MODIS
SCIENCE DATA SUPPORT TEAM
PRESENTATION

September 3, 1993

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ACTION ITEMS

No.	Due Date	Item
1.	08/13/93	[Tom Goff]. Determine MODIS requirements for metadata on ancillary products. These include Version Number, changes in generating software, etc. STATUS: Open. (Assigned 07/30/93)
2.	08/13/93	[Al Fleig] Speak to Steve Unger on simulation data. Develop an approach for a plan for simulated test data. STATUS: Open. (Assigned 07/23/93)
3.	09/03/93	[Paul Hubanks & Carl Solomon]. Evaluate the SeaWiFS scheduling algorithm and code to see if it can be applied to MODIS prototyping. STATUS: Open. (Assigned 06/25/93)

MODIS Airborne Simulator (MAS) Status

Paul A. Hubanks
Progress through 02 September 1993

1. New Platform pointing budget from Martin Marietta
   (Continuing Update of E.L.E. Report).

2. Updating MAS Level-1B Data Users Guide.

3. Request from Chris Justice to move 5 SCAR-A flights up in the processing queue.

4. MAS Processing Software Updates:
   - Request from Dr. King to change format of Flight Summary file. (completed)
   - All software successfully recompiled with HDF 3.3b2 package.
   - Acquiring information to implement software version control.

5. ASTEX Processing Status:
   - Awaiting take-off time (needed as input to calibration software) for 31May92 flight (contacted Tom Arnold and AMES).
   - Incorrect configuration shown in ASTEX Mission Summary Log (from AMES) for 29May92 flight - necessitating reprocessing of 29May flight (Halls Snow data).
   - All other ASTEX flights - completed.

6. FIRE Processing Status:
   - FIRE calibration from Dr. King's group nearing completion.
   - Setting up FIRE data to reprocess.

MAS Processing/Inventory Log

ASTEX - Atlantic Stratocumulus Transition Experiment

(27 May 1992 - 30 June 1992)

Flight #	Flight Type	Configur-ation	Date/ (Julian Date)	Take-off Time	Processing Priority h=high m=med l=low	Expected Completion Date	Level-0 File Size (512 byte blocks)	Automated Flight Tracks Selected	QA bad nav?	Flight Tracks Verified	Main Process. Produce HDF Level1b	QA bad clock/ clock offsets?	# of Flight Lines (Size of Output)	Output Tape Written/ Quicklooks to FTP site	Completion Date
92-092	fcf	N/A	27 May 92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
92-100	ff	Jedlovec	29 May 92 (150)	14.08806	h	08/11/93	2,500,000	√	ok	√		ok	14 (3,300,000)		
92-101	ff	King	31 May 92 (152)		m	08/16/93	2,700,000	√	ok	√			10		
92-102	sdf/Azores	King	02 Jun 92 (154)	9.12917	m	08/11/93	590,000	√	ok	√	√	ok	5 (700,000)	√	08/17/93
92-103	sdf/Azores	King	04 Jun 92 (156)	11.46528	m	08/31/93	1,800,000	√	ok	√	√	ok	14 (2,700,000)	√	08/24/93
92-104	System Failure	King	05 Jun 92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
92-105	sdf/Azores	King	08Jun 92 (160)	10.46667	m	08/31/93	2,300,000	√	ok	√	√	ok	17 (2,090,000)	√	08/31/93
92-106	System Failure	King	12 Jun 92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
92-107	sdf/Azores	King	17 Jun 92 (169)	11.00694	h	08/11/93	980,000	√	ok	√	√	ok	13 (1,300,000)	√	08/17/93
92-108	sdf/Azores	King	18 Jun 92 (170)	12.50556	m	08/16/93	1,300,000	√	ok	√	√	ok	13 (2,000,000)	√	08/18/93
92-109	sdf/Azores	King	19 Jun 92 (171)	10.97639	m	8/31/93	1,700,000	√	ok	√	√	ok	15 (2,300,000)	√	08/27/93
92-110	sdf/Azores	King	21 Jun 92 (173)	8.97361	m	08/11/93	1,200,000	√	ok	√	√	ok	9 (1,700,000)	√	08/18/93
92-111	sdf/Azores	King	22 Jun 92 (174)	13.52222	m	08/31/93	1,300,000	√	ok	√	√	ok	8 (2,100,000)	√	08/30/93
92-112	sdf/Azores	King	23 Jun 92 (175)	14.00556	m	08/16/93	1,000,000	√	ok	√	√	ok	8 (1,700,000)	√	08/19/93
92-113	ff	Jedlovec	29 Jun 92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
92-114	ff	Jedlovec	30 Jun 92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

fcf = functional check flight
ff = ferry flight
sdf = science data flight

MAS Processing/Inventory Log

FIRE - First ISCCP[1] Regional Experiment

(31 October 1991 - 07 December 1991)

