IACS Workshop 2019, Valladolid-Spain, 10-11 April

The European Commission's science and knowledge service

Joint Research Centre

Sentinel data potential for the CAP

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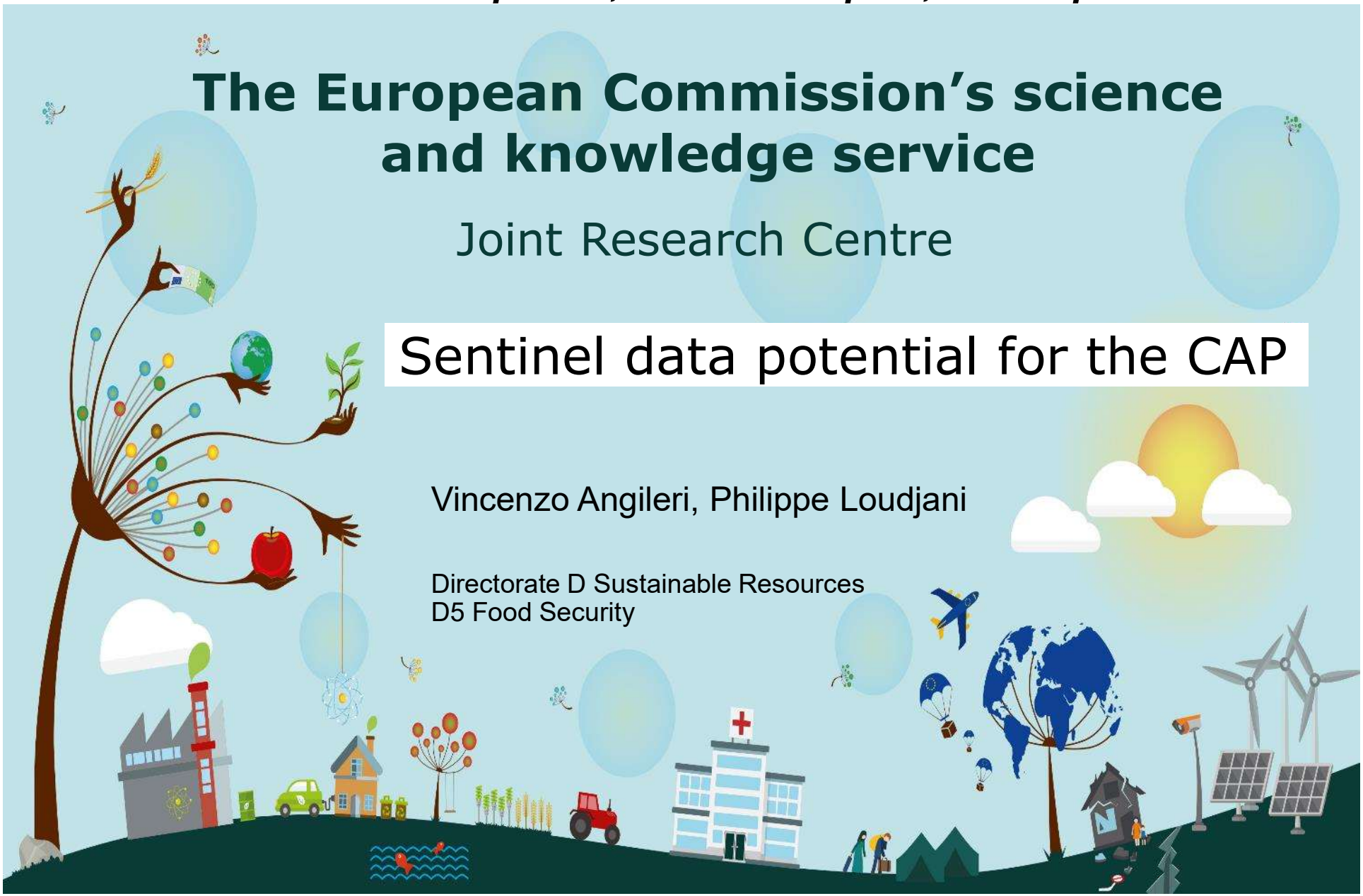
Directorate D Sustainable Resources
D5 Food Security



