IACS data sharing
Achievements

Administrative Arrangement

JRC support

JRC (T1, D3 and D5) Team

27 April 2023

JRC Team for IACS65

T1: J. Escriu (WP1 leader), A. Kotsev, M. Minghini, E. Epure

D3: P. Wojda (project coordinator), S. Scarpa, J. Martín Jiménez, D. De Medici, F. Matthews, D. Vieira, D. De Rosa, C. Schillaci, P. Panagos, A. Jones, L. Montanarella, M. Van Liedekerke

D5: K. Tóth (WP2 leader); P. Milenov, R., G. Baiamonte, R. Vinas Abad (D.1 - contribution)

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We have been working together on:

- **Discoverability** of IACS data and **accessibility**
- **Interoperability** of data sets and services through pilot projects (LULUCF, crop types/yield, statistics, CAP indicators)
- **Demonstration** through practical examples focusing on **soil health**
- **Exploration** and planning on how to use IACS potential, integrating and further analyzing available IACS data
- **Collaboration** with the Member States and other institutional stakeholders

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IACS65 Timeline

- We started in **October 2020**
- Ended of April 2023

- **We have substantially:**
  - Improved IACS data discoverability and interoperability
  - Run pilots and soil health related use cases
  - Collaborated with Member States

WP1 Discoverability and Accessibility

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WP 1. Objectives

- Let stakeholders **easily find**, **access** and **re-use** IACS data through **INSPIRE**
- Demonstrate the added value of the integration of IACS data within an **EU Common Agricultural Data Space**
- Support sharing of IACS data from Paying agencies through standard-based **APIs** (Application Programming Interface) endorsed by INSPIRE

NOTE: WP1 is executed through an AA between ENV.01 and JRC.T1 (AA 35863 EDEN-INSPIRE - Towards a European Data Ecosystem for Environment and sustainability)

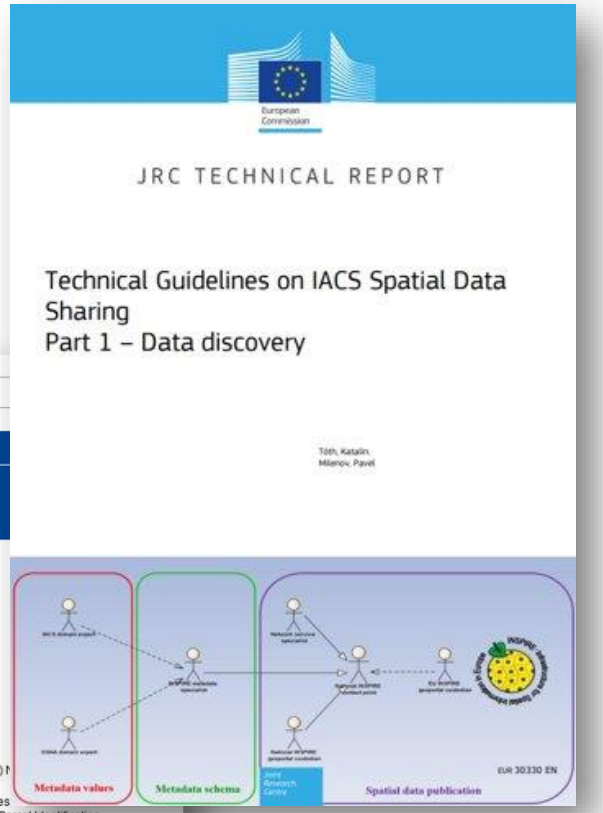
IACS Data discoverability through the INSPIRE Geoportal

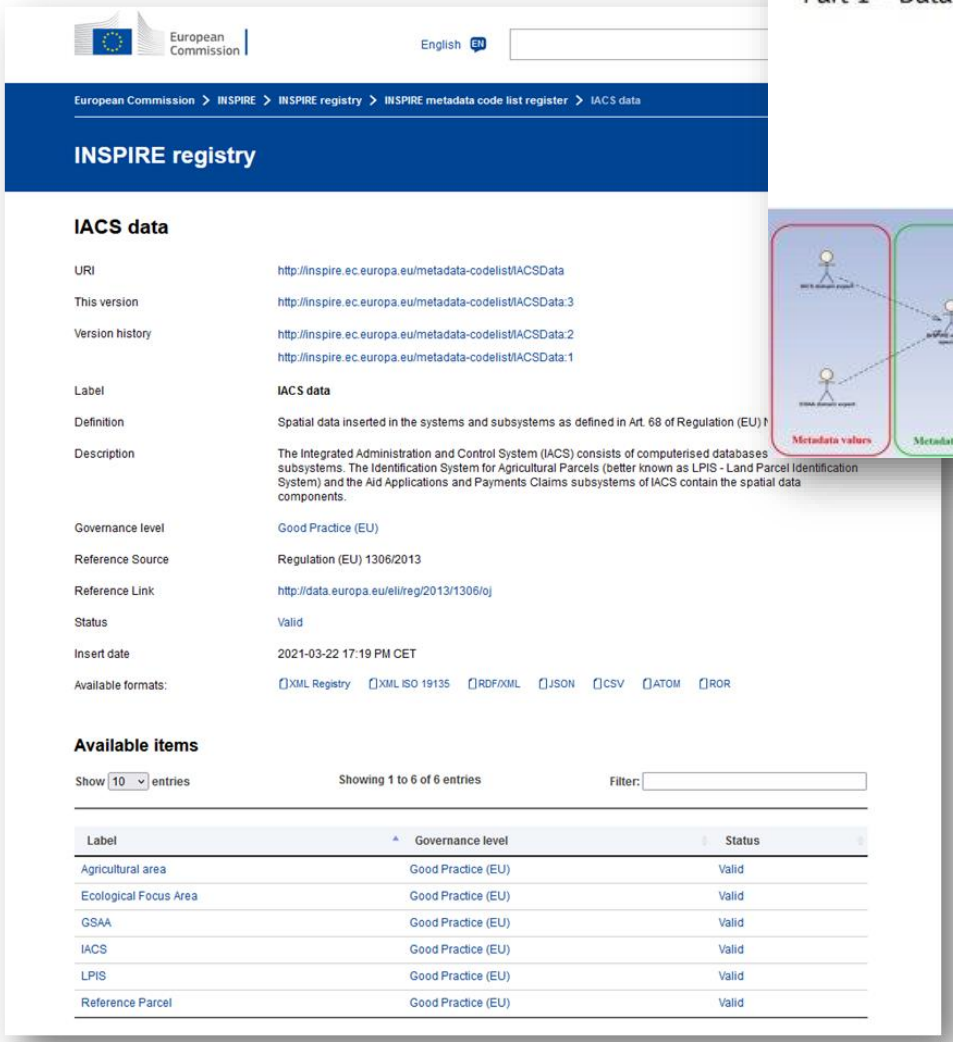
- Achieved by using interoperable metadata from MS and EFTA countries based on
- **Technical Guidelines on IACS Spatial Data Sharing, Part 1 – Data discovery**

https://op.europa.eu/en/publication-detail/-/publication/f09b0355-f7c5-11ea-991b-01aa75ed71a1/language-en

