



# **NPA's R&D activities for more effective implementation of Lithuania's CAP Strategic Plan**



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CTO / COO

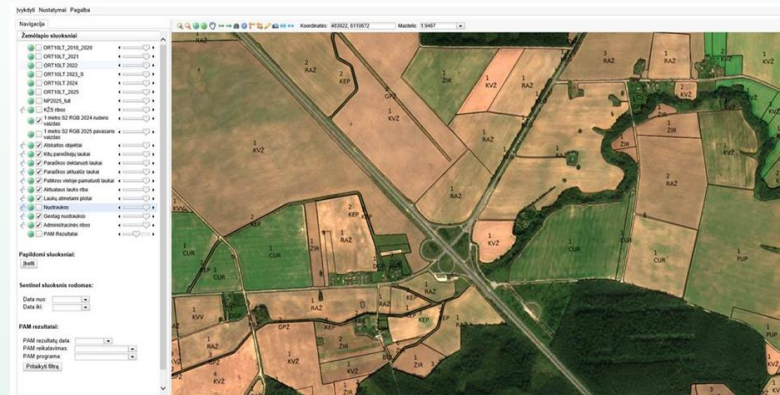
# 0. AREA MONITORING SYSTEM

- 0.1. S1/2 MARKERS FOR SPECIFIC LAND USE OR AGRICULTURAL ACITIVITY ([Operational](#))
- 0.2. AUTOMATIC DELINEATION OF PARCEL BOUNDARIES ([Operational](#))
- 0.3. S2 ENHANCED 1-METER RESOLUTION IMAGES ([Operational](#))
- 0.4. AUTOMATIC LPIS LAND COVER CLASSIFICATION ([In progress](#))
- 0.5. CROP AND OBJECT AUTO-CLASSIFICATION FROM GEOTAGGED-PHOTOS ([In progress](#))



# 0.2. AUTOMATIC DELINEATION OF PARCEL BOUNDARIES

- Lithuania: 3-year contract (2024-2026)
- Value 390 000 EUR
- Sentinel-2 enhanced 1 metre resolution 2 full country cloud/snow free images:
  - o Spring data period 15 March to 15 May, provided until 15 June
  - o Autumn data period 5 August to 31 October, provided until 1 December
- 1 set of automatically delineated parcels boundaries (>0.4 ha fields), on autumn images, eligible LPIS area, provided until 31 December
- Quality of at least 95%, calculated in randomly selected fields
- Using suppliers own solution (methodology, application, infrastructure)
- The layers provided comply with OGC API standards: WMS or WMTS types of electronic map services, also provided as a shape file
- Both data sets uploaded into GSAA for farmers as suggestions and NPA mobile application, also used for LPIS update and execute controls

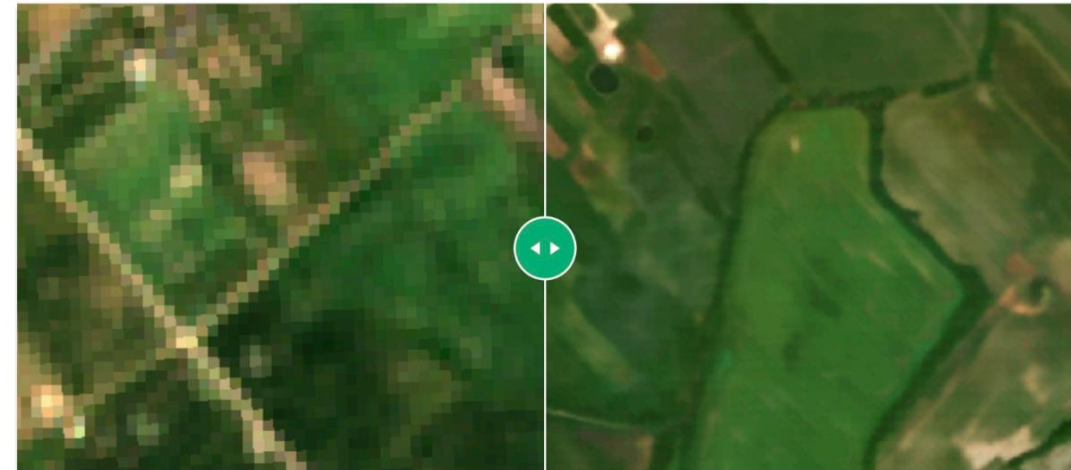


# 0.3. S2 ENHANCED 1-METER RESOLUTION IMAGES

## - INTERREG LATVIA - LITHUANIA "OASIS"



Super-resolution of Sentinel-2 from 10 meter to 1 meter



Enable more effective use of earth observation and artificial intelligence to improve agriculture, land monitoring and public sector services

Reduce mistakes, penalties and inspections

Integrate AI tool (on-demand service) into PA's GIS

Open data

Involve other sectors



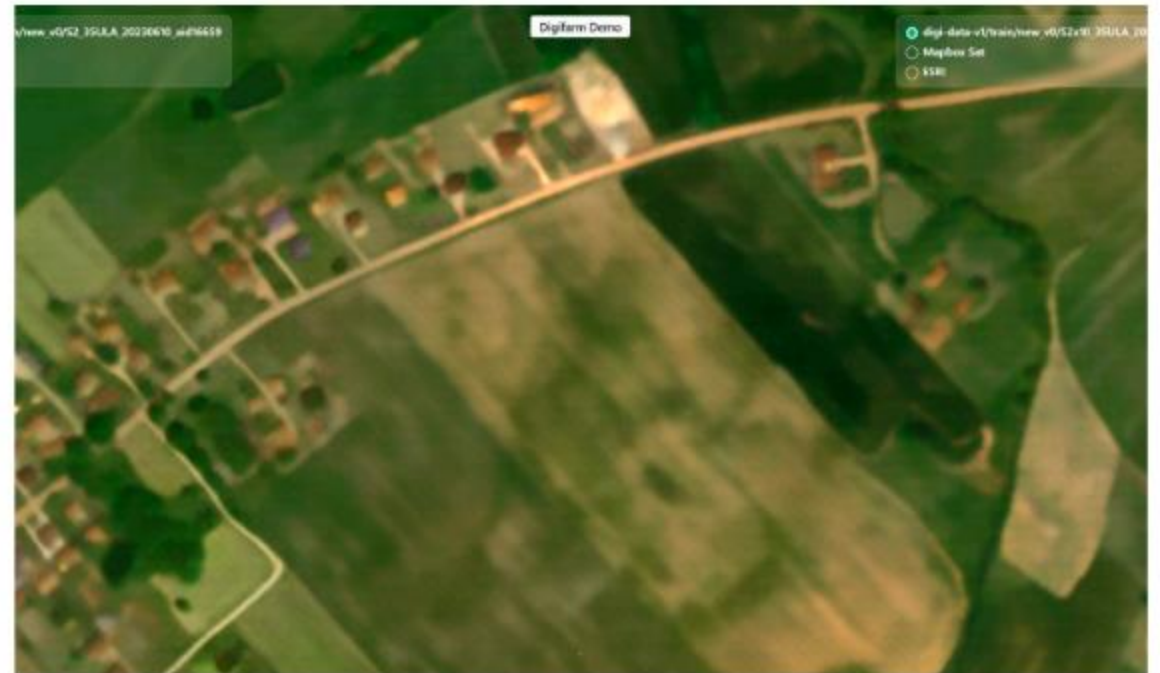
# 0.3. S2 ENHANCED 1-METER RESOLUTION IMAGES

