

## ***Cloud Products for Nowcasting Applications over Europe (CMA, CT, CTTH) Factsheet***

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## **Document Change Record**

| <b>Version</b> | <b>Version Date<br/>(as on profile)</b> | <b>DCR* No. if<br/>applicable</b> | <b>Description of Changes</b>            |
|----------------|---|-----------------------------------|--|
| 1              | 06/08/2019                              |                                   | Initial version                          |
| 2              | 03/11/2020                              |                                   | Upgrade to V2018 on NWC SAF GEO software |

**\*DCR = Document Change Request**

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## **PRODUCTS FOR NOWCASTING APPLICATIONS**

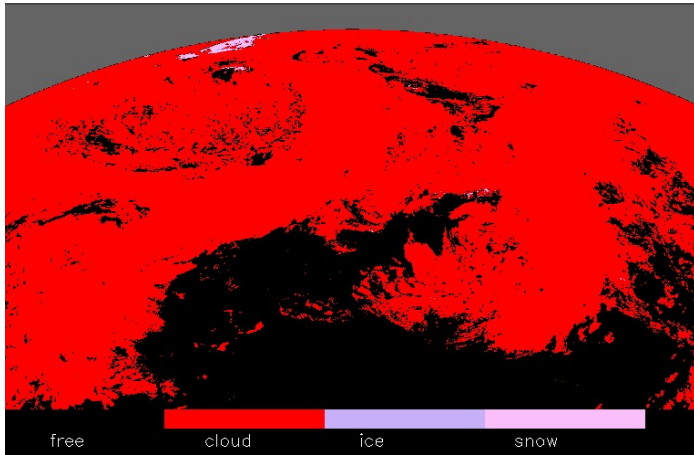
Nowcasting and very short-term weather forecasting require very timely satellite data. In addition to image data, satellite-derived cloud products play an essential role in the analysis of the current weather situation. To support these types of applications, EUMETSAT established a dedicated SAF in Support of Nowcasting and Very Short Term Forecasting (NWC SAF). This SAF produces application software packages to generate, among other things, cloud parameters from images of Meteosat satellites and the polar-orbiting satellites NOAA and Metop. The software packages are available to users for local implementation <http://www.nwcsaf.org>. For those who cannot or do not want to set up the software, EUMETSAT produces the basic cloud products for the European and North Atlantic Region and disseminates these products via EUMETCast-Europe.

## 1 CLOUD PRODUCTS

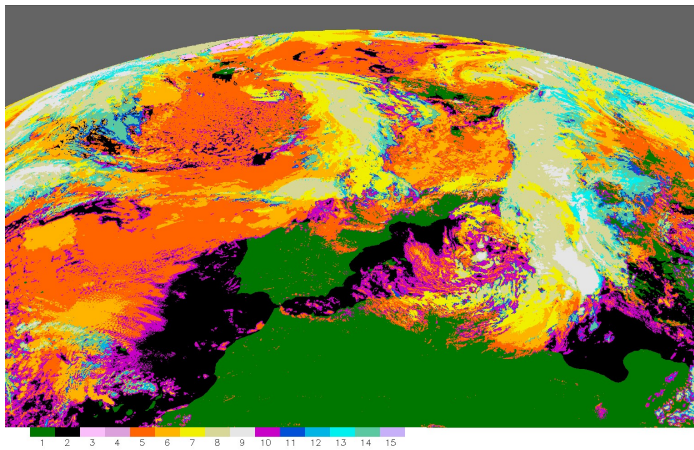
The disseminated data consists of the three separate products:

- The **Cloud Mask (CMA)** product, shows the location of clouds in a compact format. The product also includes flags for the observation conditions (e.g. sea/land, day/night), dust, volcanic ash, and snow. The EUMETCast acronym is ENCMA.
- The **Cloud Type (CT)** product allocates a meteorological cloud type to the identified clouds, gives indications if clouds are more **Stratiform** or **Cumuliform** and if **Multilayer** clouds are present. In addition the observation conditions are provided. The EUMETCast acronym is ENCT.
- The **Cloud Top Temperature and Height (CTTH)** product makes a height, pressure, and temperature assignment for the cloud tops, together with effective cloudiness represented by the cloud area fraction. The EUMETCast acronym is ENCTTH.

