

CERES Science Team Meeting

Items for Discussion - January 2001

EDOS data delivery challenges

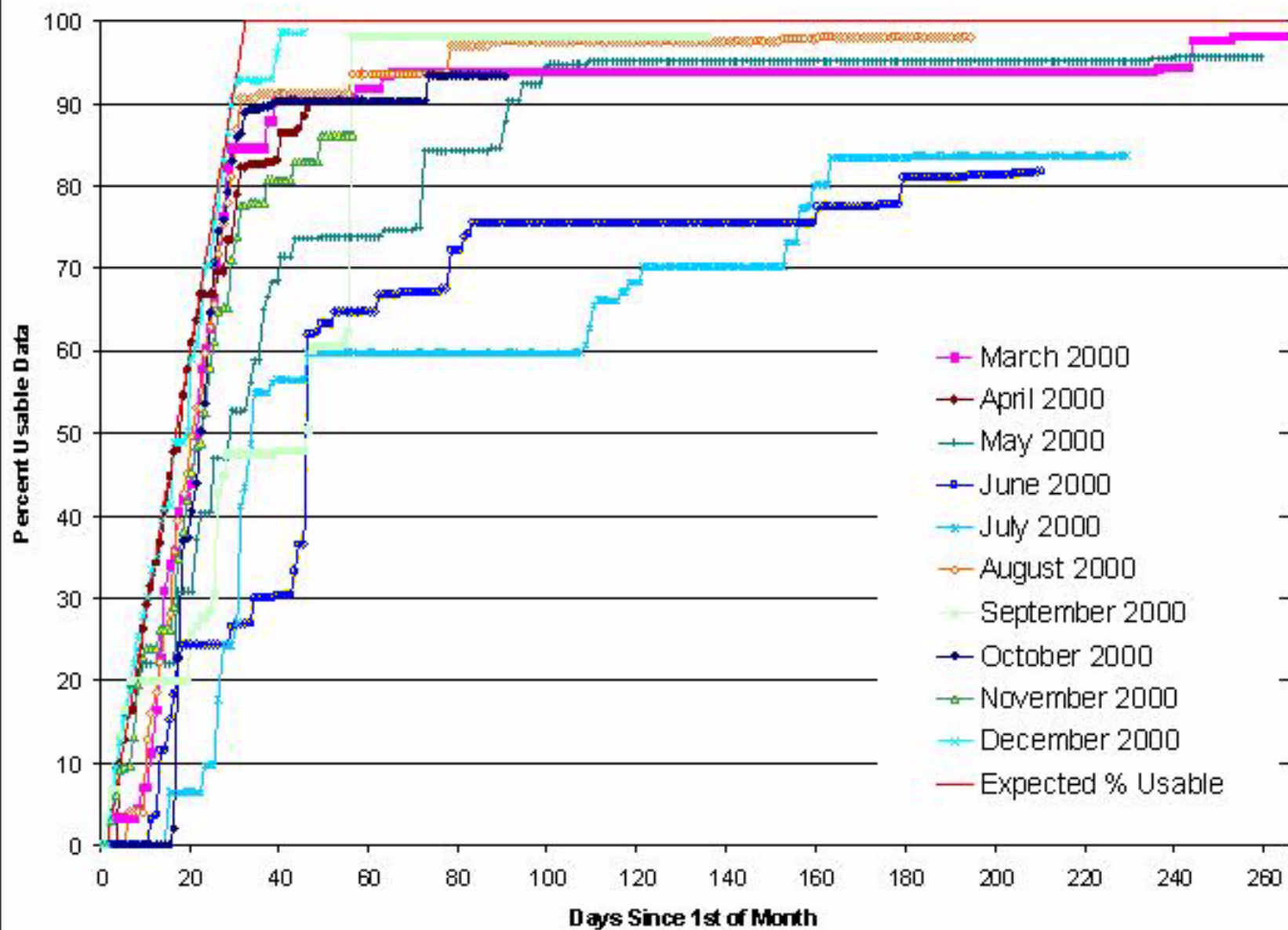
Code deliveries and Terra/Aqua processing estimates