## Deep Resolution S2 | S2 at 10m vs DRV40 Comparison | Lithuania 🇱🇻

Original Sentinel-2 10m



DRV40



# 0.3. S2 ENHANCED 1-METER RESOLUTION IMAGES

## Deep Resolution S2 | S2 at 10m vs DRV40 Comparison | Latvia 🇱🇻

Original Sentinel-2 10m

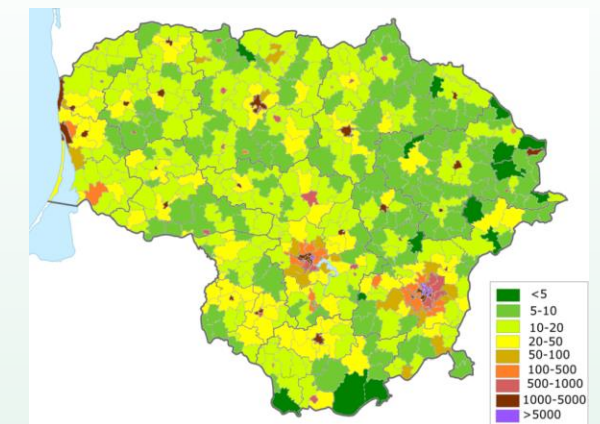
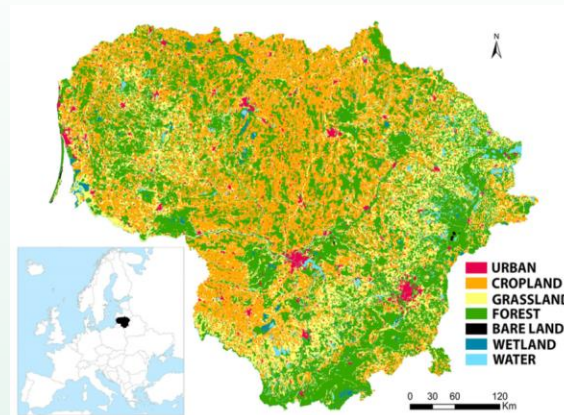


DRV40



# 0.4. AUTOMATIC LPIS LAND COVER CLASSIFICATION

BELGIUM-FLANDERS CODE	ArcGIS TOOLS	ArcGIS TOOLS-2	Recovery and Resilience Facility (RRF) project
30-50 %	75 %	80-95 %	>80% (expected)
Training done	Training done	Training done	Training done
Input orthophoto → <a href="#">Flanders phyton code</a> → shape file results	Input orthophoto → ArcMap ML classify → raster layer results	Input orthophoto → ArcGIS Pro Detect → shape file results	Input orthophoto → LPIS extent → Segmentation → shape file results
6 classes	8 classes	2 classes	Custom pixel values



# 0.5. CROP AND OBJECT AUTO-CLASSIFICATION FROM GEOTAGGED-PHOTOS

HORIZON NIVA PROJECT	VILNIUS PLAN	CHATGPT-5	ESA FUSSION PROJECT
89 %	92 %	98 %	-
Training done	Training done	No training	Training needed
Workflow had to be established	Workflow had to be established	Manual upload, clear results table, exportable as CSV, but limited to 10 photos at a time	Workflow has to be established

Vegetables, fruits and berries (15 types)



36555-nuotrauka-1\_onion\_0.99



36770-nuotrauka-1\_strawberry\_0.97



36178-nuotrauka-1\_cabbage\_0.99



38097-nuotrauka-4\_blueberry\_0.93



37208-nuotrauka-1\_strawberry\_0.45



36328-nuotrauka-2\_onion\_1.0

# 1. AREA MONITORING & SENSORS SYSTEM

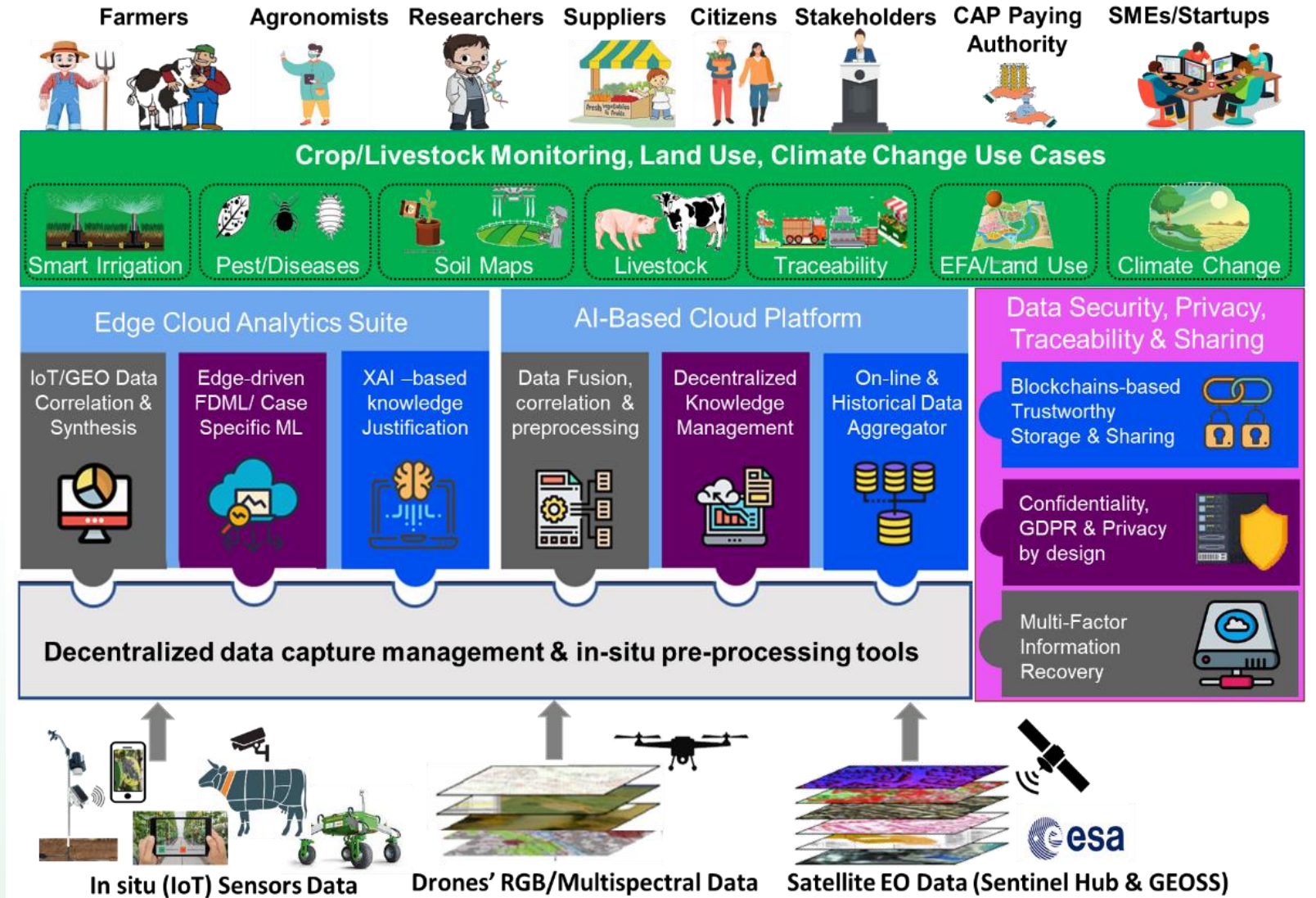
## - HORIZON EUROPE “AGRIDATAVALUE”