Flight #	Flight Type	Configur-ation	Date/ (Julian Date)	Take-off Time	Processing Priority h=high m=med l=low	Expected Completion Date	Level-0 File Size (512 byte blocks)	Automated Flight Tracks Selected	QA bad nav?	Flight Tracks Verified?	Main Process / Produce HDF Level1b	QA bad clock?/ clock offsets?	# of Flight Lines (Size of Output)	Output Tape Written / Quicklooks to FTP site	Completion Date
92-017	fcf / Cen. Ca	FIRE Cirrus	31 Oct 91 (304)		m			√	ok			offset l +.01257778			
92-026	ff / Sierra Nv	FIRE Cirrus	12 Nov 91 (316)		m			√	ok			offset l +.01617778			
92-027	sdf / N. Ok, S Ks	FIRE Cirrus	14 Nov 91 (318)		m			√	ok			offset l +.01657778			
	Ground Calibration	FIRE Cirrus	16 Nov 91	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
92-028	sdf / N. Ok S Ks	FIRE Cirrus	18 Nov 91 (322)		m			√	ok			offset l +.0180000			
	Ground Calibration	FIRE Cirrus	20 Nov 91	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
92-029	sdf / Ks	FIRE Cirrus	21 Nov 91 (325)		m			√	ok			offset l +.01862222			
92-030	sdf / Ks, Mo	FIRE Cirrus	22 Nov 91 (326)		m			√	ok			offset l +.0191111			
	Ground Calibration	FIRE Cirrus	23 Nov 91	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
92-031	sdf / La, Gulf of Mx	FIRE Cirrus	24 Nov 91 (328)		h			√	ok			offset l +.01986670			
92-032	sdf / Tx, Ok	FIRE Cirrus	25 Nov 91 (329)		h			√	ok			offset l +02026670			
92-033	sdf / Ks, Ok, Mo	FIRE Cirrus	26 Nov 91 (330)		h			√	ok			offset l +.02013333			
92-034	sdf / Tx,La, Gulf of Mx	FIRE Cirrus	03 Dec 91 (337)		m			√	ok			offset l +.02235556			
92-035	sdf / Tx, Gulf of Mx	FIRE Cirrus	04 Dec 91 (338)		m			√	ok			offset l +.02275560			
92-036	sdf /Ks, Ok Gulf of Mx	FIRE Cirrus	05 Dec 91 (339)		h			√	ok			offset l +.02315556			
92-037	sdf / Tx, Ok,Ks, Ar	FIRE Cirrus	07 Dec 91 (341)		m			√	ok			offset l +.02360000			

fcf = fuctional check flight
ff = ferry flight
sdf = science data flight

1 International Satellite Cloud Climatology Program

MODIS/MAS Spectral Band Comparison/Overlap

MODIS				MAS								
Central Wavelength MODIS (36ch)	**Bandwidth MODIS**	**MODIS Band #**	**Gnd. Res. meters**	**Central Wavelength MAS (50ch)**	**Bandwidth MAS**	**MAS Band #**	**Spectral Range MAS**	**FIRE**	**ASTEX**	**TOGA**	**CEPEX**	**SCAR-A**
0.412	(.015)	8	1000									
0.443	(.010)	9	1000									
0.469	(.020)	3	500									
0.488	(.010)	10	1000									
0.531	(.010)	11	1000									
				0.547	(.043)	1	0.529-0.572					√
0.551	(.010)	12	1000									
0.555	(.020)	4	500									
0.645	(.050)	1	250									
				0.664	(.055)	2	0.635-0.688		√	√	√	√
0.667	(.010)	13	1000									
0.678	(.010)	14	1000					.680				
				0.707	(.042)	3	0.688-0.729					
				0.745	(.040)	4	0.729-0.769					
0.748	(.010)	15	1000									
				0.786	(.040)	5	0.770-0.810					
				0.834	(.042)	6	0.810-0.852					
0.858	(.035)	2	250									
0.869	(.015)	16	1000									
				0.875	(.041)	7	0.852-0.893		√	√	√	√
0.905	(.030)	17	1000									
				0.910	(.031)	8	0.896-0927					
0.936	(.010)	18	1000									
0.940	(.050)	19	1000									
				0.945	(.043)	9	0.926-0.969		√			√
1.240	(.020)	5	500									
1.375	(.030)	26	1000									
				1.623	(.057)	10	1.595-1.652		√	√	√	
1.640	(.025)	6	500					1.630				
				1.680	(.050)	11	1.655-1.705					
				1.730	(.050)	12	1.705-1.755					
				1.780	(.050)	13	1.755-1.805					
				1.830	(.050)	14	1.805-1.855			√		

