Evaluation of Land ECVs from QA4ECV for fitness for purpose

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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 µm) has been produced and is available through a portal at http://www.qa4ecv.eu/ecvs in netCDF4 (CF). For the shortwave product we ingest BRF derived from GEO for different spatio-temporal coverages. Each 0.05º and 0.5º 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.

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