Clouds and Radiative Swath (CRS)

The Clouds and Radiative Swath (CRS) product contains one hour of instantaneous Clouds and the Earth's Radiant Energy System (CERES) data for a single scanner instrument. The CRS contains all of the CERES SSF product data. For each CERES FOV on the SSF, the CRS also contains vertical flux profiles evaluated at five levels in the atmosphere: the surface, 500 hPa, 200 hPa, 70 hPa, and the TOA. After an initial pass through the radiative transfer model, the input parameters to the model are adjusted and a constrained pass through the model is made for both clear sky and total sky. If the FOV is overcast, clear sky fluxes are still calculated.

For the longwave, shortwave, and window channels, the CRS contains the upward and downward constrained vertical flux profiles for clear sky and total sky conditions evaluated at the five levels, along with pristine (no aerosols or clouds) and aerosol-free total sky fluxes evaluated at the surface and the TOA.

The initial flux profiles are not contained on the CRS unless constrained values are unavailable; however, the adjustments between the constrained and initial profiles for the following are included for clear sky, total sky, pristine, and aerosol-free total sky conditions:

- Longwave, shortwave, and window channel upward at the surface and the TOA.
- Longwave, shortwave, and window channel downward at the surface.

The adjustments to the model input parameters between the initial and the constrained passes are also contained on the CRS. The adjustable 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: 2
Frequency: 1/Hour
Portion of Atmosphere Covered: Surface to the TOA

Time Interval Covered:
File: 1 Hour
Record: 1/100-Second

Portion of Globe Covered:
File: Satellite Swath
Record: 1 CERES FOV

Product Version:
TRMM: Edition2B, Edition2C
Terra: Edition2A, Edition2B, Edition2F, Edition2G
Aqua: Edition2A, Edition2B, Edition2C, Edition2D

CRS Metadata

The types of CRS metadata are summarized in Table 1 and contain information which need only be recorded once per hour. The CERES metadata are listed in Appendix B. Table B-1 lists the CERES Baseline Header Metadata and Table B-2 lists the parameters in the CERES_metadata Vdata Table. Note that the CERES_metadata Vdata is a subset of the CERES Baseline Header Metadata. The CRS product-specific metadata parameters are listed in Table 1 and the CRS_Header_Vdata parameters are listed in Table 2.

Table 1. CRS 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
CRS Product-specific Metadata	Table 2	1	3
CRS_Header Vdata	Table 2	1	25

Table 2. CRS_Header_Vdata

Item	Description	Units	Range	Elements	Bytes/ Elem
CRS-H1	SSF ID	N/A	112 .. 200	1	4
CRS-H2	Character name of CERES instrument	N/A	ASCII string	1	4
CRS-H3	Day and Time at hour start	N/A	ASCII string	1	28
CRS-H4	Character name of satellite	N/A	ASCII string	1	4
CRS-H5	Character name of high resolution imager instrument	N/A	ASCII string	1	8
CRS-H6	Number of imager channels	N/A	1 .. 20	1	4
CRS-H7	Central wavelengths of imager channels	μm	0.4 .. 15.0	20	4
CRS-H8	Earth-Sun distance at hour start	AU	0.98 .. 1.02	1	4
CRS-H9	Beta Angle	deg	-90 .. 90	1	4
CRS-H10	Colatitude of subsatellite point at surface at hour start	deg	0 .. 180	1	4
CRS-H11	Longitude of subsatellite point at surface at hour start	deg	0 .. 360	1	4
CRS-H12	Colatitude of subsatellite point at surface at hour end	deg	0 .. 180	1	4
CRS-H13	Longitude of subsatellite point at surface at hour end	deg	0 .. 360	1	4
CRS-H14	Along-track angle of satellite at hour end	deg	0 .. 330	1	4
CRS-H15	Number of Footprints in SSF product	N/A	0 .. 360000	1	4
CRS-H16	Subsystem 4.1 identification string	N/A	ASCII string	1	128