  - Interoperable IACS metadata shall be classified using appropriate keywords.
  - IACS data metadata code list available in the INSPIRE Registry

https://inspire.ec.europa.eu/metadata-codelist/IACSData



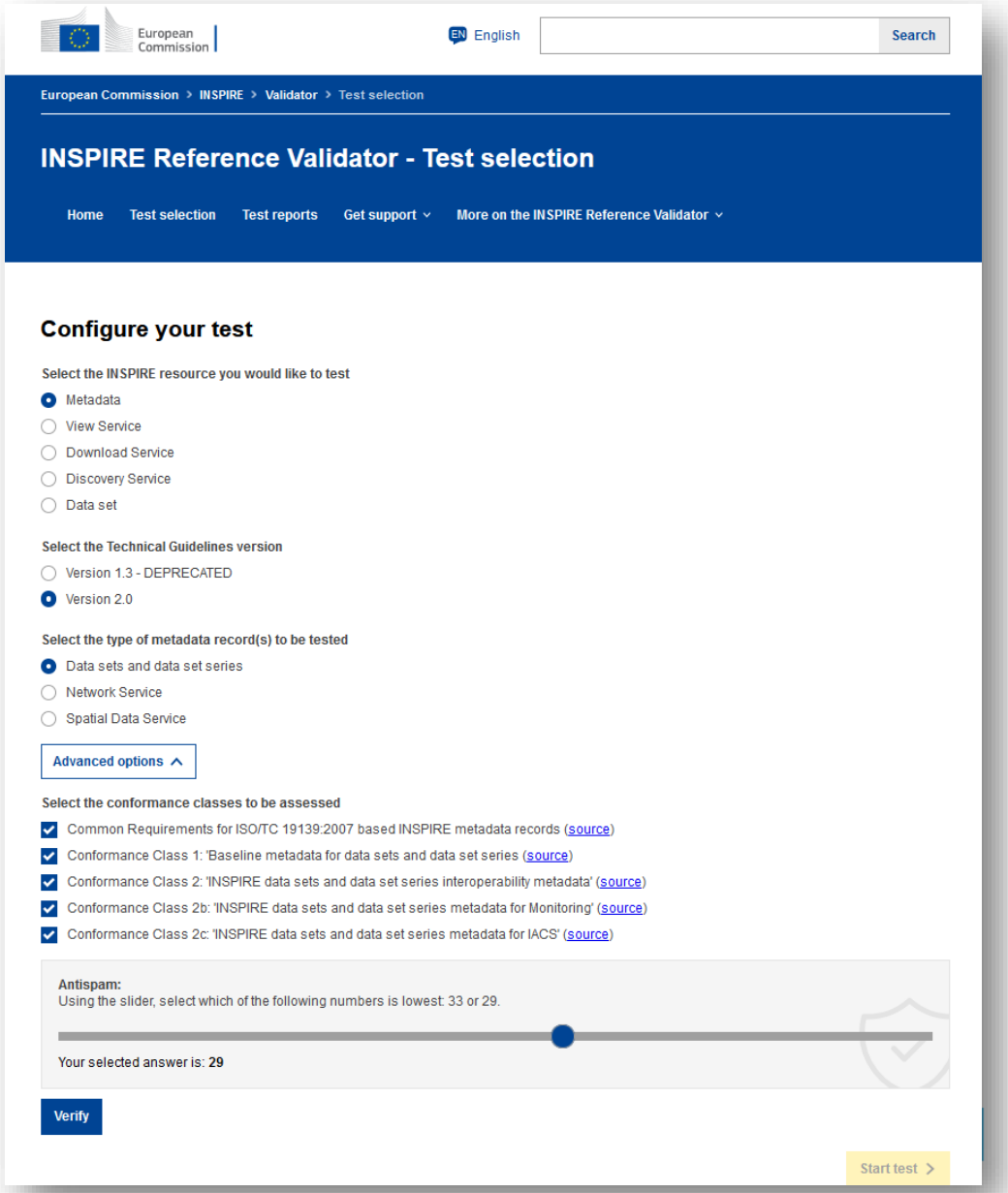


IACS Metadata tests in the INSPIRE Reference **Validator**

- **Purpose**:
  - Providing IACS data providers and CAP Paying Agencies with a common tool for assessing the conformity of metadata for their agricultural data.
  - In terms of generic INSPIRE metadata and IACS-specific requirements stated in the Technical Guidelines on IACS Spatial Data Sharing, Part 1 – Data discovery.
- **Access**:

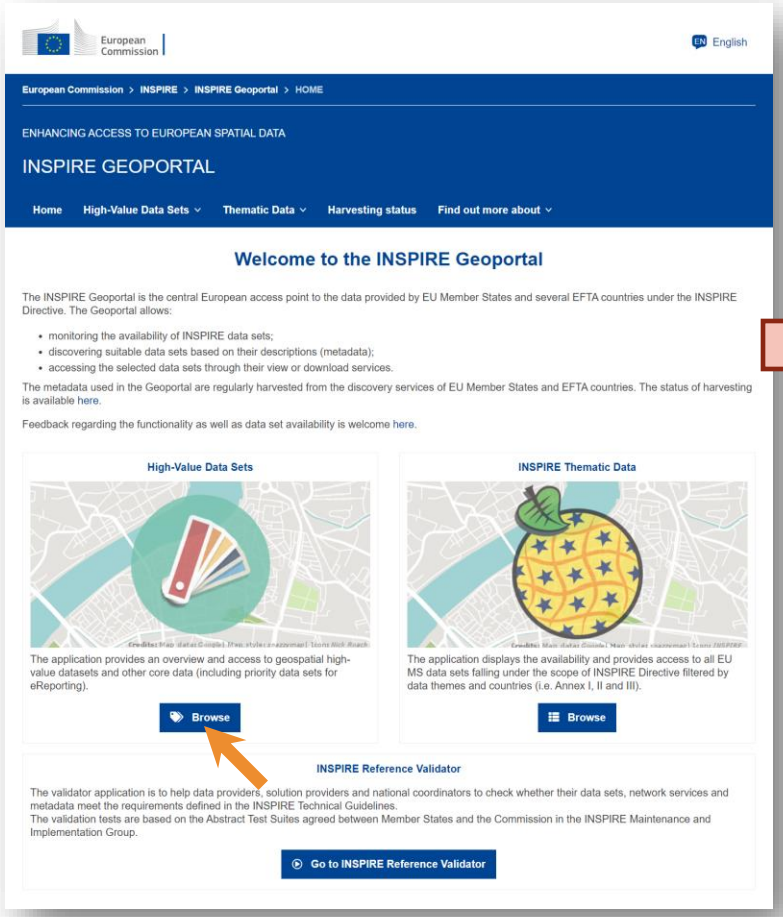
  https://inspire.ec.europa.eu/validator/test-selection/index.html

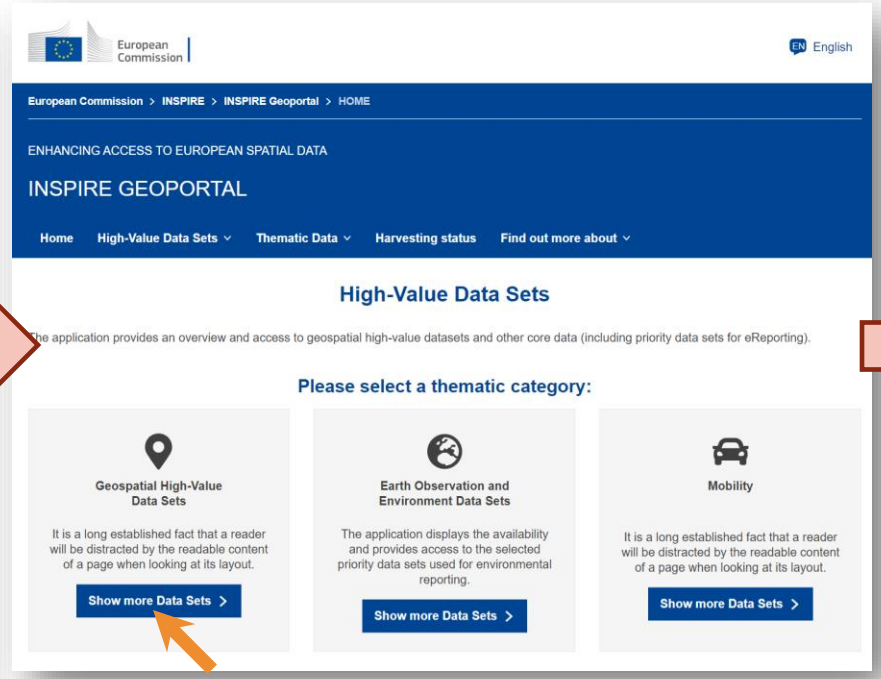
  Configure your test > Advanced Options > Conformance Class 2C: “INSPIRE data sets and data set series metadata for IACS”.

