

Climate Data Set Product: Product Guide

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Document Change Record

Issue / Revision	Date	DCN. No	Summary of Changes
1	06/10/2015		Initial document creation.
1A	25/11/2015		Updating of graphic to match description. Review by product expert.
1B	03/12/2015		Per request of Francois Montagner added Jörg Schulz as reviewer on signature table.

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1 PRODUCT DESCRIPTION

The Climate Data Set (CDS) product is a segment-based product and is derived from the pixel-based cloud analysis. The pixels are grouped according to their scene identification and are then used to derive several parameters: the number of pixels and the mean count for each identified cluster. The brightness temperatures and their standard deviation is an important component of this product. Other data components are reduced resolution scene identification information like temperature calibration data, cloud amount, sun and satellite position angles. Up to five scenes can be present in a particular segment, selected from three cloud scenes (Low, Medium and High) and six surface scenes (Sea, Desert, Savannah, Steppe, Forest, Snow-free Mountain). The CDS product is not disseminated in real-time but is provided by means of off-line retrieval by the [UMARF](#).

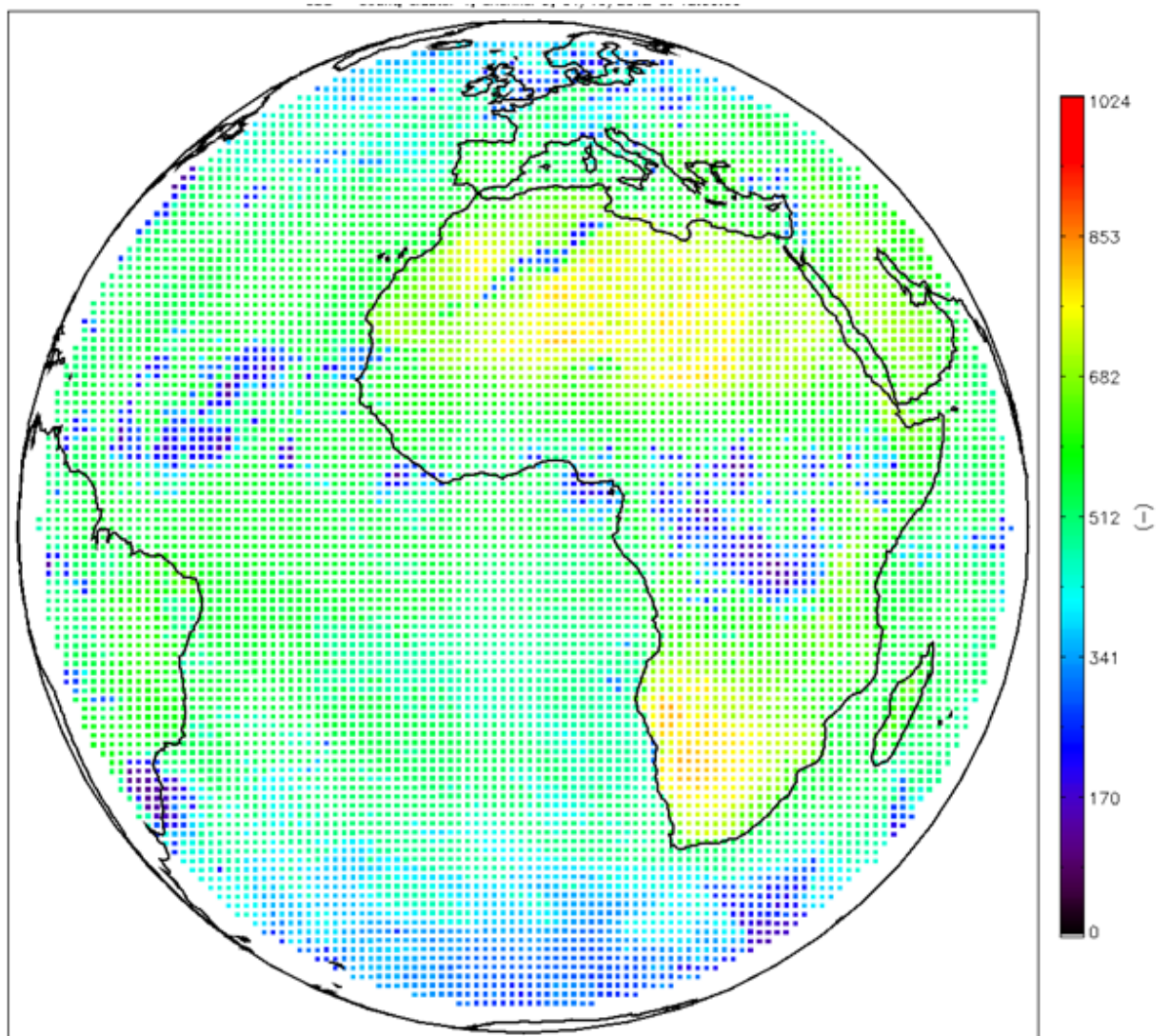


Figure 1: The number of pixels in the first cluster of the CDS product of 1 October 2012 12:00 UTC is shown for the IR10.8 channel for MSG-4. Number of pixels is assigned a colour value in the bar at right.

2 PRODUCT SPECIFICATIONS

<i>Category</i>	<i>Specification</i>
Type	Meteorological Product
Applications and users	Climate research and monitoring, research in agro-meteorology, research in hydrology
Product Distribution	EUMETSAT Data Centre
Product Area	FES Area
Product Resolution	32 × 32 pixels
Product Distribution Frequency	EUMETSAT Data Centre: every 15 minutes for the 00:00, 00:15, 00:30, ...23:45 UTC product
Product Format	BUFR format
Product Size	Approximately 2.5 MB (variable).

2.1 Product history and gaps in coverage:

Initial development and baseline:	24/06/1997
Gaps in coverage:	None

3 ALGORITHM BASICS

