**CM SAF
Service Message 143**

Upcoming releases of new data records – test files available on data server

In the upcoming months CM SAF will release a number of new climate data records (CDRs) and Interim Climate Data Records (ICDRs). The following three CDRs will become available together with an accompanying ICDR:

- SEVIRI-based regional cloud products from CLAAS-3, updated version of the CLAAS-2 based CDR and ICDR (planned release mid-Q4/2022),
- SEVIRI-based regional radiation products from SARAH-3, updated version of the SARAH-2 based CDR and ICDR (planned release ~~mid-Q4/2022~~ Q1/2023)
- AVHRR-based global cloud, surface albedo, surface and top-of-atmosphere radiation from CLARA-A3, updated version of the CLARA-A2 CDR and ICDR (planned release Q1/2023).

At the time of the release of the new CDR and ICDR, the processing of the preceding ICDRs will be stopped. In order to help our users to adapt to the new versions, test data are now available on our data server. These files are example files from the respective CDRs:

- Test files for CLAAS-3: https://public.cmsaf.dwd.de/data/perm//testdata/CLAAS-3
- Test files for SARAH-3: https://public.cmsaf.dwd.de/data/perm//testdata/SARAH-3
- Test files for CLARA-A3: https://public.cmsaf.dwd.de/data/perm//testdata/CLARA-A3

As before, all CDR and ICDR data will be provided in CF-conform netcdf4 format. The ICDR will be a continuously processed extension of the CDR and the products are based on the same algorithms as the CDR. The product portfolio is identical for the CDR and ICDR. The main difference will be in the calibration of the satellite data, which cannot be as thorough as for the CDRs because of the timeliness constraints. Additionally, the used background NWP data differs. While ERA5 was used in the generation of all three CDRs, the SARAH-3 ICDR is based on forecast data (ECMWF IFS) and for the CLAAS-3 and CLARA-A3 ICDRs the close-to-real-time extension of the ERA5 reanalysis, ERA5T, is used. The output format as well as the spatial resolution and projection of the ICDRs will be the same as for the CDRs. The timeliness of the products will be in the range of 5 days for the ICDR-part of SARAH-3 and 10 days for the CLAAS-3 and CLARA-A3 ICDRs (95% of the products being available within 5 and 10 days, respectively, and 100% of the files being available a further 5 days later).

Below are more details on the changes in the three data records and a list of the provided test files. More details will become available together with the respective documentation at the time of the release of the data records.

CLAAS-3:

The CLAAS-3 CDR will cover the time period 2004-2020 and will be processed as an ICDR from January 2021 onwards. The new release includes updates related to improved algorithms for the cloud mask, cloud top parameters as well as the cloud microphysical parameters: A novel probabilistic cloud mask was introduced. The availability of a cloud probability gives enhanced options for use of the data for specific applications. A neural network based algorithm for cloud top height, temperature and pressure was adopted. Compared to CALIOP observations it features in particular an improved height estimate for high clouds. For cloud optical and microphysical properties two sets of retrievals are provided: based on the 1.6 and 3.9 µm SEVIRI channels, respectively. In CLAAS-2.1 only 1.6 m based products were available. Liquid cloud droplet number concentration and geometrical thickness will become available as new cloud products. Uncertainty estimates for all level2 products (except binary cloud mask and phase) are included and they are fully propagated into the level3 products.

List of example files:

- Fractional Cloud Cover (CFC)
  CMAin20200720120000405SVMSG01MD.nc (level2)
  CFCdm20200720000000423SVMSG01MA.nc (daily mean)
  CFCmm20200701000000423SVMSG01MA.nc (monthly mean)
  CFCmd20200701000000419SVMSG01MA.nc (monthly mean diurnal cycle)

- Joint Cloud Property Histogram (JCH)
  JCHmh20200701000000419SVMSG01MA.nc (monthly histogram)

- Cloud Top Level (CTO)
  CTXin20200720120000405SVMSG01MD.nc (level2)
  CTOdm20200720000000423SVMSG01MA.nc (daily mean)
  CTOmm20200701000000423SVMSG01MA.nc (monthly mean)
  CTOmd20200701000000419SVMSG01MA.nc (monthly mean diurnal cycle)
  CTOmh20200701000000423SVMSG01MA.nc (monthly histogram)

- Cloud Phase (CPH)
  CPHdm20200720000000423SVMSG01MA.nc (daily mean)
  CPHmm20200701000000423SVMSG01MA.nc (monthly mean)
  CPHmd20200701000000419SVMSG01MA.nc (monthly mean diurnal cycle)

