3-Hourly Averaged Synoptic Radiative Fluxes and Clouds (SYN1deg-3Hour)

The SYN1deg product contains the 3-hourly regional means of the CERES geostationary (GEO) enhanced temporally interpolated TOA fluxes, MODIS and 1-hourly GEO cloud properties, MODIS aerosols, and computed TOA, surface and in-atmospheric (profile) fluxes consistent with the observed TOA fluxes, clouds and aerosols. The Edition4A SYN1deg product has combined the Terra and Aqua CERES observed fluxes and cloud retrievals. The SYN1deg-3Hour product is distributed in monthly HDF-EOS files.

The constrained (adjusted) to the observed CERES TOA fluxes and the initial (untuned) profile (TOA, 70mb, 200mb, 500mb, and surface) longwave, shortwave, and window channel fluxes retrieved from the Langley Fu-Liou radiative transfer model are based on inputs from MODIS and GEO cloud properties stratified by 4 vertical layers, GEOS atmosphere and skin temperature, MATCH aerosol constituents, and MODIS spectral aerosol optical depths. The fluxes are given for pristine (clear-sky no-aerosol), clear-sky, all-sky-no-aerosol, and all-sky conditions. The initial and adjusted cloud, aerosols, GEOS precipitable water, humidity and skin temperatures are also given.

The SYN1deg product contains direct and diffuse shortwave surface fluxes. The product also contains direct and diffuse surface UVA, UVB, and photosynthetically active radiation (PAR) fluxes and surface UV Index for pristine, clear-sky, and total-sky conditions. Some of these surface fluxes are also given for all-sky-no-aerosol conditions.

A new addition to the SYN1deg is entropy parameters computed with the adjusted flux at TOA, in atmosphere, and the surface.

More information about the CERES products can be obtained on the CERES subsetter ordering web page (http://ceres.larc.nasa.gov/order_data.php)

A complete listing of metadata and science parameters for this data product can be found in Table 1, Table 2, and Table 3.

Level: 3
Frequency: Every 3 Hours
Portion of Atmosphere Covered: Surface, In-Atmosphere, and TOA

Time Interval Covered:
File: 1 Day
Record: 3 Hour

Portion of Globe Covered:
File: Entire Globe
Record: 1.0-Deg Regional

Product Version:

TRMM: N/A
Terra: Edition4A
Terra-Aqua: Edition4A
Terra-NPP: Edition1A

3-Hourly Metadata

The types of 3-Hourly metadata are summarized in Table 1 and contain information which need only be recorded once per product. The CERES metadata are listed in Appendix B. The Vgroups are listed in Table 2.

Table 1. Daily Metadata Summary

HDF Name	Description Table	Records	Number of Fields
CERES Baseline Header Metadata	Table B-1	1	36
CERES_metadata gridded data	Table B-2	1	14

Table 2. List of the Vgroups contained in the 3-Hourly Averages

Vgroup Number	Vgroup Name	Daily Averages
1	Regional_Information	See Table 4
2	Observed_TOA_Fluxes	See Table 5
3	Observed_Cloud_Layer_Properties	See Table 6
4	Initial_ClearSky_Fluxes	See Table 7
5	Initial_AllSky_Fluxes	See Table 8
6	Initial_Pristine_Fluxes	See Table 9
7	Initial_AllSkyNoAerosol_Fluxes	See Table 10
8	Initial_TOA_Satellite_Emulated_WN_Fluxes	See Table 11
9	Initial_Input_Meteorological_Variables	See Table 12
10	Adjusted_ClearSky_Flux_Profiles	See Table 13
11	Adjusted_AllSky_Flux_Profiles	See Table 14
12	Adjusted_Pristine_Flux_Profiles	See Table 15
13	Adjusted_AllSkyNoAerosol_Flux_Profiles	See Table 16
14	Adjusted_TOA_Satellite_Emulated_WN_Fluxes	See Table 17
15	Adjusted_Input_Meteorological_Variables	See Table 18
16	Adjusted_AllSky_Spectral_SW_Fluxes	See Table 19
17	Adjusted_AllSky_Spectral_LW_Fluxes	See Table 20
18	Adjusted_Surface_SW_Direct_Diffuse	See Table 21
19	Adjusted_UVA_UVB_Fluxes	See Table 22
20	Adjusted_PAR_Fluxes	See Table 23