Table 2. CRS_Header_Vdata

Item	Description	Units	Range	Elements	Bytes/ Elem
CRS-H17	Subsystem 4.2 identification string	N/A	ASCII string	1	128
CRS-H18	Subsystem 4.3 identification string	N/A	ASCII string	1	128
CRS-H19	Subsystem 4.4 identification string	N/A	ASCII string	1	128
CRS-H20	Subsystem 4.5 identification string	N/A	ASCII string	1	128
CRS-H21	Subsystem 4.6 identification string	N/A	ASCII string	1	128
CRS-H22	IES production date and time	N/A	ASCII string	1	24
CRS-H23	MOA production date and time	N/A	ASCII string	1	24
CRS-H24	SSF production date and time	N/A	ASCII string	1	24
CRS-H25	Instantaneous SARB Version number	N/A	1 .. 26	1	2
CRS-H26	CRS production date and time	N/A	ASCII string	1	19

CRS Scientific Data Sets

For the TRMM satellite, the CRS contains 206 Scientific Data Sets (SDS). For the Terra and Aqua satellites, the CRS contains 250 SDSs. The first 131 SDSs (160 SDSs for Terra and Aqua) are also contained on the SSF. (For a list of these SDSs, see Table 3 through Table 15.) The remaining SDSs are generated by the CERES Surface and Atmospheric Radiation Budget (SARB) production software and are unique to the CRS product.

These SDSs are parameter collections of along-track ordered FOVs where the first dimension corresponds to the number of FOVs, and the last dimension corresponds to the number of parameters. 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 FOVs 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. Table 3 through Table 16 summarize the contents of each Vgroup and SDS contained within the CRS file. Product sizing information for the maximum number of possible FOVs is given in Table 17. (Note: the dimension n in the following tables is the number of FOVs processed: Assuming n = 245475 for sizing). Maximum SDS hourly sizes for the different dimensions are given in Table 18.

Table 3. Surface Radiative Properties

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
1	TRMM-132	Terra-161	Photosynthetically active radiation over surface	W m^{-2}	0 .. 780	n	32 bit real
2	TRMM-133	Terra-162	Direct/diffuse surface ratio	N/A	0 .. 30	n	32 bit real
3	TRMM-134	Terra-163	Corrected initial broadband surface albedo	N/A	0 .. 1	n	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.
b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 4. Vertical Profile Description

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
4	TRMM-135	Terra-164	Number of atmospheric levels	N/A	0 .. 5	n	32 bit integer
5	TRMM-136	Terra-165	Pressure levels	hPa	0 .. 1100	n x 5	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.
b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 5. Pristine Vertical Flux Profiles

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
6	TRMM-137	Terra-166	SW flux - upward - pristine	W m^{-2}	0 .. 1400	n x 2	32 bit real
7	TRMM-138	Terra-167	SW flux - downward - pristine	W m^{-2}	0 .. 1400	n x 2	32 bit real
8	TRMM-139	Terra-168	LW flux - upward - pristine	W m^{-2}	0 .. 850	n x 2	32 bit real
9	TRMM-140	Terra-169	LW flux - downward - pristine	W m^{-2}	0 .. 700	n x 2	32 bit real
10	TRMM-141	Terra-170	WN flux - upward - pristine	W m^{-2}	0 .. 370	n x 2	32 bit real
11	TRMM-142	Terra-171	WN flux - downward - pristine	W m^{-2}	0 .. 370	n x 2	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.
b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 6. Constrained Clear Sky Profiles