- Liquid Water Path (LWP:
  CPPin20200720120000405SVMSG01MD.nc (level2 for CPH, LWP, IWP)
  LWPdm20200720000000423SVMSG01MA.nc (daily mean)
  LWPmm20200701000000423SVMSG01MA.nc (monthly mean)
  LWPmd20200701000000419SVMSG01MA.nc (monthly mean diurnal cycle)
  CWPmh20200701000000423SVMSG01MA.nc (monthly histogram for LWP and IWP)

- Ice Water Path (IWP):
  IWPdm20200720000000423SVMSG01MA.nc (daily mean)
  IWPmm20200701000000423SVMSG01MA.nc (monthly mean)
  IWPmd20200701000000419SVMSG01MA.nc (monthly mean diurnal cycle)

SARAH-3

The SARAH-3 CDR will cover the time period 1983-2020 and will be processed as an ICDR from January 2021 onwards. The new release includes updates related to an improved retrieval over snow as well as an improved handling of surface albedo and water vapour. Compared to the currently available version 2.1, two new parameters become available: Photosynthetic active radiation (PAR) and Daylight (DAL). Compared to the previous CDR SARAH-2.1 and the corresponding ICDR, the dimension of the fields has been adapted. The grid boxes of the data now match the grid of the other SEVIRI-based products (e.g. CLAAS3). The products will now have 2600x2600 pixels, while the currently provided version based on SARAH-2 is at 2601x2601 pixels. As before latitude and longitude fields are included in the data. This change was implemented to improve consistency between the CM SAF products. Users can now easily work with the data without worrying about slightly different/shifted grid boxes.

List of example files:

- SIS (Solar surface radiation)
  SISin2020072000000004231000101MA.nc (instantaneous)
  SISdm2020072000000004231000101MA.nc (daily mean)
  SISmm2020070100000004231000101MA.nc (monthly mean)

- DAL (Daylight)
  DALin2020072000000004231000101MA.nc (instantaneous)
  DALdm2020072000000004231000101MA.nc (daily mean)
  DALmm2020070100000004231000101MA.nc (monthly mean)

- DNI (Direct normalized irradiance)
  DNIin2020072000000004231000101MA.nc (instantaneous)
  DNIdm2020072000000004231000101MA.nc (daily mean)
  DNImm2020070100000004231000101MA.nc (monthly mean)

- PAR (Photosynthetic active radiation)
  PARin2020072000000004231000101MA.nc (instantaneous)
  PARdm2020072000000004231000101MA.nc (daily mean)
  PARmm2020070100000004231000101MA.nc (monthly mean)

- SDU (Sunshine duration)
  SDUds2020072000000004231000101MA.nc (daily sum)
  SDUms2020070100000004231000101MA.nc (monthly sum)
- SID (Surface direct irradiance)
  SIDin2020072000000004231000101MA.nc (instantaneous)
  SIDdm2020072000000004231000101MA.nc (daily mean)
  SIDmm2020070100000004231000101MA.nc (monthly mean)

- CAL (Cloud albedo)
  CALin2020072000000004231000101MA.nc (instantaneous)
  CALdm2020072000000004231000101MA.nc (daily mean)
  CALmm2020070100000004231000101MA.nc (monthly mean)

CLARA-A3

The CLARA-A3 CDR will cover the time period 1979-2020 and will be processed as an ICDR from January 2021 onwards. New algorithm versions also allow using data from the first generation of the AVHRR-instrument, which improves the data coverage. The CDR is based on a Fundamental Data Record (FDR) provided by EUMETSAT. The extension of the ICDR is based on the same calibration coefficients and methods as used in the generation of the FDR. More uncertainty information is added to both level2 and level3 products. Algorithms have been improved for the different cloud (including the introduction of a novel probabilistic cloud mask), surface albedo and surface radiation parameters (for the latter especially over snow and ice surfaces). New data layers and products become available with the CLARA-A3 data record: Top-of-atmosphere radiation parameters, white and blue-sky surface albedo and the liquid cloud droplet number concentration (CDNC) will be included in the data record.

