Checks by Monitoring and the use of Sen4CAP products

Paying Agency of Castile and León (Spain) case

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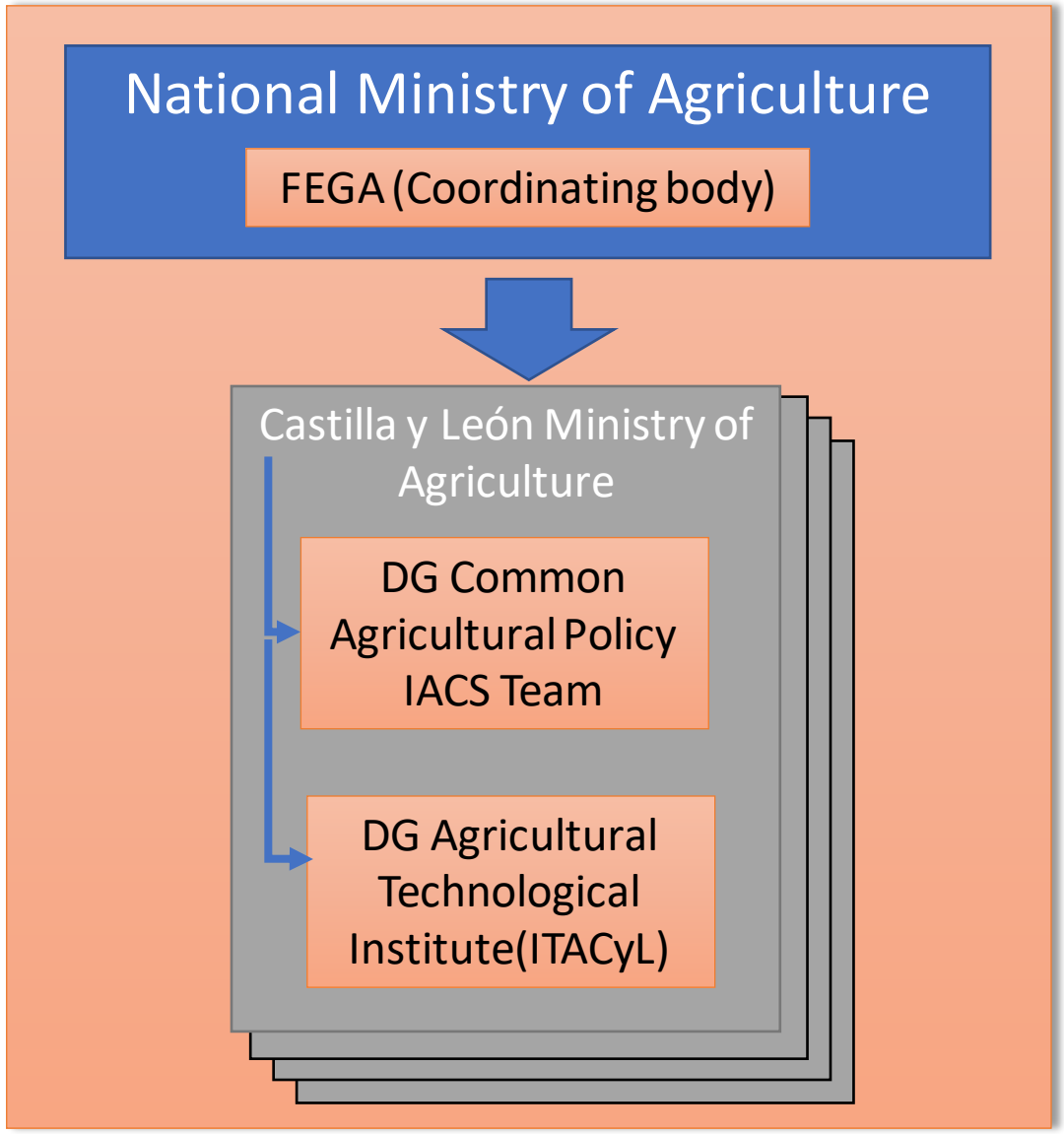
About ITACyL



