

Lessons learned from Copernicus R&D projects

Application to the Monitoring Area System in Castile and León (Spain)

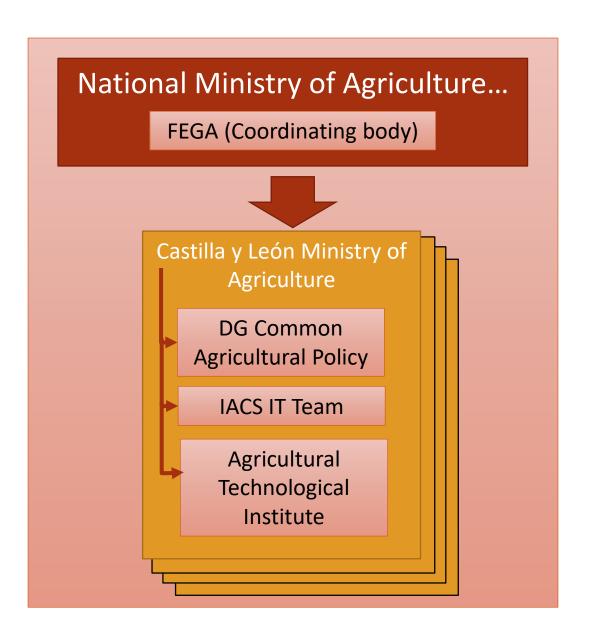
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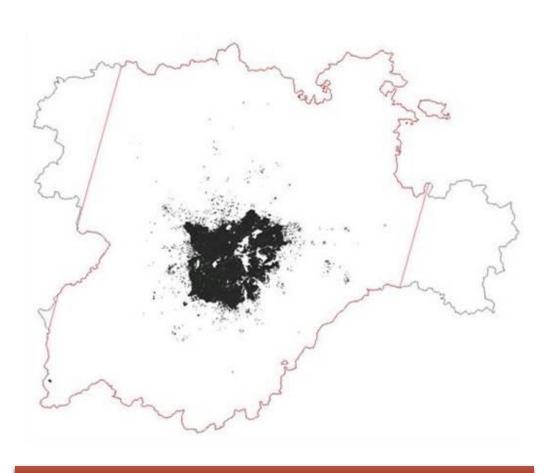


Outlook

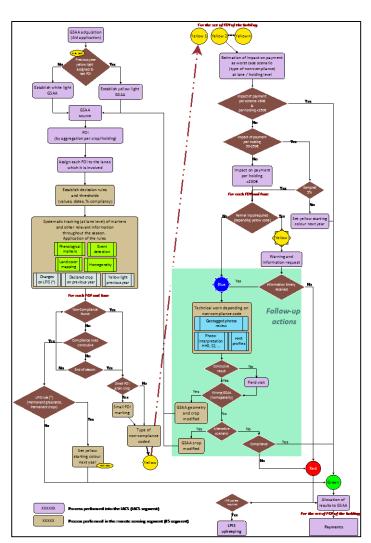




2019 Monitoring Phase-in



All pillar 1 direct payments schemes (BPS+Greening+VCS



R&D Projects



ECoLaSS
Evolution of Copernicus Land Services
based on Sentinel data



Pure Remote Sensing products

Data management oriented

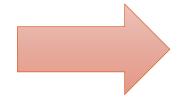


NIVA / A New IACS Vision in Action

Things that you may need and where to find them (openly)

Tools for signal processing





Tools for follow up actions

GSA Geotagg picture APP

FAST Tool



Algorithms or RS products for agricultural practices identification (Markers)



ECoLaSS

Evolution of Copernicus Land Services based on Sentinel data



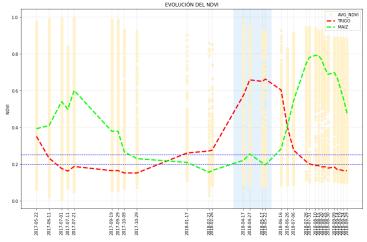


Signal processing tools









Markers, Scenarios, Lanes and Rules

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Agricultural practices: Tillage detection