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
12	TRMM-143	Terra-172	SW flux - upward for clear-sky	W m^{-2}	0 .. 1400	n x 5	32 bit real
13	TRMM-144	Terra-173	SW flux - downward for clear-sky	W m^{-2}	0 .. 1400	n x 5	32 bit real
14	TRMM-145	Terra-174	LW flux - upward for clear-sky	W m^{-2}	0 .. 850	n x 5	32 bit real
15	TRMM-146	Terra-175	LW flux - downward for clear-sky	W m^{-2}	0 .. 700	n x 5	32 bit real
16	TRMM-147	Terra-176	WN flux - upward for clear-sky	W m^{-2}	0 .. 370	n x 5	32 bit real
17	TRMM-148	Terra-177	WN flux - downward for clear-sky	W m^{-2}	0 .. 370	n x 5	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.
b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 7. Constrained Total Sky Profiles

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
18	TRMM-149	Terra-178	SW flux - upward for total-sky	W m^{-2}	0 .. 1400	n x 5	32 bit real
19	TRMM-150	Terra-179	SW flux - downward for total-sky	W m^{-2}	0 .. 1400	n x 5	32 bit real
20	TRMM-151	Terra-180	LW flux - upward for total-sky	W m^{-2}	0 .. 850	n x 5	32 bit real
21	TRMM-152	Terra-181	LW flux - downward for total-sky	W m^{-2}	0 .. 700	n x 5	32 bit real
22	TRMM-153	Terra-182	WN flux - upward for total-sky	W m^{-2}	0 .. 370	n x 5	32 bit real
23	TRMM-154	Terra-183	WN flux - downward for total-sky	W m^{-2}	0 .. 370	n x 5	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.
b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 8. Pristine Constrainment-Initial Flux Deltas

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
24	TRMM-155	Terra-184	SW flux adjustment at surface - upward - pristine	W m^{-2}	-1400 .. 1400	n	32 bit real
25	TRMM-156	Terra-185	SW flux adjustment at TOA - upward - pristine	W m^{-2}	-1400 .. 1400	n	32 bit real
26	TRMM-157	Terra-186	SW flux adjustment at surface - downward - pristine	W m^{-2}	-1400 .. 1400	n	32 bit real

Table 8. Pristine Constrainment-Initial Flux Deltas

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
27	TRMM-158	Terra-187	LW flux adjustment at surface - upward - pristine	W m^{-2}	-600 .. 600	n	32 bit real
28	TRMM-159	Terra-188	LW flux adjustment at surface - downward - pristine	W m^{-2}	-700 .. 700	n	32 bit real
29	TRMM-160	Terra-189	LW flux adjustment at TOA - upward - pristine	W m^{-2}	-700 .. 700	n	32 bit real
30	TRMM-161	Terra-190	WN flux adjustment at surface - upward - pristine	W m^{-2}	-50 .. 50	n	32 bit real
31	TRMM-162	Terra-191	WN flux adjustment at surface - downward - pristine	W m^{-2}	-50 .. 50	n	32 bit real
32	TRMM-163	Terra-192	WN flux adjustment at TOA - upward - pristine	W m^{-2}	-50 .. 50	n	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.

b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 9. Clear Sky Constrainment-Initial Flux Deltas

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
33	TRMM-164	Terra-193	SW flux adjustment at surface - upward for clear-sky	W m^{-2}	-1400 .. 1400	n	32 bit real
34	TRMM-165	Terra-194	SW flux adjustment at TOA - upward for clear-sky	W m^{-2}	-1400 .. 1400	n	32 bit real
35	TRMM-166	Terra-195	SW flux adjustment at surface - downward for clear-sky	W m^{-2}	-1400 .. 1400	n	32 bit real
36	TRMM-167	Terra-196	LW flux adjustment at surface - upward for clear-sky	W m^{-2}	-600 .. 600	n	32 bit real
37	TRMM-168	Terra-197	LW flux adjustment at surface - downward for clear-sky	W m^{-2}	-700 .. 700	n	32 bit real
38	TRMM-169	Terra-198	LW flux adjustment at TOA - upward for clear-sky	W m^{-2}	-700 .. 700	n	32 bit real
39	TRMM-170	Terra-199	WN flux adjustment at surface - upward for clear-sky	W m^{-2}	-50 .. 50	n	32 bit real
40	TRMM-171	Terra-200	WN flux adjustment at surface - downward for clear-sky	W m^{-2}	-50 .. 50	n	32 bit real
41	TRMM-172	Terra-201	WN flux adjustment at TOA - upward for clear-sky	W m^{-2}	-50 .. 50	n	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.

