



Satellite Dataspaces (for use in Agriculture)
10 May 2023
Wim Looijen NSO



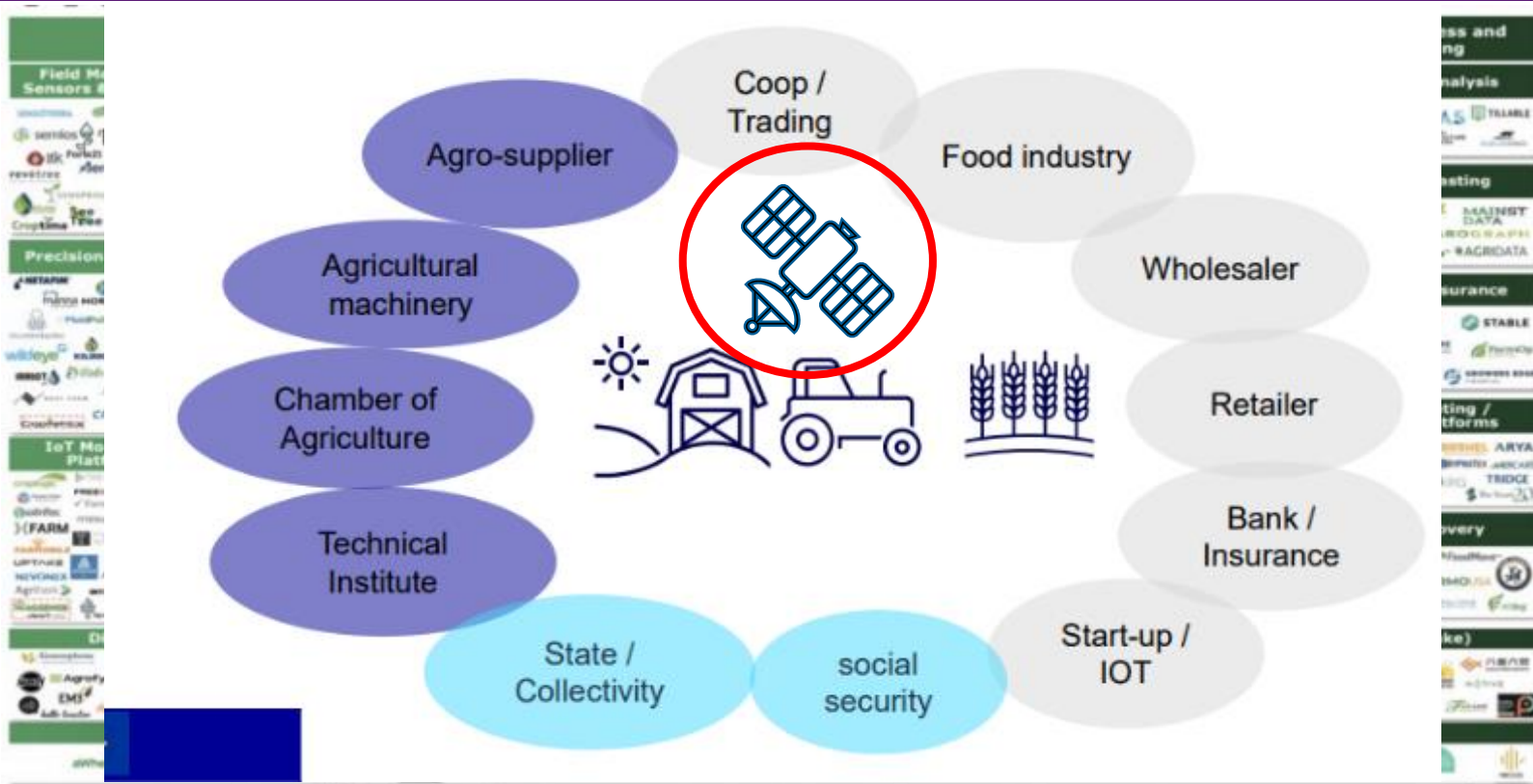
Agenda

- Introduction
- From satellite data to information
- Why it doesn't work today
- How can it work tomorrow
- Some examples
- Wrap-up