Data products available at Atmospheric Sciences Data Center

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These charts: http://asd-www.larc.nasa.gov/ceres/science_team/quarter_rept.html

Percent Usable FM1 Data (FM2 is nearly identical)



CERES PGE Sizes as Delivered to LaRC ASDC - January 2001

Working Group (Subsystem)	Delivery Date	Number of Lines				
		Source (w/ comments)	Source (executable)	Scripts	SMF/ PCF	MCF
Instrument (1.0)	10/24/00	139268	103052	15072	4062	4901
ERBE-like (2.0 & 3.0)	10/27/00	91529	42343	11584	368	10150
Clouds (4.1-4.4)	11/16/00	157590	126622	8552	5717	6236
Inversion (4.5-4.6)	12/21/00	22638	13071	2747	524	2168
SARB (5.0) (12.0)	03/22/99 12/02/00	35539 20208	22144 9577	1693 1680	136 297	1468 700
TISA (6.0 & 9.0) (7.1, 8.0, & 10.0) (11.0)	09/21/99 10/01/99 11/19/99	40325 53811 30072	25635 33224 20997	5814 2626 5535	11839 61 3278	4200 5950 1400
System (CERESlib)	11/16/00	74061	42188	8374	304	1374
System Total		659680	435911	62793	26281	37847

An additional 460,000 lines of code in use at the SCF for validation and analysis.

CERES TRMM/Terra Post-Launch ASDC Production Measurements - 1/03/2001

SS	PGE	Date	Time, sec			Block I/O		Mem, MB	Disk Storage, MB			Mnthly Runs
			Wall	User	Sys	In	Out		In	Int	Arch	
1.0	Instrument (1.1P1)- PFM	05/22/00	19896	19387	333	63864	5387	30	438	735	888	31
	Instrument (1.1P3)- FM1	11/14/00	N/A	11305	237	36033	2064	37	290	792	1276	31
	Instrument (1.1P3)- FM2	11/14/00	N/A	11195	235	36042	2366	68	288	792	1200	31
	Instrument (1.2P1)- PFM	05/23/00	233	63	16	13748	2	283	770	0	245	31
	Instrument (1.2P1)- FM1	11/15/00	N/A	76	10	1564	2	302	1010	0	275	31
	Instrument (1.2P1)- FM2	11/15/00	N/A	78	10	1403	3	303	888	0	276	31
2.0	Snow Map Gen. (2.1P1)	09/02/00	157	71	5	1169	3	55	79	0	1	31
	Daily (2.2P1)- PFM	09/02/00	1240	733	237	3978	30	440	1	0	865	31
	Daily (2.2P1) - FM1	11/24/00	1358	572	199	4548	49	492	276	0	969	31
	Daily (2.2P1) - FM2	11/24/00	790	564	197	4669	27	494	277	0	974	1
	Overlap (2.3P1) - PFM	09/04/00	95	89	2	2640	71	5	1	0	3	1
	Overlap (2.3P1) - FM1	11/30/00	103	90	3	4418	72	5	280	0	12	1
	Overlap (2.3P1) - FM2	11/30/00	102	92	3	4355	72	5	284	0	13	1
	Overlap (2.3P2) - PFM	09/04/00	153	145	4	4358	72	5	1	0	4	1
	Overlap (2.3P2) - FM1	11/30/00	103	90	4	4241	72	5	277	0	12	1
	Overlap (2.3P2) - FM2	11/30/00	104	90	4	4217	72	5	276	0	11	1
3.0	Monthly (3.1P1) - PFM	09/04/00	323	221	90	2228	103	38	108	0	192	1
	Monthly (3.1P1) - FM1	11/30/00	566	367	167	6010	208	71	340	0	437	1
	Monthly (3.1P1) - FM2	11/30/00	574	369	167	5838	190	71	344	0	440	1
	Monthly (3.2P1) -FM1+FM2	12/07/00	244	191	37	4009	80	71	245	0	449	1
	Monthly (3.2P1) -PFM+FM1	12/08/00	188	133	39	1906	47	71	167	0	514	1
	Monthly (3.2P1) -PFM+FM2	12/08/00	199	134	39	2818	76	71	168	0	517	1
	Monthly (3.2P1) -PFM+FM1+FM2	12/08/00	265	219	43	42	35	71	290	0	528	1

One execution on LaTIS of each PGE for actual production of March 1, 2000 (Hr 00 if hrly) TRMM and Terra data.

