



Greening infrastructure potential

GTCAP team

IACS 2020 webinar, 5 November 2020

Joint
Research
Centre

The context

Current **CAP failed in enhancing the environmental performance** of the policy (ECA special report: “*Greening: a more complex income support scheme, not yet environmentally effective*”)

ECA special report “*Using new imaging technologies to monitor the Common Agricultural Policy*”

Recommendation 2 – Make better use of new technologies for monitoring environmental and climate requirements

- Identify obstacles hindering the **uptake of new technologies for checking cross-compliance and rural development**
- Use, and promote the use of, information coming from the new technologies to provide better insight into the **policy performance** of the post-2020 CAP



Potential of CbM for the greening infrastructure

- Monitoring is a whole process that involves different “tools”
 - Mainly Sentinel data but also other imagery, geotag photos, LPIS and other European and national thematic data sets ...
- Some requirements are currently monitored with Sentinel
 - Conversion/ploughing of PG, presence/absence of green cover, crop rotation, ban of burning arable stubble, cutting of grassland ...
- But only the very beginning, proper analyses still have to come



Research steps

- Feasibility of using Sentinels data (automatic analysis of EO data) for checking and monitoring implementation of conditionality requirements and farming practices beneficial for environment and climate
- Feasibility of using other imagery (HHR, national ortho, VHR ...)
- Feasibility of using alternative new technologies (geotagged photos, AI, data shared by farmers, crowdsourcing data...)



Current research objectives

- Explore the potential of the current CbM methods to depicts things relevant to cross-compliance
 - FOI heterogeneity detection methods based on image segmentation of multi-temporal S2 data
 - **Checking GAEC 7** - presence of terraces/ landscape features
 - Relative amplitude difference in time series of S2 spectral bands
 - **Checking presence of long-term fallow (in EFA context)**
 - Multi-annual evolution of phenology/spatial heterogeneity in FOI
 - **Checking grazing on PG** through detecting absence of long-term transition to semi-natural vegetation



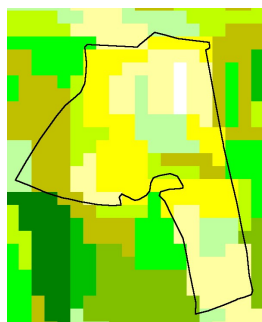
Presence of terraces/ landscape features

- Parcels with terraces results with more image segments than those without (JRC study case in Catalonia, ES)

terraces

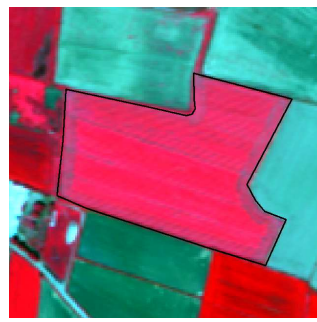


VHR, Satellite: GeoEye-1,
Source: EUSI, 4/5/2019



Segmentation

no terraces



VHR, Satellite: GeoEye-1,
Source: EUSI, 4/5/2019



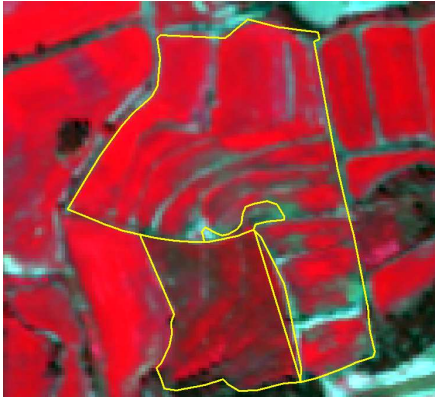
Segmentation



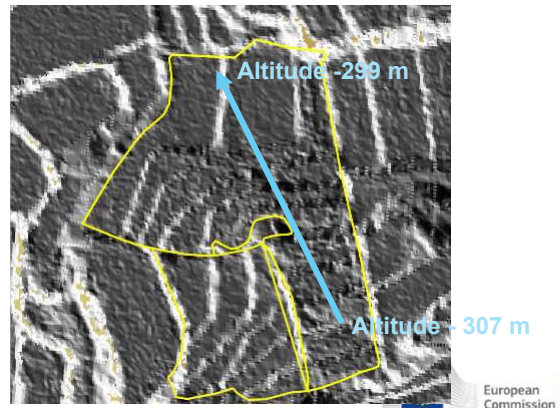
Presence of terraces/ landscape features (2)

- Use of terrain data (DTM, DSM) together with Sentinel to help depicting better the nature of phenomenon observed