Central Wavelength MODIS (36ch)	Bandwidth MODIS	MODIS Band #	Gnd. Res. meters	Central Wavelength MAS (50ch)	Bandwidth MAS	MAS Band #	Spectral Range MAS	FIRE	ASTEX	TOGA	CEPEX	SCAR-A
				1.880	(.050)	15	1.855-1.905				√	√
				1.930	(.050)	16	1.905-1.955	√				
				1.980	(.050)	17	1.955-2.005					
				2.030	(.050)	18	2.005-2.055					
				2.080	(.050)	19	2.055-2.105	√				
2.130	(.050)	7	500					2.130				
				2.142	(.047)	20	2.126-2.173		√	√	√	√
				2.180	(.050)	21	2.155-2.205					
				2.230	(.050)	22	2.205-2.255					
				2.280	(.050)	23	2.255-2.305					
				2.330	(.050)	24	2.305-2.355					
				2.380	(.050)	25	2.355-2.405					
				3.000	(.150)	26	2.925-3075					
				3.150	(.150)	27	3.075-3.225					
				3.300	(.150)	28	3.225-3.375					
				3.450	(.150)	29	3.375-3.525					
				3.600	(.150)	30	3.525-3.675					
				3.725	(.151)	31	3.659-3.810		√	√	√	√
3.750	(.180)	20	1000					3.750				
				3.900	(.150)	32	3.825-3.975					
3.959	(.059)	21	1000									
3.959	(0.59)	22	1000									
4.050	(.061)	23	1000	4.050	(.150)	33	3.975-4.125					
				4.200	(.150)	34	4.125-4.275					
				4.350	(.150)	35	4.275-4.425					
4.465	(.065)	24	1000									
				4.503	(.142)	36	4.436-4.578	4.500				
4.515	(.067)	25	1000									
				4.651	(.150)	37	4.582-4.732	4.650				
				4.800	(.150)	38	4.725-4.875					
				4.950	(.150)	39	4.875-5.025					
				5.100	(.150)	40	5.025-5.175					
				5.250	(.150)	41	5.175-5.325					
6.715	(.360)	27	1000									
7.325	(.300)	28	1000									
8.550	(.300)	29	1000									
				8.563	(.396)	42	8.342-8.738	8.800	√	√	√	√
				9.642	(.426)	43	9.451-9.877					
9.730	(.300)	30	1000									

Central Wavelength MODIS (36ch)	Bandwidth MODIS	MODIS Band #	Gnd. Res. meters	Central Wavelength MAS (50ch)	Bandwidth MAS	MAS Band #	Spectral Range MAS	FIRE	ASTEX	TOGA	CEPEX	SCAR-A
				10.438	(.466)	44	10.259-10.725					
				11.002	(.448)	45	10.791-11.239	10.950	√	√	√	√
11.030	(.500)	31	1000									
12.020	(.500)	32	1000					11.950				
				12.032	(.447)	46	11.799-12.246		√	√	√	√
				12.775	(.447)	47	12.539-12.986					
				13.186	(.352)	48	13.023-13.375		√	√	√	√
13.335	(.300)	33	1000									
13.635	(.300)	34	1000									
13.935	(.300)	35	1000									
				13.952	(.517)	49	13.630-14.147		√	√	√	
14.235	(.300)	36	1000									
				14.302	(.358)	50	14.163-14.521					

MODIS Level 2 Processing Shell Design and Development

J. J. Pan
MODIS Science Data Support Team
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Task:

- Preparation of materials (e.g. the updated algorithm dependency diagram) required for the MODIS Science Meeting (Sept. 30 - Oct. 1).

- General Concerns on Science Software Delivery and Test

1. Establish a table and CM processs to record and trace the software delivery.
2. Set up computer accounts, check disk space, and tools (e.g., code checker) which are available at the TLCF.
3. Generate a software code evaluation table.
4. Assign tasks to SDST staff.
5. Identify the information we need (e.g., TBD in the ATBD).
6. Identify the person we should contact to ask questions, etc.

