

2.9 Synoptic Radiative Fluxes and Clouds (SYN)

EOSDIS Product Code: CER07

This is a planned data product. Data are not yet available.

The Synoptic Radiative Fluxes and Clouds (SYN) product contains a day of space and time averaged Clouds and the Earth's Radiant Energy System (CERES) data for a single scanner instrument. The SYN is also produced for combinations of scanner instruments. The 1-degree regional flux at the hour of observation from the CERES FSW product and concurrent diurnal data from geostationary satellites are used to estimate the regional flux at 3-hour intervals. Also at 3-hour intervals are estimates of the adjusted fluxes at the four atmospheric levels as defined by the CERES CRS product for both clear-sky and total-sky scenes, estimates of the average cloud parameters in four cloud height categories, and column averaged cloud parameters.

The SYN contains the following constrained vertical flux profiles for both clear sky and total sky conditions evaluated at the surface, 500-, 70-, and 1-hPa:

- Longwave, Shortwave, and Window channels upward and downward.

The initial flux profiles are not contained on the SYN; however, the adjustments between the constrained and initial profiles for the following are included for both clear sky and total sky conditions:

- Longwave upward at the surface and 1 hPa.
- Longwave downward at the surface.
- Shortwave upward at the surface and 1 hPa.
- Shortwave downward at the surface.
- Window channel upward at the surface and 1 hPa.
- Window channel downward at the surface.

The adjustments to the radiative transfer model input parameters between the initial and the constrained passes are also contained on the SYN. These parameters include:

- Surface albedo and skin temperature
- Total column precipitable water and upper tropospheric relative humidity
- Aerosol optical depth
- Cloud optical depth, fractional area, and effective temperature

Level: 3

Frequency: Every 3 Hours

Portion of Atmosphere Covered: Surface, Internal and TOA

Time Interval Covered:

File: 3 Hours

Record: 3 Hours

Portion of Globe Covered:

File: Global

Record: 1 CERES region

Product Version:

TRMM:

Terra:

Aqua:

SYN Metadata

The types of SYN metadata are summarized in [Table 2.9-1](#) and contain information which need only be recorded once per hour. The CERES metadata are listed in [Appendix B](#). The SYN product-specific metadata parameters are listed in [Table 2.9-1](#) and the CRS_Header_Vdata parameters are listed in [Table 2.9-2](#).

Table 2.9-1. SYN Metadata Summary

HDF Name	Description Table	Records	Number of Fields
CERES Baseline Header Metadata	Table B-1	1	36
CERES_metadata Vdata	Table B-2	1	14
SYN_Header Vdata	Table 2.9-2	1	25

Table 2.9-2. SYN_Header_Vdata

Item	Description	Units	Range	Elements	Bytes/Elem
SYN-H1	SYN ID	N/A	112 .. 200	1	4
SYN-H2	Julian Day	N/A	ASCII string	1	28
SYN-H3	MOA production date and time	N/A	ASCII string	1	24
SYN-H4	Synoptic SARB Version number	N/A	1 .. 26	1	2
SYN-H5	SYN production date and time	N/A	ASCII string	1	19

SYN Scientific Data Sets

The SYN contains 156 Scientific Data Sets (SDS) which are parameter collections of one-degree regional data where the first dimension corresponds to the number of global regions, the last dimension corresponds to the number of parameters; and the middle dimension, if rank 3, corresponds to the number of elements in each parameter array. This ordering is used by the C programming language and most HDF viewers. In FORTRAN, the dimensions are reversed such that the number of regions becomes the last dimension and the first dimension is the number of parameters in the SDS. The SDSs are divided into tables which map to Vgroups of the same name. [Tables 2.9-3](#) to [Table 2.9-19](#) summarize the contents of each Vgroup and SDS contained within the SYN file. Product sizing information for the number of CERES regions, 64800, is given in [Table 2.9-20](#).