CERES TRMM Post-Launch ASDC Production Measurements - 1/03/2001

SS	PGE	Date	Time, sec			Block I/O		Mem, MB	Disk Storage, MB			Mnthly Runs
			Wall	User	Sys	In	Out		In	Int	Arch	
4.1-4.4	Surfmap (4.1-4.0P1)	10/26/00	3	1	0	38	1	76	11	0	5	31
4.1-4.4	Cld Ret/Ftprnt (4.1-4.1P1)	11/25/00	9538	8324	123	27064	22	812	966	757	553	744
4.1-4.4	CRH Update (4.1-4.2P1)	11/25/00	162	122	22	1665	3	115	611	0	150	31
4.1-4.4	QC Generator (4.1-4.3P1)	12/06/00	304	47	59	7703	3	517	3951	0	334	1
4.5-4.6	TOA/Surf Flx (4.5-6.1P1)	11/25/00	275	231	35	3526	48	15	552	0	421	744
4.5-4.6	TOA/Surf Flx (4.5-6.2P1)	07/28/99	79	76					186	0	183	744
5.0	Inst. SARB (5.1P1)	11/03/99	8057	8021	36			24	193	0	190	744
5.0	Inst. SARB (5.2P1)											744
7.2	Synoptic SARB	11/01/00	725	715	6	720	5	172	166	0	175	31
12.0	MOA (12.1P1) - n32bit											
6.0	Synoptic Gridding (6.1P1)	11/08/99	412	351	40	7715	1	114	6140	5	0	744
6.0	Sort FSW Files(6.2P1)	11/10/99	6325	6003	244	39375	155	1059	3720	0	3492	1
6.0	FSW HDF (6.3P1)	11/11/99	11745	11410	282	21715	20	428	3492	0	3490	1
9.0	Post MOA (9.1P1)	10/15/99	17715	3099	447	217214	4	411	10059	0	5949	1
9.0	Surface Gridding (9.2P1)	10/19/99	772	405	69	8274	1	179	6124	0	3	744
9.0	Sort SFC Files (9.3P1)	10/22/99	4138	3182	206	46681	146	506	2232	0	1682	1
9.0	SFC HDF (9.4P1)	10/22/99	5474	5160	110	19139	10	260	1682	0	1666	1
11.0	Grid GOES-8 (11.1P1)	11/03/99	55329	55068	43	34954	2	32	2125	188	0	1
11.0	Grid GOES-9 (11.1P2)	11/02/99	39720	39513	48	40841	2	29	2740	135	0	1
11.0	Grid GMS (11.1P4)	11/02/99	44455	44215	31	19278	2	27	1272	190	0	1
11.0	Grid Meteosat (11.1P3)	11/02/99	48934	48626	30	19215	2	25	1180	190	0	1
11.0	Sort GGEO (11.2P1)	11/03/99	15033	14340	648	9565	9123	509	731	0	571	1
7.1	Synoptic Interpolate	11/11/99	9920	9261	617	95438	46	62	9669	0	1094	4
8.0	Synoptic Averaging											
10.0	TOA/SRB Averaging	11/05/99	12711	10365	293	118024	7	634	8343	0	2578	1

One execution on LaTIS of each PGE for actual production of January 5, 1998 (Hr 00 if hrly) TRMM data.