- Research and IT public entity that belongs to the Regional Ministry of Agriculture of Castile and León.
- Two departments specialised in Geo-technologies for agriculture.
  - ✓ CAP support: LPIS upkeeping, OTSC and CbM
  - ✓ Research and Innovation: Earth Observation, agrometeorology and soil science, crop modelling, GNSS

Castile and León is the 12th largest EAGF Paying Agency in Europe.
94,000 km²

How did we get involved? Pre-CAP monitoring

2014 -2016

- USDA (CDL) methodology.
- Use of Deimos-1 and Landsat-8
- First Crop Map Classification (mcysncyl)

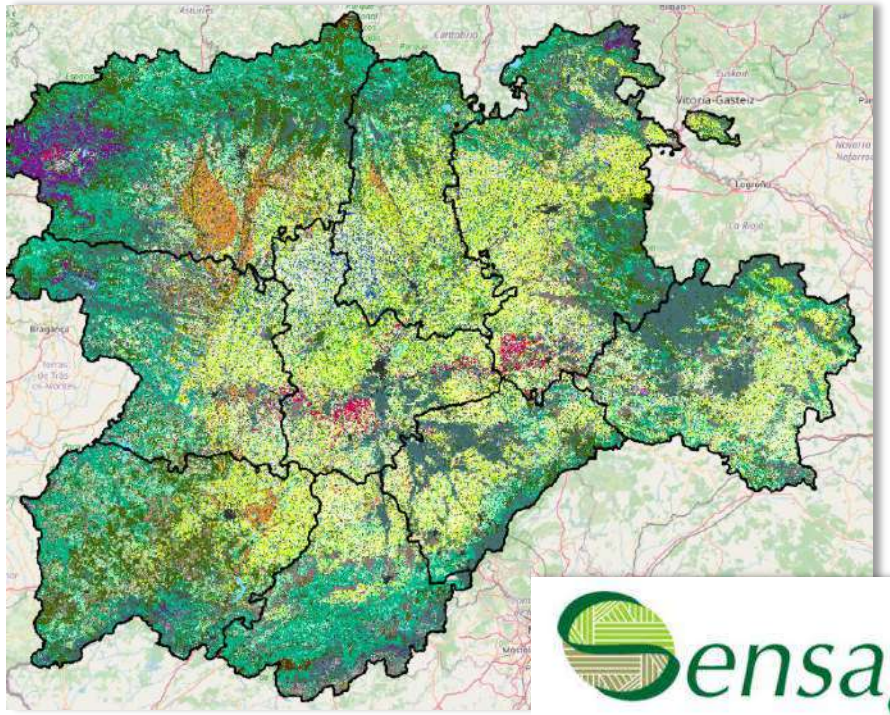
2017

- Sentinel-2 images availability
- EC shift towards CbM
- PA interest for the product

2018

- PA requirements collection
- Workflow to integrate Remote Sensing data and Crop Map Classification within IACS.
- Deployment of the infrastructure