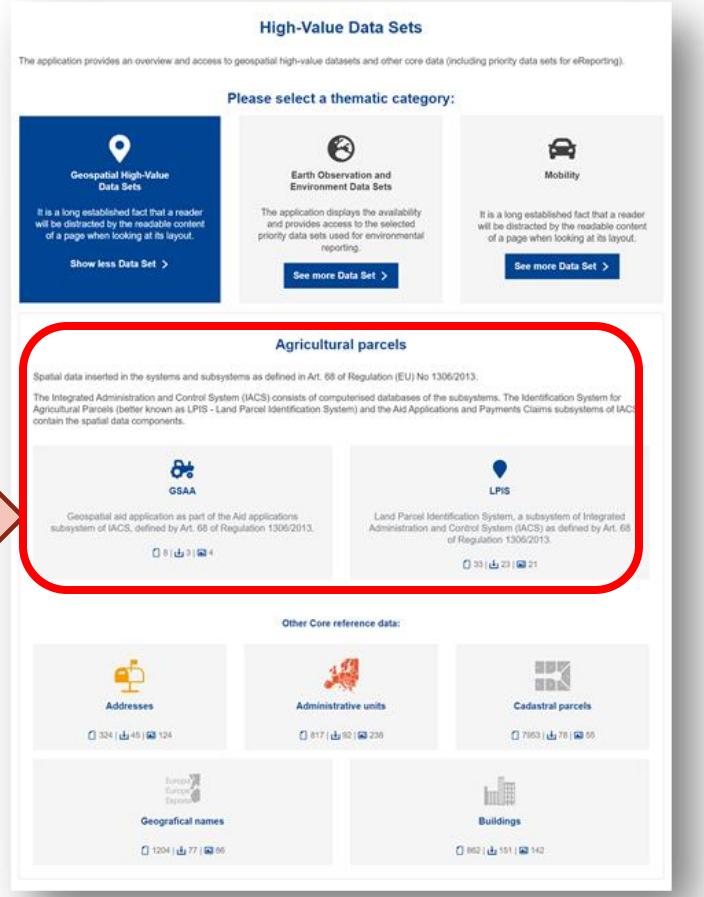


INSPIRE Geoportal & HVDs

- **Revamped INSPIRE Geoportal user interface**







- Allows browsing data based on HVDs, including Agricultural Data.
- According the Implementing Act on HVDs.
- To be launched soon!

https://inspire-geoportal.ec.europa.eu/

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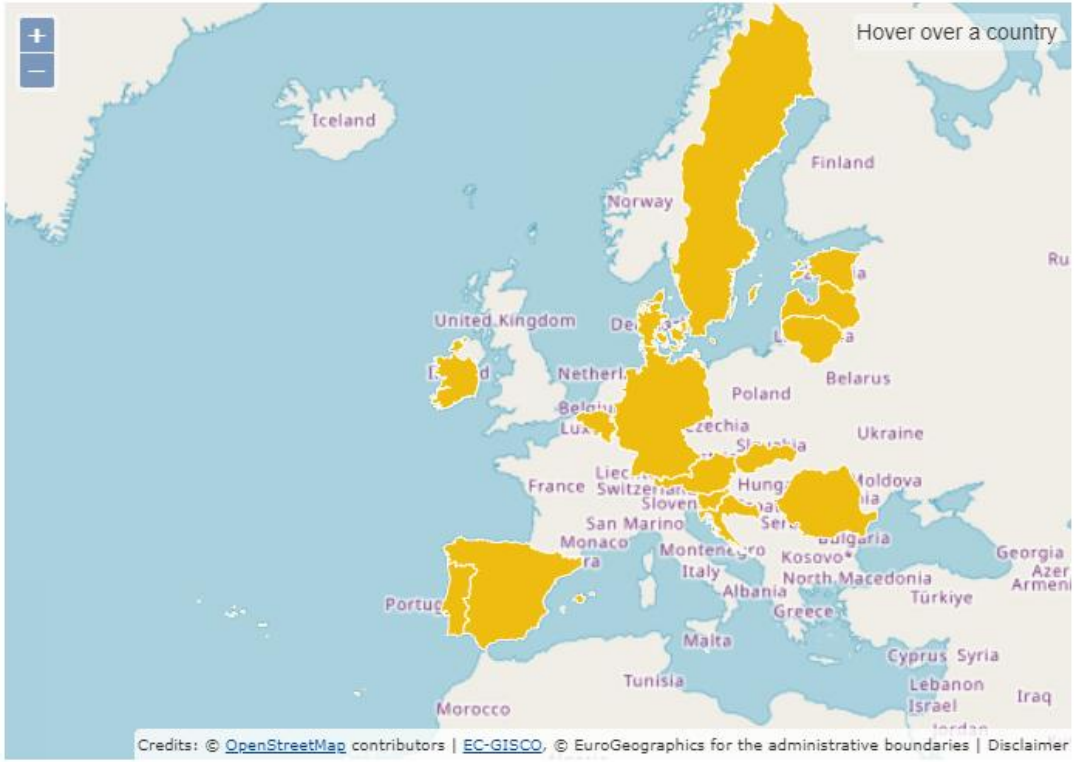
INSPIRE geoportal: High-Value Datasets– (LPIS)

INSPIRE Data Sets - EU & EFTA Country overview

Data sets by IACS: LPIS

25-04-2023



INSPIRE Geoportal Dataset Statistics

67 Metadata records

54 Downloadable Data Sets

56 Viewable Data Sets

Spatial scope coverage:

- ☐ National
- ☐ Regional

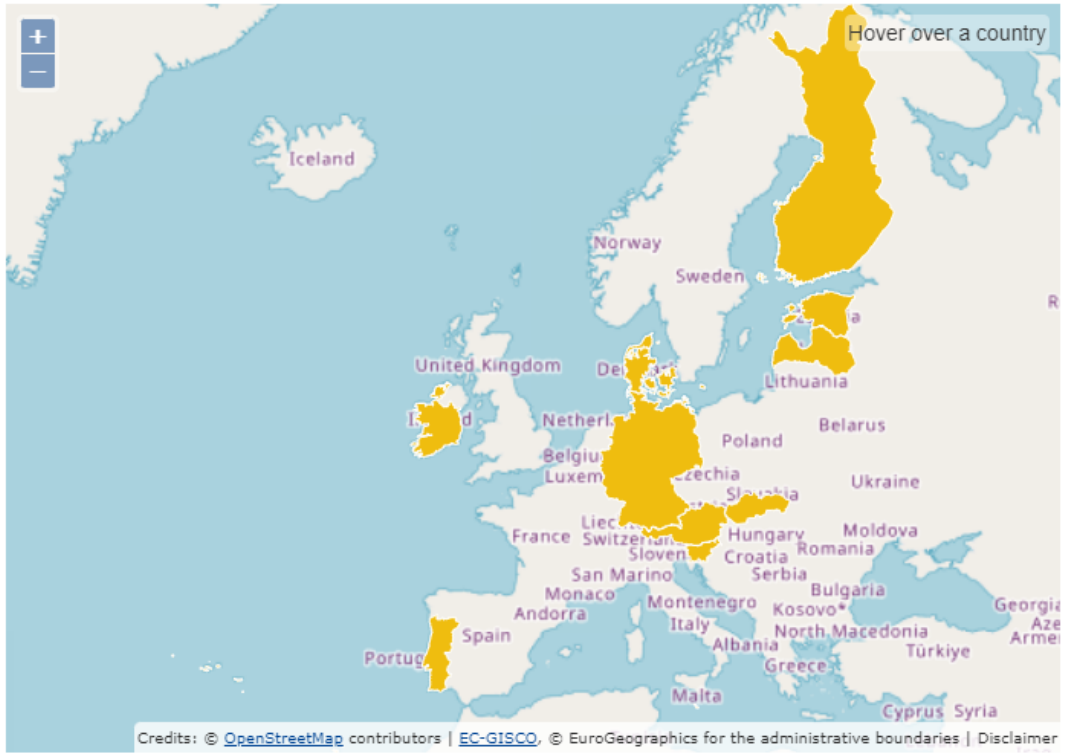
16 MS sharing already datasets (LPIS)

