

Evolution of Next-generation Copernicus High Resolution Layers on Forest and Agriculture: The ECoLaSS Project

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The ECoLaSS project: “Evolution of Copernicus Land Services based on Sentinel data” (ECoLaSS) has the objective to develop and test innovative methods and algorithms for various prototypes of improved or novel next-generation operational Copernicus Land services. The basis for creating these prototypes are dense Sentinel-1 and -2 time series, and the targeted implementation schedule is from 2020 onwards, with a primary focus on pan-European scale and secondary focus on global level.

This study introduces the ECoLaSS project concept, including user and stakeholder requirements, processing methodologies and prototypes on (i) imperviousness, (ii) forest, (iii) grassland and (iv) agriculture. A special focus is laid on the recently outlined and tested prototypes for potential future Copernicus High Resolution Layers (HRLs) on Forest and Agriculture. In order to produce these prototypes, dense time series of optical data (Sentinel-2) and synthetic aperture radar data (Sentinel-1) are analyzed by means of high-volume data processing chains for data pre-processing, integration, classification and change detection, preparing for a possible Europe-wide implementation.

The Forest HRL has already been produced for the reference years 2012 and 2015, and the ECoLaSS prototype presents improved concepts for a next-generation pan-European Forest layer. This layer consists of Dominant Leave Type (coniferous/broadleaved) and Tree Cover Density products using proxy data for 2017, and the changes between years and shorter update frequencies between product updates are tested and demonstrated in a site located in Scandinavia. The agricultural prototype provides input to a possible new product on agricultural/arable land within the Copernicus Land Monitoring Service, potentially comprising of Crop Mask and Crop Type maps. This prototype has been implemented in a large demonstration site spanning over five countries: Germany, Austria, Switzerland, Liechtenstein and France.

An outlook shows the complementarity with the recently produced HRLs 2015 on Imperviousness, Forest, Grassland and Water/Wetness, and presents as well the next steps forward towards fit-for-purpose HRL prototypes for future pan-European roll-out.