b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 10. Total Sky Constrainment-Initial Flux Deltas

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
42	TRMM-173	Terra-202	SW flux adjustment at surface - upward for total-sky	W m^{-2}	-1400 .. 1400	n	32 bit real
43	TRMM-174	Terra-203	SW flux adjustment at TOA - upward for total-sky	W m^{-2}	-1400 .. 1400	n	32 bit real
44	TRMM-175	Terra-204	SW flux adjustment at surface - downward for total-sky	W m^{-2}	-1400 .. 1400	n	32 bit real
45	TRMM-176	Terra-205	LW flux adjustment at surface - upward for total-sky	W m^{-2}	-600 .. 600	n	32 bit real
46	TRMM-177	Terra-206	LW flux adjustment at surface - downward for total-sky	W m^{-2}	-700 .. 700	n	32 bit real
47	TRMM-178	Terra-207	LW flux adjustment at TOA - upward for total-sky	W m^{-2}	-700 .. 700	n	32 bit real
48	TRMM-179	Terra-208	WN flux adjustment at surface - upward for total-sky	W m^{-2}	-50 .. 50	n	32 bit real
49	TRMM-180	Terra-209	WN flux adjustment at surface - downward for total-sky	W m^{-2}	-50 .. 50	n	32 bit real
50	TRMM-181	Terra-210	WN flux adjustment at TOA - upward for total-sky	W m^{-2}	-50 .. 50	n	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.

b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 11. Satellite Emulated Window Channel

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
51	TRMM-182	Terra-211	WN filtered radiance -satellite emulated	W $m^{-2}sr^{-1}$	0 .. 50	n	32 bit real
52	TRMM-183	Terra-212	WN filtered radiance adjustment-satellite emulated	W $m^{-2}sr^{-1}$	0 .. 50	n	32 bit real
53	TRMM-184	Terra-213	WN flux - satellite emulated - TOA	W m^{-2}	2 .. 50	n	32 bit real
54	TRMM-185	Terra-214	WN flux adjustment - satellite emulated - TOA	W m^{-2}	2 .. 50	n	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.

b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 12. Unfiltered Total Longwave

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
55	TRMM-186	Terra-215	Total LW unfiltered radiance - satellite emulated	W $m^{-2}sr^{-1}$	0 .. 200	n	32 bit real
56	TRMM-187	Terra-216	Total LW unfiltered radiance adjustment - satellite emulated	W $m^{-2}sr^{-1}$	0 .. 200	n	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.

b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 13. Constrainment Adjustments

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
57	TRMM-188	Terra-217	Total column precipitable water - initial	cm	0 .. 10	n	32 bit real
58	TRMM-189	Terra-218	Total column precipitable water - adjustment	cm	-10 .. 10	n	32 bit real
59	TRMM-190	Terra-219	Upper tropospheric precipitable water - initial	cm	0 .. 10	n	32 bit real
60	TRMM-191	Terra-220	Upper tropospheric precipitable water - adjustment	cm	-10 .. 10	n	32 bit real
61	TRMM-192	Terra-221	Upper tropospheric humidity - initial	N/A	0.0 .. 100.0	n	32 bit real
62	TRMM-193	Terra-222	Upper tropospheric humidity - adjustment	N/A	0.0 .. 100.0	n	32 bit real
63	TRMM-194	Terra-223	Surface albedo - adjustment	N/A	-1 ..1	n	32 bit real
64	TRMM-195	Terra-224	Aerosol optical depth - initial	N/A	0 .. 2	n	32 bit real
65	TRMM-196	Terra-225	Aerosol optical depth - adjustment	N/A	-2 .. 2	n	32 bit real
66	TRMM-197	Terra-226	Skin temperature - initial	K	TBD	n	32 bit real
67	TRMM-198	Terra-227	Skin temperature - adjustment	K	TBD	n	32 bit real
68	TRMM-199	Terra-228	Mean visible optical depth-adjustment	N/A	-400 .. 400	n x 2	32 bit real
69	TRMM-200	Terra-229	Mean cloud fractional area - adjustment	N/A	-1 .. 1	n x 2	32 bit real