- INSPIRE implementation for IACS: positive trend ↑
- Commission will continue to provide support (TG, pilot use cases, training, visit to PA…)

INSPIRE geoportal: High-Value Datasets– (GSAA)

INSPIRE Data Sets - EU & EFTA Country overview

Data sets by IACS: GSAA



INSPIRE Geoportal Dataset Statistics

25-04-2023

51 Metadata records

43 Downloadable Data Sets

42 Viewable Data Sets

Spatial scope coverage:

- ☐ National
- ☐ Regional

11 MS sharing already datasets (GSAA)

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WP 1. Conclusions

- **INSPIRE has proven to be effective** in the discovery and sharing of interoperable IACS Data.
- Tools are available for improving the situation (TG, IACS Metadata tests, metadata examples from countries with are ahead on implementation).
- TG is usable (48.4% of [EUR27 + CH, IS, LI, NO] with LPIS or GSAA data).
- However, European coverage has to be improved (48.4% → 100%).
- Appropriate actions need to be taken to improve the situation:
  - Continue promoting engagement of MSs (INSPIRE NCPs, PAs and DG-AGRI).
  - Organise ad-hoc training activities (e.g. this Workshop).
- Shaping the new EU Agricultural Data Space: recommendations, use of APIs (OGC SensorThings-API and OGC API-Features).

WP2 - Interoperability

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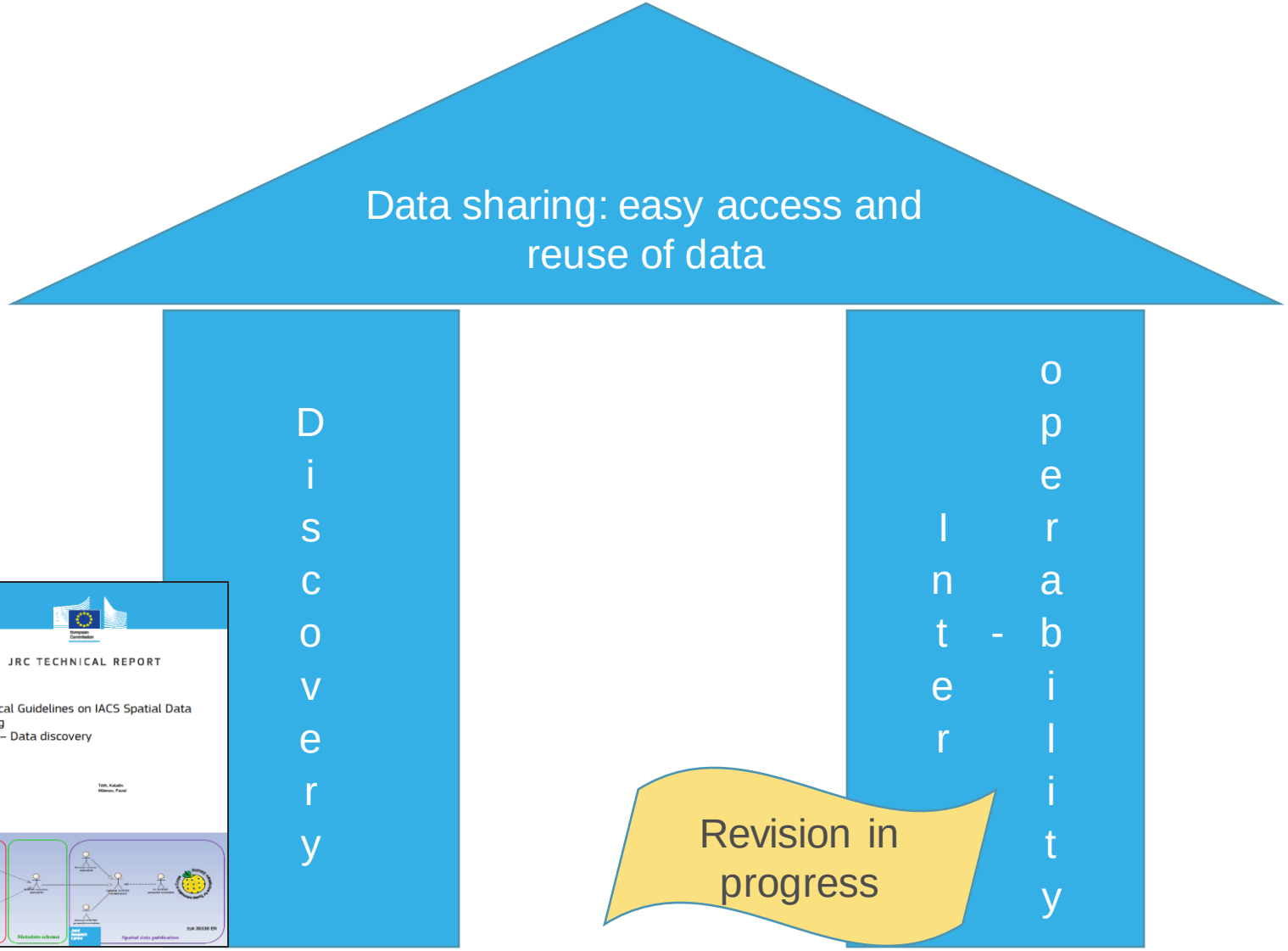
Two pillars of data sharing



Discoverability

- Agreed and well-known keywords
- Through access hubs

Interoperability

- Data publishing: according to agreed standards
- Without repetitive interventions of users