Vgroup Number	Vgroup Name	Daily Averages
21	Adjusted_Entropy	See Table 24
22*	Number_of_Observations_and_Flux_Computations *	See Table 25

** Direct/Diffuse

3-Hourly Regional Science Data

The Scientific Data Sets (SDS) are divided into tables which map to Vgroups of the same name. All of the 1-Hourly regional science data are organized into the HDF-EOS Grid data type, which is shown in Table 3(a). All parameter tables contain a list of the gridded parameters, which includes the SDS index, field name, long name, the data type, the units, the range, and the number of elements within each field. The No. of Elements or Dimensions are defined in the first set of tables. Likewise, the long name ends with regional, zonal, or global. The first 2 dimensions noted, Nlat and Nlon, correspond to the CERES region index. On a few parameters, the last dimension is Ncld and defines the cloud levels; Nlev and defines the atmospheric profile levels; Nswbnd and defines the SW spectral bands; or Nlwbnd and defines the LW spectral bands. This ordering is used by the C programming language and most HDF viewers, such as IDL. 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.

Table 3(a). Nlat, Nlon dimensions that define the CERES equal-angle 1° latitude by 1° longitude grid

Dimension	Regional	Definition
Nlat	180	Index #1 is defined at 89.5°N and #180 is at 89.5°S
Nlon	360	Index #1 is defined at 179.5°W and #360 is at 179.5°E

Table 3(b). Ngmt dimension that defines the 8 3-hourly GMT time increments.

Ngmt Index	3-hourly daily increment
1	00-03 GMT
2	03-06 GMT
3	06-09 GMT
4	09-12 GMT
5	12-15 GMT
6	15-18 GMT
7	18-21 GMT
8	21-24 GMT

Table 3(c). Ncld dimension that defines the cloud layers

Cloud Layer Index Ncld	Cloud Layer
1	High
2	Upper Mid
3	Lower Mid
4	Low
5	Total

Table 3(d). Nlev dimension that defines the atmospheric profile levels

Nlev	Atmospheric level
1	TOA (30 km)
2	70 mb
3	200 mb
4	500 mb
5	Surface

Table 3(e). Nswbnd dimension that defines the SW spectral bounds

Nswbnd	SW Bands
1	Bands 1-7
2	Bands 8-10
3	Bands 11-13
4	Bands 14-18

Table 3(f). Nlwbnd dimension that defines the LW spectral bounds

Nlwbnd	LW Bands
1	Bands 1-4
2	Bands 5-7
3	Bands 8-9
4	Bands 10-11
5	Bands 12

Table 4. Regional Information

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements Regional
0	sza	Solar Zenith Angle	32-bit real	Degrees	1 .. 90	Nlon*Nlat*Ngmt
1	sfc_altitude	Surface Altitude above Sea Level	32-bit real	m	-1000 .. 10000	Nlon*Nlat*Ngmt
2	ocean_coverage	Ocean Percent Coverage	32-bit real	%	0 .. 100	Nlon*Nlat*Ngmt
3	snow_ice_coverage	Snow/Ice Percent Coverage	32-bit real	%	0 .. 100	Nlon*Nlat*Ngmt

Table 5. Observed TOA Fluxes Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
4	obs_clr_toa_sw	Observed Clear-Sky TOA SW Flux	32-bit real	W m^{-2}	0 .. 1400	Nlon*Nlat*Ngmt
5	obs_clr_toa_lw	Observed Clear-Sky TOA LW Flux	32-bit real	W m^{-2}	0 .. 500	Nlon*Nlat*Ngmt
6	obs_clr_toa_wn	Observed Clear-Sky TOA WN Flux	32-bit real	W m^{-2}	0 .. 200	Nlon*Nlat*Ngmt
7	obs_clr_toa_net	Observed Clear-Sky TOA Net Flux	32-bit real	W m^{-2}	-425 .. 400	Nlon*Nlat*Ngmt
8	obs_clr_toa_alb	Observed Clear-Sky TOA Albedo	32-bit real	N/A	0 .. 1	Nlon*Nlat*Ngmt
9	obs_all_toa_sw	Observed All-Sky TOA SW Flux	32-bit real	W m^{-2}	0 .. 1400	Nlon*Nlat*Ngmt
10	obs_all_toa_lw	Observed All-Sky TOA LW Flux	32-bit real	W m^{-2}	0 .. 500	Nlon*Nlat*Ngmt
11	obs_all_toa_wn	Observed All-Sky TOA WN Flux	32-bit real	W m^{-2}	0 .. 200	Nlon*Nlat*Ngmt
12	obs_all_toa_net	Observed All-Sky TOA Net Flux	32-bit real	W m^{-2}	-400 .. 400	Nlon*Nlat*Ngmt
13	obs_all_toa_alb	Observed All-Sky TOA Albedo	32-bit real	N/A	0 .. 1	Nlon*Nlat*Ngmt
14	toa_sw_insol	TOA SW Insolation	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt