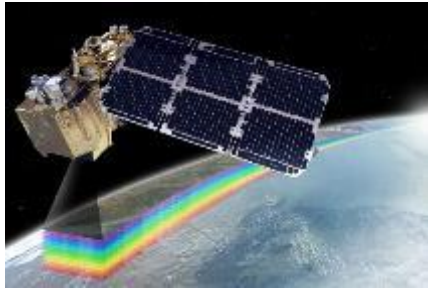
Introduction

- European strategy for data -> dataspace are key deliverable
- A dataspace is a decentralised infrastructure for trustworthy data sharing and exchange in data ecosystems based on commonly agreed principles (source: Gaia-X)
- The objective of the agricultural data space is to develop a secure and trusted data space to allow the farming sector to share and access data, improving economic and environmental performance in the field (source: EU)
- Many players, Many beneficiaries, Many initiatives





From satellite data to information



Other data
(aerial
photography,
drones,
sensors, etc)



Smart
Techniques



Useful
Information

Dataspace

The Data Platform Jungle

Copernicus Hubs
Copernicus Services
DIAS > (DAS)
TEP's
CGS
Data Cubes
GEE/AWS/MS
EOSC
(DestinE)





Why it doesn't work today?

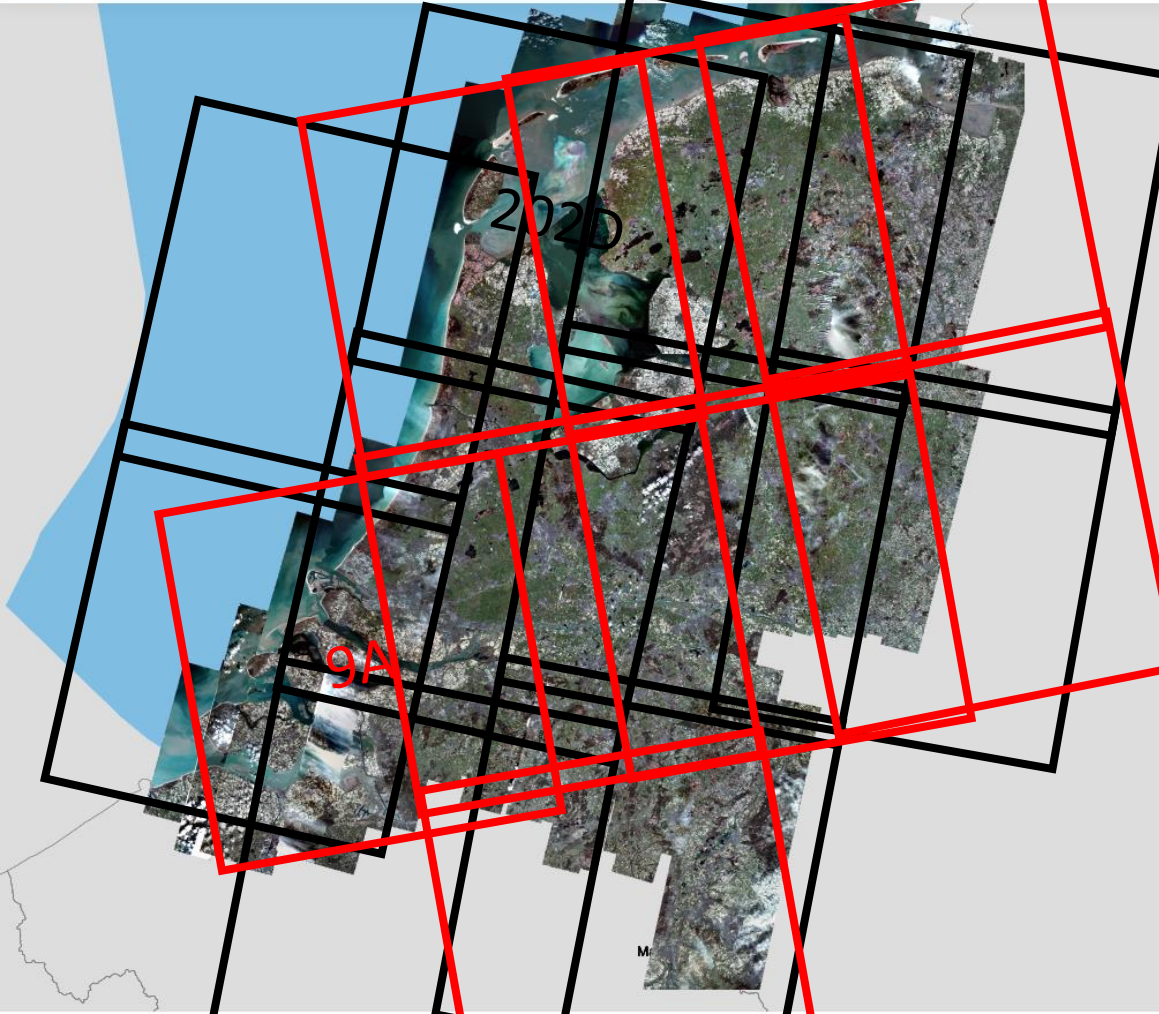
- Policy / Vision: **Lack of policy**, vision, strategy w.r.t the use of Earth observation; **refer to other measurement techniques**; stands in the way of innovations
- Innovations: Use of space data is seen as innovation, **lack of opportunities** to match supply and demand
- User friendliness: Products and services **not directly suitable**, need for (calibrated and validated) information;
- Data: **Combination with other data sources** (geo, in-situ, ..) causes problems (standardization, metadata, quality, ..); central access/purchasing is missing, delays in delivery, not always open data
- Infrastructure: **Computing capacity, embedding in operational systems**, combining with other data sources