2011 → 2016 → 2020…



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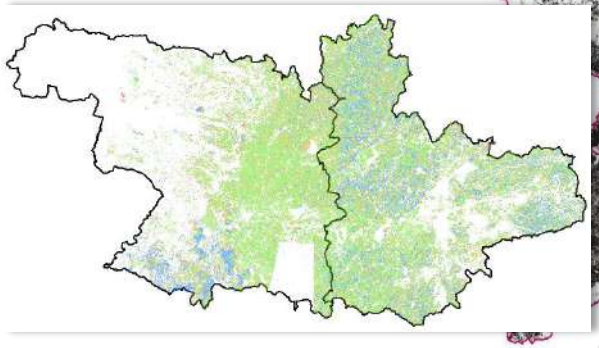
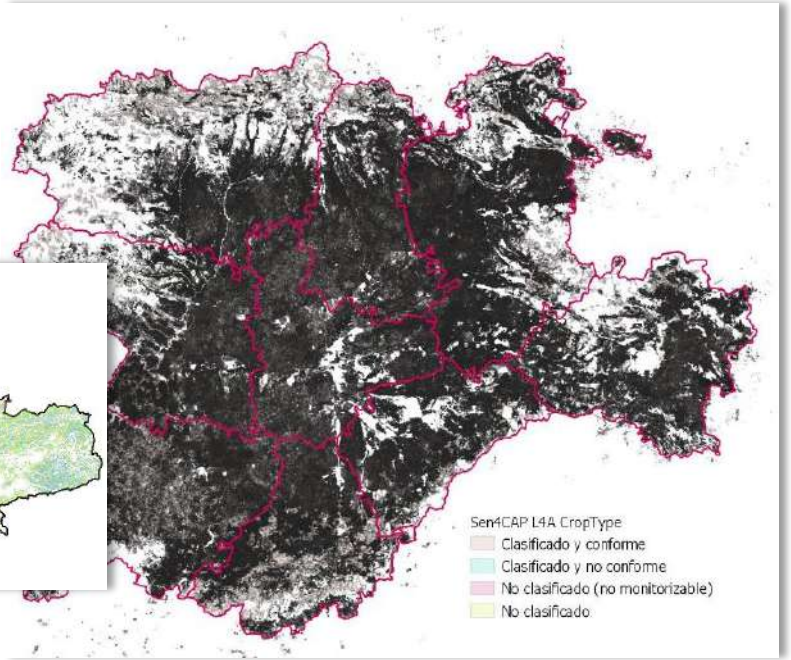
- Engagement as test site
- User requirements