Table 6. Observed Cloud Properties for Four Cloud Layers

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
15	obs_cld_amount	Observed Cloud Amount	32-bit real	Percent	0 .. 100	Nlon*Nlat*Ngmt*Ncld
16	obs_cld_od	Observed Cloud Visible Optical Depth (from 3.7 um particle size retrieval)	32-bit real	N/A	0 .. 400	Nlon*Nlat*Ngmt*Ncld
17	obs_cld_od_linavg	Observed Cloud Visible Optical Depth (linear averaged, from 3.7 um particle size retrieval)	32-bit real	N/A	0 .. 400	Nlon*Nlat*Ngmt*Ncld
18	obs_cld_ir_emiss	Observed Cloud Infrared Emissivity	32-bit real	N/A	0 .. 2*	Nlon*Nlat*Ngmt*Ncld
19	obs_cld_lwp	Observed Cloud Liquid Water Path (from 3. 7 um particle size retrieval)	32-bit real	g m^{-2}	0 .. 10000	Nlon*Nlat*Ngmt*Ncld
20	obs_cld_iwp	Observed Cloud Ice Water Path (from 3.7 um particle size retrieval)	32-bit real	g m^{-2}	0 .. 10000	Nlon*Nlat*Ngmt*Ncld
21	obs_cld_top_press	Observed Cloud Top Pressure	32-bit real	hPa	0 .. 1100	Nlon*Nlat*Ngmt*Ncld
22	obs_cld_top_temp	Observed Cloud Top Temperature	32-bit real	K	100 .. 350	Nlon*Nlat*Ngmt*Ncld
23	obs_cld_top_hgt	Observed Cloud Top Height	32-bit real	km	0 .. 20	Nlon*Nlat*Ncld*Ngmt
24	obs_cld_eff_press	Observed Cloud Effective Pressure	32-bit real	hPa	0 .. 1100	Nlon*Nlat*Ngmt*Ncld
25	obs_cld_eff_temp	Observed Cloud Effective Temperature	32-bit real	K	100 .. 350	Nlon*Nlat*Ngmt*Ncld
26	obs_cld_eff_hgt	Observed Cloud Effective Height	32-bit real	km	0 .. 20	Nlon*Nlat*Ngmt*Ncld
27	obs_cld_base_press	Observed Cloud Base Pressure	32-bit real	hPa	0 .. 1100	Nlon*Nlat*Ngmt*Ncld
28	obs_cld_base_temp	Observed Cloud Base Temperature	32-bit real	K	100 .. 350	Nlon*Nlat*Ngmt*Ncld
29	obs_cld_base_hgt	Observed Cloud Base Height	32-bit real	km	0 .. 20	Nlon*Nlat*Ngmt*Ncld

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
30	obs_cld_liq_radius	Observed Cloud Liquid Particle Radius (from 3.7 um particle size retrieval)	32-bit real	um	0 .. 40	Nlon*Nlat*Ngmt* Ncld
31	obs_cld_ice_radius	Observed Cloud Particle Phase (from 3.7 um particle size retrieval)	32-bit real	um	0 .. 300	Nlon*Nlat*Ngmt* Ncld
32	obs_cld_phase	Observed Cloud Particle Phase (from 3.7 um particle size retrieval)	32-bit real	N/A	1 .. 2	Nlon*Nlat*Ngmt* Ncld

* Range check from 0 to 2 to compensate for roundoff error.