How can it work tomorrow?

- By setting up a federative ecosystem which brings together supply and demand but also data and algorithms
- Allowing innovations, product- and service development and deployment
- Stimulating quadruple helix collaboration (science-government-industry-citizens)

- Current examples ->



Satellite data portal

Optical data:

6x per year at 30cm

Radar data:

15 x per year at 5 meter

Every 12-24 days

- Freely available for Dutch users
- Data since 2012
- Continued until May 2025

www.satellietdataportaal.nl

Browser

Login



VISUALIZE

SEARCH

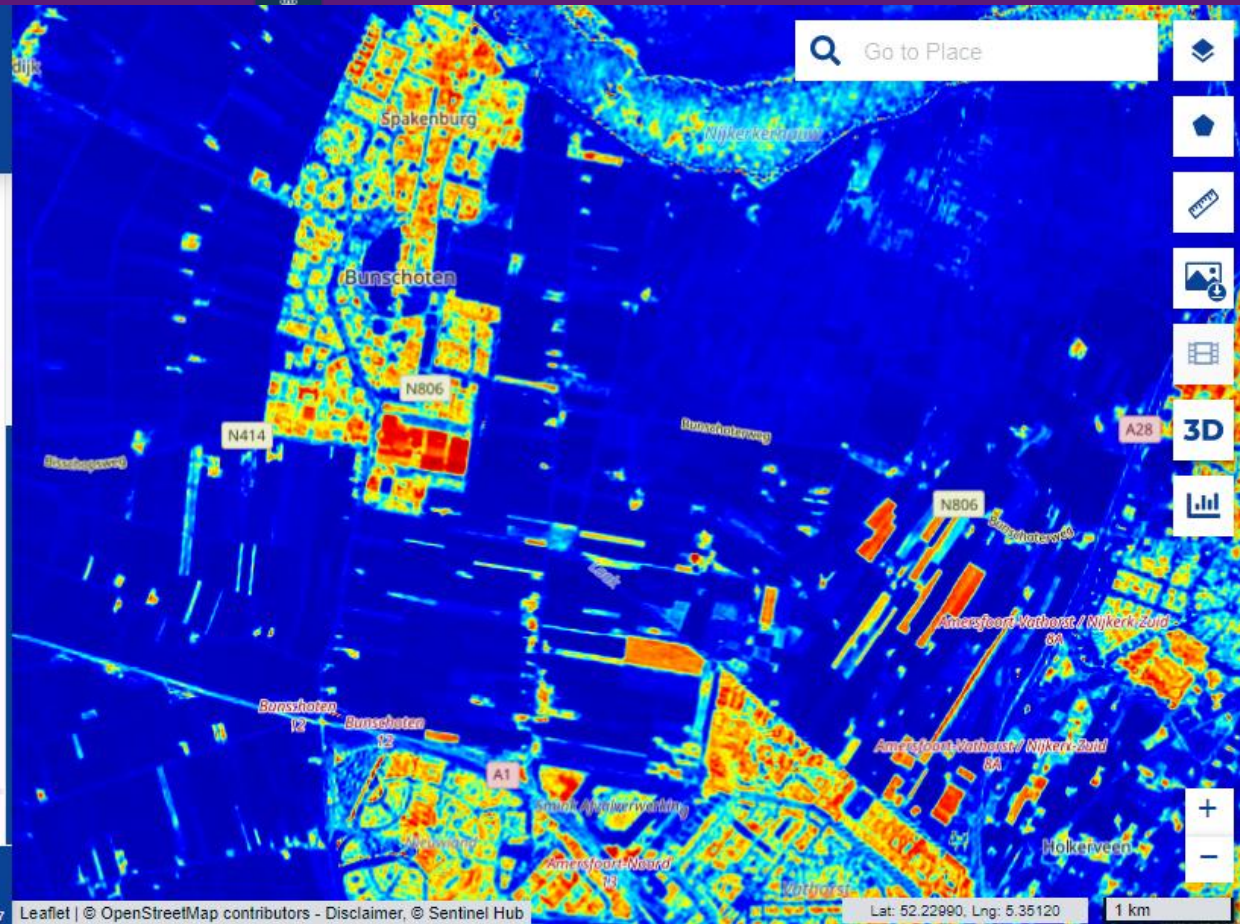
- Highlight Optimized Natural Color**
Enhanced natural color visualization
- NDVI**
Based on a combination of bands $(B8 - B4)/(B8 + B4)$
- False color (urban)**
Based on bands 12,11,4
- Moisture index**
Based on a combination of bands $(B8A - B...$ + Add to </> ⌵
- SWIR**
Based on bands 12,8A,4
- NDWI**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

Show effects and advanced options

Hide layer

Share

Go to Place



- Layers icon
- Home icon
- Fullscreen icon
- Print icon
- Image overlay icon
- Timeline icon
- 3D icon
- Stats icon

+
-

Layers

You are now looking at **Sentinel 2**



Sentinel 2 - NDVI

NDVI describes the greenness of vegetation



Sentinel 2 - LAI

LAI show the amount of green leaf area per square meter ground surface



Sentinel 2 - FCOVER

FCOVER is the fraction of ground surface which is covered by vegetation



Sentinel 2 - CHL



Anomaly Det... VITO

Regional Benchmarking using CropSAR

Incubating



BFASTmonitor Wageningen U...

