NIVA's efforts towards standardized IACS data flows

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NIVA Stakeholder Forum Santorin
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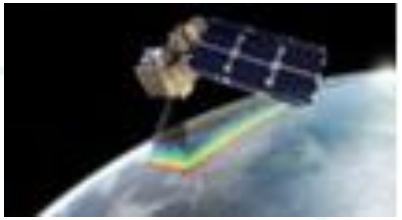
IACS data flows considered in NIVA



Satellite images

FMIS, Field book …

Farmer data

IACS

External users

EUROPEAN COMMISSION

INSPIRE · Infrastructure for Spatial Information in Europe

Access to EO data

What is the issue?

- The EO based method for CAP monitoring requires big amounts of satellite images
- The access to Sentinel-1 and Sentinel-2 images is freely possible from the ESA Hub
- But in practice, it is far from easy

⇒ **NIVA is proposing mainly consolidated knowledge**

- **General reminders**
- **State-of-play, capitalisation of NIVA experiences**

Example 1: to know more about S-1

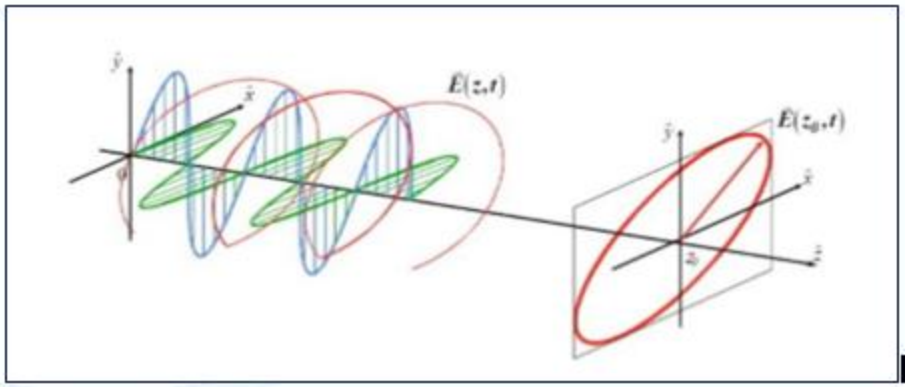
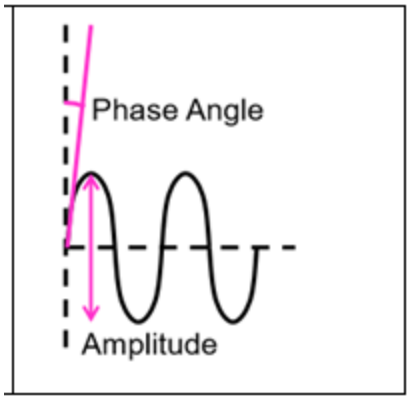


Figure 6 Vertical and horizontal polarisation of Sentinel 1 images



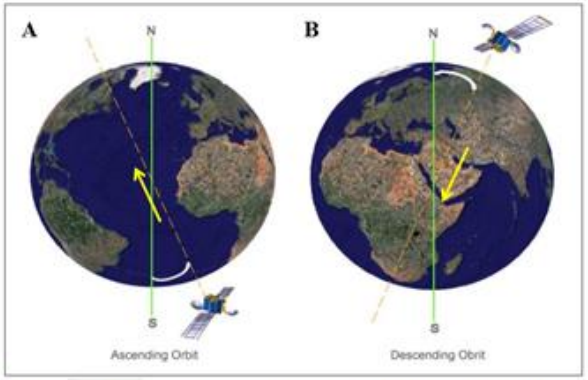


Figure 7 Ascending and descending orbits of Sentinel 1

«codeList»
Sentinel1GRDMarkerValue

+ amplitudeAscending
+ amplitudeDescending
+ ratioVVonVHAscending
+ ratioVVonVHDescending
+ VHAscending
+ VHDescending
+ VVAscending
+ VVDescending