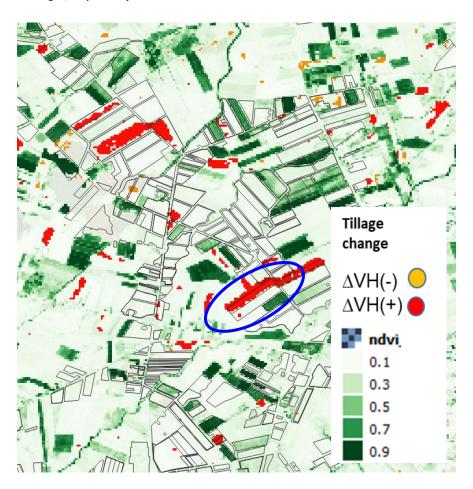
Sentinels Synergy for Agriculture

- Top agricultural activity marker
- Challenging in Mediterranean conditions: Low NDVI does not imply tillage.





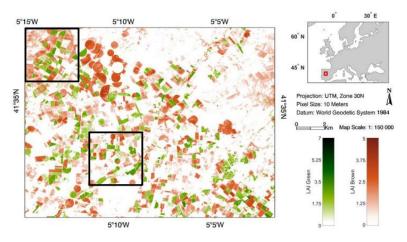
Tillage change map between July 13 and July 19, 2017, over-imposed to the NDVI on July 17, 2017. The dark yellow and red colours identify negative and positive changes, respectively.



Agricultural practices: Presence/Loss of vegetation, harvest

Leaf Area Index (Green and Brown)

- LAI is a sensor independent variable compared to NDVI
- Precise harvest detection in Mediterranean conditions thanks to brown LAI
- Interesting indicator for non bare soil detection
- LAI Green as a Proxy for number of plants present (important for some VCS)



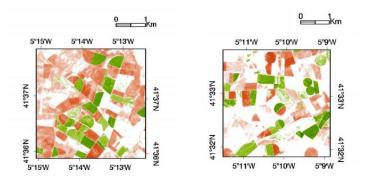
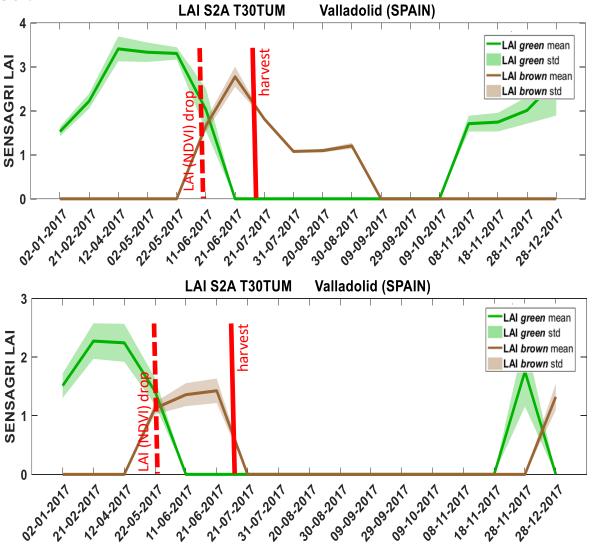


Figure 12. Composite map of LAI green and LAI brown within 50% uncertainty threshold over Valladolid (Spain).