Table 7. Initial_ClearSky_Fluxes_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
33	init_clr_sfc_sw_up	Initial Clear-Sky Surface SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
34	init_clr_sfc_sw_dn	Initial Clear-Sky Surface SW Down Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
35	init_clr_toa_sw_up	Initial Clear-Sky TOA SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
36	init_clr_sfc_lw_up	Initial Clear-Sky Surface LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat*Ngmt
37	init_clr_sfc_lw_dn	Initial Clear-Sky Surface LW Down Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat*Ngmt
38	init_clr_toa_lw_up	Initial Clear-Sky TOA LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat*Ngmt

Table 8. Initial_AllSky_Fluxes_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
39	init_all_sfc_sw_up	Initial All-Sky Surface SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
40	init_all_sfc_sw_dn	Initial All-Sky Surface SW Down Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
41	init_all_toa_sw_up	Initial All-Sky TOA SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
42	init_all_sfc_lw_up	Initial All-Sky Surface LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat*Ngmt
43	init_all_sfc_lw_dn	Initial All-Sky Surface LW Down Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat*Ngmt
44	init_all_toa_lw_up	Initial All-Sky TOA LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat*Ngmt

Table 9. Initial_Pristine_Fluxes_Regional

SDS Name	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
45	init_pristine_sfc_sw_up	Initial Pristine Surface SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
46	init_pristine_sfc_sw_dn	Initial Pristine Surface SW Down Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
47	init_pristine_toa_sw_up	Initial Pristine TOA SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
48	init_pristine_sfc_lw_up	Initial Pristine Surface LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat*Ngmt
49	init_pristine_sfc_lw_dn	Initial Pristine Surface LW Down Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat*Ngmt
50	init_pristine_toa_lw_up	Initial Pristine TOA LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat*Ngmt

Table 10. Initial_AllSkyNoAerosol_Fluxes_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
51	init_allnoaero_sfc_sw_up	Initial All-Sky-NoAerosol Surface SW Up Flux	32-bit real	W m-2	0 .. 1500	Nlon*Nlat*Ngmt
52	init_allnoaero_sfc_sw_dn	Initial All-Sky-NoAerosolSurface SW Down Flux	32-bit real	W m-2	0 .. 1500	Nlon*Nlat*Ngmt
53	init_allnoaero_toa_sw_up	Initial All-Sky-NoAerosol TOA SW Up Flux	32-bit real	W m-2	0 .. 1500	Nlon*Nlat*Ngmt
54	init_allnoaero_sfc_lw_up	Initial All-Sky-NoAerosol Surface LW Up Flux	32-bit real	W m-2	0 .. 850	Nlon*Nlat*Ngmt
55	init_allnoaero_sfc_lw_dn	Initial All-Sky-NoAerosol Surface LW Down Flux	32-bit real	W m-2	0 .. 850	Nlon*Nlat*Ngmt
56	init_allnoaero_toa_lw_up	Initial All-Sky-NoAerosol TOA LW Up Flux	32-bit real	W m-2	0 .. 850	Nlon*Nlat*Ngmt

Table 11. Initial_TOA_Satellite_Emulated_WN_Fluxes_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
57	init_all_toa_wn	Initial All-Sky TOA Satellite Emulated WN Flux	32-bit real	W m-2	0 .. 200	Nlon*Nlat*Ngmt
58	init_clr_toa_wn	Initial Clear-Sky TOA Satellite Emulated WN Flux	32-bit real	W m-2	0 .. 200	Nlon*Nlat*Ngmt

Table 12. Initial_Input_Meteorological_Variables_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
59	init_pw	Initial Precipitable Water – Regional	32-bit real	cm	0 .. 10	Nlon*Nlat*Ngmt
60	init_uth	Initial Upper Tropospheric Relative Humidity – Regional	32-bit real	%	0 .. 150	Nlon*Nlat*Ngmt
61	init_sfc_alb	Initial Surface Albedo – Regional	32-bit real	N/A	0 .. 1	Nlon*Nlat*Ngmt
62	init_skin_temp	Initial Skin Temperature – Regional	32-bit real	K	175 .. 375	Nlon*Nlat*Ngmt
63	init_match_aod55	Initial MATCH Aerosol Optical Depth at 0.55 um band – Regional	32-bit real	N/A	0 .. 8	Nlon*Nlat*Ngmt
64	init_match_aod84	Initial MATCH Aerosol Optical Depth at 0.84 um band – Regional	32-bit real	N/A	0 .. 8	Nlon*Nlat*Ngmt
65	sfc_press	Surface Pressure – Regional	32-bit real	hPa	0 .. 1100	Nlon*Nlat*Ngmt
66	col_o3	Column Ozone – Regional	32-bit real	DU	0 .. 1000	Nlon*Nlat*Ngmt
67	init_cld_amount	Initial Cloud Amount – Regional	32-bit real	%	0 .. 100	Nlon*Nlat*Ngmt*Ncld
68	init_cld_temp	Initial Cloud Temperature – Regional	32-bit real	K	100 .. 350	Nlon*Nlat*Ngmt*Ncld
69	init_cld_od	Initial Cloud Optical Depth – Regional	32-bit real	N/A	0 .. 400	Nlon*Nlat*Ngmt*Ncld
70	init_cld_lwp	Initial Cloud Liquid Water Path – Regional	32-bit real	g m-2	0 .. 10000	Nlon*Nlat*Ngmt*Ncld
71	init_cld_iwp	Initial Cloud Ice Water Path – Regional	32-bit real	g m-2	0 .. 10000	Nlon*Nlat*Ngmt*Ncld