Amplitude information only

«codeList»
Sentinel1SLCMarkerValue

+ coherenceAscending
+ coherenceDescending

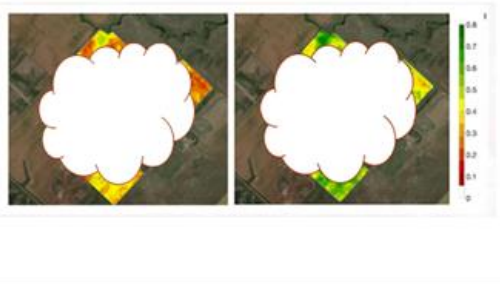
Using also the phase information

Example 2: DIAS assessment

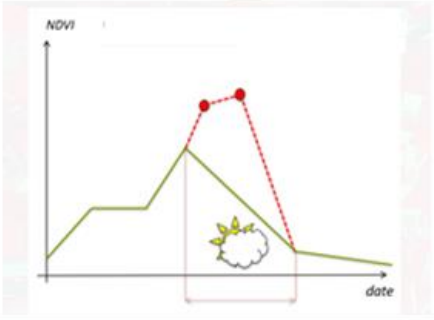
	CREODIAS	Mundi	ONDA	Sobloo	WEKEO
Sentinel 2	L1C: full archive L2A: Orderable (also non-ESA) rolling cache 1PetaByte	L1C: last 12 months L2A: last 48 months (only Europe data)	L1C: full ESA archive L2A: full ESA archive	L1C, L2A: orderable, available last 9 months	L1C: full metadata, orderable
Sentinel 1	SLC: full archive in EU, 6 month worldwide, GRD: full archive		Full archive for SLC and GRD. Part of the archive are on cold storage (delayed retrieval available)	SLC, GRD: orderable, available last 9 months	GRD, SLC: full metadata orderable
Landsat 5/7/8	Landsat 5/7/8 full archive over Europe	Landsat 7/8 orderable	Available since 04/2018 (for Europe)	Landsat 8 On-demand	-
Missing/other data retrieval	Ordering/Caching mechanism available	Missing L2A can be retrieved from ESA or processed if not available	Missing data can be Retrieved and hosted in native format. Available VHR commercial data (orderable)	Spot sample data available/orderable	Many datasets from Climate/Meteorology

Comparison conducted by end 2019

Example 3: Quality of S-2 temporal series



2 missing dates due to clouds



Linear interpolation may be not valid

The cloud issue!

«dataType»
TemporalSeriesQuality

+ numberOfObservations: Integer [0..1]
+ averageObservationFrequency: Measure [0..1]
+ longestGapInObservations: Measure [0..1]