The Climate Data Set (CDS) product contains results of the image pixel classification process, which is performed by Scenes Analysis and Cloud Analysis, together with calibration tables for the processed image channels, navigation information and sun and spacecraft position angles. As a baseline, all spectral channels are to be processed.

The classification process determines which scenes (sea or land surfaces, types of clouds) are likely to have produced the radiation measured by the satellite. This is done on a pixel-by-pixel basis. To reduce the amount of information the processed images are segmented according to the CDS Processing Segment structure (the segments being of synoptic scale, e.g. 32×32 pixels) and the pixels of a segment that are classified as belonging to the same scene type are combined into a cluster from which statistical information is derived which is finally put into the CDS product.

3.1 Inputs

- The reflectances, radiances and brightness temperatures of all MSG SEVIRI channels
- Results of the pixel-based cloud analysis (an internal product), giving the scenes type, cloud top temperature, effective cloud amount, atmospheric correction, sun zenith angle, spacecraft zenith angle, and their relative azimuth differences.

See Table 1 on the following page:

<i>Parameter</i>	<i>Mnemonic</i>	<i>Units</i>	<i>Min</i>	<i>Max</i>	<i>Prec</i>	<i>Acc</i>	<i>Res</i>	<i>Source</i>
Image data (cha_tbp_CDS)	image_i	$\text{mWm}^{-2}\text{sr}^{-1}(\text{cm}^{-1})^{-1}$	0	$2^{10}-1$	1	1	pixel	Derived from level 1.5 data
Scenes Type	scenes_type	-	-	-	-	-	pixel	CLA intermediate
Semi-transparency flag	st_flag	-	-	-	-	-	pixel	CLA intermediate
Effective Cloud Amount	cloud_amount	%	0	100	1	1	pixel	CLA intermediate
Cloud Top Temperature	cloud_top_temp	K	170	300	0.1	0.1	pixel	CLA intermediate
Atmospheric correction tables for channel	atm_corr_j	$\text{mWm}^{-2}\text{sr}^{-1}(\text{cm}^{-1})^{-1}$	0	-	-	-	pixel	RTM
Sun zenith angle	sun_zen	degrees	0	180	0.1	0.1	pixel	Derived from level 1.5 data
Spacecraft zenith angle	sat_zen	degrees	0	90	0.01	0.01	pixel	Derived from level 1.5 data
Sun/spacecraft azimuth difference	sunsat_azi	degrees	0	360	0.1	0.1	pixel	Derived from level 1.5 data

Table 1: Climate Data Set: Dynamic Application Data inputs.