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Scope of the presentation

Food for thoughts

Informal discussion to raise awareness

Starting discussion for the next CAP

… with a concrete look forward for IACS

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Toward the CAP2020+

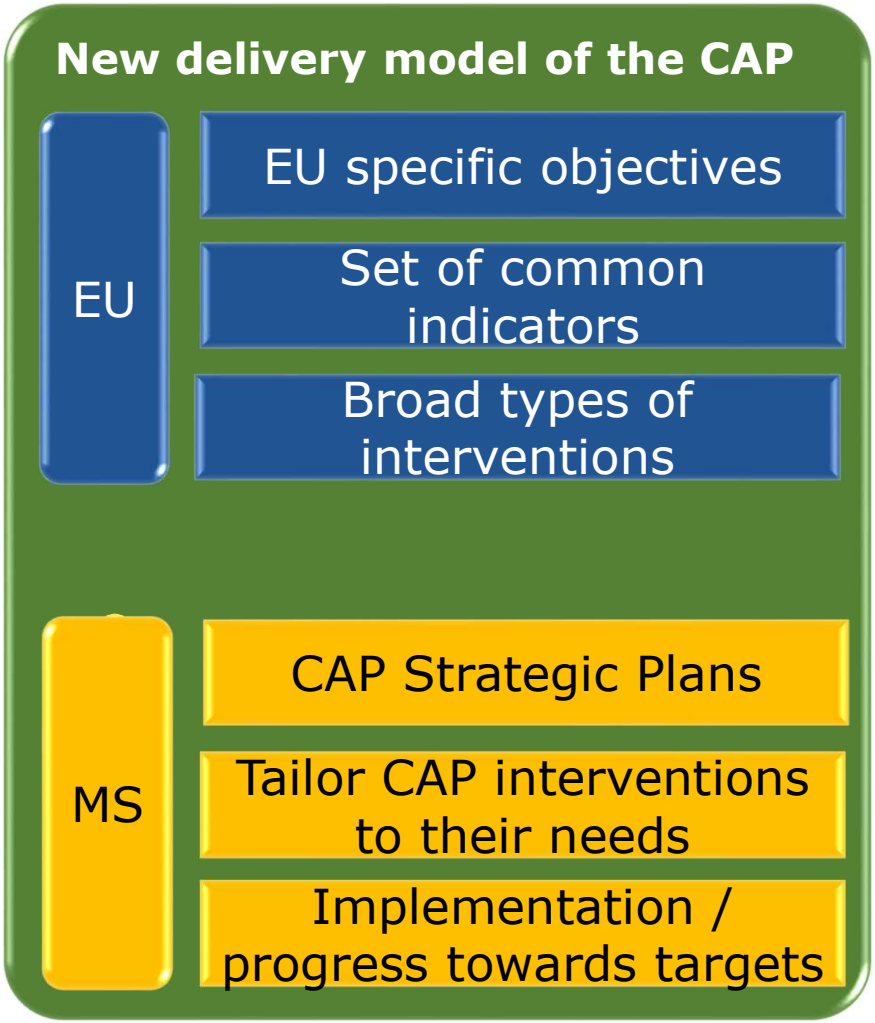
Performance based system

→ *Ensure policy results*

Better targeting

→ *Rules with better links to local realities*

Strengthening <u>environmental</u> care and <u>climate</u> action