At least, quality should be documented

The quality issue may also be solved by more advanced solutions

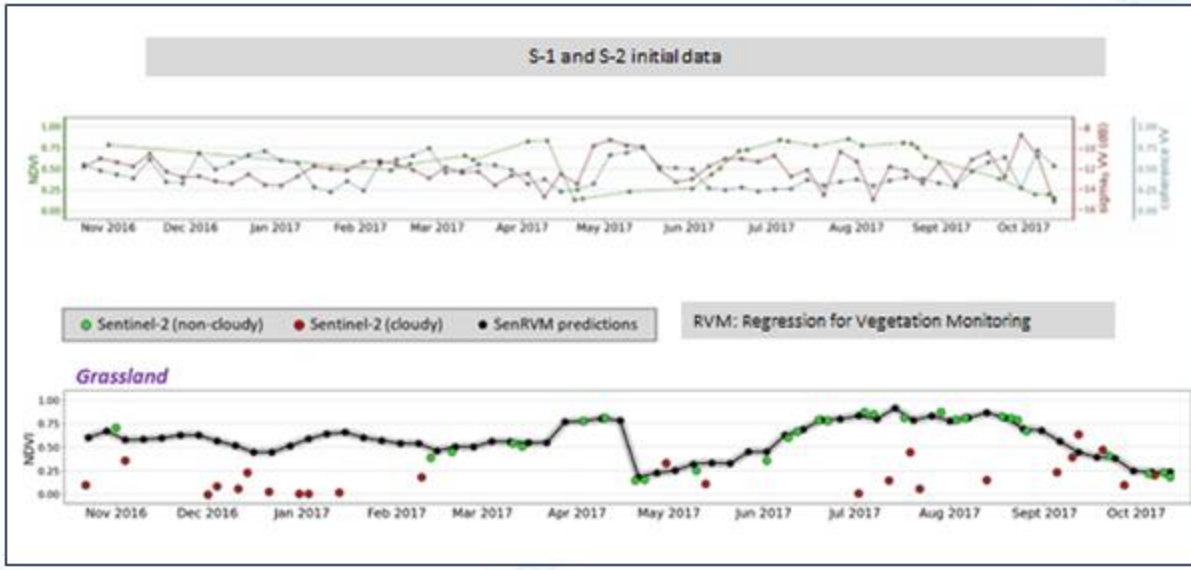
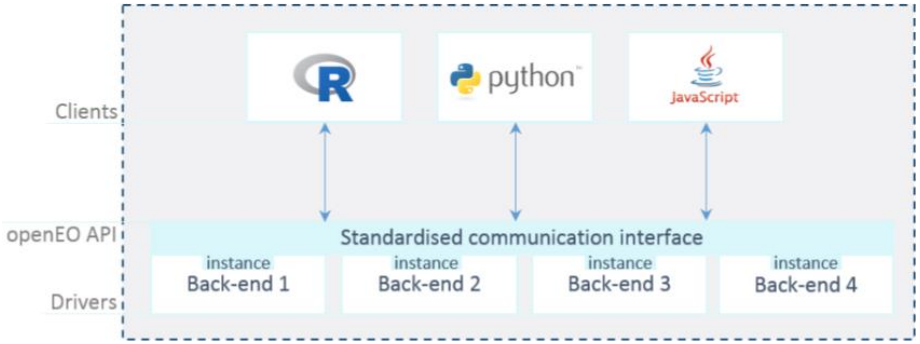