Leaf Area Index

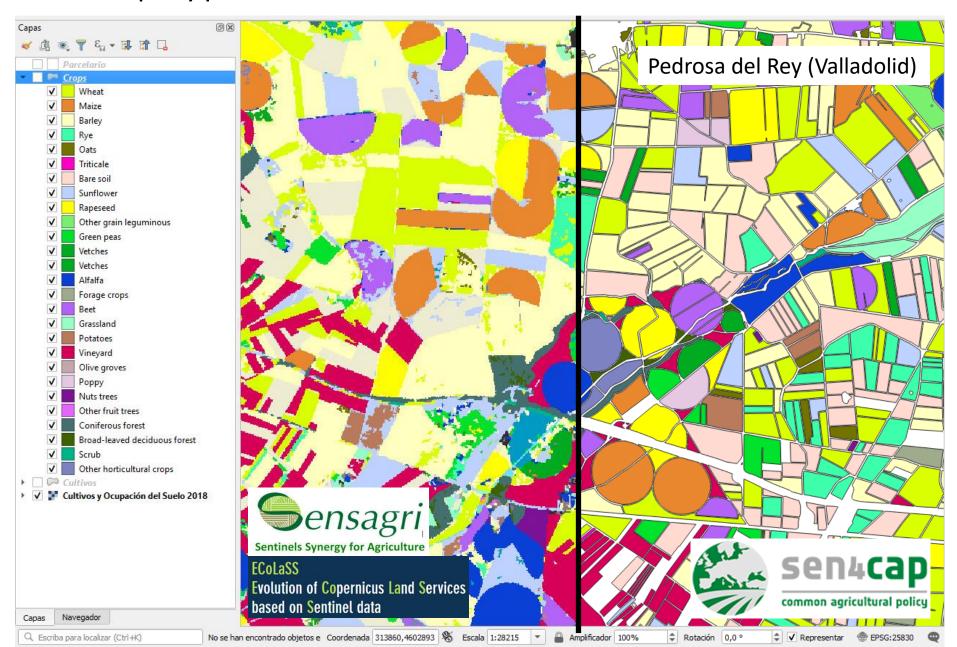
Wheat







Crop type Classification: time is crucial



Pixel classification vs GSAA



Other classifications to detect ineligibility

High Resolution Layers

- Classifications are much more powerful than setting thresholds based on indexes.
- IACS is a massive source for training ML algorithms
- IACS does not contain all kind of features that are ineligible.









Grassland







Small Woody Features



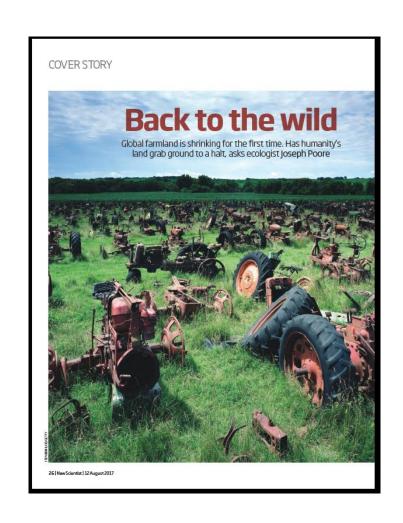
Things to be developed

 Abandonment indicators for grassland and Permanent Crops: linked to LPIS update (annually or 3-year term)

Detect long term increase of woody vegetation by means of higher NDVI at the end of dry season

Decrease of pro-rata:

Detect Increase of areas covered by bushes by means of an increase of area with vegetation height over 1 m above ground. **LIDAR**



From R&D to operational product

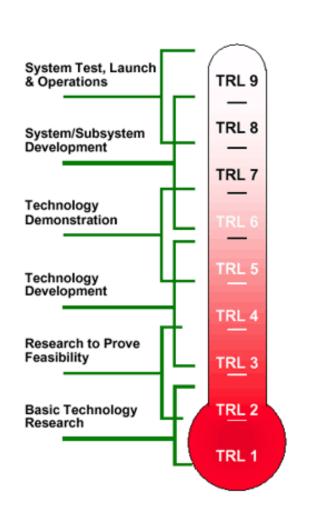
R&D projects and Copernicus services

- 1. Few users. Small impact
- 2. No legal binding with the users
- 3. Accuracy issues accepted
- 4. Very innovative approaches are welcome
- 5. Delayed production is not an issue

Paying Agency

- 1. Many organizations and beneficiaries involved.
- Very strong legal concerns due to the Public money transfer. EU+MS Layers
- 3. Used to 100% assurance in the controlled files.
- 4. Reluctance to dramatic changes
- 5. Tough time constrains

From R&D to operational product





Lesson learned

- Cloud screening is still an issue
- Try to use several complementary markers within a decision rule.

Easy for detecting activity. Complex in very specific schemes.

- Most markers require fine tuning for each PA. Difficulties to integrate R&D Projects results into PA operations.
- Start with very basic markers
- Select areas to start with according with your capacity.
- If you are dealing with a small areas, DIAS may not be necessary.
- Phase-in allows you to involve all the PA meanwhile testing stays in the "R&D" team.
- Interaction and commitment between RS/GIS team, PA managers and IACS IT team is needed.

Final message: Monitoring is not just a Remote Sensing issue



