeuvre. 🙌🙌 to our [#Sentinel1A](#) Control Team & Space Debris Office



3:35 PM · May 18, 2022 · Twitter Web App

59 Retweets 24 Quote Tweets 204 Likes

18

Landbrugsstyrelsens brug af satellitter vinder Digitaliseringsprisen for innovation



Ministry of Food, Agriculture and Fisheries of Denmark
Danish Agricultural Agency

Satellitkontrol af landmændenes marker løber med Innovationsprisen i årets uddeling af Digitaliseringsprisen, der hylder succesfulde digitaliseringer i den offentlige sektor.

Publiceret 6. september 2021



living planet symposium

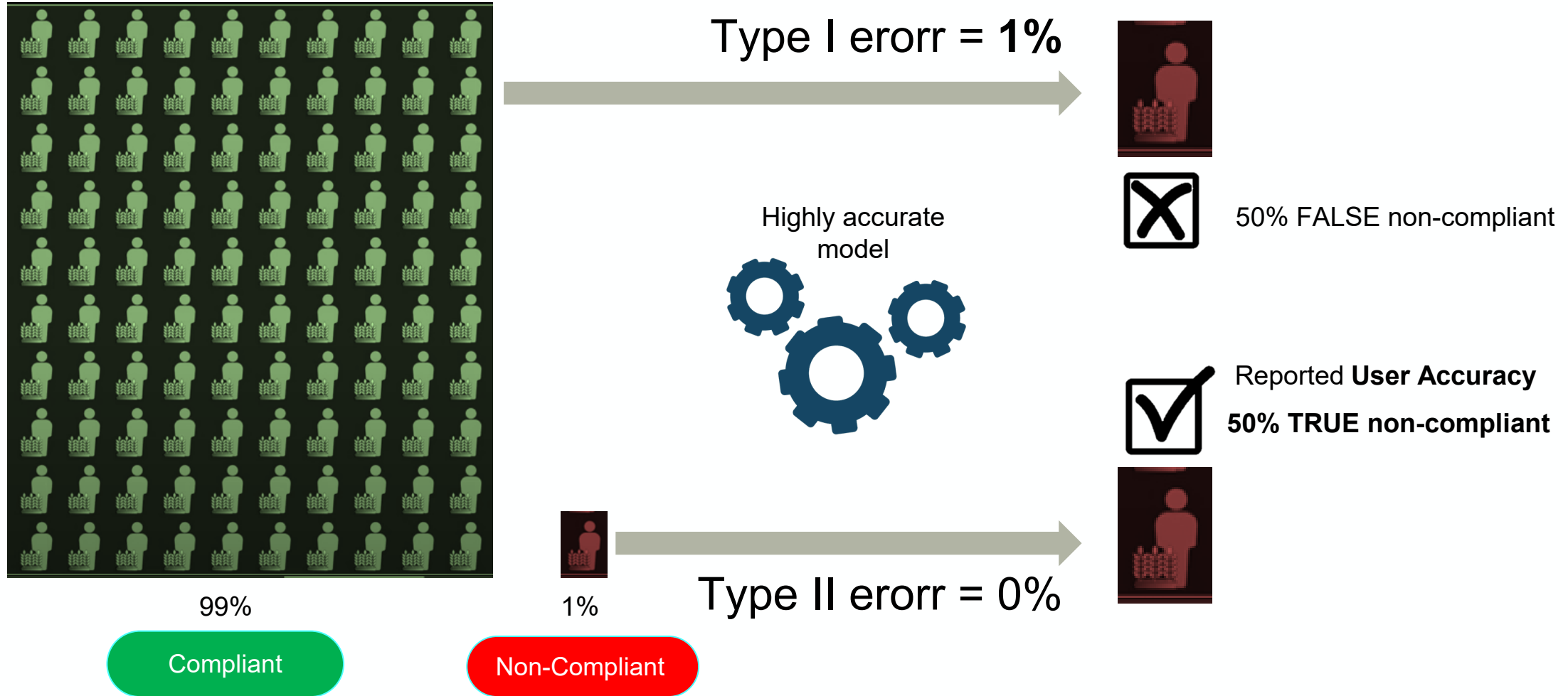
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Thank you!

Grassland monitoring: unbalanced classes can lead to low user accuracy



Grassland monitoring: unbalanced classes can lead to low user accuracy