Figure 28 The gap filling of S-2 temporal series using S-1 data

Example 4: Open EO API



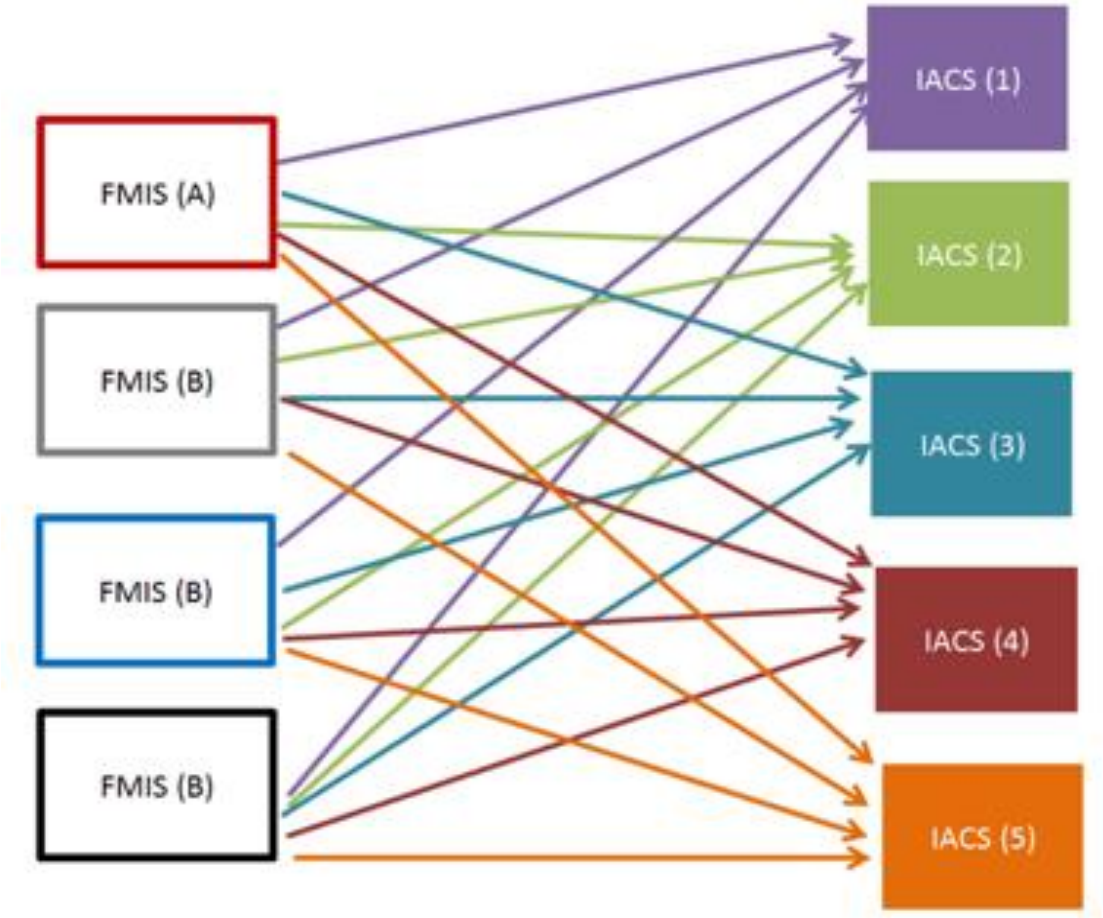
- Based on standards (STAC) and recommendations from the Open EO project

- An Open EO API specifies how to
  - discover which Earth observation data and processes are available at cloud back-ends
  - build processing graphs (list of jobs)
  - consume such services that run the predefined processing graphs

- The NIVA Open EO API enables to get Sen4CAP results as micro-services => it make data exchange more automatic