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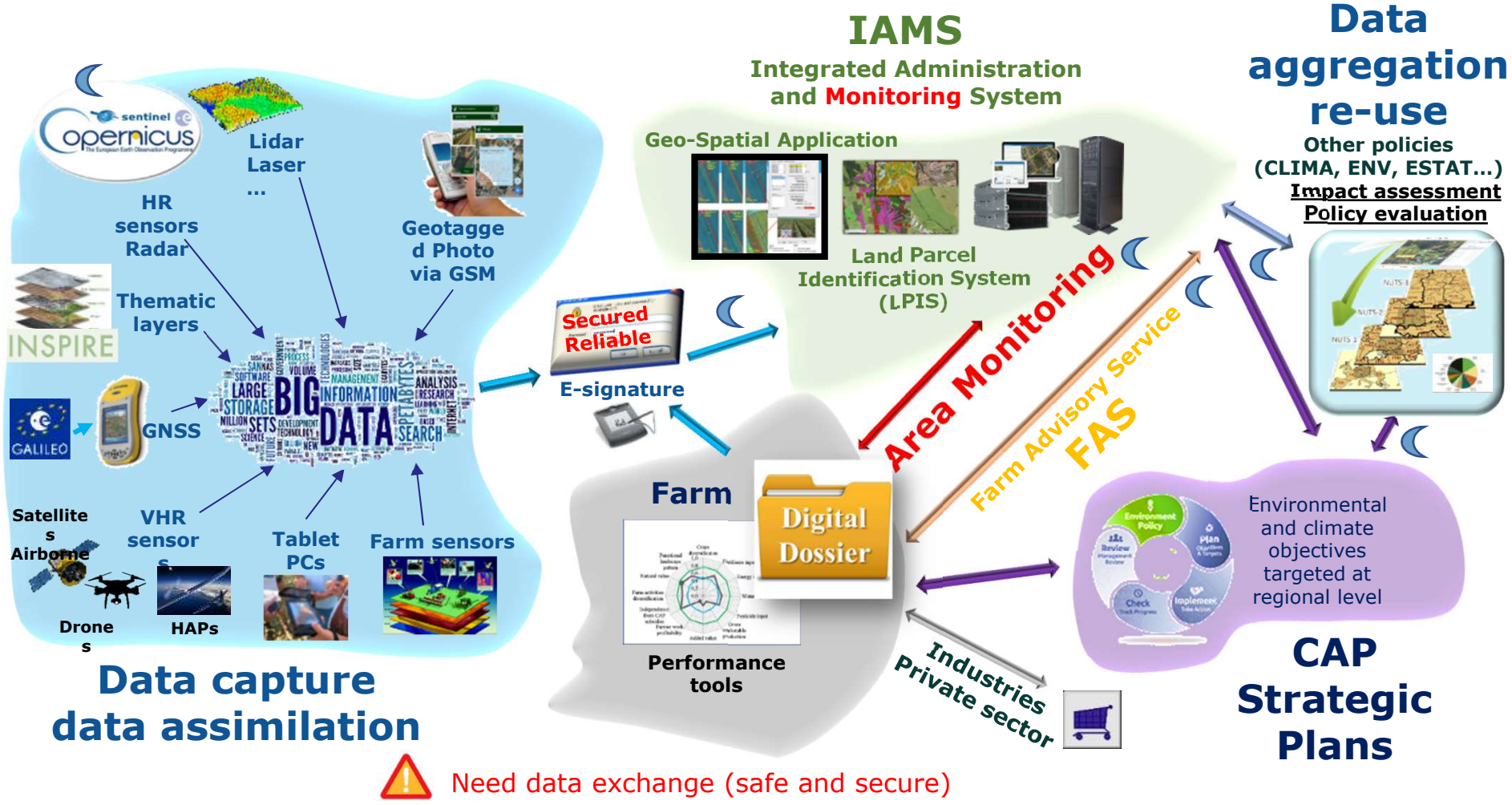
Copernicus opportunities in the IACS (r)evolution



From Check by Monitoring to Area Monitoring to wider use

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Possibilities in the use of Sentinel data

Some examples from studies in different Regions and sectors

Source:
The ever growing use of Copernicus across Europe's regions, EC Commission, ESA, NEREUS 2018

Selection:

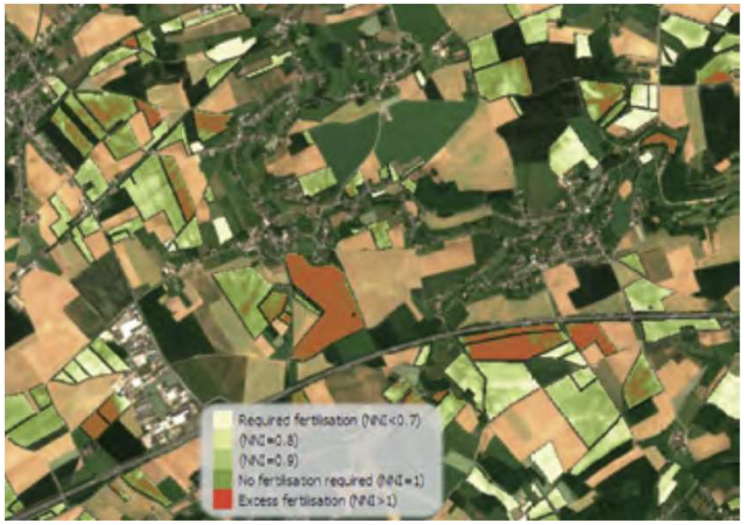
To give a flavor

To possibly use in the frame of next IAMS

Agriculture domain

BELCAM
(BELgian Collaborative Agriculture Monitoring system for sustainable cropping systems)

EO-based collaborative platform for crop monitoring



Nitrogen Nutrition index (NNI)
Crop nitrogen status of winter wheat fields
(in May 2017) (source: UCL – Louvain, Belgium).

Recommendations at parcel level:
1- Total N (start of the season);
2- Crop nitrogen status (growing season)

For wheat, potatoes and maize

Farm advisory services
FaST
New conditionality

http://maps.elie.ucl.ac.be/belcam/

funded by Belspo,
Belgian Science Policy Office, as part of the STEREO III program

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Agriculture domain

CropSAT
free internet programme for farmers

Web based application to monitor biomass at each Sentinel 2 passage

Users: 7300 in DK, 4100 in Sweden (2017)

Farmer:
apply the right amount of fertiliser and pesticides based on crop density and vigor

FAS/administration:
identify areas with issues

yellow = low biomass green= high biomass

Farm advisory services
New conditionality

https://cropsat.com/dk/da-dk

by the Knowledge Centre for Agriculture and the Danish Pig Research Centre (SEGES) in cooperation with Swedish company Dataväxt

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Environment domain

DIANA H2020
Detection and Integrated Assessment of Non-authorized water Abstractions using S2

In Dubrovnik

Service platform: EO data, meteorological and complementary data

Map of the growth patterns linked to water supply

Combined with parcels with water authorisation map

→ Detection of non-authorized water abstractions

See also Sensagri

Monitoring actions (strategic plans)
Farm advisory services
New conditionality

https://diana-h2020.eu/en/

Coordinator: AGRO APPS I.K.E., Greece

Pilot projects in Mancha and Andalucía (ES), Campania (IT) and Banat (RO)

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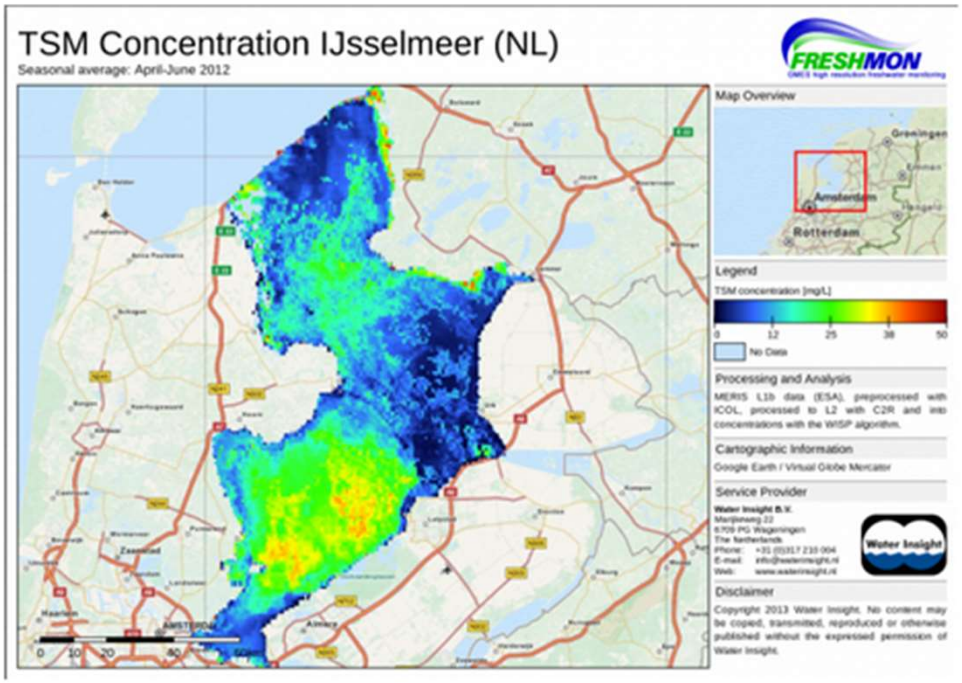
Environment domain