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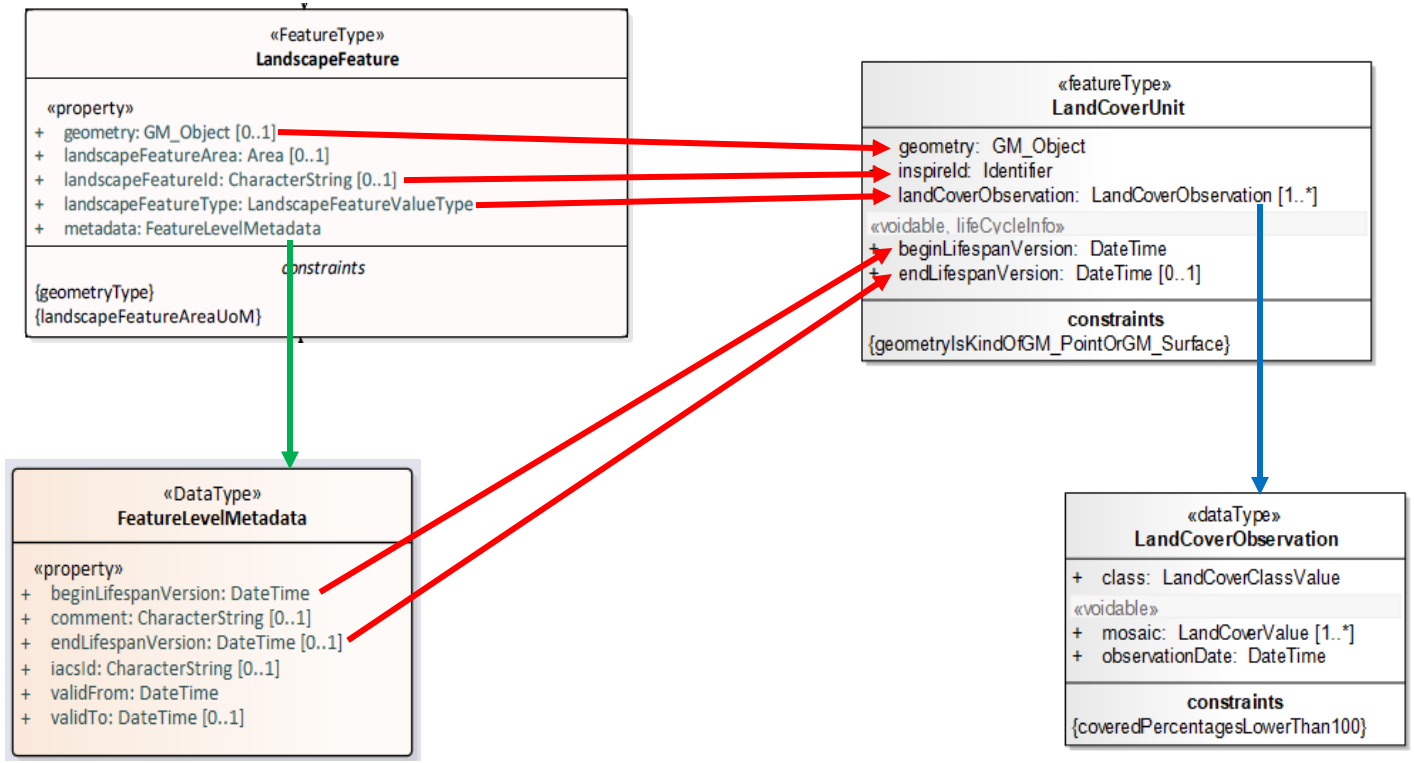
Mapping between IACS and INSPIRE



- From the elements of the harmonised LPIS and GSAA application schema to the elements INSPIRE Land cover and Land Use themes
- Currently provided as Annex of the interoperability TG

Technical Guideline 2 - Data interoperability

1) LULUCF

Case study: Bg

2) Crop classification

Case study: At, De

3) Landscape features

PMEF C.21 and I.20 →inventory and quantification of LF area

Case studies: Cz, Es, Lt, Ro

The documents are under migration from MarsWiki to a new platform

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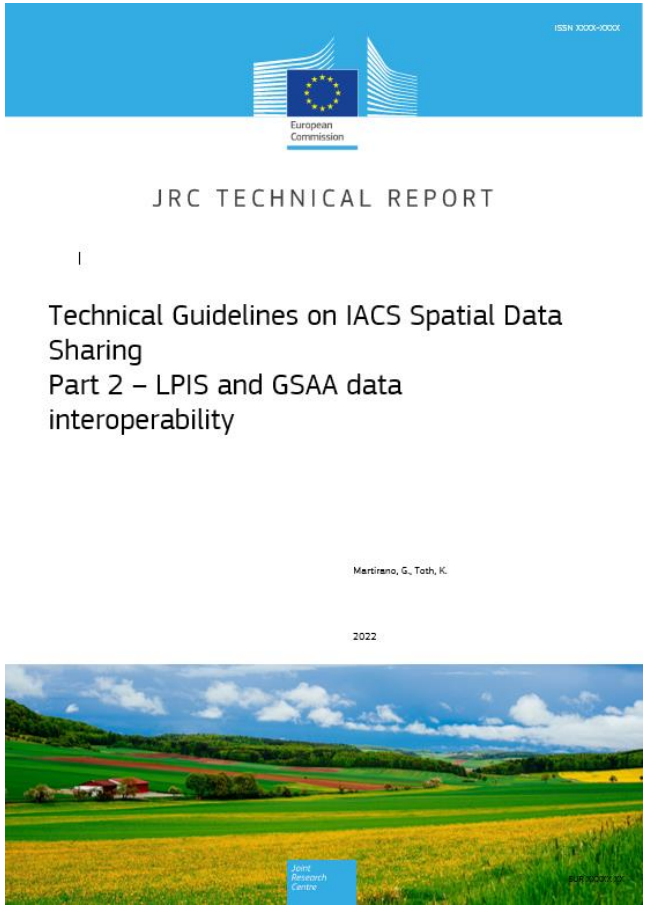
Technical Guideline 2 - Data interoperability



The document will be presented to and revised by the **agricultural community** (Paying agencies) and the INSPIRE community

The draft document will be distributed in two channels: Data sharing expert group of the PAs, INSPIRE MIG-T (28 April 2023)

The comments should be included in the '**comments template**'
The comments should be provided by 28 May at the latest

Results from the Commission in the course of June 2023

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WP3 Use-cases & modelling

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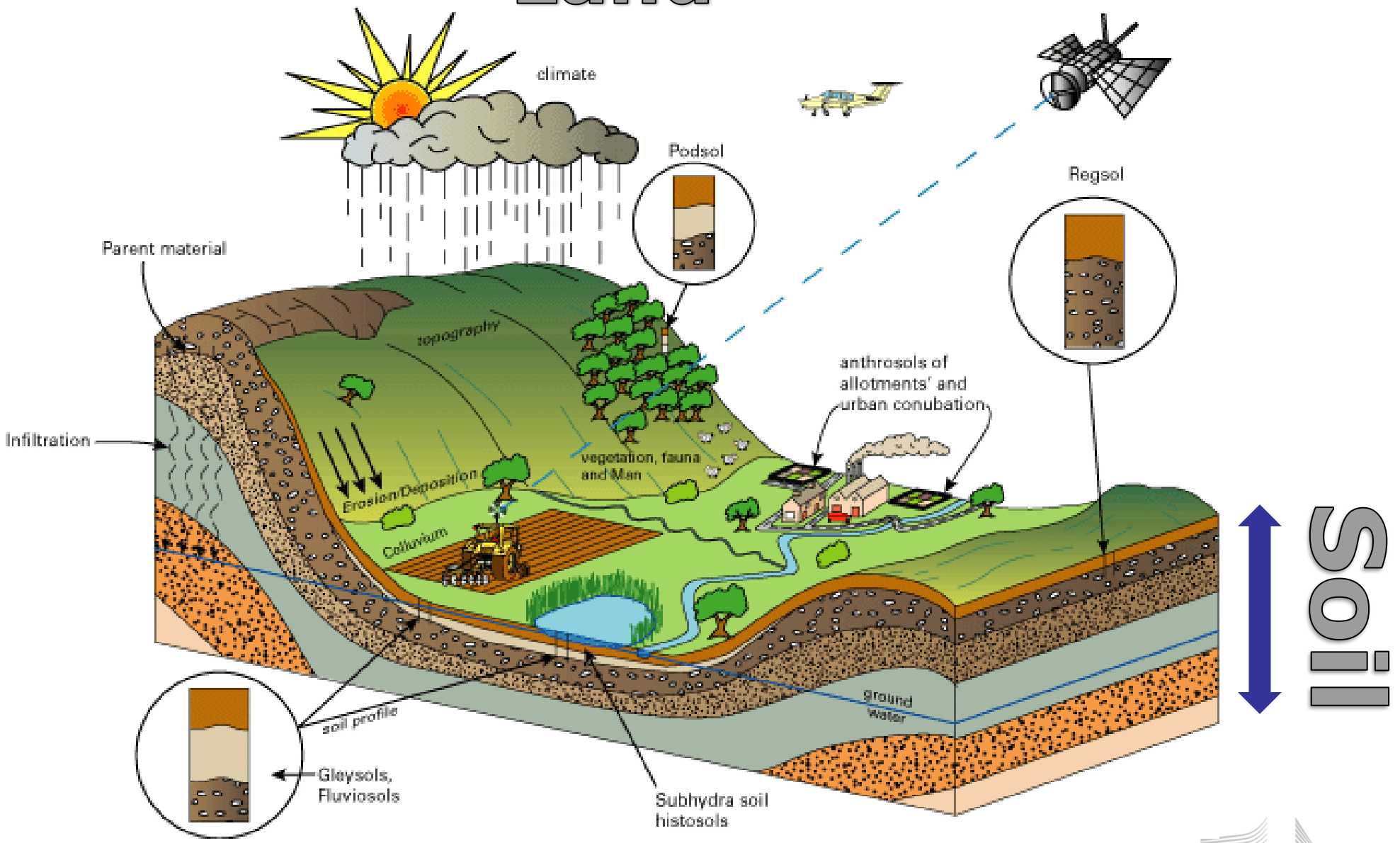
Land