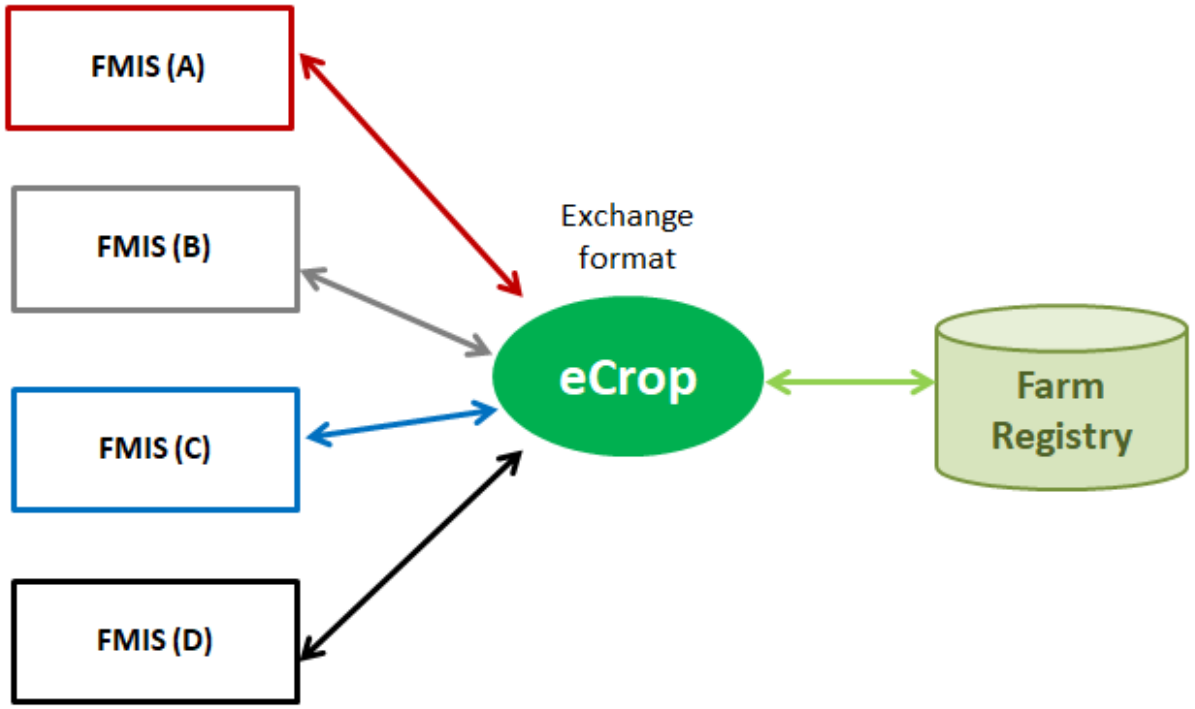
Data exchange between IACS and FMIS

Before NIVA



No interoperable solution

What NIVA has done



Prototype for interoperable solution.

