Integration of sen4cap products in the Check by Monitoring workflow

Paying Agency of Castile and León (Spain) case

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Sentinels for Common Agricultural Policy Final User Workshop (March 2021)
Agricultural research and innovation public entity

Two teams specialized in Geo-technologies for agriculture
- Research and Innovation: Earth Observation, agrometeorology and soil science, crop modelling, GNSS
- CAP support: LPIS upkeeping, OTSC and CbM

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 RS data and Crop Map Classification within IACS.
- Deployment of the infrastructure

2011 → 2016 → 2020...

- Engagement as test site thanks to FEGA
- User requirements

1st Evidence

Prototyping

Sensagri
Sentinels Synergy for Agriculture
How did we monitor CAP?

- All processors run in cloud environment
- Supervised and managed by sen4cap team
- Crop type map integrated in IACS workflow

- Sen4cap run during 2020 campaign
- Two sen4cap instances running:
  - PA premises
  - Cloud environment: SCAYLE
Sen4cap installation from IT perspective

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

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)
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?

- 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

All 1st & 2nd Pillar 100% Claim Area (5,293,871 ha)
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

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

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

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

5. Decision rules based in Monitoring and IACS databases.

6. **Expert judgement tool** that integrate application data with signals, markers and rules.

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

• Sen4cap looks appealing, it has some features quite interesting for us.
• Challenge to integrate with in-home process and IACS. Need to explore:
  • GSAA live update in sen4cap postGIS layer
  • Markers database API
• If we were starting with CbM from scratch right know, sen4cap would be the our starting point.