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Workpackage 3

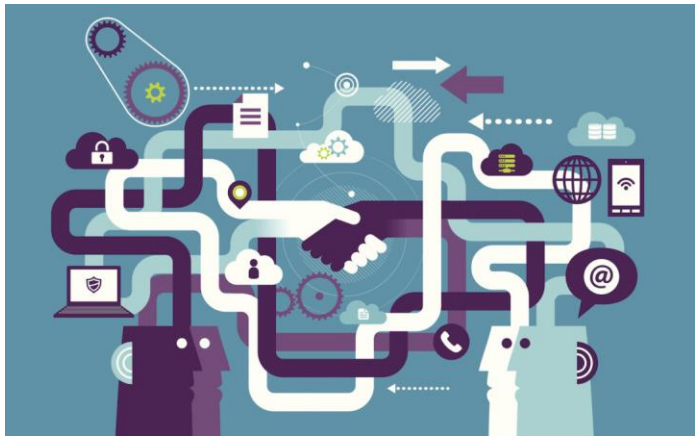
IACS: LPIS & GSAA

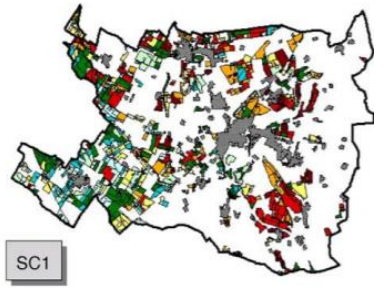
- Spatial location of agricultural features
- Practices

- Sewing/harvest date
- Cover (residue management, tillage)

- Soil properties

Soil health models





- Metadata
- Discoverability
- Accessibility
- Interoperability
- EU Common Data Space

Conclusions – Policy oriented

- IACS+ is a tool to **guide local to regional** level management practices, pesticides applications rates, intensive/extensive practices, degradation
- **Policy evaluation** – e.g. Good Agricultural and Environmental Conditions (GAEC)
- **Scenario analysis**: How can minimum soil cover maintenance (GAEC 4) reduce erosion?
- Current policies in the reduction of environmental **impacts** (e.g. reduction of use of pesticides in 50%);

Conclusions - Scientific

- IACS data in an object-oriented approach can become **a new convention in soil health modelling**: erosion, pesticides, SOC, land degradation and more

- IACS is an informatic framework to add **more properties and methods** relevant for soil health assessment

- IACS provides spatio-temporal framework with "**ground-truth**"

- IACS is useful at both the **field parcel scale and regional to continental scale**

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WP4 IACS exploration & integration

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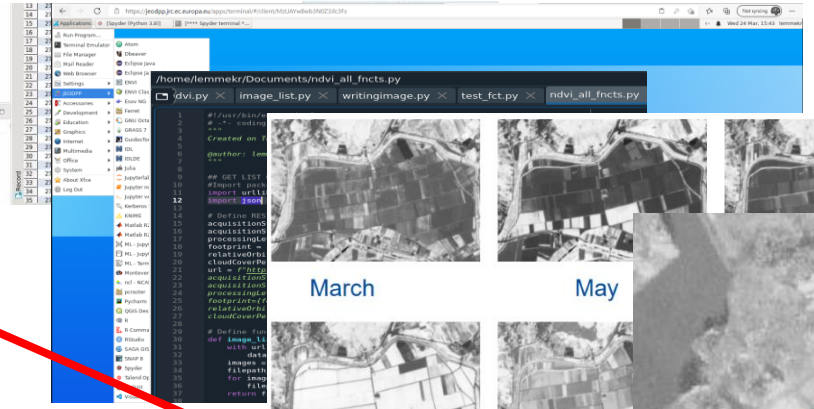
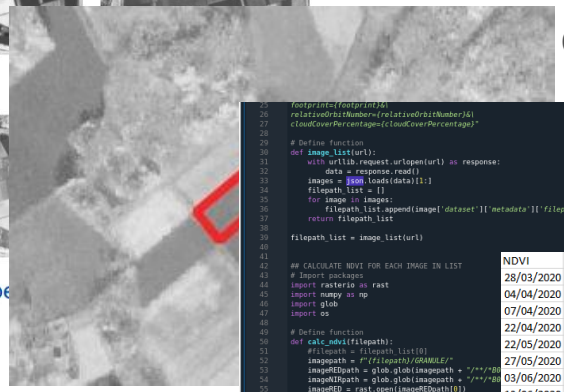
Big Data Analysis
Using JeoDPP for VI time-series on parcel level
Script process

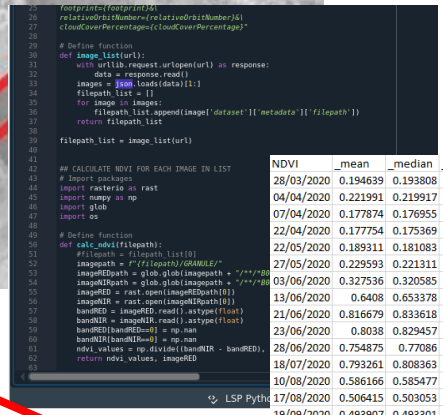
Query to select scope of analysis. Maize & Grasslands different regions.50 random parcels across Countries



Parameter selection. Year 2020, lees than 10% cloud cover and resample 1 month



Copernicus data: Sentinel 2 images

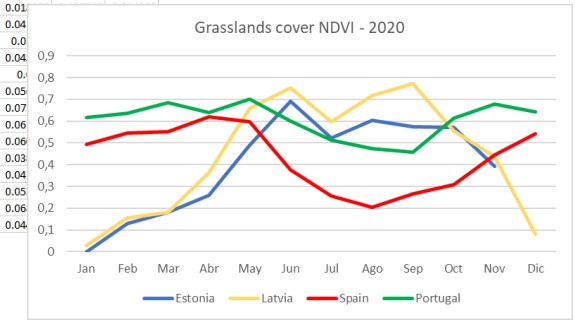


Running script

Processing Chain

Results

NDVI	_mean	_median	_stdev	_min	_max
28/03/2020	0.194639	0.193808	0.01338	0.154525	0.262956
04/04/2020	0.221991	0.219917	0.014996	0.184893	0.301874
07/04/2020	0.177874	0.176955	0.013823	0.13945	0.256903
22/04/2020	0.177754	0.175369	0.01		
22/05/2020	0.189311	0.181083	0.04		
27/05/2020	0.229593	0.221311	0.0		
03/06/2020	0.327536	0.320585	0.04		
13/06/2020	0.6408	0.653378	0.		
21/06/2020	0.816679	0.833618	0.05		
23/06/2020	0.8038	0.829457	0.07		
28/06/2020	0.754875	0.77086	0.06		
18/07/2020	0.793261	0.808363	0.06		
10/08/2020	0.586166	0.585477	0.03		
17/08/2020	0.506415	0.503053	0.04		
19/09/2020	0.493907	0.493301	0.05		
08/11/2020	0.218353	0.201459	0.06		
08/12/2020	0.116314	0.108354	0.04		