More details in next presentations

IACS data export to external users

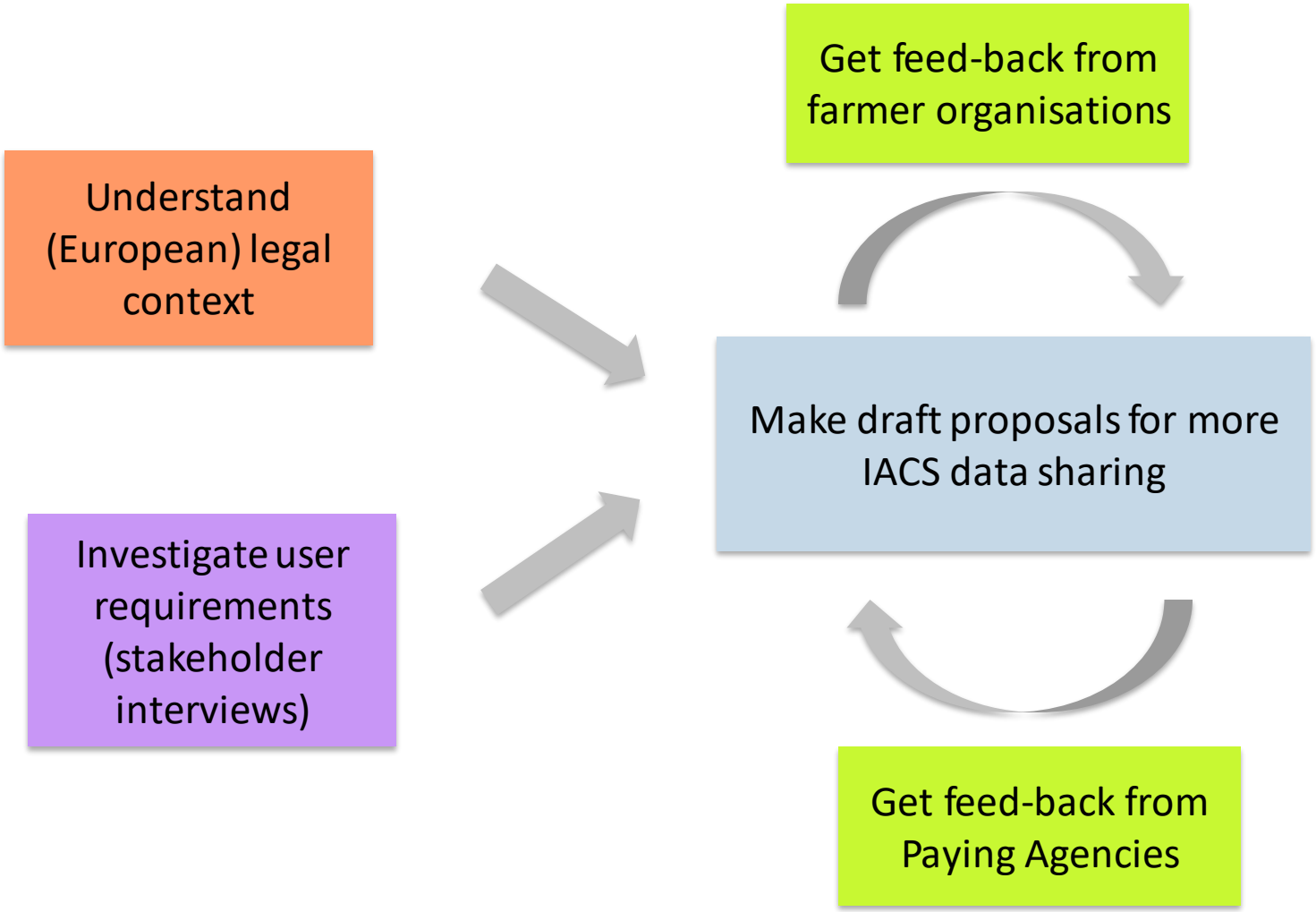
IACS data sharing: objectives

- Agriculture is a key activity having strong impact on environment and society.

- The IACS data would be of interest for many stakeholders other than just Paying Agencies.

- NIVA projects aims to encourage IACS data sharing in order to optimise the benefits for society, but without harming farmers and without breaking data protection laws.