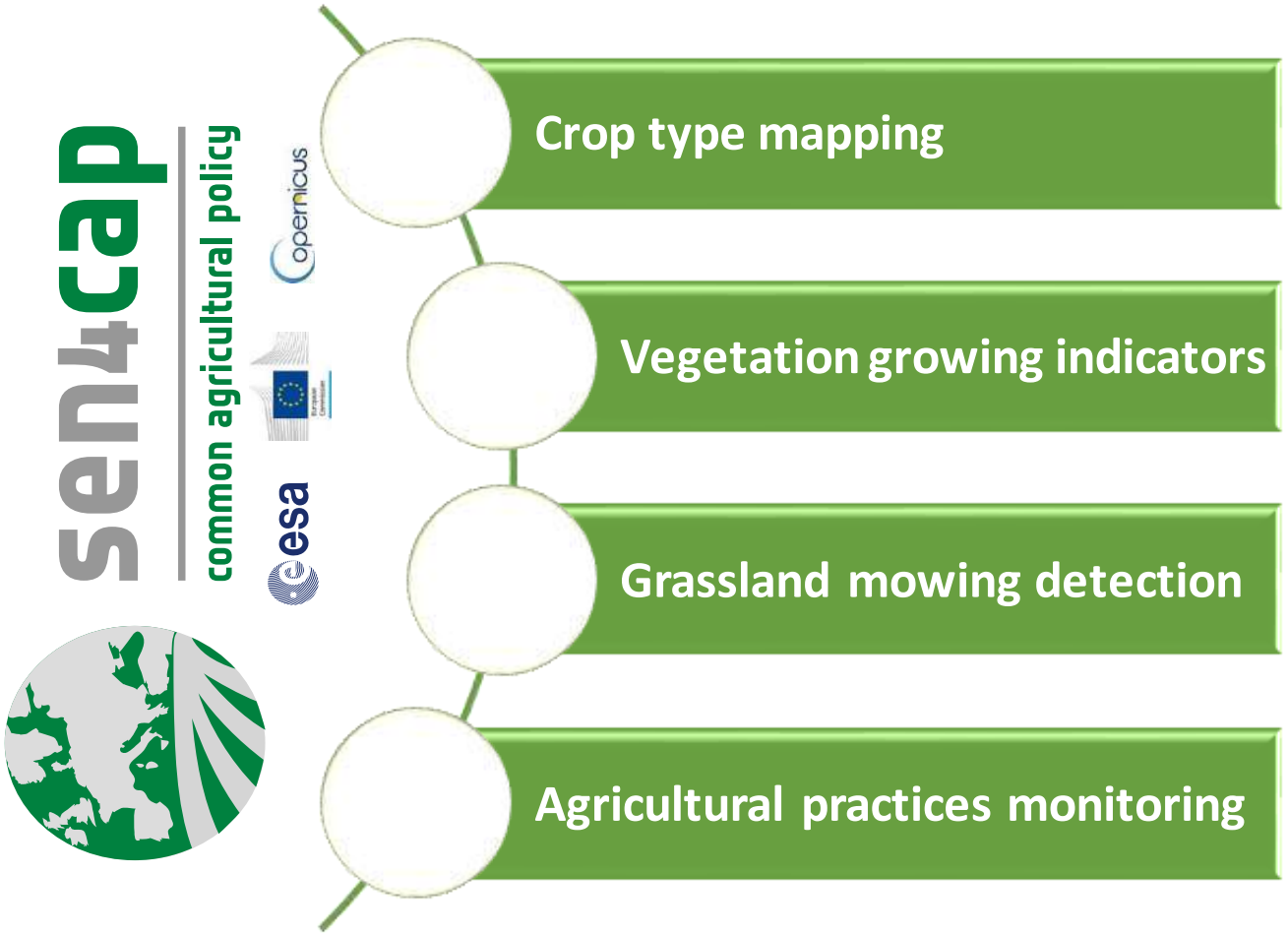
Prototyping



1st Evidence



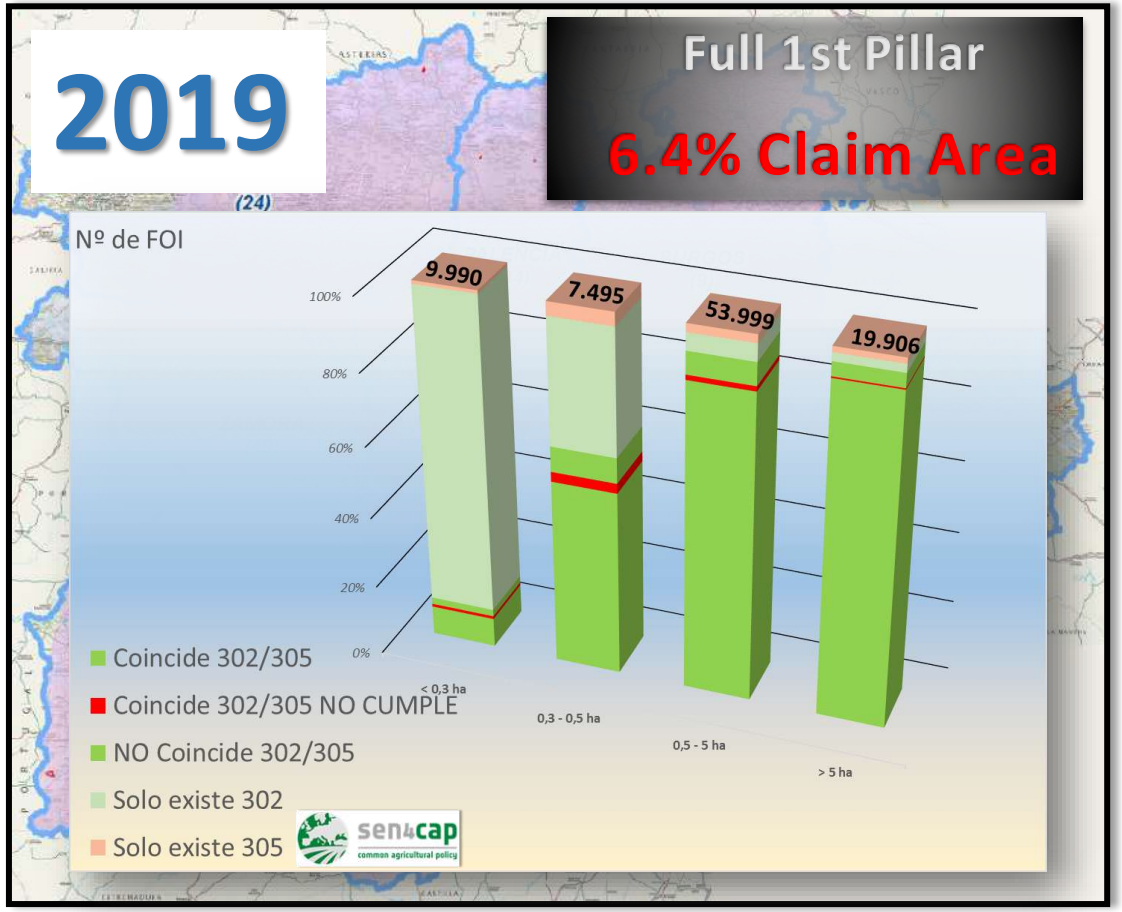
Sensagri
Sentinels Synergy for Agriculture