Table 13. Adjusted_ClearSky_Flux_Profiles_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
72	adj_clr_sw_up	Adjusted Clear-Sky SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt*Nlev
73	adj_clr_sw_dn	Adjusted Clear-Sky SW Down Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt*Nlev
74	adj_clr_sfc_lw_up	Adjusted Clear-Sky LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt*Nlev
75	adj_clr_lw_dn	Adjusted Clear-Sky LW Down Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt*Nlev

Table 14. Adjusted_AllSky_Flux_Profiles_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
76	adj_all_sw_up	Adjusted All-Sky SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt*Nlev
77	adj_all_sw_dn	Adjusted All-Sky SW Down Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt*Nlev
78	adj_all_sfc_lw_up	Adjusted All-Sky LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt*Nlev
79	adj_all_lw_dn	Adjusted All-Sky LW Down Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt*Nlev

Table 15. Adjusted_Pristine_Flux_Profiles_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
80	adj_pristine_sw_up	Adjusted Pristine SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt*Nlev
81	adj_pristine_sw_dn	Adjusted Pristine SW Down Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt*Nlev
82	adj_pristine_sfc_lw_up	Adjusted Pristine LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt*Nlev
83	adj_pristine_lw_dn	Adjusted Pristine LW Down Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt*Nlev

Table 16. Adjusted_AllSkyNoAerosol_Flux_Profiles_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
84	adj_allnoaero_sw_up	Adjusted All-Sky-NoAerosol SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt*Nlev
85	adj_allnoaero_sw_dn	Adjusted All-Sky-NoAerosol SW Down Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt*Nlev
86	adj_allnoaero sfc_lw_up	Adjusted All-Sky-NoAerosol LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt*Nlev
87	adj_allnoaero_lw_dn	Adjusted All-Sky-NoAerosol LW Down Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt*Nlev

Table 17. Adjusted_TOA_Satellite_Emulated_WN_Fluxes_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
88	adj_all_toa_wn	Adjusted All-Sky TOA Satellite Emulated WN Flux	32-bit real	W m^{-2}	0 .. 200	Nlon*Nlat*Ngmt
89	adj_clr_toa_wn	Adjusted Clear-Sky TOA Satellite Emulated WN Flux	32-bit real	W m^{-2}	0 .. 200	Nlon*Nlat*Ngmt

Table 18. Adjusted_Input_Meteorological_Variables_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
90	adj_pw	Adjusted Precipitable Water	32-bit real	cm	0 .. 10	Nlon*Nlat *Ngmt
91	adj_uth	Adjusted Upper Tropospheric Relative Humidity	32-bit real	%	0 .. 150	Nlon*Nlat *Ngmt
92	adj_sfc_alb	Adjusted Surface Albedo	32-bit real	N/A	0 .. 1	Nlon*Nlat *Ngmt
93	adj_skin_temp	Adjusted Skin Temperature	32-bit real	K	175 .. 375	Nlon*Nlat *Ngmt

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
94	adj_match_aod55	Adjusted MATCH Aerosol Optical Depth at 0.55 um band	32-bit real	N/A	0 .. 8	Nlon*Nlat *Ngmt
95	adj_cld_amount	Adjusted Cloud Amount	32-bit real	%	0 .. 100	Nlon*Nlat *Ngmt*Ncld
96	adj_cld_temp	Adjusted Cloud Temperature	32-bit real	K	100 .. 350	Nlon*Nlat *Ngmt*Ncld
97	adj_cld_od	Adjusted Cloud Optical Depth	32-bit real	N/A	0 .. 400	Nlon*Nlat *Ngmt*Ncld
98	adj_cld_lwp	Adjusted Cloud Liquid Water Path	32-bit real	g m-2	0 .. 10000	Nlon*Nlat *Ngmt*Ncld
99	adj_cld_iwp	Adjusted Cloud Ice Water Path	32-bit real	g m-2	0 .. 10000	Nlon*Nlat *Ngmt*Ncld