EOMORES
Earth Observation based services for Monitoring and Reporting of Ecological Status (S1, S2, S3)

Water quality parameters:

- Chlorophyll-a concentration
- Total Suspended Matter concentration
- Turbidity/transparency
- Colored Dissolved Organic Matter concentration
- Vegetation type and coverage
- Cyanobacteria blooms
- Water surface temperature



Suspended matter map for monitoring turbidity
(Credits: Water Insight)

Planning and monitoring actions (strategic plans)

Farm advisory services

https://eomores-h2020.eu/

Coordinator: WATER INSIGHT BV, NL
Pilot projects in IT, LT, EE, UK, FI and NL

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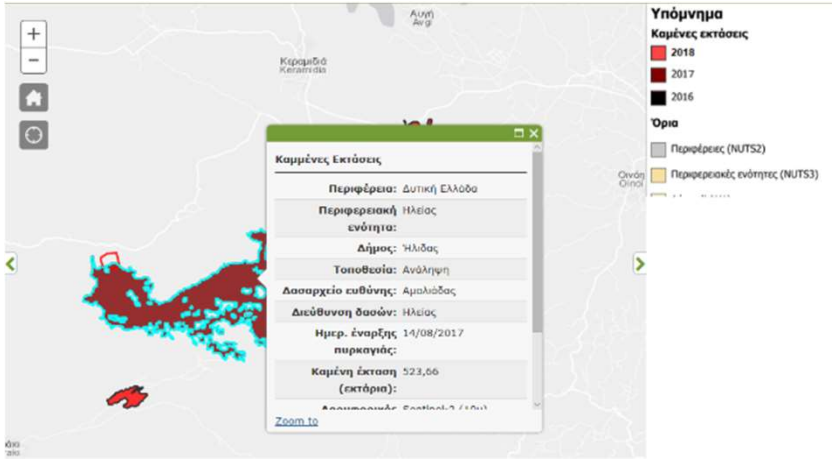
Climate domain

NOFFi-OBAM
semi-automated burned area mapping service (S2)

- Burned area mapping
- Short-term ecosystem restoration measures

2017: 97 wildfires in Greece
20710 ha in total

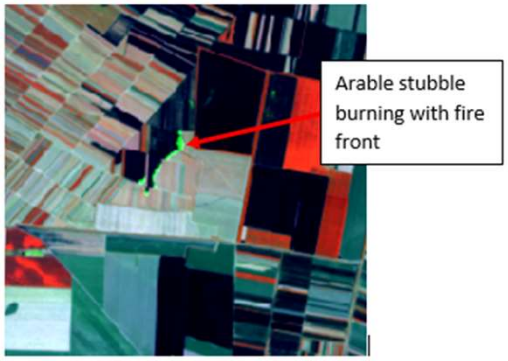


NB: Many other projects in the forest domain

http://epadap.web.auth.gr

National Observatory of Forest Fires, Greece

JRC test for stubble burning



False colour composite
Sentinel-2 bands 8,11,4 RGB,
13 July 2016

Sentinel-2 multispectral satellite image time series

+

Near Real-Time (NRT) active fire data by NASA's Fire Information

New conditionality
Strategic plans

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Agriculture/environment domain

Small Woody Features:
A Copernicus Land Monitoring Service product

Pan-European High Resolution Layers (HRL)

Complementary to CORINE land cover (CLC) datasets

Based on optical HR and VHR data, but also on S1 imagery for some HRLs

See also Ecolass

2015 reference year HRLs in production

Lot	Topic	Products	Input imagery
1	**Imperviousness**	• Imperviousness density • Imperviousness density change • Imperviousness density change classified	Multi-temporal HR and VHR for calibration
2	**Forest**	• Tree Cover Density • Dominant Leaf Type • Forest type • Tree Cover density change • Leaf Type change	Multi-temporal HR and VHR for calibration
3	**Grassland**	• Grassland	Multi-temporal HR and VHR for calibration + SAR (S1)