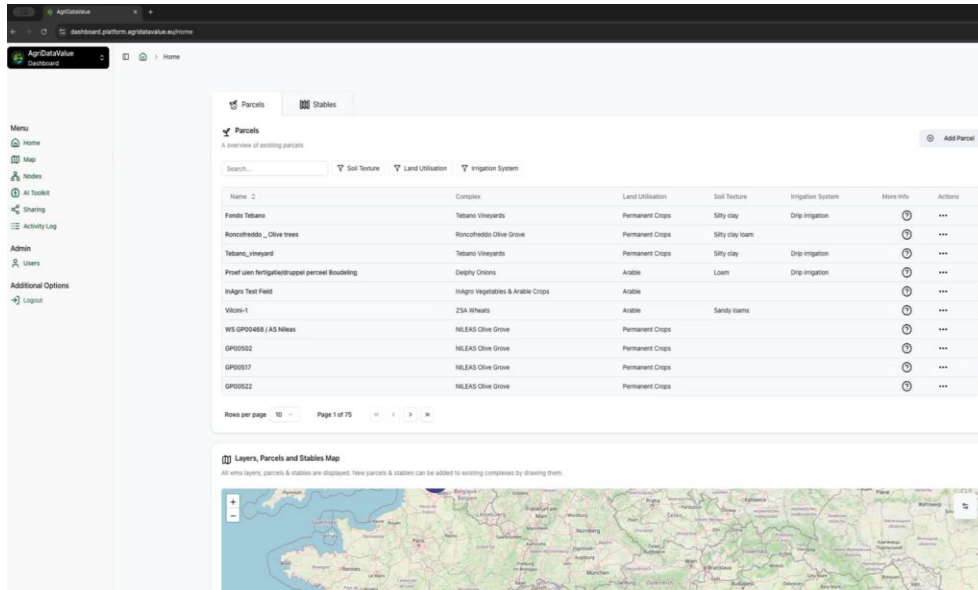
AgriDataValue



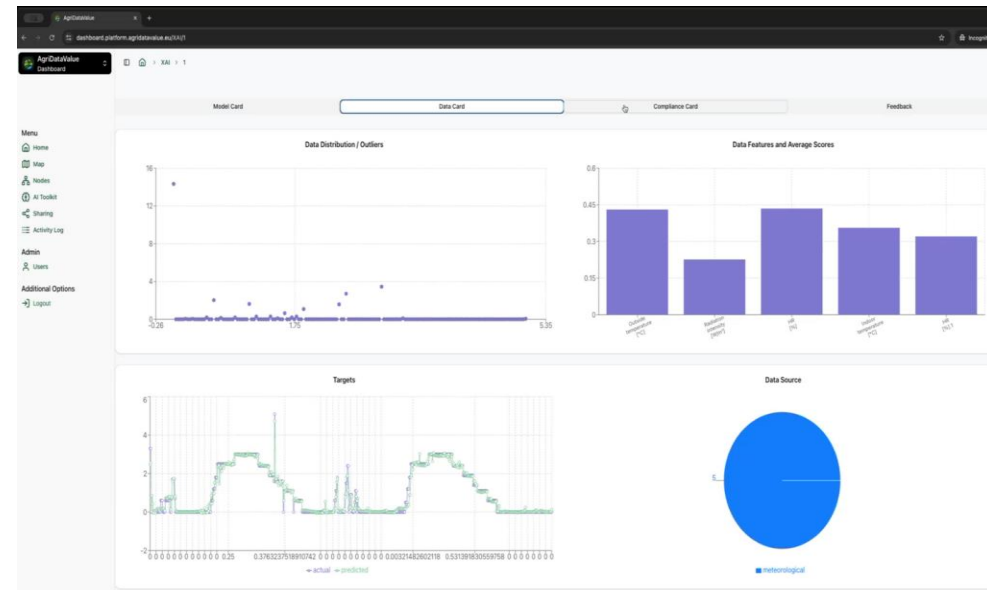
Focused on advancing digital transformation and agri-environmental monitoring in agriculture with the aim to create an innovative, distributed platform for smart farming, using big data to optimize production, enhance environmental sustainability, and ensure fair income for farmers.



# 1. AREA MONITORING & SENSORS SYSTEM



Name	Complex	Land Utilisation	Soil Texture	Irrigation System	More info	Actions
Fondo Tebano	Tebano Vineyards	Permanent Crops	Silty clay	Drip Irrigation		
Roncoheddi_Olive trees	Roncoheddi Olive Grove	Permanent Crops	Silty clay loam			
Tebano_vineyard	Tebano Vineyards	Permanent Crops	Silty clay	Drip Irrigation		
Prof di san fertighedduppal permed Boudling	Dephy Olives	Arable	Loam	Drip Irrigation		
ItAgro Test Field	ItAgro Vegetables & Arable Crops	Arable				
Vicos-1	ZSA Wheats	Arable	Sandy loams			
WS GP00468 / AS Nilvas	NILEAS Olive Grove	Permanent Crops				
GP00502	NILEAS Olive Grove	Permanent Crops				
GP00517	NILEAS Olive Grove	Permanent Crops				
GP00522	NILEAS Olive Grove	Permanent Crops				



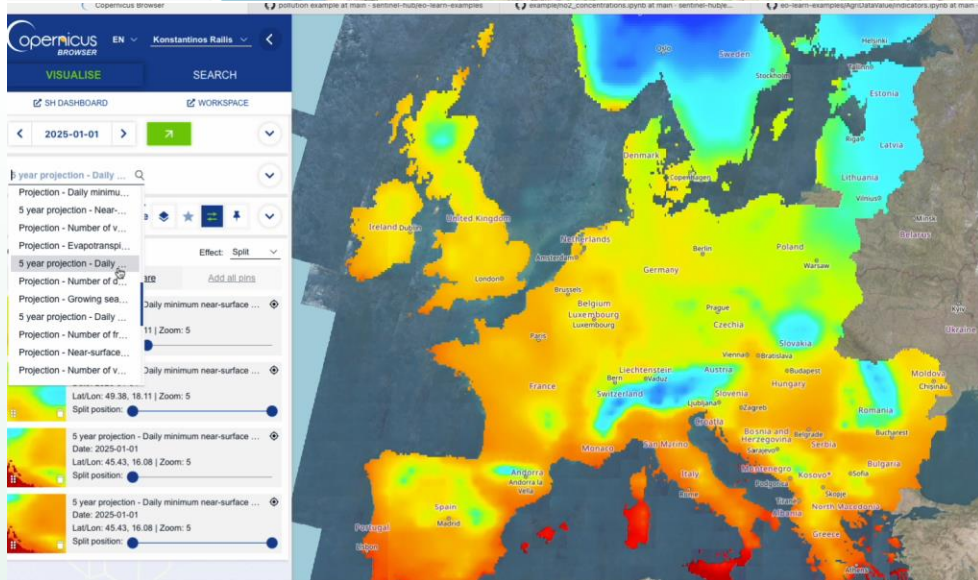
Model Card | Data Card | Compliance Card | Feedback

Data Distribution | Outliers

Data Features and Average Scores

Targets

Data Source



opernicus browser

EN Konstantinos Rallis

VISUALISE SEARCH

SH DASHBOARD WORKSPACE

2025-01-01

Projection - Daily minimum near-surface ...