Table 19. Adjusted_AllSky_Spectral_SW_Fluxes_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
100	adj_all_toa_spec_sw_dn	Adjusted All-Sky TOA Spectral SW Down Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt *Nswbnd
101	adj_all_toa_spec_sw_up	Adjusted All-Sky TOA Spectral SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt *Nswbnd
102	adj_all_sfc_spec_sw_dn	Adjusted All-Sky Surface Spectral SW Down Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt *Nswbnd
103	adj_all_sfc_spec_sw_up	Adjusted All-Sky Surface Spectral SW Up Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat *Ngmt *Nswbnd

Table 20. Adjusted_AllSky_Spectral_LW_Fluxes_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
104	adj_all_toa_spec_lw_up	Adjusted All-Sky TOA Spectral LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt *Nlwbnd

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
105	adj_all_sfc_spec_lw_up	Adjusted All-Sky Surface Spectral LW Up Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt *Nlwbnd
106	adj_all_sfc_spec_lw_dn	Adjusted All-Sky Surface Spectral LW Down Flux	32-bit real	W m^{-2}	0 .. 850	Nlon*Nlat *Ngmt *Nlwbnd

Table 21. Adjusted_Surface_SW_Direct_Diffuse_Fluxes_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
107	clr_sfc_sw_dir	Clear-Sky Surface SW Direct Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
108	clr_sfc_sw_diff	Clear-Sky Surface SW Diffuse Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
109	all_sfc_sw_dir	All-Sky Surface SW Direct Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
110	all_sfc_sw_diff	All-Sky Surface SW Diffuse Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
111	pristine_sfc_sw_dir	Pristine Surface SW Diffuse Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
112	pristine_sfc_sw_diff	Pristine Surface SW Diffuse Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
113	allnoaero_sfc_sw_dir	All-Sky-NoAerosol Surface SW Direct Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt
114	allnoaero_sfc_sw_diff	All-Sky-NoAerosol Surface SW Diffuse Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat*Ngmt

Table 22. Adjusted_UVA_UVB_Fluxes_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
115	toa_uva_dn	TOA UVA Downwelling Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt
116	toa_uvb_dn	TOA UVB Downwelling Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
117	all_sfc_uva	All-Sky Surface UVA Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt
118	all_sfc_uvb	All-Sky Surface UVB Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt
119	all_sfc_uv_index	All-Sky Surface UV Index	32-bit real	N/A	0 .. 30	Nlon*Nlat* Ngmt

Table 23. Adjusted_PAR_Fluxes_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
120	toa_par_dn	TOA PAR Downwelling Flux – Regional	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt
121	clr_sfc_par_dir	Clear-Sky Surface PAR Direct Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt
122	clr_sfc_par_diff	Clear-Sky Surface PAR Diffuse Flux – Regional	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt
123	all_sfc_par_dir	All-Sky Surface PAR Direct Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt
124	all_sfc_ par_diff	All-Sky Surface PAR Diffuse Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt
125	pristine_sfc_par_dir	Pristine Surface PAR Direct Flux - Region	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt
126	pristine_sfc_par_diff	Pristine Surface PAR Diffuse Flux	32-bit real	W m^{-2}	0 .. 1500	Nlon*Nlat* Ngmt

Table 24. Adjusted_Entropy_Regional

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
127	toa_out_entropy_lw	TOA Outgoing Entropy (LW)	32-bit real	mW m^{-2} K^{-1}	100 .. 3000	Nlon*Nlat* Ngmt
128	atmos_out_entropy_lw	Atmosphere Outgoing Entropy (LW)	32-bit real	mW m^{-2} K^{-1}	100 .. 3000	Nlon*Nlat* Ngmt
129	sfc_out_entropy_lw	Surface Outgoing Entropy (LW)	32-bit real	mW m^{-2} K^{-1}	0 .. 3000	Nlon*Nlat* Ngmt
130	up_sfc_entropy_lw	Upward Surface Entropy (LW)	32-bit real	mW m^{-2} K^{-1}	100 .. 3000	Nlon*Nlat* Ngmt