List of example files:

- Cloud Fractional Cover (CFC):
  CMAin20200720000000323AVMEA01GL.nc (level2b, global, example for Metop-A)
  CFCdm20200720000000319AVPOS01GL.nc (daily mean, global)
  CFCmm20200701000000319AVPOS01GL.nc (monthly mean, global)
  CFCdm20200720000000321AVPOS01NP.nc (daily mean, Northern Polar Region)
  CFCmm20200701000000321AVPOS01NP.nc (monthly mean, Northern Polar Region)
  CFCdm20200121000000321AVPOS01SP.nc (daily mean, Southern Polar Region)
  CFCmm20200101000000321AVPOS01SP.nc (monthly mean, Southern Polar Region)

- Joint Cloud Histogram (JCH)
  JCHmh20200701000000320AVPOS01GL.nc (monthly histogram, global)

- Cloud Top (CTO)
  CTOin20200720000000323AVMEA01GL.nc (level2b, global, example for Metop-A)
  CTOdm20200720000000319AVPOS01GL.nc (daily mean, global)
  CTOmm20200701000000319AVPOS01GL.nc (monthly mean, global)
  CTOmh20200701000000319AVPOS01GL.nc (monthly histogram, global)
  CTOdm20200720000000321AVPOS01NP.nc (daily mean, Northern Polar Region)
  CTOmm20200701000000321AVPOS01NP.nc   (monthly mean, Northern Polar Region)
  CTOdm20200121000000321AVPOS01SP.nc (daily mean, Southern Polar Region)
  CTOmm20200101000000321AVPOS01SP.nc (monthly mean, Southern Polar Region)

- Cloud Phase (CPH)
  CPHin20200720000000323AVMEA01GL.nc (level2b, global, example for Metop-A)
  CPHdm20200720000000319AVPOS01GL.nc (daily mean, global)
  CPHmm20200701000000319AVPOS01GL.nc (monthly mean, global)

- Liquid Water Path (LWP)
  CWPin20200720000000323AVMEA01GL.nc (level2b for LWP+IWP, global, example for Metop-A)
  LWPdm20200720000000319AVPOS01GL.nc (daily mean, global)
  LWPmm20200701000000319AVPOS01GL.nc (monthly mean, global)
  CWPmh20200701000000319AVPOS01GL.nc (monthly histogram for LWP and IWP, global)

- Ice Water Path (IWP)
  IWPdm20200720000000319AVPOS01GL.nc (daily mean, global)
  IWPmm20200701000000319AVPOS01GL.nc (monthly mean, global)

- Surface Incoming Solar radiation (SIS)
  SISdm20200720000000319AVPOS01GL.nc (daily mean, global)
  SISmm20200701000000319AVPOS01GL.nc (monthly mean, global)

- Surface Albedo (SAL, including white-sky, blue-sky and black sky albedo)
  SALpm20200720000000319AVPOS01GL.nc (pentad mean, global)
  SALmm20200701000000319AVPOS01GL.nc (monthly mean, global)
  SALpm20200720000000321AVPOS01NP.nc (pentad mean, Northern Polar Region)
  SALmm20200701000000321AVPOS01NP.nc (monthly mean, Northern Polar Region)
  SALpm20200121000000321AVPOS01SP.nc (pentad mean, Southern Polar Region)
  SALmm20200101000000321AVPOS01SP.nc (monthly mean, Sothern Polar Region)

- Surface Downwelling Longwave radiation (SDL)
  SDLmm20200701000000319AVPOS01GL.nc (monthly mean, global

- Surface Net Shortwave Radiation (SNS)
  SNSmm20200701000000319AVPOS01GL.nc (monthly mean, global)

- Surface Net Longwave Radiation (SNL)
  SNLmm20200701000000319AVPOS01GL.nc (monthly mean, global)

- Surface Radiation Budget (SRB)
  SRBmm20200701000000319AVPOS01GL.nc (monthly mean, global)

- ToA Reflected Solar radiation (RSF)
  RSFdm20200720000000319AVPOS01GL.nc (daily mean, global)
  RSFmm20200701000000319AVPOS01GL.nc (monthly mean, global)

- ToA Outgoing Longwave Radiation (OLR)
  OLRdm20200720000000319AVPOS01GL.nc (daily mean, global)
  OLRmm20200701000000319AVPOS01GL.nc   (monthly mean, global)

In case of monthly products, the test files cover only the case using all satellites in the generation of the final product. For some parameters (CFC, CTO, JCH, CPH, IWP, LWP), monthly products per satellite will become available as well. The file structure is the same as for the product using all available satellites.
Attention: as some parameters are based on visible channels, the example file for all products for Southern Polar Areas are for a different month than the global and Northern Polar areas (example file is for a summer month of the respective polar area).