VHR



DSM

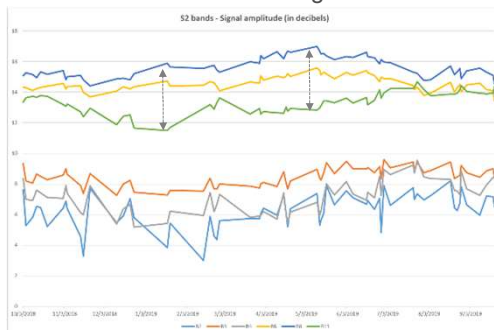


Presence of long-term fallow

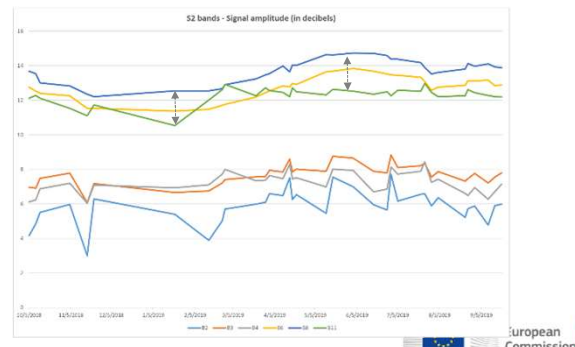
Studying the evolution relative amplitude difference between individual S2 bands
(JRC case study in BE-Flanders)

Signal behavior expressed in logarithmic scale

Mean S2 band values for grassland

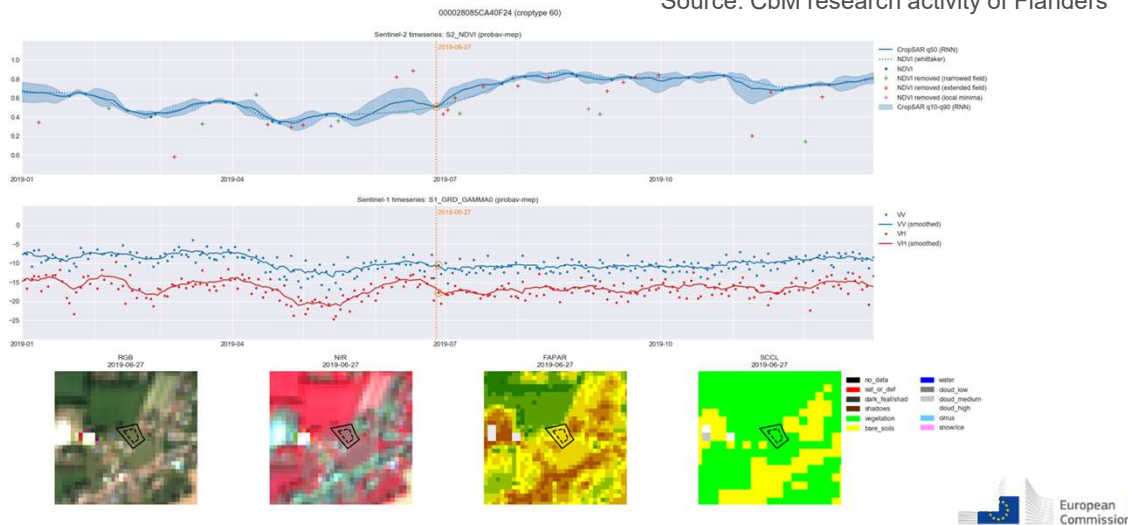


Mean S2 band values for fallow land



Multi-annual evolution of grassland characteristics

Source: CbM research activity of Flanders

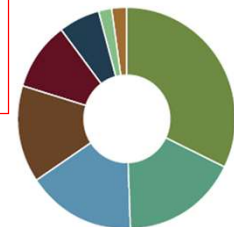


Conclusions

- At the very beginning of research/studies
- Great potential using Sentinel data
 - Practices
 - Identification, mapping, management of green infrastructures
- But also other data
 - See automatic detection of features on aerial VHR (BE-FL)

Some examples from studies in different Regions and sectors

- Agriculture, Food, Forestry and Fisheries
- Biodiversity and Environmental Protection
- Climate, Water and Energy
- Territorial Management and Urban Planning
- Civil Protection
- Transports, Civil Infrastructure and Safety
- Public Health
- Cultural heritage, Tourism and Leisure

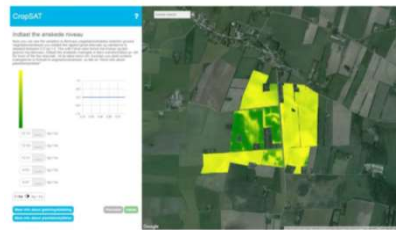


Source:
The ever growing use of Copernicus across Europe's regions, EC Commission, ESA, NEREUS 2018

Conclusions

- CAP after 2020 is ambitious for environment -> measures and tools should be consistent
- Monitoring approach is essential to assure CAP performance
- Should be very informative to help defining/setting Strategic Plans
 - multiannual information on parcel / around parcel content
 - local/regional management

Farm advisory services
New conditionality
Risk maps
Reference maps
...



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



Thank you



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