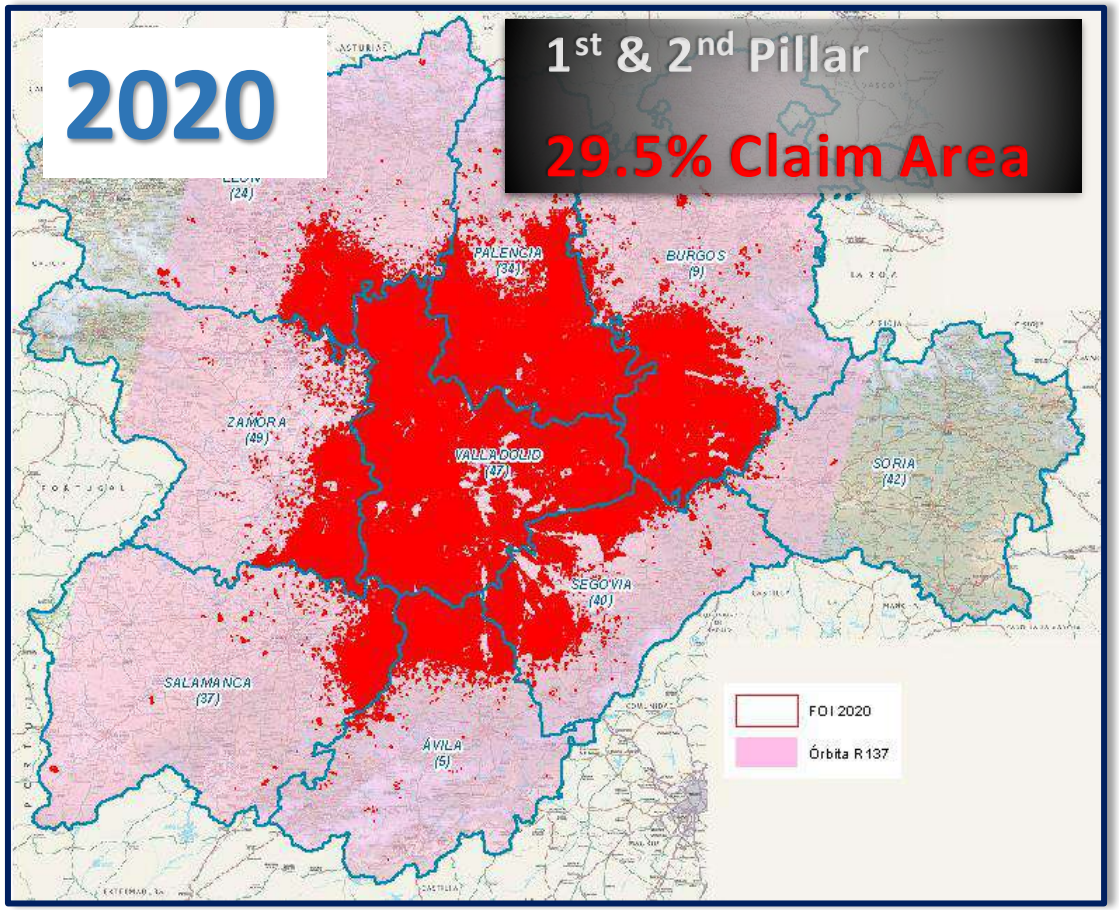


What does Sen4CAP provide to Paying Agency?