CERES Post-Launch Processing Time Summary - 1/2001

Wall-clock hours (SGI R10K, 195MHz) required to run one month of TRMM data through each subsystem

SS	PGE	Runs per Mon	TRMM Pre-Launch			TRMM Post-Launch				Terra/ Aqua Factor
			4/93	9/96	10/97	4/98	9/98	5/99	1/01	
1.0-3.0	Instrument/ERBE-like	31	9	83	134	175	176	238	184	2
4.1-4.4	Clouds/Convolution	744	425	1687	952	1351	1143	1775	2959	12
4.5-4.6	TOA/Surface Flux	744	-	12	30	(30)	281	330	90	2
5.0	Instantaneous SARB	744	4464	10731	5611	(5611)	3391	2155	1692	2
6.0	Atmospheric Gridding	744	37	789	124	(124)	14	14	90	2
7.2	Synoptic SARB	248	46	187	(187)	(187)	(187)	(190)	(190)	2
9.0	Surface Gridding	744	12	786	108	(108)	17	654	167	2
11.0	Grid Geostationary	5	-	4	(4)	(4)	96	95	57	1
	Remaining PGE's		8	7	94	(94)	(94)	(17)	(16)	2
Total for one month of data			5001	14286	7244	7684	5399	5468	5445	(40359)

() - Estimated

There is substantial variability to these estimates due to changing computer environments

- 4/93 scaled from Sparc2 measurements and research code estimates to R10K
- 9/96 scaled from R8K to R10K chips and NAG to SGI compilers
- 1/01 scaled from R12K, 300MHz to R10K
- These scalings do not properly account for the I/O and staging components of wall clock time

Interpretation of CERES Processing Estimates

Factor	Units	TRMM	Terra	Aqua
R10K CPU wall clock estimates for one month of all data products	hours	5500	40400	40400
Number of R10K CPU's running 24 hrs, 7 days at keep-up rate. The big assumption here is independent jobs: not true for either Clouds or SARB since both require daily sequential processing.	CPUs	8	55	55
ASDC is currently using R12K, 300MHz processors, reduce by 0.7	CPUs	6	39	39
Recent experience with Clouds processing shows that we can't keep the CPU's running at 100%: adds a factor of 1.7	CPUs (1x)	11	67	67

Processing/reprocessing stream	FY 01	FY 02	FY 03	FY 04	FY 05
TRMM VIRS at rate of one month in 10 days	3x = 33	3x = 33	-	-	-
Terra keep-up + backlog processing + reprocessing	0.5x = 34	2x = 134	3x = 201	3x = 201	3x = 201
Aqua initial operations + reprocessing	0.1x = 7	0.5x = 34	2x = 134	3x = 201	3x = 201
Total CPU's	74	201	335	402	402

We currently have 64 processors on LaTIS to do the work, so we've got to reduce requirements.

More processors are on the way for Aqua, but not enough to handle this job!

CERES Data Products at ASDC

What's new since last meeting?

Data Set	Comments	When?
CER_BDS_Terra-FM1_Edition1 CER_BDS_Terra-FM2_Edition1	<ul style="list-style-type: none"> • Terra count conversion offsets updated to ground determined values (previously zero) • Second time constant coefficients and algorithm updated • March 2000 - present • Terra data for June, July, and November sporadic 	11/00
CER_ES8_Terra-FM1_Edition1 CER_ES8_Terra-FM2_Edition1	<ul style="list-style-type: none"> • ERBElike data sets for Terra • Updated spectral correction coefficients for snow • March 2000 - present • Monthly products for June, July, and November 2000 not available; insufficient coverage due to missing data 	11/00
CER_ES4_Terra-FM1_Edition1 CER_ES4_Terra-FM2_Edition1		
CER_ES9_Terra-FM1_Edition1 CER_ES9_Terra-FM2_Edition1		
CER_SSF_TRMM-PFM-VIRS_Edition1	<ul style="list-style-type: none"> • Clouds, Inversion, Surface archival data set for TRMM • Software similar to ValidationR5 • Jan - Aug 1998 and March 2000 	12/00
CER_SSF_TRMM-PFM-VIRS_ValR5	<ul style="list-style-type: none"> • First SSF reprocessing since ValidationR4 in Summer 1999 • Superseded by Edition1 • Changes too numerous to itemize; see Description web page • April 1998 and 9 February days (aerosol validation) 	11/00

Reminder: Full list of products and associated links available on

http://eosweb.larc.nasa.gov/PRODOCS/ceres/table_ceres.html

You must login to the Web Ordering Tool with your CERES Science Team name and password.

CERES Data Products at ASDC

What's planned for near-term?