5 year projection - Daily minimum near-surface ...

Projection - Number of frost days (Tmin < 0°C)

Projection - Evapotranspiration ...

5 year projection - Daily minimum near-surface ...

Projection - Growing season ...

5 year projection - Daily minimum near-surface ...

Projection - Number of frost days (Tmin < 0°C)

Projection - Near-surface ...

Projection - Number of frost days (Tmin < 0°C)

Projection - Daily minimum near-surface ...

5 year projection - Daily minimum near-surface ...

Date: 2025-01-01

LatLon: 45.43, 16.08 | Zoom: 5

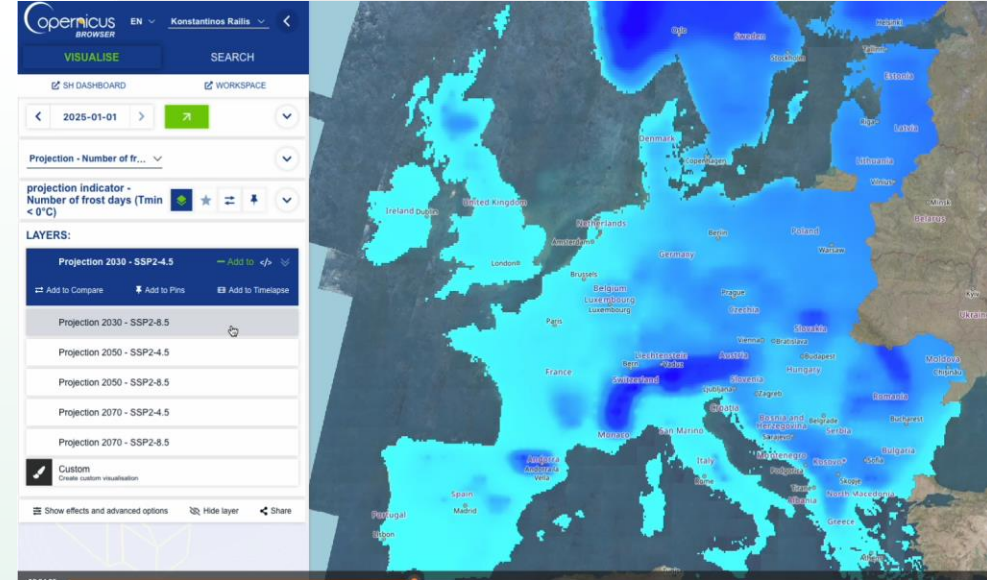
Split position: ...

5 year projection - Daily minimum near-surface ...

Date: 2025-01-01

LatLon: 45.43, 16.08 | Zoom: 5

Split position: ...



opernicus browser

EN Konstantinos Rallis

VISUALISE SEARCH

SH DASHBOARD WORKSPACE

2025-01-01

Projection - Number of frost days (Tmin < 0°C)

projection indicator - Number of frost days (Tmin < 0°C)

LAYERS:

- Projection 2030 - SSP2-4.5
- Projection 2030 - SSP2-4.5
- Projection 2050 - SSP2-4.5
- Projection 2050 - SSP2-4.5
- Projection 2070 - SSP2-4.5
- Projection 2070 - SSP2-4.5

Custom

Show effects and advanced options | Hide layer | Share

## 2. AREA & CLIMATE CHANGE MONITORING SYSTEM

- Identification and monitoring of floods, draughts and forest fires
- Identification of land areas affected by soil erosion
- Identification of fertilizer runoff risk zones
- Assessment of soil moisture
- Assessment of crop damages (due to summer storms)
- Calculation of crop yield zones and forecasting of yield
- Calculation of organic carbon and clay content

Projects (platforms, based on Sentinel data):

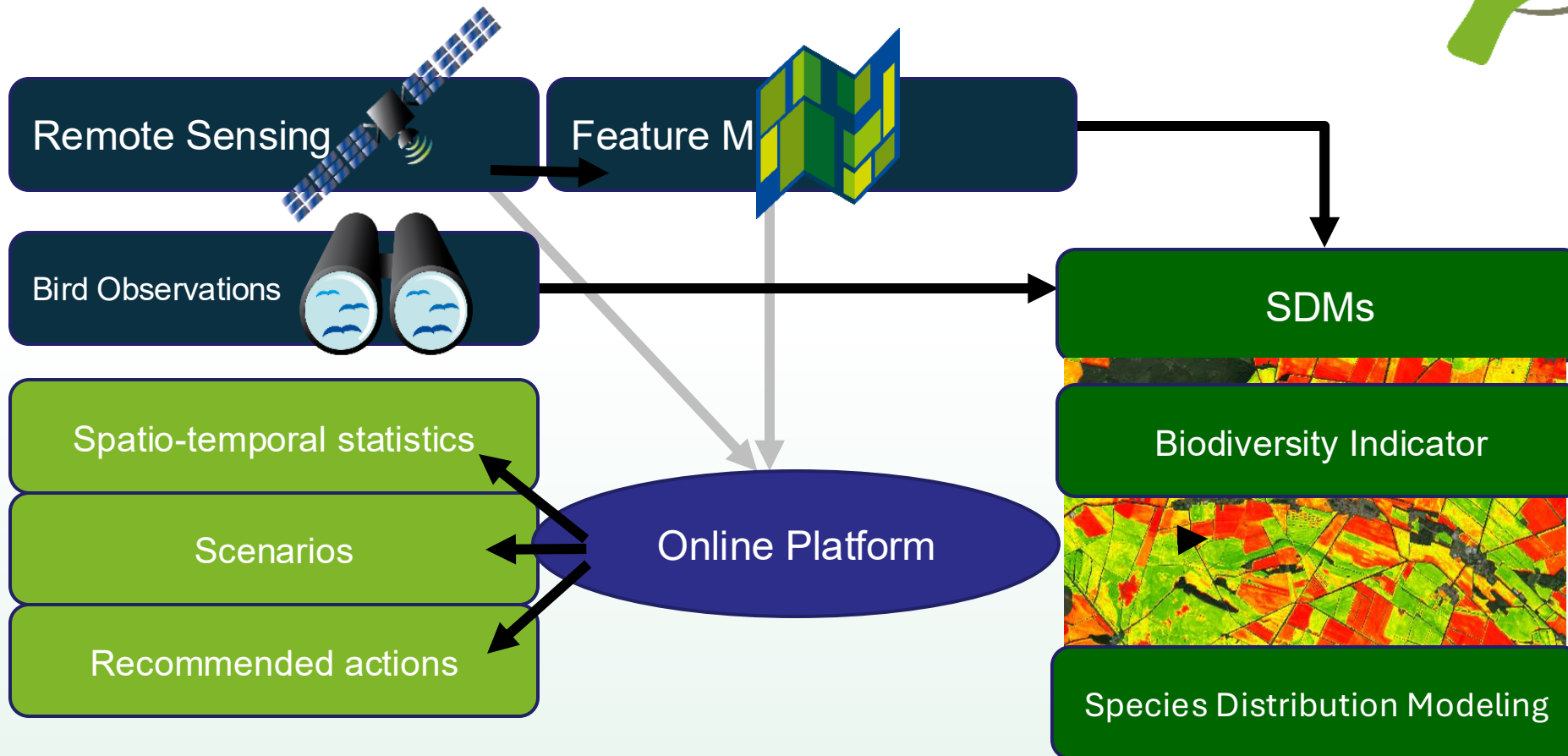
- **The Recovery and Resilience Facility Fund “AMS 2.0”**
- [HORIZON 2020 "ENVISION"](#)
- [HORIZON 2020 “EIFFEL”, platform](#)





