CM SAF Newsletter 48
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Release of global cloud, surface radiation and top of atmosphere radiation data record from AVHRR (CLARA-A3

The CLARA-A3 record provides cloud properties and radiation parameters derived from the AVHRR sensor onboard polar orbiting NOAA and METOP satellites. CLARA-A3 is the latest edition of CLARA with previous editions documented in Karlsson et al. (2013) and Karlsson et al. (2017). CLARA-A3 covers the time period 1979/01/01 until 2020/12/31 as climate data record (CDR), but is operationally extended as interim climate data record (ICDR) to the present with a latency of 10 days.
The AVHRR measurement input to the CLARA-A3 retrieval algorithms is the EUMETSAT PyGAC AVHRR Fundamental Data Record (FDR) Release 1 (DOI: 10.15770/EUM_SEC_CLM_0060). CLARA-A3 features a range of cloud products: cloud mask, cloud top temperature/pressure/height, cloud thermodynamic phase, and (for liquid and ice clouds separately) cloud optical thickness, particle effective radius and cloud water path. Additionally, cloud droplet number concentration and cloud geometrical thickness are provided for liquid clouds. Furthermore, a range of radiation products are included in CLARA-A3: surface black-sky, white-sky and blue-sky albedo; surface downwelling short- and longwave radiation as well as surface net radiation; top-of-atmosphere (TOA) upwelling short- and longwave radiation. Cloud products are available as monthly and daily averages and histograms, as well as daily resampled global products (Level 2b) for individual satellites. Surface albedo is presented as monthly and pentad (5 day) averages. Surface and TOA radiation products are provided as daily and monthly averages. All averages are available on a 0.25° x 0.25° global grid. Surface albedo and selected cloud products are also provided on two equal area grids with a resolution of 25 km x 25 km covering the polar regions. Daily resampled cloud products (level 2b) are provided in a global grid with a resolution of 0.05° x 0.05°. CLARA-A3 features a comprehensive set of documentation including User Manuals, Validation Reports and Algorithms Theoretical Baseline Documents.

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/CLARA_AVHRR/V003

Release of CM SAF Surface Radiation Data Set - Heliosat (SARAH) - Edition 3

The third edition of the Surface Solar Radiation Data Set - Heliosat (SARAH-3) is a satellite-based climate data record of the solar surface irradiance, the surface direct irradiance (direct horizontal and direct normalized), the sunshine duration, the photosynthetically active radiation, daylight, and the effective cloud albedo derived from satellite-observations of the visible channels of the MVIRI and the SEVIRI instruments onboard the geostationary Meteosat satellites. SARAH-3 covers the time period 1983/01/01 until 2020/12/31 as climate data record (CDR) and is operationally extended as interim climate data record (ICDR) to the present with a latency of 5 days; the data cover the region ±65° longitude and ±65° latitude. The products are available as monthly and daily means, and as 30-min instantaneous data (sunshine duration is available as monthly and daily sum) on a regular latitude/longitude grid with a spatial resolution of 0.05° x 0.05° degrees. The data record is complemented with a comprehensive documentation of the algorithms used and the generation of the data record. Validation report and user guidance are available as well.

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/SARAH/V003

Processing of CLARA-A2 and SARAH-2 based ICDR products will be stopped at end of May 2023

As announced earlier, the CLARA-A2 based ICDR products and the SARAH-2 based ICDR products will be discontinued after some time of parallel dissemination with the recently released new edition of the respective data record. The processing of these ICDR versions will be stopped at the end of May 2023. Previously processed data will remain available via the Web User Interface.

We recommend to change to the respective ICDR parameters of the recently released newest edition from CLARA-A3 and SARAH-3, respectively.

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.

Online Short Course Series

The EUMETSAT/CM SAF online short course series 2023 successfully started on 19 April 2023 with the short course on CLAAS-3, the latest edition of our climate data record on clouds and cloud properties. The CM SAF experts got many interesting questions by an engaged audience. If you missed the course, you can re-watch the recording via: https://training.eumetsat.int/course/view.php?id=473
Following the recent releases of the CLARA-A3 and SARAH-3 climate data records, the short course series will go on with a course about the SARAH-3 data record (14 June 2023) and a course on the CLARA-A3 data record (approx. 20 September 2023). During these online short courses of about 2 hours in length, participants learn from CM SAF experts about all important features of the data records, differences compared to their predecessors, how to order the data, and how to start working with the data. Each course contains several Q&A sessions to answer all important questions.
The registration for the SARAH-3 short course is open. The registration for the CLARA-A3 short course will be published soon via the EUMETSAT Training Website. In addition, the latest information on all courses are shared via our Twitter account (@Climate_SAF) and the CM SAF Website.

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:

Barnoud, A., Picard, B., Meyssignac, B., Marti, F., Ablain, M., **Roca, R**. (2023): Reducing the uncertainty in the satellite altimetry estimates of global mean sea level trends using highly stable water vapor climate data records. *JGR Oceans*, **128**, e2022JC019378. https://doi.org/10.1029/2022JC019378

Lauer, A., Bock, L., Hassler, B., **Schröder, M., Stengel, M.** (2022): Cloud Climatologies from Global Climate Models—A Comparison of CMIP5 and CMIP6 Models with Satellite Data. *J. Climate*, **36**, 281–311, https://doi.org/10.1175/JCLI-D-22-0181.1.

Ouhechou, A., Philippon, N., Morel, B., **Trentmann, J**., Graillet, A., Mariscal, A., Nouvellon, Y. (2023): Inter-comparison and validation against in-situ measurements of satellite estimates of incoming solar radiation for Central Africa: From the annual means to the diurnal cycles, *Atmos. Res.*, **287**,106711, https://doi.org/10.1016/j.atmosres.2023.106711.

Stengel, M., Meirink, J. F., Eliasson, S. (2023): On the temperature dependence of the cloud ice particle effective radius—A satellite perspective. *Geophys. Res. Lett.*, **50**, e2022GL102521. https://doi.org/10.1029/2022GL102521

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