4	**Wetness and Water**	• Wetness and water in 4 classes:
		  • permanent water
		  • temporary water
		  • permanent wet
		  • temporary wet
			Multi-temporal HR and VHR for calibration + SAR

5	**Small Woody Features (SWF)**	• Small woody features	VHR IMAGE 2015

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Agriculture/environment domain

Small Woody Features

Including:
- Linear hedgerows and scrubs
- Tree rows
- Isolated patches of trees

2015 layer available in 2019
Updates every 3 years

Input data:
- VHR IMAGE 2015 Riparian Zones
- In-situ data

Geometric specification of SWF

	Linear Structures	Patchy Structures
Width	<=20m	
Length	>=50m	
Area		200m²<area>5000m²

SWF detailed example

Warning:
This is not the EFA layer!

Can we do the same with only Sentinel?

Planning actions (strategic plans)
Farm advisory services

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Main messages from these projects

Many projects today and more to come

- Need to organise the knowledge transfer in the community

What can be already used and for what?

- Extending the monitoring approach to **conditionality, eco-schemes and rural development**
- Supporting the **creation of baselines** and analysis for **strategic plans** and **reporting through indicators**
- Supporting the boosting of **advisory services**
- Supporting the **management of agricultural land** at different scales (from farm to regional level)

A need to reactivate some topics

GTCAP events

year	MARS annual conference	IACS workshop	Control Campaign Kick-off	LPIS	GAEC-greening	FAS
2007	Madrid,12-14 November					
2008	Ljubljana,3-5 December	>>>	Ispra,3-4 April	Sofia,16-18 September	-FAS workshop Ispra,24-26 November	GAEC-FAS workshop Ispra,24-26 November
2009	Taormina,18-20 November	>>>	Ispra,6-8 April	Tallinn,6-8 Octob	Dublin,28-30 September	Schwäbisch Gmünd,9-10 June
2010	Bergamo,24-26 November	>>>	Ispra,13-15 April	Copenhagen Septemb	Rome,6-8 October	Barcelona,10-11 June
2011	Tallinn,23-25 November	>>>	Varese,29-30 March	Am dam,6-8 April	Vienna,3-5 October	Warsaw,8-9 February
2012	Paphos,21-23 November	>>>	Varese,27-28 March	Malta,4-6 June	Ispra,8-10 November	
2013	Vilnius,3-4 December	>>>	Varese,8 il	Baveno,14-15 October	Riga,10-12 September	Dublin,12-14 June
2014	Dresden,19-20 November	>>>	Vare 6 March	Brussels,22-24 April	Brussels,24-26 September	
2015	Thessaloniki, 24-25 November	>>>	se, 20-21 pril	Baveno, 23-25 March	Prague 21-23 October	
2016	Lisbon, 24-25 November	Baveno, 23-25 May	<<<	<<<	<<<	
2017	Dublin, 28-29 November abstracts	Gent, 29-31 May	<<<	<<<	<<<	
2018	Dubrovnik, 21-22 November - Answers to questions asked via Slido	Vilnius, 28-30 May - Day 2 discussion sessions	<<<	<<<	<<<	
2019	Prague, 26-28 November	Valladolid, 10-11 April	<<<	Varese, 13-14 March	<<<	under consideration

