

Creating an open access cal/val repository via the LACO-Wiki online validation platform

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There is a major gap in the amount of in-situ data available on land cover and land use, either as field-based ground truth information or from image interpretation, both of which are used for the calibration and validation (cal/val) of products derived from Earth Observation. Although map producers generally publish their confusion matrices and the accuracy measures associated with their land cover and land use products, the cal/val data (also referred to as reference data) are rarely shared in an open manner. Although there have been efforts in compiling existing reference datasets and making them openly available, e.g. through the GOFD/GOLD (Global Observation for Forest Cover and Land Dynamics) portal or the European Commission's Copernicus Reference Data Access (CORDA), this represents a tiny fraction of the reference data collected and stored locally around the world. Moreover, the validation of land cover and land use maps is usually undertaken with tools and procedures specific to a particular institute or organization due to the lack of standardized validation procedures; thus, there are currently no incentives to share the reference data more broadly with the land cover and land use community.

In an effort to provide a set of standardized, online validation tools and to build an open repository of cal/val data, the LACO-Wiki online validation portal has been developed, which will be presented in this paper. The portal contains transparent, documented and reproducible validation procedures that can be applied to local as well as global products. LACO-Wiki was developed through a user consultation process that resulted in a 4-step wizard-based workflow, which supports the user from uploading the map product for validation, through to the sampling process and the validation of these samples, until the results are processed and a final report is created that includes a range of commonly reported accuracy measures. One of the design goals of LACO-Wiki has been to simplify the workflows as much as possible so that the tool can be used both professionally and in an educational or non-expert context. By using the tool for validation, the user agrees to share their validation samples and therefore contribute to an open access cal/val repository.

Interest in the use of LACO-Wiki for validation of national land cover or related products has already been expressed, e.g. by national stakeholders under the umbrella of the European Environment Agency (EEA), and for global products by GOFD/GOLD and the Group on Earth Observation (GEO). Thus, LACO-Wiki has the potential to become the focal point around which an international land cover validation community could be built, and could significantly advance the state-of-the-art in land cover cal/val, particularly given recent developments in opening up of the Landsat archive and the open availability of Sentinel imagery. The platform will also offer open access to crowdsourced in-situ data, for example, from the recently developed LACO-Wiki mobile smartphone app, which can be used to collect additional validation information in the field, as well as to validation data collected via its partner platform, Geo-Wiki, where an already established community of citizen scientists collect land cover and land use data for different research applications.