- **Downloading tool:** Sentinel 1, 2 and L8
- **Pre-processing engine** (Sentinel 1 & 2)
- Toolbox of **validated algorithms** and **workflows to compute markers** for agriculture monitoring.
- **Vector** (GSAA) **Intersection** with all RS data from the previous processes

How did we monitor CAP?





- All processors run in cloud environment
- Supervised and managed by Sen4CAP team
- Crop type map integrated in IACS workflow

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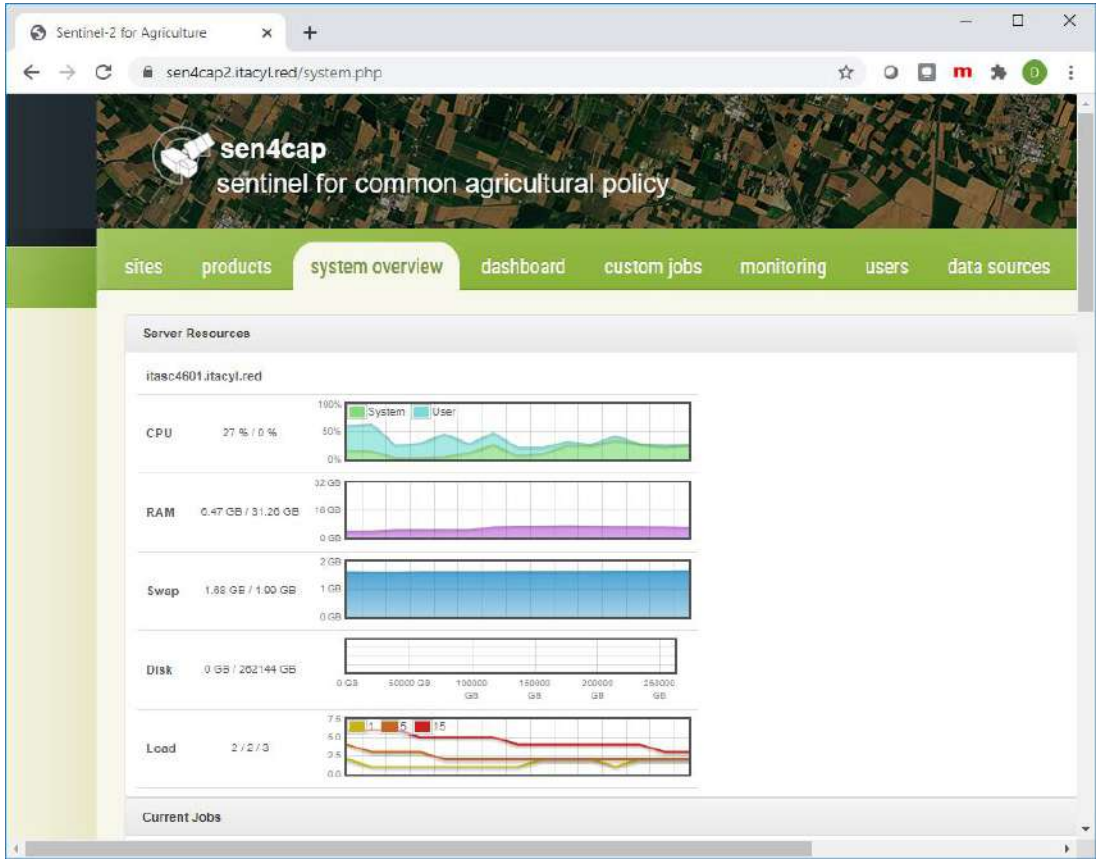
- Sen4CAP run during 2020 campaign
- Two Sen4CAP instances running:
  - ✓ PA premises
  - ✓ Regional super-computing center
- Support from Sen4CAP team