Data Set	Comments	When?
CER_SSF_TRMM-SIM-VIRS_Edition1	<ul style="list-style-type: none"> • Simulated crosstrack CERES footprints containing imager derived parameters • Plan to process September 1998 - present (except March 2000) 	3/01
CER_SFC_TRMM-PFM-VIRS_ValidationR5	<ul style="list-style-type: none"> • First SRBAVG to include GGEO clouds • Edition1 SSFs to be used as input • Plan to process at least one month 	4/01
CER_SRBAVG_TRMM-PFM-VIRS_ValidationR5		
CER_CRS_TRMM-PFM-VIRS_ValidationR4	<ul style="list-style-type: none"> • Added Clear sky and Total Sky flux profile levels at 200 hPa • Added Pristine SW, LW, and WN fluxes at surface and TOA • Monthly history map of clear sky surface albedo based on observed CERES data incorporated for use in cloudy sky conditions. • Using Hu-Cox-Munk Ocean Spectral Albedo • Edition1 SSFs to be used as input • Plan to process Jan - Aug 1998 	4/01

CERES Data Products at ASDC

What's older but possibly still of interest?

Data Set	Comments	When?
CER_BDS_TRMM-PFM_Edition1	<ul style="list-style-type: none"> • Archival BDS for TRMM • January - August '98 processed (8 months) 	4/99
CER_ES8_TRMM-PFM_Edition2 CER_ES4_TRMM-PFM_Edition2 CER_ES9_TRMM-PFM_Edition2	<ul style="list-style-type: none"> • Most current archival ERBElike data set for TRMM • Slope-intercept, day/night spectral correction • January - August '98 processed (8 months) 	4/00
CER_ES8_TRMM-PFM_TransientOps2	<ul style="list-style-type: none"> • Limited TRMM turn-on periods from 9/98 - 2/00 • Mainly for ScaRaB and INDOEX comparisons 	12/99
CER_CRS_TRMM-PFM-VIRS_ValidationR3	<ul style="list-style-type: none"> • Only CRS data set available for TRMM • Processed January '98 only 	3/99
CER_FSW_TRMM-PFM-VIRS_ValidationR4	<ul style="list-style-type: none"> • Only FSW data set available for TRMM • Processed January '98 only 	11/99
CER_SFC_TRMM-PFM-VIRS_ValidationR4 CER_SRBAVG_TRMM-PFM-VIRS_ValidationR4	<ul style="list-style-type: none"> • Only SFC and SRBAVG data sets available for TRMM • Processed January '98 only 	10/99

CERES Data Archival and Orders at ASDC

- **Last fiscal year, CERES orders averaged:**
 - **19 customers per month**
 - **300 data files per month**
 - **30 gigabytes per month**
- **In the last six weeks:**
 - **5 terabytes of data archived**
 - **Mainly products of TRMM Edition 1 Clouds processing**
 - **SSF's released to public 1/10/01**
 - **Over 1 terabyte of data orders (mostly TRMM and Terra ES8's)**
 - **318 gigabytes to Science Team outside of Langley**
 - **697 gigabytes to other public users**
- **Highest volume product is ES8**
- **Highest number of customers is for ES4**

URL's of Interest

- CERES home page with links to ASDC, documentation, quicklook results
<http://asd-www.larc.nasa.gov/ceres/ASDceres.html>
- Full list of CERES data sets and associated links
http://eosweb.larc.nasa.gov/PRODOCS/ceres/table_ceres.html
- Langley ASDC with links to data order tool and download view_hdf
<http://eosweb.larc.nasa.gov/>
- Instrument Operations and Housekeeping Data Statistics, link to Terra input availability
http://earth-www.larc.nasa.gov/ceresweb/instr_pub.html
- ERBE-like Public Web Page
http://earth-www.larc.nasa.gov/erbelike/pub_cdval
- SSF Public Web Page
http://earth-www.larc.nasa.gov/ssf/pub_ssf/
- SARB Working Group
<http://srbsun.larc.nasa.gov/sarb/>
- Surface Properties
http://tanalo.larc.nasa.gov:8080/surf_htmls/SARB_surf.html/