IACS data sharing: NIVA Methodology



NIVA recommendations target mainly Paying Agencies

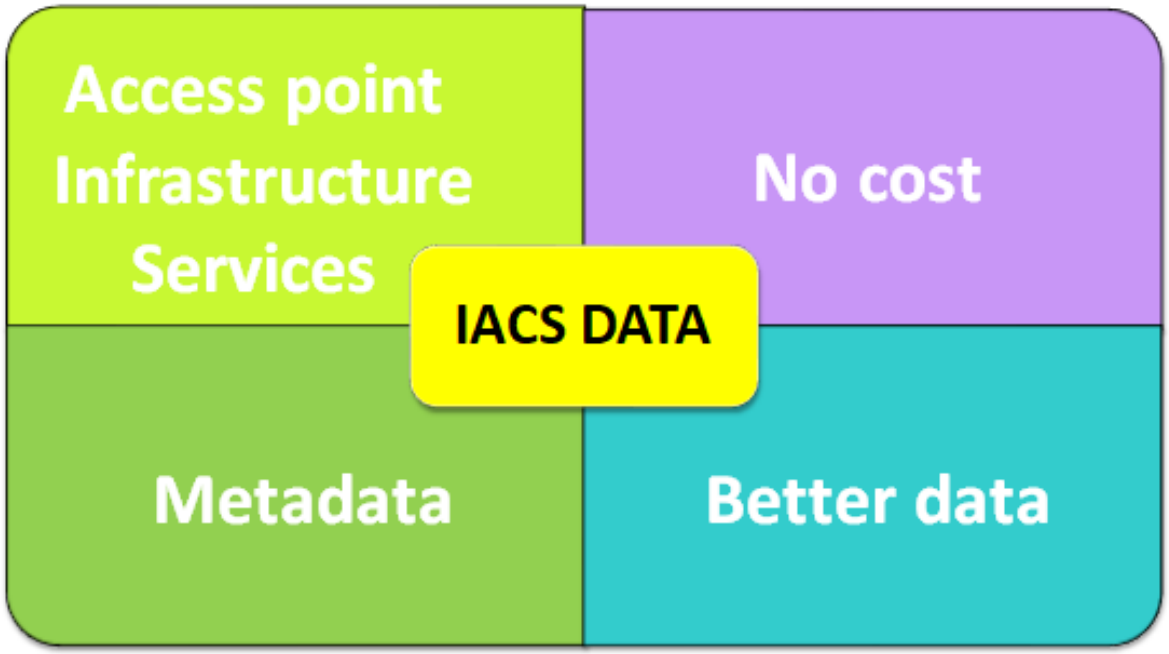
Data sharing considerations

CONCERN	Mandatory data sharing	Guaranty about data use	Distinction public/secret	Get farmer(s) agreement
		Farmers want to know who is going to use their data and for which purpose.	Farmers consider that some of the data they provide to IACS is personal or secrete data.	
SOLUTION	Open data	Licensing conditions	Data preparation	Discussions with farmer organisations
	There is general agreement that a few set of IACS data (geographical data) should be publicly available.	Licensing conditions may restrict use of some IACS data to public bodies, researchers and/or farmer organisations.	Paying Agencies may prepare IACS data in order to make them less secrete, less private (anonymisation, aggregation, rounding, simplification, …).	Global agreement will entail farmer trust about IACS data sharing.

Priorities for IACS data sharing

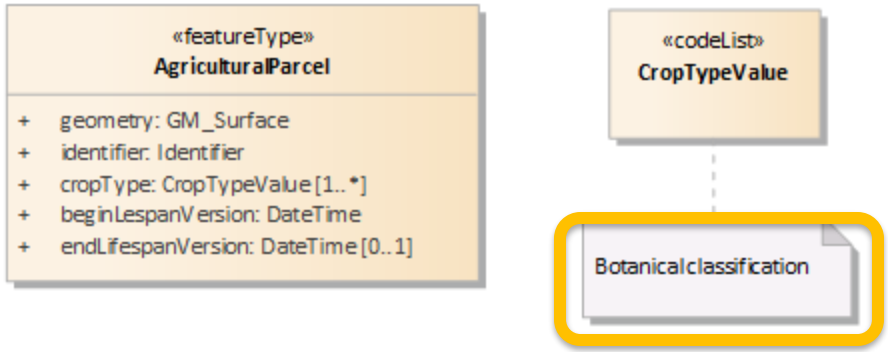
1. **LAND USE**
2. **Other geographic data** | **Payments** | **Animals**
3. **Control data** | **Geo-tagged photos** | **EO crop maps**
4. **Data about farmers** | **Entitlements** | **New data from farmers (fertilizers, PPP, practices …)**

Need for technical interoperability



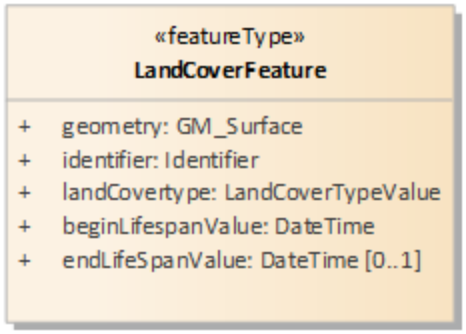
Users want free and easy access to well-documented and good IACS data (better harmonised, more up-to-date).