**Cloud Products for Nowcasting Applications over Europe (CMA, CT, CTH) Factsheet**

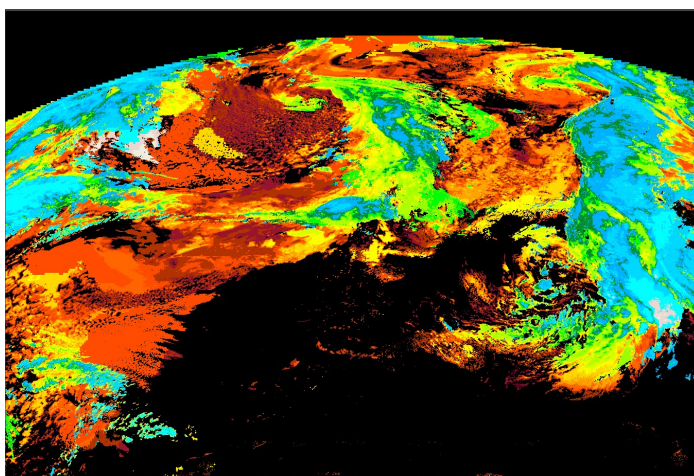


*Cloud Mask for 10th Oct. 2020, 12:00 UTC.*



Cloud type number

*Cloud Type for 10th Oct. 2020, 12:00 UTC..*



Cloud Top Pressure [hPa 1E-2]

*Cloud Top Temperature and Height, pressure parameter for 10th Oct. 2020, 12:00 UTC.*

In each of these graphics, data is displayed using the colour maps which are part of the product file in the NetCDF data format.

## 2 RETRIEVAL ALGORITHMS

The retrieval algorithms, developed in the context of NWC SAF for the three cloud products, are based on multi-channel threshold and optimal estimation methods.

A detailed description of the algorithms can be found in the Algorithm Theoretical Basis Documents (ATBD) [RD 1] and the Product User Manual (PUM) [RD 2] of the Cloud Products of the NWC SAF GEO Software package. See the list of references below. All products have quality indicators (QI). The definition of the QIs can also be found in the ATBD.

The data are provided in the [netCDF](#) data format. The files include generic colour tables which can be used to display the parameters of the products. These colour tables have also been used for the images in the previous section.

### 3 PRODUCT GENERATION

The product generation of the Cloud Products for Nowcasting Applications over Europe takes place at EUMETSAT Headquarter, using the standard user setup of the NWC SAF GEO processing package. Therefore, all standard specifications of the Product User Manual (PUM) of this software packages are applicable. The following local configurations are applied for the processing:

- Products are derived for the so-called MSGN area of the operational 0° geostationary MSG-satellite. This covers the Northern 928 lines and the middle 1530 pixels of the MSG image.
- Original MSG pixel resolution is used.
- Products are available for each repeat-cycle, every 15 minutes.
- In the case of a swap of the operational satellite (e.g. Meteosat-11 to Meteosat-9), the product generation is automatically switched as well to the new operational satellite.
- One file per product and repeat cycle is generated.
- As additional input to the processing, forecast data from the ECMWF operational model are used. The 6-hour, 12-hour, 18-hour, and 24-hour forecasts from the midday and midnight forecasts are made available for the processing.
- Production is based on Version 2018.1 of the NWC SAF GEO processing package.

#### 3.1 Limited List of References Documents

All documents are on the EUMETSAT Technical Documents Page:

<http://www.eumetsat.int/website/home/Data/TechnicalDocuments/index.html>

Note: Documentation on the NWC SAF webpage could be referring to a newer version of the NWC SAF software package than the one, which was used to generate the Cloud Products for Nowcasting Applications. Always use the applicable versions of the documentation on the EUMETSAT Technical Documents Page, as specified in the table below.

|      |  |                                   |             |
|------|--|-----------------------------------|-------------|
| RD 1 | Algorithm Theoretical Basis Document for the Cloud Product Processors of the NWC/GEO | NWC/CDOP2/GEO/MFL/SCI/ATBD/Cloud  | Version 2.1 |
| RD 2 | User Manual for the Cloud Product Processors of the NWC/GEO: Science Part            | NWC/CDOP3/GEO/MF-CMS/SCI/UM/Cloud | Version 1.0 |



## 4 PRODUCT SPECIFICATIONS

|   |  |
|---|--|
| <b><i>Which data are available?</i></b> | EUMETSAT has generated Cloud Products for Nowcasting Applications over Europe since June 2019. Data are not archived.  |
| <b><i>Allocation:</i></b>               | Near-real time products are available 10-25 minutes after sensing time finishes.   |
| <b><i>Product available:</i></b>        | CMA, CT, and CTTH Products in netCDF can be received in near-real time–10-15 minutes after the end of the image acquisition by the MSG satellite–via the EUMETSAT <a href="#">EUMETCast</a> -Europe system. For details on <i>data provision, filenaming, and file sizes</i> , please access the <a href="#">Product Navigator page</a> and search for CMA, CT, or CTTH. |
| <b><i>Product Support:</i></b>          | The EUMETSAT help desk ( <a href="mailto:ops@eumetsat.int">ops@eumetsat.int</a> ) will answer any of your questions about the Cloud Products for Nowcasting Applications.  |
| <b><i>Future Developments</i></b>       | None envisaged   |