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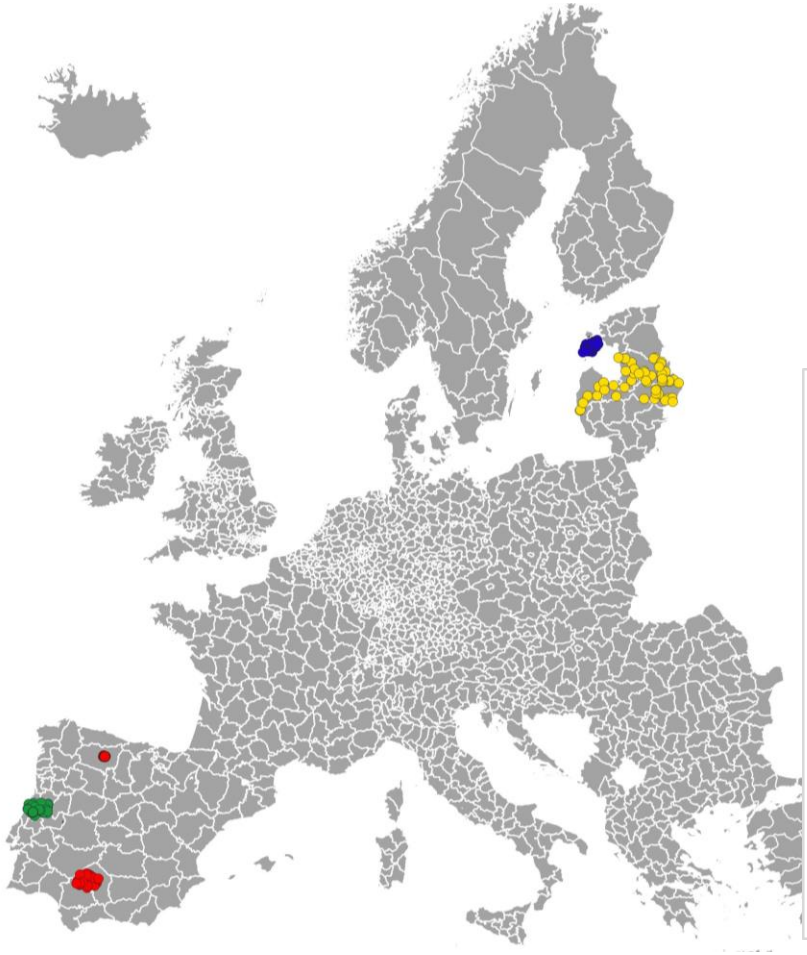
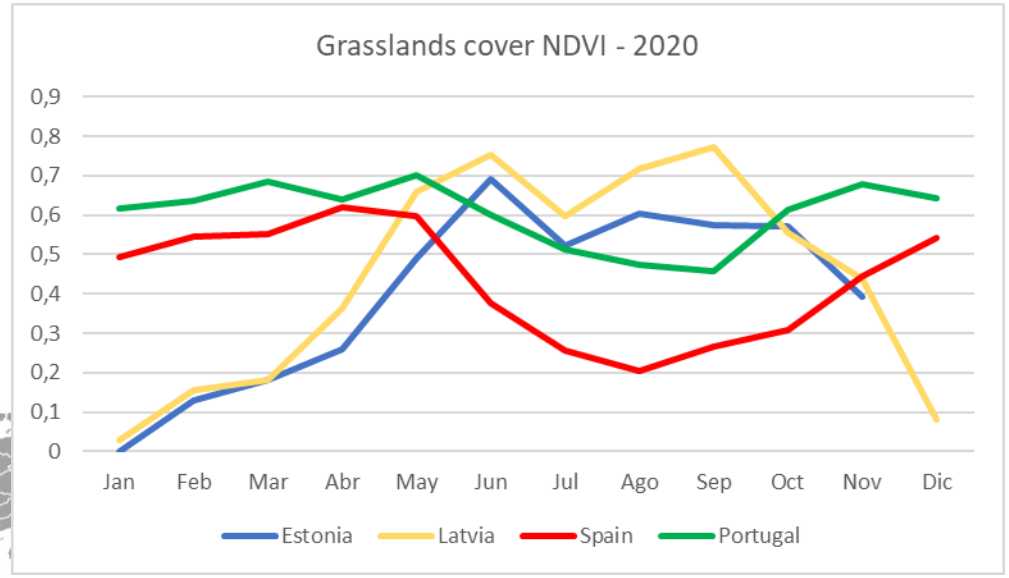
Vegetation index script examples
LPIS Grasslands



Query to select parcels → Run Script → Extract results

50 random grasslands parcels → Year 2020 Resample: 30 days → NDVI profiles



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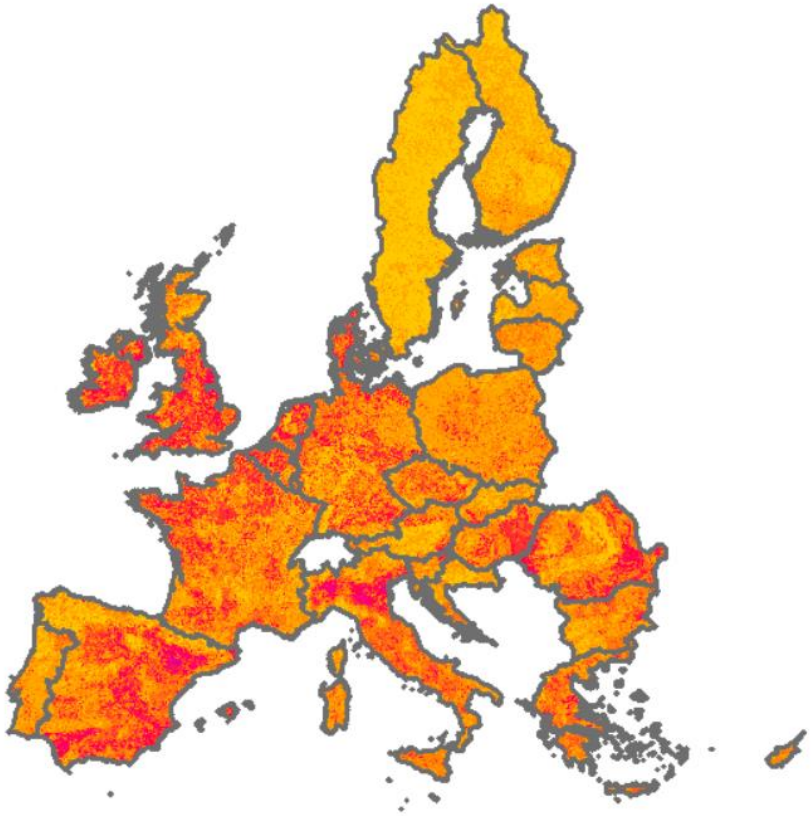
Parcels data and Soil Health Indicators