Table 13. Constrainment Adjustments

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
70	TRMM-201	Terra-230	Mean cloud effective temperature - adjustment	K	TBD	n x 2	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.

b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 14. Aerosol Constituency Information

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
71	TRMM-202	Terra-231	Aerosol constituency flags	N/A	01000000 .. 18999999	n x 7	32 bit integer
72	TRMM-203	Terra-232	Aerosol and surface albedo sources flag	N/A	100 - 303	n	32 bit integer

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.

b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 15. Constrainment Status

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
73	TRMM-204	Terra-233	Number of tuning iterations	N/A	0 .. 1	n	32 bit integer
74	TRMM-205	Terra-234	Constrainment status flag	N/A	0 .. 600	n	32 bit integer
75	TRMM-206	Terra-235	FuLiou model error code	N/A	1 .. 3000	n	32 bit integer

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.

b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 16. Cloudy Skies with No Aerosol Information

SARB SDS	TRMM CRS SDS Number[a]	Terra and Aqua CRS SDS Number[b]	SDS Name	Units	Range	Dim	Data Type
76	N/A	Terra-236	SW flux - upward - cloudy skies with no aerosol	W m^{-2}	0 .. 1400	n	32 bit real
77	N/A	Terra-237	SW flux - downward - cloudy skies with no aerosol	W m^{-2}	0 .. 1400	n	32 bit real
78	N/A	Terra-238	LW flux - upward - cloudy skies with no aerosol	W m^{-2}	0 .. 850	n	32 bit real
79	N/A	Terra-239	LW flux - downward - cloudy skies with no aerosol	W m^{-2}	0 .. 700	n	32 bit real
80	N/A	Terra-240	WN flux - upward - cloudy skies with no aerosol	W m^{-2}	0 .. 370	n	32 bit real
81	N/A	Terra-241	WN flux - downward - cloudy skies with no aerosol	W m^{-2}	0 .. 370	n	32 bit real
82	N/A	Terra-242	SW flux adjustment at surface - upward - cloudy skies with no aerosol	W m^{-2}	-1400 .. 1400	n	32 bit real
83	N/A	Terra-243	SW flux adjustment at TOA - upward - cloudy skies with no aerosol	W m^{-2}	-1400 .. 1400	n	32 bit real
84	N/A	Terra-244	SW flux adjustment at surface - downward - cloudy skies with no aerosol	W m^{-2}	-1400 .. 1400	n	32 bit real
85	N/A	Terra-245	LW flux adjustment at surface - upward - cloudy skies with no aerosol	W m^{-2}	-600 .. 600	n	32 bit real
86	N/A	Terra-246	LW flux adjustment at surface - downward - cloudy skies with no aerosol	W m^{-2}	-700 .. 700	n	32 bit real
87	N/A	Terra-247	LW flux adjustment at TOA - upward - cloudy skies with no aerosol	W m^{-2}	-700 .. 700	n	32 bit real
88	N/A	Terra-248	WN flux adjustment at surface - upward - cloudy skies with no aerosol	W m^{-2}	-50 .. 50	n	32 bit real
89	N/A	Terra-249	WN flux adjustment at surface - downward - cloudy skies with no aerosol	W m^{-2}	-50 .. 50	n	32 bit real
90	N/A	Terra-250	WN flux adjustment at TOA - upward - cloudy skies with no aerosol	W m^{-2}	-50 .. 50	n	32 bit real

a. The first 131 TRMM CRS SDSs are listed in the corresponding TRMM SSF DPC pages. TRMM SSF and CRS granules contain fewer SDSs than Terra and Aqua SSF and CRS granules.

b. The first 160 Terra and Aqua CRS SDSs are listed in the corresponding SSF DPC pages.

