

Clouds and the Earth's Radiant Energy System (CERES) Monthly Gridded Cloud Averages (ISCCP-D2like-Mrg) Data Set Abstract

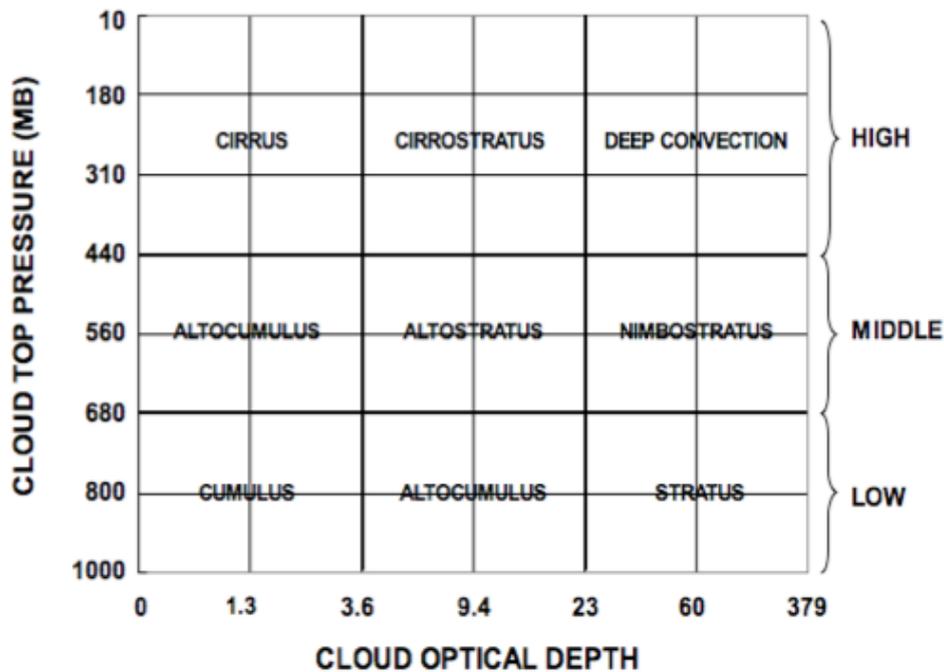


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Data Set Description:

The Monthly Gridded Cloud Averages (ISCCP-D2like-Mrg) archival data product contains monthly and monthly 3-hourly (GMT-based) $1^\circ \times 1^\circ$ gridded regional daytime mean cloud properties as a function of 18 cloud types, similar to the [ISCCP D2](#) product, where the cloud properties are stratified by pressure, optical depth, and phase. The Mrg product combines daytime cloud properties from Terra-MODIS (10:30 AM local equator crossing time LECT), Aqua-MODIS (1:30 PM LECT), and geostationary satellites (GEO) to provide the most diurnally complete daytime ISCCP-D2like product. The GEO cloud properties have been normalized with MODIS for diurnal consistency. The CERES MODIS-derived cloud properties are not the official NASA MODIS cloud retrievals, but are based on the CERES cloud working group retrievals that are also available in other CERES products. The CERES MODIS-derived cloud properties provide coverage from pole to pole. The 3-hourly GMT-based GEO cloud properties come from five satellites at 8km nominal resolution with coverage limited to 60°N to 60°S . The GEO daytime cloud retrievals incorporate only a visible and IR channel common to all geostationary satellites for spatial consistency. The geostationary calibration is normalized to Terra-MODIS. The GEO cloud properties are from the same source as for those in the SYN1deg product; however they are not temporally interpolated. The Single Scanner Footprint TOA/Surface Fluxes and Clouds (SSF) archival data product and the Gridded GEO Narrowband Radiances (GGEO) archival data product are the inputs to this product. Each ISCCP-D2like-Mrg file covers a single month using the SSFs from the CERES instrument that is in cross-track scan mode.



The stratification of the 9 (thick lines, large blocks) and 42 (thin lines, small blocks) cloud types as a function of cloud top pressure and cloud optical depth. The cloud type names are given for the 9 cloud types. The 42 cloud types are not available in the ISCCP-D2like-Mrg product.

List of cloud properties available as a function of ISCCP-D2like product.
The 42 cloud type format is not available for either the GEO or Mrg products.

Cloud Property	9 cloud types			42 cloud types		
	Day/Nit	GEO	Mrg	Day/Nit	GEO	Mrg
Total Cloud Fraction	X	X	X	X		
Liquid Cloud Fraction	X	X	X	X		
Ice Cloud Fraction	X	X	X	X		
Effective Temperature	X	X	X			
Effective Pressure	X	X	X			
Optical Depth	X	X	X			
LWP (Liquid Water Path) IWP (Ice Water Path)	X	X	X			
Particle Size	X					
IR Emissivity	X					

Additional information about the format and content of the ISCCP-D2like-Mrg product can be found in the CERES [Data Products Catalog](#). Information about the quality of the content of the ISCCP-D2like-Mrg product can be found in the [Data Quality Summary](#).

