CM SAF Newsletter 47
February 2023

EUMETSAT CM SAF CLIMATE MONITORING

Online Short Course Series on CLAAS-3, CLARA-A3 & SARAH-3

The successful series of online short courses in cooperation with EUMETSAT, which started in 2020, continues this year with courses on the new editions of the CM SAF data records CLAAS, CLARA-A and SARAH. During the approximately two hour courses, participants get the chance to learn from CM SAF experts about all important features and highlights of each data record. In hands-on sessions, users can start working with the data to get insights into data handling and data formats.

The first short course will be on CLAAS-3, the latest edition of our SEVIRI-based data record on clouds and cloud features. The course will take place on Wednesday, 19 April 2023. Online courses on SARAH-3 and CLARA-A3 will follow in May 2023 and September 2023. Information on all courses and details on how to register will be published soon via the EUMETSAT Training Website. In addition, the latest information on all courses will be shared via our Twitter account (@Climate_SAF, https://twitter.com/Climate_SAF) and the CM SAF Website.

Release of the CM SAF / WV_cci TCWV CDR: a combined near-infrared and microwave imager total column water vapour climate data record

The global total column water vapour (TCWV) data record combines microwave and near-infrared imager based TCWV over the ice-free ocean as well as over land, coastal ocean and sea-ice, respectively. The data record relies on microwave observations from SSM/I, SSMIS, AMSR-E and TMI, partly based on a fundamental climate data record (Fennig et al., 2020; Fennig et al., 2017) and on near-infrared observations from MERIS (3rd reprocessing), MODIS-Terra (collection 6.1) and OLCI (1st reprocessing). Details of the retrieval are described in Andersson et al. (2010) and ATBD HOAPS for the microwave imagers as well as in Lindstrot et al. (2012), Diedrich et al. (2015) and ABTD NIR Level 2 for the near-infrared imagers. The water vapour of the atmosphere is vertically integrated over the full column and given in units of kg/m². The microwave and near-infrared data streams are processed independently and combined afterwards by not changing the individual TCWV values and their uncertainties. The combined data record has a spatial resolution of 0.5°x0.5° and 0.05°x0.05°, with the near-infrared based data being averaged and the microwave-based data being oversampled to match the lower and higher spatial resolution, respectively. The product is available as daily and monthly means and covers the period July 2002 – December 2017.

The data record can be ordered via the Web User Interface. More information on the data record and accompanying documentation is available from the DOI page: 10.5676/EUM_SAF_CM/COMBI/V001.

Processing of CLAAS-2 based ICDR products will be stopped at end of February 2023

As announced earlier, the CLAAS-2 based ICDR products will be discontinued after some time of parallel dissemination with the next release of the data record. The processing of the CLAAS-2-based CFC and CTO products from SEVIRI will be stopped at the end of February 2023. Previously processed data will remain available via the Web User Interface.

Users should change their applications to the newest edition of the data, CLAAS-3, which is available since early December 2022 (see Service Message 146).

The parallel dissemination of the two ICDR products via EUMETCast will also be stopped at that time with the monthly mean cloud fraction of February 2023 being the last product of the CLAAS-2 based version to be disseminated via EUMETCast.

Upcoming release of regional radiation data based on MVIRI and SEVIRI (SARAH-3)

As announced earlier (see Service Message 143), a new edition of the regional radiation data record based on MVIRI and SEVIRI and its corresponding Interim Climate Data Record (ICDR) will soon become available. The release of the SARAH-3 CDR and ICDR is currently planned for early Q2/2023. With the release of this new edition, we will phase out the processing of the currently provided ICDR, which is based on the SARAH-2 algorithms. Users should already now check their applications using the test data provided earlier (see Service Message 143 and the pdf file for more information on the test files).

The SARAH-3 climate data record includes important scientific improvements and small, but relevant, technical changes compared to the previous edition of the SARAH data record. All currently available parameters from the SARAH-2 ICDR data records (SIS, SDU, SID, DNI) will also be available for SARAH-3, in addition also ICDR data for CAL, PAR and DAL will be provided.

The most important technical change in SARAH-3 compared to SARAH-2 is a shift in the definition of the spatial grid by half a grid box to harmonize the spatial grids between all CM SAF data records based on geostationary data (e.g., the CLAAS data record). Of course, the correct grid information is provided in each data file from the SARAH-3 climate data record and we strongly recommend to use this information in any data processing of the SARAH-3 data.

Scientifically, the most important changes are the improved consideration of snow-covered surfaces in the satellite retrieval, which results in higher surface irradiance over snow-covered surfaces in particular under clear-sky conditions, and the use of new data for the surface albedo and the atmospheric water vapour used in the simulation of the clear-sky surface radiation. These changes imply that for climatological assessments, e.g., the calculation of anomalies, the SARAH-3 CDR data needs to be used as reference for the SARAH-3 ICDR data. Combining SARAH-2 CDR data with SARAH-3 ICDR (or vice versa) will result in the estimation of incorrect and unrealistic anomalies/changes.

Publications by CM SAF team

The following list gives an overview of some recently published papers by the CM SAF team covering CM SAF products and developments. Authors from the current CM SAF team are marked in bold:

Rassl, A., Michel, D., Hirschi, M., **Duguay-Tetzlaff, A.**, Seneviratne, S.I.: Climatological Drought Monitoring in Switzerland Using EUMETSAT SAF Satellite Data. Remote Sens., **14**, 5961. DOI: 10.3390/rs14235961, 2022.

Tzallas, V., Hünerbein, A., **Stengel, M.**, **Meirink, J.F.**, **Benas, N.**, **Trentmann, J.**, Macke, A.: CRAAS: A European Cloud Regime dAtAset Based on the CLAAS-2.1 Climate Data Record. *Rem. Sens.*; **14**(21):5548. DOI: 10.3390/rs14215548, 2022.

Wang, Y., Zhang, J., **Trentmann, J.**, Fiedler, S., Yang, S., Sanchez-Lorenzo, A., et al.: Observations and implications of diurnal climatology and trends in direct and diffuse solar radiation over China. *J. Geophys. Res.: Atmospheres*, **127**, e2022JD036769, DOI: 10.1029/2022JD036769, 2022.

CM SAF presentations at upcoming conferences

Presentations on CM SAF topics will be given at a number of upcoming conferences presenting the latest results of our work, among others:

- 16-22 March 2023, 24th International TOVS Study Conference, Tromsø, Norway
- 23-28 April 2023, EGU General Assembly 2023, Vienna, Austria

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