Table 2.9-3. Regional Data (1 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-1	Julian date at hour start	day	2440000 .. 2480000	n	64-bit real	0.49

Table 2.9-3. Regional Data (2 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-2	Region number	N/A	1 .. 64800	n	32-bit integer	0.25
SYN-3	Hour-box number	N/A	1 .. 744	n	32-bit integer	0.25
SYN-4	Surface altitude above sea level - mean	m	-1000 .. 10000	n	32-bit real	0.25
SYN-5	Cosine of solar zenith angle	N/A	0 .. 1	n	32-bit real	0.25
SYN-6	Surface type percent coverage	N/A	0 .. 100	n x 20	32-bit integer	4.94

Table 2.9-4. Clear-sky Area Data

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-7	Snow/ice percent coverage	N/A	0 .. 100	n	32-bit real	0.25
SYN-8	Smoke percent coverage	N/A	0 .. 100	n	32-bit real	0.25
SYN-9	Fire percent coverage	N/A	0 .. 100	n	32-bit real	0.25
SYN-10	Aerosol visible optical depth - 0.63 mm	N/A	-1 .. 5	n	32-bit real	0.25
SYN-11	Aerosol visible optical depth - 1.6 mm	N/A	-1 .. 5	n	32-bit real	0.25
SYN-12	Aerosol percent coverage	N/A	0 .. 100	n	32-bit real	0.25
SYN-13	Sunglint percentage	N/A	0 .. 100	n	32-bit real	0.25

Table 2.9-5. Observed TOA Flux (1 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-14	SW TOA Flux - total skies - mean	W m^{-2}	0 .. 1400	n	32-bit real	0.25
SYN-15	SW TOA Flux - total skies - std	W m^{-2}	0 .. 1400	n	32-bit real	0.25
SYN-16	LW TOA Flux - total skies - mean	W m^{-2}	0 .. 500	n	32-bit real	0.25
SYN-17	LW TOA Flux - total skies - std	W m^{-2}	0 .. 500	n	32-bit real	0.25
SYN-18	TOA Albedo - total skies - mean	N/A	0 .. 1	n	32-bit real	0.25
SYN-19	TOA Albedo - total skies - std	N/A	0 .. 1	n	32-bit real	0.25
SYN-20	WN TOA Flux - total skies - mean	$\text{W m}^{-2} \mu\text{m}^{-1}$	2 .. 50	n	32-bit real	0.25
SYN-21	WN TOA Flux - total skies - std	$\text{W m}^{-2} \mu\text{m}^{-1}$	2 .. 50	n	32-bit real	0.25
SYN-22	SW TOA Flux - clear skies - mean	W m^{-2}	0 .. 1400	n	32-bit real	0.25

Table 2.9-5. Observed TOA Flux (2 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-23	SW TOA Flux - clear skies - std	W m^{-2}	0 .. 1400	n	32-bit real	0.25
SYN-24	LW TOA Flux - clear skies - mean	W m^{-2}	0 .. 500	n	32-bit real	0.25
SYN-25	LW TOA Flux - clear skies - std	W m^{-2}	0 .. 500	n	32-bit real	0.25
SYN-26	TOA Albedo - clear skies - mean	N/A	0 .. 1	n	32-bit real	0.25
SYN-27	TOA Albedo - clear skies - std	N/A	0 .. 1	n	32-bit real	0.25
SYN-28	WN TOA Flux - clear skies - mean	$\text{W m}^{-2} \mu\text{m}^{-1}$	2 .. 50	n	32-bit real	0.25
SYN-29	WN TOA Flux - clear skies - std	$\text{W m}^{-2} \mu\text{m}^{-1}$	2 .. 50	n	32-bit real	0.25

Table 2.9-6. Cloud Properties for Four Cloud Layers (1 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-30	Area percent coverage	N/A	0 .. 100	n x 4	32-bit real	0.99
SYN-31	Cloud visible optical depth - linear - mean	N/A	0 .. 400	n x 4	32-bit real	0.99
SYN-32	Cloud visible optical depth - linear - std	N/A	0 .. 300	n x 4	32-bit real	0.99
SYN-33	Cloud visible optical depth - logarithmic - mean	N/A	-6 .. 6	n x 4	32-bit real	0.99
SYN-34	Cloud visible optical depth - logarithmic - std	N/A	0 .. 6	n x 4	32-bit real	0.99
SYN-35	Cloud infrared emissivity - mean	N/A	0 .. 1	n x 4	32-bit real	0.99
SYN-36	Cloud infrared emissivity - std	N/A	0 .. 1	n x 4	32-bit real	0.99
SYN-37	Cloud liquid water path - mean	g m^{-2}	0 .. 10000	n x 4	32-bit real	0.99
SYN-38	Cloud liquid water path - std	g m^{-2}	0 .. 8000	n x 4	32-bit real	0.99
SYN-39	Cloud ice water path - mean	g m^{-2}	0 .. 10000	n x 4	32-bit real	0.99
SYN-40	Cloud ice water path - std	g m^{-2}	0 .. 8000	n x 4	32-bit real	0.99
SYN-41	Cloud top pressure - mean	hPa	0 .. 1100	n x 4	32-bit real	0.99
SYN-42	Cloud top pressure - std	hPa	0 .. 600	n x 4	32-bit real	0.99
SYN-43	Cloud effective pressure - mean	hPa	0 .. 1100	n x 4	32-bit real	0.99