Table 17. Sizing Information[a]

SATELLITE	HOURLY SSF SDS TOTAL SIZE (MAXIMUM)	HOURLY CRS-ONLY SDS SIZE (MAXIMUM)	HOURLY CRS TOTAL SDS SIZE (MAXIMUM)	DAILY CRS TOTAL SIZE (MAXIMUM)
TRMM SATELLITE	260.27 MB	132.97 MB	391.42	9.15 GB
TERRA AND AQUA SATELLITES	283.73MB	147.02 MB	430.75	10.10 B

a. Sizing data in this table are based solely on binary versions of the products, and do not account for HDF compression.

Table 18. Maximum Hourly SDS Sizes

Dimension	Maximum Hourly Size (MB)
n	0.94
n x 2	1.87
n x 5	4.68
n x 7	6.55

CRS 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.

CRS 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
12/20/02	R3V2	408	• Added text to indicate a different number of SDSs for the different satellites. • Updated table to include sizing information for the different satellites. • Updated summary information to include the Product Version section and eliminated the references to the CERES Configuration Codes. • Corrected references to the height used as the TOA by SARB to 0.1 hPa. • Updated format to comply with standards.	2.6 Table 2.6-16 2.6 2.6 All
12/20/02	R3V3	408	• Replaced references to the 0.1 hPa height with the term TOA and defined pristine skies as containing no clouds or aerosols. • Removed column containing individual SDS hourly size information from VGroup tables and added Table 2.6-17. • Replaced single Item Number column in VGroup Tables with three columns to distinguish the Item Number between satellites. • Updated format to comply with standards.	2.6 Tables 2.6-3 through 2.6-17 Tables 2.6-3 through 2.6-16 All
7/30/03	R3V4	458	• Updated introduction to discuss the aerosol-free total sky additions to the CRS. • Added new table to contain the aerosol-free total sky information. • Updated sizing table to reflect the additional data. • Updated format to comply with standards.	2.6 Table 2.6-16 Table 2.6-17 All
1/16/04	R3V5	498	• The revisions to the document are the updating of Table 2.6-15 to reflect the renaming of the SDS Sigma table version number SDS to FuLiou model error code, and the updating of that SDS's range.	Table 2.6-15

CRS Revision Record

SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
	Cont'd.		• Corrected name shown for SARB SDS 1.	Table 2.6-3
			• Updated format to comply with standards.	All
6/28/04	R4V1	541	• Included references to the Aqua satellite.	Sec. 2.6 Tables 2.6-6 through 2.6-17
			• Updated format to comply with standards.	All
12/20/05	R4V2	597	• Added Edition2A to the Product Version category Aqua.	Sec. 2.6
4/05/07		651	• Added Edition2B to the Product Version category Aqua.	Sec. 2.6
2/01/08	R4V3	668	• Added Edition2F to the Product Version category Terra.	Product Version Section
4/05/07		651	• Added Edition2C to the Product Version category Aqua.	Product Version Section
			• The EOSDIS Product Code line was removed from the document. (6/17/2008)	Sec. 2.6
11/12/08	R5V1	692	• Added Edition2G to the Product Version category Terra.	Product Version Section
			• Added Edition2D to the Product Version category Aqua.	Product Version Section
			• Some links were not working. They have now been modified. (12/09/2010)	All
			• The ASDC footer was added to the bottom of the document. (06/05/2013)	All
			• Eliminated section numbers from the Data Products Catalog. Specifically, in this document, section number 2.6 was removed. (12/10/2013)	All
			• Changed Appendix B links from .doc to .pdf. (06/20/2014)	All
			• Updated document to change "mm" to "μm." (09/12/2019)	Table 2