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
131	dn_sfc_entropy_lw	Downward Surface Entropy (LW)	32-bit real	mW m^{-2} K^{-1}	100 .. 3000	Nlon*Nlat* Ns*Ngmt
132	atmos_entropy_gen_lwnet	Atmosphere Entropy Generation by LW Net	32-bit real	mW m^{-2} K^{-1}	100 .. 3000	Nlon*Nlat* Ngmt
133	sfc_entropy_gen_lwnet	Surface Entropy Generation by LW Net	32-bit real	mW m^{-2} K^{-1}	-500 .. 3000	Nlon*Nlat* Ngmt
134	toa_in_entropy_sw	TOA Incoming Entropy (SW)	32-bit real	mW m^{-2} K^{-1}	0 .. 500	Nlon*Nlat* Ngmt
135	atmos_in_entropy_sw	Atmosphere Incoming Entropy (SW)	32-bit real	mW m^{-2} K^{-1}	0 .. 300	Nlon*Nlat* Ngmt
136	sfc_in_entropy_sw	Surface Incoming Entropy (SW)	32-bit real	mW m^{-2} K^{-1}	0 .. 500	Nlon*Nlat* Ngmt
137	atmos_entropy_gen_swnet	Atmosphere Entropy Generation by SW Net	32-bit real	mW m^{-2} K^{-1}	0 .. 2500	Nlon*Nlat* Ngmt
138	sfc_entropy_gen_swnet	Surface Entropy Generation by SW Net	32-bit real	mW m^{-2} K^{-1}	0 .. 4000	Nlon*Nlat* Ngmt

Table 25. Number_of_Observations_and_Flux_Computations_Regional*

SDS Index	SDS Name	Long Name	DataType	Units	Range	No. Of Elements
139	num_sw_obs	Number of CERES SW Flux Observations	32-bit real	N/A	0 .. 744	Nlon*Nlat*Ngmt
140	num_lw_obs	Number of CERES LW Flux Observations	32-bit real	N/A	0 .. 744	Nlon*Nlat*Ngmt
141	num_geo_sw_obs	Number of GEO-derived SW Flux Observation	32-bit real	N/A	0 .. 744	Nlon*Nlat*Ngmt
142	num_geo_lw_obs	Number of GEO-derived LW Flux Observation	32-bit real	N/A	0 .. 744	Nlon*Nlat*Ngmt
143	num_ini_comp	Number of Valid Initial Hourly Flux Computations	32-bit real	N/A	0 .. 744	Nlon*Nlat*Ngmt
144	num_adj_comp	Number of Valid Adjusted Hourly Flux Computations	32-bit real	N/A	0 .. 744	Nlon*Nlat*Ngmt

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SYN1deg-3Hour 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.

SYN1deg-3Hour Revision Record

SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
07/19/2010	R5V1	795	• Initial version of this document. This data product was previously named AVG/ZAVG.	All
			• The ASDC footer was added to the bottom of the document. (12/04/2013)	All
			• Eliminated section numbers from the Data Products Catalog. Specifically, in this document, section number 2.11 was removed. (12/17/2013)	All
			• Updated some links to refer to the .pdf file instead of the .doc file. (06/20/2014)	All
08/24/2021	R6V1	1410	• Initial version of SYN1deg-1Hour Edition4 DPC.	All
			• Updated Vgroup Names.	Tables 1, 2, and 3
			• Updated dimensions description.	Table 4a-
			• Replaced Time and Position with Regional Information.	Tables 5 a and b
			• Cloud properties are in one SDS with additional dimension for total instead of the previous 4.	Table 7
			• Stowe-Ignatov and MODIS Aerosol Optical Depth Tables Removed.	Tables 8 and 9
			• Untuned and tuned fluxes renamed Initial and adjusted fluxes, respectively. Order of tables changed.	Tables 8 through 11 and 14 through17
			• Changed Total to All-Sky Flux.	All
			• Untuned and tuned emulated window TOA fluxes renamed Initial and adjusted fluxes, respectively. Order of table changed.	Tables 12 and 18
			• Added Initial and Adjusted Meteorological Variables.	Tables 13 and 19

SYN1deg-3Hour Revision Record

SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
08/24/2021 (Continued	R6V1	1410	• Added spectral TOA and Sfc SW and LW fluxes. • Moved location of SW Direct/Diffuse, UVA/UVB, and PAR Tables. • Added entropy values. • Added number of observations.	Tables 20 and 21 Tables 22, 23, and 24 Table 25 Table 26