Table 2.9-6. Cloud Properties for Four Cloud Layers (2 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-44	Cloud effective pressure - std	hPa	0 .. 350	n x 4	32-bit real	0.99
SYN-45	Cloud effective temperature - mean	K	100 .. 350	n x 4	32-bit real	0.99
SYN-46	Cloud effective temperature - std	K	0 .. 150	n x 4	32-bit real	0.99
SYN-47	Cloud effective height - mean	km	0 .. 20	n x 4	32-bit real	0.99
SYN-48	Cloud effective height - std	km	0 .. 12	n x 4	32-bit real	0.99
SYN-49	Cloud base pressure - mean	hPa	0 .. 1100	n x 4	32-bit real	0.99
SYN-50	Cloud base pressure - std	hPa	0 .. 600	n x 4	32-bit real	0.99
SYN-51	Cloud liquid particle radius - 3.7 μm - mean	μm	0 .. 40	n x 4	32-bit real	0.99
SYN-52	Cloud liquid particle radius - 3.7 μm - std	μm	0 .. 20	n x 4	32-bit real	0.99
SYN-53	Cloud ice particle effective diameter - 3.7 μm - mean	μm	0 .. 300	n x 4	32-bit real	0.99
SYN-54	Cloud ice particle effective diameter - 3.7 μm - std	μm	0 .. 200	n x 4	32-bit real	0.99
SYN-55	Cloud particle phase - 3.7 μm - mean	N/A	1 .. 2	n x 4	32-bit real	0.99
SYN-56	Cloud liquid particle radius - 1.6 μm - mean	μm	0 .. 40	n x 4	32-bit real	0.99
SYN-57	Cloud ice particle effective diameter - 3.7 μm - mean	μm	0 .. 300	n x 4	32-bit real	0.99
SYN-58	Cloud particle phase - 1.6 μm - mean	N/A	1 .. 2	n x 4	32-bit real	0.99
SYN-59	Vertical aspect ratio - mean (TBD)	N/A	0 .. 20	n x 4	32-bit real	0.99
SYN-60	Vertical aspect ratio - std (TBD)	N/A	0 .. 15	n x 4	32-bit real	0.99

Table 2.9-7. Column Averaged Cloud Properties - Weighted by TOA SW, TOA LW, SFC LW, LWP, and IWP (1 of 3)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-61	Area percent coverage	N/A	0 .. 100	n x 4 x 5	32-bit real	4.94
SYN-62	Cloud visible optical depth - linear - mean	N/A	0 .. 400	n x 4 x 5	32-bit real	4.94