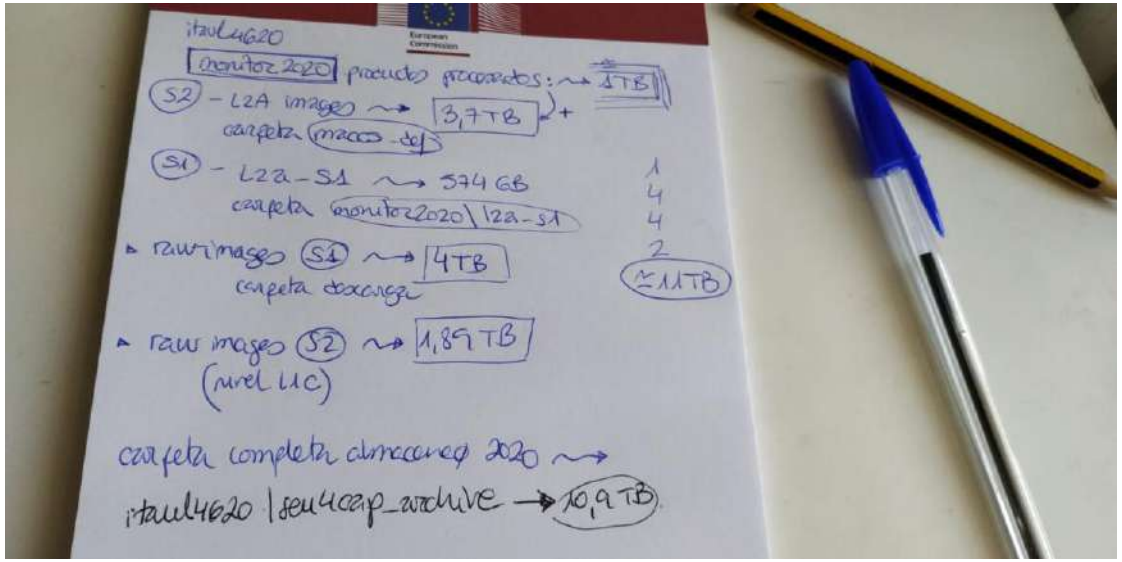
Sen4CAP installation from IT perspective

- Clean process using scripts with some dependencies.
- Well documented
- Easy update
- Very Good support from Cosmin Udroiu – Cs-Ro
- Problem with the disk usage monitoring