# 3. AREA MODELING & MONITORING SYSTEM

- HORIZON EUROPE “BIRDWATCH”
- VIDEO & BIRDS



# 3. AREA MODELING & MONITORING SYSTEM

## Target Bird Species

We selected ten bird species from the european [Farmland Bird Index \(FBI\)](#) to begin with. The choice is based on the abundance in our test areas. Additionally we wanted to cover as diverse habitats as possible. These are the first species for which BirdWatch will generate results:



**Eurasian Skylark**  
*Alauda arvensis*  
Peter Kennerley  
20 May 2020  
Suffolk, England, United Kingdom  
CornellLab  
Macaulay Library ML 237452191  
eBird S69357175



**Yellowhammer**  
*Emberiza citrinella*  
Nigel Voaden  
15 Dec 2017  
Fife, Scotland, United Kingdom  
CornellLab  
Macaulay Library ML 78557031  
eBird S41099811



**Whinchat**  
*Saxicola rubetra*  
Ian Davies  
7 Jun 2015  
South Karelia, Finland  
CornellLab  
Macaulay Library ML 42408031  
eBird S23811415



**Northern Lapwing**  
*Vanellus vanellus*  
Yann Kolbeinsson  
1 Feb 2016  
Norðurland eystra, Iceland  
CornellLab  
Macaulay Library ML 23897261  
eBird S27247900



**Meadow Pipit**  
*Anthus pratensis*  
Anne Carrington-Cotton  
9 Jun 2014  
Stirling, Scotland, United Kingdom  
CornellLab  
Macaulay Library ML 204922651  
eBird S65081540



**European Turtle-Dove**  
*Streptopelia turtur*  
Marc FASOL  
4 Jul 2018  
Ávila, Castilla y León, Spain  
CornellLab  
Macaulay Library ML 204972991  
eBird S65086849



**Red-backed Shrike**  
*Lanius collurio*  
Patrick J. Blake  
8 May 2016  
Bursa, Türkiye  
CornellLab  
Macaulay Library ML 28345901  
eBird S29484468



**Black-tailed Godwit**  
*Limosa limosa*  
Khemthong Tonsakulrungruang  
15 Apr 2015  
Samut Sakhon, Thailand  
CornellLab  
Macaulay Library ML 78879151  
eBird S22940842

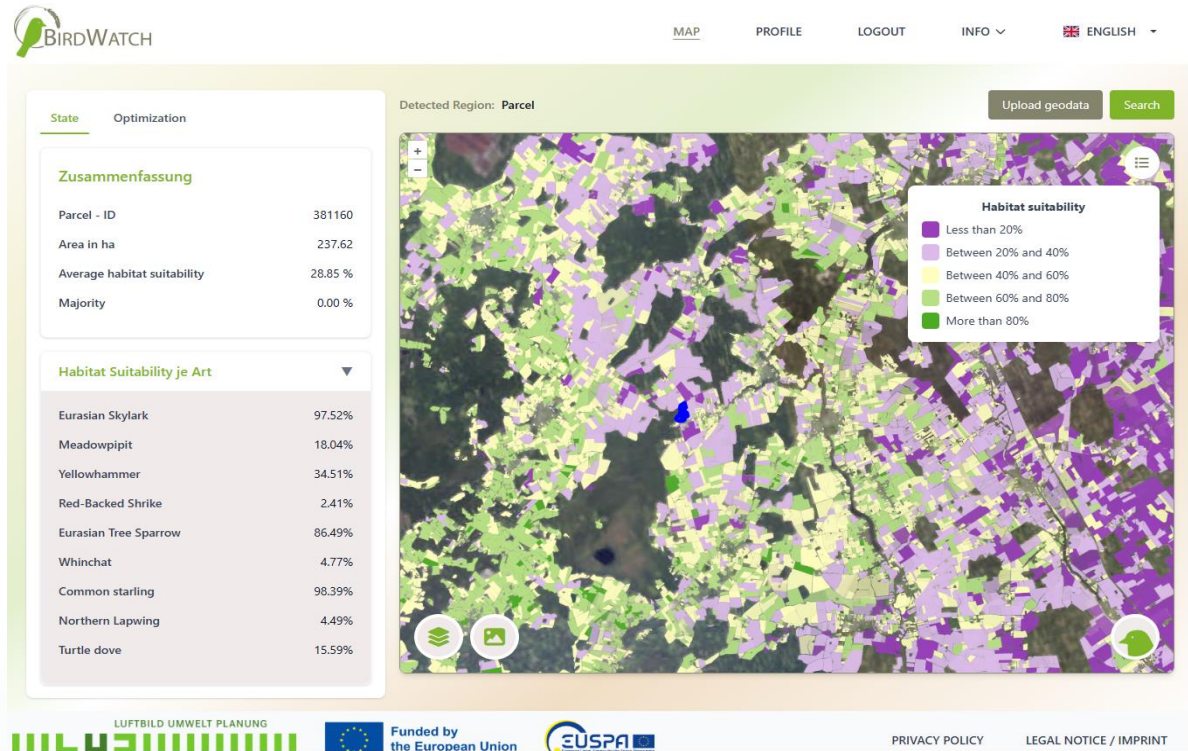


**Eurasian Tree Sparrow**  
*Passer montanus*  
Pavel Štěpánek  
22 Dec 2017  
Jihomoravský kraj, Czech Republic  
CornellLab  
Macaulay Library ML 204609651  
eBird S64998877



**European Starling**  
*Sturnus vulgaris*  
Josep del Hoyo  
18 May 2019  
Dobrich, Bulgaria  
CornellLab  
Macaulay Library ML 205138871  
eBird S64823144

