



Evaluation of Land ECVs from QA4ECV for fitness for purpose

Jan-Peter Muller (1), Said Kharbouche (1), Philip Lewis (2), Olaf Danne (3), Simon Blessing (4), Ralf Giering (4), Nadine Gobron (5), Christian Lanconelli (5), Benjamin Müller (6), Jian Peng (6), Ralf Ludwig (6), Yes Govaerts (7), Jörg Schulz (8), Alessio Lattanzio (8), Youva Aoun (8), and Eric Vermote (9)

(1) University College London, Mullard Space Science Laboratory, Space and Climate Physics, Holmbury St Mary, United Kingdom (j.muller@ucl.ac.uk), (2) NCEO, Department of Geography, UCL, Gower Street, London WC1E 6BT, UK, (3) Brockmann Consult GmbH, Max-Planck-Straße 2, D-21502 Geesthacht, Germany, (4) FastOpt GmbH, Lerchenstr. 28a, 22767 Hamburg, Germany, (5) European Commission – Joint Research Centre, Directorate D - Sustainable Resources (JRC.D), Via Enrico Fermi, 2749. 21027 Ispra (VA), Italy, (6) Department of Geography, Ludwig-Maximilians Universität Munich, Germany, (7) Rayference, Brussels, Belgium, (8) EUMETSAT, Eumetsat-Allee 1, 64295 Darmstadt, Germany, (9) NASA Goddard Space Flight Center, Greenbelt, MD, USA

In the EU-FP7-QA4ECV* project (Muller et al., EGU2017–18977), we have developed a 35 year record (1982-2016) of Earth surface spectral and broadband albedo (i.e. including the ocean and sea-ice) using optimal estimation for the land and where available, relevant sensors for “instantaneous” retrievals over polar sea-ice. This requires the longest possible “a priori” dataset for land surface spectral and broadband BRDF record that can only be supplied by a 16 year of MODIS Collection 6 BRDFs at 500m but produced on a daily basis. The JASMIN Big Data computer at RAL was used to generate 7 spectral bands and 3 broadband BRDF with and without snow and for snow_only.

After several iterations of the input NASA-NOAA Long-Term Data Record (LTDR) of AVHRR (Franch et al., 2017; doi: 10.1016/0022-1694(70)90255-6) and the development of a novel snow/cloud mask using all 5 spectral bands, a 35 year record of 3 broadband albedos (0.4-0.7, 0.7-3 and 0.4-3 μ m) has been produced and is available through a portal at <http://www.qa4ecv.eu/ecvs> in netCDF4 (CF). For the shortwave product we ingest BRDF derived from GEO for different spatio-temporal coverages. Each 0.05° and 0.5° daily and monthly pixel has an associated uncertainty derived in the processing and QA metadata compatible with EU-C3S and other international standards. We report here on the validation of this AVHRR(+GEO) product using inter-comparison with other coincident global land products (e.g. MODIS, VEGETATION/GLIOGL and GEO), with tower-based measurements from several different networks (e.g. SURFRAD, FLUXNET, BSRN) as well as upscaling studies using field PARABOLA and NASA CAR airborne measurements (Kharbouche et al., 2017; doi: 10.3390/rs9060562). We also report on highlights from evaluations on DHR-fapar and TIP-fapar and effective LAI.

A fitness for purpose has also been assessed by the LMU group using numerical GCM modelling techniques based on AMIP which will be discussed.

* QA4ECV has received funding from the European Union’s Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 607405