Geophysical Research Abstracts
Vol. 18, EGU2016-14917, 2016
EGU General Assembly 2016

Validating GEOV3 LAI, FAPAR and vegetation cover estimates derived from PROBA-V observations at 333m over Europe

Fernando Camacho (1), Jorge Sánchez (1), Roselyne Lacaze (2), Marie Weiss (3), Frédéric Baret (3), Aleixandre Verger (4), Bruno Smets (5), and Consuelo Latorre (1)

(1) EOLAB, Catedràtic José Beltrán 2, 46980 Paterna, Valencia, Spain (fernando.camacho@eolab.es, jorge.sanchez@eolab.es), (2) HYGEOS, Euratechnologies, 165 avenue de Bretagne, 59000 Lille, France (rl@hygeos.com), (3) INRA, EMMAH UMR1114, site Agroparc, 84914 Avignon, France (marie.weiss@paca.inra.fr, frederic.baret@paca.inta.fr), (4) CREAF, Cerdanyola del Vallès 08193, Catalonia, Spain (verger@creaf.uab.es), (5) VITO, Boeretang 200, 2400 Mol, Belgium (bruno.smets@vito.be)

The Copernicus Global Land Service (http://land.copernicus.eu/global/) is delivering surface biophysical products derived from satellite observations at global scale. Fifteen years of LAI, FAPAR, and vegetation cover (FCOVER) products among other indicators have been generated from SPOT/VGT observations at 1 km spatial resolution (named GEOV1, GEOV2). The continuity of the service since the end of SPOT/VGT mission (May, 2014) is achieved thanks to PROBA-V, which offers observations at a finer spatial resolution (1/3 km). In the context of the FP7 ImagineS project (http://fp7-imagines.eu/), a new algorithm (Weiss et al., this conference), adapted to PROBA-V spectral and spatial characteristics, was designed to provide vegetation products (named GEOV3) as consistent as possible with GEOV1 and GEOV2 whilst providing near real-time estimates required by some users. It is based on neural network techniques completed with a data filtering and smoothing process. The near real-time estimates are improved through a consolidation period of six dekads during which observations are accumulated every new dekad. The validation of these products is mandatory to provide associated uncertainties for efficient use of this source of information.
This work presents an early validation over Europe of the GEOV3 LAI, FAPAR and vegetation cover (FCOVER) products derived from PROBA-V observation at 333 m and 10-days frequency during the year 2014. The validation has been conducted in agreement with the CEOS LPV best practices for global LAI products. Several performance criteria were investigated for the several GEOV3 modes (near real-time, and successive consolidated estimates) including completeness, spatial and temporal consistency, precision and accuracy. The spatial and temporal consistency was evaluated using as reference PROBA-V GEOV1 and MODC5 1 km similar products using a network of 153 validation sites over Europe (EUVAL). The accuracy was assessed with concomitant data collected in the ImagineS project over six cropland sites located in Spain, Italy, Ukraine and Tunisia and non-concomitant data over forest sites made available through the CEOS OLIVE cal/val tool. The ground data was estimated from digital hemispherical photography following a well-established protocol over a sampling unit, and then sampling unit values were up-scaled using Landsat-8 imagery and a robust linear regression algorithm. The accuracy was estimated at 333m over regions of 20x20 km2, and at 1 km over areas of 3x3 km2 in order to compare with GEOV1 and MODIS satellite products. Our results show that GEOV3 presents good quality in most of the examined criteria, even if the near real-time estimates show a much lower precision and temporal stability in some biomes. However, after only two dekads the GEOV3 estimate becomes very stable. We observed a slight positive bias at the start of the season in croplands and deciduous forest, mainly, that could be introduced due to the smoothing process. The comparison with ground measurements showed that, overall, the accuracy was good for LAI (RMSE=0.7) and FAPAR (RMSE=0.05) with no bias in the estimates, whilst FCOVER shows a systematic overestimation of about 0.12 units.