Breakpoint detection in Sentinel-2 NDVI using BFAST Monitor

Prototype



Biomass VITO

Dry Matter Productivity represents overall growth rates

Incubating



BIOPAR VITO

Bio Physical Parameters

Validated



Crop Calendar VITO

Identifies a past harvest date for geometries

Incubating



CropSAR VITO

Monitor crop growth and health from space

Validated



Crop Type Cl... VITO

Crop Type prediction model

Prototype



MSI VITO

Moisture Stress Index

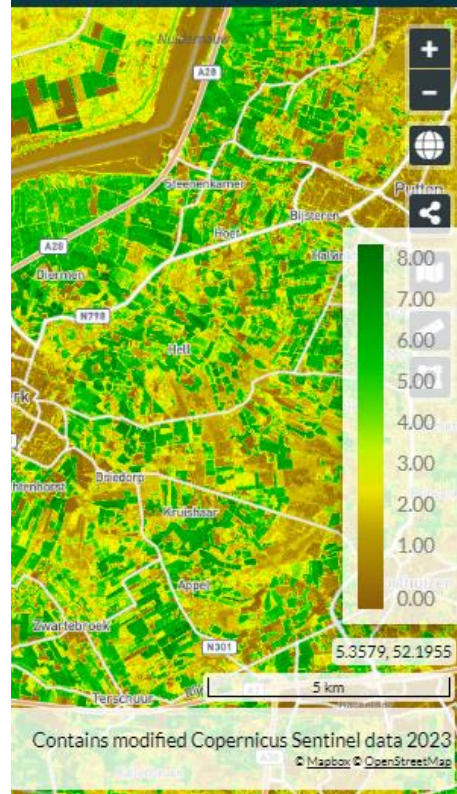
Validated



NBR VITO

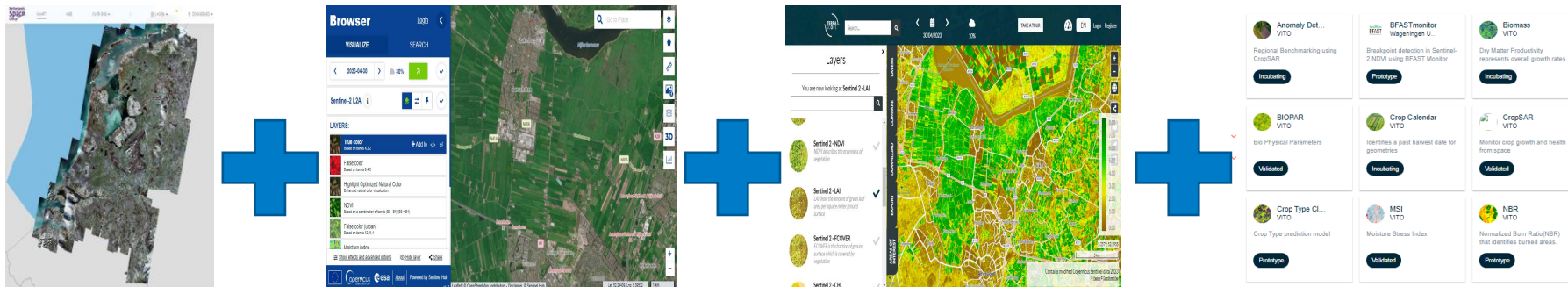
Normalized Burn Ratio(NBR) that identifies burned areas.

Prototype





Satellite based dataspace



Other data
(aerial
photography,
drones,
sensors, etc)

Smart
Techniques



Bij spoed: 112

Geen spoed: 0900-8844

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Welkom bij iLab

In het Innovatielab (iLab) werkt de politie aan nieuwe oplossingen voor veranderende veiligheidsuitdagingen. Met behulp van innovatieve technologie en door samen te werken met andere eenheden en diensten binnen de politieorganisatie én met onderwijsorganisaties, bedrijven en kennisinstellingen. Zo bouwen we samen aan de politie van de toekomst.



Wrap up

- NSO “vision”:
 - Generation of ideas on how to set up a federative ecosystem
 - Using all on-going activities (labs, hubs, ..) in NL and beyond
 - Bringing together parties, data and algorithms
 - Keeping data and algorithms at the source
 - Being a platform for supply and demand
 - Not reinventing the wheel
- To deliver the satellite based dataspace as part of a larger dataspace

Discussion

Any ideas? Do not
hesitate to contact me at
w.looijen@spaceoffice.nl