Table 1. Software Delivery Record

		Comments
Algorithm Name	MODIS Infrared Sea Surface Temperature	
MODIS Number	MODIS 22	
Investigator(s)	O.B. Brown	
Programmer(s)		
Date ATBD (Ver. No.) Received	8/1/93 (Version 1.0)	
Date Software (Ver. No.) Received		
Person to Contack (Tel.)		
Person Who Received the Package		

Table 2. Algorithm Delivery Package

		Comments
Configuration List		
Computing Resources		
ATBD	Algorithm specifications or requirements document Details on when application of an algorithm is not appropriate What inputs are required? What reasonableness checks should be made on inputs? What reasonableness checks should be made on the results of the algorithm? If algorithm is incomplete, i.e., does not cover all cases that it should. What is missing? When will it be developed and delivered?	
Source Code	Automated procedures to compile and link the programs	
	Automated test procedures - scripts to run test cases	
	Auxiliary data files - all input data files, other than test data, needed to run the test cases. (Examples are calibration coefficients, default algorithm parameters and model atmospheres)	
	Test data - both inputs and results	
	A description that will answer questions such as: Target platform How to compile How to link How to run the test cases	
	Algorithm architectural design description (annotated calling tree - a drawing/description of how the different routines call each other. It includes a description of each subroutine and data file their inputs, outputs and what the routine does).	
	Definition and characterization of any external dependencies, i.e., Math. library, data base, etc.	

Table 3. Software Code Evaluation

		Comments
Readability/Documentation	Does each module have the standard prologue?	
	Are input and output subroutines isolated from other subroutines?	
	Are definitions, descriptions and units given for all variables?	
	Are declarations and data statements placed after the prologue and before the first executable statement?	
	Are variable names meaningful?	
	Do variable names avoid the use of language keywords?	
	Has structured programming been utilized?	
	Is the code logically and adequately commented, blocked and indented to show structure?	
	Are comments uniformly set-off from code?	
	Are all transfers of control and destinations annotated?	
	Is a path defined for every possible outcome of a logical decision?	
	Is the level of nesting kept to a minimum?	
	If statement labels are used, do they occur in a clear and natural sequence?	
	Is there only one statement per line?	
	Is the program divided into cohesive and comprehensible modules of reasonable size?	
Portability	Is the software written in Standard FORTRAN or Standard C without extensions?	
	Are operating system dependencies limited to a small set of primitive operations?	
	Are mixed binary arrays of fixed and floating point numbers avoided?	
Testability	Are test data and test results provided with the code?	
	Are limit checks performed to ensure that variable contents are within the expected range of values?	
	Are input defaults explicitly tested?	

	Are errors and associated error messages kept together?	
Error Handling/Prevention	Are flagged/missing data values correctly excluded from calculations?	
	Is the code designed to handle errors and failures gracefully?	
	Are possibilities for infinite loops avoided?	
	Are stack overflow problems avoided?	

MODIS Land Prototype

Ruiming Chen
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Work through 09/02/93

MODIS Land Prototype

1. Fire Product

Upon Dr. Chris Justice's requirement, V. Kalb has calibrated the orbit of AVHRR we ran last week using the coefficients from the magnetic tape. Again, I ran the orbit of this newly calibrated AVHRR data using the global fire program. The result is going to be sent to Jackie Kendall to compare with the one we ran last week using Brent Holben's calibration coefficients. I plan to run the orbits on Africa next week.

MODIS Ancillary Data

MODIS ancillary data report has been updated to include information from the new ATBDs. Instead of separating the ancillary data into "routine" and "nonroutine" categories, we have added a column "Arch. at DAAC" to indicate whether or not the data are to be archived at the DAAC. All the ancillary data for generating standard products are going to be archived at the DAAC.

MODIS Geolocation Status

Jim Storey

September 3, 1993

Geolocation Prototyping/AVHRR Test Data

I passed the box containing the 8 millimeter tapes from EDC to Ruiming Chen. While attending the Pecora 12 Symposium in Sioux Falls I discussed the missing orbit with John Faundeen. He has not yet determined why that data set was missed but believes it may have been a problem with the input tape. If this is the case the missing orbit will have to be regenerated (run through the EDC orbit stitching process again).

I have developed initial versions of three routines to simulate the MODIS scanning geometry and to generate test images to demonstrate the scan overlap effect. The first reads an arbitrary input image and resamples it into the MODIS scanning pattern to simulate the corresponding MODIS view of the input image. The second inverts this process by performing nearest neighbor interpolation on an input simulated MODIS image. The third routine projects an input simulated MODIS image onto a regular grid including the effects of pixel overlap by adding overlapped pixels. These routines are in the process of being debugged and ported to the Challenge.