Table 2.9-7. Column Averaged Cloud Properties - Weighted by TOA SW, TOA LW,
SFC LW, LWP, and IWP (2 of 3)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-63	Cloud visible optical depth - linear - std	N/A	0 .. 300	n x 4 x 5	32-bit real	4.94
SYN-64	Cloud visible optical depth - logarithmic - mean	N/A	-6 .. 6	n x 4 x 5	32-bit real	4.94
SYN-65	Cloud visible optical depth - logarithmic - std	N/A	0 .. 6	n x 4 x 5	32-bit real	4.94
SYN-66	Cloud infrared emissivity - mean	N/A	0 .. 1	n x 4 x 5	32-bit real	4.94
SYN-67	Cloud infrared emissivity - std	N/A	0 .. 1	n x 4 x 5	32-bit real	4.94
SYN-68	Cloud liquid water path - mean	g m ⁻²	0 .. 10000	n x 4 x 5	32-bit real	4.94
SYN-69	Cloud liquid water path - std	g m ⁻²	0 .. 8000	n x 4 x 5	32-bit real	4.94
SYN-70	Cloud ice water path - mean	g m ⁻²	0 .. 10000	n x 4 x 5	32-bit real	4.94
SYN-71	Cloud ice water path - std	g m ⁻²	0 .. 8000	n x 4 x 5	32-bit real	4.94
SYN-72	Cloud top pressure - mean	hPa	0 .. 1100	n x 4 x 5	32-bit real	4.94
SYN-73	Cloud top pressure - std	hPa	0 .. 600	n x 4 x 5	32-bit real	4.94
SYN-74	Cloud effective pressure - mean	hPa	0 .. 1100	n x 4 x 5	32-bit real	4.94
SYN-75	Cloud effective pressure - std	hPa	0 .. 350	n x 4 x 5	32-bit real	4.94
SYN-76	Cloud effective temperature - mean	K	100 .. 350	n x 4 x 5	32-bit real	4.94
SYN-77	Cloud effective temperature - std	K	0 .. 150	n x 4 x 5	32-bit real	4.94
SYN-78	Cloud effective height - mean	km	0 .. 20	n x 4 x 5	32-bit real	4.94
SYN-79	Cloud effective height - std	km	0 .. 12	n x 4 x 5	32-bit real	4.94
SYN-80	Cloud bottom pressure - mean	hPa	0 .. 1100	n x 4 x 5	32-bit real	4.94
SYN-81	Cloud bottom pressure - std	hPa	0 .. 600	n x 4 x 5	32-bit real	4.94
SYN-82	Cloud liquid particle radius - 3.7 μm - mean	μm	0 .. 40	n x 4	32-bit real	4.94
SYN-83	Cloud liquid particle radius - 3.7 μm - std	μm	0 .. 20	n x 4	32-bit real	4.94
SYN-84	Cloud ice particle effective diameter - 3.7 μm - mean	μm	0 .. 300	n x 4	32-bit real	4.94
SYN-85	Cloud ice particle effective diameter - 3.7 μm - std	μm	0 .. 200	n x 4	32-bit real	4.94

Table 2.9-7. Column Averaged Cloud Properties - Weighted by TOA SW, TOA LW,
SFC LW, LWP, and IWP (3 of 3)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-86	Cloud particle phase - 3.7 μm - mean	N/A	1 .. 2	n x 4	32-bit real	4.94
SYN-87	Cloud liquid particle radius - 1.6 μm - mean	μm	0 .. 40	n x 4	32-bit real	4.94
SYN-88	Cloud ice particle effective diameter - 3.7 μm - mean	μm	0 .. 300	n x 4	32-bit real	4.94
SYN-89	Cloud particle phase - 1.6 μm - mean	N/A	1 .. 2	n x 4	32-bit real	4.94
SYN-90	Vertical aspect ratio - mean (TBD)	N/A	0 .. 20	n x 4 x 5	32-bit real	4.94
SYN-91	Vertical aspect ratio - std (TBD)	N/A	0 .. 15	n x 4 x 5	32-bit real	4.94

Table 2.9-8. Cloud Overlap Statistics

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-92	Overlap area fraction	N/A	0 .. 100	n x 11	32-bit real	2.72

Table 2.9-9. Angular Model Scene Data

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-93	Incident solar flux	W m^{-2}	0 .. 1400	n	32-bit real	0.25
SYN-94	Area percent coverage	N/A	0 .. 100	n x 12	32-bit real	2.97
SYN-95	Albedo - mean	N/A	0 .. 1	n x 12	32-bit real	2.97
SYN-96	Albedo - std	N/A	0 .. 1	n x 12	32-bit real	2.97
SYN-97	LW flux - mean	W m^{-2}	0 .. 400	n x 12	32-bit real	2.97
SYN-98	LW flux - std	W m^{-2}	0 .. 400	n x 12	32-bit real	2.97

Table 2.9-10. Surface Radiative Properties (1 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-99	Photosynthetically active radiation over surface (TBD)	W m^{-2}	0 .. 780	n	32-bit real	0.25
SYN-100	Direct/diffuse surface ratio	N/A	0 .. 30	n	32-bit real	0.25

