



A Sentinel-based Agriculture Monitoring Scheme

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Effective and efficient control of the agrarian obligations imposed by the Common Agricultural Policy (CAP) requires systematic and timely monitoring of the agricultural landscape. The introduction of the Sentinel missions, offering open access to data of unprecedented spectral, spatial and temporal characteristics, enable the development of reliable solutions for large-scale operational agriculture monitoring. To this end, H2020 RECAP project (<https://recap-h2020.eu/>) established an improved remote monitoring of the CAP. Within this context, the National Observatory of Athens has developed a platform that implements on-demand, robust, transferable and efficient fully automated EO processing chains, towards evidence-based decision making in the CAP.

The system is based on the accurate crop classification, with 85-90% overall accuracy for all major crops that describe at least 85% of the regional landscape. The method uses a parcel-based Sentinel-2 imagery time-series approach, under a supervised classification scheme. Produced crop type maps are utilized for conformity checks on CAP's crop diversification requirements. An automated water pollution risk assessment was also implemented to enable the identification of parcels prone to nitrate-rich water/soil runoff, accordant to the Statutory Management Requirements (SMR) of the CAP. Burn Scar Mapping algorithms have been additionally developed to monitor and control the stubble burning restrictions imposed by the policy. All input data are ingested in near real time through the BEYOND GS (beyond-eocenter.eu) and the Hellenic Mirror Site (<https://sentinels.space.noa.gr/>).

This agriculture monitoring scheme has been successfully applied in 5 diverse local-scale pilot scenarios in Europe, within the context of the RECAP project. NOA seeks to extend and scale up the application of the scheme, by incorporating big data technologies and other mature ICT solutions for the monitoring of Food Security at national and international scale in Asia. There we focus on the mapping of rice paddies and yield estimation using machine learning techniques that exploit both SAR (Sentinel-1) and optical (Sentinel-2), this time under the scope of the H2020 projects EOPEN (<http://eopen-project.eu/>) and GEO-CRADLE (<http://geocradle.eu>); in compliance to the UN SDG for zero hunger.