# 3. AREA MODELING & MONITORING SYSTEM

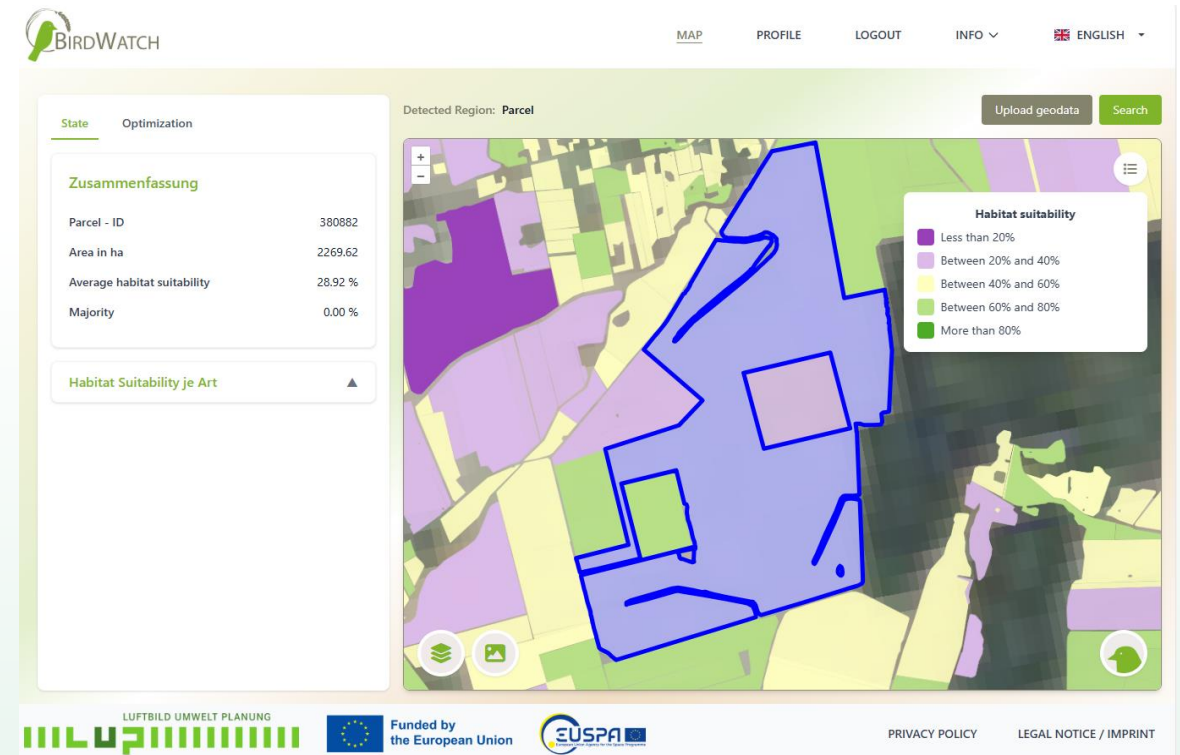


• Which eco-schemes are most suitable to increase the habitat suitability?

• What could be the financial outcome?

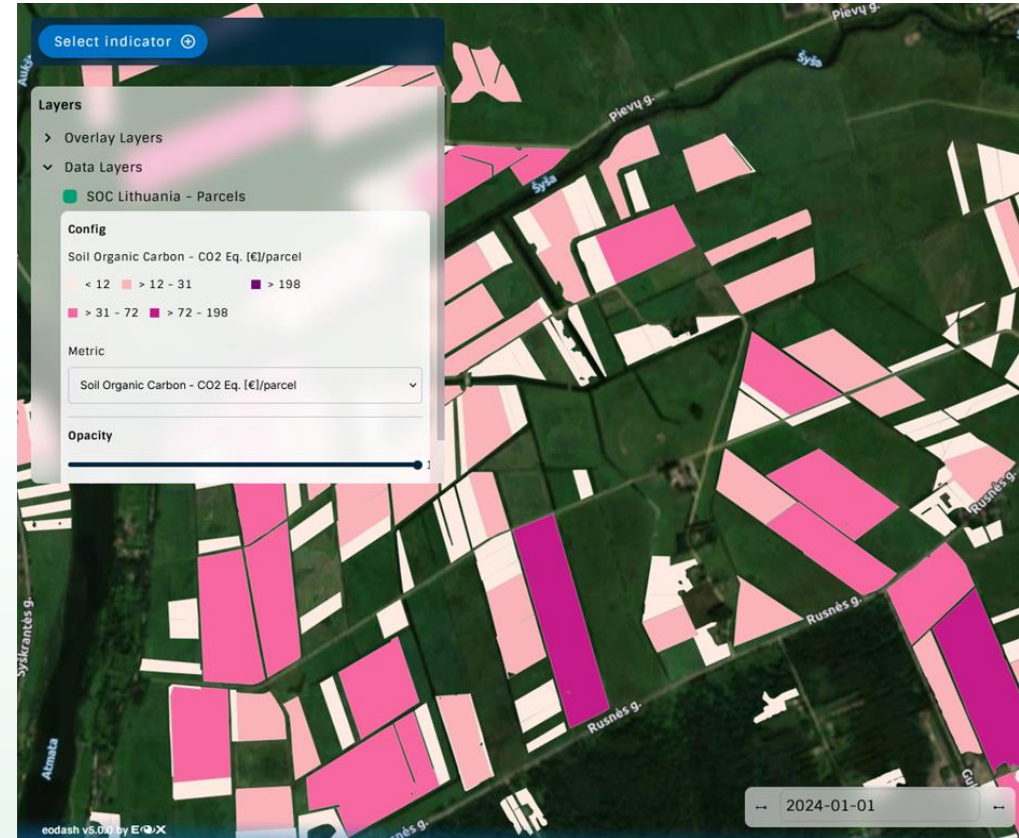
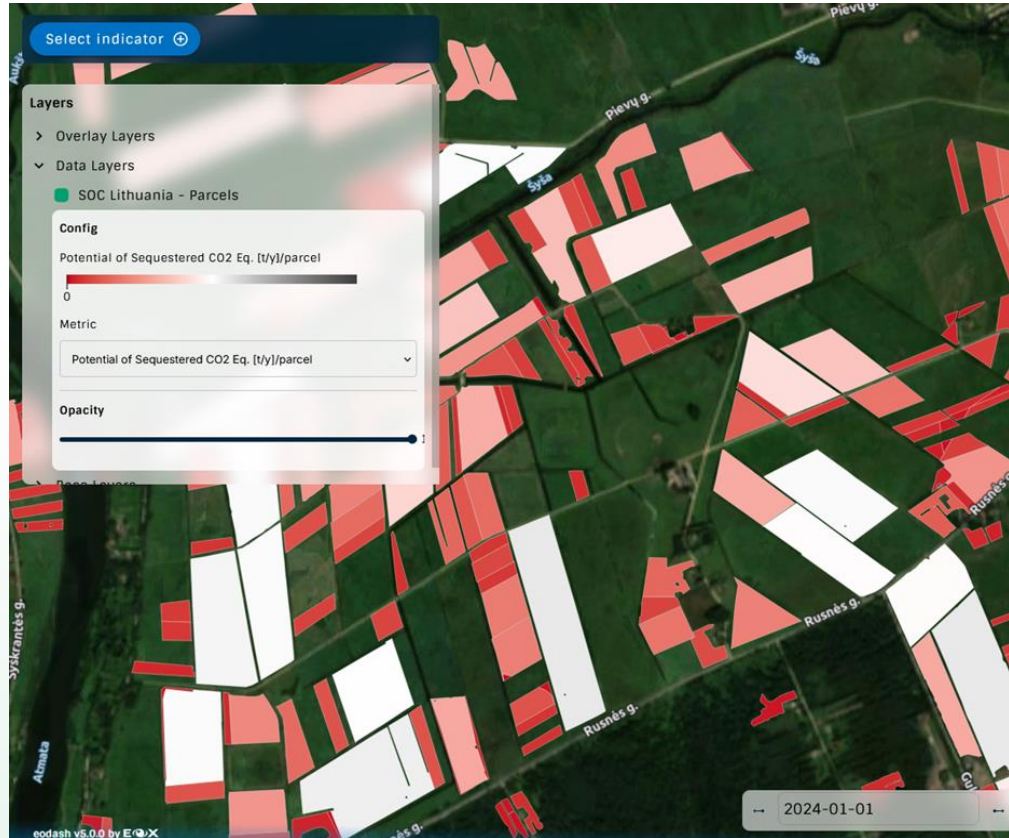
• What is the current state of habitat suitability on my parcels, in my region or in whole Lithuania?