Table 2.9-10. Surface Radiative Properties (2 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-101	Corrected initial broadband surface albedo	N/A	0 .. 1	n	32-bit real	0.25

Table 2.9-11. Vertical Profile Description

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-102	Number of atmospheric levels	N/A	0 .. 4	n	32-bit integer	0.25
SYN-103	Pressure levels	hPa	0 .. 1100	n x 4	32-bit real	0.99

Table 2.9-12. Constrained Clear Sky Profiles

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-104	SW flux - upward for clear-sky	W m ⁻²	0 .. 1400	n x 4	32-bit real	0.99
SYN-105	SW flux - downward for clear-sky	W m ⁻²	0 .. 1400	n x 4	32-bit real	0.99
SYN-106	LW flux - upward for clear-sky	W m ⁻²	0 .. 850	n x 4	32-bit real	0.99
SYN-107	LW flux - downward for clear-sky	W m ⁻²	0 .. 700	n x 4	32-bit real	0.99
SYN-108	WN flux - upward for clear-sky	W m ⁻²	0 .. 370	n x 4	32-bit real	0.99
SYN-109	WN flux - downward for clear-sky	W m ⁻²	0 .. 370	n x 4	32-bit real	0.99

Table 2.9-13. Constrained Total Sky Profiles

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-110	SW flux - upward for total-sky	W m ⁻²	0 .. 1400	n x 4	32-bit real	0.99
SYN-111	SW flux - downward for total-sky	W m ⁻²	0 .. 1400	n x 4	32-bit real	0.99
SYN-112	LW flux - upward for total-sky	W m ⁻²	0 .. 850	n x 4	32-bit real	0.99
SYN-113	LW flux - downward for total-sky	W m ⁻²	0 .. 700	n x 4	32-bit real	0.99
SYN-114	WN flux - upward for total-sky	W m ⁻²	0 .. 370	n x 4	32-bit real	0.99
SYN-115	WN flux - downward for total-sky	W m ⁻²	0 .. 370	n x 4	32-bit real	0.99

Table 2.9-14. Clear Sky Constraint-Initial Flux Deltas

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-116	SW flux adjustment at surface - upward for clear-sky	W m^{-2}	-1400 .. 1400	n	32-bit real	0.25
SYN-117	SW flux adjustment at TOA - upward for clear-sky	W m^{-2}	-1400 .. 1400	n	32-bit real	0.25
SYN-118	SW flux adjustment at surface - downward for clear-sky	W m^{-2}	-1400 .. 1400	n	32-bit real	0.25
SYN-119	LW flux adjustment at surface - upward for clear-sky	W m^{-2}	-600 .. 600	n	32-bit real	0.25
SYN-120	LW flux adjustment at surface - downward for clear-sky	W m^{-2}	-700 .. 700	n	32-bit real	0.25
SYN-121	LW flux adjustment at TOA - upward for clear-sky	W m^{-2}	-700 .. 700	n	32-bit real	0.25
SYN-122	WN flux adjustment at surface - upward for clear-sky	W m^{-2}	-50 .. 50	n	32-bit real	0.25
SYN-123	WN flux adjustment at surface - downward for clear-sky	W m^{-2}	-50 .. 50	n	32-bit real	0.25
SYN-124	WN flux adjustment at TOA - upward for clear-sky	W m^{-2}	-50 .. 50	n	32-bit real	0.25

Table 2.9-15. Total Sky Constraint-Initial Flux Deltas (1 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-125	SW flux adjustment at surface - upward for total-sky	W m^{-2}	-1400 .. 1400	n	32-bit real	0.25
SYN-126	SW flux adjustment at TOA - upward for total-sky	W m^{-2}	-1400 .. 1400	n	32-bit real	0.25
SYN-127	SW flux adjustment at surface - downward for total-sky	W m^{-2}	-1400 .. 1400	n	32-bit real	0.25
SYN-128	LW flux adjustment at surface - upward for total-sky	W m^{-2}	-600 .. 600	n	32-bit real	0.25
SYN-129	LW flux adjustment at surface - downward for total-sky	W m^{-2}	-700 .. 700	n	32-bit real	0.25
SYN-130	LW flux adjustment at TOA - upward for total-sky	W m^{-2}	-700 .. 700	n	32-bit real	0.25
SYN-131	WN flux adjustment at surface - upward for total-sky	W m^{-2}	-50 .. 50	n	32-bit real	0.25

