Clouds and the Earth's Radiant Energy System (CERES) Hourly Gridded TOA/Surface Fluxes and Clouds (SSF1deg-Hour) Data Set Abstract

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Data Set Description:

The Hourly Gridded TOA/Surface Fluxes and Clouds (SSF1deg-Hour) archival data product contains hourly single satellite flux and cloud parameters averaged over regions in a 1.0-degree equal angle grid for a day.

Input to the SSF1deg-Hour Subsystem is the Single Scanner Footprint TOA/Surface Fluxes and Clouds (SSF) archival data product. Each SSF1deg-Hour covers hourly swathes from a single CERES instrument mounted on one satellite over a day. The product is written in HDF and contains metadata as well as gridded science data. For Terra, Aqua, and Suomi-National Polar-orbitting Partnership (S-NPP), data is organized into daily HDF files, each containing data for each hour on a 1.0-degree equal-angle grid. The science data are SDSs with multiple records. Each record contains spatially averaged data..

The SSF1deg-Hour product includes:

- Time and Position Data
- CERES TOA Radiances
- All and Clear-Sky TOA Fluxes
- Parameterized Surface Fluxes
- Surface Parameters (Elevation, Ocean Coverage, Snow and Ice Coverage, Surface Properties)
- Meteorological Parameters (Winds, Temperature, Pressure, Precipitable Water)
- Cloud Macro and Micro-Properties (Fraction, Temperature, Height, Pressure, Optical Depth, Radius, Path)
- MODIS land aerosols (VIIRS for S-NPP)
- MODIS ocean aerosols (VIIRS for S-NPP)

Only footprints with imager coverage are included. Therefore, CERES footprints which fall outside of the imager swath do not appear on the SFC product. The maximum VIRS viewing zenith angle is ~48°, the maximum MODIS viewing zenith angle is ~65°, and the maximum VIIRS viewing zenith angle is ~70^{o}.

Additional information about the format and content of the SSF1deg-Hour can be found in the CERES Data Products Catalog. A detailed description of the SSF1deg-Hour can be found in the SSF Collection Guide.

Summary of Changes:

The CERES Data Management Team and the Atmospheric Science Data Center (ASDC) at Langley 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 which acquired the data in the product.

A summary of changes made to the CERES SSF1deg product is shown in the following tables.

Modification History of the CERES SSF1deg-Hour S-NPP Product
Also see Modification History for CERES SSF NPP-FM5-VIIRS

Sampling Strategy and Production Strategy	CCode	Available at ASDC	Impact on the NPP SSF1deg-Hour Product
NPP-FM5-VIIRS_ Edition1A[4]	100101	Nov 2015	• The NPP processing variations began with an Aqua/Terra Edition4A baseline.
Availability: (1) not available; (2) restricted to CERES analysts; (3) restricted to CERES Science Team and analysts; (4) public			

Modification History of the CERES Aqua SSF1deg-Hour Product (formerly SFC)
Also see Modification History for CERES SSF Aqua FM3 and FM4

Sampling Strategy and Production Strategy	CCode	Available at ASDC	Impact on Aqua SSF1deg-Hour Product
Aqua-MODIS_Edition4A[4]	400403	Sep 2015	• The product has been renamed from SFC to SSF1deg-Hour. • The product has been reorganized into daily files that display the whole globe as 360 by 180 1-degree equal area grid for each hour for easy viewing. • Variable selection was updated to include new variables from the Edition4A SSF. • Aqua Edition4A XTRK scan mode SSF data is used as input. • Single satellite daily files can contain data from multiple CERES instruments, therefore, the instrument identifier previously included in the Sampling Strategy is dropped in the file name.
Availability: (1) not available; (2) restricted to CERES analysts; (3) restricted to CERES Science Team and analysts; (4) public			

Modification History of the CERES Terra SSF1deg-Hour Product (formerly SFC)
Also see Modification History for CERES SSF Terra FM1 and FM2

Sampling Strategy and Production Strategy	CCode	Available at ASDC	Impact on Terra SSF1deg-Hour Product
Terra-MODIS_Edition4A[4]	400403	Sep 2015	• The product has been renamed from SFC to SSF1deg-Hour. • The product has been reorganized into daily files that display the whole globe as 360 by 180 1-degree equal area grid for each hour for easy viewing. • Variable selection was updated to include new variables from the Edition4A SSF. • Terra Edition4A XTRK scan mode SSF data is used as input. • Single satellite monthly files can contain data from multiple CERES instruments therefore, the instrument identifier previously included in the Sampling Strategy is dropped in the file name.
Availability: (1) not available;(2) restricted to CERES analysts; (3) restricted to CERES Science Team and analysts; (4) public			

References:

An overview of the temporal interpolation and spatial averaging algorithms used for CERES can be found in the following reference:

Young, D. F., P. Minnis. D. R. Doelling, G. G. Gibson, and T. Wong, 1998: Temporal Interpolation Methods for the Clouds and Earth's Radiant Energy System (CERES) Experiment. *J. Appl. Meteorol.*, **37**, 572-590

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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.

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