• What can I do to increase the state of habitat suitability for a specific bird?





## Lithuanian use case of Natural Capital Solutions management Dashboard to present Carbon & Biodiversity accounting



# 4. AREA MONITORING & CARBON CREDITS SYSTEM

## - LIFE “GREEN FARM FOR LIFE”



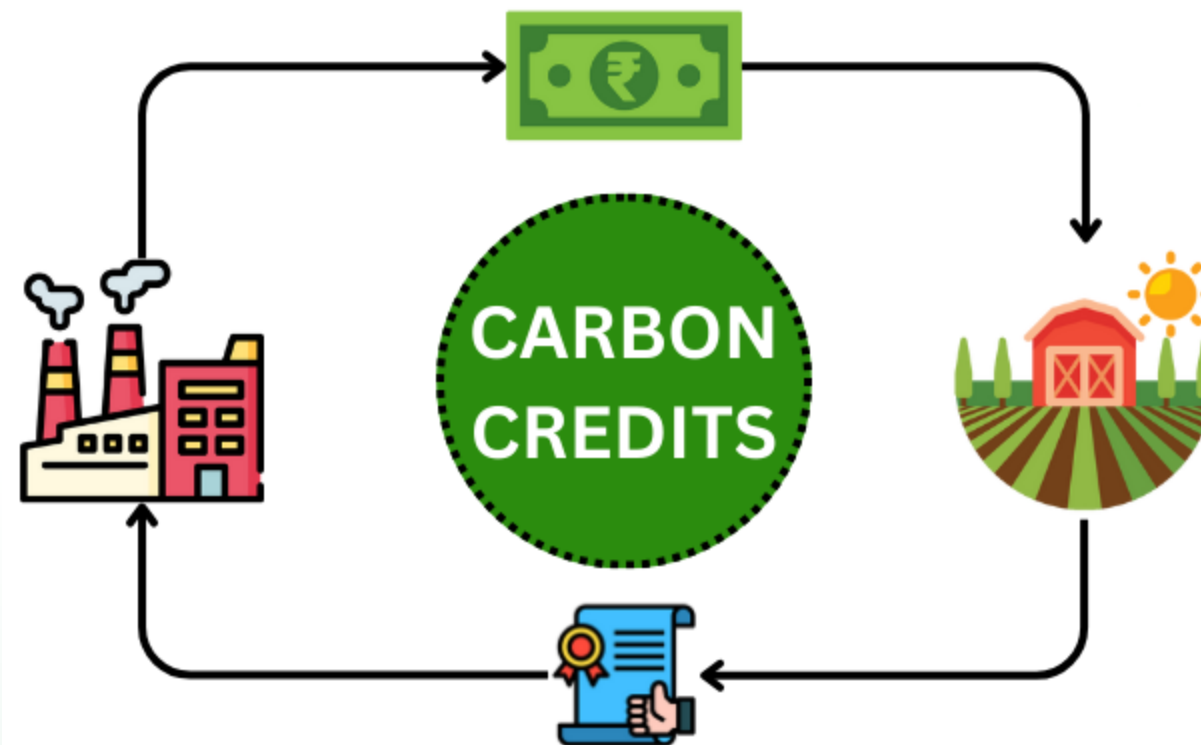
Develop, pilot and validate more accurate and reliable assessment and reporting of GHG in agriculture, forestry and other land use (AFOLU) sector at local (farm), regional and national levels



Design a framework for a national carbon absorption certification - develop and pilot a common technological infrastructure and Carbon Register for GHG balance monitoring, accounting, data exchange and governance



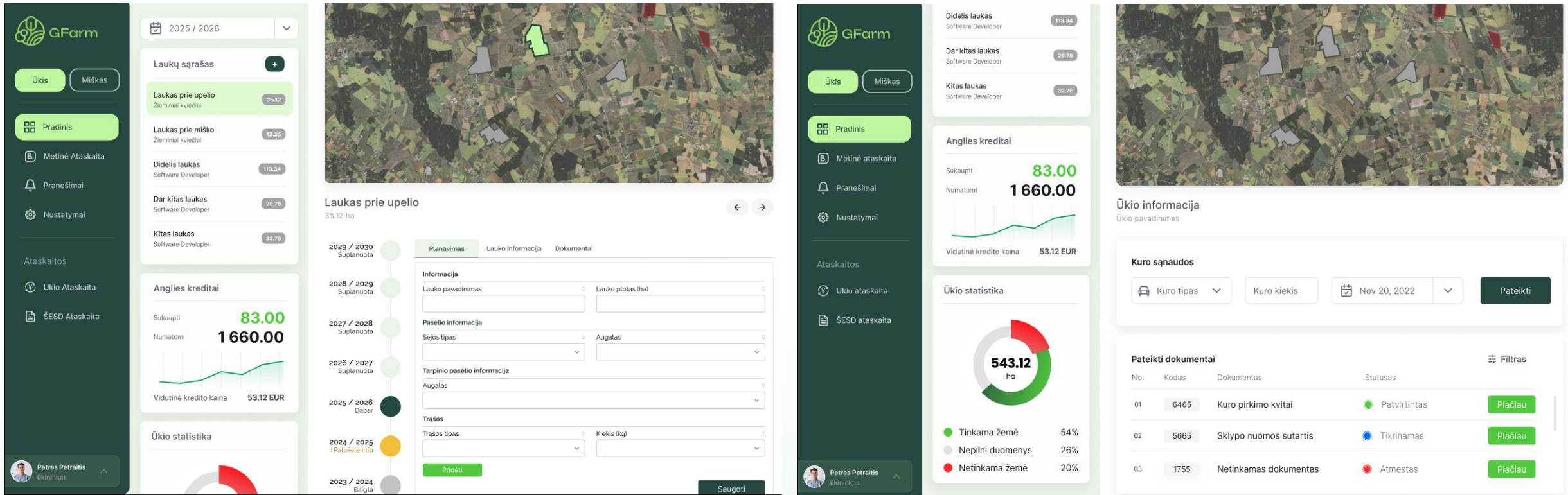
Engage policy makers and other stakeholders to develop and adapt Lithuania's national GHG assessment and Carbon Removal Certification strategy, identify future regulatory requirements, processes, needs and responsibilities, including the incentives for farmer behavioral change



Co-funded by  
the European Union



# 4. AREA MONITORING & CARBON CREDITS SYSTEM



The screenshot displays the GFarm web application interface, which is divided into several sections for area monitoring and carbon credits management.