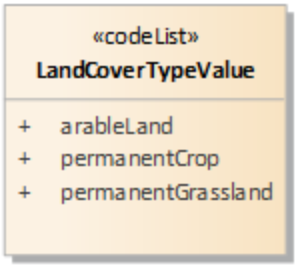
Need for semantic interoperability

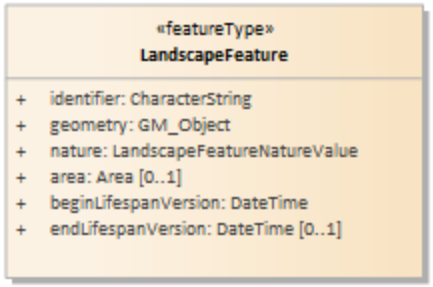


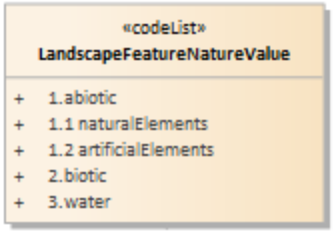
Land Use

Land Cover









Agricultural areas

Non productive areas

Need for semantic interoperability

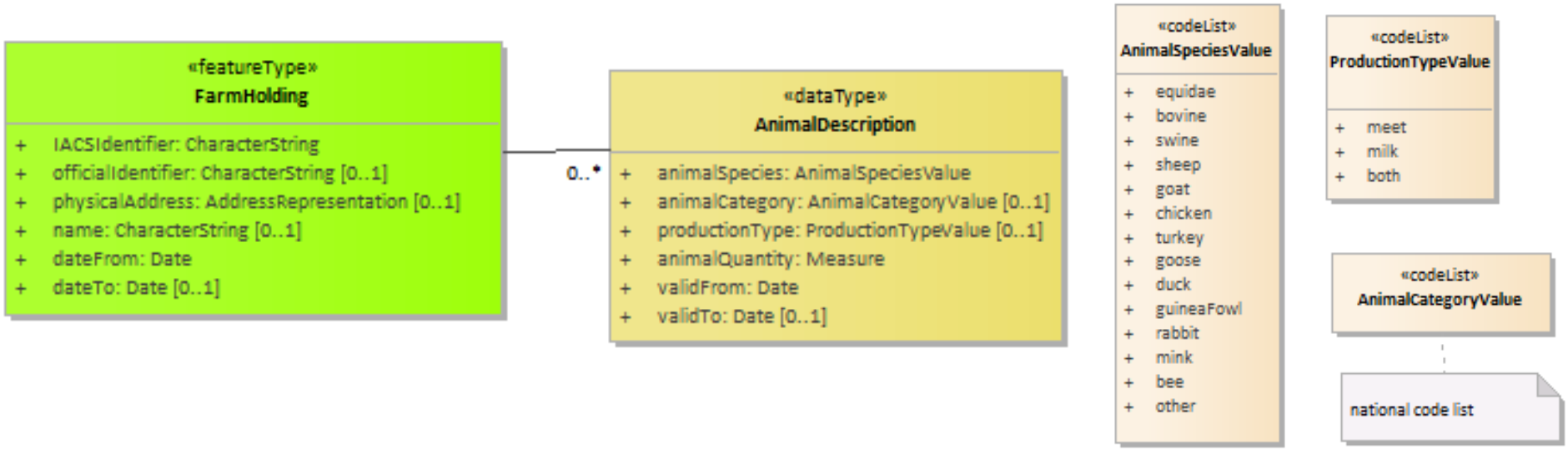
EUROPEAN COMMISSION

- List of High Value Datasets is complementing the Open Data Directive
  - List not yet adopted
- High Value Datasets have to be freely accessible to everyone through APIs
- This list includes agricultural and reference parcels
- Animal data (total number, species, production type) is required under reference parcels

Need for semantic interoperability

EUROPEAN COMMISSION

- NIVA is proposing to provide information about animals at farm level, which looks more logical



Conclusions

For more details

- WP3 deliverables targeting PA

D3.1	Common glossary	3	IGN	M3, M12, M24
D3.2	Common semantic model	3	IGN	M9, M12, M36
D3.3	Common guidelines for software development	3	Abaco	M4, M12, M24
D3.4	Recommendations for IACS data flows	3	OPEKEPE	M18
D3.5	Recommendations for standardised connections between IACS project and other applications	3	OPEKEPE	M24
D3.6	Appraisal of interoperability trials	3	FEGA	M24, M36
D3.7	Guidelines to cope with legal issues	3	OPEKEPE	M18
D3.8	Profile of priority data for external applications	3	IGN	M30

- Presentation and results of the workshops
  - NIVA FARMERS WORKSHOP – Niva4cap
  - WORKSHOP FOR PAYING AGENCIES ON IACS DATA SHARING – Niva4cap

NIVA
NEW IACS VISION IN ACTION

THANK YOU!

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