Climate-environment and FAS back as main topics in IACS

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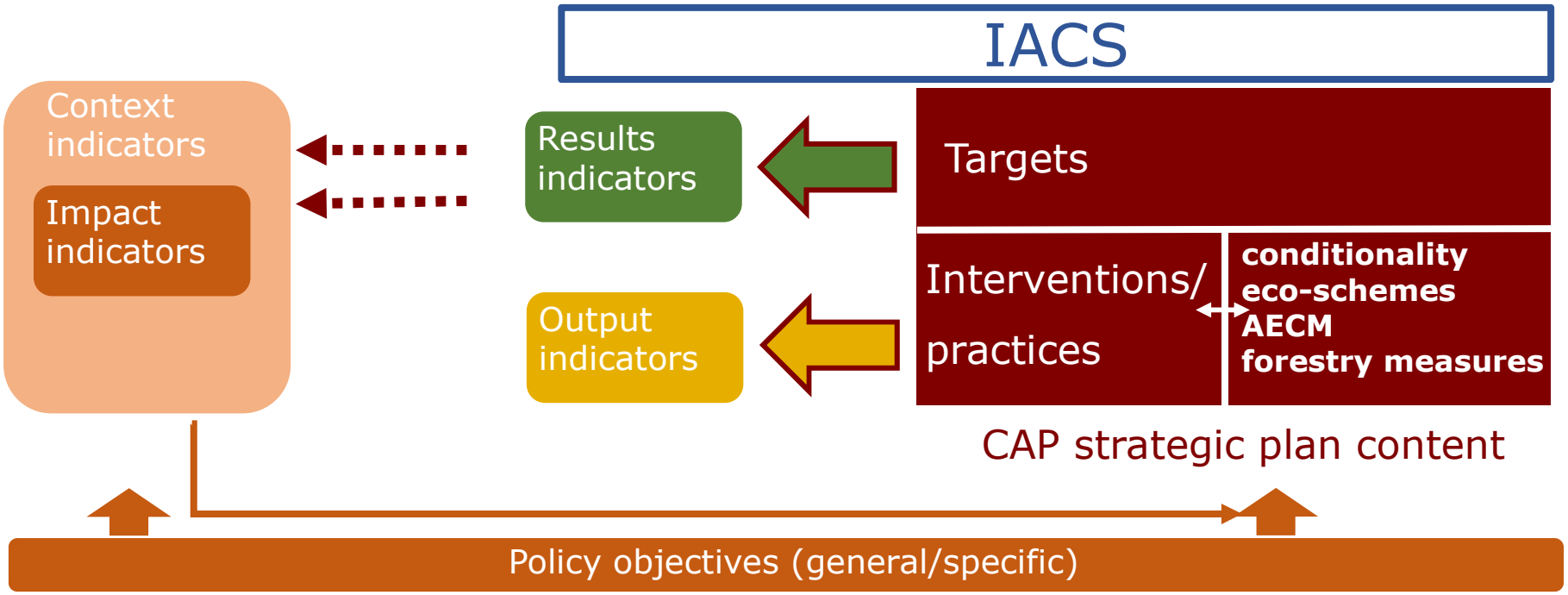
Why these emphases?