Status Report
for
2 September 1993
Thomas E. Goff

The T-1 line between GSFC and RDC is appearing at it's own pace. The C&P telephone company installed the wiring from the ground floor of RDC to our 4th floor offices. The bailment agreements have been sent to Ames. GSFC engineers know of our existance, are wiring their end, and will test the line when C&P turns the wire over to them. Our IP addresses can potentially come from two external sources (external entities in structured software jargon): the NSI people via GSFC network management for the MODIS machines, and InterNIC for the RDC class C components. The domain address from NSI has been requested from the Ames NSI supervisor. Per a phone call from the NSI networking person, the NSI IP addresses will be assigned on the 21st of September. There is an unresolved issue about the possibility of using NSI routers for InterNIC Class C addresses. Pending more knowledge in this area, RDC will handle the RDC addresses internally on the RDC class C domain address when this is issued, independently of GSFC.

The X-server software, that will reside on the HP730 and be downloaded to the NCD Xterms, is 'in the mail' (actually Federal Express). The tar tape supplied by GSFC was incomplete and without documentation. We will be using rev 3.2 of NCD's ncdWare on CD-ROM media.

I have a nice world mapping software package for PCs that is customizable for user supplied vector sets. I will be happy to provide further information to interested parties.

Considerable thought is currently being given to the criteria for gridded versus mapped level-3 data products. A discussion of the trade offs involved using these two techniques as applied to differing MODIS data products needs to be scheduled at a future date, possibly in time for the MODIS science team meeting.

MODIS SDST Meeting Calendar
September 1993

Monday	Tuesday	Wednesday	Thursday	Friday
Mtg. A: Masuoka, Fleig, Carpenter Mtg. B: Masuoka, Fleig, Barker		1	3-4p: Tech Team 2	10a: SDST, B22, Rm G95 3
Holiday 6	MODIS Calibration 7	8	3-4p: Tech Team 9	10a: SDST, B22, Rm G95 10
2:30-3:30p: A 4-5p: B 13	ECS SRR 14	ECS SRR 15	DPFT IV DOAFT 3-4p: Tech Team 16	DPFT IV DOAFT 17
2:30-3:30p: A 4-5p: B 20	21	22	3-4p: Tech Team 23	10a: SDST, B22, Rm G95 24
2:30-3:30p: A 4-5p: B US/Japan Ocean Color, GSFC 27	Calibration, B22, Rm 241 US/Japan Ocean Color, GSFC 28	8a:Science Team, B8, Auditorium 29	9a:Science Team, B8, Auditorium 30	

MODIS SDST Meeting Calendar
October 1993

Monday	Tuesday	Wednesday	Thursday	Friday
Mtg. A: Masuoka, Fleig, Carpenter Mtg. B: Masuoka, Fleig, Barker		MODIS CDR, Goleta, CA Dec. 7-10, 1993		8:30a:Science Team, B8, Auditorium 1
2:30-3:30p: A 4-5p: B 4	5	6	3-4p: Tech Team 7	10a: SDST, B22, Rm G95 8
2:30-3:30p: A 4-5p: B 11	12	13	3-4p: Tech Team 14	10a: SDST, B22, Rm G95 15
2:30-3:30p: A 4-5p: B 18	19	20	3-4p: Tech Team 21	10a: SDST, B22, Rm G95 22
2:30-3:30p: A 4-5p: B 25	26	27	3-4p: Tech Team 28	10a: SDST, B22, Rm G95 29

MODIS SDST Document Schedule						
Document	Outline	Draft	Revision	Final	Estimated Completion	Responsible Individuals
Software and Data Management Plan	completed	completed	July 15	July 30		Carl, Ed, Al, Lloyd
Science Computing Facility Plan	completed	completed	July 15	July 30		Ed Masuoka
Software Guidelines/Programing Standards						Carl, Tom, John Crocker
Operations Concept	completed	completed	August 13 (to team)	Science Team Meeting		John, Carl, J.J., Jim, Tom
Configuration Management Plan				November		Carl
Quality Assurance Plan				October		Sue
Geolocation ATBD		June 28		July 26	completed	Jim Storey
Level 1A Baseline Requirements	completed	completed	completed		completed	Lloyd, Tom, Carl, Jim
Level 1A Preliminary Design Report						Tom, Jim, John C.
Level 1B Requirements Report						John Barker, Tom, Joann Harnden
Level 2 Shell Requirements Report	Aug 27	Sept 10	Sept 24	Sept 30	Oct 8	J.J., John C.
Software Test Plan						
ATBD meta-documentation	completed			Sept 27		Al