**Left Sidebar (Navigation):**

- Logo: GFarm
- Buttons: Ūkis, Miškas
- Pradinis
- Metinė Ataskaita
- Pranešimai
- Nustatymai
- Ataskaitos
- Ūkio Ataskaita
- ŠESD Ataskaita
- User profile: Petras Petraitis, ūkininkas

**Top Panel (Date and List):**

- Date: 2025 / 2026
- Laukų sąrašas (+)
- Laukas prie upelio (35.12)
- Laukas prie miško (12.25)
- Didelis laukas (113.34)
- Dar kitas laukas (26.78)
- Kitas laukas (32.78)

**Map View:**

- Aerial map showing land parcels with a green outline highlighting a specific area.
- Label: Laukas prie upelio, 35.12 ha

**Right Panel (Summary and Statistics):**

- Didelis laukas (113.34)
- Dar kitas laukas (26.78)
- Kitas laukas (32.78)
- Anglies kreditai: Sukaupti 83.00, Numatomi 1 660.00, Vidutinė kredito kaina 53.12 EUR
- Ūkio statistika: 543.12 ha (Tinkama žemė 54%, Nepilni duomenys 26%, Netinkama žemė 20%)

**Form Section (Planavimas / Lauko informacija / Dokumentai):**

- Informacija: Lauko pavadinimas, Lauko plotas (ha)
- Pasėlio informacija: Sėjos tipas, Augalas
- Tarpinio pasėlio informacija: Augalas
- Trašos: Trašos tipas, Kiekis (kg)
- Buttons: Pridėti, Saugoti

**Bottom Right Panel (Kuro sąnaudos / Pateikti dokumentai):**

- Kuro sąnaudos: Kuro tipas, Kuro kiekis, Nov 20, 2022, Pateikti
- Pateikti dokumentai table:

No.	Kodas	Dokumentas	Statusas	Buttons
01	6465	Kuro pirkimo kvitai	Patvirtintas	Plačiau
02	5665	Sklypo nuomos sutartis	Tikrinamas	Plačiau
03	1755	Netinkamas dokumentas	Atmestas	Plačiau

# 4. CARBONDIGIPARD PROJECT



## Erasmus+

### Reducing Carbon Footprint in IPARD Investments

Methodology to calculate / evaluate carbon footprint

Carbon calculation tool

IPARD projects carbon map

Demonstrations & Trainings

E-learning platform

Policy recommendations



# 5. PROMOTION OF SOLAR ENERGY

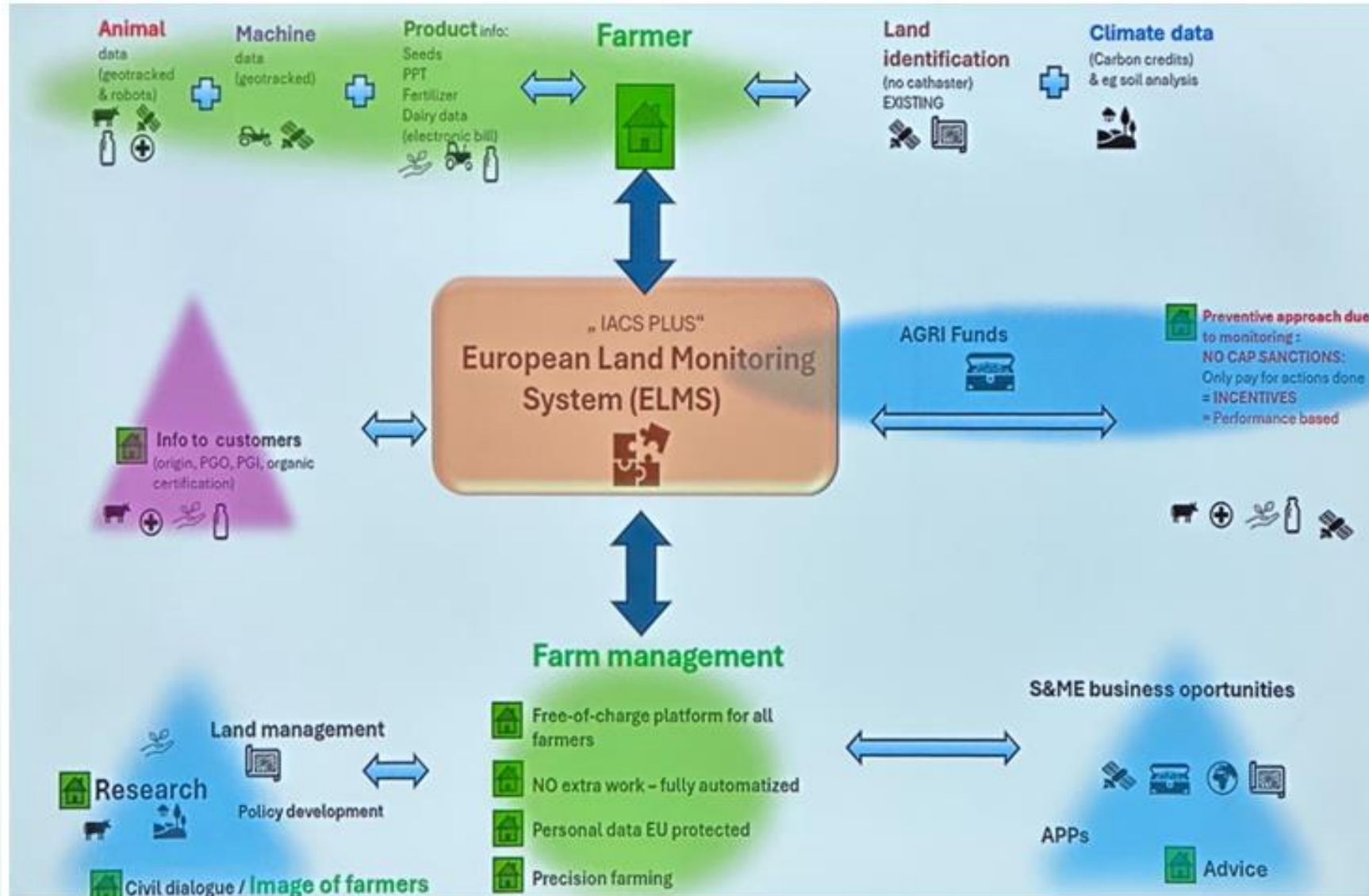
## - INTERREG EUROPE "EAGER"



Improve policies to ease APV in Europe through enabling the definition and set-up of favourable policy framework conditions for implementing APV as a tool for achieving Greener Europe.



# EC IACS VISIONS ---> IACS PLUS




**Thank you for Your attention**



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