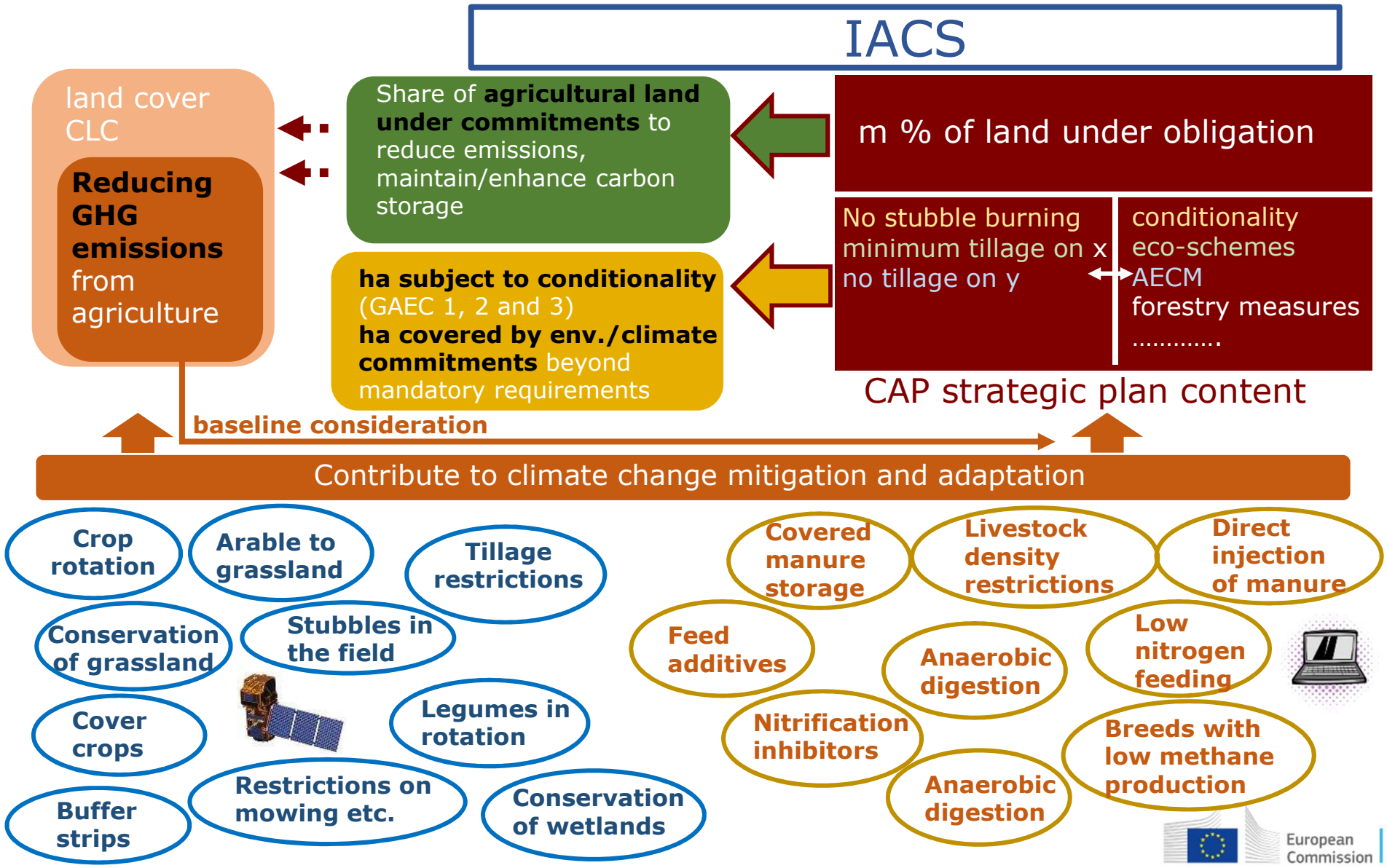
IACS holds a land cover / land use database

IACS contributes to indicator information needs

Output / result indicators can be IACS derived, what about impact indicators?

Interoperability
Scalability
Quantity
Quality
Availability

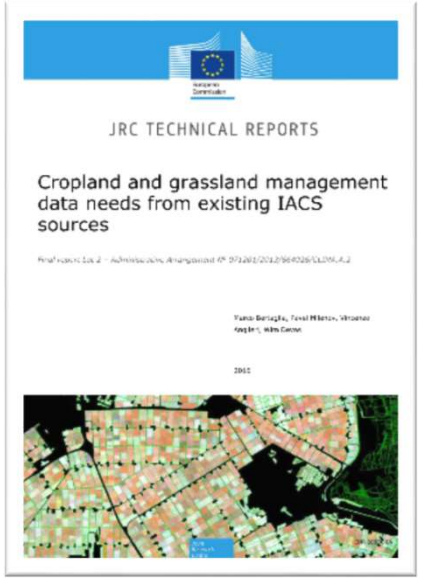
A concrete way forward (CLIMA example)



A concrete way forward (CLIMA example)

From the on-going cooperation with CLIMA

- Data are intrinsically geospatial
- High semantic congruence between categories (grassland, cropland)
- Use as a framework for data integration
- Some MS have already used IACS for LULUCF reporting
- Provide a cost effective solution
- Legal requirements on data sharing are being addressed



Modus operandi for other domains …

Conclusions

- Next CAP highly focused on climate/environment

→ Land use/land cover at parcel remain primordial

- Copernicus/Sentinel has a great potential in that frame

→ Started with Check by Monitoring

→ then AMS and → more

Need to be organized (modus operandi)

- CLIMA as 'pattern' for other domains

- Take benefit of projects

Our community has a primary role in CAP implementation

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Thank you for your attention

Any questions?

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