SAIS

Spatial Agricultural Information System

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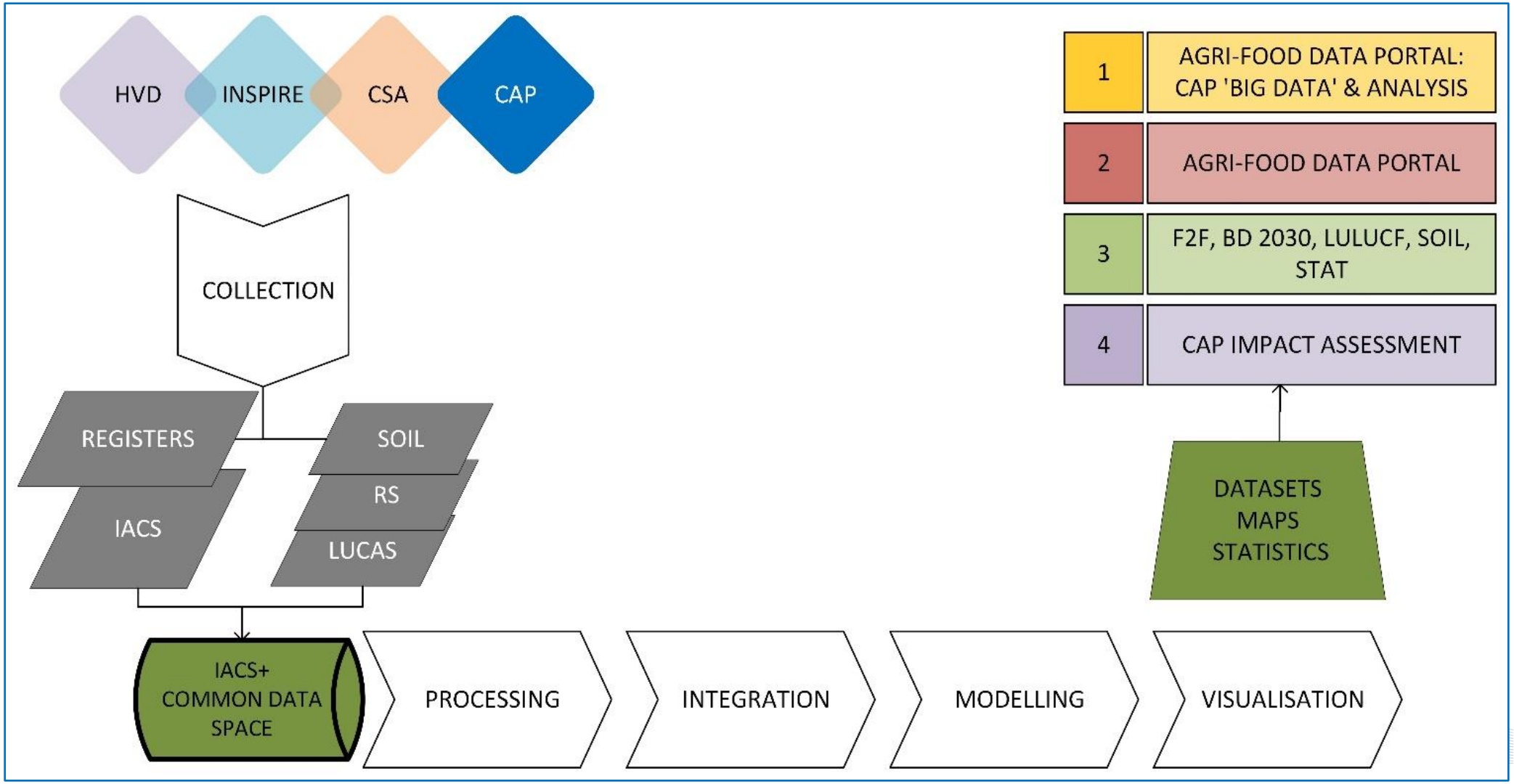
Policy context: performance and data needs



Policy context: performance and data needs

- Agriculture: important for the CAP and outside (GD)
- In addition to compliance, performance is key
- From IAS framework (process established) to ECA recommendation (improve analysis capacity, big data, disaggregated data)
- Need to continue IACS 65 activities & enlarge to other public bodies (as data owner)

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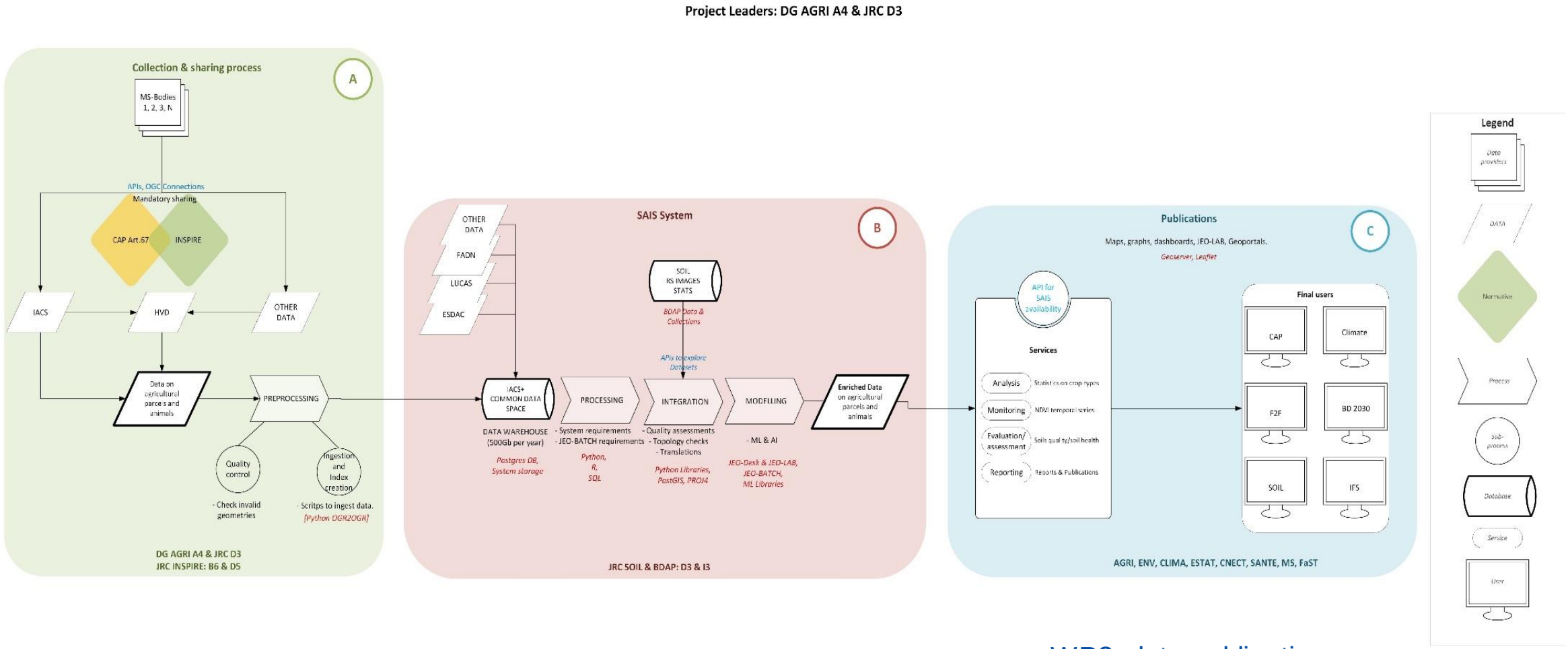
SAIS: a Spatial Agricultural Information System



WP1: data collection/processing

WP2: data integration/interoperability

WP3: data publication

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Thank you

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