Table 2.9-15. Total Sky Constraintment-Initial Flux Deltas (2 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-132	WN flux adjustment at surface - downward for total-sky	W m^{-2}	-50 .. 50	n	32-bit real	0.25
SYN-133	WN flux adjustment at TOA - upward for total-sky	W m^{-2}	-50 .. 50	n	32-bit real	0.25

Table 2.9-16. Satellite Emulated Window Channel

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-134	WN filtered radiance -satellite emulated	$\text{W m}^{-2}\text{sr}^{-1}$	0 .. 50	n	32-bit real	0.25
SYN-135	WN filtered radiance adjustment- satellite emulated	$\text{W m}^{-2}\text{sr}^{-1}$	0 .. 50	n	32-bit real	0.25
SYN-136	WN flux - satellite emulated - TOA	W m^{-2}	2 .. 50	n	32-bit real	0.25
SYN-137	WN flux adjustment - satellite emulated - TOA	W m^{-2}	2 .. 50	n	32-bit real	0.25

Table 2.9-17. Unfiltered Total Longwave

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-138	Total LW unfiltered radiance - satellite emulated	$\text{W m}^{-2}\text{sr}^{-1}$	0 .. 200	n	32-bit real	0.25
SYN-139	Total LW unfiltered radiance adjustment - satellite emulated	$\text{W m}^{-2}\text{sr}^{-1}$	0 .. 200	n	32-bit real	0.25

Table 2.9-18. Constraintment Adjustments (1 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-140	Total column precipitable water - initial	cm	0 .. 10	n	32-bit real	0.25
SYN-141	Total column precipitable water - adjustment	cm	-10 .. 10	n	32-bit real	0.25
SYN-142	Upper tropospheric precipitable water - initial	cm	0 .. 10	n	32-bit real	0.25
SYN-143	Upper tropospheric precipitable water - adjustment	cm	-10 .. 10	n	32-bit real	0.25

Table 2.9-18. Constraintment Adjustments (2 of 2)

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-144	Upper tropospheric humidity - initial	N/A	0.0 .. 100.0	n	32-bit real	0.25
SYN-145	Upper tropospheric humidity - adjustment	N/A	0.0 .. 100.0	n	32-bit real	0.25
SYN-146	Surface albedo - adjustment	N/A	-1 .. 1	n	32-bit real	0.25
SYN-147	Aerosol optical depth - initial	N/A	0 .. 2	n	32-bit real	0.25
SYN-148	Aerosol optical depth - adjustment	N/A	-2 .. 2	n	32-bit real	0.25
SYN-149	Skin temperature - initial	K	175 .. 375	n	32-bit real	0.25
SYN-150	Skin temperature - adjustment	K	TBD	n	32-bit real	0.25
SYN-151	Mean visible optical depth- adjustment	N/A	-400 .. 400	n x 4	32-bit real	0.99
SYN-152	Mean cloud fractional area - adjustment	N/A	-1 .. 1	n x 4	32-bit real	0.99
SYN-153	Mean cloud effective temperature - adjustment	K	TBD	n x 4	32-bit real	0.99

Table 2.9-19. Constraintment Status

Item	SDS Name	Units	Range	Dimensions	DataType	Hourly Size (MB)
SYN-154	Number of tuning iterations	N/A	0 .. 1	n	32-bit integer	0.25
SYN-155	Constraintment status flag	N/A	0 .. 600	n	32-bit integer	0.25
SYN-156	Sigma table version number	N/A	1 .. 20	n	32-bit integer	0.25

Table 2.9-20. Sizing Information

Data Quantity	Size (MB)
Hourly TOTAL SYN Size	240.02
Daily TOTAL SYN Size	1920.19
Monthly TOTAL SYN Size	59525.90

SYN Revision Record

The product Revision Record contains information pertaining to approved section changes. The table lists the date the Software Configuration Change Request (SCCR) was approved, the Release and Version Number, the SCCR number, a short description of the revision, and the revised sections. The authors are listed on the document cover.

SYN Revision Record

SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
N/A	R3V1	N/A	• Updated format to comply with standards.	All