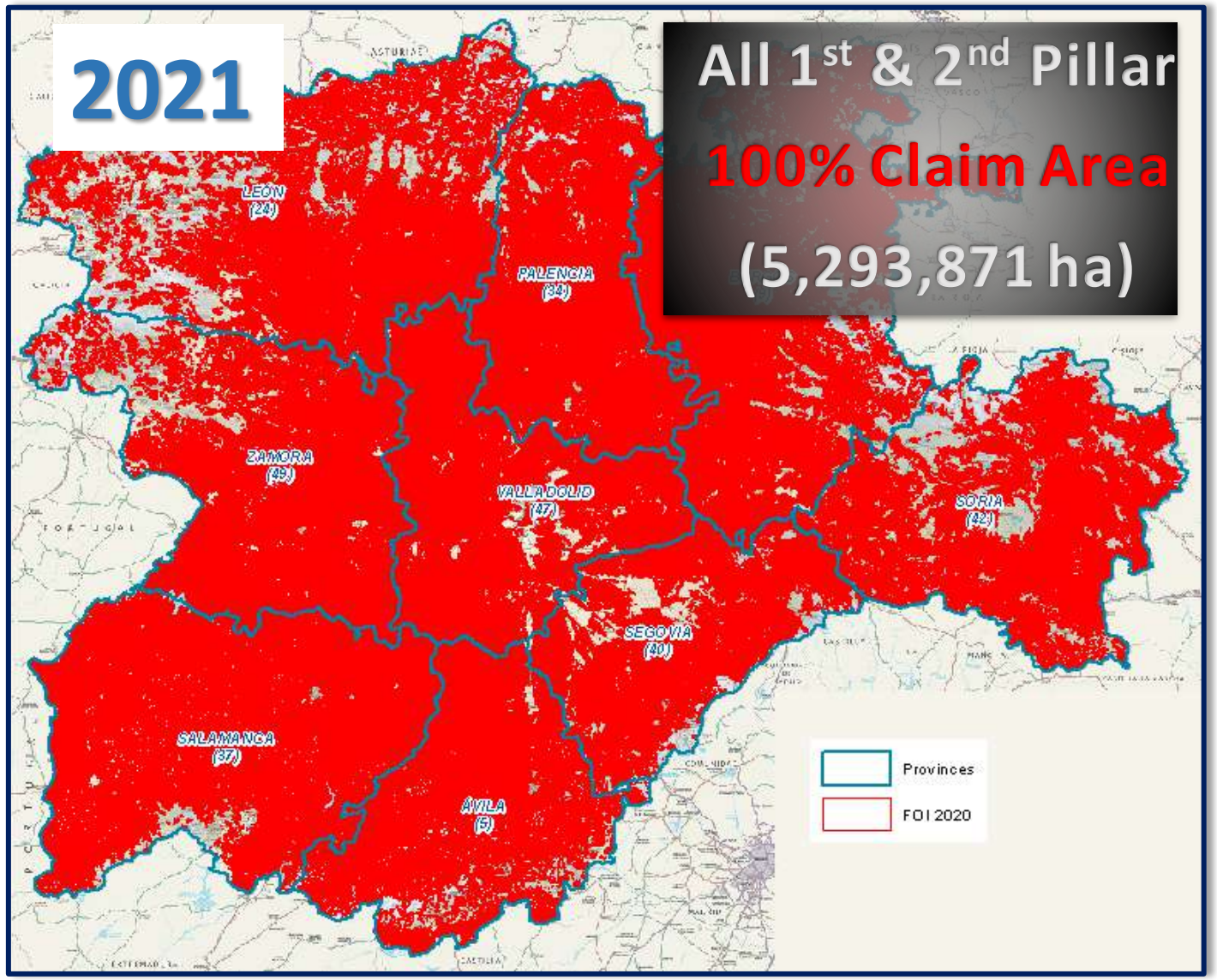
Data usage for CyL PA in 2020 (100,000 km2)

- S1 raw 4 TB
- S2 raw (L1C) 1,89 TB
- S1 derived products 4 TB
- S2 derived products 4TB



11 TB full season

What about 2021?



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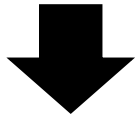
- Replace our downloading system with Sen4CAP's
- Define new markers from Sentinel-1 signal and from biophysical products
- Take advantage of new markers such as tillage from Sen4CAP 2.0

Technical requirements (~90 000km²)

- CPU: 8 Cores
- RAM: 64GB
- HDD Storage: 8 TB (without S-1, S-2 L1 storage)
- SSD Storage: 150 GB (optional)

What do PAs need to set a monitoring system?



1. **Farmers application** software
   - Updated with current season satellite imaginary
   - Preloaded markers from previous years and current season land cover

NO

essential **2. Image downloading** and pre-processing scripts (signals)

Yes

3. Derived products for crop and ag. practices identification (**markers**)

Some

essential **4. Vector intersection** to store markers in Monitoring DB next to IACS DB

Yes

essential 5. Decision rules based in Monitoring and IACS databases.

NO

essential **6. Expert judgement tool** that integrates signals, markers and decisions with image viewer.

NO

7. Farmer Interaction APP (notifications, geotagged pictures, etc.)

NO

Conclusions and remarks

- Sen4CAP gives interesting products to produce markers within a Checks by Monitoring framework.
- These markers need to be integrated in the administrative part of IACS.
- This integration could be challenging and it is out of the scope of Sen4CAP:
  - ✓ie.- IACS/GSAA live update -> Marker computation -> way back to IACS
- **Sen4CAP is a good starting point to go into Check by Monitoring**
  - ✓All tools in one place
  - ✓But there are some steps beyond it to take into account.

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Thank you for your attention