3.1.1 Static Application Data

<i>Parameter</i>	<i>Mnemonic</i>	<i>Units</i>	<i>Min</i>	<i>Max</i>	<i>Prec</i>	<i>Acc</i>	<i>Res</i>	<i>Source</i>
CDS segment structure	seg_struct_CDS	-	-	-	-	-	-	Set-up
CDS processing area	proc_area_CDS	-	-	-	-	-	-	Set-up
Channels to be processed	cha_tbp_CDS	-	-	-	-	-	-	Set-up
Channels to be corrected	cha_tbc_CDS	-	-	-	-	-	-	Set-up
Scene types	sce_typ	-	-	-	-	-	-	Set-up
Sunlint threshold	sun_glnt_tresh	°	0	90	0.1	0.1	-	Set-up
Minimum cluster size threshold	clust_tresh	pixels	1	1024	-	-	-	Set-up

Table 2: Climate Data Set: Static Application Data inputs.

3.1.2 Automatic Quality Control (AQC)

No AQC check is required; the input data are already quality-controlled.

3.2 Outputs

The data in Table 3 is considered as output from this product.

<i>Parameter</i>	<i>Mnemonic</i>	<i>Units</i>	<i>Min</i>	<i>Max</i>	<i>Prec</i>	<i>Acc</i>	<i>To</i>
Count/Temp Conversion Table	C_T_tables	counts, K	-	-	-	-	CDS
<i>Per segment:</i>							
Segment row number	row	-	0	3712	1	1	
Segment column number	column	-	0	3712	1	1	
Latitude of segment centre	lat	°	-90	90	0.1	0.1	
Longitude of segment centre	lon	°	-180	180	0.1	0.1	
Sun zenith angle (segment centre)	sun_zen_c	°	0	180	0.1	0.1	
Spacecraft zenith angle	sc_zen_c	°	0	90	0.1	0.1	
Sun/spacecraft azimuth difference	az_diff	°	0	360	0.1	0.1	
Sunglint indicator	sunglint	-	-	-	-	-	
No. of scene clusters in segment	no_scenes	-	0	64	1	1	
<i>Per scene cluster in segment:</i>							
No. of pixels in cluster	no_pixs	Pixels	1	1024	1	1	
Mean effective cloud amount	mean_ec	%	0	100	1	1	
<i>Per channel to be processed:</i>							
Mean pixel count	mean_count	Counts	0	-	1	1	
SD of cluster pixel counts	sd_count	Counts	0	-	-	-	
<i>Per channel to be corrected:</i>							
Corrected mean pixel count	c_mean_count	Counts	0	-	1	1	

Table 3: Climate Data Set: Required outputs parameter definition.

4 REFERENCES AND LINKS

Reference Documents

<i>Type</i>	<i>Document Name</i>	<i>Reference</i>
Validation	MSG-3 System Commissioning Product Validation Test Report	EUM/MSG/REP/12/0190
Detailed Algorithm	MSG Meteorological Products ASD	EUM/MSG/SPE/022

Online Resources and Assistance

All of the reference documents listed above are in the EUMETSAT Technical Documents page.

www.eumetsat.int > Satellites > Technical Documents
> Meteosat Services
> 0° Meteosat Meteorological Products

To register for data delivery from this product, go to the Data Registration page on the EUMETSAT web page:

www.eumetsat.int > Data > Data Delivery > Data Registration

To get answers to any of your questions about data delivery, registration or documentation, contact the EUMETSAT User Service Help Desk:

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