Summary of Changes:

The CERES Data Management Team and the Langley Atmospheric Science Data Center (ASDC) use a Sampling Strategy, a Production Strategy, and a Configuration Code (CCode) to track versions of CERES primary data products. In general, minor reprocessing changes are tracked by increasing the Configuration Code while major reprocessing changes result in a new Production Strategy. The Sampling Strategy identifies the satellite and instruments that acquired the data in the product.

A summary of changes made to the CERES ISCCP-D2like-Mrg product is shown in the following table.

Modification History of the CERES ISCCP-D2like-Mrg Product			
Also see Modification History for CERES SSF Edition2B and Edition2F			
Sampling Strategy and Production Strategy	CCode	Available at ASDC	Impact on ISCCP-D2like Product
Mrg_GEO-MODIS-DAY_Edition3A ⁽⁴⁾	300301	Nov 2013	<ul style="list-style-type: none"> Fixed a bug to now include cloud optical depths less than 1. Edition2A GGEO/GGEOW data and Edition3A SSF data are used as inputs.
Mrg_GEO-MODIS_Edition2A ⁽⁴⁾	200200	Jun 2010	<ul style="list-style-type: none"> Edition2A GGEO/GGEOW data and Edition2B, Edition2C, Edition2D, Edition2F, and Edition2G SSF data are used as inputs.

Availability: (1) not available; (2) restricted to CERES analysts; (3) restricted to CERES Science Team and analysts; (4) public

References:

The first two references describe the CERES MODIS cloud retrieval algorithm. The third reference explains the cloud optical depth gamma distribution assumption. The last reference outlines the GGEO cloud retrieval Layered Bispectral Threshold Model (LBTM) algorithm, which is a subset of the MODIS algorithm.

1. Minnis P., S. Sun-Mack, D. F. Young, P. W. Heck, D. P. Garber, Y. Chen, D. A. Spangenberg, R. F. Arduini, Q. Z. Trepte, W. L. Smith, Jr., J. K. Ayers, S. C. Gibson, W. F. Miller, G. Hong, V. Chakrapani, Y. Takano, K.-N. Liou, Y. Xie, and P. Yang, 2011: CERES Edition-2 cloud property retrievals using TRMM VIRS and Terra and Aqua MODIS data--Part I: Algorithms. *IEEE Trans. Geosci. Remote Sens.*, **49**, 4374-4400.

2. Minnis P., S. Sun-Mack, Y. Chen, M. M. Khaiyer, Y. Yi, J. K. Ayers, R. R. Brown, X. Dong, S. C. Gibson, P. W. Heck, B. Lin, M. L. Nordeen, L. Nguyen, R. Palikonda, W. L. Smith, Jr., D. A. Spangenberg, Q. Z. Trepte, and B. Xi, 2011: CERES Edition-2 cloud property retrievals using TRMM VIRS and Terra and Aqua MODIS data-- Part II: Examples of average results and comparisons with other data. *IEEE Trans. Geosci. Remote Sens.*, **49**, 4401-4430.
3. Kato, S.; Rose, F. G.; Charlock, T. P.; 2005: Computation of Domain-Averaged Irradiance Using Satellite-Derived Cloud Properties. *J. of Atmos. and Oceanic Tech.*, **22**, pp 146-164
4. Minnis, P.; Smith, W. L., Jr.; Garber, D. P.; Ayers, J. K.; and Doelling, D. R.: Cloud Properties Derived From GOES-7 for the Spring 1994 ARM Intensive Observing Period Using Version 1.0.0 of the ARM Satellite Data Analysis Program. *NASA RP 1366*, August 1995, 59 pp

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Acknowledgement:

The requested form of acknowledgment for any publication in which these data are used is:

"These data were obtained from the NASA Langley Research Center Atmospheric Science Data Center."

The Langley Data Center requests a reprint of any published papers or reports or a brief description of other uses (e.g., posters, oral presentations, etc.) of data that we have distributed. This will help the Data Center determine the use of data distributed, which is helpful in optimizing product development. It also helps us to keep our product related references current.

Reference:

The CERES Team has made considerable efforts to remove major errors and to verify the quality and accuracy of these data. Please provide a reference to the following paper when you publish scientific results with the CERES data:

Wielicki, B. A., B. R. Barkstrom, E. F. Harrison, R. B. Lee III, G. L. Smith, and J. E. Cooper, "Clouds and the Earth's Radiant Energy System (CERES): An Earth Observing System Experiment," *Bull. Amer. Meteor. Soc.*, **77**, 853-868, 1996.

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